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

1. Date	2a. DMR No.
4/19/94	94-DMR-000857

2. Existing Document Number/Revision	3. New Document Number or Document Number if it is to be changed with this Revision
4-E42-ER-OPS-GT.08 Rev. 3	n/a

4. Originator's Name/Phone/Page/Location	5. Document Title
SIGURD JAUNARAIS/8567/5144/080	SURFACE SOIL SAMPLING

6. Document Type and Procedure: ☐ Other _____

7. Document Modification Type (Check only one): ☐ New ☐ Revision ☒ Intent Change ☐ Nonintent Change ☐ Editorial Correction ☐ Cancellation

8. Item	9. Page	10. Step	11. Proposed Modifications
			EXPAND THE SCOPE OF 94-DMR-000133 TO INCLUDE THE BACKGROUND SOILS CHARACTERIZATION PROJECT (IN ADDITION TO OUs 8, 9, 10, 11, 12, 13, 14) FOR UNPAVED RADIOLOGICAL AND NON-RADIOLOGICAL* SURFACE SOIL SAMPLING

* SL 7.11.94

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

Item No. 1 – Methods for Background Soil Sampling must be consistent with those being used in the listed OUs. Also, less soil is needed (5 subsamples or a total of 2500g) because of limited analyte groups being sampled for.

If modification is for a new procedure or a revision, list concurring disciplines in Block 13, and enter N/A in Blocks 14 and 15. If modification is for any type of change or a cancellation, organizations are listed in Block 13, then Concurrer prints, and signs in Block 14, and dates in Block 15.

13. Organization	14. Print and Sign (if applicable)	15. Date (if applicable)
ES&E	Sigurd Jaunarais	4/20/94
EOM	Mirla Broussard	6/8/94
RE	Dick Norton for L.W. Norton	6/6/94
IH	Lisa Nelowet M.D. Schreckengast for L.A. Nelowet	7-5-94
EQS	Mark Brooks (RB)	7.7.94
SME/ESE	M.Z. Litteer	

16. Originator's Supervisor (print/sign/date): Sigurd Jaunarais 4/20/94

17. Assigned SME/Phone/Page/Location	18. Cost Center	19. Charge Number	20. Requested Completion Date	21. Effective Date
M.Z. Litteer/8583/NA/080	0202	ENV-GT	5/1/94	5/1/94 7/28/94

22. Associated Review?	23. ORC Review
Yes ☐ No ☒	ORC Review Not Required

24. Responsible Manager (print, sign, date): Gary Konwinski 4-21-94

REVIEWED FOR CLASSIFICATION/UCNI

DOCUMENT CLASSIFICATION REVIEW WAIVER PER R.B. HOFFMAN, CLASSIFICATION OFFICE JUNE 11, 1991

BY NA

DATE NA

ADMIN RECORD

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25. DMR No. 94-DMR-000857

2. or 3. Document Number/Revision	4-E42-ER-OPS-GT.08, Rev. 3	3. Document Title	Surface Soil Sampling

8. Item	9. Page	10. Step	11. Proposed Modifications
			Note: The Scope Limitation for this DMR is OUs 8, 9, 10, 12, 13, 14 (Industrial Area OUs) for unpaved radiological and non-radiological surface soil sampling.
1	6	Sec. 4.0	Replace third sentence with: "A visual description will be performed on each soil sample as they are being collected, using U.S.C.S. and Munsell reference charts to aid in the visual description. The following characteristics will be documented in the field log book and on the Surface Soil Sampling Field Activities Report: • Predominant type of material (i.e., gravel, sand, silt, clay, etc.) • Grain size (based on U.S.C.S. grain size divisions) • Color (based on Munsell Rock-Color chart) • Grading (based on U.S.C.S. classification) • Angularity (very angular through well rounded) • Moisture content (dry, moist, saturated) • Organic content (i.e., abundant roots, peat, etc.)"
2	9	Sec. 4.2.1	Change first sentence to read: "The purpose of the sampling is to determine the amount of accumulated plutonium that has been deposited on the ground, and if nonradionuclide contaminants have been deposited on the ground."

12. Justification (Reason for Modification, ECN#, TPI#, etc.)

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

5. DMR. No. 94-DMR- 000857

2. or 3. Document Number/ Revision: 4-E42-ER-OPS-GT.08, Rev. 3

3. Document Title: Surface Soil Sampling

1. Item	9. Page	10. Step	11. Proposed Modifications
3	9	4.2.1	Substitute "Five" for "Ten" in the last sentence.
4	11	4.2.4	Substitute "Five for "Ten" in the first sentence.
5	11	4.2.4	Change second sentence to read: "Samples should be collected at the center and corners of one, 1-meter square template, centered on the selected sample site."
6	12	4.2.4, Step 4	Change to: "For radiological samples, remove soil samples from the jig interior with scoop/trowel and place it in a 10-mesh metal sieve that has a plastic bag attached to the bottom to receive the soil that passes through the sieve. For nonradiological samples, remove soil samples from the jig interior with scoop/trowel and place it in a 10-mesh stainless steel sieve which is placed in a stainless steel pan. After all 5 samples (5 samples from the one 1-meter square templates) have been placed into the sieve, attach the sieve cover and seal with tape. Sieving may be done in stages if all 5 soil samples cannot be placed into the sieve at the same time."
7	12	4.2.4, Step 6	Replace the 4th through 7th sentences with: "Mix each quarter thoroughly with a scoop/trowel. Roll the quarters back together and smooth to a uniform thickness in the stainless-steel pan. Collect adequate sample volume in appropriate laboratory designated sample container(s) with stainless steel scoop/trowel by making an "S" motion through the composited soil."
8	13	4.2.4	Replace with: "Place residual sieved soil from quartering and sampling back into original disturbed area."
9	13	4.2.4	Delete Step 8.
10	38	Fig. GT.8-3	Replace Figure GT.8-3.

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

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ERM OPERATIONS PROCEDURE MANUAL	Procedure No.	GT.08,Rev.3
	Page:	1A of ~~44~~ 41 01/31/94
	Effective Date:	~~01/28/94~~ 7-25-94
	Organization: Environmental Restoration Management	JP

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LIST OF EFFECTIVE PAGES

PAGES	EFFECTIVE DATE	CHANGE NUMBER
1A	~~01/28/94~~ 7-25-94	94-DMR-000133
6-6A	~~01/28/94~~ 7-25-94	94-DMR-000133
9	~~01/28/94~~ 7-25-94	94-DMR-000133
11-13	~~01/28/94~~ 7-25-94	94-DMR-000133
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Field personnel are referred to procedure FO.13, Containerization, Preserving, Handling, and Shipping of Soil and Water Samples for further details. Above-surface plant parts and coarse material (pebbles, rocks, and stones) will be removed by the sampling team. ~~The soil samples will be classified according to procedure GT.1, Logging Alluvial and Bedrock Material.~~ A visual description will be performed on each soil sample as they are being collected, using U.S.C.S. and Munsell reference charts to aid in the visual description. The following characteristics will be documented:

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- Predominant type of material [i.e., gravel, sand, silt, clay, etc.]
- Grain size [based on U.S.C.S. grain size divisions]
- [illegible] [Munsell color chart]
- [illegible] [U.S.C.S. classification]
- Angularity [i.e., rounded through well rounded]
- Moisture content [i.e., moist, saturated]
- Organic content [i.e., abundant roots, peat, etc.]

For surficial profiling samples, the sampler will collect representative samples, including organic material and coarse material. All sampling equipment will be protected from the ground surface with plastic sheeting.

4.1 SOIL SAMPLING WITH THE CDH METHOD

4.1.1 Introduction

The CDH sampler is one method for collecting soil samples for radionuclide analysis at the RFP. The CDH sampler was designed to sample radionuclides in the top-soil that could become resuspended in the air and thus pose a migration pathway by inhalation. The sampler is designed to obtain a sample from the upper surface 1/4 inch deep from an area 2 inches wide and 2 3/8 inches long, as shown in Figure GT.8-1.

Sampling locations will be described in the FSP. Some samples will be composited to obtain representative samples of large areas and others will be single-location samples. Sampling techniques for either type of sample are the same before compositing.

4.1.2 Equipment and Materials

The following is a list of equipment used for radionuclide contaminated soil sampling:

- CDH soil sampler;
- stainless steel scoop;
- stainless steel lab spoon;
- stainless steel mixing bowl or pan equivalent;
- sample containers;
- sample labels;
- wash and rinse tubs;
- phosphate-free, lab-grade detergent (e.g., Liquinox);
- distilled water;
- plastic sheeting;
- sample locations (map and/or list);
- measuring tape or wheel;

to pour the soil into the container. Brush any soil that adheres to the scoop into the sample container.

9. Close the container.

10. After samples are placed in sample containers, the outside of the container will be wiped clean of excess material and it will be placed in a plastic bag.

11. Transfer the samples to the sample manager. Refer to procedure FO.13, Containerization, Preserving, Handling, and Shipping of Soil and Water Samples for the proper paperwork and sample transfer methods. This documentation is a QA record and must go into the ERM records center.

12. Either use another set of clean sampling equipment or decontaminate equipment after use and between sample locations. For specific decontamination guidelines, consult procedure FO.3, General Equipment Decontamination. Decontamination according to these procedures is not necessary between composite sample points; however, excess dirt or mud should be cleaned from the equipment.

Duplicate samples will be obtained by offsetting the primary sample location 6 inches to 2 feet upwind or in a direction technically more appropriate and placing the duplicate samples in a separate jar. The location of the duplicate will be documented on the data collection form. The duplicate sample will be composited and containerized following the same procedures as for the primary sample. The frequency of duplicate samples will be defined in the FSP or the Quality Assurance Addendum (QAA).

4.2 SOIL SAMPLING WITH THE RF METHOD (JIG AND SCOOP)

4.2.1 Introduction

The purpose of sampling is to determine the amount of accumulated plutonium that has been deposited on the ground, and if nonradionuclide contaminants have been deposited. This determination is accomplished by collecting a sample volume of 5,000 cm^3 of soil in situ. The jig outlines a square area with 10-cm sides and is driven 5 cm into the soil to cut three sides of the sample (Figure GT.8-2). At the fourth side, soil is removed from outside the jig's perimeter. The scoop is used to finish the cut on both the fourth side of the sample and the bottom surface. ~~Ten~~ Five samples should be collected at each location and composited.

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4.2.3 Sampling Plot Layout

A site selection plan as described in the applicable FSP should be used to specify the general site location. The plan must provide adequate information for the sample collection crew to locate each specific site. Sample locations will be marked with an identification sign, as designated in the FSP, so that the area may be located and resampled at a later date. Permission to collect samples and mark the site should be obtained from the appropriate EG&G department or the landowner. Sample collection crews will be accompanied by supervision for all sampling activities to ensure that specified procedures are followed.

The following general site selection criteria should be considered:

- undisturbed location for the time interval of interest;
- near the center of a large, flat, open area;
- not subject to excessive runoff during heavy rain;
- light to moderate vegetation and permeable soil; and
- not in an area of mechanical disturbance.

Consideration of these criteria will depend on the nature of the study. For example, in some instances it may be necessary to investigate an area of mechanical disturbance.

If a sample site is not available that meets the criteria described in the FSP, the location can be moved up to one-half the distance to the next grid sample location or within 10 feet of a staked sample location which is not part of a grid. If the sample location must be moved further than this distance, regulatory agency concurrence will need to be obtained. Any movement of sample locations will be documented on the surface soil data collection form and in the field crew supervisors logbook.

All selected sites should be located on a map.

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4.2.4 Procedures

~~Ten~~ [redacted] soil samples should be collected at each site and composited for analysis. Samples should be collected at the center and corners of ~~two one-meter squares that are spaced one meter apart~~ [redacted] ~~centered on the selected site~~. Figure GT.8-3 illustrates this sample collection spacing. The following procedures will be used for the RF method:

1. Place the sampling jig on the ground, and using the wood block and hammer, drive the jig into the soil to a depth of 5 cm.

2. With minimal disturbance to the soil inside the jig, use a scoop, trowel, or chisel to remove the soil from around the open side of the sample jig. Soil should be removed to a depth that will allow easy removal of the sample.

3. Discard the soil removed from outside the jig.

4. For radiological samples, remove soil samples from the jig interior ~~jig~~ with scoop/trowel and place it in a 10-mesh metal sieve that has a plastic bag attached to the bottom to receive the soil that passes through the sieve. ~~For nonradiological samples, remove soil samples for the jig interior with scoop/trowel and place it in a 10-mesh stainless steel sieve which is placed in a stainless steel pan.~~ After all ~~10~~ 5 samples (5 samples from ~~each of~~ the ~~two~~ one 1-meter square templates) have been placed into the sieve, attach the sieve cover and seal with tape. Sieving may be done in stages if all ~~10~~ 5 soil samples cannot be placed into the sieve at the same time.

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5. Label the sample container into which the soil sample is to be placed. Refer to procedure FO.13, Containerization, Preserving, Handling, and Shipping of Soil and Water Samples, for the type of information to be included on the label, and the appropriate type of container.

   This documentation is a QA record and must go into the ERM records center.

   Shake the sieve for several minutes. If the soil is moist, gently crush soil aggregate with fingers, while wearing proper personal protective equipment as prescribed in the applicable Health and Safety Plan, and continue shaking until all soil matrix has passed through the sieve. Discard large particles (cobbles, stones, etc.) that do not pass through the sieve into original disturbed area.

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6. In order to reduce the volume of the sieved sample to the quantity required for laboratory analysis, and still maintain a representative sample; place all sieved soil into stainless steel pan. Mix soil thoroughly with a scoop/trowel. Divide sieved soil into quarters. ~~Subsample each quarter equally so the total amount of subsampled soil to be used for analysis does not exceed 1 kg or one 1 gal paint can. Place each of the four subsamples into one plastic bag. Place plastic bag in metal 1 gal paint can. Mix each quarter thoroughly with a scoop/trowel. Roll the quarters back together and smooth to a uniform thickness in the stainless steel pan. Collect adequate sample volume in appropriate laboratory designated sample container(s) with stainless steel scoop/trowel. Repeat for a 2nd subsample and composite soil.~~ Leave about 1 inch headspace in paint can.

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7. ~~Place residual sieved soil from quartering inside plastic bag, and place bag inside another paint can. If residual soil exceeds volume of one 1-gal paint can, place excess residual sieved soil back into original disturbed area.~~ Place residual sieved soil from quartering and sampling back into original disturbed area.

~~8. Store residual sieved soil for potential use at a later date.~~

~~9~~8. Decontaminate sieve between uses following procedure FO.3, General Equipment Decontamination.

4.3 GRAB SAMPLING (SPADE AND SCOOP)

4.3.1 Introduction

Surface soil samples can be collected for radionuclide analyses using grab sampling (spade and scoop) methods.

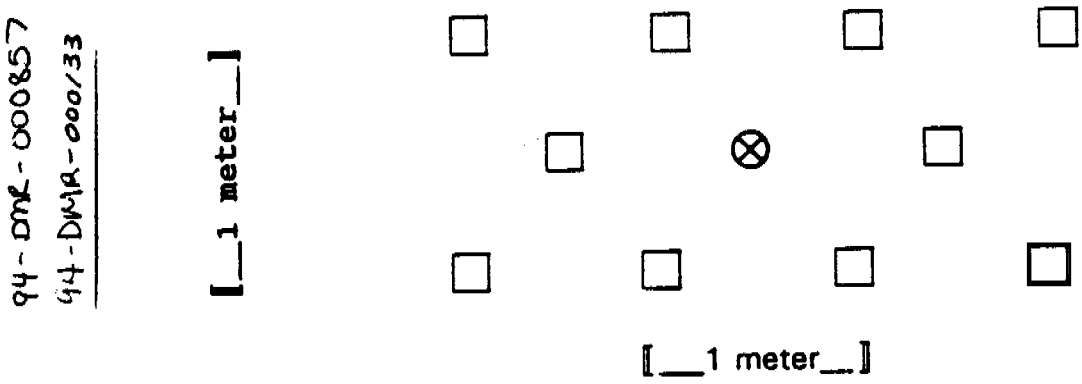
Sampling locations and the number of soil samples will be described in the specific Field Sampling Plan for each project. Equipment, sample plot layout, and sampling procedures are described in the following sections.

4.3.2 Equipment and Materials

The following is a list of equipment for contaminated soil sampling:

- spade (long handle);
- stainless steel hand auger (optional);
- mason trowel;
- stainless steel scoop;
- stainless steel lab spoon;
- sample labels;
- sample containers;
- wash/rinse tubs;
- phosphate-free, laboratory-grade detergent (e.g., Liquinox);
- distilled water;
- plastic sheeting;
- sample locations (map and/or list);
- appropriate health and safety equipment as specified in the applicable Health and Safety Plan;
- photoionization detector (PID) or flame ionization detector (FID);
- logbook;

Figure GT.8-3 RF Method Soil Sampling Location Spacing



⊗ - Sample Location

☐ - Subsample Location

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