

3849

**CERTIFICATION DESIGN LETTER FOR THE
AREA 2, PHASE I FORMER INACTIVE FLYASH
PILE, SOUTH FIELD, CAROLINA AREA,
EAST-WEST CONSTRUCTION ROAD AND
EQUIPMENT WHEEL WASH FACILITY**

**FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
FERNALD, OHIO**



AUGUST 2001

**U.S. DEPARTMENT OF ENERGY
FERNALD AREA OFFICE**

**20400-RP-0005
REVISION A
DRAFT**

000001

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LIST OF ACRONYMS AND ABBREVIATIONS

A2PI	Area 2, Phase I
A2PII	Area 2, Phase II
AFP	Active Flyash Pile
ASCOC	area-specific constituent of concern
ASL	analytical support level
BTV	benchmark toxicity value
CDL	Certification Design Letter
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	constituent of concern
CRDL	Contract Required Detection Limit
CU	certification unit
DOE	U.S. Department of Energy
EWWF	Equipment Wheel Wash Facility
EPA	U.S. Environmental Protection Agency
FEMP	Fernald Environmental Management Project
FRL	final remediation level
GMA	Great Miami Aquifer
HPGe	high-purity germanium (detector)
IFP	Inactive Flyash Pile
IRDP	Integrated Remedial Design Package (includes the Implementation Plan)
µg/kg	micrograms per kilogram
mg/kg	milligram per kilogram
MSL	mean sea level
NWU	Non-Waste Unit
OEPA	Ohio Environmental Protection Agency
OSDF	On-Site Disposal Facility
OU	Operable Unit
pCi/g	picoCuries per gram
ppm	parts per million
PSP	Project Specific Plan
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RSS	Radiation Scanning System
RTRAK	Radiation Tracking System
SCQ	Sitewide CERCLA Quality Assurance Project Plan
SED	Sitewide Environmental Database
SEP	Sitewide Excavation Plan
SF	South Field
SSOD	Storm Sewer Outfall Ditch
SWU	Southern Waste Units
UCL	Upper Confidence Limit
WAC	waste acceptance criteria

EXECUTIVE SUMMARY

This Certification Design Letter (CDL) describes the certification approach for the Area 2, Phase I (A2PI) former Inactive Flyash Pile (IFP), South Field (SF), Carolina Area, East-West Construction Road, and the Equipment Wheel Wash Facility (EWWF). These areas are located in the southeast corner of the Fernald Environmental Management Project (FEMP). The CDL includes the following information:

- A definition of the boundaries of the area to be certified under this CDL
- A discussion of the area-specific constituent of concern (ASCOC) selection process and a list of ASCOCs
- A presentation of the certification unit (CU) boundaries and proposed sampling strategy
- The analytical requirements and the statistical methodology that will be employed
- The proposed schedule for certification activities.

The scope of this CDL is limited to certification of the former IFP, SF, Carolina Area, East-West Construction Road, and the EWWF. Remediation of these areas will be completed in 2001 and 2002, thus initiating the certification process described in this CDL.

The certification design presented in this CDL follows the general approach outlined in Section 3.4 of the Sitewide Excavation Plan (SEP, DOE 1998a). The subject areas are well characterized through previous sampling investigations and final remediation level (FRL) scanning with real-time equipment. The selection process for the ASCOCs is accomplished by using constituent of concern (COC) lists in the Operable Units (OU) 2 and 5 Records of Decision (ROD, DOE 1995a and 1996), previous investigation data, and process knowledge. A total of 24 CUs have been defined for this CDL. Total uranium, thorium-228, thorium-232, radium-226, and radium-228 (the sitewide primary radiological COCs) are considered ASCOCs in each CU. Additional secondary COCs are identified for specific CUs within the certification area. In addition, the following ecological COCs will also be analyzed in specific area CUs designated in the SEP: lead and molybdenum.

A2PI certification is being performed in three phases with the first phase consisting of the AFP area east of the south construction access road, which is already certified. The second and third phase of certification is the IFP/SF area, which is the scope of this CDL. The second phase consists of 20 CUs

- 1 sampled in 2001 and the third phase consists of the remaining four CUs, which will be sampled after
- 2 the 2002 excavation season. Field sampling of phase two is scheduled to begin immediately following
- 3 excavation and precertification, in October 2001, and the Certification Report will be issued within
- 4 90 days after sampling is completed.

1.0 INTRODUCTION

This Certification Design Letter (CDL) describes the certification approach in the footprint of the former Area 2, Phase I (A2PI) Inactive Flyash Pile (IFP), South Field (SF), Carolina Area, East-West Construction Road, and the Equipment Wheel Wash Facility (EWWF); (herein referred to as the IFP/SF area). The format of this CDL follows guidelines presented in the Sitewide Excavation Plan (SEP, DOE 1998a).

The major remedial actions completed in these areas include the excavation of the SF and IFP, the debris excavation in the Carolina area, and the stabilization and excavation of the Firing Range. Certification sampling will be conducted as area excavations are completed. The majority of the certification units (CUs) will be sampled and certified beginning in October 2001. The remaining CUs will be sampled and certified after the 2002 excavation season. These CUs are clearly defined in this CDL. The major features within this area excluding the IFP and SF are the:

- Footprint of the Carolina Non-Waste Units (NWU)
- Footprint of the former Basin 1
- Former vehicle turnaround/running track area and Firing Range
- Footprint of the Equipment Wheel Wash Facility (EWWF)
- Footprint of the East-West Construction Road running from the North-South Access Road west to EWWF.

A2PI consists of the Southern Waste Units [IFP, SF and Active Flyash Pile (AFP)], and the adjacent NWU area as shown in Figure 1-1. A2PI certification is being performed in three phases with the first phase consisting of the AFP area east of the South Construction Access Road, which is already certified. The second and third phase of certification is the IFP/SF area, which is the scope of this CDL. The second phase consists of 20 CUs sampled in 2001 and the third phase consists of the remaining four CUs, which will be sampled after the 2002 excavation season.

The A2PI IFP/SF certification area is bounded to the north by an east-west ditch that runs just north of the East-West Construction Road, to the east by the South Access Construction Road, south by Paddys Run and the Storm Sewer Outfall Ditch (SSOD), and the west by Paddys Run and Area 2, Phase II

1 (A2PII). The current topography as of July 2000 is depicted in Figure 1-2. The A2PI IFP/SF
2 certification area is approximately 26 acres.

3
4 Within the certification area there will be several remediated footprints: the SF and IFP, several storm
5 water and erosion control ditches (Ditch 1-8), three retention basins (Basin 1, 2, and 4), Non-Impacted
6 Stockpile 1/Turnaround, Carolina debris area, the EWWF, and the East-West Haul Road.

7 8 1.1 OBJECTIVES

9 The primary objectives of this CDL are as follows:

- 10
- 11 • Define the boundaries of the area to be certified under this CDL
 - 12 • Present maps for newly acquired real-time data
 - 13 • Discuss the area-specific constituent of concern (ASCOC) selection process and present
14 a list of ASCOCs
 - 15 • Present the CU boundaries and proposed sampling strategy
 - 16 • Summarize the analytical requirements and the statistical methodology that will be
17 employed
 - 18 • Present the proposed schedule for the certification activities.
- 19
20
21
22
23
24

25 1.2 SCOPE

26 The scope of this CDL is the certification of the IFP/SF area that consists of 24 Group 1 CUs:

- 27
- 28 • Eight in the till areas within the former SF and IFP (contains the former Firing Range)
 - 29 • Four in the Carolina debris excavation and adjacent area
 - 30 • Three in the Great Miami Aquifer (GMA)/sand areas within the former SF and IFP
 - 31 • Two for former Basin 1
 - 32 • One for the EWWF and Basin 4 footprint
 - 33 • The East-West Construction Road
 - 34 • Two for the former Non-Impacted Stockpile 1/Turnaround area footprint
 - 35 • One for the footprint of Basin 2
 - 36 • One for the Ditch 8 which leads to Basin 2
 - 37 • One for the Grassy Knoll areas south of Basin 4.
- 38

39 The CU design is shown in Figure 4-1, and a description of each CU is provided in Section 4.1.

1 This CDL does not cover the certification sampling associated with the following:

2

3

- Utility corridor/North-South Access Road that splits the AFP and SF

4

5

- Soil beneath the basin transfer lines as well as the soil immediately adjacent to the Well House 16 and the injection/extraction well house (just west of former Basin 3).

6

7

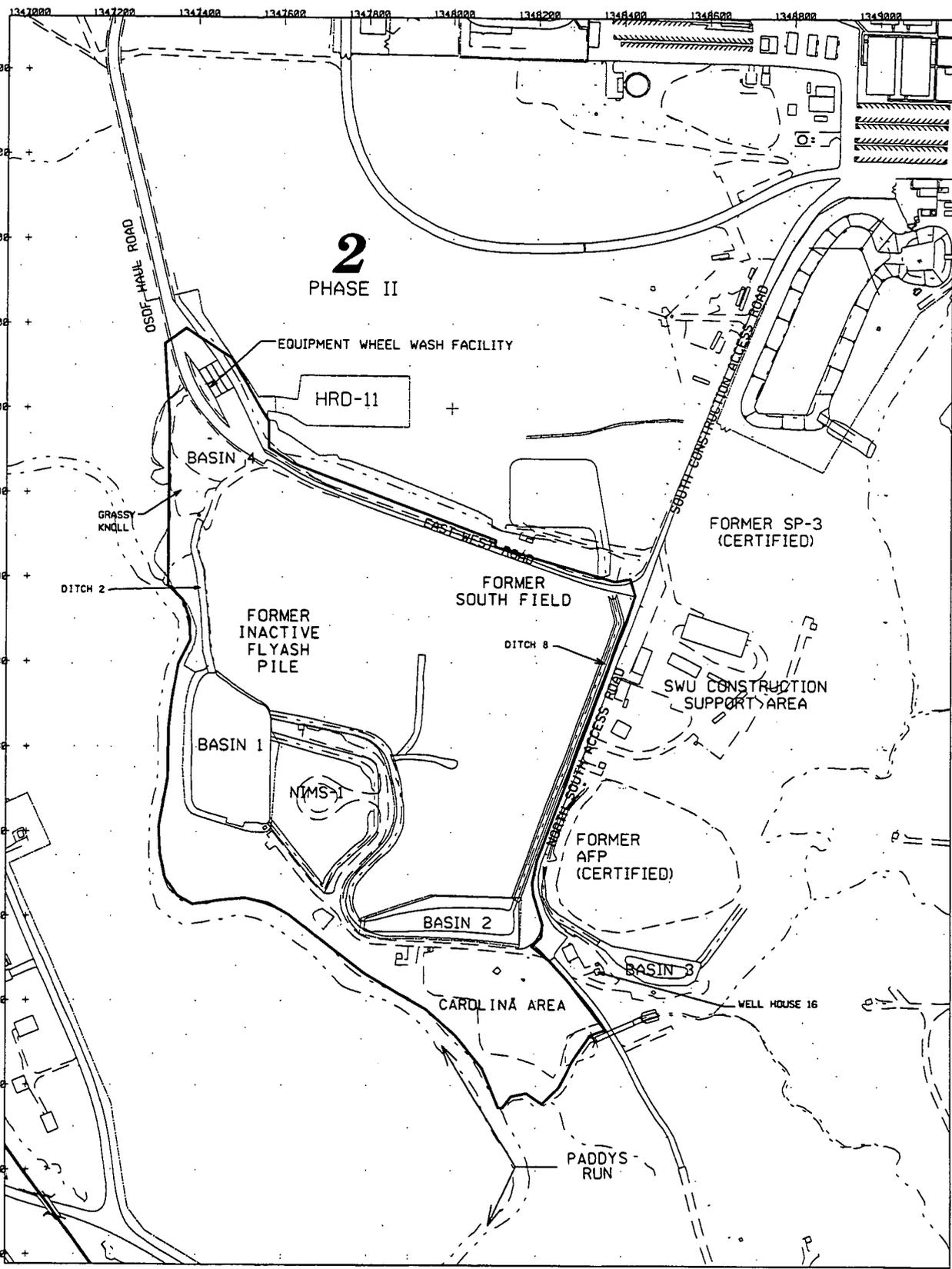
8 The certification of these soils, depicted in Figure 1-3, will be conducted as part of Area 10 certification.

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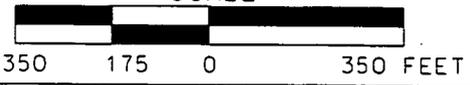
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27-AUG-2001



LEGEND:

— REMAINING A2P1 CERTIFICATION BOUNDARY SCALE



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FIGURE 1-1. A2P1 CERTIFICATION AREA

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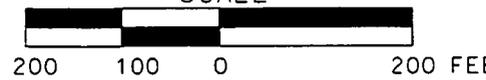
24-AUG-2001



LEGEND:

—— A2P1 BOUNDARY

SCALE



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FIGURE 1-2. A2P1 AS OF JULY 2001 TOPOGRAPHY

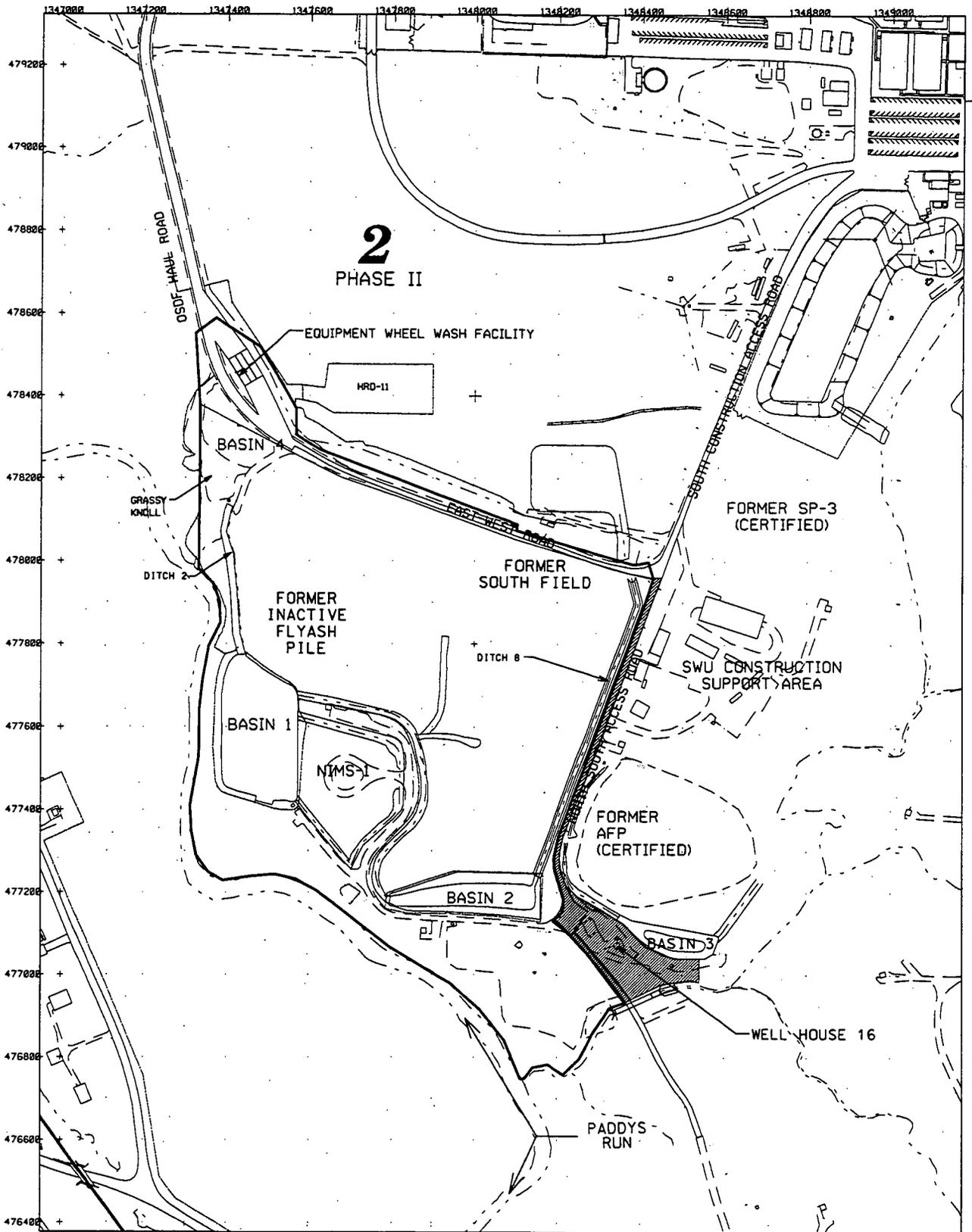
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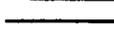
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STATE PLANAR COORDINATE SYSTEM 1927

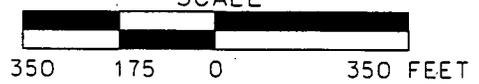
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LEGEND:

-  A2P1 BOUNDARY
-  AREA EXCLUDED FROM CERTIFICATION

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FIGURE 1-3. AREA EXCLUDED FROM CERTIFICATION

000012

2.0 HISTORICAL SOIL CONTAMINATION DATA

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

In addition to the Southern Waste Unit (SWU) site preparation investigation data, the Remedial Investigation Reports (RI, DOE 1995b and 1995c) and Feasibility Study Reports (FS, DOE 1995d and 1995e) for Operable Units (OU) 2 and 5 were used for remedial design of the IFP/SF area. Also, final grade excavation monitoring/sampling and NWU real-time scanning/sampling data have been collected pursuant to the RI/FS and remedial activities.

Before initiating certification, all historical soil data, within the IFP/SF certification area, were pulled from the Sitewide Environmental Database (SED). The data is summarized in the following sections.

2.1 HISTORICAL AND PREDESIGN DATA SUMMARY

All historical data in this area is presented in the A2PI SWUs Implementation Plan for OU2 (IRDP, DOE 1998b) and the Implementation Plan for A2PI NWUs Perimeter Area (DOE 2001). Table 2-1 summarizes the data, including the rationale for retaining certain secondary ASCOCs originally assigned to Remediation Area 2 (Table 2-7 from the SEP) for certification sampling.

In addition to the assigned constituents of concern (COCs) for Remediation Area 2, other COCs with above-FRL, non-detect concentrations include 1,2-Dichloroethane, 3,3-Dichlorobenzidine, N-nitroso-di-n-propylamine and vinyl chloride. Similar to the organic non-detects summarized in Table 2-1, the contract required detection limit (CRDL) is greater than the FRL and these COCs will not be retained for certification of this area.

Real-time measurements and physical soil samples were collected prior to installation of the storm water runoff ditches and retention basins around the IFP/SF. The real-time measurements were collected to assess On-Site Disposal Facility (OSDF) waste acceptance criteria (WAC) and FRL attainment.

Readiness and characterization for reuse soil sampling in the footprint of Basin 1 resulted in above-FRL (impacted) excavation to 1.5 feet in depth in the basin. Below-FRL, non-impacted excavation continued

1 beyond 1.5 feet until design depths for Basin 1 were attained. The results of these scanning and
2 characterization for reuse data are summarized in Appendix D of the A2PI SWUs Implementation Plan.

3
4 Predesign data for the NWUs was collected in accordance with the guidelines established in
5 Section 3.1.2 of the SEP, per the PSP for Predesign Sampling of A2PI NWU and A2PII Part One
6 (DOE 1999). Preliminary predesign data collected in the adjacent area immediately surrounding the
7 former IFP/SF have identified impacted materials requiring remediation. All data is presented in the
8 Implementation Plan for A2PI NWUs Perimeter Area.

9
10 All the predesign real-time scan data for total uranium, radium-226 and thorium-232 were below two
11 times the FRL. In addition, all analytical data were below the FRL for the primary radionuclides. Six
12 NWU predesign boring locations were identified as containing impacted material (flyash). One location,
13 A2P1-NWU-24, was already remediated in the Carolina Area debris removal. The other five locations
14 will be remediated during the 2001 excavation season and precertification scanning will be conducted in
15 the disturbed portions of the area. Prior to certification sampling approval, the scanning data will be
16 forwarded for review, as an Appendix to this CDL, to the U.S. Environmental Protection Agencies (EPA)
17 and Ohio Environmental Protection Agency (OEPA).

18 19 2.2 FINAL GRADE EXCAVATION DATA

20 Two additional investigations have been conducted in A2PI IFP/SF area pursuant to the RI/FS and site
21 preparation phases:

- 22
- 23 • Final grade excavation scanning and sampling in the IFP/SF
- 24 • Final grade excavation scanning and sampling in the Carolina Area.
- 25

26 The Radiation Tracking System (RTRAK) was used to collect information about surface soil radiological
27 contamination patterns. Supplemental Radiation Scanning System (RSS) and high-purity germanium
28 (HPGe) detector measurements were collected using the no overlap option (per the User Guidelines,
29 Measurement Strategies, and Operational Factors for Deployment of In-Situ Gamma Spectrometry at the
30 Fernald Site, hereafter referred to as the Users Manual, DOE 1998c) to ensure that any areas of elevated
31 contamination were not missed. Physical samples were collected with Geoprobe® and hand-auger
32 equipment per the Project Specific Plan (PSP) for Predesign Sampling in the A2PI NWU and A2PII
33 Part One (DOE 1999). Details on the use and capabilities of the RTRAK, the RSS, and the HPGe are

1 provided in the PSP as well as in the Users Manual and the Sitewide Comprehensive Environmental
2 Response, Compensation, and Liability Act (CERCLA) Quality Assurance Project Plan (SCQ)
3 Addendum (DOE 1998d).

4 5 2.2.1 Final Grade Excavation Scanning and Sampling IFP/SF

6 The IFP/SF excavation limits were designed based on historical RI/FS data. The IFP was excavated to
7 final grade and beyond in the 1998 excavation season. An iteration of final excavation boundary
8 measurements (both real-time and physical soil samples) within the IFP began in November 1998.

9
10 At end of November 1998, an RTRAK lift scan (Lift 12 - most of area at average elevation 544 feet) was
11 completed at the approximate final grade based on design drawings. Using these lift scan data, elevated
12 total uranium locations were identified and soil cores were collected to determine the final excavation
13 boundary. These soil core intervals were scanned for radioactivity with an HPGe core counter, and some
14 of the intervals were submitted for total uranium analysis.

15
16 In December 1998, the results from physical soil samples and core counting indicated above-FRL
17 contamination north and south of the east-west leg of Interceptor Ditch 2 to a depth of 3 to 4 feet. In
18 addition, results indicated an above-WAC location to a depth of 2 feet on the southern edge of the
19 formerly designated above-WAC excavation area (around the IFP-CC-3 sample location eventually
20 named IFP-13-3). The excavation contractor was directed to conduct a 2-foot deep, above-WAC
21 excavation around sample location IFP-CC-3 [beginning elevation at 544 feet mean sea level (MSL)].
22 After this above-WAC excavation, HPGe measurements verified that the excavation footprint was
23 below WAC. The excavation contractor was also directed to excavate to a depth of 4 feet south of the
24 east-west leg of Interceptor Ditch 2 and then transition to a 3-foot excavation south of the former
25 above-WAC area. The excavation contractor completed the above-WAC and above-FRL excavation,
26 including an exploratory trench in the southern end of the IFP, on December 2, 1998.

27
28 In early February 1999, additional core samples were collected at the IFP-CC-3 location (now identified
29 as IFP-13-3) to determine depth of additional above-FRL excavation (current elevation after
30 December 1998 excavation is 540 feet MSL). In addition, this sampling determined that the lateral
31 extent of above-FRL contamination was present to a 4-foot depth in a 100-foot x 100-foot area around
32 IFP-13-3. Based on this contamination grid size (100 feet x 100 feet), the remainder of the IFP footprint

1 was sectioned into eight grids, and one HPGe measurement was taken in the center of each grid. This
2 exercise resulted in an additional 1-foot excavation over southern end of the IFP, based on one HPGe
3 measurement within each 100-foot x 100-foot contamination grid.

4
5 Beginning in March 1999, the subcontractor excavated to a 4-foot depth the 100-foot x 100-foot area
6 around IFP-13-3. In addition, a 1-foot deep excavation of the southern tip of the IFP was also
7 completed. After the 4-foot deep, 100-foot x 100-foot excavation around IFP-13-3 (top of elevation
8 now 536 feet MSL), additional core samples and HPGe measurements (IFP-14) were collected. Based
9 on these data, another 5 feet was excavated to reach the 10-parts per million (ppm) FRL for total
10 uranium. In the field, Fluor Fernald Construction instructed the excavation subcontractor to take
11 another 2 feet immediately around IFP-13-3. After this March excavation, the depth at the IFP-13-3
12 location is 529 feet MSL.

13
14 In May 1999, another complete lift scan was conducted over the IFP footprint (IFP-14 RTRAK and
15 HPGe measurements) south of the east-west leg of Interceptor Ditch 2. The data were evaluated for
16 highest total uranium and gross activity. The lift scan indicated that most of the footprint was close to
17 the 10-ppm total uranium FRL. An HPGe measurement next to the IFP-13-3 location (IFP-15-14) was
18 26 ppm. Per the OEPA, a sample was taken at this location to determine above-FRL depth. Results of
19 the sample analysis indicated total uranium concentrations close to FRL attainment at a 2-foot depth.

20
21 In late July 1999, the subcontractor excavated 3+/- 1 foot from the area north of the east-west leg of
22 Interceptor Ditch 2. Also, an additional 2 feet was excavated in a 20-foot radius around the IFP-15-14
23 HPGe location. During this excavation, above-WAC material was encountered just north of Interceptor
24 Ditch 2 and two special material measurements (IFP-SM-96 and 97) were collected. After excavation on
25 August 2, 1999, real-time measurements (one RTRAK scan) were collected, and the results indicated
26 total uranium concentrations less than two times the FRL. The final grade scan data is presented in
27 Appendix A. Excavation in the IFP was concluded at this time pending additional precertification and
28 certification.

29
30 Beginning in the late July 2000, after remedial activities were completed to the design limits in the
31 majority of the SF, final grade HPGe scans were performed to determine if total uranium concentrations
32 were reasonably close to the FRLs. The HPGe measurements are depicted in Appendix A along with the

1 associated total uranium concentration. In addition, 14 soil borings were collected along the interface of
2 the SF and the IFP to assess FRL attainment at final grade. Some of the boring locations (SF-FG-1
3 through SF-FG-6) were placed to assess potential contamination migration from the former IFP
4 above-WAC area and the asbestos/debris area in the northwest corner of the SF. Sample intervals
5 ranging from the surface to 24 feet at depth were analyzed for total uranium, with a few samples
6 analyzed for total arsenic. The data for these samples are depicted and summarized in Appendix A.
7 Based on these data, two additional excavations were conducted in April 2001, a deep excavation at
8 sample location SF-FG-2 and a shallow excavation at SF-FG-7 as specified in the Implementation Plan
9 for the A2PI NWUs Perimeter Area.
10

11 2.2.2 Final Grade Excavation Scanning and Sampling

12 Beginning in October 2000, debris excavation commenced in the Carolina Area located just south of
13 Basin 2. In conjunction with the debris excavation, FRL scanning and sampling were conducted within
14 the bottom footprint of six excavation locations prior to interim grading. All the real-time and analytical
15 data collected were below FRL for the primary radionuclides, arsenic and beryllium. The data collected
16 are presented in Appendix A.
17

18 2.3 PRECERTIFICATION DATA

19 According to guidelines established in Section 3.3.3 of the SEP, precertification activities will be
20 conducted to evaluate residual radiological contamination patterns, as specified in the A2PI
21 Precertification Real-Time Scan PSP (DOE 2000). During precertification, a surface radiation survey
22 will be conducted over the accessible areas which are excavated or not scanned during predesign. The
23 precertification data will be presented as Appendix B in this CDL after excavation is completed. Prior to
24 certification sampling, the scanning data will be forwarded for EPA and OEPA review and approval as
25 Appendix B to this CDL.
26

27 The total population of the data used to support the conclusion that the area is ready for certification will
28 consist of predesign data for areas that required no remedial action and precertification data from the
29 remediated footprints and precertification data for the areas where excavation occurred.
30

1 2.4 CERTIFICATION OF THE DEEP EXCAVATION AREA IN THE SF

2 Certification samples were collected after excavation of the deep area in the SF before interim grading and
3 natural sloughing of surrounding material would begin to fill the deep excavation. One Group 1 CU was
4 drawn around this deep excavation area and the adjacent area to the west. This Group 1 CU encompassed
5 an area approximately 60,098ft². This CU was sub-divided into 16 sub-CUs of approximately equal size.
6 One sample location was randomly generated inside each of the sub-CUs using guidance from Section 3 of
7 the SEP. These locations are depicted in Figure 2-1. Twelve soil samples plus one duplicate sample were
8 collected from 0 to 6 inches and analyzed to ASL D for both primary radionuclides and secondary COCs
9 listed in Table 2-2. The CU identifier was SWU-C-DP.

10
11 The certification sample results for total uranium at sample locations SWU-C-DP-8-R and
12 SWU-C-DP-8-R-D were 26 and 30 ppm, respectively, which is greater than two times the FRL. As
13 required in the SEP, any single certification sample location greater than two times the FRL will be
14 remediated. A 2-foot scrape over the sub-CU was conducted. Two certification samples and one duplicate
15 were then collected in the sub-CU that was excavated. These locations are depicted in Figure 2-2 and the
16 associated data is listed in Table 2-3. After this excavation, all results for this CU are below FRL.

**TABLE 2-1
AREA 2 SECONDARY ASCOC LIST**

Area 2 Secondary ASCOC	Number of Above-FRL Hits	Number of Samples	Retained as ASCOC	Justification
Aroclor-1254 and 1260	7	291	Yes	All above-FRL hits are located within the IFP CUs and the SF CUs. This will be retained as a secondary COC for the IFP and SF CUs.
Arsenic	22	232	Yes	N/A
Benzo(a)pyrene	2	174	Yes	All above-FRL hits are located within the IFP CUs and the SF CUs. This will be retained as a secondary COC for the IFP and SF CUs.
Beryllium	24	150	Yes	N/A
Bromodichloromethane	0	144	Yes	All above-FRL hits are within the IFP CUs and the SF CUs. This will be retained as a secondary COC in the till/clay area but will not be retained in the GMA/sand because compound is expected to have volatilized completely during excavation and in sand.
Cesium-137	3	463	Yes	The above-FRL locations are within CU NWU-12. Will be retained as a secondary COC in this CU.
Dibenzo(a,h)anthracene	1	174	Yes	All above-FRL hits are located within the IFP CUs and the SF CUs. This will be retained as a secondary COC for the IFP and SF CUs.
1,1-dichloroethene	0	180	Yes	N/A
Dieldrin	1	169	No	The one above-FRL location was within the excavation footprint. Therefore, this will not be retained as a COC.
Lead	42	553	Yes	All above-FRL hits are located within CU SF-05 where the firing range was located. Lead will be retained as a secondary COC in this CU.
Neptunium-237	0	289	No	No hits at or greater than FRL
Technetium-99	1	327	No	The one above-FRL location was within the excavation footprint. Therefore, this will not be retained as a COC.
Thorium-230	2	297	Yes	The above-FRL locations are within CU NWU-12. Will be retained as a secondary COC in this CU.

* Number of hits does not include non-detects with MDCs greater than FRL.

TABLE 2-2
CU SWU-C-DP SAMPLE RESULTS

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Boring ID	Sample ID	Parameter	Result	Qualifier	Units
SWU-C-DP-1	SWU-C-DP-1-PS	Aroclor-1254	38.0	U	ug/kg
SWU-C-DP-1	SWU-C-DP-1-PS	Aroclor-1260	38.0	U	ug/kg
SWU-C-DP-1	SWU-C-DP-1-RM	Arsenic	6.4	-	mg/kg
SWU-C-DP-1	SWU-C-DP-1-PS	Benzo(a)pyrene	380.0	U	ug/kg
SWU-C-DP-1	SWU-C-DP-1-RM	Beryllium	0.3	-	mg/kg
SWU-C-DP-1	SWU-C-DP-1-RM	Cesium-137	0.0	UJ	pCi/g
SWU-C-DP-1	SWU-C-DP-1-PS	Dibenzo(a,h)anthracene	22.6	U	ug/kg
SWU-C-DP-1	SWU-C-DP-1-PS	Dieldrin	3.8	U	ug/kg
SWU-C-DP-1	SWU-C-DP-1-RM	Neptunium-237	0.0	UJ	pCi/g
SWU-C-DP-1	SWU-C-DP-1-RM	Radium-226	0.7	J	pCi/g
SWU-C-DP-1	SWU-C-DP-1-RM	Radium-228	0.5	J	pCi/g
SWU-C-DP-1	SWU-C-DP-1-RM	Technetium-99	1.4	UJ	pCi/g
SWU-C-DP-1	SWU-C-DP-1-RM	Thorium-228	0.5	J	pCi/g
SWU-C-DP-1	SWU-C-DP-1-RM	Thorium-230	1.3	J	pCi/g
SWU-C-DP-1	SWU-C-DP-1-RM	Thorium-232	0.5	J	pCi/g
SWU-C-DP-1	SWU-C-DP-1-RM	Uranium, Total	2.0	J	mg/kg
SWU-C-DP-3	SWU-C-DP-3-PS	Aroclor-1254	34.0	U	ug/kg
SWU-C-DP-3	SWU-C-DP-3-PS	Aroclor-1260	34.0	U	ug/kg
SWU-C-DP-3	SWU-C-DP-3-RM	Arsenic	2.9	-	mg/kg
SWU-C-DP-3	SWU-C-DP-3-PS	Benzo(a)pyrene	340.0	U	ug/kg
SWU-C-DP-3	SWU-C-DP-3-RM	Beryllium	0.0	U	mg/kg
SWU-C-DP-3	SWU-C-DP-3-RM	Cesium-137	0.0	UJ	pCi/g
SWU-C-DP-3	SWU-C-DP-3-PS	Dibenzo(a,h)anthracene	20.5	U	ug/kg
SWU-C-DP-3	SWU-C-DP-3-PS	Dieldrin	3.4	U	ug/kg
SWU-C-DP-3	SWU-C-DP-3-RM	Neptunium-237	0.0	UJ	pCi/g
SWU-C-DP-3	SWU-C-DP-3-RM	Radium-226	0.6	J	pCi/g
SWU-C-DP-3	SWU-C-DP-3-RM	Radium-228	0.3	J	pCi/g
SWU-C-DP-3	SWU-C-DP-3-RM	Technetium-99	1.6	UJ	pCi/g
SWU-C-DP-3	SWU-C-DP-3-RM	Thorium-228	0.3	J	pCi/g
SWU-C-DP-3	SWU-C-DP-3-RM	Thorium-230	1.0	J	pCi/g
SWU-C-DP-3	SWU-C-DP-3-RM	Thorium-232	0.3	J	pCi/g
SWU-C-DP-3	SWU-C-DP-3-RM	Uranium, Total	2.1	J	mg/kg
SWU-C-DP-4	SWU-C-DP-4-PS	Aroclor-1254	34.0	U	ug/kg
SWU-C-DP-4	SWU-C-DP-4-PS	Aroclor-1260	34.0	U	ug/kg
SWU-C-DP-4	SWU-C-DP-4-RM	Arsenic	4.2	-	mg/kg
SWU-C-DP-4	SWU-C-DP-4-PS	Benzo(a)pyrene	340.0	U	ug/kg
SWU-C-DP-4	SWU-C-DP-4-RM	Beryllium	0.0	U	mg/kg
SWU-C-DP-4	SWU-C-DP-4-RM	Cesium-137	0.0	UJ	pCi/g
SWU-C-DP-4	SWU-C-DP-4-PS	Dibenzo(a,h)anthracene	20.3	U	ug/kg
SWU-C-DP-4	SWU-C-DP-4-PS	Dieldrin	3.4	U	ug/kg
SWU-C-DP-4	SWU-C-DP-4-RM	Neptunium-237	0.0	UJ	pCi/g
SWU-C-DP-4	SWU-C-DP-4-RM	Radium-226	0.5	J	pCi/g
SWU-C-DP-4	SWU-C-DP-4-RM	Radium-228	0.3	J	pCi/g
SWU-C-DP-4	SWU-C-DP-4-RM	Technetium-99	1.6	UJ	pCi/g
SWU-C-DP-4	SWU-C-DP-4-RM	Thorium-228	0.3	J	pCi/g
SWU-C-DP-4	SWU-C-DP-4-RM	Thorium-230	2.1	-	pCi/g
SWU-C-DP-4	SWU-C-DP-4-RM	Thorium-232	0.3	J	pCi/g
SWU-C-DP-4	SWU-C-DP-4-RM	Uranium, Total	2.5	J	mg/kg
SWU-C-DP-6	SWU-C-DP-6-PS	Aroclor-1254	35.0	U	ug/kg

TABLE 2-2
CU SWU-C-DP SAMPLE RESULTS

Boring ID	Sample ID	Parameter	Result	Qualifier	Units
SWU-C-DP-6	SWU-C-DP-6-PS	Aroclor-1260	35.0	U	ug/kg
SWU-C-DP-6	SWU-C-DP-6-RM	Arsenic	4.6	-	mg/kg
SWU-C-DP-6	SWU-C-DP-6-PS	Benzo(a)pyrene	350.0	U	ug/kg
SWU-C-DP-6	SWU-C-DP-6-RM	Beryllium	0.0	U	mg/kg
SWU-C-DP-6	SWU-C-DP-6-RM	Cesium-137	0.0	UJ	pCi/g
SWU-C-DP-6	SWU-C-DP-6-PS	Dibenzo(a,h)anthracene	21.2	U	ug/kg
SWU-C-DP-6	SWU-C-DP-6-PS	Dieldrin	3.5	U	ug/kg
SWU-C-DP-6	SWU-C-DP-6-RM	Neptunium-237	0.0	UJ	pCi/g
SWU-C-DP-6	SWU-C-DP-6-RM	Radium-226	0.6	J	pCi/g
SWU-C-DP-6	SWU-C-DP-6-RM	Radium-228	0.3	J	pCi/g
SWU-C-DP-6	SWU-C-DP-6-RM	Technetium-99	1.7	UJ	pCi/g
SWU-C-DP-6	SWU-C-DP-6-RM	Thorium-228	0.3	J	pCi/g
SWU-C-DP-6	SWU-C-DP-6-RM	Thorium-230	0.8	J	pCi/g
SWU-C-DP-6	SWU-C-DP-6-RM	Thorium-232	0.3	J	pCi/g
SWU-C-DP-6	SWU-C-DP-6-RM	Uranium, Total	3.0	J	mg/kg
SWU-C-DP-7	SWU-C-DP-7-PS	Aroclor-1254	40.0	U	ug/kg
SWU-C-DP-7	SWU-C-DP-7-PS	Aroclor-1260	40.0	U	ug/kg
SWU-C-DP-7	SWU-C-DP-7-RM	Arsenic	3.7	-	mg/kg
SWU-C-DP-7	SWU-C-DP-7-PS	Benzo(a)pyrene	400.0	U	ug/kg
SWU-C-DP-7	SWU-C-DP-7-RM	Beryllium	0.2	-	mg/kg
SWU-C-DP-7	SWU-C-DP-7-RM	Cesium-137	0.0	UJ	pCi/g
SWU-C-DP-7	SWU-C-DP-7-PS	Dibenzo(a,h)anthracene	23.6	U	ug/kg
SWU-C-DP-7	SWU-C-DP-7-PS	Dieldrin	4.0	U	ug/kg
SWU-C-DP-7	SWU-C-DP-7-RM	Neptunium-237	0.0	UJ	pCi/g
SWU-C-DP-7	SWU-C-DP-7-RM	Radium-226	0.7	J	pCi/g
SWU-C-DP-7	SWU-C-DP-7-RM	Radium-228	0.5	J	pCi/g
SWU-C-DP-7	SWU-C-DP-7-RM	Technetium-99	1.6	UJ	pCi/g
SWU-C-DP-7	SWU-C-DP-7-RM	Thorium-228	0.5	J	pCi/g
SWU-C-DP-7	SWU-C-DP-7-RM	Thorium-230	0.9	J	pCi/g
SWU-C-DP-7	SWU-C-DP-7-RM	Thorium-232	0.5	J	pCi/g
SWU-C-DP-7	SWU-C-DP-7-RM	Uranium, Total	3.3	J	mg/kg
SWU-C-DP-8	SWU-C-DP-8-PS	Aroclor-1254	36.0	U	ug/kg
SWU-C-DP-8	SWU-C-DP-8-PS-D	Aroclor-1254	36.0	UJ	ug/kg
SWU-C-DP-8	SWU-C-DP-8-PS	Aroclor-1260	36.0	U	ug/kg
SWU-C-DP-8	SWU-C-DP-8-PS-D	Aroclor-1260	36.0	UJ	ug/kg
SWU-C-DP-8	SWU-C-DP-8-RM	Arsenic	4.1	-	mg/kg
SWU-C-DP-8	SWU-C-DP-8-RM-D	Arsenic	5.1	-	mg/kg
SWU-C-DP-8	SWU-C-DP-8-PS	Benzo(a)pyrene	360.0	U	ug/kg
SWU-C-DP-8	SWU-C-DP-8-PS-D	Benzo(a)pyrene	360.0	U	ug/kg
SWU-C-DP-8	SWU-C-DP-8-RM	Beryllium	0.0	-	mg/kg
SWU-C-DP-8	SWU-C-DP-8-RM-D	Beryllium	0.0	-	mg/kg
SWU-C-DP-8	SWU-C-DP-8-RM	Cesium-137	0.0	UJ	pCi/g
SWU-C-DP-8	SWU-C-DP-8-RM-D	Cesium-137	0.0	UJ	pCi/g
SWU-C-DP-8	SWU-C-DP-8-PS	Dibenzo(a,h)anthracene	21.2	U	ug/kg
SWU-C-DP-8	SWU-C-DP-8-PS-D	Dibenzo(a,h)anthracene	21.1	U	ug/kg
SWU-C-DP-8	SWU-C-DP-8-PS	Dieldrin	3.6	U	ug/kg
SWU-C-DP-8	SWU-C-DP-8-PS-D	Dieldrin	3.6	UJ	ug/kg
SWU-C-DP-8	SWU-C-DP-8-RM	Neptunium-237	0.0	UJ	pCi/g
SWU-C-DP-8	SWU-C-DP-8-RM-D	Neptunium-237	0.0	UJ	pCi/g

TABLE 2-2
CU SWU-C-DP SAMPLE RESULTS

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Boring ID	Sample ID	Parameter	Result	Qualifier	Units
SWU-C-DP-8	SWU-C-DP-8-RM	Radium-226	0.7	J	pCi/g
SWU-C-DP-8	SWU-C-DP-8-RM-D	Radium-226	0.6	J	pCi/g
SWU-C-DP-8	SWU-C-DP-8-RM	Radium-228	0.4	J	pCi/g
SWU-C-DP-8	SWU-C-DP-8-RM-D	Radium-228	0.4	J	pCi/g
SWU-C-DP-8	SWU-C-DP-8-RM	Techneium-99	1.6	UJ	pCi/g
SWU-C-DP-8	SWU-C-DP-8-RM-D	Techneium-99	1.5	UJ	pCi/g
SWU-C-DP-8	SWU-C-DP-8-RM	Thorium-228	0.4	J	pCi/g
SWU-C-DP-8	SWU-C-DP-8-RM-D	Thorium-228	0.4	J	pCi/g
SWU-C-DP-8	SWU-C-DP-8-RM	Thorium-230	1.5	-	pCi/g
SWU-C-DP-8	SWU-C-DP-8-RM-D	Thorium-230	1.6	-	pCi/g
SWU-C-DP-8	SWU-C-DP-8-RM	Thorium-232	0.4	J	pCi/g
SWU-C-DP-8	SWU-C-DP-8-RM-D	Thorium-232	0.4	J	pCi/g
SWU-C-DP-8	SWU-C-DP-8-RM	Uranium, Total	25.6	J	mg/kg
SWU-C-DP-8	SWU-C-DP-8-RM-D	Uranium, Total	30.2	J	mg/kg
SWU-C-DP-9	SWU-C-DP-9-PS	Aroclor-1254	35.0	U	ug/kg
SWU-C-DP-9	SWU-C-DP-9-PS	Aroclor-1260	35.0	U	ug/kg
SWU-C-DP-9	SWU-C-DP-9-RM	Arsenic	2.7	-	mg/kg
SWU-C-DP-9	SWU-C-DP-9-PS	Benzo(a)pyrene	350.0	U	ug/kg
SWU-C-DP-9	SWU-C-DP-9-RM	Beryllium	0.0	U	mg/kg
SWU-C-DP-9	SWU-C-DP-9-RM	Cesium-137	0.0	UJ	pCi/g
SWU-C-DP-9	SWU-C-DP-9-PS	Dibenzo(a,h)anthracene	20.8	U	ug/kg
SWU-C-DP-9	SWU-C-DP-9-PS	Dieldrin	3.5	U	ug/kg
SWU-C-DP-9	SWU-C-DP-9-RM	Neptunium-237	0.0	UJ	pCi/g
SWU-C-DP-9	SWU-C-DP-9-RM	Radium-226	0.5	J	pCi/g
SWU-C-DP-9	SWU-C-DP-9-RM	Radium-228	0.3	J	pCi/g
SWU-C-DP-9	SWU-C-DP-9-RM	Techneium-99	1.7	UJ	pCi/g
SWU-C-DP-9	SWU-C-DP-9-RM	Thorium-228	0.3	J	pCi/g
SWU-C-DP-9	SWU-C-DP-9-RM	Thorium-230	2.3	-	pCi/g
SWU-C-DP-9	SWU-C-DP-9-RM	Thorium-232	0.3	J	pCi/g
SWU-C-DP-9	SWU-C-DP-9-RM	Uranium, Total	1.6	J	mg/kg
SWU-C-DP-11	SWU-C-DP-11-PS	Aroclor-1254	35.0	U	ug/kg
SWU-C-DP-11	SWU-C-DP-11-PS	Aroclor-1260	35.0	U	ug/kg
SWU-C-DP-11	SWU-C-DP-11-RM	Arsenic	4.2	-	mg/kg
SWU-C-DP-11	SWU-C-DP-11-PS	Benzo(a)pyrene	350.0	U	ug/kg
SWU-C-DP-11	SWU-C-DP-11-RM	Beryllium	0.1	-	mg/kg
SWU-C-DP-11	SWU-C-DP-11-RM	Cesium-137	0.0	UJ	pCi/g
SWU-C-DP-11	SWU-C-DP-11-PS	Dibenzo(a,h)anthracene	20.8	U	ug/kg
SWU-C-DP-11	SWU-C-DP-11-PS	Dieldrin	3.5	U	ug/kg
SWU-C-DP-11	SWU-C-DP-11-RM	Neptunium-237	0.0	UJ	pCi/g
SWU-C-DP-11	SWU-C-DP-11-RM	Radium-226	0.6	J	pCi/g
SWU-C-DP-11	SWU-C-DP-11-RM	Radium-228	0.4	J	pCi/g
SWU-C-DP-11	SWU-C-DP-11-RM	Techneium-99	1.7	UJ	pCi/g
SWU-C-DP-11	SWU-C-DP-11-RM	Thorium-228	0.4	J	pCi/g
SWU-C-DP-11	SWU-C-DP-11-RM	Thorium-230	1.1	J	pCi/g
SWU-C-DP-11	SWU-C-DP-11-RM	Thorium-232	0.4	J	pCi/g
SWU-C-DP-11	SWU-C-DP-11-RM	Uranium, Total	5.8	J	mg/kg
SWU-C-DP-13	SWU-C-DP-13-PS	Aroclor-1254	35.0	U	ug/kg
SWU-C-DP-13	SWU-C-DP-13-PS	Aroclor-1260	35.0	U	ug/kg
SWU-C-DP-13	SWU-C-DP-13-RM	Arsenic	2.6	-	mg/kg

TABLE 2-2
CU SWU-C-DP SAMPLE RESULTS

Boring ID	Sample ID	Parameter	Result	Qualifier	Units
SWU-C-DP-13	SWU-C-DP-13-PS	Benzo(a)pyrene	350.0	U	ug/kg
SWU-C-DP-13	SWU-C-DP-13-RM	Beryllium	0.0	U	mg/kg
SWU-C-DP-13	SWU-C-DP-13-RM	Cesium-137	0.0	UJ	pCi/g
SWU-C-DP-13	SWU-C-DP-13-PS	Dibenzo(a,h)anthracene	20.8	U	ug/kg
SWU-C-DP-13	SWU-C-DP-13-PS	Dieldrin	3.5	U	ug/kg
SWU-C-DP-13	SWU-C-DP-13-RM	Neptunium-237	0.0	UJ	pCi/g
SWU-C-DP-13	SWU-C-DP-13-RM	Radium-226	0.6	J	pCi/g
SWU-C-DP-13	SWU-C-DP-13-RM	Radium-228	0.2	J	pCi/g
SWU-C-DP-13	SWU-C-DP-13-RM	Technetium-99	1.7	UJ	pCi/g
SWU-C-DP-13	SWU-C-DP-13-RM	Thorium-228	0.2	J	pCi/g
SWU-C-DP-13	SWU-C-DP-13-RM	Thorium-230	0.9	J	pCi/g
SWU-C-DP-13	SWU-C-DP-13-RM	Thorium-232	0.2	J	pCi/g
SWU-C-DP-13	SWU-C-DP-13-RM	Uranium, Total	3.7	J	mg/kg
SWU-C-DP-14	SWU-C-DP-14-PS	Aroclor-1254	34.0	U	ug/kg
SWU-C-DP-14	SWU-C-DP-14-PS	Aroclor-1260	34.0	U	ug/kg
SWU-C-DP-14	SWU-C-DP-14-RM	Arsenic	5.0	-	mg/kg
SWU-C-DP-14	SWU-C-DP-14-PS	Benzo(a)pyrene	340.0	U	ug/kg
SWU-C-DP-14	SWU-C-DP-14-RM	Beryllium	0.0	U	mg/kg
SWU-C-DP-14	SWU-C-DP-14-RM	Cesium-137	0.0	UJ	pCi/g
SWU-C-DP-14	SWU-C-DP-14-PS	Dibenzo(a,h)anthracene	20.4	U	ug/kg
SWU-C-DP-14	SWU-C-DP-14-PS	Dieldrin	3.4	U	ug/kg
SWU-C-DP-14	SWU-C-DP-14-RM	Neptunium-237	0.0	UJ	pCi/g
SWU-C-DP-14	SWU-C-DP-14-RM	Radium-226	0.5	J	pCi/g
SWU-C-DP-14	SWU-C-DP-14-RM	Radium-228	0.2	J	pCi/g
SWU-C-DP-14	SWU-C-DP-14-RM	Technetium-99	1.6	UJ	pCi/g
SWU-C-DP-14	SWU-C-DP-14-RM	Thorium-228	0.2	J	pCi/g
SWU-C-DP-14	SWU-C-DP-14-RM	Thorium-230	1.7	-	pCi/g
SWU-C-DP-14	SWU-C-DP-14-RM	Thorium-232	0.2	J	pCi/g
SWU-C-DP-14	SWU-C-DP-14-RM	Uranium, Total	7.2	J	mg/kg
SWU-C-DP-15	SWU-C-DP-15-PS	Aroclor-1254	36.0	U	ug/kg
SWU-C-DP-15	SWU-C-DP-15-PS	Aroclor-1260	36.0	U	ug/kg
SWU-C-DP-15	SWU-C-DP-15-RM	Arsenic	5.3	-	mg/kg
SWU-C-DP-15	SWU-C-DP-15-PS	Benzo(a)pyrene	360.0	U	ug/kg
SWU-C-DP-15	SWU-C-DP-15-RM	Beryllium	0.0	-	mg/kg
SWU-C-DP-15	SWU-C-DP-15-RM	Cesium-137	0.0	UJ	pCi/g
SWU-C-DP-15	SWU-C-DP-15-PS	Dibenzo(a,h)anthracene	21.4	U	ug/kg
SWU-C-DP-15	SWU-C-DP-15-PS	Dieldrin	3.6	U	ug/kg
SWU-C-DP-15	SWU-C-DP-15-RM	Neptunium-237	0.0	UJ	pCi/g
SWU-C-DP-15	SWU-C-DP-15-RM	Radium-226	0.8	J	pCi/g
SWU-C-DP-15	SWU-C-DP-15-RM	Radium-228	0.4	J	pCi/g
SWU-C-DP-15	SWU-C-DP-15-RM	Technetium-99	1.6	UJ	pCi/g
SWU-C-DP-15	SWU-C-DP-15-RM	Thorium-228	0.4	J	pCi/g
SWU-C-DP-15	SWU-C-DP-15-RM	Thorium-230	1.8	-	pCi/g
SWU-C-DP-15	SWU-C-DP-15-RM	Thorium-232	0.4	J	pCi/g
SWU-C-DP-15	SWU-C-DP-15-RM	Uranium, Total	6.5	J	mg/kg
SWU-C-DP-16	SWU-C-DP-16-PS	Aroclor-1254	34.0	U	ug/kg
SWU-C-DP-16	SWU-C-DP-16-PS	Aroclor-1260	34.0	U	ug/kg
SWU-C-DP-16	SWU-C-DP-16-RM	Arsenic	3.5	-	mg/kg
SWU-C-DP-16	SWU-C-DP-16-PS	Benzo(a)pyrene	340.0	U	ug/kg

TABLE 2-2
CU SWU-C-DP SAMPLE RESULTS

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Boring ID	Sample ID	Parameter	Result	Qualifier	Units
SWU-C-DP-16	SWU-C-DP-16-RM	Beryllium	0.0	U	mg/kg
SWU-C-DP-16	SWU-C-DP-16-RM	Cesium-137	0.0	UJ	pCi/g
SWU-C-DP-16	SWU-C-DP-16-PS	Dibenzo(a,h)anthracene	20.2	U	ug/kg
SWU-C-DP-16	SWU-C-DP-16-PS	Dieldrin	3.4	U	ug/kg
SWU-C-DP-16	SWU-C-DP-16-RM	Neptunium-237	0.0	UJ	pCi/g
SWU-C-DP-16	SWU-C-DP-16-RM	Radium-226	0.5	J	pCi/g
SWU-C-DP-16	SWU-C-DP-16-RM	Radium-228	0.2	J	pCi/g
SWU-C-DP-16	SWU-C-DP-16-RM	Technetium-99	1.7	UJ	pCi/g
SWU-C-DP-16	SWU-C-DP-16-RM	Thorium-228	0.2	J	pCi/g
SWU-C-DP-16	SWU-C-DP-16-RM	Thorium-230	1.0	J	pCi/g
SWU-C-DP-16	SWU-C-DP-16-RM	Thorium-232	0.2	J	pCi/g
SWU-C-DP-16	SWU-C-DP-16-RM	Uranium, Total	1.7	J	mg/kg

TABLE 2-3
CU SWU-C-DP POST EXCAVATION SAMPLE RESULTS

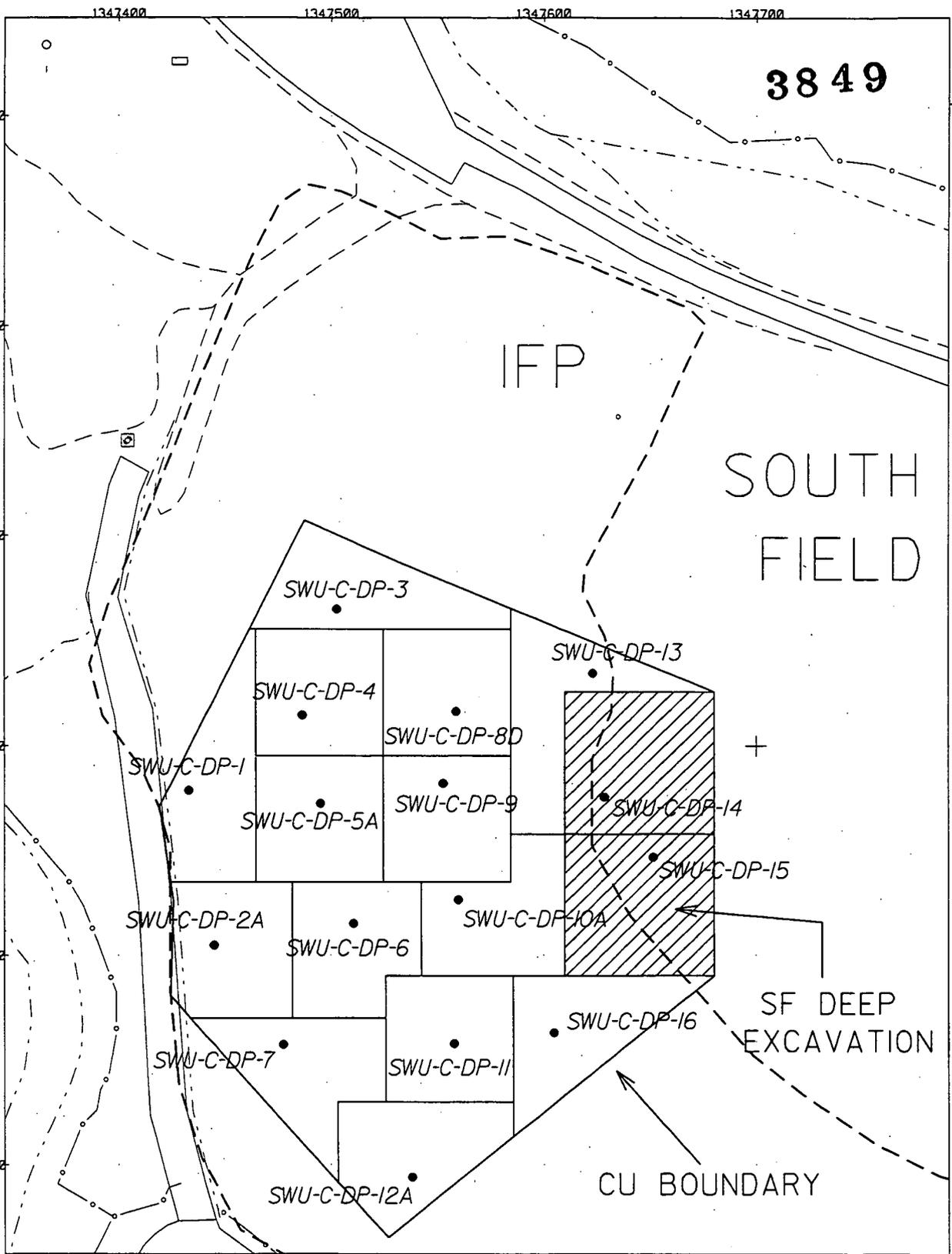
Boring ID	Sample ID	Parameter	Result	Qualifier	Units
SWU-C-DP-17	SWU-C-DP-17-R	Total Uranium	8.2	*	mg/kg
SWU-C-DP-17	SWU-C-DP-17-R-D	Total Uranium	13.0	*	mg/kg
SWU-C-DP-18	SWU-C-DP-18-R	Total Uranium	3.9	*	mg/kg

*Validation in process

V:\5C\J1\wdq\kmp\k2p1-902.dgn

STATE PLANNING COORDINATE SYSTEM 1983

23-AUG-2001



LEGEND:

--- IFP BOUNDARY

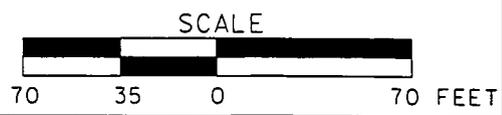


FIGURE 2-1. CU SWU-C-DP SAMPLE LOCATIONS

000026

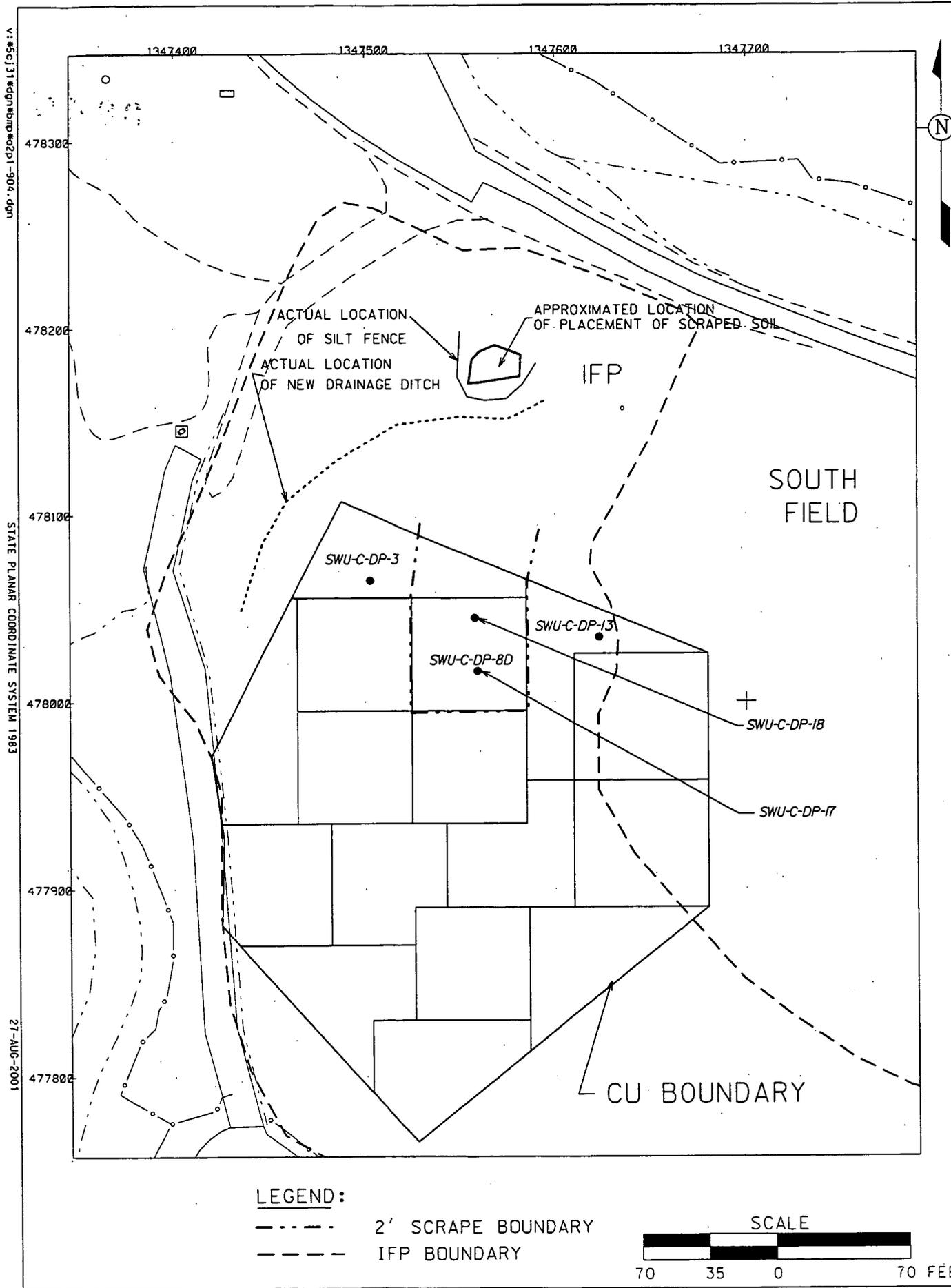


FIGURE 2-2. ADDITIONAL SAMPLE LOCATIONS IN CU SWU-C-DP AFTER EXCAVATION OF FAILED SUB-CU

03410000

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3.0 AREA-SPECIFIC CONSTITUENTS OF CONCERN

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

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

3.1 SELECTION CRITERIA

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

- It is listed as a soil COC in the OU5 ROD and,
- It can be traced to site use, either through process knowledge or known release of the constituent to the environment and,
- Analytical results indicate the contaminant is present above its FRL, and the above-FRL concentrations are not attributable to false positives or elevated CRDLs and,
- Physical characteristics of the contaminant, such as degradation rate and volatility, indicate it is likely to persist in the soil between time of release and remediation or,
- The contaminant is one of the sitewide primary COCs (total uranium, radium-226, radium-228, thorium-232, and thorium-228).

1 Using this process and the data presented in Table 2-1, the complete list of primary and secondary COCs
2 presented in Table 2-7 of the SEP for remediation Area 2 will apply for the SF till/clay CUs (IFP-1 and
3 SF-1 through SF-7). Due to the faster migration of contamination in the GMA sands, total volatiles will
4 not be required for the GMA sand CUs (IFP-2 through IFP-4). Finally, no organic analyses will be
5 required for the rest of the CUs based on the absence of above-FRL data points in these perimeter areas.
6 The ASCOCs are identified and listed in Tables 3-1, 3-2 and 3-3 along with the ecological COCs
7 required for the IFP/SF area (per Appendix C of the SEP). The ecological COCs are added to the list of
8 analytes but certification is not contingent on benchmark toxicity value (BTV) exceedences.

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TABLE 3-1
ASCOC LIST FOR IFP/SF CUs IFP-1 AND SF-1 THROUGH SF-7 (TILL CLAY AREA)

ASCOC	FRL	Reason Retained
Total Uranium	10 mg/kg	Retained as a primary ASCOC
Radium-226	1.7 pCi/g	Retained as a primary ASCOC
Radium-228	1.8 pCi/g	Retained as a primary ASCOC
Thorium-228	1.7 pCi/g	Retained as a primary ASCOC
Thorium-232	1.5 pCi/g	Retained as a primary ASCOC
Arsenic	12 mg/kg	Retained as a secondary ASCOC
Beryllium	1.5 mg/kg	Retained as a secondary ASCOC
Lead	400 mg/kg	Retained as a secondary/ecological ASCOC*
Aroclor-1254	.13 mg/kg	Retained as a secondary ASCOC
Aroclor-1260	.13 mg/kg	Retained as a secondary ASCOC
Benzo(a)pyrene	2.0 mg/kg	Retained as a secondary ASCOC
Bromodichloromethane	4.0 mg/kg	Retained as a secondary ASCOC
1,1-dichloroethene	0.41 mg/kg	Retained as a secondary ASCOC
Dibenzo(a,h)anthracene	2.0 mg/kg	Retained as a secondary ASCOC
Indeno(1,2,3-cd)pyrene	20.0 mg/kg	Retained as a secondary ASCOC
Thorium-230	6.97 pCi/g	Retained as a secondary ASCOC
Molybdenum	10 mg/kg	Retained as an ecological ASCOC**
Thorium-230	6.97 pCi/g	Retained as a secondary ASCOC

4

5 * Retained as a secondary COC for CU SF-5 where the Firing Range was located and as an ecological
6 COC for CUs SF-2 through SF-4, and SF-6 only

7

8 ** Retained as an ecological COC for CUs SF-2 through SF-6 only.

TABLE 3-2
 ASCOC LIST FOR IFP/SF CUs IFP-2 THROUGH IFP-4 (IFP GMA/SAND AREA)

ASCOC	FRL	Reason Retained
Total Uranium	10 mg/kg	Retained as a primary ASCOC
Radium-226	1.7 pCi/g	Retained as a primary ASCOC
Radium-228	1.8 pCi/g	Retained as a primary ASCOC
Thorium-228	1.7 pCi/g	Retained as a primary ASCOC
Thorium-232	1.5 pCi/g	Retained as a primary ASCOC
Arsenic	12 mg/kg	Retained as a secondary ASCOC
Beryllium	1.5 mg/kg	Retained as a secondary ASCOC
Aroclor-1254	.13 mg/kg	Retained as a secondary ASCOC
Aroclor-1260	.13 mg/kg	Retained as a secondary ASCOC
Benzo(a)pyrene	2.0 mg/kg	Retained as a secondary ASCOC
Dibenzo(a,h)anthracene	2.0 mg/kg	Retained as a secondary ASCOC
Indeno(1,2,3-cd)pyrene	20.0 mg/kg	Retained as a secondary ASCOC
Thorium-230	6.97 pCi/g	Retained as a secondary ASCOC

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2
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TABLE 3-3
ASCOC LIST FOR IFP/SF CUs NWU-1 THROUGH NWU-13

ASCOC	FRL	Reason Retained
Total Uranium	82 mg/kg	Retained as a primary ASCOC
Radium-226	1.7 pCi/g	Retained as a primary ASCOC
Radium-228	1.8 pCi/g	Retained as a primary ASCOC
Thorium-228	1.7 pCi/g	Retained as a primary ASCOC
Thorium-232	1.5 pCi/g	Retained as a primary ASCOC
Arsenic	12 mg/kg	Retained as a secondary ASCOC
Beryllium	1.5 mg/kg	Retained as a secondary ASCOC

4.0 CERTIFICATION APPROACH

4.1 CERTIFICATION DESIGN

The certification design for the IFP/SF area follows the general approach outlined in Section 3.4 of the SEP. The CU design is depicted in Figure 4-1 and the sample locations are depicted in Figure 4-2. As discussed in Section 3.0 of this document, total uranium, thorium-228, thorium-232, radium-226, and radium-228 (the primary ASCOCs), arsenic and beryllium (secondary ASCOCs) will be retained in all CUs. Additional secondary and ecological COCs are identified for specific CUs within the certification area.

4.1.1 Certification Unit Design

The IFP/SF certification area consists of the following:

- Eleven Group 1 CUs with the OU2 total uranium FRL:
 - IFP-C-1 through -4 – the footprint of the former IFP area
 - SF-C-1 through -7 – the footprint of the former SF area.
- Thirteen Group 1 CUs with the OU5 total uranium FRL (the NWU area):
 - NWU-1 and -2 – footprint of the Non-Impacted Material Stockpile 1 and the turnaround area
 - NWU-3 and -4 – footprint of Basin 1
 - NWU-5 – Grassy Knoll area south of Basin 4
 - NWU-6 through -9 – Footprint and surrounding areas of Carolina and Perimeter area excavations
 - NWU-10 – Footprint of Basin 4
 - NWU-11 – Footprint of EWWF and the East-West Construction Haul Road
 - NWU-12 and -13 – Footprint of Ditch 1 and Basin 2.

The CUs bounded by the SSOD and the unnamed tributaries extend only partially down the side banks to allow for potential backup during extreme rain events and flooding. The SSOD streambeds and lower

1 side banks are excluded from this certification event and will be certified at a later date with the stream
2 corridors.

3 If the excavation footprint is modified, either from the design and/or due to elevated precertification
4 scanning results, the CU designs will be re-evaluated. Any CU changes deemed necessary based on this
5 evaluation will be presented in the final revision of this CDL.

6 7 4.2 ANALYTICAL METHODOLOGY AND STATISTICAL ANALYSIS

8 Laboratory analyses of certification samples will be conducted using an approved analytical method, as
9 discussed in Appendix H of the SEP. Analyses will be conducted to either Analytical Support Level
10 (ASL) D or E. All requirements for ASL E are the same as ASL D except that the minimum detection
11 level for the selected analytical method must be at least 10 percent of FRL. All results will be validated
12 to ASL B, and a minimum of 10 percent (three of the 24 CUs) of the results will be validated to ASL D.
13 The CUs to be validated to ASL D (A2P1-SF-C-3, A2P1-SF-C-8 and A2P1-NWU-C-11) were randomly
14 selected. Samples rejected during validation will be re-analyzed, or an alternate sample may be collected
15 and substituted if there is insufficient material available from the initial sample. If any sample fails
16 validation, all data from the laboratory with the rejected result will then be validated to ASL D to
17 determine the integrity of all data from that laboratory. Once data are validated, results will be entered
18 into the SED, and a statistical analysis will be performed to evaluate the pass/fail criteria for the each
19 CU. The statistical approach is discussed in Section 3.4.3 and Appendix G of the SEP.

20
21 Two criteria must be met for the CU to pass certification. If the data distribution is normal or lognormal,
22 the first criterion compares the 95 percent Upper Confidence Limit (UCL) on the mean of each primary
23 ASCOC to its FRL. On an individual CU basis, any ASCOC with the 95 percent UCL above the FRL
24 results in that CU failing certification. If the data distribution is not normal or lognormal, the appropriate
25 nonparametric approach discussed in Appendix G of the SEP will be used to evaluate the second
26 criterion. The second criterion is related to individual samples. An individual sample cannot be greater
27 than two times the FRL or three times the FRL, based on its size (see Figure 3-11 of the SEP for further
28 details). When the given UCL on the mean for each ASCOC is less than its FRL, and the two-times FRL
29 hot spot criterion is met, the CU has met both criteria and will be considered certified.

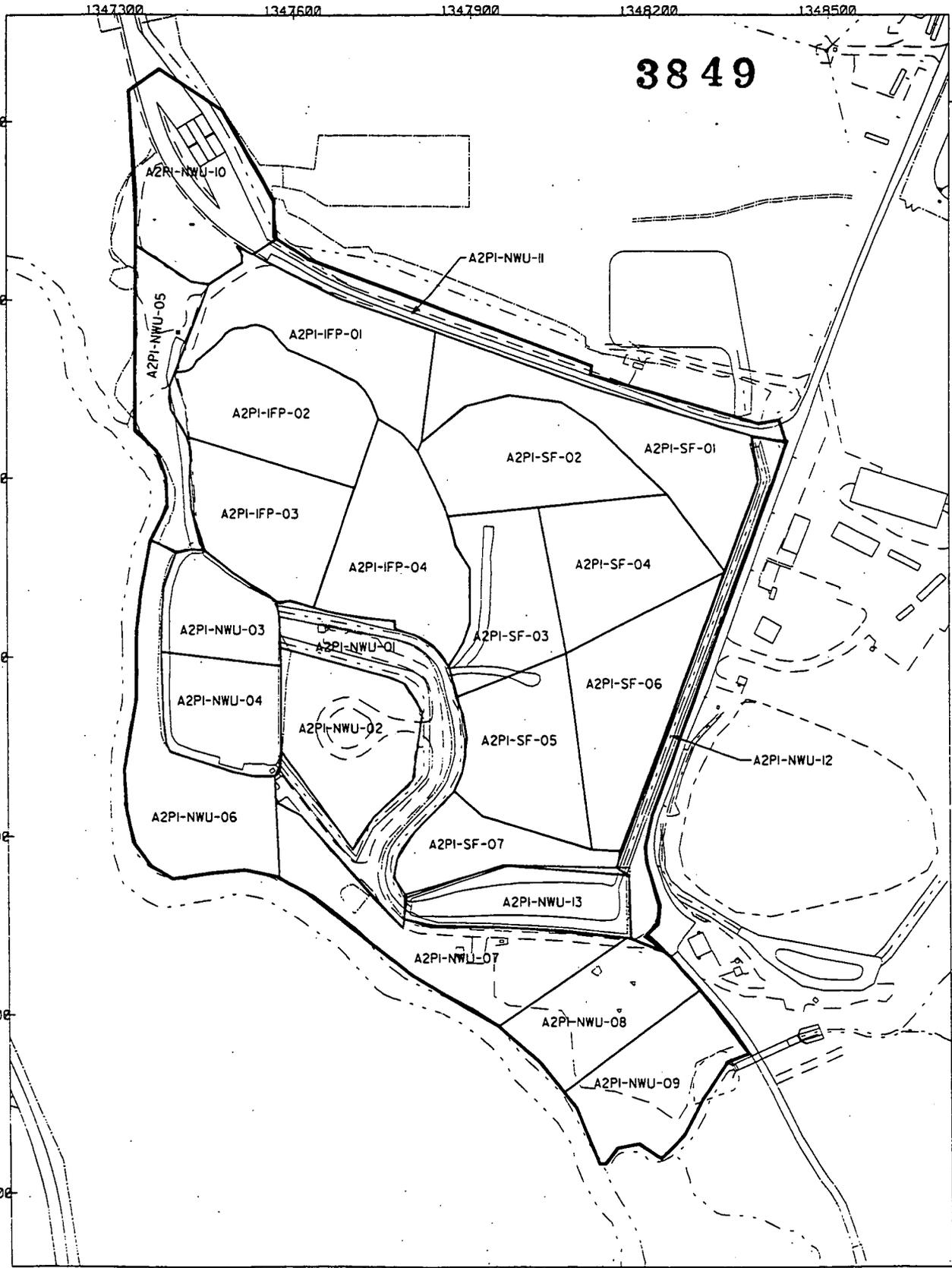
30
31 There are three conditions that could result in a CU failing certification: 1) high variability in the data
32 set, 2) localized contamination, and 3) widespread contamination. Details on the evaluation and

1 responses to these possible outcomes are provided in Section 3.4.5 of the SEP. When all CUs within the
2 scope of this CDL have passed certification, a certification report will be issued. The certification
3 reports will be submitted to EPA and OEPA to receive acknowledgment that the pertinent operable unit
4 remedial actions were completed and the individual CUs are certified to be released for interim or final
5 land use. Section 7.4 of the SEP provides additional details and describes the required content of the
6 certification reports.

vi:\scj\1\edgn\hnp\h2pi\mnu\cu.dgn

STATE PLANAR COORDINATE SYSTEM 1983

22-AUG-2001

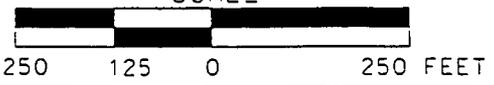


LEGEND:

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-  CU BOUNDARY

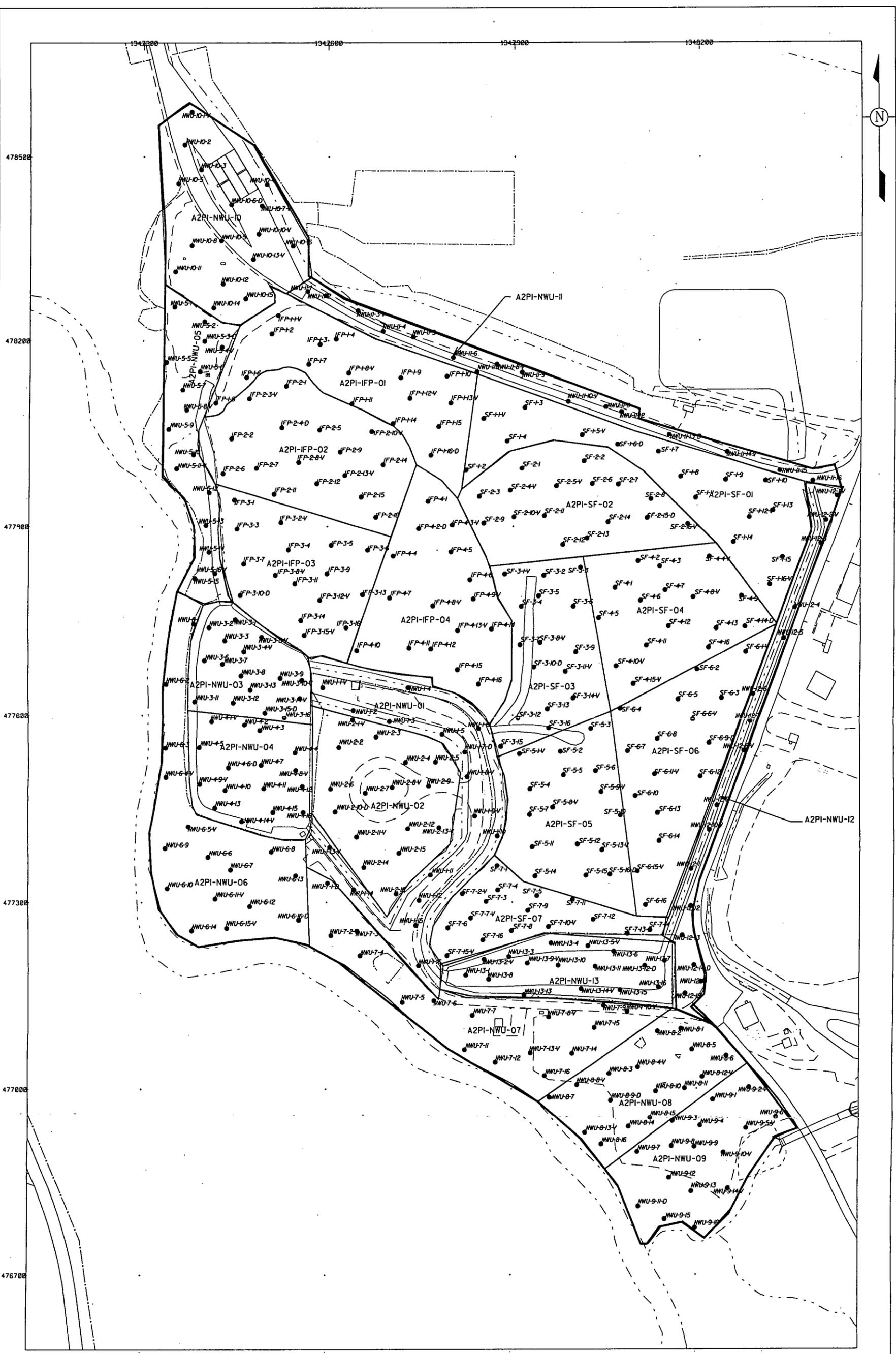
35A

SCALE



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FIGURE 4-1. AREA 2, PHASE I CU DESIGN



LEGEND:
 ——— AREA BOUNDARY
 - - - CU BOUNDARY
 • SAMPLE LOCATION

SCALE
 150 75 0 150 FEET

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FIGURE 4-2. AREA 2, PHASE I CU SAMPLE LOCATIONS

5.0 SCHEDULE

The following draft schedule shows key activities for the completion of the work within the scope of this CDL.

<u>ACTIVITY</u>	<u>TARGET DATE</u>
Submittal of Certification Design Letter	August 28, 2001*
Start of Certification Sampling	October 1, 2001
Complete Certification Sampling	November 15, 2001
Complete Analytical Work	January 15, 2001
Complete Data Validation/Statistical Analysis	March 21, 2002
Submit Certification Report (Phase II)	April 1, 2002*

* These are the submittal dates that will be incorporated in the A2PI NWU Perimeter Area IRDP.

REFERENCES

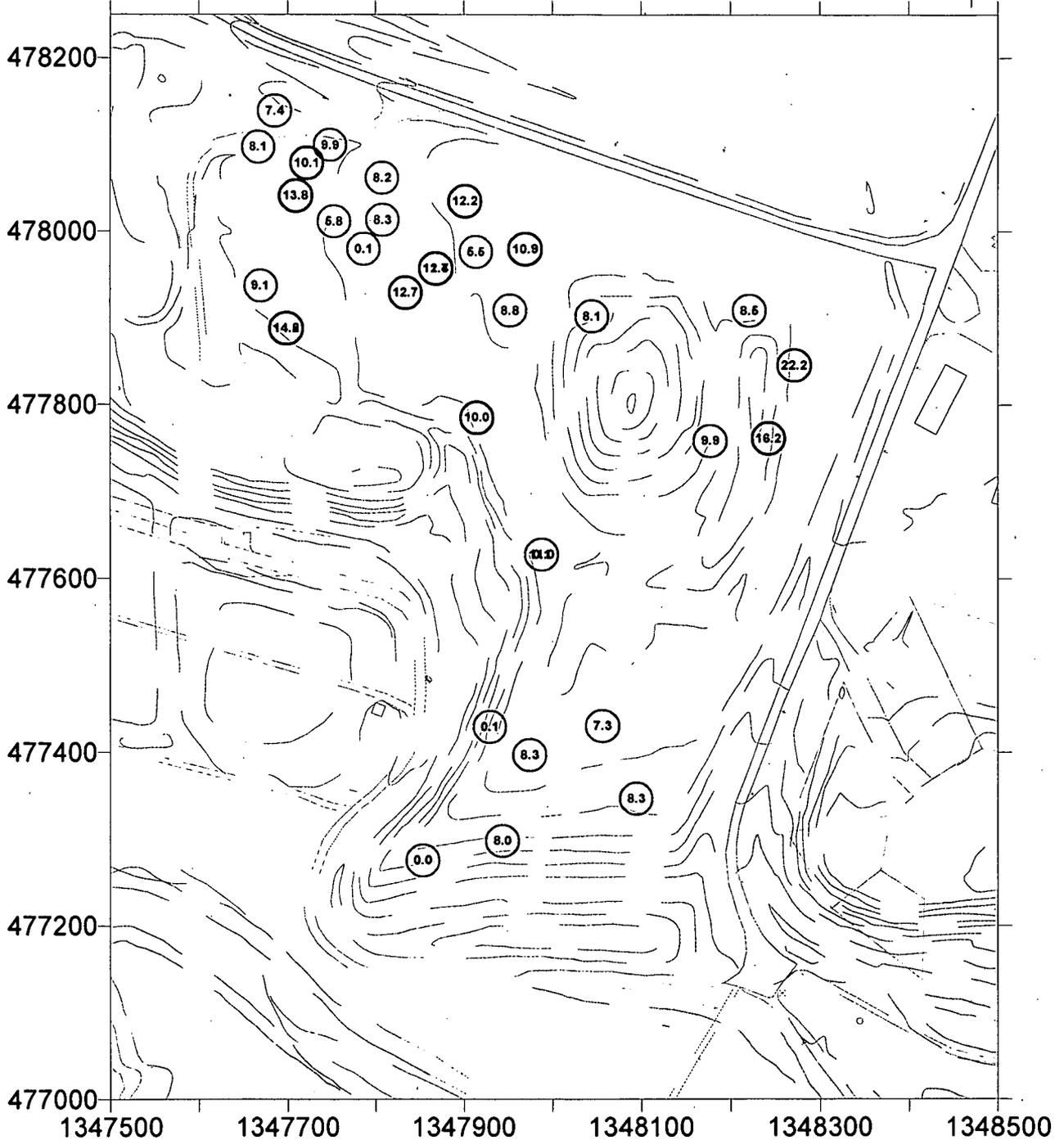
- 1
2
3
4 U.S. Department of Energy, 1995a, "Record of Decision for Operable Unit 2," Final, Fernald
5 Environmental Management Project, DOE, Fernald Area Office, Cincinnati, Ohio.
6
7 U.S. Department of Energy, 1995b, "Operable Unit 5 Remedial Investigation Report," Final, Fernald
8 Environmental Management Project, DOE, Fernald Area Office, Cincinnati, Ohio.
9
10 U.S. Department of Energy, 1995c, "Operable Unit 2 Remedial Investigation Report," Final, Fernald
11 Environmental Management Project, DOE, Fernald Area Office, Cincinnati, Ohio.
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14 Environmental Management Project, DOE, Fernald Area Office, Cincinnati, Ohio.
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45 Units Perimeter Area," Draft, Fernald Environmental Management Project, DOE, Fernald Area
46 Office, Cincinnati, Ohio.

APPENDIX A

FINAL GRADE EXCAVATION DATA

A2P1 SOUTH FIELD Final Grade 3849

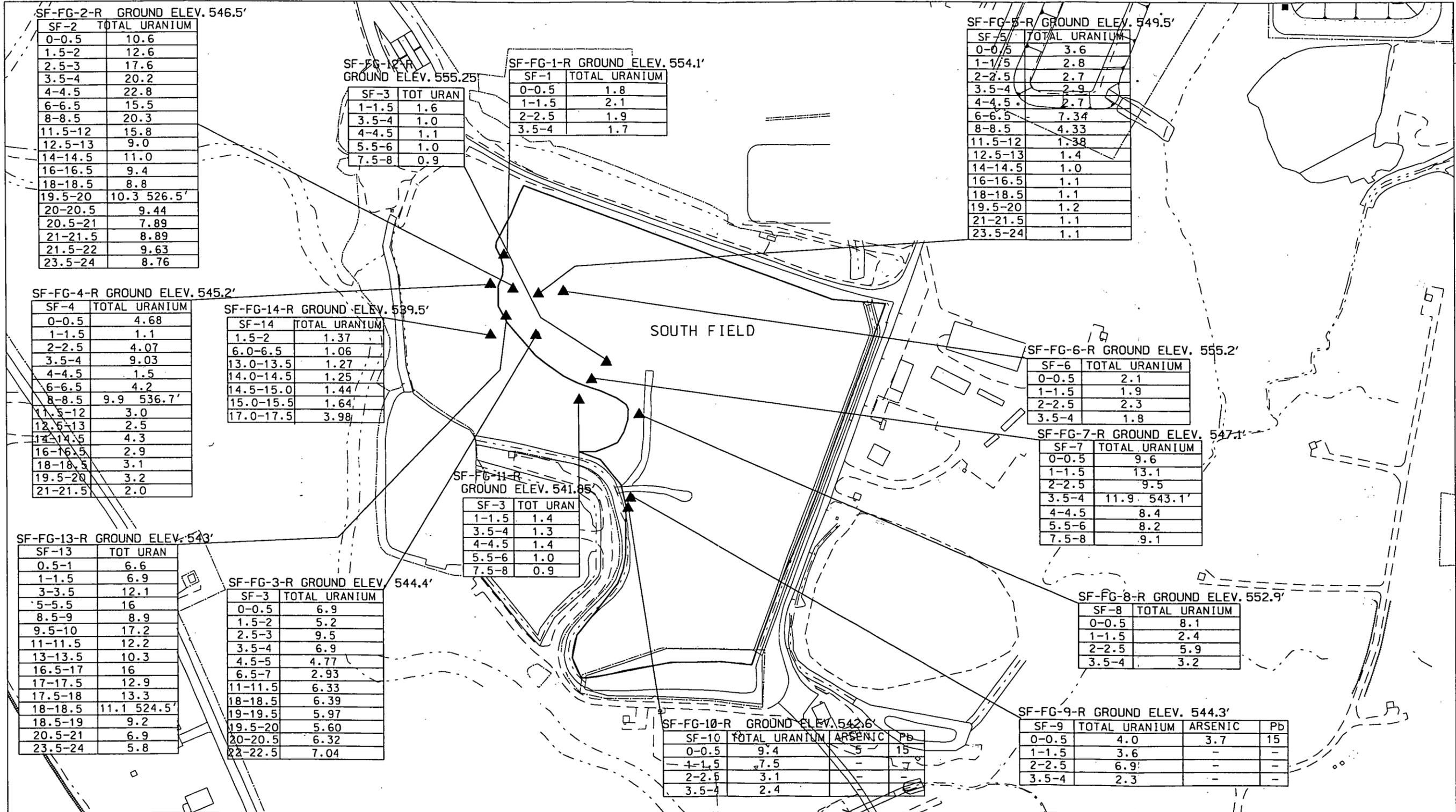
Moisture Corrected Total Uranium
HPGe #40743, 31265, 31204, 30904, 30687
Single Spectra in ppm
Coverage Plot (Field of View to scale)
Measurement Dates: 07/20/00-09/15/00



HPGe
Total Uranium (ppm)

- 0.00 to 10.00
- 10.00 to 20.00
- 20.00 to 22.30

RTIMP DWG Title: SF-FG-HPGe-TU-1PT-MC
Project #: 20402-PSP-0002
Project Name: A2P1 Southfield Exc. Char.
Prepared By: Brian McDaniel
File: SF_FG_HPGe_TU_1PT_MC.srf
Date Prepared: 09/19/00



SF-FG-2-R GROUND ELEV. 546.5'

SF-2	TOTAL URANIUM
0-0.5	10.6
1.5-2	12.6
2.5-3	17.6
3.5-4	20.2
4-4.5	22.8
6-6.5	15.5
8-8.5	20.3
11.5-12	15.8
12.5-13	9.0
14-14.5	11.0
16-16.5	9.4
18-18.5	8.8
19.5-20	10.3 526.5'
20-20.5	9.44
20.5-21	7.89
21-21.5	8.89
21.5-22	9.63
23.5-24	8.76

SF-FG-12-R GROUND ELEV. 555.25'

SF-3	TOT URAN
1-1.5	1.6
3.5-4	1.0
4-4.5	1.1
5.5-6	1.0
7.5-8	0.9

SF-FG-1-R GROUND ELEV. 554.1'

SF-1	TOTAL URANIUM
0-0.5	1.8
1-1.5	2.1
2-2.5	1.9
3.5-4	1.7

SF-FG-5-R GROUND ELEV. 549.5'

SF-5	TOTAL URANIUM
0-0.5	3.6
1-1.5	2.8
2-2.5	2.7
3.5-4	2.9
4-4.5	2.7
6-6.5	7.34
8-8.5	4.33
11.5-12	1.38
12.5-13	1.4
14-14.5	1.0
16-16.5	1.1
18-18.5	1.1
19.5-20	1.2
21-21.5	1.1
23.5-24	1.1

SF-FG-4-R GROUND ELEV. 545.2'

SF-4	TOTAL URANIUM
0-0.5	4.68
1-1.5	1.1
2-2.5	4.07
3.5-4	9.03
4-4.5	1.5
6-6.5	4.2
8-8.5	9.9 536.7'
11.5-12	3.0
12.5-13	2.5
14-14.5	4.3
16-16.5	2.9
18-18.5	3.1
19.5-20	3.2
21-21.5	2.0

SF-FG-14-R GROUND ELEV. 539.5'

SF-14	TOTAL URANIUM
1.5-2	1.37
6.0-6.5	1.06
13.0-13.5	1.27
14.0-14.5	1.25
14.5-15.0	1.44
15.0-15.5	1.64
17.0-17.5	3.98

SF-FG-6-R GROUND ELEV. 555.2'

SF-6	TOTAL URANIUM
0-0.5	2.1
1-1.5	1.9
2-2.5	2.3
3.5-4	1.8

SF-FG-7-R GROUND ELEV. 547.1'

SF-7	TOTAL URANIUM
0-0.5	9.6
1-1.5	13.1
2-2.5	9.5
3.5-4	11.9 543.1'
4-4.5	8.4
5.5-6	8.2
7.5-8	9.1

SF-FG-11-R GROUND ELEV. 541.85'

SF-3	TOT URAN
1-1.5	1.4
3.5-4	1.3
4-4.5	1.4
5.5-6	1.0
7.5-8	0.9

SF-FG-8-R GROUND ELEV. 552.9'

SF-8	TOTAL URANIUM
0-0.5	8.1
1-1.5	2.4
2-2.5	5.9
3.5-4	3.2

SF-FG-13-R GROUND ELEV. 543'

SF-13	TOT URAN
0.5-1	6.6
1-1.5	6.9
3-3.5	12.1
5-5.5	16
8.5-9	8.9
9.5-10	17.2
11-11.5	12.2
13-13.5	10.3
16.5-17	16
17-17.5	12.9
17.5-18	13.3
18-18.5	11.1 524.5'
18.5-19	9.2
20.5-21	6.9
23.5-24	5.8

SF-FG-3-R GROUND ELEV. 544.4'

SF-3	TOTAL URANIUM
0-0.5	6.9
1.5-2	5.2
2.5-3	9.5
3.5-4	6.9
4.5-5	4.77
6.5-7	2.93
11-11.5	6.33
18-18.5	6.39
19-19.5	5.97
19.5-20	5.60
20-20.5	6.32
22-22.5	7.04

SF-FG-10-R GROUND ELEV. 542.6'

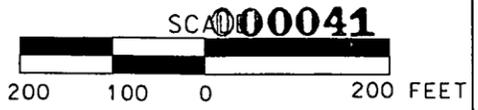
SF-10	TOTAL URANIUM	ARSENIC	Pb
0-0.5	9.4	5	15
1-1.5	7.5	-	7
2-2.5	3.1	-	-
3.5-4	2.4	-	-

SF-FG-9-R GROUND ELEV. 544.3'

SF-9	TOTAL URANIUM	ARSENIC	Pb
0-0.5	4.0	3.7	15
1-1.5	3.6	-	-
2-2.5	6.9	-	-
3.5-4	2.3	-	-

LEGEND:
 — EXCAVATION BOUNDARY
 ▲ SOUTHFIELD FRL SOIL BORINGS

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A2P1 NWU CAROLINA AREA 3849

Moisture Corrected Total Uranium

RTRK Batch #: 849

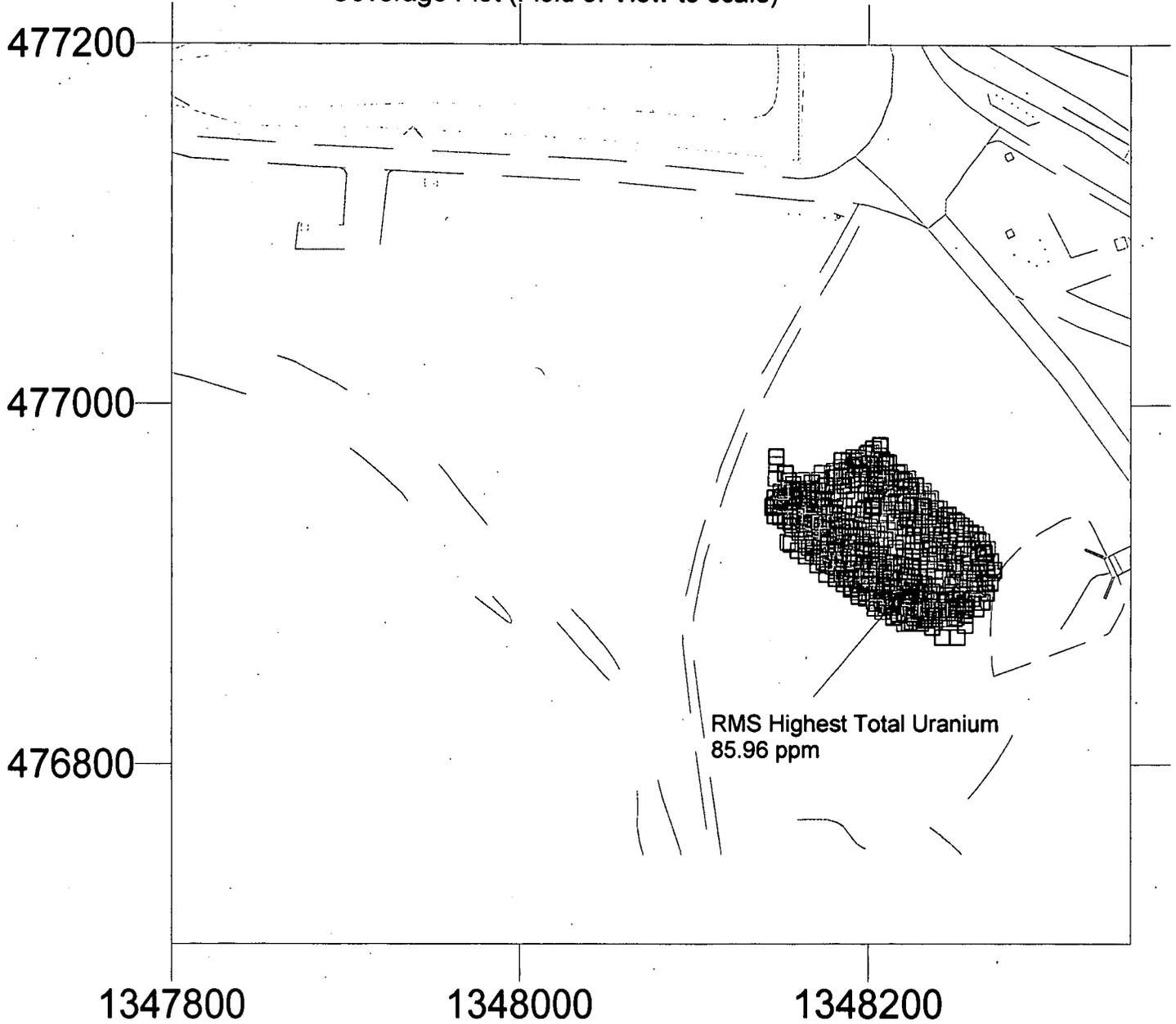
Ave Elev.: 533'

Measurement Date: 10/12/00

Two Spectra Average

Coverage Plot (Field of View to scale)

N



RMS Total Uranium (ppm)	
□	-13.80 to 41.00
□	41.00 to 82.00
□	82.00 to 164.00
□	164.00 to 246.00
■	246.00 to 10000.00

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Project #: 20400-PSP-0002
Project Name: A2P1 NWU & A2P2 PT1 PreDesign Sampling
Prepared By: Brian McDaniel
File: A2P1_NWU_CAR_4_533_TU_2PT_MC.srf
Date Prepared: 10/16/00

A2P1 NWU CAROLINA AREA

Rad0n & Moisture Corrected Radium-226

3849

RTRK Batch #: 849

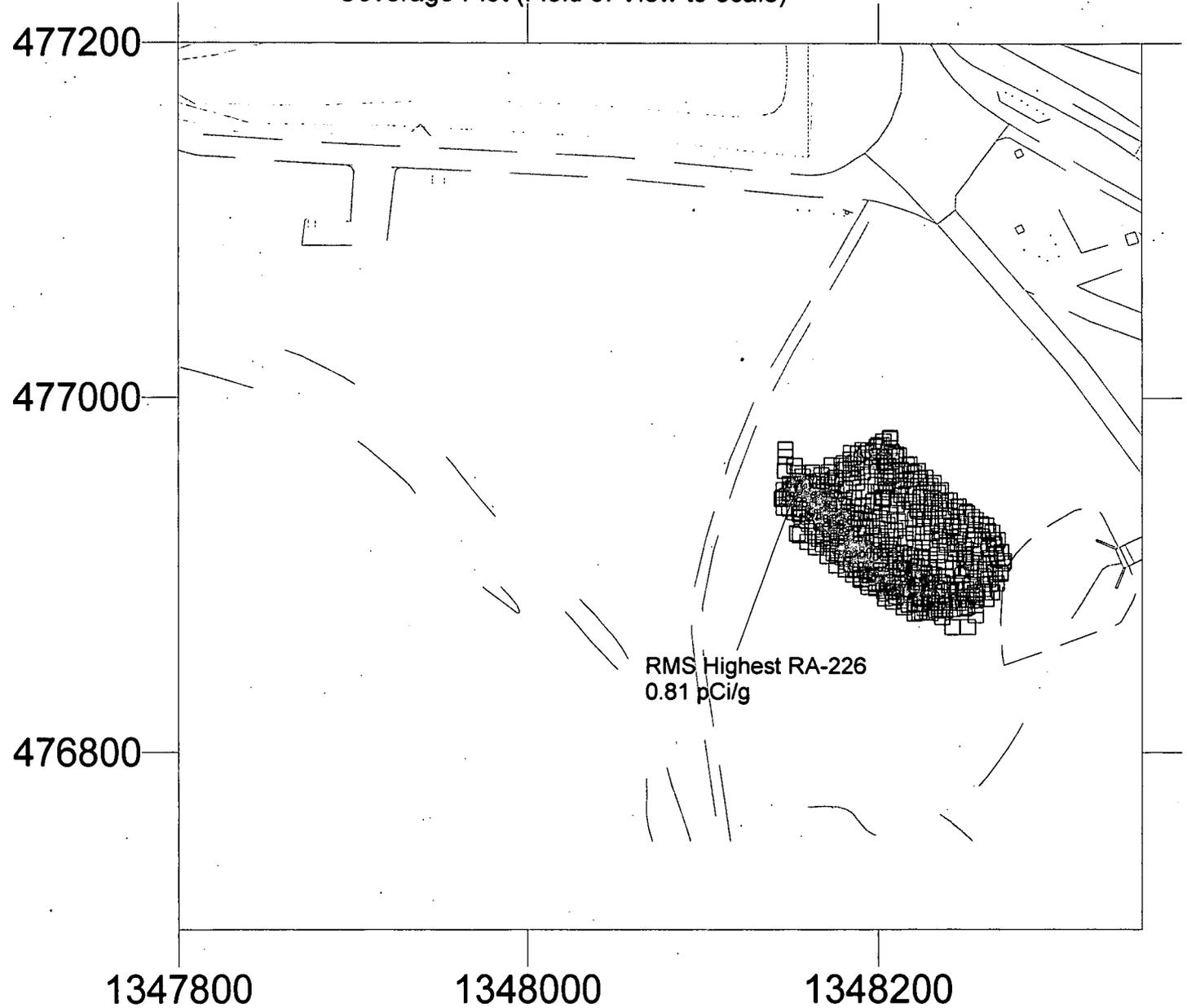
Ave Elev.: 533'

Measurement Date: 10/12/00

Two Spectra Average

Coverage Plot (Field of View to scale)

N



RMS
RA-226 (pCi/g)

- 0.00 to 0.85
- 0.85 to 1.70
- 1.70 to 3.40
- 3.40 to 5.10
- 5.10 to 10000.00

RTIMP DWG Title: A2P1-NWU-CAR-4-533-RA-2PT-MC.srf
Project #: 20400-PSP-0002
Project Name: A2P1 NWU & A2P2 PT1 PreDesign Sampling
Prepared By: Brian McDaniel
File: A2P1_NWU_CAR_4_533_RA_2PT_MC.srf
Date Prepared: 10/16/00

000043

A2P1 NWU CAROLINA AREA

Moisture Corrected Thorium-232

RTRK Batch #: 849

Ave Elev.: 533'

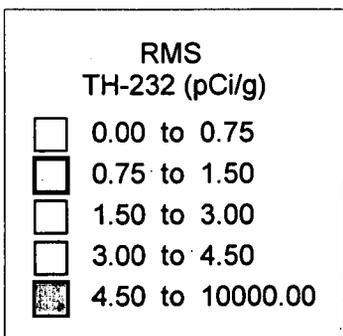
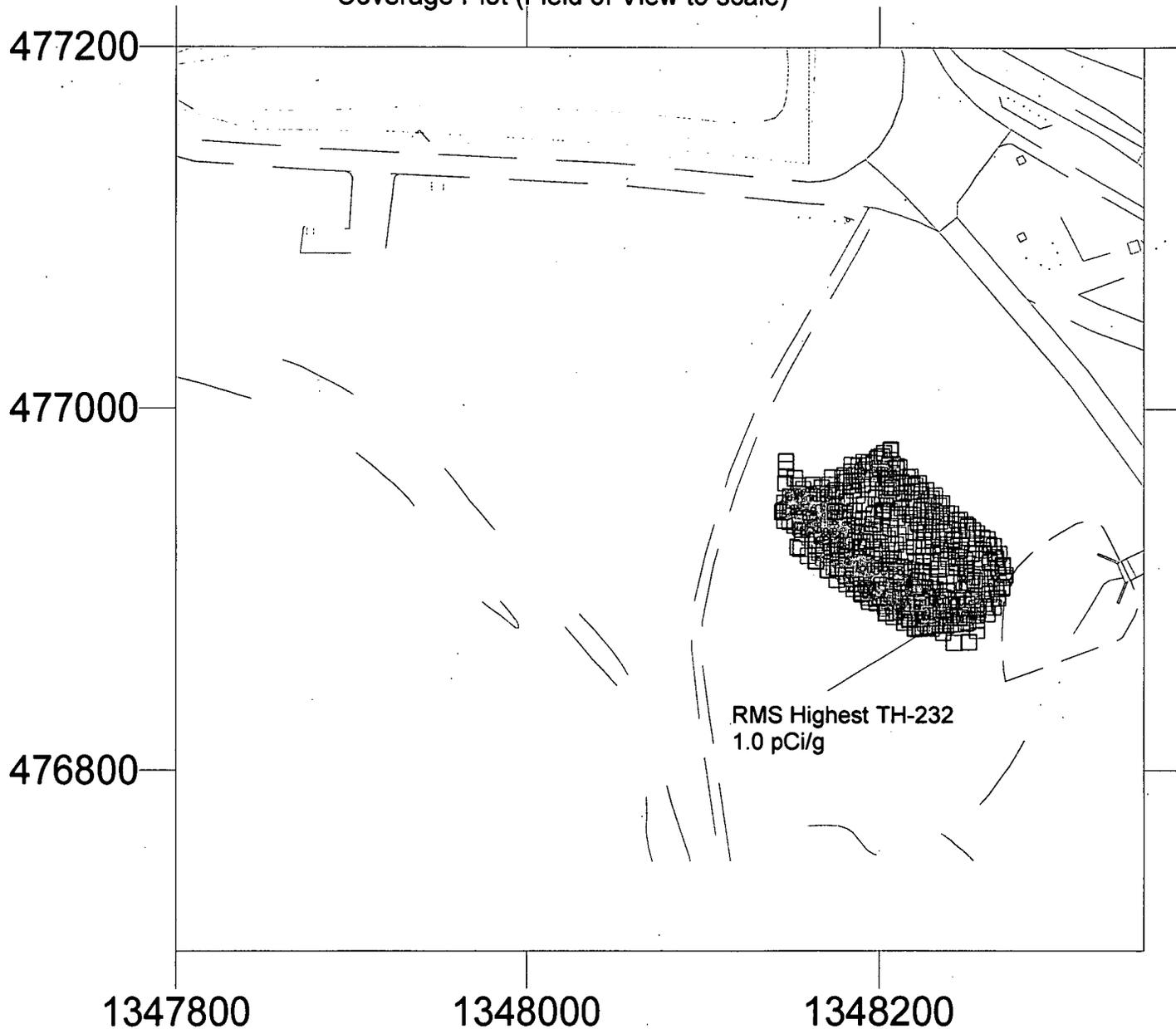
Measurement Date: 10/12/00

Two Spectra Average

Coverage Plot (Field of View to scale)

3849

N



RTIMP DWG Title: A2P1-NWU-CAR-4-533-TH-2PT-MC.srf
Project #: 20400-PSP-0002
Project Name: A2P1 NWU & A2P2 PT1 PreDesign Sampling
Prepared By: Brian McDaniel
File: A2P1_NWU_CAR_4_533_TH_2PT_MC.srf
Date Prepared: 10/16/00

000044

A2P1 NWU CAROLINA AREA

3849

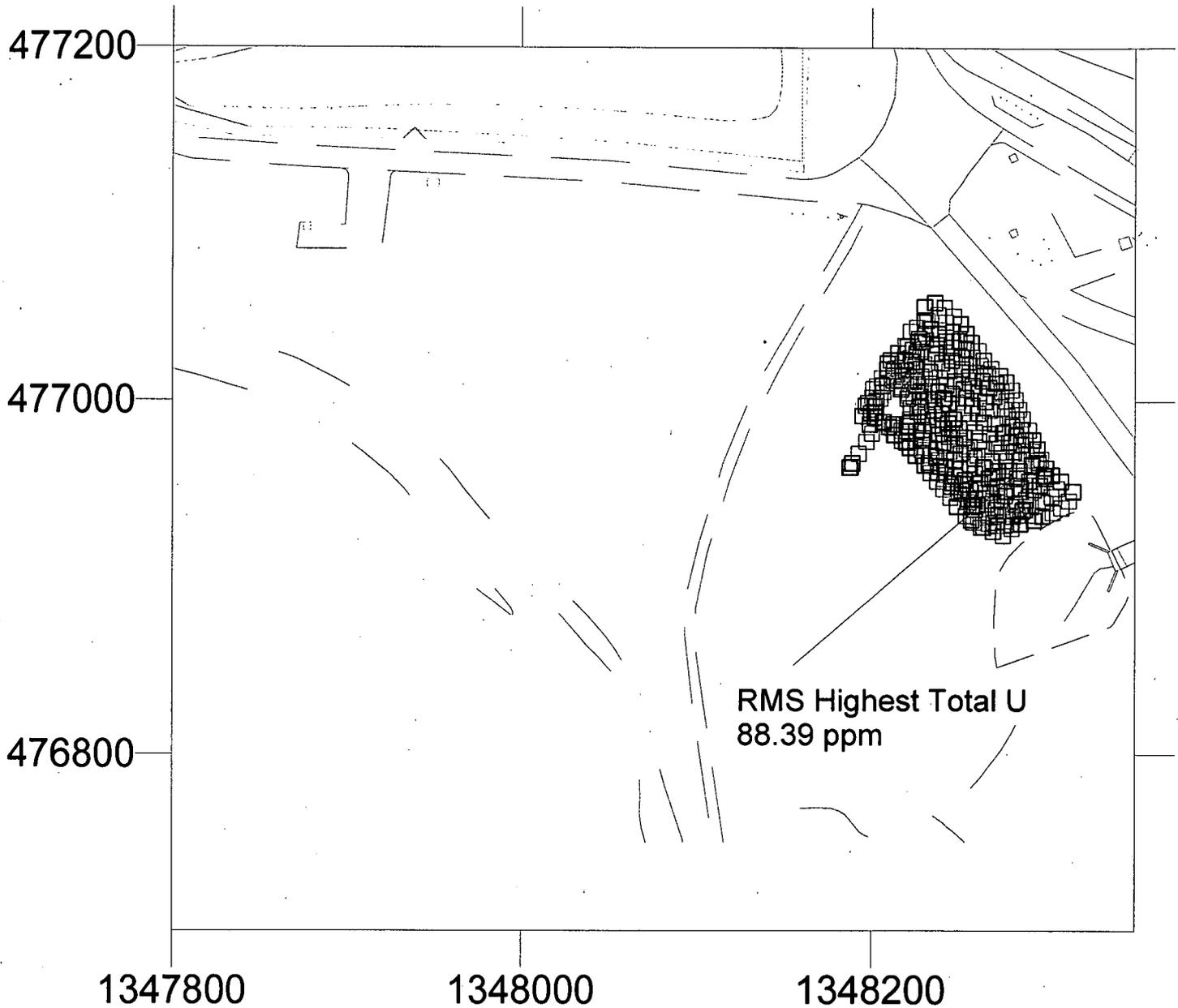
Moisture Corrected Total Uranium

RTRK batch#: 841

Measurement Date: 09/19/00

Coverage Plot (Field of View 2.4m radius)

N



RMS Total Uranium (ppm)	
□	-2.86 to 41.00
□	41.00 to 82.00
□	82.00 to 164.00
□	164.00 to 246.00
■	246.00 to 10000.00

RTIMP DWG Title: A2P1-NWU-CAR-12-TU-2PT-MC.srf
Project #: 20400-PSP-0002
Project Name: A2P1 NWU & A2P2 PT1 PreDesign Sampling
Prepared By: Brian McDaniel
File: A2P1_NWU_CAR_12_TU_2PT_MC.srf
Date Prepared: 9/19/00

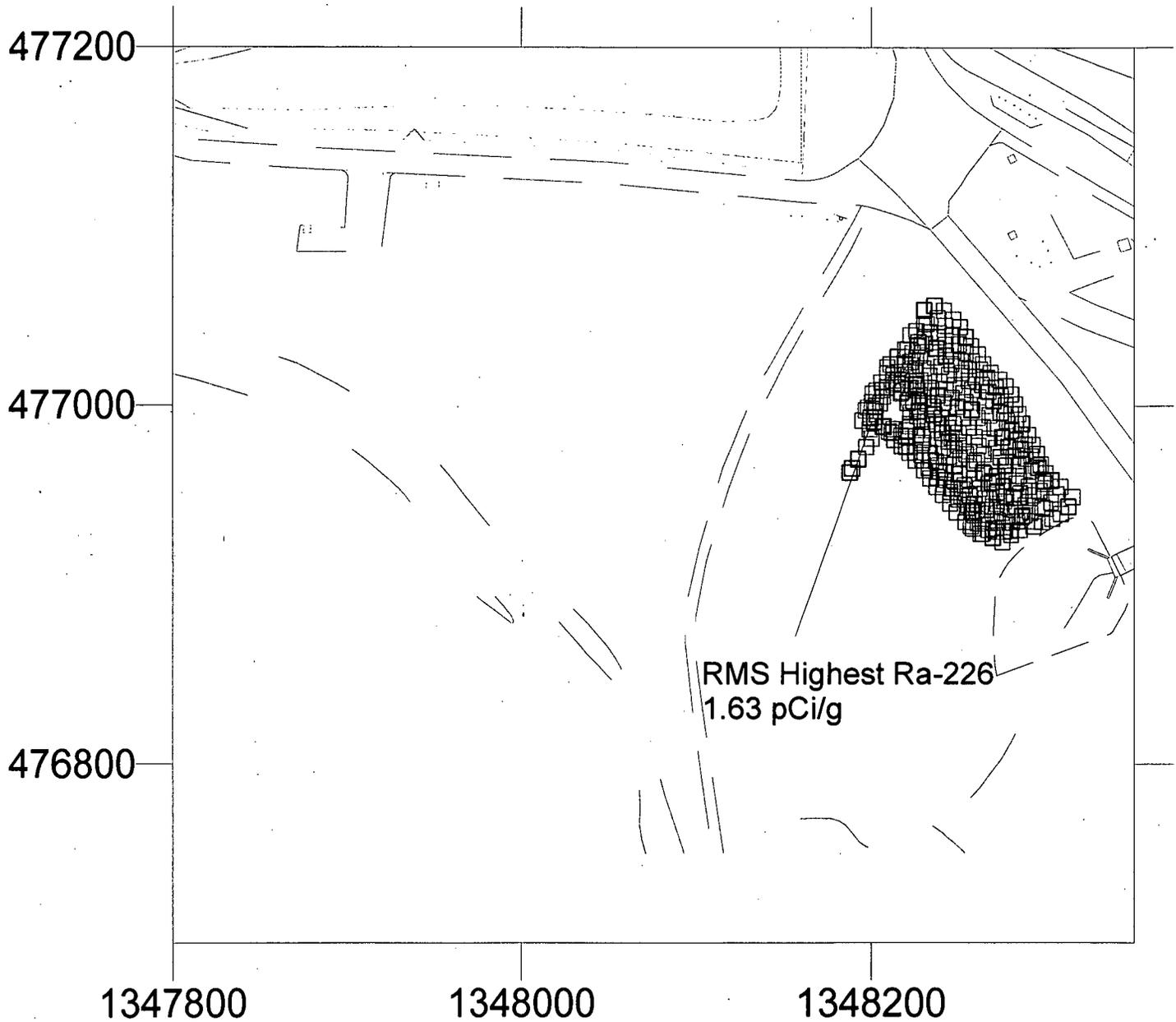
000045

A2P1 NWU CAROLINA AREA

Radon & Moisture Corrected Radium-226 3849

RTRK batch#: 841
Measurement Date: 09/19/00
Coverage Plot (Field of View 2.4m radius)

N



RMS Ra-226 (pCi/g)	
	-0.09 to 0.85
	0.85 to 1.70
	1.70 to 3.40
	3.40 to 5.10
	5.10 to 10000.00

RTIMP DWG Title: A2P1-NWU-CAR-12-RA-2PT-MC.srf
Project #: 20400-PSP-0002
Project Name: A2P1 NWU & A2P2 PT1 PreDesign Sampling
Prepared By: Brian McDaniel
File: A2P1_NWU_CAR_12_RA_2PT_MC.srf
Date Prepared: 9/20/00

000046

A2P1 NWU CAROLINA AREA

38 49

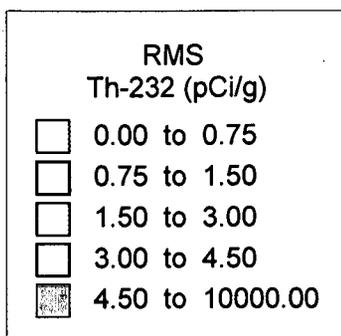
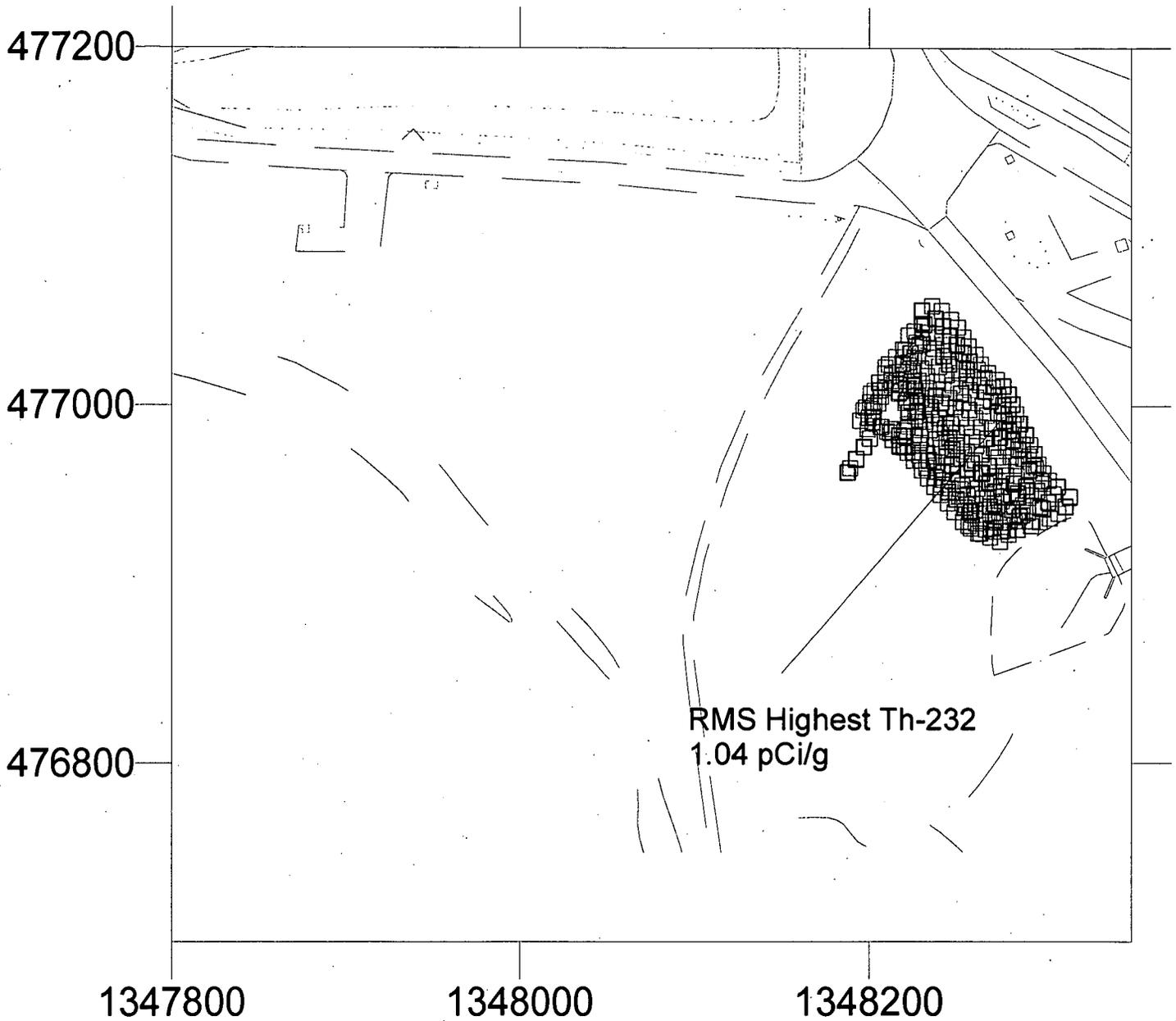
Moisture Corrected Thorium-232

RTRK batch#: 841

Measurement Date: 09/19/00

Coverage Plot (Field of View 2.4m radius)

N



RTIMP DWG Title: A2P1-NWU-CAR-12-TH-2PT-MC.srf
Project #: 20400-PSP-0002
Project Name: A2P1 NWU & A2P2 PT1 PreDesign Sampling
Prepared By: Brian McDaniel
File: A2P1_NWU_CAR_12_TH_2PT_MC.srf
Date Prepared: 9/20/00

000047

A2P1 NWU CAROLINA AREA

Moisture Corrected Total Uranium

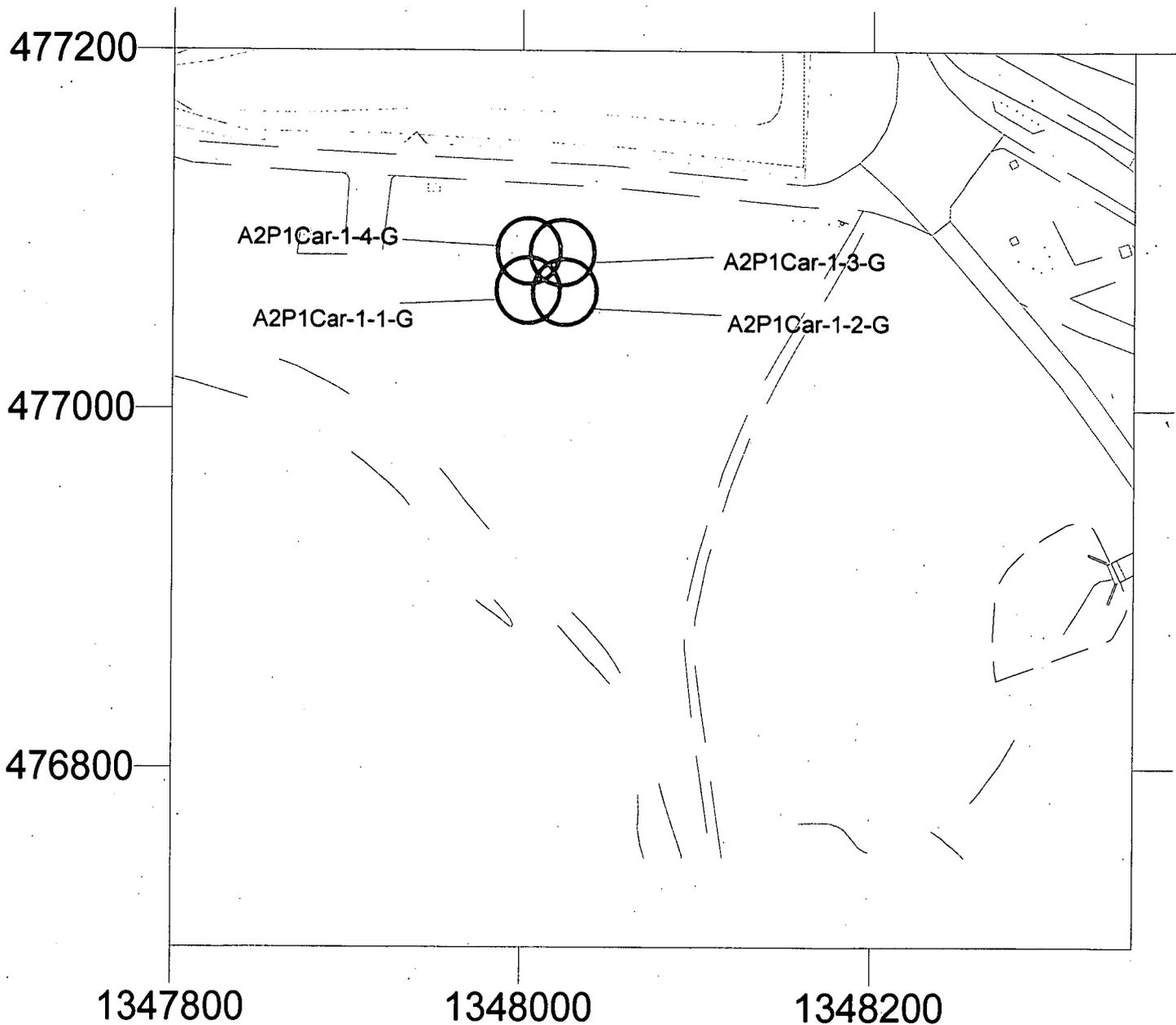
3849

HPGe Det #: 31265

Measurement Date: 10/04/00

Coverage Plot (Field of View 6m radius)

N



HPGe Total Uranium (ppm)	
○	0.00 to 41.00
○	41.00 to 82.00
○	82.00 to 164.00
○	164.00 to 246.00
●	264.00 to 10000.00

RTIMP DWG Title: A2P1-NWU-CAR-1-Lift-1-TU-1PT-MC.srf
Project #: 20400-PSP-0002
Project Name: A2P1 NWU & A2P2 PT1 PreDesign Sampling
Prepared By: Brian McDaniel
File: A2P1_NWU_CAR_1_Lift_1_TU_1PT_MC.srf
Date Prepared: 10/05/00

000048

A2P1 NWU CAROLINA AREA

3849

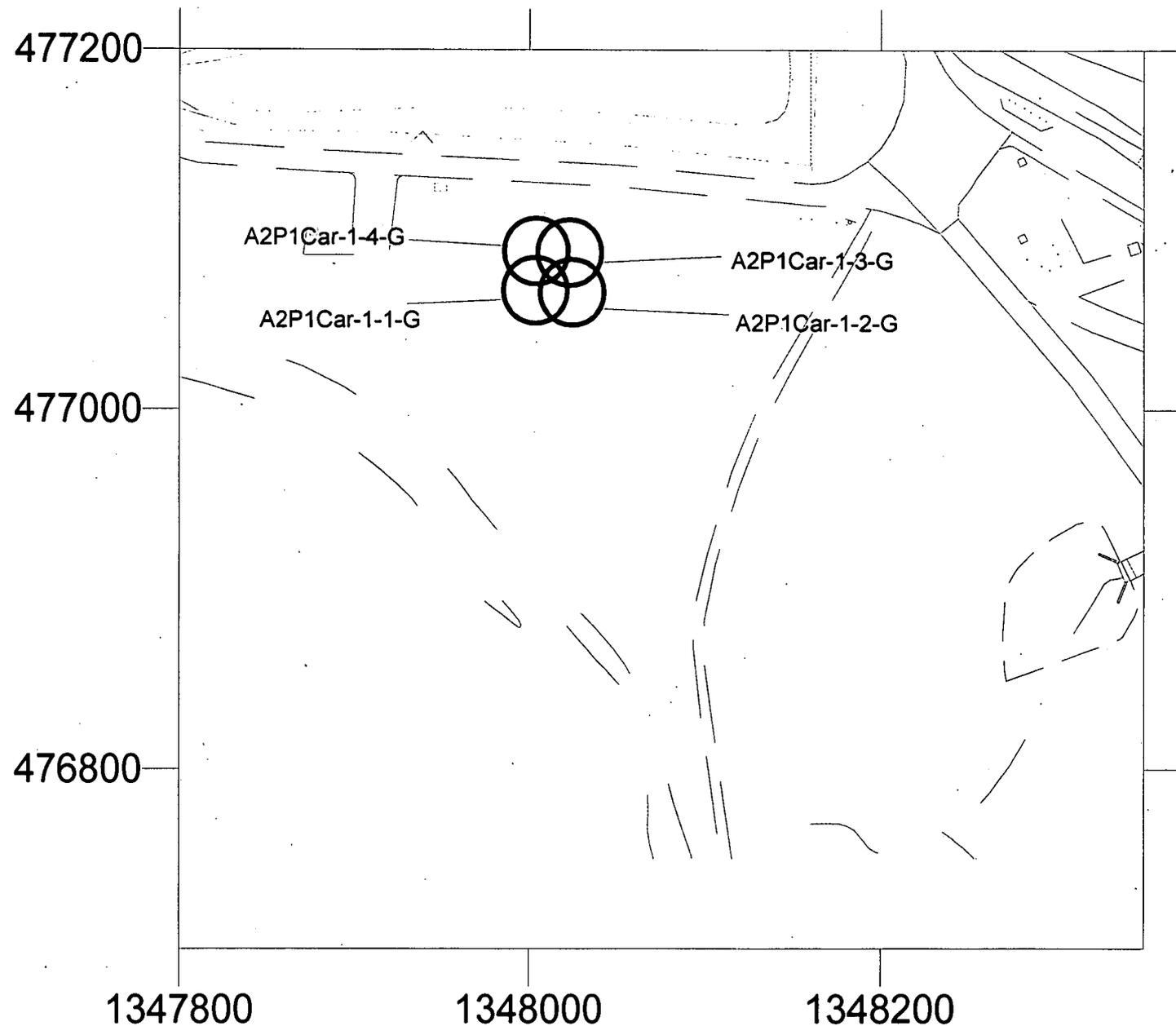
Radon & Moisture Corrected Radium-226

HPGe Det #: 31265

Measurement Date: 10/04/00

Coverage Plot (Field of View 6m radius)

N



HPGe RA-226 (pCi/g)	
○	0.00 to 0.85
○	0.85 to 1.70
○	1.70 to 3.40
○	3.40 to 5.10
●	5.10 to 10000.00

RTIMP DWG Title: A2P1-NWU-CAR-1-Lift-1-RA-1PT-MC.srf
Project #: 20400-PSP-0002
Project Name: A2P1 NWU & A2P2 PT1 PreDesign Sampling
Prepared By: Brian McDaniel
File: A2P1_NWU_CAR_1_Lift_1_RA_1PT_MC.srf
Date Prepared: 10/05/00

000049

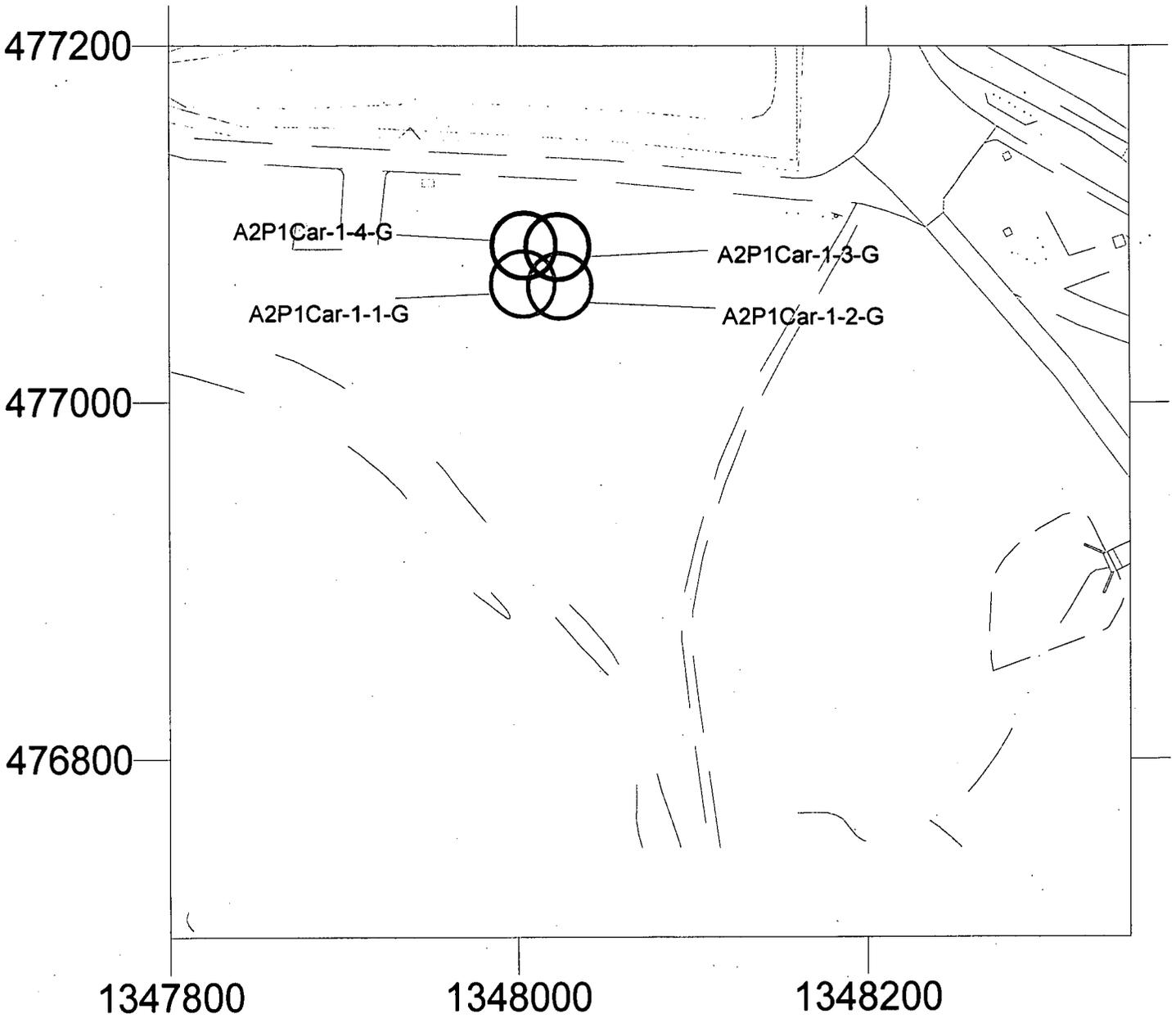
A2P1 NWU CAROLINA AREA

Moisture Corrected Thorium-232

3849

HPGe Det #: 31265
Measurement Date: 10/04/00
Coverage Plot (Field of View 6m radius)

N



HPGe TH-232 (pCi/g)	
○	0.00 to 0.75
○	0.75 to 1.50
○	1.50 to 3.00
○	3.00 to 4.50
●	4.50 to 10000.00

RTIMP DWG Title: A2P1-NWU-CAR-1-Lift-1-TH-1PT-MC.srf
Project #: 20400-PSP-0002
Project Name: A2P1 NWU & A2P2 PT1 PreDesign Sampling
Prepared By: Brian McDaniel
File: A2P1_NWU_CAR_1_Lift_1_TH_1PT_MC.srf
Date Prepared: 10/05/00

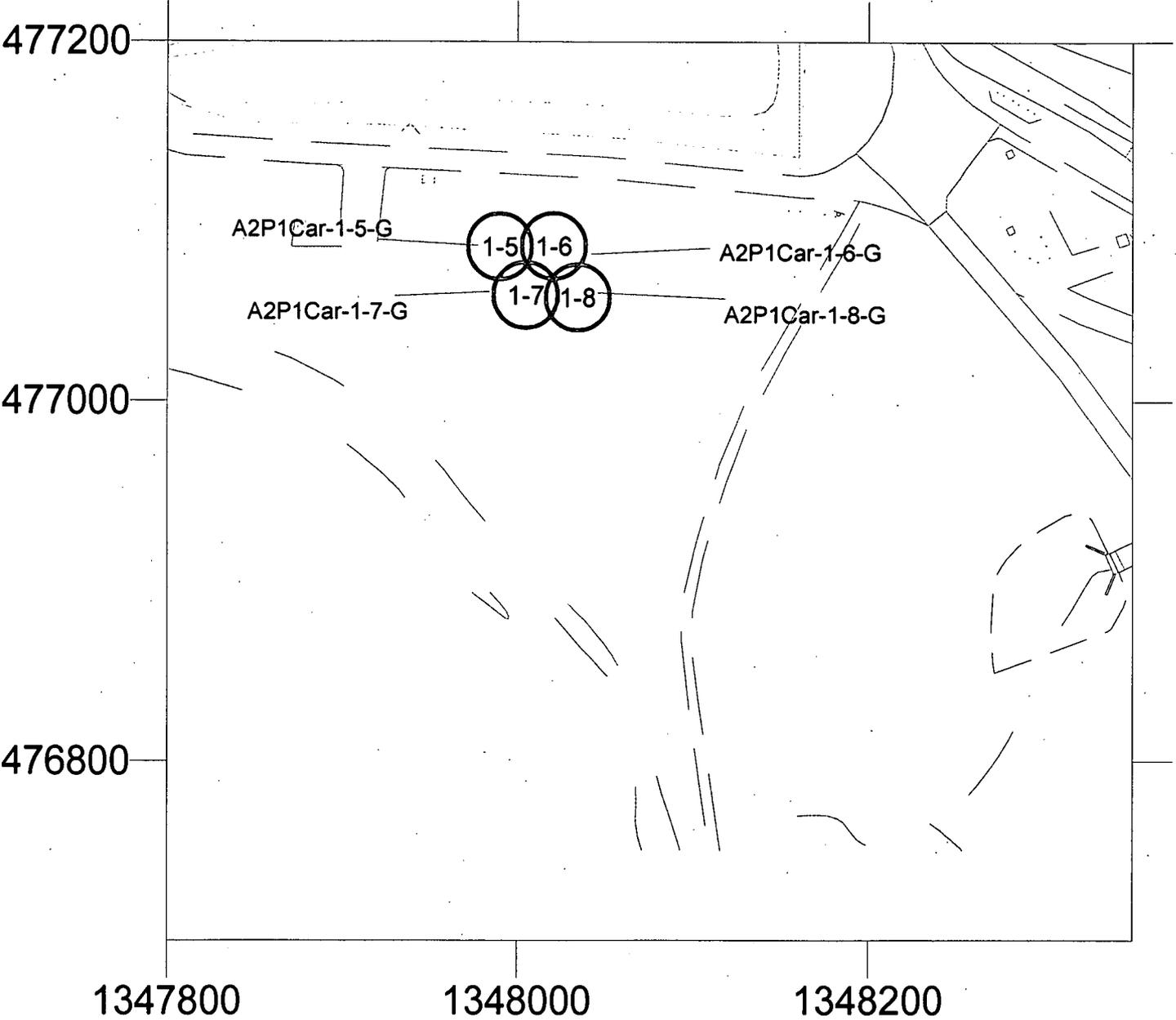
000050

A2P1 NWU CAROLINA AREA 8849

Moisture Corrected Total Uranium

HPGe Det #: 31265
 Measurement Date: 10/11/00
 Coverage Plot (Field of View 6m radius)

N



HPGe Total Uranium (ppm)	
○	0.00 to 41.00
○	41.00 to 82.00
○	82.00 to 164.00
○	164.00 to 246.00
●	264.00 to 10000.00

RTIMP DWG Title: A2P1-NWU-CAR-1-Lift-2-TU-1PT-MC.srf
 Project #: 20400-PSP-0002
 Project Name: A2P1 NWU & A2P2 PT1 PreDesign Sampling
 Prepared By: Brian McDaniel
 File: A2P1_NWU_CAR_1_Lift_2_TU_1PT_MC.srf
 Date Prepared: 10/12/00

000051

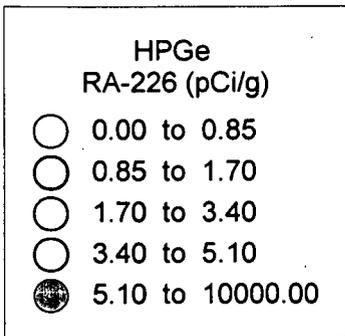
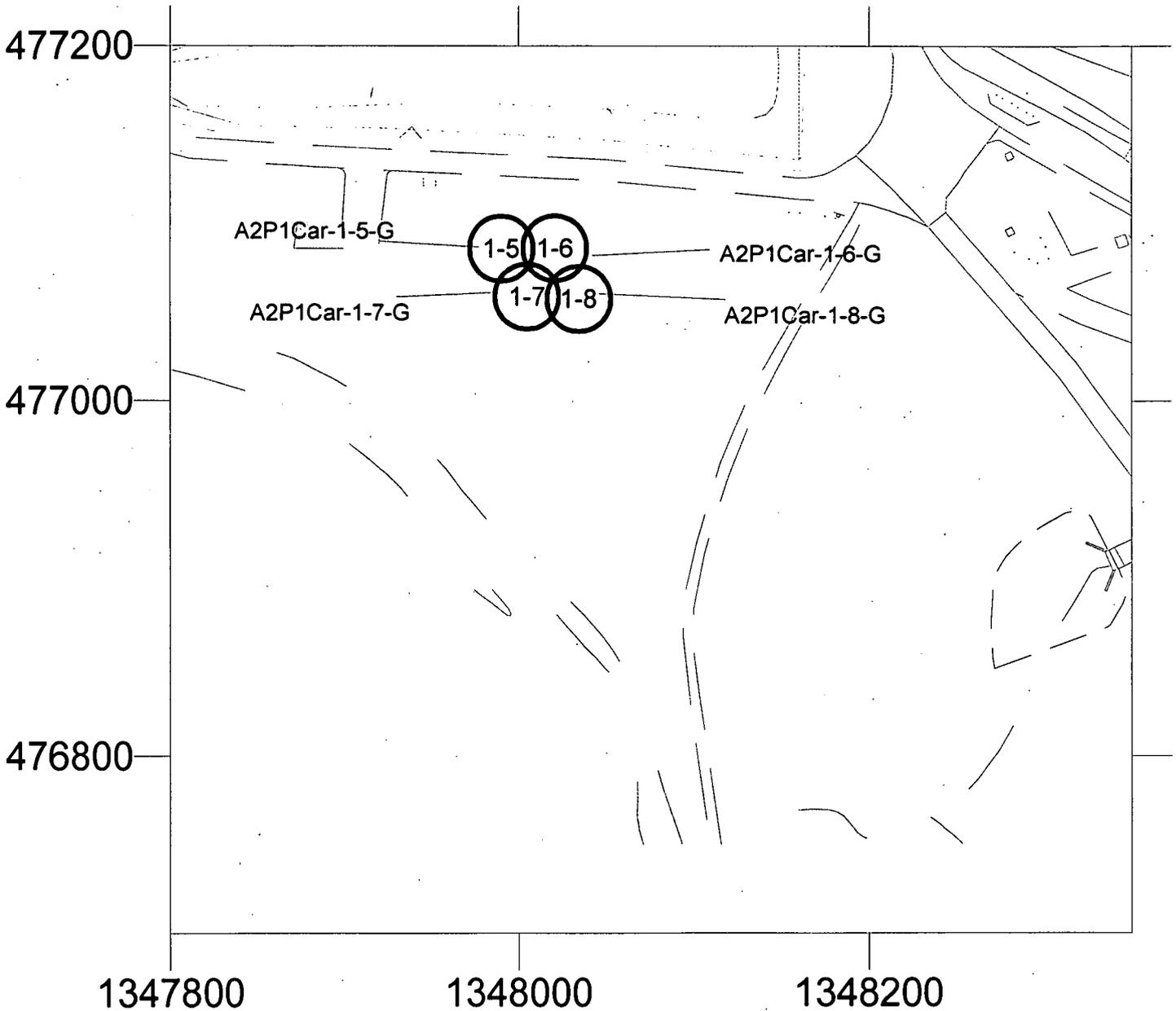
A2P1 NWU CAROLINA AREA

Radon & Moisture Corrected Radium-226

3849

HPGe Det #: 31265
Measurement Date: 10/11/00
Coverage Plot (Field of View 6m radius)

N



RTIMP DWG Title: A2P1-NWU-CAR-1-Lift-2-RA-1PT-MC.srf
Project #: 20400-PSP-0002
Project Name: A2P1 NWU & A2P2 PT1 PreDesign Sampling
Prepared By: Brian McDaniel
File: A2P1_NWU_CAR_1_Lift_2_RA_1PT_MC.srf
Date Prepared: 10/12/00

000052

A2P1 NWU CAROLINA AREA

3849

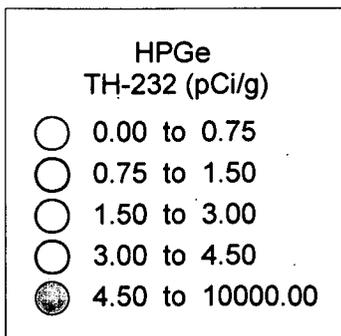
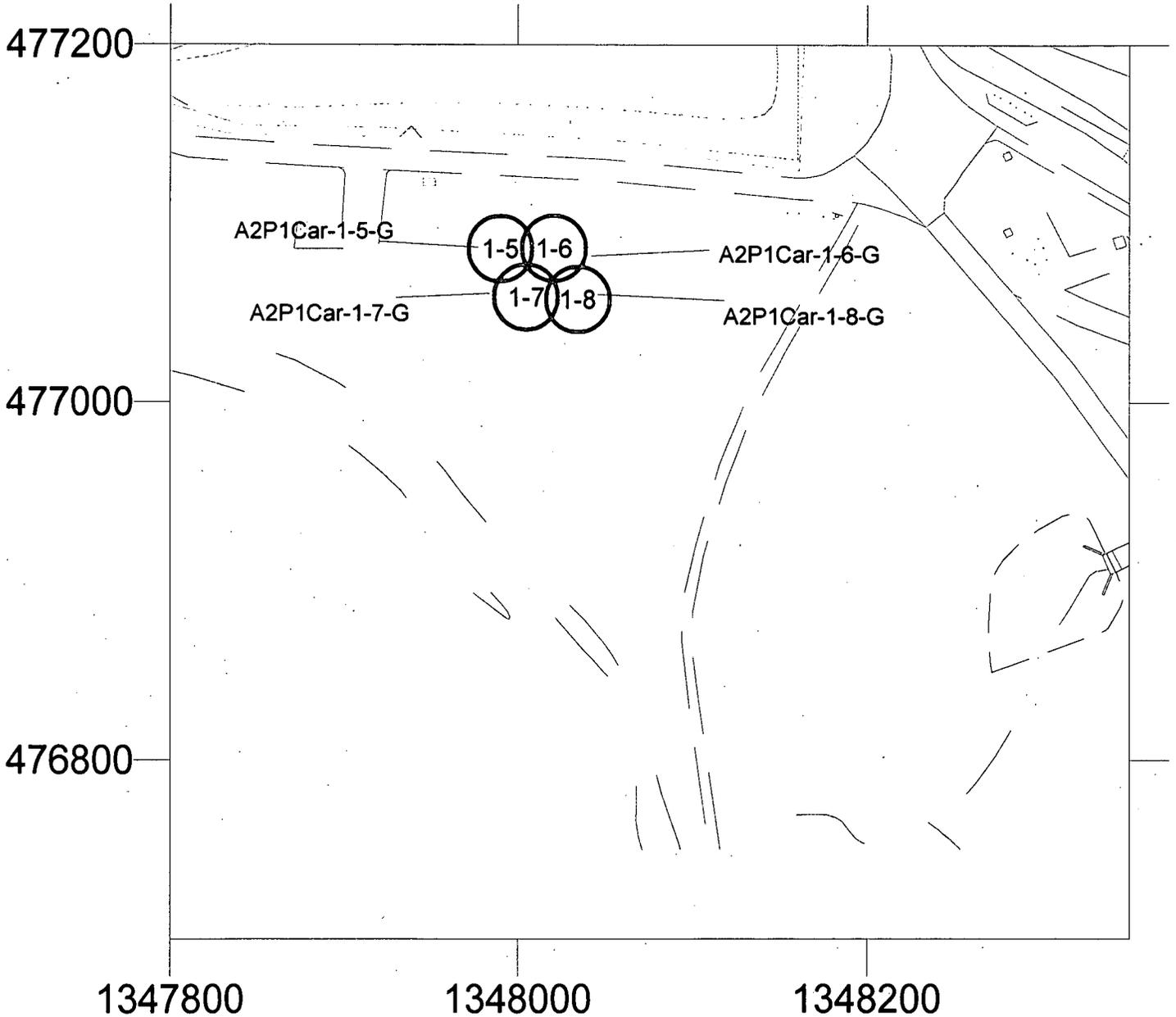
Moisture Corrected Thorium-232

HPGe Det #: 31265

Measurement Date: 10/11/00

Coverage Plot (Field of View 6m radius)

N



RTIMP DWG Title: A2P1-NWU-CAR-1-Lift-2-TH-1PT-MC.srf
Project #: 20400-PSP-0002
Project Name: A2P1 NWU & A2P2 PT1 PreDesign Sampling
Prepared By: Brian McDaniel
File: A2P1_NWU_CAR_1_Lift_2_TH_1PT_MC.srf
Date Prepared: 10/12/00

000053

A2P1 NWU CAROLINA AREA 3849

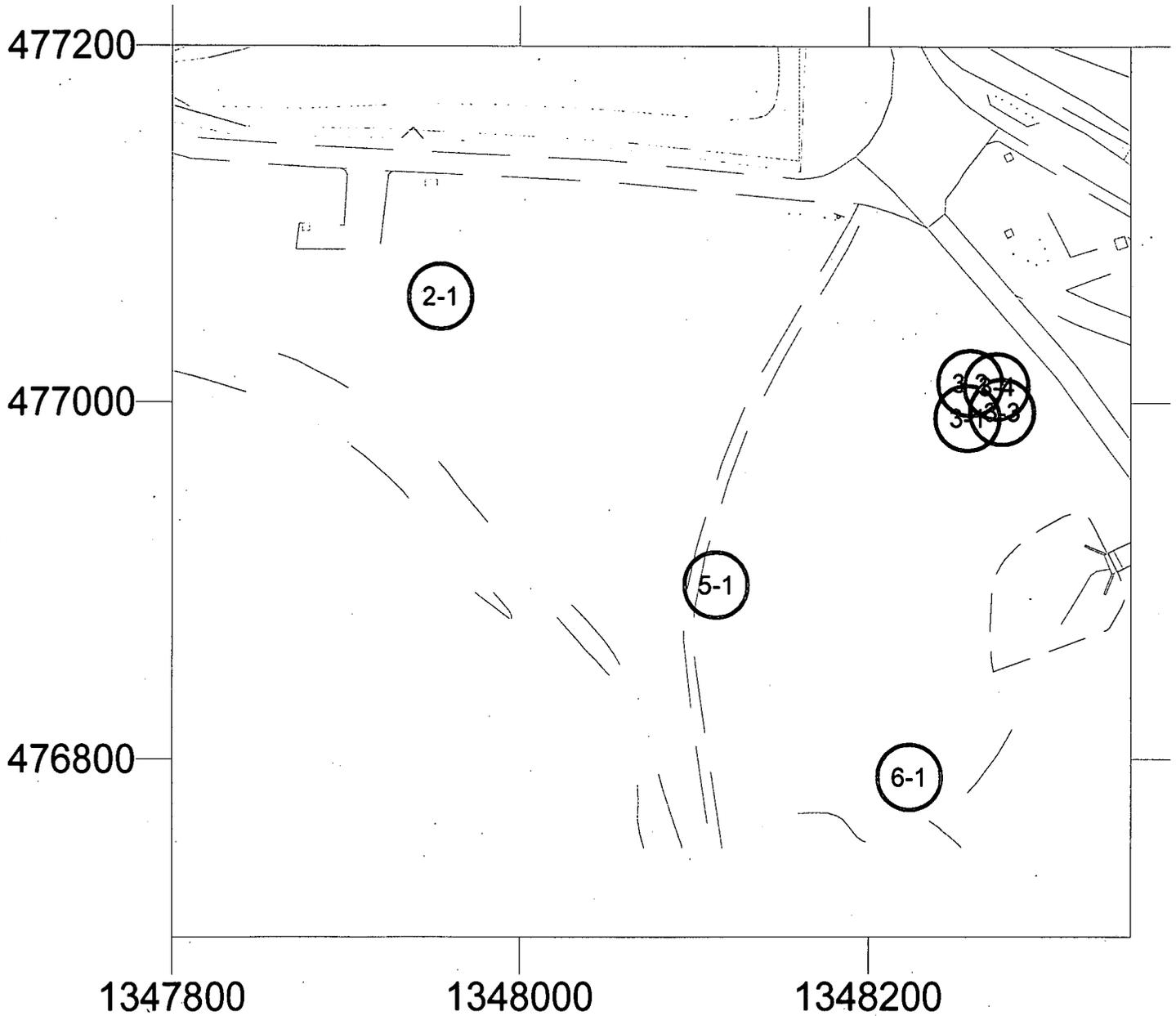
Moisture Corrected Total Uranium

HPGe Det #: 30716,31204

Measurement Date: 09/20/00

Coverage Plot (Field of View 12m radius)

N



HPGe Total Uranium (ppm)	
○	0.00 to 41.00
○	41.00 to 82.00
○	82.00 to 164.00
○	164.00 to 246.00
●	246.00 to 10000.00

RTIMP DWG Title: A2P1-NWU-CAR-2-3-5-6-TU-1PT-MC.srf
Project #: 20400-PSP-0002
Project Name: A2P1 NWU & A2P2 PT1 PreDesign Sampling
Prepared By: Brian McDaniel
File: A2P1_NWU_CAR_2_3_5_6_TU_1PT_MC.srf
Date Prepared: 9/20/00

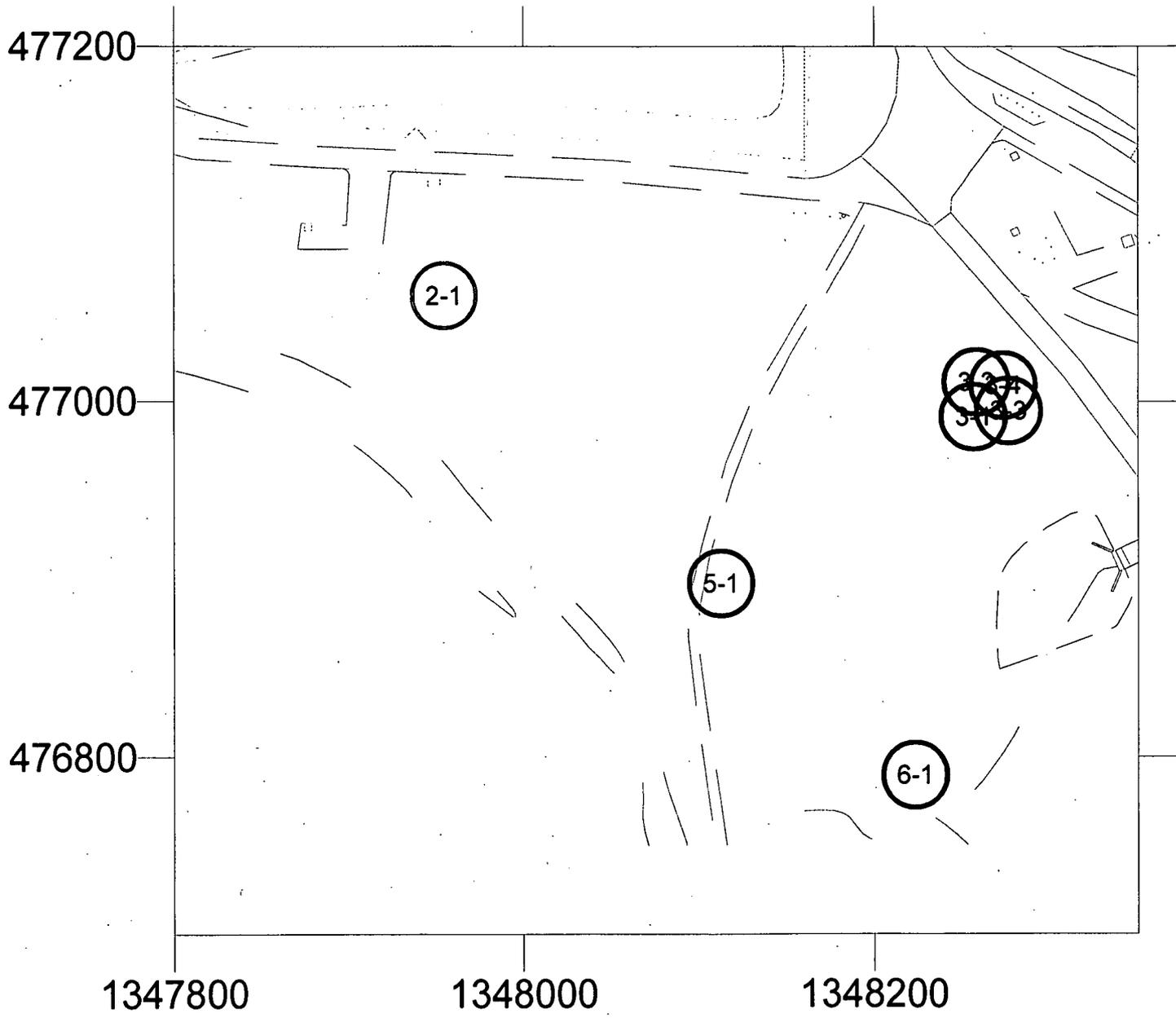
000054

A2P1 NWU CAROLINA AREA

Radon & Moisture Corrected Radium-226

3849
N

HPGe Det #: 30716,31204
Measurement Date: 09/20/00
Coverage Plot (Field of View 12m radius)



HPGe Ra-226 (pCi/g)	
○	0.00 to 0.85
○	0.85 to 1.70
○	1.70 to 3.40
○	3.40 to 5.10
⊗	5.10 to 10000.00

RTIMP DWG Title: A2P1-NWU-CAR-2-3-5-6-RA-1PT-MC.srf
Project #: 20400-PSP-0002
Project Name: A2P1 NWU & A2P2 PT1 PreDesign Sampling
Prepared By: Brian McDaniel
File: A2P1_NWU_CAR_2_3_5_6_RA_1PT_MC.srf
Date Prepared: 9/21/00

000055

A2P1 NWU CAROLINA AREA

3849

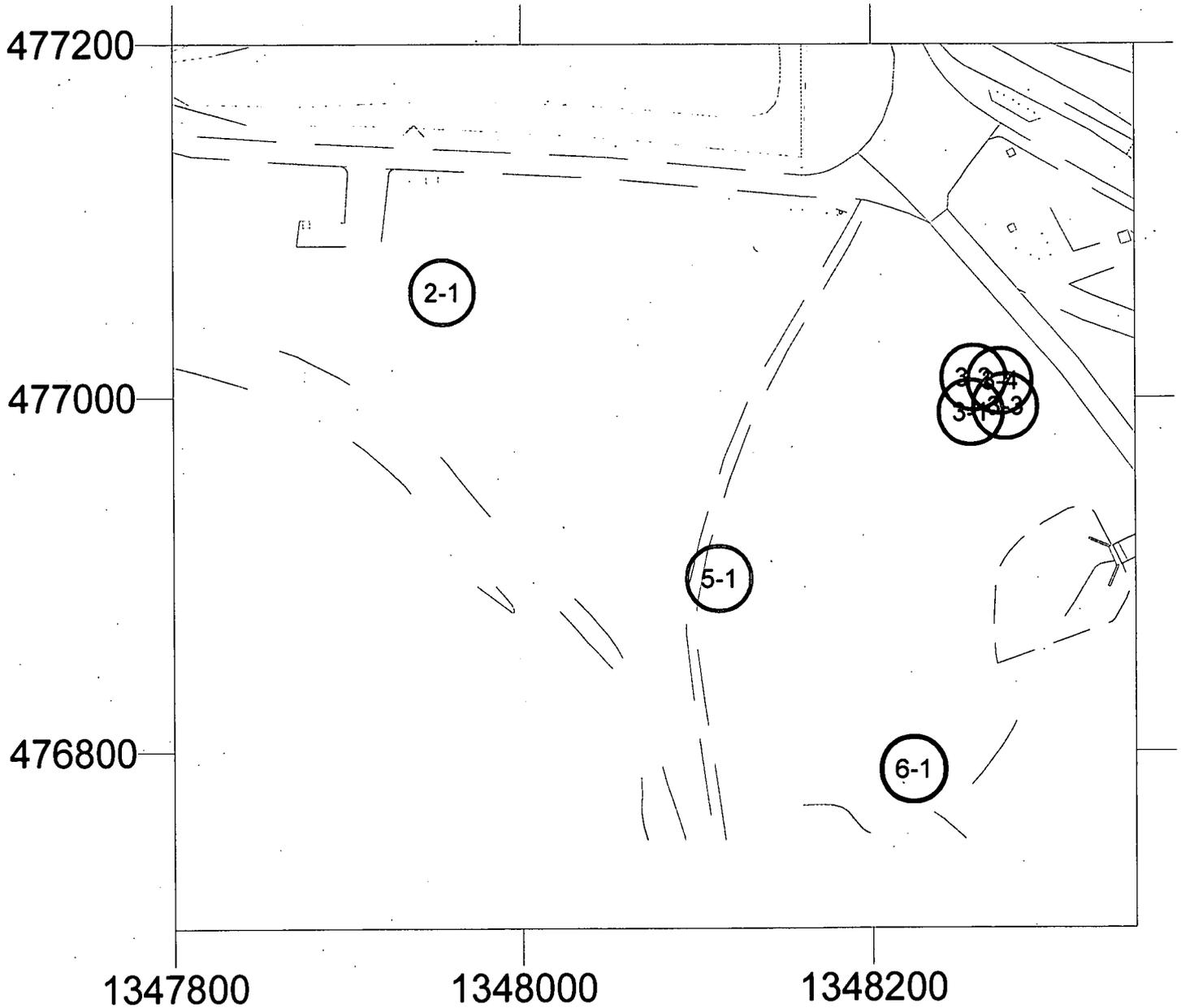
Moisture Corrected Thorium-232

HPGe Det #: 30716,31204

Measurement Date: 09/20/00

Coverage Plot (Field of View 12m radius)

N



HPGe Th-232 (pCi/g)	
○	0.00 to 0.75
○	0.75 to 1.50
○	1.50 to 3.00
○	3.00 to 4.50
⊗	4.50 to 10000.00

RTIMP DWG Title: A2P1-NWU-CAR-2-3-5-6-TH-1PT-MC.srf
Project #: 20400-PSP-0002
Project Name: A2P1 NWU & A2P2 PT1 PreDesign Sampling
Prepared By: Brian McDaniel
File: A2P1_NWU_CAR_2_3_5_6_TH_1PT_MC.srf
Date Prepared: 9/21/00

000056

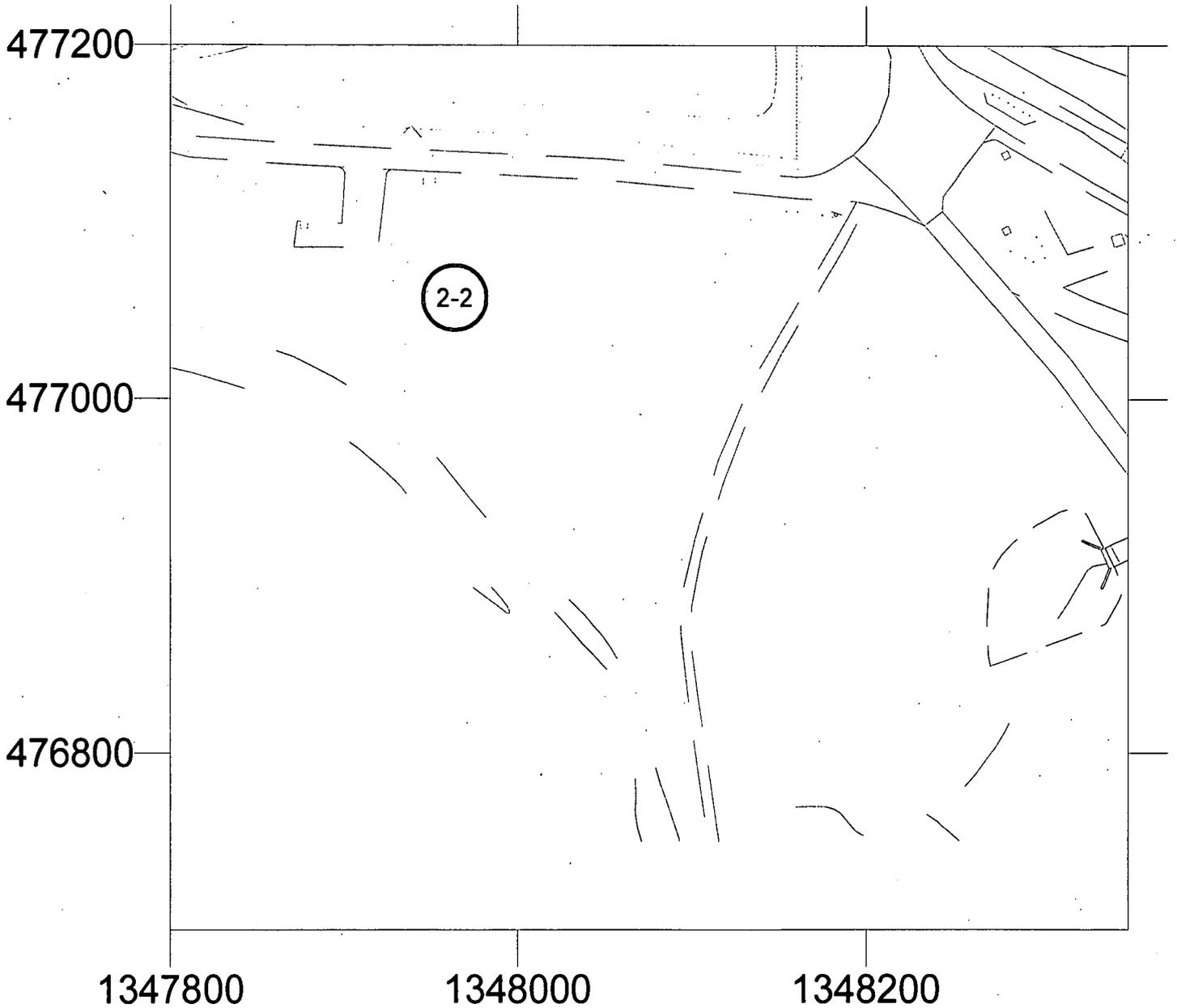
A2P1 NWU CAROLINA AREA

Moisture Corrected Total Uranium

3849

HPGe Det #: 31204
Measurement Date: 09/20/00
Coverage Plot (Field of View 12m radius)

N



HPGe

Total Uranium (ppm)

- 0.00 to 41.00
- 41.00 to 82.00
- 82.00 to 164.00
- 164.00 to 246.00
- 264.00 to 10000.00

RTIMP DWG Title: A2P1-NWU-CAR-2-Lift-2-TU-1PT-MC.srf
Project #: 20400-PSP-0002
Project Name: A2P1 NWU & A2P2 PT1 PreDesign Sampling
Prepared By: Brian McDaniel
File: A2P1_NWU_CAR_2_Lift_2_TU_1PT_MC.srf
Date Prepared: 9/21/00

000057

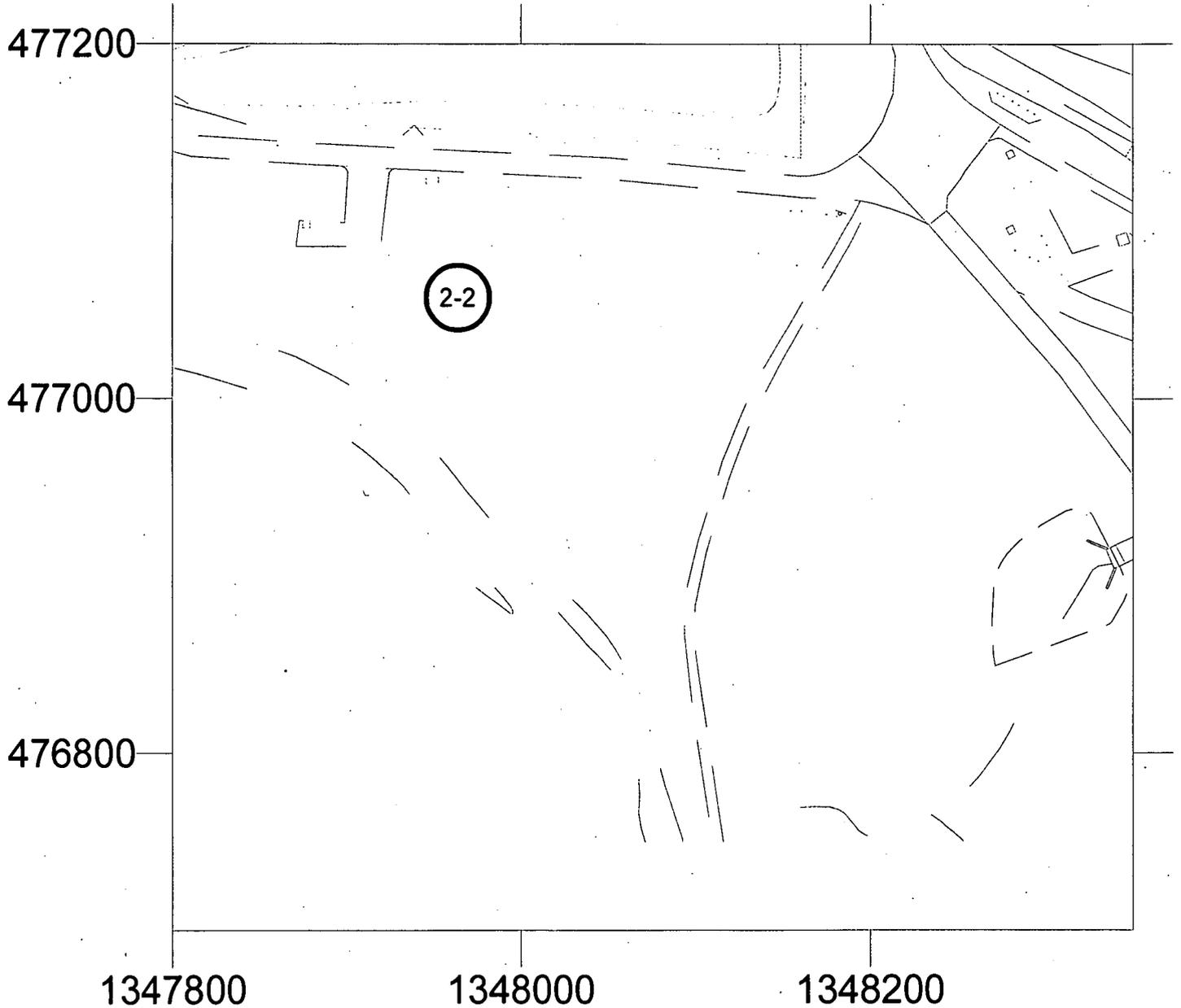
A2P1 NWU CAROLINA AREA

Radon & Moisture Corrected Radium-226

38 49

HPGe Det #: 31204
Measurement Date: 09/20/00
Coverage Plot (Field of View 12m radius)

N



HPGe Radium-226 (pCi/g)	
○	0.00 to 0.85
○	0.85 to 1.70
○	1.70 to 3.40
○	3.40 to 5.10
●	5.10 to 10000.00

RTIMP DWG Title: A2P1-NWU-CAR-2-Lift-2-RA-1PT-MC.srf
Project #: 20400-PSP-0002
Project Name: A2P1 NWU & A2P2 PT1 PreDesign Sampling
Prepared By: Brian McDaniel
File: A2P1_NWU_CAR_2_Lift_2_RA_1PT_MC.srf
Date Prepared: 9/21/00

000058

A2P1 NWU CAROLINA AREA

Moisture Corrected Thorium-232

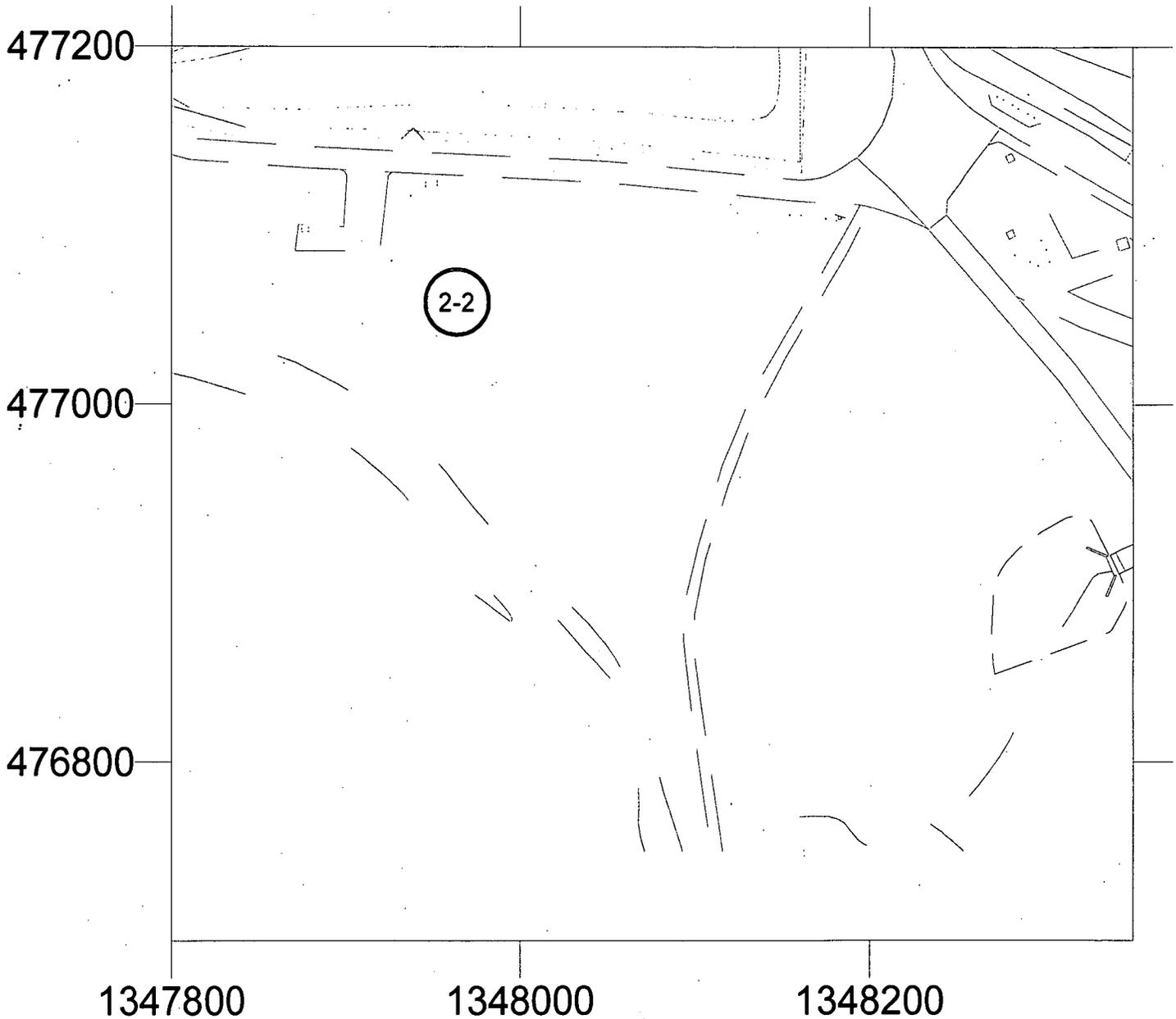
HPGe Det #: 31204

Measurement Date: 09/20/00

Coverage Plot (Field of View 12m radius)

3849

N



HPGe Thorium-232 (pCi/g)	
○	0.00 to 0.75
○	0.75 to 1.50
○	1.50 to 3.00
○	3.00 to 4.50
●	4.50 to 10000.00

RTIMP DWG Title: A2P1-NWU-CAR-2-Lift-2-TH-1PT-MC.srf
Project #: 20400-PSP-0002
Project Name: A2P1 NWU & A2P2 PT1 PreDesign Sampling
Prepared By: Brian McDaniel
File: A2P1_NWU_CAR_2_Lift_2_TH_1PT_MC.srf
Date Prepared: 9/21/00

000059

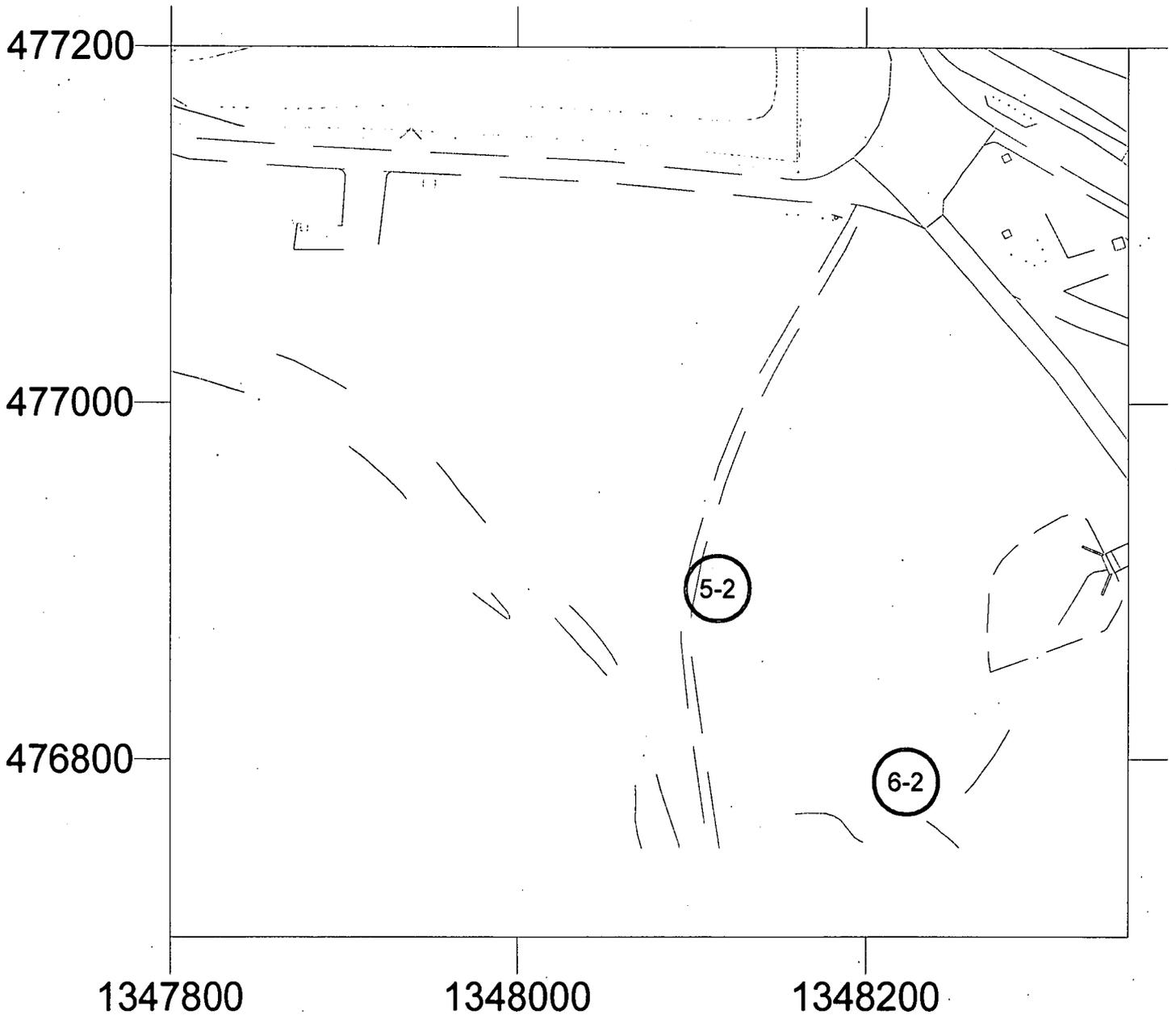
A2P1 NWU CAROLINA AREA

Moisture Corrected Total Uranium

3849

HPGe Det #: 30716
Measurement Date: 09/21/00
Coverage Plot (Field of View 12m radius)

N



HPGe Total Uranium (ppm)	
○	0.00 to 41.00
○	41.00 to 82.00
○	82.00 to 164.00
○	164.00 to 246.00
●	246.00 to 10000.00

RTIMP DWG Title: A2P1-NWU-CAR-5-6-Lift-2-TU-1PT-MC.srf
Project #: 20400-PSP-0002
Project Name: A2P1 NWU & A2P2 PT1 PreDesign Sampling
Prepared By: Brian McDaniel
File: A2P1_NWU_CAR_5_6_Lift_2_TU_1PT_MC.srf
Date Prepared: 9/21/00

000060

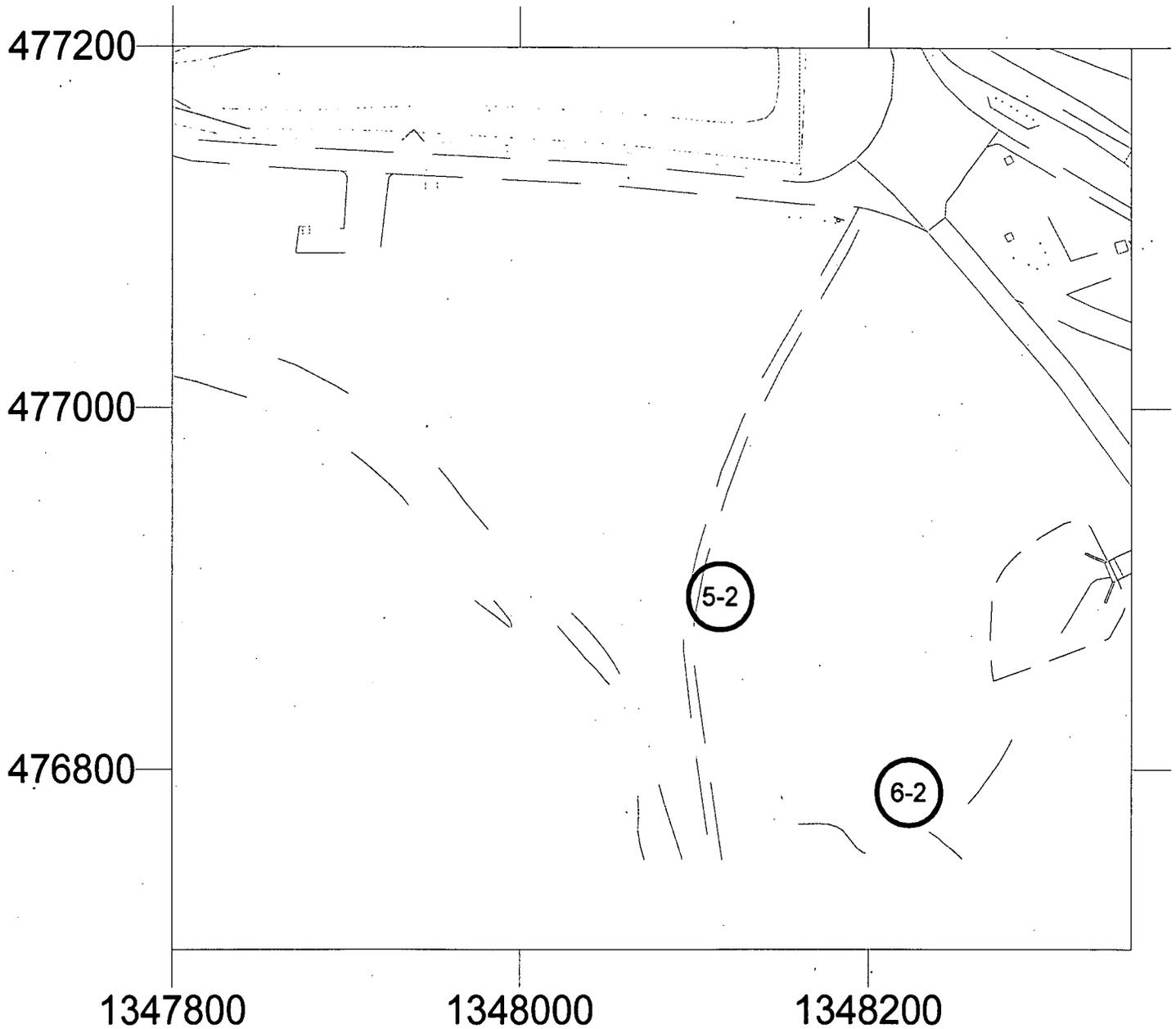
A2P1 NWU CAROLINA AREA

Radon & Moisture Corrected Radium-226

3849

HPGe Det #: 30716
Measurement Date: 09/21/00
Coverage Plot (Field of View 12m radius)

N



HPGe Ra-226 (pCi/g)	
○	0.00 to 0.85
○	0.85 to 1.70
○	1.70 to 3.40
○	3.40 to 5.10
●	5.10 to 10000.00

RTIMP DWG Title: A2P1-NWU-CAR-5-6-Lift-2-RA-1PT-MC.srf
Project #: 20400-PSP-0002
Project Name: A2P1 NWU & A2P2 PT1 PreDesign Sampling
Prepared By: Brian McDaniel
File: A2P1_NWU_CAR_5_6_Lift_2_RA_1PT_MC.srf
Date Prepared: 9/22/00

000061

A2P1 NWU CAROLINA AREA

3849

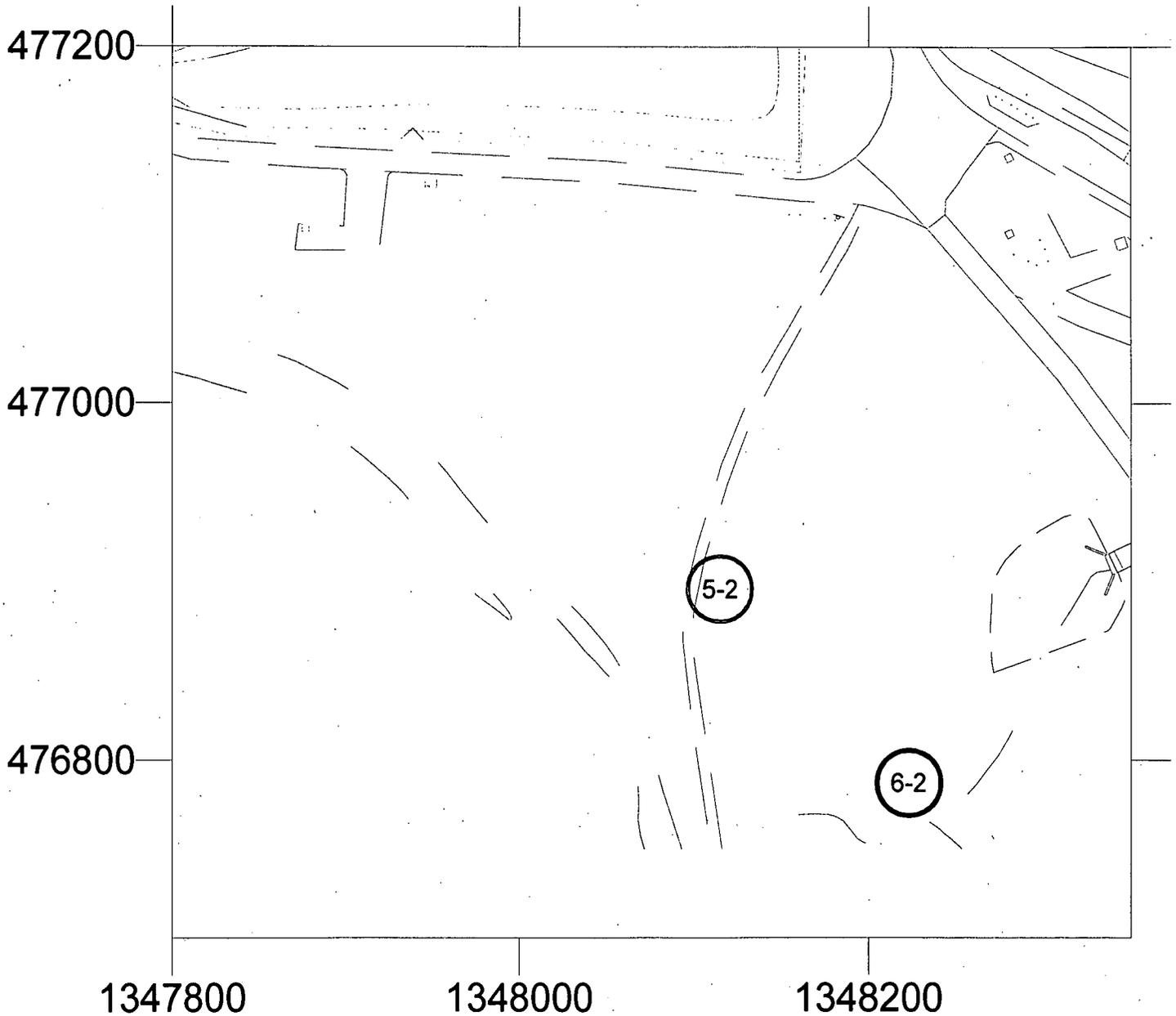
Moisture Corrected Thorium-232

HPGe Det #: 30716

Measurement Date: 09/21/00

Coverage Plot (Field of View 12m radius)

N



HPGe Th-232 (pCi/g)	
○	0.00 to 0.75
○	0.75 to 1.50
○	1.50 to 3.00
○	3.00 to 4.50
●	4.50 to 10000.00

RTIMP DWG Title: A2P1-NWU-CAR-5-6-Lift-2-TH-1PT-MC.srf
Project #: 20400-PSP-0002
Project Name: A2P1 NWU & A2P2 PT1 PreDesign Sampling
Prepared By: Brian McDaniel
File: A2P1_NWU_CAR_5_6_Lift_2_TH_1PT_MC.srf
Date Prepared: 9/22/00

000062

A2P1 NWU CAROLINA AREA

Moisture Corrected Total Uranium

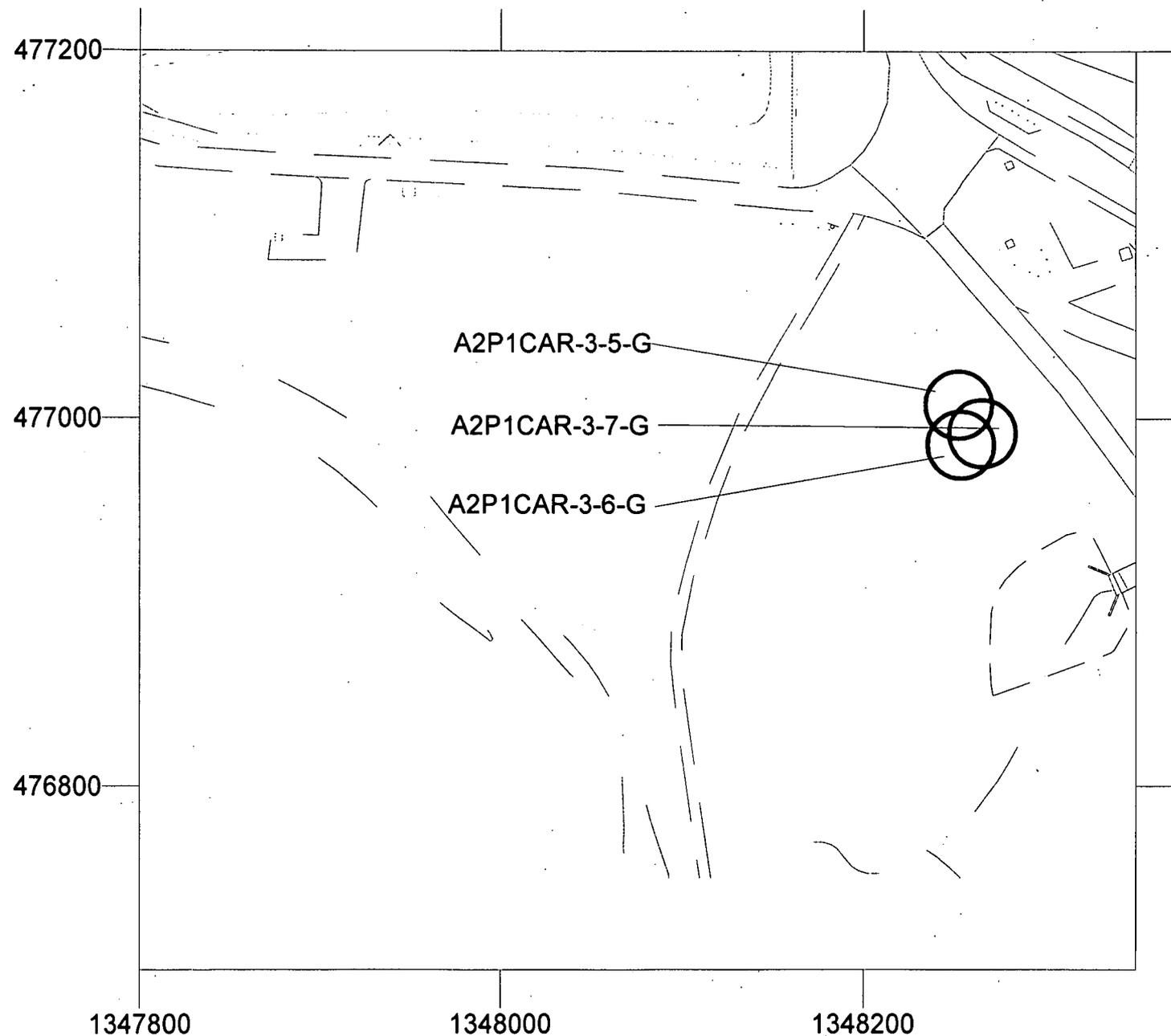
HPGe Det #: 30904

Measurement Date: 10/3/00

Coverage Plot (Field of View 6m radius)

3849

N



HPGe Total Uranium (ppm)	
○	0.00 to 41.00
○	41.00 to 82.00
○	82.00 to 164.00
○	164.00 to 246.00
●	246.00 to 10000.00

RTIMP DWG Title: A2P1-NWU-CAR-3-Lift-2-TU-1PT-MC.srf
Project #: 20400-PSP-0002
Project Name: A2P1 NWU & A2P2 PT1 PreDesign Sampling
Prepared By: David Allen
File: A2P1_NWU_CAR_3_Lift_2_TU_1PT_MC.srf
Date Prepared: 10/3/00

000063

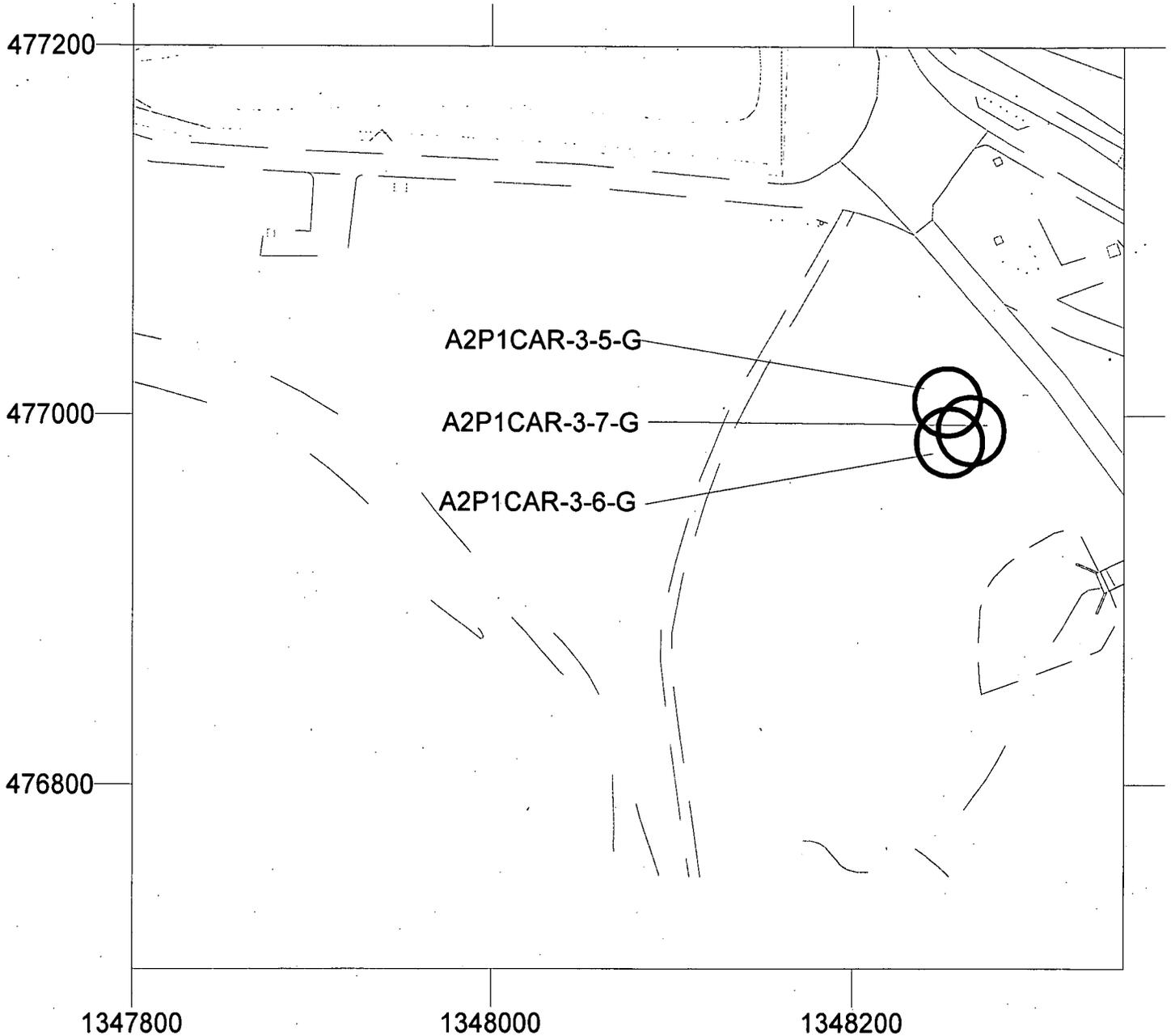
A2P1 NWU CAROLINA AREA

Moisture & Radon Corrected Radium-226

3849

HPGe Det #: 30904
Measurement Date: 10/3/00
Coverage Plot (Field of View 6m radius)

N



HPGe Ra-226 (pCi/g)	
○	0.00 to 0.85
○	0.85 to 1.70
○	1.70 to 3.40
○	3.40 to 5.10
●	5.10 to 10000.00

RTIMP DWG Title: A2P1-NWU-CAR-3-Lift-2-RA-1PT-MC.srf
Project #: 20400-PSP-0002
Project Name: A2P1 NWU & A2P2 PT1 PreDesign Sampling
Prepared By: David Allen
File: A2P1_NWU_CAR_3_Lift_2_RA_1PT_MC.srf
Date Prepared: 10/3/00

000064

A2P1 NWU CAROLINA AREA

Moisture Corrected Thorium-232

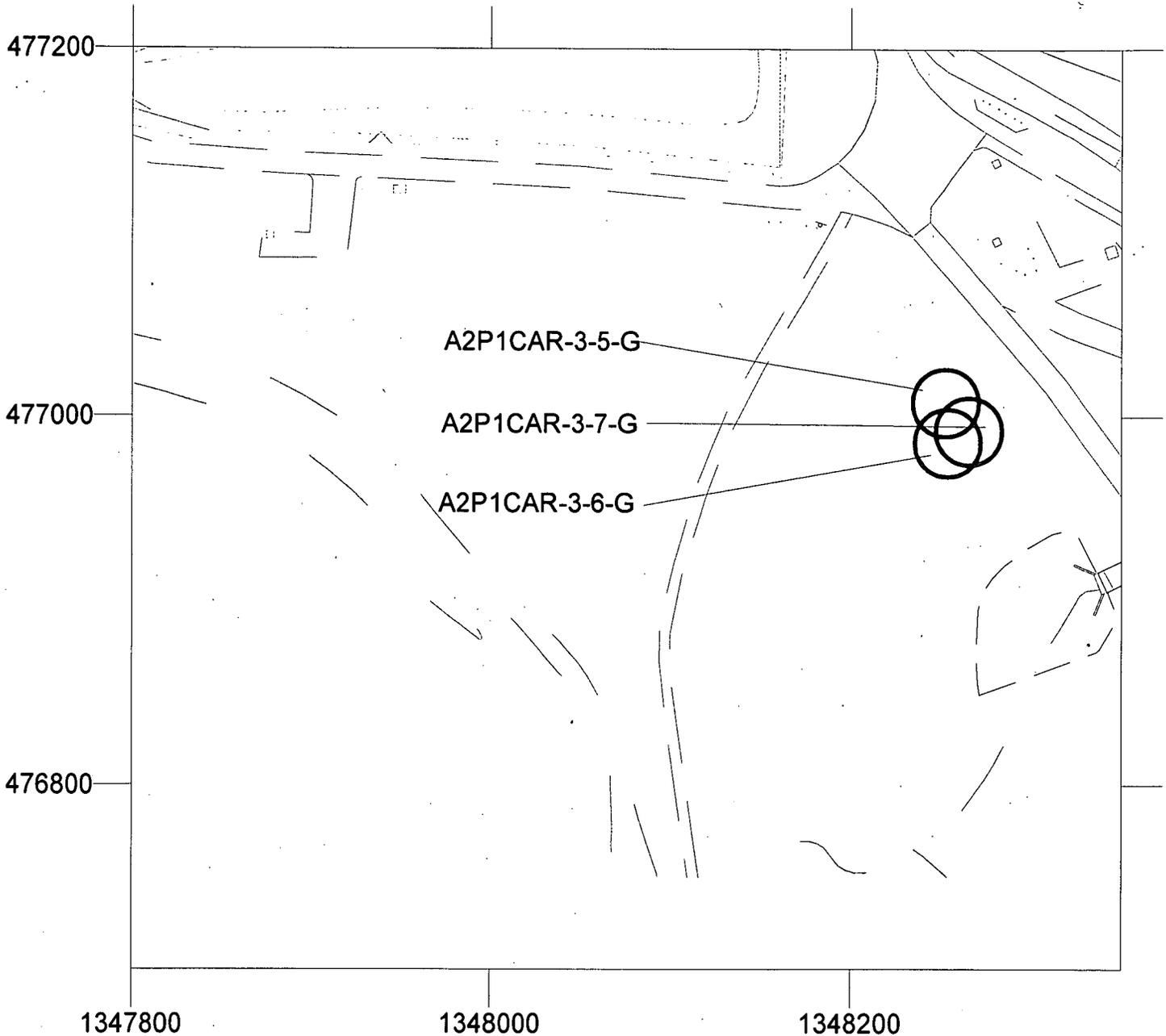
3849

HPGe Det #: 30904

Measurement Date: 10/3/00

Coverage Plot (Field of View 6m radius)

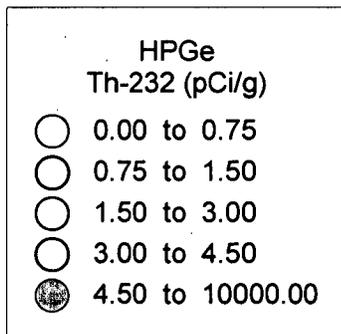
N



1347800

1348000

1348200



RTIMP DWG Title: A2P1-NWU-CAR-3-Lift-2-TH-1PT-MC.srf

Project #: 20400-PSP-0002

Project Name: A2P1 NWU & A2P2 PT1 PreDesign Sampling

Prepared By: David Allen

File: A2P1_NWU_CAR_3_Lift_2_TH_1PT_MC.srf

Date Prepared: 10/3/00

000065

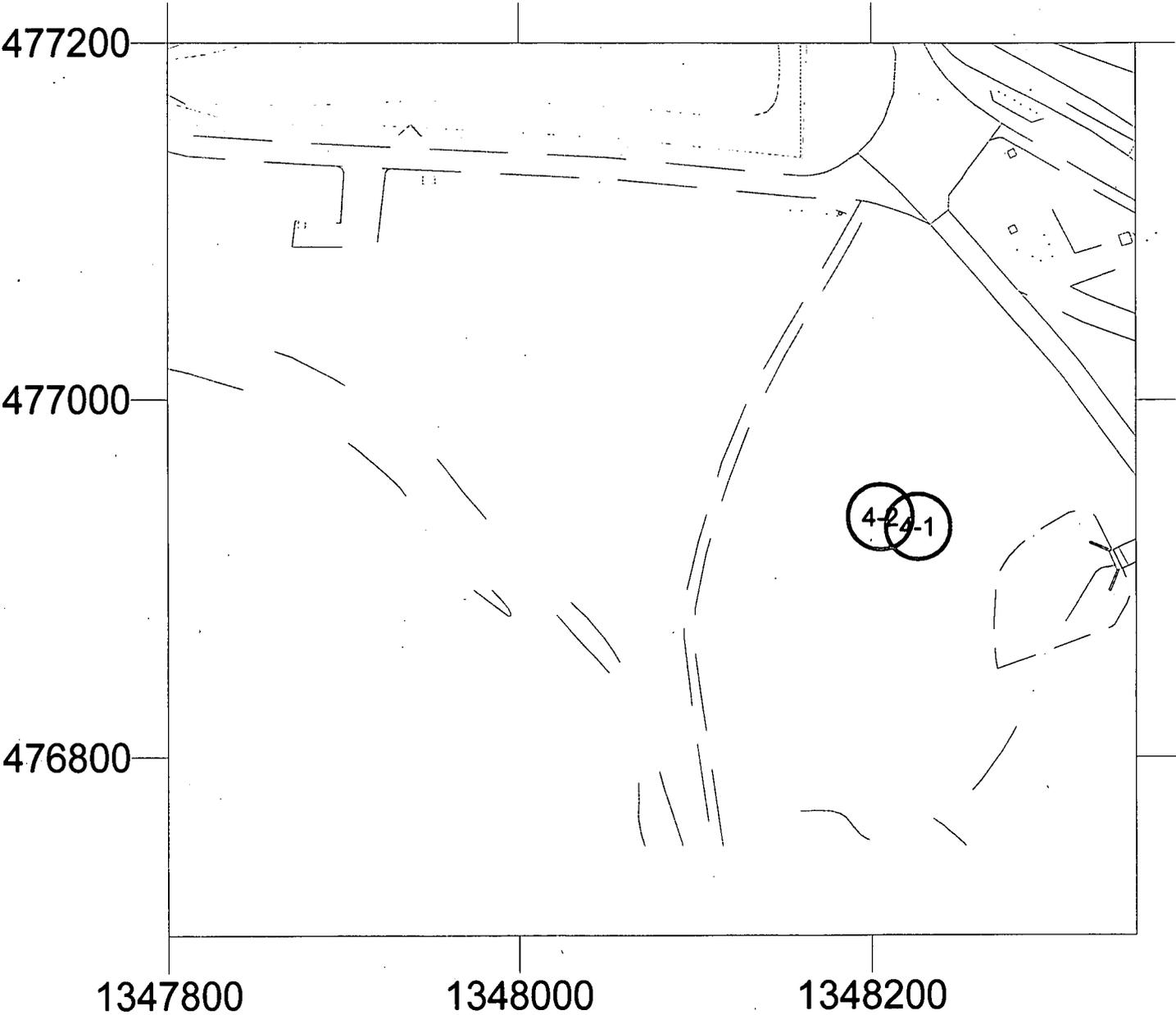
A2P1 NWU CAROLINA AREA

Moisture Corrected Total Uranium

3849

Exc. Area 4 Final Grade
HPGe Det #: 30687
Measurement Date: 10/16/00
Coverage Plot (Field of View 6m radius)

N



HPGe Total Uranium (ppm)	
○	0.00 to 41.00
○	41.00 to 82.00
○	82.00 to 164.00
○	164.00 to 246.00
○	264.00 to 10000.00

RTIMP DWG Title: A2P1-NWU-CAR-4-FG-TU-1PT-MC.srf
Project #: 20400-PSP-0002
Project Name: A2P1 NWU & A2P2 PT1 PreDesign Sampling
Prepared By: Brian McDaniel
File: A2P1_NWU_CAR_4_FG_TU_1PT_MC.srf
Date Prepared: 10/17/00

000066

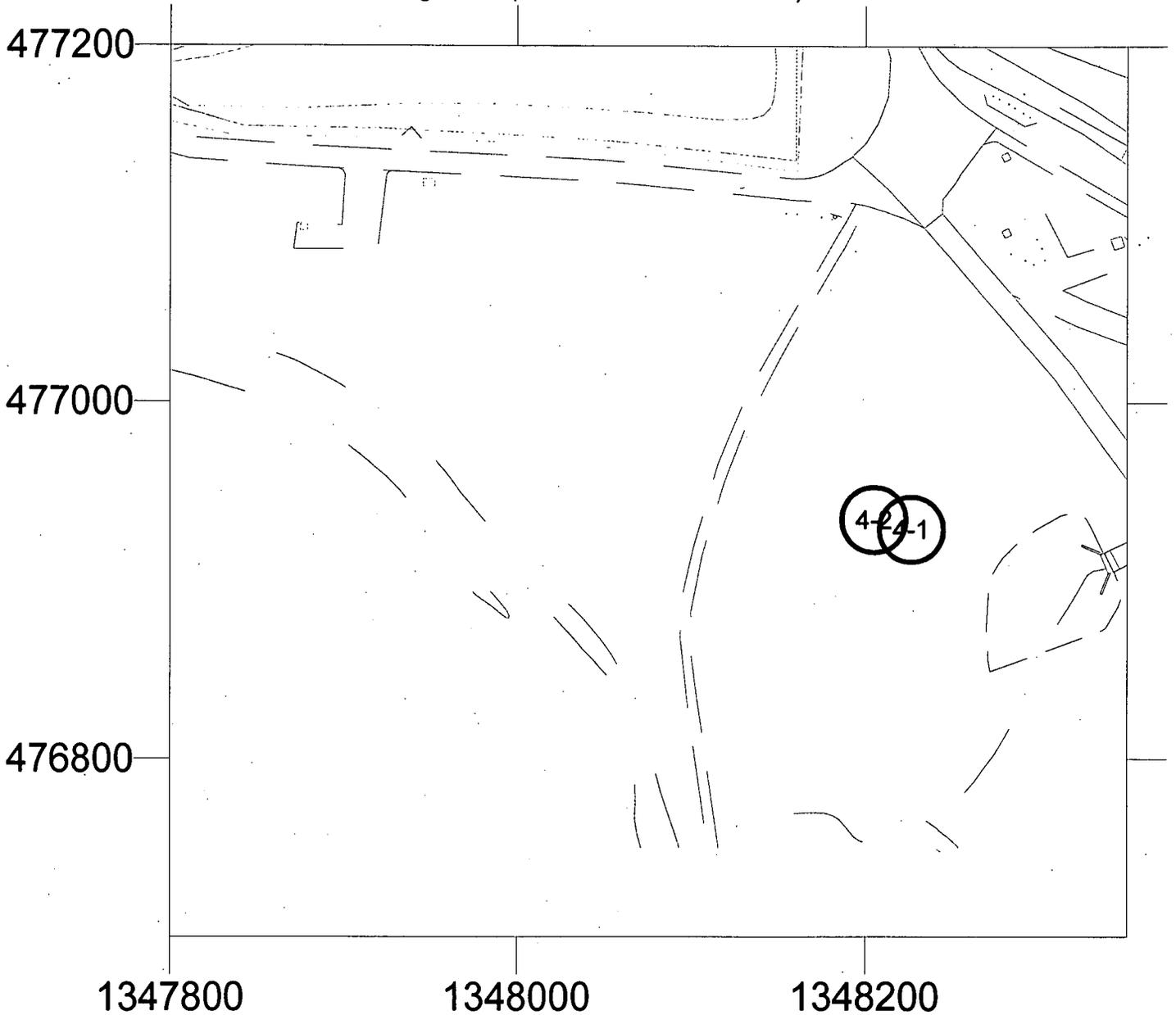
A2P1 NWU CAROLINA AREA

Radon & Moisture Corrected Radium-226

8849

Exc. Area 4 Final Grade
HPGe Det #: 30687
Measurement Date: 10/16/00
Coverage Plot (Field of View 6m radius)

N



HPGe RA-226 (pCi/g)	
○	0.00 to 0.85
○	0.85 to 1.70
○	1.70 to 3.40
○	3.40 to 5.10
●	5.10 to 10000.00

RTIMP DWG Title: A2P1-NWU-CAR-4-FG-RA-1PT-MC.srf
Project #: 20400-PSP-0002
Project Name: A2P1 NWU & A2P2 PT1 PreDesign Sampling
Prepared By: Brian McDaniel
File: A2P1_NWU_CAR_4_FG_RA_1PT_MC.srf
Date Prepared: 10/17/00

000067

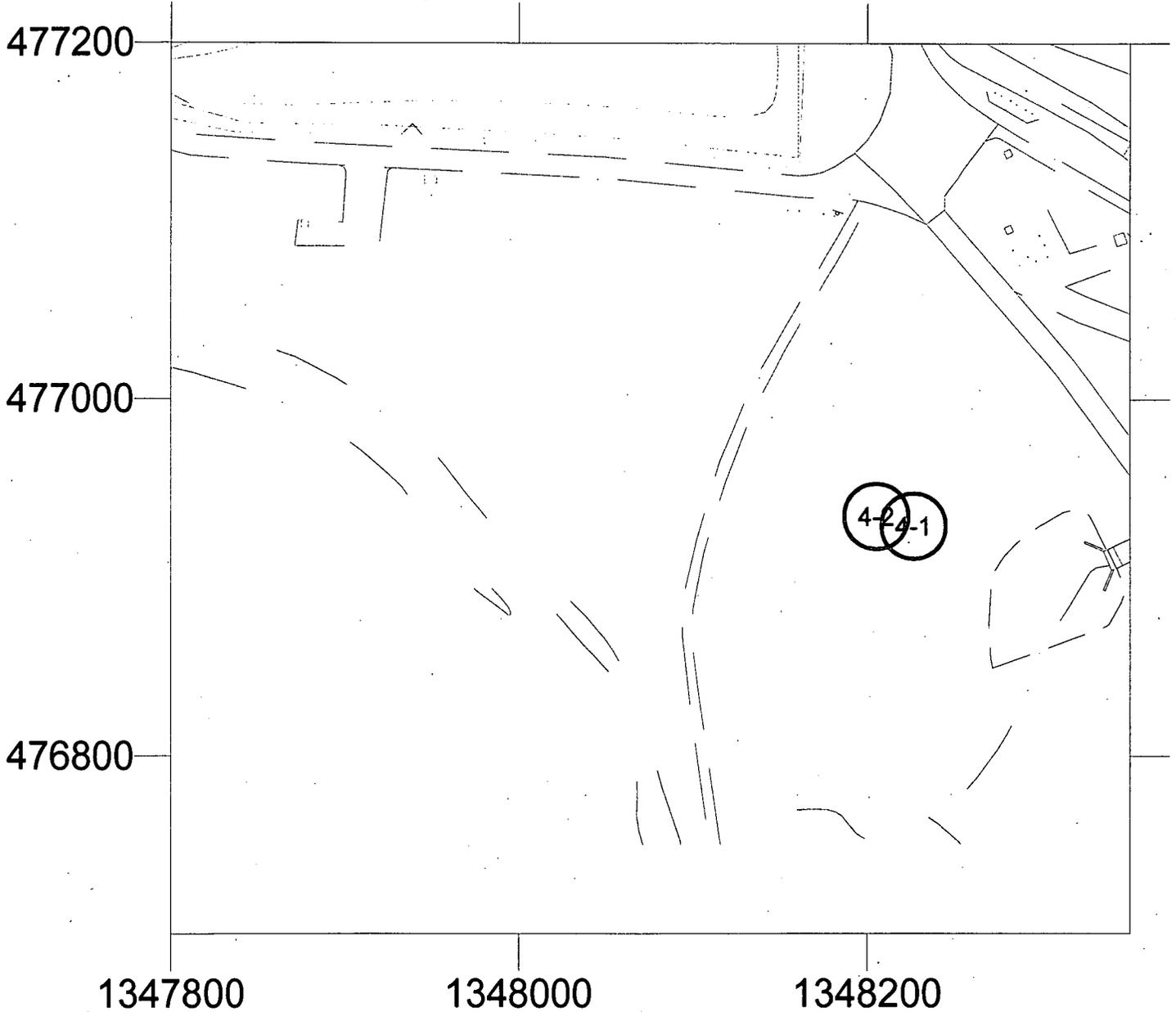
A2P1 NWU CAROLINA AREA

Moisture Corrected Thorium-232

3849

Exc. Area 4 Final Grade
HPGe Det #: 30687
Measurement Date: 10/16/00
Coverage Plot (Field of View 6m radius)

N



HPGe TH-232 (pCi/g)	
○	0.00 to 0.75
○	0.75 to 1.50
○	1.50 to 3.00
○	3.00 to 4.50
●	4.50 to 10000.00

RTIMP DWG Title: A2P1-NWU-CAR-4-FG-TH-1PT-MC.srf
Project #: 20400-PSP-0002
Project Name: A2P1 NWU & A2P2 PT1 PreDesign Sampling
Prepared By: Brian McDaniel
File: A2P1_NWU_CAR_4_FG_TH_1PT_MC.srf
Date Prepared: 10/17/00

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APPENDIX B

PRECERTIFICATION DATA

(To be Included at a Later Date)