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Date: 8/18/92Job No.: 7253-048-CR1-101

Work Group No.: _____

TO: Tom Danahy
Geraghty & MillerFAX NUMBER: 201/909-0567FROM: Sally OdlandNumber of pages transmitted including this sheet is 6.

Caroline Kwan + I tried to reach you, but you
were in a meeting. With the B-90 rig down and a
tropical storm on the way, we would like to collect
the surface soil samples today at Tutu.

Attached is an acceptable method for
sampling surface soils. Caroline had not received
your protocols yet and we don't want that
to stand in the way of sampling.

If you have any problems with this fax please call. Sally at (212) 393-9634

(Mimi - 26)

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SURFACE SOIL SAMPLING**SOP 1-3****Revision: 0****Date: June 30, 1992****Page 3 of 6****4.0 REQUIRED EQUIPMENT**

- Site-specific plans
- Field logbook
- Indelible black ink pens and markers
- Labels and appropriate forms/documentation for sample shipment
- Appropriate sample containers
- Insulated cooler and waterproof sealing tape
- Ice bags or "blue ice"
- Latex or appropriate gloves
- Plastic zip-top bags
- Personal protective clothing and gear
- Stainless steel and/or Teflon-lined spatulas and pans, trays, or bowls
- Stainless steel and/or Teflon-lined trowels or spoons (or equipment as specified in the site-specific plans)
- Plastic sheeting

5.0 PROCEDURES**5.1 Preparation**

The following steps must be followed when preparing for sample collection:

1. Don the appropriate personal protective clothing as dictated by the site-specific health and safety plan.
2. The collection points shall be stated, located on a site map, and referenced in the field logbook.
3. Processes for verifying depth of sampling must be specified in the site-specific plans.
4. Place clean plastic sheeting on a flat, level surface near the sampling area, if possible, and place equipment to be used on the plastic; place the insulated cooler(s) on separate plastic sheeting. Cover all equipment and supplies with clean plastic sheeting when not in use.
5. A clean, decontaminated trowel or spoon will be used for each sample collected.

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5.2 Collection

The following general steps must be followed when collecting surface soil samples:

1. Surface soil samples are normally collected from the least-contaminated to the most-contaminated areas. Stay outside of a specific sampling location until all samples are collected at that location.
2. Document the sampling events, recording the information in the designated field logbook. Document any and all deviations from SOPs in the field logbook and include rationale for changes. See FPC-SOP 4-1.
3. Carefully remove stones, vegetation, snow, etc. from the sampling location surface.
4. Carefully remove the top 1 to 2 cm of exposed soil, sediment, or sludge before sample collection.
5. Collect sample portions or aliquots for volatile analyses first and any other samples that would be degraded by aeration.

5.2.1 Method for Collecting Samples for Volatile Organic Compound (VOC) Analysis

The requirements for collecting grab samples of surface soil for VOCs or other samples degraded by aeration are as follows:

1. VOC samples shall be collected with the least disturbance possible.
2. VOC samples shall be collected as grab samples; however, the method of collection will vary from site to site, based on data quality objectives and the degree of known or suspected contamination.
3. Label the sample containers with the appropriate information. Secure the label, covering it with a piece of clear tape.
4. Use a clean stainless steel or Teflon-lined trowel or spoon (or tube) to collect sufficient material in one grab, over the required sampling interval, to fill the sample container.

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5. With the aid of a clean stainless steel spatula, quickly fill the sample containers directly from the sampling device, removing stones, twigs, grass, etc., from the sample. Fill the containers as full and compact as possible to minimize head space.
6. Immediately secure the Teflon-lined caps on the sample container.
7. Wipe the containers clean with a clean Kimwipe or paper towel.
8. Place the containers in individual zip-top plastic bag(s) and seal the bag(s).
9. Pack all samples according to FPC SOP 2-5. Include properly completed Traffic Reports and/or chain-of-custody forms, and affix signed and dated custody seals to the three unhinged sides of the cooler lid.
10. Decontaminate sampling equipment according to ^{Work Plan.} ~~FPC-SOP 4-5.~~

5.2.2 Method for Collecting Samples for Nonvolatile Organic or Inorganic Compound Analysis

The requirements for collecting samples of surface soil for non-volatile organic or inorganic analyses are as follows:

1. Label each sample container with the appropriate information. Secure the label by covering it with a piece of clear tape.
2. Use a decontaminated stainless steel or Teflon-lined trowel or spoon to obtain sufficient sample from the required interval and subsampling points, if necessary, to fill the specified sample containers.
3. Empty the contents of each fill of the sampling device directly into a clean stainless steel or Teflon-lined tray or bowl.
4. ~~Homogenize~~ ^{attached method described in the EPA} Composite sample according to ~~FPC-SOP 2-3.~~ ^{Region II CERCLA QA Manual, page 57, under "Homogenization."}
5. Use the spoon, spatula, or trowel to distribute the uniform mixture into the labeled sample containers. Fill organic sample containers first, then inorganics.
6. Secure the appropriate cap on each container immediately after filling it.
7. Wipe the sample containers clean with a clean Kimwipe or paper towel.

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8. Place sample containers in individual zip-top plastic bags and seal the bags.
9. Pack all samples according to FPC SOP 2-5. Include properly completed Traffic Report and/or chain-of-custody forms, and affix custody seals to the three unhinged sides of the cooler lid.
10. Decontaminate sampling equipment according to ~~FPC SOP 4-5~~ ^{Work Plan}.

6.0 RESTRICTIONS/LIMITATIONS

Grab sampling for VOC analysis or for analysis of any other compound(s) that may be degraded by aeration is necessary to minimize sample disturbance and, hence, analyte loss. The representativeness of this sample, however, is difficult to determine because the collected sample represents a single point, is not homogenized, and has been disturbed.

7.0 REFERENCES

U.S. Department of Energy, Hazardous Waste Remedial Actions Program, *Quality Control Requirements For Field Methods*, DOE/HWP-69/R1, July 1990.

U.S. Department of Energy, Hazardous Waste Remedial Actions Program, *Standard Operating Procedures For Site Characterizations*, DOE/HWP-100, July 1990.

U.S. Environmental Protection Agency, *A Compendium of Superfund Field Operations Methods* EPA/540/P-87/001, OSWER Directive 9355.0-14, December 1987.

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REGION II
CERCLA QA Manual

Revision 1
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IX. METHODS OF SAMPLE PREPARATION

A. Homogenization

The homogenization of a sample is the process of mixing individual grab samples in order to minimize any bias of sample representativeness introduced by the natural stratification of constituents within the sample.

To homogenize a sample of a soil/sediment matrix, first rocks, twigs, leaves and other debris should be removed if they are not considered part of the sample. The soil/sediment should be removed from the sampling device and placed in a stainless steel pan, then thoroughly mixed using a stainless steel spoon. The sediment in the pan should be scraped from the sides, corners and bottom of the pan, rolled to the middle of the pan, and initially mixed. The sample should then be quartered and moved to the four corners of the pan. Each quarter of the sample should be mixed individually, and then rolled to the center of the container and the entire sample mixed again.

Homogenization of an aqueous sample is only necessary if stratification of constituents is of concern, for example when sampling a lagoon or containerized liquid. Then homogenization would be performed by mixing in a stainless steel bowl.

B. Compositing

Compositing of samples is performed when samplers desire to obtain an average concentration of contaminants over a certain number of sampling points. Anytime compositing is performed, the concentration of contaminant in individual grab samples is diluted proportionately to the number of samples taken. Not only is the contaminant diluted, the detection limits for each individual sample are raised proportionately to the number of samples added to the composite. For instance, if a sampler wishes to composite two discreet samples into one, and the method detection limit for a target compound is 330 ppb, the detection limit for the target compound does not change for the composite, however, the detection limit for the compound in the individual samples which make up the composite is two times the normal detection limit or $2 \times 330 = 660$ ppb. This is important to keep in mind because it is possible that if a contaminant were present in only one of the two composited samples, and if it were at a level between 330 and 660 ppb, that contaminant would not be quantified or possibly even identified due to the effective dilution of the contaminant concentration in the composite. This concept should be taken into account when determining the data quality objectives of a composite sampling event, to ensure that useful data is collected. It is advisable that if a positive identification is made in the course of analyzing a composite sample, that the discreet samples then be analyzed individually to determine the true distribution of contaminant throughout each component of the composite.