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COARSE & DURABLE MATERIAL

SAMPLING AND ANALYSIS PLAN

BUNKER HILL SUPERFUND SITE

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1.0 INTRODUCTION

This Sampling and Analysis Plan (SAP) has been prepared for the assessment of potential demolition debris generated under the Institutional Controls Program (ICP) at the Bunker Hill Superfund Site (the Box). Sampling activities covered by this SAP will include sampling of coarse and durable demolition debris such as asphalt and concrete and collection of quality control (QC) samples.

This SAP describes procedures for field sampling and sample submittal for analysis, field chemical parameter measurement, data documentation, data assessment and data reporting requirements. The SAP delineates the methods to accomplish the quality control items to assure accurate, precise, representative, complete, legally defensible and comparable data. The SAP describes all chemical parameter measurements for all matrices for all phases of the work.

1.1 PROJECT DESCRIPTION

Materials generated under the ICP in the Box are eligible for disposal at the Page Repository. Due to limitations in repository capacity it has become necessary to explore options to control the volume of material that is sent to the repository. One option is to determine if materials classified as coarse and durable are eligible for disposal at the Page Repository. For the purposes of this project, coarse and durable materials are defined as asphalt materials and or concrete. Eligibility will be based on the contaminant levels (primarily lead) in or on these materials.

1.2 PLAN OBJECTIVES

The overall purpose of this SAP is to ensure that representative samples are collected to accurately characterize the coarse and durable materials. The objectives of the SAP include:

- Describes procedures for field sampling and sample submittal for analysis, field chemical parameter measurement, data documentation, data assessment, and data reporting requirements;
- Delineates the methods used to accomplish the chemical quality control items to assure accurate, precise, representative, complete, and legally defensible and comparable data; and

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- Describes all chemical parameter measurements for all matrices for all phases of the remediation contract.

1.3 MATERIAL SOURCES

The focus of this project will be materials generated by demolition activities (concrete) and infrastructure improvements or repair (asphalt). Concrete removed from a property may either be in slab form (from sidewalks and driveways) or in block form (from retaining walls and foundation footers) and will likely contain rebar. Asphalt generated from road removal activities will be in slab form. Depending on the potential for reuse, asphalt and concrete may be reduced in size to gravel size or smaller.

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2.0 FIELD SAMPLING PLAN

This section of the Sampling and Analysis Plan (SAP) describes the details of the technical approach and quality control (QC) procedures necessary to perform sampling and analysis activities associated with characterization of coarse and durable ICP materials.

2.1 SAMPLING METHOD AND FREQUENCY

Samples of coarse and durable ICP material will be collected at a frequency of one sample per 200 cubic yards of material. One quality control (QC) sample (duplicate) will be collected for each twenty (20) characterization samples. Samples will be sent to an independent environmental laboratory and analyzed for lead.

2.1.1 Sampling Equipment and Information Collected

The sampling equipment will include the following items: trowels, shovels, sample bags, log book, pen, pencil, and marker. Sample bags will typically consist of a plastic, 1-gallon bag which has a zip lock or snap seal type opening capable of adequately containing the sample material without intrusion of foreign matter or spillage of its contents. All sampling equipment used for sampling will be decontaminated prior to reuse.

Information that will be collected from each sampling point will include the location of the sample. A suitable hand drawn map will be developed showing the approximate location of sample points.

2.1.2 Sample Collection Procedure – Gravel-sized Material Stockpiles

A composite sample will be collected from each stockpile of coarse and durable materials that has undergone size reduction in the field (crushing or grinding) and analyzed for lead. Four discrete sub-samples will be collected and composited by the following procedure: A shallow hole approximately 12-inches deep will be dug using a decontaminated sample spade to expose fresh material. An equal amount of material from each hole will then be removed using a stainless steel spoon, trowel or spade and placed in a sample bag. The composite sample size will equal approximately one-half gallon. Sample splits for

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QC purposes will be done at this time using a riffle splitter. Each sample will be given a sample designation to indicate the sample location and sample number. The sample locations and designations as well as a location sketch map will be recorded in a field logbook.

2.1.3 Sample Collection Procedure – Large Irregular Shaped Material Stockpiles

Stockpiles of irregular shaped materials (broken pieces of asphalt or concrete greater than 3 inches in any direction) will be sampled in the following manner. At each stock pile four pieces of the larger materials will be broken off using hand tools (sledge and chisel, or rock bar). The broken pieces collected will be no larger than 3 inches in any direction. The samples will be placed in a sample bag. Each sample will be given a sample designation to indicate the sample location and sample number. The sample locations and designations as well as a location sketch map will be recorded in a field logbook.

2.1.4 Decontamination Procedures

All sampling equipment used will be decontaminated after each sample batch has been collected. This will include sample splitters, stainless steel spoons, shovels, and any other equipment that has come in contact with the samples. The following decontamination procedure will be used:

1. Remove gross contamination by brushing;
2. Wash and scrub with phosphate-free detergent in deionized water;
3. Rinse with deionized water; and
4. Air dry or wipe with clean paper towels.

2.1.5 Investigation Derived Waste

The generation of excess materials constituting investigation derived waste (IDW) is not expected on this project. If IDW (soil) has been generated it will likely be disposed of at the Page Repository.

IDW consisting of decontamination water from cleaning of sampling equipment will be disposed of at the sample site.

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2.2 SAMPLE CUSTODY

The data collected during the sampling program requires that the possession of samples be traceable from the time they were collected, through the laboratory analytical process.

2.2.1 Sample Documentation

In order to provide adequate information of the backfill and air sampling activities, the field sampling crew will maintain a field logbook and field documents. The field documents will contain sufficient details to reenact the sampling event. Entries will be made in indelible ink, with all corrections consisting of initialed line-out deletions.

The documents to be completed for each sample generated during the fill sampling program are:

- The field logbook;
- Site description;
- Chain-of-custody Transmittal form; and
- Sample tag and/or label.

The sample identification system for all samples includes:

- The year;
- The type of matrix; and
- The sequential number for the particular matrix sampled.

Other identification information will include the identifiers for rinsates and sample splits.

Example:

09-AS2	Standard sample ID signifying second asphalt sample
09-AS2-R	Rinsate taken following sample
09-AS2-S	Split of identified sample

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Upon completion, a Chain-of-Custody transmittal form will be filled out and samples will be delivered to the laboratory.

2.2.2 Field Log Book

All pertinent field survey and sampling information will be recorded in a bound field logbook, during each day of the field sampling and at each sample site. All entries into the field logbook will be made in indelible ink. Each day's entries will be initialed and dated at the end of each day by the field sampling crew supervisor. All corrections shall consist of line-out deletions, which are initialed.

At a minimum, entries in the field logbook shall include:

- Date and time at the start of work and description of weather conditions;
- Names of field sampling crew;
- Project name or number;
- Description of site conditions and any unusual circumstances;
- Location of sample site, including map reference;
- Equipment identification;
- Details of actual work effort, particularly any deviations from the aforementioned methods;
- Field observations;
- Time that field work was terminated for the day;
- Specific details for each sampling location will be recorded, such as number of samples collected and receiving laboratory; and
- Generation and handling of IDW.

Strict chain-of-custody procedures will be maintained with the field logbook. While being used in the field, field logbooks will remain with the field team at all times. Upon completion of the field effort, field logbooks will be filed in an appropriately secure manner.

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2.2.3 Sample Packaging and Shipping

Each sample container will be properly labeled in the field. Each sample will be hand delivered to the laboratory for analysis. Coolers may be used only as a convenient shipping/storage container; the samples will not be cooled until they are received by the laboratory. An alternative sample storage container may also be used, as long as it allows adequate protection against breakage and loss of chain-of-custody.

2.3 QUALITY CONTROL (QC) SAMPLES

Quality Control (QC) samples will be used to check the precision and accuracy of analyses completed by the analytical laboratory. QC samples will not have any unique identifying codes that will enable the laboratory to bias them. The sampling team will strive to obtain uniformity in the sampling technique and preparation of QC samples to limit potential sampling errors. The QC sampling will be identified only in the field logbook and maintained by the entity performing the sampling operations. Samples identified in the field logbook will include:

- Asphalt or concrete split
- Rinsate (Equipment) Blank

In addition to the composite sample collected for each soil source, a sample split will be analyzed for QA/QC data. This sample will be prepared by taking one composite sample from each source and dividing it to obtain two samples. The split will be taken once per each twenty (20) backfill samples per matrix. PE samples will be certified and contain site specific contaminants of concern. Rinsate blanks will be collected and analyzed for QA/QC data. This sample is obtained by using a distilled water rinse of decontaminated sampling equipment placed into a sample bottle. The rinsate will be taken once per each twenty (20) backfill samples per matrix. The QC samples will be defined as follows:

1. The field split sample will be an equal split of the original sample.
2. A rinsate (equipment) blank will be a distilled water rinse of decontaminated sampling equipment, placed into a sample bottle.

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Split samples will be obtained by utilizing a riffle splitter with no larger than 1 inch slots. The riffle splitter will be decontaminated prior to each use utilizing the procedure described in Section 2.3.1. The sample material will be run through the riffle splitter following a general hand mixing to break-up any clods or chunks of material, which may be present. If necessary to obtain a thoroughly homogenized sample, the sample material may be run through the splitter repeatedly until the sample crew is confident that an accurate sample split or duplicate has been obtained. Following splitting, the sample material will be placed into separate sample containers and labeled with the appropriate identifying information.

2.4 ANALYTICAL PROTOCOLS

After sample preparation by SW-846 method 200.8 all samples will be analyzed for lead using SW-846 method 6020.

The report of analytical results will include a cover letter from the laboratory identifying the sample group and any non-compliant quality control results together with the affected samples. Attached to the cover letter will be a summary of sample results and a summary of quality control results. The summary of quality control results will include instrument performance results such as standard recoveries and blanks results; matrix QC results such as spikes, duplicates and procedural blanks; and laboratory control standard recoveries.

Chain-of-custody records and internal laboratory operational and quality control documents will be kept in a site file at the laboratory for audit if desired.

2.5 HEALTH AND SAFETY

All field personnel will have, at a minimum, completed the OSHA approved 40-hour Health and Safety training course. Field personnel will be monitored by the assigned site health and safety officer. All personnel will be attired in appropriate modified level D work clothing, including appropriate eye protection during sampling of large irregular shaped materials. Field personnel will have read the site-specific Health and Safety Plan (HASP) prior to conducting sampling.