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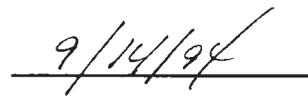
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7. Abstract *9/14/94 D. Poliv*

This is the sample and analysis plan for the closure activities at the 304 Concretion Facility. This document supports the *304 Concretion Facility Closure Plan*, DOE/RL-90-03. The sampling and analysis plan identifies sample locations, any special handling requirements, quality control samples, required chemical analysis, and data validation needed to meet the requirements of the *304 Concretion Facility Closure Plan*.

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ATTACHMENT

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1 **PHASE I SAMPLING AND ANALYSIS PLAN FOR THE 304 CONCRETION**
2 **FACILITY CLOSURE ACTIVITIES**

3
4
5
6 **1.0 PURPOSE**

7
8
9 This document provides guidance for the initial (Phase I) sampling and
10 analysis activities associated with the proposed *Resource Conservation and*
11 *Recovery Act of 1976* (RCRA) clean closure of the 304 Concretion Facility.
12 This is a supplement to *304 Concretion Facility Closure Plan* (DOE-RL 1993a),
13 and should be used in conjunction with the *Environmental Investigations and*
14 *Site Characterization Manual* (WHC 1988) for specific procedures.

15
16 The strategy for clean closure of the 304 Concretion Facility is to
17 decontaminate, sample (Phase I sampling), and evaluate results. If the
18 evaluation indicates that a limited area requires additional decontamination
19 for clean closure, the limited area will be decontaminated, resampled
20 (Phase II sampling), and the result evaluated. If the evaluation indicates
21 that the constituents of concern are below action levels, the facility will be
22 clean closed. Or, if the evaluation indicates that the constituents of
23 concern are present above action levels, the condition of the facility will be
24 evaluated and appropriate action taken.

25
26 The action levels are defined as the concentrations of dangerous waste
27 constituents above the Hanford Site background concentrations identified in
28 *Hanford Site Background: Part 1, Soil Background for Nonradioactive Analytes*
29 (DOE-RL 1993b) and above the residential concentrations identified in *Model*
30 *Toxic Control Act [Washington Administrative Code (WAC) 173-340]* residential
31 levels.

32
33 The criteria used to develop the sample locations, analytical methods,
34 quality control methodology, and data validation methodology were based on the
35 contents of Revision 2 of the *304 Concretion Facility Closure Plan*
36 (DOE-RL 1993a) and further developed during the Data Quality Objectives
37 Meetings held on May 30, June 1, and August 25, 1994, and in the monthly Unit
38 Manager Meetings held during 1994.

39
40
41 **2.0 OBJECTIVE**

42
43
44
45 The objective is to facilitate a RCRA clean closure of the site by
46 verifying that decontamination has reduced the concentrations of all
47 constituents of concern to below action levels. This objective will be met by
48 collecting samples from 37 locations. The samples will then be analyzed to
49 determine the levels of the constituents of concern.

3.0 SITE DESCRIPTION/BACKGROUND

1
2
3
4 The 304 Concretion Facility is located in the northwest corner of the
5 300 Area. The layout of the facility is shown in Figures 1 and 2. The
6 facility consists of a building, an associated changeroom, and an external
7 storage area. The building is a steel framed building with sheet metal sides
8 and a poured concrete floor. There is no interior insulation or wallboard.
9 The ceiling of the facility consists of exposed steel trusses (girders).
10 The floor area has a drainage trench, a floor drain, and a sump area. The
11 changeroom is metal with a concrete floor and the interior walls and ceiling
12 are covered with wallboard and insulated. The storage area consists of a
13 concrete pad surrounded by asphalt. The building is also surrounded by an
14 asphalt strip.

15
16 The 304 Concretion Facility has performed a variety of functions.
17 From construction in 1952 until the mid-1960's, the facility housed the pilot
18 plants associated with cladding uranium cores. From the mid-1960's until
19 1971, the facility was used to store engineering equipment and product
20 chemicals. From 1972 until 1994, the facility was used to treat low-level
21 radioactive mixed waste, recyclable scrap uranium generated during nuclear
22 fuel fabrication processes or development activities, and uranium-titanium
23 alloy chips and fines. Also, the facility was used for the repackaging of
24 spent halogenated solvents from the nuclear fuels manufacturing process.
25
26

4.0 SCOPE OF WORK

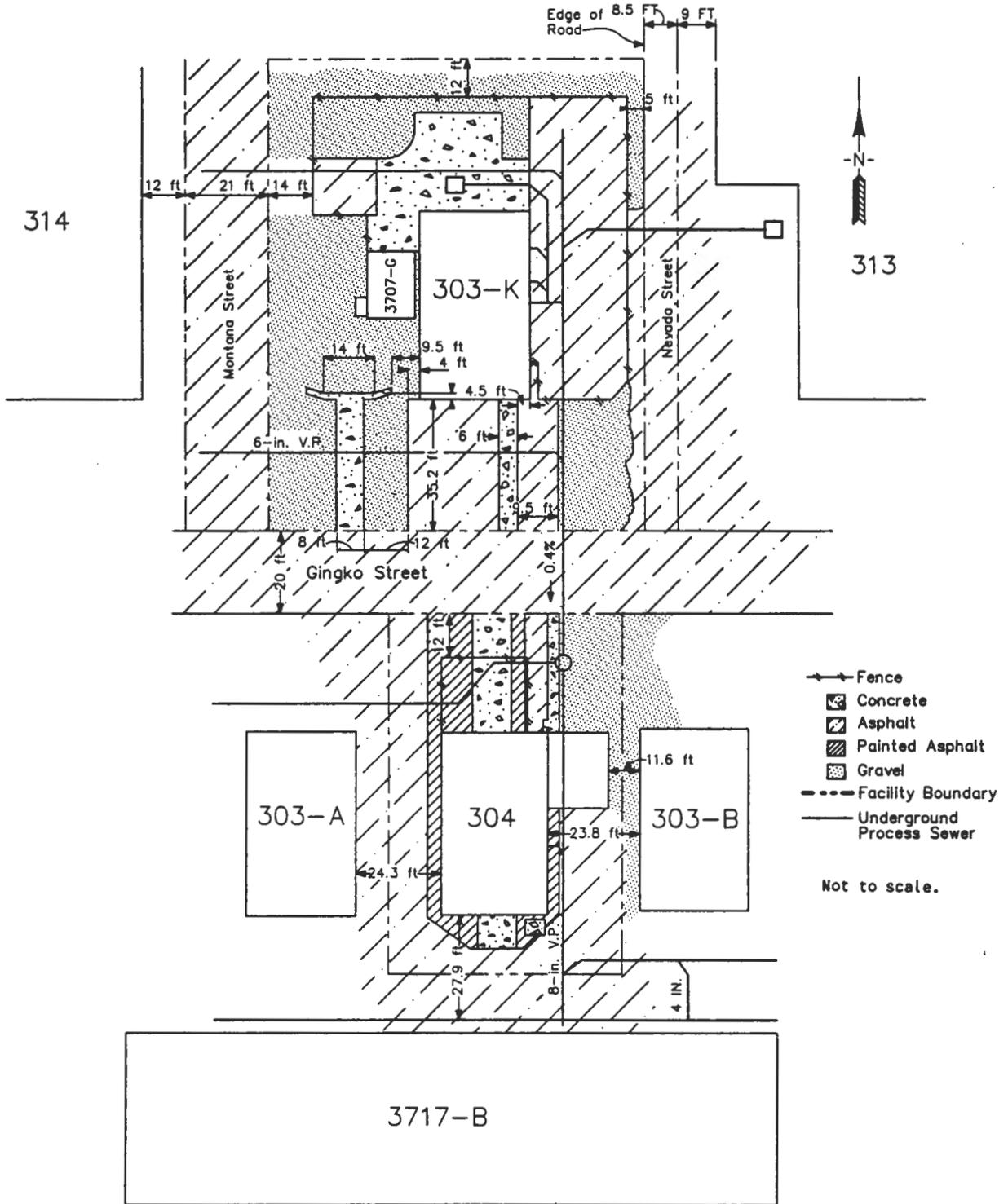
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29
30
31 There are a total of 37 sampling locations comprising 12 concrete core,
32 1 concrete chip, 9 soil, 11 wipe, and 4 asphalt core sampling locations. For
33 the 9 soil sampling locations, samples will be collected at the 0 to 6-inch,
34 6 to 18-inch and 18 to 24-inch intervals. Table 1 presents a summary of the
35 304 Facility sampling.
36

37 Analysis for inorganics and volatile organics will be performed on the
38 concrete core and soil samples. Separate concrete core samples will be
39 required for the inorganic and volatile organic analysis (VOA). Analysis for
40 inorganics only will be performed on the concrete chip, wipe, and asphalt
41 samples.
42
43
44

5.0 SAMPLING AND FIELD ACTIVITIES

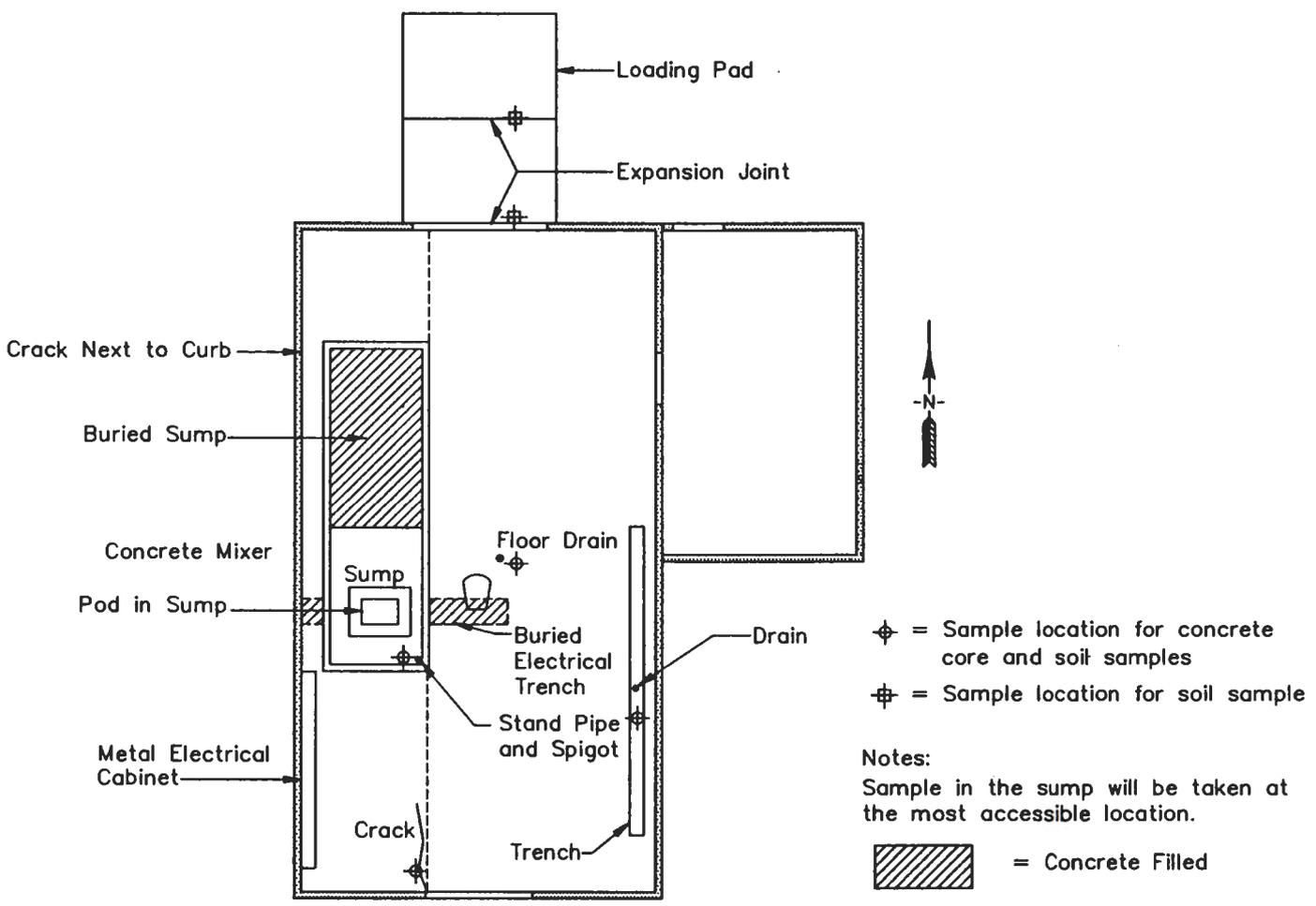
45
46
47
48 This section discusses the Phase I sampling of the 304 Concretion
49 Facility. Table 1 presents a summary of the sample types and locations.
50
51
52

1 Figure 1. Plan View of 304 Concretion Facility Surrounding Area.



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1 Figure 2. 304 Concretion Facility, Authoritative Concrete Core and Soil
2 Sample Locations in Areas of Potential Contamination.



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1
2 Table 1. Summary of 304 Concretion Facility Sampling.

3	NUMBER OF	SAMPLE TYPES	INORGANIC	ORGANIC	TOTAL
4	SAMPLE		SAMPLE	SAMPLE	NUMBER OF
5	LOCATIONS				SAMPLES
6					
7	<u>FLOOR</u>				
8	4	Authoritative Concrete Core	1	1	8
9	8	Random Concrete Core	1	1	16
10	4	Soil, 0 to 6 inches	1	1	8
11		6 to 18 inches	1	1	8
12		18 to 24 inches	1	1	8
13		(Note: Soil samples and Authoritative Concrete Core Samples are			
14		co-located.)			
15					
16	<u>STORAGE PAD</u>				
17	1	Random Asphalt Core	1	0	1
18	1	Random Concrete Core	1	1	2
19	2	Soil, 0 to 6 inches	1	1	4
20		6 to 18 inches	1	1	4
21		18 to 24 inches	1	1	4
22					
23	<u>CHANGEROOM FLOOR</u>				
24	1	Random Concrete Chip	1	0	1
25					
26	<u>NORTH WALL</u>				
27	2	Random Wipe	1	0	2
28					
29	<u>SOUTH WALL</u>				
30	2	Random Wipe	1	0	2
31					
32	<u>EAST WALL</u>				
33	3	Random Wipe	1	0	3
34					
35	<u>WEST WALL</u>				
36	3	Random Wipe	1	0	3
37					
38	<u>GIRDER</u>				
39	1	Wipe	1	0	1
40					
41	<u>WEST-SIDE, BUILDING EXTERIOR</u>				
42	2	Asphalt Core	1	0	2
43	2	Soil, 0 to 6 inches	1	1	4
44		6 to 18 inches	1	1	4
45		18 to 24 inches	1	1	4
46		(Note: Soil samples and Asphalt Core Samples are co-located.)			
47					
48	<u>EAST-SIDE, BUILDING EXTERIOR</u>				
49	1	Asphalt Core	1	0	1
50	1	Soil, 0 to 6 inches	1	1	2
51		6 to 18 inches	1	1	2
52		18 to 24 inches	1	1	2
53		(Note: Soil samples and Asphalt Core Samples are co-located.)			

1 **5.1 GENERAL PROCEDURES**

2
3 The activities associated with implementing this SAP will be conducted in
4 accordance with the following environmental investigations instruction (EII)
5 procedures (WHC 1988):

- 6
7 • EII 1.1, Hazardous Waste Site Entry Requirements
8
9 • EII 1.5, Field Logbooks
10
11 • EII 1.13, Environmental Readiness Review
12
13 • EII 5.1, Chain of Custody
14
15 • EII 5.2, Soil and Sediment Sampling
16
17 • EII 5.4, Field Cleaning and/or Decontamination of Equipment
18
19 • EII 5.5, 1706 KE Laboratory Decontamination of RCRA/*Comprehensive*
20 *Environmental Response, Compensation, and Liability Act of 1980*
21 (CERCLA) Sampling Equipment
22
23 • EII 5.10, Obtaining Sample Identification Numbers and Accessing
24 Hanford Environmental Information System Data
25
26 • EII 5.11, Sample Packaging and Shipping
27
28 • EII 14.1, Analytical Laboratory Data Management.
29

30
31 **5.1.1 Total Activity Samples**

32
33 In addition to the samples listed in Sections 5.2 to 5.6, total activity
34 samples are needed to determine radiological dose rates that control the
35 transportation and handling requirements for the samples. Total activity
36 samples will be collected as determined by the Sampling Field Team Leader as
37 needed to support sampling transportation and handling. If a total activity
38 sample is required for a VOA sample, the original VOA sample will not be used
39 and a separate VOA sample will be collected for total activity analysis.
40

41
42 **5.1.2 Figures**

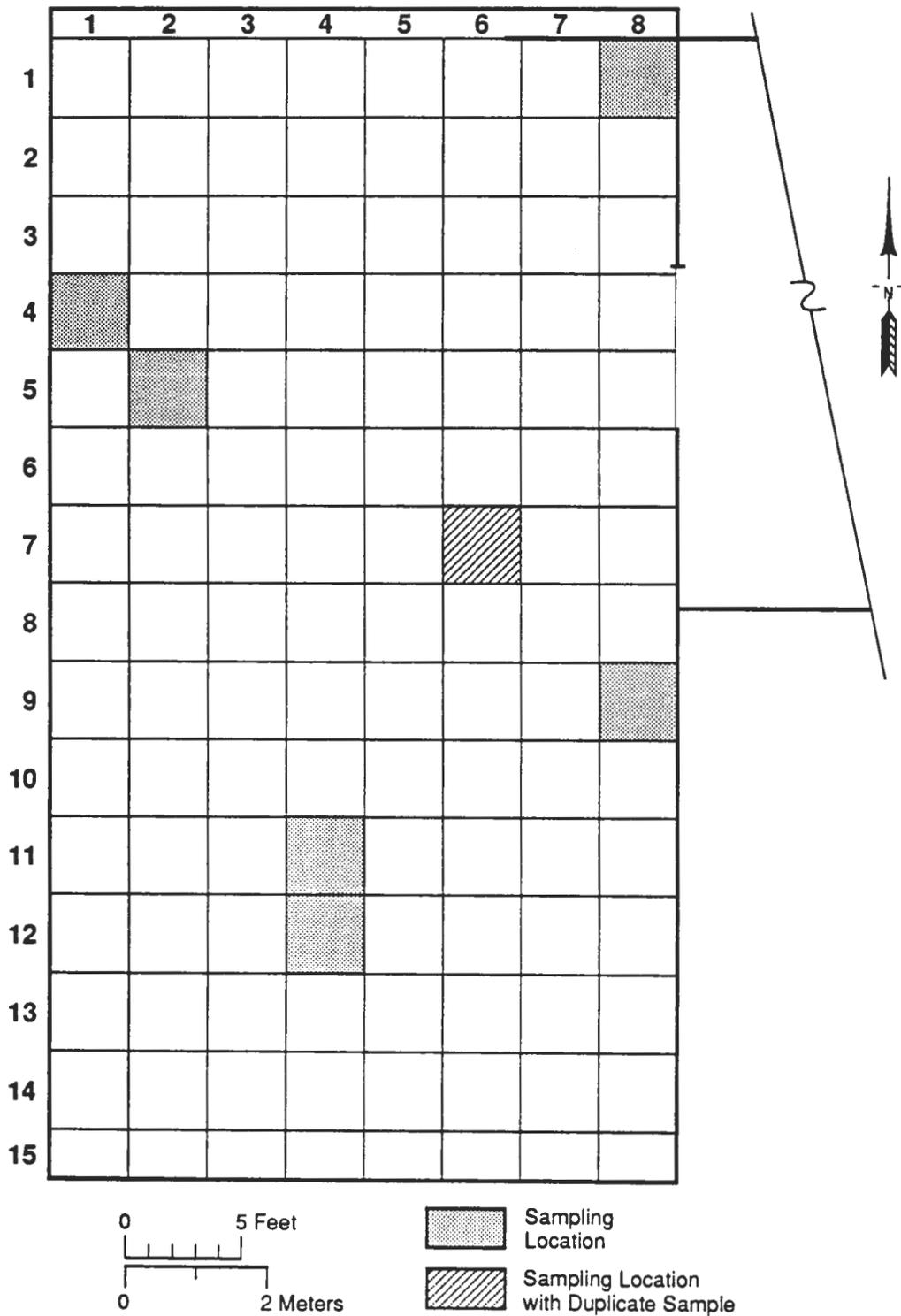
43
44 Figures 3 through 9 identify the sampling locations at the 304 Concretion
45 Facility. Sampling methodology and selection of the sampling locations is
46 discussed in the *304 Concretion Facility Closure Plan* (DOE-RL 1993a). Each
47 sampling area (wall or floor) was divided by a 1 meter by 1 meter grid.
48 Random sampling grid locations were then selected from within each area.
49

50
51 **5.2 CONCRETE CORE SAMPLING**

52
53 Concrete core samples will be collected at a total of 12 locations for
54 inorganics analysis and VOA. The sampling locations for concrete core samples

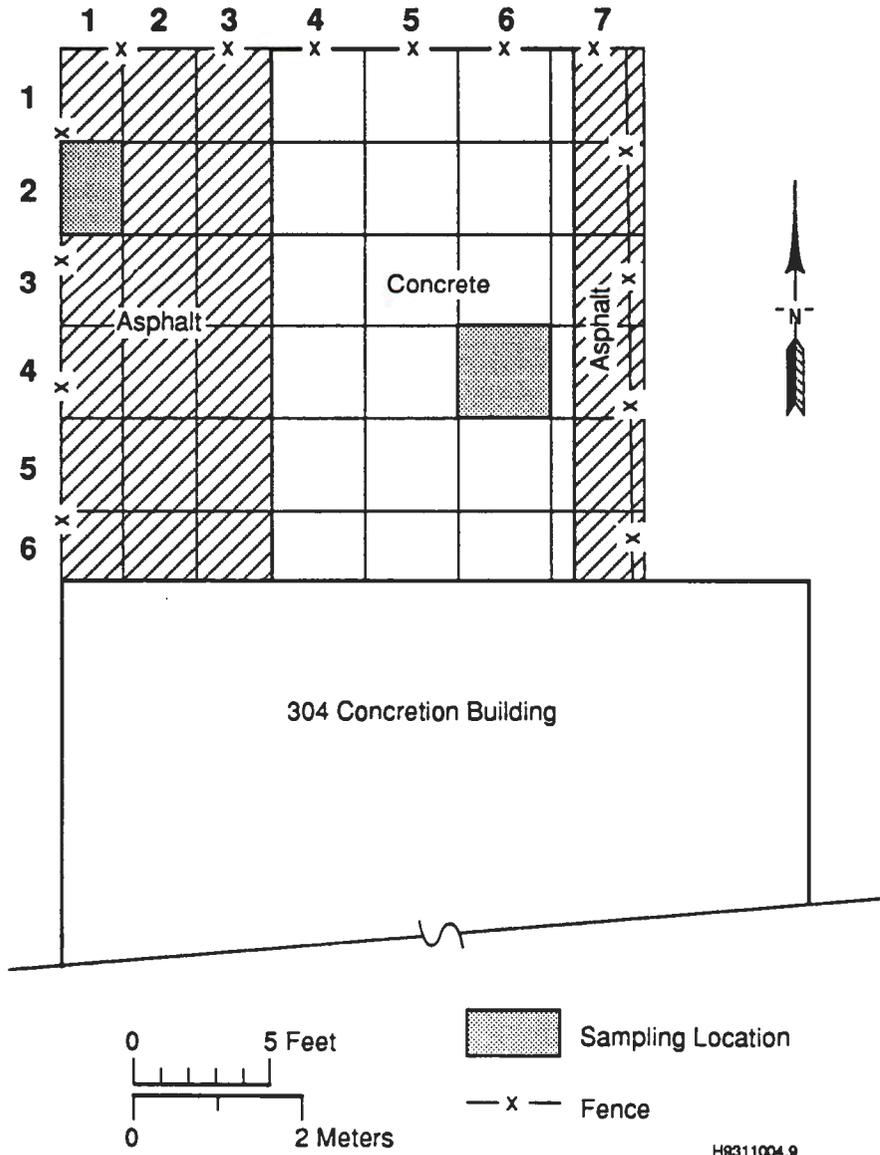
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Figure 3. 304 Concretion Facility, Building Floor
Concrete Core Sampling Locations.



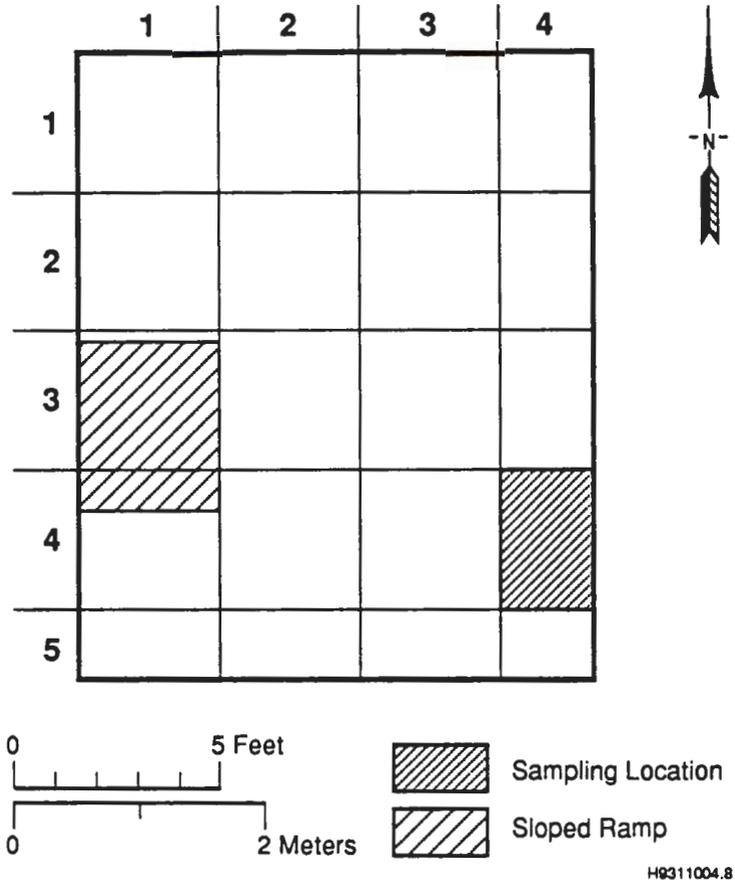
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Figure 4. 304 Concretion Facility, Outside Storage Pad Concrete and Asphalt Core Sampling Locations.



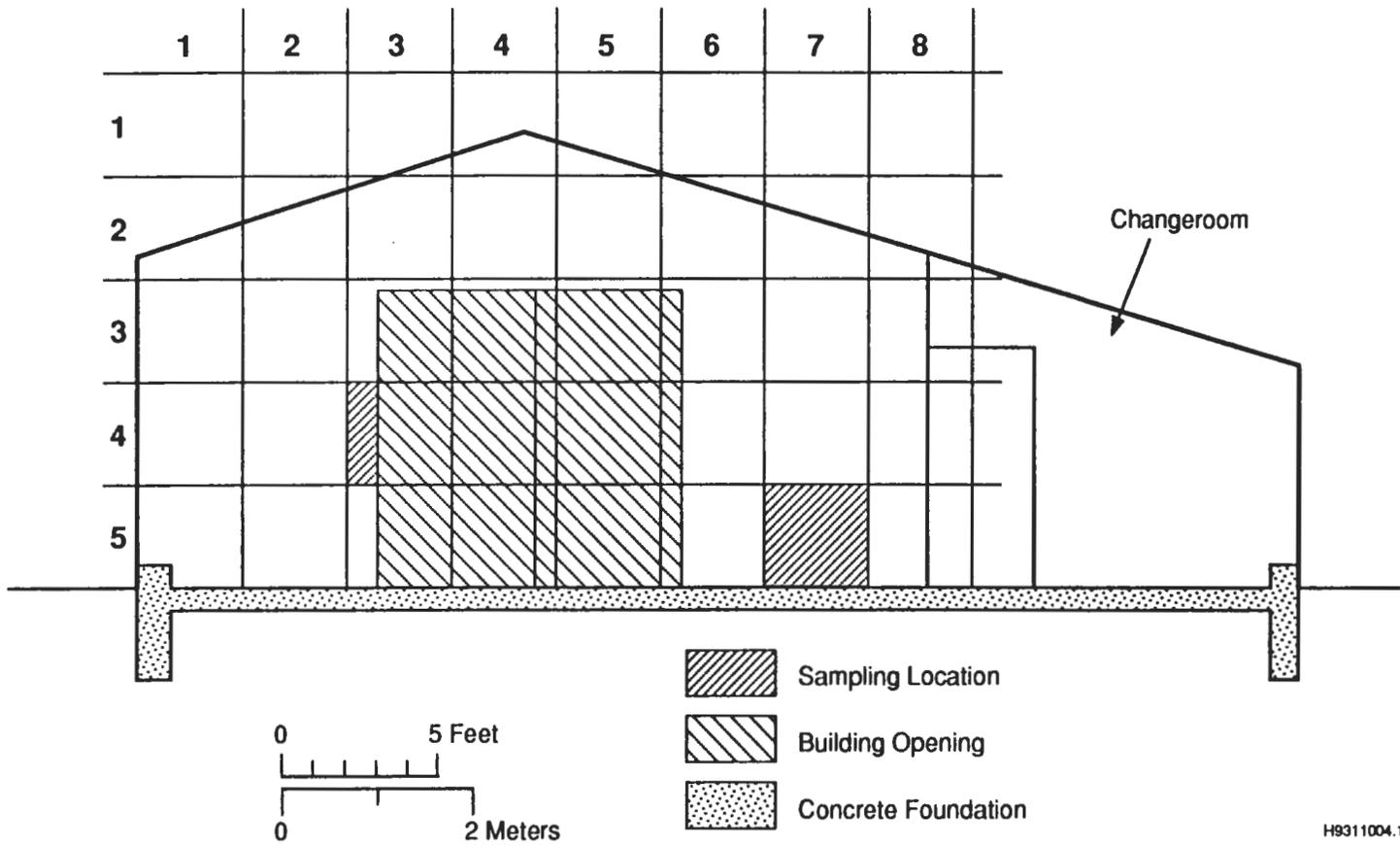
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Figure 5. 304 Concretion Facility, Changeroom Floor
Concrete Chip Sample Location.

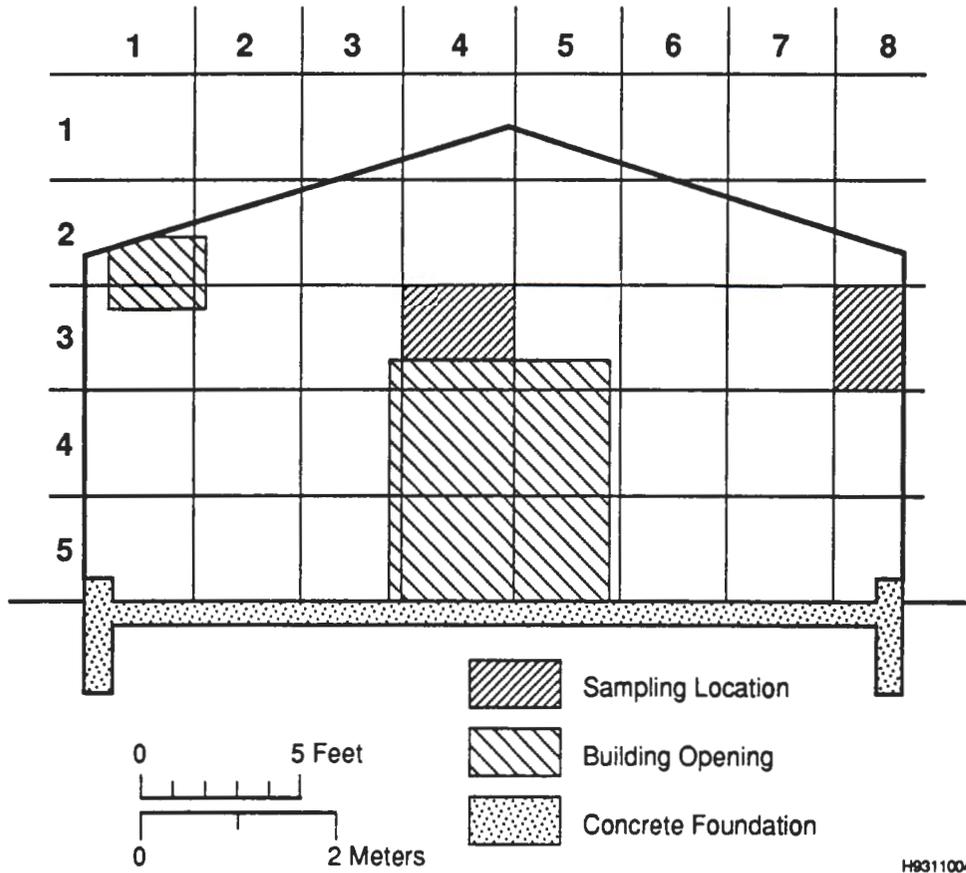


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1 Figure 6. 304 Concretion Facility, North Wall Wipe Sample Locations.

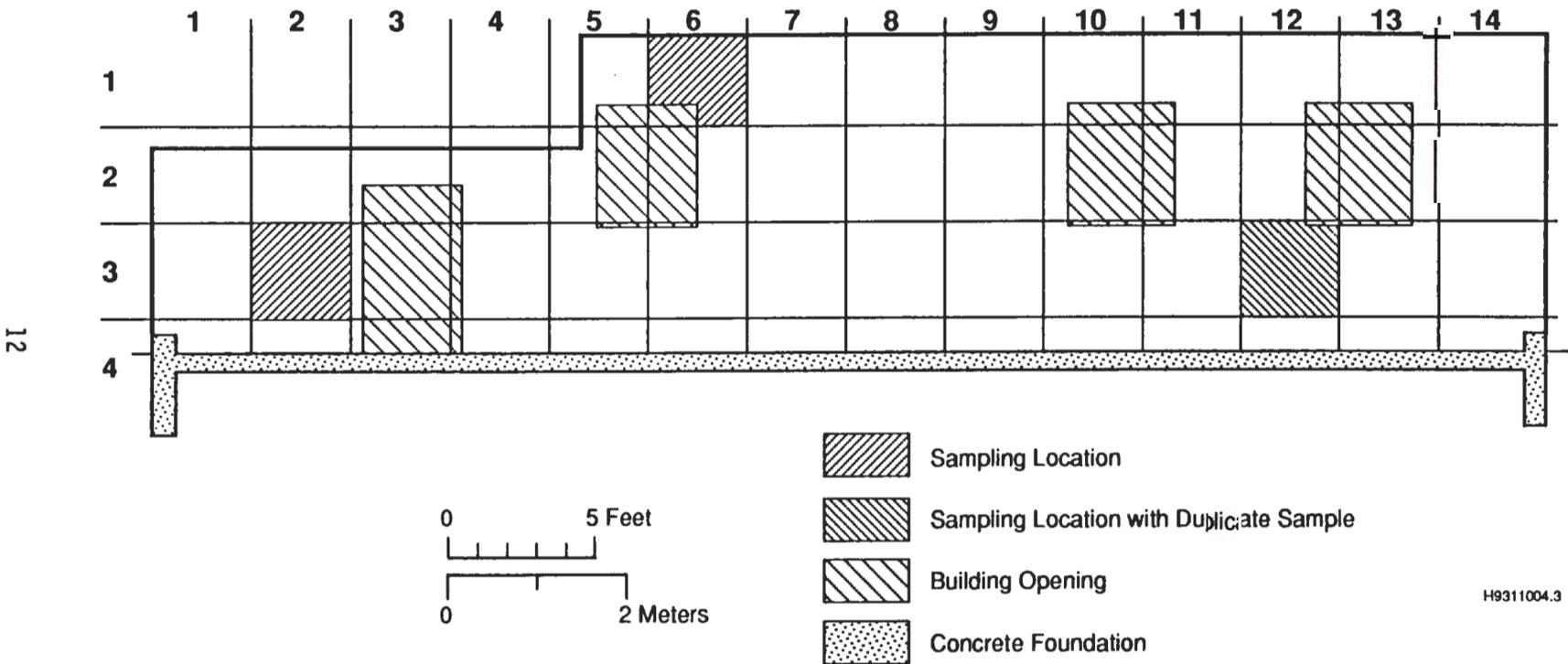


1 Figure 7. 304 Concretion Facility, South Wall Wipe Sample Locations.



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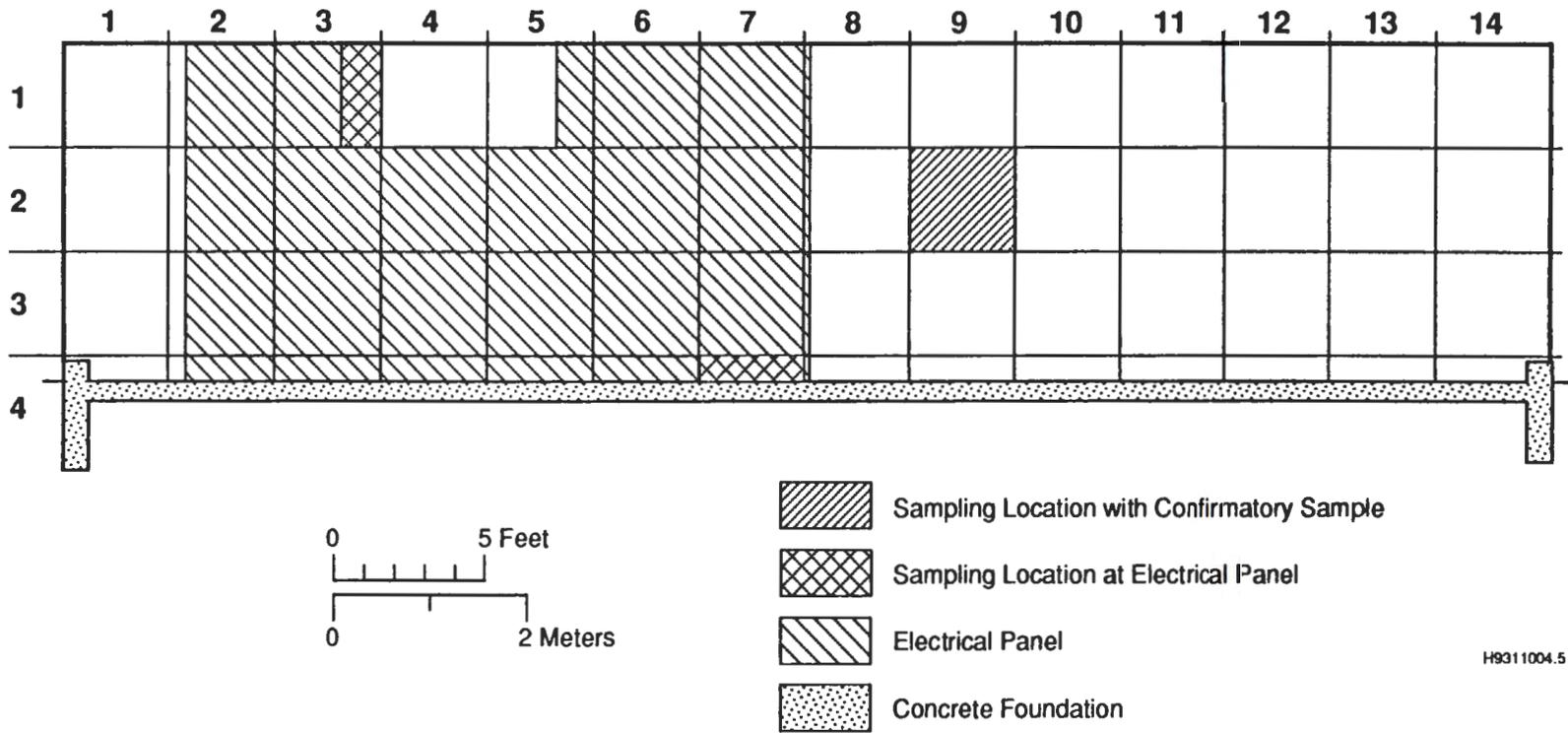
1 Figure 8. 304 Concretion Facility, East Wall Wipe Sample Locations.



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1 Figure 9. 304 Concretion Facility, West Wall Wipe Sample Locations.



H9311004.5

1 are shown in Figures 2, 3, and 4. The recommended core size is 4 inches.
2 Other core sizes may be used to meet sampling conditions. The cores will be
3 taken from the center area of each sampling grid. Separate cores will be
4 collected for inorganics analysis and VOA. The cores will be taken in a
5 manner that minimizes any overlap with other core samples.

6
7 The appropriate containers and lids (i.e., compatible) will be used for
8 the concrete core VOA samples. Sealable plastic bags may also be used if the
9 concrete cores cannot fit into a jar-type container. The type of container
10 used will be recorded in the field logbook.

11
12 There is no SW-846 method for collecting samples from concrete. The
13 sampling method or technique used will be identified and recorded in the field
14 logbook. The water used in coring will be vacuumed and containerized to
15 minimize cross-contamination and displacement of volatiles.

16 17 18 **5.3 CONCRETE CHIP SAMPLING**

19
20 Concrete chip samples will be collected at one location for inorganics
21 analysis. The sampling location for the concrete chip sample is shown in
22 Figure 5. The chips will be collected from the center of the sampling grid to
23 a depth of approximately 3/8 inch. The appropriate containers and lids (i.e.,
24 compatible) will be used for the concrete chip samples.

25
26 There is no SW-846 method for collecting chip samples from concrete. The
27 sampling method or technique used will be identified and recorded in the field
28 logbook.

29 30 31 **5.4 SOIL SAMPLING**

32
33 Soil samples will be collected at a total of 9 locations for VOA and
34 inorganics analysis. Four of the samples are co-located with the
35 authoritative concrete core samples taken from the floor of the facility, as
36 shown in Figure 2. Two of the soil sample locations are located on the
37 storage pad, as shown in Figure 2, with one each being taken by coring through
38 the concrete at the north and south expansion joints. The remaining three
39 soil samples are co-located with the asphalt samples from the east and west
40 sides of the building (Section 5.6). The appropriate containers and lids
41 (i.e., compatible) will be used for the soil VOA samples.

42
43 Most of the samples will be collected through the holes that result from
44 the concrete and asphalt coring operations. The concrete sampling is expected
45 to leave several holes in the concrete. A hole or holes specifically for soil
46 sampling will need to be drilled through the concrete at the expansion joints
47 shown in Figure 2. The Sampling Field Team Leader will determine the number
48 of holes that need to be drilled to collect the soil samples at the expansion
49 joints.

50
51 When possible, a different concrete core hole will be used for each level
52 and type (VOA or inorganic) of soil sample. The samples will be collected at

1 intervals of 0 to 6 inches, 6 to 18 inches, and 18 to 24 inches. At each
2 interval, one VOA sample and one inorganic analysis sample will be collected.
3 Hand tools will be used to collect the soil samples.

6 5.4.1 Additional Requirements for the Collection of VOA Soil Samples

8 No deviations are permitted from the requirements of this section. The
9 VOA soil samples will be collected as soon as possible after the concrete core
10 samples have been collected. Volatile organic analysis soil samples will be
11 collected the same day that the concrete cores are drilled. At any given
12 sampling interval, the VOA soil sample will be collected before the inorganics
13 sample. The VOA samples will be collected so that there is minimum or no
14 headspace in the containers. Mixing or homogenizing of the material
15 comprising the VOA sample is not allowed.

18 5.5 WIPE SAMPLING

20 Wipe samples will be collected at a total of 11 locations (10 wall and
21 1 girder) for inorganics analysis. Figures 6, 7, 8, and 9 show the locations
22 of the 10 wall samples for inorganics analysis. The 1 girder wipe sample is
23 to be collected from the top of one girder directly above the area where the
24 concretion process was located and where the fire occurred. As viewed from
25 Figure 2, the boundaries of this area are defined as follows:

- 27 • north boundary - an east-west line at the floor drain
- 28 • east boundary - a north-south line 8 feet east of the building center
29 line
- 30 • south boundary - an east-west line 10 feet from the south wall
- 31 • west boundary - a north-south line 8 feet west of the building center.

33 The specific girder will be chosen at the discretion of the Sampling Field
34 Team Leader and identified in the field logbook.

37 5.5.1 Wipe Sampling Methodology

39 The general wipe sampling methodology presented in *A Compendium of*
40 *Superfund Field Operations Methods* (EPA 1987) will be used. Wipe sampling of
41 surfaces will be performed by wiping a 100-square-centimeter area using
42 Whatman No. 42¹ filter paper or equivalent. The filter papers will be
43 laboratory-prepared with toxicity characteristic leaching procedure (TCLP)
44 extraction fluid number 2 and containerized in individual glass containers.
45 The TCLP extraction fluid number 2 will be prepared as specified in
46 Section 5.7.2 of SW-846 Method 1311. (Note: The TCLP extraction fluid is only
47 being used as a solvent for wipe sampling. No TCLP analysis will be
48 performed.)

50 The interior walls have been divided into 1-square-meter sample grids
51 (Figures 6, 7, 8, and 9). One filter paper will be used to wipe the wall

52 ¹Whatman No. 42 is a trademark of Whatman, Incorporated.

1 surface from a 100-square-centimeter section within each sample grid. The
2 entire 100-square-centimeter area within a disposable template will be
3 carefully covered, using vertical strokes, starting at one end and progressing
4 to the other end (Figure 10). The filter paper will be held using clean
5 gloves to prevent contamination. A new pair of gloves will be used for each
6 wipe sample. Care will be taken to wipe the surface only once throughout the
7 sampling effort.

8
9 The top of the one steel girder chosen for sampling will be wipe sampled
10 using the same technique as described previously. One 100-square-
11 centimeter area will be wipe sampled.

12
13 After the area is wiped, the filter paper will be folded with the exposed
14 side in, and then folded over to form a 90-degree angle in the center of the
15 filter. The filter then will be returned to the original glass container,
16 angle first, and immediately sealed.

17 18 19 **5.6 ASPHALT CORE SAMPLES**

20
21 Asphalt core samples will be collected at a total of four locations for
22 inorganics analysis. One asphalt core sample will be collected from a
23 location on the outside storage pad (Figure 4). In addition, two asphalt core
24 samples will be obtained from the west side of the 304 Building and one from
25 the east side. The exact sampling locations will be determined at the time of
26 sampling, and will be taken in places where contamination is most likely to
27 have occurred (e.g., cracks, asphalt joints, visible stains). The specific
28 locations will be chosen at the discretion of the Sampling Field Team Leader
29 and identified in the field logbook. The recommended core size is 4 inches.
30 Other core sizes may be used to meet sampling conditions. The cores will be
31 taken in a manner that minimizes any overlap with other core samples.
32 Sealable plastic bags may also be used if the asphalt cores cannot fit into a
33 jar-type container.

34
35 There is no SW-846 method for collecting core samples from asphalt. The
36 sampling method or technique used will be identified and recorded in the field
37 logbook. The water used in coring will be vacuumed and containerized to
38 minimize cross-contamination and displacement of volatiles.

39 40 41 42 **6.0 QUALITY CONTROL SAMPLES**

43
44
45 This section identifies the quality control samples for the sampling
46 effort at the 304 Concretion Facility.

47 48 **6.1 GENERAL INFORMATION**

49
50 Field quality control samples will be collected by the sampling team and
51 documented in the sampling logbook in accordance with EII 1.5, "Field
52 Logbooks" (WHC 1988). Deionized water will be used for the field and
53 equipment blanks because it provides the excellent sensitivity to
54 contamination. Table 2 presents a summary of the quality control samples for

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1 Table 2. Summary of 304 Concretion Facility Routine and Quality Control Samples.

2	3	Concrete	Concrete	Soil			Wipe ²	Asphalt
4	5	Core ¹	Chip	0 to 6	6 to 18	18 to 24		
4	NUMBER OF SAMPLE LOCATIONS	12	1	9			11	4
5	SAMPLING INTERVALS	na	na	0 to 6	6 to 18	18 to 24	na	na
6	(depth in inches)							
7	NUMBER OF SAMPLES							
8	Inorganic Analysis	12	1	9	9	9	11	4
9	Organic Analysis	12	na	9	9	9	na	na
11	DUPLICATE SAMPLES							
12	Inorganic Analysis	1	1	1	1	1	1	1
13	Organic Analysis	1	na	1	1	1	na	na
15	EQUIPMENT BLANK ⁴	V5	na	V5			1	V1
16	(Inorganic Analysis)							
17	CONFIRMATORY WIPE SAMPLE	na	na	na			1	na
18	(Inorganic Analysis)							
19	FIELD BLANKS ⁵	V5	na	V5			V1	V3
20	(Inorganic Analysis)							

- 21 NOTES:
- 22 1. Includes both the 4 authoritative and the 8 random concrete core samples.
- 23 2. Includes both the 10 random wipe samples and the 1 wipe sample from the girder.
- 24 3. Includes both the 1 random asphalt sample and the 3 asphalt core samples.
- 25 4. Frequency for each sample type: 1 per day of sampling and 1 after each time sampling equipment
- 26 undergoes field decontamination.
- 27 5. Frequency for each sample type: 1 per day of sampling or for each 20 samples collected.
- 28 V1 = Number of samples is variable; 1 expected, covering an estimated 1 day of sampling
- 29 V3 = Number of samples is variable; 3 expected, covering an estimated 3 days of sampling
- 30 V5 = Number of samples is variable; 5 expected, covering an estimated 5 days of sampling
- 31 na = not applicable

18

32

1 the 304 Concretion Facility. While the number of samples is sufficient to
2 determine if the 304 Facility can be clean-closed, there is not a sufficient
3 number of samples for a detailed statistical analysis. **6.1.1 Duplicate Samples**

4
5 Duplicate samples are included for each type of sample (concrete core
6 inorganic, concrete core VOA, concrete chip, asphalt core, soil inorganic,
7 soil VOA, and wipe). The purpose of the field duplicate samples is to
8 indicate the precision of sampling and analysis.

9
10 Duplicate samples are collected from the same location and using the same
11 methods or techniques as a regular sample, but placed in a separate container.

12 13 14 **6.1.2 Equipment Blanks**

15
16 Equipment blanks are included for each type of sample (concrete core
17 inorganic, concrete core VOA, concrete chip, asphalt core, soil inorganic,
18 soil VOA, and wipe). The purpose of the equipment blanks is to check for
19 sampling device cleanliness from the laboratory decontamination efforts.

20
21 The equipment blanks for concrete core, concrete chip, asphalt core, and
22 soil samples are collected using deionized water transported to the sampling
23 site. At the site, the deionized water is poured over or through the sample
24 collection device, collected, and returned for analysis.

25
26 The equipment blanks for wipe samples consist of filter paper saturated
27 with TCLP extraction fluid number 2. They remain sealed while in the field
28 and are returned for analysis. Additional details are provided in
29 Section 6.5.

30 31 32 **6.1.3 Field Blanks**

33
34 Field blanks will only be taken if field decontamination procedures are
35 used. The purpose of the field blanks is to check the effectiveness of the
36 field decontamination procedures to determine if there is contamination
37 originating in the sampling environment.

38
39 Field blanks for any field decontaminated equipment are collected by
40 pouring deionized water over or through the sampling device. Then the sample
41 is returned for analysis.

42
43 Field blanks for the wipe samples will be collected by removing the
44 filter paper (saturated with TCLP extraction fluid number 2) from the
45 container. The filter paper is then exposed to air for the same amount of
46 time required to collect a wipe sample, then returned to the original sample
47 container.

48
49
50

1 **6.1.4 Trip Blanks**

2
3 Trip blanks will not be included for the VOA samples. The reasons for
4 their exclusion are the following.

- 5
6 • Neither sand nor deionized water is a suitable medium for a trip blank
7 for soil. Sand has little to no affinity for adsorbing volatile
8 organics. Water absorbs organics, whereas soil primarily adsorbs
9 organics; because the mechanism is different, water is not a suitable
10 material for the trip blanks.
11
12 • The field and equipment blanks will 'trip' with the routine samples
13 and will contain any volatile contamination that may be present.
14
15

16 **6.2 CONCRETE CORE FIELD QUALITY CONTROL SAMPLES**

17
18 The quality control requirements for concrete core samples are as
19 follows.

- 20
21 • One duplicate concrete core sample will be collected for inorganic
22 analysis. The sample will be collected from the random sample
23 location shown in Figure 3.
24
25 • One duplicate concrete core sample will be collected for VOA. The
26 sample will be collected from the random sample location shown in
27 Figure 3.
28
29 • One equipment blank (deionized water) will be collected for inorganic
30 analysis per day of sampling.
31
32 • If field decontamination procedures are used, one field blank will be
33 collected after decontamination. One field blank (using deionized
34 water) will be collected per day of sampling or for each 20 samples.
35

36 The cores will be collected as close to each other as possible.
37
38

39 **6.3 CONCRETE CHIP FIELD QUALITY CONTROL SAMPLES**

40
41 The quality control requirements for concrete chip samples are as
42 follows.

- 43
44 • One duplicate concrete chip sample will be collected for inorganic
45 analysis. The sample will be collected from the random sample grid
46 location shown in Figure 5.
47
48 • One equipment blank (deionized water) will be collected for inorganic
49 analysis per day of sampling.
50

- 1 • If field decontamination procedures are used, one field blank will be
2 collected after decontamination. One field blank (using deionized
3 water) will be collected per day of sampling.
4
5

6 6.4 SOIL FIELD QUALITY CONTROL SAMPLES 7

8 The quality control requirements for soil samples are as follows.
9

- 10 • Three duplicate soil samples will be collected for VOA. Duplicate
11 soil samples will be collected at 0 to 6-inch, 6 to 18-inch, and 18 to
12 24-inch intervals. The sample will be collected from the sump
13 sampling location shown in Figure 2. This location was chosen because
14 it has a greater potential for volatile organics contamination.
15
16 • Three duplicate soil samples will be collected for inorganic analysis.
17 Duplicate soil samples will be collected at 0 to 6-inch, 6 to 18-inch,
18 and 18 to 24-inch intervals. Each duplicate sample will be collected
19 on different sampling days. One of the samples will be collected from
20 the floor drain sampling location shown in Figure 2. The other two
21 samples will be collected from locations determined by the Sampling
22 Field Team Leader and the locations recorded in the field logbook.
23
24 • One equipment blank (deionized water) will be collected for inorganic
25 analysis per sampling day.
26
27 • If field decontamination procedures are used, one field blank will be
28 collected after decontamination. One field blank (using deionized
29 water) will be collected per day of sampling or for each 20 samples.
30
31

32 6.5 WIPE FIELD QUALITY CONTROL SAMPLES 33

34 The quality control requirements for wipe samples are as follows.
35

- 36 • One duplicate wipe sample will be collected for inorganic analysis.
37 The duplicate will be collected from a 100-square-centimeter area
38 adjacent to the original sample, i.e. within the 1-square-meter sample
39 grid. The sample will be collected from the random sample grid
40 location shown in Figure 8.
41
42 • One equipment blank (clean filter paper saturated with TCLP extraction
43 fluid number 2) will be collected for inorganic analysis. This sample
44 will remain sealed during the sampling event and the filter paper will
45 not be handled in the field.
46
47 • One field blank (using clean filter paper saturated with TCLP
48 extraction fluid number 2) will be collected per day of wipe sampling
49 or for each 20 samples. The filter paper will be removed from the
50 container (with the sampler wearing clean gloves) and exposed to air
51 for the same amount of time required to collect a wipe sample.
52

1 In addition to the quality control samples listed, one confirmatory wipe
2 sample will be collected. This sample will only be taken once during the
3 sampling of the 304 Concretion Facility. The purpose of this sample is to
4 determine if wipe samples are effective.

- 5
- 6 • One confirmatory wipe sample will be collected for inorganic analysis.
7 The confirmatory sample will be collected from the same 100-square-
8 centimeter area as the original wipe sample. The sample will be
9 collected from the random sample grid location shown in Figure 9.

10

11

12 6.6 ASPHALT CORE FIELD QUALITY CONTROL SAMPLES

13

14 The quality control requirements for asphalt core samples are as follows.

- 15
- 16 • One duplicate asphalt core sample will be collected for inorganic
17 analysis. The sample will be collected from the same sample location
18 as the asphalt core sample collected on the outside east of the
19 building (Section 5.6).
- 20
- 21 • One equipment blank (deionized water) will be collected for inorganic
22 analysis per pay of sampling.
- 23
- 24 • If field decontamination procedures are used, one field blank will be
25 collected after decontamination. One field blank (using deionized
26 water) will be collected per day of sampling or for each 20 samples.
- 27

28 The cores will be collected as close to each other as possible.
29
30
31

32 7.0 LABORATORY ANALYSIS

33

34

35 Laboratory analysis will be performed on the samples to determine the
36 concentration and, for wipe samples, the amount of the constituents of concern
37 that remain at the 304 Facility after decontamination.
38
39

40 7.1 CONSTITUENTS OF CONCERN

41

42 The samples to be analyzed for inorganic constituents are as follows:

- 43
- 44 • concrete core inorganic samples
- 45 • soil inorganic samples
- 46 • asphalt samples
- 47 • concrete chip samples
- 48 • wipe samples.
- 49
- 50

1 The inorganic constituents of concern are as follows:

- 2
- 3 • Beryllium
- 4 • Cadmium
- 5 • Chromium
- 6 • Lead
- 7 • Nickel
- 8 • Uranium.
- 9

10 The samples to be analyzed for volatile organic constituents are as follows:

- 11
- 12 • concrete core organic samples
- 13 • soil organic samples.
- 14

15 The volatile organic constituents of concern are as follows:

- 16
- 17 • Trichloroethylene
- 18 • Tetrachloroethylene
- 19 • 1,1,1-Trichloroethane
- 20 • 1,1-Dichloroethylene
- 21 • cis-1,2-Dichloroethylene
- 22 • trans-1,2-Dichloroethylene
- 23 • Methyl ethyl ketone.
- 24

25 The analytical methods are identified in Section 7.5.

26
27

28 **7.2 SAMPLE PREPARATION FOR CONCRETE CORE, CONCRETE CHIP,**
29 **AND ASPHALT CORE INORGANIC SAMPLES**

30
31 Before the concrete core, concrete chip, and asphalt core samples can be
32 analyzed for inorganics, it may be necessary to crush or break-up the samples
33 to reduce the size of the material sent for analysis. Size reduction may
34 occur in either the field or the laboratory. If size reduction occurs in the
35 field, the sample number, technique used for reduction, and any other
36 pertinent or relevant information, will be documented in the field logbook.

37
38

39 **7.3 SAMPLE PREPARATION FOR CONCRETE ORGANIC SAMPLES**

40
41 The preparation of the concrete organic samples will be performed at the
42 222-S Analytical Laboratory. Before the concrete cores can be analyzed for
43 volatile organics, additional laboratory preparation is required. Before
44 analysis, the concrete core will be handled according to *Preparation of*
45 *Concrete for Volatile Organics Analysis*, (WHC 1994). The resulting extractant
46 from each sample will be analyzed at the 222-S Analytical Laboratory for
47 volatile organics in accordance with Section 7.5.

48
49
50

1 **7.4 SAMPLE PREPARATION FOR WIPE SAMPLES**

2
3 Before the wipe samples can be analyzed for inorganics, additional
4 laboratory preparation is required. Each wipe sample will be handled
5 according to *Acid Digestion of Sediments, Sludges, and Soils*, SW-846 Method
6 3050 (EPA 1986). The resulting extractant from each sample will be analyzed
7 for inorganics in accordance with Section 7.5.

8
9
10 **7.5 ANALYTICAL METHODS**

11
12 The SW-846 analytical methods (EPA 1986) will be used for the sample
13 analysis, except for uranium. The uranium results will be determined by
14 SCINTREX UA-2 laser method², Eastern Environmental Radiation Facility
15 Method 00.07 (EPA 1984) or Laser Kinetic Phosphorimetric Analysis. The
16 inorganics analysis methods are as follows:

- 17
18 • Method 6010, Inductively coupled plasma-atomic emission spectroscopy
19 (analysis will be for the target analyte list. Except for lead, this
20 list includes the inorganic constituents of concern listed in
21 Section 6.1)
22
23 • Method 7421, Lead (Atomic Absorption, Furnace Technique)
24
25 • SCINTREX UA-2 laser method, EERF Method 00.07, or Laser Kinetic
26 Phosphorimetric Analysis.

27
28 The VOA methods are as follows:

- 29
30 • Method 8260, Volatile organic compounds by gas chromatograph/mass
31 spectroscopy capillary column technique
32
33 • Method 8015, Nonhalogenated volatile organics by gas chromatograph.
34
35

36 **7.6 DATA REQUIREMENTS FOR THE ANALYTICAL LABORATORIES**

37
38 The 222-S Laboratory is required to record and provide sufficient data in
39 the performance of any preparation and analysis of the concrete VOA samples to
40 support the data validation described in Section 8.0. The contract laboratory
41 is required to supply stand-alone data packages to support full data
42 validation.
43

44
45 **7.7 BATCHING OF INORGANIC SAMPLES**

46
47 The inorganic samples will be batched for analysis, providing holding
48 times are not violated. The inorganic samples consist of 12 concrete core

49 ²SCINTREX is a trademark of SCINTREX, Incorporated.

1 inorganic, 27 soil inorganic, 11 wipe, 1 concrete chip, and 4 asphalt core
2 samples and the associated quality control samples. The concrete core organic
3 and soil organic samples will not be batched.

8.0 DATA VALIDATION

10 Data validation will be conducted to Level D as defined in the *Data*
11 *Validation Procedures For Radiological Analysis* (WHC 1993a) and *Data*
12 *Validation Procedures For Chemical Analyses* (WHC 1993b), as appropriate.
13 Level D validation consists of the following:

- 14 • verification of required deliverables
- 15 • verification of requested versus reported analyses
- 16 • verification of transcription errors
- 17 • evaluation and qualification of results based on analytical holding
- 18 times
- 19 • matrix spikes
- 20 • laboratory control samples (radiological samples only)
- 21 • laboratory duplicates
- 22 • analytical method blanks
- 23 • chemical recoveries
- 24 • tracer recoveries
- 25 • surrogate recoveries
- 26 • initial and continuing instrument calibrations
- 27 • quench monitoring
- 28 • counting instrument resolution checks
- 29 • calculation checks.

31
32 There will be 100 percent validation of the data because of the small
33 size of the sample set and that similar types of samples (e.g., all wipe
34 samples) can be batch analyzed at the analytical laboratory.

9.0 REFERENCES

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29
30

METRIC CONVERSION CHART

Into metric units

Out of metric units

If you know	Multiply by	To get	If you know	Multiply by	To get
Length			Length		
inches	25.40	millimeters	millimeters	0.0393	inches
inches	2.54	centimeters	centimeters	0.393	inches
feet	0.3048	meters	meters	3.2808	feet
yards	0.914	meters	meters	1.09	yards
miles	1.609	kilometers	kilometers	0.62	miles
Area			Area		
square inches	6.4516	square centimeters	square centimeters	0.155	square inches
square feet	0.092	square meters	square meters	10.7639	square feet
square yards	0.836	square meters	square meters	1.20	square yards
square miles	2.59	square kilometers	square kilometers	0.39	square miles
acres	0.404	hectares	hectares	2.471	acres
Mass (weight)			Mass (weight)		
ounces	28.35	grams	grams	0.0352	ounces
pounds	0.453	kilograms	kilograms	2.2046	pounds
short ton	0.907	metric ton	metric ton	1.10	short ton
Volume			Volume		
fluid ounces	29.57	milliliters	milliliters	0.03	fluid ounces
quarts	0.95	liters	liters	1.057	quarts
gallons	3.79	liters	liters	0.26	gallons
cubic feet	0.03	cubic meters	cubic meters	35.3147	cubic feet
cubic yards	0.76	cubic meters	cubic meters	1.308	cubic yards
Temperature			Temperature		
Fahrenheit	subtract 32 then multiply by 5/9ths	Celsius	Celsius	multiply by 9/5ths, then add 32	Fahrenheit

Source: *Engineering Unit Conversions*, M. R. Lindeburg, PE., Second Ed., 1990, Professional Publications, Inc., Belmont, California.

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