

NOTICE

All drawings located at the end of the document.

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE FINAL PHASE I RFI/RI WORK PLAN FOR OPERABLE UNIT 5 WOMAN CREEK PRIORITY DRAINAGE	Manual No.: Procedure No.: Page: Effective Date: Organization:	21100-WP-OU 05.1 Table of Contents, Rev 10 1 of 2 02/07/95 Environmental Management
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DOCUMENT CLASSIFICATION REVIEW WAIVER
PER R.B. HOFFMAN, CLASSIFICATION OFFICE
JUNE 11, 1991

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Refer to 1-A01-PPG-001 for Processing Instructions.
 Print or Type All Information (Except Signatures)

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2. or 3. Document Number/Revision WP-OU05.1/Rev. 9	3. Document Title: FINAL PHASE I RFI/RI WORKPLAN FOR OPERABLE UNIT 5 WOMAN CREEK PRIORITY DRAINAGE, Volume III - Text to Technical Memorandum No. 15 - Amended Field Sampling Plan
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8. Item	9. Page	10. Step	11. Proposed Modifications
9	3-22	3.2.2.1	First paragraph, third sentence, insert revised Figure 3.2.2.1-1 into appendix under Figures.
10	3-22	3.2.2.1	After first paragraph and four bullet items add the following paragraph. An eighth borehole will be drilled to geologically and chemically characterize the surface and subsurface materials in the additional TDEM anomaly identified at TDEM survey coordinates 540 East and 180 South (Figure 3.2.2.1-1). The area is approximately 5 by 8 feet in area and described as a small oblong mound.
11	3-27	3.4.2	First paragraph, insert revised Table 3.4.2-1
12	3-27	3.4.2.1	Second paragraph, first sentence, replace the first sentence with the following sentence. To provide full HPGe coverage of the areas of interest a grid spacing of 150 ft will be used.
13	3-28	3.4.2.1	<p>After second paragraph, insert the following paragraphs and add Figures 3.4.2.1-3 and 3.4.2.1-4 to the appendix under Figures. The HPGe survey indicated 24 anomalous areas with detectable americium-241 within IHSS 209, the Surface Disturbance West of IHSS 209, and the Surface Disturbance South of the Ash Pits (Figures 3.4.2.1-3 and 3.4.2.1-4). A FIDLER survey of the HPGe anomalous areas detected readings above background at six HPGe locations in IHSS 209 and the Surface Disturbance South of The Ash Pits. These anomalies are as follows:</p> <p><u>IHSS 209</u></p> <p>K-56: K-56A (25 West/4 North), approximately 46 ft south of HPGe station K-56, was frisked with a Bicon B-50 beta/gamma probe with net readings of 66 cpm, 35 cpm, 70 cpm, and 61 cpm.</p> <p>K-57: K-57A (10 West/90 North), approximately 60 ft northeast of HPGe station K-57, showed FIDLER counts of 350 cpm above background.</p> <p>L-55: L-55A (0 West/100 North), located at the NNE corner of L-55 grid, showed elevated FIDLER counts of 500-600cpm above background.</p> <p>H-60: following are anomaly coordinates with counts above background. (0 West/10 North) 600 cpm (8 West/65 North) 750 cpm (16 West/60 North) 600 cpm (28 West/55 North) 600 cpm (28 West/96 North) 650 cpm (36 West/25 North) 625 cpm</p> <p>I-62: following are anomaly coordinates with counts above background. (100 West/50-100 North) 350 cpm (92 West/50 North) 600 cpm (66 West/30 North) 600 cpm</p> <p><u>Surface Disturbance South of the Ash Pits</u></p> <p>M-14: M-14A (90 West/90 North), located approximately 70 ft northwest of HPGe station M-14, showed elevated FIDLER counts of approximately 750 cpm above background.</p> <p><u>Summary</u></p> <p>As stated above, the results of both the HPGe survey and the FIDLER survey(s) and proposed surface soi sampling locations were submitted to EPA and CDH in a brief letter report.</p> <p>A total of six samples will be collected from the five anomalies within IHSS 209 (Figure 3.4.2.1-3). One sample each will be collected at anomalies K-56A and L-55A. Two samples each will be collected from the anomalies identified at stations H-60 and I-62. The relatively low activities detected with the FIDLER at the latter two stations do not warrant the collection of surface-soil samples at the location of each anomaly. Therefore, one sample will be collected at the two anomalies with the greatest number of counts. At station H-60, one sample will be collected at coordinates 8 West/65 North and one will be collected at coordinates 28 West/96 North. Similarly, one sample will be collected from the two anomalies with the greatest number of counts at station I-62 (coordinates 92 West/50 North and 66 West/30 North). Due to the relatively low activities detected with the FIDLER survey at anomaly K-57A, the collection of surface-soil samples at this location is not warranted.</p> <p>One sample will be collected from anomaly M-14A at the Surface Disturbance South of the Ash Pits (Figure 3.4.2.1-4). As discussed in Section 3.4.1, a relatively high activity of plutonium-239/240 was detected in a surface-soil sample collected from the Surface Disturbance West of IHSS 209 (sample SS50075AS). The plutonium-239/240 activity detected at this location was the primary reason that additional radiological surveys and surface-soil sampling was necessary at these sites. Although, the HPGe survey did not detect americium-241 and plutonium-239/240 in the vicinity of this location, an additional surface-soil sample will be collected at this location (Figure 3.4.2.1-3) as a verification and quality control check.</p> <p>All of the surface-soil samples to be collected from IHSS 209 and other surface disturbances will be collected using the Rocky Flats Method as outlined in GT.08, Surface Soil Sampling. The samples will be submitted to a laboratory for analysis of plutonium-239/240and americium-241. One duplicate and one rinsate sample will also be collected and analyzed for the same parameters.</p>

12. Justification (Reason for Modification, EJO#, TP#, etc.)

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to revise the bedrock topography in OU5. Two of the cased geotechnical borings will be converted to unweathered bedrock monitoring well, see Section 3.1.2.3.

To facilitate the access of the hollow-stem auger drill rig to the geotechnical borings located in the central landslide area, the subcontractor will coordinate with EG&G Construction Management, Heavy Equipment and Labor, Trucking, and Ecology and Watershed Management for the purpose of constructing a temporary fill road. The temporary fill road will be located as shown on Figure 3.1.2.2-1. The temporary fill road will be placed without excavating or disturbing the existing hillside to allow level access for the drill rig to the boring location. Heavy Equipment and Labor and Trucking will provide the necessary heavy equipment consisting of, but not limited to, a front-end loader, dump truck, and bulldozer. Clean fill material will be provided by Heavy Equipment and Labor and compacted in place with the bulldozer or front-end loader. Ecology and Watershed Management will clear the access route and provide direction regarding reseeding and revegetating the fill material at completion of the task. Access to the temporary fill road will be blocked by trenching at the east end of each fill material placement area upon completion of the task.

Core samples will be retained in core boxes and logged in accordance with SOP GT.1. Logging Alluvial and Bedrock Material. Core samples will not be submitted for environmental chemical analysis. However, if field screening indicates the potential for contaminants, environmental samples will be collected for analysis for OU5 target analytes (Table 3.1.2-1). Soil cuttings generated from within IHSS 115 will be composite sampled, one per four drums, and managed in accordance with the following SOPs: FO.8, Handling of Drilling Fluids and Cuttings; FO.10, Receiving, Labeling, and Handling Environmental Material Containers; FO.23, Management of Soil and Sediment Investigative Derived Materials (IDM); and FO.29, Disposition of Soil and Sediment Investigation Derived Materials. Boreholes located outside of IHSS 115 and adjacent

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3.1.2.3 Groundwater Investigation

In order to more completely evaluate the presence and quality of groundwater at and downgradient of the Original Landfill, additional groundwater samples need to be collected and analyzed. Since the presence and quantity of groundwater appears to be limited, this task shall consist of three work elements:

- 1) install and develop up to 9 piezometers, 5 mini-wells, and 5 deep bedrock (LHSU) monitoring wells (Figure 3.1.2.2-1);
- 2) measure water levels in all well points, mini-wells, piezometers, and monitoring wells that are along or north of Woman Creek, south of the south Buffer-Zone access road, east of the western edge of IHSS 115 (approximately CPT07393), and west of the eastern edge of IHSS 115 (approximately CPT05393) on a monthly basis for one year; and
- 3) obtain samples from any location that is downgradient of the landfill if water level measurements indicate presence of a sufficient quantity of water.

The purpose of installing the nine piezometers and five mini-wells is to further characterize the present or absence of groundwater. The nine piezometers to be installed will be constructed in the geotechnical boreholes (see Section 3.1.2.2) where groundwater is encountered. The five proposed mini-well locations are placed in 1) bedrock lows that were identified during the CPT investigation (but water was not detected), and 2) between existing well points. Of the five mini-wells to be installed, four shall be installed downgradient of IHSS 115 and one shall be installed on the upper level part of the eastern end of IHSS 115 in the vicinity of borehole 50792. This latter location will be used for only water level input for the hydrogeologic model and not sampling. These mini-wells will be installed using a small all-terrain vehicle rig which does not produce soil cuttings. Composite soil samples will be collected during drilling in accordance with the procedures outlined in TM7 (EG&G, 1993e). In addition, discrete samples

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will be collected at 2-foot intervals for VOC analyses. Analytical parameters for soil samples will be the same as specified in the OU5 Work Plan (see Table 3.1.2-1).

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Three bedrock monitoring wells will be installed to evaluate the potential for hydraulic interaction between the groundwater from the Upper Hydrostratigraphic Unit (UHSU), consisting of alluvial and weathered bedrock materials, and the Lower Hydrostratigraphic Unit (LHSU), unweathered bedrock materials. The bedrock monitoring wells will be installed in an attempt to identify possible sandstone units, fracture zones, or other potential water bearing intervals in the LHSU. Figure 3.1.2.2-1 shows the location of the three bedrock monitoring well locations around IHSS 115 (the old landfill). There will be three wells installed, one upgradient and two downgradient. In addition, the bedrock wells are located near UHSU wells or mini-wells for evaluation of vertical hydraulic gradients. Two of the geotechnical borings will be converted to deep bedrock monitoring wells with the same purpose as stated above and to evaluate the potential presence of an inferred fault trace in the area of the Old Landfill. The first location to be converted is northeast of the former pond area (IHSS 196) and north of the borehole cluster 58393, 58493, and 58593 (Figure 3.1.2.2-1). The second location to be converted is the geotechnical boring location at the west end of the temporary fill road (Figure 3.1.2.2-1). These two locations will also have a shallow piezometer/monitoring well installed adjacent to the deep bedrock monitoring wells to collect additional geotechnical soil samples and to monitor for UHSU groundwater.

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Borings will be drilled in accordance with SOPS GT.2, Drilling and Sampling Using Hollow-Auger Drilling Techniques and GT.4, Rotary Drilling and Rock Coring. A 6-inch or eight-inch nominal diameter, schedule 80 PVC, surface casing will be grouted a minimum of 3 feet into unweathered bedrock in accordance with SOP GT.3, Isolating Bedrock from Alluvium with Grouted Surface Casing. Based on existing boring log information, this depth will be approximately 20 to 40 feet below ground surface. The borings will be advanced to an approximate depth of 150 feet or 15 feet past a potential water bearing interval, if the water bearing interval is encountered at a depth less than 150 feet. The borings will be geophysically

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Field QC samples will be collected for both soil and groundwater samples. Duplicate samples will be collected with the frequency of one duplicate sample per 10 real samples. Rinsate samples will be collected with the frequency of one rinsate sample per 20 real samples or a minimum of one rinsate sample per day of sampling. Because groundwater sampling equipment is dedicated, the instrument probes used to measure field parameters will be rinsed to obtain the groundwater rinsate samples. One VOC trip blank will be prepared and will accompany each groundwater sampling crew per cooler per day.

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Due to the fact that any VOCs would have been destroyed during the incineration process, volatile chemical species are not a concern at IHSS 133. Therefore, no field work to measure the emission rates of volatile species is proposed for IHSS 133.

3.2.2 Field Sampling Plan

This section details the amended FSP for the IHSS 133 sites. Table 3.2.2-1 summarizes the amended FSP for the IHSS 133 sites.

3.2.2.1 Investigation of TDEM Anomalies

The results of the TDEM survey indicate that many geophysical anomalies are present throughout IHSS 133. Although some of these geophysical anomalies are associated with known trenches and ash pits, many more anomalies appear to exist in this area, but their origins are as yet unknown. These anomalies may be associated with either surface metallic debris not observed at the time of the survey due to snow cover, or previously unknown trenches and pits, which require further investigation.

Comprehensive field inspection will be performed over the entire geophysical survey grid to identify areas where surface metallic debris (i.e., cans and fence posts) is present. The source of the anomalies will be documented in field books or on maps and will include the approximate grid coordinates and type of debris. If a source cannot be identified for a mapped anomaly, this will be also documented. A TDEM anomaly was identified that is not associated with surface debris, therefore, an additional work element will be performed to investigate the source and characteristics of the anomaly per the letter proposed to EPA and CDH.

Soil boreholes will be drilled to geologically and chemically characterize the surface and subsurface materials within the four anomalous areas identified from the TDEM survey that seem to be associated with possible trenches (see discussion in Section 2.5.2.2.3 of Volume 2). These soil boreholes will also assist in assessing the lateral and vertical extent of the trenches and pits. Seven boreholes (Figure 3.2.2.1-1) will be drilled in these four anomalous areas. Specifically,

- one borehole will be located approximately 10 ft southeast of the concrete pad, in the north-central portion of IHSS 133,
- two soil boreholes will be advanced at a location approximately 25 ft north of IHSS 133.6 and 25 ft south of the dirt road underneath the power lines,
- one borehole will be drilled at IHSS 133.4, in the center of the TDEM anomaly associated with the northern trench, approximately midway between existing boreholes 55993 and 56093C, and
- three boreholes will be advanced on either end and the center of the geophysical anomaly between IHSS 133.3 and IHSS 133.4, approximately 20 ft south of the dirt road beneath the power lines.

An eighth borehole will be drilled to geologically and chemically characterize the surface and subsurface materials in the additional TDEM anomaly identified at TDEM survey coordinates 540 East and 180 South (Figure 3.2.2.1-1). The area is approximately 5 by 8 feet in area and described as a small oblong mound.

All drilling and sampling activities will be conducted in accordance with the procedures outlined in TM7 and as defined by EG&G's SOPs. These soil samples will be analyzed for TAL metals, uranium-233/234, uranium-235, uranium-238, plutonium-239/240, americium-241, gross

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alpha, and gross beta. Ten percent of the soil samples collected will also be analyzed for grain-size distribution (+200 fraction).

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In addition, the TDEM anomalies or existing known trenches observed with representative ash pit material will have bulk soil samples collected for solidification treatability studies. The bulk sample will be collected using the large diameter Kansas sampler and placed into DOT 3-gallon or 5-gallon containers. Bulk soil samples will be analyzed for the above referenced target analytes.

Due to the overhead powerlines, it is anticipated that all of the drilling will be accomplished with small rigs using the Kansas sampler. This type of borehole also offers the advantage over HSA boreholes in that there are no cuttings and only small quantities of residual soil from sampling that need to be handled (disposed).

samples SS50075, SS50085, and SS50086 were an order of magnitude greater than the BUTL. Therefore, additional sampling for plutonium-239/240 and americium-241 in IHSS 209 and the other surface disturbances is recommended.

3.4.2 Field Sampling Plan

The following sections outline the amended FSP for IHSS 209 and the other surface disturbances. Table 3.4.2-1 summarizes the amended FSP.

3.4.2.1 Surface Radiological Survey and Surface Soil Sampling

The following work elements will be conducted at IHSS 209 and the other surface disturbances;

- an HPGe survey of portions of IHSS 209 and the other surface disturbances be conducted (Figures 3.4.2.1-1 and 3.4.2.1-2),
- HPGe anomalies will then be FIDLER surveyed to identify the locations with the greatest activity, and
- surface soil samples will then be collected from these locations and analyzed for plutonium-239/240 and americium-241.

To provide full HPGe coverage of the areas of interest a grid spacing of 150 ft will be used. In addition to providing full coverage this geometry also reduces the size of the areas to be FIDLER surveyed to a manageable size. Assuming that each HPGe survey station will require 1 hour, all three areas of interest could be surveyed in about 5 weeks. After the HPGe data are processed and anomalies identified, FIDLER surveys will be designed.

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The FIDLER survey will be conducted in accordance with SOP FO.16, Surface Radiological Measurements, as modified by Document Change Notice (DCN) 93.01, and Environmental Management Radiological Guideline 6.6, as modified by DCN 93.01. These surveys will be performed by establishing a square grid across an anomaly. Lines on 4-foot spacing will then slowly walked while slowly moving the FIDLER in an arcing motion. The display on the FIDLER will be carefully watched during this process so as to observe any deflections from background levels. If readings in excess of background are detected, a survey confined to a smaller area will be completed to attempt to identify the source(s) of the radiation detected.

A surface soil sampling program will be designed based upon the results of the FIDLER survey(s). A surface soil sample will be collected from each anomaly identified by the FIDLER survey. If the FIDLER survey does not identify any sources of anomalous radiation within the HPGe anomalies, three surface soil samples will be collected randomly within each HPGe anomaly. The surface soil samples will be collected using the Rocky Flats Method and will be analyzed for plutonium-239/240 and americium-241. The number of surface soil samples to be collected would be proposed to EPA and CDH in a brief letter report. This report will summarize the results of both the HPGe survey and the FIDLER survey(s) and proposed surface soil sampling locations.

The HPGe survey indicated 24 anomalous areas with detectable americium-241 within IHSS 209, the Surface Disturbance West of IHSS 209, and the Surface Disturbance South of the Ash Pits (Figures 3.4.2.1-3 and 3.4.2.1-4). A FIDLER survey of the HPGe anomalous areas detected readings above background at six HPGe locations in IHSS 209 and the Surface Disturbance South of the Ash Pits. These anomalies are as follows:

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IHSS 209

K-56: K-56A (25 West/4 North), approximately 46 ft south of HPGe station K-56, was frisked with a Bicorn B-50 beta/gamma probe with net readings of 66cpm, 35cpm, 70cpm, and 61cpm.

K-57: K-57A (10 West/90 North), approximately 60 ft northeast of HPGe station K-57, showed FIDLER counts of 350 cpm above background.

L-55: L-55A (0 West/100 North), located at the NNE corner of L-55 grid, showed elevated FIDLER counts of 500-600 cpm above background.

H-60: following are anomaly coordinates with counts above background.

(0 West/10 North) 600cpm	(8 West/65 North) 750cpm
(16 West/60 North) 600cpm	(28 West/55 North) 600cpm
(28 West/96 North) 650cpm	(36 West/25 North) 625cpm

I-62: following are anomaly coordinates with counts above background.

(100 West/50-100 North) 350cpm	(92 West/50 North) 600cpm
(66 West/30 North) 600cpm	

Surface Disturbance South of the Ash Pits

M-14: M-14A (90 West/90 North), located approximately 70 ft northwest of HPGe station M-14, showed elevated FIDLER counts of approximately 750 cpm above background.

Summary

As stated above, the results of both the HPGe survey and the FIDLER survey(s) and proposed surface soil sampling locations were submitted to EPA and CDH in a brief letter report.

A total of six samples will be collected from the five anomalies within IHSS 209 (Figure 3.4.2.1-3). One sample each will be collected at anomalies K-56A and L-55A. Two samples each will be collected from the anomalies identified at stations H-60 and I-62. The relatively low activities detected with the FIDLER at the latter two stations do not warrant the collection of surface-soil samples at the location of each anomaly. Therefore, one sample will be collected

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at the two anomalies with the greatest number of counts. At station H-60, one sample will be collected at coordinates 8 West/65 North and one will be collected at coordinates 28 West/96 North. Similarly, one sample will be collected from the two anomalies with the greatest number of counts at station I-62 (coordinates 92 West/50 North and 66 West/30 North). Due to the relatively low activities detected with the FIDLER at anomaly K-57A, the collection of surface-soil samples at this location is not warranted.

One sample will be collected from anomaly M-14A at the Surface Disturbance South of the Ash Pits (Figure 3.4.2.1-4). As discussed in Section 3.4.1, a relatively high activity of plutonium-239/240 was detected in a surface soil sample collected from the Surface Disturbance West of IHSS 209 (sample SS50075AS). The plutonium-239/240 activity detected at this location was the primary reason that additional radiological surveys and surface-soil sampling was necessary at these sites. Although, the HPGe survey did not detect americium-241 and plutonium-239/240 in the vicinity of this location, an additional surface soil sample will be collected at this location (Figure 3.4.2.1-3) as a verification and quality-control check.

All of the samples to be collected from IHSS 209 and the other surface disturbances will be collected using the Rocky Flats method as outlined in SOP GT.8, Surface Soil Sampling. The samples will be submitted to a laboratory for analysis of plutonium-239/240 and americium-241.

One duplicate and one rinsate sample will also be collected and analyzed for the same parameters.

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Table 3.1.2-1. Summary of Amended Field Sampling Plan
 IHSS 115 (Original Landfill) and IHSS 196 (Filter Backwash Pond)
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EVALUATION	ACTIVITY	NO. OF SAMPLING LOCATIONS	SAMPLING FREQUENCY	ANALYTICAL PARAMETERS	FIELD QUALITY CONTROL SAMPLES/PROGRAM	APPLICABLE SECTION OF TEXT
GEOTECHNICAL EVALUATION (CONT.)	Evaluate Subsurface geometry/geotechnical properties (cont.)	9 piezometers (HSA borehole advanced as discussed on preceding page)	Soil samples of shear zone/weathered bedrock	Selected samples	8 - ICU (ASTM D4767-88) 2 - Consolidation (ASTM D2435-90) 10 - Atterberg Limits (ASTM D4318-93) 5 - Gradation (ASTM D1140-92)	3.1.2.2
			Soil samples of unweathered bedrock	Selected samples	3- Drained Direct Shear (ASTM D3080-90)	
			monthly quarterly for one year	water level TCL VOCs, SVOCs, Pest. & PCBs, TAL Metals, and Radionuclides	replicate measurements as specified in SOP GW.01 1 dup/10 samples, 1 rinse/20 samples or minimum of 1 rinse/day and associated trip blank	
Groundwater Investigation	Waste and core characterization Back calculate strength parameters and calculate long-term stability by method of slices. Install and sample mini-wells	19 HSA boreholes and 5 deep bedrock monitoring wells NA	1 drum composite per 4 drums (approx. 1 drum per 10 ft. of borehole)	TCL VOCs, SVOCs, Pest. & PCBs, TAL Metals, and Radionuclides	1 dup/10 samples, 1 rinse/20 samples or minimum of 1 rinse/day and associated trip blank	3.1.2.3
			2-foot discrete soil samples	TCL VOCs	1 dup/10 samples, 1 rinse/20 samples or minimum of 1 rinse/day and 1 trip blank per field crew per day per cooler	
			6-foot composite soil samples or alternative composites as specified in TM7	SVOCs, Pesticides & PCBs, TAL Metals, and Radionuclides		

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Table 3.1.2-1. Summary of Amended Field Sampling Plan
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EVALUATION	ACTIVITY	NO. OF SAMPLING LOCATIONS	SAMPLING FREQUENCY	ANALYTICAL PARAMETERS	FIELD QUALITY CONTROL SAMPLES/PROGRAM	APPLICABLE SECTION OF TEXT
Groundwater Investigation	Install and sample mini-wells (cont.)		Groundwater - quarterly	TCL VOCs, SVOCs, Pesticides & PCBs, TAL Metals, and Radionuclides	1 dup/10 samples, 1 rinse/20 samples or minimum of 1 rinse/day and 1 trip blank per field crew per day per cooler	3.1.2.3
	Measure water levels	46	monthly	water level	replicate measurements as specified in SOP GW.01	
	Sample existing well points	TBD	quarterly	TCL VOCs, SVOCs, Pesticides & PCBs, TAL Metals, and Radionuclides	1 dup/10 samples, 1 rinse/20 samples or minimum of 1 rinse/day and 1 trip blank per crew per day per cooler	
	Characterize bedrock LHSU and install monitoring wells	5	continuous core-field screen Groundwater - quarterly	TCL VOCs, SVOCs, Pesticides & PCBs, TAL Metals, and Radionuclides	1 dup/10 samples, 1 rinse/20 samples or minimum of 1 rinse/day and 1 trip blank per crew per day per cooler	
	Aquifer tests	1	once	NA	NA	
Storm Sewer Sampling	Collect samples from storm sewer outfall	1	quarterly	TCL VOCs, TAL Metals, Radionuclides, and Water Quality Parameters	1 dup/10 samples, 1 rinse/20 samples or minimum of 1 rinse/day and 1 trip blank, one per crew per day	3.1.2.4
Air Monitoring	RAAMP Monitoring	Monitoring will be conducted as specified in RAAMP documentation.				3.1.2.5
	OU5 Ambient Air Samplers	3	bi-weekly samples composited monthly	Radionuclides	As specified in SOP AP.13	
	Wind Resuspension - Evaluate Applicability of OU3 Wind Tunnel Study	TBD	TBD	TBD	TBD	
	OU5 Wind Tunnel Study	TBD	TBD	TBD	TBD	
	Evaluation of Gas Volatilization	TBD	TBD	TBD	TBD	

NA = Not Applicable TBD = To Be Determined

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Table 3.1.2.3-1. Analysis Parameters, Sequence of Collection, and Order of Priority for Groundwater Samples¹

<u>Parameter (in order of priority)</u>	<u>Minimum Volume</u>
• Radiation Screening	6 oz (180 ml)
• TCL VOCs	2 - 40 ml
• Dissolved Uranium-233/234, Uranium-235, and Uranium-238	100 ml*
• Americium-241	1 L
• Plutonium-239/240	1 L
• Field Test Parameters:	
•• Ph, Conductivity, and Temperature	35 ml
• Dissolved Metals - CLP w/ Cs, Li, Sr, Sn, Mo, Si	1 L*
• BNA (Base Neutral Acid)	1 L (1000 ml)
• Pesticides / PCB	1 L
• Dissolved Gross Alpha and Gross Beta	550 ml*
• ³H	100 ml
• TSS (Total Suspended Solids)	125 ml
• TOC (Total Organic Carbon)	125 ml
• COD (Chemical Oxygen Demand)	125 ml
• Orthophosphate (filtered)	250 ml*
• Nitrate / Nitrite as N	250 ml
• Dissolved Strontium-89/90	700 ml*
• Dissolved Radium-226/228	750 ml*
• TDS, Cl, F, SO ₄ , CO ₃ , HCO ₃	1 L
• Cyanide	1 L
• Dissolved Cesium-137	2.5 L (2500 ml)*

* = On-site filtered sample (0.45-micrometer filter)

¹ See Tables 3.1.2-1, 3.2.2-1, and 3.4.2-1 for lists of analytes for samples to be collected.

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Table 3.2.2-1. Summary of Amended Field Sampling Plan
IHSS 133 (Ash Pits, Incinerator, and Concrete-wash Pad)
Page 1 of 1

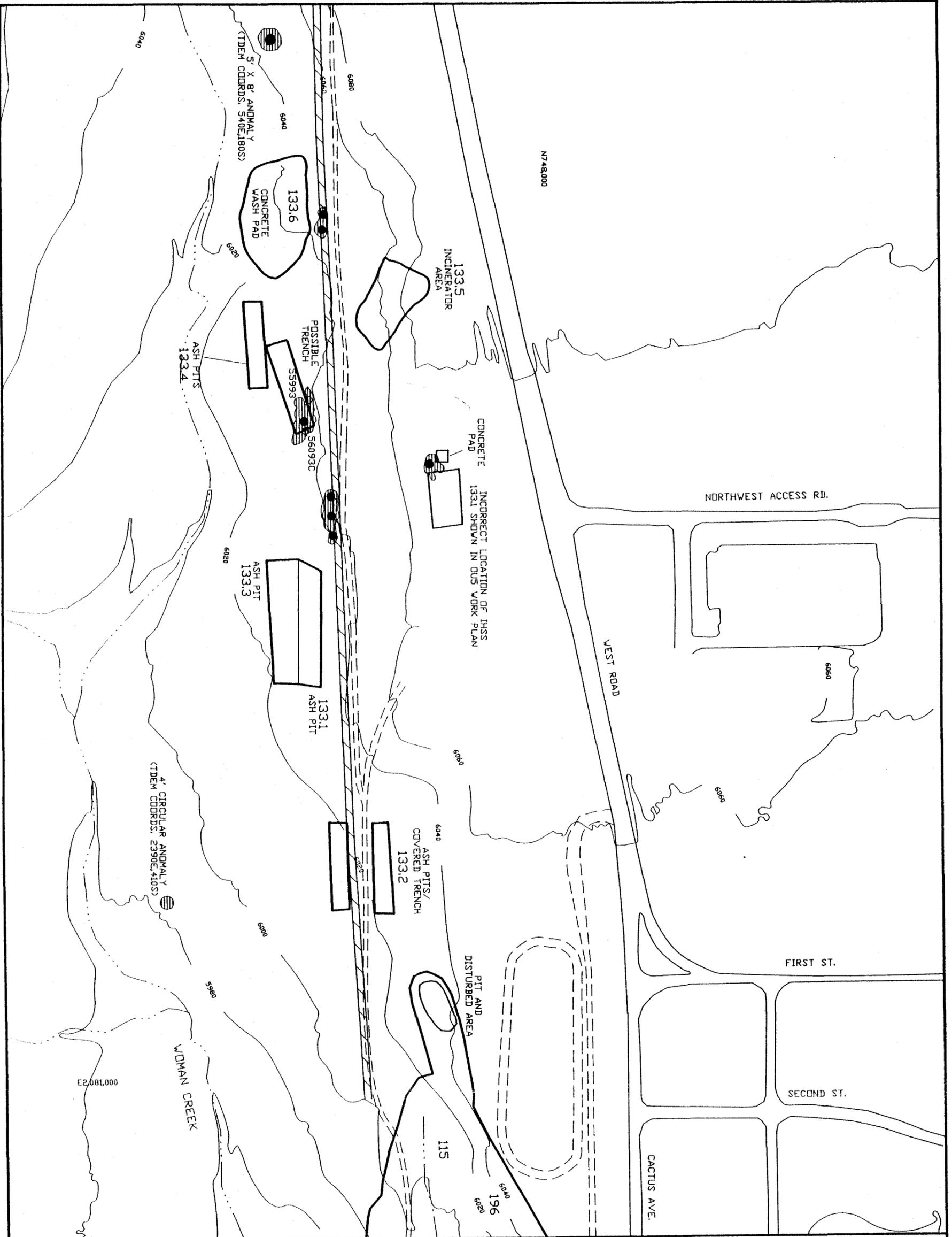
EVALUATION	ACTIVITY	NO. OF SAMPLING LOCATIONS	SAMPLING FREQUENCY	ANALYTICAL PARAMETERS	FIELD QUALITY CONTROL SAMPLES/PROGRAM	APPLICABLE SECTION OF TEXT
Investigation of TDEM Anomalies	Comprehensive field inspection	NA	NA	NA	NA	3.2.2.1
	Soil boreholes	8	6-foot composite samples or alternative composites as specified in TM7	TAL metals and radionuclides	1 duplicate/10 samples and 1 rinse/20 samples or minimum of 1 rinse/day	
	Collection of geotechnical samples	TBD	10 percent of total number of composite samples	grain-size distribution (+200 fraction)	NA	
	Collection of groundwater samples from soil boreholes	TBD (1/location with water)	once	TAL metals and radionuclides	1 duplicate/10 samples (none anticipated) and 1 rinse/20 samples or minimum of 1 rinse/day	
	Advance soil boreholes and install piezometers (mini-wells)	9	every third sampler (approx. 6 feet)	natural moisture content	NA	
Groundwater Investigation	Measure water levels	TBD	monthly	water level	replicate measurements as specified in SOP GW.01	3.2.2.2
	Sample piezometers	TBD	quarterly	TAL metals, SVOCs, pesticides, PCBs, and radionuclides	1 duplicate/10 samples (none anticipated) and 1 rinse/20 samples or minimum of 1 rinse/day (rinse probes)	
	Visual survey of Woman Creek stream channel	NA	NA	NA	NA	
	Aquifer tests	1	once	NA	NA	
	RAAMP Monitoring	Monitoring will be conducted as specified in RAAMP documentation.				
Air Monitoring	Special OU5 Ambient Air Samplers	3	bi-weekly samples composited monthly	Radionuclides	As specified in SOP AP.13	3.2.2.3
	Wind Resuspension	TBD	TBD	TBD	TBD	
	NA = Not Applicable TBD = To Be Determined					

95-LINE-ETRM-0015

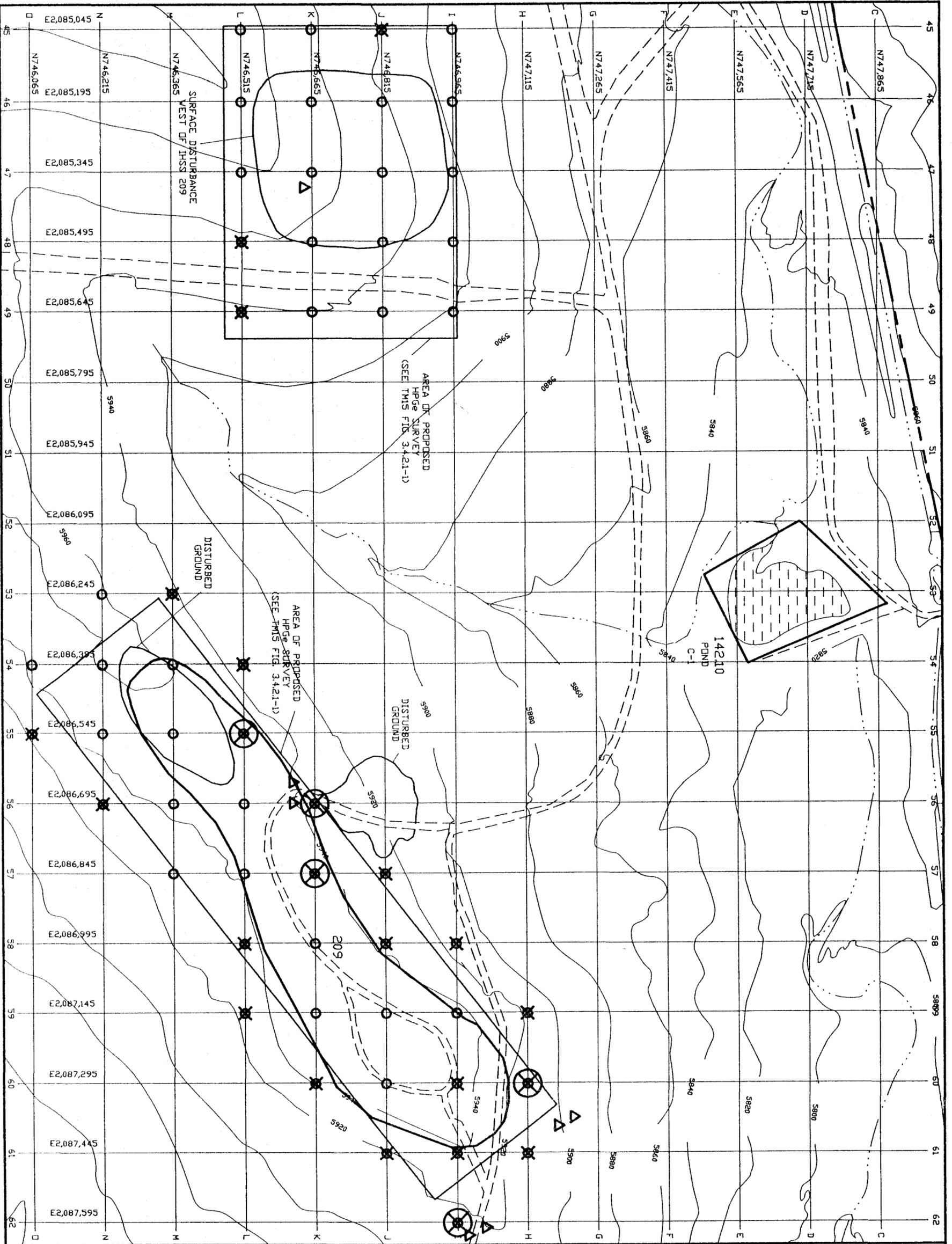
Table 3.4.2-1. Summary of Amended Field Sampling Plan
 IHSS 209 and Other Surface Disturbances
 Page 1 of 1

EVALUATION	ACTIVITY	NO. OF SAMPLING LOCATIONS	SAMPLING FREQUENCY	ANALYTICAL PARAMETERS	FIELD QUALITY CONTROL SAMPLES/PROGRAM	APPLICABLE SECTION OF TEXT
Surface Radiological Survey and Surface-Soil Sampling	HPGe survey	74	150-foot grid	NA	NA	3.4.2.1
	FIDLER survey	24	4-foot line spacing	NA	NA	
	Surface-soil sampling	8	NA	Plutonium-239/240 and americium-241	1 duplicate/10 samples and 1 rinseate/20 samples or minimum of 1 rinseate/day.	
NA = Not Applicable TBD = To Be Determined						

95-DMR-ERM-005

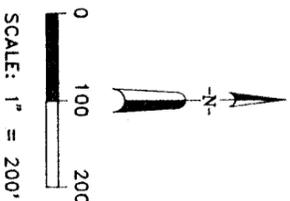


<p>MAP LEGEND</p> <ul style="list-style-type: none"> STREAMS, DITCHES, DRAINAGE FEATURES PAVED ROADS DIRT ROADS INDIVIDUAL HAZARDOUS SUBSTANCE SITES PROPOSED BOREHOLE WELL LOCATION (TMS) EXISTING BOREHOLE TDEM ANOMALY POWER LINES 	
<p>SCALE: 1" = 200'</p>	
<p>Drawn: NAM 2/2/95</p> <p>Checked: JEP 2/2/95</p> <p>Approved: MAB 2/4/95</p> <p>Approved: DDE</p>	<p>PROPOSED BOREHOLE LOCATION MAP</p> <p>IHSS 133 SERIES AREA</p> <p>TA15 - AMENDED FIELD SAMPLING PLAN</p> <p>OUS PHASE I REF/RI IMPLEMENTATION</p> <p>EG&G</p> <p>FIGURE 3.2.2.1-1</p>



MAP LEGEND

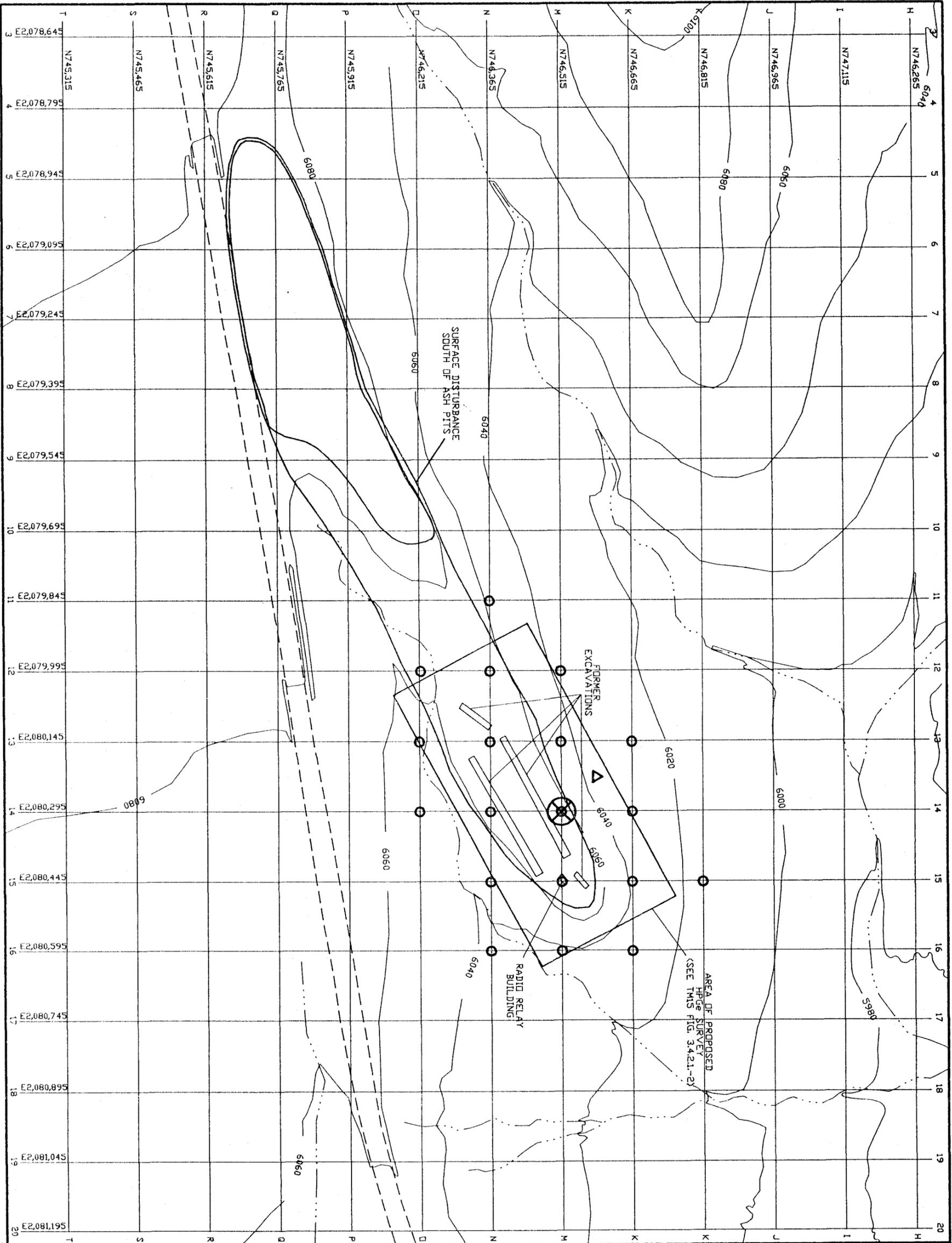
- STREAMS, DITCHES, DRAINAGE FEATURES
- DIRT ROADS
- INDIVIDUAL HAZARDOUS SUBSTANCE SITES (IHSS)
- HPGe STATION
- HPGe SURVEY LOCATION WITH DETECTABLE AM-241
- FIDLER SURVEY LOCATIONS WITH ACTIVITY > BACKGROUND
- APPROXIMATE SURFACE-SOIL SAMPLE LOCATION
- GRID FOR HPGe SURVEY



Drawn NAM 2/2/95
 Checked JEH 2/2/95
 Approved MLO 2/6/95
 Date 2/6/95
 Approved _____
 Date _____

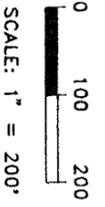
HPGe AND FIDLER SURVEY LOCATIONS IHSS 209 AND SURFACE DISTURBANCE WEST OF IHSS 209

005 PHASE I RFI/RI IMPLEMENTATION



MAP LEGEND

- STREAMS, DITCHES, DRAINAGE FEATURES
- DIRT ROADS
- INDIVIDUAL HAZARDOUS SUBSTANCE SITES (IHSS)
- HPGe STATION
- HPGe SURVEY LOCATION WITH DETECTABLE AM-241
- FIDLER SURVEY LOCATIONS WITH ACTIVITY > BACKGROUND
- APPROXIMATE SURFACE-SOIL SAMPLE LOCATION
- GRID FOR HPGe SURVEY



Drawn NAM 2/2/95
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 Approved [Signature] 2/4/95
 Date 2/4/95
 Approved _____
 Date _____

HPGe AND FIDLER SURVEY LOCATIONS SURFACE DISTURBANCE SOUTH OF THE ASH PITTS

005 PHASE I RPT/RI IMPLEMENTATION