December 30, 2013

Mr. Dwight Leisle
Port of Portland
7200 NE Airport Way
Portland, Oregon 97218

Re: Revisions to Proposed Incremental Surface Soil Sampling
Willamette Cove Upland Facility
Portland, Oregon
ECSI No. 271
1056-03

Dear Mr. Leisle:

This letter presents the revised scope for proposed incremental surface soil sampling activities for the Willamette Cove Upland Facility (the Facility; Figures 1 and 2) in the St. Johns area of Portland, Oregon. The sampling activities are being conducted to support the preparation of the Feasibility Study (FS). Work at the Facility is being conducted under Voluntary Agreement EC-NWR-00-26 between the Port of Portland (Port), Metro, and the Oregon Department of Environmental Quality (DEQ).

Dioxin/furans (D/F) were detected in grab and incremental samples collected in the former Wharf Road area. Based on the detected D/F concentrations, the DEQ has requested further characterization of the nature and extent of D/F in upland surface soil (DEQ, 2013).

PROPOSED SAMPLING ACTIVITIES

Preparatory Activities

The following activities and schedule coordination will be completed in preparation for the field work.

- **Health and Safety Plan (HASP).** Apex Companies, LLC (Apex) will update the HASP for its personnel involved with the project.
- **Coordination of Facility Access.** The work activities will be conducted in coordination with Metro.

Surface Soil Sampling

The following protocol was prepared based on the *ITRC Technical and Regulatory Guidance Incremental Sampling Methodology* (dated February 2012).

Surface soil samples will be collected from four decision unit areas (DU-4 through DU-7) using an incremental sampling technique to assess the extent of D/F (Figure 3). Consistent with the historical incremental sampling, the lower margin of the decision units begins at the approximate Mean High Water Line. A relatively small area representing two grids within the East Parcel will not be sampled due to complete coverage by a historical Portland-cement concrete slab (Figure 3). The Western Cooperage Plant was constructed over the slab between 1907 and 1915. This was the first industry on the East Parcel and was before any substantive industry on the upland Central Parcel and before the McCormick and Baxter Creosoting Company operated (1944 to 1991).

Each incremental sample will consist of 50 soil increments collected from a randomly selected quadrant as shown on the grids presented on Figure 3. The sample locations within each decision unit will be established using a high-accuracy, handheld global positioning system (GPS) device (Trimble© GeoXH™). Hand taping methods will be employed to augment the use of the GPS in areas of reduced satellite coverage. The lower portions of the decision units along the riverbank will overlap the armoring present on the riverbank. If the proposed sample location is not sampleable (e.g., due to the presence of armor rock, significant woody debris, etc.) the sample location will be moved to a different randomly selected quadrant within the grid, as necessary. Final sample locations will be documented in field notes.

The soil increments will be collected from the top 6 inches of surface soil after removing vegetation. The target mass of each increment will be approximately 30 grams in order to achieve the overall target sample mass of 1.5 kilograms. The soil increments will be collected with a 0.5 inch diameter cylindrical stainless steel sampler. If multiple attempts with the cylindrical sampler are unsuccessful (e.g., due to the presence of gravel) a six-inch deep hole will be initially excavated with hand tools (e.g., shovel, hand auger, etc.). A 30-gram increment will be collected from the sidewall of the hole using a sampling spoon and added to the sampling container for the decision unit. Sieving will be completed by the laboratory as part of the sample drying process, but care will be taken in the field to avoid particles larger than 2 millimeters where practicable. Traditional triplicate analyses are not planned, but a replicate sample will be collected from DU-5 (replicate increments to be collected 10 feet east of the primary location).

Non-disposable items (e.g., hand trowels, spoons, etc.) will be cleaned by washing in a detergent (Alconox®) solution, rinsing with tap water, followed with a deionized water rinse prior to initiating sampling and between sampling for each decision unit.

CHEMICAL ANALYSES

The soil samples will be submitted to Vista Analytical (Vista) of El Dorado Hills, California for chemical analyses on a normal turnaround basis for the following:

- D/F by EPA Method 8290;
- Priority Pollutant 13 metals by EPA 6000/7000 series methods; and
- Polycyclic aromatic hydrocarbons (PAHs) by EPA Method 8270-SIM.

Vista completed the incremental sample processing and D/F laboratory analyses for the former Wharf Road incremental samples in 2012. The requested method reporting limits (MRLs) will be consistent with the historical laboratory analyses and the concentrations will be presented to the method detection limit (MDL).

The Vista standard operating procedure (SOP) for incremental sample processing is included in Attachment A. The final mass following air drying and sieving will be recorded by the laboratory. No sample grinding or milling is planned. Laboratory quality assurance/quality control (QA/QC) will include a method blank and a batch laboratory control sample (LCS)/laboratory control sample duplicate (LCSD). One laboratory process replicate will be collected from the two dimensional slabcake prepared by the laboratory (along with the percent moisture analysis).

REPORTING

The results of the sampling proposed in this letter will be presented in a data report and used to evaluate remedial options in the FS.

If you have any questions regarding these activities, please contact the undersigned at (503) 924-4704.

Sincerely,

expires 12/31/2014

Michael J. Pickering, R.G.
Senior Associate Hydrogeologist

REFERENCES

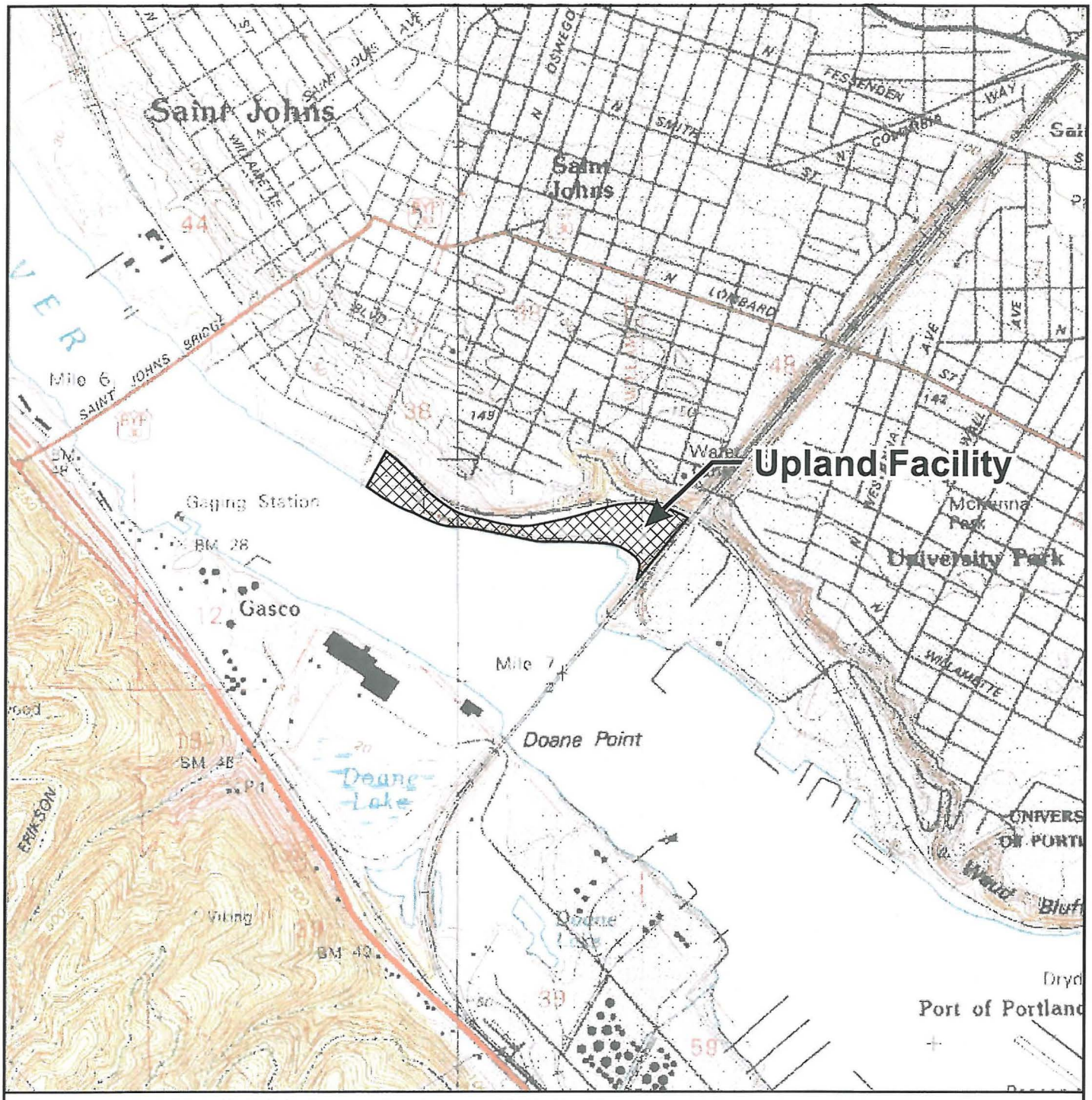
DEQ/EPA, 2005. Portland Harbor Joint Source Control Strategy – Final (Table 3-1 Updated July 16, 2007). December 2005.

DEQ, 2013. DEQ Approval of October 7, 2013 Response to DEQ July 19, 2013 Letter, Draft Human Health and Ecological Residual Risk Assessments, Willamette Cove Upland Facility. ECSI# 2066. November 8, 2013.

ATTACHMENTS

Figure 1 – Facility Location Map
Figure 2 – Upland Facility Map
Figure 3 – Proposed Sampling Plan

Attachment A – Vista Analytical Standard Operating Procedure – Laboratory Incremental Sub-Sampling



Base map prepared from USGS 7.5-minute quadrangles as provided by TerraServer.

0 2,000 4,000

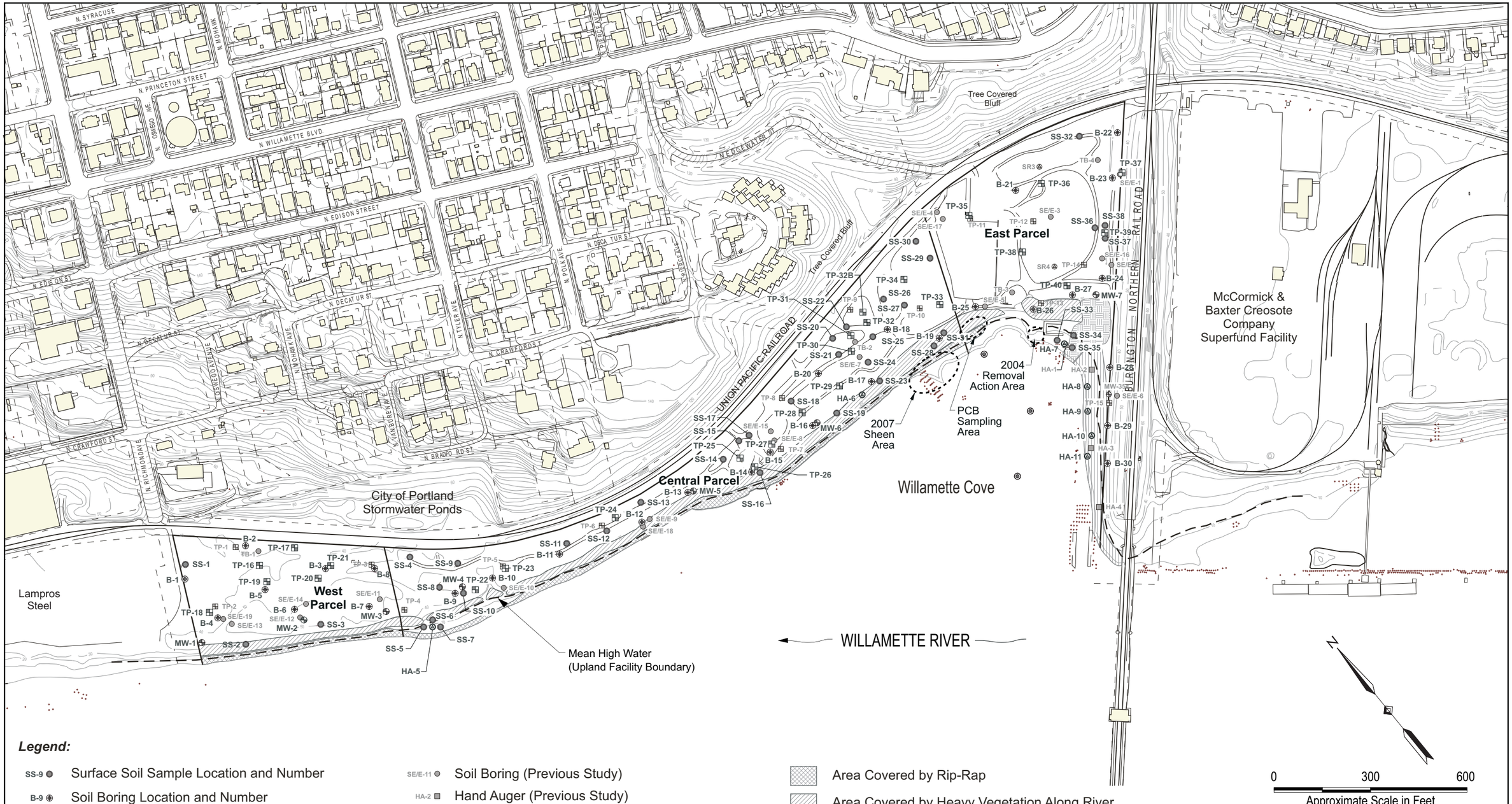
Approximate Scale in Feet

N

Facility Location Map

Revisions to Proposed Incremental Surface Soil Sampling
Willamette Cove Upland Facility
Portland, Oregon

APEX Apex Companies, LLC 3015 SW First Avenue Portland, Oregon 97201	Project Number	1056-03	Figure
	December 2013		1



Legend:

- SS-9 Surface Soil Sample Location and Number
- B-9 Soil Boring Location and Number
- HA-5 Hand Auger Soil Boring Location and Number
- TP-24 Test Pit Location and Number
- MW-5 Monitoring Well Location and Number
- Sediment Sample Location
- SE/E-11 Soil Boring (Previous Study)
- HA-2 Hand Auger (Previous Study)
- TP-4 Test Pit (Previous Study)
- SR4 Surface Soil Sample (Previous Study)
- MW-35s Monitoring Well Location and Number (Previous Study)
- Area Covered by Rip-Rap
- Area Covered by Heavy Vegetation Along River
- Area Covered by Clean Imported Sand
- Area of Armored Sediment Cap

Note: Base map prepared from an electronic file provided by Hart Crowser.

Upland Facility Plan

Revisions to Proposed Incremental Surface Soil Sampling
Willamette Cove Upland Facility
Portland, Oregon

APEX	Apex Companies, LLC 3015 SW First Avenue Portland, Oregon 97201	Project Number 1056-03 December 2013	Figure 2

Legend:

- Proposed Incremental Sample Location
- Historical Wharf Road Incremental Samples
- Grids Fully Covered by Portland-Cement Concrete Slab
- Site Boundary

Source: Base map prepared from a 2005 aerial photograph.

0 250 500
Scale in Feet

Proposed Sampling Plan

Revisions to Proposed Incremental Surface Soil Sampling
Willamette Cove Upland Facility
Portland, Oregon

APEX
Apex Companies, LLC
3015 SW First Avenue
Portland, Oregon 97201

Project Number	1056-03	Figure
December 2013		3

Attachment A

Vista Analytical Standard Operating Procedure – Laboratory Incremental Sub-Sampling

The content of the SOP is the confidential property of Vista Analytical Laboratory, Inc. and may not be copied, modified, retransmitted, or used for any purposes other than those that have been determined by associated contractual agreements without Vista's written authorization.

Vista Analytical Laboratory

SOP 44	Revision: 0	Supersedes:
LABORATORY INCREMENTAL SUB-SAMPLING		
Analyst Review:		
Management:		
Quality Assurance:		
Effective Date: 18 July 2012		

Revision	Description of Revision
	no changes: 9/3/2013

Vista Analytical Laboratory
El Dorado Hills, CA 95762

1. PURPOSE

1.1. The purpose of this SOP is to provide a procedure for Incremental Sub-Sampling, a technique designed to statistically reduce or limit variability associated with discrete sampling. The procedure provides a more representative and reproducible estimate of the mean concentration of analytes in a specific area of interest.

2. METHOD SUMMARY

2.1. Field samples are processed by drying, removing extraneous material, and sieving to establish a representative sample. The entire sample is then divided into sub-samples using the incremental sampling technique.

3. INTERFERENCES

3.1. Solvents, reagents, glassware and other sample processing hardware may yield discrete artifacts or elevated baselines that may cause misinterpretation in chromatographic data. All of these materials must be demonstrated to be free from interferants under the conditions of analysis by performing laboratory method blanks. Analysts should avoid using PVC gloves.

3.2. The use of high purity reagents and solvents helps minimize interference problems.

3.3. Interferants coextracted from the sample will vary considerably from matrix to matrix.

3.4. Conducting most of the manipulations in a hood will minimize contamination of the laboratory.

4. DEFINITIONS

4.1. Definitions are presented in the Glossary.

5. SAFETY

5.1. Procedures shall be carried out in a manner that protects the health and safety of all Vista employees, including the appropriate use of Personal Protective Equipment and engineering controls.

5.2. Each chemical compound should be treated as a potential health hazard. Exposure to these compounds should be reduced to the lowest possible level. Only highly trained personnel thoroughly familiar with handling and cautionary procedures and the associated risks should handle all compounds

or reagents.

5.3. Each chemical compound should be handled in well-ventilated, controlled access laboratories.

5.4. Additional health and safety information can be obtained from material safety data sheets (MSDSs) available to all personnel involved in these analyses.

5.5. In the event of a known or potential compromise to the health and safety of a Vista associate, all work must stop and the incident reported immediately to management.

5.6. Contamination of the laboratory will be minimized by conducting most of the manipulations in a hood.

6. APPARATUS AND MATERIALS

6.1. Analytical Balances, capable of reading to 0.01g and 0.0001 g

6.2. Metal trays

6.3. US Standard Sieve 12” #10 2mm Mesh

6.4. Mortar and Pestle

6.5. Spoons, scoopulas

6.6. Solvents

6.6.1. Toluene

6.6.2. Hexane

6.6.3. Methylene chloride (DCM)

6.6.4. Acetone

7. COLLECTION, PRESERVATION, AND HANDLING

7.1. Samples must be stored, extracted, and analyzed according to the requirements of the associated analytical method.

8. SAMPLE PREPARATION

8.1. Compositing

8.1.1. Remove any obviously extraneous materials and homogenize sample prior to sub-sampling.

8.1.2. Samples are individually homogenized with a clean spoon, spoonula or spatula.

8.1.3. Spread the entire sample into a clean metal tray.

8.1.4. Repeat the homogenization for each sample.

8.1.5. All homogenization components are cleaned prior to homogenization and between each sample. Wash with soap and water and rinse with HPLC water. Solvent rinse in the following order: Acetone → toluene → hexane → methylene chloride

8.1.6. If samples are very wet, allow to air dry in a hood for 24 hours or until dry.

8.2. Sieving

8.2.1. Sieve dry samples through a 2 mm sieve, #10. Replace any sample that cannot be sieved back into the original sample container.

8.2.2. Place each individual sample into a new, separate labeled container. Record the weight of each sample on the benchsheet.

Note: The entire "bulk" sample must be sieved.

8.3. Sub-Sampling

8.3.1. Spread the sieved sample evenly across a metal tray of uniform thickness.

8.3.2. Divide the tray into 30 equal parts and take a sub-sample from each of the 30 parts, taking a representative sample from bottom to top. The sample weight of each sub-sample should be approximately 1/30th of the total sample weight.

Note: Sub-sampling scheme may be performed in accordance with client specifications if requested.

8.3.3. Combine each sub-sample into a new, labeled container.

8.3.4. Store at 0-4°C until extraction.

Note: the entire contents of the sample jar must be extracted and analyzed, minus the portion for the percent solids determination.

9. POLLUTION PREVENTION

9.1. The solvent evaporation techniques used in this method are amenable to solvent recovery, and it is recommended that the laboratory recover solvents wherever feasible.

10. WASTE MANAGEMENT

10.1. Waste generated in the procedure must be segregated and disposed according to the facility hazardous waste procedures. Safety officer should be contacted if additional information is required.

10.2. The laboratory waste management is in compliance with all federal, state, and local regulations to protect the air, water, and land by minimizing and controlling all releases from fume hoods and bench operations.

11. REFERENCES

11.1. Alaska Dept. of Environmental Conservation, Division of Spill Prevention and Response, Contaminated Sites Program, Draft Guidance on Multi Increment Soil Sampling, March 2009.

11.2. State of Hawaii Department of Health, Office of Hazard Evaluation and Emergency Response, Technical Guidance Manual for the Implementation of the Hawaii State Contingency Plan, Interim Final – November 12, 2009.

11.3. Vista Analytical Laboratory SOP 11 - Laboratory Support Instrument Calibration.

Glossary

Analyte — A CDD or CDF tested for by this method. The analytes are listed in Table 2.

Calibration Standard (CAL) — A solution prepared from a secondary standard and/or stock solutions and used to calibrate the response of the instrument with respect to analyte concentration.

Calibration Verification Standard (VER) — The mid-point calibration standard (CS3) that is used in to verify calibration. See Table 2.

CDD — Chlorinated Dibenzo-p-Dioxin — The isomers and congeners of tetra- through octa-chlorodibenzo-p-dioxin.

CDF — Chlorinated Dibenzofuran — The isomers and congeners of tetra- through octa-chlorodibenzofuran.

CS0, CS1, CS2, CS3, CS4, CS5 — See Calibration standards and Table 2.

Field Blank — An aliquot of reagent water or other reference matrix that is placed in a sample container in the laboratory or the field, and treated as a sample in all respects, including exposure to sampling site conditions, storage, preservation, and all analytical procedures. The purpose of the field blank is to determine if the field or sample transporting procedures and environments have contaminated the sample.

GC — Gas chromatograph or gas chromatography.

HRGC — High resolution GC.

HRMS — High resolution MS.

IPR — Initial precision and recovery; four aliquots of the diluted PAR standard analyzed to establish the ability to generate acceptable precision and accuracy. An IPR is performed prior to the first time this method is used and any time the method or instrumentation is modified.

Laboratory Blank — See method blank.

Laboratory Control sample (LCS) — See ongoing precision and recovery standard (OPR).

Laboratory Reagent Blank — See method blank.

May — This action, activity, or procedural step is neither required nor prohibited.

May Not — This action, activity, or procedural step is prohibited.

Method Blank — An aliquot of reagent water that is treated exactly as a sample including exposure to all glassware, equipment, solvents, reagents, internal standards, and surrogates that are used with samples. The method blank is used to determine if analytes or interferences are present in the laboratory environment, the reagents, or the apparatus.

Minimum Level (ML) — The level at which the entire analytical system must give a recognizable signal and acceptable calibration point for the analyte. It is equivalent to the concentration of the lowest calibration standard, assuming that all method-specified sample weights, volumes, and cleanup procedures have been employed.

MS — Mass spectrometer or mass spectrometry.

Must — This action, activity, or procedural step is required.

OPR — Ongoing precision and recovery sample (OPR); a laboratory blank spiked with known quantities of analytes. The OPR is analyzed exactly like a sample. Its purpose is to assure that the results produced by the laboratory remain within the limits specified in this method for precision and recovery.

PAR — Precision and recovery standard; secondary standard that is diluted and spiked to form the IPR and OPR.

PFK — Perfluorokerosene; the mixture of compounds used to calibrate the exact m/z scale in the HRMS.

Preparation Blank — See method blank.

Primary Dilution Standard — A solution containing the specified analytes that is purchased or prepared from stock solutions and diluted as needed to prepare calibration solutions and other solutions.

Quality Control Check Sample (QCS) — A sample containing all or a subset of the analytes at known concentrations. The QCS is obtained from a source external to the laboratory or is prepared from a source of standards different from the source of calibration standards. It is used to check laboratory performance with test materials prepared external to the normal preparation process.

Reagent Water — Water demonstrated to be free from the analytes of interest and potentially interfering substances at the method detection limit for the analyte.

Relative Standard Deviation (RSD) — The standard deviation times 100 divided by the mean. Also termed "coefficient of variation."

RF — Response factor.

RR — Relative response.

RSD — See relative standard deviation.

SDS — Soxhlet/Dean-Stark extractor; an extraction device applied to the extraction of solid and semi-solid materials.

Should — This action, activity, or procedural step is suggested but not required.

SICP — Selected ion current profile; the line described by the signal at an exact m/z.

SPE — Solid-phase extraction; an extraction technique in which an analyte is extracted from an aqueous sample by passage over or through a material capable of reversibly adsorbing the analyte. Also termed liquid-solid extraction.

Stock Solution — A solution containing an analyte that is prepared using a reference material traceable to EPA, the National Institute of Science and Technology (NIST), or a source that will attest to the purity and authenticity of the reference material.

TCDD — Tetrachlorodibenzo-p-dioxin.

TCDF — Tetrachlorodibenzofuran.

VER — See calibration verification standard.