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Department of Energy

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

NOV 29 2005

DOE-0030-06

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

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

Dear Mr. Saric and Mr. Schneider:

TRANSMITTAL OF THE DRAFT CERTIFICATION DESIGN LETTER AND CERTIFICATION PROJECT SPECIFIC PLAN FOR AREA 6 FORMER PRODUCTION AREA AND MAIN DRAINAGE CORRIDOR AREA

Enclosed for your review is the draft Certification Design Letter and Certification Project Specific Plan for Area 6 Former Production Area and Main Drainage Corridor Area.

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

Sincerely,

Johnny W. Reising

Johnny W. Reising
Director

cc w/enclosure:
J. Desormeau, OH/FCP
J. Reising, OH/FCP
T. Schneider, OEPA-Dayton (three copies of enclosure)
G. Jablonowski, USEPA-V, SR-6J
C. Connell, ATSDR
M. Cullerton, Tetra Tech
M. Shupe, HSI GeoTrans
R. Vandegrift, ODH
AR Coordinator, Fluor Fernald, Inc./MS6

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

CERTIFICATION DESIGN LETTER AND CERTIFICATION PROJECT SPECIFIC PLAN FOR AREA 6 FORMER PRODUCTION AREA AND MAIN DRAINAGE CORRIDOR AREA

FERNALD CLOSURE PROJECT
FERNALD, OHIO

NOVEMBER 2005

U.S. DEPARTMENT OF ENERGY

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DRAFT

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CERTIFICATION DESIGN LETTER AND CERTIFICATION PROJECT SPECIFIC PLAN FOR AREA 6 FORMER PRODUCTION AREA AND MAIN DRAINAGE CORRIDOR AREA

Document Number 20810-PSP-0010
Draft Revision A

November 2005

APPROVAL:

Jyh-Dong Chiou, Project Manager Environmental Closure Project	Date
Frank Miller, Characterization Manager Environmental Closure Project	Date
Tom Buhrlage, Sampling Manager Environmental Closure Project	Date
Reinhard Friske, Quality Assurance/Quality Control Safety, Health and Quality	Date

FERNALD CLOSURE PROJECT

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Cincinnati, Ohio 45253-8704

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LIST OF ACRONYMS AND ABBREVIATIONS

ASCOC	area-specific constituent of concern
ASL	analytical support level
BTV	benchmark toxicity value
CDL	Certification Design Letter
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
COC	constituent of concern
CRDL	contract required detection limit
CU	certification unit
CVAA	Cold Vapor Atomic Absorption
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
FACTS	Fernald Analytical Computerized Tracking System
FAL	Field Activity Log
FCP	Fernald Closure Project
FPA	Former Production Area
FRL	final remediation level
GC	gas chromatograph
GC/MS	gas chromatography/mass spectroscopy
HWMU	Hazardous Waste Management Unit
ICP/MS	inductively coupled plasma/mass spectroscopy
LSC	liquid scintillation counting
µg/kg	micrograms per kilogram
µg/L	micrograms per liter
MDC	Main Drainage Corridor
MDL	minimum detectable level
mg/L	milligrams per liter
mg/kg	milligrams per kilogram
NAD83	North American Datum of 1983
OEPA	Ohio Environmental Protection Agency
OU	Operable Unit
PCB	polychlorinated biphenyl
pCi/g	picoCuries per gram
PSP	Project Specific Plan
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
SCQ	Sitewide CERCLA Quality Assurance Project Plan
SED	Sitewide Environmental Database
SEP	Sitewide Excavation Plan
SPL	Sample Processing Laboratory
SVOC	semi-volatile organic compound
TAL	Target Analyte List
TAT	turnaround time
UCL	Upper Confidence Limit
UST	underground storage tank
V/FCN	Variance/Field Change Notice
VOC	volatile organic compound
VSL	validation support level
WAC	waste acceptance criteria

LIST OF ACRONYMS AND ABBREVIATIONS
(Continued)

WAO	Waste Acceptance Organization
yd^3	cubic yards

EXECUTIVE SUMMARY

This document is a combination of the Certification Design Letter and Certification Sampling Project Specific Plan for Area 6 Former Production Area (FPA), Main Drainage Corridor (MDC) Area into one document. This document describes the certification design, sampling, analysis, and validation for Area 6 FPA and MDC Area. These areas fall in an area that was originally identified as Area 3, Area 4A, Area 4B, and Area 6 FPA. Certification demonstrates that risk based, area-specific constituents of concern (ASCOCs) meet the final remediation levels. The following information is included:

- The original boundary of Area 3, Area 4A, Area 4B, and Area 6;
- The boundary of MDC Area and Area 6 FPA and a description of the areas to be certified under the guidance of this document;
- A discussion of historical data from the area proposed for certification;
- A discussion of the ASCOC selection process and list of ASCOCs assigned to the MDC Area and Area 6 FPA;
- A presentation of the certification unit (CU) boundaries and proposed sampling strategy;
- Details of certification sampling, analysis, and validation that will take place;
- The analytical requirements and the statistical methodology that will be employed; and
- The proposed schedule for the certification activities.

The scope of this certification effort is limited to the certification of Area 6 FPA and MDC Area, as shown on Figure 1-2. Remediation was complete in Area 6 FPA and MDC Area in 2005, thus initiating the certification process described in this document. Field sampling is scheduled to begin immediately following approval of this document.

The certification design presented in this document follows the general approach outlined in Section 3.4 of the Sitewide Excavation Plan (SEP, DOE 1998a) and SEP Addendum (DOE 2001a). The only exception to this certification approach is that some samples collected under this certification effort will be through a roadbed to the underlying soil. This roadbed was designed to allow for entry of restoration vehicles to the certified areas adjacent to Area 6 FPA and MDC Area.

The selection of Area 6 FPA and MDC Area ASCOCs was accomplished using constituent of concern (COC) lists in the Operable Unit 5 Record of Decision (DOE 1996), previous investigation data, and process knowledge. Thirty CUs have been defined for this certification effort. Total uranium, thorium-228, thorium-232, radium-226, and radium-228 (the sitewide primary radiological COCs) are considered ASCOCs in each CU. Secondary COCs are identified for specific CUs within the certification area, including those for closure of Underground Storage Tank 6, Hazardous Waste Management Unit (HWMU) 17, HWMU 36, and HWMU 48.

1.0 INTRODUCTION

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

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

2.0 Historical and Precertification Data - Discussion of historical soil data and presentation of precertification data from Area 6 FPA and MDC Area

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

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

5.0 Schedule

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

7.0 Health and Safety

8.0 Disposition of Waste

9.0 Data Management

References

1.1 OBJECTIVES

The primary objectives of this document are to:

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

1.2 SCOPE AND AREA DESCRIPTION

The scope of this CDL and Certification PSP includes details of certification sampling, analysis, and validation that will take place in Area 6 FPA and MDC Area. The only exception to this certification approach is that some samples collected under this certification effort will be through a roadbed to the underlying soil. This roadbed was designed to allow for entry of restoration vehicles to the certified areas adjacent to Area 6 FPA and MDC Area.

It should be noted that the scope of Area 6 FPA and MDC Area was originally included in Area 3, Area 4A, Area 4B, and Area 6. Figure 1-1 depicts the area to be certified under this CDL and Certification PSP as well as the original layout of Area 3, Area 4A, Area 4B, and Area 6.

Area 6 FPA and MDC Area is located in between Areas 3A and 3B, to the north and east of Area 3A, between Areas 3A and 4A, and between Areas 4A and 4B. The western section of Area 6 FPA and MDC Area is bounded by 1st Street to the south, Area 3B and 4B to the west, and Area 3A and 4A to the east. The northern section of Area 6 FPA and MDC Area is bounded by "B" Street to the west, Area 3A to the south, Area 1 to the east, and the railyard to the north. The eastern section of Area 6 FPA and MDC Area is bounded by Area 3A to the west, Area 1 to the east, 2nd Street to the south, and the railyard to the north. Predominant structures formerly located in Area 6 FPA and MDC Area includes KC-2 Warehouse and the Scrap metal pile, Tank Farm Sump and Tank Farm Settling Basin. Area 6 FPA and MDC Area also includes a high-leachability zone where the total uranium FRL is 20 milligrams per kilogram (mg/kg), Hazardous Waste Management Unit (HWMU) 36 (Storage Pad north of Plant 6), HWMU 17 (Plant 8 East Drum Storage Pad), HWMU 48 (UNH Tank southwest of Plant 2A), and Underground Storage Tank (UST) 6 (Maintenance Shop) as shown on Figure 1-2. Area 6 FPA and MDC Area is approximately 34.4 acres. Figure 1-3 depicts the topography of Area 6 FPA and MDC Area.

1.3 KEY PROJECT PERSONNEL

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

TABLE 1-1
KEY PROJECT PERSONNEL

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

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

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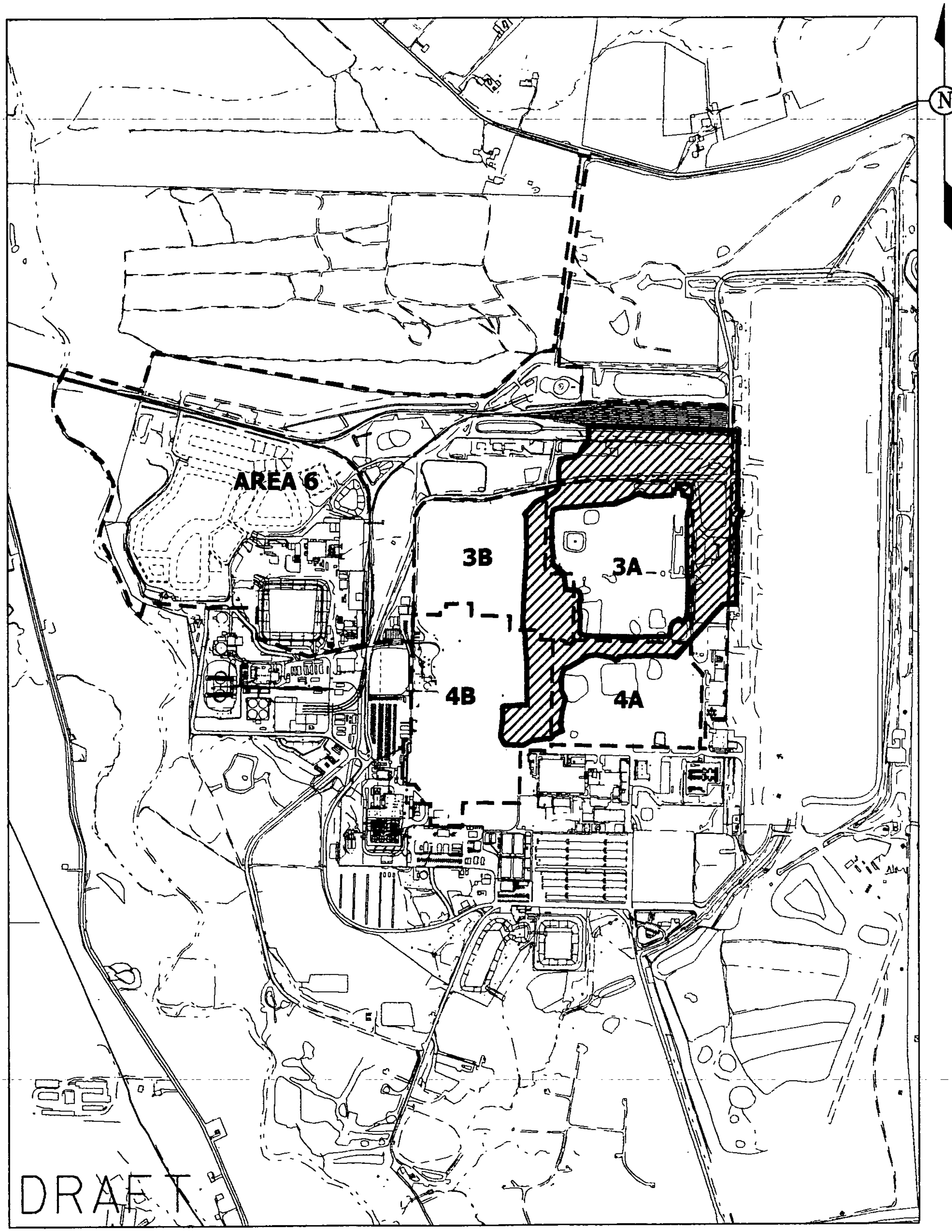
STATE PLANAR COORDINATE SYSTEM 1983

22-NOV-2005



LEGEND:

- - - ORIGINAL AREA 3, AREA 4A, AREA 4B, AND AREA 6 BOUNDARY

AREA 6 FPA & MDC BOUNDARY

SCALE

1000 500 0 1000 FEET

FIGURE 1-1. AREA 6 FPA AND MDC AREA LOCATION MAP

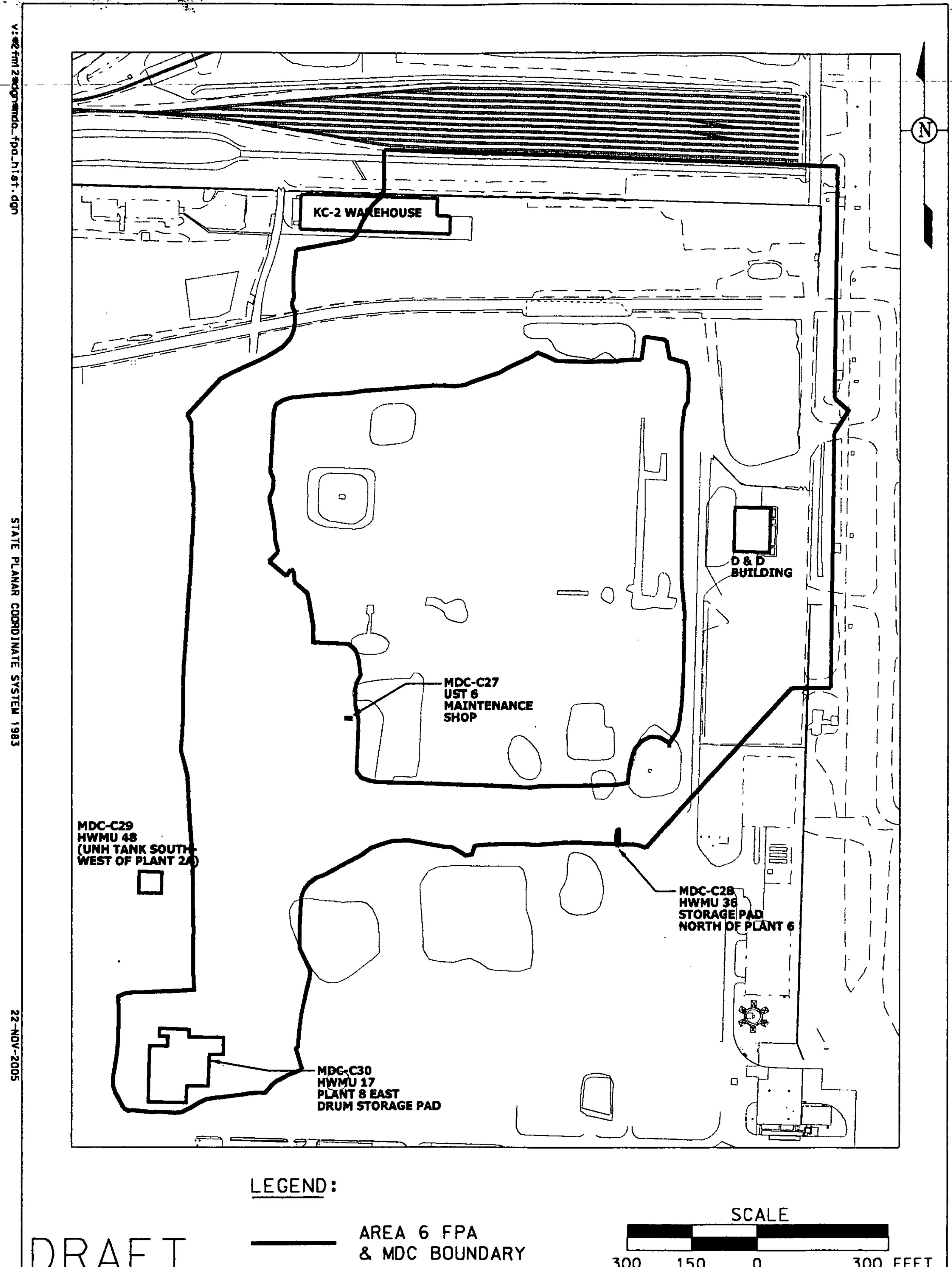


FIGURE 1-2. AREA 6 FPA AND MDC AREA HISTORICAL SURFACE FEATURES

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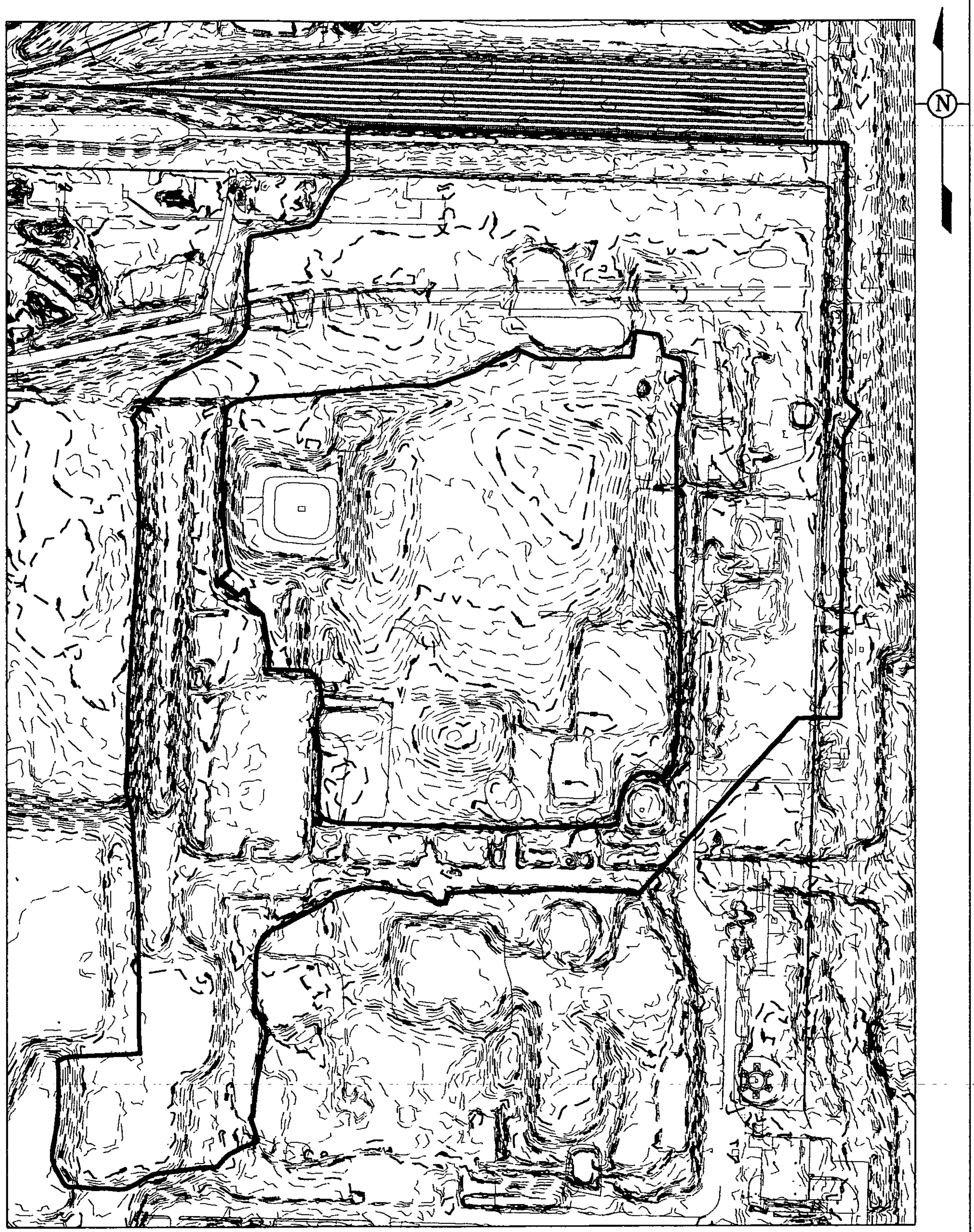

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STATE PLANAR COORDINATE SYSTEM 1983

22-NOV-2005

LEGEND:

AREA 6 FPA
& MDC BOUNDARY

SCALE

300 150 0 300 FEET

DRAFT

FIGURE 1-3. AREA 6 FPA AND MDC AREA TOPOGRAPHY

2.0 HISTORICAL AND PRECERTIFICATION DATA

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

In addition to the Predesign Investigations, the Remedial Investigation Reports (RI, DOE 1995a and 1995b), and Feasibility Study Reports (FS, DOE 1995c and 1995d) for Operable Units (OU) 3 and 5 were used for remedial design of Area 6 FPA and MDC Area. Final grade excavation monitoring/ sampling and real-time scanning/sampling data have been collected pursuant to the Remedial Investigation/Feasibility Study and remedial activities.

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

2.1 Area 6 FPA and MDC Area

2.1.1 Area 6 FPA and MDC Area Historical, Predesign and Excavation Control

All historical data for Area 6 FPA and MDC Area are presented in the Implementation Plan for Area 3A/4A (DOE 2001b), Implementation Plan for Area 3B/4B/5 (DOE 2004a), and the Implementation Plan for Area 6 Former Production Area (DOE 2005a). This includes data collected during the RI/FS and during three separate predesign investigations; PSP for Delineating Known Exceedances of the On-Site Disposal Facility WAC in Areas 3B/4B/5 (DOE 2002a), PSP for Area 3 Predesign Investigation of Potentially Characteristic Areas (DOE 1998b), PSP for Predesign of Area 6 Subarea 1 (Supplement to 20300-PSP-0011) (DOE 2005b), and PSP for Predesign of Area 6 Subarea 2 (Supplement to 20300-PSP-0011) (DOE 2004b). Data were also collected during the remediation/excavation activities for excavation control and following the remediation/excavation activities for precertification per the PSP for Area 3A/4A Excavation Characterization and Precertification (DOE 2002b), PSP for Excavation Control of Areas 3B, 4B, and 5 (Supplement to 20300-PSP-0011) (DOE 2004c), and PSP for Excavation Control of Area 6 - Former Production Area (Supplement to 20300-PSP-0011) (DOE 2005c).

The following is a brief discussion of the remediation/excavation activities of the utility isolation trench, above-WAC, HWMU, and UST areas in Area 6 FPA and MDC Area. The excavation activities within this area were completed to not only capture the contamination plume but were extended to capture any subsurface utilities that existed below the design grade.

In order to verify that the trenching method used to isolate all subsurface utilities in the adjacent areas did not introduce contamination further into the subsurface, borings were placed along the length of the utility isolation trench footprint. Samples of the disturbed soil, which resulted from churning action of the trenching equipment, were collected from the existing surface and from the base of the trench just above the native surface. The sampling is described in detail in Variance/Field Change Notice (V/FCN) 20600-PSP-0015-12 written to the PSP for Excavation Control of Area 6 FPA. All samples of the disturbed soil along the length of the Utility Isolation Trench demonstrated that the trenching activities did not spread or introduce contamination into the disturbed soils. Therefore, excavation of any disturbed soil beneath the design grade was not performed. The variance, sampling locations, and data for this sampling event are presented in Appendix A.

There was one designed above-WAC area that originally fell in Area 6 FPA, but is now included in Area 6 FPA and MDC Area. During remediation/excavation activities in Area 6 FPA, additional above-WAC (i.e., visible product) material was discovered in the northwest section of the area. This material was excavated until all of the visible product material was removed. All above-WAC material was removed during the remediation/excavation activities in Area 6 FPA and MDC Area. Once all of the above-WAC material was removed from these areas, the excavation proceeded to remove the remaining above-FRL material.

The final above-WAC soil volume removed from Area 6 FPA and MDC Area was 1,680 (bank) cubic yards (yd^3). The final above-FRL soil and concrete volume removed from Area 6 FPA and MDC Area was 199,092 (bank) yd^3.

One UST was listed in Section 2.1.5 of the Implementation Plan for Area 3A/4A as being within the original Area 3A boundaries; however, because the certification boundary for Area 3A was reduced, UST 6 is now within the boundaries of Area 6 FPA and MDC Area.

One HWMU was listed in Section 2.1.4 of the Implementation Plan for Area 3A/4A as being within the original Area 4A boundary; however, because the certification boundary for Area 4A was reduced, HWMU 36 is now within the boundary of MDC Area. Additionally, one HWMU was listed in Section 2.1.4 of the Implementation Plan for Area 3B/4B/5 as being within the original Area 4B boundary; however, because the certification boundary for Area 4B was reduced, HWMU 17 is now within the boundary Area 6 FPA and MDC Area. Finally, HWMU 48 was added to the list of HWMUs to be closed by the Soils Project as Part of the Joint Resource Conservation and Recovery Act (RCRA)/Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Process as discussed in Letter DOE-0005-05 entitled Final Remediation Level Development and Resource Conservation and Recovery Act Hazardous Waste Management Unit Closure (DOE 2004d).

2.1.2 Precertification Data

According to guidelines established in Section 3.3.3 of the SEP, precertification activities were conducted to evaluate residual radiological contamination patterns as specified in the PSP for Guidelines for General Characterization for Sitewide Soil Remediation (DOE 2005d). Prior to conducting a precertification real-time scan, Area 6 FPA and MDC Area was scanned with a magnetometer to determine if residual debris remained following excavation activities. Minor occurrences of metallic objects were located and were either excavated or hand picked from the area.

Due to the shine of the staged silos canisters north of the rail yard extensive interference was detected with the real-time measurement systems. As shown on Figure B-1 the total gross counts per second were elevated in a unique pattern from this interference. To correct for this situation, V/FCN 20300-PSP-0011-02 was written to precertification protocols found in the PSP Guidelines for General Characterization for Sitewide Soil Remediation.

All areas in Area 6 FPA and MDC Area passed the requirements of precertification. The results of the precertification scans are presented on data maps in Appendix B.

Subsequent to the initial precertification, a vehicle entered the area from an uncertified area without deconning the equipment. The potentially impacted area was re-scanned by Real-Time personnel. The uranium data are presented in Figure B-4a as indicators that precertification conditions still exist in this area.

3.0 AREA-SPECIFIC CONSTITUENTS OF CONCERN

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

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

3.1 SELECTION CRITERIA

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

- It is listed as a soil COC in the OU5 ROD, and it is listed as an ASCOC in Table 2-7 of the SEP for the Remediation Area of interest;

- It is listed as a COC for the HWMU(s) of interest (Table 2-1 of the SEP) or the UST(s) of interest (Table 2-2 of the SEP) that lies within the certification area boundary;

- It can be traced to site use in the remediation area of interest, either through process knowledge or known release of the constituent to the environment;

- Analytical results indicate that a contaminant is present above its FRL, and the above-FRL concentrations are not attributable to false positives or elevated CRDLs;

- Physical characteristics of the contaminant, such as degradation rate and volatility, indicate it is likely to persist in the soil between time of release and remediation; or

- The contaminant is one of the sitewide primary COCs (total uranium, radium-226, radium-228, thorium-238, and thorium-232).

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

3.1.1 ASCOC Selection

Each COC listed in Table 3-1 was evaluated for their relevance to Area 6 FPA and MDC Area. Table 3-2 presents the reasoning for either retaining or eliminating the ASCOC. Table 3-3 lists the ASCOCs for Area 6 FPA and MDC Area and Table 3-4 lists the ASCOCs by CU.

TABLE 3-1
AREA 3/AREA 4/AREA 6 ASCOC LIST

ASCOC	FRL/(*BTV*)[a]
Radionuclides	
Total Uranium[b]	20 mg/kg
Radium-226	1.7 pCi/g
Radium-228	1.8 pCi/g
Thorium-228	1.7 pCi/g
Thorium-232	1.5 pCi/g
Cesium-137	1.4 pCi/g
Plutonium-238	78 pCi/g
Strontium-90	14 pCi/g
Technetium-99	30.0 pCi/g
Thorium-230	280 pCi/g
Organic	
1,1-dichloroethene	0.16 mg/kg
1,2-dichloroethane	0.015 mg/kg
1,1,1-tricholoroethane	4.3 mg/kg
Acetone	43,000 mg/kg
Aroclor-1254	0.13 mg/kg
Aroclor-1260	0.13 mg/kg
Benzene	850 mg/kg
Benzo(a)pyrene	2.0 mg/kg/(*1.0 mg/kg*)
Bromodichloromethane	4.0 mg/kg
Carbon tetrachloride	2.1 mg/kg
Dibenzo(a,h)anthracene	2.0 mg/kg /(*0.088 mg/kg*)
Dieldrin	0.015 mg/kg
Ethylbenzene	5,100 mg/kg
Fluoride	78,000 mg/kg
Heptachlorodibenzo-p-dioxins	0.00108 mg/kg
Methyl Chloride	37 mg/kg /(*85 mg/kg*)
Methyl Ethyl Ketone (2-butanone)[c]	23.5 mg/kg[c]
Octachlorodibenzo-p-dioxin	0.0088 mg/kg
Tetrachloroethene	3.6 mg/kg
Toluene	100,000 mg/kg
Trichloroethene	25 mg/kg
Xylene	920,000 mg/kg

TABLE 3-1
AREA 3/AREA 4/AREA 6 ASCOC LIST

ASCOC	FRL/(*BTV*)[a]
Metals	
Antimony	96 mg/kg (*10 mg/kg*)
Arsenic	12.0 mg/kg
Barium	68,000 mg/kg
Beryllium	1.5 mg/kg
Cadmium	82 mg/kg /(*5.0 mg/kg*)
Chromium	300 mg/kg /(*0.05 mg/kg*)
Lead	400 mg/kg
Mercury	7.5 mg/kg /(*5.0 mg/kg*)
Selenium	5400 mg/kg /(*3.0 mg/kg*)
Ecological	
Antimony	96 mg/kg/(*10 mg/kg*)
Molybdenum	2900 mg/kg /(*10 mg/kg*)
Silver	29,000 mg/kg /(*10 mg/kg*)
Benzo(a)anthracene	20 mg/kg /(*1.0 mg/kg*)
Benzo(b)fluoranthene	20 mg/kg /(*1.0 mg/kg*)
Benzo(g,h,i)perylene	(*1.0 mg/kg*)
Benzo(k)fluoranthene	200 mg/kg /(*1.0 mg/kg*)
Chrysene	2000 mg/kg /(*1.0 mg/kg*)
Fluoranthene	(*10 mg/kg*)
Indeno(1,2,3-cd)pyrene	20 mg/kg/(*1.0 mg/kg*)
Phenanthrene	(*5 mg/kg*)
Pyrene	(*10 mg/kg*)

[a] Benchmark toxicity value (BTV) applies to Ecological COCs.

[b] The total uranium FRL is lower in the defined high leachability zones.

[c] 2-butanone does not have an associated soil FRL. 23.5 mg/kg is listed on Table 1 of the June 2004 Closure Plan Review Guidance for RCRA Facilities, written by the Ohio Environmental Protection Agency (OEPA) Division of Hazardous Waste Management (OEPA 2004).

pCi/g - picoCuries per gram

TABLE 3-2
ASCOC LIST FOR AREA 6 FPA AND MDC AREA

ASCOC	Retained as ASCOC?	Justification	CU(s)
Radionuclides			
Total Uranium	Yes	Primary Radionuclide	All
Radium-226	Yes	Primary Radionuclide	All
Radium-228	Yes	Primary Radionuclide	All
Thorium-228	Yes	Primary Radionuclide	All
Thorium-232	Yes	Primary Radionuclide	All
Thorium-230	No	Only one above-FRL concentration was detected within Area 6 FPA and MDC Area. This single exceedance was located within the excavation footprint in the 0 to 0.5-foot interval and will therefore not be retained as a secondary COC.	None
Cesium-137	Yes	Two above-FRL concentrations were detected within Area 6 FPA and MDC Area. The first exceedance was located near the KC-2 Warehouse and was within the excavation footprint in the 0 to 0.5-foot (surface) interval. Therefore it will not be retained as a secondary COC in that area. The second exceedance was in the 6 to 6.5-foot (subsurface) interval and therefore is more likely to persist even though the area was excavated.	25, 30
Plutonium-238	No	Not detected at concentrations above the FRL	None
Strontium-90	No	Not detected at concentrations above the FRL	None
Technetium-99	Yes	Above-FRL and above-WAC concentrations were detected within Area 6 FPA and MDC Area.	11-18, 23-30
Organic			
1,1-dichlorethene	Yes	UST 6 specific COC.	27
1,2-dichloroethane	Yes	UST 6 specific COC.	27
1,1,1-tricholoroethane	Yes	HWMU 36 and UST 6 specific COC. Only one above-FRL concentration detected within Area 6 FPA and MDC Area. This single exceedance was located within the excavation footprint in the 0 to 0.5-foot interval and will therefore not be retained as a secondary COC.	27, 28
Acetone	Yes	UST 6 specific COC	27
Aroclor-1254	Yes	Above-FRL concentrations within Area 6 FPA and MDC Area.	2-5, 13-16, 22, 27, 29
Aroclor-1260	Yes	Above-FRL concentrations within Area 6 FPA and MDC Area.	5, 16
Benzene	Yes	UST 6 specific COC	27
Benzo(a)anthracene	Yes	UST 6 specific COC. Ecological ASCOC	13, 14, 27
Benzo(b)fluoranthene	Yes	UST 6 specific COC. Ecological ASCOC	13, 14, 27
Benzo(a)pyrene	Yes	Above-FRL concentrations within Area 6 FPA and MDC Area. UST 6 specific COC. Ecological ASCOC.	2, 3, 13, 14, 16, 27
Benzo(g,h,i)perylene	Yes	UST 6 specific COC. Ecological ASCOC	13, 14, 27
Benzo(k)fluoranthene	Yes	UST 6 specific COC. Ecological ASCOC	13, 14, 27

TABLE 3-2
ASCOC LIST FOR AREA 6 FPA AND MDC AREA

ASCOC	Retained as ASCOC?	Justification	CU(s)
Bromodichloromethane	No	Not detected at concentrations above the FRL	None
Carbon tetrachloride	Yes	UST 6 specific COC.	27
Chrysene	Yes	UST 6 specific COC. Ecological ASCOC	13, 14, 27
Dibenzo(a,h)anthracene	Yes	UST 6 specific COC. Ecological ASCOC	13, 14, 27
Dieldrin	No	Not detected at concentrations above the FRL	None
Ethylbenzene	Yes	UST 6 specific COC.	27
Fluoranthene	Yes	UST 6 specific COC. Ecological ASCOC	13, 14, 27
Fluoride	No	Not detected at concentrations above the FRL	None
Heptachlorodibenzo-p-dioxins	No	Not detected at concentrations above the FRL	None
Indeno(1,2,3-cd)pyrene	Yes	UST 6 specific COC. Ecological ASCOC	13, 14, 27
Methyl Chloride	Yes	UST 6 specific COC	27
2-butanone	Yes	HWMU 17 and UST 6 specific COC	27, 30
Octachlorodibenzo-p-dioxin	No	Not detected at concentrations above the FRL	None
Phenanthrene	Yes	UST 6 specific COC. Ecological ASCOC	13, 14, 27
Pyrene	Yes	UST 6 specific COC. Ecological ASCOC	13, 14, 27
Tetrachloroethene	Yes	UST 6 specific COC.	27
Toluene	Yes	UST 6 specific COC	27
Trichloroethene	Yes	UST 6 specific COC.	27
Xylenes	Yes	HWMU 17 and UST 6 specific COC	27, 30
Metals			
Arsenic	Yes	UST 6 specific COC. Five above-FRL concentrations detected within Area 6 FPA and MDC Area	2, 5, 7, 22, 24, 27
Barium	Yes	HWMU 48 specific COC	29
Beryllium	Yes	Above-FRL concentrations within Area 6 FPA and MDC Area	7, 16, 18, 29
Cadmium	Yes	UST 6 specific COC. Ecological ASCOC.	6, 7, 11-15, 17, 18, 27, 28
Chromium	Yes	HWMU 48 and UST 6 specific COC	27, 29
Lead	Yes	HWMUs 17, 36, 48, and UST 6 specific COC. Above-FRL concentrations within Area 6 FPA and MDC Area	22, 27, 28, 29, 30
Mercury	Yes	HWMU 48 and UST 6 specific COC	27, 29
Selenium	Yes	UST 6 specific COC	27
Ecological			
Antimony	Yes	Ecological ASCOC	11-15, 27
Molybdenum	Yes	Ecological ASCOC.	2, 6, 7, 11-15, 27
Silver	Yes	Ecological ASCOC.	6-8, 11-15, 27

TABLE 3-3
AREA 6 FPA AND MDC AREA ASCOC LIST

ASCOC	FRL/Residential Generic Cleanup Number/(*BTV*[a])
Radionuclides	
Total Uranium [b]	20 mg/kg
Radium-226	1.7 pCi/g
Radium-228	1.8 pCi/g
Thorium-228	1.7 pCi/g
Thorium-232	1.5 pCi/g
Technetium-99	30.0 pCi/g [c]
Cesium-137	1.4 pCi/g
Organic	
1,1-dichloroethene	0.16 mg/kg
1,2-dichloroethane	0.015 mg/kg
1,1,1-Tricholoroethane	4.3 mg/kg
Acetone	43,000 mg/kg
Aroclor-1254	0.13 mg/kg
Aroclor-1260	0.13 mg/kg
Benzene	850 mg/kg
Benzo(a)pyrene	2.0 mg/kg/(*1.0 mg/kg*)
Benzo(a)anthracene	20 mg/kg /(*1.0 mg/kg*)
Benzo(b)fluoranthene	20 mg/kg /(*1.0 mg/kg*)
Benzo(g,h,i)perylene	(*1.0 mg/kg*)
Benzo(k)fluoranthene	200 mg/kg /(*1.0 mg/kg*)
Carbon tetrachloride	2.1 mg/kg
Chrysene	2000 mg/kg /(*1.0 mg/kg*)
Dibenzo(a,h)anthracene	2.0 mg/kg /(*0.088 mg/kg*)
Ethylbenzene	5,100 mg/kg
Fluoranthene	(*10 mg/kg*)
Indeno(1,2,3-cd)pyrene	20 mg/kg/(*1.0 mg/kg*)
Methyl Chloride	37 mg/kg /(*85 mg/kg*)
2-butanone[d]	23.5 mg/kg[d]
Phenanthrene	(*5 mg/kg*)
Pyrene	(*10 mg/kg*)
Tetrachloroethene	3.6 mg/kg
Toluene	100,000 mg/kg
Trichloroethene	25 mg/kg
Xylene	920,000 mg/kg

TABLE 3-3
AREA 6 FPA AND MDC AREA ASCOC LIST

ASCOC	FRL/Residential Generic Cleanup Number/(*BTV*[a])
Metals	
Antimony	96 mg/kg/(*10 mg/kg*)
Arsenic	12.0 mg/kg
Barium	68,000 mg/kg
Beryllium	1.5 mg/kg
Cadmium	82 mg/kg /(*5.0 mg/kg*)
Chromium	300 mg/kg [e]
Lead	400 mg/kg
Mercury	7.5 mg/kg
Molybdenum	2900 mg/kg /(*10 mg/kg*)
Selenium	5,400 mg/kg
Silver	29,000 mg/kg /(*10 mg/kg*)

[a] Benchmark toxicity value (BTV) applies to Ecological COCs.
[b] The total uranium FRL is lower in the defined high leachability zones.

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

[d] 2-butanone does not have an associated soil FRL. 23.5 mg/kg is listed as a General Cleanup Number.

[e] The FRL is actually for hexavalent chromium because total chromium does not have a FRL.

TABLE 3-4
AREA 6 FPA AND MDC AREA ASCOCs BY CU

	CU																													
ASCOCs	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27-U06**	**28-H36**	**29-H48**	**30-H17**
Total Uranium	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Radium-226	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Radium-228	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Thorium-228	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Thorium-232	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Cesium-137																									X					X
Technetium-99											X	X	X	X	X	X	X	X					X	X	X	X	X	X	X	X
Antimony											X	X	X	X	X												X			
Arsenic		X			X		X															X		X			X			
Barium																													X	
Beryllium							X									X		X											X	
Cadmium						X	X				X	X	X	X	X		X	X									X	X		
Chromium																											X		X	
Lead																						X					X	X	X	X
Mercury																											X		X	
Molybdenum		X				X	X				X	X	X	X	X												X			
Selenium																											X			
Silver						X	X	X			X	X	X	X	X												X			
1,1-dichlorethene																											X			
1,2-dichlorethane																											X			
1,1,1-tricholoroethane																											X	X		
Acetone																											X			
Aroclor-1254		X	X	X	X								X	X	X	X						X					X		X	
Aroclor-1260					X											X														
Benzene																											X			
Benzo(a)anthracene													X	X													X			
Benzo(a)pyrene		X	X										X	X		X											X			
Benzo(b)fluoranthene													X	X													X			
Benzo(g,h,i)perylene													X	X													X			
Benzo(k)fluoranthene													X	X													X			

TABLE 3-4
AREA 6 FPA AND MDC AREA ASCOCs BY CU

ASCOCs	CU																													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27-U06	28-H36	29-H48	30-H17
Carbon tetrachloride																											X			
Chrysene													X	X													X			
Dibenzo(a,h)anthracene													X	X													X			
Ethylbenzene																											X			
Fluoranthene													X	X													X			
Indeno(1,2,3-cd)pyrene													X	X													X			
Methyl Chloride																											X			
2-Butanone																											X			X
Phenanthrene													X	X													X			
Pyrene													X	X													X			
Tetrachloroethene																											X			
Toluene																											X			
Trichloroethene																											X			
Xylene																											X			X

4.0 CERTIFICATION APPROACH

4.1 CERTIFICATION DESIGN

The certification design for Area 6 FPA and MDC Area follows the general approach outlined in Section 3.4 of the SEP. The design for Area 6 FPA and MDC Area is depicted on Figure 4-1 and the sample locations are depicted in Figures 4-2 through 4-11. As discussed in Section 3.0 of this document, the five primary ASCOCs (total uranium, radium-226, radium-228, thorium-228, and thorium-232) will be retained in each CU. Additional secondary COCs are identified for specific CUs within the certification area as well as unique COCs for HWMUs 17, 36, and 48; and UST 6.

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

4.1.1 Certification Unit Design

Area 6 FPA and MDC Area consists of 26 Group 1 CUs as well as four CUs designed around the boundaries of three HWMUs and one UST. As shown of Figure 4-1, 17 CUs 3, 4, 7, 8, 9, 11, 15, 16, 17, 18, 23, 24, 25, 26, 28, 29, and 30 are either partially or entirely within a high leachability zone. As a conservative measure, these 17 CUs will be treated as though they were completely within a high leachability zone.

Due to the presence of HWMUs 17, 36, 48 and UST 6 in Area 6 FPA and MDC Area, the certification effort must include demonstration of soil FRL attainment, HWMU, and UST closure. Per Sections 2.2.5 (HWMU closure) and 2.2.6 (UST closure) of the SEP:

- Each HWMU and UST footprint will form a distinct CU.

- At least eight locations will be sampled in each HWMU and UST.

- Samples will be analyzed for the COCs identified for each particular HWMU in Table 2-1 and UST in Table 2-2 of the SEP.

4.1.2 Sample Location Design

The selection of certification sampling locations was conducted according to Section 3.4.2 of the SEP. Each CU was first divided into 16 approximately equal sub-CUs with the exception of HWMU 17 (12 approximately equal sub-CUs); HWMUs 36 and 48 (eight approximately equal sub-CUs); and the

UST 6 (eight approximately equal sub-CUs). Sample locations were then generated by randomly selecting an easting and northing coordinate within the boundaries of each sub-CU, then testing those locations against the minimum distance criteria for the CU. If the minimum distance criteria were not met, an alternative random location was selected for that sub-CU, and all the locations were re-tested. This process continued, until all random locations met the minimum distance criteria.

A road was constructed of clean gray clay within the northern section of Area 6 FPA in order to allow access for restoration vehicles to haul restoration materials into Certified Areas 3A, 4A, and 3B. Several random sample locations fell within the bounds of this road. Samples will be collected from the brown clay by boring through the roadbed (i.e. gray clay) to the surface to be certified.

All Area 6 FPA and MDC Area sub-CUs and planned certification sampling locations are shown on Figures 4-2 through 4-11. Samples will be collected for analysis from 0 to 6 inches in each CU. Four of the 16 sample locations (one location from each quadrant of the non-HWMU CUs) are designated with a "V," indicating archive sample locations. No archive sample locations are planned for the HWMU or UST CUs. Archive samples will not be collected unless they are needed for additional analysis. One sample location in each CU is designated with a "D," indicating a field duplicate sample collection location.

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

4.2 SURVEYING

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

The Area 6 FPA and MDC Area CU boundaries are shown on Figure 4-1, and the tentative certification sampling locations for CUs one through 26 are shown on Figures 4-2 through 4-7. The tentative sample locations for the HWMU 17, 36, and 48 footprints are shown on Figures 4-9, 4-10, and 4-11 respectively. The tentative sample locations for the UST 6 footprint are shown on Figure 4-8. All tentative certification sample locations meet the minimum distance criterion. All sample location information can be found in Appendix C.

4.3 PHYSICAL SOIL SAMPLE COLLECTION

4.3.1 Sample Collection

Soil samples will be collected in accordance with procedure SMPL-01, Solids Sampling. Surface samples will be collected using 3-inch diameter, 6-inch long, plastic liners, or an alternate method as identified in SMPL-01, as long as sufficient volume is collected from the appropriate depth to perform the prescribed analyses. Sampling at depth will be completed using the Geoprobe® Model 5400 and Model 6600 per EQT-06, or an alternate method identified in SMPL-01, as long as sufficient volume is collected from the appropriate depth to perform the prescribed analyses. Ultimately, the method of sample collection will be left to the discretion of the Field Sampling Lead. Following sample collection, each soil core shall be divided, if necessary, and placed into the proper sample containers. Upon completion of sample collection, the boreholes will be collapsed and no additional abandonment is necessary.

Quality control sample requirements will include a duplicate field sample, a trip blank, and a container blank and/or rinsate, and will be collected per procedure SMPL-21, Collection of Field Quality Control Samples. For the duplicate field sample, twice the soil volume (a second core) will be collected at one location in the CU, and will not be homogenized with the original sample. The location that requires the collection of a duplicate sample is identified in Appendix C. A trip blank will be collected each day that volatile organic compound (VOC) samples are collected, or one per 20 VOC samples that are collected, or one per cooler that will be shipped, whichever is more frequent. Depending on the sample collection method used, container blanks and/or rinsates will be collected. If container blanks are collected, one will be done before sample collection begins and one at the conclusion of sample collection for the entire Area 6 FPA and MDC Area. If rinsate(s) are required, one rinsate will be collected at a minimum frequency of one per 20 pieces of equipment reused in the field. All samples will be assigned unique sample identification numbers.

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

- The distance moved must be as small as possible (less than 3 feet);
- It must remain within the boundary of the same CU and sub-CU, and must still meet the minimum distance criterion;
- If the distance moved is greater than 3 feet, the move must be documented in a V/FCN, considered as significant, which will be approved by the agencies prior to collection.
- Anytime a location is moved, the appropriate figure should be used to determine the best direction to move the point to adhere to the above guidelines. The Characterization Manager or designee should be contacted when a sample location is moved. All final sampling locations will be documented in the Area 6 FPA and MDC Area Certification Report.

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

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

4.3.2 <u>Equipment Decontamination</u>

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

4.3.3 <u>Physical Sample Identification</u>

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

MDC	=	Sample collected from Remediation Area 6 FPA and MDC Area
C##	=	Certification unit from which sample was collected
H##	=	HWMU number (if applicable) from which sample was collected
U##	=	UST number (if applicable) from which sample was collected
Location	=	Sample location number within the CU [1 through 16 (12 for HWMU 17, 8 for HWMUs 36 and 48, and 8 for UST 6)]
Analysis	=	"R" indicates radiological analysis; "M" indicates metals analysis; "P" indicates polychlorinated biphenyl (PCB) analysis; "S" indicates semi-volatile organic compound (SVOC) analysis; and "L" indicates VOC analysis.

QC = Quality control sample, if applicable. A "D" indicates a field duplicate sample; "Y1" indicates the first container blank sample; "X1" indicates the first rinsate sample; "TB1" indicates the first trip blank collected, and each additional trip blank collected will be consecutively numbered.

For example, a field duplicate sample taken from the 3rd sample location from Area 6 FPA and MDC Area CU 28, HWMU 36 for VOC analysis would be identified as MDC-C28-H36-3^L-D. If a rinsate sample is required, the first rinsate sample will be identified as MDC-C-X1-M and MDC-C-X1-R. If a container blank is required, the first container blank will be identified as MDC-C-Y1-RM. The first trip blank will be identified as MDC-C-L-TB1. It should be noted that the "^" symbol should not be included in the sample number for container blanks, rinsates, and trip blanks.

4.4 ANALYTICAL METHODOLOGY

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

All samples will be prepared for shipment to off-site laboratories per procedure 9501, Shipping Samples to Off-site Laboratories. Samples will only be shipped to off-site laboratories that are listed on the Fluor Fernald Approved Laboratories List. Historical data from the area will be used to ship the samples off site. The highest post-excavation total uranium result from Area 6 FPA and MDC Area is 339 mg/kg from boring A6FP-NOA-DG-43.

Samples collected for VOC analysis should be shipped to an off-site laboratory within 24 hours of sample collection. As soon as the samples arrive at the laboratory where the analysis will take place, all samples should be prepared for analysis (including homogenization for non-VOC samples), and radiological samples should be sealed to begin the in-growth period for radium analysis. A 14-day turnaround time (TAT) will be required for all non-gamma (i.e. chemical and technetium-99) analyses and data reporting. A 30-day TAT will be required for the standard in-growth gamma analysis and data reporting.

The sampling and analytical requirements are listed in Table 4-1 and the Target Analyte Lists (TAL) are shown in Table 4-2.

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

A minimum of 10 percent of the laboratory data will be validated to Validation Support Level (VSL) D with the remainder validated to VSL B. Samples rejected during validation will be re-analyzed, or an archive sample will be collected and submitted for analysis.

4.5 STATISTICAL ANALYSIS

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

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

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

TABLE 4-1
SAMPLING AND ANALYTICAL REQUIREMENTS

Analyte[a]	Method[a]	Matrix	Preserve	Hold Time	TAT	Container[b]	Minimum Mass/Volume
Rads/Metals/ PCBs/SVOC (Any combination of TALs A through S)	Gamma Spec and LSC	Solid	Cool, 4° C	12 months	Prelim 10 days Final 30 days	Glass with Teflon-lined lid	500 g (1500 g)[c]
	ICP or ICP/MS or CVAA			6 months	10 days		
	GC			14 days	10 days		
VOCs (TAL T, U, or V)	GC/MS	Solid	Cool, 4° C	48 hours	10 days	3 x 1-Encore Sampler[c] plus 1 x 2-oz jar for % moisture	Each full Encore Sampler[c] will hold approx. 5 g
Radiological (TAL C)	Gamma Spec and LSC	Liquid (rinsate[d])	HNO_3 pH<2	6 months	30 days	Polyethylene	4 liters
Metals (TAL W)	ICP or ICP/MS or CVAA	Liquid (rinsate[d])	HNO_3 pH<2	6 months	10 days	Polyethylene	500 ml
VOCs (TALs T)	GC/MS	Liquid (trip blank)	H_2SO_4 pH<2 Cool, 4° C	14 days	10 days	3 x 40-ml glass with teflon-lined septa	120 ml (no headspace)

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

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

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

[d] If "push tubes" are used for sampling, the off-site laboratories will be sent container blanks. If an alternative sample method is used, the Field Technicians will collect a rinsate. Rinsate samples will not be collected for PCBs or SVOCs.

CVAA - Cold Vapor Atomic Absorption
GC/MS - gas chromatography mass spectroscopy
GC - gas chromatography
ICP/MS - inductively coupled plasma/mass spectroscopy
LSC - liquid scintillation counting

TABLE 4-2
TARGET ANALYTE LISTS

20810-PSP-0010-A
(Radiological - ASL D/E*)

Analyte	On-Property FRL	MDL (soil)
Total Uranium	20 mg/kg	2.0 mg/kg
Radium-226	1.7 pCi/g	0.17 pCi/g
Radium-228	1.8 pCi/g	0.18 pCi/g
Thorium-228	1.7 pCi/g	0.17 pCi/g
Thorium-232	1.5 pCi/g	0.15 pCi/g

20810-PSP-0010-B
(Radiological - ASL D/E*)

Analyte	On-Property FRL/*WAC*	MDL (soil)[a]
Total Uranium	20 mg/kg	2.0 mg/kg
Radium-226	1.7 pCi/g	0.17 pCi/g
Radium-228	1.8 pCi/g	0.18 pCi/g
Thorium-228	1.7 pCi/g	0.17 pCi/g
Thorium-232	1.5 pCi/g	0.15 pCi/g
Technetium-99	30.0 pCi/g *(29.1 pCi/g)*	2.91 pCi/g [a]

20810-PSP-0010-C
(Radiological - ASL D/E*)

Analyte	On-Property FRL/*WAC*	MDL (soil)[a]	MDL (water)
Total Uranium	20 mg/kg	2.0 mg/kg	3000 µg/L
Radium-226	1.7 pCi/g	0.17 pCi/g	255 pCi/L
Radium-228	1.8 pCi/g	0.18 pCi/g	270 pCi/L
Thorium-228	1.7 pCi/g	0.17 pCi/g	255 pCi/L
Thorium-232	1.5 pCi/g	0.15 pCi/g	225 pCi/L
Cesium-137	1.4 pCi/g	0.14 pCi/g	210 pCi/L
Technetium-99	30.0 pCi/g *(29.1 pCi/g)*	2.91 pCi/g [a]	45,000 pCi/L

20810-PSP-0010-D
(Metals - ASL D/E*)

Analyte	On-Property FRL/(BTV)	MDL (soil)
Arsenic	12.0 mg/kg	1.2 mg/kg

20810-PSP-0010-E
(Metals - ASL D/E*)

Analyte	On-Property FRL/(BTV)	MDL (soil)
Beryllium	1.5 mg/kg	0.15 mg/kg

20810-PSP-0010-F
(Metals - ASL D/E*)

Analyte	On-Property FRL/(BTV)	MDL (soil)
Cadmium	82 mg/kg (5.0 mg/kg)	0.5 mg/kg

20810-PSP-0010-G
(Metals - ASL D/E*)

Analyte	On-Property FRL/(BTV)	MDL (soil)
Lead	400 mg/kg (200 mg/kg)	20 mg/kg

20810-PSP-0010-H
(Metals - ASL D/E*)

Analyte	On-Property FRL/(BTV)	MDL (soil)
Molybdenum	2900 mg/kg (10 mg/kg)	1.0 mg/kg

20810-PSP-0010-I
(Metals - ASL D/E*)

Analyte	On-Property FRL/(BTV)	MDL (soil)
Silver	29,000 mg/kg /(10 mg/kg)	1.0 mg/kg

20810-PSP-0010-J
(Metals - ASL D/E*)

Analyte	On-Property FRL/(BTV)	MDL (soil)
Cadmium	82 mg/kg (5.0 mg/kg)	0.5 mg/kg
Molybdenum	2900 mg/kg (10 mg/kg)	1.0 mg/kg
Silver	29,000 mg/kg (10 mg/kg)	1.0 mg/kg

20810-PSP-0010-K
(Metals - ASL D/E*)

Analyte	On-Property FRL/(BTV)	MDL (soil)
Arsenic	12.0 mg/kg	1.2 mg/kg
Beryllium	1.5 mg/kg	0.15 mg/kg
Cadmium	82 mg/kg (5.0 mg/kg)	0.5 mg/kg
Molybdenum	2900 mg/kg /(10 mg/kg)	1.0 mg/kg
Silver	29,000 mg/kg /(10 mg/kg)	1.0 mg/kg

20810-PSP-0010-L
(Metals - ASL D/E*)

Analyte	On-Property FRL/(BTV)	MDL (soil)
Antimony	96 mg/kg (10 mg/kg)	1.0 mg/kg
Cadmium	82 mg/kg (5.0 mg/kg)	0.5 mg/kg
Molybdenum	2900 mg/kg (10 mg/kg)	1.0 mg/kg
Silver	29,000 mg/kg (10 mg/kg)	1.0 mg/kg

20810-PSP-0010-M
(Metals - ASL D/E*)

Analyte	On-Property FRL/(BTV)	MDL (soil)
Antimony	96 mg/kg (10 mg/kg)	1.0 mg/kg
Arsenic	12.0 mg/kg	1.2 mg/kg
Cadmium	82 mg/kg (5.0 mg/kg)	0.5 mg/kg
Chromium	300 mg/kg	30 mg/kg
Lead	400 mg/kg (200 mg/kg)	20 mg/kg
Mercury	7.5 mg/kg (5 mg/kg)	0.5 mg/kg
Molybdenum	2900 mg/kg (10 mg/kg)	1.0 mg/kg
Selenium	5400 mg/kg	540 mg/kg
Silver	29,000 mg/kg (10 mg/kg)	1.0 mg/kg

20810-PSP-0010-N
(Metals - ASL D/E*)

Analyte	On-Property FRL/(BTV)	MDL (soil)
Barium	68,000 mg/kg (500 mg/kg)	50 mg/kg
Chromium	300 mg/kg	30 mg/kg
Lead	400 mg/kg (200 mg/kg)	20 mg/kg
Mercury	7.5 mg/kg (5 mg/kg)	0.5 mg/kg

20810-PSP-0010-O
(PCBs - ASL D/E*)

Analyte	On-Property FRL	MDL (soil)
Aroclor-1254	0.13 mg/kg	0.013 mg/kg
Benzo(a)pyrene	2.0 mg/kg/(1.0 mg/kg)	0.1 mg/kg

20810-PSP-0010-P
(PCBs - ASL D/E*)

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

20810-PSP-0010-Q
(PCBs - ASL D/E*)

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

20810-PSP-0010-R
(PCBs - ASL D/E*)

Analyte	On-Property FRL	MDL (soil)
Aroclor-1254	0.13 mg/kg	0.013 mg/kg
Aroclor-1260	0.13 mg/kg	0.013 mg/kg
Benzo(a)pyrene	2.0 mg/kg/(1.0 mg/kg)	0.1 mg/kg

20810-PSP-0010-S
(SVOCs - ASL D/E*)

Analyte	On-Property FRL/(BTV)	MDL (soil)
Benzo(a)pyrene	2.0 mg/kg (1.0 mg/kg)	0.1 mg/kg
Benzo(a)anthracene	20 mg/kg (1.0 mg/kg)	0.1 mg/kg
Benzo(b)fluoranthene	20 mg/kg (1.0 mg/kg)	0.1 mg/kg
Benzo(g,h,i)perylene	(1.0 mg/kg)	0.1 mg/kg
Benzo(k)fluoranthene	200 mg/kg (1.0 mg/kg)	0.1 mg/kg
Chrysene	2000 mg/kg (1.0 mg/kg)	0.1 mg/kg
Dibenzo(a,h)anthracene	2.0 mg/kg (0.088 mg/kg)	0.0088 mg/kg
Fluoranthene	(10 mg/kg)	1.0 mg/kg
Indeno(1,2,3-cd)pyrene	20 mg/kg (1.0 mg/kg)	0.1 mg/kg
Phenanthrene	(5 mg/kg)	0.5 mg/kg
Pyrene	(10 mg/kg)	1.0 mg/kg

20810-PSP-0010-T
(VOCs - ASL D/E*)

Analyte	On-Property FRL/ Residential Generic Cleanup Number [b]	MDL (soil)	MDL (water)
1,1-dichloroethene	0.16 mg/kg	0.016 mg/kg	10 µg/L
1,2-dichloroethane	0.015 mg/kg	0.0015 mg/kg	10 µg/L
1,1,1-Tricholoroethane[c]	4.3 mg/kg[c]	0.43 mg/kg[c]	10 µg/L
2-Butanone[b]	23.5 mg/kg[b]	2.35 mg/kg[b]	10 µg/L
Acetone	43,000 mg/kg	4,300 mg/kg	10 µg/L
Benzene	850 mg/kg	85 mg/kg	10 µg/L
Carbon tetrachloride	2.1 mg/kg	0.21 mg/kg	10 µg/L
Ethylbenzene	5,100 mg/kg	510 mg/kg	10 µg/L
Methyl Chloride	37 mg/kg	3.7 mg/kg	10 µg/L
Tetrachloroethene	3.6 mg/kg	0.36 mg/kg	10 µg/L
Toluene	100,000 mg/kg	10,000 mg/kg	10 µg/L
Trichloroethene	25 mg/kg	2.5 mg/kg	10 µg/L
Xylene	920,000 mg/kg	92,000 mg/kg	10 µg/L

20810-PSP-0010-U
(VOCs - ASL D/E*)

Analyte	On-Property FRL	MDL (soil)
1,1,1-Tricholoroethane[c]	4.3 mg/kg[c]	0.43 mg/kg[c]

20810-PSP-0010-V
(VOCs - ASL D/E*)

Analyte	On-Property FRL/ Residential Generic Cleanup Number [b]	MDL (soil)
2-Butanone[b]	23.5 mg/kg[b]	2.35 mg/kg[b]
Xylene	920,000 mg/kg	92,000 mg/kg

20810-PSP-0010-W
(Metals - ASL D/E*)

Analyte	On-Property FRL/(BTV)	MDL (soil)	MDL (water)
Antimony	96 mg/kg (10 mg/kg)	1.0 mg/kg	1.5 mg/L
Arsenic	12 mg/kg	1.2 mg/kg	1.8 mg/L
Barium	68,000 mg/kg (500 mg/kg)	50 mg/kg	10,200 mg/L
Beryllium	1.5 mg/kg	0.15 mg/kg	0.22 mg/L
Cadmium	82 mg/kg (5.0 mg/kg)	0.5 mg/kg	0.75 mg/L
Chromium	300 mg/kg	30 mg/kg	45 mg/L
Lead	400 mg/kg (200 mg/kg)	20 mg/kg	30 mg/L
Mercury	7.5 mg/kg (5 mg/kg)	0.5 mg/kg	0.75 mg/L
Molybdenum	2900 mg/kg (10 mg/kg)	1.0 mg/kg	1.5 mg/L
Selenium	5400 mg/kg	540 mg/kg	810 mg/L
Silver	29,000 (10 mg/kg)	1.0 mg/kg	1.5 mg/L

*Analytical requirements will meet ASL D but the minimum detection level (MDL) may cause some analyses to be considered ASL E.

[a] The MDL for technetium-99 is 10 percent of the WAC limit, which is lower than the FRL.

[b] 2-Butanone (Methyl Ethyl Ketone) does not have an associated soil FRL. 23.5 mg/kg is listed on Table 1 of the June 2004 Closure Plan Review Guidance for RCRA Facilities (OEPA 2004).

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

mg/L micrograms per liter
µg/L - micrograms per liter

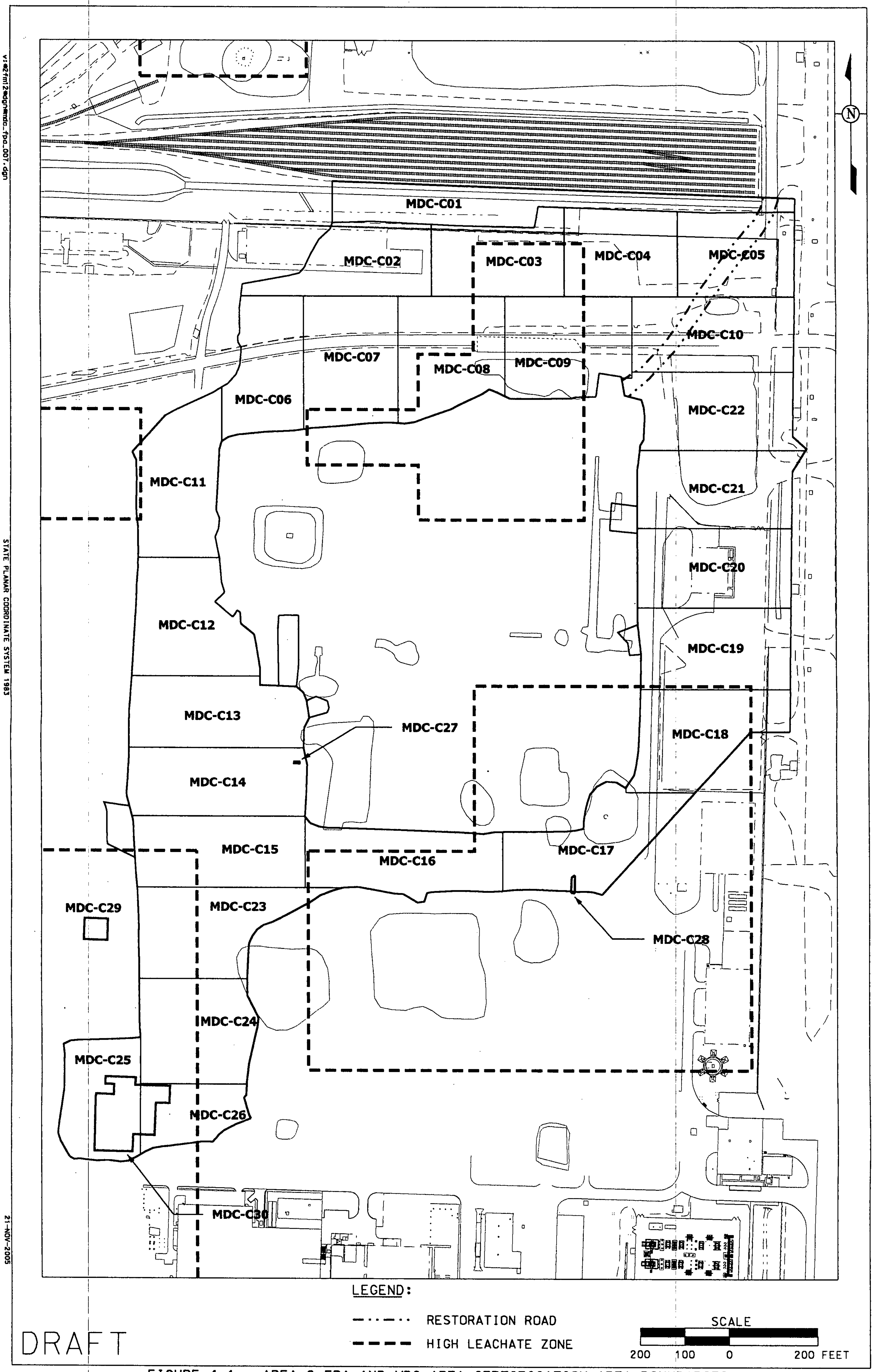

FIGURE 4-1. AREA 6 FPA AND MDC AREA CERTIFICATION AREA BOUNDARIES

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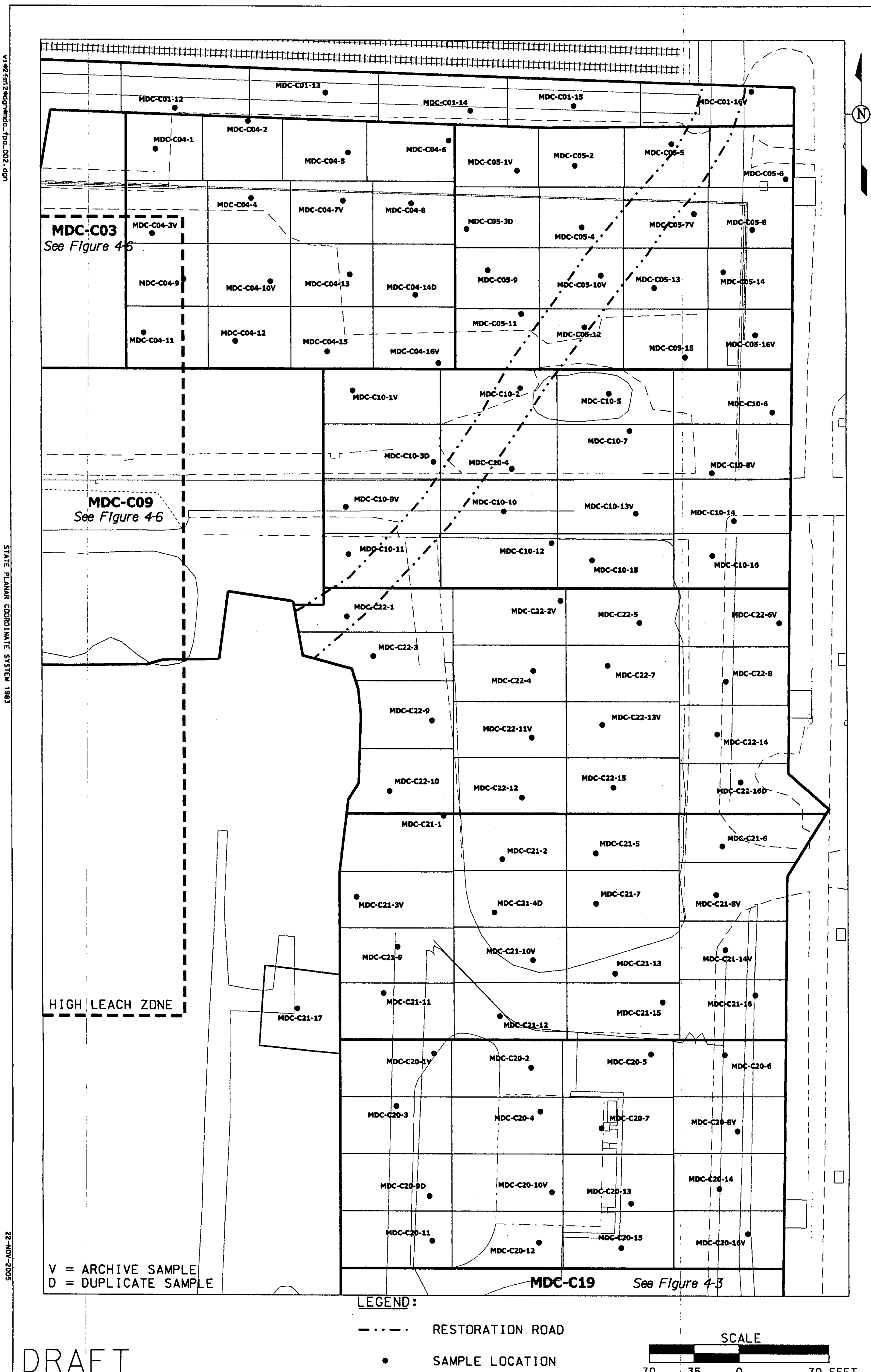

FIGURE 4-2. CERTIFICATION SAMPLING LOCATIONS FOR CU04, CU10, CU20, CU21, AND CU22

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STATE PLANAR COORDINATE SYSTEM 1983

22-NOV-2005

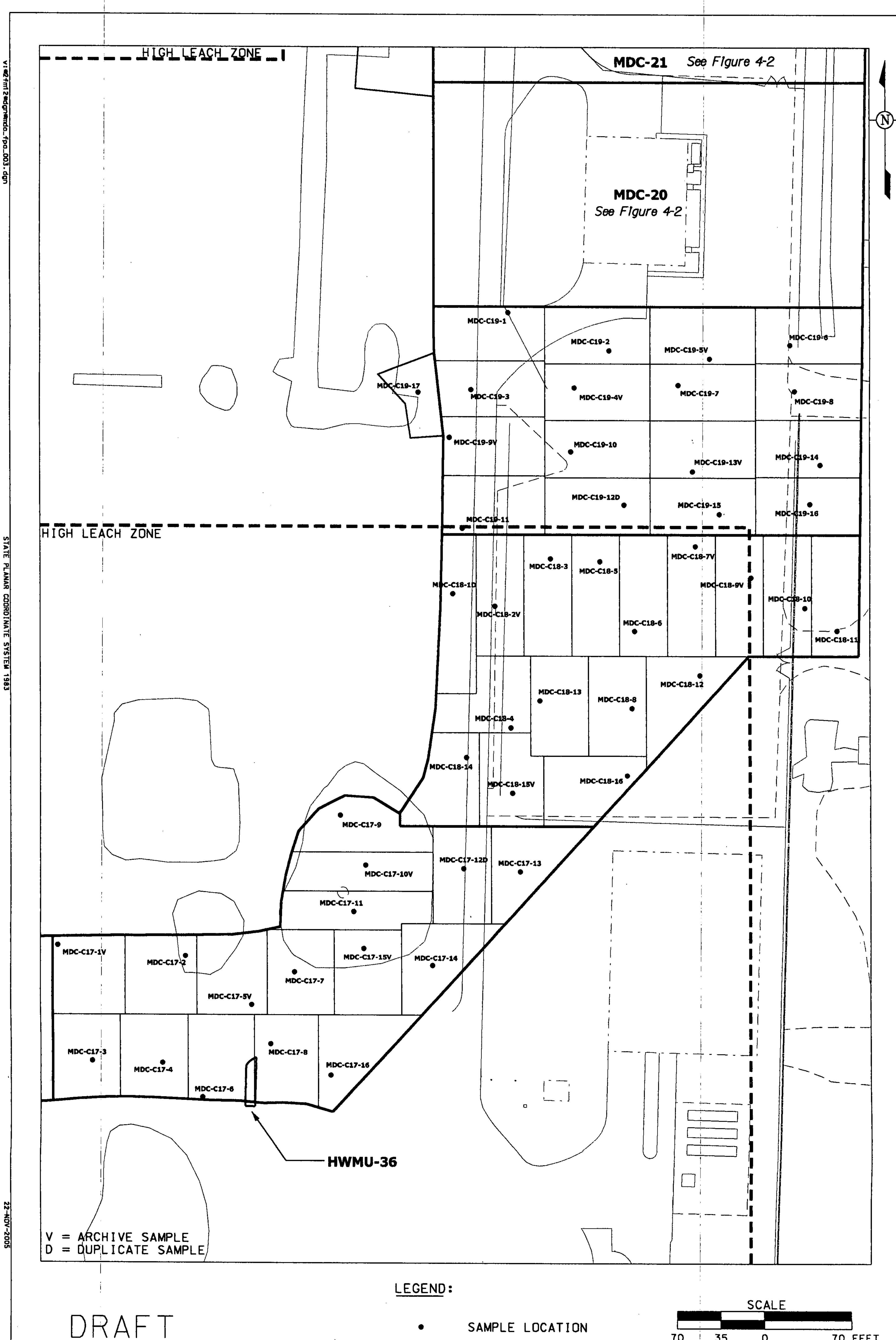
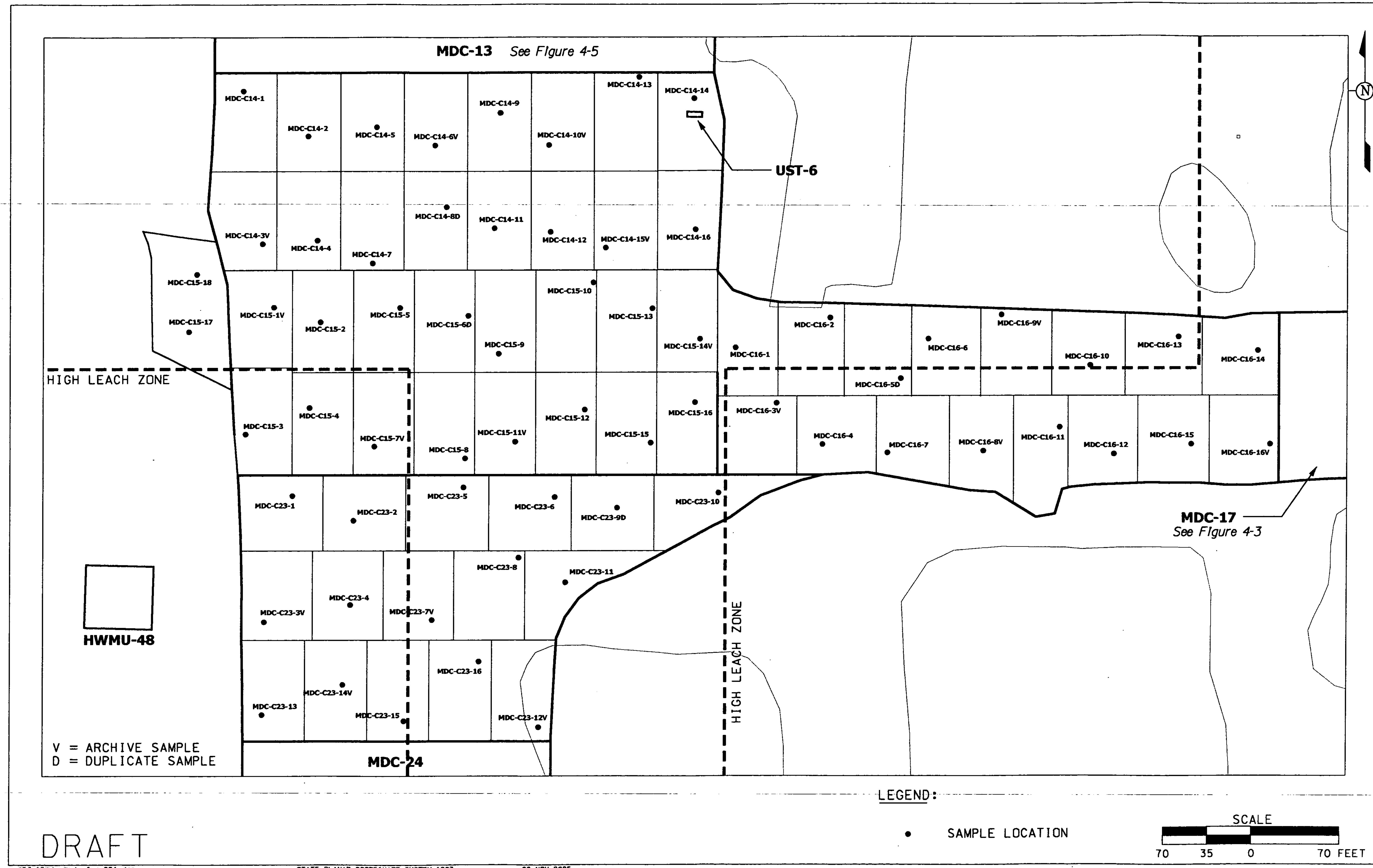


FIGURE 4-3. CERTIFICATION SAMPLING LOCATIONS FOR CU17, CU18, AND CU19



v:\2fm12\dgn\mdc_fpa_004.dgn STATE PLANAR COORDINATE SYSTEM 1983 22-NOV-2005

FIGURE 4-4. CERTIFICATION SAMPLING LOCATIONS FOR CU14, CU15, CU16, AND CU23

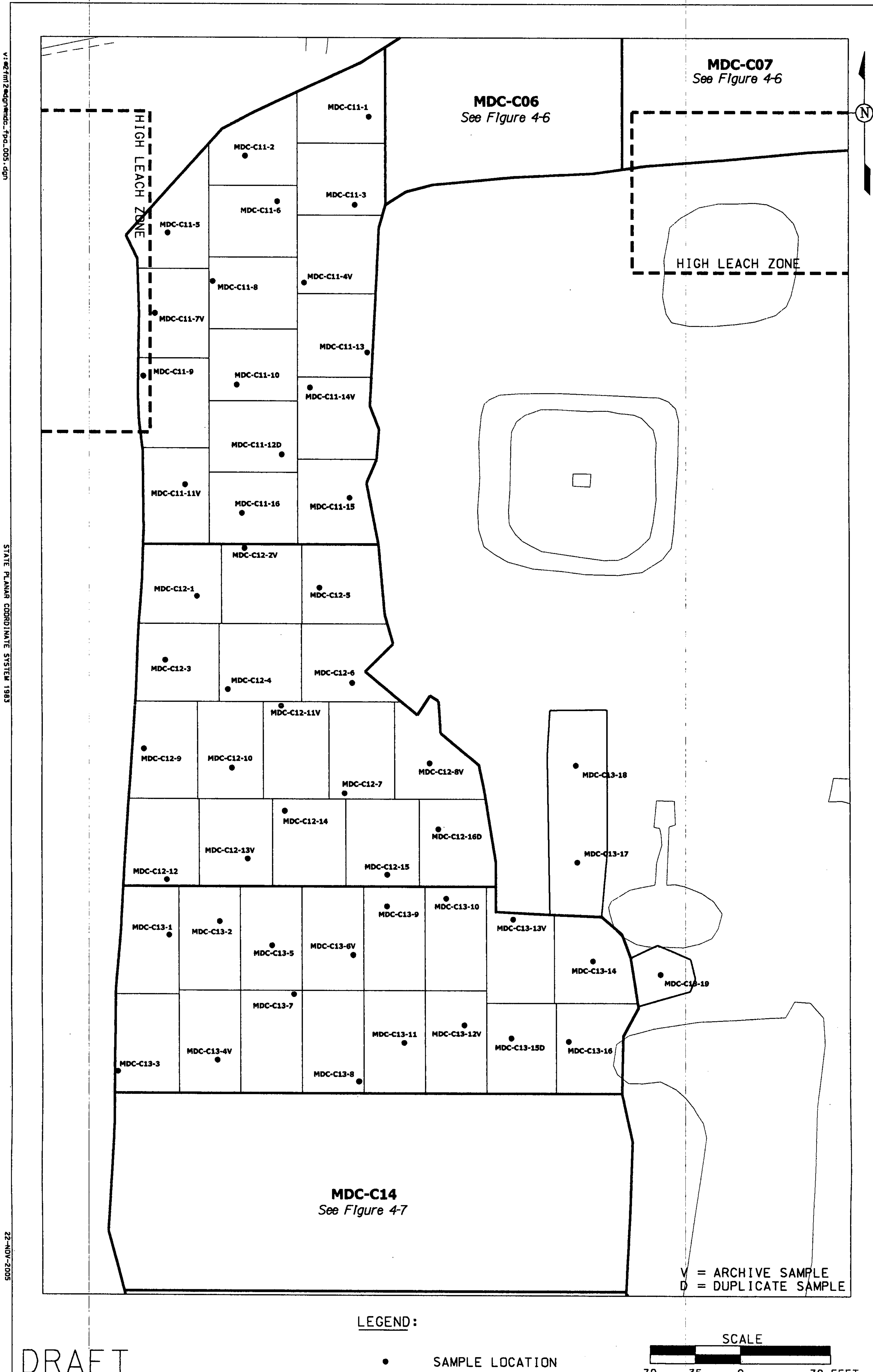


FIGURE 4-5. CERTIFICATION SAMPLING LOCATIONS FOR CU11, CU12, AND CU13

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STATE PLANAR COORDINATE SYSTEM 1983

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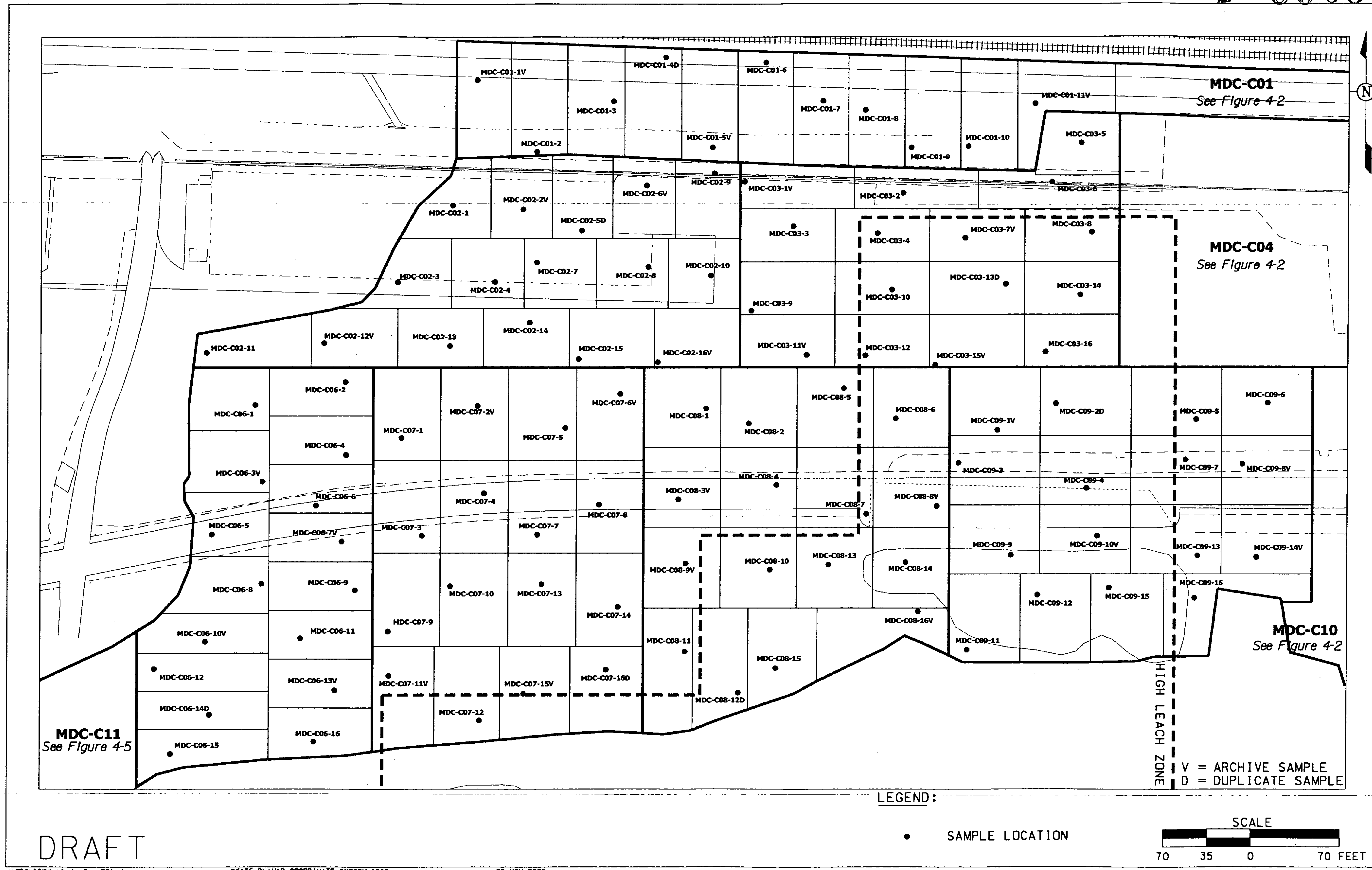

v:\2fm12\dgn\mdc_fpa_001.dgn STATE PLANAR COORDINATE SYSTEM 1983 22-NOV-2005

FIGURE 4-6. CERTIFICATION SAMPLING LOCATIONS FOR CU01, CU02, CU03, AND CU06 THROUGH CU09

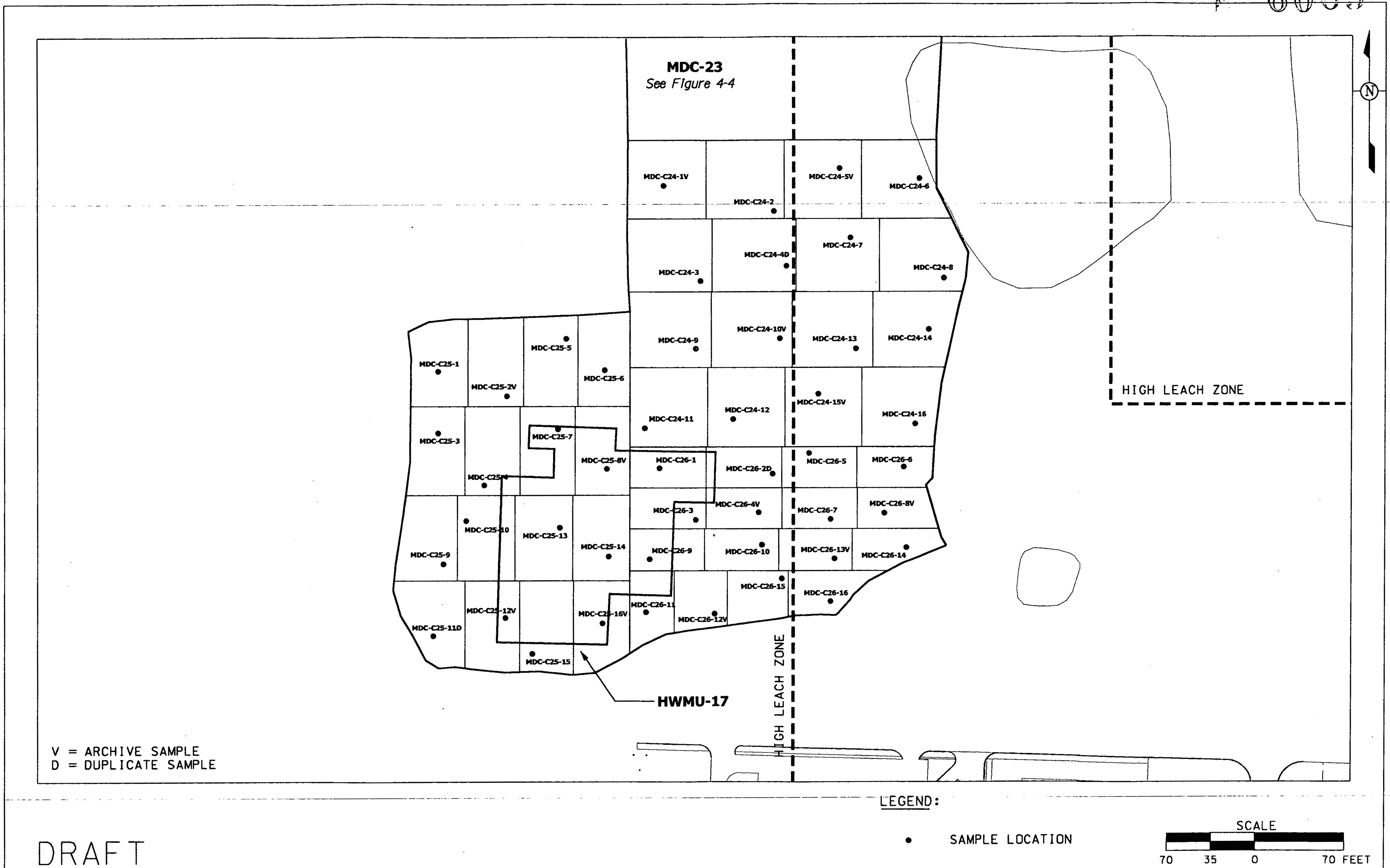

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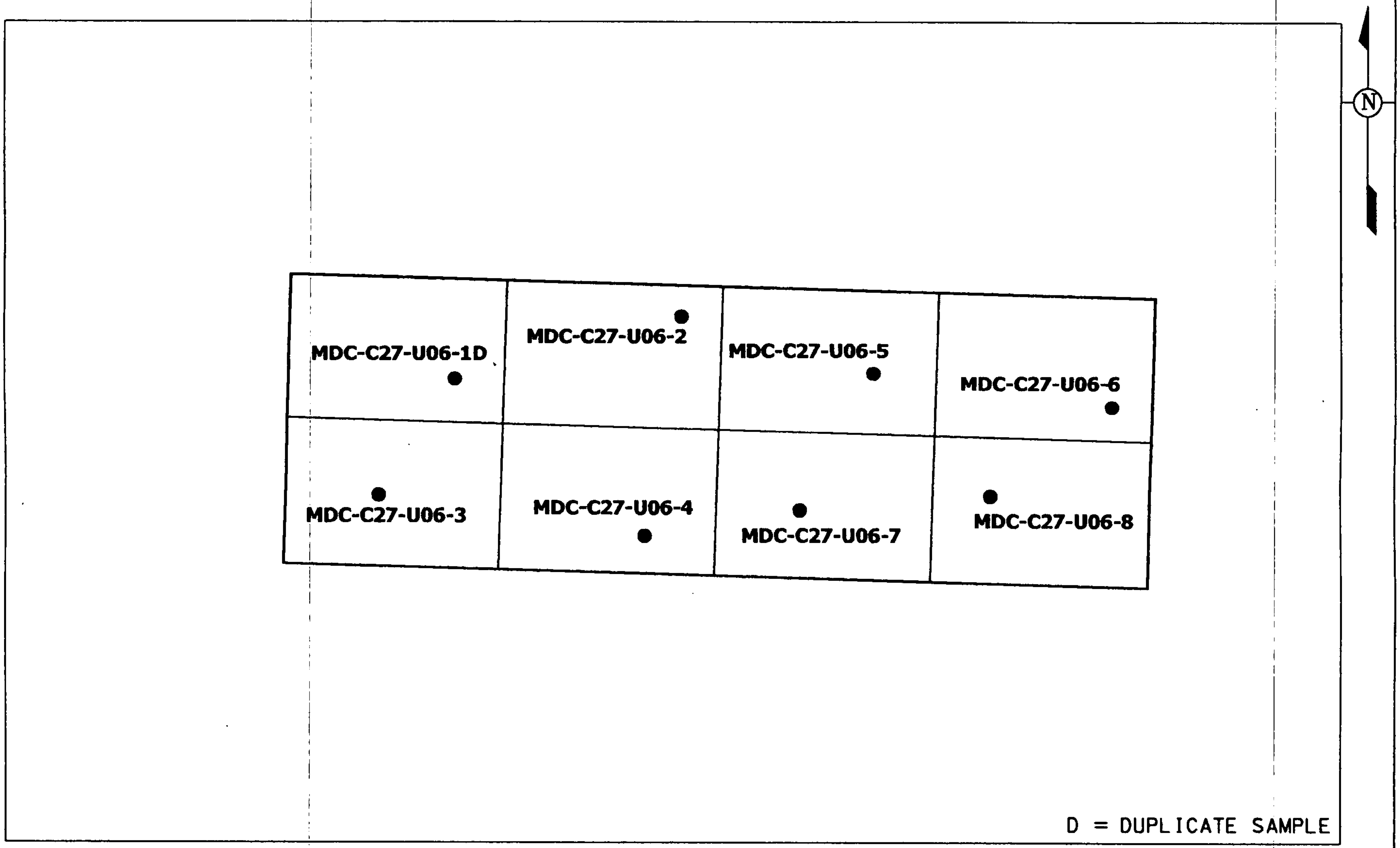
FIGURE 4-7. CERTIFICATION SAMPLING LOCATIONS FOR CU24, CU25, AND CU26



LEGEND:

● SAMPLE LOCATION

SCALE

2 1 0 2 FEET

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STATE PLANAR COORDINATE SYSTEM 1983

FIGURE 4-8. CERTIFICATION SAMPLING LOCATIONS FOR CU27 (UST6)

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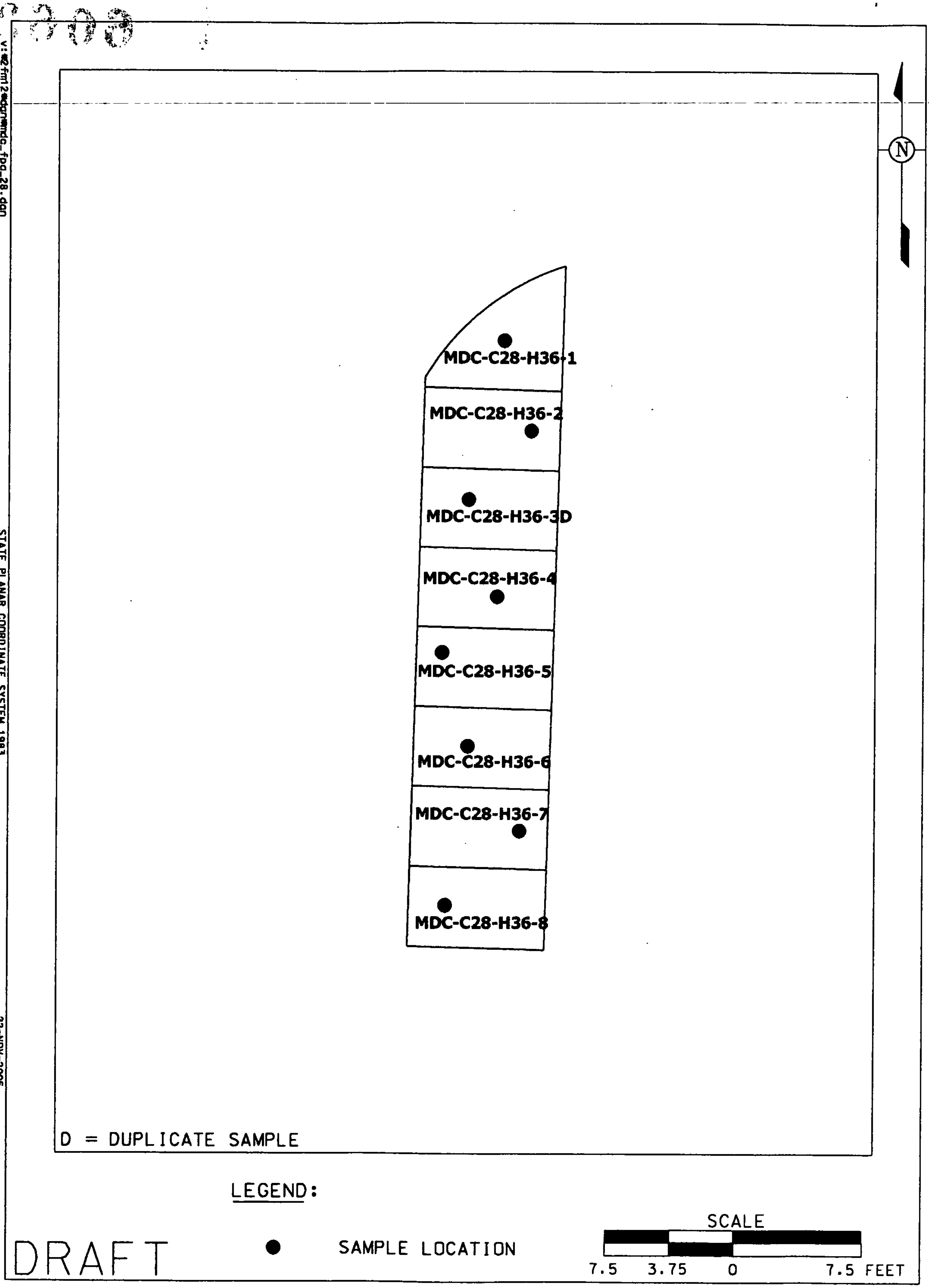
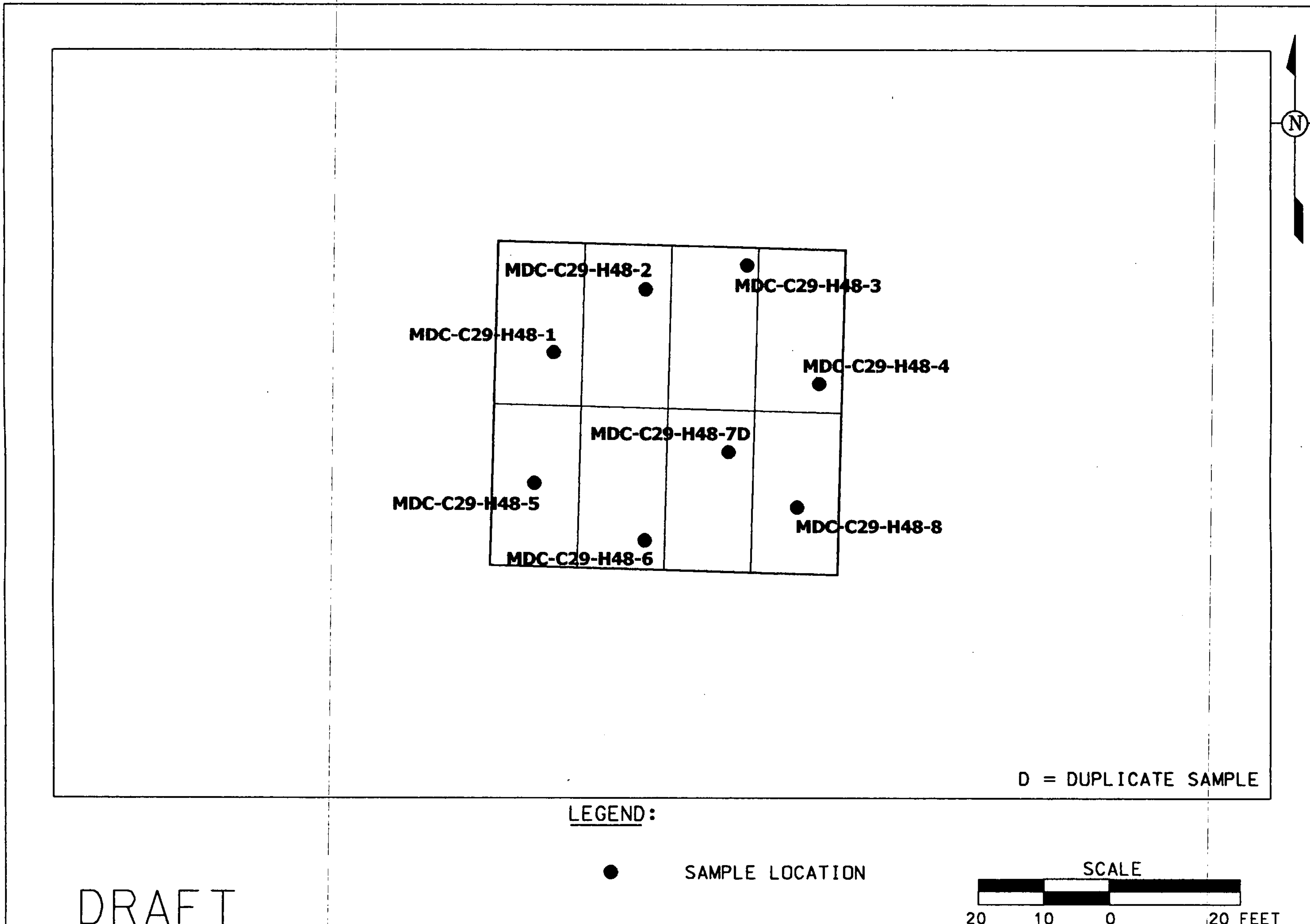


FIGURE 4-9. CERTIFICATION SAMPLING LOCATIONS FOR CU28 (HWMU36)



v:#2fm12#dgn#mdc_fpa_29.dgn
STATE PLANAR COORDINATE SYSTEM 1983

FIGURE 4-10. CERTIFICATION SAMPLING LOCATIONS FOR CU29 (HWMU48)

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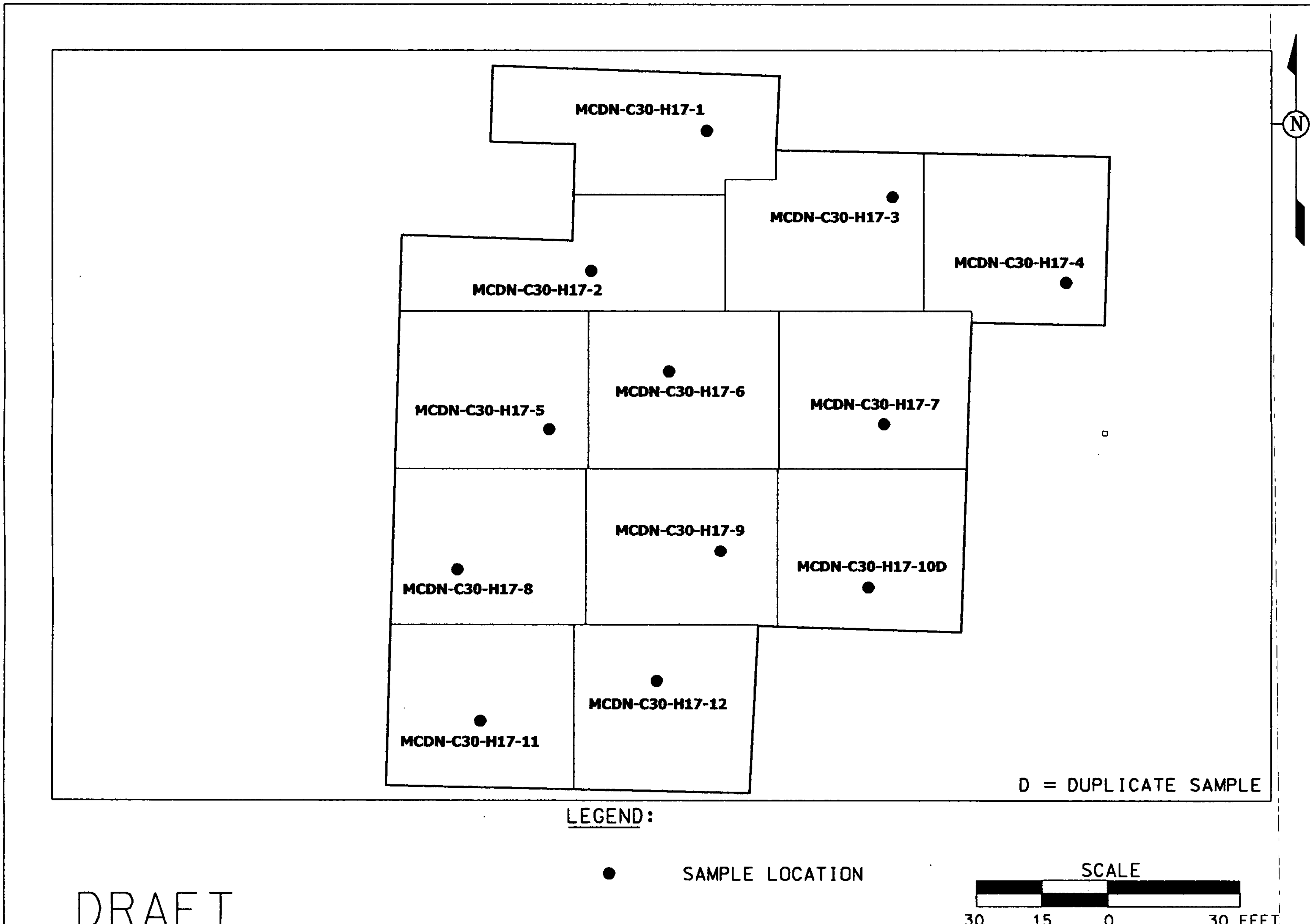

v:#2fm12#dgn#mdc_fpa_30.dgn
STATE PLANAR COORDINATE SYSTEM 1983

FIGURE 4-11. CERTIFICATION SAMPLING LOCATIONS FOR CU30(HWMU17)

22-NOV-2005

5.0 SCHEDULE

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

Activity	Target Date
Submittal of Certification Design Letter	December 1, 2005
Start of Certification Sampling	January 3, 2005
Complete Field Work	January 27, 2005
Complete Analytical Work	February 28, 2006
Complete Data Validation and Statistical Analysis	March 10, 2006
Submit Certification Report	March 15, 2006[a]

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

6.0 QUALITY ASSURANCE/QUALITY CONTROL REQUIREMENTS

6.1 FIELD QUALITY CONTROL SAMPLES, ANALYTICAL REQUIREMENTS AND DATA VALIDATION

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

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

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

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

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

- All field data will be validated. A minimum of 10 percent of the laboratory data will be validated to VSL D with the remainder validated to VSL B. The following CUs will be validated to VSL D: MDCN-C16, MDCN-C27-U6, MDCN-C29-H48, and MDCN-C30-H17. If any result is rejected during validation, the sample will be re-analyzed or an archive location will be sampled and analyzed in its place. If necessary, this change will be documented in a V/FCN.

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

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

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

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

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

6.2 PROJECT SPECIFIC PROCEDURES, MANUALS AND DOCUMENTS

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

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

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

6.3 INDEPENDENT ASSESSMENT

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

6.4 IMPLEMENTATION OF CHANGES

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

7.0 HEALTH AND SAFETY

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

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

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

8.0 DISPOSITION OF WASTE

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

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

9.0 DATA MANAGEMENT

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

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

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

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

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

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

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

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APPENDIX A

UTILITY ISOLATION TRENCH SAMPLING DATA

APPENDIX A
UTILITY ISOLATION TRENCH SAMPLING DATA

Boring	Sample ID	Parameter	Sample Date	Result	Lab Qualifier	Units	Suffix
A6FPE-UIT-1	A6FPE-UIT-1^1-L	1,1-Dichloroethene	7/21/2005	0.000968	U	mg/kg	None
A6FPE-UIT-1	A6FPE-UIT-1^12-L	1,1-Dichloroethene	7/21/2005	0.000988	U	mg/kg	None
A6FPE-UIT-2	A6FPE-UIT-2^1-L	1,1-Dichloroethene	7/21/2005	0.00104	U	mg/kg	None
A6FPE-UIT-2	A6FPE-UIT-2^4-L	1,1-Dichloroethene	7/21/2005	0.000783	U	mg/kg	None
A6FPE-UIT-3	A6FPE-UIT-3^1-L	1,1-Dichloroethene	7/21/2005	0.000865	U	mg/kg	None
A6FPE-UIT-1	A6FPE-UIT-1^1-L	1,2-Dichloroethene (Total)	7/21/2005	0.000968	U	mg/kg	None
A6FPE-UIT-1	A6FPE-UIT-1^12-L	1,2-Dichloroethene (Total)	7/21/2005	0.000988	U	mg/kg	None
A6FPE-UIT-2	A6FPE-UIT-2^1-L	1,2-Dichloroethene (Total)	7/21/2005	0.00104	U	mg/kg	None
A6FPE-UIT-2	A6FPE-UIT-2^4-L	1,2-Dichloroethene (Total)	7/21/2005	0.000783	U	mg/kg	None
A6FPE-UIT-3	A6FPE-UIT-3^1-L	1,2-Dichloroethene (Total)	7/21/2005	0.000865	U	mg/kg	None
A6FPE-UIT-1	A6FPE-UIT-1^1-RMP	Aroclor-1254	7/21/2005	14	U	ug/kg	None
A6FPE-UIT-1	A6FPE-UIT-1^12-RMP	Aroclor-1254	7/21/2005	16	U	ug/kg	None
A6FPE-UIT-2	A6FPE-UIT-2^1-RMP	Aroclor-1254	7/21/2005	22		ug/kg	None
A6FPE-UIT-2	A6FPE-UIT-2^4-RMP	Aroclor-1254	7/21/2005	14	U	ug/kg	None
A6FPE-UIT-3	A6FPE-UIT-3^1-RMP	Aroclor-1254	7/21/2005	14	U	ug/kg	None
A6FPE-UIT-1	A6FPE-UIT-1^1-RMP	Aroclor-1260	7/21/2005	14	U	ug/kg	None
A6FPE-UIT-1	A6FPE-UIT-1^12-RMP	Aroclor-1260	7/21/2005	16	U	ug/kg	None
A6FPE-UIT-2	A6FPE-UIT-2^1-RMP	Aroclor-1260	7/21/2005	15	U	ug/kg	None
A6FPE-UIT-2	A6FPE-UIT-2^4-RMP	Aroclor-1260	7/21/2005	14	U	ug/kg	None
A6FPE-UIT-3	A6FPE-UIT-3^1-RMP	Aroclor-1260	7/21/2005	14	U	ug/kg	None
A6FPE-UIT-1	A6FPE-UIT-1^1-RMP	Arsenic	7/21/2005	5.99		mg/kg	None
A6FPE-UIT-1	A6FPE-UIT-1^12-RMP	Arsenic	7/21/2005	6.14		mg/kg	None
A6FPE-UIT-2	A6FPE-UIT-2^1-RMP	Arsenic	7/21/2005	8.97		mg/kg	None
A6FPE-UIT-2	A6FPE-UIT-2^4-RMP	Arsenic	7/21/2005	3.78	J	mg/kg	None
A6FPE-UIT-3	A6FPE-UIT-3^1-RMP	Arsenic	7/21/2005	4.51	J	mg/kg	None
A6FPE-UIT-1	A6FPE-UIT-1^1-RMP	Beryllium	7/21/2005	0.549	J	mg/kg	None
A6FPE-UIT-1	A6FPE-UIT-1^12-RMP	Beryllium	7/21/2005	0.574	J	mg/kg	None
A6FPE-UIT-2	A6FPE-UIT-2^1-RMP	Beryllium	7/21/2005	0.826	J	mg/kg	None
A6FPE-UIT-2	A6FPE-UIT-2^4-RMP	Beryllium	7/21/2005	0.628	J	mg/kg	None
A6FPE-UIT-3	A6FPE-UIT-3^1-RMP	Beryllium	7/21/2005	0.421	J	mg/kg	None
A6FPE-UIT-1	A6FPE-UIT-1^1-RMP	Cadmium	7/21/2005	0.307	J	mg/kg	None
A6FPE-UIT-1	A6FPE-UIT-1^12-RMP	Cadmium	7/21/2005	0.284	J	mg/kg	None
A6FPE-UIT-2	A6FPE-UIT-2^1-RMP	Cadmium	7/21/2005	0.301	J	mg/kg	None
A6FPE-UIT-2	A6FPE-UIT-2^4-RMP	Cadmium	7/21/2005	0.482	J	mg/kg	None
A6FPE-UIT-3	A6FPE-UIT-3^1-RMP	Cadmium	7/21/2005	0.401	J	mg/kg	None
A6FPE-UIT-4	A6FPE-UIT-4^1-RM	Cadmium	7/21/2005	0.434	J	mg/kg	None
A6FPE-UIT-4	A6FPE-UIT-4^8-RM	Cadmium	7/21/2005	0.424	J	mg/kg	None
A6FPE-UIT-5	A6FPE-UIT-5^1-RM	Cadmium	7/21/2005	0.362	J	mg/kg	None
A6FPE-UIT-5	A6FPE-UIT-5^7-RM	Cadmium	7/21/2005	0.386	J	mg/kg	None
A6FPE-UIT-6	A6FPE-UIT-6^1-RM	Cadmium	7/21/2005	0.37	J	mg/kg	None
A6FPE-UIT-6	A6FPE-UIT-6^8-RM	Cadmium	7/21/2005	0.326	J	mg/kg	None
A6FPE-UIT-1	A6FPE-UIT-1^1-RMP	Molybdenum	7/21/2005	1.05	J	mg/kg	None
A6FPE-UIT-1	A6FPE-UIT-1^12-RMP	Molybdenum	7/21/2005	1.02	J	mg/kg	None
A6FPE-UIT-2	A6FPE-UIT-2^1-RMP	Molybdenum	7/21/2005	1.12	J	mg/kg	None
A6FPE-UIT-2	A6FPE-UIT-2^4-RMP	Molybdenum	7/21/2005	1.36	J	mg/kg	None
A6FPE-UIT-3	A6FPE-UIT-3^1-RMP	Molybdenum	7/21/2005	1.31	J	mg/kg	None
A6FPE-UIT-4	A6FPE-UIT-4^1-RM	Molybdenum	7/21/2005	1.75	J	mg/kg	None
A6FPE-UIT-4	A6FPE-UIT-4^8-RM	Molybdenum	7/21/2005	1.52	J	mg/kg	None

APPENDIX A
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Boring	Sample ID	Parameter	Sample Date	Result	Lab Qualifier	Units	Suffix
A6FPE-UIT-5	A6FPE-UIT-5^1-RM	Molybdenum	7/21/2005	0.978	J	mg/kg	None
A6FPE-UIT-5	A6FPE-UIT-5^7-RM	Molybdenum	7/21/2005	1.1	J	mg/kg	None
A6FPE-UIT-6	A6FPE-UIT-6^1-RM	Molybdenum	7/21/2005	1.06	J	mg/kg	None
A6FPE-UIT-6	A6FPE-UIT-6^8-RM	Molybdenum	7/21/2005	0.914	J	mg/kg	None
A6FPE-UIT-1	A6FPE-UIT-1^1-RMP	Radium-226	7/21/2005	1.09		pCi/g	None
A6FPE-UIT-1	A6FPE-UIT-1^12-RMP	Radium-226	7/21/2005	0.959		pCi/g	None
A6FPE-UIT-2	A6FPE-UIT-2^1-RMP	Radium-226	7/21/2005	1.19		pCi/g	None
A6FPE-UIT-2	A6FPE-UIT-2^4-RMP	Radium-226	7/21/2005	0.959		pCi/g	None
A6FPE-UIT-3	A6FPE-UIT-3^1-RMP	Radium-226	7/21/2005	0.797		pCi/g	None
A6FPE-UIT-4	A6FPE-UIT-4^1-RM	Radium-226	7/21/2005	1.16		pCi/g	None
A6FPE-UIT-4	A6FPE-UIT-4^8-RM	Radium-226	7/21/2005	0.919		pCi/g	None
A6FPE-UIT-5	A6FPE-UIT-5^1-RM	Radium-226	7/21/2005	0.756		pCi/g	None
A6FPE-UIT-5	A6FPE-UIT-5^7-RM	Radium-226	7/21/2005	0.933		pCi/g	None
A6FPE-UIT-6	A6FPE-UIT-6^1-RM	Radium-226	7/21/2005	0.647		pCi/g	None
A6FPE-UIT-6	A6FPE-UIT-6^8-RM	Radium-226	7/21/2005	0.877		pCi/g	None
A6FPE-UIT-1	A6FPE-UIT-1^1-RMP	Radium-228	7/21/2005	1.1		pCi/g	None
A6FPE-UIT-1	A6FPE-UIT-1^12-RMP	Radium-228	7/21/2005	0.864		pCi/g	None
A6FPE-UIT-2	A6FPE-UIT-2^1-RMP	Radium-228	7/21/2005	1.07		pCi/g	None
A6FPE-UIT-2	A6FPE-UIT-2^4-RMP	Radium-228	7/21/2005	0.771		pCi/g	None
A6FPE-UIT-3	A6FPE-UIT-3^1-RMP	Radium-228	7/21/2005	0.559		pCi/g	None
A6FPE-UIT-4	A6FPE-UIT-4^1-RM	Radium-228	7/21/2005	0.987		pCi/g	None
A6FPE-UIT-4	A6FPE-UIT-4^8-RM	Radium-228	7/21/2005	0.749		pCi/g	None
A6FPE-UIT-5	A6FPE-UIT-5^1-RM	Radium-228	7/21/2005	0.733		pCi/g	None
A6FPE-UIT-5	A6FPE-UIT-5^7-RM	Radium-228	7/21/2005	0.773		pCi/g	None
A6FPE-UIT-6	A6FPE-UIT-6^1-RM	Radium-228	7/21/2005	0.642		pCi/g	None
A6FPE-UIT-6	A6FPE-UIT-6^8-RM	Radium-228	7/21/2005	0.826		pCi/g	None
A6FPE-UIT-1	A6FPE-UIT-1^1-RMP	Silver	7/21/2005	0.432	J	mg/kg	None
A6FPE-UIT-1	A6FPE-UIT-1^12-RMP	Silver	7/21/2005	0.429	J	mg/kg	None
A6FPE-UIT-2	A6FPE-UIT-2^1-RMP	Silver	7/21/2005	0.652	J	mg/kg	None
A6FPE-UIT-2	A6FPE-UIT-2^4-RMP	Silver	7/21/2005	0.286	J	mg/kg	None
A6FPE-UIT-3	A6FPE-UIT-3^1-RMP	Silver	7/21/2005	0.243	J	mg/kg	None
A6FPE-UIT-4	A6FPE-UIT-4^1-RM	Silver	7/21/2005	0.646	J	mg/kg	None
A6FPE-UIT-4	A6FPE-UIT-4^8-RM	Silver	7/21/2005	0.202	J	mg/kg	None
A6FPE-UIT-5	A6FPE-UIT-5^1-RM	Silver	7/21/2005	0.291	J	mg/kg	None
A6FPE-UIT-5	A6FPE-UIT-5^7-RM	Silver	7/21/2005	0.324	J	mg/kg	None
A6FPE-UIT-6	A6FPE-UIT-6^1-RM	Silver	7/21/2005	0.476	J	mg/kg	None
A6FPE-UIT-6	A6FPE-UIT-6^8-RM	Silver	7/21/2005	0.399	J	mg/kg	None
A6FPE-UIT-1	A6FPE-UIT-1^1-RMP	Technetium-99	7/21/2005	2.38	U	pCi/g	None
A6FPE-UIT-1	A6FPE-UIT-1^12-RMP	Technetium-99	7/21/2005	1.47	U	pCi/g	None
A6FPE-UIT-1	A6FPE-UIT-1^12-RMP	Technetium-99	7/21/2005	1.01	U	pCi/g	Re
A6FPE-UIT-2	A6FPE-UIT-2^1-RMP	Technetium-99	7/21/2005	2.41	U	pCi/g	None
A6FPE-UIT-2	A6FPE-UIT-2^1-RMP	Technetium-99	7/21/2005	1.65	U	pCi/g	Re
A6FPE-UIT-2	A6FPE-UIT-2^4-RMP	Technetium-99	7/21/2005	1.86	U	pCi/g	None
A6FPE-UIT-2	A6FPE-UIT-2^4-RMP	Technetium-99	7/21/2005	1.27	U	pCi/g	Re
A6FPE-UIT-3	A6FPE-UIT-3^1-RMP	Technetium-99	7/21/2005	1.64	U	pCi/g	None
A6FPE-UIT-4	A6FPE-UIT-4^1-RM	Technetium-99	7/21/2005	1.39	U	pCi/g	None
A6FPE-UIT-4	A6FPE-UIT-4^8-RM	Technetium-99	7/21/2005	1.63	U	pCi/g	None
A6FPE-UIT-5	A6FPE-UIT-5^1-RM	Technetium-99	7/21/2005	1.43	U	pCi/g	None

APPENDIX A
UTILITY ISOLATION TRENCH SAMPLING DATA

Boring	Sample ID	Parameter	Sample Date	Result	Lab Qualifier	Units	Suffix
A6FPE-UIT-5	A6FPE-UIT-5^7-RM	Technetium-99	7/21/2005	1.92	U	pCi/g	None
A6FPE-UIT-6	A6FPE-UIT-6^1-RM	Technetium-99	7/21/2005	1.68	U	pCi/g	None
A6FPE-UIT-6	A6FPE-UIT-6^8-RM	Technetium-99	7/21/2005	1.4	U	pCi/g	None
A6FPE-UIT-1	A6FPE-UIT-1^1-L	Tetrachloroethene	7/21/2005	0.000968	U	mg/kg	None
A6FPE-UIT-1	A6FPE-UIT-1^12-L	Tetrachloroethene	7/21/2005	0.000988	U	mg/kg	None
A6FPE-UIT-2	A6FPE-UIT-2^1-L	Tetrachloroethene	7/21/2005	0.00104	U	mg/kg	None
A6FPE-UIT-2	A6FPE-UIT-2^4-L	Tetrachloroethene	7/21/2005	0.000783	U	mg/kg	None
A6FPE-UIT-3	A6FPE-UIT-3^1-L	Tetrachloroethene	7/21/2005	0.000865	U	mg/kg	None
A6FPE-UIT-1	A6FPE-UIT-1^1-RMP	Thorium-228	7/21/2005	1.1		pCi/g	None
A6FPE-UIT-1	A6FPE-UIT-1^12-RMP	Thorium-228	7/21/2005	0.871		pCi/g	None
A6FPE-UIT-2	A6FPE-UIT-2^1-RMP	Thorium-228	7/21/2005	1.07		pCi/g	None
A6FPE-UIT-2	A6FPE-UIT-2^4-RMP	Thorium-228	7/21/2005	0.794		pCi/g	None
A6FPE-UIT-3	A6FPE-UIT-3^1-RMP	Thorium-228	7/21/2005	0.565		pCi/g	None
A6FPE-UIT-4	A6FPE-UIT-4^1-RM	Thorium-228	7/21/2005	0.975		pCi/g	None
A6FPE-UIT-4	A6FPE-UIT-4^8-RM	Thorium-228	7/21/2005	0.767		pCi/g	None
A6FPE-UIT-5	A6FPE-UIT-5^1-RM	Thorium-228	7/21/2005	0.747		pCi/g	None
A6FPE-UIT-5	A6FPE-UIT-5^7-RM	Thorium-228	7/21/2005	0.784		pCi/g	None
A6FPE-UIT-6	A6FPE-UIT-6^1-RM	Thorium-228	7/21/2005	0.639		pCi/g	None
A6FPE-UIT-6	A6FPE-UIT-6^8-RM	Thorium-228	7/21/2005	0.826		pCi/g	None
A6FPE-UIT-1	A6FPE-UIT-1^1-RMP	Thorium-232	7/21/2005	1.1		pCi/g	None
A6FPE-UIT-1	A6FPE-UIT-1^12-RMP	Thorium-232	7/21/2005	0.864		pCi/g	None
A6FPE-UIT-2	A6FPE-UIT-2^1-RMP	Thorium-232	7/21/2005	1.07		pCi/g	None
A6FPE-UIT-2	A6FPE-UIT-2^4-RMP	Thorium-232	7/21/2005	0.771		pCi/g	None
A6FPE-UIT-3	A6FPE-UIT-3^1-RMP	Thorium-232	7/21/2005	0.559		pCi/g	None
A6FPE-UIT-4	A6FPE-UIT-4^1-RM	Thorium-232	7/21/2005	0.987		pCi/g	None
A6FPE-UIT-4	A6FPE-UIT-4^8-RM	Thorium-232	7/21/2005	0.749		pCi/g	None
A6FPE-UIT-5	A6FPE-UIT-5^1-RM	Thorium-232	7/21/2005	0.733		pCi/g	None
A6FPE-UIT-5	A6FPE-UIT-5^7-RM	Thorium-232	7/21/2005	0.773		pCi/g	None
A6FPE-UIT-6	A6FPE-UIT-6^1-RM	Thorium-232	7/21/2005	0.642		pCi/g	None
A6FPE-UIT-6	A6FPE-UIT-6^8-RM	Thorium-232	7/21/2005	0.826		pCi/g	None
A6FPE-UIT-1	A6FPE-UIT-1^1-L	Trichloroethene	7/21/2005	0.000968	U	mg/kg	None
A6FPE-UIT-1	A6FPE-UIT-1^12-L	Trichloroethene	7/21/2005	0.000988	U	mg/kg	None
A6FPE-UIT-2	A6FPE-UIT-2^1-L	Trichloroethene	7/21/2005	0.00104	U	mg/kg	None
A6FPE-UIT-2	A6FPE-UIT-2^4-L	Trichloroethene	7/21/2005	0.000783	U	mg/kg	None
A6FPE-UIT-3	A6FPE-UIT-3^1-L	Trichloroethene	7/21/2005	0.000865	U	mg/kg	None
A6FPE-UIT-1	A6FPE-UIT-1^1-RMP	Uranium, Total	7/21/2005	8.57		ug/g	None
A6FPE-UIT-1	A6FPE-UIT-1^12-RMP	Uranium, Total	7/21/2005	8.44		ug/g	None
A6FPE-UIT-2	A6FPE-UIT-2^1-RMP	Uranium, Total	7/21/2005	6.34		ug/g	None
A6FPE-UIT-2	A6FPE-UIT-2^4-RMP	Uranium, Total	7/21/2005	3.63		ug/g	None
A6FPE-UIT-3	A6FPE-UIT-3^1-RMP	Uranium, Total	7/21/2005	2.44		ug/g	None
A6FPE-UIT-4	A6FPE-UIT-4^1-RM	Uranium, Total	7/21/2005	25.3		ug/g	None
A6FPE-UIT-4	A6FPE-UIT-4^8-RM	Uranium, Total	7/21/2005	9.18		ug/g	None
A6FPE-UIT-5	A6FPE-UIT-5^1-RM	Uranium, Total	7/21/2005	7.21		ug/g	None
A6FPE-UIT-5	A6FPE-UIT-5^7-RM	Uranium, Total	7/21/2005	9.69		ug/g	None
A6FPE-UIT-6	A6FPE-UIT-6^1-RM	Uranium, Total	7/21/2005	9.55		ug/g	None
A6FPE-UIT-6	A6FPE-UIT-6^8-RM	Uranium, Total	7/21/2005	11.6		ug/g	None

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VARIANCE / FIELD CHANGE NOTICE	Significant? (Yes or No): NO	V/F: 20600-PSP-0015-12
WBS NO.: PROJECT/DOCUMENT/ECDC # 20600-PSP-0015 Rev.0		Page: 1 of 4
PROJECT TITLE: Project Specific Plan For Excavation Control Of Area 6 – Former Production Area		Date: 7/19/05

VARIANCE / FIELD CHANGE NOTICE (Include justification):

EXCAVATION CONTROL SAMPLING

This Variance/Field Change Notice (V/FCN) documents the collection of soil samples from the Utility Isolation Trench. This trench was cut to approximately twelve feet in depth in order to isolate any remaining utilities. The soil was not removed from the trench and samples are required to verify that no contamination remains above FRLs.

To verify no contamination is present, three locations spaced evenly along both the northern and eastern sections of the trench (total of six locations) have been surveyed to determine the current MSL. This MSL was then compared to the designed excavation depth of the Utility Isolation Trench. A sample from the surface and a sample from the approximate last six inches of the projected trench depth (just above native soil) will be collected and analyzed per Attachment 1. UNLESS NOTED OTHERWISE IN ATTACHMENT 2. CMP 7-26-05 Boring A6FPE-UIT-3 is at trench bottom grade; therefore only one interval will be collected from this location. See Figure 1 for sample locations.

See Attachment 1 for the TAL and the Sampling and Analytical Requirements. The first sample ID shall be A6FPE-UIT-1^1-R and each additional sample ID will be sequentially numbered (e.g. second sample ID is A6FPE-UIT-2^1-L). See Attachment 2 for the Boring Table and Sample Identifier requirements.

Where:
A6FPE = Area 6 Former Production Area Excavation Control
UIT = Utility Isolation Trench
1, 2 etc. = Consecutive Sample Numbers (Locations)
1, 2, etc. = depth interval from the soil surface
R = radiological analysis, L = volatile analysis, P = PCB analysis, M = metals analysis

Surveying required: No, surveying is not required as the locations have already been surveyed and staked.
Field QC samples required: Yes
Field data validation: Yes
Analytical data validation: Yes
Off-site data package requirements (if applicable): Full data package
The highest total uranium result for the area is 5490 mg/kg from boring A6-SA1-4F.

Justification:
Samples will be analyzed to ensure contamination is not present within the boundaries of the trench, which were disturbed during area isolation activities. Physical sampling is required to ensure above-WAC total uranium contamination is not present. Per Section 1.3 of the PSP, the collection of physical samples will be documented with a V/FCN.

REQUESTED BY: Catherine Payne — Date: 7/18/05

X IF REQD	VARIANCE/FCN APPROVAL	DATE	X IF REQD	VARIANCE/FCN APPROVAL	DATE
X	QUALITY ASSURANCE: R. Fries [signature]	7-19-05	X	PROJECT MANAGER: J.D. Chiou [signature]	7/19/05
	DATA QUALITY MANAGEMENT		X	CHARACTERIZATION MANAGER: F. Miller [signature]	7/19/05
X	ANALYTICAL CUSTOMER SUPPORT: Heather Medley	7/19/05		RTIMP Manager	
X	WAO [signature]	7-19-05	X	SAMPLING MANAGER: T. Buhrlage [signature] for T.E.B	7/19/05

VARIANCE/FCN APPROVED [X]YES [ ]NO — REVISION REQUIRED: [ ]YES [x]NO

DISTRIBUTION

PROJECT MANAGER:	DOCUMENT CONTROL: Jeannie Rosser	OTHER:
QUALITY ASSURANCE:	CHARACTERIZATION MANAGER: Frank Miller	OTHER:
FIELD MANAGER:	OTHER:	OTHER:

Component	MDL	FRL	WAC
TAL 20600-PSP-0015-B			
Total Uranium (High Leachability)	2 mg/kg	20 mg/kg	NA
Thorium-228	0.17 pCi/g	1.70 pCi/g	NA
Thorium-232	0.15 pCi/g	1.5 pCi/g	NA
Radium-226	0.17 pCi/g	1.7 pCi/g	NA
Radium-228	0.18 pCi/g	1.8 pCi/g	NA
TAL 20600-PSP-0015-C			
Technetium-99	2.9 pCi/g	29 pCi/g	30 pCi/g
TAL 20600-PSP-0015-D			
Cadmium	8.2 mg/kg	82 mg/kg	NA
Molybdenum	290 mg/kg	2900 mg/kg	NA
Silver	2900 mg/kg	29000 mg/kg	NA
TAL 20600-PSP-0015-E			
Tetrachloroethene (PCE)	0.36 mg/kg	3.6 mg/kg	128 mg/kg
Trichloroethene (TCE)	2.5 mg/kg	25 mg/kg	128 mg/kg
1,1-Dichloroethene	0.041 mg/kg	0.41 mg/kg	11.4 mg/kg
1,2-Dichloroethene (DCE) (Total)	0.016 mg/kg	0.160 mg/kg	11.4 mg/kg
TAL 20600-PSP-0015-F			
Aroclor-1254	0.013 mg/kg	0.13 mg/kg	NA
Aroclor-1260	0.013 mg/kg	0.13 mg/kg	NA
Arsenic	1.2 mg/kg	12 mg/kg	NA
Beryllium	0.15 mg/kg	1.5 mg/kg	NA

SAMPLING AND ANALYTICAL REQUIREMENTS

Analyte	Sample Matrix	Lab	ASL	Preservative	Holding Time	Container[a]	Sample Volume/Mass
TAL B, C, D (Rads/Metals)	Solid	Offsite	D	Cool, 4°C (due to metals)	12 months 6 months	Appropriate Glass with Teflon lid	500 g[b]
TAL B, C, D, F (Rads/Metals/PCBs)	Solid	Offsite	D	Cool, 4°C (due to metals & PCBs)	12 months 6 months 14 days	Appropriate size Glass with Teflon lid	500 g[b]
TAL E VOA	Solid	Offsite	D	Cool, 4°C	48 hours	3 x 1-Encore Sampler plus 1 x 1-oz jar for % moisture[b]	Each full Encore Sampler[b] will hold approx. 5 g
TAL E VOA	Liquid (Trip blank)	Offsite	D	Cool, 4°C H_2SO_4 pH<2	48 hours	3 x 40-mL glass with Teflon-lined septa	120 mL (no headspace)

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

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

Northing	Easting	Current MSL, feet	Designed MSL, feet	Boring	Sample ID	Depth to Sample, feet	Analysis
481902.235	1349571.779	587.394	581	A6FPE-UIT-1	A6FPE-UIT-1^1-RMP	0-0.5	TAL B, C, D, F
					A6FPE-UIT-1^1-L	0-0.5	TAL E
					A6FPE-UIT-1^12-RMP	5.5-6	TAL B, C, D, F
					A6FPE-UIT-1^12-L	5.5-6	TAL E
481906.476	1349815.881	583.291	581	A6FPE-UIT-2	A6FPE-UIT-2^1-RMP	0-0.5	TAL B, C, D, F
					A6FPE-UIT-2^1-L	0-0.5	TAL E
					A6FPE-UIT-2^4-RMP	1.5-2	TAL B, C, D, F
					A6FPE-UIT-2^4-L	1.5-2	TAL E
481902.008	1350059.619	577.7	578	A6FPE-UIT-3	A6FPE-UIT-3^1-RMP	0-0.5	TAL B, C, D, F
					A6FPE-UIT-3^1-L	0-0.5	TAL E
481624.836	1350294.729	581.27	574	A6FPE-UIT-4	A6FPE-UIT-4^1-RM	0-0.5	TAL B, C, D
					A6FPE-UIT-4^~~14~~ 8 CMP 7-26-05 -RM	~~6.5-7~~ 3.5-4 CMP 7-26-05	* TAL B, C, D
481352.367	1350290.892	579.676	576	A6FPE-UIT-5	A6FPE-UIT-5^1-RM	0-0.5	TAL B, C, D
					A6FPE-UIT-5^7-RM	3-3.5	TAL B, C, D
481081.1	1350281.573	578.707	569	A6FPE-UIT-6	A6FPE-UIT-6^1-RM	0-0.5	TAL B, C, D
					A6FPE-UIT-6^~~19~~ 8 CMP 7-26-05 -RM	~~9-9.5~~ 3.5-4 CMP 7-26-05	* TAL B, C, D

* Unable to collect the last 6 inches above the native soil in the Utility Isolation Trench at Locations A6FPE-UIT-4 and A6FPE-UIT-6 because of access problems due to the depth of the trench. The intent of collecting 2 intervals per boring, one at the surface and one of the last 6-inches of 'trencher-mixed' soil, was to provide information about the overall depth of potential impact. Since soil in the trench was mixed when the trench was dug, samples from any depth will provide similar information. Therefore, at locations A6FPE-UIT-4 and A6FPE-UIT-6 samples were collected from the 3.5-4 foot interval.

CMP 7-26-05

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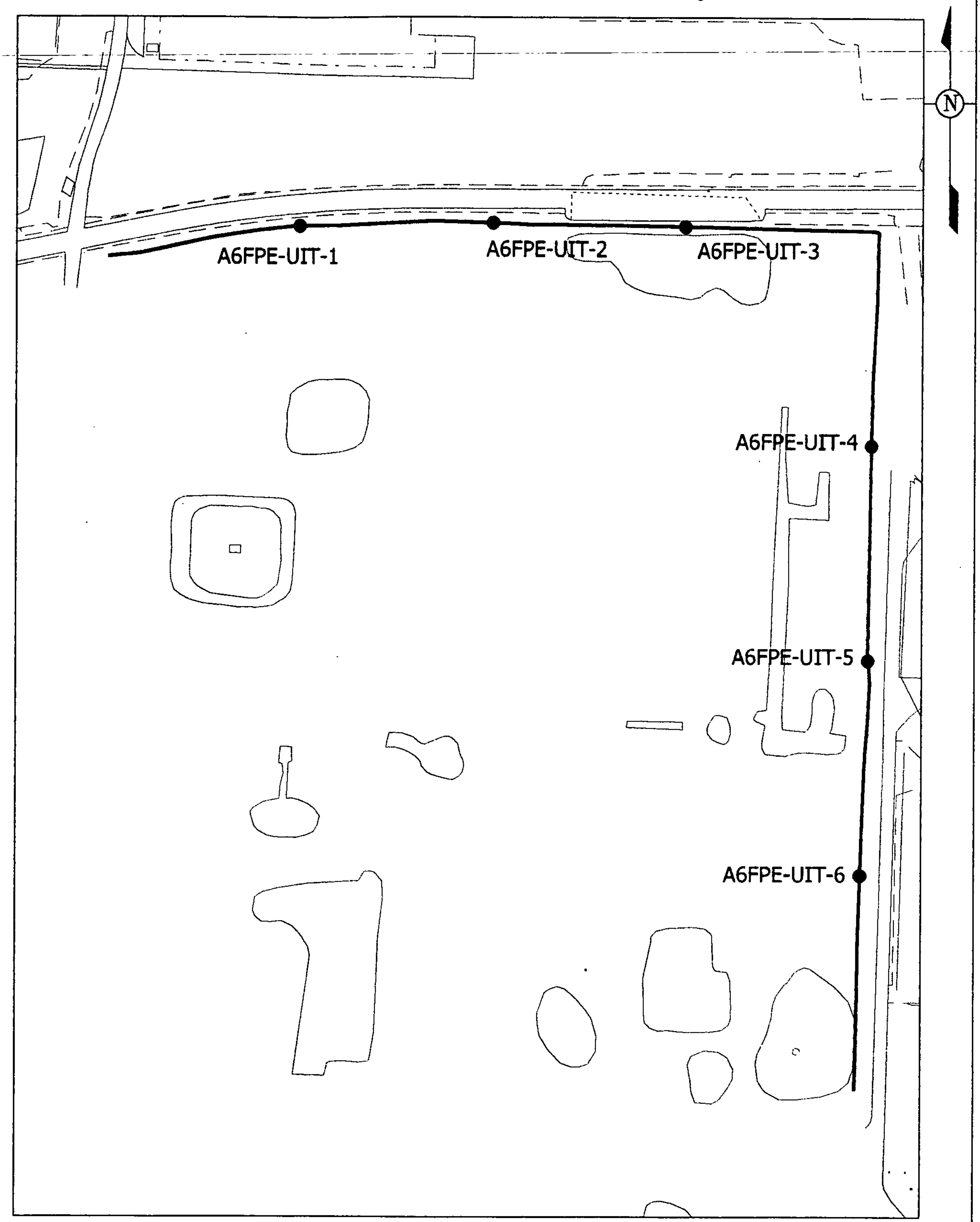

STATE PLANAR COORDINATE SYSTEM 1983

19-JUL-2005

LEGEND:

● SAMPLE LOCATION

SCALE

180 90 0 180 FEET

DRAFT

FIGURE 1.

APPENDIX B

PRECERTIFICATION REAL-TIME SCAN DATA FOR AREA 6 FPA AND MDC AREA

TABLE B-1
AREA 6 FPA AND MDC AREA
DETECTOR HEIGHT 31 cm

Location ID	Measurement Date	Northing	Easting	Detector Height	U-238 (pCi/g)	Ra-226 (pCi/g)	Th-232 (pCi/g)	Total U (ppm)
A6-FPA&MDC-P2-26	08Nov05	480806	1350091	31	0	1.969	0.998	8.26E-02
A6-FPA&MDC-P2-26-D	08Nov05	480806	1350091	31	0	2.061	1.06	0.108
A6-FPA&MDC-P2-27	08Nov05	480800	1350071	31	0	2.184	1	6.24E-02
A6-FPA&MDC-P2-29	08Nov05	480725	1349846	31	0	1.382	0.833	0
A6-FPA&MDC-P2-29-D	08Nov05	480725	1349845	31	0	1.398	0.742	0
A6-FPA&MDC-P2-30	08Nov05	480727	1349808	31	0	1.457	0.753	0
A6-FPA&MDC-P2-31	08Nov05	480692	1349860	31	0	1.316	0.669	0
A6-FPA&MDC-P2-32	08Nov05	480698	1349806	31	0	1.394	0.705	0
A6-FPA&MDC-P2-33	08Nov05	480705	1349839	31	0	1.394	0.646	0
A6-FPA&MDC-P2-34	08Nov05	480767	1349820	31	0	1.217	0.647	0
A6-FPA&MDC-P2-35	08Nov05	480685	1349778	31	5.56	2.112	0.95	16.5
A6-FPA&MDC-P2-36	08Nov05	480746	1349807	31	0	1.205	0.629	0
A6-FPA&MDC-P2-37	08Nov05	480766	1349734	31	0	1.404	0.701	5.83E-02
A6-FPA&MDC-P2-38	08Nov05	480759	1349551	31	0	1.102	0.509	4.73E-02
A6-FPA&MDC-P2-40	08Nov05	480676	1349271	31	5.61	1.467	0.776	16.8
A6-FPA&MDC-P2-41	08Nov05	480635	1349270	31	13.2	1.371	0.829	39.7
A6-FPA&MDC-P2-42	08Nov05	480669	1349247	31	6.86	1.458	0.917	20.6
A6-FPA&MDC-P2-43	09Nov05	480912	1350245	31	2.49	1.006	0.681	7.4
A6-FPA&MDC-P2-45	09Nov05	480749	1349766	31	0	1.232	0.755	0
A6-FPA&MDC-P2-47	09Nov05	480748	1349743	31	0	1.145	0.613	6.30E-02
A6-FPA&MDC-P2-49	09Nov05	480677	1349270	31	0	1.161	0.813	9.91E-02
A6-FPA&MDC-P2-51	09Nov05	480634	1349268	31	14.8	1.319	0.784	44.5
A6-FPA&MDC-P2-53	09Nov05	480668	1349247	31	12.3	1.348	0.902	36.7
A6-FPA&MDC-P2-64	11Nov05	482100	1350078	31	4	1.381	0.939	12
A6-FPA&MDC-P2-66	11Nov05	482101	1350687	31	6	1.364	0.897	17.9
A6-FPA&MDC-P2-68	11Nov05	482063	1350064	31	10.2	1.185	0.77	30.6
A6-FPA&MDC-P2-70	11Nov05	482076	1350023	31	3.94	1.212	0.73	11.8
A6-FPA&MDC-HL-P2-65	12Nov05	482130	1349939	31	5.88	2.434	0.969	17.6
A6-FPA&MDC-HL-P2-65-D	12Nov05	482130	1349939	31	5.27	2.198	0.855	15.7

TABLE B-1
AREA 6 FPA AND MDC AREA
DETECTOR HEIGHT 31 cm

Location ID	Measurement Date	Northing	Easting	Detector Height	U-238 (pCi/g)	Ra-226 (pCi/g)	Th-232 (pCi/g)	Total U (ppm)
A6-FPA&MDC-HL-P2-67	12Nov05	482050	1349986	31	0	2.179	0.695	0
A6-FPA&MDC-HL-P2-69	12Nov05	482075	1349937	31	4.87	2.374	0.887	14.6
A6-FPA&MDC-HL-P2-71	12Nov05	482106	1349924	31	0	2.315	0.954	5.85E-02
A6-FPA&MDC-HL-P2-72	12Nov05	482151	1349914	31	5.14	2.637	0.914	15.4
A6-FPA&MDC-HL-P2-95	17Nov05	481051	1350494	31	5.37	1.424	0.979	16.1
A6-FPA&MDC-P2-79	17Nov05	482081	1350213	31	0	0.891	0.695	0
A6-FPA&MDC-P2-79-D	17Nov05	482081	1350213	31	3.39	0.899	0.731	10.1
A6-FPA&MDC-HL-P2-80	17Nov05	482144	1350128	31	0	0.964	0.616	0
A6-FPA&MDC-HL-P2-81	17Nov05	482119	1350105	31	0	1.009	0.647	6.59E-02
A6-FPA&MDC-HL-P2-82	17Nov05	482032	1350059	31	0	0.858	0.663	0
A6-FPA&MDC-HL-P2-83	17Nov05	482067	1349915	31	0	1.158	0.732	5.19E-02
A6-FPA&MDC-P2-84	17Nov05	482054	1349871	31	0	1.022	0.656	0
A6-FPA&MDC-P2-85	17Nov05	482109	1349849	31	0	1.089	0.805	9.10E-02
A6-FPA&MDC-P2-86	17Nov05	482177	1349899	31	7.08	1.232	0.992	21.1
A6-FPA&MDC-P2-87	17Nov05	481962	1349813	31	7.58	1.203	1.01	22.7
A6-FPA&MDC-HL-P2-88	17Nov05	481813	1349857	31	0	1.218	0.77	0
A6-FPA&MDC-HL-P2-89	17Nov05	481942	1349905	31	0	1.17	0.798	0
A6-FPA&MDC-P2-90	17Nov05	482195	1350539	31	5.91	1.297	1.15	17.7
A6-FPA&MDC-P2-91	17Nov05	482097	1349740	31	0	1.2	1.02	9.21E-02
A6-FPA&MDC-P2-92	17Nov05	482001	1349544	31	6.33	1.325	1.04	18.9
MDC-P2-8	18Jun05	481687	1349162	31	0	1.294	0.925	0
MDC-P2-8-D	18Jun05	481687	1349162	31	8.93	1.163	0.835	26.5
MDC-HL-P2-9	20Jun05	481681	1349158	31	0	1.374	0.813	8.48E-02
MDC-HL-P2-10	20Jun05	481721	1349154	31	0	1.02	0.548	0
MDC-HL-P2-10-D	20Jun05	481721	1349154	31	5.85	1.081	0.58	17.5

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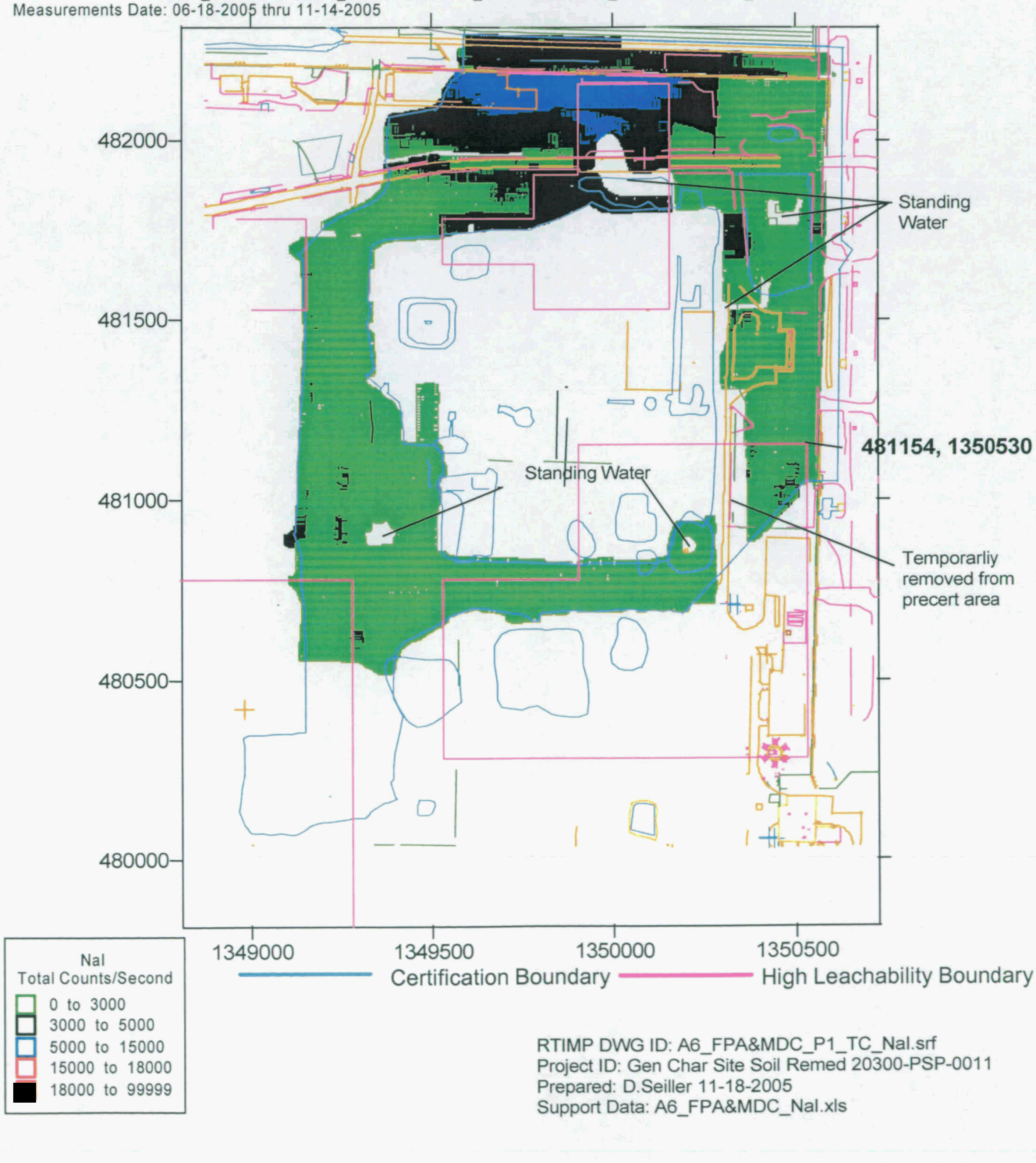
Figure B-1 Area 6 FPA and MDC Area Phase 1 Total Gross Counts per Second

Data Groups: GATOR_0646_08-08-2005;0649_08-10-2005;0703_10-14-2005; 0708_10-15-2005;0722_10-29-2005; 0725_10-30-2005;0738_11-04-2005;0742_11-05-2005; 0745_11-09-2005;0747_11-09-2005; 0750_11-11-2005
RSS1_2108_08-09-2005;2119_08-11-2005;2231_10-14-2005; 2234_10-15-2005;2268_10-30-2005; 2281_11-03-2005;2291_11-05-2005;2290_11-05-2005;2308_11-11-2005
RSS2_1207_10-14-2005;1211_11-04-2005;1214_11-08-2005;1217_11-09-2005;1218_11-09-2005
RSS3_0985_08-05-2005;1051_10-14-2005;1078_10-31-2005;1086_11-04-2005;1090_11-05-2005; 1105_11-14-2005
RSS4_0234_08-05-2005;0239_08-08-2005;0246_08-10-2005;0512_10-14-2005; 0544_10-29-2005; 0550_10-30-2005;0556_10-31-2005;0573_11-04-2005;0602_11-09-2005;0606_11-10-2005; 0611_11-11-2005;0612_11-11-2005;0615_11-12-2005;0618_11-14-2005;0047_06-18-2005
Measurements Date: 06-18-2005 thru 11-14-2005



RTIMP DWG ID: A6_FPA&MDC_P1_TC_NaI.srf
Project ID: Gen Char Site Soil Remed 20300-PSP-0011
Prepared: D.Seiller 11-18-2005
Support Data: A6_FPA&MDC_NaI.xls

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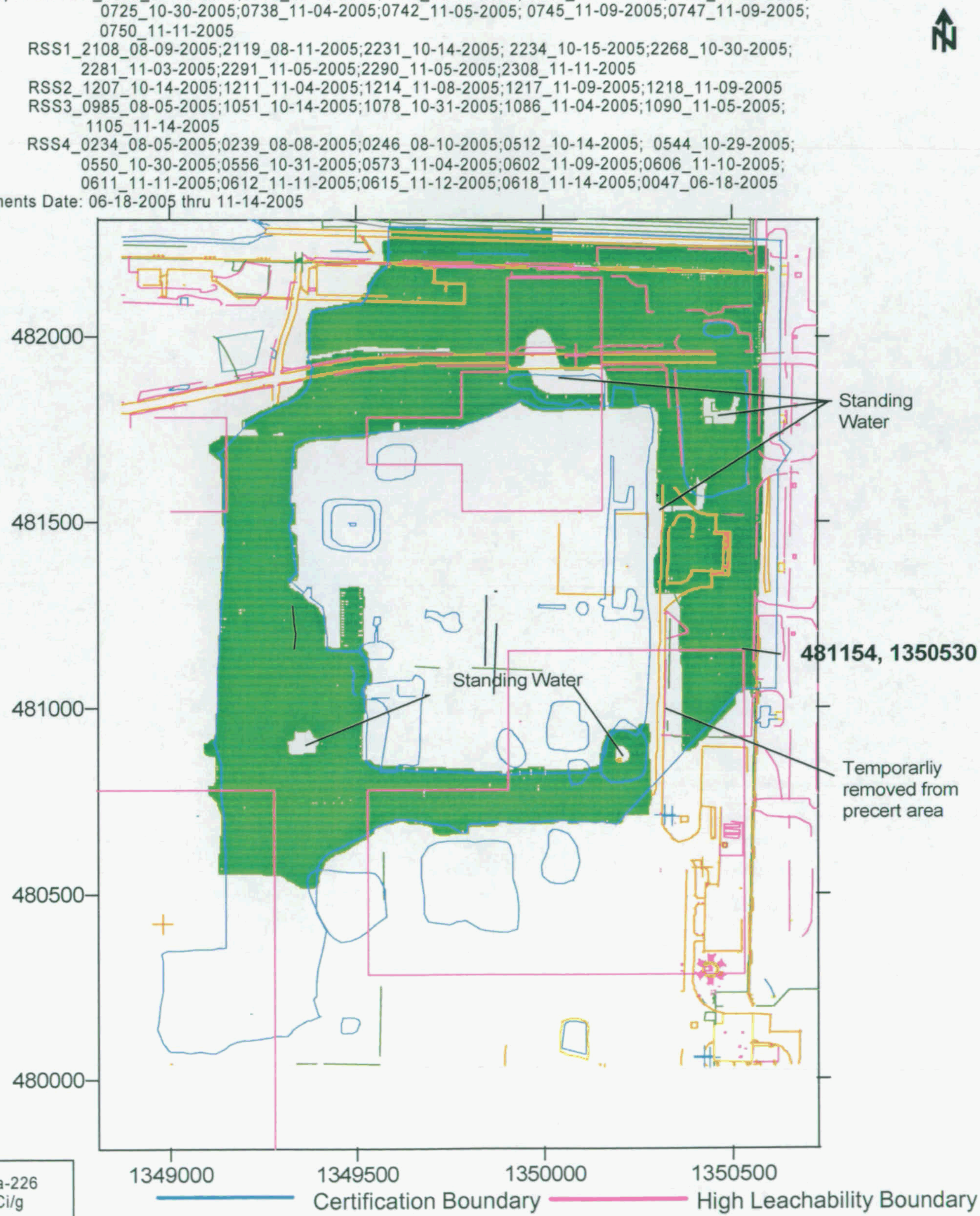
Figure B-2 Area 6 FPA and MDC Area Phase 1 Moisture Corrected Radium-226

Data Groups: GATOR_0646_08-08-2005;0649_08-10-2005;0703_10-14-2005; 0708_10-15-2005;0722_10-29-2005; 0725_10-30-2005;0738_11-04-2005;0742_11-05-2005; 0745_11-09-2005;0747_11-09-2005; 0750_11-11-2005
RSS1_2108_08-09-2005;2119_08-11-2005;2231_10-14-2005; 2234_10-15-2005;2268_10-30-2005; 2281_11-03-2005;2291_11-05-2005;2290_11-05-2005;2308_11-11-2005
RSS2_1207_10-14-2005;1211_11-04-2005;1214_11-08-2005;1217_11-09-2005;1218_11-09-2005
RSS3_0985_08-05-2005;1051_10-14-2005;1078_10-31-2005;1086_11-04-2005;1090_11-05-2005; 1105_11-14-2005
RSS4_0234_08-05-2005;0239_08-08-2005;0246_08-10-2005;0512_10-14-2005; 0544_10-29-2005; 0550_10-30-2005;0556_10-31-2005;0573_11-04-2005;0602_11-09-2005;0606_11-10-2005; 0611_11-11-2005;0612_11-11-2005;0615_11-12-2005;0618_11-14-2005;0047_06-18-2005
Measurements Date: 06-18-2005 thru 11-14-2005

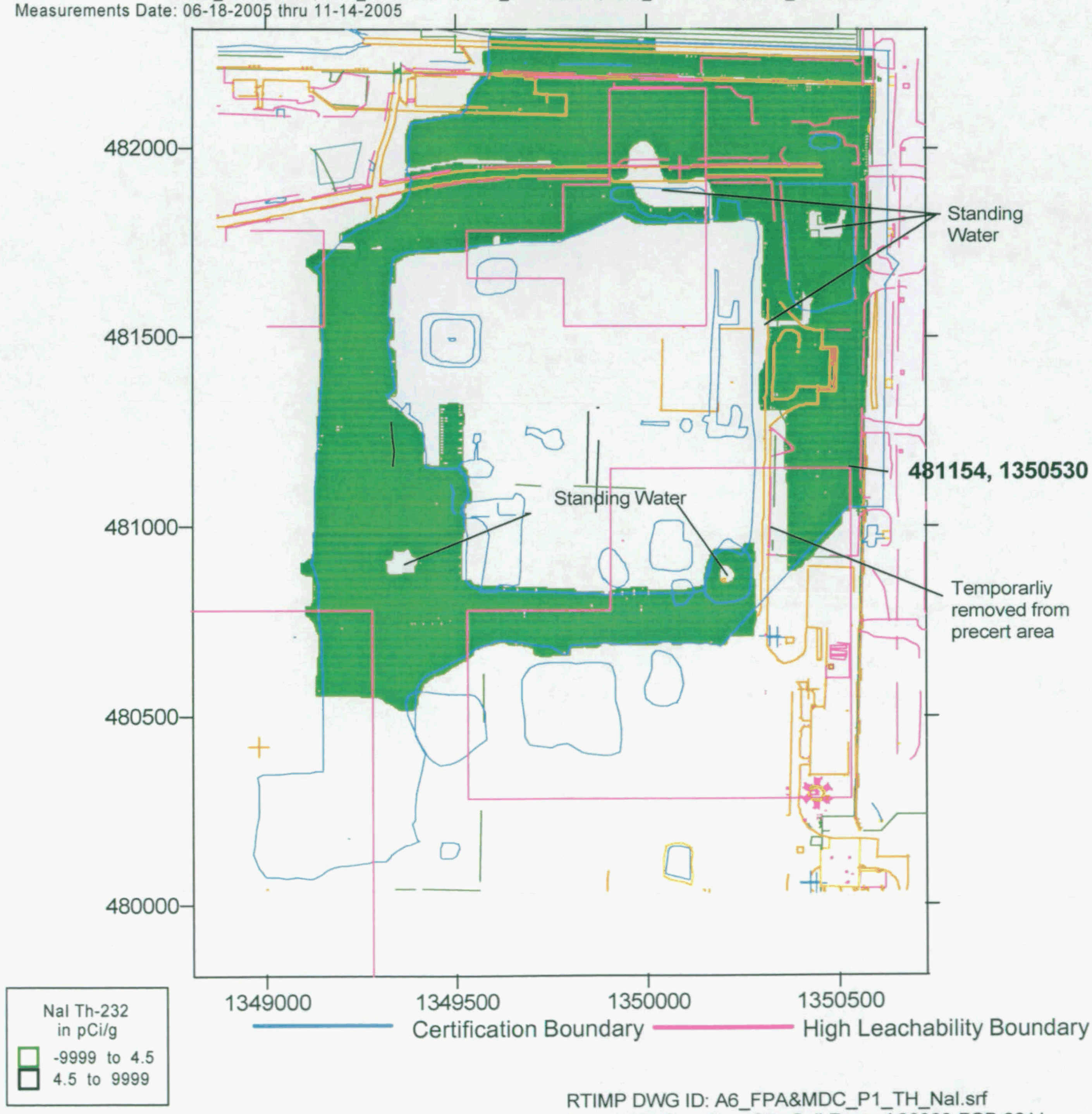


NaI Ra-226 in pCi/g
-9999 to 5.1
5.1 to 9999

RTIMP DWG ID: A6_FPA&MDC_P1_RA_NaI.srf
Project ID: Gen Char Site Soil Remed 20300-PSP-0011
Prepared: D.Seiller 11-18-2005
Support Data: A6_FPA&MDC_NaI.xls

Figure B-3 Area 6 FPA and MDC Area Phase 1 Moisture Corrected Thorium-232

Data Groups: GATOR_0646_08-08-2005;0649_08-10-2005;0703_10-14-2005; 0708_10-15-2005;0722_10-29-2005; 0725_10-30-2005;0738_11-04-2005;0742_11-05-2005; 0745_11-09-2005;0747_11-09-2005; 0750_11-11-2005
RSS1_2108_08-09-2005;2119_08-11-2005;2231_10-14-2005; 2234_10-15-2005;2268_10-30-2005; 2281_11-03-2005;2291_11-05-2005;2290_11-05-2005;2308_11-11-2005
RSS2_1207_10-14-2005;1211_11-04-2005;1214_11-08-2005;1217_11-09-2005;1218_11-09-2005
RSS3_0985_08-05-2005;1051_10-14-2005;1078_10-31-2005;1086_11-04-2005;1090_11-05-2005; 1105_11-14-2005
RSS4_0234_08-05-2005;0239_08-08-2005;0246_08-10-2005;0512_10-14-2005; 0544_10-29-2005; 0550_10-30-2005;0556_10-31-2005;0573_11-04-2005;0602_11-09-2005;0606_11-10-2005; 0611_11-11-2005;0612_11-11-2005;0615_11-12-2005;0618_11-14-2005;0047_06-18-2005
Measurements Date: 06-18-2005 thru 11-14-2005



RTIMP DWG ID: A6_FPA&MDC_P1_TH_NaI.srf
Project ID: Gen Char Site Soil Remed 20300-PSP-0011
Prepared: D.Seiller 11-18-2005
Support Data: A6_FPA&MDC_NaI.xls

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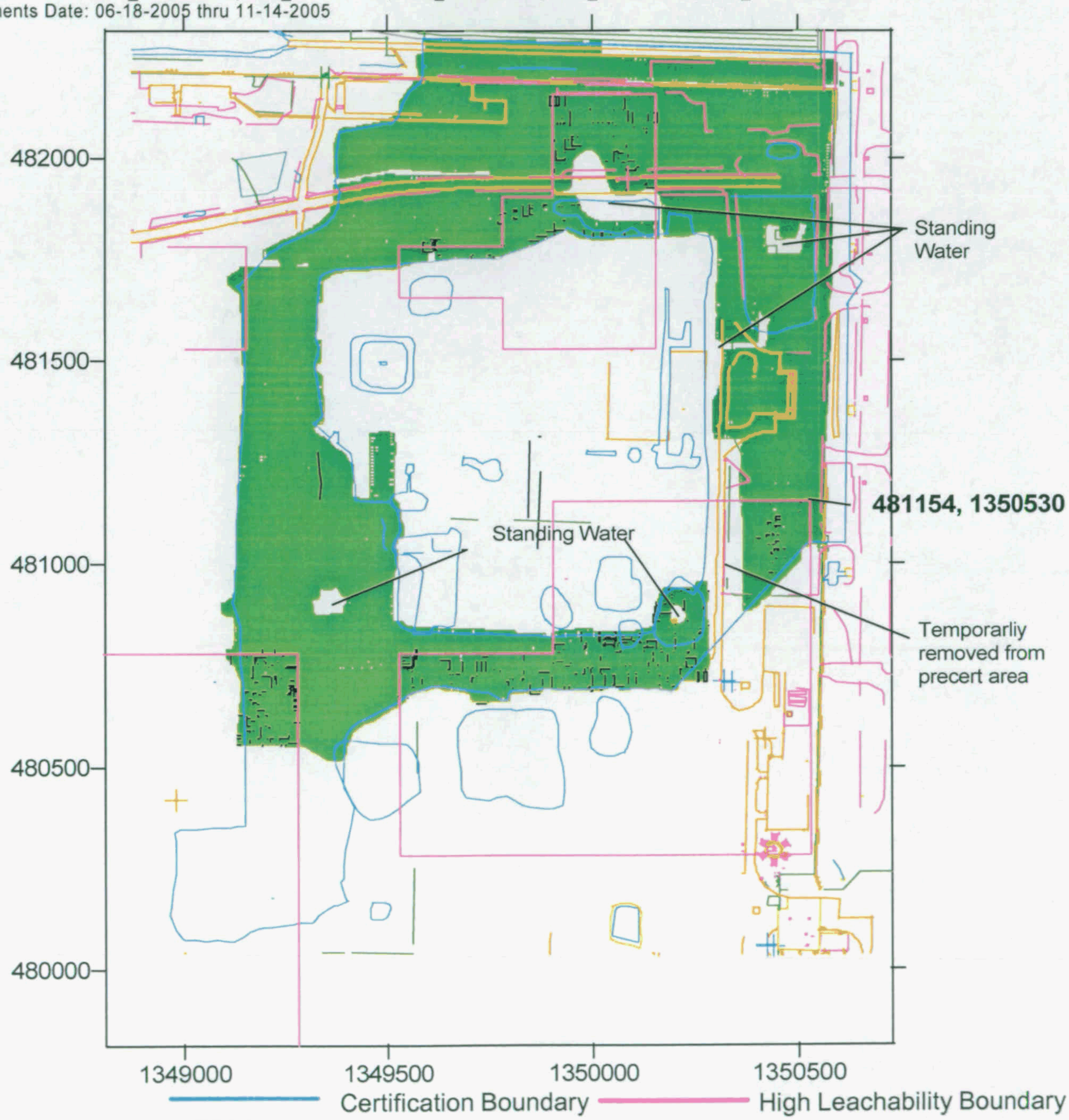
Figure B-4 Area 6 FPA and MDC Area Phase 1 Moisture Corrected Total Uranium

Data Groups: GATOR_0646_08-08-2005;0649_08-10-2005;0703_10-14-2005; 0708_10-15-2005;0722_10-29-2005; 0725_10-30-2005;0738_11-04-2005;0742_11-05-2005; 0745_11-09-2005;0747_11-09-2005; 0750_11-11-2005
RSS1_2108_08-09-2005;2119_08-11-2005;2231_10-14-2005; 2234_10-15-2005;2268_10-30-2005; 2281_11-03-2005;2291_11-05-2005;2290_11-05-2005;2308_11-11-2005
RSS2_1207_10-14-2005;1211_11-04-2005;1214_11-08-2005;1217_11-09-2005;1218_11-09-2005
RSS3_0985_08-05-2005;1051_10-14-2005;1078_10-31-2005;1086_11-04-2005;1090_11-05-2005; 1105_11-14-2005
RSS4_0234_08-05-2005;0239_08-08-2005;0246_08-10-2005;0512_10-14-2005; 0544_10-29-2005; 0550_10-30-2005;0556_10-31-2005;0573_11-04-2005;0602_11-09-2005;0606_11-10-2005; 0611_11-11-2005;0612_11-11-2005;0615_11-12-2005;0618_11-14-2005;0047_06-18-2005
Measurements Date: 06-18-2005 thru 11-14-2005



Nal Non H-L Area Total U (ppm)	Nal H-L Area Total U (ppm)
-9999 to 246	-9999 to 60
246 to 9999	60 to 9999

RTIMP DWG ID: A6_FPA&MDC_P1_TU_Nal.srf
Project ID: Gen Char Site Soil Remed 20300-PSP-0011
Prepared: D.Seiller 11-18-2005
Support Data: A6_FPA&MDC_Nal.xls

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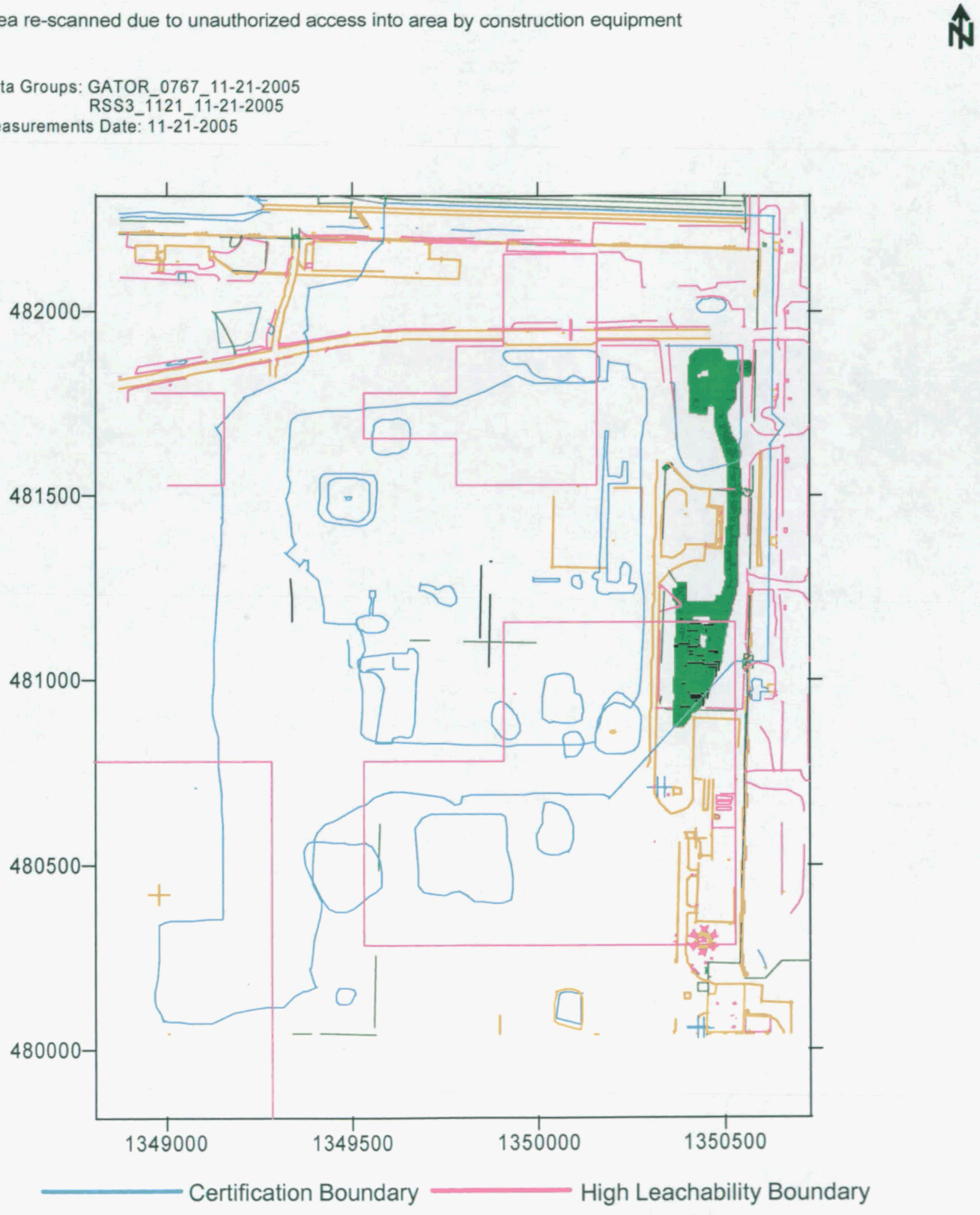
Figure B-4a Area 6 FPA and MDC Area Phase 1 Moisture Corrected Total Uranium

Area re-scanned due to unauthorized access into area by construction equipment

Data Groups: GATOR_0767_11-21-2005
RSS3_1121_11-21-2005
Measurements Date: 11-21-2005

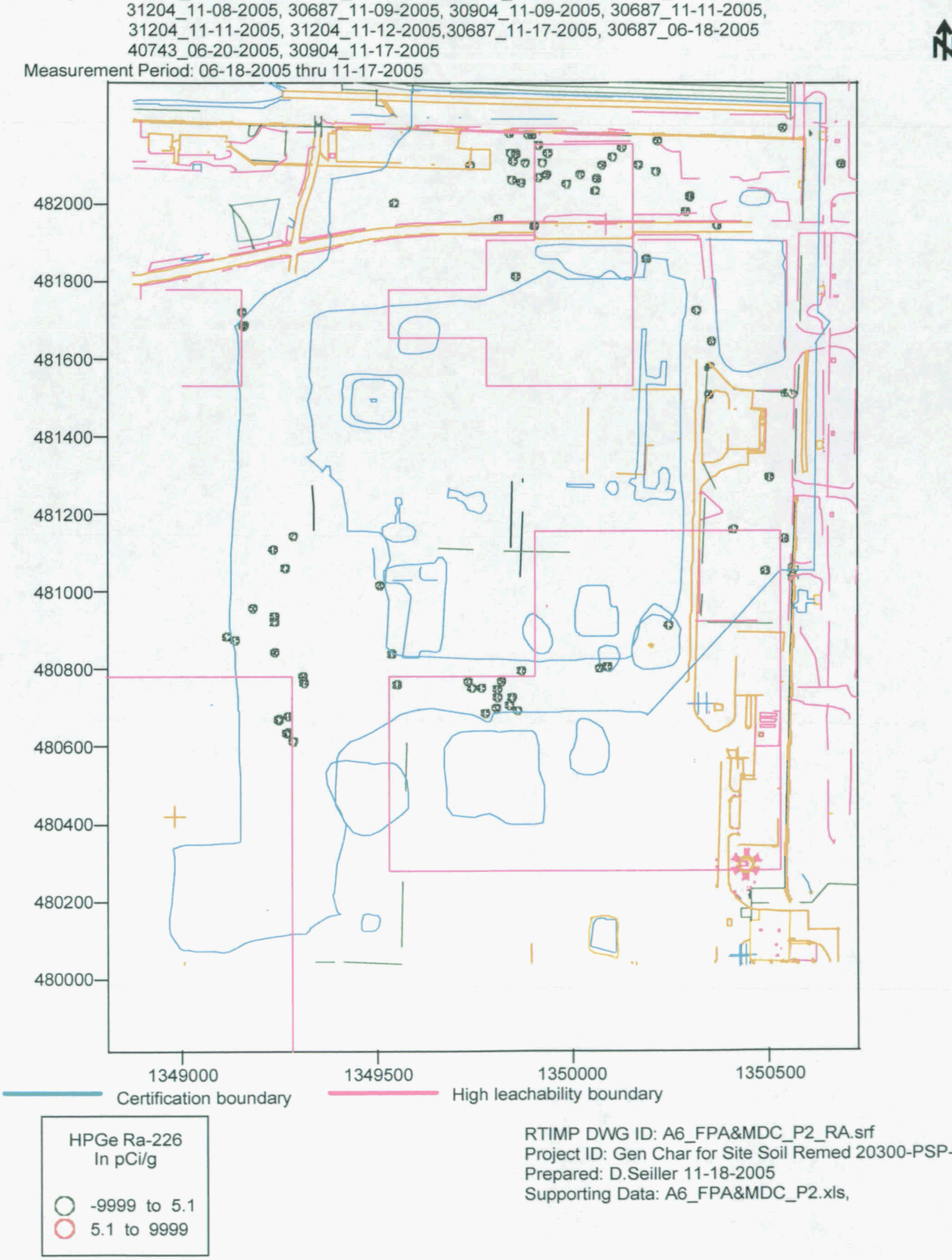


NaI Non H-L Area Total U (ppm)	NaI H-L Area Total U (ppm)
-9999 to 246	-9999 to 60
246 to 9999	60 to 9999

RTIMP DWG ID: A6_FPA&MDC_P1_TU_RERUN_NaI.srf
Project ID: Gen Char Site Soil Remed 20300-PSP-0011
Prepared: D.Seiller 11-23-2005
Support Data: A6_FPA&MDC_RERUN_NaI.xls

Figure B-5 Area 6 FPA and MDC Area Phase 2 Moisture Corrected Radium-226

Data groups: 30687_08-09-2005, 30904_10-31-2005, 30687_11-08-2005, 30904_11-08-2005, 31204_11-08-2005, 30687_11-09-2005, 30904_11-09-2005, 30687_11-11-2005, 31204_11-11-2005, 31204_11-12-2005,30687_11-17-2005, 30687_06-18-2005 40743_06-20-2005, 30904_11-17-2005
Measurement Period: 06-18-2005 thru 11-17-2005



RTIMP DWG ID: A6_FPA&MDC_P2_RA.srf
Project ID: Gen Char for Site Soil Remed 20300-PSP-0011
Prepared: D.Seiller 11-18-2005
Supporting Data: A6_FPA&MDC_P2.xls,

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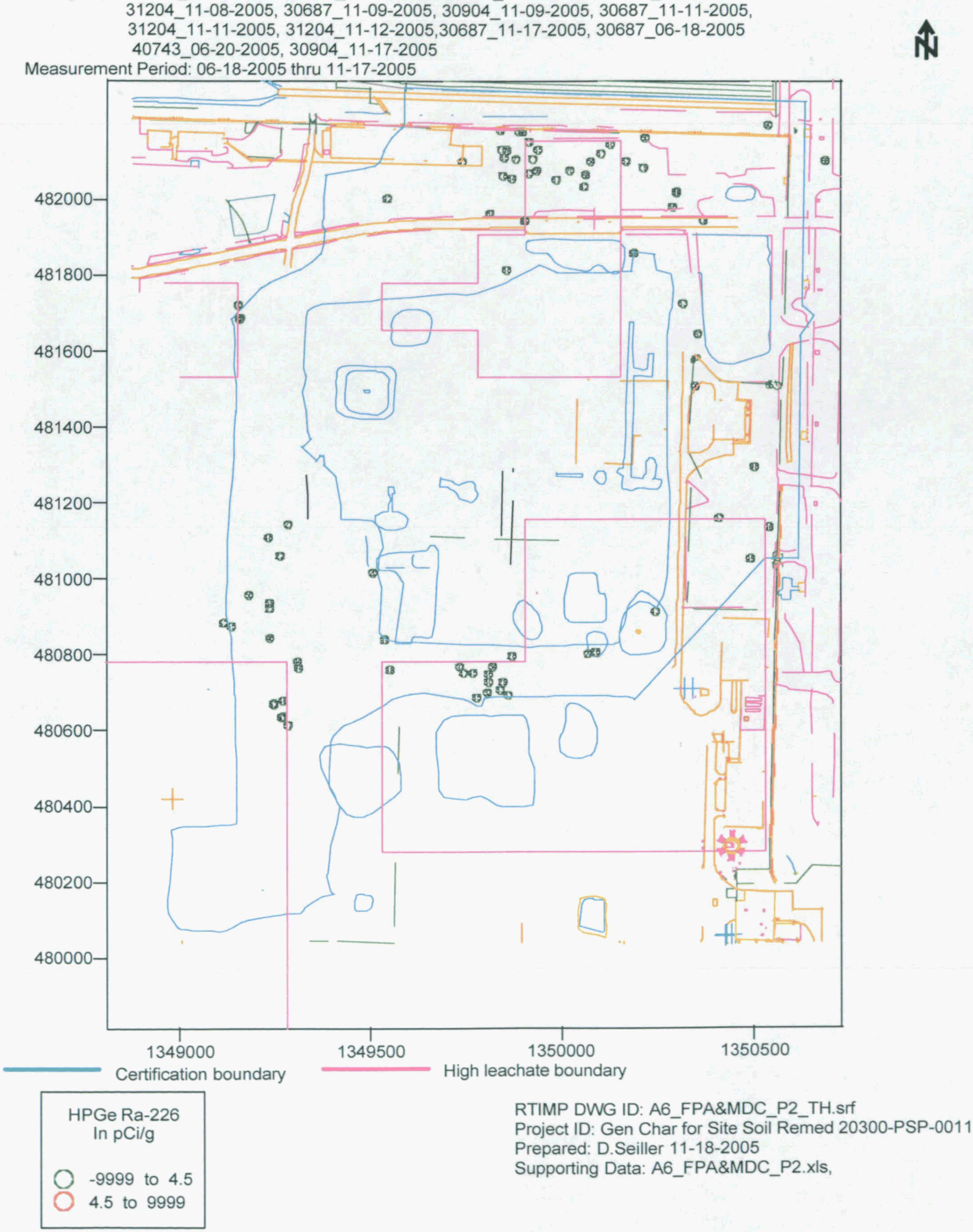
Figure B-6 Area 6 FPA and MDC Area Phase 2 Moisture Corrected Thorium-232

Data groups: 30687_08-09-2005, 30904_10-31-2005, 30687_11-08-2005, 30904_11-08-2005, 31204_11-08-2005, 30687_11-09-2005, 30904_11-09-2005, 30687_11-11-2005, 31204_11-11-2005, 31204_11-12-2005,30687_11-17-2005, 30687_06-18-2005 40743_06-20-2005, 30904_11-17-2005

Measurement Period: 06-18-2005 thru 11-17-2005

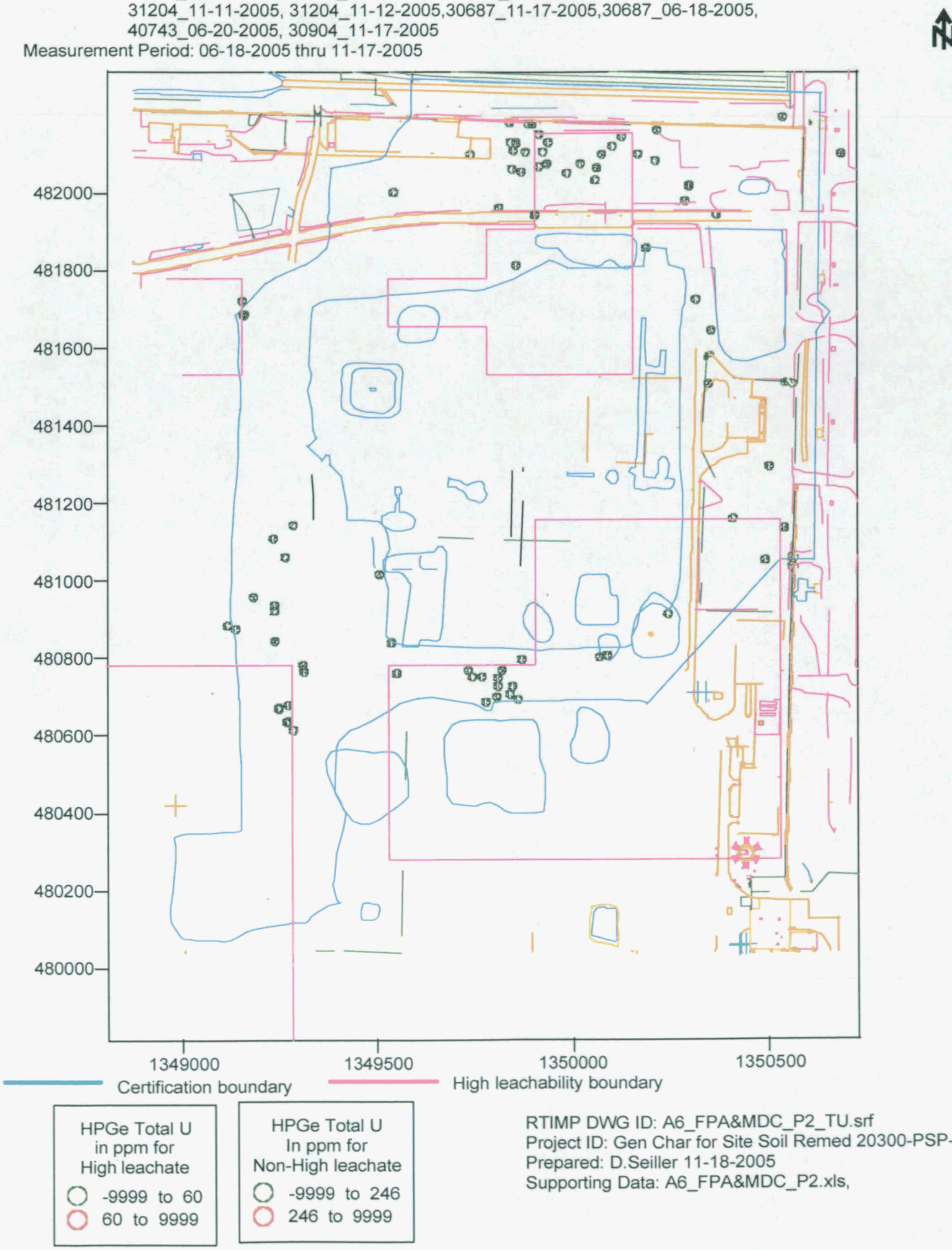


RTIMP DWG ID: A6_FPA&MDC_P2_TH.srf
Project ID: Gen Char for Site Soil Remed 20300-PSP-0011
Prepared: D.Seiller 11-18-2005
Supporting Data: A6_FPA&MDC_P2.xls,

6063

Figure B-7 Area 6 FPA and MDC Area Phase 2
Moisture Corrected Total Uranium

Data groups: 30687_08-09-2005, 30904_10-31-2005, 30687_11-08-2005, 30904_11-08-2005, 31204_11-08-2005, 30687_11-09-2005, 30904_11-09-2005, 30687_11-11-2005, 31204_11-11-2005, 31204_11-12-2005,30687_11-17-2005,30687_06-18-2005, 40743_06-20-2005, 30904_11-17-2005
Measurement Period: 06-18-2005 thru 11-17-2005



RTIMP DWG ID: A6_FPA&MDC_P2_TU.srf
Project ID: Gen Char for Site Soil Remed 20300-PSP-0011
Prepared: D.Seiller 11-18-2005
Supporting Data: A6_FPA&MDC_P2.xls,

APPENDIX C

AREA 6 FPA AND MDC AREA
CERTIFICATION SAMPLE LOCATIONS AND IDENTIFIERS

APPENDIX C

AREA 6 FPA AND MDC AREA CERTIFICATION SAMPLE LOCATIONS AND IDENTIFIERS

CU	Location	Depth	Sample ID	TAL	North-83	East-83
	1-1V	0"-6"	MDC-C01-1^V	Archive	482262.23	1349603.75
1	1-2	0"-6"	MDC-C01-2^R	A	482205.97	1349650.39
	1-3	0"-6"	MDC-C01-3^R	A	482245.55	1349710.96
	1-4D	0"-6"	MDC-C01-4^R	A	482280.14	1349751.88
		0"-6"	MDC-C01-4^R-D			
	1-5V	0"-6"	MDC-C01-5^V	Archive	482209.59	1349788.81
	1-6	0"-6"	MDC-C01-6^R	A	482276.02	1349830.96
	1-7	0"-6"	MDC-C01-7^R	A	482245.74	1349876.19
	1-8	0"-6"	MDC-C01-8^R	A	482238.69	1349909.92
	1-9	0"-6"	MDC-C01-9^R	A	482209.1	1349946.14
	1-10	0"-6"	MDC-C01-10^R	A	482210.13	1349991.19
	1-11V	0"-6"	MDC-C01-11^V	Archive	482243.69	1350044.35
	1-12	0"-6"	MDC-C01-12^R	A	482239.4	1350149.68
	1-13	0"-6"	MDC-C01-13^R	A	482251.63	1350266.7
	1-14	0"-6"	MDC-C01-14^R	A	482237.88	1350379.7
	1-15	0"-6"	MDC-C01-15^R	A	482241.6	1350460.63
	1-16V	0"-6"	MDC-C01-16^V	Archive	482252.87	1350599.52
2	2-1	0"-6"	MDC-C02-1^RMPS	ADHO	482163.98	1349584.77
	2-2V	0"-6"	MDC-C02-2^V	Archive	482160.71	1349639.82
	2-3	0"-6"	MDC-C02-3^RMPS	ADHO	482103.47	1349541.61
	2-4	0"-6"	MDC-C02-4^RMPS	ADHO	482103.75	1349617.94
	2-5D	0"-6"	MDC-C02-5^RMPS	ADHO	482144.2	1349685.99
			MDC-C02-5^RMPS-D			
	2-6V	0"-6"	MDC-C02-6^V	Archive	482179.65	1349737.16
	2-7	0"-6"	MDC-C02-7^RMPS	ADHO	482119.07	1349650.67
	2-8	0"-6"	MDC-C02-8^RMPS	ADHO	482115.47	1349738.66
	2-9	0"-6"	MDC-C02-9^RMPS	ADHO	482189.29	1349790.52
	2-10	0"-6"	MDC-C02-10^RMPS	ADHO	482108.76	1349787.97
	2-11	0"-6"	MDC-C02-11^RMPS	ADHO	482043.19	1349683.75
	2-12V	0"-6"	MDC-C02-12^V	ADHO	482040.62	1349746.29
	2-13	0"-6"	MDC-C02-13^RMPS	ADHO	482047.98	1349392.13
	2-14	0"-6"	MDC-C02-14^RMPS	ADHO	482055.56	1349484.1
	2-15	0"-6"	MDC-C02-15^RMPS	ADHO	482053.31	1349582.87
	2-16V	0"-6"	MDC-C02-16^V	Archive	482071.75	1349645.05

APPENDIX C
AREA 6 FPA AND MDC AREA CERTIFICATION SAMPLE LOCATIONS AND IDENTIFIERS

CU	Location	Depth	Sample ID	TAL	North-83	East-83
3	3-1V	0"-6"	MDC-C03-1^V	Archive	482182.41	1349814.14
	3-2	0"-6"	MDC-C03-2^RPS	AO	482173.48	1349939.78
	3-3	0"-6"	MDC-C03-3^RPS	AO	482147.31	1349852.92
	3-4	0"-6"	MDC-C03-4^RPS	AO	482141.72	1349919.46
	3-5	0"-6"	MDC-C03-5^RPS	AO	482212.89	1350081.12
	3-6	0"-6"	MDC-C03-6^RPS	AO	482182.09	1350057.81
	3-7V	0"-6"	MDC-C03-7^V	Archive	482138.09	1349988.97
	3-8	0"-6"	MDC-C03-8^RPS	AO	482142.87	1350089.29
	3-9	0"-6"	MDC-C03-9^RPS	AO	482080.89	1349819.67
	3-10	0"-6"	MDC-C03-10^RPS	AO	482097.61	1349931.12
	3-11V	0"-6"	MDC-C03-11^V	Archive	482046.27	1349863.48
	3-12	0"-6"	MDC-C03-12^RPS	AO	482045.63	1349910.21
	3-13D	0"-6"	MDC-C03-13^RPS MDC-C03-13^RPS-D	AO	482101.91	1350021.17
	3-14	0"-6"	MDC-C03-14^RPS	AO	482093.48	1350080.48
	3-15V	0"-6"	MDC-C03-15^V	Archive	482038.23	1349965.55
	3-16	0"-6"	MDC-C03-16^RPS	AO	482048.57	1350052.97
4	4-1	0"-6"	MDC-C04-1^RP	AP	482207.22	1350134.44
	4-2	0"-6"	MDC-C04-2^RP	AP	482229.26	1350206.5
	4-3V	0"-6"	MDC-C04-3^V	Archive	482141.67	1350131.53
	4-4	0"-6"	MDC-C04-4^RP	AP	482179.01	1350208.83
	4-5	0"-6"	MDC-C04-5^RP	AP	482204.66	1350284.12
	4-6	0"-6"	MDC-C04-6^RP	AP	482214.3	1350362.76
	4-7V	0"-6"	MDC-C04-7^V	Archive	482167.32	1350280.29
	4-8	0"-6"	MDC-C04-8^RP	AP	782165.25	1350333.27
	4-9	0"-6"	MDC-C04-9^RP	AP	482106.22	1350156
	4-10V	0"-6"	MDC-C04-10^V	Archive	482104.73	1350223.58
	4-11	0"-6"	MDC-C04-11^RP	AP	482064.23	1350124.84
	4-12	0"-6"	MDC-C04-12^RP	AP	482057.8	1350196.14
	4-13	0"-6"	MDC-C04-13^RP	AP	482110.18	1350285.25
	4-14D	0"-6"	MDC-C04-14^RP MDC-C04-14^RP-D	AP	482094.37	1350336.37
	4-15	0"-6"	MDC-C04-15^RP	AP	482049.8	1350267.63
	4-16V	0"-6"	MDC-C04-16^V	Archive	482041.03	1350354.33

APPENDIX C

AREA 6 FPA AND MDC AREA CERTIFICATION SAMPLE LOCATIONS AND IDENTIFIERS

CU	Location	Depth	Sample ID	TAL	North-83	East-83
	5-1V	0"-6"	MDC-C05-1^V	Archive	482190.91	1350416.05
5	5-2	0"-6"	MDC-C05-2^RMP	ADQ	482194.87	1350461.32
	5-3D	0"-6"	MDC-C05-3^RMP MDC-C05-3^RMP-D	ADQ	482145.48	1350376.61
	5-4	0"-6"	MDC-C05-4^RMP	ADQ	482146.98	1350466.74
	5-5	0"-6"	MDC-C05-5^RMP	ADQ	482211.74	1350536.88
	5-6	0"-6"	MDC-C05-6^RMP	ADQ	482184.57	1350625.97
	5-7V	0"-6"	MDC-C05-7^V	Archive	482157.37	1350554.48
	5-8	0"-6"	MDC-C05-8^RMP	ADQ	482145.16	1350600.06
	5-9	0"-6"	MDC-C05-9^RMP	ADQ	482113.65	1350393.05
	5-10V	0"-6"	MDC-C05-10^V	Archive	482109.53	1350481.55
	5-11	0"-6"	MDC-C05-11^RMP	ADQ	482079.58	1350419.08
	5-12	0"-6"	MDC-C05-12^RMP	ADQ	482069.26	1350468.65
	5-13	0"-6"	MDC-C05-13^RMP	ADQ	482099.85	1350523.27
	5-14	0"-6"	MDC-C05-14^RMP	ADQ	482112.29	1350577.25
	5-15	0"-6"	MDC-C05-15^RMP	ADQ	482045.7	1350547.07
	5-16V	0"-6"	MDC-C05-16^V	Archive	482063.02	1350601.68
6	6-1	0"-6"	MDC-C06-1^RM	AJ	482006.86	1349430.41
	6-2	0"-6"	MDC-C06-2^RM	AJ	482024.9	1349500.85
	6-3V	0"-6"	MDC-C06-3^V	Archive	481946.64	1349436.17
	6-4	0"-6"	MDC-C06-4^RM	AJ	481967.46	1349501.42
	6-5	0"-6"	MDC-C06-5^RM	AJ	481905.02	1349396.65
	6-6	0"-6"	MDC-C06-6^RM	AJ	481927.71	1349478.05
	6-7V	0"-6"	MDC-C06-7^V	Archive	481899.56	1349498.19
	6-8	0"-6"	MDC-C06-8^RM	AJ	481866.45	1349435.89
	6-9	0"-6"	MDC-C06-9^RM	AJ	481861.47	1349508.69
	6-10V	0"-6"	MDC-C06-10^V	Archive	481821.02	1349391.79
	6-11	0"-6"	MDC-C06-11^RM	AJ	481823.78	1349466.11
	6-12	0"-6"	MDC-C06-12^RM	AJ	481799.68	1349351.56
	6-13V	0"-6"	MDC-C06-13^V	Archive	481783	1349493.14
	6-14D	0"-6"	MDC-C06-14^RM MDC-C06-14^RM-D	AJ	481763.79	1349395.08
	6-15	0"-6"	MDC-C06-15^RM	AJ	481733.13	1349364.43
	6-16	0"-6"	MDC-C06-16^RM	AJ	481742.74	1349476.86

APPENDIX C
AREA 6 FPA AND MDC AREA CERTIFICATION SAMPLE LOCATIONS AND IDENTIFIERS

CU	Location	Depth	Sample ID	TAL	North-83	East-83
7	7-1	0"-6"	MDC-C07-1^RM	AK	481980.89	1349544.83
	7-2V	0"-6"	MDC-C07-2^V	Archive	482006.19	1349604.63
	7-3	0"-6"	MDC-C07-3^RM	AK	481904.15	1349561.18
	7-4	0"-6"	MDC-C07-4^RM	AK	481937.45	1349609.98
	7-5	0"-6"	MDC-C07-5^RM	AK	481988.65	1349673.42
	7-6V	0"-6"	MDC-C07-6^V	Archive	482015.48	1349716.72
	7-7	0"-6"	MDC-C07-7^RM	AK	481904.85	1349651.55
	7-8	0"-6"	MDC-C07-8^RM	AK	481928.6	1349700.2
	7-9	0"-6"	MDC-C07-9^RM	AK	481829.12	1349534.68
	7-10	0"-6"	MDC-C07-10^RM	AK	481864.58	1349583.71
	7-11V	0"-6"	MDC-C07-11^V	Archive	481794.37	1349535.41
	7-12	0"-6"	MDC-C07-12^RM	AK	481759.62	1349606.72
	7-13	0"-6"	MDC-C07-13^RM	AK	481866.11	1349655.1
	7-14	0"-6"	MDC-C07-14^RM	AK	481848.42	1349715.41
	7-15V	0"-6"	MDC-C07-15^V	Archive	481780.27	1349641.25
	7-16D	0"-6"	MDC-C07-16^RM MDC-C07-16^RM-D	AK	481799.38	1349706.04
8	8-1	0"-6"	MDC-C08-1^RM	AI	482003.97	1349784.36
	8-2	0"-6"	MDC-C08-2^RM	AI	481992.28	1349817.9
	8-3V	0"-6"	MDC-C08-3^V	Archive	481932.39	1349762.59
	8-4	0"-6"	MDC-C08-4^RM	AI	481943.76	1349839.86
	8-5	0"-6"	MDC-C08-5^RM	AI	482019.82	1349893.19
	8-6	0"-6"	MDC-C08-6^RM	AI	481996.07	1349934.14
	8-7	0"-6"	MDC-C08-7^RM	AI	481921.05	1349911.35
	8-8V	0"-6"	MDC-C08-8^V	Archive	481927.25	1349967.11
	8-9V	0"-6"	MDC-C08-9^V	Archive	481882.32	1349768.46
	8-10	0"-6"	MDC-C08-10^RM	AI	481877.51	1349834.92
	8-11	0"-6"	MDC-C08-11^RM	AI	481813.49	1349768.2
	8-12D	0"-6"	MDC-C08-12^RM MDC-C08-12^RM-D	AI	481781.15	1349810.15
	8-13	0"-6"	MDC-C08-13^RM	AI	481881.47	1349881.54
	8-14	0"-6"	MDC-C08-14^RM	AI	481883.37	1349942.45
	8-15	0"-6"	MDC-C08-15^RM	AI	481800.25	1349839.7
	8-16V	0"-6"	MDC-C08-16^V	Archive	481844.83	1349952.35

APPENDIX C
AREA 6 FPA AND MDC AREA CERTIFICATION SAMPLE LOCATIONS AND IDENTIFIERS

CU	Location	Depth	Sample ID	TAL	North-83	East-83
9	9-1V	0"-6"	MDC-C09-1^V	Archive	481986.96	1350014.6
	9-2D	0"-6"	MDC-C09-2^R MDC-C09-2^R-D	A	482007.96	1350061.32
	9-3	0"-6"	MDC-C09-3^R	A	481961.15	1349984.1
	9-4	0"-6"	MDC-C09-4^R	A	481941.2	1350085.73
	9-5	0"-6"	MDC-C09-5^R	A	481995.41	1350171.97
	9-6	0"-6"	MDC-C09-6^R	A	482008.32	1350229.11
	9-7	0"-6"	MDC-C09-7^R	A	481963.58	1350163.75
	9-8V	0"-6"	MDC-C09-8^V	Archive	481960.31	1350209.35
	9-9	0"-6"	MDC-C09-9^R	A	481889.06	1350025.89
	9-10V	0"-6"	MDC-C09-10^V	Archive	481903.8	1350094.44
	9-11	0"-6"	MDC-C09-11^R	A	481814.72	1349991.18
	9-12	0"-6"	MDC-C09-12^R	A	481857.92	1350047.16
	9-13	0"-6"	MDC-C09-13^R	A	481888.39	1350173.48
	9-14V	0"-6"	MDC-C09-14^V	Archive	481887.19	1350220.75
	9-15	0"-6"	MDC-C09-15^R	A	481863.43	1350103.83
	9-16	0"-6"	MDC-C09-16^R	A	481855.35	1350171.22
10	10-1V	0"-6"	MDC-C10-1^V	Archive	482019.51	1350287.3
	10-2	0"-6"	MDC-C10-2^R	A	482021.59	1350418.11
	10-3D	0"-6"	MDC-C10-3^R MDC-C10-3^R-D	A	481963.94	1350350.05
	10-4	0"-6"	MDC-C10-4^R	A	481958.79	1350411.35
	10-5	0"-6"	MDC-C10-5^R	A	482017.3	1350487.56
	10-6	0"-6"	MDC-C10-6^R	A	482002.86	1350615.03
	10-7	0"-6"	MDC-C10-7^R	A	481988.39	1350503.68
	10-8V	0"-6"	MDC-C10-8^V	Archive	481955.54	1350567.86
	10-9V	0"-6"	MDC-C10-9^V	Archive	481928.49	1350281.88
	10-10	0"-6"	MDC-C10-10^R	A	481925.23	1350404.88
	10-11	0"-6"	MDC-C10-11^R	A	481891.5	1350283.83
	10-12	0"-6"	MDC-C10-12^R	A	481900.29	1350442.27
	10-13V	0"-6"	MDC-C10-13^V	Archive	481923.64	1350508.28
	10-14	0"-6"	MDC-C10-14^R	A	481918.03	1350584.95
	10-15	0"-6"	MDC-C10-15^R	A	481887.04	1350474.08
	10-16	0"-6"	MDC-C10-16^R	A	481890.49	1350568.06

APPENDIX C
AREA 6 FPA AND MDC AREA CERTIFICATION SAMPLE LOCATIONS AND IDENTIFIERS

CU	Location	Depth	Sample ID	TAL	North-83	East-83
11	11-1	0"-6"	MDC-C11-1^RM	BL	481775.42	1349325.35
	11-2	0"-6"	MDC-C11-2^RM	BL	481744.95	1349229.39
	11-3	0"-6"	MDC-C11-3^RM	BL	481706.93	1349314.37
	11-4V	0"-6"	MDC-C11-4^V	Archive	481646.19	1349274.86
	11-5	0"-6"	MDC-C11-5^RM	BL	481684.69	1349169.13
	11-6	0"-6"	MDC-C11-6^RM	BL	481709.51	1349254.13
	11-7V	0"-6"	MDC-C11-7^V	Archive	481622.13	1349159.21
	11-8	0"-6"	MDC-C11-8^RM	BL	481647.21	1349204
	11-9	0"-6"	MDC-C11-9^RM	BL	481573.56	1349150.24
	11-10	0"-6"	MDC-C11-10^RM	BL	481566.86	1349222.62
	11-11V	0"-6"	MDC-C11-11^V	Archive	481488.91	1349182.59
	11-12D	0"-6"	MDC-C11-12^RM MDC-C11-12^RM-D	BL	481512.49	1349257.55
	11-13	0"-6"	MDC-C11-13^RM	BL	481592.16	1349323.87
	11-14V	0"-6"	MDC-C11-14^V	Archive	481564.8	1349279.54
	11-15	0"-6"	MDC-C11-15^RM	BL	481478.77	1349309.92
	11-16	0"-6"	MDC-C11-16^RM	BL	481466.89	1349226.6
12	12-1	0"-6"	MDC-C12-1^RM	BL	481402.19	1349191.45
	12-2V	0"-6"	MDC-C12-2^V	Archive	481439.53	1349228.5
	12-3	0"-6"	MDC-C12-3^RM	BL	481352.28	1349166.88
	12-4	0"-6"	MDC-C12-4^RM	BL	481329.58	1349215.43
	12-5	0"-6"	MDC-C12-5^RM	BL	481408.73	1349286.55
	12-6	0"-6"	MDC-C12-6^RM	BL	481334.58	1349311.77
	12-7	0"-6"	MDC-C12-7^RM	BL	481248.37	1349305.63
	12-8V	0"-6"	MDC-C12-8^V	Archive	481272	1349371.62
	12-9	0"-6"	MDC-C12-9^RM	BL	481282.94	1349149.96
	12-10	0"-6"	MDC-C12-10^RM	BL	481268.23	1349218.39
	12-11V	0"-6"	MDC-C12-11^V	Archive	481316.67	1349256.82
	12-12	0"-6"	MDC-C12-12^RM	BL	481180.9	1349167.9
	12-13V	0"-6"	MDC-C12-13^V	Archive	481197.26	1349230.48
	12-14	0"-6"	MDC-C12-14^RM	BL	481234.6	1349259.37
	12-15	0"-6"	MDC-C12-15^RM	BL	481185.05	1349338.63
	12-16D	0"-6"	MDC-C12-16^RM MDC-C12-16^RM-D	BL	481220.5	1349378.29

APPENDIX C
AREA 6 FPA AND MDC AREA CERTIFICATION SAMPLE LOCATIONS AND IDENTIFIERS

CU	Location	Depth	Sample ID	TAL	North-83	East-83
13	13-1	0"-6"	MDC-C13-1^RMPS	BLPS	481137.54	1349169.61
	13-2	0"-6"	MDC-C13-2^RMPS	BLPS	481148.39	1349208.67
	13-3	0"-6"	MDC-C13-3^RMPS	BLPS	481030.34	1349129.38
	13-4V	0"-6"	MDC-C13-4^V	Archive	481039.51	1349206.75
	13-5	0"-6"	MDC-C13-5^RMPS	BLPS	481129.46	1349249.33
	13-6V	0"-6"	MDC-C13-6^V	Archive	481122.07	1349312.12
	13-7	0"-6"	MDC-C13-7^RMPS	BLPS	481091.27	1349266.13
	13-8	0"-6"	MDC-C13-8^RMPS	BLPS	481022.62	1349316.6
	13-9	0"-6"	MDC-C13-9^RMPS	BLPS	481160.27	1349338.31
	13-10	0"-6"	MDC-C13-10^RMPS	BLPS	481166.47	1349384.5
	13-11	0"-6"	MDC-C13-11^RMPS	BLPS	481053.26	1349351.46
	13-12V	0"-6"	MDC-C13-12^V	Archive	481067.02	1349398.25
	13-13V	0"-6"	MDC-C13-13^V	Archive	481150.13	1349436.42
	13-14	0"-6"	MDC-C13-14^RMPS	BLPS	481117.54	1349498.6
	13-15D	0"-6"	MDC-C13-15^RMPS MDC-C13-15^RMPS-D	BLPS	481056.97	1349434.88
	13-16	0"-6"	MDC-C13-16^RMPS	BLPS	481054.3	1349479.65
	13-17	0"-6"	MDC-C13-17^RMPS	BLPS	481194.77	1349486.7
	13-18	0"-6"	MDC-C13-18^RMPS	BLPS	481270.42	1349485.65
	13-19	0"-6"	MDC-C13-19^RMPS	BLPS	481106.95	1349551.22
14	14-1	0"-6"	MDC-C14-1^RMPS	BLPS	480998.68	1349149.96
	14-2	0"-6"	MDC-C14-2^RMPS	BLPS	480963.09	1349200.83
	14-3V	0"-6"	MDC-C14-3^V	Archive	480878.41	1349165.25
	14-4	0"-6"	MDC-C14-4^RMPS	BLPS	480881.17	1349208.13
	14-5	0"-6"	MDC-C14-5^RMPS	BLPS	480970.13	1349254.77
	14-6V	0"-6"	MDC-C14-6^V	Archive	480955.85	1349300.76
	14-7	0"-6"	MDC-C14-7^RMPS	BLPS	480863.1	1349251.5
	14-8D	0"-6"	MDC-C14-8^RMPS MDC-C14-8^RMPS-D	BLPS	480907.3	1349309.92
	14-9	0"-6"	MDC-C14-9^RMPS	BLPS	480981.4	1349351.95
	14-10V	0"-6"	MDC-C14-10^V	Archive	480956.04	1349390.38
	14-11	0"-6"	MDC-C14-11^RMPS	BLPS	480890.64	1349347.48
	14-12	0"-6"	MDC-C14-12^RMPS	BLPS	480887.85	1349391.77
	14-13	0"-6"	MDC-C14-13^RMPS	BLPS	481009.56	1349461.64
	14-14	0"-6"	MDC-C14-14^RMPS	BLPS	480992.81	1349505.13
	14-15V	0"-6"	MDC-C14-15^V	Archive	480875.17	1349435.48
	14-16	0"-6"	MDC-C14-16^RMPS	BLPS	480889.46	1349506.42

APPENDIX C

AREA 6 FPA AND MDC AREA CERTIFICATION SAMPLE LOCATIONS AND IDENTIFIERS

CU	Location	Depth	Sample ID	TAL	North-83	East-83
15	15-1V	0"-6"	MDC-C15-1^V	Archive	480828.16	1349174.14
	15-2	0"-6"	MDC-C15-2^RMPS	BLP	480816.64	1349210.63
	15-3	0"-6"	MDC-C15-3^RMPS	BLP	480727.85	1349152.14
	15-4	0"-6"	MDC-C15-4^RMPS	BLP	480748.84	1349202.22
	15-5	0"-6"	MDC-C15-5^RMPS	BLP	480827.83	1349273.33
	15-6D	0"-6"	MDC-C15-6^RMPS	BLP	480821.64	1349327.15
			MDC-C15-6^RMPS-D			
	15-7V	0"-6"	MDC-C15-7^V	Archive	480718.39	1349253.08
	15-8	0"-6"	MDC-C15-8^RMPS	BLP	480708.94	1349324.91
	15-9	0"-6"	MDC-C15-9^RMPS	BLP	480791.53	1349351.01
	15-10	0"-6"	MDC-C15-10^RMPS	BLP	480847.81	1349425.79
	15-11V	0"-6"	MDC-C15-11^V	Archive	480722.11	1349364.26
	15-12	0"-6"	MDC-C15-12^RMPS	BLP	480747.32	1349419.21
	15-13	0"-6"	MDC-C15-13^RMPS	BLP	480827.17	1349472.56
	15-14V	0"-6"	MDC-C15-14^V	Archive	480803.18	1349510.1
	15-15	0"-6"	MDC-C15-15^RMPS	BLP	480721	1349471.26
	15-16	0"-6"	MDC-C15-16^RMPS	BLP	480753.01	1349506.1
16	16-1	0"-6"	MDC-C16-1^RMPS	BER	480796.37	1349538.1
	16-2	0"-6"	MDC-C16-2^RMPS	BER	480819.61	1349612.9
	16-3V	0"-6"	MDC-C16-3^V	Archive	480752.5	1349570.42
	16-4	0"-6"	MDC-C16-4^RMPS	BER	480719.64	1349606.9
	16-5D	0"-6"	MDC-C16-5^RMPS	BER	480771.61	1349669.15
			MDC-C16-5^RMPS-D			
	16-6	0"-6"	MDC-C16-6^RMPS	BER	480802.76	1349690.95
	16-7	0"-6"	MDC-C16-7^RMPS	BER	480713.1	1349658.43
	16-8V	0"-6"	MDC-C16-8^V	Archive	480714.33	1349734.63
	16-9V	0"-6"	MDC-C16-9^V	Archive	480821.86	1349749.02
	16-10	0"-6"	MDC-C16-10^RMPS	BER	480781.78	1349819.82
	16-11	0"-6"	MDC-C16-11^RMPS	BER	480733.08	1349795.63
	16-12	0"-6"	MDC-C16-12^RMPS	BER	480711.83	1349838.63
	16-13	0"-6"	MDC-C16-13^RMPS	BER	480804.18	1349889.46
	16-14	0"-6"	MDC-C16-14^RMPS	BER	480793.32	1349952.33
	16-15	0"-6"	MDC-C16-15^RMPS	BER	480719.5	1349899.56
	16-16V	0"-6"	MDC-C16-16^V	Archive	480719.5	1349962.28

APPENDIX C

AREA 6 FPA AND MDC AREA CERTIFICATION SAMPLE LOCATIONS AND IDENTIFIERS

CU	Location	Depth	Sample ID	TAL	North-83	East-83
17	17-1V	0"-6"	MDC-C17-1^V	Archive	480816.04	1349973.47
	17-2	0"-6"	MDC-C17-2^RM	BF	480807.27	1350076.11
	17-3	0"-6"	MDC-C17-3^RM	BF	480722.11	1350000.99
	17-4	0"-6"	MDC-C17-4^RM	BF	480720.38	1350057.58
	17-5V	0"-6"	MDC-C17-5^V	Archive	480767.7	1350129.07
	17-6	0"-6"	MDC-C17-6^RM	BF	480794.38	1350163.51
	17-7	0"-6"	MDC-C17-7^RM	BF	480692.33	1350089.69
	17-8	0"-6"	MDC-C17-8^RM	BF	480735.87	1350144.44
	17-9	0"-6"	MDC-C17-9^RM	BF	480921.37	1350200.61
	17-10V	0"-6"	MDC-C17-10^V	Archive	480880.96	1350220.73
	17-11	0"-6"	MDC-C17-11^RM	BF	480843.42	1350211.21
	17-12D	0"-6"	MDC-C17-12^RM	BF	480878.22	1350299.54
			MDC-C17-12^RM-D			
	17-13	0"-6"	MDC-C17-13^RM	BF	480875.9	1350345.28
	17-14	0"-6"	MDC-C17-14^RM	BF	480799.85	1350274.29
	17-15V	0"-6"	MDC-C17-15^V	Archive	480813.47	1350219.19
	17-16	0"-6"	MDC-C17-16^RM	BF	480710.34	1350192.53
18	18-1D	0"-6"	MDC-C18-1^RM	BEF	481100.5	1350291.29
			MDC-C18-1^RM-D			
	18-2V	0"-6"	MDC-C18-2^V	Archive	481090.52	1350325.17
	18-3	0"-6"	MDC-C18-3^RM	BEF	481128.9	1350370.15
	18-4	0"-6"	MDC-C18-4^RM	BEF	480992.79	1350337.81
	18-5	0"-6"	MDC-C18-5^RM	BEF	481126.49	1350410.05
	18-6	0"-6"	MDC-C18-6^RM	BEF	481070.58	1350437.94
	18-7V	0"-6"	MDC-C18-7^V	Archive	481138.89	1350486.99
	18-8	0"-6"	MDC-C18-8^RM	BEF	481008.46	1350435.75
	18-9V	0"-6"	MDC-C18-9^V	Archive	481113.78	1350531.71
	18-10	0"-6"	MDC-C18-10^RM	BEF	481089.35	1350575.03
	18-11	0"-6"	MDC-C18-11^RM	BEF	481070.94	1350600.76
	18-12	0"-6"	MDC-C18-12^RM	BEF	481035.13	1350490.36
	18-13	0"-6"	MDC-C18-13^RM	BEF	481014.65	1350361.27
	18-14	0"-6"	MDC-C18-14^RM	BEF	480968.7	1350302.06
	18-15V	0"-6"	MDC-C18-15^V	Archive	480939.79	1350339.07
	18-16	0"-6"	MDC-C18-16^RM	BEF	480954.26	1350431.68

APPENDIX C
AREA 6 FPA AND MDC AREA CERTIFICATION SAMPLE LOCATIONS AND IDENTIFIERS

CU	Location	Depth	Sample ID	TAL	North-83	East-83
19	19-1	0"-6"	MDC-C19-1^R	A	481327.12	1350335.96
	19-2	0"-6"	MDC-C19-2^R	A	481296.5	1350417.6
	19-3	0"-6"	MDC-C19-3^R	A	481264.65	1350306.05
	19-4V	0"-6"	MDC-C19-4^V	Archive	481266.38	1350389.51
	19-5V	0"-6"	MDC-C19-5^V	Archive	481289.97	1350498.62
	19-6	0"-6"	MDC-C19-6^R	A	481301.16	1350563.21
	19-7	0"-6"	MDC-C19-7^R	A	481268.63	1350473.27
	19-8	0"-6"	MDC-C19-8^R	A	481263.65	1350566.79
	19-9V	0"-6"	MDC-C19-9^V	Archive	481226.11	1350288.52
	19-10	0"-6"	MDC-C19-10^R	A	481214.76	1350386.52
	19-11	0"-6"	MDC-C19-11^R	A	481153.15	1350298.93
	19-12D	0"-6"	MDC-C19-12^R MDC-C19-12^R-D	A	481171.92	1350429.44
	19-13V	0"-6"	MDC-C19-13^V	Archive	481198.94	1350484.84
	19-14	0"-6"	MDC-C19-14^R	A	481204.46	1350587.35
	19-15	0"-6"	MDC-C19-15^R	A	481164.66	1350506.24
	19-16	0"-6"	MDC-C19-16^R	A	481172.8	1350579.05
	19-17	0"-6"	MDC-C19-17^R	A	481262.42	1350263.53
20	20-1V	0"-6"	MDC-C20-1^V	Archive	481500.74	1350349.2
	20-2	0"-6"	MDC-C20-2^R	A	481489.79	1350424.94
	20-3	0"-6"	MDC-C20-3^R	A	481459.26	1350319.58
	20-4	0"-6"	MDC-C20-4^R	A	481455.15	1350432.08
	20-5	0"-6"	MDC-C20-5^R	A	481500.07	1350518.66
	20-6	0"-6"	MDC-C20-6^R	A	481499.56	1350576.31
	20-7	0"-6"	MDC-C20-7^R	A	481442.08	1350479.79
	20-8V	0"-6"	MDC-C20-8^V	Archive	481439.85	1350585.81
	20-9D	0"-6"	MDC-C20-9^R MDC-C20-9^R-D	A	481388.38	1350345.19
	20-10V	0"-6"	MDC-C20-10^V	Archive	481391.5	1350441
	20-11	0"-6"	MDC-C20-11^R	A	481353.45	1350347.37
	20-12	0"-6"	MDC-C20-12^R	A	481352.08	1350430.69
	20-13	0"-6"	MDC-C20-13^R	A	481382.71	1350502.6
	20-14	0"-6"	MDC-C20-14^R	A	481394.25	1350571.61
	20-15	0"-6"	MDC-C20-15^R	A	481348	1350495.01
	20-16V	0"-6"	MDC-C20-16^V	Archive	481359	1350593.93

APPENDIX C
AREA 6 FPA AND MDC AREA CERTIFICATION SAMPLE LOCATIONS AND IDENTIFIERS

CU	Location	Depth	Sample ID	TAL	North-83	East-83
21	21-1	0"-6"	MDC-C21-1^R	A	481687.09	1350357.1
	21-2	0"-6"	MDC-C21-2^R	A	481653.37	1350402.92
	21-3V	0"-6"	MDC-C21-3^V	Archive	481623.93	1350289.32
	21-4D	0"-6"	MDC-C21-4^R MDC-C21-4^R-D	A	481611.73	1350396.81
	21-5	0"-6"	MDC-C21-5^R	A	481657.85	1350476.07
	21-6	0"-6"	MDC-C21-6^R	A	481663.37	1350574.89
	21-7	0"-6"	MDC-C21-7^R	A	481618.62	1350476.17
	21-8V	0"-6"	MDC-C21-8^V	Archive	481625.34	1350570
	21-9	0"-6"	MDC-C21-9^R	A	481584.36	1350320.93
	21-10V	0"-6"	MDC-C21-10^V	Archive	481573.87	1350426.62
	21-11	0"-6"	MDC-C21-11^R	A	481547.53	1350309.9
	21-12	0"-6"	MDC-C21-12^R	A	481529.6	1350400.71
	21-13	0"-6"	MDC-C21-13^R	A	481563.04	1350490.84
	21-14V	0"-6"	MDC-C21-14^V	Archive	481581.81	1350577.1
	21-15	0"-6"	MDC-C21-15^R	A	481540.33	1350527.84
	21-16	0"-6"	MDC-C21-16^R	A	481545.85	1350600.46
	21-17	0"-6"	MDC-C21-17^R	A	481535.28	1350242.94
22	22-1	0"-6"	MDC-C22-1^RMP	ADGP	481843.06	1350282.43
	22-2V	0"-6"	MDC-C22-2^V	Archive	481855.55	1350449.27
	22-3	0"-6"	MDC-C22-3^RMP	ADGP	481812.17	1350302.79
	22-4	0"-6"	MDC-C22-4^RMP	ADGP	481800.83	1350427.72
	22-5	0"-6"	MDC-C22-5^RMP	ADGP	481838.25	1350510.96
	22-6V	0"-6"	MDC-C22-6^V	Archive	481838.19	1350619.97
	22-7	0"-6"	MDC-C22-7^RMP	ADGP	481804.97	1350485.99
	22-8	0"-6"	MDC-C22-8^RMP	ADGP	481792.7	1350578.21
	22-9	0"-6"	MDC-C22-9^RMP	ADGP	481761.94	1350348.41
	22-10	0"-6"	MDC-C22-10^RMP	ADGP	481748.52	1350426.26
	22-11V	0"-6"	MDC-C22-11^V	Archive	481706.53	1350315.08
	22-12	0"-6"	MDC-C22-12^RMP	ADGP	481701.38	1350418.42
	22-13V	0"-6"	MDC-C22-13^V	Archive	481758.68	1350481.62
	22-14	0"-6"	MDC-C22-14^RMP	ADGP	481751.12	1350571.17
	22-15	0"-6"	MDC-C22-15^RMP	ADGP	481709.47	1350490.14
	22-16D	0"-6"	MDC-C22-16^RMP MDC-C22-16^RMP-D	ADGP	481713.78	1350589.4

APPENDIX C

AREA 6 FPA AND MDC AREA CERTIFICATION SAMPLE LOCATIONS AND IDENTIFIERS

CU	Location	Depth	Sample ID	TAL	North-83	East-83
23	23-1	0"-6"	MDC-C23-1^R	B	480679.33	1349188.95
	23-2	0"-6"	MDC-C23-2^R	B	480659.89	1349236.92
	23-3V	0"-6"	MDC-C23-3^V	Archive	480580.3	1349166.93
	23-4	0"-6"	MDC-C23-4^R	B	480593.73	1349234.56
	23-5	0"-6"	MDC-C23-5^R	B	480686.09	1349323.66
	23-6	0"-6"	MDC-C23-6^R	B	480678.32	1349395.5
	23-7V	0"-6"	MDC-C23-7^V	Archive	480581.92	1349298.97
	23-8	0"-6"	MDC-C23-8^R	B	480630.78	1349367.13
	23-9D	0"-6"	MDC-C23-9^R MDC-C23-9^R-D	B	480669.98	1349444.96
	23-10	0"-6"	MDC-C23-10^R	B	480681.79	1349524.93
	23-11	0"-6"	MDC-C23-11^R	B	480611.45	1349404.17
	23-12V	0"-6"	MDC-C23-12^V	Archive	480497.61	1349383.24
	23-13	0"-6"	MDC-C23-13^R	B	480507.41	1349165.32
	23-14V	0"-6"	MDC-C23-14^V	Archive	480531.04	1349228.66
	23-15	0"-6"	MDC-C23-15^R	B	480502.58	1349276.96
	23-16	0"-6"	MDC-C23-16^R	B	480549.29	1349336
24	24-1V	0"-6"	MDC-C24-1^V	Archive	480451.03	1349178.2
	24-2	0"-6"	MDC-C24-2^RM	BD	480431.16	1349264.62
	24-3	0"-6"	MDC-C24-3^RM	BD	480376.52	1349207.19
	24-4D	0"-6"	MDC-C24-4^RM MDC-C24-4^RMD	BD	480388.34	1349274.82
	24-5V	0"-6"	MDC-C24-5^V	Archive	480464.59	1349316.68
	24-6	0"-6"	MDC-C24-6^RM	BD	480456.53	1349379.48
	24-7	0"-6"	MDC-C24-7^RM	BD	480410.35	1349325.27
	24-8	0"-6"	MDC-C24-8^RM	BD	480378.67	1349398.8
	24-9	0"-6"	MDC-C24-9^RM	BD	480323.36	1349203.43
	24-10V	0"-6"	MDC-C24-10^V	Archive	480331.42	1349269.45
	24-11	0"-6"	MDC-C24-11^RM	BD	480261.21	1349163.71
	24-12	0"-6"	MDC-C24-12^RM	BD	480268.19	1349232.95
	24-13	0"-6"	MDC-C24-13^RM	BD	480323.5	1349329.56
	24-14	0"-6"	MDC-C24-14^RM	BD	480338.53	1349386.99
	24-15V	0"-6"	MDC-C24-15^V	Archive	480288.06	1349300.04
	24-16	0"-6"	MDC-C24-16^RM	BD	480264.43	1349376.26

APPENDIX C
AREA 6 FPA AND MDC AREA CERTIFICATION SAMPLE LOCATIONS AND IDENTIFIERS

CU	Location	Depth	Sample ID	TAL	North-83	East-83
25	25-1	0"-6"	MDC-C25-1^R	C	480305.78	1349002.42
	25-2V	0"-6"	MDC-C25-2^V	Archive	480286.45	1349056.1
	25-3	0"-6"	MDC-C25-3^R	C	480257.45	1349002.42
	25-4	0"-6"	MDC-C25-4^R	C	480216.64	1349038.38
	25-5	0"-6"	MDC-C25-5^R	C	480331.55	1349102.26
	25-6	0"-6"	MDC-C25-6^R	C	480306.85	1349132.31
	25-7	0"-6"	MDC-C25-7^R	C	480260.67	1349095.82
	25-8V	0"-6"	MDC-C25-8^V	Archive	480229.53	1349133.92
	25-9	0"-6"	MDC-C25-9^R	C	480155.16	1349006.72
	25-10	0"-6"	MDC-C25-10^R	C	480188.99	1349024.43
	25-11D	0"-6"	MDC-C25-11^R MDC-C25-11^R-D	C	480099.31	1348998.67
	25-12V	0"-6"	MDC-C25-12^V	Archive	480113.28	1349055.02
	25-13	0"-6"	MDC-C25-13^R	C	480183.62	1349097.43
	25-14	0"-6"	MDC-C25-14^R	C	480161.07	1349135.53
	25-15	0"-6"	MDC-C25-15^R	C	480085.35	1349075.96
	25-16V	0"-6"	MDC-C25-16^V	Archive	480108.98	1349130.7
26	26-1	0"-6"	MDC-C26-1^R	B	480229.8	1349175.25
	26-2D	0"-6"	MDC-C26-2^R MDC-C26-2^R-D	B	480225.5	1349263.81
	26-3	0"-6"	MDC-C26-3^R	B	480189.52	1349203.7
	26-4V	0"-6"	MDC-C26-4^V	Archive	480195.43	1349253.08
	26-5	0"-6"	MDC-C26-5^R	B	480241.61	1349292.8
	26-6	0"-6"	MDC-C26-6^R	B	480230.87	1349367.27
	26-7	0"-6"	MDC-C26-7^R	B	480190.06	1349309.84
	26-8V	0"-6"	MDC-C26-8^V	Archive	480194.89	1349352.24
	26-9	0"-6"	MDC-C26-9^R	B	480158.92	1349167.6
	26-10	0"-6"	MDC-C26-10^R	B	480170.19	1349255.63
	26-11	0"-6"	MDC-C26-11^R	B	480117.57	1349164.92
	26-12V	0"-6"	MDC-C26-12^V	Archive	480116.5	1349218.59
	26-13V	0"-6"	MDC-C26-13^V	Archive	480159.45	1349313.06
	26-14	0"-6"	MDC-C26-14^R	B	480168.05	1349369.42
	26-15	0"-6"	MDC-C26-15^R	B	480143.88	1349271.19
	26-16	0"-6"	MDC-C26-16^R	B	480126.16	1349309.84

CU	Location	Depth	Sample ID	TAL	North-83	East-83
27-U06	27-U06-1D	0"-6"	MDC-C27-U06-1^RMPS	BMS	480980.71	1349501.84
			MDC-C27-U06-1^L	T		
			MDC-C27-U06-1^RMPS-D	BMS		
			MDC-C27-U06-1^L-D	T		
	27-U06-2	0"-6"	MDC-C27-U06-2^RMPS	BMS	480981.58	1349504.98
			MDC-C27-U06-2^L	T		
	27-U06-3	0"-6"	MDC-C27-U06-3^RMPS	BMS	480979.1	1349500.78
			MDC-C27-U06-3^L	T		
	27-U06-4	0"-6"	MDC-C27-U06-4^RMPS	BMS	480978.53	1349504.47
			MDC-C27-U06-4^L	T		
	27-U06-5	0"-6"	MDC-C27-U06-5^RMPS	BMS	480980.78	1349507.65
			MDC-C27-U06-5^L	T		
	27-U06-6	0"-6"	MDC-C27-U06-6^RMPS	BMS	480978.89	1349506.63
			MDC-C27-U06-6^L	T		
	27-U06-7	0"-6"	MDC-C27-U06-7^RMPS	BMS	480980.31	1349510.96
			MDC-C27-U06-7^L	T		
	27-U06-8	0"-6"	MDC-C27-U06-8^RMPS	BMS	480979.08	1349509.28
			MDC-C27-U06-8^L	T		
28-H36	28-H36-1	0"-6"	MDC-C28-H36-1^RM	BFG	480720.33	1350129.26
			MDC-C28-H36-1^L	U		
	28-H36-2	0"-6"	MDC-C28-H36-2^RM	BFG	480715.08	1350130.86
			MDC-C28-H36-2^L	U		
	28-H36-3D	0"-6"	MDC-C28-H36-3^RM	BFG	480711.05	1350127.21
			MDC-C28-H36-3^L	U		
			MDC-C28-H36-3^RM-D	BFG		
			MDC-C28-H36-3^L-D	U		
	28-H36-4	0"-6"	MDC-C28-H36-4^RM	BFG	480705.34	1350128.88
			MDC-C28-H36-4^L	U		
	28-H36-5	0"-6"	MDC-C28-H36-5^RM	BFG	480702.07	1350125.68
			MDC-C28-H36-5^L	U		
	28-H36-6	0"-6"	MDC-C28-H36-6^RM	BFG	480696.59	1350127.21
			MDC-C28-H36-6^L	U		
	28-H36-7	0"-6"	MDC-C28-H36-7^RM	BFG	480691.65	1350130.25
			MDC-C28-H36-7^L	U		
	28-H36-8	0"-6"	MDC-C28-H36-8^RM	BFG	480687.31	1350125.91
			MDC-C28-H36-8^L	U		
29-H48	29-H48-1	0"-6"	MDC-C29-H48-1^RMP	BENP	480608.52	1349035.26
	29-H48-2	0"-6"	MDC-C29-H48-2^RMP	BENP	480618.01	1349049.32
	29-H48-3	0"-6"	MDC-C29-H48-3^RMP	BENP	480621.61	1349064.8
	29-H48-4	0"-6"	MDC-C29-H48-4^RMP	BENP	480603.72	1349075.81
	29-H48-5	0"-6"	MDC-C29-H48-5^RMP	BENP	480588.56	1349032.31
	29-H48-6	0"-6"	MDC-C29-H48-6^RMP	BENP	480579.84	1349049.1
	29-H48-7D	0"-6"	MDC-C29-H48-7^RMP	BENP	480593.25	1349061.97
			MDC-C29-H48-7^RMP-D			
	29-H48-8	0"-6"	MDC-C29-H48-8^RMP	BENP	480584.85	1349072.43

APPENDIX C
AREA 6 FPA AND MDC AREA CERTIFICATION SAMPLE LOCATIONS AND IDENTIFIERS

CU	Location	Depth	Sample ID	TAL	North-83	East-83
30-H17	30-H17-1	0"-6"	MDC-C30-H17-1^RM	CG	480248.37	1349124.24
			MDC-C30-H17-1^L	V		
	30-H17-2	0"-6"	MDC-C30-H17-2^RM	CG	480215.57	1349096.87
			MDC-C30-H17-2^L	V		
	30-H17-3	0"-6"	MDC-C30-H17-3^RM	CG	480232.83	1349168.11
			MDC-C30-H17-3^L	V		
	30-H17-4	0"-6"	MDC-C30-H17-4^RM	CG	480212.86	1349208.97
			MDC-C30-H17-4^L	V		
	30-H17-5	0"-6"	MDC-C30-H17-5^RM	CG	480178.4	1349086.95
			MDC-C30-H17-5^L	V		
	30-H17-6	0"-6"	MDC-C30-H17-6^RM	CG	480191.97	1349115.3
			MDC-C30-H17-6^L	V		
	30-H17-7	0"-6"	MDC-C30-H17-7^RM	CG	480179.64	1349166.08
			MDC-C30-H17-7^L	V		
	30-H17-8	0"-6"	MDC-C30-H17-8^RM	CG	480145.11	1349065.32
			MDC-C30-H17-8^L	V		
	30-H17-9	0"-6"	MDC-C30-H17-9^RM	CG	480149.55	1349127.44
			MDC-C30-H17-9^L	V		
	30-H17-10D	0"-6"	MDC-C30-H17-10^RM	CG	480140.92	1349162.44
			MDC-C30-H17-10^L	V		
			MDC-C30-H17-10^RM-D	CG		
			MDC-C30-H17-10^L-D	V		
	30-H17-11	0"-6"	MDC-C30-H17-11^RM	CG	480109.66	1349070.74
			MDC-C30-H17-11^L	V		
	30-H17-12	0"-6"	MDC-C30-H17-12^RM	CG	480119.03	1349112.4
			MDC-C30-H17-12^L	V		

APPENDIX D

DATA QUALITY OBJECTIVES SL-052, REV. 3

Control Number ___________

Fernald Environmental Management Project

Data Quality Objectives

Title: Sitewide Certification Sampling and Analysis

Number: SL-052

Revision: 3

Effective Date: March 13, 2000

Contact Name: Mike Rolfes

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

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

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

DATA QUALITY OBJECTIVES
Sitewide Certification Sampling and Analysis

Members of Data Quality Objectives (DQO) Scoping Team

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

Conceptual Model of the Site

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

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

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

1.0 Statement of Problem

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

Exposure to Soil

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

Available Resources

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

Project Constraints: Certification sampling and analytical testing must be performed with existing manpower, materials and equipment to support the certification effort. Remediation areas are prioritized for certification sampling and analysis according to the date required for initiation of sequential construction activities in those areas. Fluor Daniel Fernald (FDF) and DOE must demonstrate post-remedial compliance with the CU-specific COC FRLs to release the designated Remediation Area for planned interim grading, eventual restoration under the Natural Resources Restoration Plan (NRRP), and other final land use activities.

2.0 Identify the Decision

Decision

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

Possible Results

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

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

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

3.0 Inputs That Affect the Decision

Required Information

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

Source of Information

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

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

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

4.0 The Boundaries of the Situation

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

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

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

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

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

5.0 Decision Rule

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

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

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

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

6.0 Limits on Decision Errors

Types of Decision Errors and Consequences

Definition

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

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

True State of Nature for the Decision Errors

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

Null Hypothesis

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

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

False Positive and False Negative Errors

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

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

7.0 Design for Obtaining Quality Data

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

Soil Sample Locations

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

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

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

Physical Samples

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

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

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

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

8.0 Use of Data to Test Null Hypothesis

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

Data Quality Objectives
Sitewide Certification Sampling and Analysis

1A. Task Description:

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

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

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

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

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

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

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

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

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

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5. Site Information (Description):

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

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

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

* As identified in the area certification PSP

6.B. Equipment Selection and SCQ Reference:

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

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

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

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

Background samples: OU5 RI

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

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

8A. Field Quality Control Samples:

Trip Blanks	☒[1]	Container Blanks	☒
Field Blanks	☒[2]	Duplicate Samples	☒
Equipment Rinsate Blanks	☒	Split Samples	☒[3]
Preservative Blanks	☐	Performance Evaluation Samples	☐
Other (specify) ____________			

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

8B. Laboratory Quality Control Samples:

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

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

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