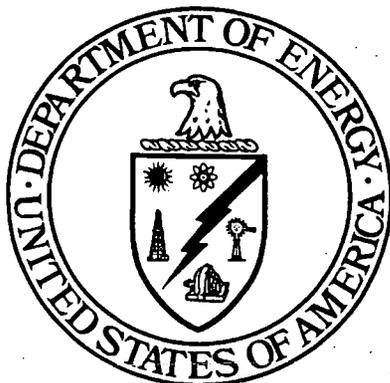


**PROJECT SPECIFIC PLAN FOR
PREDESIGN OF AREA 6 SUBAREA 2
(SUPPLEMENT TO 20300-PSP-0011)**

DEMOLITION, SOIL AND DISPOSAL PROJECT

**FERNALD CLOSURE PROJECT
FERNALD, OHIO**



DECEMBER 2004

U.S. DEPARTMENT OF ENERGY

**20600-PSP-0011
REVISION 0
FINAL**

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PREDESIGN OF AREA 6 SUBAREA 2
(SUPPLEMENT TO 20300-PSP-0011)**

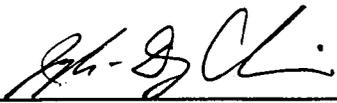
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Document Number 20600-PSP-0011

Revision 0

FINAL

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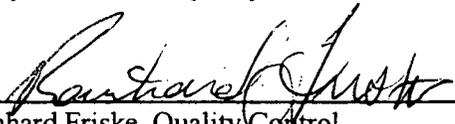
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FERNALD CLOSURE PROJECT

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LIST OF ACRONYMS AND ABBREVIATIONS

ASCOC	area-specific constituent of concern
ASL	analytical support level
ccpm	corrected counts per minute
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
COC	constituent of concern
DOE	U.S. Department of Energy
DQO	Data Quality Objectives
EMS	Excavation Monitoring System
FCP	Fernald Closure Project
FRL	final remediation level
FTF	Fire Training Facility
GC/MS	gas chromatograph/mass spectroscopy
GPC	gas proportional counter
HEPA	high efficiency particulate air
HPGe	high-purity germanium (detector)
ICP-AES	inductively coupled plasma-atomic emission spectrometry
ICP-MS	inductively coupled plasma-mass spectrometry
LSC	liquid scintillation counter
µg/kg	micrograms per kilogram
MDL	minimum detection level
mg/kg	milligrams per kilogram
MSL	mean sea level
NaI	sodium iodide
OMTA	OSDF Material Transfer Area
OSDF	On-Site Disposal Facility
OU	Operable Unit
PCB	polychlorinated biphenyl
pCi/g	picoCuries per gram
PID	photoionization detector
ppm	parts per million
PSP	Project Specific Plan
QC	Quality Control
RCRA	Resource Conservation Recovery Act
RI/FS	Remedial Investigation/Feasibility Study
RSS	Radiation Scanning System
RTRAK	Real-Time Radiation Tracking System
RWP	Radiological Work Permit
SCQ	Sitewide CERCLA Quality Assurance Project Plan
SEP	Sitewide Excavation Plan
SP	Soil Pile
SWL	Solid Waste Landfill
TAL	Target Analyte List
TSCA	Toxic Substance Control Act
V/FCN	Variance/Field Change Notice
VOA	volatile organic analysis
WAC	Waste Acceptance Criteria

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1.0 INTRODUCTION

This Project Specific Plan (PSP) describes the data collection activities necessary to support predesign of the eastern portion of Area 6. The format of this PSP differs from that of previously submitted PSPs as this PSP only presents the specific information regarding this eastern portion of Area 6 identified as Subarea 2. The general information that is routinely addressed in a PSP, can be found in 20300-PSP-0011, *Project Specific Plan Guidelines for General Characterization for Sitewide Soil Remediation*. While this PSP (20600-PSP-0011) has section headings similar to a full-length PSP, where the information in the section is identical to the information in the General PSP, 20300-PSP-0011, a reference to this General PSP is made, and the information is not repeated.

1.1 PURPOSE

The purpose of this PSP is to provide specific direction regarding the predesign sampling of the eastern portion of Area 6. This detailed information includes reasons for sample collection, sample locations, number of borings, depth intervals, and constituents of concern.

1.2 SCOPE

Remediation Area 6 lies northwest, northeast, and east of the Former Production Area. See Figure 1-1. Due to the urgency to begin excavation in the northern portion of this area, Area 6 was divided into four subareas, of which the eastern portion (Subarea 2) will be addressed in this PSP. Figure 1-2 presents a graphic of this area. The areas included within the scope of this PSP (Subarea 2) are as follows: Main Electrical Switchyard, Plant 6 Warehouse Building 79, Finished Products Warehouse Building 77, On-Site Disposal Facility (OSDF) Materials Transfer Area (OMTA) Container Staging Area, Building 78, and the OMTA Soil Staging Area (OMTA Debris Stockpile). These areas collectively constitute the Former Production Area to the east of Areas 3A and 4A. The schedule for implementation of this PSP is Fall 2004.

As stated previously, this document does not cover the northern (Subarea 1) or western (Subareas 3 and 4) portions of Area 6. Subarea 1 was addressed in 20600-PSP-0006, *Project Specific Plan for Predesign of Area 6 Subarea 1 (Supplement to 20300-PSP-0011)* and Subareas 3 and 4 will be covered in subsequent supplemental PSPs. Additionally, this document does not cover the predesign activities for Waste Pits 1 through 6, Clear Well, Burn Pit, Operable Unit (OU) 1 Stockpile Area, Soil Pile (SP) 7 Area, Area 6 Phase I area, and the Fire Training Facility (FTF) area, as the predesign of these areas is covered or will

6

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1 be covered in other PSPs specific to these areas. The areas addressed in other PSPs are indicated on
2 Figure 1-2.

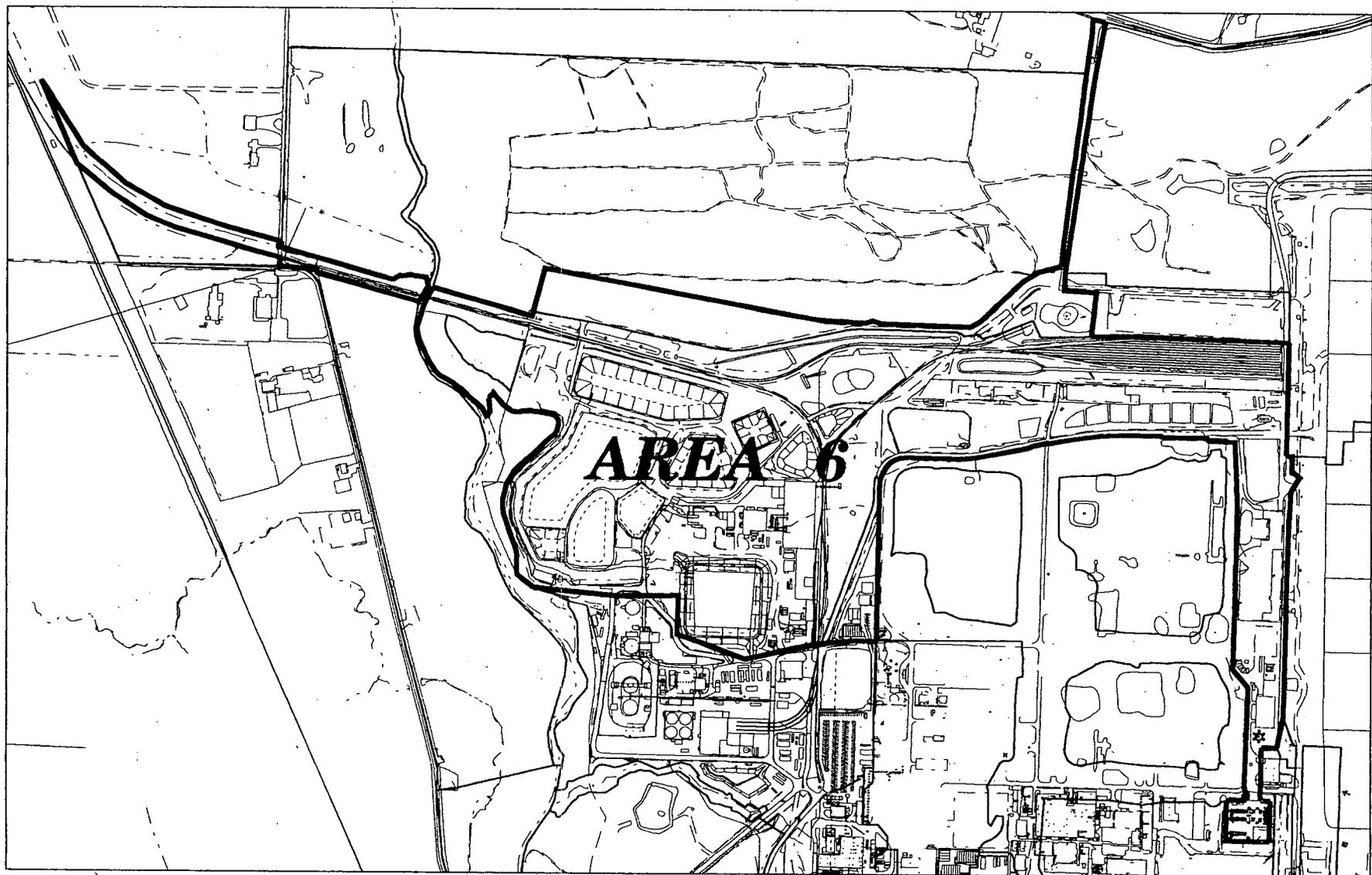
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4 This PSP is not considered a work authorization document (for implementation of fieldwork) per
5 SH-0021, Work Permits. Work authorization documents directing the implementation of fieldwork,
6 per SH-0021, may include applicable Environmental Services procedures, Fluor Fernald work permits,
7 Radiological Work Permit (RWP), penetration permits, and other applicable permits.

8
9 1.3 VARIANCE/FIELD CHANGE NOTICE (V/FCN) DOCUMENTATION

10 Reference Section 7.5 of 20300-PSP-0011, *Project Specific Plan Guidelines for General*
11 *Characterization for Sitewide Soil Remediation.*

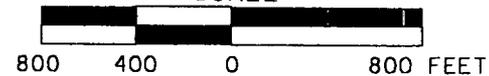
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13 1.4 KEY PERSONNEL

14 Reference Section 1.4 of 20300-PSP-0011, *Project Specific Plan Guidelines for General*
15 *Characterization for Sitewide Soil Remediation.*



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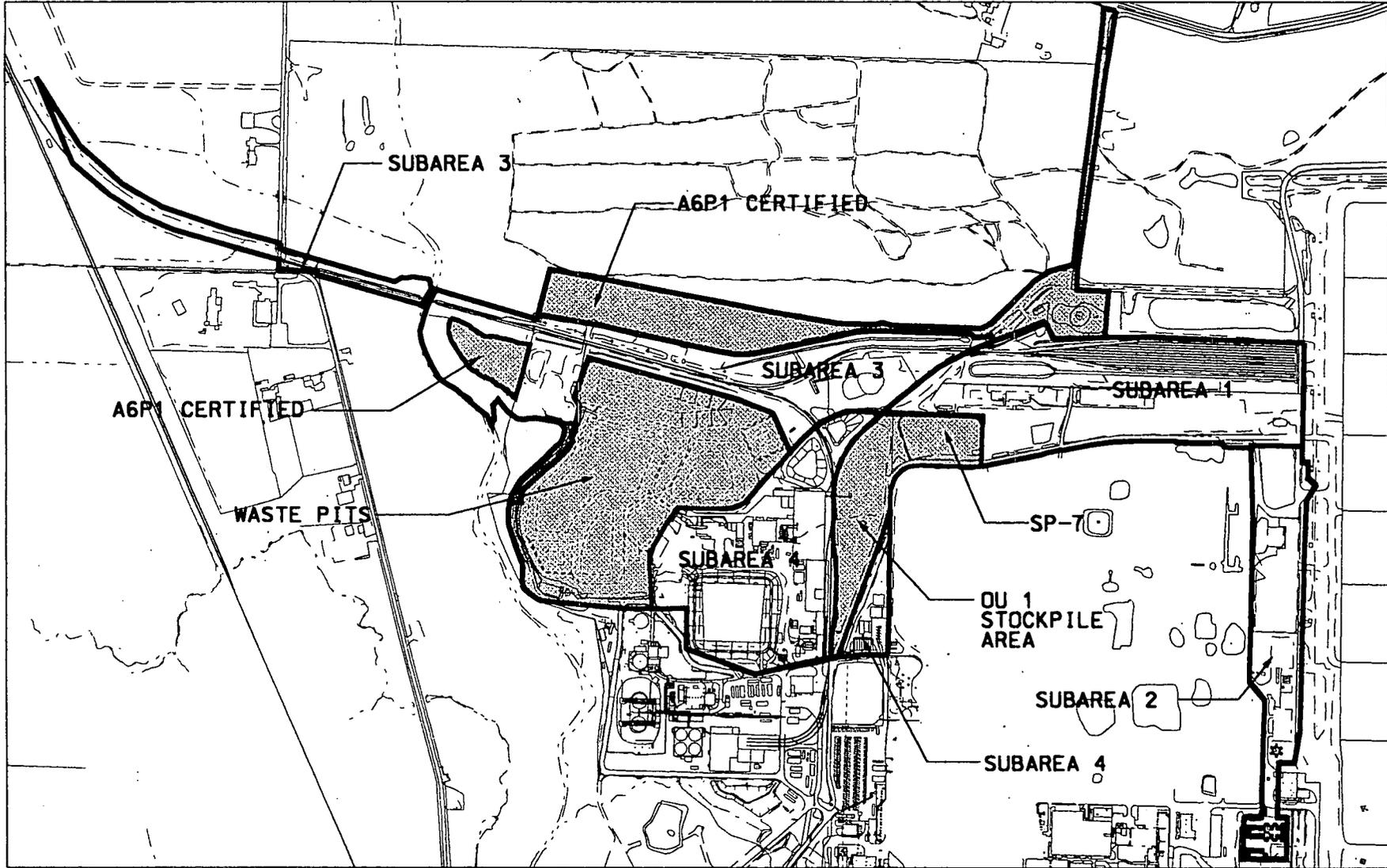
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STATE PLANAR COORDINATE SYSTEM 1983

FIGURE 1-1. AREA 6 LOCATION MAP

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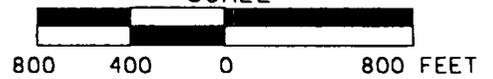
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AREA 6 AREAS INCLUDED IN PREVIOUSLY SUBMITTED DOCUMENTS

NOTE: SUBAREAS 1, 3 & 4 ARE NOT ADDRESSED IN THIS PSP

SCALE



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FIGURE 1-2. AREA 6 REMEDIATION AREAS

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1
2
3 **2.0 AREA-SPECIFIC WORK**

4 **2.1 AREA 6**

5 **2.1.1 History**

6 In general, the western portion of Area 6 is occupied by the OUI Waste Pit area and associated facilities
7 where pit material was excavated, dried, and loaded into rail cars. Moving eastward, the perimeter of the
8 Solid Waste Landfill (SWL) still requires further investigation now that all of the waste material has been
9 removed. These areas will be addressed in a subsequent PSP. Additionally, the Waste Pits' footprints
10 and berms are being investigated under separate PSPs.

11 The far east side of Area 6 is located between the Former Production Area (Areas 3A/4A) and Area 1.
12 This area includes the footprints of Buildings 77 and 79, liquid mixed waste project bulk tanks for the
13 offsite Toxic Substance Control Act (TSCA) incinerator, as well as the container storage area. The
14 northeast corner of this portion of Area 6 was previously excavated in Calendar Year 2000 to remove the
15 defined above-waste acceptance criteria (WAC) conditions but still requires further excavation to bring
16 the conditions to below FRL.

17
18 **2.1.2 Predesign**

19 Predesign will be performed under the guidelines of Section 4.0 of 20300-PSP-0011, *Project Specific*
20 *Plan Guidelines for General Characterization for Sitewide Soil Remediation.*

21
22 **2.1.2.1 Scope**

23 This PSP covers data collection activities associated with predesign in Area 6. This PSP supplements
24 previous investigations for Area 6 and does not cover excavation control or certification sampling.

25
26 Area 6 has been divided into four subareas to facilitate the investigation of above-WAC and above-final
27 remediation level (FRL) material (see Figure 1-2). Subarea 2 will be addressed in this PSP. Using the
28 historical uranium data from this area, a preliminary excavation model of the uranium plume in Subarea 2
29 was completed. This model adequately models the excavation requirements in the northern part of
30 Subarea 2, the OMTA Debris Stockpile. Therefore, no samples to supplement the preliminary excavation
31 model are required.
32

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1 Additional sampling required to discretely bound borings with above-FRL results and to provide further
2 characterization information in the Main Electrical Switchyard and Building 79 areas within Subarea 2 is
3 described in this document.

4 All data collection activities will be consistent with the Sitewide Comprehensive Environmental
5 Response, Compensation and Liability Act (CERCLA) Quality Assurance Plan (SCQ) and Section 3.1 of
6 the Sitewide Excavation Plan (SEP). Physical samples will be collected in accordance with the Data
7 Quality Objective (DQO) SL-048. Real-time data collection activities will be in accordance with DQOs
8 SL-054 and SL-055. These DQOs are provided in the appendices of the General PSP (20300-PSP-0011).
9 The data will be utilized to assess whether constituent of concern (COC) concentrations in these areas are
10 lower than the FRLs outlined in the OU5 Record of Decision. The data collected under this plan will also
11 be utilized to determine whether soil and soil-like material from the area meet the OSDF WAC, as
12 defined in the SEP, the OSDF WAC Attainment Plan, and the Impacted Materials Placement Plan.

13
14 2.1.2.2 Determination of FRL COCs and WAC COCs

15 Using the Remedial Investigation/Feasibility Study (RI/FS) data for Area 6 and Table 2-7 of the SEP a
16 list of FRL COCs was determined. The FRL COCs for this PSP are listed in this section.

17
18 2.1.2.2.1 WAC COCs

19 The Area 6 data from the OU5 RI/FS were compared to the OSDF WAC to identify areas that exceed the
20 OSDF WAC. Figure 2-1 details areas where historical sample results showed greater than OSDF WAC
21 concentrations within Area 6 Subarea 2. In Calendar Year 2000, these defined above-WAC conditions in
22 the OMTA Debris Stockpile, formerly identified as the "Northeast Corner of Area 3A," were excavated.
23 However, the depth of above-FRL material was not determined. Therefore, while the above-WAC
24 material from this area has been removed, this area still requires further excavation to bring the conditions
25 to below FRL and is addressed in Section 2.1.2.3.2.

26
27 2.1.2.2.2 FRL COCs

28 Within the scope of this PSP, the list of FRL area-specific constituent of concern (ASCOC) for Area 6
29 that will be analyzed is given below. These FRL ASCOCs will be investigated to confirm the removal of
30 the COC or to discretely bound the above-FRL location.

31
32 Primary COCs

- 33 • Thorium-232
- 34 • Total Uranium

35

1 Secondary COCs

- 2 • Arsenic
3 • Beryllium
4 • Lead
5 • Technetium-99
6 • Aroclor-1254
7 • Aroclor-1260

8
9 Plant 6 Warehouse (Building 79 – HWMU-37)

- 10 • Arsenic
11 • Barium
12 • Cadmium
13 • Chromium*
14 • Lead
15 • Mercury
16 • Selenium
17 • Silver
18 • Benzene
19 • Carbon tetrachloride
20 • Chlorobenzene
21 • Chlordane
22 • 1,1-dichloroethene
23 • Tetrachloroethene
24 • Trichloroethene
25 • Vinyl chloride

26
27 * Total chromium will be analyzed first as an indicator. If the total chromium result is above FRL for
28 Cr⁺⁶ then Cr⁺⁶ will be analyzed.
29

30 2.1.2.3 Sampling Strategy

31 The entire length of all soil cores collected will be surveyed with a beta/gamma (Geiger-Mueller) survey
32 meter and results will be recorded as part of the field documentation. In the event that the field screening
33 results exceed 450 corrected counts per minute (ccpm) from an interval that is not planned for collection
34 for total uranium analysis, a sample to be analyzed for total uranium will be collected from this interval
35 since this interval is considered potential above-WAC material. Subsequent intervals greater than
36 450 ccpm will be collected (even if the target interval has been reached) until the collected interval is
37 below 450 ccpm. All of the samples obtained from these intervals, including the interval below
38 450 ccpm, will be submitted for total uranium analysis.
39

1 2.1.2.3.1 WAC Sampling Strategy

2 Area 6 Subarea 2 data was reviewed to determine above-WAC locations (see Figure 2-1). In 2000, these
3 above-WAC locations in the OMTA Debris Stockpile were excavated. A real-time scan of the area was
4 performed to confirm the removal of the above-WAC material. Figure 2-3 provides a graphic of these
5 real-time results. Since the above-WAC material in Subarea 2 has been excavated, no above-WAC
6 locations require investigation.

8 2.1.2.3.2 FRL Sampling Strategy

9 A preliminary excavation model of the uranium plume in Subarea 2 was completed. This model
10 adequately models the excavation requirements in the northern part of Subarea 2, the OMTA Debris
11 Stockpile. Therefore, no samples to supplement the preliminary excavation model are required.

12
13 Additional sampling required to discretely bound borings with above-FRL results and to provide further
14 characterization information in the Main Electrical Switchyard and Building 79 areas within Subarea 2 is
15 described below.

16
17 Subarea 2

18 Figure 2-1 provides historical boring locations for Subarea 2. Figure 2-2 provides proposed boring
19 locations as described in the paragraphs below. Twenty-seven borings will be placed in Subarea 2.

20
21 The depth to sample will be based off of the original mean sea level (MSL) of the historical above-FRL
22 interval. The boring table located in Appendix B describes the target intervals to be collected.

23
24 If soil fill is encountered prior to reaching the top of the first target interval, a sample from the first 6-inch
25 interval of this soil fill will be collected and analyzed for the Target Analyte List (TAL) specified for the
26 boring. The target intervals will then be collected as described in the boring table located in Appendix B.

27
28 If the target interval is soil fill and a soil fill sample has not been previously collected at the boring, a
29 sample from the first 6-inch interval of this soil fill will be collected and analyzed for the TAL specified
30 for the boring. The boring will be advanced until soil is encountered. The same number of intervals as
31 specified in the boring table located in Appendix B will then be collected, but these will be at a deeper
32 interval than specified in the boring table.

33

1 If the target interval is not soil, the boring will be advanced until soil is encountered. The same number of
2 intervals as specified in the boring table located in Appendix B will then be collected, but these will be at
3 a deeper interval than specified in the boring table.

4
5 If the above situations occur, this will be documented in the field paperwork. If any location is moved
6 more than 3 feet, the revised coordinates will be documented with a V/FCN.

7
8 The following isolated borings with above-FRL results within Subarea 2 will be supplemented with data
9 from additional borings at these locations to discretely bound the area to be excavated.

- 10
11 • An above-FRL result for total thorium [13.6 milligrams per kilogram (mg/kg) FRL calculated
12 from the thorium-232 isotope] was detected in the 2 to 2.5 and 5 to 5.5-foot intervals of
13 Boring 1133, located outside the southwest corner of Building 77. The results were 26 mg/kg and
14 25 mg/kg, respectively. A confirmatory boring (A6-SA2-14) will be placed at this location.
15 Samples to be analyzed for thorium-232 will be collected from the 2 to 2.5, 5 to 5.5, and 5.5 to
16 6-foot intervals of this boring.
- 17
18 • An above-FRL result for total thorium of 26 mg/kg (13.6 mg/kg FRL calculated from the
19 thorium-232 isotope) was detected in the 0 to 0.5-foot intervals of Boring 1302, located on the
20 northwest side of the OMTA Container Staging Area. A confirmatory boring (A6-SA2-22) will
21 be placed at this location. Samples to be analyzed for thorium-232 will be collected from the 0 to
22 0.5 and 0.5 to 1-foot intervals of this boring.
- 23
24 • An above-FRL result for total uranium of 84.7 mg/kg was detected in the 0 to 0.5-foot interval of
25 Boring Zone 2-208, located on the east side, outside of Building 77. A boring (A6-SA2-15) will
26 be placed at this location. A sample to be analyzed for total uranium will be collected from the
27 0.5 to 1-foot interval of this boring to bound this above-FRL result.
- 28
29 • An above-FRL result for total uranium of 190 mg/kg was detected in the 1 to 1.5-foot interval of
30 Boring 040, located southwest of the slab of Building 78. A boring (A6-SA2-28) will be placed
31 at this location. A sample to be analyzed for total uranium will be collected from the 1.5 to 2-foot
32 interval of this boring to bound this above-FRL result.
- 33
34 • An above-FRL result for total uranium of 94.8 mg/kg was detected in the 0.5 to 1-foot interval of
35 Boring Zone 1-181, located on the south side of the OMTA Container Staging Area. A boring
36 (A6-SA2-16) will be placed at this location. A sample to be analyzed for total uranium will be
37 collected from the 1 to 1.5-foot interval of this boring to bound this above-FRL result.
- 38
39 • An above-FRL result for thorium-232 of 1.7 picoCuries per gram (pCi/g) was detected in the 0 to
40 0.5-foot interval of Boring Zone 2-231, located in the northeast corner of the OMTA Container
41 Staging Area. Since this location is not bound by other physical samples, this location will be
42 bound both horizontally and at depth. A confirmatory boring will be located at the original
43 boring (A6-SA2-23). Samples from this boring will be collected at the 0.5 to 1, 1.5 to 2, and
44 3.5 to 4-foot intervals and will be analyzed for thorium-232. Four borings will be located 15 feet
45 from the original boring, Zone 2-231, in each of the four cardinal directions, A6-SA2-24 to the
46 north, A6-SA2-25 to the south, A6-SA2-26 to the west, and A6-SA2-27 to the east. Samples

1 from each of these four borings will be collected at the 0 to 0.5, 0.5 to 1, 1.5 to 2, and 3.5 to
2 4-foot intervals and will be analyzed for thorium-232.

- 3
- 4 • An above-FRL result for beryllium of 5.7 mg/kg was detected in the 0 to 0.5-foot interval of
5 Boring 11199, located in the center of the OMTA Container Staging Area. Since this location is
6 not bound by other physical samples, this location will be bound both horizontally and at depth.
7 A confirmatory boring will be located at the original boring (A6-SA2-17). Samples from this
8 boring will be collected at the 0.5 to 1, 1.5 to 2, and 3.5 to 4-foot intervals and will be analyzed
9 for beryllium. Four borings will be located 5 feet from the original boring, Boring 11199, in each
10 of the four cardinal directions, A6-SA2-18 to the north, A6-SA2-19 to the south, A6-SA2-20 to
11 the west, and A6-SA2-21 to the east. Samples from each of these four borings will be collected at
12 the 0 to 0.5, 0.5 to 1, 1.5 to 2, and 3.5 to 4-foot intervals and will be analyzed for beryllium.
13
 - 14 • An above-FRL result for beryllium of 1.69 mg/kg was detected in the 1 to 1.5-foot interval of
15 Boring 12564, located outside of the northwest corner of Building 79. This location is bound
16 below by below-FRL results at the 2 to 2.5 (1.32 mg/kg), 3 to 3.5 (1.08 mg/kg), 4 to 4.5
17 (1.12 mg/kg), 5 to 5.5 (1.17 mg/kg), and 6 to 6.5 (1.04 mg/kg)-foot intervals. Boring 12564 is
18 bounded to the east by Boring 12565 with below-FRL results at the 1 to 1.5 (0.94 mg/kg), 2 to 2.5
19 (0.50 mg/kg), 3 to 3.5 (1.23 mg/kg), 4 to 4.5 (0.50 mg/kg), 5 to 5.5 (0.41 mg/kg), and 6 to 6.5
20 (0.35 mg/kg)-foot intervals. Boring 12564 is bounded to the southeast by Boring 12563 with
21 below-FRL results at the 1 to 1.5 (0.97 mg/kg), 2 to 2.5 (1.04 mg/kg), 3 to 3.5 (1.17 mg/kg), 4 to
22 4.5 (1.17 mg/kg), 5 to 5.5 (0.67 mg/kg), and 6 to 6.5 (0.40 mg/kg)-foot intervals. Since this
23 location is not bound to the north or west by other physical samples, this location will be bound in
24 these directions. A6-SA2-12 will be placed 5 feet north of the original boring and A6-SA2-13
25 will be placed 5 feet west of the original boring. Samples from each of these two borings will be
26 collected at the 0 to 0.5, 0.5 to 1, 1 to 1.5, 1.5 to 2, 2 to 2.5, and 2.5 to 3-foot intervals and will be
27 analyzed for beryllium.
28
 - 29 • In the Main Electrical Switchyard, above-FRL results for arsenic at Boring P5-19 and P5-7 and
30 lead at Boring ESA-4 were detected. These above-FRL results require bounding to the east.
31 Boring A5P-14 and ESA-10 located to the east of the Main Electrical Switchyard are both
32 above-FRL for aroclor-1254 [292 micrograms per kilogram ($\mu\text{g}/\text{kg}$) and 200 $\mu\text{g}/\text{kg}$, respectively]
33 at the 0 to 0.5-foot interval and require bounding. Borings to bound these locations are described
34 below.
35
 - 36 - Boring A6-SA2-4 will be placed at Boring A5P-14 and Boring A6-SA2-5 will be placed at
37 Boring ESA-10. Samples from the 0.5 to 1-foot interval and the 3.5 to 4-foot intervals will
38 be collected and analyzed for aroclor-1254.
39
 - 40 - Boring A6-SA2-1 will be placed northeast of A5P-14 as a bounding boring for total uranium,
41 arsenic, and lead, in addition to the aroclor-1254 in the Main Electrical Switchyard. The
42 boring will be advanced to 3 feet with samples collected from the 0 to 0.5, 1 to 1.5, and 2.5 to
43 3-foot intervals. These samples will be analyzed for total uranium, arsenic, lead, and
44 aroclor-1254.
45
 - 46 - Boring A6-SA2-2 will be placed southeast of ESA-10 as a bounding boring for the Main
47 Electrical Switchyard. The boring will be advanced to 3 feet with samples collected from the
48 0 to 0.5, 1 to 1.5, and 2.5 to 3-foot intervals. These samples will be analyzed for total
49 uranium and arsenic.
50

1 - Since historical uranium data in the Main Electrical Switchyard area is lacking, total uranium
2 will also be analyzed from the 0 to 0.5-foot interval of Boring A6-SA2-6 placed in the
3 northwest corner of the Main Electrical Switchyard. This boring is in addition to A6-SA2-1
4 and A6-SA2-2 which are also being analyzed for total uranium as discussed above.
5

6 The Plant 6 Warehouse, Building 79, was used to store Resource Conservation Recovery Act (RCRA) and
7 polychlorinated biphenyl (PCB) waste. Five borings will be placed on the slab of this building. Three
8 borings will be collected under the slab and two will be collected from the area outside of the slab. Of the
9 borings from under the slab, two will be placed in the northeast corner, one at the center of the former
10 HEPA Ventilated Processing Area (A6-SA2-7) and one at the center of the former Incoming Staging Area
11 (A6-SA2-8). A third boring will be placed in the center of the former Bay C (A6-SA2-9). Of the two
12 borings outside of the building slab, one will be placed on the northwest side of the slab at the west side
13 of the grate (A6-SA2-10) and a second boring in the yard on the west side of the slab on the north side of
14 the stormwater drain (A6-SA2-11). A sample obtained from the 0 to 0.5-foot interval (below any existing
15 concrete or gravel) at each of these borings will be analyzed for total uranium, technetium-99,
16 aroclor-1254, aroclor-1260, and the following RCRA constituents: arsenic, barium, cadmium, chromium,
17 lead, mercury, selenium, silver, benzene, carbon tetrachloride, chlorobenzene, chlordane,
18 1,1-dichloroethene, tetrachloroethene, trichloroethene, and vinyl chloride.
19

20 Below FRL technetium-99 and total uranium results were obtained from samples collected per *Project*
21 *Specific Plan for Sampling of Miscellaneous Areas for WAC Attainment*, 20600-PSP-0001 Variances 30
22 and 31 in Building 77. This building requires no further predesign investigation.
23

24 Other above-FRL points not labeled with a boring identification on Figure 2-1 are adequately bound and
25 do not require further investigation.
26

27 See Appendix A for the Target Analyte Lists (TALs) and Appendix B for the boring table and sample
28 identifiers. Table 2-1 addresses the physical sample volumes, preservation requirements, and analysis
29 information.
30

31 2.1.3 Precertification

32 Precertification will be performed per 20300-PSP-0011, Section 3.0 and Section 6.0.

TABLE 2-1
PHYSICAL SAMPLE ANALYTICAL REQUIREMENTS

Analyte ^a	Method	Matrix	Holding Time	Preservative	Container ^b	Minimum Mass
TAL A or B (rads only)	Gamma Spec, Alpha Spec, LSC, or GPC	Solid	12 months	None	Appropriate size glass or plastic with Teflon lined lid	300 g
TAL AF or AG (rads/metals)	Gamma Spec, Alpha Spec, LSC, or GPC	Solid	12 months	Cool, 4°C (due to metals)	Appropriate size glass or plastic with Teflon-lined lid	350 g
	ICP-AES or ICP-MS	Solid	6 months			
TAL ACDHIJ or ACFG (rads/metals/PCBs)	Gamma Spec, Alpha Spec, LSC, or GPC	Solid	12 months	Cool, 4°C (due to metals and PCBs)	Appropriate size glass with Teflon lined lid	500 g ^c
	ICP-AES or ICP-MS	Solid	6 months			
	GC	Solid	14 days			
TAL C (PCBs)	GC	Solid	14 days	Cool, 4°C	Appropriate size glass with Teflon-lined lid	100 g ^c
TAL E (metals only)	ICP-AES or ICP-MS	Solid	6 months	Cool, 4°C	Appropriate size glass or plastic with Teflon-lined lid	50 g
TAL K (VOCs)	GC/MS	Solid	48 hours	Cool, 4°C	3 x 1-Encore Sampler plus 1 x 1-oz jar for % moisture ^c	Each full Encore Sampler ^c will hold approx. 5 g
TAL K (VOCs)	GC/MS	Liquid (Trip blank)	14 days	Cool, 4°C H ₂ SO ₄ pH<2	3 x 40-mL glass with Teflon-lined septa	120 mL ^c (no headspace)

^a Samples will be analyzed according to Analytical Support Level (ASL) B 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 release in order for the contract laboratory to perform the required quality control analysis. The samples shall be identified on the Chain of Custody/Request for Analysis forms as "designated for laboratory quality control (QC)".

ICP-AES - inductively coupled plasma-atomic electron spectrometry

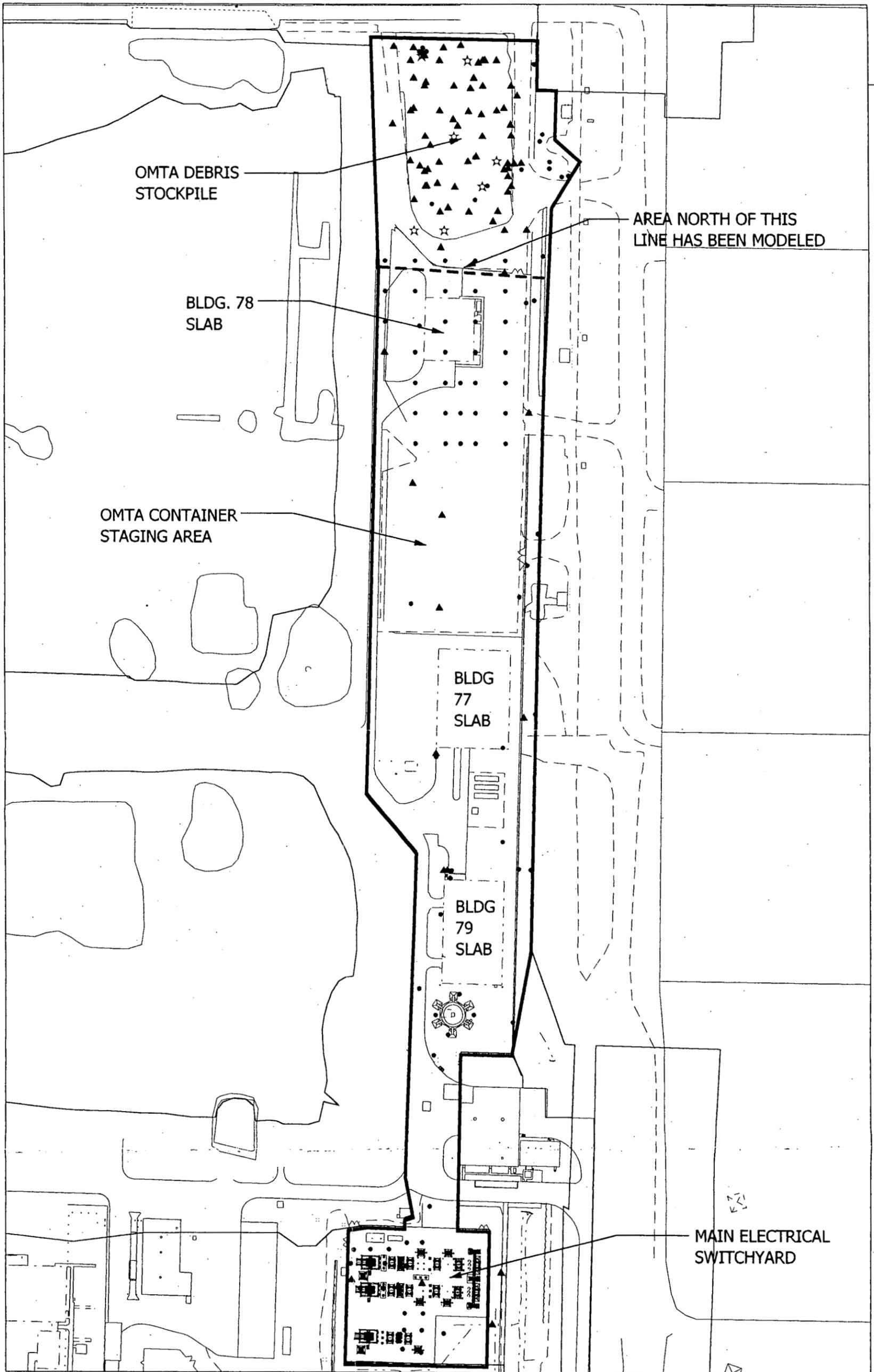
GC/MS - gas chromatography/mass spectroscopy

GPC - gas proportional counter

ICP-MS - inductively coupled plasma-mass spectroscopy

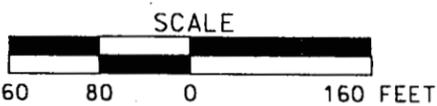
LSC - liquid scintillation counter

VOA - volatile organic analysis



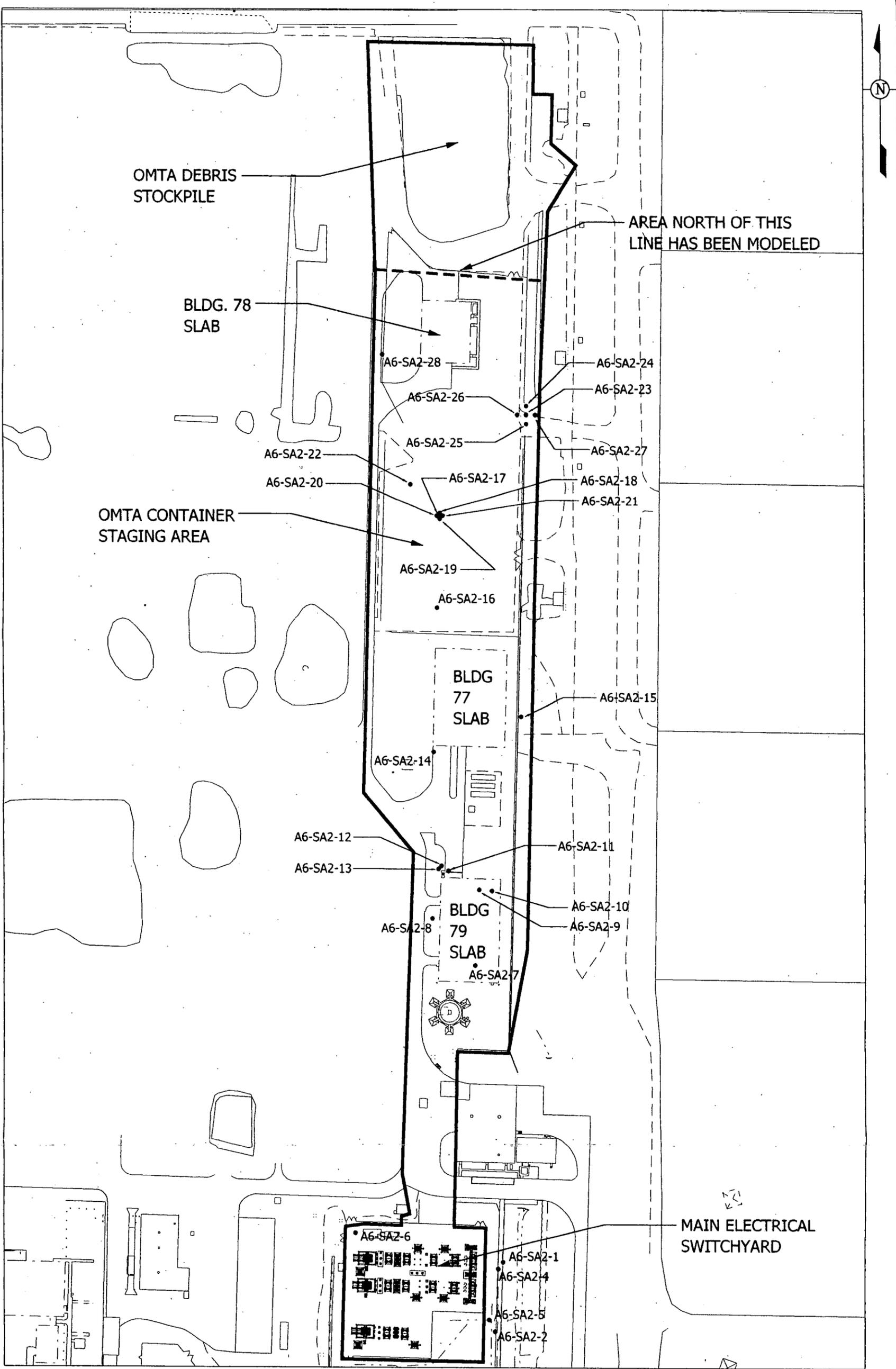
LEGEND:

- ☆ ABOVE-WAC BORING
- ▲ ABOVE-FRL BORING
- BELOW-FRL BORING



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FIGURE 2-1. AREA 6. SUBAREA 2. HISTORICAL BORING LOCATIONS COVERAGE MAP



LEGEND:

• PROPOSED BORING

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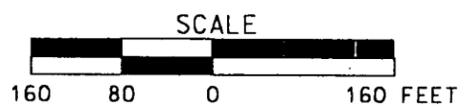


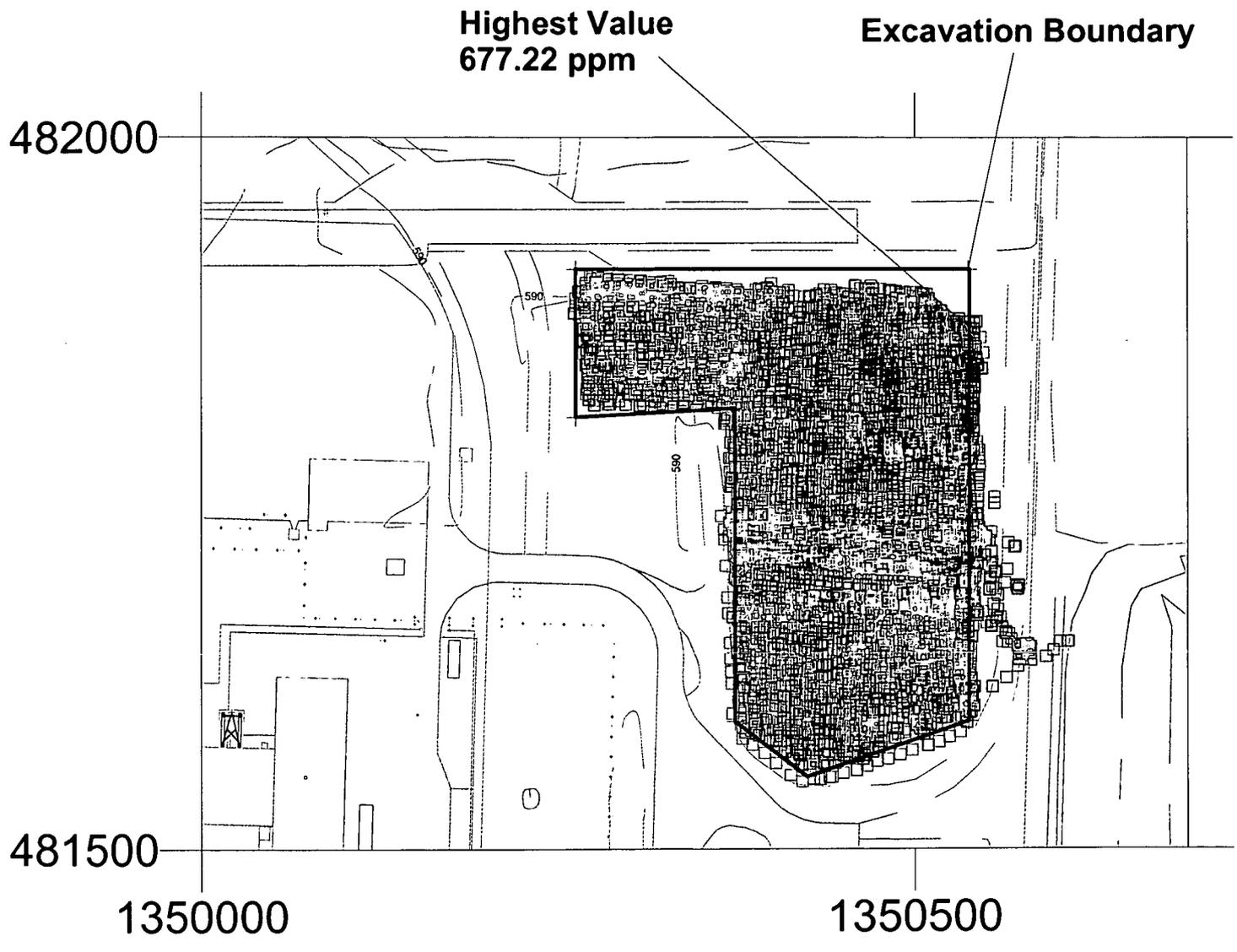
FIGURE 2-2. AREA 6, SUBAREA 2, PROPOSED BORING LOCATIONS

Figure 2-3 Above WAC Excavation Footprint NE Corner of Production Area

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Moisture Corrected Total Uranium
RSS1 batch #0635, 0636, & 0638
RSS2 batch #0175, 0176, 0177; & 0178
Coverage Plot, Field of View to scale
Measurement Dates: 3/20/2001 through 4/2/2001

N



ppm Total Uranium	
□	-300.00 to 82.00
□	82.00 to 400.00
□	400.00 to 721.00
□	721.00 to 10000.00

RTIMP DWG Title: NECRNR-WAC-TU-1PT-MC
Project: 20200-PSP-0004
Name: Area 3A/4A Surface PreDesign Inv.
Prepared by: David Allen
File: NECRNR_WAC_TU_1PT_MC.srf
Date Prepared: 4/2/2001

1 **3.0 INSTRUMENTATION AND TECHNIQUES**

2
3 Reference the corresponding section of 20300-PSP-0011, *Project Specific Plan Guidelines for General*
4 *Characterization for Sitewide Soil Remediation* for each of the following sections:

5
6 3.1 MEASUREMENT INSTRUMENTATION AND TECHNIQUES

7 3.1.1 Real-Time

8 3.1.1.1 Sodium Iodide Data Acquisition (RTRAK, RSS, GATOR, EMS)

9 3.1.1.2 HPGe Data Acquisition

10 3.1.1.3 Excavation Monitoring System

11 3.1.1.4 Radon Monitor

12 3.1.2 Surface Moisture Measurements

13 3.2 REAL-TIME MEASUREMENT IDENTIFICATION

14 3.3 REAL-TIME DATA MAPPING

15 3.4 REAL-TIME SURVEYING

16
17 **4.0 PREDESIGN**

18
19 4.1 REAL-TIME ACTIVITIES

20 refer to Section 4.1 of 20300-PSP-0011, *Project Specific Plan Guidelines for General Characterization*
21 *for Sitewide Soil Remediation*.

22
23 4.2 SAMPLE COLLECTION METHODS

24 4.3 PHYSICAL SAMPLE IDENTIFICATION

25 4.4 BOREHOLE ABANDONMENT

5.0 EXCAVATION CONTROL MEASURES

Reference the corresponding section of 20300-PSP-0011, *Project Specific Plan Guidelines for General Characterization for Sitewide Soil Remediation* for each of the following sections:

5.1 EXCAVATION DESIGN CONTROL REQUIREMENTS

5.1.1 Contamination Zone

5.1.2 Floors, Roads and Foundations

5.1.3 Real-Time Lift Scans

5.1.4 Above-WAC Lift Scans

5.2 ORGANIC SCREENING AND PHYSICAL SAMPLING REQUIREMENTS

5.2.1 Above-WAC Photoionization Detector (PID)/Gas Chromatograph (GC) Screening

5.2.2 All Other Physical Sample Requirements

5.2.3 PID Screening and Physical Sampling Procedures

5.2.4 Physical Sample Identification

6.0 PRECERTIFICATION

Reference the corresponding section of 20300-PSP-0011, *Project Specific Plan Guidelines for General Characterization for Sitewide Soil Remediation* for each of the following sections:

6.1 INITIAL PRECERTIFICATION NaI SCAN AT BASE OF DESIGN GRADE

6.2 PRECERTIFICATION HPGe MEASUREMENTS IN 20 PPM FRL (URANIUM) AREAS

6.3 PRECERTIFICATION HPGe MEASUREMENTS IN 82 PPM FRL (URANIUM) AREAS

6.4 DELINEATING HOT SPOTS FOLLOWING PRECERTIFICATION HPGe MEASUREMENTS

7.0 QUALITY ASSURANCE/QUALITY CONTROL REQUIREMENTS

Reference the corresponding section of 20300-PSP-0011, *Project Specific Plan Guidelines for General Characterization for Sitewide Soil Remediation* for each of the following sections:

7.1 QUALITY CONTROL SAMPLES - REAL-TIME MEASUREMENTS AND PHYSICAL SAMPLES

7.2 DATA VALIDATION

7.2.1 Physical Sample Data Validation

7.2.2 Real-Time Data Verification/Validation

7.3 APPLICABLE DOCUMENTS, METHODS AND STANDARDS

7.4 SURVEILLANCES

7.5 IMPLEMENTATION AND DOCUMENTATION OF V/FCNs

8.0 SAFETY AND HEALTH

Reference the corresponding section of 20300-PSP-0011, *Project Specific Plan Guidelines for General Characterization for Sitewide Soil Remediation* for this section.

9.0 EQUIPMENT DECONTAMINATION

Reference the corresponding section of 20300-PSP-0011, *Project Specific Plan Guidelines for General Characterization for Sitewide Soil Remediation* for this section.

10.0 DISPOSITION OF WASTES

Reference the corresponding section of 20300-PSP-0011, *Project Specific Plan Guidelines for General Characterization for Sitewide Soil Remediation* for this section.

11.0 DATA AND RECORDS MANAGEMENT

Reference the corresponding section of 20300-PSP-0011, *Project Specific Plan Guidelines for General Characterization for Sitewide Soil Remediation* for each of the following sections:

11.1 REAL-TIME

11.2 PHYSICAL SAMPLES

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APPENDIX A

**TARGET ANALYTE LISTS FOR
PREDESIGN OF AREA 6 SUBAREA 2**

**APPENDIX A
TARGET ANALYTE LISTS FOR PREDESIGN OF AREA 6 SUBAREA 2**

**TAL A
Soil Analysis, Off-site, (ASL B)**

Analyte (Rad)	WAC	FRL	Requested MDL
Total Uranium	1030 mg/kg	82 mg/kg	8.2 mg/kg

MDL – minimum detection level

**TAL B
Soil Analysis, Off-site, (ASL B)**

Analyte (Rad)	FRL	Requested MDL
Thorium-232	1.5 pCi/g	0.15 pCi/g

**TAL C
Soil Analysis, Off-site, (ASL B)**

Analyte (PCB)	FRL	Requested MDL
Aroclor-1254	0.13 mg/kg	0.013 mg/kg

**TAL D
Soil Analysis, Off-site, (ASL B)**

Analyte (PCB)	FRL	Requested MDL
Aroclor-1260	0.13 mg/kg	0.013 mg/kg

**TAL E
Soil Analysis, Off-site, (ASL B)**

Analyte (Metal)	FRL	Requested MDL
Beryllium	1.50 mg/kg	0.150 mg/kg

**TAL F
Soil Analysis, Off-site, (ASL B)**

Analyte (Metal)	FRL	Requested MDL
Arsenic	12.0 mg/kg	1.20 mg/kg

**TAL G
Soil Analysis, Off-site, (ASL B)**

Analyte (Metal)	FRL	Requested MDL
Lead	400 mg/kg	40 mg/kg

**TAL H
Soil Analysis, Off-site, (ASL B)**

Analyte (Rad)	FRL*	Requested MDL
Technetium-99	29.1 pCi/g (WAC)	2.91 pCi/g

*If the WAC is lower than the established FRL, the MDL will be set at 10 percent of the OSDF WAC.

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1
2

TAL I
Soil Analysis, Off-site, (ASL B)

Analyte (Metals)	FRL/20 x Rule*	Requested MDL
Arsenic	12.0 mg/kg	1.20 mg/kg
Barium	2000.0 mg/kg	200.0 mg/kg
Cadmium	20.0 mg/kg	2.0 mg/kg
Chromium	100.0 mg/kg	10.0 mg/kg
Lead	100.0 mg/kg	10.0 mg/kg
Mercury	4.0 mg/kg	0.40 mg/kg
Selenium	20.0 mg/kg	2.0 mg/kg
Silver	100.0 mg/kg	10.0 mg/kg

3
4
5
6
7

* The value in this column is either the FRL value or 20 times TCLP Limits value (whichever is lower).

TAL J
Soil Analysis, Off-site, (ASL B)

Analyte (Pesticide)	FRL	Requested MDL
Chlordane	0.190 mg/kg	0.0190 mg/kg

8
9
10

TAL K
Soil Analysis, Off-site, (ASL B)

Analyte (Volatile)	FRL/20 x Rule*	Requested MDL
Benzene	10.0 mg/kg	1.0 mg/kg
Carbon tetrachloride	2.10 mg/kg	0.210 mg/kg
Chlorobenzene	340.0 mg/kg	34.0 mg/kg
1,1-Dichloroethene	0.410 mg/kg	0.041 mg/kg
Tetrachloroethene	3.60 mg/kg	0.360 mg/kg
Trichloroethene	10.0 mg/kg	1.0 mg/kg
Vinyl chloride	0.130 mg/kg	0.013 mg/kg

11
12
13

* The value in this column is either the FRL value or 20 times TCLP Limits value (whichever is lower).

01

APPENDIX B

**BORING TABLE AND SAMPLE IDENTIFIERS
FOR PREDESIGN OF AREA 6 SUBAREA 2**

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**APPENDIX B
BORING TABLE AND SAMPLE IDENTIFIERS FOR AREA 6 SUBAREA 2**

Boring	Sample Identification	Northing	Easting	Depth to Sample, feet	Analysis
A6-SA2-1	A6-SA2-1^1-RMP	479879.48	1350529.75	0-0.5	TAL A, C, F, G
	A6-SA2-1^3-RMP			1-1.5	TAL A, C, F, G
	A6-SA2-1^6-RMP			2.5-3	TAL A, C, F, G
A6-SA2-2	A6-SA2-2^1-RM	479765.57	1350516.33	0-0.5	TAL A, F
	A6-SA2-2^3-RM			1-1.5	TAL A, F
	A6-SA2-2^6-RM			2.5-3	TAL A, F
A6-SA2-3	Intentionally left blank				
A6-SA2-4	A6-SA2-4^2-P	479868.6	1350521.546	0.5-1	TAL C
	A6-SA2-4^8-P			3.5-4	TAL C
A6-SA2-5	A6-SA2-5^2-P	479785.12	1350506.711	0.5-1	TAL C
	A6-SA2-5^8-P			3.5-4	TAL C
A6-SA2-6	A6-SA2-6^1-R	479926.9	1350282.77	0-0.5	TAL A
A6-SA2-7	A6-SA2-7^2-RMP	480368.42	1350483.3	0-0.5	TAL A,C,D,H,I,J
	A6-SA2-7^2-L			0-0.5	TAL K
A6-SA2-8	A6-SA2-8^2-RMP	480445.91	1350412.06	0-0.5	TAL A,C,D,H,I,J
	A6-SA2-8^2-L			0-0.5	TAL K
A6-SA2-9	A6-SA2-9^2-RMP	480493.07	1350490.52	0-0.5	TAL A,C,D,H,I,J
	A6-SA2-9^2-L			0-0.5	TAL K
A6-SA2-10	A6-SA2-10^2-RMP	480491.51	1350511.66	0-0.5	TAL A,C,D,H,I,J
	A6-SA2-10^2-L			0-0.5	TAL K
A6-SA2-11	A6-SA2-11^2-RMP	480524.12	1350439.05	0-0.5	TAL A,C,D,H,I,J
	A6-SA2-11^2-L			0-0.5	TAL K
A6-SA2-12	A6-SA2-12^1-M	480532.28	1350427.42	0-0.5	TAL E
	A6-SA2-12^2-M			0.5-1	TAL E
	A6-SA2-12^3-M			1-1.5	TAL E
	A6-SA2-12^4-M			1.5-2	TAL E
	A6-SA2-12^5-M			2-2.5	TAL E
	A6-SA2-12^6-M			2.5-3	TAL E
A6-SA2-13	A6-SA2-13^1-M	480527.28	1350422.42	0-0.5	TAL E
	A6-SA2-13^2-M			0.5-1	TAL E
	A6-SA2-13^3-M			1-1.5	TAL E
	A6-SA2-13^4-M			1.5-2	TAL E
	A6-SA2-13^5-M			2-2.5	TAL E
	A6-SA2-13^6-M			2.5-3	TAL E
A6-SA2-14	A6-SA2-14^5-R	480719.058	1350414.54	2-2.5	TAL B
	A6-SA2-14^11-R			5-5.5	TAL B
	A6-SA2-14^12-R			5.5-6	TAL B
A6-SA2-15	A6-SA2-15^2-R	480779.41	1350560.979	0.5-1	TAL A
A6-SA2-16	A6-SA2-16^3-R	480959.41	1350420.977	1-1.5	TAL A

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**APPENDIX B
BORING TABLE AND SAMPLE IDENTIFIERS FOR AREA 6 SUBAREA 2**

Boring	Sample Identification	Northing	Easting	Depth to Sample, feet	Analysis
A6-SA2-17	A6-SA2-17^2-M	481110.902	1350425.906	0.5-1	TAL E
	A6-SA2-17^4-M			1.5-2	TAL E
	A6-SA2-17^8-M			3.5-4	TAL E
A6-SA2-18	A6-SA2-18^1-M	481115.902	1350425.906	0-0.5	TAL E
	A6-SA2-18^2-M			0.5-1	TAL E
	A6-SA2-18^4-M			1.5-2	TAL E
	A6-SA2-18^8-M			3.5-4	TAL E
A6-SA2-19	A6-SA2-19^1-M	481105.902	1350425.906	0-0.5	TAL E
	A6-SA2-19^2-M			0.5-1	TAL E
	A6-SA2-19^4-M			1.5-2	TAL E
	A6-SA2-19^8-M			3.5-4	TAL E
A6-SA2-20	A6-SA2-20^1-M	481110.902	1350420.906	0-0.5	TAL E
	A6-SA2-20^2-M			0.5-1	TAL E
	A6-SA2-20^4-M			1.5-2	TAL E
	A6-SA2-20^8-M			3.5-4	TAL E
A6-SA2-21	A6-SA2-21^1-M	481110.902	1350430.906	0-0.5	TAL E
	A6-SA2-21^2-M			0.5-1	TAL E
	A6-SA2-21^4-M			1.5-2	TAL E
	A6-SA2-21^8-M			3.5-4	TAL E
A6-SA2-22	A6-SA2-22^1-R	481163.391	1350377.045	0-0.5	TAL B
	A6-SA2-22^2-R			0.5-1	TAL B
A6-SA2-23	A6-SA2-23^2-R	481279.415	1350570.973	0.5-1	TAL B
	A6-SA2-23^4-R			1.5-2	TAL B
	A6-SA2-23^8-R			3.5-4	TAL B
A6-SA2-24	A6-SA2-24^1-R	481294.415	1350570.973	0-0.5	TAL B
	A6-SA2-24^2-R			0.5-1	TAL B
	A6-SA2-24^4-R			1.5-2	TAL B
	A6-SA2-24^8-R			3.5-4	TAL B
A6-SA2-25	A6-SA2-25^1-R	481264.415	1350570.973	0-0.5	TAL B
	A6-SA2-25^2-R			0.5-1	TAL B
	A6-SA2-25^4-R			1.5-2	TAL B
	A6-SA2-25^8-R			3.5-4	TAL B
A6-SA2-26	A6-SA2-26^1-R	481279.415	1350555.973	0-0.5	TAL B
	A6-SA2-26^2-R			0.5-1	TAL B
	A6-SA2-26^4-R			1.5-2	TAL B
	A6-SA2-26^8-R			3.5-4	TAL B
A6-SA2-27	A6-SA2-27^1-R	481279.415	1350585.973	0-0.5	TAL B
	A6-SA2-27^2-R			0.5-1	TAL B
	A6-SA2-27^4-R			1.5-2	TAL B
	A6-SA2-27^8-R			3.5-4	TAL B
A6-SA2-28	A6-SA2-28^4-R	481379.413	1350330.973	1.5-2	TAL A

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