6019

Department of Energy

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

JUL 20 2005

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

DOE-0285-05

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

Dear Mr. Saric and Mr. Schneider:

TRANSMITTAL OF THE FINAL CERTIFICATION REPORT FOR AREA 9, PHASE III ABANDONED OUTFALL LINE

References:
1) Letter, T. Schneider to W. Taylor, "Approval - Certification Report for A9PIII AOL," dated June 30, 2005

2) Letter, J. Saric to J. Reising, "A9, P3 AOL Certification Report," dated July 5, 2005

Enclosed for your information is the final Certification Report for Area 9, Phase III Abandoned Outfall Line. This document has been finalized based on the approvals received as noted in the references above.

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

Sincerely,

Johnny Reising

for William J. Taylor
Director

FCP:Reising

Enclosure

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July 13, 2005

Fernald Closure Project
Letter No. C:PROJ:2005-0085

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

Dear Mr. Reising:

CONTRACT DE-AC24-01OH20115, TRANSMITTAL OF THE FINAL CERTIFICATION REPORT FOR AREA 9, PHASE III ABANDONED OUTFALL LINE

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

Sincerely,

Per

Jyh-Dong Chiou
Project Manager
Environmental Closure Project

JDC:FLM:jkp
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-- 6019

CERTIFICATION REPORT FOR AREA 9, PHASE III ABANDONED OUTFALL LINE

FERNALD CLOSURE PROJECT
FERNALD, OHIO

JULY 2005

U.S. DEPARTMENT OF ENERGY
FERNALD AREA OFFICE

21140-RP-0005
REVISION 0
FINAL

TABLE OF CONTENTS

List of Acronyms and Abbreviations iv
List of Figures ii
List of Tables ii

Executive Summary ES-1

1.0 Introduction 1-1
1.1 Purpose 1-1
1.2 Background 1-1
1.3 Scope and Area Description 1-1
1.4 Objectives 1-2
1.5 Report Format 1-2
1.6 FCP Master Certification Map 1-2

2.0 Certification Approach 2-1
2.1 Certification Strategy 2-1
2.1.1 Area-Specific Constituents of Concern 2-1
2.1.2 ASCOC Selection Criteria 2-1
2.1.3 ASCOC Selection Process 2-2
2.2 Certification Approach 2-2
2.2.1 Certification Design 2-2
2.2.1.1 Area 9, Phase III Part One Certification Unit Design 2-2
2.2.1.2 Area 9, Phase III Part Two Certification Unit Design 2-3
2.2.1.3 Area 9, Phase III Part Three Certification Unit Design 2-3
2.2.2 Sample Selection Process 2-4
2.2.3 Certification Sampling 2-5
2.2.4 Statistical Analysis 2-5

3.0 Overview of Field Activities 3-1
3.1 Area Preparation and Precertification 3-1
3.1.1 Area 9, Phase III - Part One 3-1
3.1.2 Area 9, Phase III - Part Two 3-2
3.1.3 Area 9, Phase III - Part Three 3-3
3.2 Changes to Scope of Work 3-3

4.0 Analytical Methodologies, Data Validation Processes, and Data Reduction 4-1
4.1 Analytical Methodologies 4-1
4.1.1 Chemical Methods 4-1
4.1.2 Radiochemical Methods 4-2
4.2 Data Verification and Validation 4-3
4.3 Data Reduction 4-4

TABLE OF CONTENTS
(Continued)

5.0 Certification Evaluation and Conclusions 5-1
5.1 Certification Results and Evaluation 5-1
5.2 Area 9, Phase III Certification Conclusions 5-3

6.0 Protection of Certified Areas 6-1

References R-1

Appendix A Certification Samples, Analytical Results and Final Statistics Tables
Appendix B Variances/Field Change Notices for the A9PIII Certification Sampling Abandoned Outfall Line - Part One Project Specific Plan
Appendix C Release Justification for Area 9, Phase III Abandoned Outfall Structure Sheet Piles

LIST OF TABLES

Table 2-1 ASCOC List for A9PIII Certification Units East of A1PII

LIST OF FIGURES

Figure 1-1 Area 9 Phase III Location Map
Figure 1-2 Area 9 Phase III, Part One Location Map
Figure 1-3 Area 9 Phase III, Part Two Location Map
Figure 1-4 Area 9 Phase III, Part Three Location Map
Figure 1-5 FCP Controlled Certification Map
Figure 2-1 Area 9 Phase III, Part One Certification Units
Figure 2-2 Area 9 Phase III, Part Two and Three CU Locations
Figure 2-3 Certification Sampling Locations for CU 01
Figure 2-4 Certification Sampling Locations for CU 02
Figure 2-5 Certification Sampling Locations for CU 03
Figure 2-6 Certification Sampling Locations for CU 04
Figure 2-7 Certification Sampling Locations for CU 05
Figure 2-8 Certification Sampling Locations for CU 06 West
Figure 2-9 Certification Sampling Locations for CU 06 East
Figure 2-10 Certification Sampling Locations for CU 07
Figure 2-11 Certification Sampling Locations for CU 08
Figure 2-12 Certification Sampling Locations for CU 09
Figure 3-1 A9P3, West of SR 128, West Half, Phase 2 Trench Bedding Scan - Radium-226
Figure 3-2 A9P3, West of SR 128, West Half, Phase 2 Trench Bedding Scan - Thorium-232
Figure 3-3 A9P3, West of SR 128, West Half, Phase 2 Trench Bedding Scan - Total Uranium
Figure 3-4 A9P3, West of SR 128, Manhole 180A, Design Grade Scan - Radium-226
Figure 3-5 A9P3, West of SR 128, Manhole 180A, Design Grade Scan - Thorium-232

LIST OF FIGURES
(Continued)

Figure 3-6 A9P3, West of SR 128, Manhole 180A, Design Grade Scan - Total Uranium
Figure 3-7 A9P3, West of SR 128, East Half, Phase 2 Trench Bedding Scan - Radium-226
Figure 3-8 A9P3, West of SR 128, East Half, Phase 2 Trench Bedding Scan - Thorium-232
Figure 3-9 A9P3, West of SR 128, East Half, Phase 2 Trench Bedding Scan - Total Uranium
Figure 3-10 A9P3, East of SR 128, West Half, Phase 2 Trench Bedding Scan - Radium-226
Figure 3-11 A9P3, East of SR 128, West Half, Phase 2 Trench Bedding Scan - Thorium-232
Figure 3-12 A9P3, East of SR 128, West Half, Phase 2 Trench Bedding Scan - Total Uranium
Figure 3-13 A9P3, East of SR 128, Manhole 181A, Design Grade Scan - Radium-226
Figure 3-14 A9P3, East of SR 128, Manhole 181A, Design Grade Scan - Thorium-232
Figure 3-15 A9P3, East of SR 128, Manhole 181A, Design Grade Scan - Total Uranium
Figure 3-16 A9P3, East of SR 128, East Half, Phase 2 Trench Bedding Scan - Radium-226
Figure 3-17 A9P3, East of SR 128, East Half, Phase 2 Trench Bedding Scan - Thorium-232
Figure 3-18 A9P3, East of SR 128, East Half, Phase 2 Trench Bedding Scan - Total Uranium
Figure 3-19 A9P3, Riverbank, Surface Scan for Southern Slope Excavation - Radium-226
Figure 3-20 A9P3, Riverbank, Surface Scan for Southern Slope Excavation - Thorium-232
Figure 3-21 A9P3, Riverbank, Surface Scan for Southern Slope Excavation - Total Uranium
Figure 3-22 A9P3, Outfall Line at River, Phase 2 Trench Bedding Scan - Radium-226
Figure 3-23 A9P3, Outfall Line at River, Phase 2 Trench Bedding Scan - Thorium-232
Figure 3-24 A9P3, Outfall Line at River, Phase 2 Trench Bedding Scan - Total Uranium
Figure 3-25 A9P3, Beneath SR 128 (East Side), Phase 2 Scan - Radium-226
Figure 3-26 A9P3, Beneath SR 128 (East Side), Phase 2 Scan - Thorium-232
Figure 3-27 A9P3, Beneath SR 128 (East Side), Phase 2 Scan - Total Uranium
Figure 3-28 A9P3, West of SR 128, Load Out Area Phase 1 Scan - Radium-226
Figure 3-29 A9P3, West of SR 128, Load Out Area Phase 1 Scan - Thorium-232
Figure 3-30 A9P3, West of SR 128, Load Out Area Phase 1 Scan - Total Uranium
Figure 3-31 A9P3, East of SR 128, Load Out Area Phase 1 Scan - Radium-226
Figure 3-32 A9P3, East of SR 128, Load Out Area Phase 1 Scan - Thorium-232
Figure 3-33 A9P3, East of SR 128, Load Out Area Phase 1 Scan - Total Uranium
Figure 3-34 A9P3, Outfall Line at River, Load Out Area Phase 1 Scan - Radium-226
Figure 3-35 A9P3, Outfall Line at River, Load Out Area Phase 1 Scan - Thorium-232
Figure 3-36 A9P3, Outfall Line at River, Load Out Area Phase 1 Scan - Total Uranium
Figure 3-37 A9P3, West of SR 128, Load Out Area Phase 2 Confirmation - Radium-226
Figure 3-38 A9P3, West of SR 128, Load Out Area Phase 2 Confirmation - Thorium-232
Figure 3-39 A9P3, West of SR 128, Load Out Area Phase 2 Confirmation - Total Uranium
Figure 3-40 A9P3, Ramp to 54" Casing Pipe Phase 2 Confirmation - Radium-226
Figure 3-41 A9P3, Ramp to 54" Casing Pipe Phase 2 Confirmation - Thorium-232
Figure 3-42 A9P3, Ramp to 54" Casing Pipe Phase 2 Confirmation - Total Uranium

LIST OF ACRONYMS AND ABBREVIATIONS

A1PII	Area 1, Phase II Sector 3 Utility Trenches
A9PIII	Area 9, Phase III
ASCOC	area-specific constituent of concern
ASL	analytical support level
CDL	Certification Design Letter
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	constituent of concern
CU	certification unit
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
FCP	Fernald Closure Project
FRL	final remediation level
GC/MS	gas chromatography/mass spectrometry
HAMDC	highest allowable minimum detectable concentration
HPGe	high purity germanium (detector)
ICP-AES	inductively coupled plasma-atomic emission spectroscopy
ICP-MS	inductively coupled plasma-mass spectrometry
MH	manhole
µg/kg	micrograms per kilogram
MDL	minimum detection level
mg/kg	milligrams per kilogram
NPDES	National Pollution Discharge Elimination System
OSDF	On-Site Disposal Facility
OU	Operable Unit
PCB	polychlorinated biphenyl
pCi/g	picoCuries per gram
ppm	parts per million
PSP	Project Specific Plan
RAWP	Remedial Action Work Plan
RCRA	Resource Conservation and Recovery Act
ROD	Record of Decision
SCQ	Sitewide CERCLA Quality Assurance Project Plan
SED	Sitewide Environmental Database
SEP	Sitewide Excavation Plan
SR	State Route
TPU	total propagated uncertainty
UCL	Upper Confidence Limit
V/FCN	Variance/Field Change Notice
V&V	verification and validation
VOC	volatile organic compound
WAC	waste acceptance criteria

EXECUTIVE SUMMARY

This Certification Report presents the information and data used by the U.S. Department of Energy (DOE) to determine that soils in Area 9, Phase III (A9PIII) meet established final remediation levels (FRLs). A9PIII is located off site, stretching east from the eastern boundary of the Fernald Closure Project (FCP) to the Great Miami River. This area encompasses the soil beneath the abandoned outfall line bedding material, the area excavated in the vicinity of Manhole (MH) 180A, section of the abandoned outfall line the was beneath State Route 128, the area excavated in the vicinity of MH 181A, the soil beneath the riprap and broken concrete that was lining the Great Miami River riverbank, sandbar in the middle of the Great Miami River, and the sheet piling on the north and south sides of the abandoned outfall line where it exited the riverbank.

This Certification Report includes details of the certification sampling, analysis, validation, and statistical analysis that took place in A9PIII. Consistent with the Sitewide Excavation Plan (DOE 1998), these areas underwent predesign, excavation, and precertification activities, including the use of real-time instrumentation as well as physical sampling and analysis. As a result of these activities, it was determined that no further remediation was necessary prior to certification.

All A9PIII certification units (CUs) were sampled and statistical analysis was conducted where necessary to ensure certification criteria were met. As discussed in the Certification Design Letters and Certification Sampling Project Specific Plans for A9PIII Abandoned Outfall Line - Part One (DOE 2004a and 2004b), Part Two (DOE 2004c and 2004d), and Part Three (DOE 2005a and 2005b), the certification criteria are that the average primary area-specific constituent of concern (ASCOC) concentrations within a CU are below-FRLs at a 95 percent upper confidence level (90 percent Upper Confidence Limit for secondary ASCOCs), and that no certification result is greater than twice the FRL (the hotspot criterion). None of the reported results are greater than two times the FRL.

On the basis of this reported information and supporting project files, DOE has determined that no additional remedial actions are required in this portion of the site. The area will be considered certified when the U.S. Environmental Protection Agency and the Ohio Environmental Protection Agency concur that certification criteria have been met.

1.0 INTRODUCTION

1.1 PURPOSE

This Certification Report presents the information and data used by the U.S. Department of Energy (DOE) to determine that soils in Area 9, Phase III (A9PIII) meet established final remediation levels (FRLs). A9PIII is located offsite, stretching east from just inside the eastern boundary of the Fernald Closure Project (FCP) to the Great Miami River (see Figure 1-1). On the basis of this reported information and supporting project files, DOE has determined that no additional remedial actions are required in this area.

1.2 BACKGROUND

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

In the OU5 Remedial Action Work Plan (RAWP, DOE 1996b), DOE committed to preparing a Sitewide Excavation Plan (SEP, DOE 1998), defining the overall approach to implementing the soil, and at- and below-grade debris cleanup obligations identified in the OU2 (DOE 1995b), OU3 (DOE 1996c), and OU5 RODs. In the SEP, the FCP was divided into ten remedial areas; this report addresses A9PIII.

1.3 SCOPE AND AREA DESCRIPTION

A9PIII is located offsite, stretching east from just inside the eastern boundary of the FCP to the Great Miami River. A9PIII was certified in three parts. Part One extends from the just inside of the eastern boundary of the FCP to State Route 128 (SR 128). It covers the soil beneath the abandoned outfall line as well as the impacted area in the proximity of Manhole (MH) 180A. Part Two covers the soil beneath the riprap and broken concrete lining the riverbank that falls within the project boundary identified in the A9PIII Abandoned Outfall Line Excavation Plan, Part Two (DOE 2004e); the abandoned outfall line bedding material from approximately 38 feet west of the Great Miami River to the location that the abandoned outfall line exits the riverbank, as well as the section of abandoned outfall line that rests on a sand bar in the Great Miami River; and the sheet pilings that extend from the top of the riverbank to the end of the abandoned outfall line and are positioned on both sides of the abandoned outfall line. Part Three covers the portion of A9PIII that extends from the eastern side of SR 128 to approximately 38 feet west of the Great Miami River and the impacted area in the proximity of MH 181A. The location of A9PIII is shown on Figure 1-1, the location of A9PIII - Part One is shown on Figure 1-2, the location of A9PIII - Part Two is shown on Figure 1-3, the location of A9PIII - Part Three is shown on Figure 1-4.

1.4 OBJECTIVES

The objectives of this Certification Report are:

- Summarize the precertification and remedial activities,
- Describe the analytical methods, data validation processes, data reduction and statistical processes used to support the certification process,
- Present certification sampling results for all certification units (CUs),
- Present the statistical analysis showing that all CUs have passed the certification criteria, including FRL attainment and hotspot criteria.

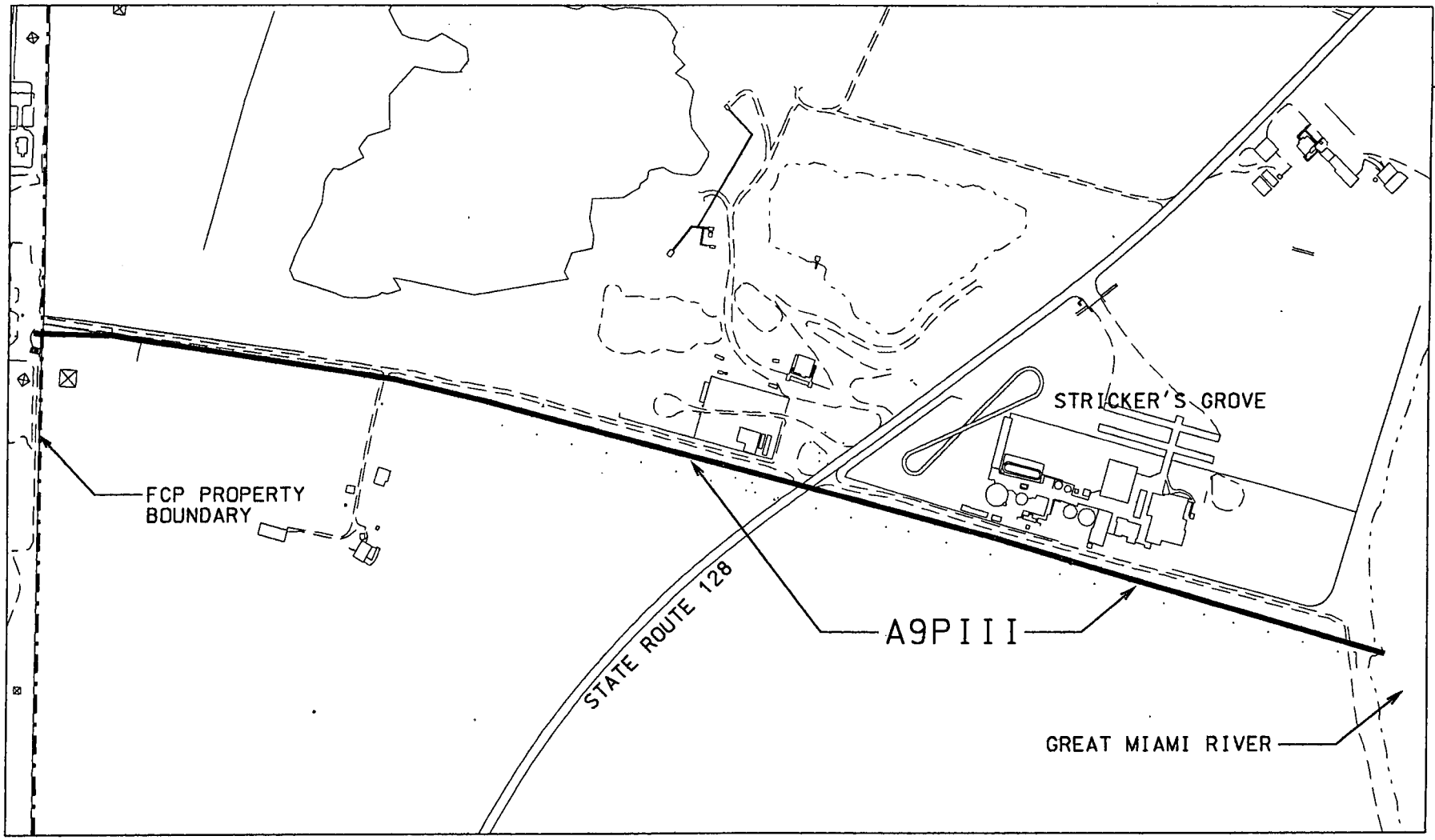
1.5 REPORT FORMAT

This Certification Report is presented in six sections with supporting documentation and data in the appendices. These sections are as follows:

Section 1.0	Introduction: Purpose, background, area description, scope, and objectives of the report
Section 2.0	Certification Approach: The approach for certification sampling and analysis
Section 3.0	Overview of Field Activities: Historical data evaluation, precertification, area preparation, excavation and changes to work scope
Section 4.0	Analytical Methodologies, Data Validation Processes and Data Reduction
Section 5.0	Certification Evaluation and Conclusions
Section 6.0	Protection of Certified Areas
Appendix A	Certification Samples, Analytical Results and Final Statistics Tables
Appendix B	Variances/Field Change Notices (V/FCNs) for the A9PIII Certification Sampling Abandoned Outfall Line - Part One Project Specific Plan (PSP, DOE 2004b)
Appendix C	Release Justification for A9PIII Abandoned Outfall Structure Sheet Piles

1.6 FCP MASTER CERTIFICATION MAP

In order to track certification and characterization for reuse areas at the FCP, DOE updates a controlled map (Figure 1-5) showing the status of the soil remediation areas and phased areas with all Certification Reports. This map has been updated to include certification of A9PIII.



LEGEND:

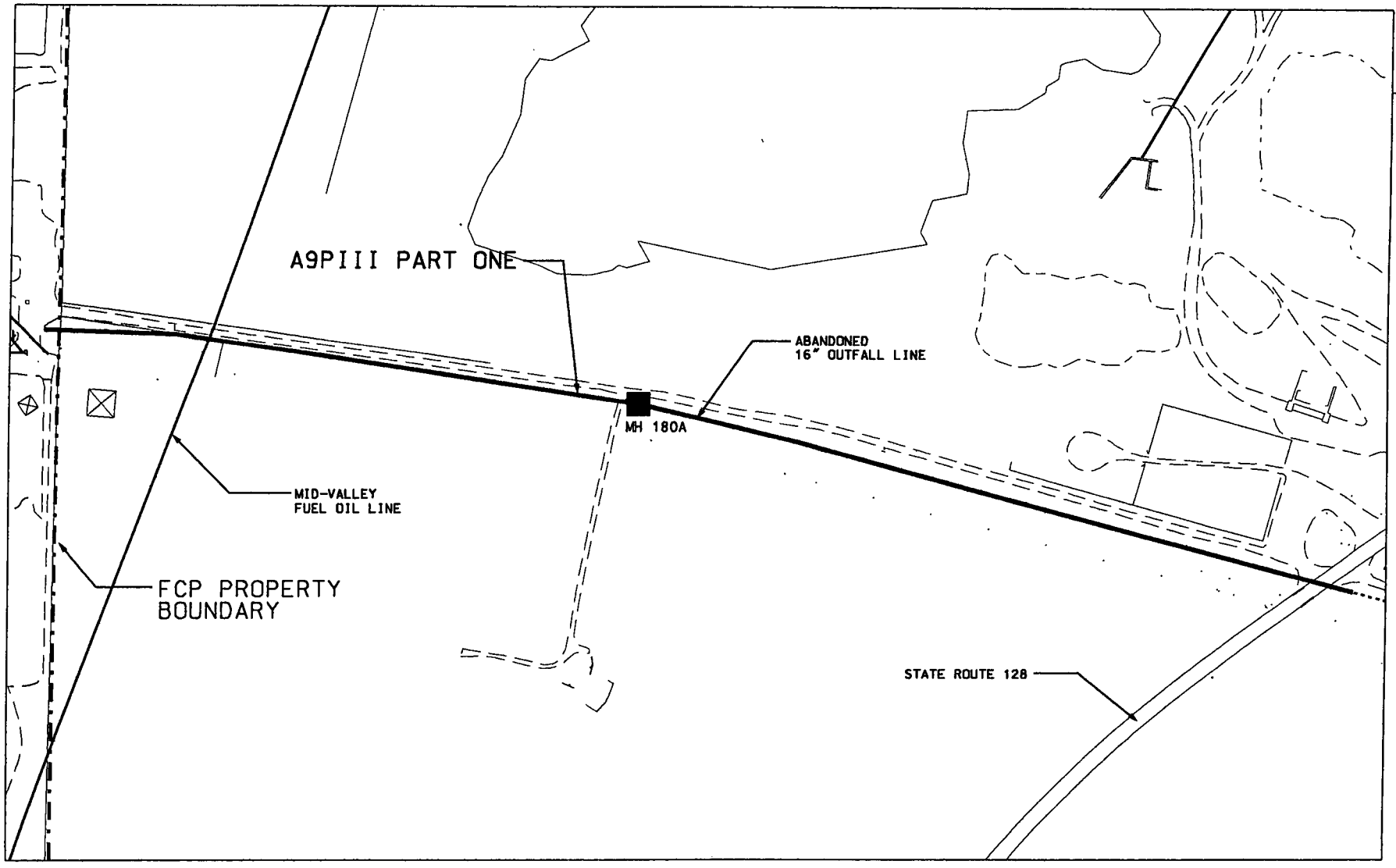
SCALE

400 200 0 400 FEET

v:\#2fm12\dgn\a9p3_015.dgn
STATE PLANAR COORDINATE SYSTEM 1983

FIGURE 1-1. AREA 9 PHASE III LOCATION MAP

15-FEB-2005



LEGEND:

SCALE

250 125 0 250 FEET

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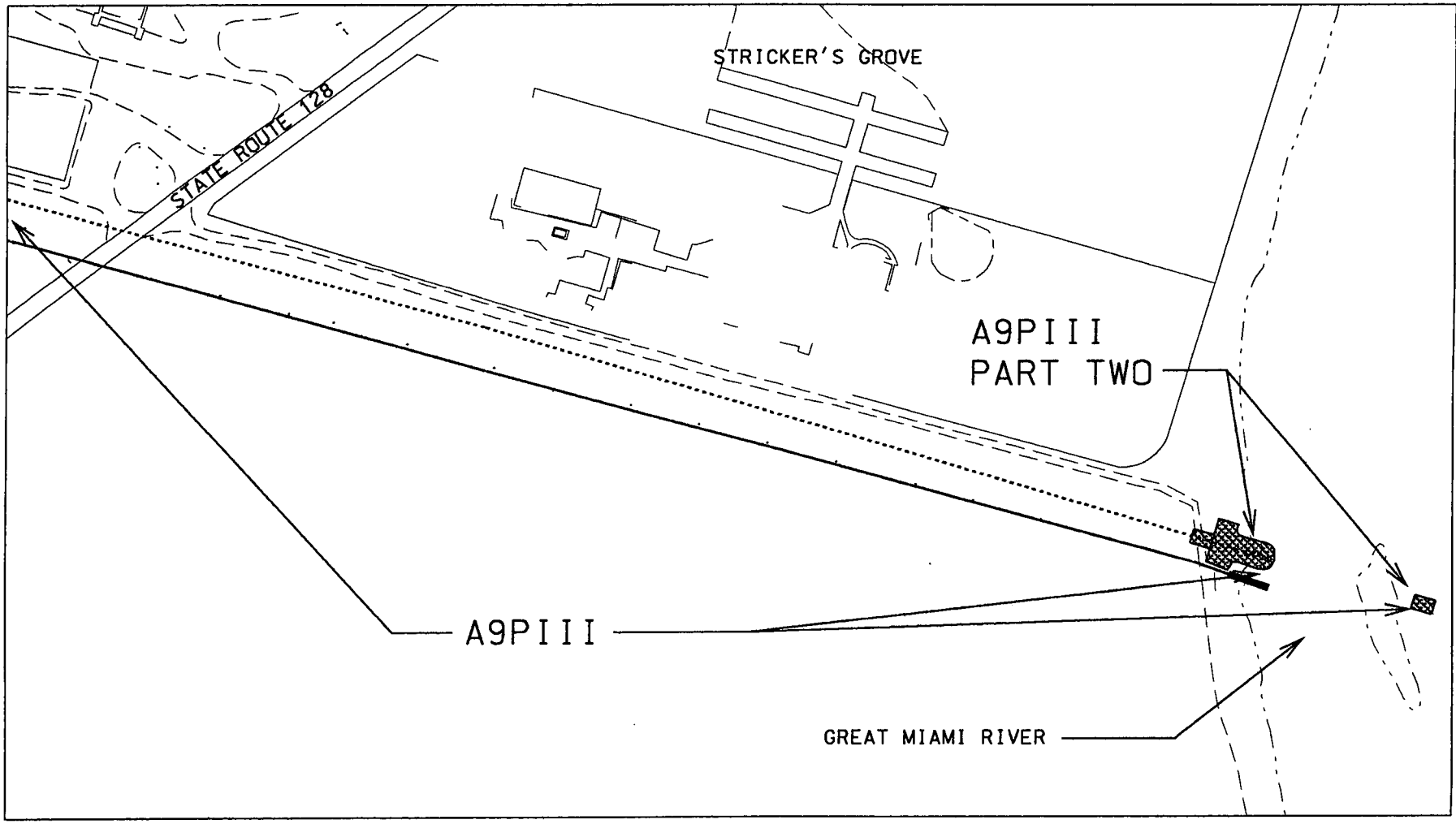
STATE PLANAR COORDINATE SYSTEM 1983

FIGURE 1-2. AREA 9 PHASE III, PART ONE LOCATION MAP

26-MAY-2005



LEGEND:

ABANDONED 16" OUTFALL LINE

EXISTING 24" OUTFALL LINE

A9PIII PART TWO

SCALE

200 100 0 200 FEET

15-FEB-2005

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STATE PLANAR COORDINATE SYSTEM 1983

FIGURE 1-3. AREA 9 PHASE III, PART TWO LOCATION MAP

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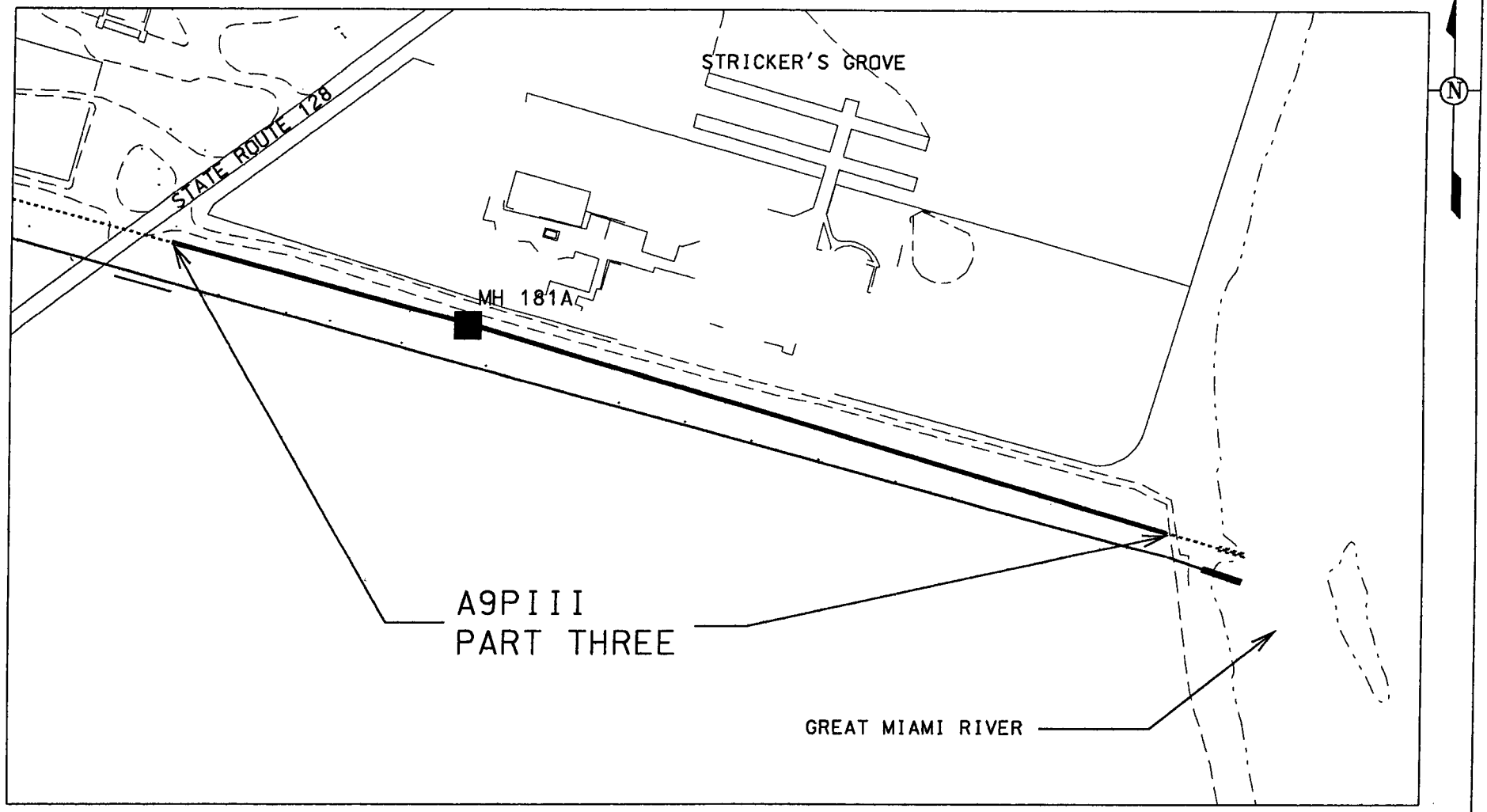


LEGEND:

..... ABANDONED 16" OUTFALL LINE

——— EXISTING 24" OUTFALL LINE

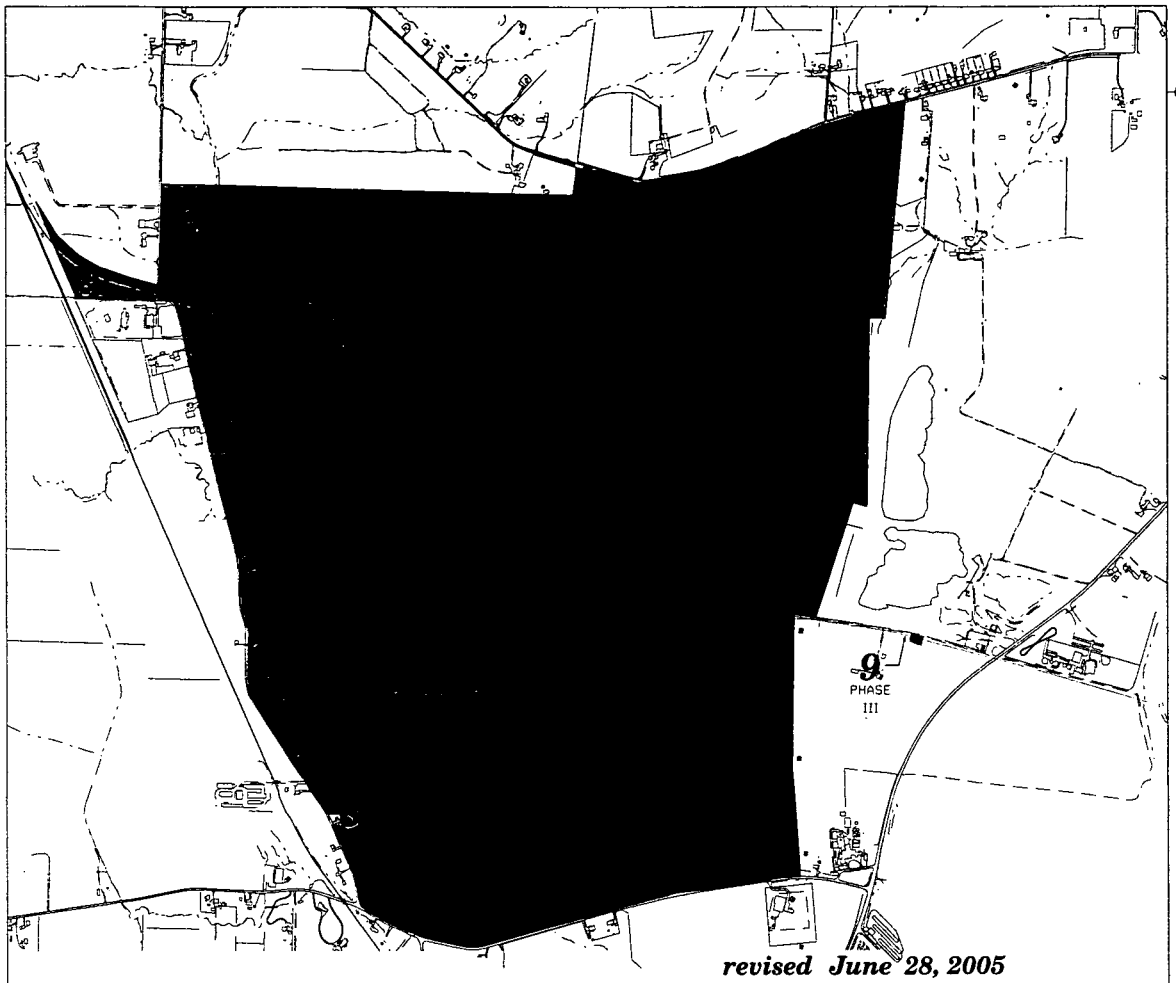
SCALE

200 100 0 200 FEET

v:\#2fm12\dgn\a9p3_071.dgn
STATE PLANAR COORDINATE SYSTEM 1983

FIGURE 1-4. AREA 9 PHASE III, PART THREE LOCATION MAP

26-MAY-2005



AREAS	TOTAL ACRES	[redacted]				REMAINING ACRES
AREA 1	395.8	393.3	0	1.7	0.8	0
AREA 2	174.7	162.1	3.9	0	8.7	0
AREA 3A/4A	29.3	29.3	0	0	0	0
AREA 3B/4B	26.2	11.1	15.1	0	0	0
AREA 5	26.9	7.6	2.7	16.7	0	0
AREA 6	140.9	18.8	1.4	113.9	6.8	0
AREA 7	85.2	0	1.2	8.9	75.1	0
AREA 8	98.9	98.9	0	0	0	0
MDC	39.0	0	0	39.0	0	0
PR/SSOD/PPDD	32.7	0	7.0	25.8	0	0
TOTAL ON SITE	1049.6	721.1	31.2	206.0	91.3	0
AREA 9	85.6	85.6	0	0	0	0
TOTAL OFF SITE	85.6	85.6	0	0	0	0

* ONSITE AREA9 REMAINING ACRES INCLUDE THE DISSOLVED OXYGEN FACILITY AREA. THE INTERIM LEACHATE LINE CORRIDOR IS INCLUDED IN AREA 6.

AREA 10 INCLUDES PIPELINES RELATED TO GROUNDWATER REMEDIATION AND OTHER UTILITIES NOT SPECIFICALLY LISTED.

SCALE

1100 550 0 1100 FEET

FIGURE 1-5. FCP CONTROLLED CERTIFICATION MAP

STATE PLANAR COORDINATE SYSTEM 1983

12-JUL-2005

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2.0 CERTIFICATION APPROACH

2.1 CERTIFICATION STRATEGY

This section summarizes the area-specific constituent of concern (ASCOC) selection process and the certification approach, including CU establishment, sampling design, and statistical analysis. The general certification strategy is described in Section 3.4 of the SEP, and the specific strategy for A9PIII is described in the Certification Design Letter (CDL) for A9PIII Abandoned Outfall Line - Part One (DOE 2004a), CDL for A9PIII Abandoned Outfall Line - Part Two (DOE 2004c), and CDL for A9PIII Abandoned Outfall Line - Part Three (DOE 2005a).

2.1.1 Area-Specific Constituents of Concern

Total uranium, radium-226, radium-228, thorium-228 and thorium-232 are sitewide primary constituents of concern (COCs), and were retained as ASCOCs for the A9PIII CUs. Cesium-137 and technetium-99 were retained because of historical FRL exceedances. The remaining suite of ASCOCs that were analyzed during certification of the A9PIII - Parts One, Two, and Three were based on the list of ASCOCs from the adjacent FCP soil remediation area as well as those constituents identified on the 1988 National Pollution Discharge Elimination System (NPDES) Permit Application that either have a FRL or are Resource Conservation and Recovery Act (RCRA) characteristic and were detected in the abandoned outfall line. The ASCOCs were certified to the more stringent off-property soil FRLs identified in the OU5 ROD. Table 2-1 lists the ASCOCs that will be retained for sampling based on the above-listed criteria. The reason for constituent retention and their applicable FRLs are also listed in the table.

2.1.2 ASCOC Selection Criteria

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

- It was retained as an ASCOC in adjacent FCP soil remediation areas;
- 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 (Note: Table 2-7 does not include off-property Area 9);
- Analytical results show that a contaminant is present above its FRL, and the above-FRL concentrations are not attributable to false positives or elevated Contract Required Detection Limits;
- It can be traced to site use, either through process knowledge or known release of the constituent to the environment; or
- Physical characteristics of the contaminant, such as degradation rate and volatility, indicate it is likely to persist in the soil between time of release and remediation.

2.1.3 ASCOC Selection Process

Table 2-1 lists the ASCOCs that will be retained for sampling based on the above-listed criteria. The reason for constituent retention is included in the table.

2.2 CERTIFICATION APPROACH

2.2.1 Certification Design

The certification design for trench CUs (1, 2, 3, 6, 7, and 8) in A9PIII - Parts One, Two, and Three followed a similar approach described in the CDL for Area 1, Phase II (A1PII) Sector 3 Utility Trenches (A1PII-S3UT, DOE 1999). The trench described in the CDL for A1PII-S3UT was evaluated to determine the maximum distance between sampling locations for this certification effort. The distance between locations was approximately 54 feet for the longest trench in A1PII-S3UT. Since the trench within A9PIII - Parts One, Two, and Three was significantly longer, a conservative distance of 50 feet between sampling locations was selected as a starting point. The certification design for the non-trench CUs (4, 5, and 9) covered in the CDLs for A9PIII - Parts One, Two, and Three followed the general approach outlined in Section 3.4 of the SEP.

2.2.1.1 Area 9, Phase III - Part One Certification Unit Design

A9PIII - Part One consisted of trench CUs (CUs 1, 2, and 3) and one non-trench CU (CU 4), see Figure 2-1. The trench CU points were laid out in the trench that overlay the western section of the abandoned outfall line. In order to achieve a whole number of CUs in the A9PIII - Part One trench, the sampling locations had to be more closely spaced (approximately 43 feet), which enabled the placement of CUs 1, 2, and 3, and resulted in a higher sampling density.

Originally, CU 1 extended east from the FCP property boundary. However, since manhole 176A was added to the A9PIII Abandoned Outfall Line Excavation Plan for Part One (DOE 2004f), it also needed to be added to the certification effort. Manhole 176A is located on FCP property just to the west of the eastern property boundary. Therefore, instead of redesigning CU 1, an additional sampling location was added to CU 1 (i.e., sampling location 17) for a total of 17 sampling locations within this CU.

Also, the section of abandoned outfall line that lies beneath the Mid Valley Pipeline easement was excavated and removed as part of the A9PIII Abandoned Outfall Line Excavation Plan for Part Three (DOE 2005c). Because the easement is bound to the east and west by CU 1, this area was included in the certification of CU 1. The size of CU 1 was increased again to encompass the area that falls within the Mid Valley Pipeline easement, which added two additional sampling locations (i.e., sampling locations A9P3-C03-18 and A9P3-C03-19).

CU 3 was originally bound to the east by the SR 128 right of way. However, when excavation on the section of abandoned outfall line that was between CU 3 and SR 128 began in February 2003, CU 3 was extended to the western side of SR 128. Two additional certification locations (A9P3-C03-17 and A9P3-C03-18) were sampled between the original eastern boundary of CU 3 and SR128.

Additionally, after a 54-inch casing pipe was pushed (jacked) around the 24-inch/26-inch protective casing and 16-inch outfall line in April 2005, and the outfall line/protective casing was removed; CU 3 was extended further to the eastern end of the 54-inch casing pipe. Certification samples were collected from within the eastern and western ends of the 54-inch casing (i.e., sampling locations A9P3-C03-19 and A9P3-C03-20) to confirm that the soil surrounding the 24-inch/26-inch protective casing was not contaminated with any above-FRL material.

CU 4 covers an impacted area in the proximity of MH 180A. Above-FRL sample results for silver were detected in the area of MH 180A during predesign sampling. Therefore, this area was horizontally and vertically bound, and was excavated to remove the impacted soil. Certification samples were collected following excavation.

2.2.1.2 Area 9, Phase III - Part Two Certification Unit Design

The certification design and sampling strategy for CU 5, which represents the surface of the area after the riprap was removed along the Great Miami River, followed the general approach outlined in Section 3.4 of the SEP. The certification design and sampling strategy for CU 6, which represents the trench between the sheet pilings after the abandoned outfall line was removed (western section of CU 6) and the section of abandoned outfall line that was on a sand bar in the Great Miami River (eastern section of CU 6), followed the approach described in the CDL For A1PII-S3UT, see Figure 2-2.

The trench CU points were laid out in the trench that overlay the western section of the abandoned outfall line. Because the size of the excavation (CU 6 west) was predetermined, the certification sampling locations were spaced evenly across the excavation (5.64 feet apart) with one location falling within each of the sub-CUs (12 for CU 6 west and the remaining four for CU 6 east). Certification samples were collected following excavation.

2.2.1.3 Area 9, Phase III - Part Three Certification Unit Design

The certification design for the A9PIII - Part Three trench CUs follows the same approach described in the CDL for A9PIII - Part One. The points were laid out in the trench that overlay the eastern section of the abandoned outfall line. In order to achieve a whole number of trench CUs in A9PIII - Part Three, the distance between sampling locations had to be conservatively reduced to approximately 47 feet, which enabled the placement of CUs 7 and 8.

The certification design for CU 9 covered an impacted area in the proximity of MH 181A. Above-FRL sample results for technetium-99 were detected within the area during predesign sampling. This area was horizontally and vertically bound by predesign samples, and was excavated to remove the impacted soil. Because the abandoned outfall line ran beneath a portion of CU 9, CU 9 needed to pass certification before the abandoned outfall line excavation passed through it. Therefore, these samples were collected and results were obtained prior to the abandoned outfall line removal. See Figure 2-2 for the CU locations.

2.2.2 Sample Selection Process

Sample locations were evenly spaced across the length of each trench CU (CUs 1, 2, 3, 6, 7, and 8) with one location falling within each of the 16 sub-CUs (19 sub-CUs in CU 1 and 18 sub-CUs in CU 6). The only exception to this sample selection process was in CU 3. Sample locations A9P3-C03-17, A9P3-C03-18, A9P3-C03-19, A9P3-C03-20W, A9P3-C03-21W, and A9P3-C03-22E were field located on both the east and west sides of SR 128.

After the excavation of the section of abandoned outfall line piping that was between the original eastern boundary of CU 3 and SR 128, the abandoned outfall line could not be safely lifted from the trench in complete sections; therefore, it was broken into more manageable sections with a trackhoe bucket. Sampling locations A9P3-C03-17 and A9P3-C03-18 were placed at the two locations where the abandoned outfall line was broken. Biased samples were collected and included in the certification of CU 3.

Additionally, biased samples were collected on both the eastern and western sides of SR 128 from within the ends of the 54-inch casing pipe. The eastern biased sampling locations were A9P3-C03-19, A9P3-C03-22E (technetium-99 only), and excavation control sample location A9P3-E128-SM-1. The western biased sampling locations were A9P3-C03-20W (technetium-99 only) and A9P3-C03-21W (technetium-99 only). Excavation control sample location A9P3-E128-SM-1 was originally sampled for uranium and technetium-99; however, when the sample result was above-FRL for technetium-99, additional analysis for thorium-228, thorium-232, radium-226, and radium-228. Since samples were not collected for the chemical ASCOCs when sample location A9P3-E128-SM-1 was sampled, sample location A9P3-C03-19 was placed in the vicinity of A9P3-E128-SM-1 and the remaining ASCOCs were collected.

The selection of certification sampling locations in CUs 4 and 5 was conducted according to Section 3.4.2 of the SEP. Sample locations were tested against the minimum distance criteria for each CU. Each CU was first divided into 16 approximately equal sub-CUs. Sample locations were then generated by randomly selecting an easting and northing coordinate within the boundaries of each sub-CU, then testing those locations against the minimum distance criteria for the CU. If the minimum distance criteria were not met,

an alternative random location was selected for that sub-CU, and all the locations were re-tested. This process continued, until all 16 random locations met the minimum distance criteria.

The selection of certification sampling locations in CU 9 was also conducted according to Section 3.4.2 of the SEP. However, biased samples were placed on the shear walls of the excavation. Sample locations with the exception of biased samples were tested against the minimum distance criteria for this CU.

All A9PIII sub-CUs planned and biased certification sampling locations are shown on Figures 2-3 through 2-12. Four of the 16 sample locations (one location from each quadrant of the CUs 4, 5, and 9) were designated with a "V," indicating archive sample locations. One sample location in each CU was designated with a "D," indicating a field duplicate sample collection location.

2.2.3 Certification Sampling

All sampling locations in each of the trench CUs were collected from the bottom of the excavation from the bucket of an excavator after the piping, bedding material, and approximately 6 inches of underlying soil were removed. Samples were collected from the top 6 inches of soil from the bottom of the excavation. The samples collected in CUs 4 and 9 were collected from the top 6 inches of the soil that remained after excavation of impacted material around MH 180A and MH 181A respectively. The samples collected in CU 5 were collected from the top 6 inches of the soil that remained after the riprap lining the bank of the Great Miami River was removed. After the riprap was removed from the riverbank, several sample locations (A9P3-C05-9, A9P3-C05-12, A9P3-C05-13, A9P3-C05-15, and A9P3-C05-16) were located in the river. These samples were collected from the river bottom (i.e., sediment samples). The biased sample locations (A9P3-C03-19, A9P3-C03-20W, A9P3-C03-21W, and A9P3-C03-22E) collected from within the 54-inch casing pipe were collected from the top 6 inches of the soil contained within the ends of the piping. The four samples designated as "archive" in each CU were collected and stored.

2.2.4 Statistical Analysis

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 COC to its FRL, or the 90 percent UCL on the mean of each secondary ASCOC. On an individual CU basis, any ASCOC with the 95 percent UCL (for primary ASCOCs) or 90 percent UCL (for secondary ASCOCs) 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 *a posteriori* test will the performed to determine whether the sample size is sufficient for a meaningful conclusion of this comparison. The second criterion is the hotspot criterion, which states that primary or secondary ASCOC results must not exceed two time the FRL. When the given

UCL on the mean for each COC is less that its FRL and the hotspot criterion is met, the CU will be considered certified.

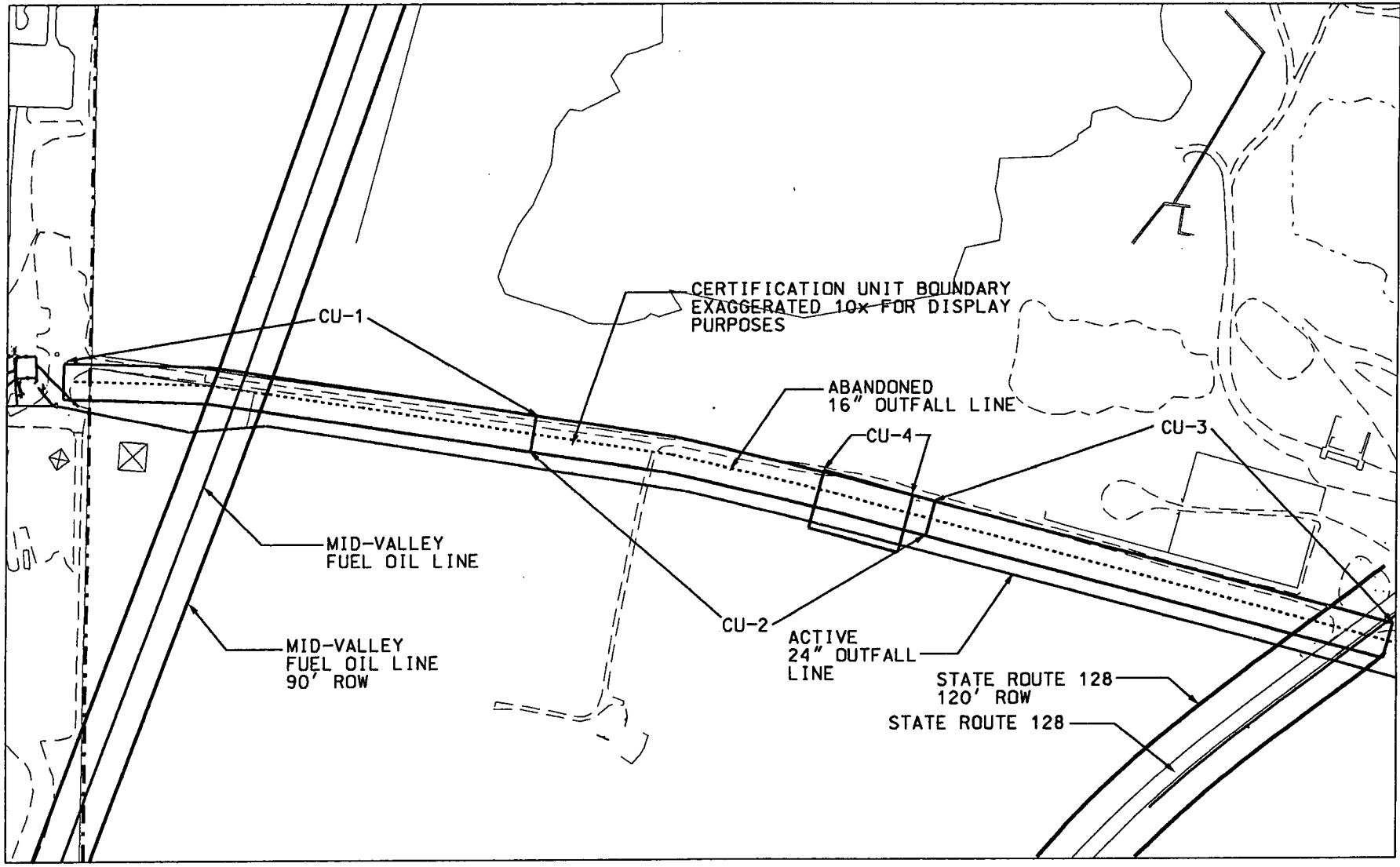
In the event that a CU passes the *a posteriori* test but fails certification, the following two scenarios will be evaluated: 1) localized contamination, and 2) widespread contamination. Details on the evaluation and responses to these possible outcomes are provided in Section 3.4.5 of the SEP.

TABLE 2-1
ASCOC LIST FOR A9PIII CERTIFICATION UNITS EAST OF A1PII

ASCOC	Off-Property FRL	Reason Retained
Total Uranium	50 mg/kg	Retained as a primary ASCOC Sitewide
Radium-226	1.5 pCi/g	Retained as a primary ASCOC Sitewide
Radium-228	1.4 pCi/g	Retained as a primary ASCOC Sitewide
Thorium-228	1.5 pCi/g	Retained as a primary ASCOC Sitewide
Thorium-232	1.4 pCi/g	Retained as a primary ASCOC Sitewide
Cesium-137	0.82 pCi/g	Above-FRL concentration
Technetium-99	1.0 pCi/g	Above-FRL concentration
Antimony	0.61 mg/kg	ASCOC for A1PII[1]
Arsenic	9.6 mg/kg	ASCOC for A1PII
Beryllium	0.62 mg/kg	ASCOC for A1PII
Cadmium	0.91 mg/kg	On NPDES Permit Application and detected
Copper	20 mg/kg	On NPDES Permit Application and detected
Fluoride	850 mg/kg	On NPDES Permit Application and detected
Hexavalent Chromium	11 mg/kg (0.05 mg/kg)	On NPDES Permit Application and detected
Lead	400 mg/kg (200 mg/kg)	ASCOC for A1PII[1]
Manganese	1400 mg/kg	On NPDES Permit Application and detected
Molybdenum	13 mg/kg (10 mg/kg)	ASCOC for A1PII[1]
Nickel	34 mg/kg	On NPDES Permit Application and detected
Silver	1.0 mg/kg	On NPDES Permit Application and detected
Zinc	82 mg/kg	On NPDES Permit Application and detected
1,1-dichloroethene	0.059 mg/kg	On NPDES Permit Application and detected
Aroclor-1254	0.04 mg/kg	ASCOC for A1PII
Aroclor-1260	0.04 mg/kg	ASCOC for A1PII
Carbon Tetrachloride	0.091 mg/kg	On NPDES Permit Application and detected
1,1,1-trichloroethane[2]	0.19 mg/kg	On NPDES Permit Application and detected
Tetrachloroethene	1.0 mg/kg	ASCOC for A1PII On NPDES Permit Application and detected

[1]Ecological COC
[2]FRL is actually for 1,1,2-trichloroethane since 1,1,1-trichloroethane does not have a FRL.

mg/kg - milligrams per kilogram
pCi/g - picoCuries per gram



LEGEND:

FCP BOUNDARY

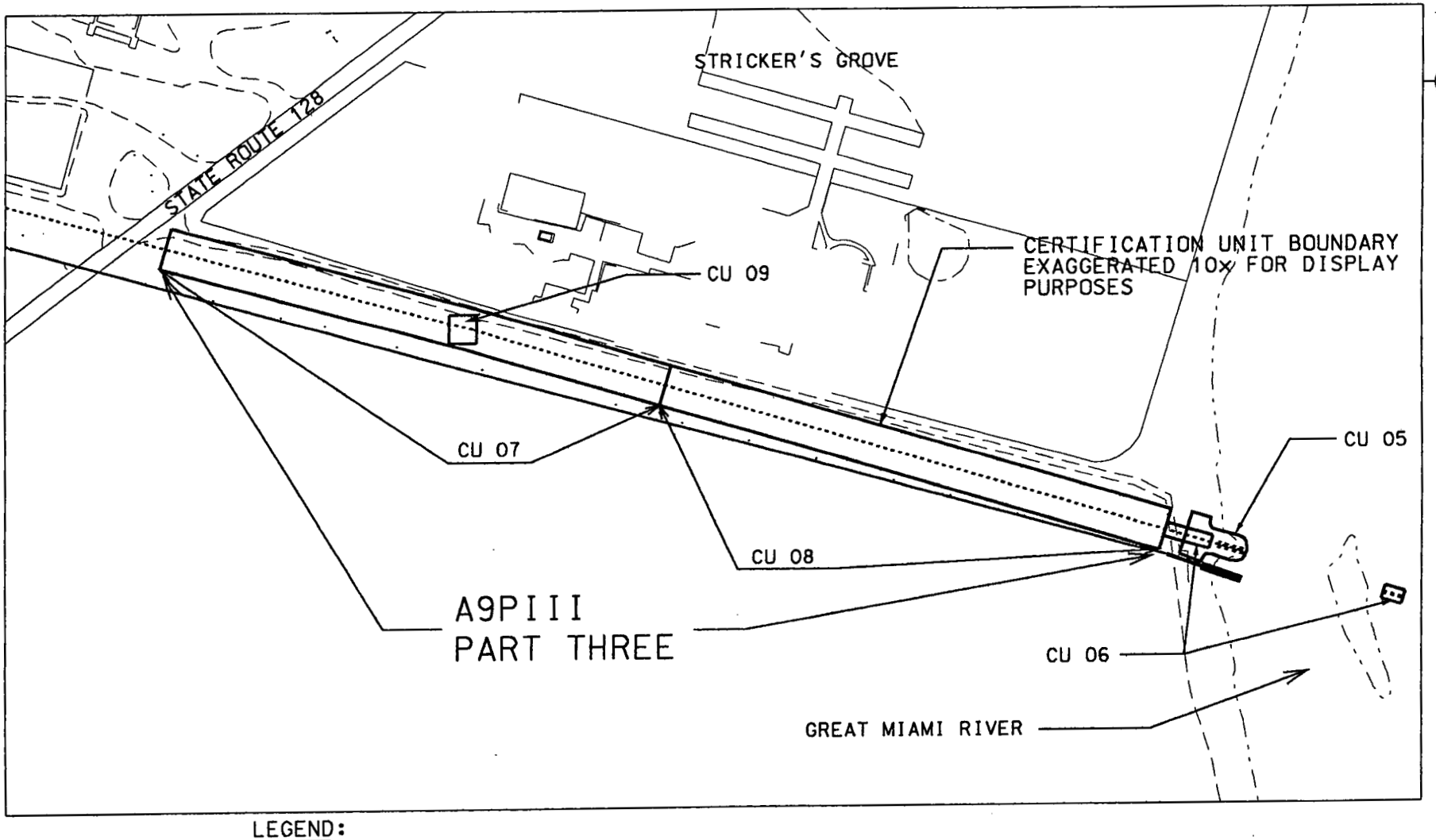
SCALE

250 125 0 250 FEET

v:\#2fm12\dgn\a9p3_013.dgn
STATE PLANAR COORDINATE SYSTEM 1983

FIGURE 2-1. AREA 9 PHASE III, PART ONE CERTIFICATION UNITS

12-MAY-2005



LEGEND:

ABANDONED 16" OUTFALL LINE

EXISTING 24" OUTFALL LINE

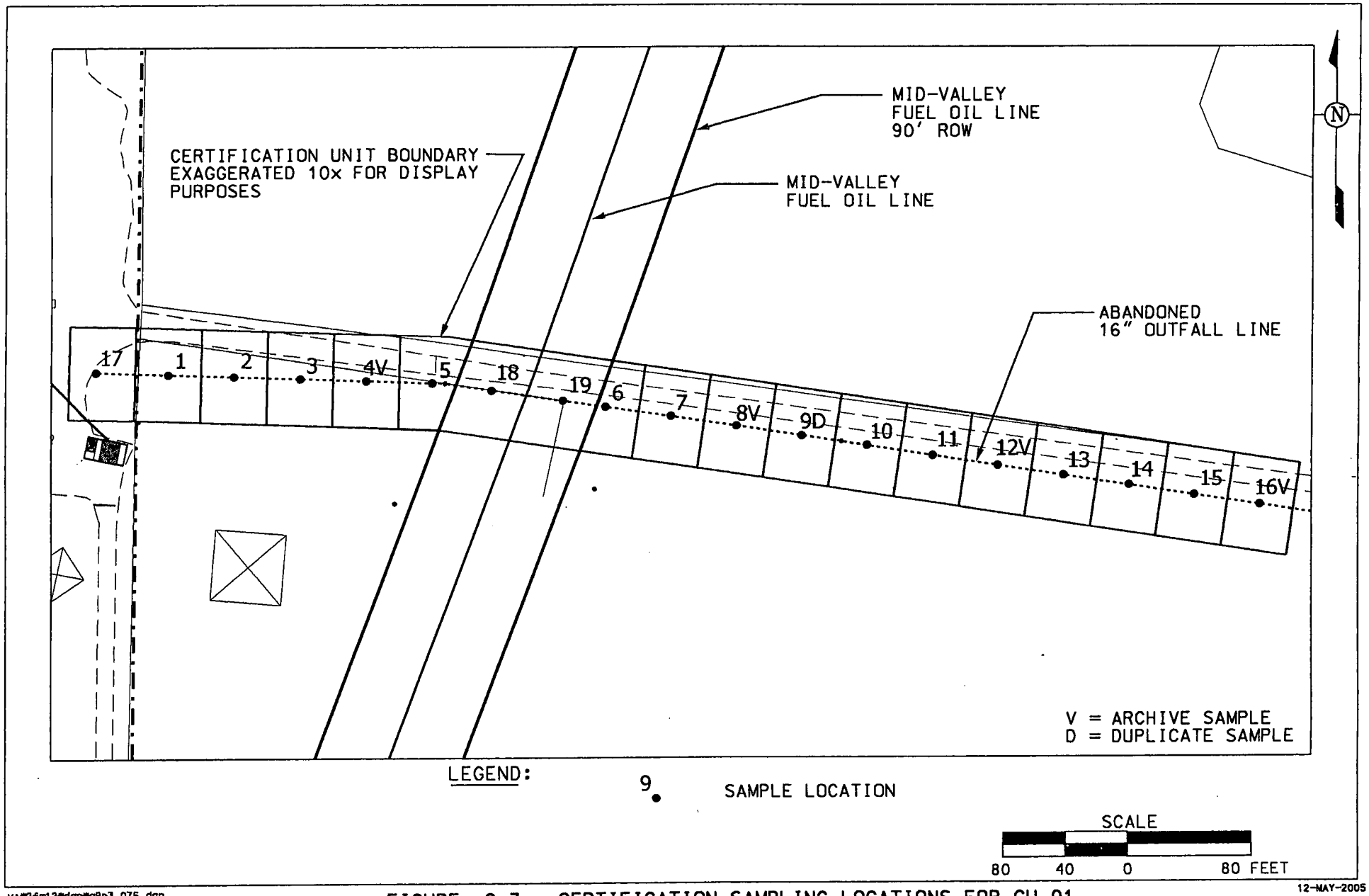
SCALE

200 100 0 200 FEET

16-FEB-2005

v:\#2fm12\dgn\a9p3_078.dgn
STATE PLANAR COORDINATE SYSTEM 1983

FIGURE 2-2. AREA 9 PHASE III, PART TWO & THREE CU LOCATIONS

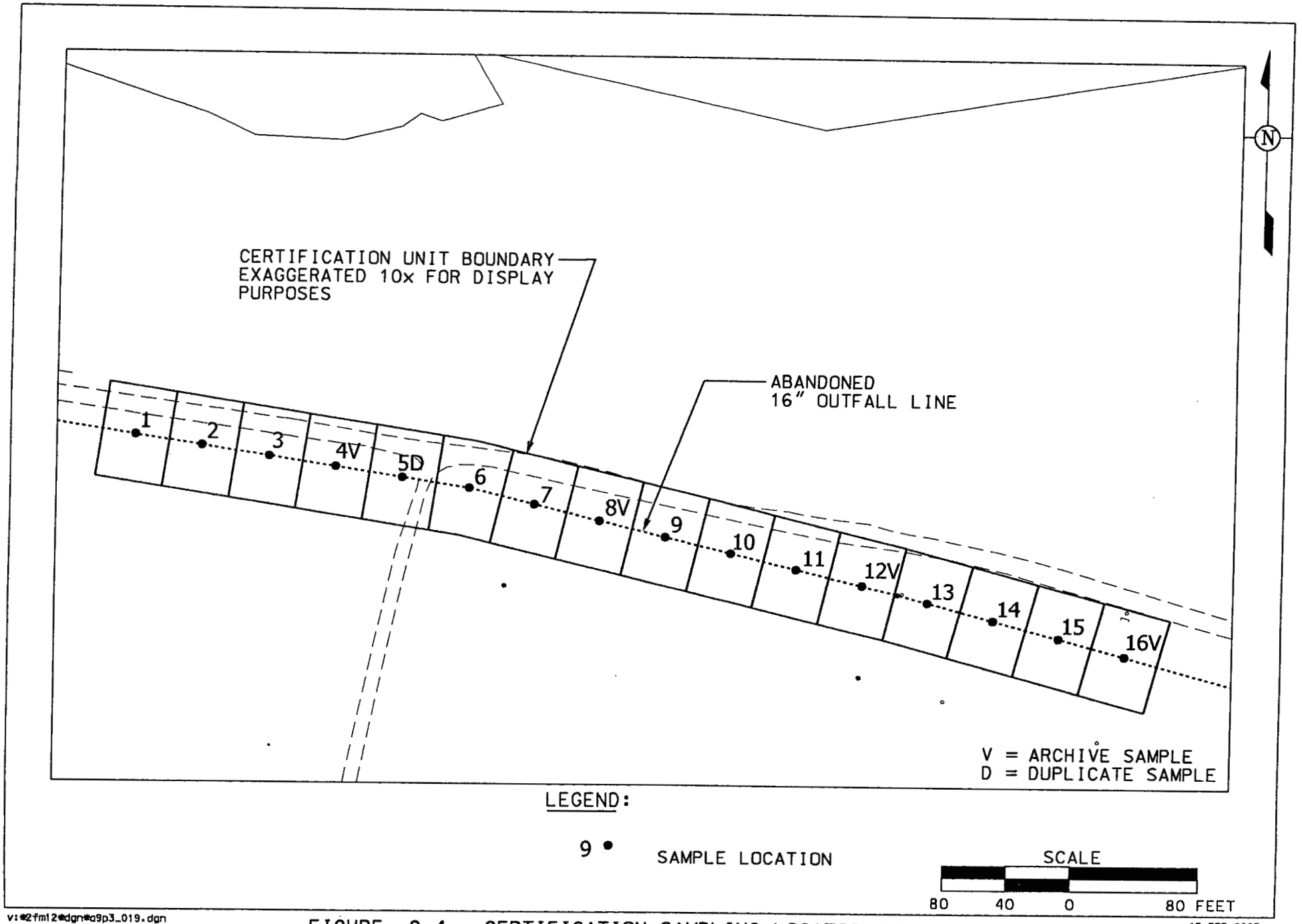


vi#2fm12#dgn#a9p3_076.dgn
STATE PLANAR COORDINATE SYSTEM 1983

FIGURE 2-3. CERTIFICATION SAMPLING LOCATIONS FOR CU 01

12-MAY-2005

6019



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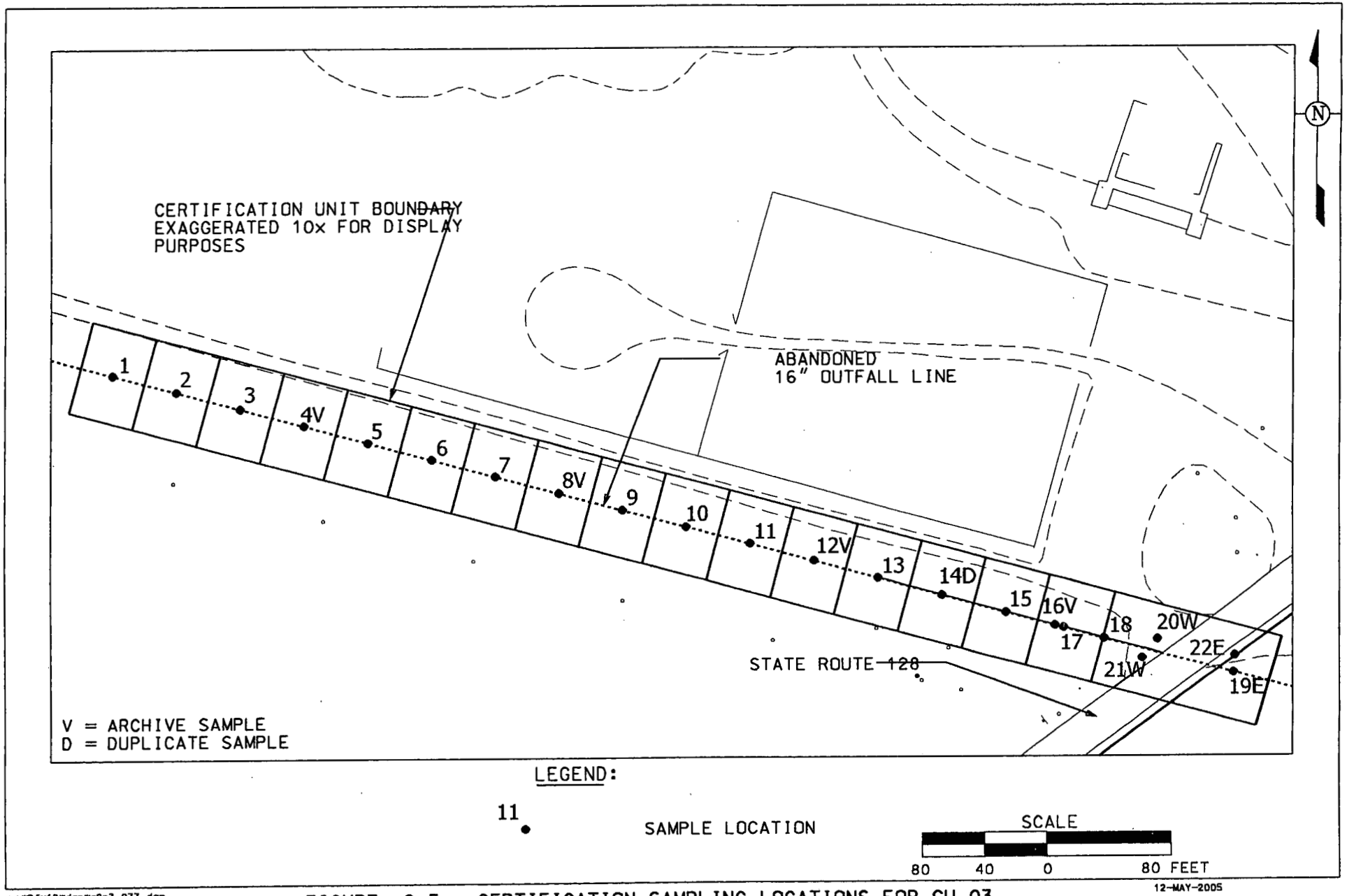
STATE PLANAR COORDINATE SYSTEM 1983

FIGURE 2-4. CERTIFICATION SAMPLING LOCATIONS FOR CU 02

15-FEB-2005



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STATE PLANAR COORDINATE SYSTEM 1983

FIGURE 2-5. CERTIFICATION SAMPLING LOCATIONS FOR CU 03

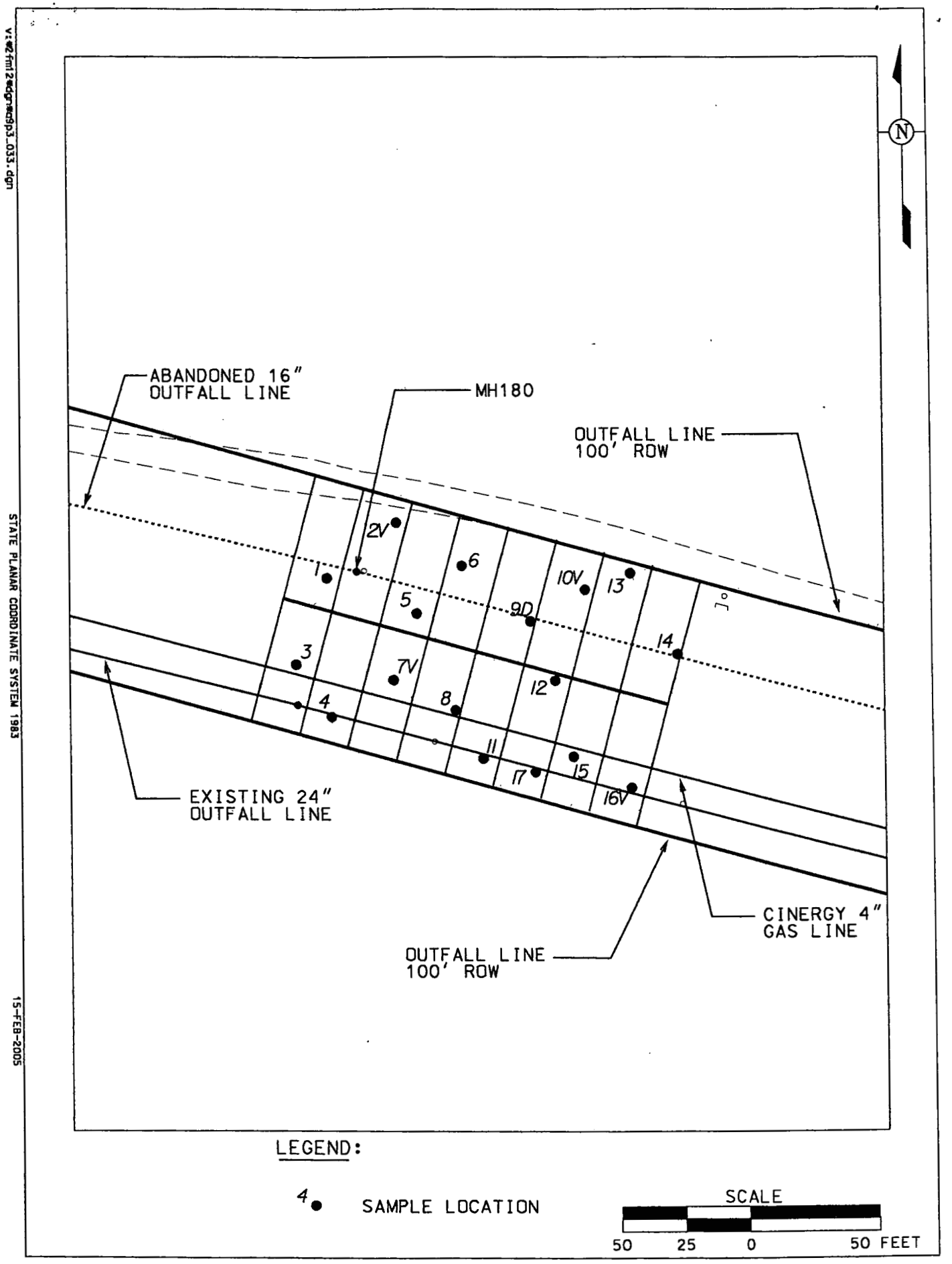
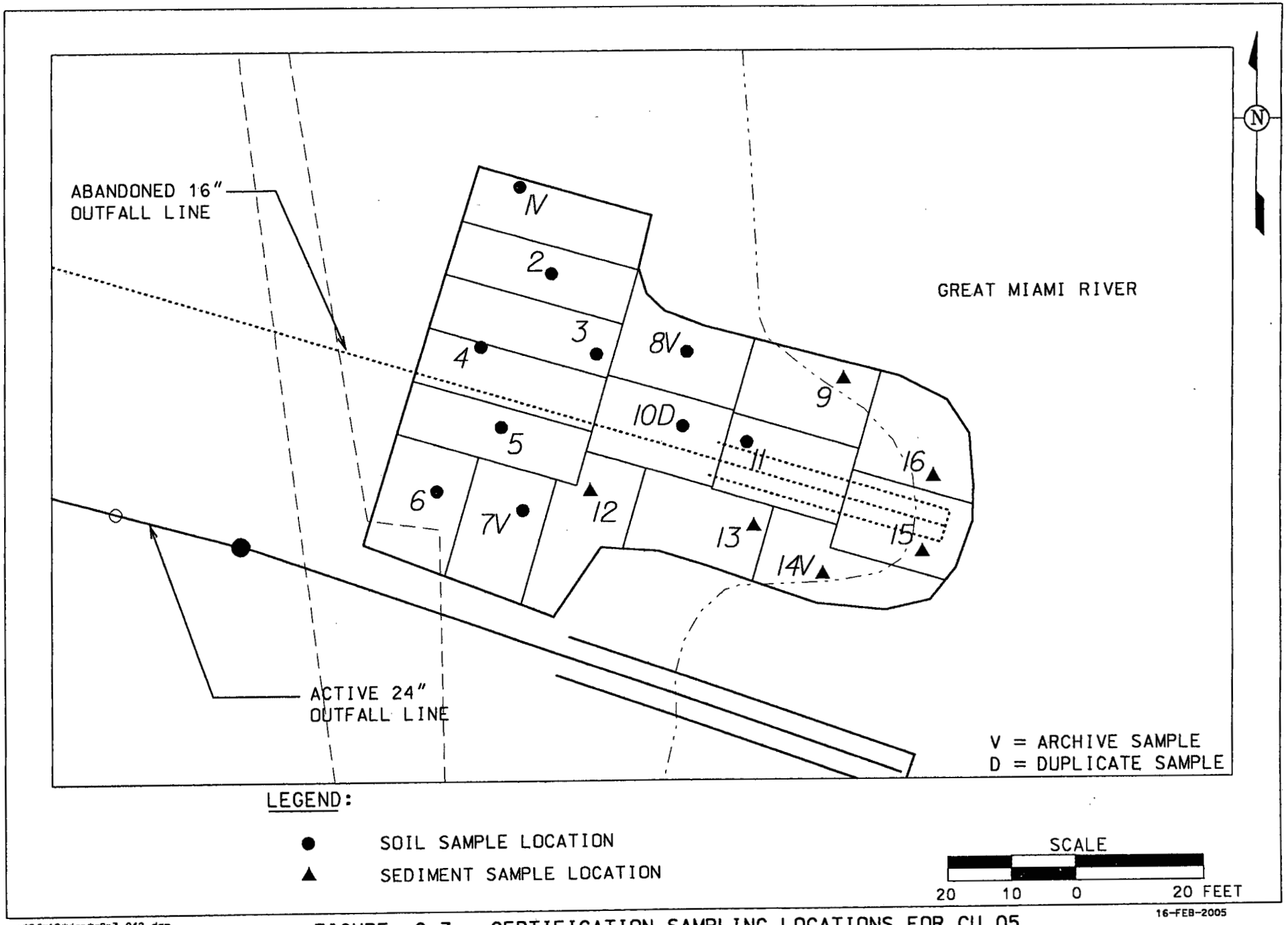


FIGURE 2-6. CERTIFICATION SAMPLING LOCATIONS FOR CU 4



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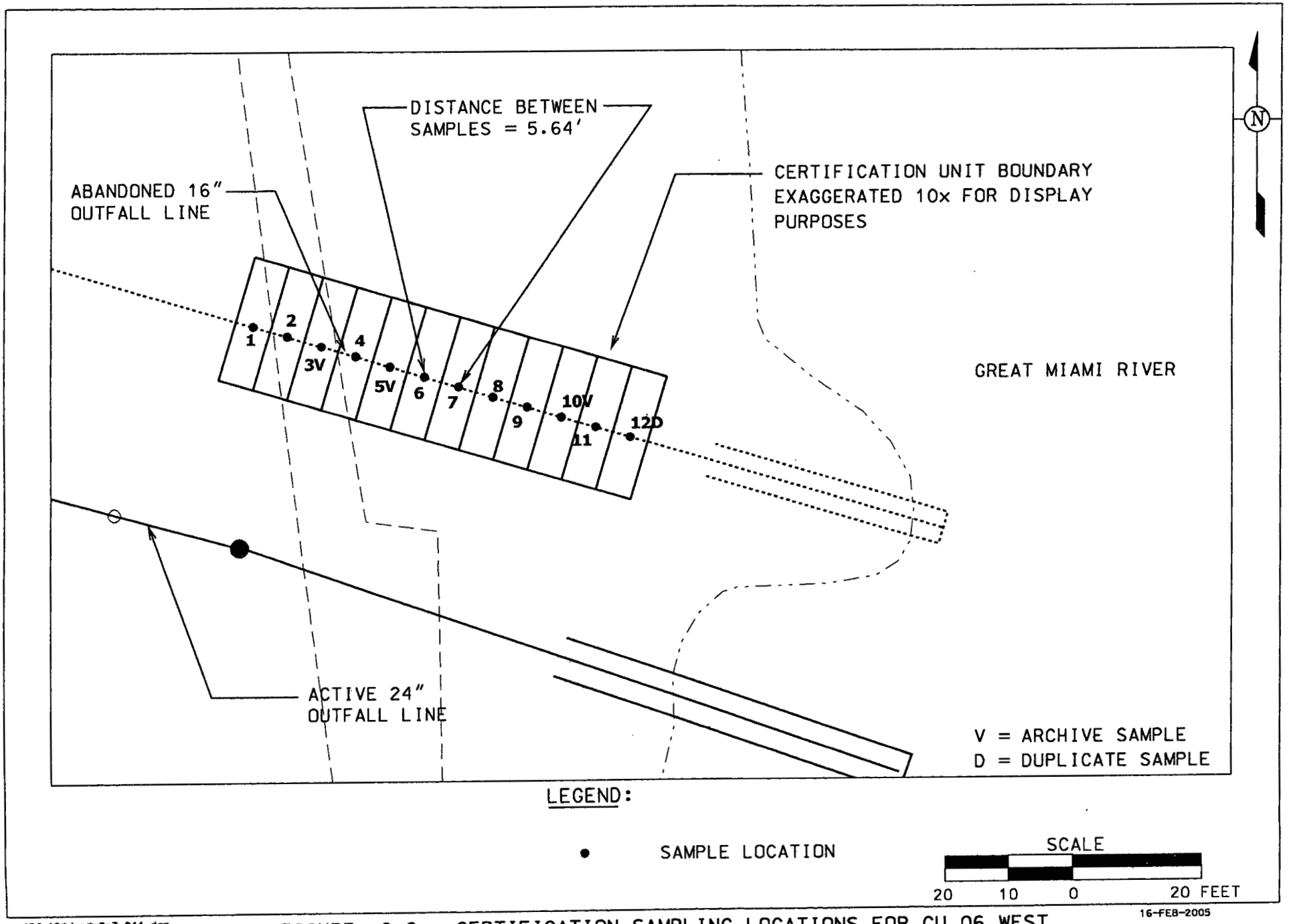
STATE PLANAR COORDINATE SYSTEM 1983

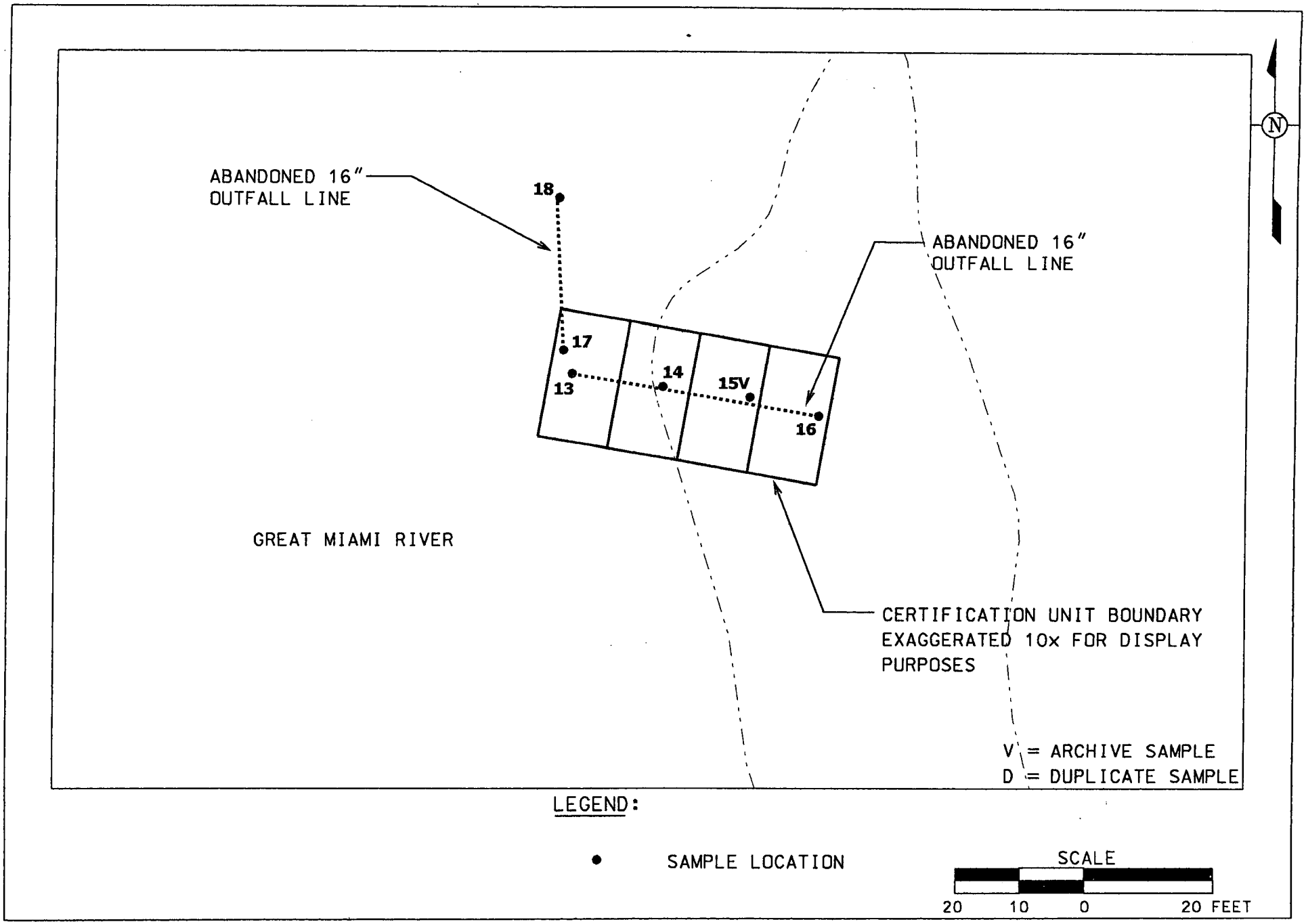
FIGURE 2-7. CERTIFICATION SAMPLING LOCATIONS FOR CU 05



v:\#2fm12\dgn\#d9p3_044.dgn
STATE PLANAR COORDINATE SYSTEM 1983

FIGURE 2-8. CERTIFICATION SAMPLING LOCATIONS FOR CU 06 WEST

16-FEB-2005

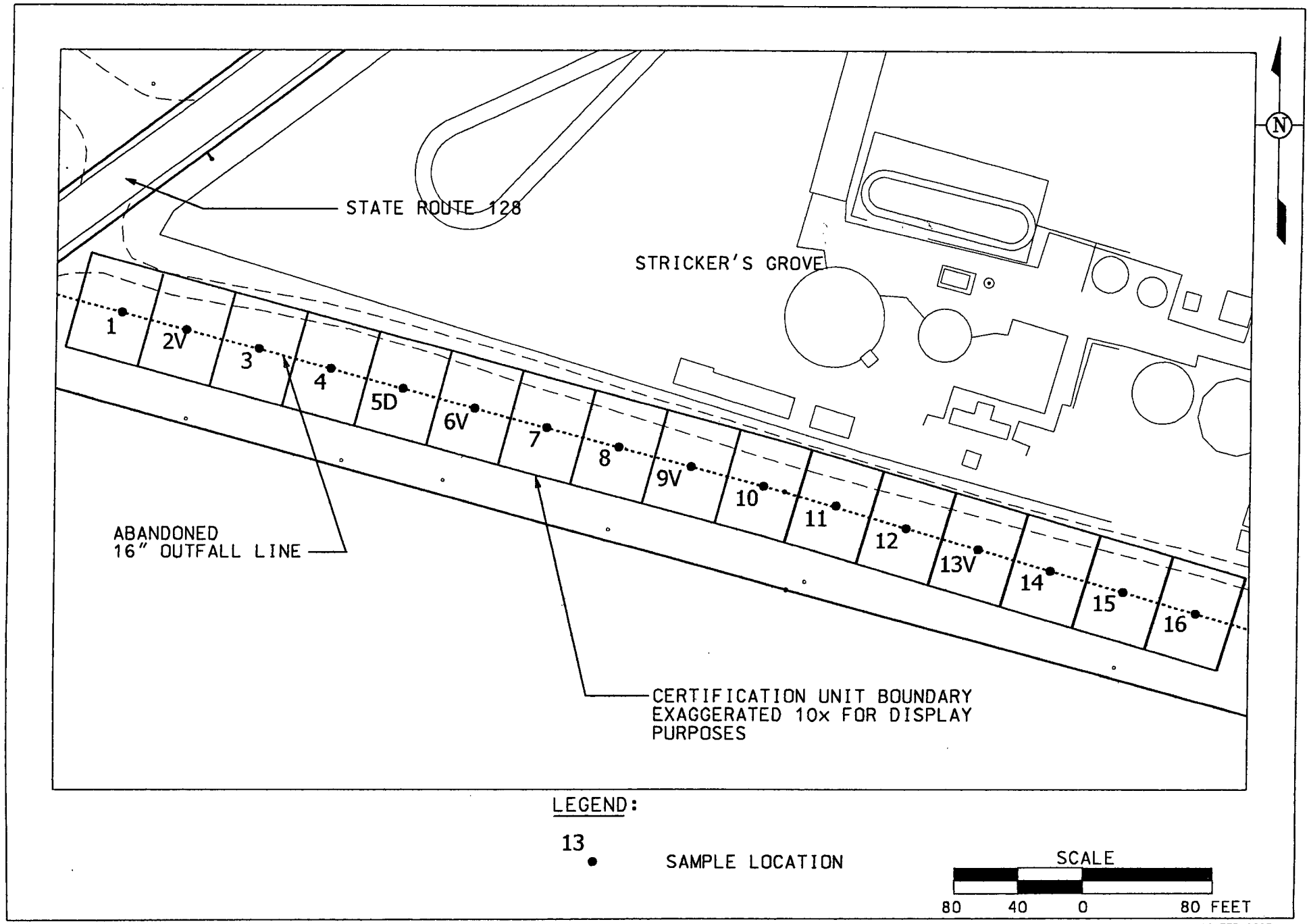


v:\#2fm12\dgn\a9p3_072.dgn
STATE PLANAR COORDINATE SYSTEM 1983

FIGURE 2-9. CERTIFICATION SAMPLING LOCATIONS FOR CU 06 EAST

16-FEB-2005

6019



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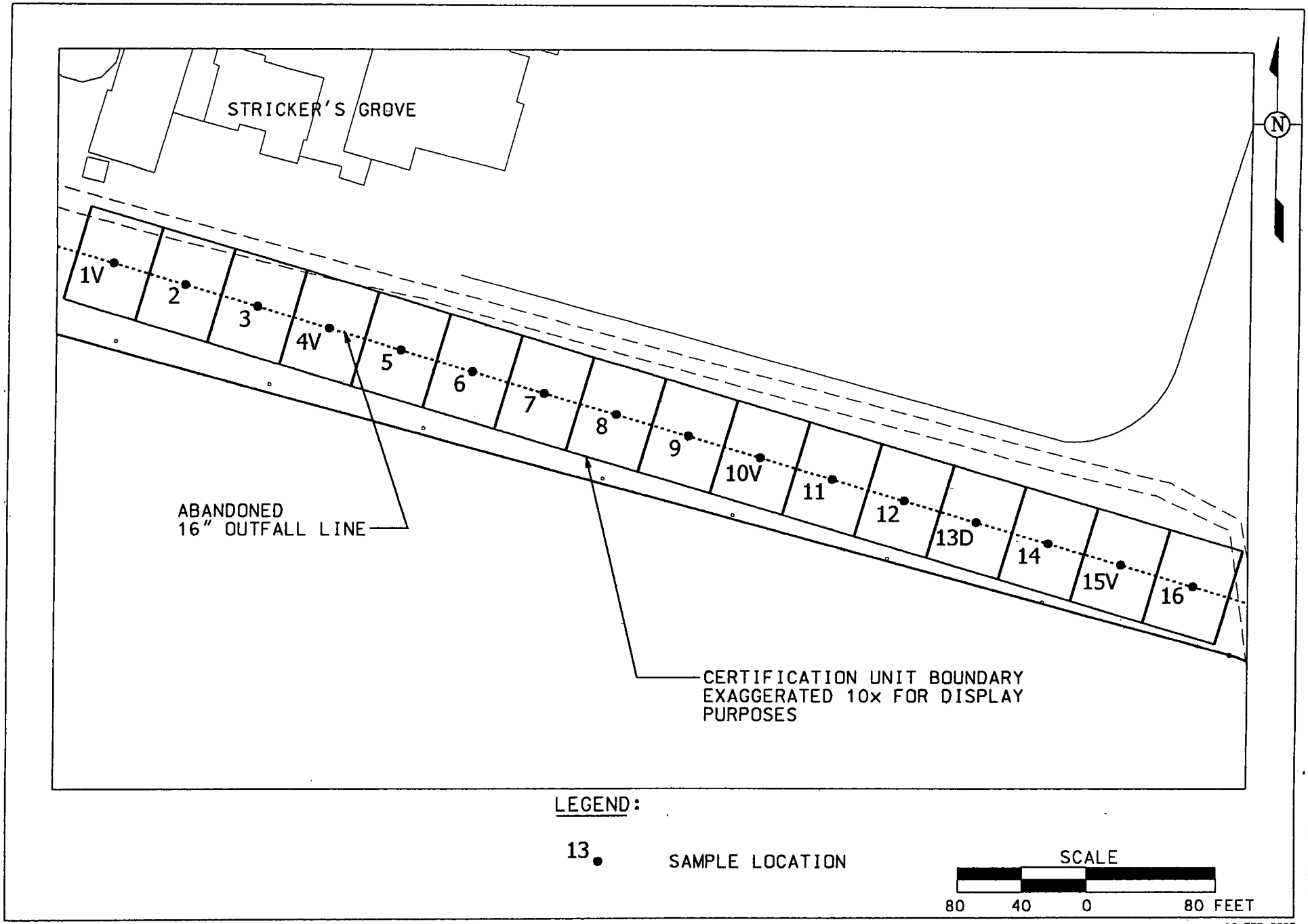
STATE PLANAR COORDINATE SYSTEM 1983

FIGURE 2-10. CERTIFICATION SAMPLING LOCATIONS FOR CU 07

16-FEB-2005



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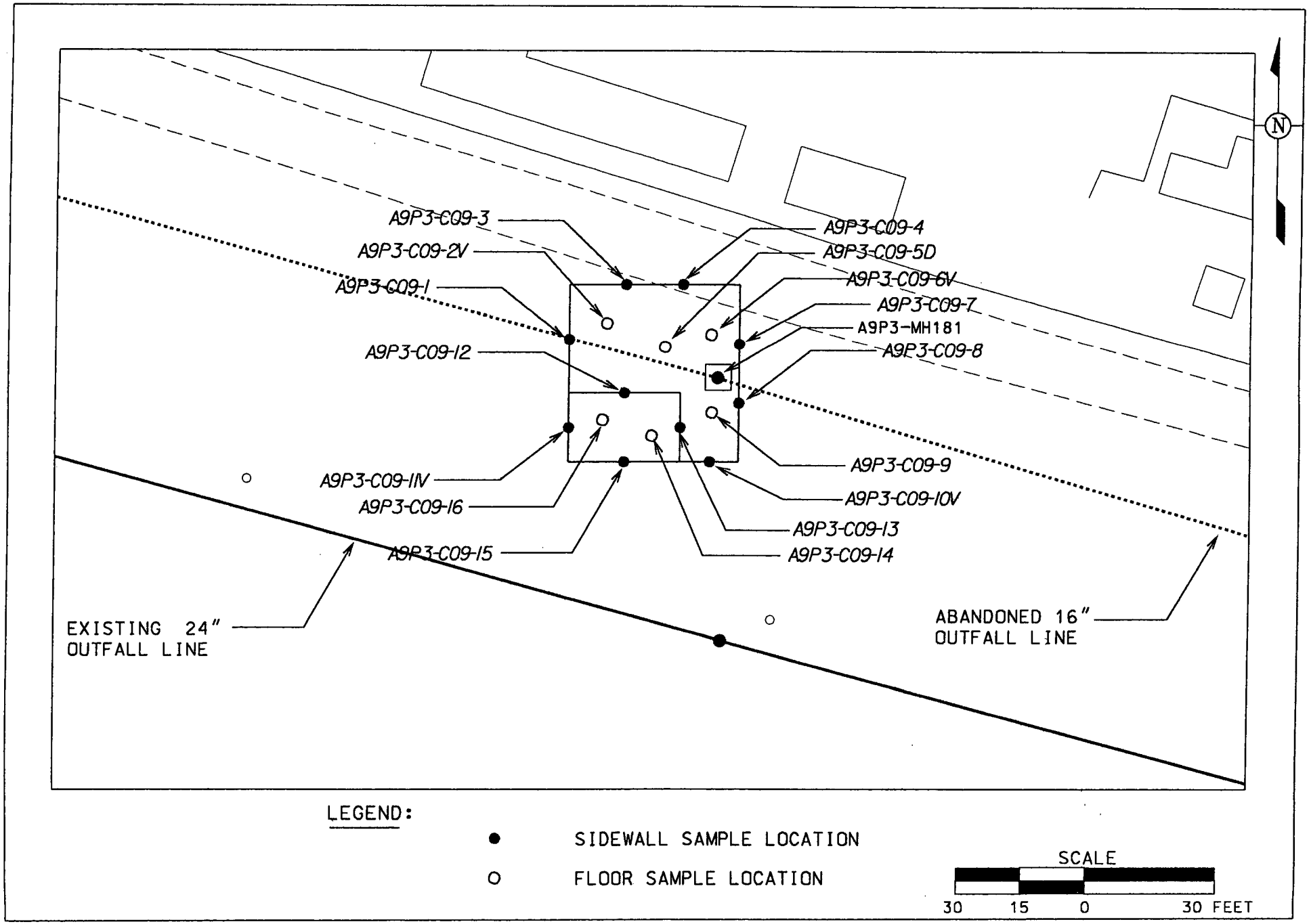
STATE PLANAR COORDINATE SYSTEM 1983

FIGURE 2-11. CERTIFICATION SAMPLING LOCATIONS FOR CU 08

16-FEB-2005



v:\#2fm12\dgn\a9p3_068.dgn
STATE PLANAR COORDINATE SYSTEM 1983

FIGURE 2-12. CERTIFICATION SAMPLING LOCATIONS FOR CU 09

16-FEB-2005

3.0 OVERVIEW OF FIELD ACTIVITIES

In accordance with the SEP, prior to conducting precertification and certification activities, all soil demonstrated to contain contamination above the associated FRLs were evaluated for remedial actions.

In addition to the predesign investigations, the Offsite Soils Removal Action Around Manhole 180, FMPC Effluent Line was used for remedial design of A9PIII. Before initiating the certification process, all historical soil data within the A9PIII certification areas were pulled from the Sitewide Environmental Database (SED). The data are summarized in Section 3.1.1.

Based on the results of sampling and scanning activities summarized in Sections 3.1 and 3.2, it has been determined that no further remedial actions are necessary to remove above-FRL soil.

3.1 AREA PREPARATION AND PRECERTIFICATION

Precertification surveys were performed from 7/22/04 through 4/7/05 per the PSP Guidelines for General Characterization for Sitewide Soil Remediation, Section 3.0 and Section 6.0 (DOE 2005d). After the impacted material and top 6 inches of soil was removed from the trench, the excavator excavated a bucket load of soil from the bottom of the trench at 25 feet intervals. Each bucket-load of material was placed next to the trench to form a circular pad no less than 6 feet in diameter and 6 inches or less in thickness for high purity germanium (HPGe) detector measurements at a 15-cm detector height. The HPGe tripod measurement over the formed circular pad was used to determine if the soil met the radiological FRLs. Once the HPGe measurements confirmed the absence of contaminated soil, the trench was backfilled with the material from the circular soil pad and the section of trench was backfilled using the stockpiled overburden soil. Areas that were excavated, but were not part of the trench excavation, were directly scanned when possible. At the end of each day, precertification scans were performed on the areas where impacted material loadout. See Figures 3-1 through 3-42 for real-time precertification maps.

3.1.1 Area 9, Phase III - Part One

In April 1989, an overflow of the abandoned outfall line occurred at MH 180 (in 1989 it was the active outfall line). In May 1989, characterization soil samples were taken. The results of the characterization sampling revealed that the soil immediately to the east of MH 180 exceeded the adopted criteria for soil removal for the site area at that time. The criteria identified for this removal action was 52 parts per million (ppm) total uranium and/or 46 ppm total thorium. These action levels were established and used prior to the development of the current FRLs. The affected area was 8 feet by 8 feet by 2 feet deep and was excavated in June 1989. Following excavation, samples were collected and analyzed with results demonstrating that the soil concentration criteria were achieved, and the excavated area was backfilled.

Above-FRL sample results for silver were detected during predesign sampling in the proximity of MH 180A. The area was horizontally and vertically bound, and was excavated to remove the impacted soil. Precertification surveys were performed following excavation of the impacted area and confirmed the absence of radiologically contaminated soil.

Additionally, an inspection of the abandoned outfall line piping following removal resulted in the discovery of a stained section on the outside of the piping, which is a sign of piping leakage. Therefore, per Section 2.3 of the PSP for A9PIII Certification Sampling Abandoned Outfall Line - Part One, biased samples were collected from the floor and both the north and south sidewalls approximately 1 foot from the floor of the excavation. These biased sampling locations were placed at A9P3-C01-B1C, A9P3-C01-B1N, and A9P3-C01-B1S in CU 1. Results of theses samples confirmed that no contaminated soil existed in the area of the stained piping.

After the excavation of the section of the abandoned outfall line that stretched from the original eastern end of CU 3 to the western side of SR 128, the abandoned outfall line could not be safely lifted from the trench in complete sections; therefore, it was broken into more manageable sections with a trackhoe bucket. Biased samples were collected from the area beneath each break. Results of theses samples confirmed that no contaminated soil existed in the area of the pipe breaks.

Finally, after removal of the 16-inch abandoned outfall line and the surrounding 24-inch/26-inch protective casing from within the 54-inch casing pipe, biased samples were collected from within both ends of the 54-inch casing pipe. One of the four technetium-99 sample results was above-FRL; however, it appears as though this was an isolated point of contamination since the other three samples were below-FRL. Sample results for the other certification parameters demonstrated that no other constituents of concern were above-FRL.

3.1.2 Area 9, Phase III - Part Two

In the past, riprap and broken concrete had been placed on the western riverbank of the Great Miami River to armor the riverbank against erosion in the vicinity of the outfall structure. Since some of the broken concrete was discovered to be radioactively contaminated, the riprap and broken concrete in the vicinity of the abandoned outfall structure were removed and transported to site for proper disposal. After the riprap and broken concrete were removed, precertification surveys were performed following excavation of the impacted area and confirmed the absence of radiologically contaminated soil.

Additionally, after the broken concrete and riprap were removed from the impacted area, radiological controls personnel monitored the riprap that remains outside of the project boundary on the western riverbank. None of the riprap outside of the impacted area was contaminated.

Finally, a section of abandoned outfall line that rested on the sandbar on the eastern side of the Great Miami River was removed from the sand bar, and physical samples were collected from the surface of the sandbar. When this section was removed, another section was found beneath the surface of the river to the west of the sandbar. This section of piping was attached to the section that was on the sandbar. During removal of the first section of abandoned outfall line, the second section separated from the first and rolled up onto the sandbar. This section of piping remained intact, and samples were collected on either end of the pipe from the sandbar surface where the second section of piping came to rest.

3.1.3 Area 9, Phase III - Part Three

Above-FRL sample results for technetium-99 were detected during predesign sampling in the proximity of MH 181A. The area was horizontally and vertically bound, and was excavated to remove the impacted soil. Precertification surveys were performed following excavation of the impacted area and confirmed the absence of radiologically contaminated soil.

3.2 CHANGES TO SCOPE OF WORK

The scope of work for the PSP for A9PIII Certification Sampling Abandoned Outfall Line - Part One required eleven changes, which were documented with V/FCNs and are discussed in the following paragraphs. These eleven documents are included in Appendix B. No variances were required for the PSPs for A9PIII Certification Sampling Abandoned Outfall Line - Parts Two and Three (DOE 2004d and 2005b).

The first V/FCN written for this project, 21140-PSP-0003-01, added the naming convention for biased samples to the PSP and was incorporated into Revision 0 of the PSP for A9PIII Certification Sampling Abandoned Outfall Line - Part One.

V/FCN 21140-PSP-0003-02 added the requirement to collect a container blank when push tubes and/or core tubes are used.

V/FCN 21140-PSP-0003-03 documents the removal of boron from the list of secondary constituents of concern for this PSP.

V/FCN 21140-PSP-0003-04 documents the addition of copper, manganese, nickel, zinc, fluoride, and carbon tetrachloride to the list of secondary constituents of concern. Additionally, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene, dieldrin, benzo(a)pyrene, benzo(b)fluoranthene, and bromodichloromethane were removed from the list of secondary constituents of concern.

V/FCN 21140-PSP-0003-05 documents the collection of certification samples from two additional locations in CU 1.

V/FCN 21140-PSP-0003-06 documents the addition of copper, manganese, nickel, zinc, fluoride, and carbon tetrachloride to the list of secondary constituents of concern for V/FCN 21140-PSP-0003-05.

V/FCN 21140-PSP-0003-07 documents the addition of two certification samples to CU 3, which encompassed the west side of SR 128.

V/FCN 21140-PSP-0003-08 replaces V/FCN 21140-PSP-0003-07, which was disapproved by the Ohio Environmental Protection Agency on 2/8/05, and documents the addition of two certification samples to CU 3, which encompassed the west side of SR 128. Because the abandoned outfall line piping could not be safely lifted from the trench in complete sections, it was necessary to break it into more manageable sections with a trackhoe bucket. The samples were collected in the vicinity of the breaks in the piping. These two locations were field located and surveyed.

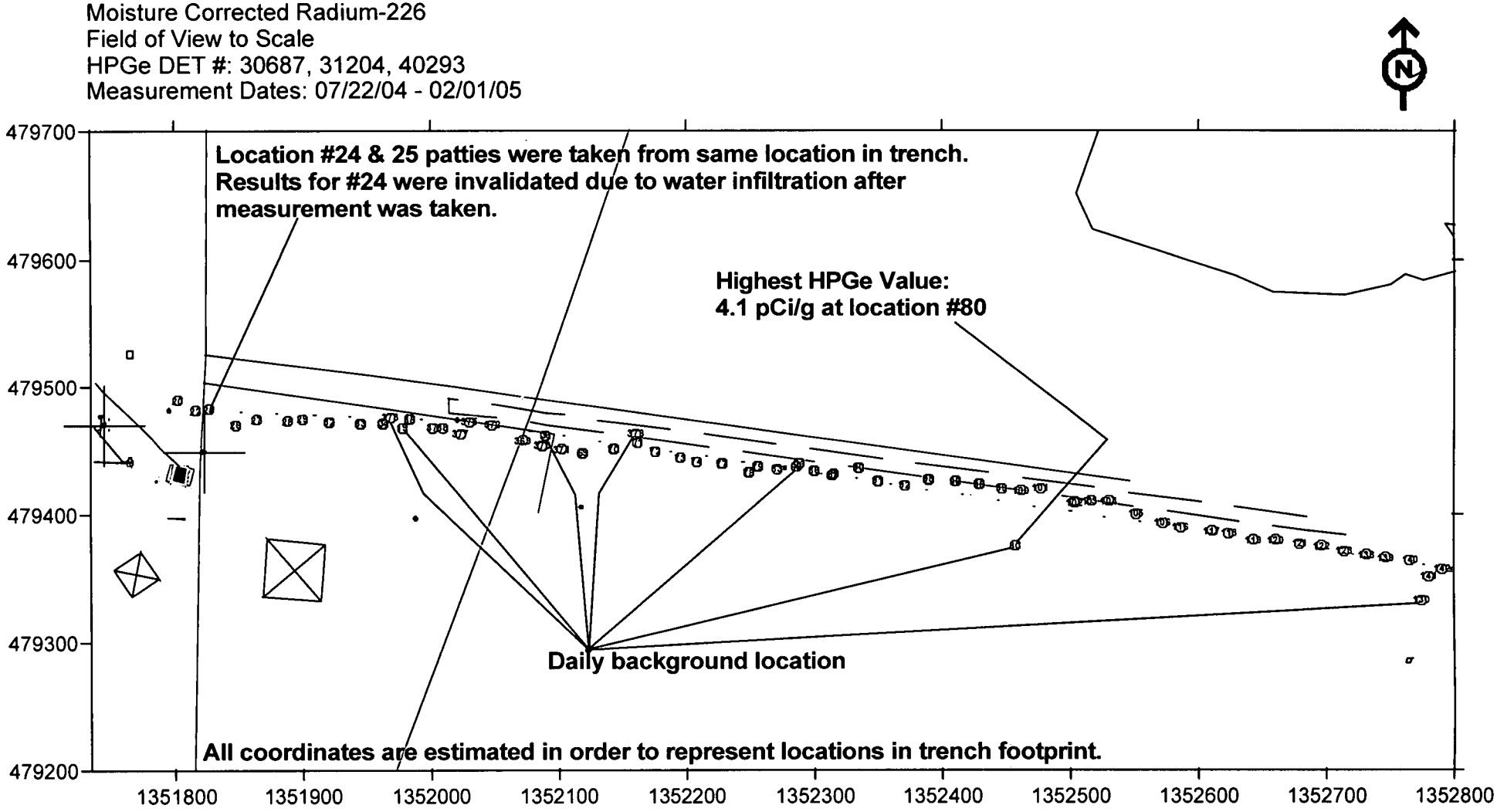
V/FCN 21140-PSP-0003-09 documents the addition of one certification sample to CU 3, which will encompass the east side of SR 128 from within the 54-inch casing.

V/FCN 21140-PSP-0003-10 documents the addition of technetium-99 (Target Analyte List I) analysis to sample A9P3-C03-19^MP.

V/FCN 21140-PSP-0003-11 documents the addition of three certification samples to CU 3, which encompassed both the east and west sides of SR 128 from within the 54-inch casing. Two samples were collected from within the west sides, and the third sample was collected from the within the east side. Samples were analyzed for technetium-99.

Figure 3-1. A9P3, West of SR 128, West Half, Phase 2 Trench Bedding Scan - Radium-226

Moisture Corrected Radium-226
Field of View to Scale
HPGe DET #: 30687, 31204, 40293
Measurement Dates: 07/22/04 - 02/01/05



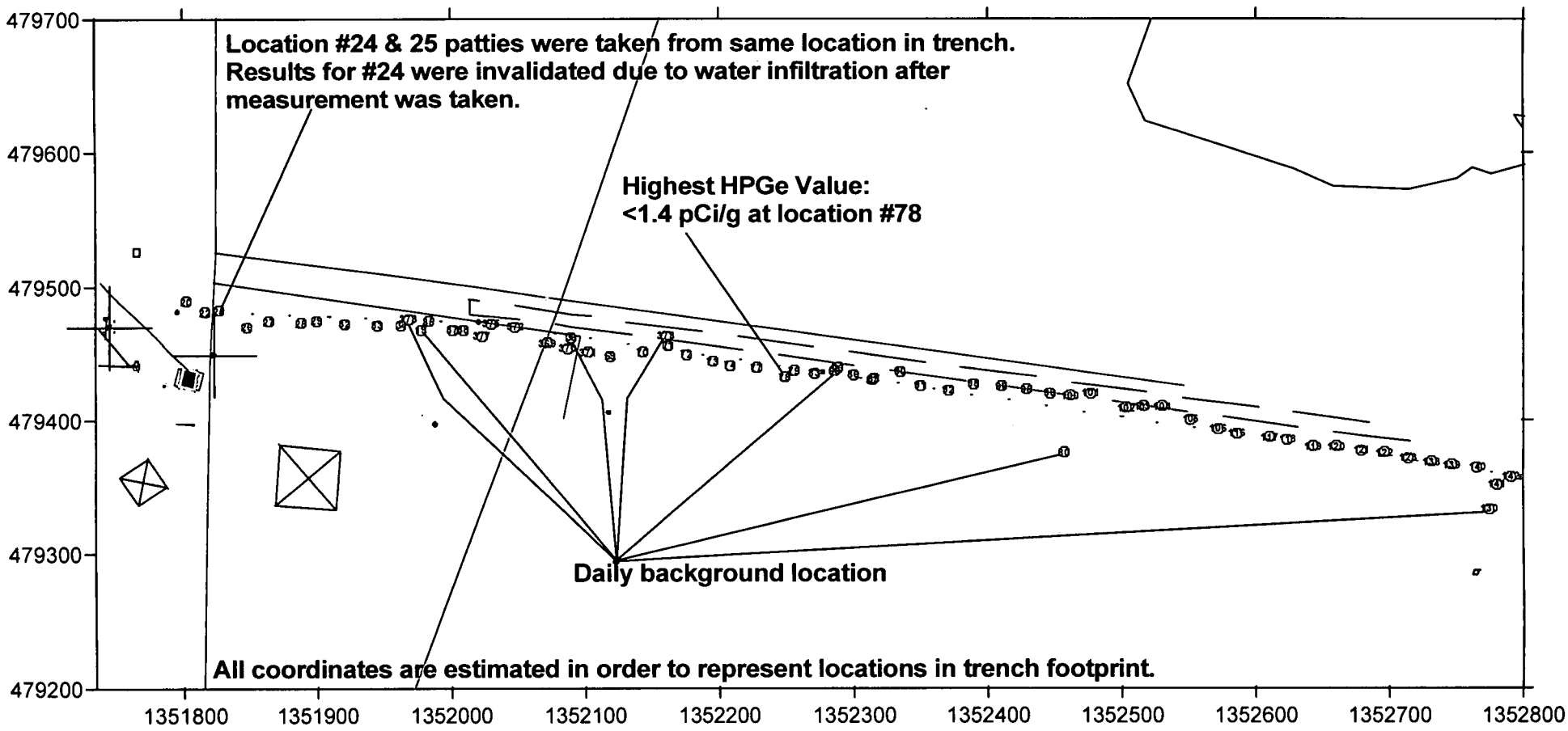
HPGe @ 15cm
Ra-226 (pCi.g)
- 0 to 1.5
- 1.5 to 3
- 3 to 4.5
- 4.5 to 9999

RTIMP DWG Title: A9P3_TM_P2_RA_ZOOM_WEST.srf
Project Name: Exc. Ctrl. of A9P3
Project #: 21140-PSP-0004
Verified By: Curt Baumann/78329
Date Verified: 02/22/05
Support Data: A9P3_TM_P2_HPGe_15cm.xls; A9P3_TM_BKG_HPGe_15cm.xls

6019

Figure 3-2. A9P3, West of SR 128, West Half, Phase 2 Trench Bedding Scan - Thorium-232

Moisture Corrected Thorium-232
Field of View to Scale
HPGe DET #: 30687, 31204, 40293
Measurement Dates: 07/22/04 - 02/01/05

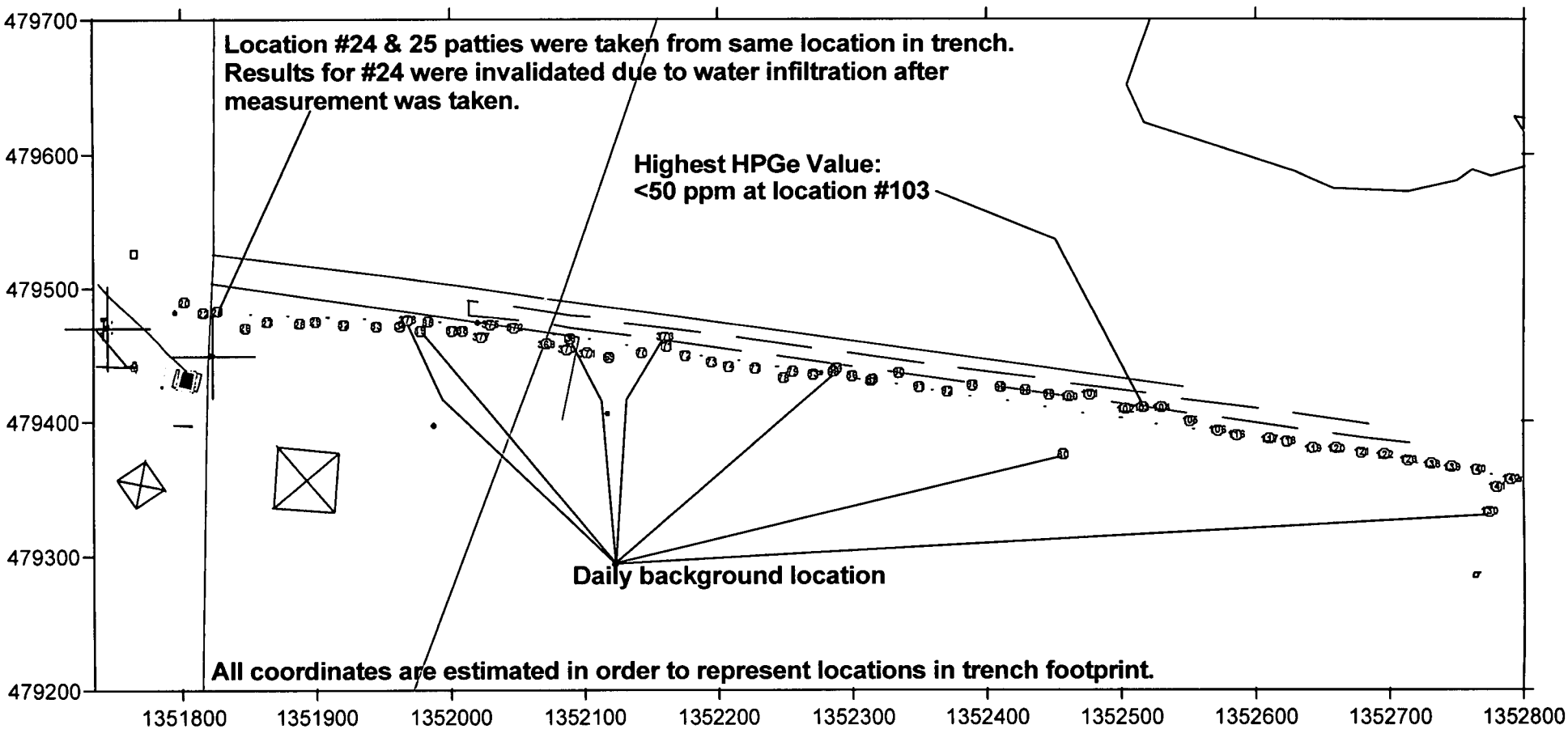


HPGe @ 15cm
Th-232 (pCi/g)
- 0 to 1.4
- 1.4 to 2.8
- 2.8 to 4.2
- 4.2 to 9999

RTIMP DWG Title: A9P3_TM_P2_TH_ZOOM_WEST.srf
Project Name: Exc. Ctrl. of A9P3
Project #: 21140-PSP-0004
Verified By: Curt Baumann/78329
Date Verified: 02/22/05
Support Data: A9P3_TM_P2_HPGe_15cm.xls; A9P3_TM_BKG_HPGe_15cm.xls

Figure 3-3. A9P3, West of SR 128, West Half, Phase 2 Trench Bedding Scan - Total Uranium

Moisture Corrected Total Uranium
Field of View to Scale
HPGe DET #: 30687, 31204, 40293
Measurement Dates: 07/22/04 - 02/01/05

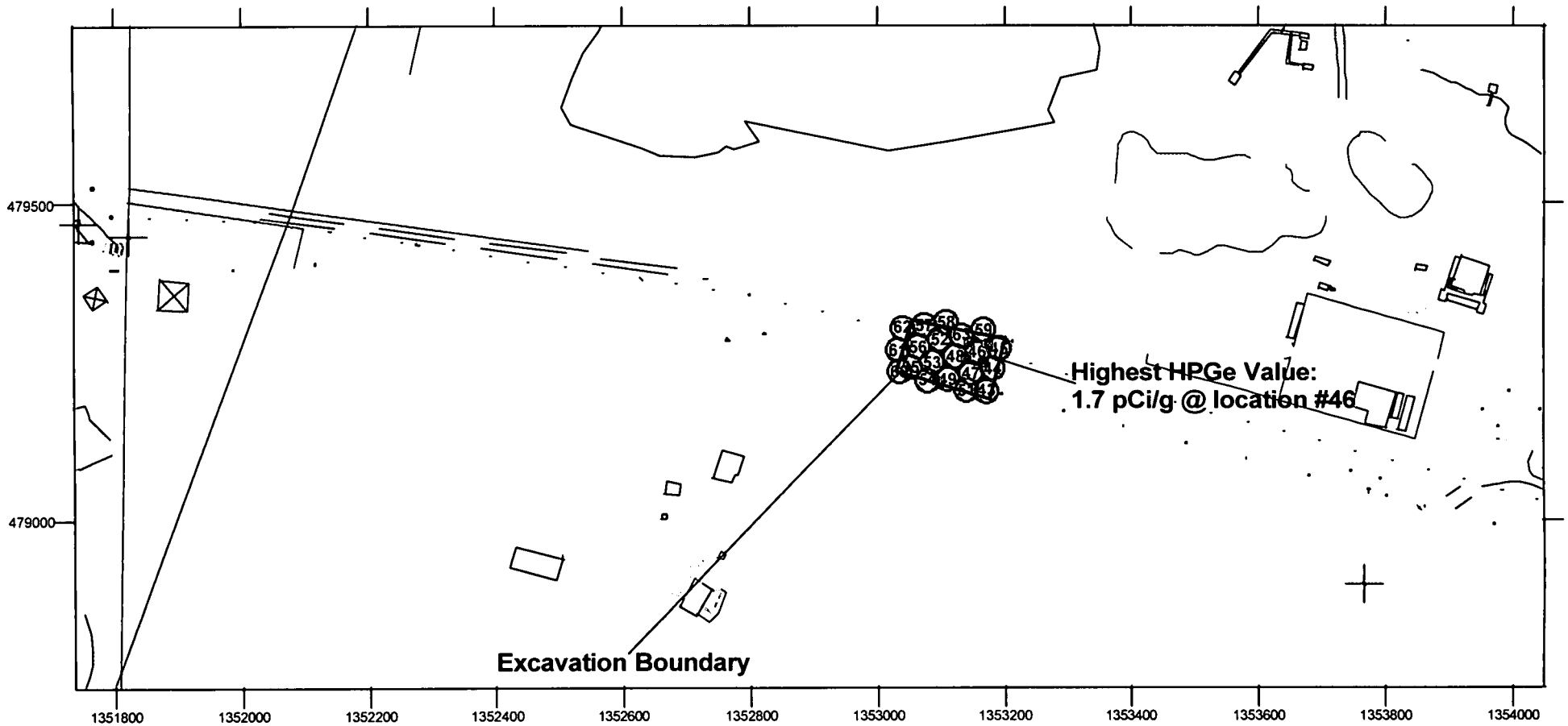


HPGe @ 15cm
Total U (ppm)
- 0 to 50
- 50 to 100
- 100 to 150
- 150 to 928
- 928 to 9999

RTIMP DWG Title: A9P3_TM_P2_TU_ZOOM_WEST.srf
Project Name: Exc. Ctrl. of A9P3
Project #: 21140-PSP-0004
Verified By: Curt Baumann/78329
Date Verified: 02/22/05
Support Data: A9P3_TM_P2_HPGe_15cm.xls; A9P3_TM_BKG_HPGe_15cm.xls

Figure 3-4. A9P3, West of SR 128, Manhole 180A, Design Grade Scan - Radium-226

Moisture & Radon Corrected Radium-226
Field of View to Scale
HPGe DET #: 30699, 40293
Measurement Dates: 08/18/04 - 08/19/04

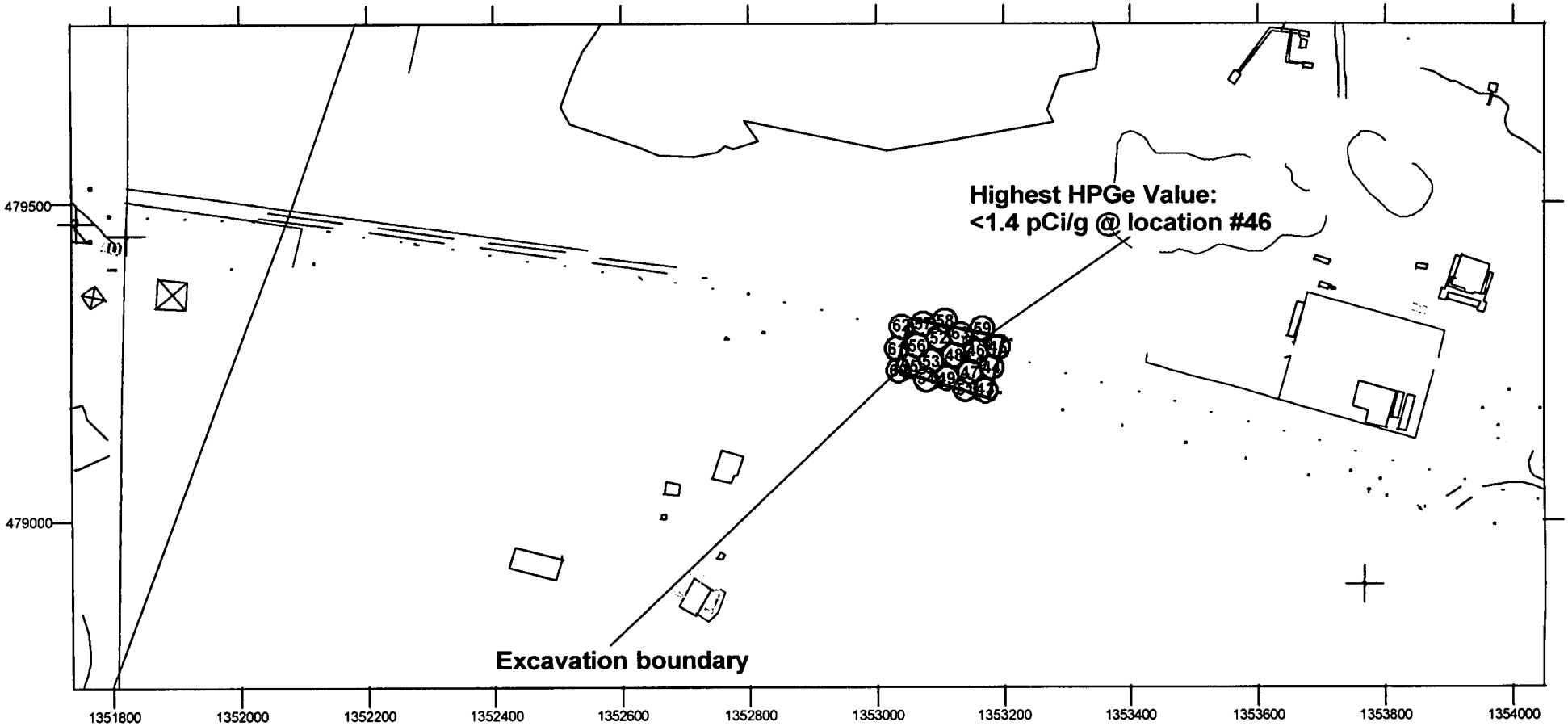


HPGe @ 31, 100cm
Ra-226 (pCi/g)
- 0 to 1.5
- 1.5 to 3
- 3 to 4.5
- 4.5 to 9999

RTIMP DWG Title: A9P3_DG_RA.srf
Project Name: Exc. Ctrl. of A9P3
Project #: 21140-PSP-0004
Verified By: Brian McDaniel/11058
Date Verified: 08/24/04
Support Data: A9P3_DG_HPGe_31cm.xls; A9P3_DG_HPGe_100cm.xls

Figure 3-5. A9P3, West of SR 128, Manhole 180A, Design Grade Scan - Thorium-232

Moisture Corrected Thorium-232
Field of View to Scale
HPGe DET #: 30699, 40293
Measurement Dates: 08/18/04 - 08/19/04



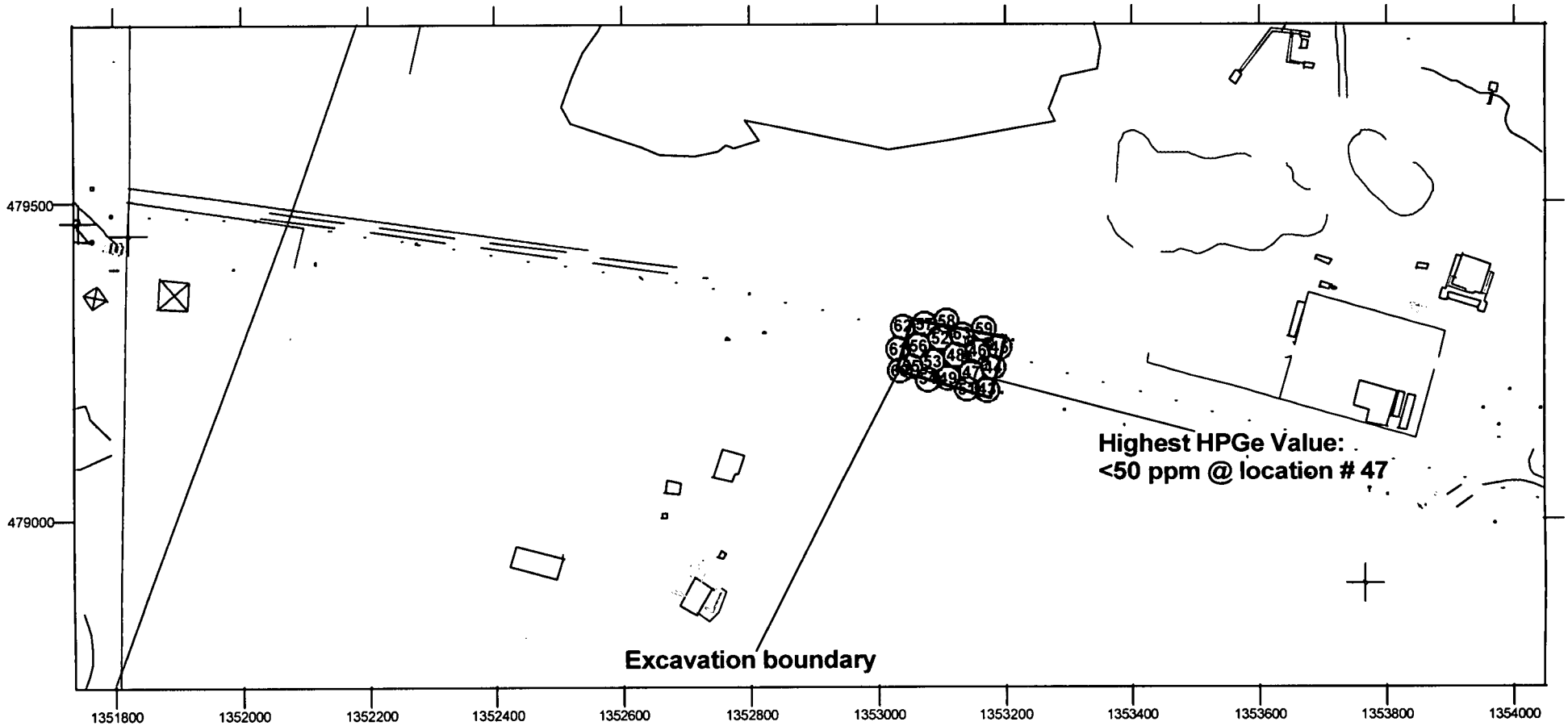
HPGe @ 31, 100cm
Th-232 (pCi/g)

- 0 to 1.4
- 1.4 to 2.8
- 2.8 to 4.2
- 4.2 to 9999

RTIMP DWG Title: A9P3_DG_TH.srf
Project Name: Exc. Ctrl. of A9P3
Project #: 21140-PSP-0004
Verified By: Brian McDaniel/11058
Date Verified: 08/24/04
Support Data: A9P3_DG_HPGe_31cm.xls; A9P3_DG_HPGe_100cm.xls

Figure 3-6. A9P3, West of SR 128, Manhole 180A, Design Grade Scan - Total Uranium

Moisture Corrected Total Uranium
Field of View to Scale
HPGe DET #: 30699, 40293
Measurement Dates: 08/18/04 - 08/19/04



HPGe @ 100cm Total U (ppm)
0 to 50
50 to 100
100 to 150
150 to 400
400 to 9999

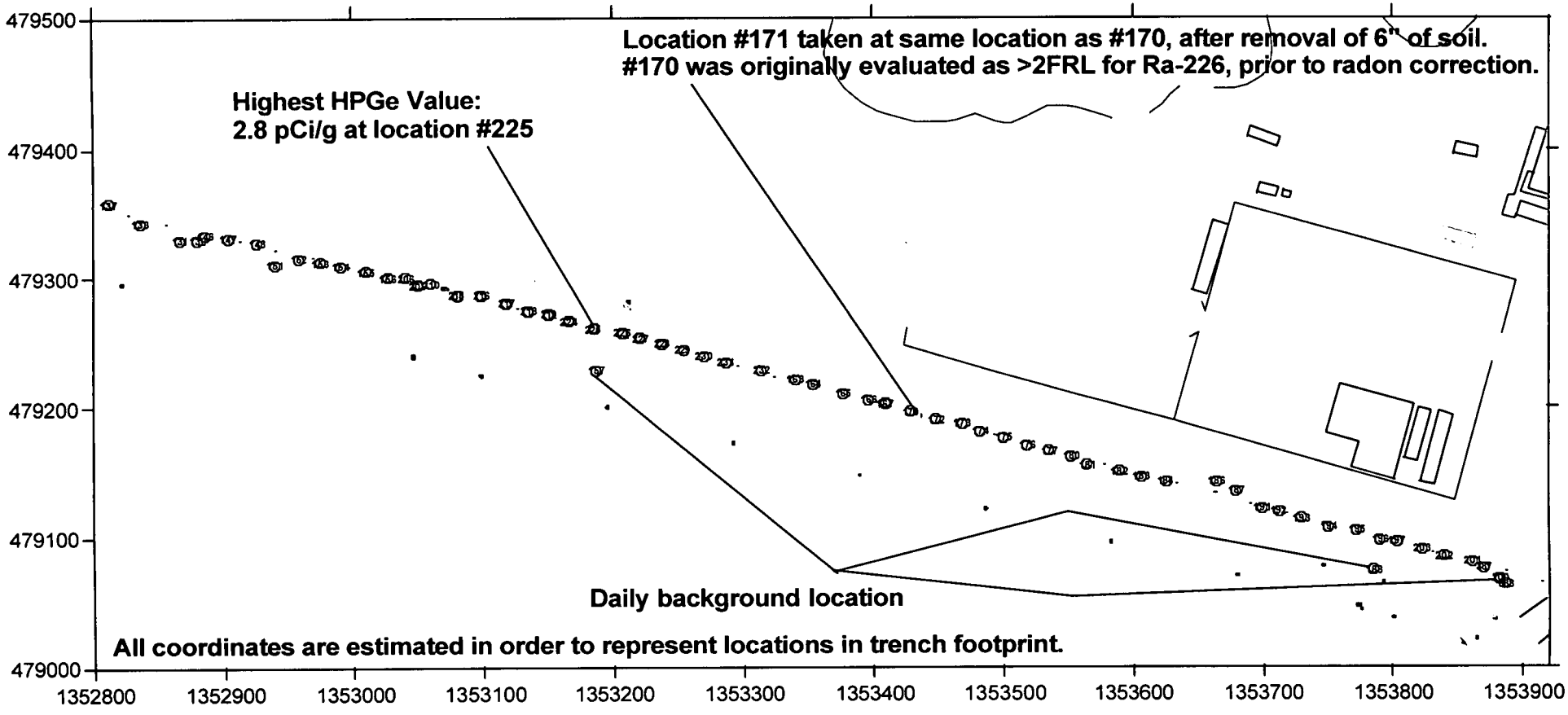
HPGe @ 31cm Total U (ppm)
0 to 50
50 to 100
100 to 150
150 to 928
928 to 9999

RTIMP DWG Title: A9P3_DG_TU.srf
Project Name: Exc. Ctrl. of A9P3
Project #: 21140-PSP-0004
Verified By: Brian McDaniel/11058
Date Verified: 08/24/04
Support Data: A9P3_DG_HPGe_31cm.xls; A9P3_DG_HPGe_100cm.xls

6019

Figure 3-7. A9P3, West of SR 128, East Half, Phase 2 Trench Bedding Scan - Radium-226

Moisture Corrected Radium-226
Field of View to Scale
HPGe DET #: 30687, 31204, 40293
Measurement Dates: 07/22/04 - 02/01/05

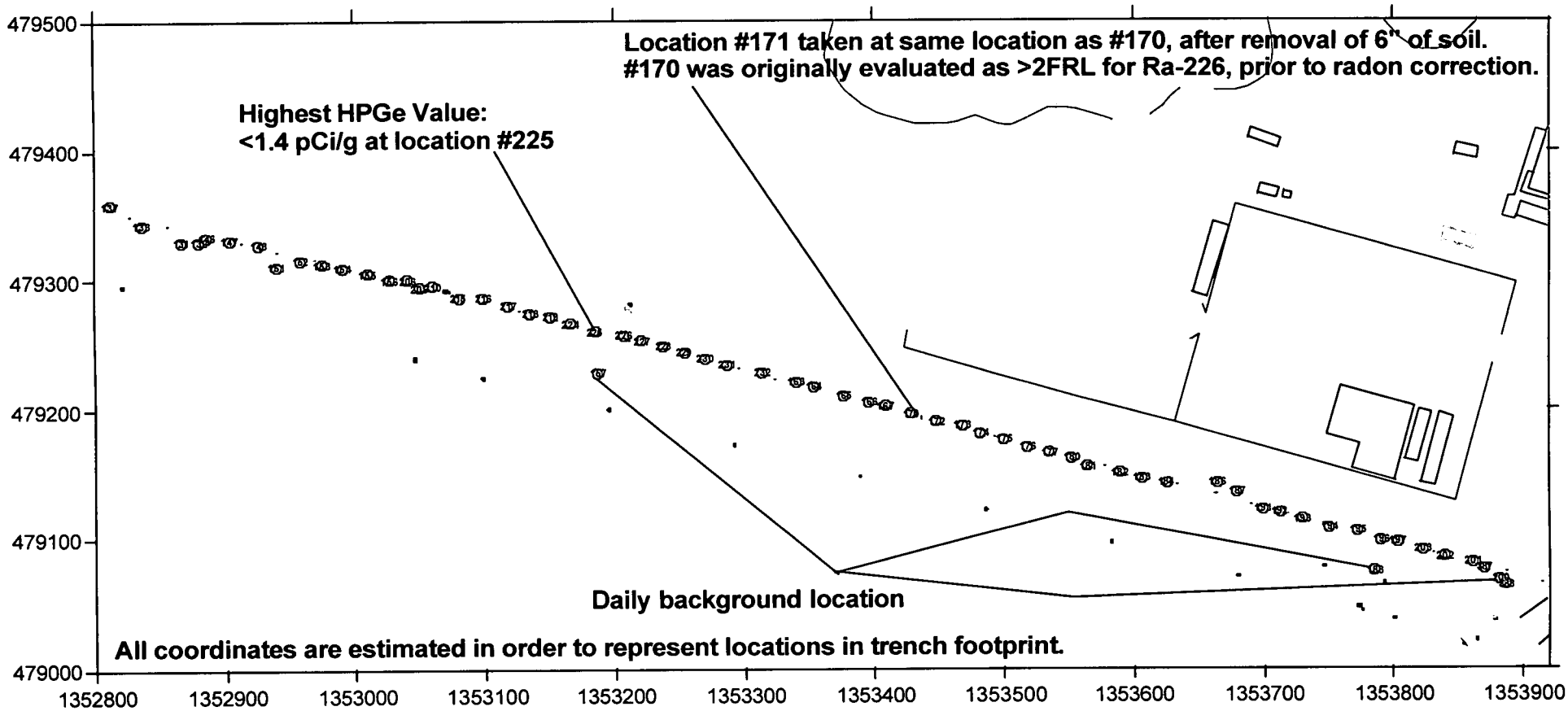


HPGe @ 15cm
Ra-226 (pCi/g)
- 0 to 1.5
- 1.5 to 3
- 3 to 4.5
- 4.5 to 9999

RTIMP DWG Title: A9P3_TM_P2_RA_ZOOM_EAST.srf
Project Name: Exc. Ctrl. of A9P3
Project #: 21140-PSP-0004
Verified By: Curt Baumann/78329
Date Verified: 02/22/05
Support Data: A9P3_TM_P2_HPGe_15cm.xls;
A9P3_TM_BKG_HPGe_15cm.xls

Figure 3-8. A9P3, West of SR 128, East Half, Phase 2 Trench Bedding Scan - Thorium-232

Moisture Corrected Thorium-232
Field of View to Scale
HPGe DET #: 30687, 31204, 40293
Measurement Dates: 07/22/04 - 02/01/05



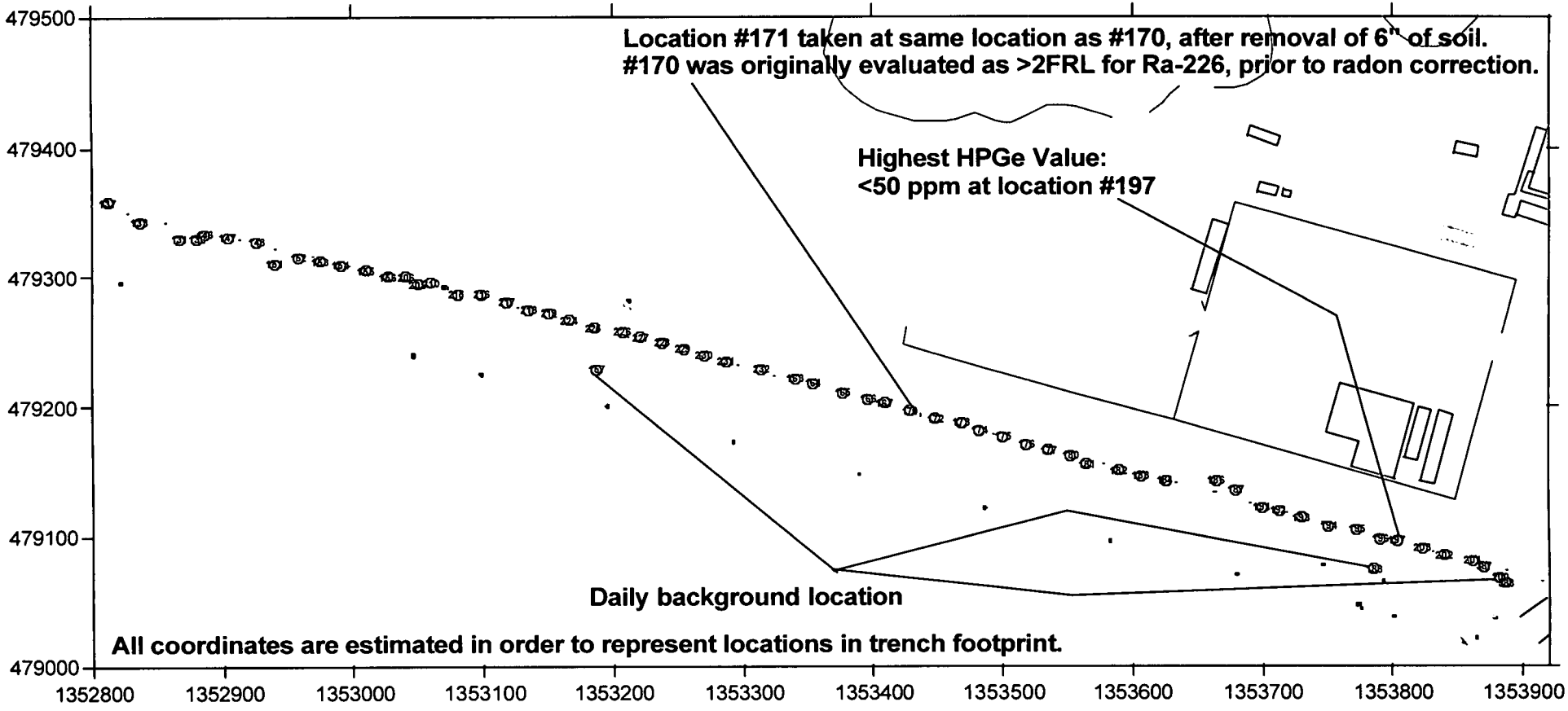
HPGe @ 15cm
Th-232 (pCi/g)
- 0 to 1.4
- 1.4 to 2.8
- 2.8 to 4.2
- 4.2 to 9999

RTIMP DWG Title: A9P3_TM_P2_TH_ZOOM_EAST.srf
Project Name: Exc. Ctrl. of A9P3
Project #: 21140-PSP-0004
Verified By: Curt Baumann/78329
Date Verified: 02/22/05
Support Data: A9P3_TM_P2_HPGe_15cm.xls;
A9P3_TM_BKG_HPGe_15cm.xls

6109

Figure 3-9. A9P3, West of SR 128, East Half, Phase 2 Trench Bedding Scan - Total Uranium

Moisture Corrected Total Uranium
Field of View to Scale
HPGe DET #: 30687, 31204, 40293
Measurement Dates: 07/22/04 - 02/01/05

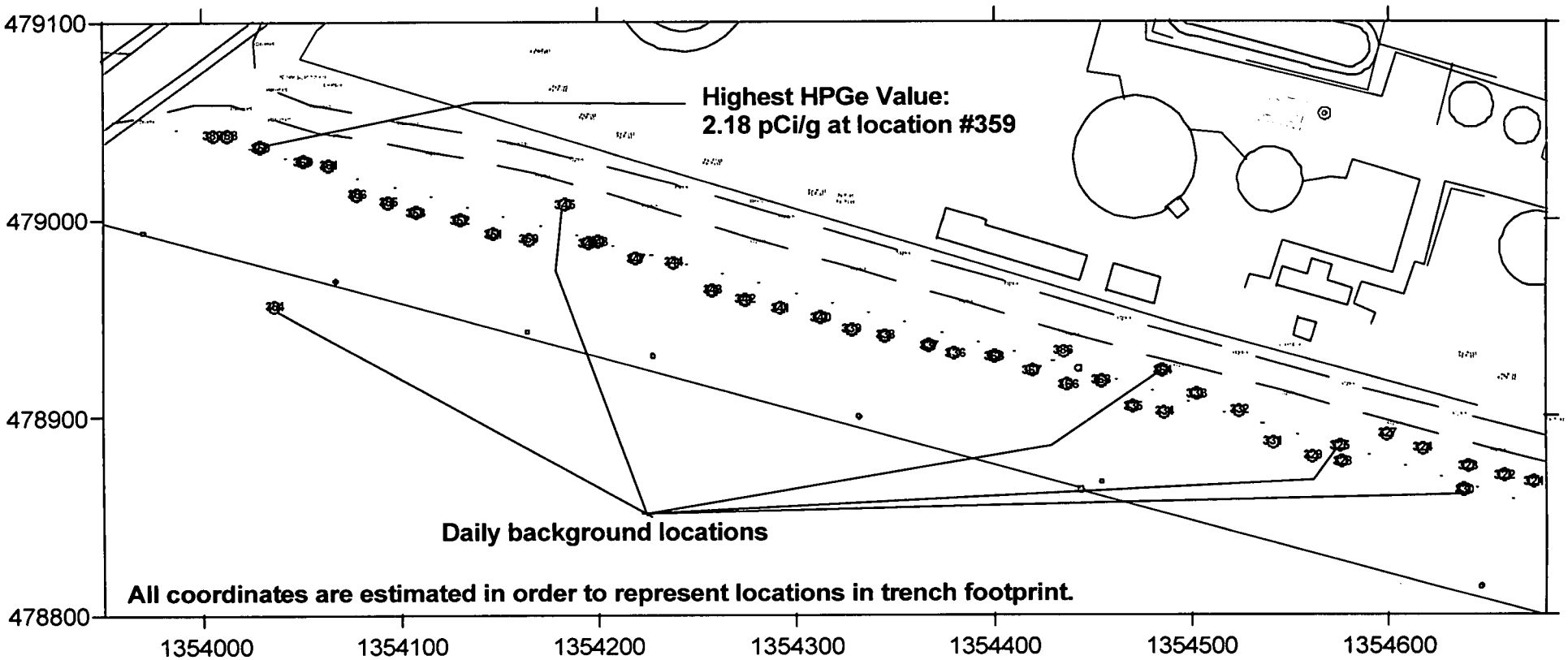


HPGe @ 15cm
Total U (ppm)
- 0 to 50
- 50 to 100
- 100 to 150
- 150 to 928
- 928 to 9999

RTIMP DWG Title: A9P3_TM_P2_TU_ZOOM_EAST.srf
Project Name: Exc. Ctrl. of A9P3
Project #: 21140-PSP-0004
Verified By: Curt Baumann/78329
Date Verified: 02/22/05
Support Data: A9P3_TM_P2_HPGe_15cm.xls;
A9P3_TM_BKG_HPGe_15cm.xls

Figure 3-10. A9P3, East of SR 128, West Half, Phase 2 Trench Bedding Scan - Radium-226

Moisture Corrected Radium-226
Field of View to Scale
HPGe DET #: 40293
Measurement Dates: 10/29/04 - 02/10/05

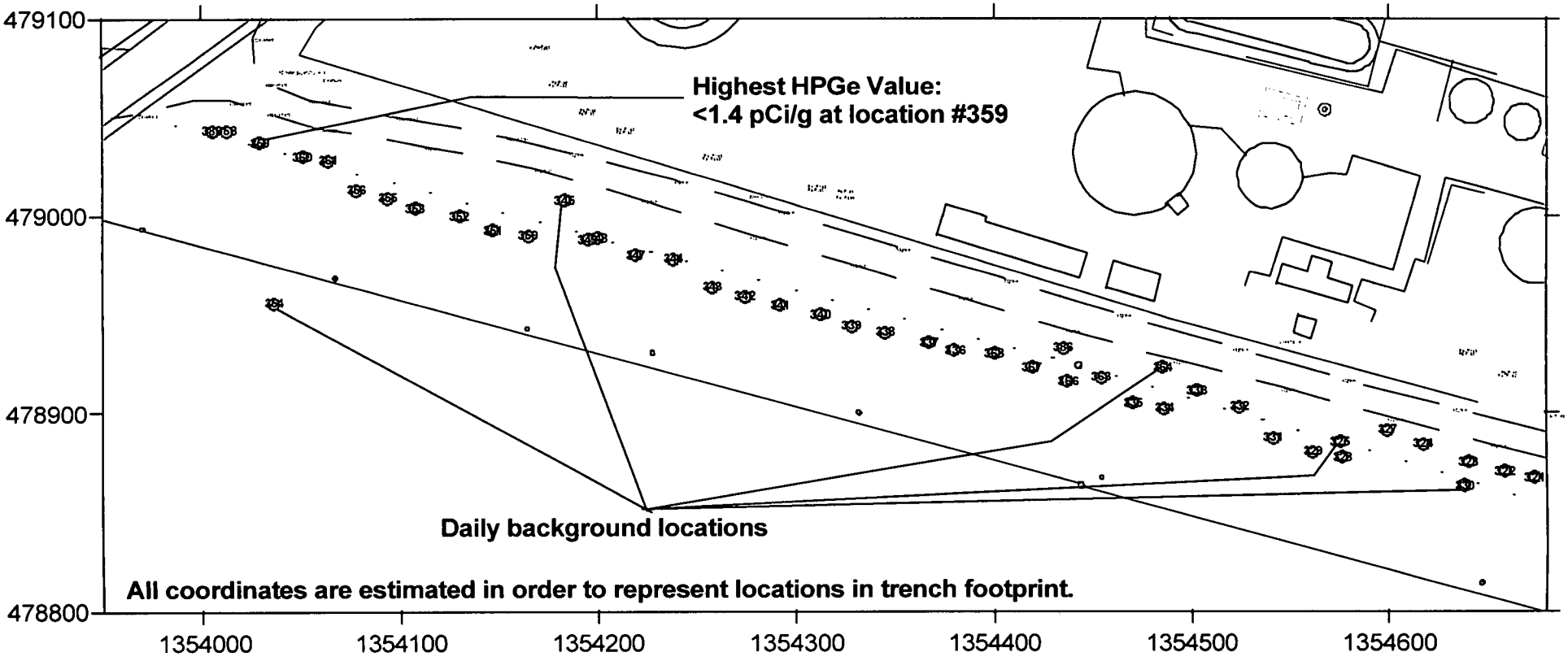


HPGe @ 15cm
Ra-226 (pCi/g)
- 0 to 1.5
- 1.5 to 3
- 3 to 4.5
- 4.5 to 9999

RTIMP DWG Title: A9P3_TM_P2_EAST_RA_ZOOM_WEST.srf
Project Name: Gen. Char for Site. Soil Rem.
Project #: 20300-PSP-0011
Verified By: C. Baumann/78329
Date Verified: 02/22/05
Support Data: A9P3_EAST_TM_P2_HPGe_15cm.xls;
A9P3_EAST_TM_BKG_HPGe_15cm.xls

Figure 3-11. A9P3, East of SR 128, West Half, Phase 2 Trench Bedding Scan - Thorium-232

Moisture Corrected Thorium-232
Field of View to Scale
HPGe DET #: 40293
Measurement Dates: 10/29/04 - 02/10/05

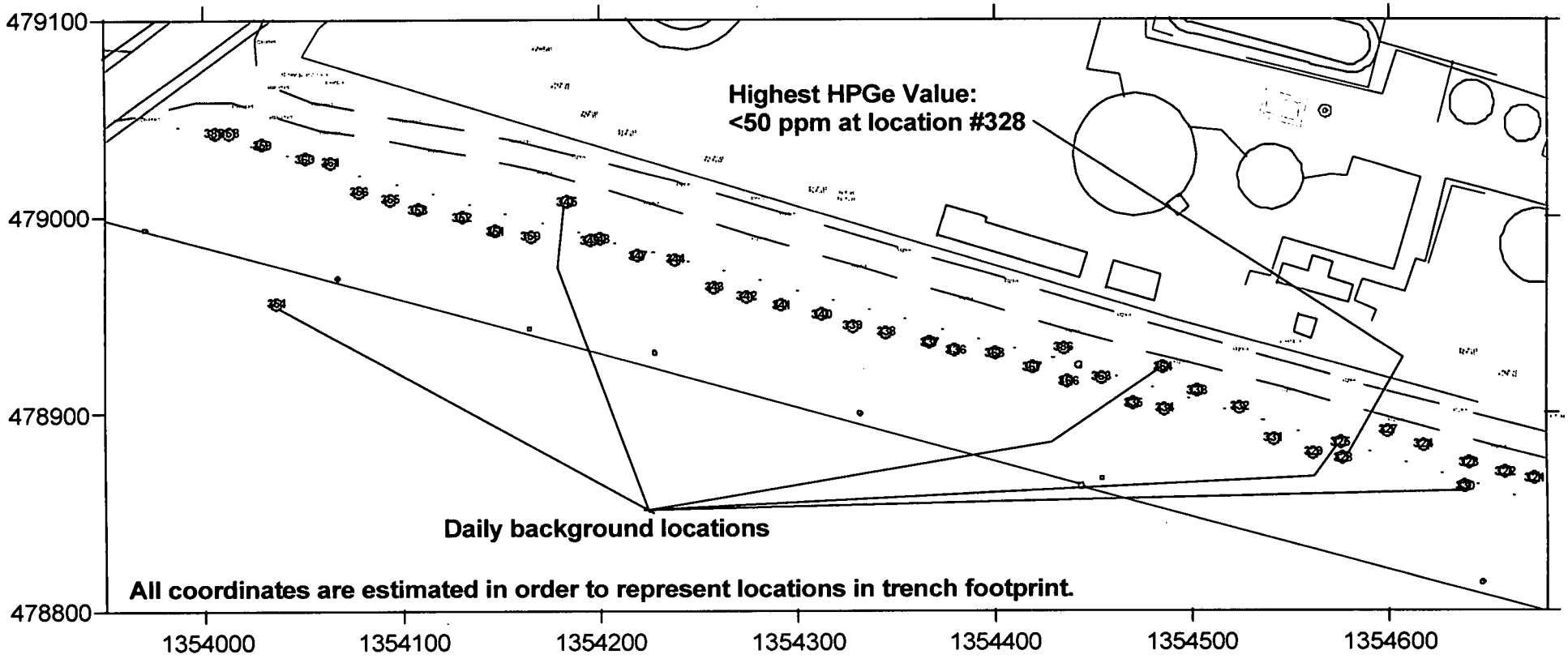


HPGe @ 15cm
Th-232 (pCi/g)
- 0 to 1.4
- 1.4 to 2.8
- 2.8 to 4.2
- 4.2 to 9999

RTIMP DWG Title: A9P3_TM_P2_EAST_TH_ZOOM_WEST.srf
Project Name: Gen. Char for Site. Soil Rem.
Project #: 20300-PSP-0011
Verified By: C. Baumann/78329
Date Verified: 02/22/05
Support Data: A9P3_EAST_TM_P2_HPGe_15cm.xls;
A9P3_EAST_TM_BKG_HPGe_15cm.xls

Figure 3-12. A9P3, East of SR 128, West Half, Phase 2 Trench Bedding Scan - Total Uranium

Moisture Corrected Total Uranium
Field of View to Scale
HPGe DET #: 40293
Measurement Dates: 10/29/04 - 02/10/05

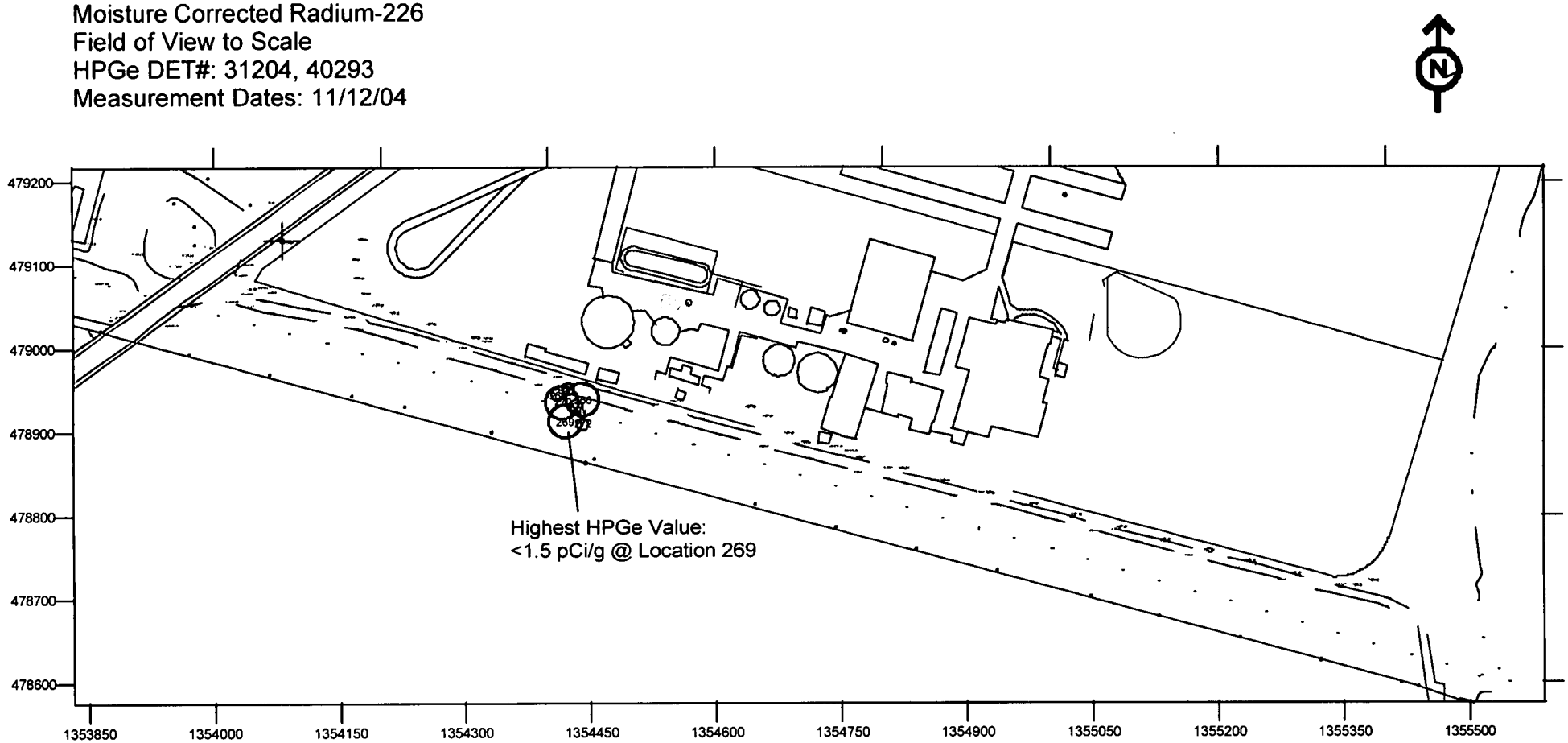


HPGe @ 15cm
Total U (ppm)
- 0 to 50
- 50 to 100
- 100 to 150
- 150 to 928
- 928 to 9999

RTIMP DWG Title: A9P3_TM_P2_EAST_TU_ZOOM_WEST.srf
Project Name: Gen. Char for Site. Soil Rem.
Project #: 20300-PSP-0011
Verified By: C. Baumann/78329
Date Verified: 02/22/05
Support Data: A9P3_EAST_TM_P2_HPGe_15cm.xls;
A9P3_EAST_TM_BKG_HPGe_15cm.xls

Figure 3-13. A9P3, East of SR 128, Manhole 181A, Design Grade Scan - Radium-226

Moisture Corrected Radium-226
Field of View to Scale
HPGe DET#: 31204, 40293
Measurement Dates: 11/12/04



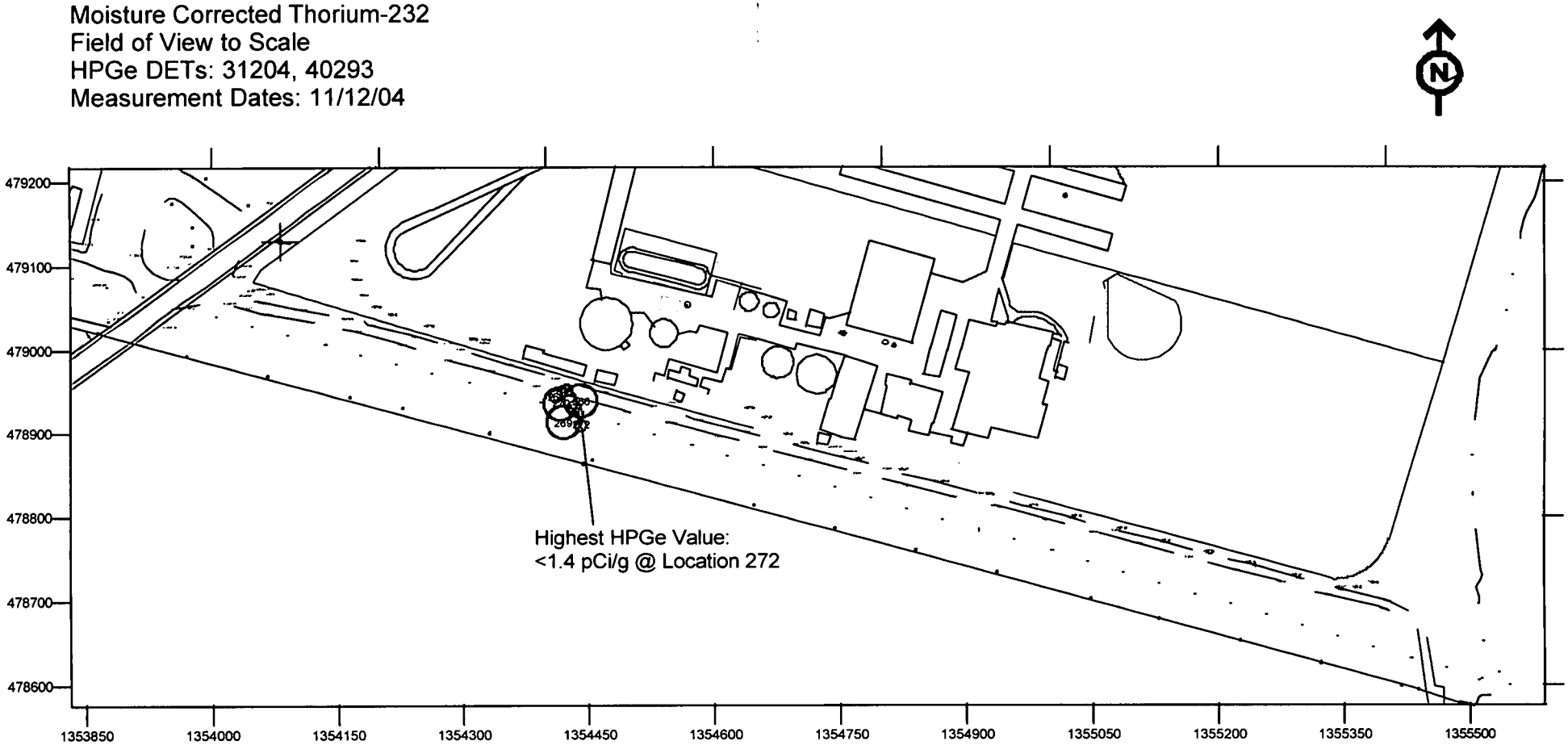
HPGe @ 31, 100cm
Ra-226 (pCi/g)

- 0 to 1.5
- 1.5 to 3
- 3 to 4.5
- 4.5 to 9999

RTIMP DWG Title: A9P3_DG_P1_East_RA.srf
Project Name: Gen. Char. for Site. Soil Rem.
Project #: 20300-PSP-0011
Verified By: Curt Baumann/78329
Date Verified: 02/22/05
Support Data: A9P3_DG_P1_East_HPGe_100cm_Summary.xls
A9P3_DG_P1_East_HPGe_31cm_Summary.xls

Figure 3-14. A9P3, East of SR 128, Manhole 181A, Design Grade Scan - Thorium-232

Moisture Corrected Thorium-232
Field of View to Scale
HPGe DETs: 31204, 40293
Measurement Dates: 11/12/04



HPGe @ 31, 100cm
Th-232 (pCi/g)

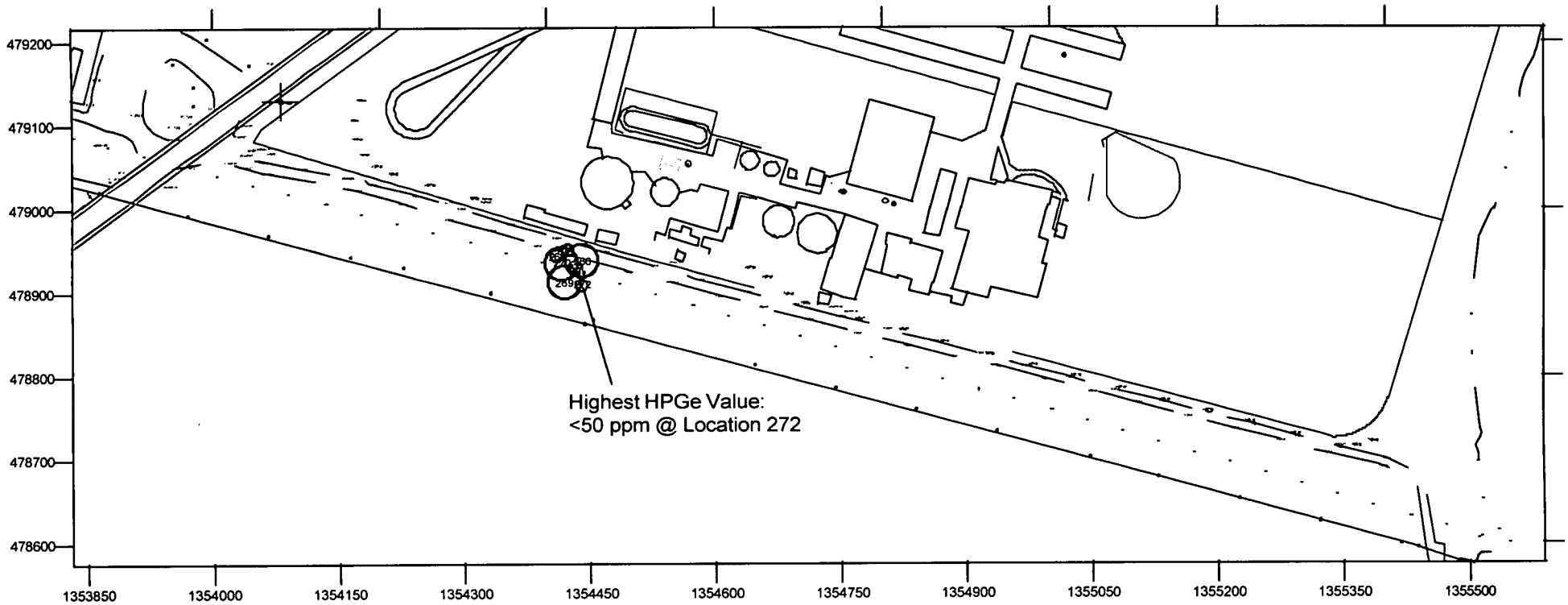
- 0 to 1.4
- 1.4 to 2.8
- 2.8 to 4.2
- 4.2 to 9999

RTIMP DWG Title: A9P3_DG_P1_East_TH.srf
Project Name: Gen. Char. for Site. Soil Rem.
Project #: 20300-PSP-0011
Verified By: Curt Baumann/78329
Date Verified: 02/22/05
Support Data: A9P3_DG_P1_East_HPGe_100cm_Summary.xls
A9P3_DG_P1_East_HPGe_31cm_Summary.xls

6019

Figure 3-15. A9P3, East of SR 128, Manhole 181A, Design Grade Scan - Total Uranium

Moisture Corrected Total Uranium
Field of View to Scale
HPGe DET#: 31204, 40293
Measurement Dates: 11/12/04



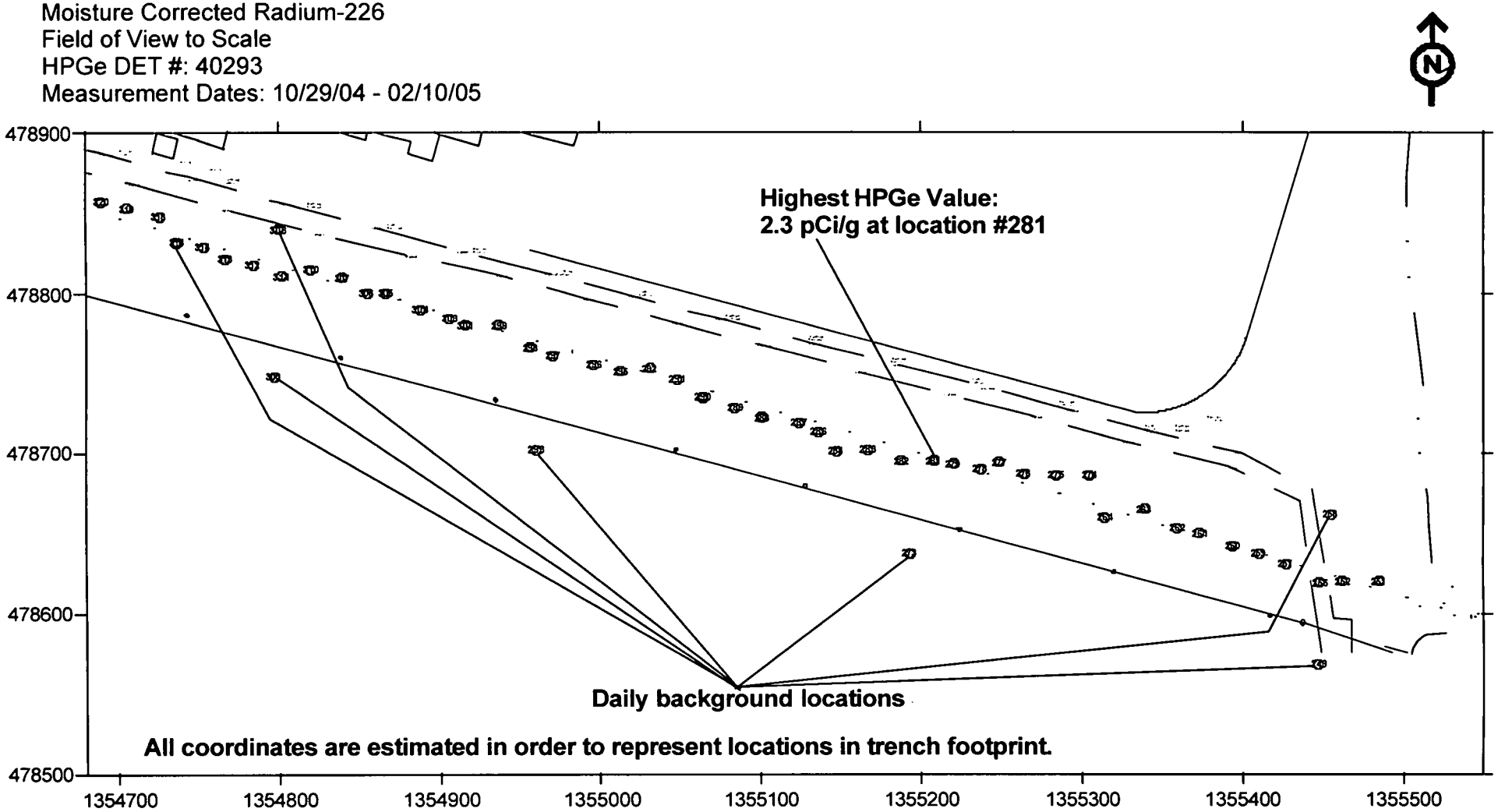
HPGe @ 100cm Total U (ppm)
0 to 50
50 to 100
100 to 150
150 to 400
400 to 9999

HPGe @ 31cm Total U (ppm)
0 to 50
50 to 100
100 to 150
150 to 928
928 to 9999

RTIMP DWG Title: A9P3_DG_P1_East_TU.srf
Project Name: Gen. Char. for Site. Soil Rem.
Project #: 20300-PSP-0011
Verified By: Curt Baumann/78329
Date Verified: 02/22/05
Support Data: A9P3_DG_P1_East_HPGe_100cm_Summary.xls
A9P3_DG_P1_East_HPGe_31cm_Summary.xls

Figure 3-16. A9P3, East of SR 128, East Half, Phase 2 Trench Bedding Scan - Radium-226

Moisture Corrected Radium-226
Field of View to Scale
HPGe DET #: 40293
Measurement Dates: 10/29/04 - 02/10/05

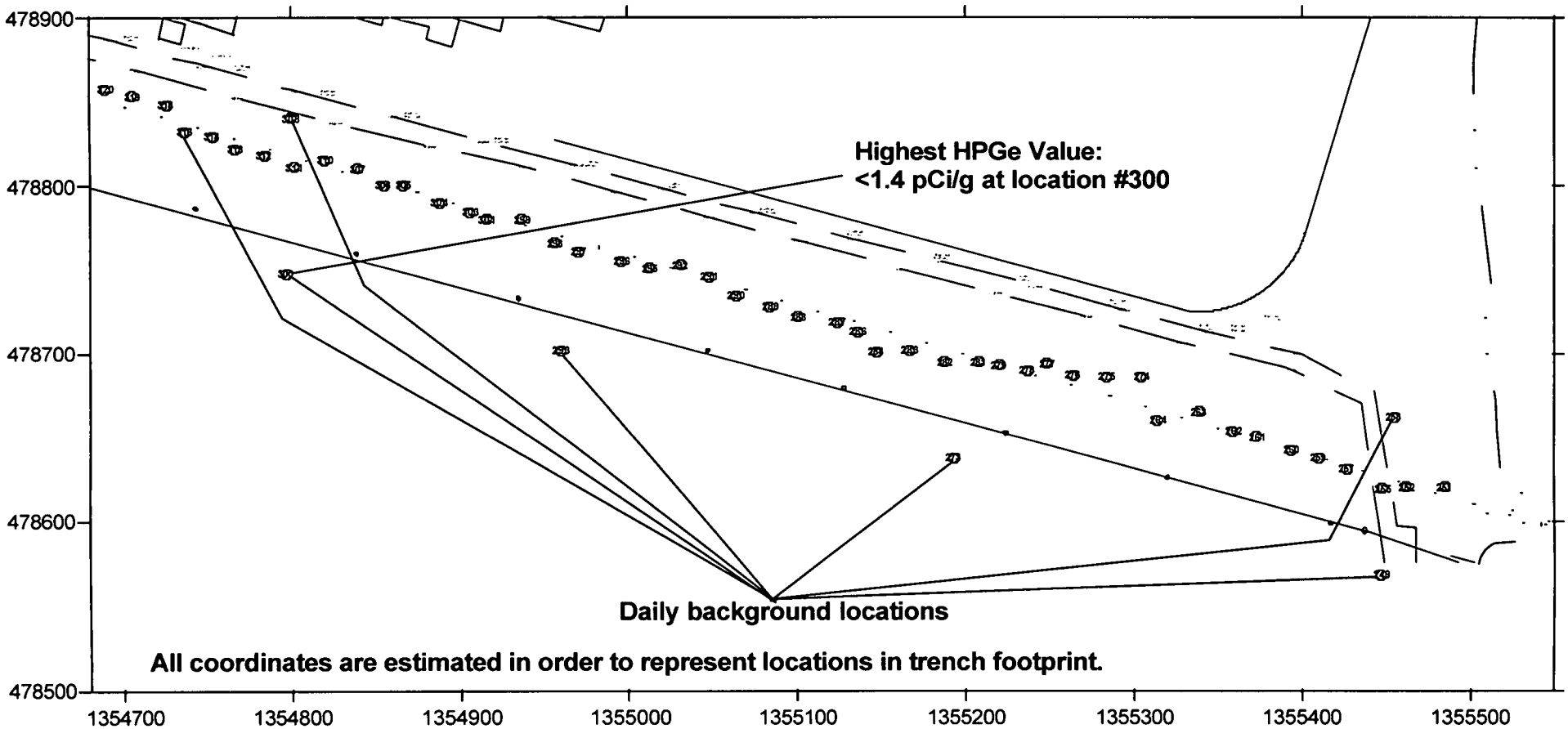


HPGe @ 15cm
Ra-226 (pCi/g)
- 0 to 1.5
- 1.5 to 3
- 3 to 4.5
- 4.5 to 9999

RTIMP DWG Title: A9P3_TM_P2_EAST_RA_ZOOM_EAST.srf
Project Name: Gen. Char for Site. Soil Rem.
Project #: 20300-PSP-0011
Verified By: Curt Baumann/78329
Date Verified: 02/22/05
Support Data: A9P3_EAST_TM_P2_HPGe_15cm.xls;
A9P3_EAST_TM_BKG_HPGe_15cm.xls

Figure 3-17. A9P3, East of SR 128, East Half, Phase 2 Trench Bedding Scan - Thorium-232

Moisture Corrected Thorium-232
Field of View to Scale
HPGe DET #: 40293
Measurement Dates: 10/29/04 - 02/10/05

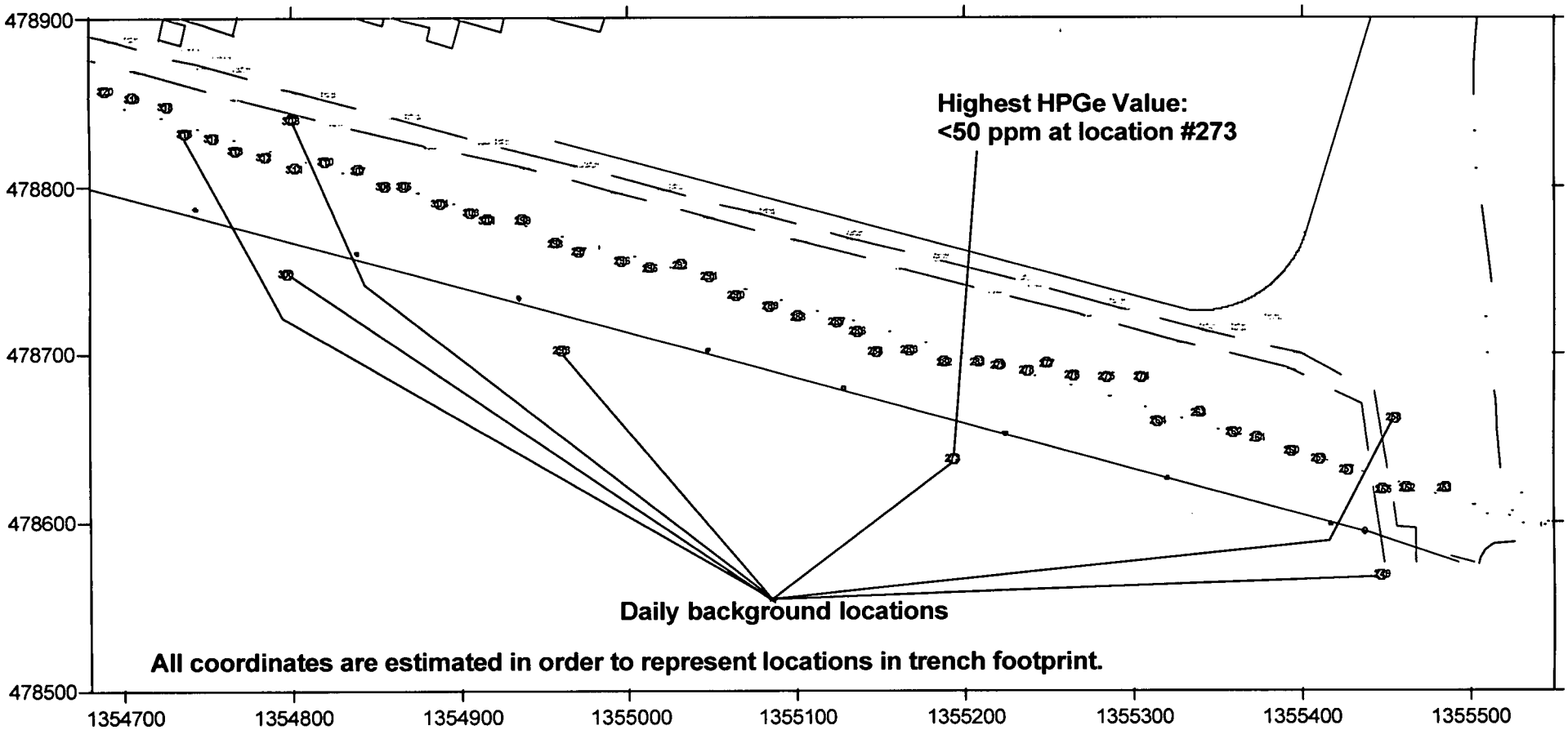


HPGe @ 15cm
Th-232 (pCi/g)
- 0 to 1.4
- 1.4 to 2.8
- 2.8 to 4.2
- 4.2 to 9999

RTIMP DWG Title: A9P3_TM_P2_EAST_TH_ZOOM_EAST.srf
Project Name: Gen. Char for Site. Soil Rem.
Project #: 20300-PSP-0011
Verified By: Curt Baumann/78329
Date Verified: 02/22/05
Support Data: A9P3_EAST_TM_P2_HPGe_15cm.xls;
A9P3_EAST_TM_BKG_HPGe_15cm.xls

Figure 3-18. A9P3, East of SR 128, East Half, Phase 2 Trench Bedding Scan - Total Uranium

Moisture Corrected Total Uranium
Field of View to Scale
HPGe DET #: 40293
Measurement Dates: 10/29/04 - 02/10/05



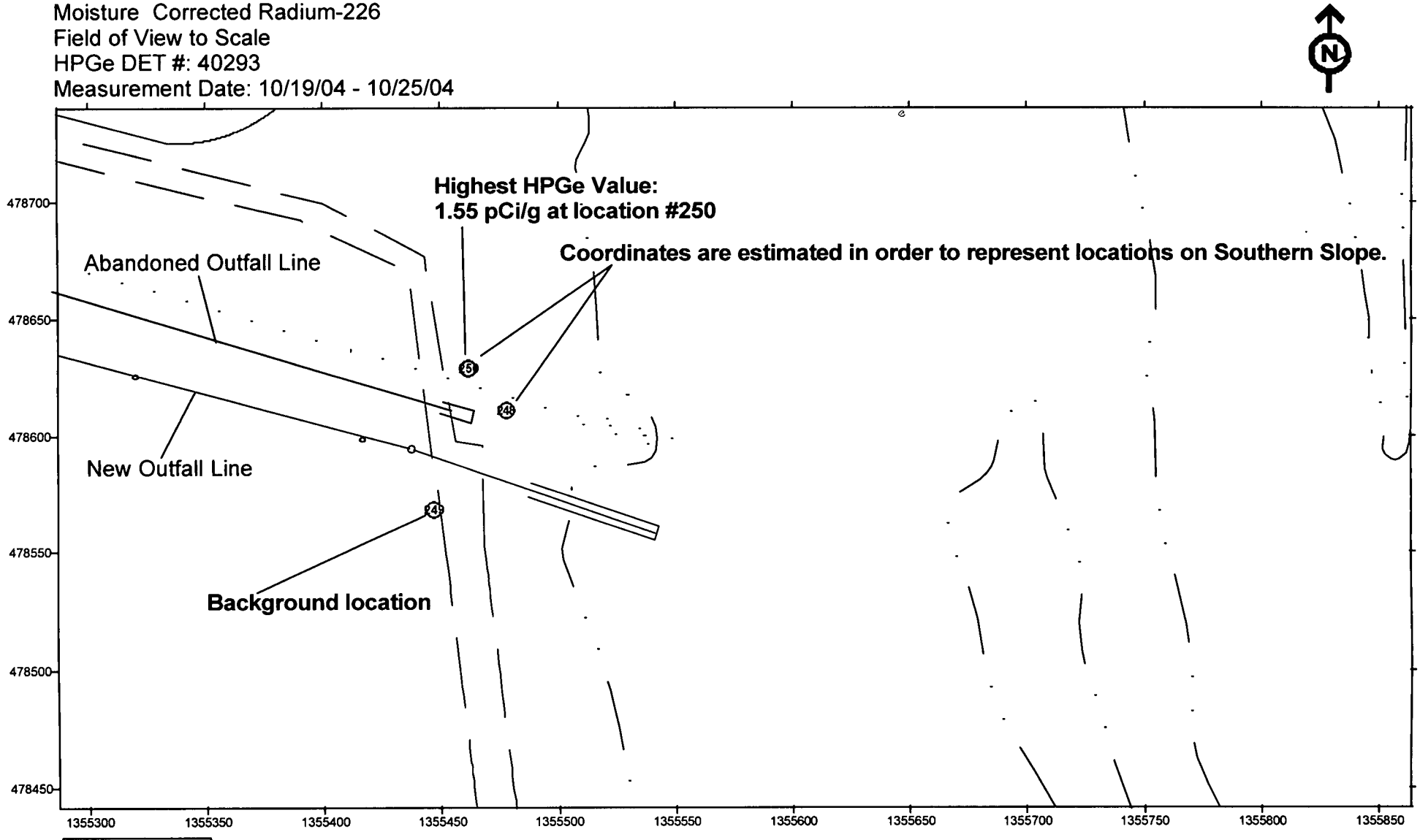
HPGe @ 15cm
Total U (ppm)
- 0 to 50
- 50 to 100
- 100 to 150
- 150 to 928
- 928 to 9999

RTIMP DWG Title: A9P3_TM_P2_EAST_TU_ZOOM_EAST.srf
Project Name: Gen. Char for Site. Soil Rem.
Project #: 20300-PSP-0011
Verified By: Curt Baumann/78329
Date Verified: 02/22/05
Support Data: A9P3_EAST_TM_P2_HPGe_15cm.xls;
A9P3_EAST_TM_BKG_HPGe_15cm.xls

6019

Figure 3-19. A9P3, Riverbank, Surface Scan for Southern Slope Excavation - Radium-226

Moisture Corrected Radium-226
Field of View to Scale
HPGe DET #: 40293
Measurement Date: 10/19/04 - 10/25/04

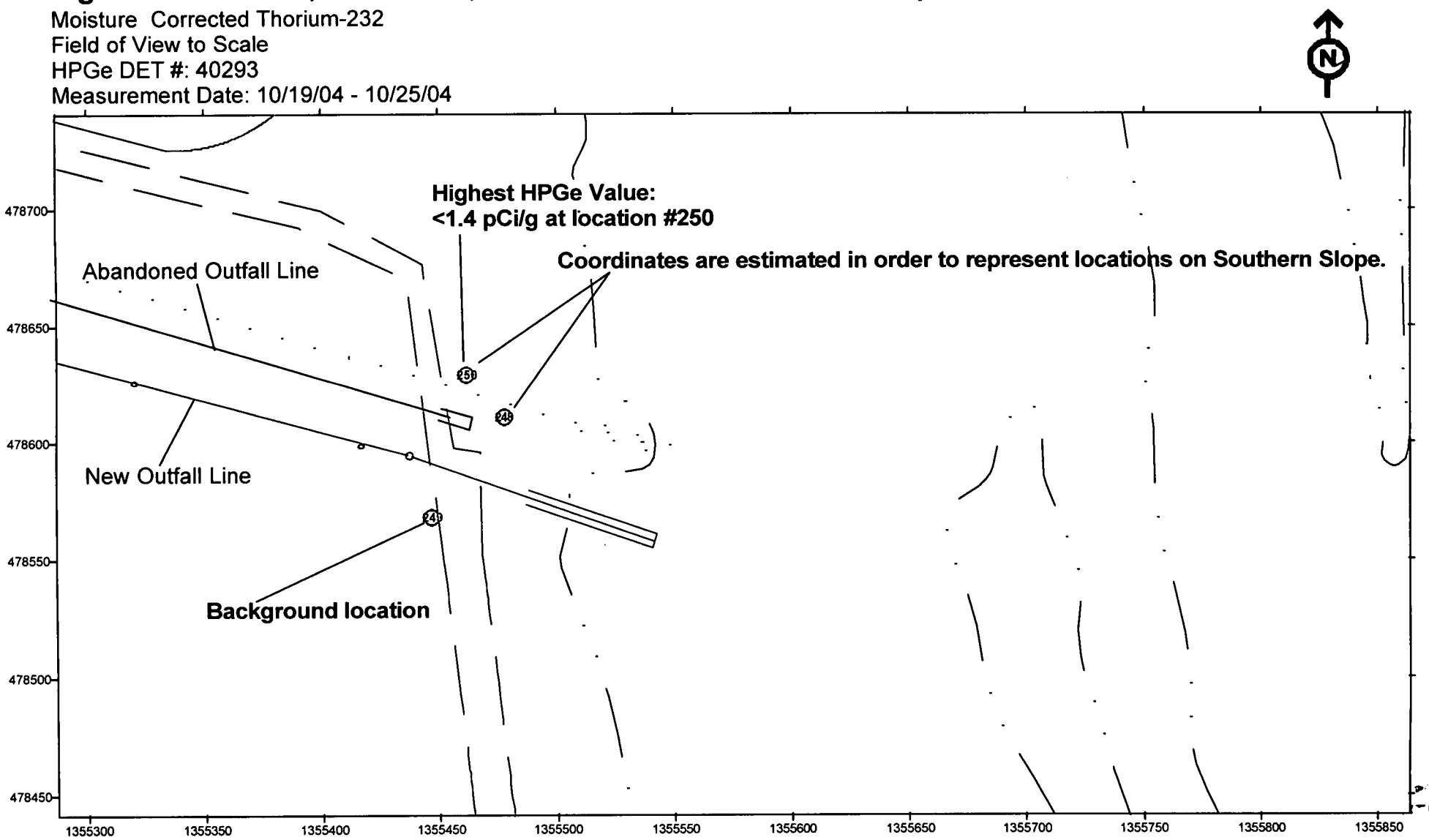


HPGe @ 15cm
Ra-226 (pCi/g)
- 0 to 1.5
- 1.5 to 3
- 3 to 4.5
- 4.5 to 9999

RTIMP DWG Title: A9P3_River_SF_RA.srf
Project Name: Exc. Ctrl. of A9P3
Project #: 21140-PSP-0004
Verified By: Curt Baumann/78329
Date Verified: 02/22/05
Support Data: A9P3_SF_HPGe_15cm.xls;
A9P3_SF_BKG_HPGe_15cm.xls

Figure 3-20. A9P3, Riverbank, Surface Scan for Southern Slope Excavation - Thorium-232

Moisture Corrected Thorium-232
Field of View to Scale
HPGe DET #: 40293
Measurement Date: 10/19/04 - 10/25/04

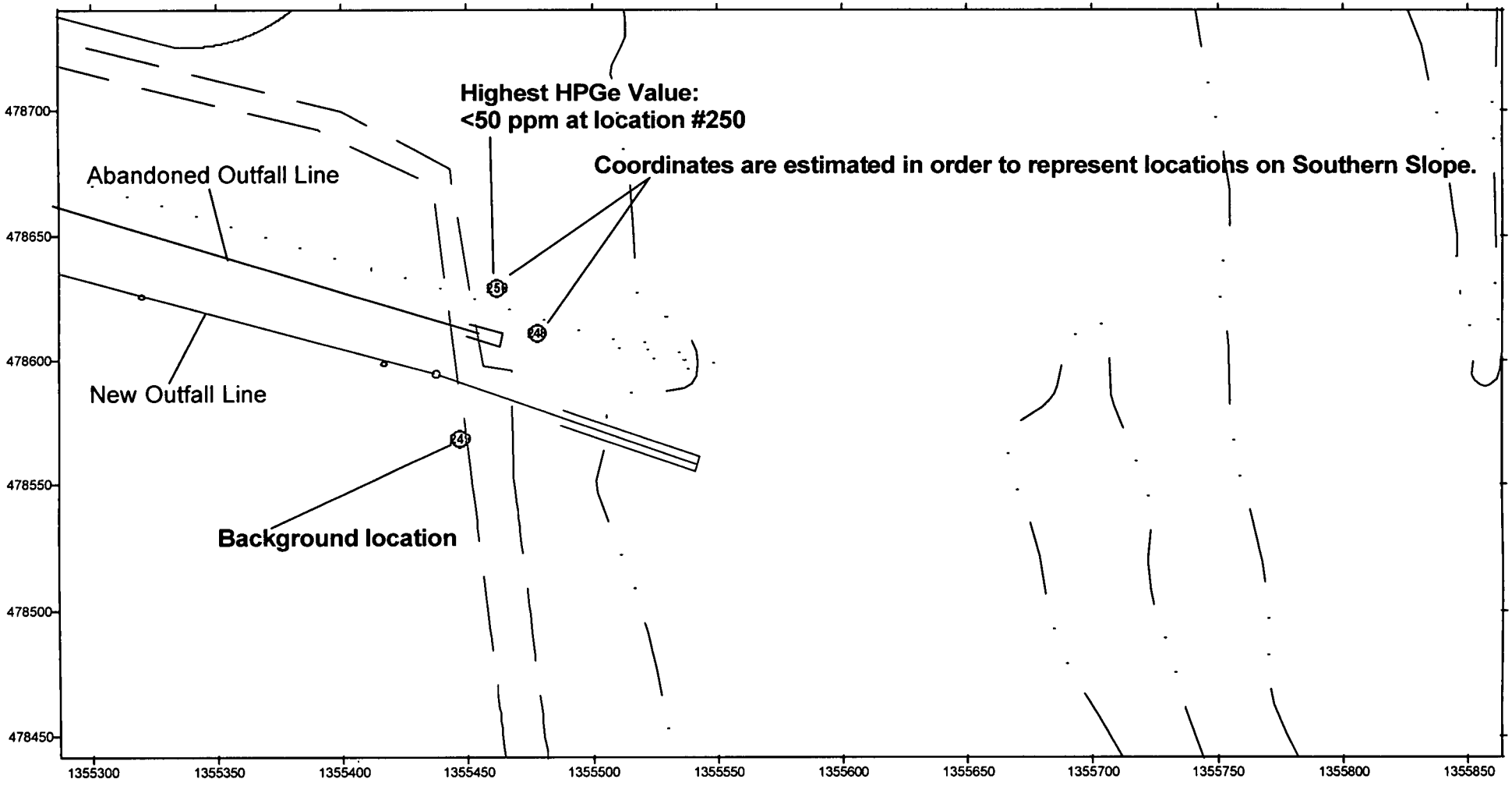


HPGe @ 15cm
Th-232 (pCi/g)
- 0 to 1.4
- 1.4 to 2.8
- 2.8 to 4.2
- 4.2 to 9999

RTIMP DWG Title: A9P3_River_SF_TH.srf
Project Name: Exc. Ctrl. of A9P3
Project #: 21140-PSP-0004
Verified By: Curt Baumann/78329
Date Verified: 02/22/05
Support Data: A9P3_SF_HPGe_15cm.xls;
A9P3_SF_BKG_HPGe_15cm.xls

Figure 3-21. A9P3, Riverbank, Surface Scan for Southern Slope Excavation - Total Uranium

Moisture Corrected Total Uranium
Field of View to Scale
HPGe DET #: 40293
Measurement Date: 10/19/04 - 10/25/04

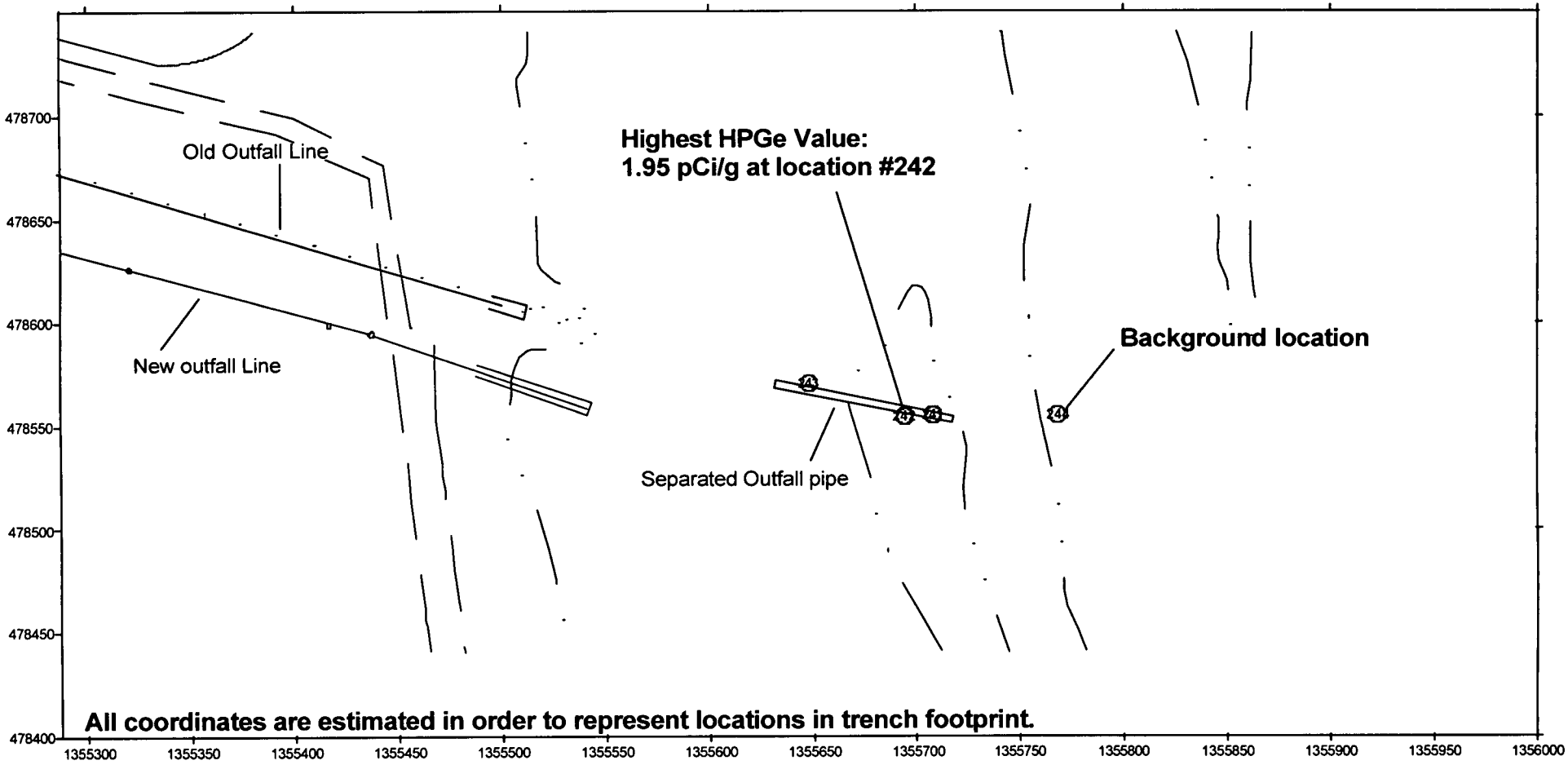


HPGe @ 15cm
Total U (ppm)
- 0 to 50
- 50 to 100
- 100 to 150
- 150 to 928
- 928 to 9999

RTIMP DWG Title: A9P3_River_SF_TU.srf
Project Name: Exc. Ctrl. of A9P3
Project #: 21140-PSP-0004
Verified By: Curt Baumann/78329
Date Verified: 02/22/05
Support Data: A9P3_SF_HPGe_15cm.xls;
A9P3_SF_BKG_HPGe_15cm.xls

Figure 3-22. A9P3, Outfall Line at River, Phase 2 Trench Bedding Scan - Radium-226

Moisture Corrected Radium-226
Field of View to Scale
HPGe DET #: 40293
Measurement Date: 10-06-2004

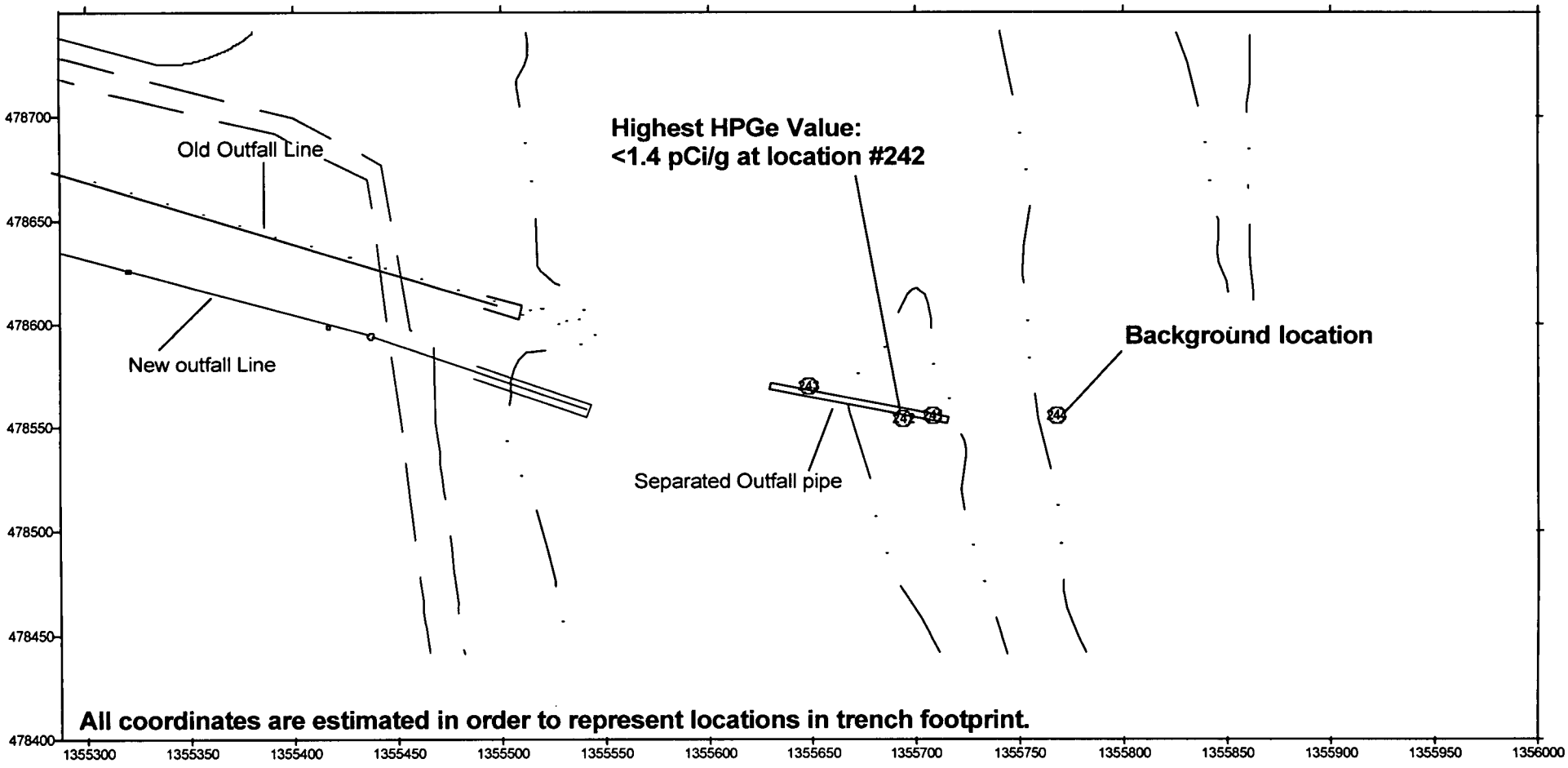


HPGe @ 15cm
Ra-226 (pCi/g)
- 0 to 1.5
- 1.5 to 3
- 3 to 4.5
- 4.5 to 9999

RTIMP DWG Title: A9P3_River_TM_P2_RA.srf
Project Name: Exc. Ctrl. of A9P3
Project #: 21140-PSP-0004
Verified By: Curt Baumann/78329
Date Verified: 02-22-05
Support Data: A9P3_River_TM_P2_HPGe_15cm.xls; A9P3_River_TM_BKG_HPGe_15cm.xls

Figure 3-23. A9P3, Outfall Line at River, Phase 2 Trench Bedding Scan - Thorium-232

Moisture Corrected Thorium-232
Field of View to Scale
HPGe DET #: 40293
Measurement Date: 10-06-2004

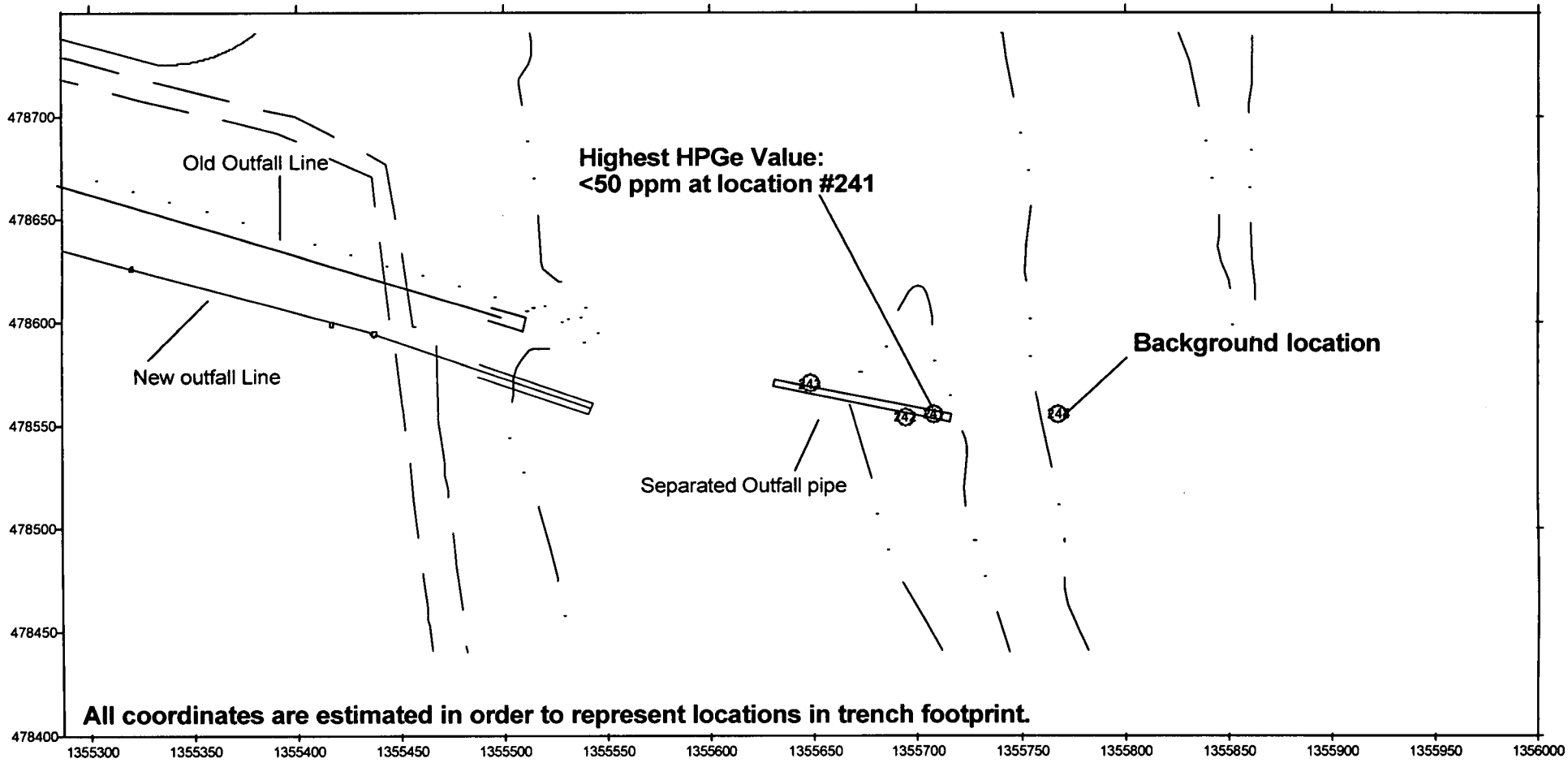


HPGe @ 15cm
Th-232 (pCi/g)
- 0 to 1.4
- 1.4 to 2.8
- 2.8 to 4.2
- 4.2 to 9999

RTIMP DWG Title: A9P3_River_TM_P2_TH.srf
Project Name: Exc. Ctrl. of A9P3
Project #: 21140-PSP-0004
Verified By: Curt Baumann/78329
Date Verified: 02-22-05
Support Data: A9P3_River_TM_P2_HPGe_15cm.xls; A9P3_River_TM_BKG_HPGe_15cm.xls

Figure 3-24. A9P3, Outfall Line at River, Phase 2 Trench Bedding Scan - Total Uranium

Moisture Corrected Total Uranium
Field of View to Scale
HPGe DET #: 40293
Measurement Date: 10-06-2004



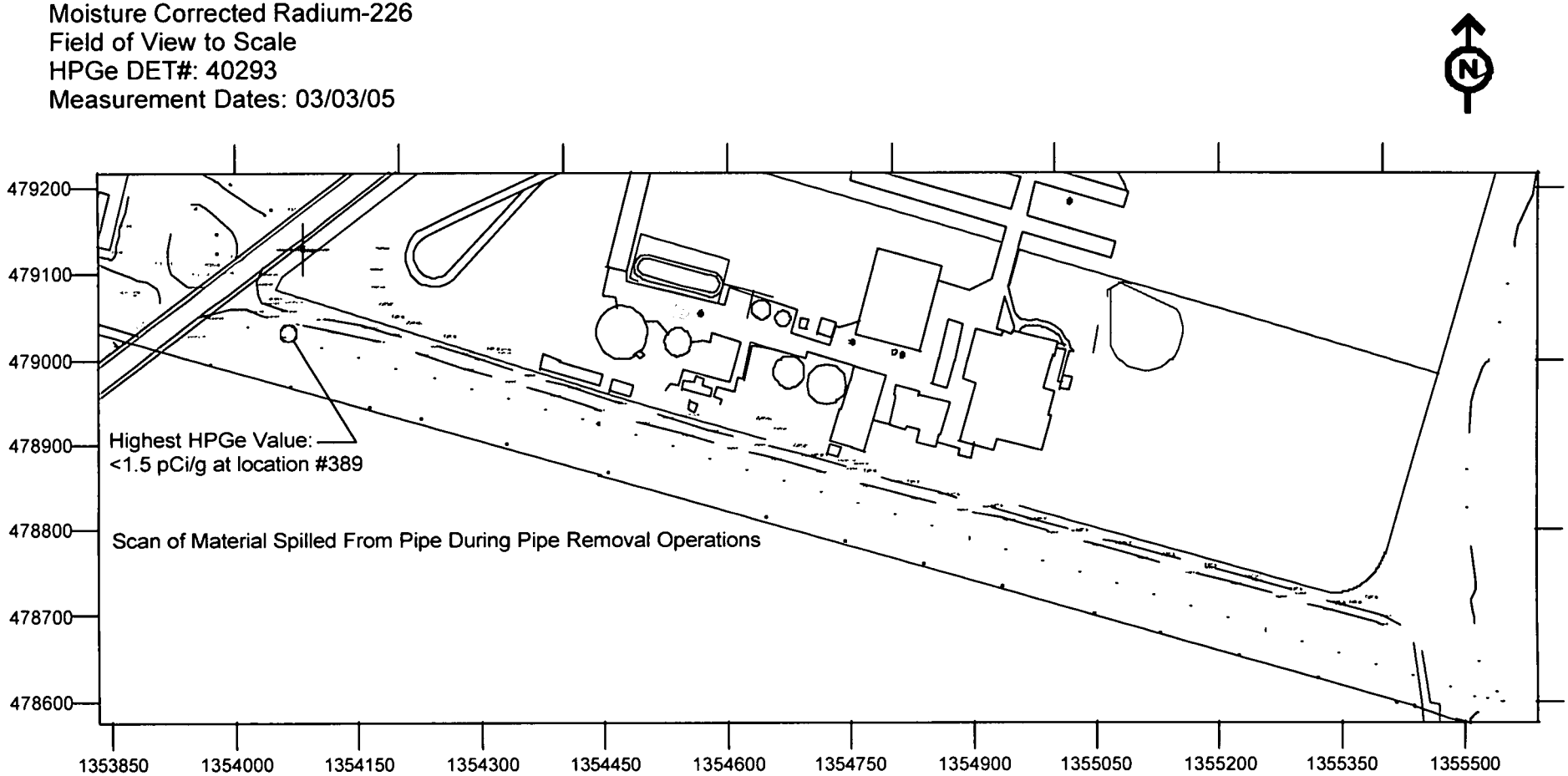
HPGe @ 15cm
Total U (ppm)
- 0 to 50
- 50 to 100
- 100 to 150
- 150 to 928
- 928 to 9999

RTIMP DWG Title: A9P3_River_TM_P2_TU.srf
Project Name: Exc. Ctrl. of A9P3
Project #: 21140-PSP-0004
Verified By: Curt Baumann/78329
Date Verified: 02/22/05
Support Data: A9P3_River_TM_P2_HPGe_15cm.xls; A9P3_River_TM_BKG_HPGe_15cm.xls

6019

Figure 3-25. A9P3, Beneath SR 128 (East Side), Phase 2 Scan - Radium-226

Moisture Corrected Radium-226
Field of View to Scale
HPGe DET#: 40293
Measurement Dates: 03/03/05



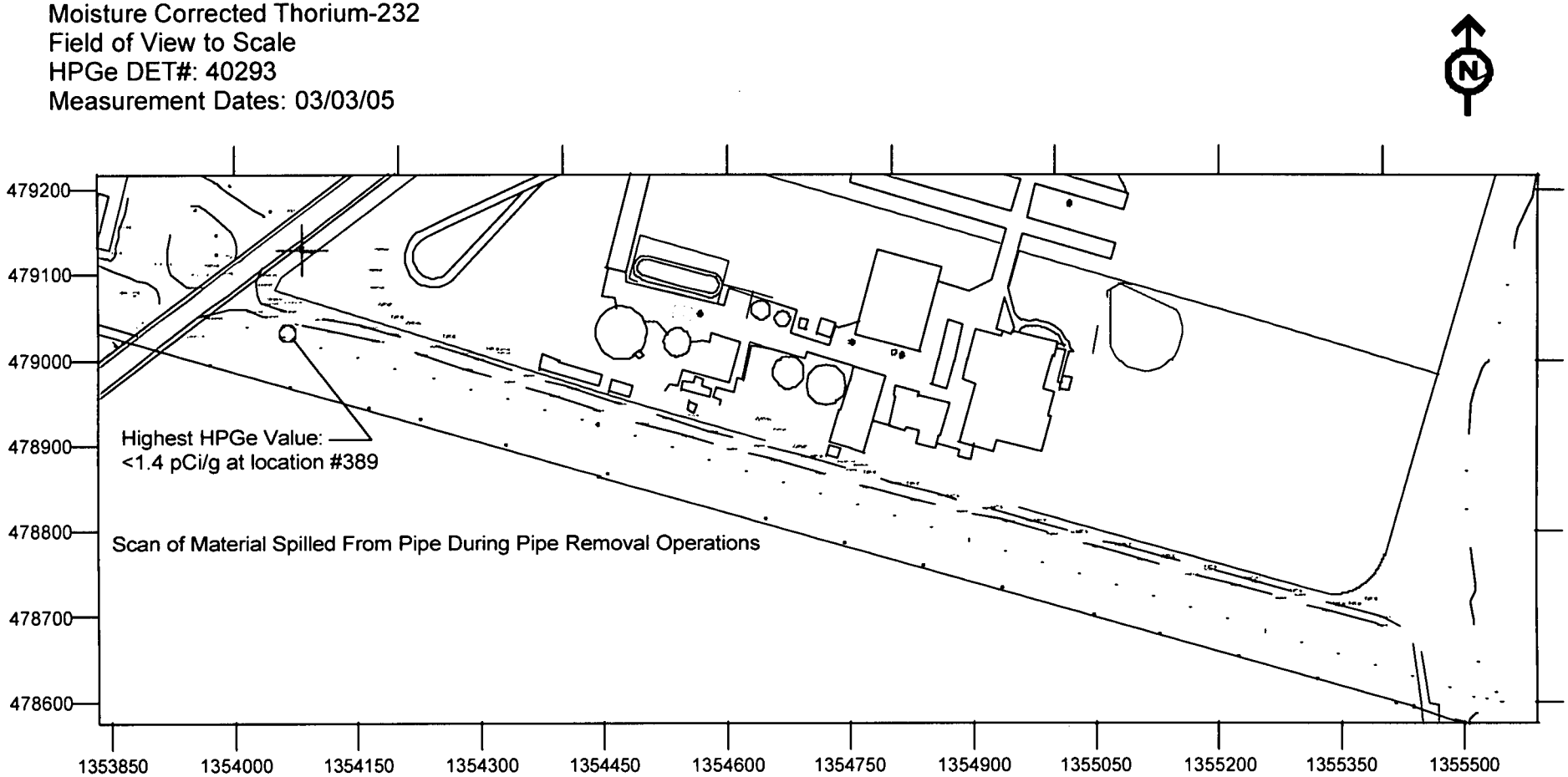
HPGE @ 31 cm
Ra-226 (pCi/g)
- 0 to 1.5
- 1.5 to 3
- 3 to 4.5
- 4.5 to 9999

RTIMP DWG Title: A9P3_SF_P2_East_RA.srf
Project Name: Gen. Char. for Site. Soil Rem.
Project #: 20300-PSP-0011
Verified By: A. Veach/80515
Date Verified: 03/03/05
Support Data: A9P3_SF_P2_East_HPGe_31cm_Summary.xls

6019

Figure 3-26. A9P3, Beneath SR 128 (East Side), Phase 2 Scan - Thorium-232

Moisture Corrected Thorium-232
Field of View to Scale
HPGe DET#: 40293
Measurement Dates: 03/03/05



HPGE @ 31 cm
Th-232 (pCi/g)

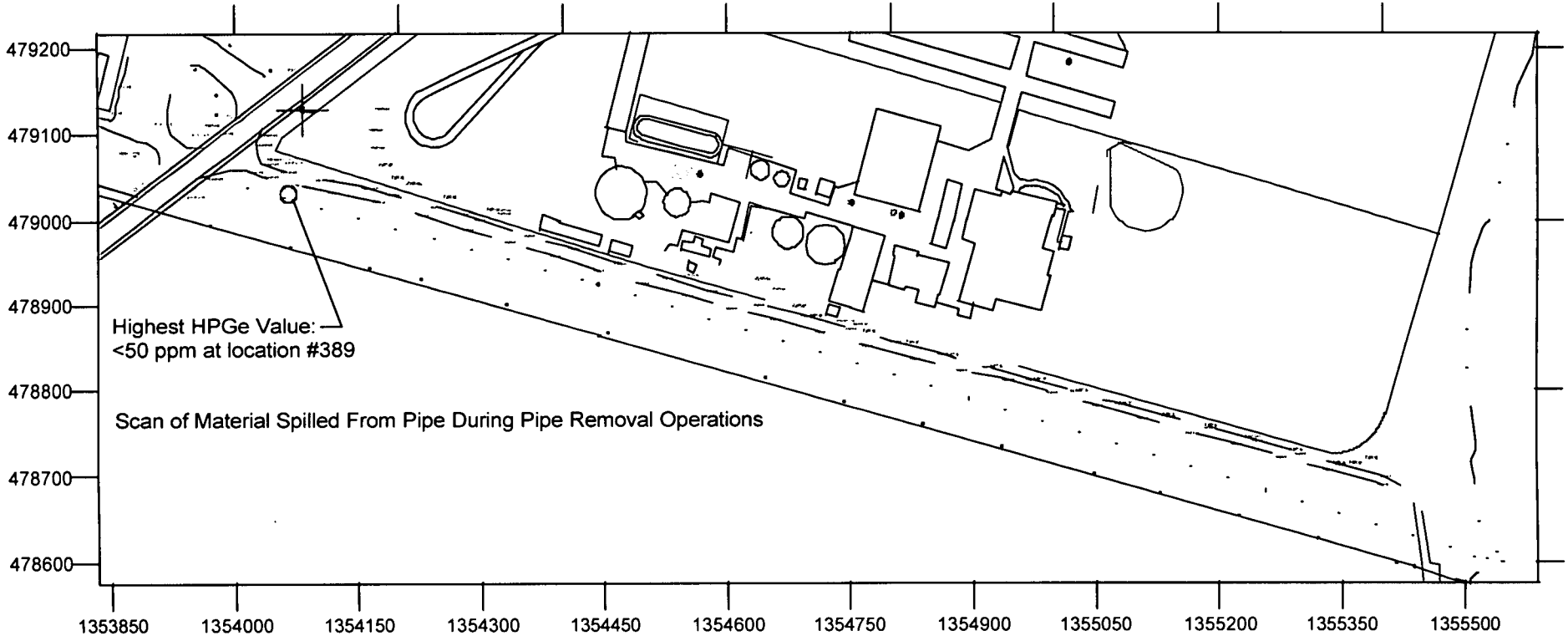
- 0 to 1.4
- 1.4 to 2.8
- 2.8 to 4.2
- 4.2 to 9999

RTIMP DWG Title: A9P3_SF_P2_East_TH.srf
Project Name: Gen. Char. for Site. Soil Rem.
Project #: 20300-PSP-0011
Verified By: A. Veach/80515
Date Verified: 03/03/05
Support Data: A9P3_SF_P2_East_HPGe_31cm_Summary.xls

6019

Figure 3-27. A9P3, Beneath SR 128 (East Side), Phase 2 Scan - Total Uranium

Moisture Corrected Total Uranium
Field of View to Scale
HPGe DET#: 40293
Measurement Dates: 03/03/05



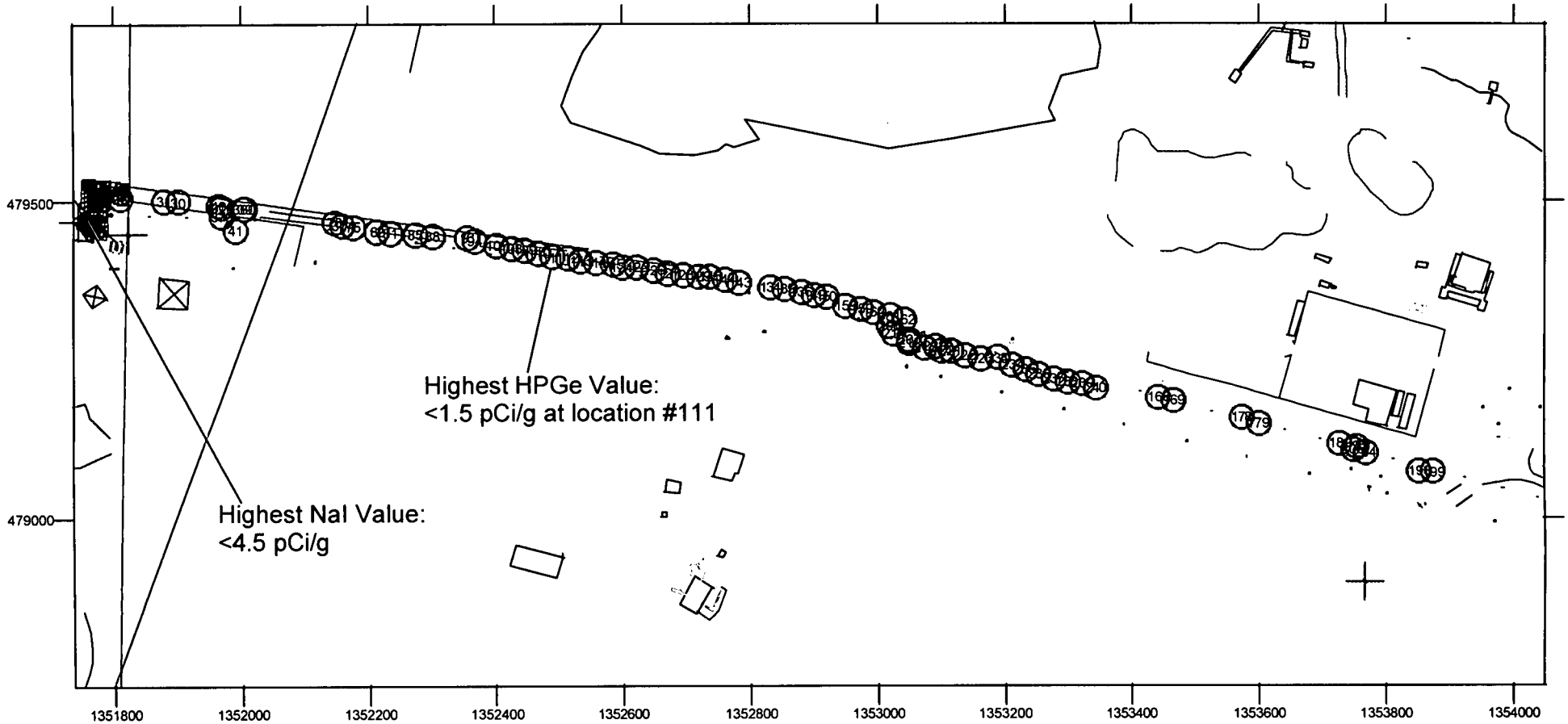
HPGe @ 31cm
Total U (ppm)

- 0 to 50
- 50 to 100
- 100 to 150
- 150 to 928
- 928 to 9999

RTIMP DWG Title: A9P3_SF_P2_East_TU.srf
Project Name: Gen. Char. for Site. Soil Rem.
Project #: 20300-PSP-0011
Verified By: A. Veach/80515
Date Verified: 03/03/05
Support Data: A9P3_SF_P2_East_HPGe_31cm_Summary.xls

Figure 3-28. A9P3, West of SR 128, Load Out Area Phase 1 Scan - Radium-226

Moisture Corrected Radium-226
Field of View to Scale
HPGe DET #: 30687, 31204, 40293
NaI Batch #: RSS1-1213
Measurement Dates: 07/23/04 - 12/13/04



NaI Ra-226 (pCi/g)
-9999 to 4.5
4.5 to 9999

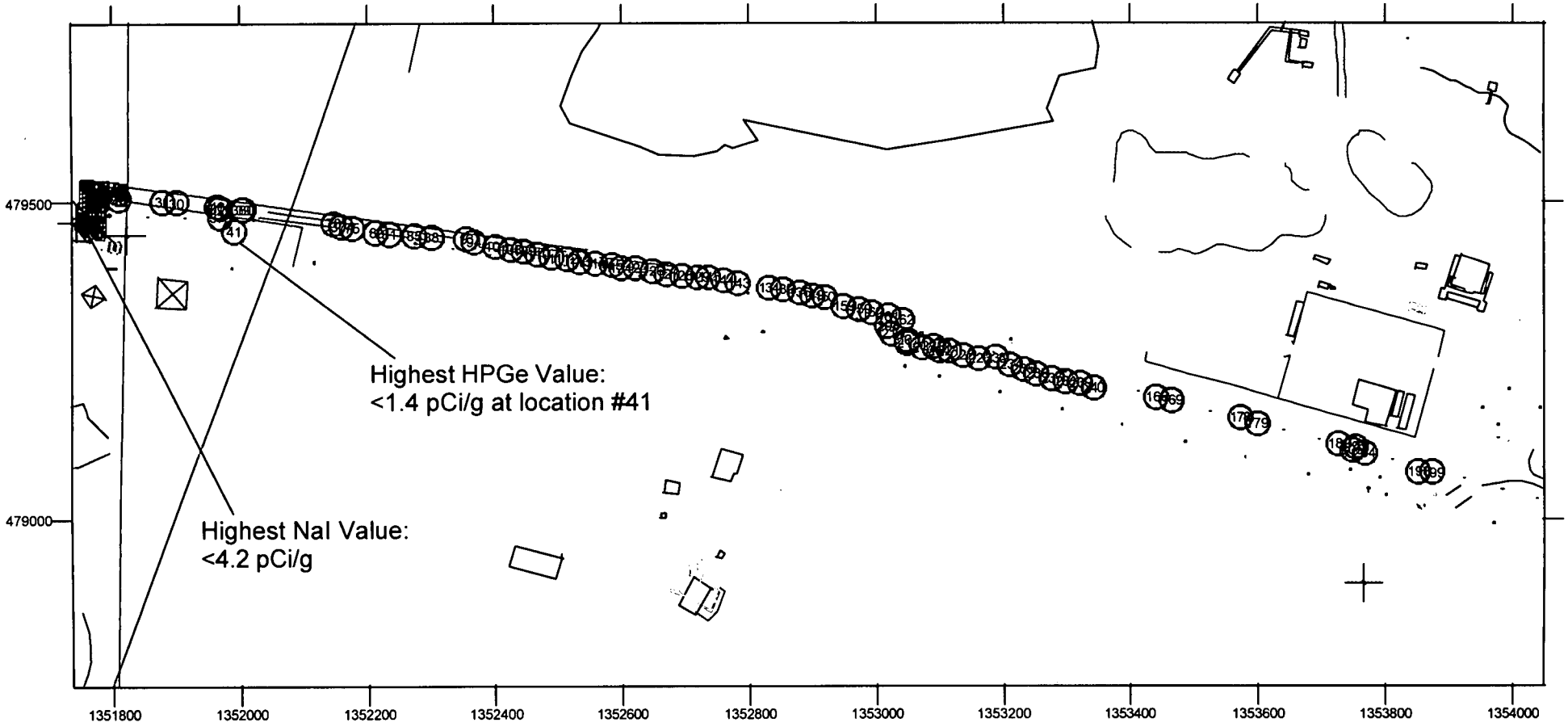
HPGe @ 100cm Ra-226 (pCi/g)
0 to 1.5
1.5 to 3
3 to 4.5
4.5 to 9999

RTIMP DWG Title: A9P3_LOAD_OUT_P1_RA.srf
Project Name: Exc. Ctrl. of A9P3
Project #: 21140-PSP-0004
Verified By: Curt Baumann/78329
Date Verified: 12/14/04
Support Data: A9P3_LOAD_OUT_P1_NaI.xls; A9P3_LOAD_OUT_P1_HPGe_100cm.xls

6019

Figure 3-29. A9P3, West of SR 128, Load Out Area Phase 1 Scan - Thorium-232

Moisture Corrected Thorium-232
Field of View to Scale
HPGe DET #: 30687, 31204, 40293
NaI Batch #: RSS1-1213
Measurement Dates: 07/23/04 - 12/13/04



NaI Th-232 (pCi/g)
-9999 to 4.2
4.2 to 9999

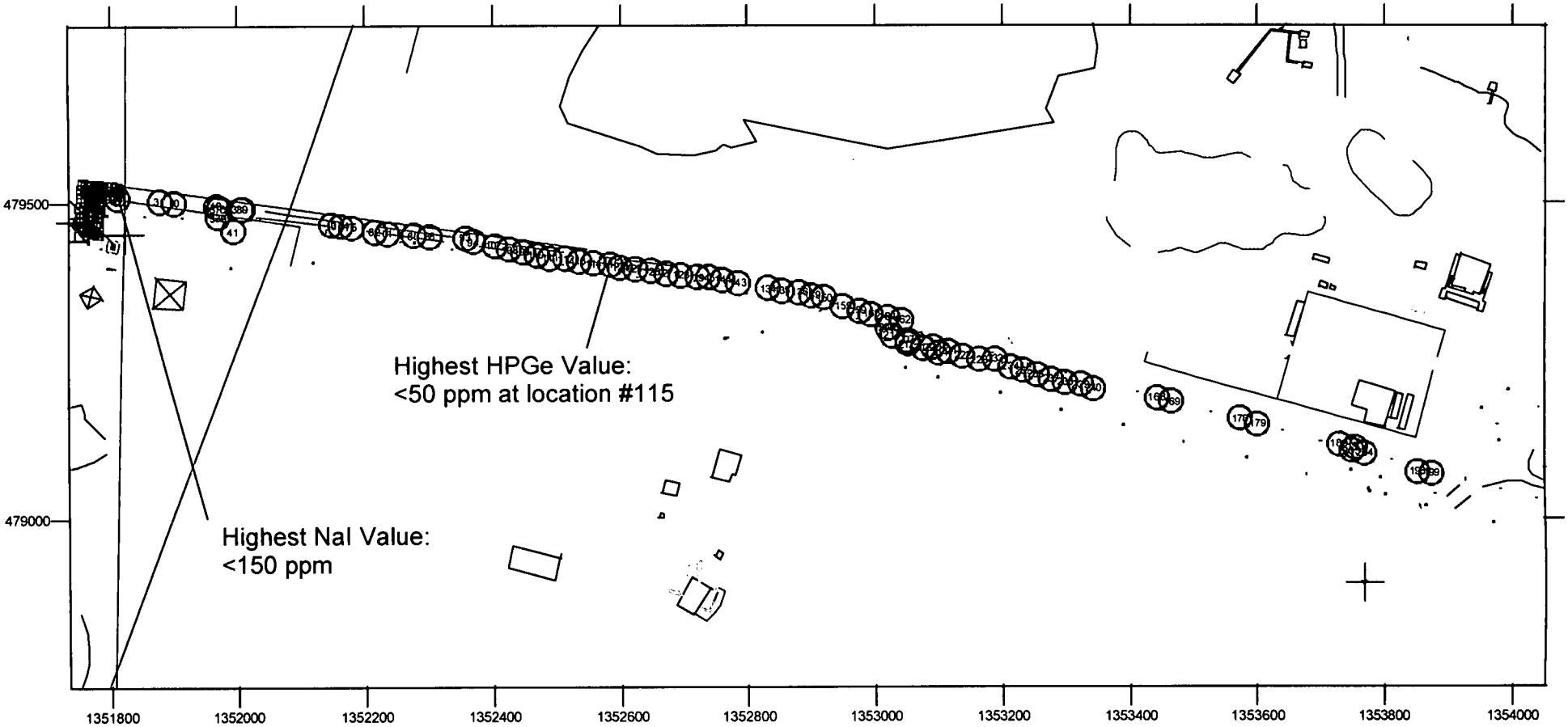
HPGe @ 100cm Th-232 (pCi/g)
0 to 1.4
1.4 to 2.8
2.8 to 4.2
4.2 to 9999

RTIMP DWG Title: A9P3_LOAD_OUT_P1_TH.srf
Project Name: Exc. Ctrl. of A9P3
Project #: 21140-PSP-0004
Verified By: Curt Baumann/78329
Date Verified: 12/14/04
Support Data: A9P3_LOAD_OUT_P1_NaI.xls; A9P3_LOAD_OUT_P1_HPGe_100cm.xls

6019

Figure 3-30. A9P3, West of SR 128, Load Out Area Phase 1 Scan - Total Uranium

Moisture Corrected Total Uranium
Field of View to Scale
HPGe DET #: 30687, 31204, 40293
NaI Batch #: RSS1-1213
Measurement Dates: 07/23/04 - 12/13/04



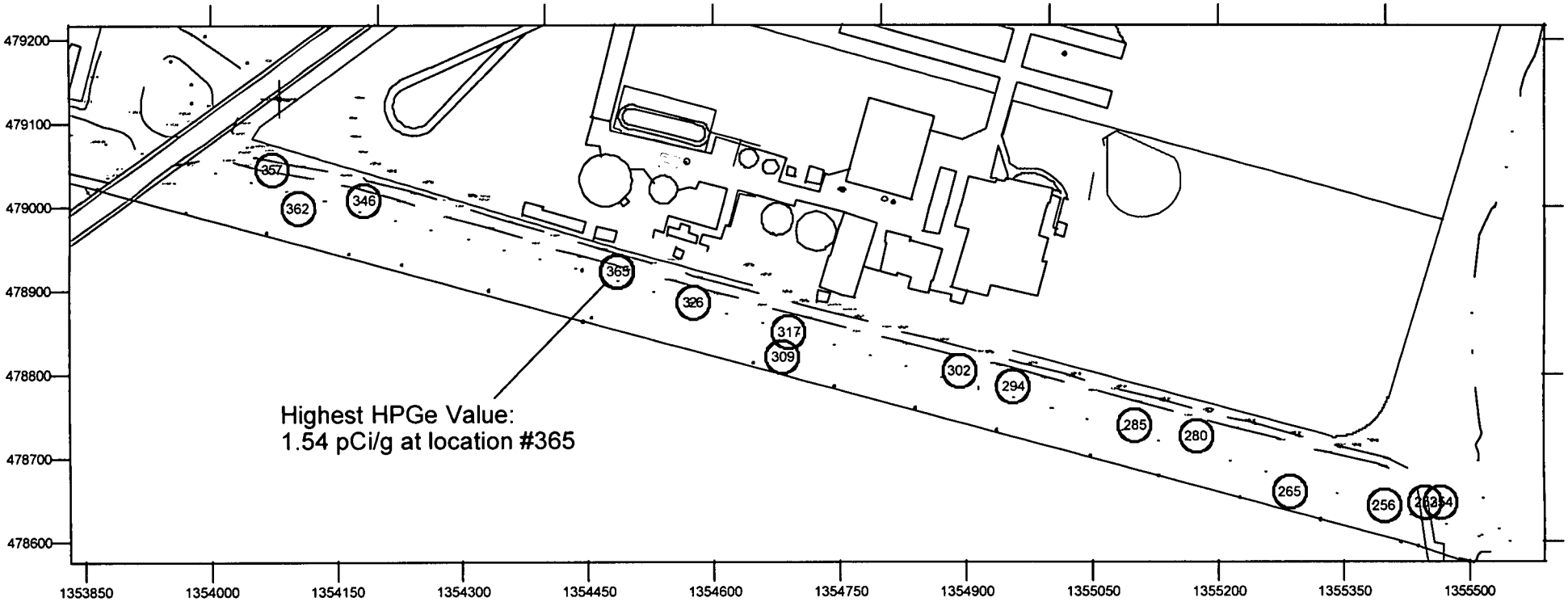
NaI Total U (ppm)
-9999 to 150
150 to 875
875 to 9999

HPGe @ 100cm Total U (ppm)
0 to 50
50 to 100
100 to 150
150 to 400
400 to 9999

RTIMP DWG Title: A9P3_LOAD_OUT_P1_TU.srf
Project Name: Exc. Ctrl. of A9P3
Project #: 21140-PSP-0004
Verified By: Curt Baumann/78329
Date Verified: 12/14/04
Support Data: A9P3_LOAD_OUT_P1_NaI.xls; A9P3_LOAD_OUT_P1_HPGe_100cm.xls

Figure 3-31. A9P3, East of SR 128, Load Out Area Phase 1 Scan - Radium-226

Moisture Corrected Radium-226
Field of View to Scale
HPGe DET#: 40293
Measurement Dates: 10/29/04 - 12/04/04



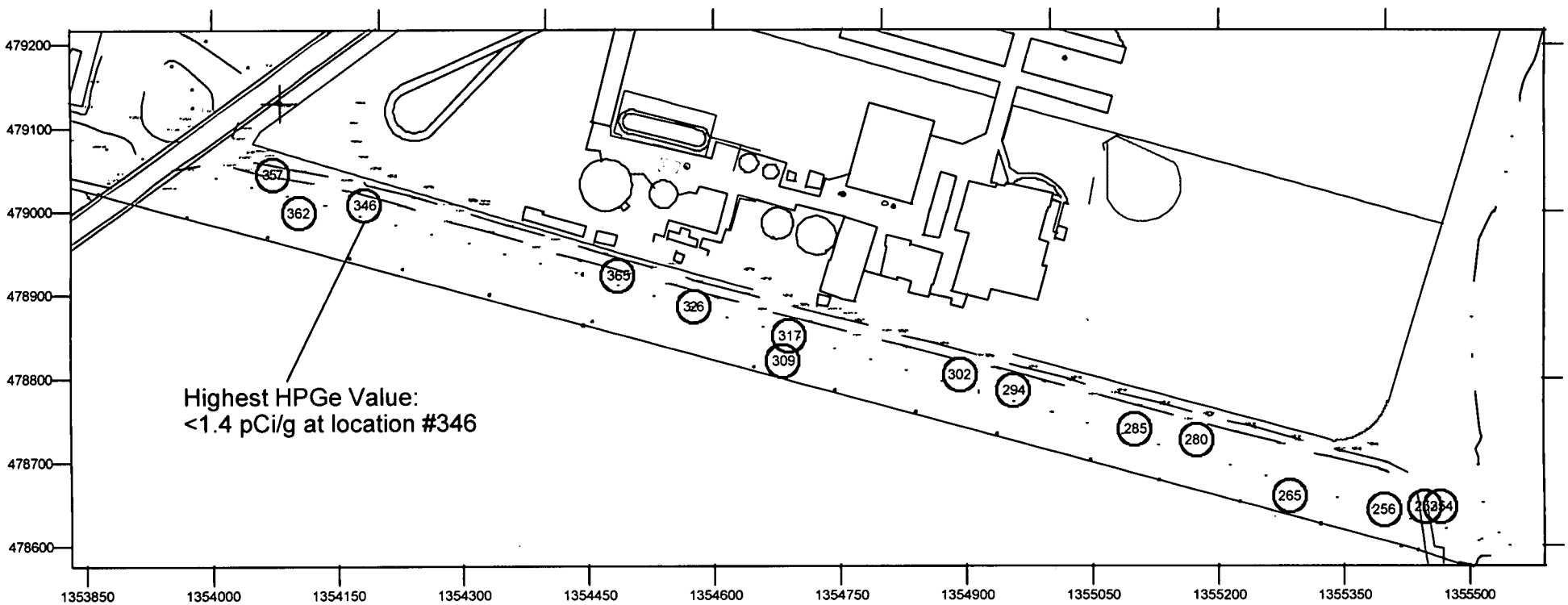
HPGe @ 100cm
Ra-226 (pCi/g)

- 0 to 1.5
- 1.5 to 3
- 3 to 4.5
- 4.5 to 9999

RTIMP DWG Title: A9P3_LOAD_OUT_P1_East_RA.srf
Project Name: Gen. Char. for Site. Soil Rem.
Project #: 20300-PSP-0011
Verified By: Curt Baumann/78329
Date Verified: 12/06/04
Support Data: A9P3_LOAD_OUT_P1_East_HPGe_100cm.xls

Figure 3-32. A9P3, East of SR 128, Load Out Area Phase 1 Scan - Thorium-232

Moisture Corrected Thorium-232
Field of View to Scale
HPGe DETs: 40293
Measurement Dates: 10/29/04 - 12/04/04



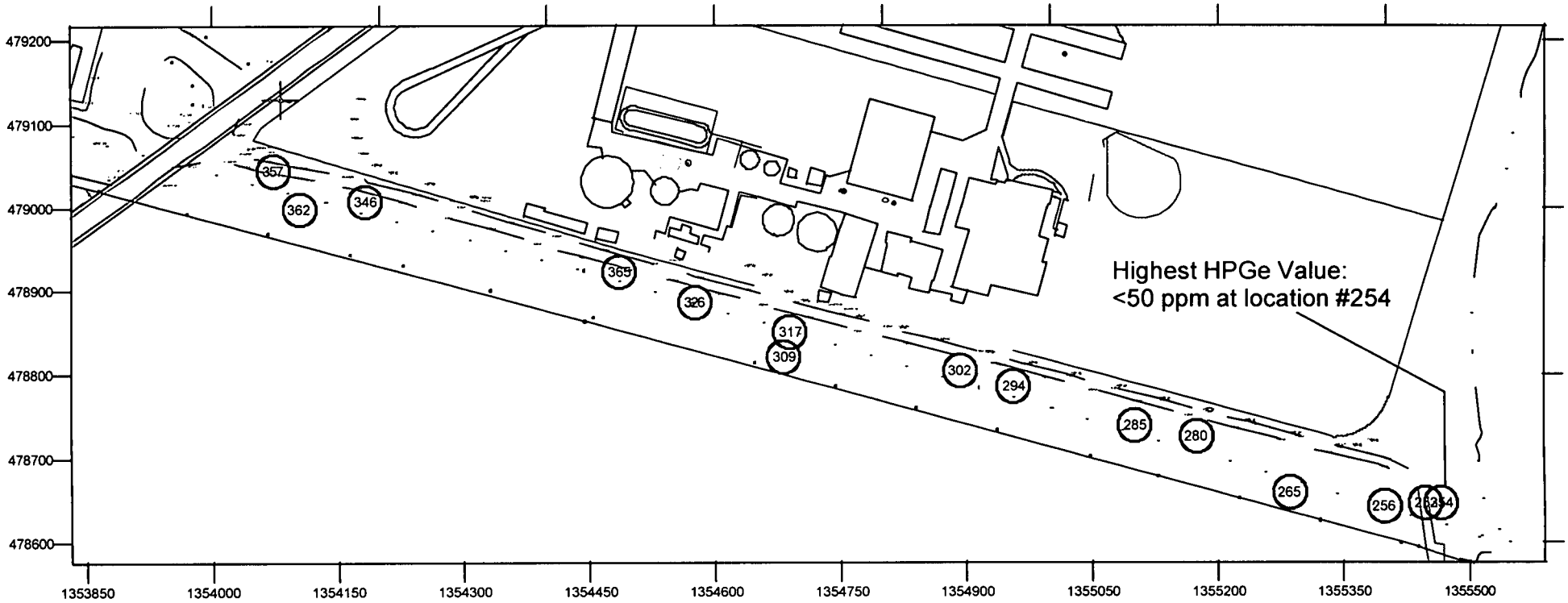
HPGe @ 100cm
Th-232 (pCi/g)

- 0 to 1.4
- 1.4 to 2.8
- 2.8 to 4.2
- 4.2 to 9999

RTIMP DWG Title: A9P3_LOAD_OUT_P1_East_TH.srf
Project Name: Gen. Char. for Site. Soil Rem.
Project #: 20300-PSP-0011
Verified By: Curt Baumann/78329
Date Verified: 12/06/04
Support Data: A9P3_LOAD_OUT_P1_East_HPGe_100cm.xls

Figure 3-33. A9P3, East of SR 128, Load Out Area Phase 1 Scan - Total Uranium

Moisture Corrected Total Uranium
Field of View to Scale
HPGe DET#: 40293
Measurement Dates: 10/29/04 - 12/04/04



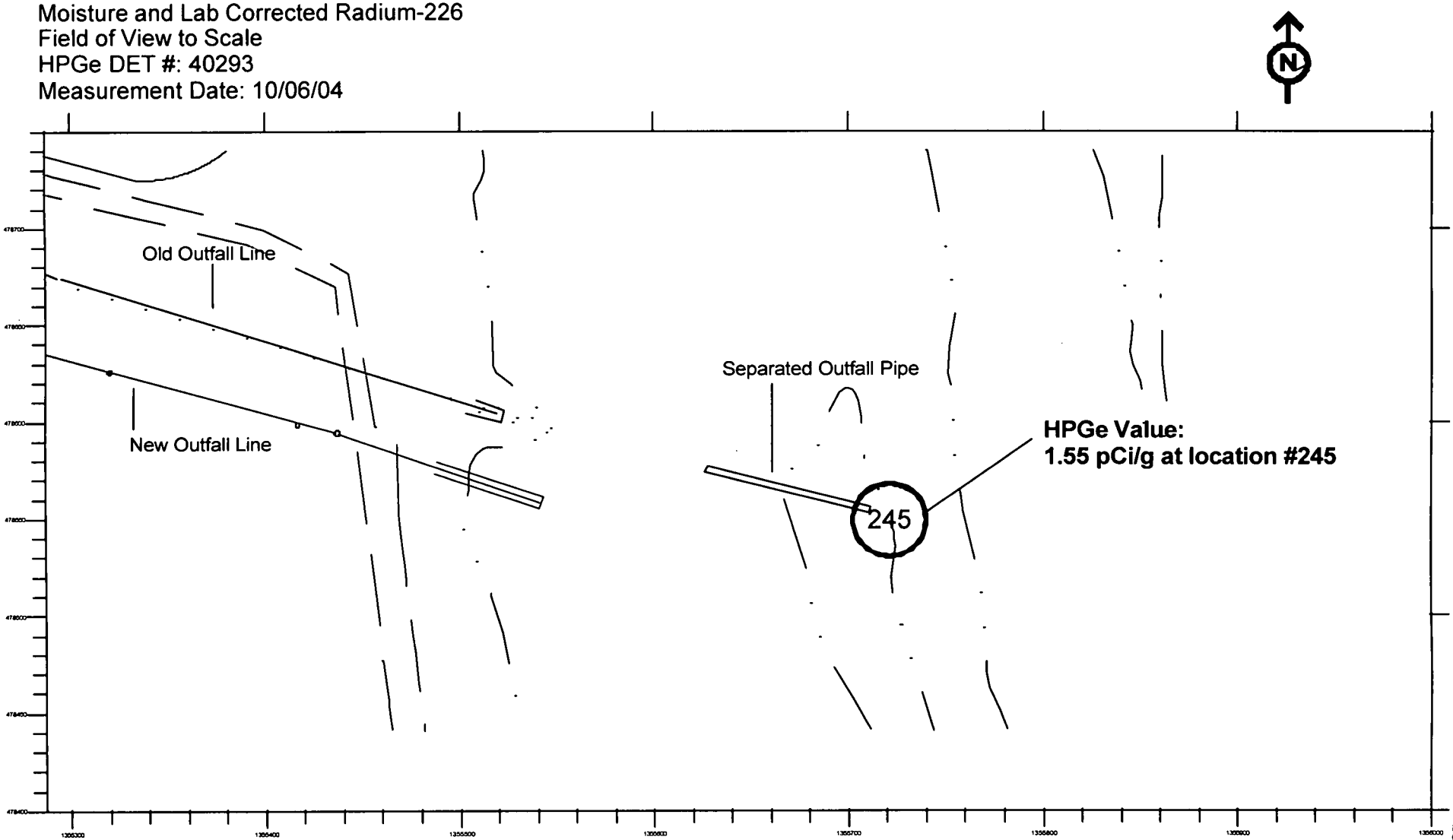
HPGe @ 100cm
Total U (ppm)

- 0 to 50
- 50 to 100
- 100 to 150
- 150 to 400
- 400 to 9999

RTIMP DWG Title: A9P3_LOAD_OUT_P1_East_TU.srf
Project Name: Gen. Char. for Site. Soil Rem.
Project #: 20300-PSP-0011
Verified By: Curt Baumann/78329
Date Verified: 12/06/04
Support Data: A9P3_LOAD_OUT_P1_East_HPGe_100cm.xls

Figure 3-34. A9P3, Outfall Line at River, Load Out Area Phase 1 Scan - Radium-226

Moisture and Lab Corrected Radium-226
Field of View to Scale
HPGe DET #: 40293
Measurement Date: 10/06/04

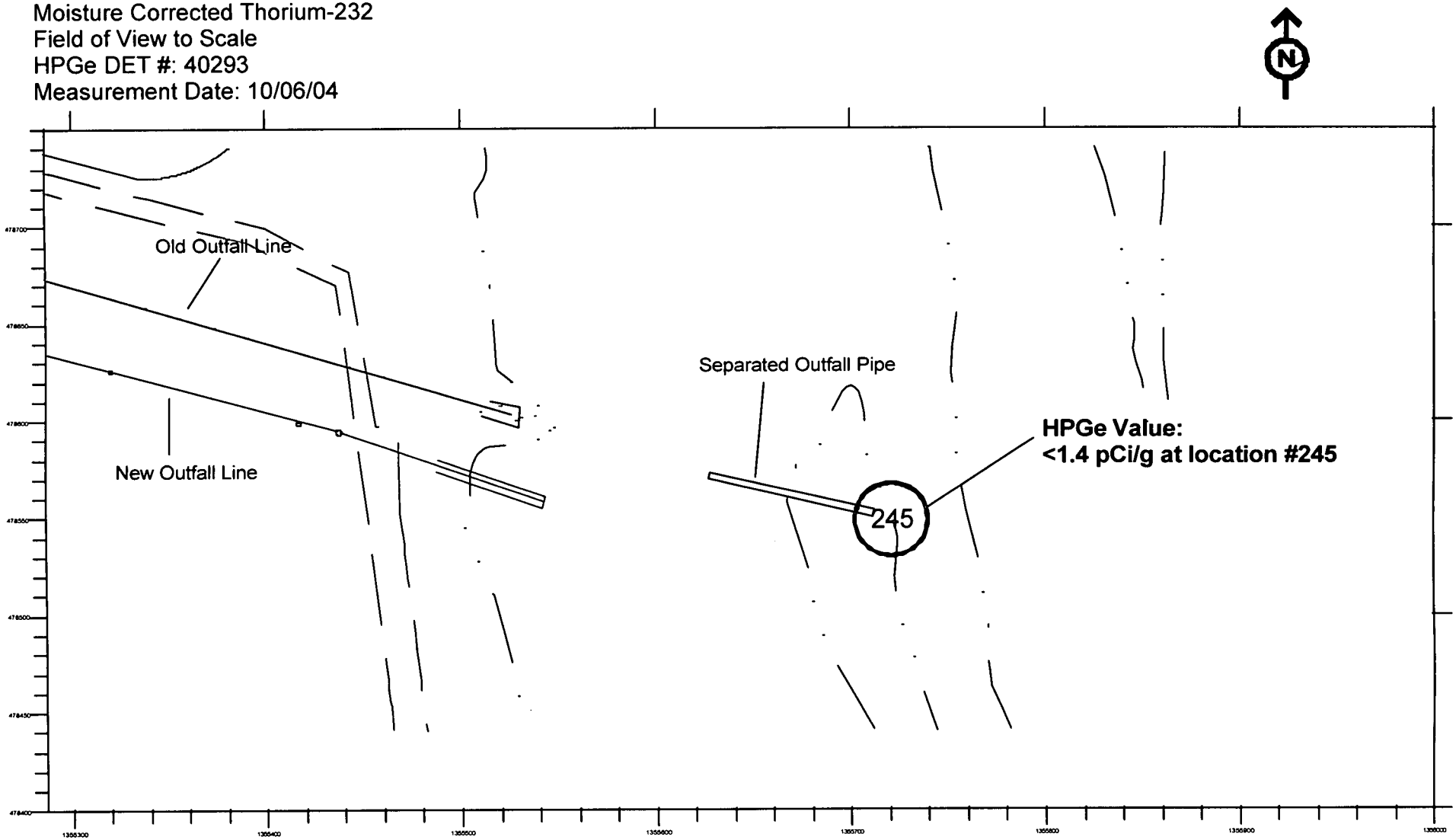


HPGe @ 100cm
Ra-226 (pCi/g)
- 0 to 1.5
- 1.5 to 3
- 3 to 4.5
- 4.5 to 9999

RTIMP DWG Title: A9P3_LOAD_OUT_RIVER_P1_RA.srf
Project Name: Exc. Ctrl. of A9P3
Project #: 21140-PSP-0004
Verified By: D.Seiller
Date Verified: 10/07/04
Support Data: A9P3_LOAD_OUT_RIVER_P1_HPGe_100cm.xls

Figure 3-35. A9P3, Outfall Line at River, Load Out Area Phase 1 Scan - Thorium-232

Moisture Corrected Thorium-232
Field of View to Scale
HPGe DET #: 40293
Measurement Date: 10/06/04

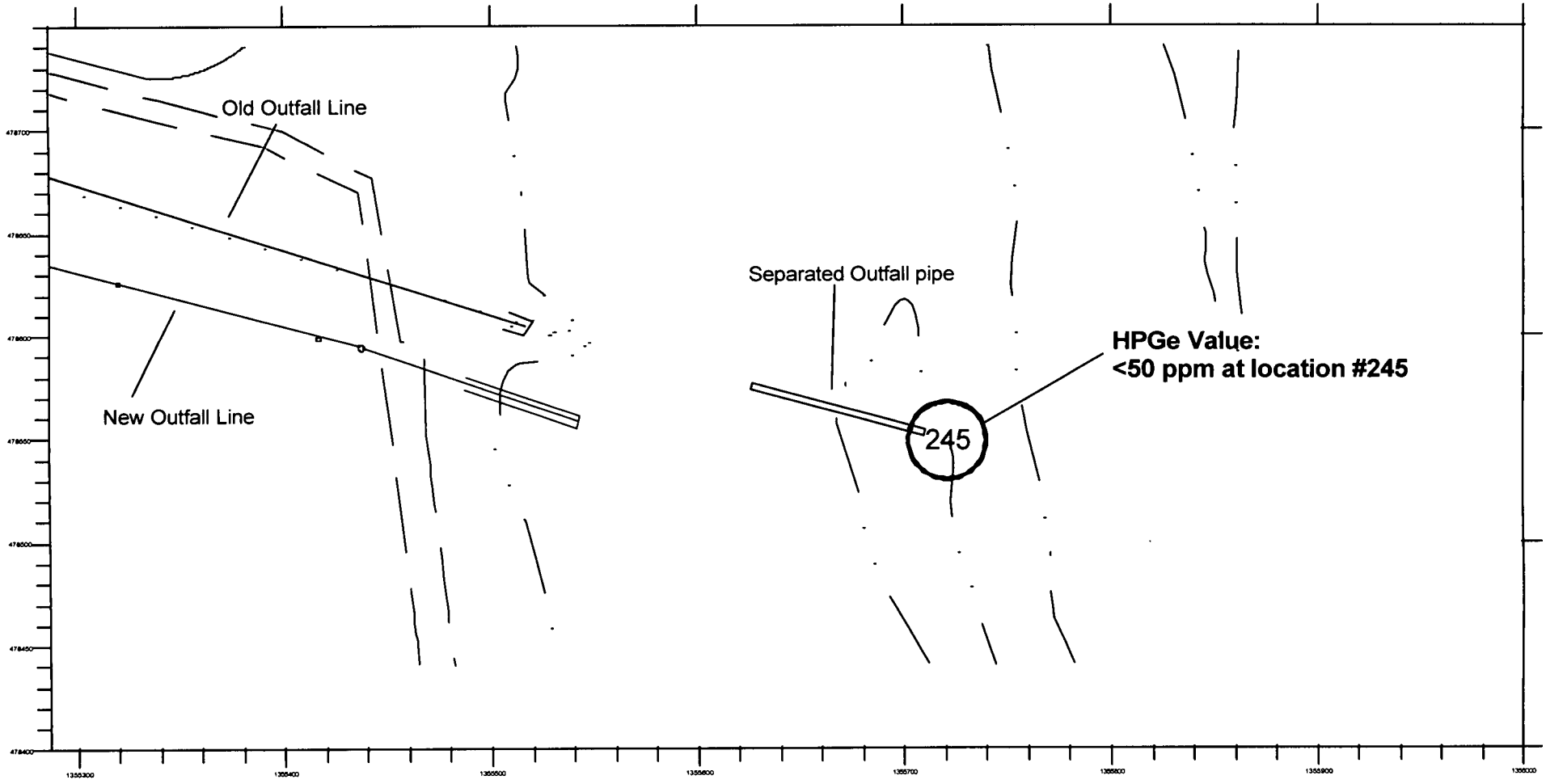


HPGe @ 100cm
Th-232 (pCi/g)
- 0 to 1.4
- 1.4 to 2.8
- 2.8 to 4.2
- 4.2 to 9999

RTIMP DWG Title: A9P3_LOAD_OUT_RIVER_P1_TH.srf
Project Name: Exc. Ctrl. of A9P3
Project #: 21140-PSP-0004
Verified By: D.Seiller
Date Verified: 10/07/04
Support Data: A9P3_LOAD_OUT_RIVER_P1_HPGe_100cm.xls

Figure 3-36. A9P3, Outfall Line at River, Load Out Area Phase 1 Scan - Total Uranium

Moisture Corrected Total Uranium
Field of View to Scale
HPGe DET #: 40293
Measurement Date: 10/06/04

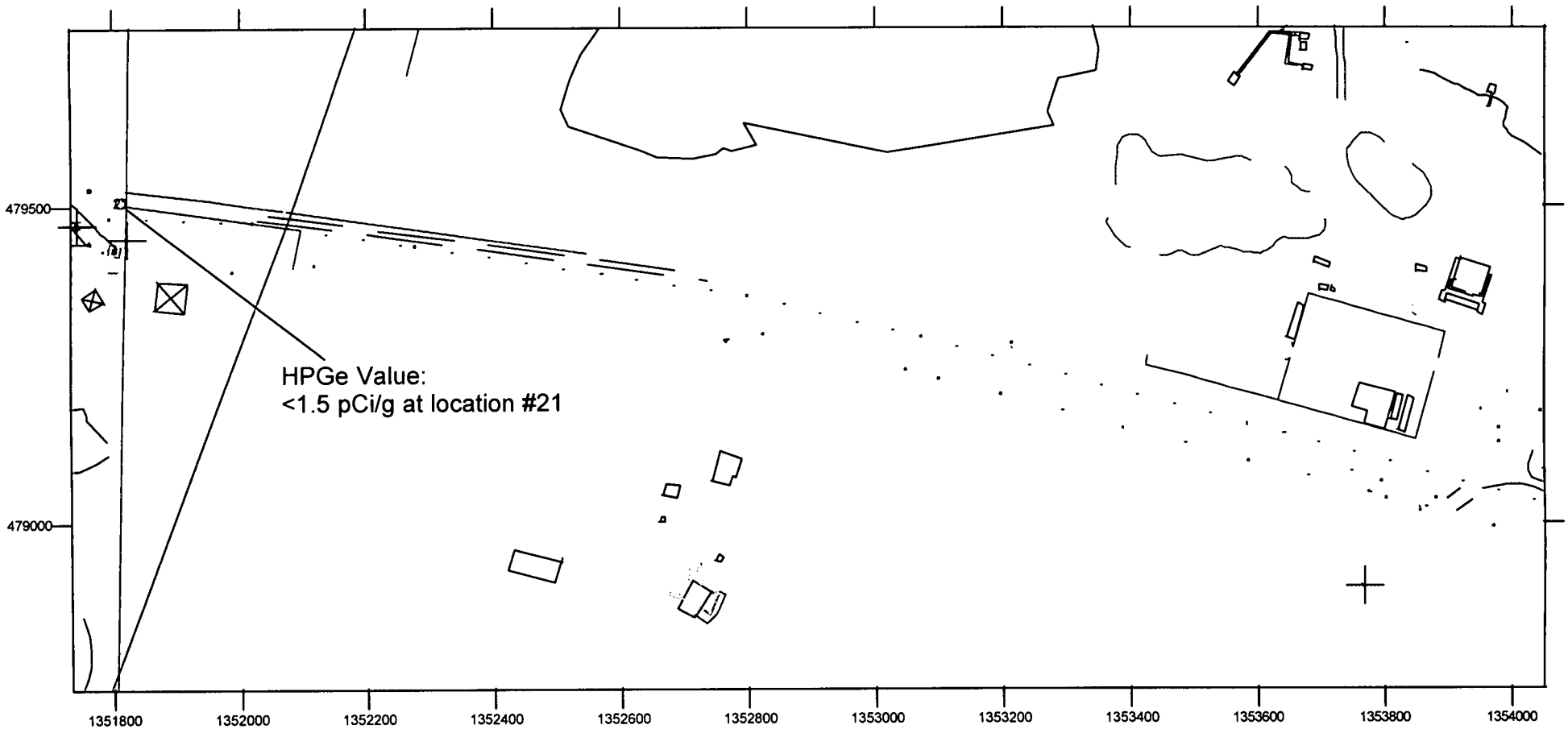


HPGe @ 100cm Total Uranium (ppm)
0 to 50
50 to 100
100 to 150
150 to 400
400 to 9999

RTIMP DWG Title: A9P3_LOAD_OUT_RIVER_P1_TU.srf
Project Name: Exc. Ctrl. of A9P3
Project #: 21140-PSP-0004
Verified By: D.Seiller
Date Verified: 10/07/04
Support Data: A9P3_LOAD_OUT_RIVER_P1_HPGe_100cm.xls

Figure 3-37. A9P3, West of SR 128, Load Out Area Phase 2 Confirmation - Radium-226

Moisture Corrected Radium-226
Field of View to Scale
HPGe DET #: 40293
Measurement Date: 07/23/04

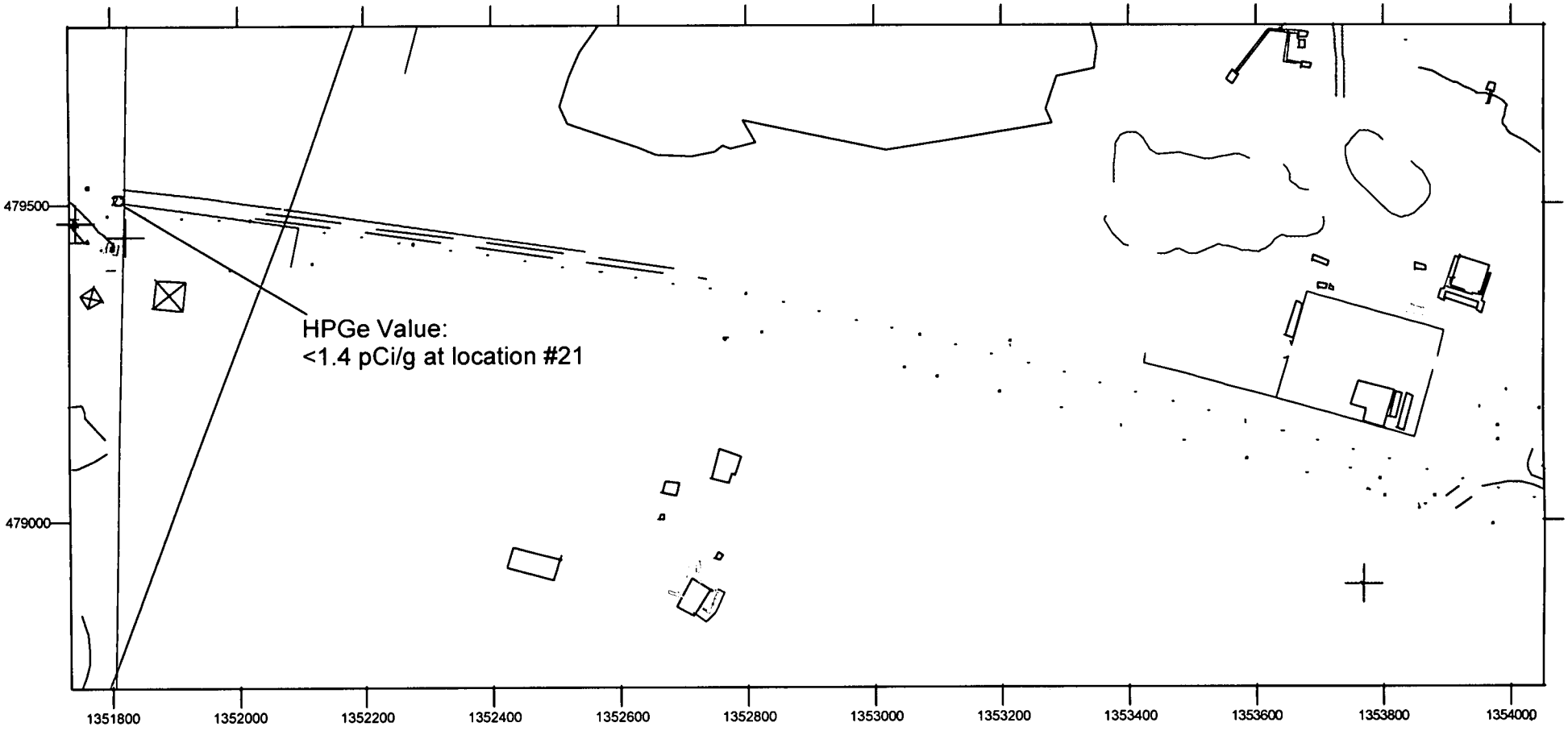


HPGe @ 31cm
Ra-226 (pCi/g)
- 0 to 1.5
- 1.5 to 3
- 3 to 4.5
- 4.5 to 9999

RTIMP DWG Title: A9P3_Load_Out_P2_RA.srf
Project Name: Gen. Char. for Site. Soil Rem.
Project #: 20300-PSP-0011
Verified By: Brian McDaniel/11058
Date Verified: 08/12/04
Support Data: A9P3_Load_Out_P2_HPGe_31cm.xls

Figure 3-38. A9P3, West of SR 128, Load Out Area Phase 2 Confirmation - Thorium-232

Moisture Corrected Thorium-232
Field of View to Scale
HPGe DET #: 40293
Measurement Date: 07/23/04

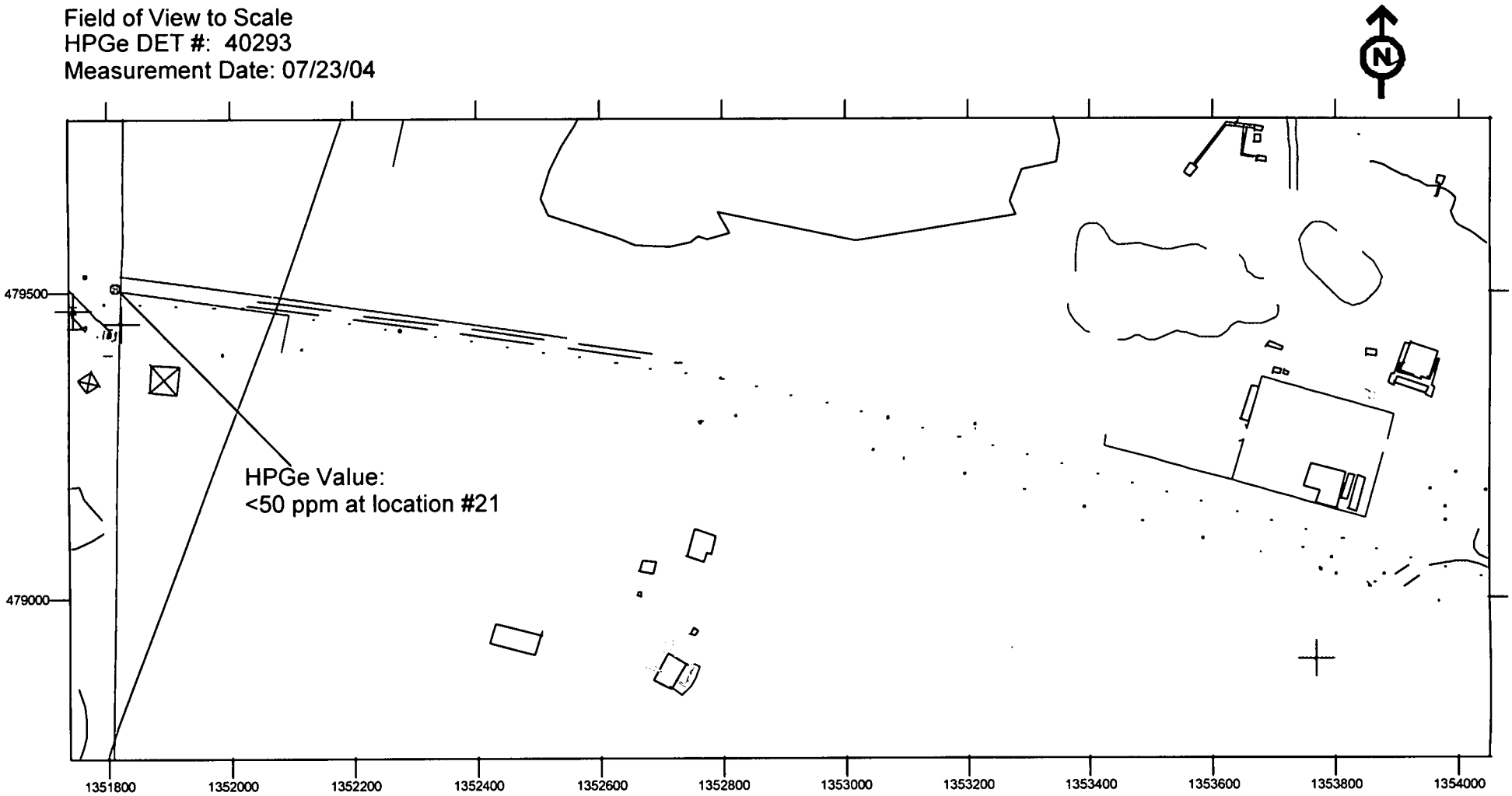


HPGe @ 31cm
Th-232 (pCi/g)
- 0 to 1.4
- 1.4 to 2.8
- 2.8 to 4.2
- 4.2 to 9999

RTIMP DWG Title: A9P3_Load_Out_P2_TH.srf
Project Name: Gen. Char. for Site. Soil Rem.
Project #: 20300-PSP-0011
Verified By: Brian McDaniel/11058
Date Verified: 08/12/04
Support Data: A9P3_Load_Out_P2_HPGe_31cm.xls

Figure 3-39. A9P3, West of SR 128, Load Out Area Phase 2 Confirmation - Total Uranium

Moisture Corrected Total Uranium
Field of View to Scale
HPGe DET #: 40293
Measurement Date: 07/23/04



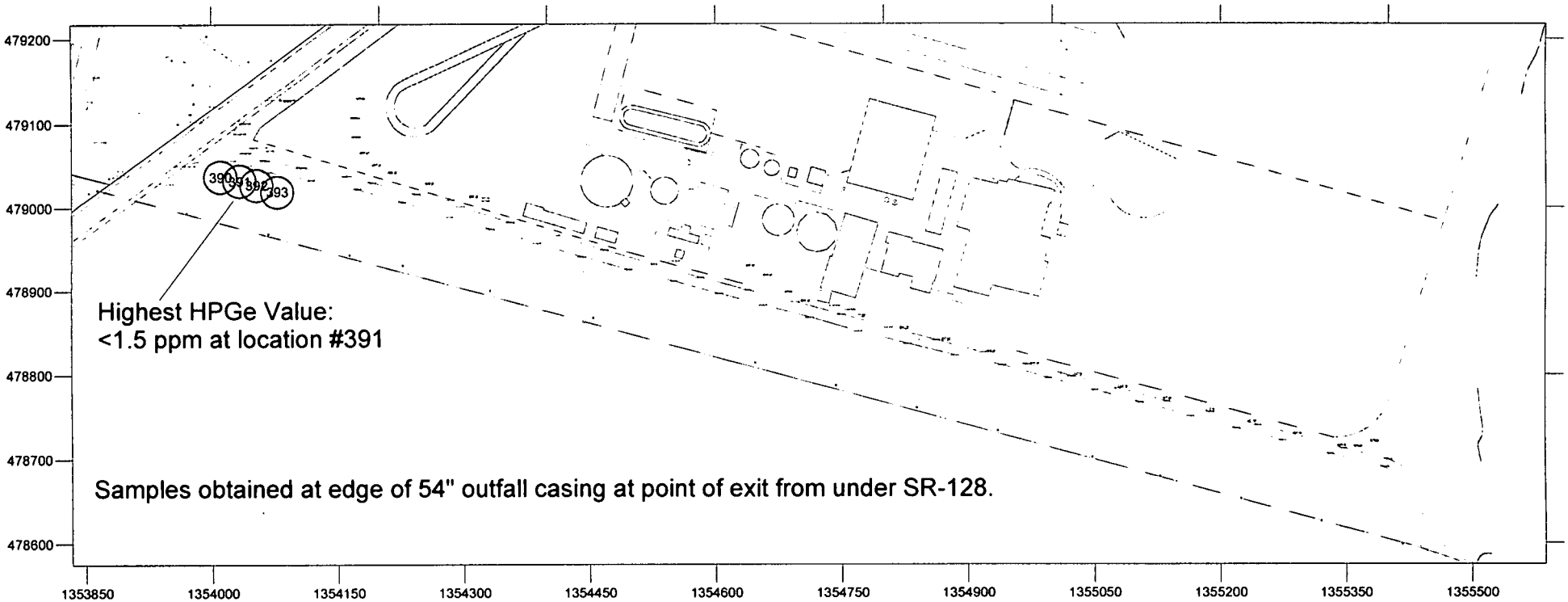
HPGe @ 31cm
Total U (ppm)
- 0 to 50
- 50 to 100
- 100 to 150
- 150 to 928
- 928 to 9999

RTIMP DWG Title: A9P3_Load_Out_P2_TU.srf
Project Name: Gen. Char. for Site. Soil Rem.
Project #: 20300-PSP-0011
Verified By: Brian McDaniel/11058
Date Verified: 08/12/04
Support Data: A9P3_Load_Out_P2_HPGe_31cm.xls

6019

Figure 3-40. A9P3, Ramp to 54" Casing Pipe Phase 2 Confirmation - Radium-226

Moisture Corrected Radium-226
Field of View to Scale
HPGe DET#: 30699
Measurement Dates: 04/04/05



HPGe @ 100cm
Ra-226 (pCi/g)

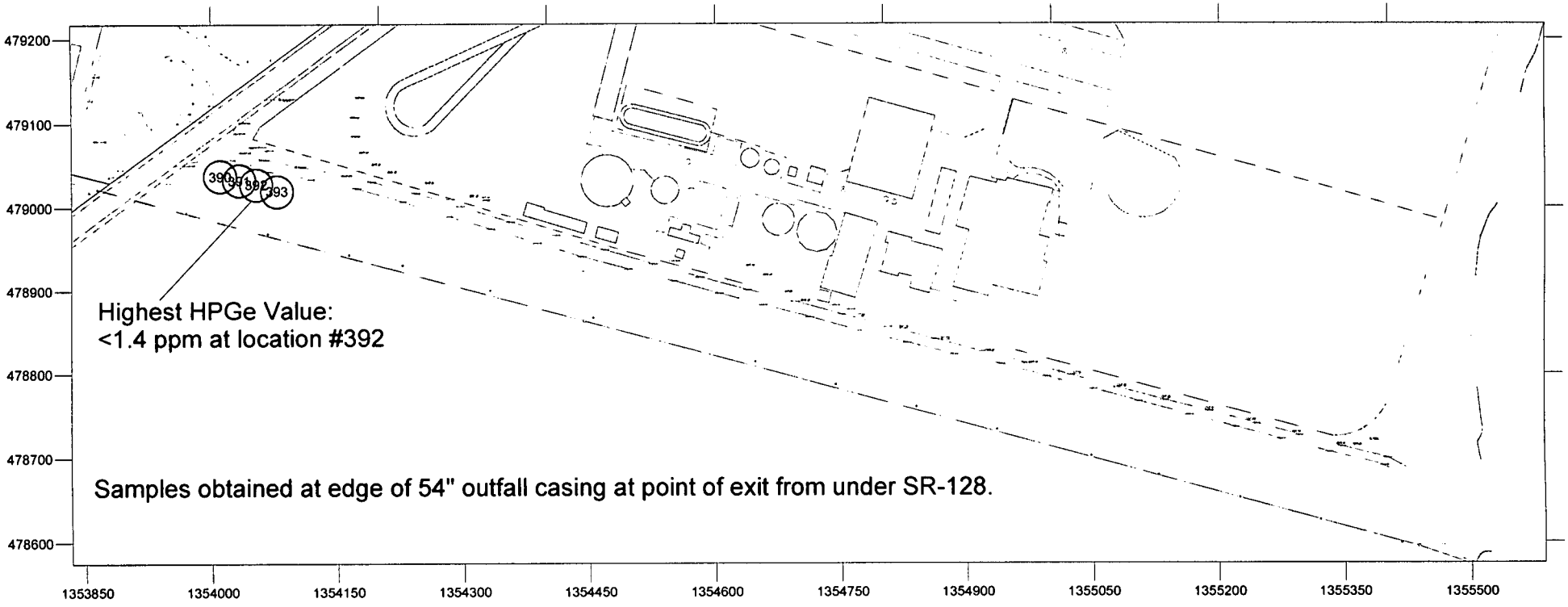
- 0 to 1.5
- 1.5 to 3
- 3 to 4.5
- 4.5 to 9999

RTIMP DWG Title: A9P3_P1_East_RA.srf
Project Name: Gen. Char. for Site. Soil Rem.
Project #: 20300-PSP-0011
Verified By: Curt Baumann/78329
Date Verified: 04/07/05
Support Data: A9P3_P1_East_HPGe_100cm.xls

6019

Figure 3-41. A9P3, Ramp to 54" Casing Pipe Phase 2 Confirmation - Thorium-232

Moisture Corrected Thorium-232
Field of View to Scale
HPGe DET#: 30699
Measurement Dates: 04/04/05



HPGe @ 100cm
Th-232 (pCi/g)

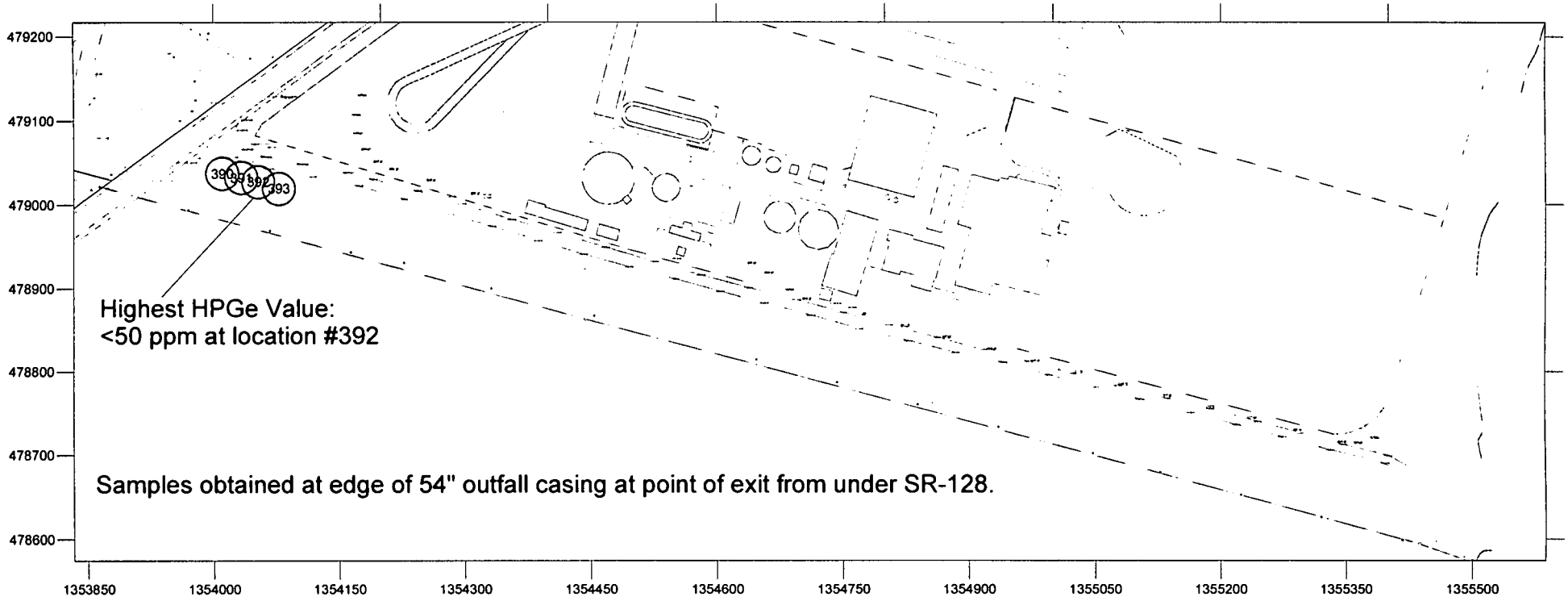
- 0 to 1.4
- 1.4 to 2.8
- 2.8 to 4.2
- 4.2 to 9999

RTIMP DWG Title: A9P3_P1_East_TH.srf
Project Name: Gen. Char. for Site. Soil Rem.
Project #: 20300-PSP-0011
Verified By: Curt Baumann/78329
Date Verified: 04/07/05
Support Data: A9P3_P1_East_HPGe_100cm.xls

6019

Figure 3-42. A9P3, Ramp to 54" Casing Pipe Phase 2 Confirmation - Total Uranium

Moisture Corrected Total Uranium
Field of View to Scale
HPGe DET#: 30699
Measurement Dates: 04/04/05



HPGe @ 100cm
Total U (ppm)

- ○ 0 to 50
- ○ 50 to 100
- ○ 100 to 150
- ○ 150 to 400
- ● 400 to 9999

RTIMP DWG Title: A9P3_P1_East_TU.srf
Project Name: Gen. Char. for Site. Soil Rem.
Project #: 20300-PSP-0011
Verified By: Curt Baumann/78329
Date Verified: 04/07/05
Support Data: A9P3_P1_East_HPGe_100cm.xls

4.0 ANALYTICAL METHODOLOGIES, DATA VALIDATION PROCESSES, AND DATA REDUCTION

4.1 ANALYTICAL METHODOLOGIES

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

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

4.1.1 Chemical Methods

Fluoride

Samples submitted for fluoride analysis were analyzed by ion chromatograph.

Hexavalent chromium

Samples submitted for hexavalent chromium were analyzed calorimetrically.

Metals

Samples submitted for arsenic, beryllium, cadmium, copper, lead, manganese, molybdenum, nickel, silver, and zinc were analyzed by inductively coupled plasma-mass spectrometry (ICP-MS).

Samples submitted for antimony were analyzed by ICP-MS unless matrix interferences were present then they were analyzed using inductively coupled plasma- atomic emission spectroscopy (ICP-AES).

Polychlorinated Biphenyl (PCBs)

Samples submitted for PCB analyses were analyzed by GC.

Volatile Organic Compounds (VOCs)

Samples submitted for VOC analyses were analyzed by gas chromatography/mass spectrometry (GC/MS).

4.1.2 Radiochemical Methods

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

Total Uranium

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

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

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

Cesium-137

Samples were analyzed by gamma spectrometry, and cesium-137 was quantified by measuring gamma rays emitted by members of its decay chain. The off-site laboratory used the same gamma ray emission lines and error weighted average methodology to calculate all certification results.

Radium-226

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

Radium-228

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

Isotopic Thorium

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

Technetium-99

Techentium-99 was quantified by using a liquid scintillation counter.

4.2 DATA VERIFICATION AND VALIDATION

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

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

The V&V process evaluated the following parameters:

- Specific field forms for sample collection and handling
- Chain of Custody forms
- Completeness of laboratory data deliverable.

The data validation process examined the analytical data to determine the validation qualifier of the results. General areas examined that apply to all the chemical data include the following:

- Holding Times
- Instrument calibrations
- Calculation of results
- Matrix spike/matrix spike duplicate recoveries
- Laboratory/field duplicate precision
- Field/Laboratory Blank contamination
- Dry weight correction for solid samples
- Correct detection limits reported
- Laboratory control sample recoveries and compliance with established limits.

Parameters unique to the evaluation of radiochemical analyses include:

- Calibration data for specific energies
- Background checks
- Relative Error ratios

- Detector efficiencies
- Background count correction.

For this project, all the radiological data were reviewed and validated for all criteria noted above. Per project requirements, a minimum of 10 percent of the certification data were validated to Level D. This validation included the same review process as for Level B, but included a systematic review of the raw data and recalculations. For A9PIII all of the analytical data from one CU was validated to Level D, while all remaining analytical data from the other eight CUs were validated to Level B.

Following V&V, qualifier codes were applied to specific data points, reflecting the level of confidence assigned to the particular datum. These codes included:

- No qualification; the positive result or detection limit is confident as reported

J Positive result is estimated or imprecise; data point is usable for decision-making purposes. Positive results less than the contract required reporting limit are also qualified in this manner

R Positive result or detection limit is considered unreliable; data point should not be used for decision-making purposes

U Undetected result at the stated limit of detection

UJ Undetected result; detection limit is considered estimated or imprecise; the data point is usable for decision-making purposes

N Positive result is tentatively identified - that is, there is some question regarding the actual identification and quantification of the result. Compound reported is best professional judgement of the interpretation of the supporting data, such as mass spectra. Caution must be exercised with the use of these data

NV Not Validated. The results for this sample were not validated

Z This result, or detection limit in this analysis is not the best one to use; another analysis (e.g., the dilution or re-analysis) contains a more confident and usable result.

The V&V of this data set did not identify any problems. All other results were either not qualified, qualified as a redundant analysis (Z), or qualified as estimated (J) and/or non-detects (U). No results were qualified as rejected (R).

4.3 DATA REDUCTION

Each sample used to support the A9PIII certification decision was entered in the SED with the following information:

Field Information

- Sample Identification Number - A unique number assigned to each discrete sample point
- Coordinate Information - Northing and Easting locations.

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

1. All of the data for each CU were queried from SED. All of the data were used even if the CU had more than the minimum required data points.

2. The data from the validation fields were used for statistical calculations.

3. Data with a qualifier of R or Z was not used in the statistical calculations.

4. The higher of the two duplicate results was used in the statistical calculations.

5. One half on the non-detect (U or UJ) values were used in the statistical calculations.

Laboratory Information

For each sample result the following information is entered:

- Laboratory Result - The reported analytical value from the laboratory.

- Laboratory Qualifier - The qualifier reported from the lab. For radiological parameters non-detect values are assigned a U qualifier.

- Total Propagated Uncertainty (TPU) - The TPU is an estimate of the overall uncertainty associated with a measured or calculated result that has been derived from an evaluation of all factors that can influence a result, including both systematic and random sources of uncertainty. For both *in situ* and laboratory-based radioactivity measurements, factors such as the random nature of the radioactive decay process (i.e., counting uncertainty), the mass or volume of the "sample" being analyzed, the variation in radiation detection efficiency with the energy of the emitted radiation and the density and chemical composition of the sample, uncertainty in nuclear decay parameters used to convert counts to activity, and attenuation of the radiation must be considered to properly asses the overall uncertainty of the measured result.

- Units - The units in which the Laboratory Result is reported.

Validation Information

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

- Validation TPU - The TPU based on the validation process (applicable to radiological parameters only). The data Validation Section evaluates the reported TPU as described in the SCQ in Section 11.2 and Appendix D to assess the impact on the data quality and will qualify the data as estimated if the uncertainty is excessive.

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

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

5.0 CERTIFICATION EVALUATION AND CONCLUSIONS

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

5.1 CERTIFICATION RESULTS AND EVALUATION

The following sections discuss the analytical results and statistical analyses of the data for each CU in A9PIII.

A9P3-C01

In A9P3-C01, there were four above-FRL results for arsenic, nine above-FRL results for beryllium, three above-FRL results for copper, one above-FRL result for zinc, and two above-FRL results for radium-226 all of which were less than two times the FRL. Statistical analysis conducted on the arsenic, copper, zinc, and radium-226 results indicated that the CU met all of the certification criteria discussed in Section 2.2.4.

A statistical analysis conducted on the beryllium results indicated that the CU did not meet all of the certification criteria discussed in Section 2.2.4. The beryllium data for CU 1 underwent the a posteriori test after the preliminary data evaluation. The a posteriori test indicated that additional samples were needed to differentiate between the mean and the FRL (see Appendix A). However, it was determined that the mean of the beryllium results were less than the mean of the corresponding background concentration based on a population-to-population comparison (see Appendix A A9P3-C01a Background). Therefore, this CU is not significantly different than subsurface background conditions. Since the first requirement of certification was met for the CU, the hotspot criterion was met with no samples being greater than two times the FRL, and concentrations are within the subsurface background conditions for beryllium, DOE concludes that this area is still protective of human health and does not require remediation.

Final certification data and statistics are presented in Appendix A.

A9P3-C02

In A9P3-C02 there was one above-FRL result for beryllium, one above-FRL result for copper, one above-FRL result for zinc, and one above-FRL results for radium-226 all of which were less than two times the FRL. Statistical analysis conducted on these results indicated that the CU met all of the certification criteria discussed in Section 2.2.4. Final certification data and statistics are presented in Appendix A.

A9P3-C03

In A9P3-C03, there were two above-FRL results for beryllium and two above-FRL results for copper all of which were less than two times the FRL. One sample collected within the eastern end of the 54-inch casing pipe was above-FRL for technetium-99. The technetium-99 results from two confirmation samples taken in the same location were non-detects (i.e., below-FRL) and could not reproduce the original elevated result. An investigation of the original sample handling suggests that the original above-FRL result may have been a consequence of sample cross contamination at the laboratory; therefore, the original sample result is considered suspect and was not used in the statistical analysis of the data.

Statistical analysis conducted on beryllium and copper results indicated that the CU met all of the certification criteria discussed in Section 2.2.4. Final certification data and statistics are presented in Appendix A.

A9P3-C04

In A9P3-C04, there was one above-FRL results for arsenic, three above-FRL results for beryllium, two above-FRL results for copper, one above-FRL result for zinc, and one above-FRL result for radium-226 all of which were less than two times the FRL. Statistical analysis conducted on these results indicated that the CU met all of the certification criteria discussed in Section 2.2.4. Final certification data and statistics are presented in Appendix A.

A9P3-C05

Certification sampling locations within A9P3-C05 were collected from the surface of the area after the riprap was removed along the Great Miami River. In A9P3-C04, there were two above-FRL results for antimony, one above-FRL result for arsenic, one above-FRL result for beryllium, one above-FRL result for cadmium, one above-FRL result for copper, one above-FRL result for zinc, and two above-FRL results for aroclor-1254 all of which were less than two times the FRL. A statistical analysis of all of the data collected in A9P3-C05 demonstrated that all constituents of concern (passed the certification criteria with the exception of technetium-99, which failed the hotspot criteria. A review of the data and the sampling locations revealed that the failure was caused by two sampling locations, which were located within the sediment of the Great Miami River. The soil FRL for technetium-99 is 1.0 pCi/g whereas the sediment FRL is 200,000 pCi/g.

Sub-CUs A9P3-C05-9, A9P3-C05-12, A9P3-C05-13, A9P3-C05-14 (archive), A9P3-C05-15, and A9P3-C05-16 were located in the sediment within the Great Miami River. Sub-CUs A9P3-C05-1 (archive), A9P3-C05-2, A9P3-C05-3, A9P3-C05-4, A9P3-C05-5, A9P3-C05-6, A9P3-C05-7 (archive), A9P3-C05-8 (archive) were located in the soil on the riverbank. In order to perform a more accurate

statistical analysis on the technetium-99 data, this CU has been split into two CUs [A9P3-C05a (soil on the riverbank) and A9P3-C05b (sediment in the river)].

Statistical analysis was conducted on each newly defined CU (i.e., CUs A9P3-C05a and A9P3-C05b) that indicated that they met all of the certification criteria discussed in Section 2.2.4. Additionally, because there were fewer sampling locations in these two CUs, an *a posteriori* test was run on each of the two CUs, which demonstrated that enough samples were collected to make the certification decision. Final certification data and statistics are presented in Appendix A.

Additionally, radiological controls personnel directly frisked all accessible areas of the sheet pilings. Neither fixed nor removable contamination was detected; therefore, the sheet pilings are considered certified clean. The Release Justification for A9PIII Abandoned Outfall Structure Sheet Piles memorandum and the associated radiological survey results are presented in Appendix C.

A9P3-C06

In A9P3-C06, there was one above-FRL result for radium-226, which was less than two times the FRL. Statistical analysis conducted on these results indicated that the CU met all of the certification criteria discussed in Section 2.2.4. Final certification data and statistics are presented in Appendix A.

A9P3-C07

In A9P3-C07, there was one above-FRL result for arsenic and five above-FRL results for beryllium all of which were less than two times the FRL. Statistical analysis conducted on these results indicated that the CU met all of the certification criteria discussed in Section 2.2.4. Final certification data and statistics are presented in Appendix A.

A9P3-C08

In A9P3-C08, there were no above-FRL results. Final certification data are presented in Appendix A.

A9P3-C09

In A9P3-C09, there were three above-FRL results for technetium-99, which were less than two times the FRL. Statistical analysis conducted on these results indicated that the CU met all of the certification criteria discussed in Section 2.2.4. Final certification data and statistics are presented in Appendix A.

5.2 AREA 9, PHASE III CERTIFICATION CONCLUSIONS

Based on the certification analytical results, precertification data, and statistical analysis, DOE has determined that no further remedial actions are required in A9PIII and the certification activities for A9PIII are complete.

6.0 PROTECTION OF CERTIFIED AREAS

The area of certification is located outside the FCP boundaries. Therefore, FCP Procedure EP-0008 does not apply. The intent of protecting certified areas is to prevent recontamination by routine remedial work in adjacent areas. There is no future plan for remedial work near A9PIII that could potentially impact the certification status. No formal procedures will be implemented to protect A9PIII from recontamination other than the procedures that already exist, which cover fugitive dust emissions from the entire FCP boundary. No land use restrictions will be required.

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APPENDIX A

CERTIFICATION SAMPLES, ANALYTICAL RESULTS AND FINAL STATISTICS TABLES

APPENDIX A
STATISTICAL ABBREVIATIONS AND SYMBOLS

The procedure used to determine if the data are to be assumed to be either normally distributed or lognormally distributed is outlined in Section G.2.3 of Appendix G to the SEP. The second paragraph under "Step 3: Perform the Shapiro-Wilk Test to evaluate if the data are normally or lognormally distributed" states that "If the Shapiro-Wilk Test indicates both normal and lognormal distributions fit the data, the distribution with the highest p-value will be used in the Student's t-Test (Section G.2.2.2) to make the certification decision." Therefore, the distribution testing procedure is not a matter of transforming the data and then testing for lognormality only when the normality assumption fails as the comment seems to imply. The method is to test both normality and lognormality and select the distribution that "best" fits the data as defined by the test yielding the higher p-value above a minimum acceptable value. The minimum acceptable p-value for acceptance of a distribution was set at 0.05.

Abbreviations:

W-Statistic Probability - Shapiro-Wilk probability of the "better" fit – either normal or lognormal (note: a value less than 0.05 indicates that neither normality nor lognormality could be accepted, but the highest p-value is still shown.)

t-Test (N) - indicates that the normal distribution is best fit to data with a p-value greater than or equal to 0.05.

t-Test (LN) - indicates that the lognormal distribution is best fit to data with a p-value greater than or equal to 0.05.

Sign Test - the Sign test was used because one of the following situations occurred:
1. there were greater than 50 percent non-detects,
2. between 15 and 50 percent non-detects and data not symmetrically distributed,
3. less than 15 percent non-detects, but fails Shapiro-Wilk test for both normality and lognormality and data not symmetrically distributed.

Wilcoxon SR - the Wilcoxon Signed Rank procedure was used because of one of the following situations:
1. between 15 and 50 percent non-detects and data symmetrically distributed,
2. less than 15 percent non-detects, but fails Shapiro-Wilk test for both normality and lognormality and data symmetrically distributed.

Note: Data was considered to be "symmetrically distributed" if the Standardized Skewness had an Absolute Value of less than or equal to 2.00 (i.e., between -2.00 and 2.00).

Number of NDs - number of non-detects.

@ - maximum result was below the FRL indicating that no statistical result needed to be reported.

Certification Unit A9P3-C01

	Primary COCs					Secondary COCs									
SAMPLE_ID	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Cesium-137	Technetium-99	Antimony	Arsenic	Beryllium	Cadmium	Copper	Fluoride	Hexavalent Chromium	Lead
A9P3-C01-1	0.747 -	0.47 J	0.483 J	0.47 J	1.67 U	0.0272 U	0.262 U	0.062 UJ	3.47 -	0.266 -	0.262 -	10. J	3.02 J	0.0598 UJ	5.65 J
A9P3-C01-2	0.862 -	0.701 J	0.746 J	0.701 J	4.28 J	0.0306 U	0.385 U	0.0561 UJ	3.8 -	0.555 -	0.238 -	11. J	2.18 J	0.0607 UJ	8.14 J
A9P3-C01-3	0.842 -	0.57 -	0.561 -	0.57 -	3.13 -	0.0725 U	0.262 U	0.0539 UJ	3.83 -	0.657 J	0.283 -	13.5 J	1.97 J	0.0593 U	9.47 J
A9P3-C01-5	0.884 -	0.74 -	0.744 -	0.74 -	3.85 -	0.0307 U	0.336 U	0.0568 UJ	5.48 -	0.559 J	0.271 -	12.7 J	2.64 J	0.0619 U	8.69 J
A9P3-C01-6	0.845 -	0.635 -	0.649 -	0.635 -	1.22 U	0.0252 U	0.308 U	0.055 UJ	5.59 -	0.611 -	0.457 -	16.1 J	4.41 J	0.583 U	10.2 J
A9P3-C01-7	0.53 -	0.255 -	0.259 -	0.255 -	2.69 J	0.0184 U	0.329 -	0.052 J	3.67 -	0.143 -	0.283 -	10.2 J	0.945 J	0.603 J	4.75 J
A9P3-C01-9	1.12 J	0.988 J	1.09 -	0.988 J	6.12 -	0.0365 U	0.293 U	0.0568 UJ	9.28 -	0.707 -	0.38 -	18.3 J	2.73 J	0.619 U	16.8 J
A9P3-C01-9-D	1.81 J	1.24 J	1.26 -	1.24 J	9.23 -	0.0615 U	0.315 U	0.0576 UJ	10.5 -	0.791 -	0.461 -	22.8 J	2.4 J	0.614 U	18.9 J
A9P3-C01-10	1.4 -	0.8 -	0.796 -	0.8 -	4.71 J	0.0382 U	0.4 U	0.0724 J	10.9 -	0.64 -	0.462 -	20.4 J	3.3 J	0.625 U	15 J
A9P3-C01-11	1.62 -	0.953 -	0.951 -	0.953 -	7.09 -	0.0457 U	0.392 U	0.0591 UJ	12.0 J	0.654 -	0.399 -	20.6 -	2.21 J	0.667 U	14.8 J
A9P3-C01-13	0.528 -	0.339 -	0.345 -	0.339 -	1.49 -	0.0309 U	0.269 U	0.0569 UJ	5.52 -	0.291 -	0.258 -	10.4 J	1.68 J	0.574 U	10 J
A9P3-C01-14	0.44 -	0.191 -	0.195 -	0.191 -	1.46 U	0.0326 U	0.253 U	0.0507 UJ	2.84 -	0.123 -	0.182 J	4.2 J	0.865 J	0.529 U	3.35 J
A9P3-C01-15	0.791 -	0.277 -	0.277 -	0.277 -	1.72 U	0.0396 U	0.264 U	0.0509 UJ	4.72 -	0.186 -	0.235 -	8.2 J	1.04 J	0.558 U	4.61 J
A9P3-C01-17	0.732 -	0.706 -	0.726 -	0.706 -	3.78 -	0.0399 U	0.248 U	0.0553 UJ	3.25 -	0.663 -	0.423 -	14.8 J	2.18 J	0.0607 U	9.08 J
A9P3-C01-18	0.929 -	0.767 -	0.765 -	0.767 -	4. -	0.0593 U	0.366 U	0.4 UJ	6.6 -	0.7 -	0.44 -	15.5 J	1.25 J	0.766 J	10.2 J
A9P3-C01-19	0.801 -	0.457 -	0.487 -	0.457 -	2.28 J	0.0304 U	0.387 U	0.383 UJ	6.1 -	0.44 -	0.42 -	12.8 J	0.938 J	0.603 UJ	7.7 J
A9P3-C01-B1C	0.762 -	0.525 -	0.612 J	0.525 -	2.76 -	0.0107 U	0.271 U	0.0554 UJ	4.01 -	0.598 -	0.29 -	13.4 J	3.44 J	0.0613 U	8.83 J
A9P3-C01-B1N	1.09 -	0.902 -	1.05 J	0.902 -	4.27 -	0.013 U	0.219 U	0.0595 UJ	8.22 -	0.812 -	0.393 -	16.6 J	3.06 J	0.065 U	12.6 J
A9P3-C01-B1S	1.3 -	1.1 -	1.12 J	1.1 -	4.06 -	0.0229 U	0.22 U	0.0626 UJ	9.88 -	0.829 -	0.523 -	17.8 J	2.82 J	0.0686 U	15.7 J
Limit	1.5	1.4	1.5	1.4	82	0.82	1	0.61	9.6	0.62	0.91	20	850	11	400
Units	pCi/g	pCi/g	pCi/g	pCi/g	mg/kg	pCi/g	pCi/g	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%
Max. Result	1.81	1.24	1.26	1.24	9.23	0.0725 U	0.329	0.0724	12.0	0.829	0.523	22.8	4.41	0.766	18.9
Max. >= Limit	Yes	No	No	No	No	No	No	No	Yes	Yes	No	Yes	No	No	No
W-statistic Prob. #	47.5% (LN)	--	--	--	--	--	--	--	27.6% (LN)	4.9% (N)	--	97.0% (N)	--	--	--
Test Procedure	Lognormal	--	--	--	--	--	--	--	Lognormal	Wilcoxon	--	Normal	--	--	--
Sample Size	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18
Nondetects	0	0	0	0	4	18	17	14	0	0	0	0	0	16	0
% Nondetects	0%	0%	0%	0%	22%	100%	94%	78%	0%	0%	0%	0%	0%	89%	0%
Est. Mean*	0.942	--	--	--	--	--	--	--	6.15	0.605	--	13.9	--	--	--
UCL	1.12	--	--	--	--	--	--	--	7.24	0.657	--	15.4	--	--	--
Prob. > Limit	--	--	--	--	--	--	--	--	--	0.152	--	--	--	--	--
Pass / Fail	pass	--	--	--	--	--	--	--	pass	Fail *	--	pass	--	--	--
a posteriori Sample	5	--	--	--	--	--	--	--	4	35	--	4	--	--	--
Size calculation	Pass	--	--	--	--	--	--	--	Pass	Fail *	--	Pass	--	--	--

Note: Est. Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median)
The maximum value of the two duplicates was used in all statistical equations.
#: This is the highest reported probability of the Shapiro-Wilk W-statistic for tests for the validity of the normality assumption.
The test is performed on the raw data (untransformed) data (N) and the log-transformed data (LN) to test for lognormality.
* See Section 5.1 for discussion.

Certification Unit A9P3-C01

(cont.)

	Secondary COCs										
SAMPLE_ID	Manganese	Molybdenum	Nickel	Silver	Zinc	Carbon Tetrachloride	Tetrachloroethene	1,1,1-Trichloroethane	1,1-Dichloroethene	Aroclor-1254	Aroclor-1260
A9P3-C01-1	321 -	1.8 -	10.4 -	0.0516 J	21.7 -	0.00088 U	0.0009 UJ	0.0009 U	0.0009 U	0.0037 U	0.0037 U
A9P3-C01-2	490 -	1.33 -	15.3 -	0.0428 J	38.2 J	0.00091 U	0.0009 U	0.0009 U	0.0009 U	0.0038 U	0.0038 U
A9P3-C01-3	494 -	2.02 J	19. J	0.049 J	45. J	0.0009 U	0.0009 UJ	0.0009 U	0.0009 U	0.0037 U	0.0037 UJ
A9P3-C01-5	523 -	1.32 J	17.2 J	0.0443 J	57.9 J	0.0009 U	0.0009 U	0.0009 U	0.0009 U	0.0038 U	0.0038 UJ
A9P3-C01-6	610 -	2.13 -	17 J	0.0462 J	49.6 -	0.0009 U	0.0009 U	0.0009 U	0.0009 U	0.0038 U	0.0038 U
A9P3-C01-7	314 -	1.36 -	9.28 J	0.027 J	22.2 -	0.001 U	0.001 U	0.001 U	0.001 U	0.0035 U	0.0035 U
A9P3-C01-9	859 -	1.95 -	20.9 J	0.0564 J	68.9 -	0.0009 U	0.0009 U	0.0009 U	0.0009 U	0.0038 U	0.0038 U
A9P3-C01-9-D	847 -	2.97 -	31.5 J	0.0632 J	78.8 -	0.001 U	0.001 U	0.001 U	0.001 U	0.0038 U	0.0038 U
A9P3-C01-10	669 J	3.12 -	22.4 J	0.0479 J	76.1 -	0.001 U	0.001 U	0.001 U	0.001 U	0.0056 -	0.0039 U
A9P3-C01-11	459 -	3.16 -	21.1 -	0.0525 J	83 -	0.00092 U	0.0009 U	0.0009 U	0.0005 J	0.004 U	0.004 U
A9P3-C01-13	338 J	1.69 -	11.7 -	0.0344 J	30.7 -	0.001 U	0.001 U	0.001 U	0.001 U	0.0038 U	0.0038 U
A9P3-C01-14	113 J	1.31 -	4 -	0.0187 J	9.9 -	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0034 U	0.0034 U
A9P3-C01-15	200 J	2.14 -	9.4 -	0.0236 J	22.5 J	0.0012 U	0.0012 U	0.0012 U	0.0012 U	0.0034 U	0.0034 U
A9P3-C01-17	406 J	1.61 -	20.1 J	0.052 J	52.4 -	0.0009 U	0.0009 U	0.0009 U	0.0009 U	0.0037 U	0.0037 U
A9P3-C01-18	421 -	1.5 -	20.2 J	0.057 J	56.1 J	0.0009 U	0.0009 U	0.0009 U	0.0012 -	0.0039 U	0.0039 U
A9P3-C01-19	469 -	2.5 -	16.3 J	0.043 J	37.9 J	0.0009 U	0.0009 U	0.0009 U	0.0035 -	0.0037 U	0.0037 U
A9P3-C01-B1C	432 J	1.81 -	18.2 J	0.0512 J	44.2 -	0.001 U	0.001 U	0.001 U	0.001 U	0.0038 U	0.0038 U
A9P3-C01-B1N	387 J	1.11 -	19.4 J	0.0903 J	75. -	0.001 U	0.001 U	0.001 U	0.001 U	0.0041 U	0.0041 U
A9P3-C01-B1S	689 J	1.44 -	23.4 J	0.0927 J	75. -	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0042 U	0.0042 U
Limit	1400	13	34	1	82	91	1000	190	59	40	40
Units	mg/kg	ug/kg	ug/kg	ug/kg	mg/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Conf. Level	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%
Max. Result	859	3.16	31.5	0.0927	83	0.0012 U	0.0012 U	0.0012 U	0.0035	0.0056	0.0042 U
Max. >= Limit	No	No	No	No	Yes	No	No	No	No	No	No
W-statistic Prob. #	--	--	--	--	40.7% (N)	--	--	--	--	--	--
Test Procedure	--	--	--	--	Normal	--	--	--	--	--	--
Sample Size	18	18	18	18	18	18	18	18	18	18	18
Nondetects	0	0	0	0	0	18	18	18	15	17	18
% Nondetects	0%	0%	0%	0%	0%	100%	100%	100%	83%	94%	100%
Est. Mean*	--	--	--	--	48.7	--	--	--	--	--	--
UCL	--	--	--	--	55.7	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	pass	--	--	--	--	--	--
a posteriori Sample	--	--	--	--	3	--	--	--	--	--	--
Size calculation	--	--	--	--	Pass	--	--	--	--	--	--

Note: Est. Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median)
The maximum value of the two duplicates was used in all statistical equations.
#: This is the highest reported probability of the Shapiro-Wilk W-statistic for tests for the validity of the normality assumption.
The test is performed on the raw data (untransformed) data (N) and the log-transformed data (LN) to test for lognormality.
* See Section 5.1 for discussion.

Certification Unit A9P3-C01a Beryllium vs. Background

Beryllium (mg/kg) Subsurface

	A9P3-C01	Background
Samples	18	140
Average	0.529	0.775
Median	0.605	0.745
Std. Dev.	0.231	0.36
Minimum	0.123	0.220
Maximum	0.829	3.05
Lower Quartile	0.291	0.540
Upper Quartile	0.660	0.940
UCL-Mean (90%)	0.601	0.814
t-Test Prob.	**0.0053**	
F-test (SD) Prob.	**0.0393**	
W-test (median) P	**0.0036**	
K-S (distr.) Prob.	**0.0089**	

INTERPRETATION
A9P3 < Background at the 99% level
Std. Dev. Dissimilar
A9P3< Background at the 99% level
A9P3 < Background at the 99% level

CONCLUSION: There is strong evidence that A9P3 is less than Background.

Note: Back is lognormal; A9P3 is normal; F-test (equality of std. Dev.) fails - best test is W-test, but, results are overwhelming any way you look at it.

Certification Unit A9P3-C02

	Primary COCs					Secondary COCs									
SAMPLE_ID	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Cesium-137	Technetium-99	Antimony	Arsenic	Beryllium	Cadmium	Copper	Fluoride	Hexavalent Chromium	Lead
A9P3-C02-1	0.483 -	0.198 -	0.221 -	0.198 -	2.83 -	0.022 U	0.244 U	0.0959 U	4.47 -	0.147 -	0.207 -	8.8 -	0.737 J	0.555 U	4.04 J
A9P3-C02-2	0.573 -	0.264 -	0.277 -	0.264 -	2.37 -	0.0295 U	0.24 U	0.0796 U	3.95 -	0.154 -	0.202 -	10.3 -	0.844 J	0.538 U	4.24 J
A9P3-C02-3	0.577 -	0.236 -	0.236 -	0.236 -	2.51 -	0.0321 U	0.251 U	0.106 U	4.82 -	0.167 -	0.232 -	8.5 -	1.05 J	0.539 U	4.63 J
A9P3-C02-5	0.488 -	0.243 -	0.25 -	0.243 -	2.75 -	0.0367 U	0.372 U	0.0851 U	4.86 J	0.262 -	0.265 -	11.4 J	1.37 J	0.577 U	6.52 J
A9P3-C02-5-D	0.462 -	0.191 -	0.191 -	0.191 -	0.819 U	0.0306 U	0.383 U	0.123 U	4.95 J	0.15 -	0.231 -	9.5 J	1.06 J	0.545 U	3.46 J
A9P3-C02-6	0.458 -	0.223 -	0.227 -	0.223 -	1.72 -	0.0195 U	0.384 U	0.0696 U	4.71 J	0.186 -	0.214 -	9.1 J	1.21 J	0.516 U	4.82 J
A9P3-C02-7	0.721 -	0.261 -	0.272 -	0.261 -	1.84 -	0.0356 U	0.281 U	0.0694 J	5.47 -	0.229 -	0.26 -	11.7 -	1.48 J	0.569 U	5.47 J
A9P3-C02-9	0.463 -	0.282 -	0.295 -	0.282 -	1.54 -	0.0214 U	0.401 U	0.0714 U	3.7 J	0.185 -	0.226 -	10 J	0.812 J	0.877 J	4.32 J
A9P3-C02-10	0.511 -	0.305 -	0.303 -	0.305 -	2.23 -	0.0183 U	0.294 U	0.071 U	2.96 J	0.13 -	0.166 J	9.2 J	0.514 UJ	0.536 U	3.25 J
A9P3-C02-11	0.779 -	0.296 -	0.307 -	0.296 -	3.48 -	0.0245 U	0.296 U	0.11 U	5.19 J	0.262 -	0.234 -	13.4 J	0.572 UJ	0.538 U	6.74 J
A9P3-C02-13	0.753 -	0.529 -	0.53 -	0.529 -	2.68 -	0.0391 U	0.471 -	0.0551 UJ	6.4 -	0.42 -	0.32 -	11.9 J	2.17 -	0.608 U	6.67 -
A9P3-C02-14	1.37 -	0.717 -	0.703 -	0.717 -	9.72 -	0.0334 U	0.376 -	0.0576 UJ	5.9 -	0.49 -	0.38 -	14.8 J	2.68 -	0.602 U	12.3 -
A9P3-C02-15	2.12 -	1.21 -	1.22 -	1.21 -	5.63 -	0.0671 U	0.362 U	0.0617 UJ	9.37 -	0.844 -	0.507 -	23.2 J	2.7 -	0.678 U	16.8 J
Limit	1.5	1.4	1.5	1.4	82	0.82	1	0.61	9.6	0.62	0.91	20	850	11	400
Units	pCi/g	pCi/g	pCi/g	pCi/g	mg/kg	pCi/g	pCi/g	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%
Max. Result	2.12	1.21	1.22	1.21	9.72	0.0671 U	0.471	0.0694	9.4	0.844	0.507	23.2	2.7	0.877	16.8
Max. >= Limit	Yes	No	No	No	No	No	No	No	No	Yes	No	Yes	No	No	No
W-statistic Prob. #	< 0.01% (LN)	--	--	--	--	--	--	--	--	18.9% (LN)	--	6.2% (LN)	--	--	--
Test Procedure	Median (Sign)	--	--	--	--	--	--	--	--	Lognormal	--	Lognormal	--	--	--
Sample Size	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Nondetects	0	0	0	0	0	12	10	11	0	0	0	0	2	11	0
% Nondetects	0%	0%	0%	0%	0%	100%	83%	92%	0%	0%	0%	0%	17%	92%	0%
Est. Mean*	0.575	--	--	--	--	--	--	--	--	0.287	--	11.8	--	--	--
UCL	0.779	--	--	--	--	--	--	--	--	0.378	--	13.4	--	--	--
Prob. > Limit	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Pass / Fail	Pass	--	--	--	--	--	--	--	--	pass	--	pass	--	--	--
a posteriori Sampl	7	--	--	--	--	--	--	--	--	3	--	2	--	--	--
Size calculation	Pass	--	--	--	--	--	--	--	--	Pass	--	Pass	--	--	--

Note: Est. Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median)
The maximum value of the two duplicates was used in all statistical equations.
#: This is the highest reported probability of the Shapiro-Wilk W-statistic for tests for the validity of the normality assumption.
The test is performed on the raw data (untransformed) data (N) and the log-transformed data (LN) to test for lognormality.
* See Section 5.1 for discussion

Certification Unit A9P3-C02

(cont.)

	Secondary COCs										
SAMPLE_ID	Manganese	Molybdenum	Nickel	Silver	Zinc	Carbon Tetrachloride	Tetrachloroethene	1,1,1-Trichloroethane	1,1-Dichloroethene	Aroclor-1254	Aroclor-1260
A9P3-C02-1	227 J	1.54 -	8.8 J	0.0253 J	20.2 J	0.001 U	0.001 U	0.001 U	0.001 U	0.0034 U	0.0034 U
A9P3-C02-2	254 J	1.68 -	10.6 J	0.0236 J	29.1 J	0.001 U	0.001 U	0.001 U	0.001 U	0.0039 -	0.0034 U
A9P3-C02-3	214 J	1.39 -	7.9 J	0.0233 J	24.9 J	0.0009 U	0.0009 U	0.0009 U	0.0009 U	0.0035 U	0.0035 U
A9P3-C02-5	330 J	1.53 -	10.5 J	0.0291 J	33.2 -	0.001 U	0.001 U	0.001 U	0.001 U	0.0035 U	0.0035 U
A9P3-C02-5-D	299 J	1.61 -	8.8 J	0.0266 J	29.2 -	0.001 U	0.001 U	0.001 U	0.001 U	0.0035 U	0.0035 U
A9P3-C02-6	218 J	1.22 -	8.7 J	0.0281 J	26.5 -	0.001 U	0.001 U	0.001 U	0.001 U	0.0034 U	0.0034 U
A9P3-C02-7	165 J	2.25 -	9.31 -	0.0278 J	29.3 -	0.0012 U	0.0012 U	0.0012 U	0.0012 U	0.0035 U	0.0035 U
A9P3-C02-9	277 J	1.29 -	10.6 J	0.0288 J	30.8 -	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0035 U	0.0035 U
A9P3-C02-10	164 J	1.31 -	5.9 J	0.0221 J	22.7 -	0.001 U	0.001 U	0.001 U	0.001 U	0.0035 U	0.0035 U
A9P3-C02-11	123 J	1.86 -	10.3 J	0.0282 J	31.3 -	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0036 U	0.0036 U
A9P3-C02-13	535 J	1 -	16.5 J	0.034 -	46.8 J	0.0009 U	0.0009 U	0.0009 U	0.0009 U	0.0037 U	0.0037 U
A9P3-C02-14	518 J	1.6 -	15 J	0.052 -	58.1 J	0.0009 U	0.0009 U	0.0009 U	0.0057 -	0.0039 U	0.0039 U
A9P3-C02-15	649 J	2.28 -	24.9 J	0.0723 J	89.3 -	0.001 U	0.001 U	0.001 U	0.0006 J	0.0014 J	0.0041 U
Limit	1400	13	34	1	82	91	1000	190	59	40	40
Units	mg/kg	ug/kg	ug/kg	ug/kg	mg/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Conf. Level	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%
Max. Result	649	2.28	24.9	0.0723	89.3	0.0012 U	0.0012 U	0.0012 U	0.0057	0.0039	0.0041 U
Max. >= Limit	No	No	No	No	Yes	No	No	No	No	No	No
W-statistic Prob. #	--	--	--	--	9.3% (LN)	--	--	--	--	--	--
Test Procedure	--	--	--	--	Lognormal	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12	12	12	12	12
Nondetects	0	0	0	0	0	12	12	12	10	10	12
% Nondetects	0%	0%	0%	0%	0%	100%	100%	100%	83%	83%	100%
Est. Mean*	--	--	--	--	36.7	--	--	--	--	--	--
UCL	--	--	--	--	44.5	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	pass	--	--	--	--	--	--
a posteriori Sample	--	--	--	--	2	--	--	--	--	--	--
Size calculation	--	--	--	--	Pass	--	--	--	--	--	--

Note: Est. Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median)
The maximum value of the two duplicates was used in all statistical equations.
#: This is the highest reported probability of the Shapiro-Wilk W-statistic for tests for the validity of the normality assumption.
The test is performed on the raw data (untransformed) data (N) and the log-transformed data (LN) to test for lognormality.
* See Section 5.1 for discussion

Certification Unit A9P3-C03

	Primary COCs					Secondary COCs									
SAMPLE_ID	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Cesium-137	Technetium-99	Antimony	Arsenic	Beryllium	Cadmium	Copper	Fluoride	Hexavalent Chromium	Lead
A9P3-C03-1	1.46 -	0.895 -	0.864 -	0.895 -	3.02 -	0.0523 U	0.324 U	0.0603 UJ	7.32 -	0.723 -	0.522 -	18.4 J	3.1 -	0.681 J	14.7 J
A9P3-C03-2	1.2 -	0.757 -	0.757 -	0.757 -	4.57 -	0.0476 U	0.305 U	0.0584 UJ	4.84 -	0.472 -	0.36 -	12.2 J	2.33 -	0.619 U	12.2 J
A9P3-C03-3	0.355 -	0.185 -	0.174 -	0.185 -	2 -	0.0197 U	0.285 U	0.0515 U	5.66 J	0.166 -	0.17 J	29.2 J	0.822 J	0.552 U	4.16 J
A9P3-C03-5	1.05 -	0.915 -	0.919 -	0.915 -	4.57 -	0.0358 U	0.44 U	0.0633 U	7.33 J	0.8 -	0.766 -	20.8 J	2.23 J	0.658 U	14.4 J
A9P3-C03-6	0.382 -	0.149 -	0.149 -	0.149 -	1.35 -	0.0228 U	0.287 U	0.0598 U	3.72 -	0.109 J	0.144 J	4.1 J	0.762 J	0.91 J	2.22 J
A9P3-C03-7	0.411 -	0.241 -	0.246 -	0.241 -	1.14 -	0.0233 U	0.274 U	0.0514 U	2.58 -	0.0999 -	0.134 J	3.83 J	0.99 J	0.966 J	1.97 J
A9P3-C03-9	0.344 -	0.195 -	0.203 -	0.195 -	1.15 U	0.0263 U	0.318 U	0.052 U	2.95 -	0.157 -	0.197 J	3.3 J	1.12 -	0.542 U	2.64 J
A9P3-C03-10	0.524 -	0.318 -	0.344 -	0.318 -	1.95 -	0.0238 U	0.334 U	0.0539 UJ	3.19 -	0.172 -	0.249 -	5 J	1.01 -	0.565 U	3.25 J
A9P3-C03-11	0.411 -	0.238 -	0.241 -	0.238 -	1.1 U	0.0276 U	0.336 U	0.0518 UJ	2.64 -	0.107 -	0.185 J	5.9 J	0.888 J	0.535 U	2.5 J
A9P3-C03-13	0.424 J	0.259 J	0.255 -	0.259 J	1.4 U	0.0327 U	0.317 U	0.0507 UJ	2.78 -	0.101 -	0.138 J	3 J	0.664 J	0.542 U	1.64 J
A9P3-C03-14	0.309 J	0.217 J	0.212 -	0.217 J	1.71 -	0.0305 U	0.319 U	0.0511 UJ	1.84 -	0.098 -	0.113 J	2.7 J	0.744 J	0.556 U	1.98 J
A9P3-C03-14-D	0.445 J	0.286 J	0.293 -	0.286 J	2.59 -	0.035 U	0.294 U	0.0504 UJ	1.8 -	0.0932 -	0.122 J	2.9 J	0.802 J	0.545 U	1.91 J
A9P3-C03-15	0.645 -	0.371 -	0.398 -	0.371 -	1.35 -	0.0191 U	0.249 U	0.0568 UJ	2.9 -	0.228 -	0.244 -	5.7 -	1.16 -	0.597 U	4.42 J
A9P3-C03-17	0.366 -	0.24 -	0.23 -	0.24 -	1.43 U	0.0199 U	0.379 U	0.344 U	1.75 -	0.202 -	0.175 J	5.66 -	0.572 U	0.55 U	6.34 J
A9P3-C03-18	0.507 -	0.38 -	0.387 -	0.38 -	3.5 -	0.0331 U	0.392 U	0.332 U	1.64 -	0.38 -	0.123 J	4.76 -	0.55 U	0.544 U	3.06 J
A9P3-C03-19							0.472 U	0.187 U	5.81 J	0.329 -	0.203 -	6.4 -	0.337 J	0.0413 J	4.91 J
A9P3-E128-SM-1	1.08 -	0.494 -	0.512 -	0.494 -	3.4 U	0.0196 U									
A9P3-C03-20W							0.297 U								
A9P3-C03-21W							0.31 U								
A9P3-C03-22E							0.297 U								
Limit	1.5	1.4	1.5	1.4	82	0.82	1	0.61	9.6	0.62	0.91	20	850	11	400
Units	pCi/g	pCi/g	pCi/g	pCi/g	mg/kg	pCi/g	pCi/g	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%
Max. Result	1.46	0.915	0.919	0.915	4.57	0.0523 U	0.472 U	0.344 U	7.33	0.8	0.766	29.2	3.1	0.966	14.7
Max. >= Limit	No	No	No	No	No	No	No	No	No	Yes	No	Yes	No	No	No
W-statistic Prob. #	--	--	--	--	--	--	--	--	--	8.3% (LN)	--	4.2% (LN)	--	--	--
Test Procedure	--	--	--	--	--	--	--	--	--	Lognormal	--	Median (Sign)	--	--	--
Sample Size	15	15	15	15	15	15	18	15	15	15	15	15	15	15	15
Nondetects	0	0	0	0	5	15	18	15	0	0	0	0	2	11	0
% Nondetects	0%	0%	0%	0%	33%	100%	100%	100%	0%	0%	0%	0%	13%	73%	0%
Est. Mean*	--	--	--	--	--	--	--	--	--	0.275	--	5.7	--	--	--
UCL	--	--	--	--	--	--	--	--	--	0.383	--	6.4	--	--	--
Prob. > Limit	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--	--	--	pass	--	Pass	--	--	--
a posteriori Sampl	--	--	--	--	--	--	--	--	--	3	--	7	--	--	--
Size calculation	--	--	--	--	--	--	--	--	--	Pass	--	Pass	--	--	--

Note: Est. Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median)
The maximum value of the two duplicates was used in all statistical equations.
#: This is the highest reported probability of the Shapiro-Wilk W-statistic for tests for the validity of the normality assumption.
The test is performed on the raw data (untransformed) data (N) and the log-transformed data (LN) to test for lognormality.
* See Section 5.1 for discussion

Certification Unit A9P3-C03

(cont.)

	Secondary COCs										
SAMPLE_ID	Manganese	Molybdenum	Nickel	Silver	Zinc	Carbon Tetrachloride	Tetrachloroethene	1,1,1-Trichloroethane	1,1-Dichloroethene	Aroclor-1254	Aroclor-1260
A9P3-C03-1	672 J	1.44 -	21.7 J	0.0675 J	73.5 -	0.0009 U	0.0009 U	0.0009 U	0.0009 J	0.0022 J	0.0015 J
A9P3-C03-2	467 J	0.982 J	15.1 J	0.0533 J	47.9 -	0.001 U	0.001 U	0.001 U	0.002 -	0.006 -	0.003 J
A9P3-C03-3	239 J	0.834 J	6.1 J	0.0187 J	29.7 -	0.001 U	0.001 U	0.001 U	0.001 U	0.0035 U	0.0035 U
A9P3-C03-5	772 J	1.16 -	21.1 J	0.0752 J	77.4 -	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0043 U	0.0043 U
A9P3-C03-6	307 J	0.497 J	8.9 J	0.0148 J	10.5 J	0.001 U	0.001 U	0.001 U	0.001 U	0.002 J	0.0035 U
A9P3-C03-7	238 J	0.471 J	7 J	0.0187 J	13.8 J	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0035 U	0.0035 U
A9P3-C03-9	182 -	0.444 J	7.3 J	0.0269 J	13.8 J	0.001 U	0.001 U	0.001 U	0.001 U	0.0035 U	0.0035 U
A9P3-C03-10	300 -	0.542 J	8.9 J	0.0323 J	17 J	0.001 U	0.001 U	0.001 U	0.001 U	0.0036 U	0.0036 U
A9P3-C03-11	180 -	0.36 J	7.1 J	0.0205 J	13 J	0.001 U	0.001 U	0.001 U	0.001 U	0.0035 U	0.0035 U
A9P3-C03-13	289 -	0.407 J	6.2 J	0.0114 J	9.9 J	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0034 U	0.0034 U
A9P3-C03-14	170 -	0.367 J	5.2 J	0.0164 J	10.8 J	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0034 U	0.0034 U
A9P3-C03-14-D	193 -	0.34 J	5.5 J	0.0157 J	10.6 J	0.001 U	0.001 U	0.001 U	0.001 U	0.0034 U	0.0034 U
A9P3-C03-15	271 J	0.639 J	8.6 J	0.0254 J	21.4 J	0.0009 U	0.0009 U	0.0009 U	0.0009 U	0.0038 U	0.0038 U
A9P3-C03-17	166 J	0.705 J	7.66 -	0.253 U	24.1 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 J	0.0035 U
A9P3-C03-18	170 J	0.593 J	8.15 -	0.244 U	16.4 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0017 J	0.0035 U
A9P3-C03-19	417 J	0.808 J	9.64 -	0.214 U	21.1 -	0.0009 U	0.0009 U	0.0009 U	0.0008 J	0.0009 J	0.0038 U
A9P3-E128-SM-1											
A9P3-C03-20W											
A9P3-C03-21W											
A9P3-C03-22E											
Limit	1400	13	34	1	82	91	1000	190	59	40	40
Units	mg/kg	ug/kg	ug/kg	ug/kg	mg/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Conf. Level	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%
Max. Result	772	1.44	21.7	0.253 U	77.4	0.0011 U	0.0011 U	0.0011 U	0.002	0.006	0.003
Max. >= Limit	No	No	No	No	No	No	No	No	No	No	No
W-statistic Prob. #	--	--	--	--	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--	--	--	--	--
Sample Size	15	15	15	15	15	15	15	15	15	15	15
Nondetects	0	0	0	3	2	15	15	15	11	9	13
% Nondetects	0%	0%	0%	20%	13%	100%	100%	100%	73%	60%	87%
Est. Mean*	--	--	--	--	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--	--	--	--	--
a posteriori Sampl	--	--	--	--	--	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--	--	--	--	--

Note: Est. Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median)
The maximum value of the two duplicates was used in all statistical equations.
#: This is the highest reported probability of the Shapiro-Wilk W-statistic for tests for the validity of the normality assumption.
The test is performed on the raw data (untransformed) data (N) and the log-transformed data (LN) to test for lognormality.
* See Section 5.1 for discussion

Certification Unit A9P3-C04

	Primary COCs					Secondary COCs									
SAMPLE_ID	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Cesium-137	Technetium-99	Antimony	Arsenic	Beryllium	Cadmium	Copper	Fluoride	Hexavalent Chromium	Lead
A9P3-C04-1	1.33 -	0.633 -	0.634 -	0.633 -	2.08 U	0.0436 U	0.412 -	0.0761 U	7.55 J	0.596 -	0.484 U	15.9 J	1.83 J	0.635 J	14.3 J
A9P3-C04-3	0.547 -	0.275 -	0.278 -	0.275 -	1.52 U	0.0362 U	0.342 U	0.0713 U	6.11 J	0.385 -	0.264 U	10.3 J	0.985 J	0.586 U	9.21 J
A9P3-C04-4	1.05 -	0.54 -	0.538 -	0.54 -	4.67 J	0.0561 -	0.383 U	0.0541 U	6.51 J	0.552 -	0.371 U	17.7 J	1.64 J	0.596 U	11.9 J
A9P3-C04-5	1.23 -	0.66 -	0.675 -	0.66 -	4.17 J	0.0953 -	0.389 U	0.0541 U	7.45 J	0.674 -	0.516 U	16.1 J	1.67 J	0.575 U	20.5 J
A9P3-C04-6	0.955 -	0.584 -	0.607 -	0.584 -	2.78 J	0.049 U	0.362 U	0.0547 UJ	4.25 J	0.313 -	0.205 U	11.5 J	0.896 J	0.561 U	8.41 J
A9P3-C04-8	0.777 -	0.557 -	0.552 -	0.557 -	5.13 J	0.0698 -	0.751 -	0.0513 UJ	6.61 J	0.491 -	0.354 U	15.8 J	2.25 J	0.749 J	13.1 J
A9P3-C04-9	1.39 -	0.767 -	0.75 -	0.767 -	4.84 J	0.051 U	0.443 U	0.057 UJ	7.06 J	0.556 -	0.365 U	17.5 J	1.25 J	0.909 J	15.4 J
A9P3-C04-9-D	1.31 -	0.71 -	0.743 -	0.71 -	2.37 U	0.0479 U	0.361 U	0.0971 U	7.29 J	0.579 -	0.373 U	19.1 J	1.21 J	1.4 -	15 J
A9P3-C04-11	0.704 -	0.407 -	0.393 -	0.407 -	2.81 J	0.0474 U	0.334 U	0.0534 UJ	5.05 J	0.403 -	0.256 U	8 J	1.1 J	0.597 U	8.36 J
A9P3-C04-12	1.18 -	0.783 -	0.773 -	0.783 -	5.19 J	0.178 -	0.392 U	0.0664 U	7.6 J	0.666 -	0.567 J	20.4 J	1.32 J	0.574 U	25.7 J
A9P3-C04-13	0.632 -	0.198 -	0.199 -	0.198 -	4.26 J	0.165 -	0.319 U	0.0861 U	4.45 J	0.256 -	0.285 U	8.1 J	1.44 J	0.534 U	19.1 J
A9P3-C04-14	1.61 -	0.957 -	0.955 -	0.957 -	6.73 J	0.13 -	0.407 U	0.079 U	10.2 J	0.875 -	0.679 J	26.1 J	1.8 J	0.641 J	36.4 J
A9P3-C04-15	0.617 -	0.369 -	0.446 -	0.369 -	2.28 J	0.0309 U	0.316 U	0.0548 U	5.46 J	0.419 -	0.358 U	14 J	1.24 J	0.588 U	9.71 J
A9P3-C04-17	0.611 -	0.376 -	0.384 -	0.376 -	2.62 -	0.0543 -	0.395 -	0.054 UJ	3.19 J	0.188 -	0.21 -	9 J	0.822 J	0.544 U	4.78 J
Limit	1.5	1.4	1.5	1.4	50	0.82	1	0.61	9.6	0.62	0.91	20	850	11	400
Units	mg/kg	pCi/g	pCi/g	pCi/g	mg/kg	pCi/g	pCi/g	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%
Max. Result	1.61	0.957	0.955	0.957	6.73	0.178	0.751	0.0861 U	10.2	0.875	0.679	26.1	2.25	1.4	36.4
Max. >= Limit	Yes	No	No	No	No	No	No	No	Yes	Yes	No	Yes	No	No	No
W-statistic Prob. #	34.3% (LN)	--	--	--	--	--	--	--	79.3% (N)	96.4% (N)	--	53.9% (LN)	--	--	--
Test Procedure	Lognormal	--	--	--	--	--	--	--	Normal	Normal	--	Lognormal	--	--	--
Sample Size	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13
Nondetects	0	0	0	0	2	5	10	13	0	0	10	0	0	9	0
% Nondetects	0%	0%	0%	0%	15%	38%	77%	100%	0%	0%	77%	0%	0%	69%	0%
Est. Mean*	0.977	--	--	--	--	--	--	--	6.29	0.492	--	14.9	--	--	--
UCL	1.21	--	--	--	--	--	--	--	6.98	0.564	--	17.4	--	--	--
Prob. > Limit	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Pass / Fail	pass	--	--	--	--	--	--	--	pass	pass	--	pass	--	--	--
a posteriori Sample	5	--	--	--	--	--	--	--	3	11	--	6	--	--	--
Size calculation	Pass	--	--	--	--	--	--	--	Pass	Pass	--	Pass	--	--	--

Note: Est. Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median)
The maximum value of the two duplicates was used in all statistical equations.
#: This is the highest reported probability of the Shapiro-Wilk W-statistic for tests for the validity of the normality assumption.
The test is performed on the raw data (untransformed) data (N) and the log-transformed data (LN) to test for lognormality.
* See Section 5.1 for discussion

Certification Unit A9P3-C04

(cont.)

	Secondary COCs										
SAMPLE_ID	Manganese	Molybdenum	Nickel	Silver	Zinc	Carbon Tetrachloride	Tetrachloroethene	1,1,1-Trichloroethane	1,1-Dichloroethene	Aroclor-1254	Aroclor-1260
A9P3-C04-1	644 -	2.06 -	18.8 J	0.0523 J	67.7 J	0.0009 U	0.0009 U	0.0009 U	0.0009 U	0.0112 U	0.0112 U
A9P3-C04-3	289 -	1.96 -	12.2 J	0.0315 J	47 J	0.0009 U	0.0009 U	0.0009 U	0.0009 U	0.0108 U	0.0108 U
A9P3-C04-4	517 -	1.76 -	18.6 J	0.0535 J	57.1 J	0.0009 U	0.0009 U	0.0009 U	0.0009 U	0.0108 U	0.0108 U
A9P3-C04-5	608 -	1.73 -	16.5 J	0.0716 J	75.1 J	0.001 U	0.001 U	0.001 U	0.001 U	0.0109 U	0.0109 U
A9P3-C04-6	322 -	1.5 -	13.2 J	0.0271 J	30.9 J	0.0009 U	0.0009 U	0.0009 U	0.0009 U	0.0109 U	0.0109 U
A9P3-C04-8	485 -	1.81 -	17.1 J	0.0472 J	54.7 J	0.0009 U	0.0009 U	0.0009 U	0.0009 U	0.0105 U	0.0105 U
A9P3-C04-9	516 -	1.83 -	18.3 J	0.0506 J	59.4 J	0.0009 U	0.0009 U	0.0009 U	0.0009 U	0.0114 U	0.0114 U
A9P3-C04-9-D	582 -	2.25 -	20.8 J	0.0515 J	60.7 J	0.0009 U	0.0009 U	0.0009 U	0.0009 U	0.0114 U	0.0114 U
A9P3-C04-11	375 -	1.33 -	10.8 J	0.0372 J	39.1 J	0.0009 U	0.0009 U	0.0009 U	0.0009 U	0.0109 U	0.0109 U
A9P3-C04-12	669 -	1.79 -	21.9 J	0.0858 J	78.2 J	0.0012 U	0.0012 U	0.0012 U	0.0012 U	0.0111 U	0.0111 U
A9P3-C04-13	390 -	1.62 -	9.8 J	0.0312 J	32.2 J	0.001 U	0.001 U	0.001 U	0.001 U	0.0103 U	0.0103 U
A9P3-C04-14	778 -	2.56 -	27.7 J	0.103 J	101 J	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.012 U	0.012 U
A9P3-C04-15	764 -	1.52 -	16.7 J	0.0427 J	43.4 J	0.001 U	0.001 U	0.001 U	0.001 U	0.0107 U	0.0107 U
A9P3-C04-17	428 -	0.823 J	10.7 J	0.0289 J	32.3 J	0.0009 U	0.0009 U	0.0009 U	0.0009 U	0.0041 -	0.0036 U
Limit	1400	13	34	1	82	91	1000	190	59	40	40
Units	mg/kg	ug/kg	ug/kg	ug/kg	mg/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Conf. Level	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%
Max. Result	778	2.56	27.7	0.103	101	0.0012 U	0.0012 U	0.0012 U	0.0012 U	0.0041	0.012 U
Max. >= Limit	No	No	No	No	Yes	No	No	No	No	No	No
W-statistic Prob. #	--	--	--	--	66.5% (LN)	--	--	--	--	--	--
Test Procedure	--	--	--	--	Lognormal	--	--	--	--	--	--
Sample Size	13	13	13	13	14	13	13	13	13	13	13
Nondetects	0	0	0	0	0	13	13	13	13	12	13
% Nondetects	0%	0%	0%	0%	0%	100%	100%	100%	100%	92%	100%
Est. Mean*	--	--	--	--	55.9	--	--	--	--	--	--
UCL	--	--	--	--	64.7	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	pass	--	--	--	--	--	--
a posteriori Sample	--	--	--	--	4	--	--	--	--	--	--
Size calculation	--	--	--	--	Pass	--	--	--	--	--	--

Note: Est. Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median)
The maximum value of the two duplicates was used in all statistical equations.
#: This is the highest reported probability of the Shapiro-Wilk W-statistic for tests for the validity of the normality assumption.
The test is performed on the raw data (untransformed) data (N) and the log-transformed data (LN) to test for lognormality.
* See Section 5.1 for discussion

Certification Unit A9P3-C05

	Primary COCs					Secondary COCs									
SAMPLE_ID	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Cesium-137	Technetium-99	Antimony	Arsenic	Beryllium	Cadmium	Copper	Fluoride	Hexavalent Chromium	Lead
A9P3-C05-2	1 -	0.592 J	0.608 J	0.592 J	4.89 J	0.0218 U	0.306 U	0.372 UJ	5.34 -	0.41 -	0.322 -	11.4 J	3 U	0.795 J	8.2 J
A9P3-C05-3	1.01 -	0.681 J	0.703 J	0.681 J	7.46 J	0.0224 U	0.304 U	0.376 UJ	5.02 -	0.42 -	0.325 -	11 J	3.02 U	0.568 U	8.08 J
A9P3-C05-4	0.784 -	0.562 J	0.564 J	0.562 J	3.94 J	0.034 -	0.335 U	0.399 UJ	5.8 -	0.401 -	0.387 -	11.7 J	3.24 U	0.609 U	12.7 J
A9P3-C05-5	0.746 -	0.485 J	0.499 J	0.485 J	5.55 J	0.0218 U	0.442 -	0.394 UJ	6.35 -	0.402 -	0.385 -	21.1 J	3.16 U	0.591 U	15.9 J
A9P3-C05-6	0.525 -	0.203 J	0.215 J	0.203 J	0.671 U	0.0113 U	0.281 U	0.355 UJ	3.31 -	0.128 -	0.169 J	6.47 J	2.86 U	0.535 U	3.89 J
A9P3-C05-9	1.14 -	0.947 J	0.988 J	0.947 J	2.76 U	0.0544 U	0.515 -	0.414 UJ	6.07 -	0.896 -	0.413 -	12.9 J	3.26 U	0.651 U	13.9 J
A9P3-C05-10	1.11 -	0.848 J	0.861 J	0.848 J	18.1 J	0.0576 U	0.366 U	0.434 UJ	5.32 -	0.431 -	0.427 -	12.1 J	3.51 U	0.674 U	10.8 J
A9P3-C05-10-D	1.04 -	0.716 J	0.719 J	0.716 J	13.2 J	0.0423 U	0.353 U	0.423 UJ	5.85 -	0.513 -	0.457 -	13.3 J	3.42 U	0.763 J	13.1 J
A9P3-C05-11	0.953 -	0.705 J	0.693 J	0.705 J	20.8 J	0.056 U	0.407 -	0.422 UJ	5.49 -	0.429 -	0.68 -	16.4 J	3.03 U	0.654 U	19.6 J
A9P3-C05-12	0.781 -	0.523 -	0.515 -	0.523 -	8.2 -	0.0595 -	0.797 -	0.955 U	7.16 J	0.433 -	1.31 -	17.2 J	2.96 J	0.602 U	21.3 J
A9P3-C05-13	0.846 -	0.268 -	0.276 -	0.268 -	3.17 -	0.0366 U	1.07 -	0.672 U	14.1 J	0.184 -	0.23 J	8.47 J	1.04 J	0.612 U	4.26 J
A9P3-C05-15	0.744 -	0.311 -	0.287 -	0.311 -	1.85 -	0.0484 -	3.69 -	0.549 U	3.35 J	0.116 -	0.188 -	3.74 J	1.07 J	0.551 U	5.13 J
A9P3-C05-16	1.03 -	0.868 J	0.868 J	0.868 J	12 J	0.0719 -	6.72 -	0.408 UJ	5.47 -	0.481 -	0.562 -	13.3 J	3.1 U	0.736 J	19.5 J
Limit	1.5	1.4	1.5	1.4	50	0.82	1	0.61	9.6	0.62	0.91	20	850	11	400
Units	mg/kg	pCi/g	pCi/g	pCi/g	mg/kg	pCi/g	pC/g	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%
Max. Result	1.14	0.947	0.988	0.947	20.8	0.0719	6.72 *	0.955 U	14.1	0.896	1.31	21.1	2.96	0.763	21.3
Max. >= Limit	No	No	No	No	No	No	Yes	No	Yes	Yes	Yes	Yes	No	No	No
W-statistic Prob. #	- -	- -	- -	- -	- -	- -	7.0% (LN)	< 0.01% (LN)	4.7% (LN)	4.4% (N)	70.4% (LN)	95.8% (N)	- -	- -	- -
Test Procedure	- -	- -	- -	- -	- -	- -	Median (Sign)	Proportions (Sign)	Median (Sign)	Wilcoxon	Lognormal	Normal	- -	- -	- -
Sample Size	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Nondetects	0	0	0	0	2	8	5	12	0	0	0	0	9	10	0
% Nondetects	0%	0%	0%	0%	17%	67%	42%	100%	0%	0%	0%	0%	75%	83%	0%
Est. Mean*	- -	- -	- -	- -	- -	- -	0.4245	0.2055	5.65	0.415	0.452	12.2	- -	- -	- -
UCL	- -	- -	- -	- -	- -	- -	0.797	- -	6.07	0.433	0.596	14.1	- -	- -	- -
Prob. > Limit	- -	- -	- -	- -	- -	- -	- -	0.0007	- -	0.008	- -	- -	- -	- -	- -
Pass / Fail	- -	- -	- -	- -	- -	- -	Pass	pass	Pass	pass	pass	pass	- -	- -	- -
a posteriori Sample	- -	- -	- -	- -	- -	- -	17	2	5	6	3	3	- -	- -	- -
Size calculation	- -	- -	- -	- -	- -	- -	Fail *	Pass	Pass	Pass	Pass	Pass	- -	- -	- -

Note: Est. Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median)
The maximum value of the two duplicates was used in all statistical equations.
#: This is the highest reported probability of the Shapiro-Wilk W-statistic for tests for the validity of the normality assumption.
The test is performed on the raw data (untransformed) data (N) and the log-transformed data (LN) to test for lognormality.
* See Section 5.1 A9P3-C05 for discussion.

6019

Certification Unit A9P3-C05

(cont.)

	Secondary COCs										
SAMPLE_ID	Manganese	Molybdenum	Nickel	Silver	Zinc	Carbon Tetrachloride	Tetrachloroethene	1,1,1-Trichloroethane	1,1-Dichloroethene	Aroclor-1254	Aroclor-1260
A9P3-C05-2	506 -	0.953 J	13.7 J	0.0357 J	39.3 -	0.0012 UNV	0.0012 UNV	0.0012 UNV	0.0012 UNV	0.0036 UNV	0.0036 UNV
A9P3-C05-3	474 -	0.909 J	13.7 J	0.038 J	39.9 -	0.0011 UNV	0.0011 UNV	0.0011 UNV	0.0011 UNV	0.00082 NV	0.0037 UNV
A9P3-C05-4	525 -	1 -	13.9 J	0.0627 J	47.8 -	0.00098 UNV	0.00098 UNV	0.00098 UNV	0.00098 UNV	0.0028 NV	0.0016 NV
A9P3-C05-5	480 -	1.38 -	15.9 J	0.0856 J	49.5 -	0.00091 UNV	0.00091 UNV	0.00091 UNV	0.00091 UNV	0.013 NV	0.0029 NV
A9P3-C05-6	241 -	1.03 -	7.95 J	0.0142 J	16.9 -	0.001 UNV	0.001 UNV	0.001 UNV	0.001 UNV	0.0035 UNV	0.0035 UNV
A9P3-C05-9	483 -	0.599 J	25.3 J	0.0483 J	58.4 -	0.00091 UNV	0.00091 UNV	0.00091 UNV	0.00091 UNV	0.0079 NV	0.0013 NV
A9P3-C05-10	449 -	1.02 -	14 J	0.0591 J	42.2 -	0.0012 UNV	0.0012 UNV	0.0012 UNV	0.0012 UNV	0.0059 NV	0.0042 UNV
A9P3-C05-10-D	522 -	0.967 J	16 J	0.0699 J	50.1 -	0.0013 UNV	0.0013 UNV	0.0013 UNV	0.0013 UNV	0.0076 NV	0.0017 NV
A9P3-C05-11	451 -	0.862 J	14.6 J	0.125 J	70.5 -	0.001 UNV	0.001 UNV	0.001 UNV	0.001 UNV	0.0097 NV	0.0042 NV
A9P3-C05-12	443 -	1.49 -	17.5 -	0.214 J	87.3 -	0.0011 UNV	0.0011 UNV	0.0011 UNV	0.0011 UNV	0.14 NV	0.019 NV
A9P3-C05-13	717 -	1.54 -	9.87 -	0.0294 J	18.6 -	0.0012 UNV	0.0012 UNV	0.0012 UNV	0.0012 UNV	0.0024 NV	0.0039 UNV
A9P3-C05-15	437 -	0.313 J	7.33 -	0.0216 J	11.8 -	0.00097 UNV	0.00097 UNV	0.00097 UNV	0.00097 UNV	0.01 NV	0.0011 NV
A9P3-C05-16	490 -	0.702 J	17.4 J	0.0939 J	57.9 -	0.001 UNV	0.001 UNV	0.001 UNV	0.001 UNV	0.06 NV	0.0089 NV
Limit	1400	13	34	1	82	91	1000	190	59	40	40
Units	mg/kg	ug/kg	ug/kg	ug/kg	mg/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Conf. Level	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%
Max. Result	717	1.54	25.3	0.214	87.3	0.0013 UNV	0.0013 UNV	0.0013 UNV	0.0013 UNV	0.14	0.019
Max. >= Limit	No	No	No	No	Yes	No	No	No	No	No	No
W-statistic Prob. #	--	--	--	--	69.1% (N)	--	--	--	--	--	--
Test Procedure	--	--	--	--	Normal	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12	12	12	12	12
Nondetects	0	0	0	0	0	12	12	12	12	2	4
% Nondetects	0%	0%	0%	0%	0%	100%	100%	100%	100%	17%	33%
Est. Mean*	--	--	--	--	45.7	--	--	--	--	--	--
UCL	--	--	--	--	54.5	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	pass	--	--	--	--	--	--
a posteriori Sample	--	--	--	--	3	--	--	--	--	--	--
Size calculation	--	--	--	--	Pass	--	--	--	--	--	--

Note: Est. Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median)
The maximum value of the two duplicates was used in all statistical equations.
#: This is the highest reported probability of the Shapiro-Wilk W-statistic for tests for the validity of the normality assumption.
The test is performed on the raw data (untransformed) data (N) and the log-transformed data (LN) to test for lognormality.
* See Section 5.1 A9P3-C05 for discussion.

Certification Unit A9P3-C05a Soil

SAMPLE_ID	Technetium-99
A9P3-C05-2	0.306 U
A9P3-C05-3	0.304 U
A9P3-C05-4	0.335 U
A9P3-C05-5	0.442 -
A9P3-C05-6	0.281 U
A9P3-C05-10	0.366 U
A9P3-C05-10-D	0.353 U
A9P3-C05-11	0.407 -
Limit	1
Units	mg/kg
Conf. Level	90%
Max. Result	0.442
Max. >= Limit	No
W-statistic Prob. #	1.8% (LN)
Test Procedure	Proportions (Sign)
Sample Size	7
Nondetects	5
% Nondetects	71%
Est. Mean*	0.168
UCL	- -
Prob. > Limit	1.17%
Pass / Fail	Pass
a posteriori Sample	2
Size calculation	Pass

Note: Est. Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median)
The maximum value of the two duplicates was used in all statistical equations.
#: This is the highest reported probability of the Shapiro-Wilk W-statistic for tests for the validity of the normality assumption.
The test is performed on the raw data (untransformed) data (N) and the log-transformed data (LN) to test for lognormality.
* See Section 5.1 for discussion

Certification Unit A9P3-C05b Sediment

SAMPLE_ID	Technetium-99
A9P3-C05-9	0.515 -
A9P3-C05-12	0.797 -
A9P3-C05-13	1.07 -
A9P3-C05-15	3.69 -
A9P3-C05-16	6.72 -
Sediment Limit	200000
Units	mg/kg
Conf. Level	90%
Max. Result	6.72
Max. >= Limit	No
W-statistic Prob. #	47.6% (LN)
Test Procedure	Lognormal
Sample Size	5
Nondetects	0
% Nondetects	0%
Est. Mean*	- -
UCL	- -
Prob. > Limit	- -
Pass / Fail	- -
a posteriori Sample	1
Size calculation	Pass

Note: Est. Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median)
The maximum value of the two duplicates was used in all statistical equations.
#: This is the highest reported probability of the Shapiro-Wilk W-statistic for tests for the validity of the normality assumption.
The test is performed on the raw data (untransformed) data (N) and the log-transformed data (LN) to test for lognormality.
* See Section 5.1 for discussion

Certification Unit A9P3-C06

	Primary COCs					Secondary COCs									
SAMPLE_ID	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Cesium-137	Technetium-99	Antimony	Arsenic	Beryllium	Cadmium	Copper	Fluoride	Hexavalent Chromium	Lead
A9P3-C06-1	0.541 -	0.246 -	0.239 -	0.246 -	2 -	0.0273 U	0.236 U	0.0523 UJ	2.94 -	0.187 -	0.185 J	5.89 J	0.581 U	0.551 U	4.23 J
A9P3-C06-2	0.413 -	0.178 -	0.182 -	0.178 -	2.1 -	0.0312 U	0.222 U	0.0511 UJ	3.4 -	0.14 -	0.17 J	3.1 J	0.562 U	0.727 J	2.4 J
A9P3-C06-4	1 -	0.545 J	0.57 J	0.545 J	4.89 J	0.0359 U	0.438 -	0.371 UJ	5.6 -	0.334 -	0.325 -	14.3 J	1.52 J	0.59 U	9.56 J
A9P3-C06-6	0.957 -	0.509 J	0.509 J	0.509 J	3.03 J	0.0511 U	0.296 U	0.376 UJ	6.22 -	0.389 -	0.358 -	11 J	0.724 J	0.784 J	10.5 J
A9P3-C06-7	0.706 -	0.519 J	0.514 J	0.519 J	3.04 J	0.0408 U	0.274 U	0.386 UJ	4.27 -	0.36 -	0.282 -	10.1 J	0.686 J	0.562 U	8.94 J
A9P3-C06-8	0.794 -	0.541 J	0.525 J	0.541 J	2.21 U	0.0462 U	0.267 U	0.377 UJ	4.38 -	0.363 -	0.309 -	9.31 J	0.922 J	0.574 U	8.11 J
A9P3-C06-9	0.693 -	0.469 J	0.47 J	0.469 J	3.08 J	0.0532 U	0.276 U	0.372 UJ	2.89 -	0.307 -	0.261 -	8.29 J	0.911 J	1.02 J	6.45 J
A9P3-C06-11	0.99 -	0.467 J	0.465 J	0.467 J	5.13 J	0.0577 U	0.311 -	0.369 UJ	4.71 -	0.378 -	0.369 -	12.1 J	0.934 J	0.892 J	10.1 J
A9P3-C06-12	0.906 -	0.56 J	0.567 J	0.56 J	5.36 J	0.0522 U	0.282 U	0.377 UJ	4.42 -	0.402 -	0.368 -	10.6 J	1.39 J	0.596 U	10 J
A9P3-C06-12-D	1.04 -	0.686 J	0.715 J	0.686 J	2.99 U	0.0552 U	0.282 U	0.373 UJ	4.47 -	0.4 -	0.394 -	10.6 J	1.13 J	0.578 U	12.9 J
A9P3-C06-13	0.648 -	0.249 -	0.275 -	0.249 -	2.23 -	0.036 U	0.311 U	0.107 U	3.51 J	0.243 -	0.248 -	7.1 J	0.592 UJ	0.568 U	7.1 J
A9P3-C06-14	0.495 -	0.303 -	0.302 -	0.303 -	2.58 -	0.0347 U	0.315 U	0.0767 U	3.87 J	0.196 -	0.313 -	7.71 J	0.65 UJ	0.639 U	6.59 J
A9P3-C06-16	0.482 -	0.311 -	0.309 -	0.311 -	1.16 -	0.0377 U	0.309 U	0.0619 U	3.77 J	0.174 -	0.18 J	5.21 J	0.566 UJ	0.85 J	4.32 J
A9P3-C06-17	1.55 -	0.313 -	0.315 -	0.313 -	1.3 -	0.0337 U	0.311 U	0.125 U	3.16 J	0.178 -	0.455 -	7.88 J	0.738 UJ	0.72 U	9.65 J
A9P3-C06-18	0.426 -	0.229 -	0.231 -	0.229 -	1.29 U	0.0273 U	0.317 U	0.0627 U	3 J	0.143 -	0.186 J	3.75 J	0.616 UJ	0.609 U	3.62 J
Limit	1.5	1.4	1.5	1.4	50	0.82	1	0.61	9.6	0.62	0.91	20	850	11	400
Units	mg/kg	pCi/g	pCi/g	pCi/g	mg/kg	pCi/g	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%
Max. Result	1.55	0.686	0.715	0.686	5.36	0.0577 U	0.438	0.396	6.22	0.402	0.455	14.3	1.52	1.02	12.9
Max. >= Limit	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No
W-statistic Prob. #	58.0% (LN)	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Test Procedure	Lognormal	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sample Size	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14
Nondetects	0	0	0	0	2	14	12	14	0	0	0	0	7	9	0
% Nondetects	0%	0%	0%	0%	14%	100%	86%	100%	0%	0%	0%	0%	50%	64%	0%
Est. Mean*	0.770	--	--	--	--	--	--	--	--	--	--	--	--	--	--
UCL	0.95	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Pass / Fail	pass	--	--	--	--	--	--	--	--	--	--	--	--	--	--
a posteriori Sample	4	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Size calculation	Pass	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Note: Est. Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median)
The maximum value of the two duplicates was used in all statistical equations.
#: This is the highest reported probability of the Shapiro-Wilk W-statistic for tests for the validity of the normality assumption.
The test is performed on the raw data (untransformed) data (N) and the log-transformed data (LN) to test for lognormality.
* See Section 5.1 for discussion

Certification Unit A9P3-C06

(cont.)

	Secondary COCs										
SAMPLE_ID	Manganese	Molybdenum	Nickel	Silver	Zinc	Carbon Tetrachloride	Tetrachloroethene	1,1,1-Trichloroethane	1,1-Dichloroethene	Aroclor-1254	Aroclor-1260
A9P3-C06-1	298 -	0.668 -	7.54 J	0.0237 J	20.1 J	0.001 U	0.001 U	0.001 U	0.001 U	0.0035 U	0.0035 U
A9P3-C06-2	642 -	0.51 -	6.7 J	0.014 J	13.1 J	0.001 U	0.001 U	0.001 U	0.001 U	0.0014 J	0.0034 U
A9P3-C06-4	455 -	0.908 J	12.3 -	0.0703 J	34 J	0.001 U	0.001 U	0.001 U	0.001 U	0.0077 -	0.002 J
A9P3-C06-6	444 -	1.02 -	13.4 -	0.0434 J	39.4 J	0.001 U	0.001 U	0.001 U	0.001 U	0.0011 J	0.0038 U
A9P3-C06-7	380 -	0.906 J	11.7 -	0.0395 J	34.8 J	0.001 U	0.001 U	0.001 U	0.001 U	0.0037 U	0.0037 U
A9P3-C06-8	314 -	0.797 J	11.7 -	0.0436 J	33.9 J	0.001 U	0.001 U	0.001 U	0.001 U	0.011 -	0.0036 J
A9P3-C06-9	196 -	0.584 J	9.64 -	0.034 J	28.6 J	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.007 -	0.0021 J
A9P3-C06-11	321 -	0.953 J	12.6 -	0.0664 J	37.6 J	0.001 U	0.001 U	0.001 U	0.001 U	0.037 -	0.0075 -
A9P3-C06-12	410 -	1.22 -	13.1 -	0.0494 J	39.2 J	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.018 -	0.0038 -
A9P3-C06-12-D	393 -	1.1 -	12.6 -	0.0537 J	39.6 J	0.001 U	0.001 U	0.001 U	0.001 U	0.026 -	0.006 -
A9P3-C06-13	272 J	0.819 -	10.6 -	0.0488 -	33.9 J	0.001 U	0.001 U	0.001 U	0.001 U	0.034 -	0.018 -
A9P3-C06-14	454 J	0.814 J	11.5 -	0.0413 -	38 J	0.0009 U	0.0009 U	0.0009 U	0.0009 U	0.017 -	0.0034 J
A9P3-C06-16	300 J	0.713 J	8.94 -	0.0229 J	24.8 J	0.0009 U	0.0009 U	0.0009 U	0.0009 U	0.01 J	0.0017 J
A9P3-C06-17	286 J	1.13 -	11.4 -	0.0663 J	61.6 J	0.0012 U	0.0012 U	0.0012 U	0.0022 J	0.037 -	0.0062 J
A9P3-C06-18	411 J	0.621 J	7.83 -	0.0177 J	18.3 J	0.001 U	0.001 U	0.001 U	0.001 U	0.0059 -	0.0037 U
Limit	1400	13	34	1	82	91	1000	190	59	40	40
Units	mg/kg	ug/kg	ug/kg	ug/kg	mg/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Conf. Level	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%
Max. Result	642	1.22	13.4	0.070	61.6	0.0012 U	0.0012 U	0.0012 U	0.0022	0.037	0.018
Max. >= Limit	No	No	No	No	No	No	No	No	No	No	No
W-statistic Prob. #	--	--	--	--	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--	--	--	--	--
Sample Size	14	14	14	14	14	14	14	14	14	14	14
Nondetects	0	0	0	0	0	14	14	14	13	2	5
% Nondetects	0%	0%	0%	0%	0%	100%	100%	100%	93%	14%	36%
Est. Mean*	--	--	--	--	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--	--	--	--	--
a posteriori Sample	--	--	--	--	--	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--	--	--	--	--

Note: Est. Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median)
The maximum value of the two duplicates was used in all statistical equations.
#: This is the highest reported probability of the Shapiro-Wilk W-statistic for tests for the validity of the normality assumption.
The test is performed on the raw data (untransformed) data (N) and the log-transformed data (LN) to test for lognormality.
* See Section 5.1 for discussion

Certification Unit A9P3-C07

	Primary COCs					Secondary COCs									
SAMPLE_ID	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Cesium-137	Technetium-99	Antimony	Arsenic	Beryllium	Cadmium	Copper	Fluoride	Hexavalent Chromium	Lead
A9P3-C07-1	1.13 J	0.7 -	0.702 -	0.7 -	4.06 -	0.0357 U	0.294 U	0.443 UJ	10 J	0.64 -	0.58 -	15.6 J	0.707 U	0.693 U	11.5 J
A9P3-C07-3	1.04 J	0.659 -	0.662 -	0.659 -	3.12 -	0.0245 U	0.328 U	0.409 UJ	6.5 -	0.63 -	0.57 -	16.6 J	0.672 U	0.641 U	16.9 J
A9P3-C07-4	1.2 J	0.722 -	0.719 -	0.722 -	3.2 -	0.0286 U	0.29 U	0.42 UJ	6.7 -	0.71 -	0.57 -	16.6 J	0.675 U	0.683 U	12.9 J
A9P3-C07-5	1.14 J	0.659 -	0.657 -	0.659 -	2.54 -	0.0237 U	0.306 U	0.427 UJ	5.6 -	0.66 -	0.58 -	14 J	0.695 U	0.675 U	9.9 J
A9P3-C07-5-D	1.13 J	0.661 -	0.726 -	0.661 -	2.63 -	0.0246 U	0.325 U	0.42 UJ	6.4 -	0.64 -	0.59 -	14.8 J	0.69 U	0.675 U	11.4 J
A9P3-C07-7	0.919 -	0.486 J	0.495 J	0.486 J	3.48 -	0.0391 U	0.274 U	0.416 UJ	4.06 -	0.35 -	0.377 -	7.99 -	0.662 U	0.623 U	6.2 J
A9P3-C07-8	0.692 -	0.439 J	0.452 J	0.439 J	1.36 -	0.0336 U	0.276 U	0.427 UJ	5.1 -	0.48 -	0.472 -	12.2 -	0.687 U	0.64 U	9.95 J
A9P3-C07-10	0.58 J	0.314 J	0.326 -	0.314 J	2.47 J	0.0289 U	0.413 -	0.392 UJ	3.4 -	0.24 -	0.27 -	5.9 J	1.09 J	0.602 U	4.5 J
A9P3-C07-11	0.723 -	0.436 -	0.423 -	0.436 -	3.22 -	0.0397 U	0.3 U	0.393 UJ	4.05 -	0.339 -	0.383 -	9.9 J	0.59 U	0.599 U	8.98 J
A9P3-C07-12	0.717 -	0.406 -	0.418 -	0.406 -	2.56 -	0.0364 U	0.253 U	0.0522 UJ	4.25 J	0.166 -	0.182 J	4.75 -	0.577 U	0.572 U	4.45 J
A9P3-C07-14	0.367 -	0.255 -	0.253 -	0.255 -	1.09 J	0.012 U	0.305 U	0.0517 UJ	1.68 -	0.0959 -	0.135 J	2.59 -	0.575 U	0.54 U	1.88 J
A9P3-C07-15	0.576 -	0.349 -	0.348 -	0.349 -	1.29 J	0.0135 U	0.298 U	0.0543 UJ	2.98 -	0.204 -	0.273 -	6.24 -	0.61 U	0.556 U	3.62 J
A9P3-C07-16	0.946 -	0.552 -	0.557 -	0.552 -	3.26 -	0.0191 U	0.309 U	0.0602 UJ	4.72 -	0.393 -	0.388 -	10.4 -	0.666 U	0.631 U	6.96 J
Limit	1.5	1.4	1.5	1.4	50	0.82	1	0.61	9.6	0.62	0.91	20	850	11	400
Units	mg/kg	pCi/g	pCi/g	pCi/g	mg/kg	pCi/g	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%
Max. Result	1.14	0.722	0.726	0.722	4.06	0.0397 U	0.413	0.443 UJ	10.00	0.71	0.59	16.6	1.09	0.693 U	16.9
Max. >= Limit	No	No	No	No	No	No	No	No	Yes	Yes	No	No	No	No	No
W-statistic Prob. #	--	--	--	--	--	--	--	--	79.4% (LN)	39.5% (N)	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--	--	Lognormal	Normal	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Nondetects	0	0	0	0	0	12	11	12	0	0	0	0	11	12	0
% Nondetects	0%	0%	0%	0%	0%	100%	92%	100%	0%	0%	0%	0%	92%	100%	0%
Est. Mean*	--	--	--	--	--	--	--	--	5.06	0.409	--	--	--	--	--
UCL	--	--	--	--	--	--	--	--	6.26	0.493	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--	--	pass	pass	--	--	--	--	--
a posteriori Sampl	--	--	--	--	--	--	--	--	3	6	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--	--	Pass	Pass	--	--	--	--	--

Note: Est. Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median)
The maximum value of the two duplicates was used in all statistical equations.
#: This is the highest reported probability of the Shapiro-Wilk W-statistic for tests for the validity of the normality assumption.
The test is performed on the raw data (untransformed) data (N) and the log-transformed data (LN) to test for lognormality.
* See Section 5.1 for discussion

Certification Unit A9P3-C07

(cont.)

	Secondary COCs										
SAMPLE_ID	Manganese	Molybdenum	Nickel	Silver	Zinc	Carbon Tetrachloride	Tetrachloroethene	1,1,1-Trichloroethane	1,1-Dichloroethene	Aroclor-1254	Aroclor-1260
A9P3-C07-1	453 -	0.87 J	18.3 J	0.075 J	61.6 -	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0043 U	0.0043 U
A9P3-C07-3	625 -	1.2 -	16.8 J	0.087 J	62 -	0.001 U	0.001 U	0.001 U	0.001 U	0.0041 U	0.0041 U
A9P3-C07-4	658 -	1.1 -	19.8 J	0.077 J	63.5 -	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0043 U	0.0043 U
A9P3-C07-5	562 -	0.98 J	17 J	0.062 J	54.3 -	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0042 U	0.0042 U
A9P3-C07-5-D	623 -	1.1 -	16.8 J	0.066 J	54.7 -	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0042 U	0.0042 U
A9P3-C07-7	412 -	0.792 J	11.5 J	0.0373 J	28.4 J	0.001 U	0.001 U	0.001 U	0.001 U	0.004 U	0.004 U
A9P3-C07-8	492 -	0.961 J	14.5 J	0.0576 J	43.2 J	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0041 U	0.0041 U
A9P3-C07-10	275 J	1 -	8.2 J	0.028 J	21.2 J	0.0012 U	0.0007 J	0.0012 U	0.0012 U	0.0039 U	0.0039 U
A9P3-C07-11	392 -	0.86 J	11 J	0.0547 J	36 J	0.001 U	0.001 U	0.001 U	0.001 U	0.004 U	0.004 U
A9P3-C07-12	306 J	1.11 -	10.1 J	0.0282 J	12.9 J	0.0009 U	0.0009 U	0.0009 U	0.0009 U	0.0035 U	0.0035 U
A9P3-C07-14	189 -	0.447 -	5.5 J	0.0159 J	10.3 J	0.001 U	0.001 U	0.001 U	0.001 U	0.0035 U	0.0035 U
A9P3-C07-15	313 -	0.55 J	8.25 J	0.0261 J	19.1 J	0.0009 U	0.0009 U	0.0009 U	0.001 -	0.0037 U	0.0037 U
A9P3-C07-16	487 -	0.86 J	14.9 J	0.0485 J	37.7 J	0.0009 U	0.0009 U	0.0009 U	0.0009 U	0.004 U	0.004 U
Limit	1400	13	34	1	82	91	1000	190	59	40	40
Units	mg/kg	ug/kg	ug/kg	ug/kg	mg/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Conf. Level	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%
Max. Result	658	1.2	19.8	0.087	63.5	0.0012 U	0.0007	0.0012 U	0.001	0.0043 U	0.0043 U
Max. >= Limit	No	No	No	No	No	No	No	No	No	No	No
W-statistic Prob. #	--	--	--	--	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12	12	12	12	12
Nondetects	0	0	0	0	0	12	11	12	11	12	12
% Nondetects	0%	0%	0%	0%	0%	100%	92%	100%	92%	100%	100%
Est. Mean*	--	--	--	--	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--	--	--	--	--
a posteriori Sample	--	--	--	--	--	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--	--	--	--	--

Note: Est. Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median)
The maximum value of the two duplicates was used in all statistical equations.
#: This is the highest reported probability of the Shapiro-Wilk W-statistic for tests for the validity of the normality assumption.
The test is performed on the raw data (untransformed) data (N) and the log-transformed data (LN) to test for lognormality.
* See Section 5.1 for discussion

Certification Unit A9P3-C08

	Primary COCs					Secondary COCs									
SAMPLE_ID	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Cesium-137	Technetium-99	Antimony	Arsenic	Beryllium	Cadmium	Copper	Fluoride	Hexavalent Chromium	Lead
A9P3-C08-2	0.414 -	0.268 -	0.265 -	0.268 -	1.8 J	0.0139 U	0.267 U	0.0523 UJ	3.49 -	0.352 -	0.284 -	8.85 -	0.591 U	0.56 U	6.82 J
A9P3-C08-3	0.62 J	0.341 -	0.339 -	0.341 -	3.67 -	0.0275 U	0.318 U	0.0522 UJ	2.32 J	0.106 -	0.119 J	2.67 -	0.577 U	0.533 U	2.31 J
A9P3-C08-5	0.418 -	0.223 -	0.249 -	0.223 -	1.31 U	0.0257 U	0.285 U	0.0524 UJ	8.35 -	0.18 -	0.34 -	6.88 -	0.58 U	0.572 U	3.42 J
A9P3-C08-6	0.749 -	0.509 -	0.529 -	0.509 -	3.61 -	0.0471 U	0.296 U	0.0596 UJ	3.62 -	0.351 -	0.392 -	9.67 -	0.653 U	0.634 U	6.81 J
A9P3-C08-7	1 -	0.591 -	0.6 -	0.591 -	2.81 -	0.0501 U	0.327 U	0.0639 UJ	5.5 -	0.493 -	0.45 -	10.8 J	0.692 U	0.666 U	9.24 J
A9P3-C08-8	0.734 -	0.568 -	0.559 -	0.568 -	2.98 -	0.0476 U	0.334 U	0.064 UJ	2.98 -	0.41 -	0.411 -	11.9 J	0.702 U	0.684 U	7.23 J
A9P3-C08-9	0.265 -	0.211 -	0.196 -	0.211 -	2.67 U	0.0544 U	0.253 U	0.0508 UJ	2.47 -	0.131 -	0.147 J	4.0 J	0.557 U	0.547 U	2.47 J
A9P3-C08-11	0.72 -	0.547 -	0.568 -	0.547 -	2.81 -	0.0155 U	0.243 U	0.433 UJ	4.27 -	0.462 -	0.338 -	10.6 -	0.701 U	0.839 J	7.34 J
A9P3-C08-12	0.931 J	0.505 -	0.529 -	0.505 -	2.2 -	0.0324 U	0.502 UJ	0.407 UJ	3.83 -	0.433 -	0.306 -	10.4 -	0.64 U	0.625 U	7.01 J
A9P3-C08-13	0.695 J	0.535 -	0.544 -	0.535 -	2.13 -	0.0269 U	0.41 U	0.411 UJ	4.7 -	0.404 -	0.301 -	10.9 -	0.601 U	0.651 U	8.68 J
A9P3-C08-13-D	0.902 J	0.526 -	0.538 -	0.526 -	2.77 -	0.0326 U	0.47 U	0.409 UJ	4.81 -	0.394 -	0.336 -	10.9 -	0.638 U	0.627 U	9.79 J
A9P3-C08-14	0.898 -	0.552 -	0.562 -	0.552 -	4.29 J	0.0355 U	0.302 U	0.0639 UJ	4.59 -	0.381 -	0.349 -	10.3 J	0.691 U	0.678 U	7.61 J
A9P3-C08-16	0.417 -	0.198 -	0.2 -	0.198 -	1.7 J	0.029 U	0.293 U	0.0509 UJ	4.91 -	0.111 -	0.135 J	3.61 J	0.464 U	0.567 U	2.96 J
Limit	1.5	1.4	1.5	1.4	50	0.82	1	0.61	9.6	0.62	0.91	20	850	11	400
Units	mg/kg	pCi/g	pCi/g	pCi/g	mg/kg	pCi/g	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%
Max. Result	1	0.591	0.6	0.591	4.29	0.0544 U	0.502 UJ	0.433 UJ	8.35	0.493	0.45	11.9	0.702 U	0.839	9.79
Max. >= Limit	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
W-statistic Prob. #	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Nondetects	0	0	0	0	2	12	12	12	0	0	0	0	12	11	0
% Nondetects	0%	0%	0%	0%	17%	100%	100%	100%	0%	0%	0%	0%	100%	92%	0%
Est. Mean*	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
a posteriori Sample	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Note: Est. Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median)
The maximum value of the two duplicates was used in all statistical equations.
#: This is the highest reported probability of the Shapiro-Wilk W-statistic for tests for the validity of the normality assumption.
The test is performed on the raw data (untransformed) data (N) and the log-transformed data (LN) to test for lognormality.
* See Section 5.1 for discussion

Certification Unit A9P3-C08

(cont.)

	Secondary COCs										
SAMPLE_ID	Manganese	Molybdenum	Nickel	Silver	Zinc	Carbon Tetrachloride	Tetrachloroethene	1,1,1-Trichloroethane	1,1-Dichloroethene	Aroclor-1254	Aroclor-1260
A9P3-C08-2	399 J	0.757 J	10.1 J	0.0335 J	31.6 J	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0036 U	0.0036 U
A9P3-C08-3	183 -	0.413 J	7.12 -	0.0217 J	14.3 J	0.0011 U	0.0011 U	0.0011 U	0.0007 J	0.0035 U	0.0035 U
A9P3-C08-5	957 -	1.37 -	13.8 -	0.0298 J	23.8 -	0.001 U	0.001 U	0.001 U	0.001 U	0.0035 U	0.0035 U
A9P3-C08-6	327 -	0.794 J	12.6 -	0.0417 J	31.9 -	0.001 U	0.001 U	0.001 U	0.001 U	0.004 U	0.004 U
A9P3-C08-7	505 J	1.23 -	12.6 -	0.0513 J	36.7 -	0.0011 U	0.0011 U	0.0011 U	0.0018 -	0.0026 J	0.0042 U
A9P3-C08-8	185 J	0.519 J	11.3 -	0.0453 J	33.4 -	0.0011 U	0.0044 -	0.0011 U	0.0011 U	0.0043 U	0.0043 U
A9P3-C08-9	229 J	0.41 J	5.8 -	0.023 J	11.3 -	0.001 U	0.001 U	0.001 U	0.001 U	0.0012 J	0.0034 U
A9P3-C08-11	381 J	0.789 J	13.4 -	0.0381 J	36.5 -	0.0012 U	0.0012 U	0.0012 U	0.0012 U	0.0033 U	0.0033 U
A9P3-C08-12	358 -	0.649 J	11.8 -	0.241 J	35.9 -	0.0011 U	0.0011 U	0.0011 U	0.001 J	0.004 UJ	0.004 UJ
A9P3-C08-13	402 -	0.98 J	12. -	0.037 J	37.8 -	0.001 U	0.001 U	0.001 U	0.0011 -	0.0041 UJ	0.0041 UJ
A9P3-C08-13-D	426 -	0.952 J	11.9 -	0.0418 J	37.8 -	0.001 U	0.001 U	0.001 U	0.001 U	0.0041 UJ	0.0041 UJ
A9P3-C08-14	244 J	0.459 J	12.2 J	0.0373 J	35.9 J	0.0011 U	0.0011 U	0.0011 U	0.0012 -	0.0043 U	0.0043 U
A9P3-C08-16	257 J	0.432 J	6.33 J	0.0163 J	14.2 J	0.001 U	0.001 U	0.001 U	0.001 U	0.0034 U	0.0034 U
Limit	1400	13	34	1	82	91	1000	190	59	40	40
Units	mg/kg	ug/kg	ug/kg	ug/kg	mg/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Conf. Level	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%
Max. Result	957	1.37	13.8	0.241	37.8	0.0012 U	0.0044	0.0012 U	0.0018	0.0026	0.0043 U
Max. >= Limit	No	No	No	No	No	No	No	No	No	No	No
W-statistic Prob. #	--	--	--	--	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12	12	12	12	12
Nondetects	0	0	0	0	0	12	11	12	7	10	12
% Nondetects	0%	0%	0%	0%	0%	100%	92%	100%	58%	83%	100%
Est. Mean*	--	--	--	--	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--	--	--	--	--
a posteriori Sample	--	--	--	--	--	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--	--	--	--	--

Note: Est. Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median)
The maximum value of the two duplicates was used in all statistical equations.
#: This is the highest reported probability of the Shapiro-Wilk W-statistic for tests for the validity of the normality assumption.
The test is performed on the raw data (untransformed) data (N) and the log-transformed data (LN) to test for lognormality.
* See Section 5.1 for discussion

Certification Unit A9P3-C09

	Primary COCs					Secondary COCs									
SAMPLE_ID	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Cesium-137	Technetium-99	Antimony	Arsenic	Beryllium	Cadmium	Copper	Fluoride	Hexavalent Chromium	Lead
A9P3-C09-1	1.03 -	0.709 J	0.725 J	0.709 J	2.74 U	0.0572 U	0.282 U	0.402 U	6.29 -	0.536 J	0.056 U	16.1 -	0.61 U	0.63 U	12.4 -
A9P3-C09-3	0.83 -	0.543 J	0.544 J	0.543 J	4.78 -	0.0465 U	0.267 U	0.384 U	5.4 -	0.363 J	0.0535 U	11 -	0.633 U	0.592 U	9.94 -
A9P3-C09-4	1.49 -	0.664 J	0.663 J	0.664 J	2.42 U	0.0537 U	0.355 U	0.402 U	4.46 -	0.369 J	0.056 U	12.8 -	0.606 U	0.625 U	9.88 -
A9P3-C09-5	1.06 -	0.7 J	0.698 J	0.7 J	7.16 -	0.0457 U	0.33 -	0.398 U	5.99 -	0.483 J	0.0554 U	13.9 -	0.629 U	0.609 U	10.8 -
A9P3-C09-5-D	1.1 -	0.67 J	0.669 J	0.67 J	4.64 -	0.0601 U	0.281 U	0.395 U	6.5 -	0.474 J	0.055 U	14 -	0.627 U	0.714 J	10.1 -
A9P3-C09-7	0.68 -	0.479 J	0.482 J	0.479 J	3.44 -	0.0179 U	0.276 U	0.384 U	3.96 -	0.222 J	0.0535 U	7.37 -	0.631 U	0.612 U	6.73 -
A9P3-C09-8	0.922 -	0.767 J	0.763 J	0.767 J	4.74 -	0.0501 U	1.27 -	0.407 U	6.36 -	0.538 J	0.0567 U	15.7 -	0.622 U	0.64 U	10.8 -
A9P3-C09-9	1.15 -	0.806 J	0.787 J	0.806 J	5.57 -	0.257 -	1.74 -	0.417 U	6.09 -	0.562 J	0.0581 U	17.1 -	1.19 J	0.748 J	15.7 -
A9P3-C09-12	0.925 -	0.78 J	0.781 J	0.78 J	1.73 U	0.0471 U	0.296 U	0.412 U	6.62 -	0.53 J	0.0574 U	15.6 -	0.614 U	0.629 U	11.8 -
A9P3-C09-13	1.23 -	0.656 J	0.649 J	0.656 J	5.07 -	0.0959 -	1.27 -	0.408 U	6.56 -	0.582 J	0.0568 U	17.8 -	0.53 U	0.642 U	12.2 -
A9P3-C09-14	1.03 -	0.694 J	0.712 J	0.694 J	3.14 -	0.0209 U	0.676 -	0.411 U	6.36 -	0.527 J	0.0573 U	13.8 -	0.627 U	0.64 U	8.31 -
A9P3-C09-15	1.25 -	0.703 J	0.711 J	0.703 J	3.91 -	0.0276 U	0.516 -	0.411 U	6.52 -	0.557 J	0.0572 U	14.5 -	0.633 U	0.624 U	8.48 -
A9P3-C09-16	1.2 -	0.715 J	0.714 J	0.715 J	3.64 -	0.025 U	0.283 U	0.406 U	6.45 -	0.571 J	0.0566 U	14.7 -	0.631 U	0.655 U	9.14 -
Limit	1.5	1.4	1.5	1.4	50	0.82	1	0.61	9.6	0.62	0.91	20	850	11	400
Units	mg/kg	pCi/g	pCi/g	pCi/g	mg/kg	pCi/g	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%
Max. Result	1.49	0.806	0.787	0.806	7.16	0.257	1.74	0.417 U	6.62	0.582	0.0581 U	17.8	1.19	0.748	15.7
Max. >= Limit	No	No	No	No	No	No	Yes	No	No	No	No	No	No	No	No
W-statistic Prob. #	--	--	--	--	--	--	2.3% (LN)	--	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	Wilcoxon	--	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Nondetects	0	0	0	0	3	10	6	12	0	0	12	0	11	10	0
% Nondetects	0%	0%	0%	0%	25%	83%	50%	100%	0%	0%	100%	0%	92%	83%	0%
Est. Mean*	--	--	--	--	--	--	0.254	--	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	0.676	--	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	0.0081	--	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	pass	--	--	--	--	--	--	--	--
a posteriori Sample	--	--	--	--	--	--	10	--	--	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	Pass	--	--	--	--	--	--	--	--

Note: Est. Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median)
The maximum value of the two duplicates was used in all statistical equations.
#: This is the highest reported probability of the Shapiro-Wilk W-statistic for tests for the validity of the normality assumption.
The test is performed on the raw data (untransformed) data (N) and the log-transformed data (LN) to test for lognormality.
* See Section 5.1 for discussion

Certification Unit A9P3-C09

(cont.)

	Secondary COCs										
SAMPLE_ID	Manganese	Molybdenum	Nickel	Silver	Zinc	Carbon Tetrachloride	Tetrachloroethene	1,1,1-Trichloroethane	1,1-Dichloroethene	Aroclor-1254	Aroclor-1260
A9P3-C09-1	585 -	0.755 J	15.4 -	0.106 U	52.1 J	0.001 U	0.001 U	0.001 U	0.001 U	0.0017 J	0.0039 U
A9P3-C09-3	424 -	0.797 J	10.6 -	0.101 U	34.7 J	0.0009 U	0.0009 U	0.0009 U	0.0009 U	0.0038 U	0.0038 U
A9P3-C09-4	582 -	0.58 J	11.4 -	0.106 U	36.6 J	0.0009 U	0.0009 U	0.0009 U	0.0009 U	0.0039 U	0.0039 U
A9P3-C09-5	513 -	0.629 J	14.1 -	0.105 U	45.4 J	0.0009 U	0.0009 U	0.0009 U	0.0009 U	0.0039 U	0.0039 U
A9P3-C09-5-D	552 -	0.643 J	15.2 -	0.104 U	48.2 J	0.0009 U	0.0009 U	0.0009 U	0.0009 U	0.0039 U	0.0039 U
A9P3-C09-7	378 -	0.514 J	8.64 -	0.101 U	24.9 J	0.001 U	0.001 U	0.001 U	0.001 U	0.0038 U	0.0038 U
A9P3-C09-8	563 -	1.04 J	15.6 -	0.107 U	50.5 J	0.0009 U	0.0003 J	0.0009 U	0.0009 U	0.004 U	0.004 U
A9P3-C09-9	522 -	0.775 J	15.2 -	0.11 U	56 J	0.0009 U	0.0009 U	0.0009 U	0.0009 U	0.0075 -	0.0027 J
A9P3-C09-12	552 -	0.75 J	15 -	0.108 U	51.2 J	0.001 U	0.001 U	0.001 U	0.001 U	0.0014 J	0.004 U
A9P3-C09-13	625 -	1.01 J	16.4 -	0.107 U	56.6 J	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0039 J	0.0012 J
A9P3-C09-14	568 -	0.726 J	16.1 -	0.108 U	47.2 J	0.001 U	0.001 U	0.001 U	0.001 U	0.004 U	0.004 U
A9P3-C09-15	594 -	0.481 J	16.6 -	0.108 U	48.3 J	0.001 U	0.001 U	0.001 U	0.001 U	0.0009 J	0.004 U
A9P3-C09-16	611 -	0.501 J	17.2 -	0.107 U	49 J	0.0012 U	0.0012 U	0.0012 U	0.0012 U	0.004 U	0.004 U
Limit	1400	13	34	1	82	91	1000	190	59	40	40
Units	mg/kg	ug/kg	ug/kg	ug/kg	mg/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Conf. Level	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%
Max. Result	625	1.04	17.2	0.11 U	56.6	0.0012 U	0.0003	0.0012 U	0.0012 U	0.0075	0.0027
Max. >= Limit	No	No	No	No	No	No	No	No	No	No	No
W-statistic Prob. #	--	--	--	--	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12	12	12	12	12
Nondetects	0	0	0	12	0	12	11	12	12	7	10
% Nondetects	0%	0%	0%	100%	0%	100%	92%	100%	100%	58%	83%
Est. Mean*	--	--	--	--	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--	--	--	--	--
a posteriori Sample	--	--	--	--	--	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--	--	--	--	--

Note: Est. Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median)
The maximum value of the two duplicates was used in all statistical equations.
#: This is the highest reported probability of the Shapiro-Wilk W-statistic for tests for the validity of the normality assumption.
The test is performed on the raw data (untransformed) data (N) and the log-transformed data (LN) to test for lognormality.
* See Section 5.1 for discussion

APPENDIX B

VARIANCES/FIELD CHANGE NOTICES FOR THE A9PIII CERTIFICATION SAMPLING ABANDONED OUTFALL LINE - PART ONE PROJECT SPECIFIC PLAN

VARIANCE/FIELD CHANGE NOTICE LOG FOR PROJECT SPECIFIC PLAN FOR AREA 9, PHASE III CERTIFICATION SAMPLING ABANDONED OUTFALL LINE – PART ONE

Variance No.	Variance Date	Variance Description	Significant? (Y or N)	Date Signed	Date Distributed	EPA/OEPA Approval
21140-PSP-0003-01	8/09/04	Documents the naming convention to be followed when bias samples are collected.	N	8/09/04	8/20/04	NA
Variance 1 was incorporated into Revision 0						
21140-PSP-0003-02	8/30/04	Documents that a container blank is required when push tubes and/or core tubes are used.	N	9/2/04	9/17/04	NA
21140-PSP-0003-03	9/20/04	Documents the removal of boron from the list of secondary constituents of concern for this PSP.	N	9/21/04	10/05/04	NA
21140-PSP-0003-04	10/11/04	Documents the addition of copper, manganese, nickel, zinc, fluoride, and carbon tetrachloride to the list of secondary constituents of concern for this PSP. Additionally, dibenzo(a,h)anthracene, indeno(1,2,3-cd)Pyrene, dieldrin, benzo(a)pyrene, benzo(b)fluoranthene, and bromodichloromethane are being removed from the list of secondary constituents of concern for this PSP.	Y	10/11/04	10/15/04	10/13/04
21140-PSP-0003-05	12/06/04	Documents the collection of certification samples from two additional locations in certification unit 01 (CU01).	Y	12/7/04	12/8/04	12/7/04
21140-PSP-0003-06	1/12/05	Documents the addition of copper, manganese, nickel, zinc, fluoride, and carbon tetrachloride to the list of secondary constituents of concern for variance 21140-PSP-0003-05.	Y	1/12/05	2/1/05	1/13/05
21140-PSP-0003-07	2/1/05	Documents the addition of two certification samples to certification unit 3, which will encompass the west side of State Route 128.	Y	2/1/05	2/14/05	Disapproved 2/8/05
21140-PSP-0003-08	2/08/05	Replaces V/FCN 21140-PSP-0003-07, which was disapproved by OEPA on 2/08/05, and documents the addition of two certification samples to certification unit 3, which will encompass the west side of State Route 128.	Y	2/8/05	2/14/05	Approved 2/9/05
21140-PSP-0003-09	4/07/05	Documents the addition of one certification sample to certification unit 3 (CU 3), which will encompass the east side of State Route 128 (SR 128) from within the 54" casing.	N	4/11/05	4/13/05	NA
21140-PSP-0003-10	4/11/05	Documents the re-prep and analysis on sample A9P3-E128-SM-1^R for technetium-99 two times.	N	4/11/05	4/13/05	NA

6019

VARIANCE/FIELD CHANGE NOTICE LOG FOR PROJECT SPECIFIC PLAN FOR AREA 9, PHASE III CERTIFICATION SAMPLING ABANDONED OUTFALL LINE – PART ONE

Variance No.	Variance Date	Variance Description	Significant? (Y or N)	Date Signed	Date Distributed	EPA/OEPA Approval
21140-PSP-0003-11	4/12/05	Documents the addition of three certification samples to certification unit 3 (CU 3), which will encompass both the east and west sides of State Route 128 (SR 128) from within the 54" casing.	N	4/12/05	4/13/05	NA

VARIANCE / FIELD CHANGE NOTICE	Significant? (Yes or No): NO	V/F: 21140-PSP-0003-01
WBS NO.: PROJECT/DOCUMENT/ECDC # 21140-PSP-0003 Rev.B		Page: 1 of 1
PROJECT TITLE: Project Specific Plan For Area 9, Phase III Certification Sampling Abandoned Outfall Line – Part One		Date: 8/09/04

6019

VARIANCE / FIELD CHANGE NOTICE (Include justification):

This Variance/Field Change Notice (V/FCN) documents the naming convention to be followed when bias samples are collected.

Each bias soil certification sample will be assigned a unique sample identification number as *A9P3-C#-B#N(or C or S)^Analysis-QC,* where:

A9P3 = Sample collected from Remediation A9PIII (Note that the number "3" is used in place of the roman numeral "III" in the ID for data management purposes)

C# = Certification sample representing certification unit from which sample was collected (numbered as C01 through C03)

B#N(or C or S) = Sequential Bias Sample Location number within each CU and "N" indicates North, "C" indicates Center, and "S" indicates South

Analysis = "R" indicates radiological analysis; "M" indicates metals; "P" indicates PCBs; "S" indicates semi-volatiles; "L" indicates volatiles; and "V" indicates archives

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

For example, the first a bias sample taken from the north wall of the trench of CU 3 for radiological, metals, and PCB analysis would be identified as A9P3-C3-B1N^RMP; from the center of the trench would be identified as A9P3-C3-B1C^RMP; and from the south wall of the trench would be identified as A9P3-C3-B1S^RMP.

Justification:
The naming convention for bias samples was not documented in the PSP.

Per Section 4.4 of the PSP, changes to PSP will be documented with a V/FCN.

REQUESTED BY: Denise Arico Date: 8/09/04

X IF REQD	VARIANCE/FCN APPROVAL	DATE	X IF REQD	VARIANCE/FCN APPROVAL	DATE
X	QUALITY ASSURANCE: R. Friske	8-10-04	X	PROJECT MANAGER: J.D. Chew for J.D.	8/10/04
	DATA QUALITY MANAGEMENT		X	CHARACTERIZATION MANAGER: F. Miller	8/9/04
X	ANALYTICAL CUSTOMER SUPPORT:	8-10-04		RTIMP Manager	
	WAO		X	SAMPLING MANAGER: T. Bullard	8/10/04

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:

VARIANCE / FIELD CHANGE NOTICE	Significant? (Yes or No): NO	V/F: 21140-PSP-0003-02 601
WBS NO.: PROJECT/DOCUMENT/ECDC # 21140-PSP-0003 Rev.0		Page: 1 of 1
PROJECT TITLE: Project Specific Plan For Area 9, Phase III Certification Sampling Abandoned Outfall Line – Part One		Date: 8/30/04

VARIANCE / FIELD CHANGE NOTICE (Include justification):

This Variance/Field Change Notice (V/FCN) documents that a container blank is required when push tubes and/or core tubes are used. The end caps as well as the tubes require decontamination prior to use. The container blank should be identified as

A9P3C-Analysis-QC#, where:

A9P3 = Sample collected from Remediation A9PIII (Note that the number "3" is used in place of the roman numeral "III" in the ID for data management purposes)

C = Certification

Analysis = "R" indicates radiological analysis; "M" indicates metals; "P" indicates PCBs; "S" indicates semi-volatiles; "L" indicates volatiles; and "V" indicates archives

QC = Quality control sample, "Y" indicates a container blank sample. "#" indicates the number of the container blank (e.g. 1 = first container blank collected for the project.

The first container blank collected will be identified as A9P3C-L-Y1 and A9P3C-RMP-Y1.

Justification:

The naming convention for a container blank was not documented in the PSP.

Per Section 4.4 of the PSP, changes to PSP will be documented with a V/FCN.

REQUESTED BY: Greg Lupton Date: 8/30/04

X IF REQD	VARIANCE/FCN APPROVAL	DATE	X IF REQD	VARIANCE/FCN APPROVAL	DATE
X	QUALITY ASSURANCE: R. Friske	8-31-04	X	PROJECT MANAGER: J.D. Chase for J.D.	31 Aug 04
	DATA QUALITY MANAGEMENT		X	CHARACTERIZATION MANAGER: F. Miller	8/31/04
X	ANALYTICAL CUSTOMER SUPPORT: Heather Milley	8/31/04		RTIMP Manager	
	WAO		X	SAMPLING MANAGER: T. Buhrlage	9/2/04

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:

VARIANCE / FIELD CHANGE NOTICE	Significant? (Yes or No): NO	V/F: 21140-PSP-0003-0019
WBS NO.: PROJECT/DOCUMENT/ECDC # 21140-PSP-0003 Rev.0		Page: 1 of 1
PROJECT TITLE: Project Specific Plan For Area 9, Phase III Certification Sampling Abandoned Outfall Line – Part One		Date: 9/20/04

VARIANCE / FIELD CHANGE NOTICE (Include justification):

This Variance/Field Change Notice (V/FCN) documents the removal of boron from the list of secondary constituents of concern for this PSP.

Justification:

Recent surface data indicated that both boron and silver had results above the FRL near MH-180A, which is on the northwest corner of the lower plowed field west of State Route 128. Additional samples have been collected significantly upgradient of MH-180A in a separate plowed field that is on a plateau west of MH-180A, and they were analyzed for boron and silver in an effort to determine if the elevated values are the result of the overflow event. It was decided that if the results of these constituents upgradient from MH 180A were consistent with the levels determined at MH-180A, then the source of the concentrations was not from the overflow event and could be attributed to natural or agricultural activity. However, if the results of the samples collected upgradient of MH-180A were less than the levels found at MH-180A, then the source would be attributed to the overflow event at MH-180A and, therefore, considered a contaminant that required remediation. The concentrations of boron from the samples collected upgradient of MH-180A were consistent with those determined at MH-180A. Therefore, boron has been excluded from the list of constituents of concern. SILVER REMAINS.

Per Section 4.4 of the PSP, changes to PSP will be documented with a V/FCN.

REQUESTED BY: Greg Lupton Date: 9/20/04

X IF REQD	VARIANCE/FCN APPROVAL	DATE	X IF REQD	VARIANCE/FCN APPROVAL	DATE
X	QUALITY ASSURANCE: R. Frisk	9-20-04	X	PROJECT MANAGER: J.D. Ollow	9/21/04
	DATA QUALITY MANAGEMENT		X	CHARACTERIZATION MANAGER: F. Miller	9/20/04
X	ANALYTICAL CUSTOMER SUPPORT:	9/21/04		RTIMP Manager	
	WAO		X	SAMPLING MANAGER: T. Bahrlage	9/21/04

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:

VARIANCE / FIELD CHANGE NOTICE	Significant? (Yes or No): YES	V/F: 21140-PSP-0003-04
WBS NO.: PROJECT/DOCUMENT/ECDC # 21140-PSP-0003 Rev.0		Page: 1 of 1
PROJECT TITLE: Project Specific Plan For Area 9, Phase III Certification Sampling Abandoned Outfall Line – Part One		Date: 10/11/04

VARIANCE / FIELD CHANGE NOTICE (Include justification):

This Variance/Field Change Notice (V/FCN) documents the addition of copper, manganese, nickel, zinc, fluoride, and carbon tetrachloride to the list of secondary constituents of concern for this PSP. Additionally, dibenzo(a,h)anthracene, indeno(1,2,3-cd)Pyrene, dieldrin, benzo(a)pyrene, benzo(b)fluoranthene, and bromodichloromethane are being removed from the list of secondary constituents of concern for this PSP.

Justification:

During the research into the detection limits for dibenzo(a,h)anthracene and indeno(1,2,3-cd)pyrene it was discovered that according to the process discussed in the CDL for retaining constituents, these two semi-voas do not truly need to be retained. In short, the process for secondary ASCOCs was to retain the adjacent area's ASCOCs and then look at the list of COCs on the 1988 NPDES Permit Renewal Application that either have a FRL or are RCRA characteristic and were detected in the abandoned outfall line. These two constituents along with dieldrin, benzo(a)pyrene, benzo(b)fluoranthene, and bromodichloromethane were not detected in the abandoned outfall line and therefore are not required to be retained and therefore are being removed from the PSP. These constituents were incorporated into the ASCOC list in response to an informal comment on the initial version of the A9PIII - Part One CDL (Rev. A), which requested that ALL OU5 ASCOCs be added unless we could provide justification otherwise. The additional OU5 ASCOCs were not compared to the list of constituents that were detected in the abandoned outfall line and therefore were incorrectly retained.

Conversely, there are six constituents on the 1988 NPDES Permit Application that were screened out as non-detects during the data review process and not originally retained and therefore are being added to the PSP. However, an email from the Aquifer group noted them as detected in the abandoned outfall line. This additional information from the Aquifer group was not in the database. Therefore, these six constituents (fluoride, copper, manganese, nickel, zinc, and carbon tetrachloride) should have been retained.

Per Section 4.4 of the PSP, changes to PSP will be documented with a V/FCN.

REQUESTED BY: Greg Lupton Date: 10/11/04

X IF REQD	VARIANCE/FCN APPROVAL	DATE	X IF REQD	VARIANCE/FCN APPROVAL	DATE
X	QUALITY ASSURANCE: R. Bieber	10/11/04	X	PROJECT MANAGER: J.D. Chris	10/11/04
	DATA QUALITY MANAGEMENT		X	CHARACTERIZATION MANAGER: F. Miller	10/11/04
X	ANALYTICAL CUSTOMER SUPPORT:	10/13/04		RTIMP Manager	
	WAO		X	SAMPLING MANAGER: T. Bubenage	10/12/04

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:

State of Ohio Environmental Protection Agency

Southwest District Office

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Bob Taft, Governor
Maureen O'Connor, Lt. Governor
Christopher Jones, Director

MEMO

Post-it® Fax Note 7671	Date	# of pages ▶
To J.D. Chiou	From Ohio EPA	
Co./Dept.	Co	
Phone #	Phone #	
Fax # x 5131	Fax #	

TO: J.D. Chiou

FROM: Donna Bohannon (DB)

DATE: October 13, 2004

SUBJECT: V/FCN21140-PSP-0003-04 Project Specific Plan for Area 9, Phase III Certification Sampling Abandoned Outfall Line - Part One

This V/FCN documents adding six secondary COCs to this PSP from the 1988 NPDES Permit, which were detected in the AOL. The constituents that will be added to the list include copper, manganese, nickel, zinc, fluoride, and carbon tetrachloride. In addition six COC's that aren't required to be retained, due to not being detected in the AOL, which will be removed from this PSP include, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene, dieldrin, benzo(a)pyrene, benzo(b)fluoranthene, and bromodichloromethane. Ohio EPA approves of this change.

6019

VARIANCE / FIELD CHANGE NOTICE	Significant? (Yes or No): YES	V/F: 21140-PSP-0003-05
WBS NO.: PROJECT/DOCUMENT/ECDC # 21140-PSP-0003 Rev.0		Page: 1 of 4
PROJECT TITLE: Project Specific Plan For Area 9, Phase III Certification Sampling Abandoned Outfall Line – Part One		Date: 12/06/04

VARIANCE / FIELD CHANGE NOTICE (Include justification):

This Variance/Field Change Notice (V/FCN) documents the collection of certification samples from two additional locations in certification unit 1 (CU 1).

The Sampling and Analytical Requirements are listed in Attachment 1, target analytes are listed in Attachment 2, and the sample information is listed in Attachment 3. See Figure 1 for boring locations.

The first two Sample IDs are identified as A9P3-C01-18^RMP and A9P3-C01-18^L.

Where:
A9P3 = Area 9, Phase III
C01 = CU01
18 = eighteenth sample location
RMP or L = Suite Identifier
"R" for radiological
"M" for metals
"P" for PCBs
"L" for volatiles

Surveying required: Yes, Surveying will survey these two locations.
Field QC samples required: Yes, trip blank
Field data validation: Yes
Analytical data validation: Yes
Data package requirements: Yes

The highest total uranium result for this area is 9.23 mg/kg from boring A9P3-C01-9.

Justification:
The section of abandoned outfall line that lies beneath the Mid Valley Pipeline easement is being excavated and removed. The easement is bound to the east and west by CU 1. Therefore, this area will be included in the certification of CU 1.

Per Section 4.4 of the PSP, changes to PSP will be documented with a V/FCN.

REQUESTED BY: Greg Lupton Date: 12/06/04

X IF REQD	VARIANCE/FCN APPROVAL	DATE	X IF REQD	VARIANCE/FCN APPROVAL	DATE
X	QUALITY ASSURANCE: R. Frieke	12/7/04	X	PROJECT MANAGER: J.D. Ehiqu	12/6/04
	DATA QUALITY MANAGEMENT		X	CHARACTERIZATION MANAGER: F. Miller	12/6/04
X	ANALYTICAL CUSTOMER SUPPORT:	12-7-04		RTIMP Manager	
	WAO		X	SAMPLING MANAGER: T. Barbage	12/7/04

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:

ADDITIONAL SAMPLE LOCATIONS AND IDENTIFIERS FOR CU 1

CU	Location	Depth	Sample ID	Analysis	East-83	North-83
1	1-18	0"-6"	A9P3-C01-18^RMP	TAL A & B	1352050.18	479469.44
			A9P3-C01-18^L	TAL D		
	1-19	0"-6"	A9P3-C01-19^RMP	TAL A & B	1352096.54	479462.58
			A9P3-C01-19^L	TAL D		

SAMPLING AND ANALYTICAL REQUIREMENTS

Analyte	Method	Sample Matrix	ASL	Preserve	Hold Time	Container [b]	Minimum Mass/Volume
Radiological (TAL A)	Gamma Spec, Alpha Spec, Liquid Scintillation or GPC	Solid	D/E[a]	Cool, 4° C	12 months	Glass with Teflon lined lid	500 g (1500 g) c
Metals (TAL B)	ICP-AES or ICP/MS				6 months		
PCBs (TAL B)	GC				14 days		
VOCs (TAL D)	GC/MS	Solid	D/E[a]	Cool, 4° C	48 hours	3 x 1-Encore Sampler [c] or equivalent plus a 60 ml jar for %	Each full Encore Sampler [c] will hold app. 5 g of soil
VOCs (TAL D)	GC/MS	Liquid (trip blank)	D/E[a]	Cool, 4° C H_2SO_4 pH<2	14 days	3 x 40-ml glass with lined-lined septa	120 ml [c] (no headspace)

[a]Samples will be analyzed according to Analytical Support Level (ASL) D requirements but the minimum detection level may cause some analyses to be considered ASL E.
[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 per 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".
ICP-AES – inductively coupled plasma atomic emission spectroscopy
ICP/MS – inductively coupled plasma mass spectroscopy
GC/MS – gas chromatography mass spectroscopy
GPC – gas proportional counting
VOC – volatile organic compound

21130-PSP-0003-A (ASL D/E[1])

Analyte	Off-Property FRL	MDL
Total Uranium	50 mg/kg	5 mg/kg
Radium-226	1.5 pCi/g	0.15 pCi/g
Radium-228	1.4 pCi/g	0.14 pCi/g
Thorium-228	1.5 pCi/g	0.15 pCi/g
Thorium-232	1.4 pCi/g	0.14 pCi/g
Cesium-137	0.82 pCi/g	0.082 pCi/g
Technetium-99	1 pCi/g	0.5 pCi/g[2]

21130-PSP-0003-B (ASL D/E[1])

Analyte	Off-Property FRL (BTV)[3]	MDL
Antimony	0.61 mg/kg	0.2 mg/kg[2]
Arsenic	9.6 mg/kg	0.96 mg/kg
Beryllium	0.62 mg/kg	0.062 mg/kg
Boron	4.0 mg/kg	0.4 mg/kg
Cadmium	0.91 mg/kg	0.091 mg/kg
Hexavalent Chromium	11 mg/kg (0.05 mg/kg)	0.11 mg/kg
Lead	400 mg/kg (200 mg/kg)	20 mg/kg
Molybdenum	13 mg/kg (10 mg/kg)	1 mg/kg
Silver	1.0 mg/kg	0.1 mg/kg
Aroclor-1254	0.04 mg/kg	0.004 mg/kg
Aroclor-1260	0.04 mg/kg	0.004 mg/kg

TAL 21130-PSP-0003-D (ASL D/E[1])

Analyte	Off-Property FRL	MDL
1,1-dichloroethene	0.059 mg/kg	0.0059 mg/kg
1,1,1-trichloroethane	0.19[4] mg/kg	0.0019 mg/kg
Tetrachloroethene	1 mg/kg	0.1 mg/kg

[1]Analytical requirements will meet ASL D but the minimum detection level may cause some analyses to be considered ASL E

[2]10 percent of the FRL is not achievable for this analyte

[3]If the BTV is lower than the established FRL, the MDL shall bet set at 10 percent of the BTV

[4]FRL is actually for 1,1,2-Trichloroethane since 1,1,1-Trichloroethane does not have a FRL.

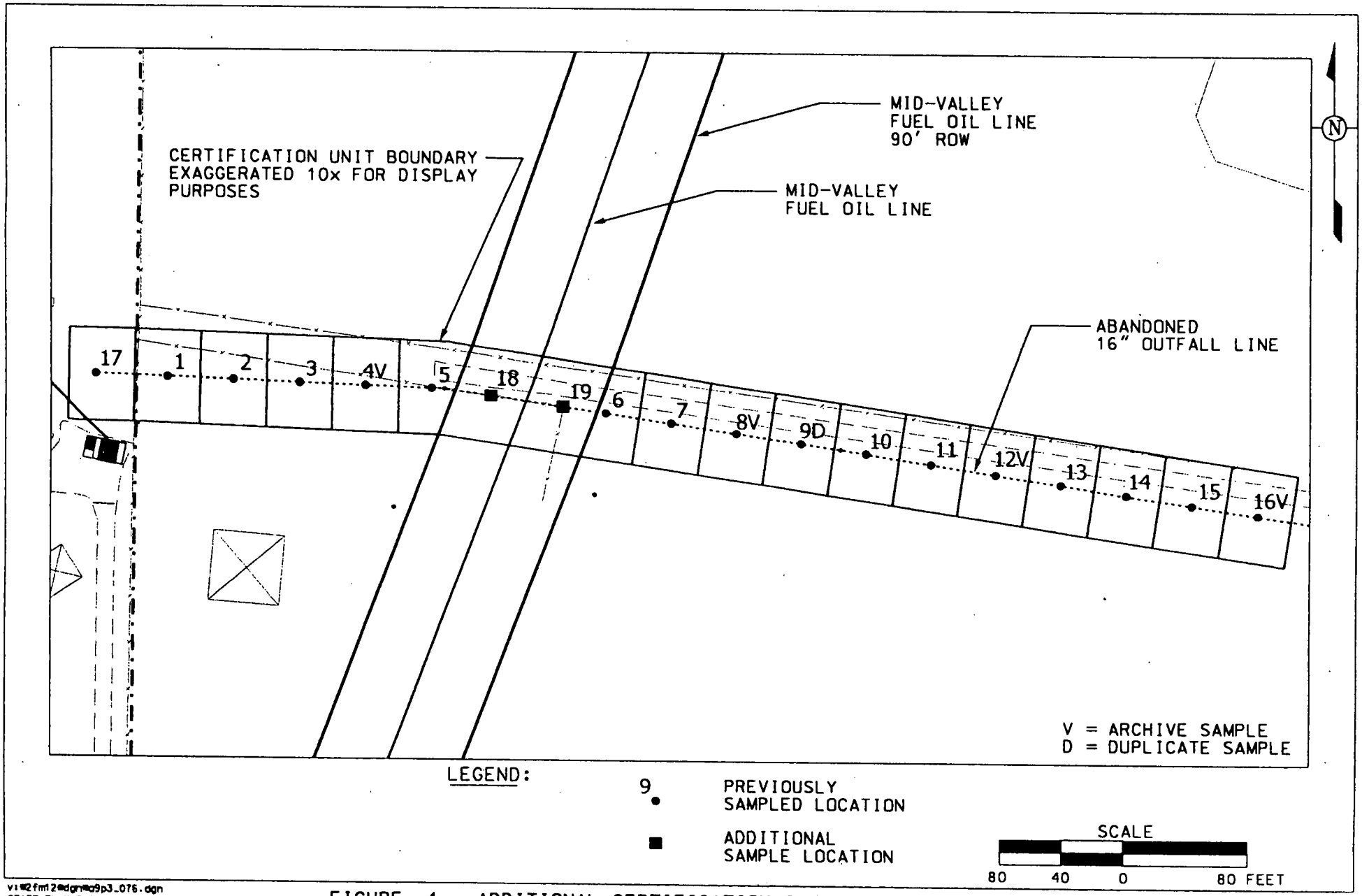
[5]FRL is not achievable for these analytes

BTV – Benchmark Toxicity Value

MDL – minimum detection level

mg/kg – milligrams per kilogram

pCi/g – picoCuries per gram



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STATE PLANAR COORDINATE SYSTEM 1983

FIGURE 1. ADDITIONAL CERTIFICATION SAMPLING LOCATIONS FOR CU 01

06-DEC-2004

6019

State of Ohio Environmental Protection Agency

Southwest District Office

401 East Fifth Street
Dayton, Ohio 45402-2911

TELE: (937) 285-6357 FAX: (937) 285-6404

Bob Taft, Governor
Maureen O'Connor, Lt. Governor
Christopher Jones, Director

MEMO

Post-it® Fax Note 7671	Date	# of pages ▶
To J.D. Chiou	From Ohio EPA	
Co./Dept.	Co.	
Phone #	Phone #	
Fax # x 5131	Fax #	

TO: J.D. Chiou

FROM: Donna Bohannon (DB)

DATE: December 7, 2004

SUBJECT: **V/FCN21140-PSP-0003-05 Project Specific Plan for Area 9, Phase III Certification Sampling Abandoned Outfall Line - Part One**

This V/FCN documents the addition of two certification sampling locations in CU 1 in A9PIII - Part One. The two sample I.D.s are A9P3-C01-18^RMP and A9P3-C01-18^L. The samples will be collected for the A9PIII - Part 1 certification constituent list for radiological, metals, PCBs, and volatiles. Ohio EPA approves of this addition.

6019

VARIANCE / FIELD CHANGE NOTICE	Significant? (Yes or No): YES	V/F: 21140-PSP-0003-06
WBS NO.: PROJECT/DOCUMENT/ECDC # 21140-PSP-0003 Rev.0		Page: 1 of 1
PROJECT TITLE: Project Specific Plan For Area 9, Phase III Certification Sampling Abandoned Outfall Line – Part One		Date: 1/12/05

VARIANCE / FIELD CHANGE NOTICE (Include justification):

This Variance/Field Change Notice (V/FCN) documents the addition of copper, manganese, nickel, zinc, fluoride, and carbon tetrachloride to the list of secondary constituents of concern for variance 21140-PSP-0003-05. Variance 21140-PSP-0003-04, which has been approved, added these constituents to the PSP; however, these constituents were inadvertently omitted from variance 21140-PSP-0003-05.

Justification:
These constituents were inadvertently omitted from variance 21140-PSP-0003-05. Therefore, they are being added at this time.

Per Section 4.4 of the PSP, changes to PSP will be documented with a V/FCN.

REQUESTED BY: Greg Lupton Date: 1/12/05

X IF REQD	VARIANCE/FCN APPROVAL	DATE	X IF REQD	VARIANCE/FCN APPROVAL	DATE
X	QUALITY ASSURANCE: R. Friske Karen Wessel	1-12-05	X	PROJECT MANAGER: J.D. Chiou	1/12/05
	DATA QUALITY MANAGEMENT		X	CHARACTERIZATION MANAGER: F. Miller	1/12/05
X	ANALYTICAL CUSTOMER SUPPORT:	1-25-05		RTIMP Manager	
	WAO		X	SAMPLING MANAGER: T. Buhrlage 1/12/04	

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:

ORIGINAL

State of Ohio Environmental Protection Agency

Southwest District Office

401 East Fifth Street
Dayton, Ohio 45402-2911

TELE: (937) 285-6357 FAX: (937) 285-6404

Bob Taft, Governor
Maureen O'Connor, Lt. Governor
Christopher Jones, Director

MEMO

Post-it® Fax Note 7671	Date	# of pages ▶
To J D Chiou	From Ohio EPA	
Co./Dept.	Co.	
Phone #	Phone #	
Fax # x 5131	Fax #	

TO: J.D. Chiou

FROM: Donna Bohannon (DB)

DATE: January 13, 2005

SUBJECT: **V/FCN 21140-PSP-0003-06 Project Specific Plan for Area 9, Phase III Certification Sampling Abandoned Outfall Line - Part One**

This V/FCN documents the addition of several secondary COCs, copper, manganese, nickel, zinc, fluoride, and carbon tetrachloride for V/FCN 21140-PSP-0003-06. Ohio EPA approves of this addition.

Q:\temp\ou5\A9PIII\VFCN3CertsampPart1.wpd

6019

VARIANCE / FIELD CHANGE NOTICE	Significant? (Yes or No): YES	V/F: 21140-PSP-0003-07
WBS NO.: PROJECT/DOCUMENT/ECDC # 21140-PSP-0003 Rev.0		Page: 1 of 3
PROJECT TITLE: Project Specific Plan For Area 9, Phase III Certification Sampling Abandoned Outfall Line – Part One		Date: 2/01/05

VARIANCE / FIELD CHANGE NOTICE (Include justification):

This Variance/Field Change Notice (V/FCN) documents the addition of two certification samples to certification unit 3 (CU 3), which will encompass the west side of State Route 128 (SR 128). These two locations will be field located and surveyed.

The Sampling and Analytical Requirements and the sample information are listed in Attachment 1, and the target analytes are listed in Attachment 2. The Sampling and Analytical Requirements and target analyte lists can also be found in the PSP.

The first two Sample IDs are identified as A9P3-C03-17^RMP and A9P3-C03-17^L.

Where:
A9P3 = Area 9, Phase III
C03 = CU03
17 = seventeenth sample location; 18 = eighteenth sample location
RMP or L = Suite Identifier
"R" for radiological
"M" for metals
"P" for PCBs
"L" for volatiles

Surveying required: Yes, Surveying will survey these two locations.
Field QC samples required: Yes, trip blank
Field data validation: Yes
Analytical data validation: Yes
Data package requirements: Yes

The highest total uranium result for this area is 1.35 mg/kg from boring A9P3-C03-15.

ORIGINAL

Justification:
Approximately 30 feet of the abandoned outfall line extends west from the location where it exits the protective casing. Because the outfall line piping could not be safely lifted from the trench, it was crushed in place in order to remove it along with the bedding material. Therefore, additional biased samples are being collected and will be included in the certification of CU 3.

Per Section 4.4 of the PSP, changes to PSP will be documented with a V/FCN.

REQUESTED BY: Greg Lupton Date: 2/01/05

X IF REQD	VARIANCE/FCN APPROVAL	DATE	X IF REQD	VARIANCE/FCN APPROVAL	DATE
X	QUALITY ASSURANCE: R. Friske	2-1-05	X	PROJECT MANAGER: J.D. Chio	2/1/05
	DATA QUALITY MANAGEMENT		X	CHARACTERIZATION MANAGER: F. Miller	2/1/05
X	ANALYTICAL CUSTOMER SUPPORT:	2-1-05		RTIMP Manager	
	WAO		X	SAMPLING MANAGER: T. Buhrlage	2/1/05

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:

ADDITIONAL SAMPLE LOCATIONS AND IDENTIFIERS FOR CU 3

CU	Location	Depth	Sample ID	Analysis	East-83	North-83
3	3-17	0"-6"	A9P3-C03-17^RMP	TAL A & B	TBD	TBD
			A9P3-C03-17^L	TAL D		
	3-18	0"-6"	A9P3-C03-18^RMP	TAL A & B	TBD	TBD
			A9P3-C03-18^L	TAL D		

SAMPLING AND ANALYTICAL REQUIREMENTS

Analyte	Method	Sample Matrix	ASL	Preserve	Hold Time	Container [b]	Minimum Mass/Volume
Radiological (TAL A)	Gamma Spec, Alpha Spec, Liquid Scintillation or GPC	Solid	D/E[a]	Cool, 4° C	12 months	Glass with Teflon lined lid	500 g (1500 g) c
Metals (TAL B)	ICP-AES or ICP/MS				6 months		
PCBs (TAL B)	GC				14 days		
VOCs (TAL D)	GC/MS	Solid	D/E[a]	Cool, 4° C	48 hours	3 x 1-Encore Sampler [c] or equivalent plus a 60 ml jar for %	Each full Encore Sampler [c] will hold app. 5 g of soil
VOCs (TAL D)	GC/MS	Liquid (trip blank)	D/E[a]	Cool, 4° C H_2SO_4 pH<2	14 days	3 x 40-ml glass with lined-lined septa	120 ml [c] (no headspace)

[a]Samples will be analyzed according to Analytical Support Level (ASL) D requirements but the minimum detection level may cause some analyses to be considered ASL E.
[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 per 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".
ICP-AES – inductively coupled plasma atomic emission spectroscopy
ICP/MS – inductively coupled plasma mass spectroscopy
GC/MS – gas chromatography mass spectroscopy
GPC – gas proportional counting
VOC – volatile organic compound

21140-PSP-0003-A (ASL D/E[1])

Analyte	Off-Property FRL	MDL
Total Uranium	50 mg/kg	5 mg/kg
Radium-226	1.5 pCi/g	0.15 pCi/g
Radium-228	1.4 pCi/g	0.14 pCi/g
Thorium-228	1.5 pCi/g	0.15 pCi/g
Thorium-232	1.4 pCi/g	0.14 pCi/g
Cesium-137	0.82 pCi/g	0.082 pCi/g
Technetium-99	1 pCi/g	0.5 pCi/g[2]

21140-PSP-0003-B (ASL D/E[1])

Analyte	Off-Property FRL (BTV)[3]	MDL
Antimony	0.61 mg/kg	0.25 mg/kg[2]
Arsenic	9.6 mg/kg	0.96 mg/kg
Beryllium	0.62 mg/kg	0.062 mg/kg
Cadmium	0.91 mg/kg	0.091 mg/kg
Copper	20 mg/kg	2 mg/kg
Fluoride	850 mg/kg	85 mg/kg
Hexavalent Chromium	11 mg/kg (0.05 mg/kg)	0.11 mg/kg
Lead	400 mg/kg (200 mg/kg)	20 mg/kg
Manganese	1400 mg/kg	140 mg/kg
Molybdenum	13 mg/kg (10 mg/kg)	1 mg/kg
Nickel	34 mg/kg	3.4 mg/kg
Silver	1.0 mg/kg	0.1 mg/kg
Zinc	82 mg/kg	8.2 mg/kg
Aroclor-1254	0.04 mg/kg	0.004 mg/kg
Aroclor-1260	0.04 mg/kg	0.004 mg/kg

TAL 21140-PSP-0003-D (ASL D/E[1])

Analyte	Off-Property FRL	MDL
1,1-dichloroethene	0.059 mg/kg	0.0059 mg/kg
1,1,1-trichloroethane	0.19[4] mg/kg	0.0019 mg/kg
Carbon Tetrachloride	0.091 mg/kg	0.0091 mg/kg
Tetrachloroethene	1 mg/kg	0.1 mg/kg

[1]Analytical requirements will meet ASL D but the minimum detection level may cause some analyses to be consid

[2]10 percent of the FRL is not achievable for this analyte

[3]If the BTV is lower than the established FRL, the MDL shall bet set at 10 percent of the BTV

[4]FRL is actually for 1,1,2-Trichloroethane since 1,1,1-Trichloroethane does not have a FRL.

BTV – Benchmark Toxicity Value

MDL – minimum detection level

mg/kg – milligrams per kilogram

pCi/g – picoCuries per gram

OhioEPA
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www.epa.state.oh.us

Bob Taft, Governor
Bruce Johnson, Lt. Governor
Joseph P. Koncelik, Director

MEMO

TO: J.D. Chiou

FROM: Tom Schneider

DATE: February 08, 2005

SUBJECT: **DISAPPROVAL - V/FCN21140-PSP-0003-07** *Project Specific Plan for Area 9, Phase III Certification Sampling Abandoned Outfall Line - Part One*

This V/FCN should be revised to provide a justification for the two samples. Based upon Ohio EPA's 2/8/05 call with JD Chiou & Jack McCormick, the pipe was not crushed but chopped into segments with a track hoe bucket. Obviously, this isn't consistent with approved methods for pipe removal and substantially increases the likelihood of contaminant release. It is however, much less drastic than the variance suggests. Revise the variance to better describe the field actions and to justify the sample locations. All reasonable efforts should be made to prevent intentional breakage of the AOL pipe

Q:\ou5\A9PIII\VFCN4CertSampPart1.wpd

VARIANCE / FIELD CHANGE NOTICE	Significant? (Yes or No): YES	V/F: 21140-PSP-0003-08
WBS NO.: PROJECT/DOCUMENT/ECDC # 21140-PSP-0003 Rev.0		Page: 1 of 3
PROJECT TITLE: Project Specific Plan For Area 9, Phase III Certification Sampling Abandoned Outfall Line – Part One		Date: 2/08/05

VARIANCE / FIELD CHANGE NOTICE (Include justification):

This Variance/Field Change Notice (V/FCN) replaces V/FCN 21140-PSP-0003-07, which was disapproved by OEPA on 2/08/05, and documents the addition of two certification samples to certification unit 3 (CU 3), which will encompass the west side of State Route 128 (SR 128). Because the abandoned outfall line piping could not be safely lifted from the trench in complete sections, it was necessary to break it into more manageable sections with a track hoe bucket. The samples were collected in the vicinity of the breaks in the piping. These two locations were field located and surveyed.

The Sampling and Analytical Requirements and the sample information were listed in Attachment 1, and the target analytes are listed in Attachment 2. The Sampling and Analytical Requirements and target analyte lists can also be found in the PSP.

The first two Sample IDs were identified as A9P3-C03-17^RMP and A9P3-C03-17^L.

Where:
A9P3 = Area 9, Phase III
C03 = CU03
17 = seventeenth sample location; 18 = eighteenth sample location
RMP or L = Suite Identifier
"R" for radiological
"M" for metals
"P" for PCBs
"L" for volatiles

Surveying required: Yes, Surveying will survey these two locations.
Field QC samples required: Yes, trip blank
Field data validation: Yes
Analytical data validation: Yes
Data package requirements: Yes

The highest total uranium result for this area is 1.35 mg/kg from boring A9P3-C03-15.

Justification:
Approximately 30 feet of the abandoned outfall line extends west from the location where it exits the protective casing. Because the abandoned outfall line piping could not be safely lifted from the trench in complete sections, it was broken into more manageable sections with a track hoe bucket. Therefore, additional biased samples are being collected and will be included in the certification of CU 3. The abandoned outfall line was not crushed entirely in place as previously implied in variance 21140-PSP-0003-07, which was disapproved by OEPA.

Per Section 4.4 of the PSP, changes to PSP will be documented with a V/FCN.

REQUESTED BY: Greg Lupton Date: 2/08/05

X IF REQD	VARIANCE/FCN APPROVAL	DATE	X IF REQD	VARIANCE/FCN APPROVAL	DATE
X	QUALITY ASSURANCE: R. Friske	2/9/05	X	PROJECT MANAGER: J. DeCicco	2/8/05
	DATA QUALITY MANAGEMENT		X	CHARACTERIZATION MANAGER: F. Miller	2/8/05
X	ANALYTICAL CUSTOMER SUPPORT: Amy Meyer	2-10-05		RTIMP Manager	
	WAO		X	SAMPLING MANAGER: T. Bollinger for TEB	2/10/05

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:

ORIGINAL

ADDITIONAL SAMPLE LOCATIONS AND IDENTIFIERS FOR CU 3

CU	Location	Depth	Sample ID	Analysis	East-83	North-83
3	3-17	0"-6"	A9P3-C03-17^RMP	TAL A & B	TBD	TBD
			A9P3-C03-17^L	TAL D		
	3-18	0"-6"	A9P3-C03-18^RMP	TAL A & B	TBD	TBD
			A9P3-C03-18^L	TAL D		

SAMPLING AND ANALYTICAL REQUIREMENTS

Analyte	Method	Sample Matrix	ASL	Preserve	Hold Time	Container [b]	Minimum Mass/Volume
Radiological (TAL A)	Gamma Spec, Alpha Spec, Liquid Scintillation or GPC	Solid	D/E[a]	Cool, 4° C	12 months	Glass with Teflon lined lid	500 g (1500 g) c
Metals (TAL B)	ICP-AES or ICP/MS				6 months		
PCBs (TAL B)	GC				14 days		
VOCs (TAL D)	GC/MS	Solid	D/E[a]	Cool, 4° C	48 hours	3 x 1-Encore Sampler [c] or equivalent plus a 60 ml jar for %	Each full Encore Sampler [c] will hold app. 5 g of soil
VOCs (TAL D)	GC/MS	Liquid (trip blank)	D/E[a]	Cool, 4° C H_2SO_4 pH<2	14 days	3 x 40-ml glass with lined-lined septa	120 ml [c] (no headspace)

[a]Samples will be analyzed according to Analytical Support Level (ASL) D requirements but the minimum detection level may cause some analyses to be considered ASL E.
[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 per 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".
ICP-AES – inductively coupled plasma atomic emission spectroscopy
ICP/MS – inductively coupled plasma mass spectroscopy
GC/MS – gas chromatography mass spectroscopy
GPC – gas proportional counting
VOC – volatile organic compound

21140-PSP-0003-A (ASL D/E[1])

Analyte	Off-Property FRL	MDL
Total Uranium	50 mg/kg	5 mg/kg
Radium-226	1.5 pCi/g	0.15 pCi/g
Radium-228	1.4 pCi/g	0.14 pCi/g
Thorium-228	1.5 pCi/g	0.15 pCi/g
Thorium-232	1.4 pCi/g	0.14 pCi/g
Cesium-137	0.82 pCi/g	0.082 pCi/g
Technetium-99	1 pCi/g	0.5 pCi/g[2]

21140-PSP-0003-B (ASL D/E[1])

Analyte	Off-Property FRL (BTV)[3]	MDL
Antimony	0.61 mg/kg	0.25 mg/kg[2]
Arsenic	9.6 mg/kg	0.96 mg/kg
Beryllium	0.62 mg/kg	0.062 mg/kg
Cadmium	0.91 mg/kg	0.091 mg/kg
Copper	20 mg/kg	2 mg/kg
Fluoride	850 mg/kg	85 mg/kg
Hexavalent Chromium	11 mg/kg (0.05 mg/kg)	0.11 mg/kg
Lead	400 mg/kg (200 mg/kg)	20 mg/kg
Manganese	1400 mg/kg	140 mg/kg
Molybdenum	13 mg/kg (10 mg/kg)	1 mg/kg
Nickel	34 mg/kg	3.4 mg/kg
Silver	1.0 mg/kg	0.1 mg/kg
Zinc	82 mg/kg	8.2 mg/kg
Aroclor-1254	0.04 mg/kg	0.004 mg/kg
Aroclor-1260	0.04 mg/kg	0.004 mg/kg

TAL 21140-PSP-0003-D (ASL D/E[1])

Analyte	Off-Property FRL	MDL
1,1-dichloroethene	0.059 mg/kg	0.0059 mg/kg
1,1,1-trichloroethane	0.19[4] mg/kg	0.0019 mg/kg
Carbon Tetrachloride	0.091 mg/kg	0.0091 mg/kg
Tetrachloroethene	1 mg/kg	0.1 mg/kg

[1]Analytical requirements will meet ASL D but the minimum detection level may cause some analyses to be consid

[2]10 percent of the FRL is not achievable for this analyte

[3]If the BTV is lower than the established FRL, the MDL shall bet set at 10 percent of the BTV

[4]FRL is actually for 1,1,2-Trichloroethane since 1,1,1-Trichloroethane does not have a FRL.

BTV – Benchmark Toxicity Value

MDL – minimum detection level

mg/kg – milligrams per kilogram

pCi/g – picoCuries per gram

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www.epa.state.oh.us

Bob Taft, Governor
Bruce Johnson, Lt. Governor
Joseph P. Koncelik, Director

MEMO

TO: J.D. Chiou

FROM: Donna Bohannon

DATE: February 09, 2005

SUBJECT: **APPROVAL - V/FCN21140-PSP-0003-0~~7~~8** *Project Specific Plan for Area 9, Phase III Certification Sampling Abandoned Outfall Line - Part One*

This V/FCN documents the collection of two additional certification samples to CU 3 located on the west side of the State Route 128. Since the AOL had to be sectioned in two places, in order to be handled by the track hoe bucket, the biased samples were necessary to determine that all contamination was removed from the two areas of sectioned pipe.

Q:\ou5\A9P3\VFCNCertSampPart1.wpd

VARIANCE / FIELD CHANGE NOTICE	Significant? (Yes or No): NO	V/F: 21140-PSP-0003-09
WBS NO.: PROJECT/DOCUMENT/ECDC # 21140-PSP-0003 Rev.0		Page: 1 of 3
PROJECT TITLE: Project Specific Plan For Area 9, Phase III Certification Sampling Abandoned Outfall Line – Part One		Date: 4/07/05

VARIANCE / FIELD CHANGE NOTICE (Include justification):

This Variance/Field Change Notice (V/FCN) documents the addition of one certification sample to certification unit 3 (CU 3), which will encompass the east side of State Route 128 (SR 128) from within the 54" casing.

The Sampling and Analytical Requirements and the sample information are listed in Attachment 1, and the target analytes are listed in Attachment 2.

The Sample IDs are identified as A9P3-C03-19^L, A9P3-C03-19^M, or A9P3-C03-19^MP.

Where:
A9P3 = Area 9, Phase III
C03 = CU03
19 = nineteenth sample location
M, MP, or L = Suite Identifier
"M" for metals
"P" for PCBs
"L" for volatiles

Surveying required: No
Field QC samples required: Yes, trip blank
Field data validation: Yes
Analytical data validation: Yes
Data package required: Yes

The highest total uranium result for this area is 3.27 mg/kg from A9P3-SM-2.

Justification:
A sample from within the 54" casing is necessary to determine if any constituents of concern are present above action limits.

Per Section 4.4 of the PSP, changes to PSP will be documented with a V/FCN.

REQUESTED BY: Greg Lupton Date: 4/07/05

X IF REQD	VARIANCE/FCN APPROVAL	DATE	X IF REQD	VARIANCE/FCN APPROVAL	DATE
X	QUALITY ASSURANCE: R. Frisbie	4-11-05	X	PROJECT MANAGER: J.D. Chiou	4/11/05
	DATA QUALITY MANAGEMENT		X	CHARACTERIZATION MANAGER: F. Miller	4/7/05
X	ANALYTICAL CUSTOMER SUPPORT:	4-12-05		RTIMP Manager	
	WAO		X	SAMPLING MANAGER: T. Bubbage	4/12/05

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:

ADDITIONAL SAMPLE LOCATIONS AND IDENTIFIERS FOR CU 3

CU	Location	Depth	Sample ID	Analysis
3	3-19	0"-6"	A9P3-C03-19^MP	TAL G
			A9P3-C03-19^M	TAL H
			A9P3-C03-19^L	TAL D

SAMPLING AND ANALYTICAL REQUIREMENTS

Analyte	Method	Sample Matrix	ASL	Preserve	Hold Time	Container [a]	Minimum Mass/Volume
Metals (TAL H)	ICP-AES or ICP/MS	Solid	D/E[a]	Cool, 4° C	6 months	Glass with Teflon-lined lid	50 g
Hexavalent Chromium (TAL G)	4-12-05 Colorimetric	Solid	D/E[a]	Cool, 4° C		Glass with Teflon-lined lid	250 g
Fluoride (TAL G)	IC				28 days		
PCBs (TAL G)	GC				14 days		
VOCs (TAL D)	GC/MS	Solid	D/E[a]	Cool, 4° C	48 hours	9 x 1-Encore Sampler [b] or equivalent plus a 60 ml jar for % moisture	Each full Encore Sampler [b] will hold app. 5 g of soil
VOCs (TAL D)	GC/MS	Liquid (trip blank)	D/E[a]	Cool, 4° C H_2SO_4 pH<2	14 days	3 x 40-ml glass with lined-lined septa	120 ml [b] (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 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".

ICP-AES – inductively coupled plasma atomic emission spectroscopy

ICP/MS – inductively coupled plasma mass spectroscopy

GC/MS – gas chromatography mass spectroscopy

VOC – volatile organic compound

6019

TAL 21140-PSP-0003-D

Analyte	Off-Property FRL	MDL
1,1-dichloroethene	0.059 mg/kg	0.0059 mg/kg
1,1,1-trichloroethane	0.19[3] mg/kg	0.019 mg/kg
Carbon Tetrachloride	0.091 mg/kg	0.0091 mg/kg
Tetrachloroethene	1 mg/kg	0.1 mg/kg

21140-PSP-0003-G

Analyte	Off-Property FRL (BTV)[2]	MDL
Fluoride	850 mg/kg	85 mg/kg
Hexavalent Chromium	11 mg/kg (0.05 mg/kg)	0.11 mg/kg
Aroclor-1254	0.04 mg/kg	0.004 mg/kg
Aroclor-1260	0.04 mg/kg	0.004 mg/kg

21140-PSP-0003-H

Analyte	Off-Property FRL (BTV)[2]	MDL
Antimony	0.61 mg/kg	0.25 mg/kg[1]
Arsenic	9.6 mg/kg	0.96 mg/kg
Beryllium	0.62 mg/kg	0.062 mg/kg
Cadmium	0.91 mg/kg	0.091 mg/kg
Copper	20 mg/kg	2 mg/kg
Lead	400 mg/kg (200 mg/kg)	20 mg/kg
Manganese	1400 mg/kg	140 mg/kg
Molybdenum	13 mg/kg (10 mg/kg)	1 mg/kg
Nickel	34 mg/kg	3.4 mg/kg
Silver	1.0 mg/kg	0.1 mg/kg
Zinc	82 mg/kg	8.2 mg/kg

[1]10 percent of the FRL is not achievable for this analyte

[2]If the BTV is lower than the established FRL, the MDL shall bet set at 10 percent of the BTV

[3]FRL is actually for 1,1,2-Trichloroethane since 1,1,1-Trichloroethane does not have a FRL.

BTV – Benchmark Toxicity Value

MDL – minimum detection level

mg/kg – milligrams per kilogram

pCi/g – picoCuries per gram

VARIANCE / FIELD CHANGE NOTICE	Significant? (Yes or No): NO	V/F: 21140-PSP-0003-10
WBS NO.: PROJECT/DOCUMENT/ECDC # 21140-PSP-0003 Rev.0		Page: 1 of 1
PROJECT TITLE: Project Specific Plan For Area 9, Phase III Certification Sampling Abandoned Outfall Line – Part One		Date: 4/11/05 6019

VARIANCE / FIELD CHANGE NOTICE (Include justification):

This Variance/Field Change Notice (V/FCN) documents the addition of technetium-99 (TAL I) analysis to sample A9P3-C03-19^MP, which has already been collected and is at an off-site laboratory. The sample should be prepped and analyzed for technetium-99 three times. The final remediation level is 1.0 pCi/g, and the MDL should be the best achievable.

Analytical data validation: Yes, VSL B
Data package required: Yes

Justification:
The technetium-99 analysis is necessary to confirm the results obtained from another off-site laboratory.

Per Section 4.4 of the PSP, changes to PSP will be documented with a V/FCN.

REQUESTED BY: Greg Lupton Date: 4/11/05

X IF REQD	VARIANCE/FCN APPROVAL	DATE	X IF REQD	VARIANCE/FCN APPROVAL	DATE
X	QUALITY ASSURANCE: R. Friske	4-11-05	X	PROJECT MANAGER: J.D. Chiou	4/11/05
	DATA QUALITY MANAGEMENT		X	CHARACTERIZATION MANAGER: F. Miller	4/11/05
X	ANALYTICAL CUSTOMER SUPPORT:	4-12-05		RTIMP Manager	
	WAO			SAMPLING MANAGER: T. Buhrlage	4/12/05

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:

6019

VARIANCE / FIELD CHANGE NOTICE	Significant? (Yes or No): NO	V/F: 21140-PSP-0003-11
WBS NO.: PROJECT/DOCUMENT/ECDC # 21140-PSP-0003 Rev.0		Page: 1 of 2
PROJECT TITLE: Project Specific Plan For Area 9, Phase III Certification Sampling Abandoned Outfall Line – Part One		Date: 4/12/05

VARIANCE / FIELD CHANGE NOTICE (Include justification):

This Variance/Field Change Notice (V/FCN) documents the addition of three certification samples to certification unit 3 (CU 3), which will encompass both the east and west sides of State Route 128 (SR 128) from within the 54" casing. Two samples will be collected from within the west sides, and the third sample will be collected from the within the east side. Samples will be analyzed for technetium-99 (TAL I).

The Sampling and Analytical Requirements and the sample information are listed in Attachment 1, and the target analytes are listed in Attachment 2.

The Sample IDs are identified as A9P3-C03-20W^R, A9P3-C03-21W^R, or A9P3-C03-22E^R.

Where:
A9P3 = Area 9, Phase III
C03 = CU03
20, 21, and 22 = unique sample location
E = east side of SR128; W = west side of SR128
R = technetium-99

Surveying required: No
Field QC samples required: Yes, trip blank
Field data validation: Yes
Analytical data validation: Yes, VSL B
Data package required: Yes

The highest total uranium result for this area is 3.27 mg/kg from A9P3-SM-2.

Justification:
Samples from within the 54" casing are necessary to determine if technetium-99 is present above the action limit.

Per Section 4.4 of the PSP, changes to PSP will be documented with a V/FCN.

REQUESTED BY: Greg Lupton Date: 4/12/05

X IF REQD	VARIANCE/FCN APPROVAL	DATE	X IF REQD	VARIANCE/FCN APPROVAL	DATE
X	QUALITY ASSURANCE: R. Friske	4-12-05	X	PROJECT MANAGER: J.D. Chio	4/13/05
	DATA QUALITY MANAGEMENT	4-12-05	X	CHARACTERIZATION MANAGER: F. Mi	4/12/05
X	ANALYTICAL CUSTOMER SUPPORT:	4-12-05		RTIMP Manager	
	WAO		X	SAMPLING MANAGER: T. Buhrlage	4/12/05

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:

ADDITIONAL SAMPLE LOCATIONS AND IDENTIFIERS FOR CU 3

CU	Location	Depth	Sample ID	Analysis
3	3-20	0"-6"	A9P3-C03-20W^R	TAL I
	3-21	0"-6"	A9P3-C03-21W^R	TAL I
	3-22	0"-6"	A9P3-C03-22W^R	TAL I

TAL 21140-PSP-0003-I

Analyte	Off-Property FRL	MDL
Technetium-99	1 pCi/g	0.5 pCi/g[a]

[a]10 percent of the FRL is not achievable for this analyte

SAMPLING AND ANALYTICAL REQUIREMENTS

Analyte	Method	Sample Matrix	ASL	Preserve	Hold Time	Container [b]	Minimum Mass/Volume
Tc-99 (TAL I)	Liquid Scintillation or GPC	Solid	D/E[a]	None	12 months	Glass with Teflon-lined lid	50 g

[a]Samples will be analyzed according to Analytical Support Level (ASL) D requirements but the minimum detection level may cause some analyses to be considered ASL E.
[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] One sample shall be identified on the Chain of Custody/Request for Analysis forms as "designated for laboratory QC". 50g is sufficient for lab QC.
GPC – gas proportional counting

APPENDIX C

RELEASE JUSTIFICATION FOR AREA 9, PHASE III ABANDONED OUTFALL STRUCTURE SHEET PILES

6019

FLUOR

Memorandum Fluor Fernald, Inc.

To:	Distribution	Date:	November 4, 2004
Location:	Fernald	Reference:	RP-0025
From:	Corey Fabricante, MS52-1	Fernald #:	M:DSDP:2004-0085
Location:	Fernald	Client:	DOE DE-AC24-01OH20115
Extension:	648-4962	Subject:	**RELEASE JUSTIFICATION FOR AREA 9, PHASE III ABANDONED OUTFALL STRUCTURE SHEET PILES**

Distribution:

Rich Abitz, MS64
Jyh-Dong Chiou, MS64
Uday Kumthekar, MS64
Greg Lupton, MS64
Frank Miller, MS64
Dan Powell, MS64

c: File Record Subject – Free Release of A9PIII AOL Sheet Piles
Project Number 21140.1.5

This serves as an unrestricted free release justification for remaining sheet piles at the abandoned outfall structure along the Great Miami River. A justification is required due to the lower/below-grade portion of the sheet piles being inaccessible for radiological surveys after outfall pipe excavation. The guiding documents and regulations which support such justifications are, DOE Order 5400.5, Supporting Document SD-1014 and 10 CFR 835 and site Radiological Control procedure RP-0025. The SD-1014, Section 3, Surface Release Criteria, states:

> "For material with inaccessible areas, documented process knowledge must be combined with surveys of all accessible areas to ensure the material meets the release guidelines. The documented process knowledge must clearly show that there is reasonably no potential for the inaccessible areas of the material to have been contaminated. If this can not be done, then the material must be disassembled to allow access for proper survey or the material is not eligible for unrestricted release."

SD-1014, Attachment A also contains the limits for unrestricted free release, which are the same as 10 CFR 835 and DOE Order 5400.5.

Following process knowledge is available as justification for free release of the remaining sheet piles:

- All potentially contaminated pipe and debris at and above outfall pipe grade have been removed from outside and inside the sheet piles including at least 6-inch of bedding materials and soil below the pipes.

- Remaining soil within the sheet piles has been scanned using real time instrumentation and meets all pre-certification action levels.

- All outside surface of the removed pipe sections between the sheet piles have been monitored for fixed plus removable contamination using portable hand held friskers. All results meet applicable free release criteria listed in SD-1014, Attachment A.

- All accessible surfaces of the sheet piles have been monitored for fixed plus removable contamination using portable hand held friskers. All results meet applicable free release criteria listed in SD-1014, Attachment A.

- The inaccessible portions of the sheet piles are below the pipe grade and are less likely to be impacted by any historical releases from the pipes than the outside surface of the pipes, soils around the pipes, and accessible portion of the sheet piles adjacent to the pipes.

- Review of the original piling installation construction documentation determines that new sheet piles were used.

- Review of piling backfill soil data determined that only clean backfill was placed.

The radionuclides listed in SD-1014 and associated with the outfall line include radium-226, thorium-232 and uranium-238. The applicable free release criteria are the limits for uranium-238, radium-226 and thorium-230, which is more restrictive than the limits for thorium-232 (see SD-1014, Attachment A).

In closing, items being abandoned in place can be free released as a whole including inaccessible areas due to:

- Complete removal of all potentially contaminated pipes, debris, and soils.

- No indication of contamination on the outside surface of all the removed pipes.

- All results of the radiological surveys on all accessible areas of items being left in place meet criteria for unrestricted free release. There was no detectable impact of contamination from the pipes, debris, and soils on the adjacent sheet piles.

- All real time scanning results of adjoining remaining soils are below all pre-certification action levels.

Based on process knowledge and direct radiological measurements, it is concluded that there is no radiological contamination on any accessible or inaccessible areas of the sheet piles left in place. Included with this memorandum are copies of all survey results.

If you have any questions or comments, please feel free to give me a call at 648-4962.

CRF:jkp
Attachments (3)

6019

FEMP COVER SHEET

SURVEY NUMBER 04-10-14-195

DATE 10/26/04	RCT PR [redacted]		PAGE 1 of 2
TIME 1000	SIGNAT [redacted]		BADGE # 23689
RWP NUMBER 03-0114	REVIEW [redacted]		DATE 10/26/04
	SIGNAT [redacted]		BADGE # 7472

LOCATION: Outfall Line

REASON FOR SURVEY: Job Coverage, Excavation of Lift Crack

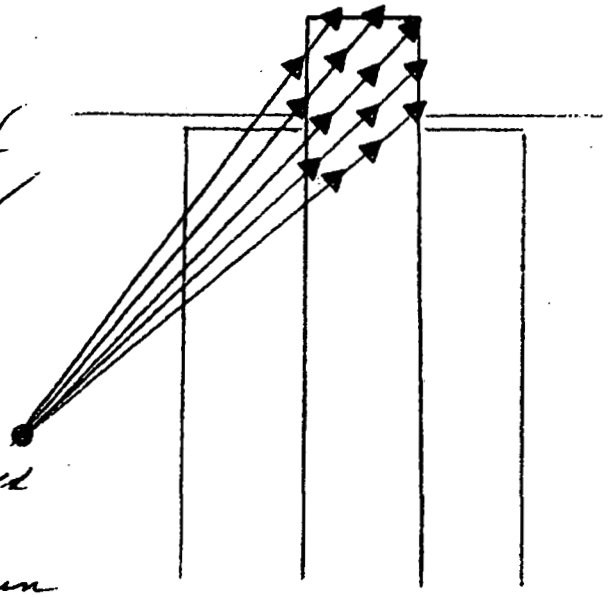
SUMMARY:

-E-

Rinse

Direct Scan w/ HP3 of Pipe line trench out to Water end.

-H-



-A-

Direct Scan w/ HP3 Down to Water line All area <MDCR

COPY

-W-

FS-F-4617
REV. 2: 04/01/99, RP-0023

FEMP / RADIOLOGICAL SURVEY REPORT

SURVEY NUMBER: 04-10-14-195 **PAGE** 2 **OF** 2

DATE:	[redacted]	BADGE #:
10/26/00		7365
DATE REVIEWED:	[redacted]	**BADGE #:**
10/26/04		7472

MODEL	SERIAL NUMBER	PROBE	CALIBRATION DUE DATE	BACKGROUND	EFFICIENCY	SOURCE	BATTERY	FUNCTIONAL CHECK	NA
443	7760	BJ	April 05	60	4/30	4/1	440/32	✓	NA
			M. A.						

ITEM NUMBER	LOCATION AND/OR DESCRIPTION	DPM/100 cm²				DPM/100 cm²			
		REMOVABLE			REMOVABLE				
1.	See Comments								

COPY

M. A.

M. A.

Note (1): Values identified by an asterisk (*) indicate results are less than the calculated MDA.

FS-F-1993-1

REV. 3: 09/18/00, RP-0023

6019

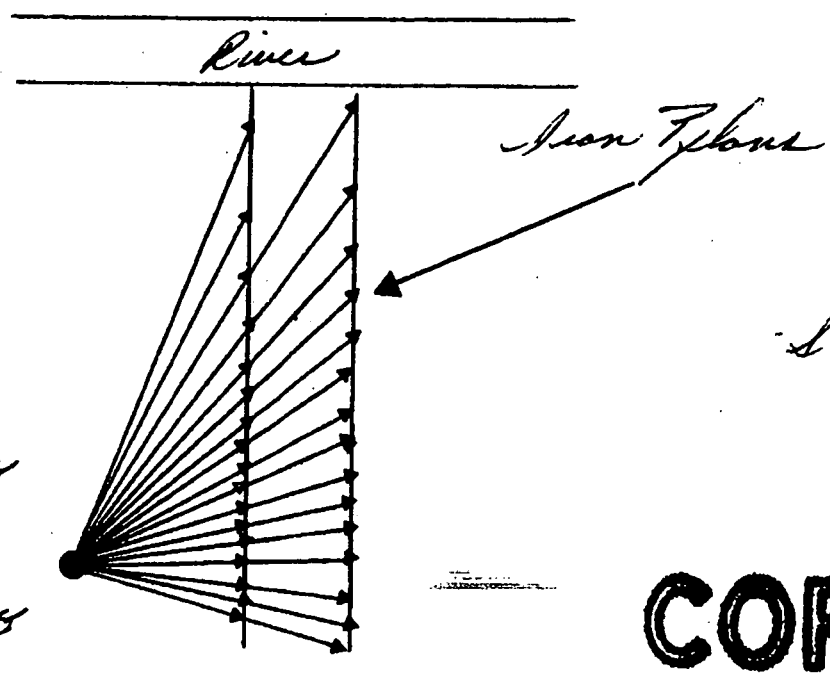
FEMP COVER SHEET		SURVEY NUMBER 04-11-14-39
DATE 11/4/04	RCT P[redacted]	PAGE 1 of 4
TIME 0830	SIGNA[redacted]	BADGE # 78659
RWP NUMBER 05204	REVIEW[redacted]	DATE 11/4/04
	SIGNA[redacted]	BADGE # 7478

LOCATION: Outfall Line

REASON FOR SURVEY Job Coverage, Support of Soil & Pipe Excavation

SUMMARY:

-E-



Direct Scan Survey w/ 44/3 & B.J

Direct Scan Survey w/ 2221 X

Smear Survey completed

-W-

Note: See Attachment

Surveys conducted on all accessable surfaces.

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REV. 2: 04/01/99, RP-0023

FEMP
MATERIAL UNRESTRICTED RELEASE FORM

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SURVEY # 04-11-14-29

DATE: 11/4/2004 LOCATION: Outfall Line [redacted] [redacted] PAGE 2 OF 4

BADGE #: 7459

MODEL	SERIAL NUMBER	TYPE ALPHA or BETA/GAMMA	CAL DUE DATE	BKGD (CPM)	EFF./CF	COUNT TIME (MIN)	(DPM)	INST. PERFORMANCE TEST SAT? YES	NO
2443	90212	B/G	Aug 05	60	4/30	N/A	400/2K	✓	N/A
2221	25441	B	6/05	1.5	18.9%	1	12	✓	N/A
LB5100/Frendel	#5	L.B	12/05	0.4/13	0.338 / 0.306	.5	5/7	✓	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TIME	RCT INITIAL	MATERIAL DESCRIPTION	RELEASE CRITERIA SURF. or VOL	DPM//100cm² ALPHA REMOVABLE	ALPHA FIXED + REM	BETA//GAMMA REMOVABLE	BETA//GAMMA FIXED + REM	RELEASE JUSTIFICATION	RECIPIENT	MATERIAL RELEASE EVALUATOR BADGE # and SIGNATURE (1)
0830	[illegible]	1. Iron Filter Wall	Surf	-1	<MDA	1	<MDA	RP-025	Floor	10552 [illegible]
		2.		-1		1				
		3.		-1		-3				
		4.		-1		-3				
		5.		-1		1				
		6.		-1		1				
		7.		-1		-3				
		8.		-1		6				
		9.		-1		-3				
		10		-1		1				
		20. West Wall		-1		1				
		19.		-1		6				
		18.		-1		-3				
		17.		-1		-3				
		16.		5		-3				
		15. East Wall		-1	<MDA	1	<MDA			10552 [illegible]

Comments N/A

REVIEW: [redacted] PRINT SIGNATURE BADGE # 7472 DATE 11/4/04

(1) Material Release Evaluator approval required in accordance with RP-0025, radiological release of items and materials, if any of the following conditions exist:
a. Material has potential for contamination in areas which are inaccessible for proper survey.
b. Process knowledge is used to support the release decision.
c. Material has potential of contamination beneath any coating applied while the material was in the Controlled Area.
d. Material has potential for volume or in-depth radioactivity within the material matrix.
e. Special case items are being released, such as radioactive consumer products, industrial sources, etc.
f. Material has detectable activity present and the activity is below the contamination limits listed in Attachment 1 of RP-0025.

FS-F-3915-1
Rev. 5: 03/05/01, RP-0025

FEMP

MATERIAL UNRESTRICTED RELEASE FORM

(Continuation)

COPY

SURVEY # 04-11-14-29

Date: 11/4/2004 LOCATION: Outfall Line [redacted] [redacted] BADGE #: 28659

TIME	RCT INITIAL	MATERIAL DESCRIPTION	RELEASE CRITERIA SURF or VOL	ALPHA REMOVABLE	ALPHA FIXED + REM	BETA/GAMMA REMOVABLE	BETA/GAMMA FIXED + REM	JUSTIFICATION		MATERIAL RELEASE EVALUATOR BADGE # and SIGNATURE (1)
				0cm²						
0830	[illegible]	Inner Pipe Line 14.	Surf	-1	<MDA	1	<MDA	RP-025	Flout	10556 [signature]
		13.		5		16				
		12.		-1		-3				
		11 East Wall		-1		1				
		21. West Wall		-1		1				
		22.		-1		6				
		23.		-1		-3				
		24.		-1		-3				
		25.		12		-3				
		26.		-1		1				
		27.		-1		6				
		28.		-1		1				
		29.		-1		1				
		30.		-1	<MDA	1	<MDA			10556 [signature]
		N/A					N/A			N/A

Comments: ~ K

REVIEW: [redacted] PRINT SIGNATURE BADGE 7472 DATE 11/4/04

FS-F-3915-2
REV. 2: 01/22/98: RP-0025

RECORD COPY

6019

WED NOV 03, 2004 11:27:35
GROSS ALPHA/BETA COUNTED FOR (0.5 MIN) ON TENNELEC # 5

SAMPLE NUMBER	COUNT TIME	GROSS ALPHA	GROSS B-g	DPM ALPHA	DPM B-g	TIME COUNTED
1	0.50	0	1	-1	1	11:28:08
2	0.50	0	1	-1	1	11:28:49
3	0.50	0	0	-1	-3	11:29:30
4	0.50	0	0	-1	-3	11:30:12
5	0.50	0	1	-1	1	11:30:53
6	0.50	0	1	-1	1	11:31:34
7	0.50	0	0	-1	-3	11:32:16
9	0.50	0	2	-1	6	11:32:57
8	0.50	0	0	-1	-3	11:33:38
10	0.50	0	1	-1	1	11:34:20
20	0.50	0	1	-1	1	11:35:01
19	0.50	0	2	-1	6	11:35:42
18	0.50	0	0	-1	-3	11:36:24
17	0.50	0	0	-1	-3	11:37:05
16	0.50	1	0	5	-3	11:37:46
15	0.50	0	1	-1	1	11:38:27
14	0.50	0	1	-1	1	11:39:09
13	0.50	1	4	5	16	11:39:50
12	0.50	0	0	-1	-3	11:40:31
11	0.50	0	1	-1	1	11:41:13
21	0.50	0	1	-1	1	11:41:54
22	0.50	0	2	-1	6	11:42:35
23	0.50	0	0	-1	-3	11:43:17
24	0.50	0	0	-1	-3	11:43:58
25	0.50	2	0	12	-3	11:44:39
26	0.50	0	1	-1	1	11:45:21
27	0.50	0	2	-1	6	11:46:02
28	0.50	0	1	-1	1	11:46:43
29	0.50	0	1	-1	1	11:47:25
30	0.50	0	1	-1	1	11:48:06

OPERATION COMPLETE

OPERATION COMPLETE

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FEMP RADIOLOGICAL SURVEY REPORT pg 4 of 4
SURVEY # 04.11.14-B DATED 11/4/04
(name) (signature)
RCT: R.W. Hart
REVIEWER: C.W. Hoeck

6019

FEMP COVER SHEET		SURVEY NUMBER: 04-11-14-31	
DATE 110404	RCT P[redacted]		PAGE 1 of 2
TIME 1315	SIGNA[redacted]		BADGE # 28659
RWP NUMBER	REVIEWER PRINT[redacted]		DATE 11/4/04
N/A	SIGNATURE[redacted]		BADGE # 7472

LOCATION: Outfall Line

REASON FOR SURVEY: Job Coverage Soil & Rock Excavation.

SUMMARY:

COPY

N/A

FS-F-4617
REV. 2: 04/01/99, RP-0023

FEMP
MATERIAL UNRESTRICTED RELEASE FORM

SURVEY # 04-11-14-31

DATE: 11/4/04 | LOCATION: Outfall Line | RCT (PRI[redacted] | [redacted] | PAGE 2 OF 3 | BADGE #: 78659

MODEL	SERIAL NUMBER	TYPE ALPHA or BETA/GAMMA	DUE DATE	BKGD (CPM)	EFF./CF	(MIN)	(DPM)	INST. PERFORMANCE TEST SAT? YES	NO
3/3	22120	Bg	4/in/05	60	4/30	N/A	400/3K	✓	NA
	N/A			N/A			N/A		

TIME	RCT INITIAL	MATERIAL DESCRIPTION	RELEASE CRITERIA SURF or VOL	DPM//100cm² ALPHA REMOVABLE	ALPHA FIXED + REM	BETA//GAMMA REMOVABLE	BETA//GAMMA FIXED + REM	RELEASE JUSTIFICATION	RECIPIENT	MATERIAL RELEASE EVALUATOR BADGE # and SIGNATURE (1)
1365	[illegible]	Iron Pipe	Surf	N/A	N/A	<MDA	<MDA	04-10-14-RK	Flour	7472 [illegible]
		N/A	N/A					N/A	N/A	

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Comments

REVIEW: [redacted] | PRINT | SIGNATURE | BADGE # 7472 | DATE 11/4/04

(1) Material Release Evaluator approval required in accordance with RP-0025, radiological release of items and materials, if any of the following conditions exist:
a. Material has potential for contamination in areas which are inaccessible for proper survey.
b. Process knowledge is used to support the release decision.
c. Material has potential of contamination beneath any coating applied while the material was in the Controlled Area.
d. Material has potential for volume or in-depth radioactivity within the material matrix.
e. Special case items are being released, such as radioactive consumer products, industrial sources, etc.
f. Material has detectable activity present and the activity is below the contamination limits listed in Attachment 1 of RP-0025.

FS-F-3915-1
Rev. 5: 03/05/01, RP-0025