

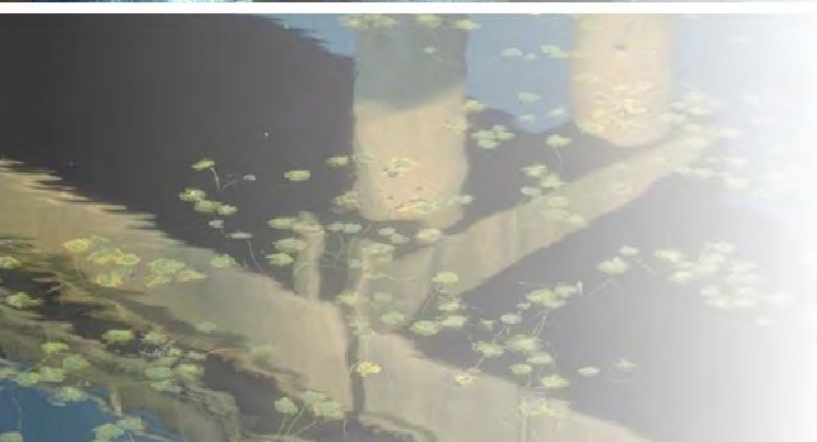
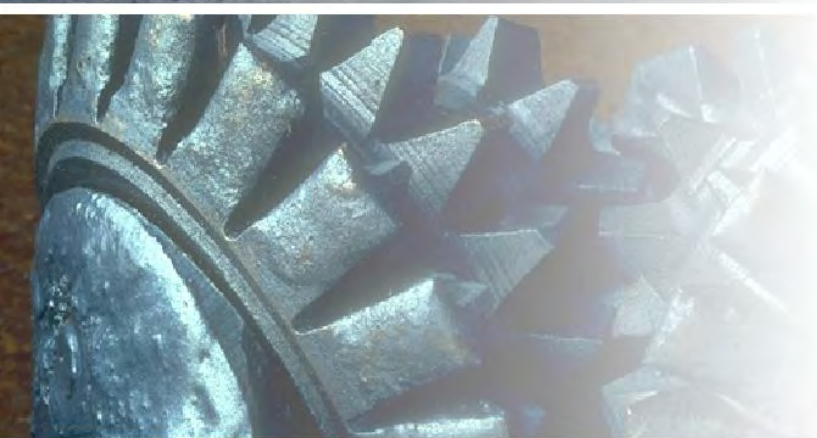
***Sediment Characterization Report
Terminal 2, Berths 205 and 206
NW Front Avenue
Portland, Oregon***



***Prepared for
Port of Portland***



***April 10, 2012
15665-01***



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Prepared by
Hart Crowser, Inc.



Expires: 5/31/12

Richard D. Ernst, RG
Principal

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ACRONYMS

ARI	Analytical Resources, Inc.
CCV	Continuing Calibration Verifications
COC	chemical of concern
Corps	U.S. Army Corps of Engineers
CRD	Columbia River Datum
cy	cubic yard
DEHP	<i>bis</i> (2-ethylhexyl)phthalate
DEQ	Oregon Department of Environmental Quality
DMEF	Dredged Material Evaluation Framework
DMMU	Dredge material management unit
EPA	Environmental Protection Agency
GPS	global positioning system
IS	Internal Standard
LCS	laboratory control sample
LCSD	laboratory control sample duplicate
MDL	method detection limit
µg/kg	micrograms per kilogram
MRL	method reporting limit
MS	matrix spike
MSD	matrix spike duplicate
NSM	new surface material
NUC	Northwest Underwater Construction
PAHs	polycyclic aromatic hydrocarbons
PCBs	polychlorinated biphenyls
Port	Port of Portland
PSET	Portland Sediment Evaluation Team
QA/QC	quality assurance/quality control
RPD	relative percent difference
RSD	Relative Standard Deviation
SAP	Sampling and Analysis Plan
SEF	Sediment Evaluation Framework for the Pacific Northwest
SL	screening level
SRM	Standard Reference Material
SVOC	semivolatile organic compound
TBT	tributyltin
TOC	total organic carbon
Total DDx	DDT, DDE, and DDD
TPH	total petroleum hydrocarbons

SEDIMENT CHARACTERIZATION REPORT TERMINAL 2, BERTHS 205 AND 206 NW FRONT AVENUE, PORTLAND, OREGON

1.0 INTRODUCTION

The Port of Portland (Port) proposes to conduct a maintenance dredging event at Berths 205 and 206 at Terminal 2 along the Willamette River in Portland, Oregon (Figure 1). To provide chemical quality data on sediment to be dredged and the future “leave surface” or new surface material (NSM), sediment characterization activities were completed in accordance with the Sediment Evaluation Framework (SEF) for the Pacific Northwest (U.S. Army Corps of Engineers [Corps] et al., 2009) and our Sampling and Analysis Plan (SAP) (Hart Crowser, 2011) as modified by comments from the Portland Sediment Evaluation Team (PSET, 2012). This report presents the results and findings of these activities.

1.1 Terminal 2 and Berth Descriptions

Terminal 2 is located at 3556 NW Front Avenue in Portland, Oregon, on the west bank of the Willamette River at river mile 10 (Figure 1). The Willamette River at this location is heavily developed and supports a variety of industrial activities. Terminal 2 has four berths (Berths 203, 204, 205, and 206) and is used as a breakbulk and container general cargo facility (Figure 2). This facility handles many types of cargo, including lumber and forest products, steel, machinery, and packaged goods. The project site is Berths 205 and 206.

Figure 2 shows Berths 205 and 206, along with July 2011 bathymetric survey conducted by the Port. Sediment contours are relative to the Columbia River Datum (CRD). These berths are contiguous and comprise an area of 1,550 feet long by 125 feet wide. A description of these berths is as follows.

- Berth 205. This berth is approximately 700 feet long. Based on the survey, the river bottom within the berthing area varies from approximately -27 to -37.5 feet CRD. The design depth of Berth 205 is -40 feet CRD but in this project the Port intends to dredge Berth 205 only to a project design depth of -36 feet CRD.
- Berth 206. This berth is approximately 850 feet long. Based on the survey, the river bottom within the berthing area varies from approximately -31 to -41 feet CRD. The design depth of Berth 206 is -40 feet CRD but in this project the Port intends to dredge Berth 206 only to a project design depth of -38 feet CRD.

1.2 Previous Sediment Characterization Activities

Previous sediment characterization and berth maintenance events for Berths 205 and 206 are discussed in the SAP (Hart Crowser, 2011). The Port has conducted maintenance dredging of Berths 205 and 206, along with Berth 204, six times from 1990 through 2008. The last dredging event in 2008 removed 12,242 cubic yards (cy) from Berths 205 and 206.

Previous sampling data detected total DDx (DDT plus its breakdown products DDE and DDD) slightly above its Dredged Material Evaluation Framework (DMEF) screening level (SL) within the dredge prism in a 2001 study, but not in the NSM (the previous individual detections of DDT, DDE, and DDD are below their respective SEF SLs). This material was partially dredged in 2002, and sampling in 2004 and 2008 did not detect DDT, DDE, and DDD above SEF SLs. As such, total DDx or its breakdown products are no longer chemicals of concern (COCs) for the project site.

Analytical results on grab samples in 2004 did not detect compounds above SEF SLs. The 2008 study detected benzoic acid and *bis* (2-ethylhexyl) phthalate (DEHP) above their respective SLs in NSM samples at Berth 205 and a NSM sample had a bioassay failure (likely due to ammonia). After dredging, benzoic acid and DEHP were below SEF SLs in the NSM. Because of these prior and recent detections, benzoic acid and DEHP were identified as COCs at this site. Based on these slight COC exceedances and the prior bioassay failure, a “moderate” rank was proposed for Berths 205 and 206 in accordance with Table 4-2 of the SEF. PSET (2012) concurred with this ranking.

1.3 Project Description

Maintenance dredging is needed due to the gradual and persistent deposition of river sediment in the berthing areas that compromises the authorized navigational depth clearances required for ships. The Port conducts maintenance dredging under Corps permit NWP-2006-635 (expiration January 31, 2017) issued under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act and Oregon DSL permit 34105-RF (expiration July 18, 2013). These permits allow dredging up to -40 feet CRD with two feet of overdredge.

In-water dredging activities will be performed during the Willamette River in-water work window from July 1 to October 31, 2012. Project specifics for each berth are presented below, including the authorized dredging depths (per Corps permit NWP-2006-635), the approximate leave surface elevation for NSM considering overdredge for maintenance and inherent dredging accuracy, and the estimated

volume of sediment to be dredged. The Port considered two different design depths for each berth and thus sediment characterization included sampling both possible NSM depths. The Port has since decided to conduct maintenance dredging to the shallower NSM depth as indicated below. Figure 2 shows the approximate area where dredging will occur for Berths 205 and 206.

- Berth 205. This berth's design depth for this project is -36 feet CRD. With an additional two feet of overdredge allowance, the NSM will likely average -37 feet CRD. The estimated volume of sediment in the dredge prism ranges from approximately 6,000 to 18,000 cy. A deeper design depth of -38 feet CRD was considered (NSM of -39 feet CRD), but will not be selected.
- Berth 206. This berth's design depth for this project is -38 feet CRD. With an additional two feet of overdredge allowance, the NSM will likely average -39 feet CRD. The estimated volume of sediment in the dredge prism ranges from approximately 5,000 to 10,000 cy. A deeper design depth of -40 feet CRD was considered (NSM of -41 feet CRD), but will not be selected.

The Port will use its standard berth dredging methods, which are designed and have been previously demonstrated to minimize water quality impacts. A clamshell dredge will remove sediments using a close-lipped bucket operated either from the dock or from a floating crane. The depth and position of the bucket and dredge would be monitored by visual and positioning computer systems, including a global positioning system (GPS). The dredge material will be placed in a barge for transport and placement at the West Hayden Island Upland Placement Site (pending approval of a Beneficial Use Determination from the Oregon Department of Environmental Quality [DEQ]). Placement of this dredged material at this upland placement site is not anticipated to generate return water to the Columbia River.

2.0 SEDIMENT CHARACTERIZATION OBJECTIVES

The overall objective of this sediment characterization study was to characterize the quality of the proposed dredge material and NSM. Specific objectives of the study were to:

- Characterize sediment affected by proposed dredging activities along the berths (i.e., the dredge prism) to document the quality of the sediments;
- Additionally, characterize the underlying NSM (a.k.a. leave surface) along the berths to document the chemical quality of these remaining sediments;
- Collect, handle, and analyze samples representative of the dredge prism and NSM sediments in accordance with the SEF;

- Compare the sediment analytical results to applicable SLs to evaluate the nature of the dredge prisms and NSM sediments; and
- Evaluate and report the results of the analytical sediment testing in a complete and timely manner to support the necessary maintenance dredging activities.

Sediment characterization activities were conducted in accordance with our SAP (Hart Crowser, 2011), comments from PSET (PSET, 2012), the SEF, and an EPA technical manual for sediment sampling (EPA, 2001). Quality assurance/quality control (QA/QC) procedures described in our Quality Assurance Project Plan in the SAP were followed.

3.0 SAMPLING AND ANALYSIS ACTIVITIES

This section summarizes the sampling activities and presents the analytical program for the dredge prism and NSM samples (which included two NSM depths). Our activities also included collecting a reference sample in the Willamette River for contingency biological testing (based on chemical results on sediment, biological testing was not necessary).

3.1 *Sediment Core Sampling*

On January 31 and February 1, 2012, Northwest Underwater Construction (NUC) of Vancouver, Washington (under subcontract to Hart Crowser), obtained sediment cores C-1 through C-4 from along Berths 205 and 206 at Terminal 2 (Figure 2). A representative of Hart Crowser was present to observe and document the coring activities and to collect dredge prism and NSM samples for analysis. Logs of the cores are included in Appendix A.

Field Coring Procedures. Positioning over each core location was performed using a GPS. Cores were obtained using a vibracorer with a 4-inch-diameter core barrel deployed from a sampling vessel operated by NUC. Cores were advanced to depths ranging from 9 to 11 feet, penetrating through the proposed dredge prism, a shallow NSM interval (NSM1; 0 to 2 feet below the dredge prism), and a deeper NSM interval (NSM2; 2 to 4 feet below the dredge prism). Sediment was contained in a polycarbonate liner inside of the core barrel. Upon retrieval of the vibracorer, the liner with core was removed from the core barrel, and the ends sealed with caps. The sediment core was examined for acceptance. Core recoveries ranged from 80 to 97 percent. Table 1 presents the sampling information, including core identification, coordinates, mudline elevations, and target sample intervals. The sediment cores were then transported to our office for processing.

Core Processing for Samples. In the processing area, the core liners were split lengthwise and sediment photographed and described (including, as appropriate, physical description, odor, visual stratification, debris, and biological activity). As described further below, composite samples were collected from the dredge prism and two NSM intervals. Containers for both chemical and contingency biological testing were filled with sediment. Because design depths are different between the two berths, a dredge material management unit (DMMU) was designated for each berth. Sediment from cores C-1 and C-2 from Berth 206 were composited together for a DMMU for Berth 206, and similarly cores C-3 and C-4 were composited for a Berth 205 DMMU. Table 1 indicates the compositing scheme.

Discrete Sample Collection. Because samples for sulfide analyses cannot be composited, discrete sediment samples were obtained from the dredge prism, NSM1, and NSM2 intervals from cores C-1 and C-3 for sulfides analysis to represent Berth 206 and 205, respectively. These samples were labeled with the same nomenclature as the composite samples (e.g., C1/2-DP) for consistency.

Dredge Prism Samples. Sediment representing the entire dredge prism interval from each core was placed into a stainless steel bowl and homogenized with a stainless steel spoon until both color and texture were uniform. A discrete sample was obtained for archival purposes (these samples were frozen at our office's field room). The homogenized contents from both cores in the same DMMU were then combined (composited) and homogenized to yield a sample representative of the sediment of the dredge prism. For the Berth 205 DMMU, sediment from cores C-3 and C-4 were composited (e.g., C3/4-DP). For Berth 206 DMMU, sediment from cores C-1 and C-2 were composited (C1/2-DP). These two composite samples were submitted for analysis.

NSM Samples. The sampling procedure above was also used for the NSM samples. Because the Port was considering two different design depths, we sampled two NSM intervals: NSM1 from 0 to 2 feet below the dredge prism, and NSM2 from 2 to 4 feet below the dredge prism. These samples were labeled with the cores and an abbreviated NSM suffix; for example, sample C1/2-N1 was the NSM1 interval from cores C-1 and C-2, which were from Berth 206.

3.2 Reference Sediment Sampling

On February 1, 2012, we collected reference sediment for contingency biological testing from Willamette River mile 19.5 near Elk Rock Island. NUC (under subcontract to Hart Crowser) used a grab sampler to obtain the sample from the upper 7 inches of sediment. Reference sediment was comprised of a silty, fine sand, similar to the fine-grained sediments at Terminal 2. Sediment

retrieved by the grab sampler was placed in a stainless steel bowl, homogenized, and then transferred into sample containers for chemical and possible biological testing. Table 1 presents reference sample identification (“Reference 1”), coordinates, and mudline depth.

3.3 Analytical Program

Samples collected in Section 3.1 and 3.2 were submitted for chemical analysis under chain of custody to Analytical Resources, Inc. (ARI), of Tukwila, Washington (under subcontract to Hart Crowser). Discrete core interval samples and sediment samples for contingency biological testing were archived (frozen and refrigerated, respectively) at our office pending chemical analyses results. Based on results, no discrete sample analyses or biological testing was performed.

3.3.1 Dredge Prism Samples

Dredge prism samples for the two DMMUs (e.g., C1/2-DP and C3/4-DP) were analyzed to assess the chemical quality of newly deposited sediment, evaluate whether sediments could qualify for in-water placement, and perform a DEQ beneficial use determination for upland placement. The samples were analyzed for the physical and chemical analyses listed below.

- Grain size by ASTM D 422M;
- Total solids by EPA Method 160.3;
- Total organic carbon (TOC) by Plumb (1981);
- Ammonia by EPA Method 350.1M;
- Sulfide by EPA Method 376.2;
- Total petroleum hydrocarbons (TPH) as diesel and oil by Northwest Method NWTPH-Dx with a silica gel cleanup;
- Total metals (antimony, arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc) by EPA Method 200.8/6010B/7471A;
- TBT in bulk sediment by Krone, et al. (written 1988; published 1989);
- Polycyclic aromatic hydrocarbon (PAHs) by EPA Method 8270D-SIM;
- Semivolatile organic compounds (SVOCs) by EPA Method 8270D;
- Organochlorine pesticides by EPA Method 8081A; and
- Polychlorinated biphenyls (PCBs) by EPA Method 8082.

3.3.2 NSM Samples

The four NSM samples (NSM1 and NSM2 intervals for both berths) were analyzed for the COCs identified by previous characterization activities at the site (Section 1.2). Due to holding time constraints and the possibility that biological testing might be performed, we also analyzed the samples for several convention parameters. As such, the NSM samples were initially analyzed for the chemical compounds listed below using the methods indicated above in Section 3.3.1.

- Total solids;
- Total sulfides;
- Ammonia;
- Benzoic acid; and
- DEHP.

Based on the chemical results on dredge prism samples, further analysis of NSM samples for other compounds was performed. Benzyl alcohol, phenol, and 2,4-dimethylphenol were detected above SEF marine SLs in dredge prism sediment at Berth 205, and benzyl alcohol in dredge prism sediment at Berth 206 (these compounds can be generated through degradation of organic matter). Per the SAP, these compounds were reported for NSM samples. Additionally, due to the detection of PCBs and total DDx compounds in the dredge prism, NSM samples were analyzed for these compounds as requested by PSET (2012).

3.3.3 Reference Sample

Due to holding time constraints and the possibility that biological testing might be performed, we analyzed the reference sample for total solids, ammonia, and total sulfides.

3.4 Modifications to the SAP

Field activities and the analytical program were conducted in accordance with the SAP (Hart Crowser, 2011). As explained below, some modifications were made to the analytical program to incorporate recommendations from PSET (2012).

- PSET indicated that testing for bioaccumulative COCs (Portland District List 1 in Appendix C of the SEF) in the NSM samples should be completed if any of

these COCs were detected in the overlying dredge prism samples. In subsequent correspondence with the Corps, this was clarified to focus on only PCBs and DDx compounds. Because these compounds were detected in the dredge prism samples, we analyzed the NSM samples for them.

- Per the SAP, ARI reported the concentrations of benzyl alcohol, phenol, and 2,4-dimethylphenol in NSM samples, as applicable, where these compounds were present in dredge prism samples in comparison to marine SLs (no freshwater SLs exist). The Corps, however, subsequently clarified that SEF marine SLs should not be used for these compounds; as such, we are not screening against marine SLs for these compounds.

4.0 SEDIMENT QUALITY

ARI completed analyses on two dredge prism samples and four NSM samples corresponding to the two DMMUs at Berths 205 and 206. Tables 2 and 3 list the physical and chemical results, respectively. Chemical results were compared to SLs to assess the chemical quality of the dredge prism and NSM sediments. This section presents the results and provides an evaluation of them.

4.1 Data Quality Review

A QA review of the data is provided in Appendix B. Method detection limits (MDLs) were reported for all chemical analyses except conventional analyses. The laboratory analyzed QC samples, including surrogates, method blanks, laboratory control samples (LCS), matrix spikes (MS), and laboratory, LCS, and MS duplicates. Upon review, the overall data quality objectives for collection and chemical testing of sediment samples were met, and the data for this project are acceptable for use as qualified. Two QA issues of note are as follows:

- DEHP was detected in all dredge prism and NSM samples; however, it was also detected in the method blank (21 µg/kg). Where the sample results were less than five times the method blank concentration, the sample concentration was qualified as undetected (U-flag).
- The results for DDE in samples C1/2-N2, C 3/4-N1, and C3/4-N2 differed by more than 40 percent between the two chromatographic columns (P-flag). The results were also qualified as estimated (J-flag).

Laboratory reports for chemical analysis, including QC samples, are included in Appendix C.

4.2 Grain Size Characteristics

The grain size results on the dredge prism samples are presented in Table 2, and grain size distribution curves are provided in Appendix C. All samples are primarily comprised of grain sizes from a fine silt to a very fine sand. Sediments from both berths were essentially the same, consisting of a clayey, sandy silt with a total of 80.7 to 81.1 percent fines.

4.3 Comparison to SEF Screening Levels

Table 3 presents the chemical results on the sediment samples. These results were compared to the SEF SLs. These SLs were established in the SEF for protection of the aquatic environment and to provide a uniform framework for evaluating sediment quality of dredged material for unconfined aquatic disposal. Freshwater SEF SLs have not been finalized, so SLs in Table 3 are freshwater Screening Level 1 values from Table 7-1 of the Interim Final SEF (Corps, et al., 2006; table revised October 20, 2006). Pesticides compounds do not have SL1 values so the Corps indicates marine SEF SLs are to be used (Corps, et al. 2009, Table 6-3).

4.3.1 Dredge Prism Samples

Analytical results for the two dredge prism samples for Berth 205 and 206 DMMUs detected TOC; ammonia; sulfides; metals except antimony and silver; oil-range TPH; PAHs; several SVOCs; DDE; and PCBs (Table 3). Ammonia, benzoic acid, benzyl alcohol, phenol, and 2,4-dimethylphenol were relatively higher in concentration and are likely the result of degradation of organic matter. No compounds, however, exceeded SEF SLs.

4.3.2 NSM1 Samples

The Port has selected that maintenance dredging will be conducted to the shallower NSM (NSM1) sample interval. Analytical results detected ammonia, several SVOCs, DDD and DDE in both NSM1 samples, and sulfides and PCBs in the Berth 206 NSM1 sample (Table 3). There were no exceedances of SEF SLs.

4.3.3 NSM2 Samples

The NSM2 sample horizon will remain covered by the NSM1 interval after dredging; as such, it will not be exposed. Analytical results on NSM2 samples detected ammonia; sulfides; several SVOCs, DDD, DDE, and PCBs (Table 3). There were no exceedances of SEF SLs.

4.4 Data Evaluation

Sediment results on dredge prism, NSM1, and NSM2 samples did not detect any contaminants exceeding SEF SLs. As such, dredge prism sediments are suitable for in-water placement after dredging. Currently, the Port plans to place the dredged sediments upland at the West Hayden Island Placement Site and has submitted a Beneficial Use Determination to the DEQ for approval.

As requested by PSET, NSM1 and NSM2 sediments were analyzed for PCBs and DDx compounds. Detected concentrations in NSM samples were similar to the overlying dredge prism samples. After dredging, the NSM1 sample interval will be exposed. Total PCBs will decrease from the dredge prism to non-detectable levels in the NSM at Berth 205 and remain essentially the same at Berth 206 (the 3.5 µg/kg difference between the dredge prism and NSM1 samples is within the range of laboratory variation; the relative percent difference [RPD] of 18 percent is within the 40 percent RPD ARI uses for replicates). Total DDx varied less than 1 µg/kg between respective dredge prism and NSM1 samples. As such, dredging will not result in a change of sediment quality in the aquatic environment.

5.0 SUMMARY

The Port is proposing to conduct maintenance dredging at Berths 205 and 206 to maintain the navigational depth clearances for vessels docking at these berths. In early 2012, we obtained two sediment cores from each berth. Sediment from each set of cores was sampled to represent the dredge prism, a shallow NSM interval (NSM1), and a deeper NSM interval (NSM2). A total of two dredge prism and four NSM samples were submitted for physical and chemical analyses.

Chemical results on the samples did not detect any contaminants exceeding SEF SLs. Dredge prism data indicate that sediment from the Berth 205 and 206 DMMUs is suitable for unconfined in-water placement (the Port, however, will be placing dredged material upland). The Port has selected dredging to the NSM1 depth (-36 and -38 feet CRD for Berths 205 and 206, respectively) with two feet of overdredge allowance. An estimated total of approximately 11,000 to 28,000 cy of sediment will be dredged. After dredging, the NSM will be of similar sediment quality as before dredging.

6.0 REFERENCES

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U.S. Army Corps of Engineers, Seattle District, Portland District, Walla Walla District, and Northwestern Division; U.S. EPA, Region 10; Washington Departments of Ecology and Natural Resources; Oregon Department of Environmental Quality; Idaho Department of Environmental Quality; National Marine Fisheries Service; and U.S. Fish and Wildlife Service, 2006. *Northwest Region Sediment Evaluation Framework, Interim Final.* September 2006.

U.S. Army Corps of Engineers, Seattle District, Portland District, Walla Walla District, and Northwestern Division; U.S. EPA, Region 10; Washington Departments of Ecology and Natural Resources; Oregon Department of Environmental Quality; Idaho Department of Environmental Quality; National Marine Fisheries Service; and U.S. Fish and Wildlife Service, 2009. *Sediment Evaluation Framework for the Pacific Northwest.* September 2009.

**Table 1 - Core and Sample Information
Terminal 2 Sediment Characterization
Portland, Oregon**

Core Sample Location	Date	Location			Core Penetration in Feet	Number of Cores Obtained	Percent Sediment Recovery
		Berth	Northing (Latitude)	Easting (Longitude)			
Terminal 2							
C-1	31-Jan-12	206	693274.9 (45° 32' 50.1")	7639170.8 (122° 41' 51.4")	10	1	80
C-2	1-Feb-12	206	693467.6 (45° 32' 52.0")	7638962.6 (122° 41' 54.4")	10	1	90
C-3	1-Feb-12	205	693747.2 (45° 32' 54.7")	7638664.7 (122° 41' 58.6")	9	1	97
C-4	1-Feb-12	205	693981.4 (45° 32' 56.9")	7638415.6 (122° 41' 02.2")	11	1	80
Willamette River Reference Sediment							
Reference	1-Feb-12	-	652827.9 (45° 26' 14.1")	7651252.2 (122° 38' 46.5")	1	Grab Sample	-

Core Sample Location	Approximate Mudline Elevation* (CRD)	Dredge Prism		NSM1		NSM2	
		Sample Interval (CRD)	Composite Sample for Analysis	Sample Interval (CRD)	Composite Sample for Analysis	Sample Interval (CRD)	Composite Sample for Analysis
Terminal 2							
C-1	-33	-33 to -39	C1/2-DP	-39 to -41	C1/2-N1	-41 to -43	C1/2-N2
C-2	-33	-33 to -39		-39 to -41		-41 to -43	
C-3	-34	-34 to -37	C3/4-DP	-37 to -39	C3/4-N1	-39 to -41	C3/4-N2
C-4	-30	-30 to -37		-37 to -39		-39 to -41	
Willamette River Reference Sediment							
Reference	**	-	-	**	Reference 1	-	-

Notes:

1. Northing and easting based on North American Datum of 1983 (NAD 83/98), State Plane Coordinate System, Oregon North Zone.
2. CRD = Columbia River Datum.
3. - = Not applicable.
4. *Based on lead line measurement and river levels from USGS Willamette River gage station 14211720 on Morrison Bridge. Mudline elevations were within 1 foot of the July 2011 bathymetric survey.
5. **Depth of water to mudline was 14 feet. Sample from top 7 inches of sediment.

**Table 2 - Grain Size Distributions
Terminal 2 Sediment Characterization
Portland, Oregon**

		Berth	205	206
		Sample ID	C3/4-DP	C1/2-DP
		Lab ID	UH13B	UH13A
		Date	2-Feb-12	2-Feb-12
Classification	Sieve Size (Microns)	Percent (%)		
Gravel	>#10 (2,000)	0.0	0.0	
Very Coarse Sand	10-18 (2,000-1,000)	1.0	1.0	
Coarse Sand	18-35 (1,000-500)	1.0	0.8	
Medium Sand	35-60 (500-250)	0.8	1.1	
Fine Sand	60-120 (250-125)	4.0	3.8	
Very Fine Sand	120-230 (125-62.5)	12.0	12.5	
Coarse Silt	(62.5-31)	25.3	24.1	
Medium Silt	(31-16)	21.1	21.2	
Fine Silt	(16-8)	12.2	10.9	
Very Fine Silt	(8-4)	8.4	7.5	
8-9 Phi Clay	(4-2)	4.3	5.4	
9-10 Phi Clay	(2-1)	3.9	4.6	
> 10 Phi Clay	(<1)	5.9	7.0	
Total Fines	(<62.5)	81.1	80.7	
Material Description		Sandy, clayey SILT	Sandy, clayey SILT	

Note:

1. Sample C1/2 was run in triplicate as part of laboratory quality control. The result shown is the first sample. The other samples were almost the same (total fines of 80.5 and 80.8).

Table 3 - Sediment Chemical Analyses Results
Terminal 2 Sediment Characterization
Portland, Oregon

Berth Sediment Horizon Sample Lab ID Date	205			206			SEF Screening Levels
	Prism C3/4-DP UH13B 2-Feb-12	NSM1 C3/4-N1 UH13E/UJ37C 2-Feb-12	NSM2 C3/4-N2 UH13F/UJ37D 2-Feb-12	Prism C1/2-DP UH13A 2-Feb-12	NSM1 C1/2-N1 UH13C/UJ37A 2-Feb-12	NSM2 C1/2-N2 UH13D/UJ37B 2-Feb-12	
Conventional Parameters							
Total Solids (%)	47.2	50.6	52.1	48.5	57.7	55.8	-
Total Organic Carbon (%)	2.21	-	-	2.40	-	-	-
Ammonia (mg/kg)	311	274	285	206	252	269	-
Total Sulfides (mg/kg)	27.9	2.13 U	19.8	14.3 J	47.6	10.8	-
TPH in mg/kg							
Diesel-Range	2.7 U	-	-	2.8 U	-	-	-
Oil-Range	24	-	-	3.4 U	-	-	-
Total TPH	24	-	-	3.4 U	-	-	-
Metals in mg/kg							
Antimony	0.69 UJ	-	-	0.60 UJ	-	-	-
Arsenic	4.1	-	-	3.9	-	-	20
Cadmium	0.6	-	-	0.6	-	-	1.1
Chromium	38	-	-	37.8	-	-	95
Copper	47.6	-	-	46.3	-	-	80
Lead	13	-	-	13	-	-	340
Mercury	0.07	-	-	0.06	-	-	0.28
Nickel	29	-	-	28	-	-	60
Silver	0.065 U	-	-	0.057 U	-	-	2.0
Zinc	107	-	-	104	-	-	130
Tributyltin (TBT)							
TBT in Bulk Sediment (µg/kg)	1.0 U	-	-	1.0 U	-	-	75
PAHs in µg/kg							
<u>LPAHs</u>							
Naphthalene	21	-	-	13	-	-	500
Acenaphthylene	14 J	-	-	3.2 J	-	-	470
Acenaphthene	12	-	-	3.1 J	-	-	1,100
Fluorene	15 J	-	-	4.1 J	-	-	1,000
Phenanthrene	46	-	-	25	-	-	6,100
Anthracene	17 J	-	-	4.9	-	-	1,200
2-Methylnaphthalene	13 J	-	-	4.2 J	-	-	470
Total LPAHs	147	-	-	66	-	-	6,600
<u>HPAHs</u>							
Fluoranthene	52	-	-	40	-	-	11,000
Pyrene	45	-	-	32	-	-	8,800
Benzo(a)anthracene	20	-	-	12 J	-	-	4,300
Chrysene	30	-	-	21	-	-	5,900
Benzo(b)fluoranthene	-	-	-	-	-	-	-
Benzo(k)fluoranthene	-	-	-	-	-	-	-
Benzo(b+k)fluoranthenes	44	-	-	26	-	-	600
Benzo(a)pyrene	20	-	-	13	-	-	3,300
Indeno(1,2,3-cd)pyrene	16 J	-	-	8.1	-	-	4,100
Dibenz(a,h)anthracene	2.7 J	-	-	2.7 J	-	-	800
Benzo(g,h,i)perylene	18	-	-	9.5	-	-	4,000
Total HPAHs	248	-	-	164	-	-	31,000
SVOCs in µg/kg							
<u>Chlorinated Hydrocarbons</u>							
1,4-Dichlorobenzene	2.8 U	-	-	2.7 U	-	-	-
1,2-Dichlorobenzene	2.4 U	-	-	2.9 U	-	-	-
1,2,4-Trichlorobenzene	11 J	-	-	3.8 U	-	-	-
Hexachlorobenzene	4.2 U	-	-	3.3 U	-	-	-

Please refer to notes on the last page of this table.

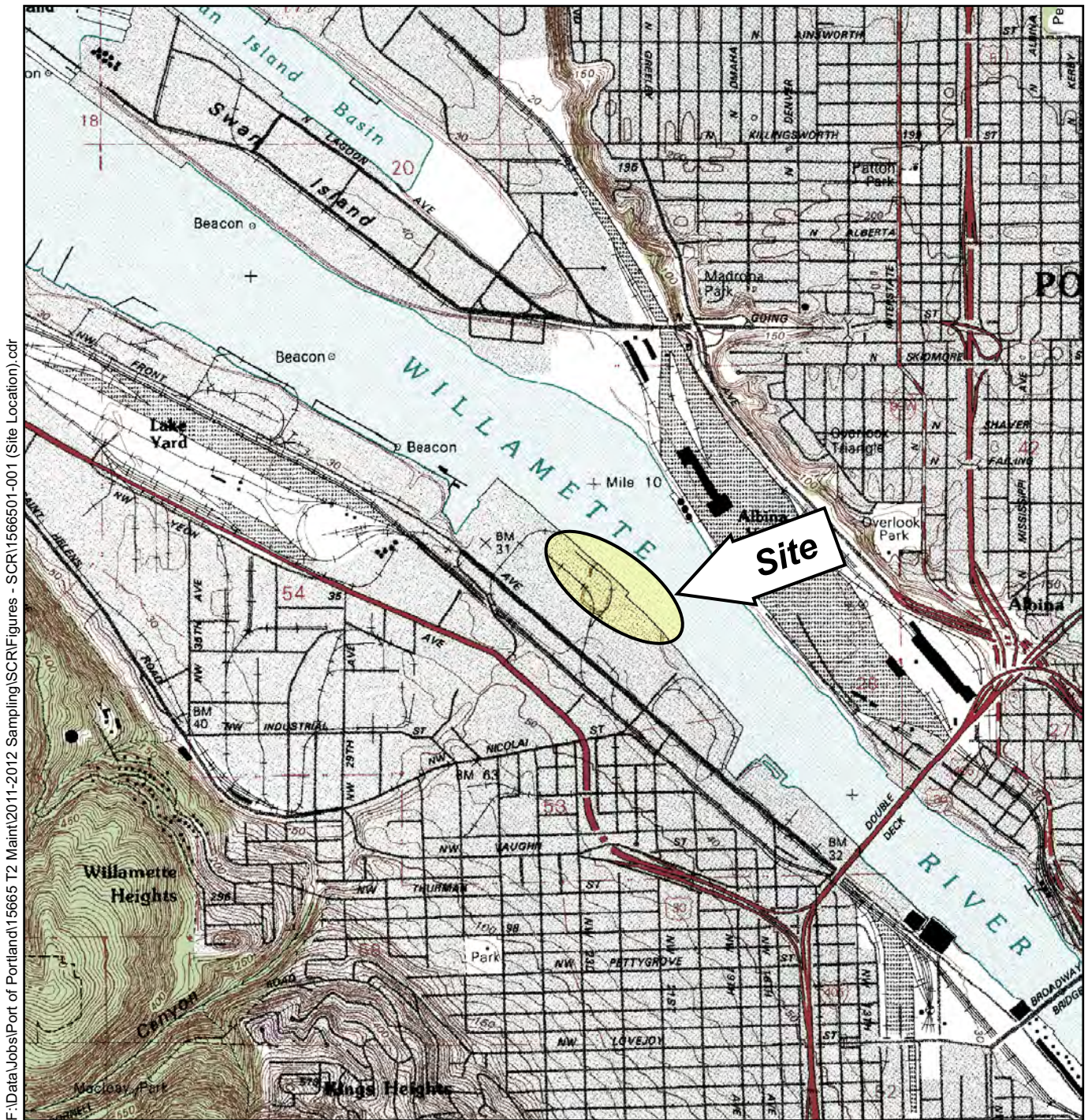
Table 3 - Sediment Chemical Analyses Results
Terminal 2 Sediment Characterization
Portland, Oregon

Berth Sediment Horizon Sample Lab ID Date	205			206			SEF Screening Levels
	Prism C3/4-DP UH13B 2-Feb-12	NSM1 C3/4-N1 UH13E/UJ37C 2-Feb-12	NSM2 C3/4-N2 UH13F/UJ37D 2-Feb-12	Prism C1/2-DP UH13A 2-Feb-12	NSM1 C1/2-N1 UH13C/UJ37A 2-Feb-12	NSM2 C1/2-N2 UH13D/UJ37B 2-Feb-12	
SVOCs in µg/kg (Continued)							
<i>Phthalates</i>							
Dimethyl Phthalate	16 J	-	-	2.8 U	-	-	46
Diethyl Phthalate	36 U	-	-	35 U	-	-	-
Di-n-butyl Phthalate	14 J	-	-	7.8 U	-	-	-
Butyl Benzyl Phthalate	17 J	-	-	5.8 U	-	-	260
Bis (2-ethylhexyl) Phthalate	78 U	54 U	60 U	56 U	130	120	220
Di-n-octyl Phthalate	5.7 U	-	-	21	-	-	26
<i>Phenols</i>							
2,4-Dimethylphenol	41 J	3.3 U	3.3 U	5.0 U	-	-	-
2-Methylphenol	12 J	-	-	5.3 U	-	-	-
4-Methylphenol	53 J	-	-	37 J	-	-	-
Pentachlorophenol	50 J	-	-	46 U	-	-	-
Phenol	460	340	180	290	-	-	-
<i>Miscellaneous Extractables</i>							
Benzoic Acid	120 J	250 J	140 J	120 J	100 J	150 J	-
Benzyl Alcohol	170 J	220 J	130 J	90 J	85 J	110 J	-
Dibenzofuran	13	-	-	3.5 J	-	-	400
Hexachlorobutadiene	4.3 U	-	-	4.3 U	-	-	-
n-Nitrosodiphenylamine	5.1 U	-	-	5.1 U	-	-	-
Pesticides in µg/kg							
4,4'-DDD	0.13 U	0.97 J	1.0	0.13 U	0.97 J	1.4	16 ^a
4,4'-DDE	1.9	1.5 JP	1.7 JP	1.9	1.8	2.0 JP	9 ^a
4,4'-DDT	0.18 U	0.19 U	0.18 U	0.19 U	0.19 U	0.19 U	12 ^a
Aldrin	0.053 U	-	-	0.053 U	-	-	9.5 ^a
alpha-Chlordane	0.049 U	-	-	0.049 U	-	-	2.8 ^a
Dieldrin	0.096 U	-	-	0.097 U	-	-	1.9 ^a
Heptachlor	0.13 U	-	-	0.13 U	-	-	1.5 ^a
gamma-BHC (Lindane)	0.046 U	-	-	0.047 U	-	-	10 ^b
PCBs in µg/kg							
Aroclor 1016	0.98 U	0.99 U	0.98 U	0.99 U	1 U	0.99 U	-
Aroclor 1221	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	-
Aroclor 1232	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	-
Aroclor 1242	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	-
Aroclor 1248	1.3 U	1.3 U	1.3 U	1.3 U	5.1	5.4	-
Aroclor 1254	5.1	1.3 U	1.3 U	10	8.2	8.5	-
Aroclor 1260	5.3	1.3 U	4.6	7.5	8.2	9.2	-
Aroclor 1262	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	-
Aroclor 1268	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	-
Total PCBs	10.4	1.3 U	4.6	18	21.5	23.1	60

Notes:

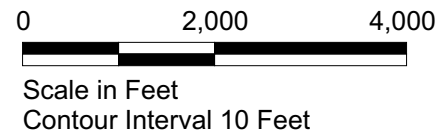
- Screening levels (SLs) are Freshwater Screening Levels 1 (no adverse effects) from the Sediment Evaluation Framework (SEF) (Corps, et al., 2006; Table 7-1, revised 10/20/06). For pesticides, no freshwater SLs have been established and the Corps uses marine SLs from corrected Table 6-3 of the Final SEF (Corps, et al., 2009). These marine SLs are listed and flagged with an ^a.
- PAH and dibenzofuran concentrations are the higher of the EPA Method 8270D-SIM and EPA Method 8270D analyses.
- Bolded values are detected concentrations.
- For undetected compounds, method detection limits (MDLs) are shown.
- = Not analyzed or not available.
- J = Estimated concentration. Result may be estimated due to value between MDL and method reporting limit (MRL), or due to QA exceedance.
- U = Not detected at the indicated MDL.
- P = The analyte was detected on both chromatographic columns but the RPD was greater than 40%.
- Reference sample results: 59.5% solids, 17.1 mg/kg ammonia, and 1.7 mg/kg total sulfides.

Site Location Map
Terminal 2 Sediment Characterization
NW Front Avenue, Portland, Oregon

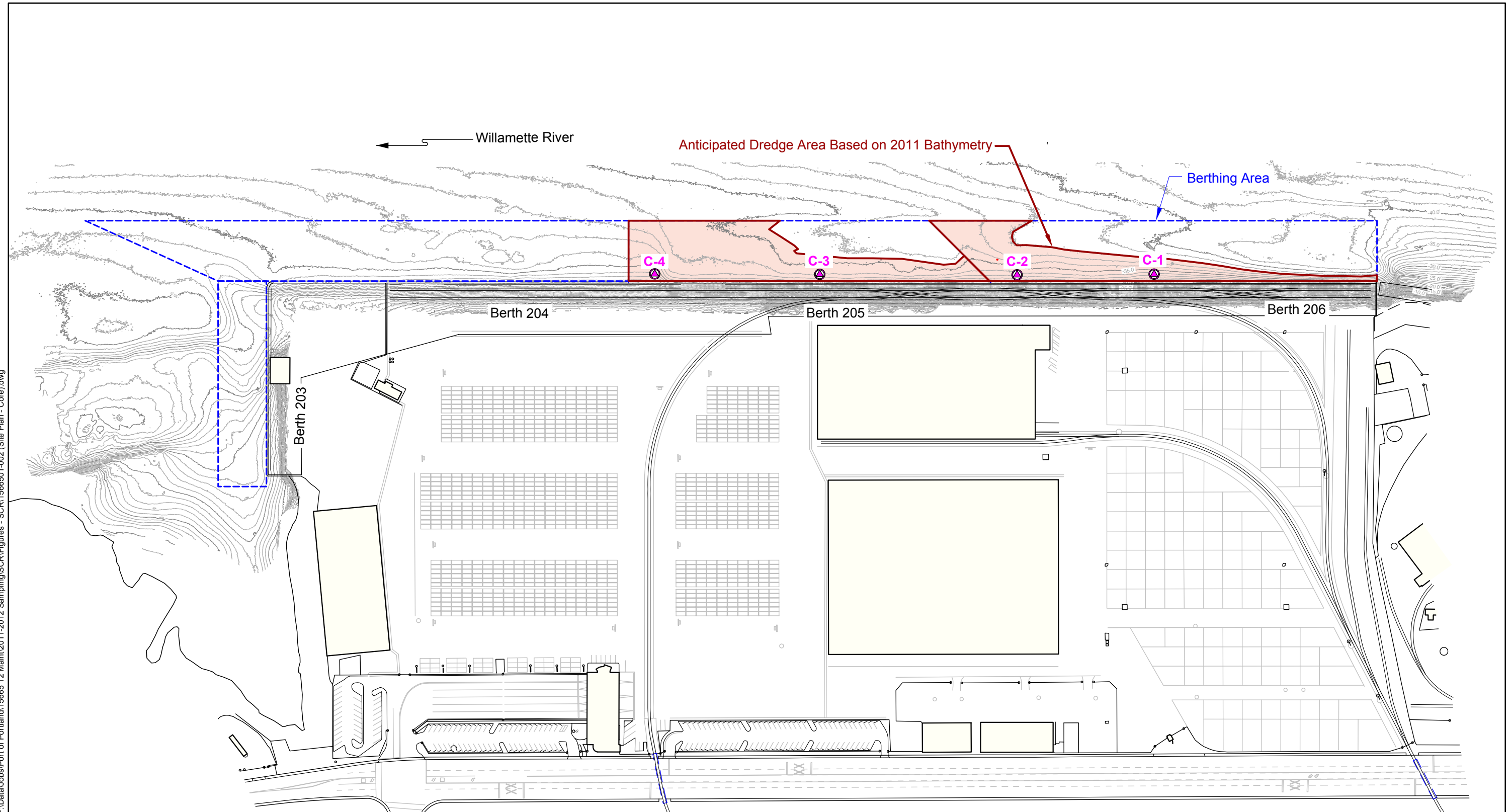


F:\Data\Jobs\Port of Portland\15665 T2 Maint\2011-2012 Sampling\SCR\Figures - SCR\1566501-001 (Site Location).cdr

Source: Base map prepared from the USGS 7.5-minute quadrangle of Portland, Oregon, dated 1990.



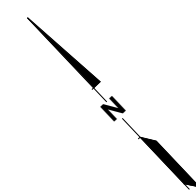
Site Plan and Core Sampling Locations
Terminal 2 Sediment Characterization
NW Front Avenue, Portland, Oregon



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Source: Port of Portland, 2011 Hydrographic Condition Survey, Terminal 2.

- C-4** ● Core Sampling Location and Number
- Yellow Shading Represents Building or Warehouse
- 25— Contours Based on a 2011 Bathymetric Survey in Feet (CRD)



0 200 400
 Scale in Feet

**APPENDIX A
SEDIMENT CORE LOGS**

Key to Exploration Logs

Sample Description

Classification of soils in this report is based on visual field and laboratory observations which include density/consistency, moisture condition, grain size, and plasticity estimates and should not be construed to imply field nor laboratory testing unless presented herein. Visual-manual classification methods of ASTM D 2488 were used as an identification guide.

Density/Consistency

Soil density/consistency in borings is related primarily to the Standard Penetration Resistance. Soil density/consistency in test pits and probes is estimated based on visual observation and is presented parenthetically on the logs.

SAND or GRAVEL Density	Standard Penetration Resistance (N) in Blows/Foot	SILT or CLAY Consistency	Standard Penetration Resistance (N) in Blows/Foot
Very loose	0 to 4	Very soft	0 to 2
Loose	4 to 10	Soft	2 to 4
Medium dense	10 to 30	Medium stiff	4 to 8
Dense	30 to 50	Stiff	8 to 15
Very dense	>50	Very stiff	15 to 30
		Hard	>30

Moisture

Dry Little perceptible moisture
 Damp Some perceptible moisture, likely below optimum
 Moist Likely near optimum moisture content
 Wet Much perceptible moisture, likely above optimum

Minor Constituents Estimated Percentage

Trace	<5
Slightly (clayey, silty, etc.)	5 - 12
Clayey, silty, sandy, gravelly	12 - 30
Very (clayey, silty, etc.)	30 - 50

Sampling Test Symbols

	Split Spoon		Cuttings		Core Run
	Push Probe		Grab (Jar)		

Test Symbols

NA	Not Available
NS	No Sheen
SS	Slight Sheen
MS	Moderate Sheen
HS	Heavy Sheen
PID	Photoionization Detector Reading

SOIL CLASSIFICATION CHART

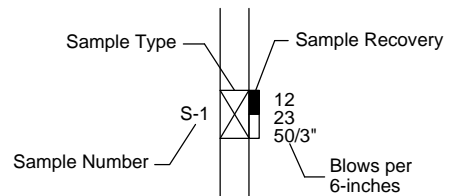
MAJOR DIVISIONS			SYMBOLS		TYPICAL DESCRIPTIONS
			GRAPH	LETTER	
COARSE GRAINED SOILS MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVEL AND GRAVELLY SOILS (LITTLE OR NO FINES)	CLEAN GRAVELS		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES		GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
	SAND AND SANDY SOILS (LITTLE OR NO FINES)	CLEAN SANDS		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
		SANDS WITH FINES		SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
	SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)	SANDS WITH FINES		SM	SILTY SANDS, SAND - SILT MIXTURES
		SANDS WITH FINES		SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS LIQUID LIMIT LESS THAN 50			ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50			MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

Groundwater Indicators

Groundwater Level on Date or (ATD) At Time of Drilling
 Groundwater Seepage (Test Pits)

Sample Key



HARTCROWSER

15665-01

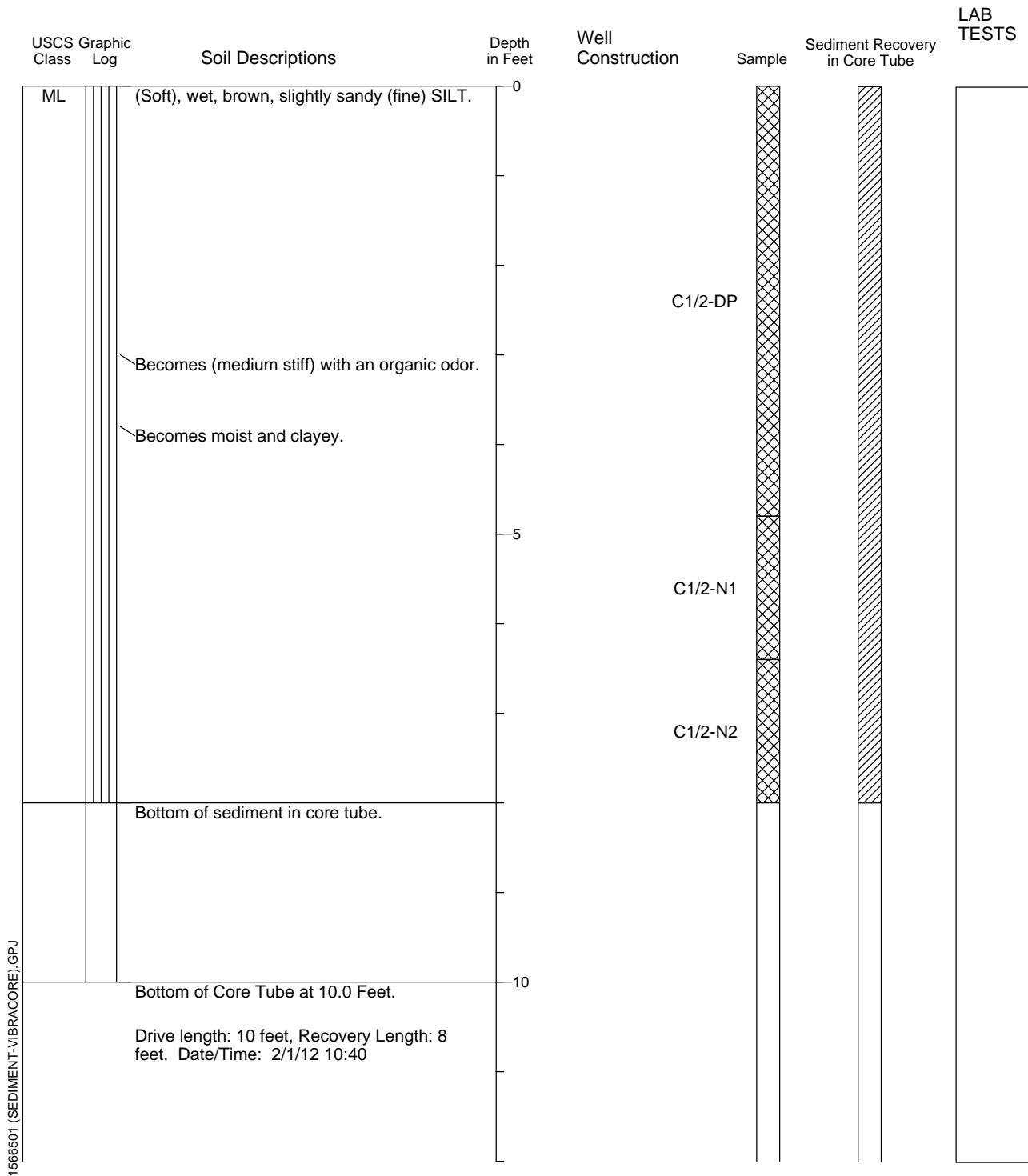
3/12

Figure A-1

Vibracore Log C-1

Location: Terminal 2, Berth 206
 Mudline Elevation: -33 Feet CRD
 Water Depth in Feet: 40.5

Type of Sample: Vibracore
 Core Diameter: 4 inches
 Northing: 693274.92
 Easting: 7639170.847
 Logged By: J. Miles Reviewed By: R. Ernst



1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Sample interval based on interpretation of core recovery and geological observations.
5. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.



15665-01

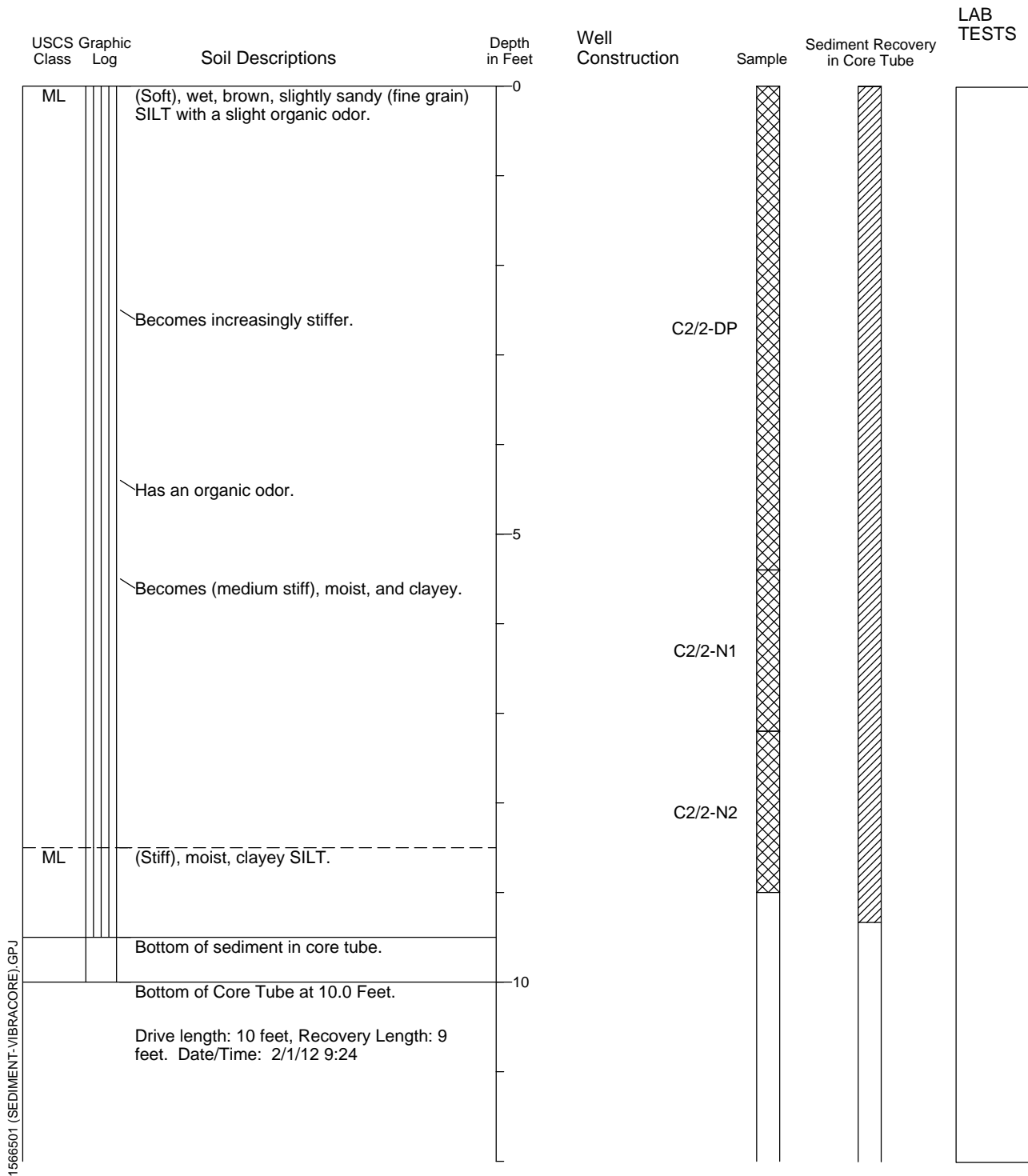
3/12

Figure A-2

Vibracore Log C-2

Location: Terminal 2, Berth 206
 Mudline Elevation: -33 Feet CRD
 Water Depth in Feet: 40

Type of Sample: Vibracore
 Core Diameter: 4 inches
 Northing: 693467.555
 Easting: 7638962.575
 Logged By: J. Miles Reviewed By: R. Ernst



1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Sample interval based on interpretation of core recovery and geological observations.
5. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.



15665-01

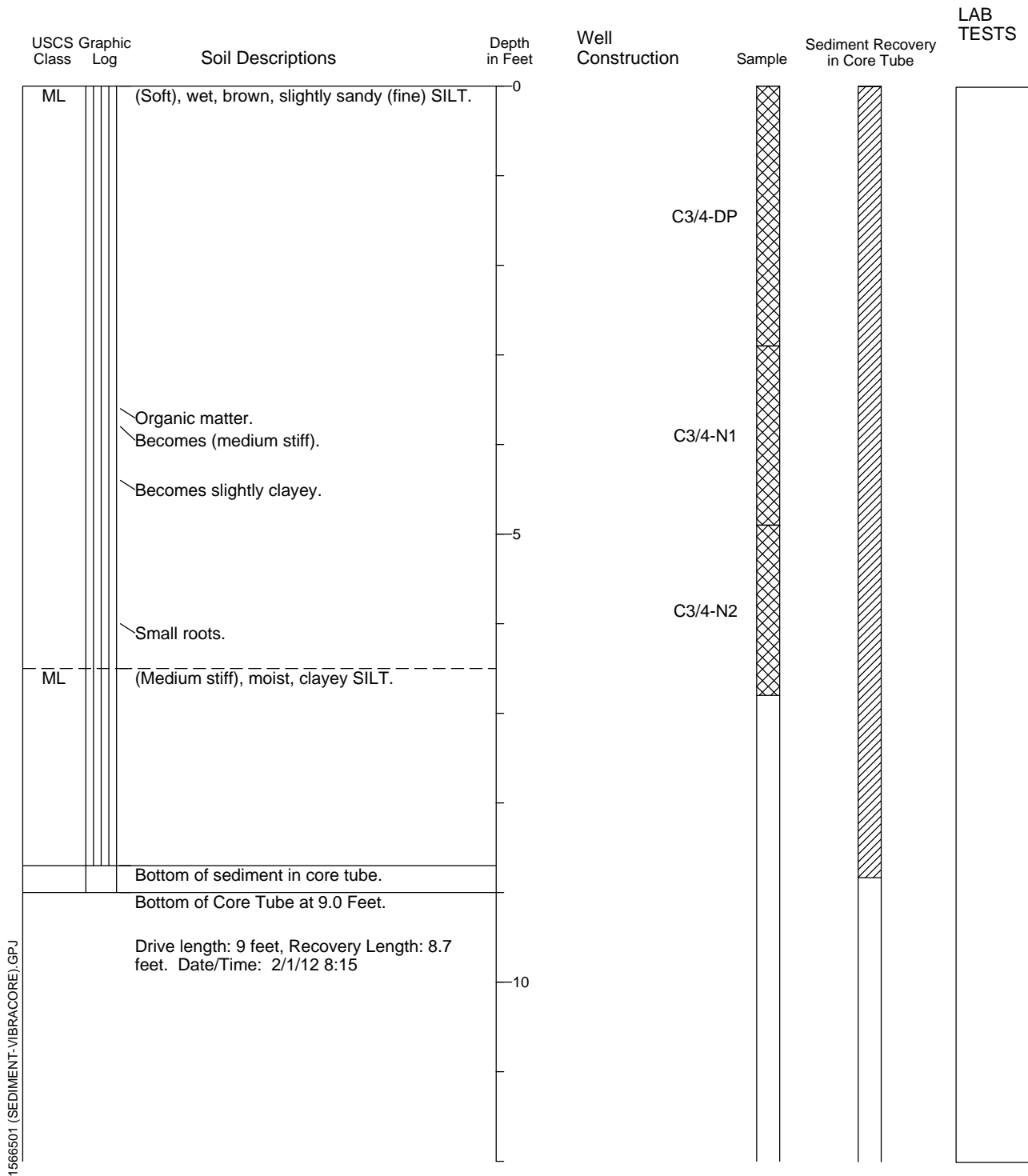
3/12

Figure A-3

Vibracore Log C-3

Location: Terminal 2, Berth 206
 Mudline Elevation: -34 Feet CRD
 Water Depth in Feet: 40.3

Type of Sample: Vibracore
 Core Diameter: 4 inches
 Northing: 693981.362
 Easting: 7638664.698
 Logged By: J. Miles Reviewed By: R. Ernst

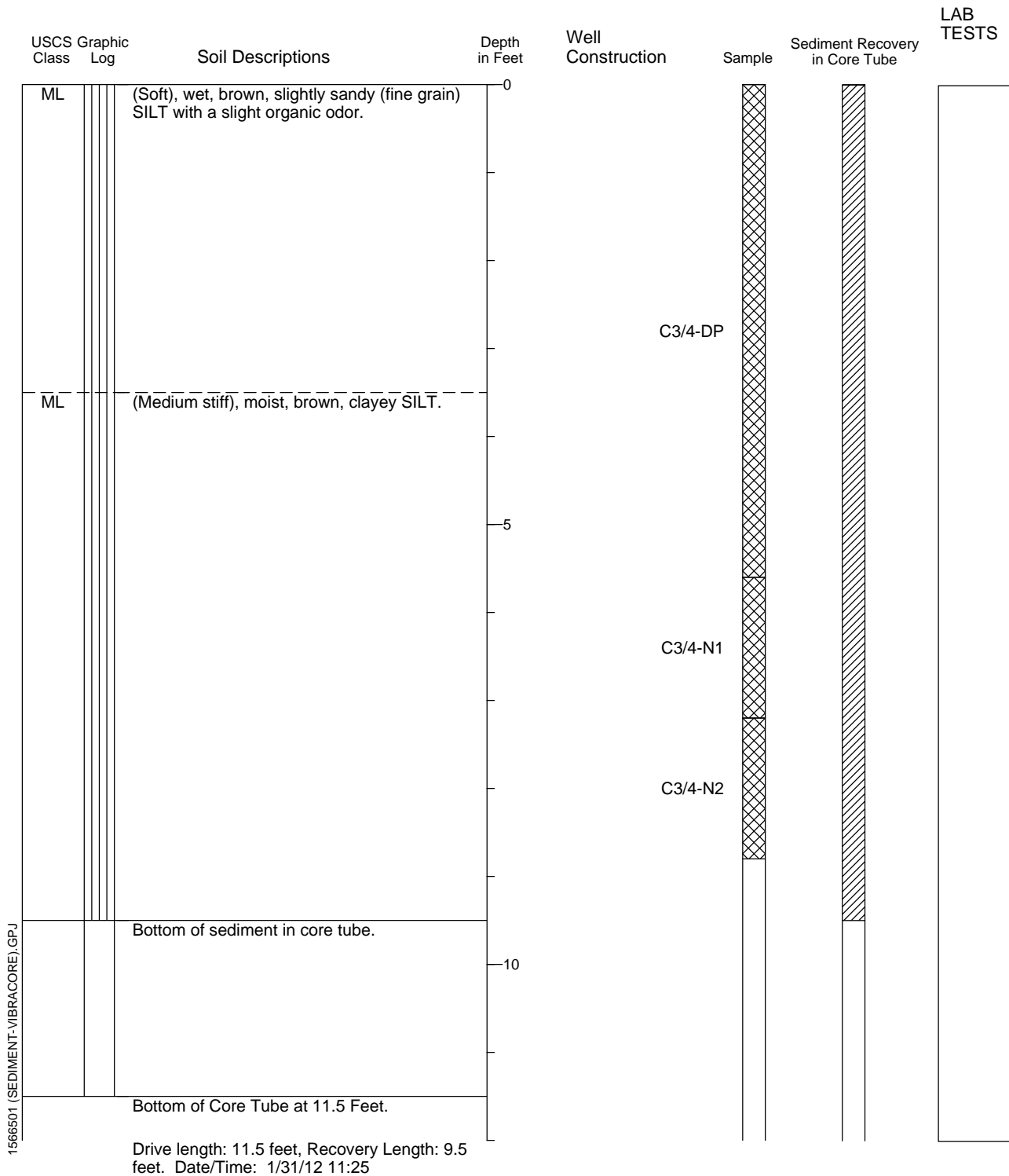


1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Sample interval based on interpretation of core recovery and geological observations.
5. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

Vibracore Log C-4

Location: Terminal 2, Berth 206
 Mudline Elevation: -30 Feet CRD
 Water Depth in Feet: 38

Type of Sample: Vibracore
 Core Diameter: 4 inches
 Northing: 693747.23
 Easting: 7638415.604
 Logged By: J. Miles Reviewed By: R. Ernst



1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Sample interval based on interpretation of core recovery and geological observations.
5. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

APPENDIX B
QUALITY ASSURANCE REVIEW

APPENDIX B QUALITY ASSURANCE REVIEW

This appendix documents the results of a quality assurance (QA) review of the analytical data for dredge prism and new surface material (NSM) samples collected during the January and February 2012 sediment characterization at the Berths 205 and 206. Field procedures used for sample collection are discussed in our Sampling and Analysis Plan (SAP; Hart Crowser, 2011). Hart Crowser submitted sediment samples to Analytical Resources, Inc. (ARI), of Tukwila, Washington, for chemical analysis. Copies of the analytical laboratory reports (ARI Job Nos. UH13 and UJ37) are included in Appendix C. Upon review, the analytical data are valid with minor qualifications for their intended use. A Data Completeness (QA1) checklist is included as Table B-1 in this appendix.

The quality assurance review included examination and validation of the laboratory's summary reports, including:

- Holding times;
- Method blanks;
- Surrogate recoveries;
- Laboratory control sample/laboratory control sample duplicate (LCS/LCSD) recoveries;
- Standard reference material (SRM) recoveries;
- Matrix spike and matrix spike duplicate (MS/MSD) recoveries;
- Calibration criteria;
- Internal Standard (IS) recoveries, where applicable;
- Laboratory duplicate relative percent difference (RPD), where applicable; and
- Laboratory replicate relative standard deviation (RSD), where applicable.

A Level IV Data Deliverables Package was available for review.

ANALYTICAL METHODS AND DETECTION LIMITS

Chemical Analyses on Sediment

Four cores were obtained during the sediment characterization fieldwork on January 31 and February 1, 2012, with two cores from Berth 205 and two cores

from Berth 206. The cores from each berth were divided into three sections to represent the dredge prism, a shallow NSM interval (NSM1), and deeper NSM interval (NSM2) and each respective portion of the two cores was composited, for a total of six sediment samples. A reference sample was collected on February 1, 2012, and submitted with the core samples. The sediment samples were analyzed for one or more of the following:

- Total solids by EPA Method 160.3 modified;
- Total organic carbon (TOC) by Plumb (1981);
- Ammonia by EPA Method 350.1 modified;
- Sulfide by EPA Method 376.2;
- Total metals (antimony, arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc) by EPA Methods 6010B/7471A/200.8;
- Total petroleum hydrocarbons as diesel and oil by Northwest Method NWTPH-Dx with silica gel and acid cleanup;
- Tributyltin (TBT) by Krone, et al. (written 1988; published 1989);
- Polycyclic aromatic hydrocarbon (PAHs) by EPA Method 8270D-SIM;
- Semivolatile organic compounds (SVOCs) by EPA Method 8270D;
- Organochlorine pesticides by EPA Method 8081A;
- Polychlorinated biphenyls (PCBs) by EPA Method 8082; and
- Grain size by Puget Sound Estuarine Protocol.

These analytical test methods were the analytical methods specified in the SAP (Hart Crowser, 2011) or in the case of grain size is an equivalent method.

Detection and Reporting Limits

Method detection limits (MDLs) are the minimum concentration of a chemical compound that can be measured and reported that the compound is present, and is based on instrumentation abilities and sample matrix. Method reporting limits (MRLs) are set by the laboratory and are based on the low standard of the initial calibration curve or low-level calibration check standard, and represent the concentration that can be accurately quantified. In some cases, the MRL is raised due to high concentrations of analytes in the samples or matrix interferences. MRLs were consistent with industry standards. Table 3 of this report lists the MDLs for undetected samples. The MDLs are sufficient in

achieving the SEF SLs listed in Table 3. Analytical results that fell between the MDL and MRL are qualified as estimated (J).

QA REVIEW RESULTS

The laboratory provided QC sample results, which were underwent a QA review. Laboratory QC samples were consistent with those specified in the SAP (Hart Crowser, 2011) to evaluate precision, accuracy, representativeness, comparability, and completeness. Upon review, the sample data and laboratory QC data were found to be suitable for their intended use with minor qualifications. The following summarizes, by analyte or test, the results of our QA review of the analytical data.

Total Solids. All required holding times were met. The laboratory replicate RSD was acceptable.

TOC. All required holding times were met. No method blank contamination was detected. LCS, MS, and SRM recoveries were within control limits. The laboratory replicate RSD was acceptable.

Ammonia. All required holding times were met. No method blank contamination was detected. SRM and MS recoveries were within control limits. The laboratory replicate RSD was acceptable.

Sulfide. All required holding times were met. No method blank contamination was detected. The LCS recovery was within laboratory control limits. For sample C1/2-DP, the MS recovery fell below control limits and the laboratory duplicate RPD exceeded control limits. As such, the sulfide result on sample C1/2-DP was qualified as estimated (J).

Total Metals. All required holding times were met. No method blank contamination was detected. LCS recoveries were within control limits for all elements. The laboratory duplicate RPD was acceptable. MS recoveries were within control limits except for antimony in sample C1/2-DP. In this case, antimony (21.6%) was below control limits. A post-digestion spike for antimony was analyzed and was within control limits. Results for antimony in the associated samples (C1/2-DP and C3/4-DP) were qualified as estimated (UJ). We also noted that the Continuing Calibration Verifications (CCVs) were within control limits except for CCV 4 for silver (recovery was high); however, no project samples were associated with this CCV, and no results were qualified.

TPH as Diesel and Oil. All required holding times were met. No method blank contamination was detected. Surrogate and LCS recoveries were within laboratory control limits. The initial calibration curve and continuing calibrations were within acceptance criteria.

Tributyltin. All required holding times were met. Method blank contamination was not detected. Surrogate and LCS recoveries were within laboratory control limits. IS recoveries were within acceptance criteria. The initial calibration curve and continuing calibrations were within acceptance criteria.

PAHs. All required holding times were met. No method blank contamination was detected. Surrogate and LCS recoveries were within laboratory control limits. IS recoveries were within acceptance criteria. The initial calibration curve was within acceptance criteria. CCVs were within control limits except for the CCV on 02/13/12 where the recovery for benz(a)anthracene was low. The associated sample results (C1/2-DP and C3/4-DP) were qualified as estimated (J).

SVOCs. All required holding times were met. Surrogate, LCS, and MS recoveries were within default laboratory control limits. IS recoveries were within acceptance criteria. The initial calibration curve was within acceptance criteria.

SVOCs were not detected in the method blank except for *bis*(2-ethylhexyl) phthalate (DEHP) in MB-020812. DEHP was detected between the MDL and the RL. The laboratory qualified DEHP detections in the associated samples with "B". The results were evaluated thus:

- Sample results for DEHP that were less than five times the method blank detection were qualified as U (C1/2-DP, C3/4-DP, C3/4-N1, and C3/4-N2).
- Sample results that were greater than five times the method blank detection had the B qualifier removed (C1/2-N1 and C1/2-N2).

CCVs were within control limits with the following exceptions:

- CCV 02/10/12: The recovery for benzyl alcohol failed high. The results for benzyl alcohol in the associated samples (C1/2-DP, C1/2-N1, C1/2-N2, C3/4-DP, C3/4-N1, C3/4-N2, Method Blank, LCS, LCSD, and MS) were qualified with "Q" by the laboratory. The Q qualifier was changed to J (estimated). The recoveries for 2,2'-oxybis(1-chloropropane), 4-chlorophenyl phenyl ether, 4-nitroaniline, carbazole, 3,3'-dichlorobenzidine, benzidine, and hexachlorocyclopentadiene failed low. These analytes are not target analytes and associated sample results were not qualified.

- CCV 02/14/12: The recovery for benzyl alcohol failed high. The result for benzyl alcohol in the associated sample (MSD) was qualified as Q by laboratory. The Q qualifier was changed to J (estimated). The recoveries for 2,2'-oxybis(1-chloropropane), 3,3'-dichlorobenzidine, 4-chlorophenyl phenyl ether, benzidine, and hexachlorocyclopentadiene failed low. These analytes are not target analytes and associated sample results were not qualified.

Organochlorine Pesticides. All required holding times were met. No method blank contamination was detected. IS recoveries were within acceptance criteria. The initial calibration curve was within acceptance criteria.

Surrogate recoveries were within laboratory control limits except for one of two surrogates exceeded control limits in QC samples MB-020912 MB-022512, and LCS-022512. The method blank was non-detect, and no results were qualified.

LCS recoveries were within laboratory control limits, except for *gamma*-BHC in LCSD-020912. The recovery in this LCSD exceeded the control limits, but was within control limits for the LCS. Because associated samples were non-detect for that analyte, no results were qualified.

CCVs were within control limits with the following exceptions:

- CCV 02/10/12 at 1733: The recovery for *delta*-BHC failed low on the STX-CLP2 column, but passed on the STX-CLP1 column. The analyte *delta*-BHC was not a target analyte, and no results were qualified.
- CCV 02/11/12 at 0209: The recovery for *beta*-BHC failed high on the STX-CLP2 column, but passed on the STX-CLP1 column. The analyte *beta*-BHC was not a target analyte, and no results were qualified.
- CCV 02/27/12 at 2355: The recovery for 4,4'-DDE failed high on the STX-CLP1 column, but passed on the STX-CLP2 column. The recovery for *delta*-BHC failed high on the STX-CLP2 column, but passed on the STX-CLP1 column. The analyte *delta*-BHC was not a target analyte, and no results were qualified. Results were reported from the passing column for the associated samples (Method Blank, LCS, and LCSD) and were not qualified.
- CCV 02/28/12 at 0328: The recovery for 4,4'-DDE failed high on the STX-CLP1 column, but passed on the STX-CLP2 column. The recovery for *delta*-BHC failed high on the STX-CLP2 column, but passed on the STX-CLP1 column. The analyte *delta*-BHC was not a target analyte, and no results were qualified. Results were reported from the passing column for the associated samples (C1/2-N1, C1/2-N2, C3/4-N1, and C3/4-N2) and were not qualified.

- CCV 02/28/12 at 0608: The recovery for 4,4'-DDE failed high on the STX-CLP1 column, but passed on the STX-CLP2 column. The recoveries for *delta*-BHC and 4,4'-DDD failed high on the STX-CLP2 column, but passed on the STX-CLP1 column. The analyte *delta*-BHC was not a target analyte, and no results were qualified. Results were reported from the passing column for the associated samples (C1/2-N1, C1/2-N2, C3/4-N1, and C3/4-N2) and were not qualified.

The results for 4,4'-DDE in samples C1/2-N2, C3/4-N1, and C3/4-N2 differed by more than 40 percent between the two chromatographic columns. The laboratory qualified the results with "P". The P qualifier was changed to JP.

The reporting limits for 4,4'-DDD, 4,4'-DDT, and *trans*-chlordane in sample C1/2-DP were elevated by the laboratory due to chromatographic interferences and qualified with "Y". The reporting limits for 4,4'-DDD and *trans*-chlordane in sample C3/4-DP were elevated by the laboratory due to chromatographic interferences and qualified with "Y". Y qualifiers on sample results were changed to U.

PCBs. All required holding times were met. No method blank contamination was detected. Surrogate and LCS recoveries were within laboratory control limits. IS recoveries were within acceptance criteria. The initial calibration curve and continuing calibrations were within acceptance criteria. The reporting limits for Aroclors 1248 and 1262 in sample C 1/2-DP were elevated by the laboratory due to chromatographic interferences and qualified with "Y". The reporting limits for Aroclor 1232 in sample C3/4-N2 were elevated by the laboratory due to chromatographic interferences and qualified with "Y". Y qualifiers on sample results were changed to U.

Grain Size. All required holding times were met. The laboratory triplicate RSD was within criteria.

**Table B-1 - QA1 Data Checklist
Terminal 2 Sediment Characterization
Portland, Oregon**

	Test Sediment	Reference Sediment	Control Sediment	Water Control
Sample Locations and Compositing				
Latitude and Longitude (to nearest 0.1 second)	NAD 83	NAD 83	N/A	N/A
NAD 1983 HARN (requirement for SEDQUAL)	Yes	Yes	N/A	N/A
Station Name (e.g., Carr Inlet)	Yes	Yes	N/A	N/A
Water depth (corrected to MLLW)	Lead Line	Lead Line		
Drawing showing sampling locations and ID numbers	Yes	In SAP	N/A	N/A
Compositing scheme (sampling locations/depths for composites)	Yes	N/A	N/A	N/A
Sampling method	Yes	Yes	N/A	N/A
Sampling dates	Yes	Yes		
Estimated volume of dredged material represented by each DMMU	Yes	N/A	N/A	N/A
Positioning method	Yes	Yes	N/A	N/A
Sediment Conventionals				
Preparation and analysis methods	Yes	Yes	N/A	N/A
Sediment conventional data and QA/QC qualifiers	Yes	All but TOC	N/A	N/A
QA qualifier code definitions	Yes	Yes	N/A	N/A
Units (dry weight except total solids)	Yes	Yes	N/A	N/A
Method blank data (sulfides, ammonia, TOC)	Yes	Yes	N/A	N/A
Method blank units (dry weight)	Yes	Yes	N/A	N/A
Analysis dates (sediment conventionals, blanks, TOC CRM)	Yes	Yes	N/A	N/A
TOC CRM ID	Yes	N/A	N/A	N/A
TOC CRM analysis data	Yes	N/A	N/A	N/A
TOC CRM target values	Yes	N/A	N/A	N/A
Grain Size Analysis				
Fine grain analysis method	Yes	N/A	N/A	N/A
Analysis dates	Yes	N/A	N/A	N/A
Triplicate for each batch	Yes	N/A	N/A	N/A
Grain size data (complete sieve and phi size distribution)	Yes	N/A	N/A	N/A
Metals, SVOCs/PAHs, Pesticides/PCBs, VOCs				
	Metals	SVOCs/PAHs	Pesticides/PCBs	VOCs
Extraction/digestion method				N/A
Extraction/digestion dates (test sediment, blanks, matrix spike, reference material)	Yes	Yes	Yes	N/A
Analysis method	Yes	Yes	Yes	N/A
Data and QA qualifier included for:				
Test sediments	Yes	Yes	Yes	N/A
Reference materials including 95% confidence interval (each batch)				N/A
Method blanks (each batch)	Yes	Yes	Yes	N/A
Matrix spikes (each batch)	Yes	SVOCs Only	Yes	N/A
Matrix spike added (dry weight basis)	Yes	SVOCs Only	Yes	N/A
Laboratory control sample (each batch)	Yes	Yes	Yes	N/A
Laboratory control sample duplicate (each batch)	No	No	Pest. Only	N/A
Replicates (each batch)	Yes			
Continuing calibration verification	Yes	Yes	Yes	N/A
Units (dry weight)	Yes	Yes	Yes	N/A
Method blank units (dry weight)	Yes	Yes	Yes	N/A
QA/QC qualifier definitions	Yes	Yes	Yes	N/A
Surrogate recovery for test sediment, blank, matrix spike, ref. material	Yes (TBT)	Yes	Yes	N/A
Analysis dates (test sediment, blanks, matrix spike, reference material)	Yes	Yes	Yes	N/A

Please refer to notes at the end of this table.

**Table B-1 - QA1 Data Checklist
Terminal 2 Sediment Characterization
Portland, Oregon**

Notes:

QA Checklist based on Figures 12-2 and 12-3 of the SEF (Corps, et al., 2006).
Shaded boxes indicated those type of data are not applicable for that column.
N/A = Not applicable or not analyzed.

Acronyms and Abbreviations:

CRM = Control Reference Material
DMMU = Dredge Material Management Unit
MLLW = Mean lower low water
NAD = North American Datum
PAHs = Polynuclear aromatic hydrocarbons
PCBs = Polychlorinated biphenyls
QA = Quality assurance
QC = Quality control
SEF = Sediment evaluation framework
SVOCs = Semivolatile organic compounds
TBT = Tributyltin
TOC = Total organic carbon
VOCs = Volatile organic compounds

APPENDIX C
ANALYTICAL LABORATORY REPORTS



February 29, 2012

Mr. Rick Ernst
Hart Crowser, Inc.
5 Centerpointe Dr #240
Lake Oswego, OR 97035

RE: Project: 15665-01 Terminal 2 Berth 205/206, Port of Portland
ARI Job No: UH13

Dear Mr. Ernst:

Please find enclosed the original Chain-of-Custody (COC) record, sample receipt documentation, and the analytical results for samples from the project referenced above. Analytical Resources, Inc. (ARI) accepted seven soil samples on February 3, 2012. The samples were received in good condition. There were no discrepancies between the sample containers' labels and the COC.

Please reference the Case Narrative for analytical details associated with this project.

An electronic copy of this data package will remain on file with ARI. If you have any questions or require additional information, please contact me at your convenience.

Respectfully,

ANALYTICAL RESOURCES, INC.

A handwritten signature in black ink, appearing to read "Cheronne Oreiro", written over a horizontal line.

Cheronne Oreiro
Project Manager

-For-

Kelly Bottem
Client Services Manager
kellyb@arilabs.com
206/695-6211

Enclosures

cc: files UH13

Chain of Custody Documentation

ARI Job ID: UH13

Chain of Custody Record & Laboratory Analysis Request



Analytical Resources, Incorporated
 Analytical Chemists and Consultants
 4611 South 134th Place, Suite 100
 Tukwila, WA 98168
 206-695-6200 206-695-6201 (fax)

ARI Assigned Number: UH13	Turn-around Requested: Standards	Page: 1 of 1
ARI Client Company: Hart Crowser	Phone: 503-620-7284	Date: 02/02/2012
Client Contact: Rick Ernst	503-620-7284	Ice Present?
Client Project Name: Terminal 2 - Berth 205/206 (Port of Portland)	Client Project #: 15665-01	No. of Coolers: 2
Samplers: Susan Miles/Chris Martin		Cooler Temps:

Sample ID	Date	Time	Matrix	No Containers	Analysis Requested										Notes/Comments		
					Grain size	Total Solids	TOC	Total Solids	Ammonia	TPH as D601	Metals Antimony, Ar, Cd, Cr, Cu, Pb, Hg, Ni, Zn, Fe	TSS	SVOCs - Phenols PAHs, phthalates, and interrelated to PCBs	Pesticides		PLBS	
C1/2-DP	02/02/12	11:11	Soil	6	X	X	X	X	X	X	X	X	X	X	X	X	X
C1/2-N1 ✓		11:25		6		X		X	X					X			
C1/2-N2 ✓		11:45		6		X		X	X					X			
C3/4-DP		14:00		6	X	X	X	X	X	X	X	X	X	X	X	X	X
C3/4-N1 ✓		14:15		6		X		X	X					X			
C3/4-N2 ✓		14:35		6		X		X	X					X			
Reference 1	02/01/12	14:02		3		X		X	X								

Comments/Special Instructions For C1/2-N1, C1/2-N2, C3/4-N1, and C3/4-N2 SVOCs are to determine benzoic acid and DEHP concentrations.	Relinquished by (Signature) <i>[Signature]</i>	Received by (Signature) <i>[Signature]</i>	Relinquished by (Signature)	Received by (Signature)
	Printed Name Susan R Miles	Printed Name A. Volgardsen	Printed Name:	Printed Name:
	Company Hart Crowser, Inc	Company ARI	Company:	Company:
	Date & Time: 02/02/2012 / 15:45	Date & Time: 2/3/12 1100	Date & Time:	Date & Time:

Limits of Liability: ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.



Cooler Receipt Form

ARI Client: Hart + CROWSEY

Project Name: Terminal 2 = Berth 205/206

COC No(s): _____ (NA)

Delivered by: Fed-Ex (UPS) Courier Hand Delivered Other: _____

Assigned ARI Job No. UH13

Tracking No: 1297X0471349276530 NA

1297X0471348509145

Preliminary Examination Phase:

- Were intact, properly signed and dated custody seals attached to the outside of to cooler? YES NO
- Were custody papers included with the cooler? YES NO
- Were custody papers properly filled out (ink, signed, etc) . YES NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry) 1.6 0.6

If cooler temperature is out of compliance fill out form 00070F Temp Gun ID#: 90877952

Cooler Accepted by: AV Date 2/3/12 Time 1100

Complete custody forms and attach all shipping documents

Log-In Phase:

- Was a temperature blank included in the cooler? YES NO
- What kind of packing material was used? ... Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other: _____
- Was sufficient ice used (if appropriate)? NA YES NO
- Were all bottles sealed in individual plastic bags? YES NO
- Did all bottles arrive in good condition (unbroken)? YES NO
- Were all bottle labels complete and legible? YES NO
- Did the number of containers listed on COC match with the number of containers received? YES NO
- Did all bottle labels and tags agree with custody papers? YES NO
- Were all bottles used correct for the requested analyses? YES NO
- Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs) .. NA YES NO
- Were all VOC vials free of air bubbles? NA YES NO
- Was sufficient amount of sample sent in each bottle? YES NO
- Date VOC Trip Blank was made at ARI... NA
- Was Sample Split by ARI NA YES Date/Time _____ Equipment _____ Split by _____

Samples Logged by AV Date 2/3/12 Time: 1250

**** Notify Project Manager of discrepancies or concerns ****

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Additional Notes, Discrepancies, & Resolutions:

By _____ Date _____

Small Air Bubbles ~2mm 	Peabubbles 2-4 mm 	LARGE Air Bubbles > 4 mm 	Small → "sm" Peabubbles → "pb" Large → "lg" Headspace → "hs"
--------------------------------------	---------------------------------	--	---

Subject: RE: Port - T2 Samples
From: Rick Ernst <rick.ernst@hartcrowser.com>
Date: Fri, 3 Feb 2012 14:46:18 -0800
To: Kelly Bottem <kellyb@arilabs.com>

Hi Kelly,

Please run for the entire list, but only report to me BEHP and benzoic acid. There's potential that we will need other SVOCs on the list if they exceed SEF SLs in the DP samples.

Also, one note by the Corps approval of our SAP regarding grain-size:

Note that the SEF utilizes the Udden-Wentworth scale to characterize dredged material and differentiate between fines and sands (ASTM No. 230 [63 µm] sieve) and sands and gravels (ASTM No. 10 [2 mm] sieve).

I don't know if that changes anything on how grain-size is reported (looks like you have a No. 230 and No. 10 sieve in prior results).

Also, we are on the standard Port turn of 2 weeks. If you have any results prior to this, please forward.

Thanks, Rick

-----Original Message-----

From: Kelly Bottem [<mailto:kellyb@arilabs.com>]
Sent: Friday, February 03, 2012 2:31 PM
To: Rick Ernst
Cc: Jason Miles
Subject: Re: Port - T2 Samples

Rick-

There is a note on the COC listing Ids of four samples and that the SVOCs are for BEHP and Benzoic acid. Do you want only those analytes for those samples?

On 2/2/2012 3:41 PM, Rick Ernst wrote:

. Being sent out today for receipt tomorrow.

· Rick Ernst, RG

Principal Geologist

Hart Crowser, Inc.

· 8910 SW Gemini Drive

Beaverton, OR 97008-7123

Direct: 971.327.9121

Fax: 503.620.7284

CONFIDENTIALITY NOTICE: This communication (including any attachments) may contain privileged or confidential information. If you have received it in error, please advise the sender by reply email and immediately delete the message and any attachments without copying or disclosing the contents. Thank you.

--

Kelly Frances Bottem, Client Services Manager Analytical Resources, Inc.
4611 S. 134th Place, Suite 100
Tukwila, WA 98168-3240
Website: <http://www.arilabs.com>

Subject: UH13

From: Rick Ernst <rick.ernst@hartcrowser.com>

Date: Thu, 16 Feb 2012 16:02:41 -0800

To: Kelly Bottem <kellyb@arilabs.com>

I knew this would happen... Can you release SVOC data as follows:

UH13C and UH13D: benzyl alcohol 9126

UH13E and UH13F: 2,4-Dimethylphenol, phenol, and benzyl alcohol
9136 9121 9126

Thanks,

Rick Ernst, RG
Principal Geologist
Hart Crowser, Inc.
8910 SW Gemini Drive
Beaverton, OR 97008-7123
Direct: 971 327.9121
Fax: 503.620.7284

CONFIDENTIALITY NOTICE. This communication (including any attachments) may contain privileged or confidential information. If you have received it in error, please advise the sender by reply email and immediately delete the message and any attachments without copying or disclosing the contents. Thank you

Case Narrative, Data Qualifiers, Control Limits

ARI Job ID: UH13

**Case Narrative****Hart Crowser****15665-01 Terminal 2 Berth 205/206, Port of Portland****ARI Job: UH13****February 29, 2012****Sample Receipt:**

Analytical Resources, Inc. (ARI) accepted seven soil samples in good condition on February 3, 2012 under Sample Delivery Group (SDG) UH13. The samples were received with cooler temperatures of 0.6 and 1.6°C. Select sample containers were archived upon receipt. For further details regarding sample receipt please refer to the enclosed Cooler Receipt Form.

The samples were analyzed for SVOCs, SIM PAHs, Butyl Tins, Pesticides, PCBs, NWTPH-Dx, Metals, Total Solids, TOC, Sulfide, Ammonia, and Grain Size, as requested.

Semivolatiles Analysis (PSDDA):

The samples were extracted on 2/8/12 and the extracts were analyzed on 2/10/12 and 2/14/12 within the method recommended holding times.

Initial calibration (s): All analytes were within method acceptance criteria.

Continuing calibration (s): The continuing calibrations (CCALs) on 2/10/12 and 2/14/12 were outside the 20% control limit high for Benzyl Alcohol. All detected results for this compound have been flagged with a "Q" qualifier. No further corrective action was taken.

Method Blank (s): Bis(2-Ethylhexylphthalate was present in the method blank at a level that was greater than ½ the reporting limit. All detected results for this compound have been flagged with a "B" qualifier. No further corrective action was taken.

Surrogate(s): All surrogate recoveries were within control limits.

Samples: There were no anomalies associated with the samples.

LCS/LCSD (s): All percent recoveries and RPDs were in control.

MS/MSD (s): All percent recoveries and RPDs were within advisory control limits.

SIM PAH Analysis:

The samples were extracted on 2/9/12 and the extracts were analyzed on 2/13/12 within the method recommended holding times.

Initial calibration (s): All analytes were within method acceptance criteria.

Continuing calibration (s): All analytes of interest were within method acceptance criteria for the associated analyses.



Case Narrative

Hart Crowser

15665-01 Terminal 2 Berth 205/206, Port of Portland

ARI Job: UH13

February 29, 2012

Method Blank (s): The method blank was free of contamination.

Surrogate(s): All surrogate recoveries were within control limits.

Samples: There were no anomalies associated with the samples.

LCS/LCSD (s): All percent recoveries and RPDs were in control.

Butyl Tin Analysis:

The samples were extracted on 2/8/12 and the extracts were analyzed on 2/11/12 within the method recommended holding times.

Initial calibration (s): All analytes were within method acceptance criteria.

Continuing calibration (s): All analytes of interest were within method acceptance criteria for the associated analyses.

Method Blank (s): The method blank was free of contamination

Surrogate(s): All surrogate recoveries were within control limits.

Samples: There were no anomalies associated with the samples.

LCS/LCSD (s): All percent recoveries and RPDs were in control.

Pesticides Analysis (PSDDA):

The samples were extracted on 2/9/12 and the extracts were analyzed on 2/10/12 within the method recommended holding times.

Initial calibration (s): All analytes were within method acceptance criteria.

Continuing calibration (s): The analytes of interest were within method acceptance criteria for the associated analyses.

Method Blank (s): The method blank was free of contamination

Surrogate(s): The surrogate percent recovery of Decachlorobiphenyl was outside the control limits high for MB-020912. This method blank was undetected for all requested compounds. All other surrogate percent recoveries were within control limits. No corrective action was taken.



Case Narrative

Hart Crowser

15665-01 Terminal 2 Berth 205/206, Port of Portland

ARI Job: UH13

February 29, 2012

Samples: There were no anomalies associated with the samples.

LCS/LCSD (s): The LCSD percent recovery of gamma-BHC (Lindane) was outside the control limits high for **LCS-020912**. All other percent recoveries were within control limits. No corrective action was taken.

PCBs Analysis (PSDDA):

The samples were extracted on 2/9/12 and the extracts were analyzed on 2/11/12 within the method recommended holding times.

Initial calibration (s): All analytes were within method acceptance criteria.

Continuing calibration (s): All analytes of interest were within method acceptance criteria for the associated analyses.

Method Blank (s): The method blank was free of contamination

Surrogate(s): All surrogate recoveries were within control limits.

Samples: There were no anomalies associated with the samples.

LCS/LCSD (s): All percent recoveries and RPDs were in control.

Acid/Silica Cleaned NWTPH-Dx Analysis:

The samples were extracted on 2/6/12 and the extracts were analyzed on 2/7/12 within the method recommended holding times.

Initial calibration (s): All analytes were within method acceptance criteria.

Continuing calibration (s): All analytes of interest were within method acceptance criteria for the associated analyses.

Method Blank (s): The method blank was free of contamination

Surrogate(s): All surrogate recoveries were within control limits.

Samples: There were no anomalies associated with the samples.

LCS/LCSD (s): All percent recoveries and RPDs were in control.



Case Narrative

Hart Crowser

15665-01 Terminal 2 Berth 205/206, Port of Portland

ARI Job: UH13

February 29, 2012

Total Metals Analysis:

The samples were digested on 2/7/12 and analyzed on 2/8/12 and 2/9/12 within the method recommended holding time.

Initial calibration (s): All analytes were within method acceptance criteria.

Continuing calibration (s): The fourth continuing calibration verification (CCV) was outside the control limits high for silver. No sample results were associated with this CCV. No corrective action was taken.

Method Blank (s): The method blank was free of contamination

Samples: There were no anomalies associated with the samples.

Blank Spike (s): All percent recoveries were in control.

Matrix Spike/Duplicate (s): The matrix spike percent recovery of antimony fell outside the control limit low for sample C1/2-DP. A post digestion spike was performed and the recovery was within control limits. All relevant data have been flagged with an "N" qualifier on the appropriate Form V. No further corrective action was taken.

All duplicate RPDs were within control limits.

Conventional Parameters (TS, NH₃, S₂, TOC):

The samples were prepared and analyzed between 2/3/12 and 2/9/12 within the method recommended holding time.

Method Blank (s): The method blanks were free of contamination

Samples: There were no anomalies associated with the samples.

LCS/SRM (s): All percent recoveries were in control.

Matrix Spike/Replicate (s): The matrix spike percent recovery and replicate RPD of sulfide were outside the control limits for sample C1/2-DP due to matrix effects. No corrective action was taken.

Geotechnical Parameters (Grain Size):

A laboratory-specific Case Narrative follows this page.



Client: Hart Crowser

ARI Job No.: UH13

Client Project: Terminal 2 Berth 205/206

Client Project No.: 15665-01

Case Narrative

1. Two samples were submitted for grain size analysis according to Puget Sound Estuary Protocol (PSEP) methodology on February 3, 2012.
2. The samples were run in a single batch and one sample from this job, C1/2-DP, was chosen for triplicate analysis. The triplicate data is reported on the QA summary.
3. The data is provided in summary tables and plots.
4. There were no other noted anomalies in this project.

Released by: *Juliana Swade*
Title: Geotechnical Laboratory Manager

Date: 2/15/12

Reviewed by: *[Signature]*
Title: Lead Technician

Date: 2.15.2012

Sample ID Cross Reference Report



ARI Job No: UH13
Client: Hart Crowser
Project Event: 15665-01
Project Name: Terminal 2 Berth 205/206

Sample ID	ARI Lab ID	ARI LIMS ID	Matrix	Sample Date/Time	VTSR
1. C1/2-DP	UH13A	12-2074	Soil	02/02/12 11:11	02/03/12 11:00
2. C3/4-DP	UH13B	12-2075	Soil	02/02/12 14:00	02/03/12 11:00
3. C1/2-N1	UH13C	12-2076	Soil	02/02/12 11:25	02/03/12 11:00
4. C1/2-N2	UH13D	12-2077	Soil	02/02/12 11:45	02/03/12 11:00
5. C3/4-N1	UH13E	12-2078	Soil	02/02/12 14:15	02/03/12 11:00
6. C3/4-N2	UH13F	12-2079	Soil	02/02/12 14:35	02/03/12 11:00
7. Referance 1	UH13G	12-2080	Soil	02/01/12 14:02	02/03/12 11:00



Data Reporting Qualifiers

Effective 2/14/2011

Inorganic Data

- U Indicates that the target analyte was not detected at the reported concentration
- * Duplicate RPD is not within established control limits
- B Reported value is less than the CRDL but \geq the Reporting Limit
- N Matrix Spike recovery not within established control limits
- NA Not Applicable, analyte not spiked
- H The natural concentration of the spiked element is so much greater than the concentration spiked that an accurate determination of spike recovery is not possible
- L Analyte concentration is ≤ 5 times the Reporting Limit and the replicate control limit defaults to ± 1 RL instead of the normal 20% RPD

Organic Data

- U Indicates that the target analyte was not detected at the reported concentration
- * Flagged value is not within established control limits
- B Analyte detected in an associated Method Blank at a concentration greater than one-half of ARI's Reporting Limit or 5% of the regulatory limit or 5% of the analyte concentration in the sample.
- J Estimated concentration when the value is less than ARI's established reporting limits
- D The spiked compound was not detected due to sample extract dilution
- E Estimated concentration calculated for an analyte response above the valid instrument calibration range. A dilution is required to obtain an accurate quantification of the analyte.
- Q Indicates a detected analyte with an initial or continuing calibration that does not meet established acceptance criteria ($< 20\%$ RSD, $< 20\%$ Drift or minimum RRF).



- S Indicates an analyte response that has saturated the detector. The calculated concentration is not valid; a dilution is required to obtain valid quantification of the analyte
- NA The flagged analyte was not analyzed for
- NR Spiked compound recovery is not reported due to chromatographic interference
- NS The flagged analyte was not spiked into the sample
- M Estimated value for an analyte detected and confirmed by an analyst but with low spectral match parameters. This flag is used only for GC-MS analyses
- M2 The sample contains PCB congeners that do not match any standard Aroclor pattern. The PCBs are identified and quantified as the Aroclor whose pattern most closely matches that of the sample. The reported value is an estimate.
- N The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification"
- Y The analyte is not detected at or above the reported concentration. The reporting limit is raised due to chromatographic interference. The Y flag is equivalent to the U flag with a raised reporting limit.
- EMPC Estimated Maximum Possible Concentration (EMPC) defined in EPA Statement of Work DLM02.2 as a value "calculated for 2,3,7,8-substituted isomers for which the quantitation and /or confirmation ion(s) has signal to noise in excess of 2.5, but does not meet identification criteria" **(Dioxin/Furan analysis only)**
- C The analyte was positively identified on only one of two chromatographic columns. Chromatographic interference prevented a positive identification on the second column
- P The analyte was detected on both chromatographic columns but the quantified values differ by $\geq 40\%$ RPD with no obvious chromatographic interference
- X Analyte signal includes interference from polychlorinated diphenyl ethers. **(Dioxin/Furan analysis only)**
- Z Analyte signal includes interference from the sample matrix or perfluorokerosene ions. **(Dioxin/Furan analysis only)**



Geotechnical Data

- A The total of all fines fractions. This flag is used to report total fines when only sieve analysis is requested and balances total grain size with sample weight.
- F Samples were frozen prior to particle size determination
- SM Sample matrix was not appropriate for the requested analysis. This normally refers to samples contaminated with an organic product that interferes with the sieving process and/or moisture content, porosity and saturation calculations
- SS Sample did not contain the proportion of "fines" required to perform the pipette portion of the grain size analysis
- W Weight of sample in some pipette aliquots was below the level required for accurate weighting

SURRE SOLUTIONS

LABEL	SOLN ID	TEST	CONC. UG/ML	SOLVENT	EXP.
A	1920-1	ABN	100/150	MEOH	06/09/12
B	1917-2	SIM PNA	15/75	ACETONE	05/30/12
C	NA	SIM ABN	25/37.5	MEOH	NA
D	1925-5	LOW PCB	0.2	ACETONE	05/28/12
E	1900-2	HERB	62.5	MEOH	10/06/12
F	1919-5	PCP	12.5	ACETONE	12/09/12
G	1906-3	d8-DIOXANE	100	MEOH	04/30/12
H	1847-2	OP-PEST	25	ACETONE	03/23/12
I	1896-3	LOW S. PNA	1.5	ACETONE	09/22/12
J	1915-4	TBT-PORE	0.125	MECL2	11/23/12
K	1925-4	MED PCB	20	ACETONE	05/28/12
L	1915-3	TBT	2.5	MECL2	11/23/12
M	1888-4	EPH	1500	MECL2	04/04/12
N	1914-2	PCB	2	ACETONE	05/28/12
O	1947-2	TPH	450	MECL2	09/28/12
P	1948-3	HCID	2250	MECL2	09/28/12
Q	NA	EDB	1	MEOH	NA
R	1886-3	RESIN ACID	250	ACETONE	02/19/12
S	1864-1	PBDE	.5	MEOH	05/21/12
T	1884-2	ALKYL PNA	10	MEOH	07/15/12
U	NA	CONGENER	2.5	ACETONE	NA
V	1925-2	LOW PCP	1.25	ACETONE	12/09/12

LCS SOLUTIONS

LABL SOLN ID	TEST	CONC. UG/ML	SOLVENT	EXP.	
1	1907-1	PCB 1660	20	ACETONE	11/01/12
2#		BCOC PEST	10	ACETONE	NA
3	1922-2	PEST	01/02/10	ACETONE	12/13/12
4	1922-3	LOW PEST	.1/.2/1	ACETONE	12/13/12
5	1902-4	EPH	1500	MECL2	10/04/12
6	1919-2	PCP	12.5/125	ACETONE	10/15/12
7	1926-2	ABN	100	MEOH	05/31/12
8	1916-2	TBT	2.5	MECL2	11/23/12
9	1918-2	PORE TBT	.125/.25	MECL2	11/23/12
10					
11	1860-4	TPHD	15000	ACETONE	05/12/12
12					
13	1948-1	LOW PCB	2	ACETONE	11/01/12
14					
15	1929-1	SIM PNA	15/75	MEOH	06/21/12
16	1906-4	1,4-DIOXANE	100	MEOH	04/30/12
17	1869-4	1248 PCB	10	ACETONE	06/14/12
18	1927-2	LOW SIM PNA	1.5	ACETONE	06/20/12
19	1931-1	AK103	7500	ACETONE	05/17/12
20	1930-1	PNA	100	ACETONE	06/23/12
21	1943-2	SKY/BHT	100	MEOH	07/27/12
22	1852-1	HERB	04 to 5000	MEOH	03/03/12
23	1887-2	EXTRA PNA	15	ACETONE	08/25/12
24					
25#		DIPHENYL	100	MEOH	NA
26	1904-2	OP-PEST	25	MEOH	02/10/12
27		STEROLS	200	MEOH	NA
28#		ADD. PEST	2	ACETONE	NA
29#		DECANES	100	MEOH	NA

LCS SOLUTIONS

30		EDB/DBCP	0.2	MEOH	NA
31	1944-1	TERPINEOL	100	MEOH	07/27/12
32	1876-1	GUAIACOL	50-200	ACETONE	01/05/12
33		RETENE	100	MEOH	NA
34	1867-3	CONGENERS	0.5	ACETONE	03/14/12
35	1875-3	ALKYL PNA A	10	MEOH	07/18/12
36		ALKYL PNA B	10	MEOH	NA
37		CAR/PERY	100	ACETONE	NA
38	1926-3	ABN ACID	200-450	MEOH	06/19/12
39	1853-4	BENZIDINE	500	MEOH	04/30/12
40	1851-3	PBDE	0.5	MEOH	04/22/12
50	1900-1	FULL RESIN	250	ACETONE	08/12/12
51		DDTS	0.01	ACETONE	NA
52		1232 PCB	20	ACETONE	NA
53	1919-1	DALAPON	50	MEOH	08/22/12
54		T-CHLORDANE	10	ACETONE	NA
55		TOXAPHENE	50	ACETONE	NA
56	1917-1	ABN BASE	50-200	MEOH	05/31/12
		#=PROJECT SPECIFIC SOLUTION			



LOD¹, LOQ² and Control Limits Summary
GC - MS – SVOA Analysis of Sediment
EPA Method 8270 Full Scan & SIM
ARI Analysis: BANDMP

Microwave Extraction (EPA Method 3546) using 10 g sample with extract concentrated to 1 mL final volume

LOD Spike level = LOQ (unless otherwise noted)

Analyte	Full Scan Analysis		SIM Analysis		LCS, MS Control Limits	Replicate RPD ²
	LOD ¹ µg/kg	LOQ ¹ µg/kg	LOD ¹ µg/kg	LOQ ¹ µg/kg	% Recovery	
Phenol	8.65	20	2.56	5	30 – 160	≤ 40
<i>bis</i> -(2-Chloroethyl)ether	3.35	20	--	--	30 – 160	≤ 40
2-Chlorophenol	2.39	20	--	--	30 – 160	≤ 40
1,3-Dichlorobenzene	2.63	20	1.31	5	30 – 160	≤ 40
1,4-Dichlorobenzene	2.86	20	1.19	5	30 – 160	≤ 40
1,2-Dichlorobenzene	2.50	20	1.10	5	30 – 160	≤ 40
Benzyl alcohol	6.09	20	7.04	20 ³	30 – 160	≤ 40
2,2'-oxy- <i>bis</i> -(1-Chloropropane)	3.76	20	--	--	30 – 160	≤ 40
2-Methylphenol	5.25	20	1.81	5	30 – 160	≤ 40
Hexachloroethane	2.94	20	--	--	30 – 160	≤ 40
N-Nitroso-di-n-propylamine	3.36	20	9.48	12 ³	30 – 160	≤ 40
4-Methylphenol ⁶	6.63	40	2.52	10	30 – 160	≤ 40
Nitrobenzene	4.06	20	--	--	30 – 160	≤ 40
Isophorone	2.86	20	--	--	30 – 160	≤ 40
2-Nitrophenol	38.7	100	--	--	30 – 160	≤ 40
2,4-Dimethylphenol	3.46	40	2.89	20	30 – 160	≤ 40
<i>bis</i> -(2-Chloroethoxy)methane	2.00	20	--	--	30 – 160	≤ 40
2,4-Dichlorophenol	21.5	200	--	--	30 – 160	≤ 40
1,2,4-Trichlorobenzene	3.48	20	1.86	5	30 – 160	≤ 40
Naphthalene	2.76	20	--	--	30 – 160	≤ 40
Benzoic acid	101	400 ⁵	--	--	30 – 160	≤ 40
4-Chloroaniline	22.3	270 ⁴	--	--	30 – 160	≤ 40
Hexachlorobutadiene	4.57	100	0.96	5	30 – 160	≤ 40
4-Chloro-3-methylphenol	15.1	100	--	--	30 – 160	≤ 40
2-Methylnaphthalene	3.06	20	--	--	30 – 160	≤ 40
Hexachlorocyclopentadiene	66.4	400 ⁴	--	--	30 – 160	≤ 40
2,4,6-Trichlorophenol	22.4	100	--	--	30 – 160	≤ 40
2,4,5-Trichlorophenol	21.4	100	--	--	30 – 160	≤ 40
2-Chloronaphthalene	2.64	20	--	--	30 – 160	≤ 40
2-Nitroaniline	18.4	100	--	--	30 – 160	≤ 40
Acenaphthylene	5.71	20	--	--	30 – 160	≤ 40
Dimethylphthalate	2.90	20	1.34	5	30 – 160	≤ 40
2,6-Dinitrotoluene	30.6	100	--	--	30 – 160	≤ 40



LOD¹, LOQ² and Control Limits Summary
GC - MS – SVOA Analysis of Sediment
EPA Method 8270 Full Scan & SIM
ARI Analysis: BANDMP

Microwave Extraction (EPA Method 3546) using 10 g sample with extract concentrated to 1 mL final volume

LOD Spike level = LOQ (unless otherwise noted)

Analyte	Full Scan Analysis		SIM Analysis		LCS, MS Control Limits	Replicate RPD ²
	LOD ¹ µg/kg	LOQ ¹ µg/kg	LOD ¹ µg/kg	LOQ ¹ µg/kg	% Recovery	
Acenaphthene	3.28	20	--	--	30 – 160	≤ 40
3-Nitroaniline	22.5	100	--	--	30 – 160	≤ 40
2,4-Dinitrophenol	111	850 ⁴	--	--	30 – 160	≤ 40
Dibenzofuran	4.10	20	--	--	30 – 160	≤ 40
4-Nitrophenol	34.7	100	--	--	30 – 160	≤ 40
2,4-Dinitrotoluene	19.5	100	--	--	30 – 160	≤ 40
Fluorene	4.35	20	--	--	30 – 160	≤ 40
4-Chlorophenyl-phenylether	5.29	20	--	--	30 – 160	≤ 40
Diethylphthalate	36.6	50 ³	3.26	5.0	30 – 160	≤ 40
4-Nitroaniline	37.9	100	--	--	30 – 160	≤ 40
4,6-Dinitro-2-methylphenol	21.2	200	--	--	30 – 160	≤ 40
N-Nitrosodiphenylamine	5.39	20	1.38	20	30 – 160	≤ 40
4-Bromophenyl-phenylether	5.03	20	--	--	30 – 160	≤ 40
Hexachlorobenzene	4.29	20	1.26	5	30 – 160	≤ 40
Pentachlorophenol	48.5	200 ⁴	14.3	50	30 – 160	≤ 40
Phenanthrene	3.64	20	--	--	30 – 160	≤ 40
Anthracene	4.50	20	--	--	30 – 160	≤ 40
Carbazole	2.69	20	--	--	30 – 160	≤ 40
Di-n-butylphthalate	8.16	20	--	--	30 – 160	≤ 40
Fluoranthene	2.91	20	--	--	30 – 160	≤ 40
Pyrene	1.94	20	--	--	30 – 160	≤ 40
Butylbenzylphthalate	6.14	20	2.89	5	30 – 160	≤ 40
Benzo(a)anthracene	3.29	20	--	--	30 – 160	≤ 40
3,3'-Dichlorobenzidine	17.8	150 ⁴	--	--	30 – 160	≤ 40
Chrysene	3.75	20	--	--	30 – 160	≤ 40
bis-(2-Ethylhexyl)phthalate	14.6	25 ³	--	--	30 – 160	≤ 40
Di-n-octylphthalate	5.84	20	--	--	30 – 160	≤ 40
Benzo(b)fluoranthene ⁷	3.47	20			30 – 160	≤ 40
Benzo(k)fluoranthene ⁷	4.18	20			30 – 160	≤ 40
Benzo(a)fluoranthene-Total ⁸	6.67	40	--	--	30 – 160	≤ 40
Benzo(a)pyrene	5.45	20	--	--	30 – 160	≤ 40
Indeno(1,2,3-cd)pyrene	4.68	20	--	--	30 – 160	≤ 40
Dibenzo(a,h)anthracene	4.31	20	2.02	5	30 – 160	≤ 40
Benzo(g,h,i)perylene	4.40	20	--	--	30 – 160	≤ 40



LOD¹, LOQ² and Control Limits Summary
GC - MS – SVOA Analysis of Sediment
EPA Method 8270 Full Scan & SIM
ARI Analysis: BANDMP

Microwave Extraction (EPA Method 3546) using 10 g sample with extract concentrated to 1 mL final volume

LOD Spike level = LOQ (unless otherwise noted)

Analyte	Full Scan Analysis		SIM Analysis		LCS, MS Control Limits	Replicate RPD ²
	LOD ¹ µg/kg	LOQ ¹ µg/kg	LOD ¹ µg/kg	LOQ ¹ µg/kg	% Recovery	
N-Nitrosodimethylamine	14.1	100	3.15	25	30 – 160	≤ 40
Aniline	40.0	540 ⁴	--	--	30 – 160	≤ 40
Pyridine	32.7	150 ⁴	--	--	30 – 160	≤ 40
1-Methylnaphthalene	2.68	20	--	--	30 – 160	≤ 40
Azobenzene (1,2-DP-Hydrazine)	2.98	20	--	--	30 – 160	≤ 40
Surrogate Standards				MB / LCS	Samples	RPD
2-Fluorophenol				30 – 160	30 – 160	≤ 40
Phenol-d ₅				30 – 160	30 – 160	≤ 40
2-Chlorophenol-d ₄				30 – 160	30 – 160	≤ 40
1,2-Dichlorobenzene-d ₄				30 – 160	30 – 160	≤ 40
Nitrobenzene-d ₅				30 – 160	30 – 160	≤ 40
2-Fluorobiphenyl				30 – 160	30 – 160	≤ 40
2,4,6-Tribromophenol				30 – 160	30 – 160	≤ 40
p-Terphenyl-d ₁₄				30 – 160	30 – 160	≤ 40

(1) Limit of Detection (LOD), Limit of Quantitation (LOQ) are defined in ARI SOP 1018S

(2) Relative Percent Difference between analytes in replicate analyzes. If C_O and C_D are the concentrations of the original and duplicate respectively then

$$RPD = \frac{|C_o - C_D|}{\frac{C_o + C_D}{2}} \times 100$$

(3) Spiked at 5 ppb

(4) Spiked at 100 ppb

(5) Spiked at 200 ppb

(6) 3-Methylphenol (not calibrated) co-elutes with 4-Methylphenol (calibrated)

(7) Benzo(b)fluoranthene and Benzo(k)fluoranthene are reported as separate analytes only when the height of the valley between the isomer peaks is less than 50% of the average of the two peak heights, otherwise total Benzofluoranthenes are reported.

(8) Benzo(b)fluoranthene + Benzo(j)fluoranthene + Benzo(k)fluoranthene (only the b & k isomers are calibrated)



DL, LOD, LOQ and Control Limits Summary Analysis of Solid Samples for PNA EPA Method 8270 – SIM

Microwave (EPA 3546) or Sonication (EPA 3550C) Extraction using 10 g sample with extract with 0.5 mL final volume. ARI Bench Sheet 3060F or 3051F ARI Analyses: PNSSMI & PNSSCI

Analyte	DL ¹ µg/kg	LOD ^{1,2} µg/kg	LOQ ¹ µg/kg	LCS Control Limit ^{3,4}	Replicate RPD ⁵
Naphthalene	2.63	5.0	5.0	37 – 100	≤ 40
1-Methylnaphthalene	1.71	2.5	5.0	30 – 160 ⁶	≤ 40
2-Methylnaphthalene	1.52	2.5	5.0	37 – 100	≤ 40
Biphenyl	1.44	2.5	5.0	30 – 160 ⁶	≤ 40
2,6-Dimethylnaphthalene	0.75	2.5	5.0	30 – 160 ⁶	≤ 40
Acenaphthylene	1.26	2.5	5.0	35 – 100	≤ 40
Acenaphthene	1.32	2.5	5.0	39 – 100	≤ 40
Dibenzofuran	1.51	2.5	5.0	39 – 100	≤ 40
1,6,7-Trimethylnaphthalene	0.42	2.5	5.0	30 – 160 ⁶	≤ 40
Fluorene	1.29	2.5	5.0	42 – 100	≤ 40
Benzothiophene	0.43	2.5	5.0	30 – 160 ⁶	≤ 40
Phenanthrene	1.98	2.5	5.0	47 – 100	≤ 40
Anthracene	1.46	2.5	5.0	41 – 106	≤ 40
Carbazole	0.62	2.5	5.0	30 – 160 ⁶	≤ 40
1-Methylphenanthrene	0.70	2.5	5.0	30 – 160 ⁶	≤ 40
Fluoranthene	1.77	4.0	5.0	52 – 109	≤ 40
Pyrene	2.22	4.0	5.0	47 – 111	≤ 40
Benzo(a)anthracene	1.60	2.5	5.0	47 – 114	≤ 40
Chrysene	1.88	2.5	5.0	51 – 106	≤ 40
Benzo(b)fluoranthene	1.90	2.5	5.0	30 – 160 ⁶	≤ 40
Benzo(k)fluoranthene	2.05	2.5	5.0	30 – 160 ⁶	≤ 40
Benzo(e)pyrene	0.65	2.5	5.0	30 – 160 ⁶	≤ 40
Benzo(a)pyrene	1.75	2.5	5.0	44 – 111	≤ 40
Indeno(1,2,3-cd)pyrene	3.47	4.0	5.0	41 – 114	≤ 40
Dibenz(a,h)anthracene	2.38	4.0	5.0	42 – 116	≤ 40
Benzo(g,h,i)perylene	3.05	4.0	5.0	37 – 115	≤ 40
Perylene	2.99	4.0	5.0	30 – 160 ⁶	≤ 40
Surrogate Recovery			MB / LCS	Samples	RPD
2-Methylnaphthalene-d ₁₀			35 – 100	34 – 100	≤ 40
Dibenzo(a,h)anthracene-d ₁₄			37 – 120	10 – 117	≤ 40

(1) Detection Limit (DL), Limit of Detection (LOD), Limit of Quantitation (LOQ) as defined in ARI SOP 1018S

(2) LOD verification performed 8/26/11 ARI Sample TJ75I

(3) Highlighted control limits (**bold font**) are adjusted from the calculated values to reflect that ARI does not use control limits < 10 for the lower limit or < 100 for the upper limit.

(4) Control limits calculated using all data from 1/1/08 through 12/31/08.

(5) Relative Percent Difference between analytes in replicate analyzes. If C_O and C_D are the concentrations of the original and duplicate respectively then

$$RPD = \frac{|C_o - C_d|}{\frac{C_o + C_d}{2}} \times 100$$

(6) Default limits pending generation of historic limits.



Quality Control Summary for Butyl Tin Compounds EPA Methods 8270D – SIM							
Analyte	DL ¹	LOD ¹	LOQ ¹	Spike Recovery Limits (%) ^{2,3}			RPD ⁴
				LCS	MB/LCS Surrogate	Sample Surrogate	
TBTWSI – Aqueous Samples (Separatory Funnel Extraction – 100 to 0.5 mL) EPA Method 3510C – ARI Benchsheet TBT#1 – 3043F							
Tributyl Tin Ion ⁵	0.043 µg/L	0.096 µg/L	0.193 µg/L	30-160	--	--	≤ 40
Dibutyl Tin Ion ⁵	0.096 µg/L	0.216 µg/L	0.433 µg/L	30-160	--	--	≤ 40
Butyl Tin Ion ⁵	0.108 µg/L	0.153 µg/L	0.306 µg/L	30-160	--	--	≤ 40
Tripentyl Tin	--	--	--	--	30-160	30-160	≤ 40
Tripropyl Tin	--	--	--	--	30-160	30-160	≤ 40
TBTWSI – Pore Water Samples (Separatory Funnel Extraction – 150 to 0.5 mL) EPA Method 3510C – ARI Benchsheet TBT #3 – 3047F							
Tributyl Tin Ion ⁶	--	--	0.0052 µg/L	30-160	--	--	≤ 40
Dibutyl Tin Ion ⁶	--	--	0.0077 µg/L	30-160	--	--	≤ 40
Butyl Tin Ion ⁶	--	--	0.0054 µg/L	30-160	--	--	≤ 40
Tripentyl Tin	--	--	--	--	30-160	30-160	≤ 40
Tripropyl Tin	--	--	--	--	30-160	30-160	≤ 40
TBTSMI – Soil / Sediment Samples (Microwave Extraction – 5g dry wt to 0.5mL) EPA Method 3546 – ARI Benchsheet TBT#4 – 3064F							
Tributyl Tin Ion	1.52 µg/kg	1.93 µg/kg	3.86 µg/kg	40 – 144	--	--	≤ 40
Dibutyl Tin Ion	3.72 µg/kg	4.33 µg/kg	5.78 µg/kg	34 – 115	--	--	≤ 40
Butyl Tin Ion	2.95 µg/kg	3.06 µg/kg	4.08 µg/kg	10 – 111	--	--	≤ 40
Tripentyl Tin	--	--	--	--	35 – 130	25 – 140	≤ 40
Tripropyl Tin	--	--	--	--	28 – 106	32 – 104	≤ 40

(1) Detection Limit (DL), limit of detection (LOD) and limit of quantation (LOQ) as defined in ARI SOP 1018S.

(2) Highlighted control limits (**bold font**) are adjusted from the calculated values to reflect that ARI does not use control limits < 10 for the lower limit or < 100 for the upper limit.

(3) 30 – 160 are default, advisory control limits used when there is insufficient data to calculate historic control limits. These limits are not used as the sole reason to reject data from a batch of analytes.

(4) Acceptance criteria for the relative percent difference (RPD) between analytes in replicate analytes. If C_O and C_D are the concentrations of the original and duplicate respectively then

$$RPD = \frac{|C_O - C_D|}{\frac{C_O + C_D}{2}} \times 100$$

(5) DL from ARI MDL study QD32

(6) ARI does not report concentrations below the LOQ (low calibration standard concentration) and does not, therefore, determine a DL or LOD for butyl tin analysis in interstitial (pore) water.



Spike Recovery Control Limits for Chlorinated Pesticides
EPA Method SW-846-8081B Analysis of Soil / Sediment Samples ^(1,2)
Effective 10/25/11

Control limits are updated periodically. Assure that you have ARI's current control limits by downloading the files at the time of use. <http://www.arilabs.com/portal/downloads/ARI-CLs.zip>

Sample Dry Weight / Final Vol.	12.5 g to 2.5 mL	
Extraction Method	Microwave EPA Method 3546	
LCS Spike Recovery ⁽⁵⁾	Control Limits	ME Limits ⁽³⁾
<i>alpha</i> -BHC	49 - 111	39 - 121
<i>beta</i> -BHC	54 - 107	45 - 116
<i>delta</i> -BHC	72 - 112	65 - 119
<i>gamma</i> -BHC (Lindane)	54 - 115	44 - 125
Heptachlor	45 - 133	30 - 148
Aldrin	53 - 114	43 - 124
Hepachlor Epoxide	60 - 121	50 - 131
Endosulfan I	40 - 129	25 - 144
Dieldrin	68 - 123	59 - 132
4,4'-DDE	66 - 124	56 - 134
Endrin	60 - 135	48 - 148
Endosulfan II	46 - 130	32 - 144
4,4'-DDD	54 - 129	42 - 142
Endosulfan Sulfate	36 - 110	24 - 122
4,4'-DDT	50 - 133	36 - 147
Methoxychlor	46 - 138	31 - 153
Endrin Ketone	45 - 131	31 - 145
Endrin Aldehyde	25 - 100	13 - 113
<i>trans</i> -Chlordane (<i>beta</i> -Chlordane, <i>gamma</i> -Chlordane)	66 - 119	57 - 128
<i>cis</i> -Chlordane (<i>alpha</i> -chlordane)	62 - 119	53 - 129
Hexachlorobenzene	41 - 108	30 - 119
Hexachlorobutadiene	39 - 100	29 - 110
MB / LCS Surrogate Recovery		
Tetrachloro- <i>m</i> -xylene (TCMX)	42 - 112	(4)
Decachlorobiphenyl	59 - 123	(4)
Sample Surrogate Recovery		
Tetrachloro-xylene (TCMX)	29 - 142	(4)
Decachlorobiphenyl	22 - 156	(4)

(1) Control limits calculated using all available spike recovery data from 1/1/11 to 10/1/11.

(2) Highlighted control limits (**bold font**) adjusted to demonstrate that ARI does not use control limits < 10 for the lower limit or < 100 for the upper limit.

(3) ME = A **marginal exceedance** defined in the NELAC Standard ⁽⁶⁾ as beyond the LCS-CL but still within the ME limits. ME limits are between 3 and 4 standard deviations around the mean. A maximum of one marginal exceedance is acceptable. Two or more marginal exceedances require corrective action.

(4) Marginal Exceedances not allowed for a surrogate standard.

(5) Laboratory Control Sample (LCS) spike recovery control limits also used as advisory control limits for sample matrix spike (MS) analyzes. MS recovery values are advisory and not used to assess the acceptability of an analytical batch.

(6) 2003 NELAC Standard (EPA/600/R-04/003), July 2003, Chapter 5, pages 251-252.



Quality Control Criteria for Analysis of Solid
Matrix Samples for Aroclors
(Polychlorinated Biphenyls – PCB)
EPA Method 8082B

Analysis Code	Extraction	DL ¹ (ppb)	LOD ¹ (ppb)	LOQ ¹ (ppb)	Analyte	Spike Recovery Control Limits (%) ^{2,3,8}			RPD ⁴
						LCS	MB/LCS Surrogate	Sample Surrogate	
Soil / Sediment Samples (Microwave Extraction – EPA Method 3546)									
PCBSMI 15-3067F	12g to 4 mL	9.83	17	33	Aroclor 1016	55 – 109	--	--	≤ 40
		7.06	17	33	Aroclor 1260	50 – 125	--	--	
PCBSCI 08-3025F		--	--	--	TCMX	--	53 – 108	39 – 122	
		--	--	--	DCBP	--	49 – 126	31 – 140	
PCBDMP20 05-3017F	12.5 g to 2.5 mL ⁶	9.33	10	20 ⁶	Aroclor 1016	46 – 110	--	--	≤ 40
		10.82	15	20 ⁶	Aroclor 1260	47 – 124	--	--	
PCBDMP20 06-3026F		--	--	--	TCMX	--	43 – 107	34 – 109	
		--	--	--	DCBP	--	48 – 123	24 – 127	
PCBDMP10 05-3017F	12.5 g to 2.5 mL ⁶	0.759	5	10 ⁶	Aroclor 1016	46 – 110	--	--	≤ 40
		1.066	5	10 ⁶	Aroclor 1260	47 – 124	--	--	
PCBDMP10 06-3026F		--	--	--	TCMX	--	43 – 107	34 – 109	
		--	--	--	DCBP	--	48 – 123	24 – 127	
PCBDMP4 05-3017F	12.5 g to 2.5 mL ⁶	0.577	2	4 ⁶	Aroclor 1016	46 – 110	--	--	≤ 40
		0.610	2	4 ⁶	Aroclor 1260	47 – 124	--	--	
PCBDMP4 06-3026F		--	--	--	TCMX	--	43 – 107	34 – 109	
		--	--	--	DCBP	--	48 – 123	24 – 127	
Soil / Sediment Samples Medium Level (Vortex Extraction – EPA Method 3546)									
PCBSVX 12-3019F	5 g to 40 mL	109 ⁷	400	800	Aroclor 1016	30 – 160	--	--	≤ 40
		192 ⁷	400	800	Aroclor 1260	30 – 160	--	--	
		--	--	--	TCMX	--	30 – 160	30 – 160	
		--	--	--	DCBP	--	30 – 160	30 – 160	

(1) Detection Limit (DL), Limit of Detection (LOD) & Limit of Quantitation (LOQ) are defined in ARI SOP 1018S.

(2) Highlighted control limits (**bold font**) are adjusted from the calculated values to reflect that ARI does not use control limits < 10 for the lower limit or < 100 for the upper limit.

(3) 30 – 160 are default limits used when there is insufficient data to calculate historic control limits

(4) Acceptance criteria for the relative percent difference (RPD) between analytes in replicate analyzes. If C_O and C_D are the concentrations of the original and duplicate respectively then

$$RPD = \frac{|C_O - C_D|}{\frac{C_O + C_D}{2}} \times 100$$

(6) LOQ determined by lowest concentration used to calibrate the GC-ECD instrument.

(7) MDL Study PC66 6/24/09

(8) Control Limits calculated using all data generated between 1/1/11 and 11/30/11



Analysis Code	Analyte ⁵	LOD ¹	LOQ ² ppm	Spike % Recovery Control Limits ³			RPD ⁴
				LCS	MB/LCS Surrogate	Sample Surrogate	
HCIWVX	NWTPH-HCID – Water Samples	--	0.50 ⁷	--	--	50-150	≤ 40
HCISVX	NWTPH-HCID – Solid Samples	--	50 ⁷	--	--	50-150	
Aqueous Samples – No Extract Clean-up – Separatory Funnel Extraction – 500 to 1.0 mL							
DIESWI	DRO – NWTPH-Dext (C ₁₂ -C ₂₄)	0.022	0.1	64-112	50-150	50-150	≤ 40
AK2WSI	DRO – AK102 (C ₁₀ -C ₂₅)	0.022	0.1	75-125 ⁶	60-120	50-150	
OILWSI	RRO – NWTPH-Dext (C ₂₄ -C ₃₈)	0.044	0.2	64-112	50-150	50-150	
AK3WSI	RRO – AK103 (C ₂₅ -C ₃₆)	0.030 ⁸	0.2	60-120 ⁶	60-120	50-150	
Aqueous Samples – With Acid and/or Silica Gel Clean-up – Separatory Funnel Extraction – 500 to 1.0 mL							
DIESWI	DRO – NWTPH-Dext (C ₁₂ -C ₂₄)	0.039	0.1	61-104	50-150	50-150	≤ 40
AK2WSI	DRO – AK102 (C ₁₀ -C ₂₅)	0.042	0.1	75-125 ⁶	60-120	50-150	
OILWSI	RRO – NWTPH-Dext (C ₂₄ -C ₃₈)	0.010	0.2	61-104	50-150	50-150	
AK3WSI	RRO – AK103 (C ₂₅ -C ₃₆)	0.030 ⁸	0.2	60-120 ⁶	60-120	50-150	
Solid Matrix Samples – No Extract Clean-up – Microwave Extraction – 10 g to 1 mL							
DIESMI	DRO – NWTPH-Dext (C ₁₂ -C ₂₄)	1.35	5	62-119	50-150	50-150	≤ 40
AK2SMI	DRO – AK102 (C ₁₀ -C ₂₅)	2.43	5	75-125 ⁶	60-120	50-150	
OILSMI	RRO – NWTPH-Dext (C ₂₄ -C ₃₈)	2.48	10	62-119	50-150	50-150	
AK3SMI	RRO – AK103 (C ₂₅ -C ₃₆)	0.665 ⁹	10	60-120 ⁶	60-120	50-150	
Solid Matrix Samples – With Acid and/or Silica Gel Clean-up – Microwave Extraction – 10 g to 1 mL							
DIESMI	DRO – NWTPH-Dext (C ₁₂ -C ₂₄)	1.28	5	60-108	50-150	50-150	≤ 40
AK2SMI	DRO – AK102 (C ₁₀ -C ₂₅)	2.06	5	75-125 ⁶	60-120	50-150	
OILSMI	RRO – NWTPH-Dext (C ₂₄ -C ₃₈)	1.57	10	60-108	50-150	50-150	
AK3SMI	RRO – AK103 (C ₂₅ -C ₃₆)	0.665 ⁹	10	60-120 ⁶	60-120	50-150	

(1) Limit of Detection as defined in ARI SOP 1018S.

(2) Limit of Quantitation as defined in ARI SOP 1018S. The spike concentration used to determine the LOD and the concentration of the lowest standard used to calibrate the GC-FID instrument.

(3) All surrogate recovery limits are specified in the published methods (AK102, AK103 & NWTPH-Dext). The surrogate standard is *o*-Terphenyl.

(4) Acceptance criteria for the relative percent difference (RPD) between analytes in replicate analyzes. If C_O and C_D are the concentrations of the original and duplicate respectively then

$$RPD = \frac{|C_O - C_D|}{\frac{C_O + C_D}{2}} \times 100$$

(5) DRO = Diesel Range Organics and RRO = Residual Range Organics as defined in the methods referenced in footnote 3.

(6) Method specified LCS acceptance limits.

(7) Method specified reporting limits

(8) MDL study QD55 completed 2/12/10

(9) MDL study QD35 completed 1/29/10



Quality Control Parameters for Metals Analysis using ICP-OES

Analyte	Aqueous Samples ²			Spike Recovery		RPD ⁵	Solids ³	Tissue ⁴
	DL ¹ µg/L	LOD ¹ µg/L	LOQ ¹ µg/L	Matrix Spike	LCS		LOQ mg/kg	LOQ mg/kg
Aluminum	7.57	25	50	75 – 125	80 – 120	≤ 20	5.0	1.0
Antimony	6.28	25	50	75 – 125	80 – 120	≤ 20	5.0	1.0
Arsenic	3.33	25	50	75 – 125	80 – 120	≤ 20	5.0	1.0
Barium	1.33	1.5	3.0	75 – 125	80 – 120	≤ 20	0.3	0.06
Beryllium	0.16	0.5	1.0	75 – 125	80 – 120	≤ 20	0.1	0.02
Boron	7.39	10	20	75 – 125	80 – 120	≤ 20	2.0	0.4
Cadmium	0.18	0.5	2.0	75 – 125	80 – 120	≤ 20	0.2	0.04
Calcium	11.27	25	50	75 – 125	80 – 120	≤ 20	5.0	1.0
Chromium	1.24	2.5	5.0	75 – 125	80 – 120	≤ 20	0.5	0.1
Cobalt	0.27	1.5	3.0	75 – 125	80 – 120	≤ 20	0.3	0.06
Copper	0.92	1.0	2.0	75 – 125	80 – 120	≤ 20	0.2	0.04
Iron	7.50	25	50	75 – 125	80 – 120	≤ 20	5.0	1.0
Lead	1.55	10	20	75 – 125	80 – 120	≤ 20	2.0	0.4
Magnesium	9.61	25	50	75 – 125	80 – 120	≤ 20	5.0	1.0
Manganese	0.28	0.5	1.0	75 – 125	80 – 120	≤ 20	0.1	0.02
Molybdenum	0.79	2.5	5.0	75 – 125	80 – 120	≤ 20	0.5	0.1
Nickel	3.86	5.0	10	75 – 125	80 – 120	≤ 20	0.1	0.02
Potassium	65.70	250	500	75 – 125	80 – 120	≤ 20	5.0	1.0
Selenium	4.99	25	50	75 – 125	80 – 120	≤ 20	0.5	0.01
Silicon	8.17	30	60	75 – 125	80 – 120	≤ 20	(6)	(6)
Silver	0.43	1.5	3.0	75 – 125	80 – 120	≤ 20	0.3	0.06
Sodium	11.35	250	500	75 – 125	80 – 120	≤ 20	5.0	1.0
Strontium	0.09	1.0	1.0	75 – 125	80 – 120	≤ 20	0.1	0.02
Thallium	3.10	25	50	75 – 125	80 – 120	≤ 20	5.0	1.0
Tin	1.41	5.0	10	75 – 125	80 – 120	≤ 20	1.0	0.2
Titanium	2.11	2.5	5.0	75 – 125	80 – 120	≤ 20	0.5	0.01
Vanadium	0.27	1.5	3.0	75 – 125	80 – 120	≤ 20	0.3	0.06
Zinc	1.45	5.0	10	75 – 125	80 – 120	≤ 20	1.0	0.2

(1) Detection Limit (DL), Limit of Detection Limit (LOD) and Limit of Quantitation (LOQ) as defined in ARI SOP 1018S

(2) 50 mL sample and 50 mL final volume

(3) Solids LOQ based on 100% solids using 1.0 g sample with 100 mL final volume.

(4) Tissue is reported on an "as received" (wet weight) basis using 2.5 g sample with 50 mL final volume.

(5) Relative Percent Difference between analytes in replicate analyzes. If C_O and C_D are the concentrations of the original and duplicate respectively then

$$RPD = \frac{|C_O - C_D|}{\frac{C_O + C_D}{2}} \times 100$$

(6) ARI does not analyze for Silicon in solids or tissue samples



Quality Control Parameters for Metals Analysis using ICP-MS

Analyte	Mass	Aqueous Samples ²			Spike Recovery		RPD ⁴	Solids ³
		DL ¹ µg/L	LOD ¹ µg/L	LOQ ¹ µg/L	Matrix Spike	LCS		LOQ ¹ mg/kg
Aluminum	27	1.601	10	20.0	75 – 125	80 – 120	≤ 20	20.0
Antimony	121	0.010	0.1	0.2	75 – 125	80 – 120	≤ 20	0.2
	123	0.011	0.1	0.2	75 – 125	80 – 120	≤ 20	0.2
Arsenic #1	75	0.048	0.1	0.2	75 – 125	80 – 120	≤ 20	0.2
Arsenic #2	75	0.092	0.25	0.5	75 – 125	80 – 120	≤ 20	0.5
Barium	135	0.020	0.25	0.5	75 – 125	80 – 120	≤ 20	0.5
	137	0.019	0.25	0.5	75 – 125	80 – 120	≤ 20	0.5
Beryllium	9	0.021	0.1	0.2	75 – 125	80 – 120	≤ 20	0.2
Cadmium	111	0.010	0.05	0.1	75 – 125	80 – 120	≤ 20	0.1
	114	0.005	0.05	0.1	75 – 125	80 – 120	≤ 20	0.1
Calcium	43	3.983	25	50.0	75 – 125	80 – 120	≤ 20	50.0
Chromium	52	0.045	0.25	0.5	75 – 125	80 – 120	≤ 20	0.5
	53	0.118	0.25	0.5	75 – 125	80 – 120	≤ 20	0.5
Cobalt	59	0.011	0.1	0.2	75 – 125	80 – 120	≤ 20	0.2
Copper	63	0.158	0.25	0.5	75 – 125	80 – 120	≤ 20	0.5
	65	0.236	0.25	0.5	75 – 125	80 – 120	≤ 20	0.5
Iron	54	5.753	10	20.0	75 – 125	80 – 120	≤ 20	20.0
	57	3.876	10	20.0	75 – 125	80 – 120	≤ 20	20.0
Lead	208	0.046	0.05	0.1	75 – 125	80 – 120	≤ 20	0.1
Magnesium	24	0.297	10	20.0	75 – 125	80 – 120	≤ 20	20.0
Manganese	55	0.022	0.25	0.5	75 – 125	80 – 120	≤ 20	0.5
Molybdenum	98	0.013	0.1	0.2	75 – 125	80 – 120	≤ 20	0.2
Nickel	60	0.079	0.25	0.5	75 – 125	80 – 120	≤ 20	0.5
	62	0.089	0.25	0.5	75 – 125	80 – 120	≤ 20	0.5
Potassium	39	2.944	10	20.0	75 – 125	80 – 120	≤ 20	20.0
Selenium	82	0.127	0.25	0.5	75 – 125	80 – 120	≤ 20	0.5
	78	0.324	0.25	2.0	75 – 125	80 – 120	≤ 20	2.0
Silver	107	0.008	0.1	0.2	75 – 125	80 – 120	≤ 20	0.2
Sodium	23	2.833	50	100.0	75 – 125	80 – 120	≤ 20	100.0
Thorium	232	0.013	0.1	0.2	75 – 125	80 – 120	≤ 20	0.2
Thallium	205	0.004	0.1	0.2	75 – 125	80 – 120	≤ 20	0.2
Uranium	238	0.003	0.1	0.2	75 – 125	80 – 120	≤ 20	0.2
Vanadium	51	0.043	0.1	0.2	75 – 125	80 – 120	≤ 20	0.2
Zinc	66	0.497	2	4.0	75 – 125	80 – 120	≤ 20	4.0
	67	0.531	2	4.0	75 – 125	80 – 120	≤ 20	4.0
	68	0.524	2	4.0	75 – 125	80 – 120	≤ 20	4.0

(1) Detection Limit (DL), Limit of Detection Limit (LOD) and Limit of Quantitation (LOQ) as defined in ARI SOP 1018S

(2) 50 mL sample and 50 mL final volume

(3) Solids LOQ based on 100% solids using 1.0 g sample with 100 mL final volume.

(4) Relative Percent Difference between analytes in replicate analyzes. If C_O and C_D are the concentrations of the original and duplicate respectively then

$$RPD = \frac{|C_O - C_D|}{\frac{C_O + C_D}{2}} \times 100$$



Quality Control Parameters for Mercury Analysis using CVAA						
	Aqueous Samples²			Spike Recovery		RPD⁵
	DL¹ µg/L	LOD¹ µg/L	LOQ¹ µg/L	Matrix Spike	LCS	
Mercury	0.0069	0.05	0.10²	75 – 125	80 – 120	≤ 20
Mercury (low level)	0.0026	0.01	0.02³	75 – 125	80 – 120	≤ 20
	Soil / Sediment / Tissue⁴ Samples			Spike Recovery		RPD⁵
	DL¹ mg/kg	LOD¹ mg/kg	LOQ¹ mg/kg	Matrix Spike	LCS	
Mercury	0.0021	0.0125	0.025^{3,4}	75 – 125	80 – 120	≤ 20

(1) Detection Limit (DL), Limit of Detection Limit (LOD) and Limit of Quantitation (LOQ) as defined in ARI SOP 1018S

(2) 20 mL sample with 20 mL final volume

(3) 0.2 g sample with 50 mL final volume assuming 100% dry weight. Soil and sediment are reported on a dry weight basis.

(4) Tissue LOQ is 0.005 mg/kg as received (wet weight) based on 1 g sample with 50 mL final volume.

(5) Relative Percent Difference between analytes in replicate analyzes. If C_o and C_D are the concentrations of the original and duplicate respectively then

$$RPD = \frac{|C_o - C_D|}{\frac{C_o + C_D}{2}} \times 100$$



Spike Recovery Control Limits for Conventional Wet Chemistry

Effective 5/1/09

Control limits are updated periodically. Assure that you have ARI's current control limits by downloading the files at the time of use. <http://www.arilabs.com/portal/downloads/ARI-CLs.zip>

Sample Matrix:	ARI's Control Limits	
	Water	Soil / Sediment
Matrix Spike Recoveries	% Recovery	% Recovery
Ammonia	75 - 125	75 - 125
Bromide	75 - 125	75 - 125
Chloride	75 - 125	75 - 125
Cyanide	75 - 125	75 - 125
Ferrous Iron	75 - 125	75 - 125
Fluoride	75 - 125	75 - 125
Formaldehyde	75 - 125	75 - 125
Hexane Extractable Material	-- - --	78 - 114
Hexavalent Chromium	75 - 125	75 - 125
Nitrate/Nitrite	75 - 125	75 - 125
Oil and Grease	75 - 125	75 - 125
Phenol	75 - 125	75 - 125
Phosphorous	75 - 125	75 - 125
Sulfate	75 - 125	75 - 125
Sulfide	75 - 125	75 - 125
Total Kjeldahl Nitrogen	75 - 125	75 - 125
Total Organic Carbon	75 - 125	75 - 125
Duplicate RPDs		
Acidity	±20%	±20%
Alkalinity	±20%	±20%
BOD	±20%	±20%
Cation Exchange	±20%	±20%
COD	±20%	±20%
Conductivity	±20%	±20%
Salinity	±20%	±20%
Solids	±20%	±20%
Turbidity	±20%	±20%

**Semivolatile Analysis
Report and Summary QC Forms**

ARI Job ID: UH13

ORGANICS ANALYSIS DATA SHEET

PSDDA Semivolatiles by SW8270D GC/MS
Page 1 of 1

Sample ID: C1/2-DP
SAMPLE

Lab Sample ID: UH13A

QC Report No: UH13-Hart Crowser

LIMS ID: 12-2074

Project: Terminal 2 Berth 205/206

Matrix: Soil

15665-01

Data Release Authorized: *[Signature]*

Date Sampled: 02/02/12

Reported: 02/14/12

Date Received: 02/03/12

Date Extracted: 02/08/12

Sample Amount: 10.5 g-dry-wt

Date Analyzed: 02/10/12 19:52

Final Extract Volume: 1.0 mL

Instrument/Analyst: NT10/YZ

Dilution Factor: 1.00

GPC Cleanup: No

Percent Moisture: 52.5%

CAS Number	Analyte	MDL	RL	Result
108-95-2	Phenol	8.2	19	290
541-73-1	1,3-Dichlorobenzene	2.5	19	< 19 U
106-46-7	1,4-Dichlorobenzene	2.7	19	< 19 U
100-51-6	Benzyl Alcohol	5.8	19	90 Q
95-50-1	1,2-Dichlorobenzene	2.4	19	< 19 U
95-48-7	2-Methylphenol	5.0	19	< 19 U
106-44-5	4-Methylphenol	6.3	38	37 J
67-72-1	Hexachloroethane	2.8	19	< 19 U
105-67-9	2,4-Dimethylphenol	3.3	38	< 38 U
65-85-0	Benzoic Acid	96	380	120 J
120-82-1	1,2,4-Trichlorobenzene	3.3	19	< 19 U
91-20-3	Naphthalene	2.6	19	< 19 U
87-68-3	Hexachlorobutadiene	4.3	95	< 95 U
91-57-6	2-Methylnaphthalene	2.9	19	< 19 U
131-11-3	Dimethylphthalate	2.8	19	< 19 U
208-96-8	Acenaphthylene	5.4	19	< 19 U
83-32-9	Acenaphthene	3.1	19	< 19 U
132-64-9	Dibenzofuran	3.9	19	< 19 U
84-66-2	Diethylphthalate	35	48	< 48 U
86-73-7	Fluorene	4.1	19	< 19 U
86-30-6	N-Nitrosodiphenylamine	5.1	19	< 19 U
118-74-1	Hexachlorobenzene	4.1	19	< 19 U
87-86-5	Pentachlorophenol	46	190	< 190 U
85-01-8	Phenanthrene	3.5	19	17 J
120-12-7	Anthracene	4.3	19	< 19 U
84-74-2	Di-n-Butylphthalate	7.8	19	< 19 U
206-44-0	Fluoranthene	2.8	19	36
129-00-0	Pyrene	1.8	19	31
85-68-7	Butylbenzylphthalate	5.8	19	< 19 U
56-55-3	Benzo (a) anthracene	3.1	19	12 J
117-81-7	bis (2-Ethylhexyl) phthalate	14	24	56 B
218-01-9	Chrysene	3.6	19	21
117-84-0	Di-n-Octyl phthalate	5.6	19	< 19 U
50-32-8	Benzo (a) pyrene	5.2	19	13 J
193-39-5	Indeno (1,2,3-cd) pyrene	4.5	19	< 19 U
53-70-3	Dibenz (a,h) anthracene	4.1	19	< 19 U
191-24-2	Benzo (g,h,i) perylene	4.2	19	9.5 J
90-12-0	1-Methylnaphthalene	2.5	19	< 19 U
TOTBFA	Total Benzofluoranthenes	2.6	19	26


Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	47.4%	2-Fluorobiphenyl	47.6%
d14-p-Terphenyl	57.0%	d4-1,2-Dichlorobenzene	45.6%
d5-Phenol	53.9%	2-Fluorophenol	49.5%
2,4,6-Tribromophenol	65.5%	d4-2-Chlorophenol	47.9%

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS
 Page 1 of 1

Sample ID: C3/4-DP
SAMPLE

Lab Sample ID: UH13B
 LIMS ID: 12-2075
 Matrix: Soil
 Data Release Authorized: 
 Reported: 02/14/12

QC Report No: UH13-Hart Crowser
 Project: Terminal 2 Berth 205/206
 15665-01
 Date Sampled: 02/02/12
 Date Received: 02/03/12

Date Extracted: 02/08/12
 Date Analyzed: 02/10/12 20:26
 Instrument/Analyst: NT10/YZ
 GPC Cleanup: No

Sample Amount: 10.3 g-dry-wt
 Final Extract Volume: 1.0 mL
 Dilution Factor: 1.00
 Percent Moisture: 53.9%

CAS Number	Analyte	MDL	RL	Result
108-95-2	Phenol	8.4	20	460
541-73-1	1,3-Dichlorobenzene	2.6	20	< 20 U
106-46-7	1,4-Dichlorobenzene	2.8	20	< 20 U
100-51-6	Benzyl Alcohol	5.9	20	170 Q
95-50-1	1,2-Dichlorobenzene	2.4	20	< 20 U
95-48-7	2-Methylphenol	5.1	20	12 J
106-44-5	4-Methylphenol	6.5	39	53
67-72-1	Hexachloroethane	2.9	20	< 20 U
105-67-9	2,4-Dimethylphenol	3.4	39	41
65-85-0	Benzoic Acid	98	390	240 J
120-82-1	1,2,4-Trichlorobenzene	3.4	20	11 J
91-20-3	Naphthalene	2.7	20	18 J
87-68-3	Hexachlorobutadiene	4.4	97	< 97 U
91-57-6	2-Methylnaphthalene	3.0	20	13 J
131-11-3	Dimethylphthalate	2.8	20	16 J
208-96-8	Acenaphthylene	5.6	20	14 J
83-32-9	Acenaphthene	3.2	20	12 J
132-64-9	Dibenzofuran	4.0	20	13 J
84-66-2	Diethylphthalate	36	49	< 49 U
86-73-7	Fluorene	4.2	20	15 J
86-30-6	N-Nitrosodiphenylamine	5.2	20	< 20 U
118-74-1	Hexachlorobenzene	4.2	20	< 20 U
87-86-5	Pentachlorophenol	47	200	50 J
85-01-8	Phenanthrene	3.5	20	25
120-12-7	Anthracene	4.4	20	17 J
84-74-2	Di-n-Butylphthalate	7.9	20	14 J
206-44-0	Fluoranthene	2.8	20	52
129-00-0	Pyrene	1.9	20	45
85-68-7	Butylbenzylphthalate	6.0	20	17 J
56-55-3	Benzo (a) anthracene	3.2	20	20
117-81-7	bis (2-Ethylhexyl) phthalate	14	24	78 B
218-01-9	Chrysene	3.7	20	30
117-84-0	Di-n-Octyl phthalate	5.7	20	< 20 U
50-32-8	Benzo (a) pyrene	5.3	20	20
193-39-5	Indeno (1,2,3-cd) pyrene	4.6	20	16 J
53-70-3	Dibenz (a,h) anthracene	4.2	20	< 20 U
191-24-2	Benzo (g,h,i) perylene	4.3	20	18 J
90-12-0	1-Methylnaphthalene	2.6	20	11 J
TOTBFA	Total Benzofluoranthenes	2.7	20	44

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	51.6%	2-Fluorobiphenyl	51.6%
d14-p-Terphenyl	59.8%	d4-1,2-Dichlorobenzene	51.0%
d5-Phenol	59.5%	2-Fluorophenol	54.4%
2,4,6-Tribromophenol	73.9%	d4-2-Chlorophenol	53.1%

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS
 Page 1 of 1

Sample ID: C1/2-N1
SAMPLE

Lab Sample ID: UH13C
 LIMS ID: 12-2076
 Matrix: Soil
 Data Release Authorized: **VI B**
 Reported: 02/18/12

QC Report No: UH13-Hart Crowser
 Project: Terminal 2 Berth 205/206
 15665-01
 Date Sampled: 02/02/12
 Date Received: 02/03/12

Date Extracted: 02/08/12
 Date Analyzed: 02/10/12 21:00
 Instrument/Analyst: NT10/YZ
 GPC Cleanup: No

Sample Amount: 10.2 g-dry-wt
 Final Extract Volume: 1.0 mL
 Dilution Factor: 1.00
 Percent Moisture: 44.2%

CAS Number	Analyte	MDL	RL	Result
100-51-6	Benzyl Alcohol	6.0	20	85 Q
65-85-0	Benzoic Acid	99	390	100 J
117-81-7	bis(2-Ethylhexyl)phthalate	14	25	130 B

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	47.0%	2-Fluorobiphenyl	44.8%
d14-p-Terphenyl	52.6%	d4-1,2-Dichlorobenzene	46.8%
d5-Phenol	52.0%	2-Fluorophenol	49.1%
2,4,6-Tribromophenol	63.3%	d4-2-Chlorophenol	47.9%

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS
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Sample ID: C1/2-N2
SAMPLE

Lab Sample ID: UH13D
 LIMS ID: 12-2077
 Matrix: Soil
 Data Release Authorized: **VID**
 Reported: 02/18/12

QC Report No: UH13-Hart Crowser
 Project: Terminal 2 Berth 205/206
 15665-01
 Date Sampled: 02/02/12
 Date Received: 02/03/12

Date Extracted: 02/08/12
 Date Analyzed: 02/10/12 21:34
 Instrument/Analyst: NT10/YZ
 GPC Cleanup: No

Sample Amount: 10.7 g-dry-wt
 Final Extract Volume: 1.0 mL
 Dilution Factor: 1.00
 Percent Moisture: 44.5%

CAS Number	Analyte	MDL	RL	Result
100-51-6	Benzyl Alcohol	5.7	19	110 Q
65-85-0	Benzoic Acid	95	380	150 J
117-81-7	bis (2-Ethylhexyl)phthalate	14	23	120 B

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	49.4%	2-Fluorobiphenyl	54.4%
d14-p-Terphenyl	57.4%	d4-1,2-Dichlorobenzene	48.8%
d5-Phenol	56.8%	2-Fluorophenol	51.9%
2,4,6-Tribromophenol	74.5%	d4-2-Chlorophenol	50.9%

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS
 Page 1 of 1

Sample ID: C3/4-N1
SAMPLE

Lab Sample ID: UH13E
 LIMS ID: 12-2078
 Matrix: Soil
 Data Release Authorized: *VN*
 Reported: 02/18/12

QC Report No: UH13-Hart Crowser
 Project: Terminal 2 Berth 205/206
 15665-01
 Date Sampled: 02/02/12
 Date Received: 02/03/12

Date Extracted: 02/08/12
 Date Analyzed: 02/10/12 22:08
 Instrument/Analyst: NT10/YZ
 GPC Cleanup: No

Sample Amount: 10.4 g-dry-wt
 Final Extract Volume: 1.0 mL
 Dilution Factor: 1.00
 Percent Moisture: 50.8%

CAS Number	Analyte	MDL	RL	Result
108-95-2	Phenol	8.3	19	340
100-51-6	Benzyl Alcohol	5.8	19	220 Q
105-67-9	2,4-Dimethylphenol	3.3	38	< 38 U
65-85-0	Benzoic Acid	97	380	250 J
117-81-7	bis(2-Ethylhexyl)phthalate	14	24	54 B

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	52.0%	2-Fluorobiphenyl	52.8%
d14-p-Terphenyl	64.2%	d4-1,2-Dichlorobenzene	50.6%
d5-Phenol	60.4%	2-Fluorophenol	55.5%
2,4,6-Tribromophenol	74.0%	d4-2-Chlorophenol	54.0%

ORGANICS ANALYSIS DATA SHEET

PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: C3/4-N2
SAMPLE

Page 1 of 1

Lab Sample ID: UH13F

QC Report No: UH13-Hart Crowser

LIMS ID: 12-2079

Project: Terminal 2 Berth 205/206

Matrix: Soil

15665-01

Data Release Authorized: *VAD*

Date Sampled: 02/02/12

Reported: 02/18/12

Date Received: 02/03/12

Date Extracted: 02/08/12

Sample Amount: 10.6 g-dry-wt

Date Analyzed: 02/10/12 22:43

Final Extract Volume: 1.0 mL

Instrument/Analyst: NT10/YZ

Dilution Factor: 1.00

GPC Cleanup: No

Percent Moisture: 47.6%

CAS Number	Analyte	MDL	RL	Result
108-95-2	Phenol	8.2	19	180
100-51-6	Benzyl Alcohol	5.7	19	130 Q
105-67-9	2,4-Dimethylphenol	3.3	38	< 38 U
65-85-0	Benzoic Acid	95	380	140 J
117-81-7	bis(2-Ethylhexyl)phthalate	14	24	60 B

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	40.8%	2-Fluorobiphenyl	47.8%
d14-p-Terphenyl	50.6%	d4-1,2-Dichlorobenzene	44.0%
d5-Phenol	49.7%	2-Fluorophenol	46.4%
2,4,6-Tribromophenol	65.9%	d4-2-Chlorophenol	45.3%

SW8270 SEMIVOLATILES SOIL/SEDIMENT SURROGATE RECOVERY SUMMARY

Matrix: Soil

QC Report No: UH13-Hart Crowser
Project: Terminal 2 Berth 205/206
15665-01

Client ID	NBZ	FBP	TPH	DCB	PHL	2FP	TBP	2CP	TOT	OUT
MB-020812	71.8%	70.2%	80.4%	71.8%	74.1%	69.9%	99.3%	70.7%	0	
LCS-020812	57.0%	60.4%	70.0%	55.2%	60.7%	58.4%	88.4%	56.9%	0	
LCSD-020812	75.0%	79.4%	94.4%	72.8%	81.5%	78.8%	114%	76.7%	0	
C1/2-DP	47.4%	47.6%	57.0%	45.6%	53.9%	49.5%	65.5%	47.9%	0	
C3/4-DP	51.6%	51.6%	59.8%	51.0%	59.5%	54.4%	73.9%	53.1%	0	
C1/2-N1	47.0%	44.8%	52.6%	46.8%	52.0%	49.1%	63.3%	47.9%	0	
C1/2-N2	49.4%	54.4%	57.4%	48.8%	56.8%	51.9%	74.5%	50.9%	0	
C3/4-N1	52.0%	52.8%	64.2%	50.6%	60.4%	55.5%	74.0%	54.0%	0	
MB-020812	71.8%	70.2%	80.4%	71.8%	74.1%	69.9%	99.3%	70.7%	0	
LCS-020812	57.0%	60.4%	70.0%	55.2%	60.7%	58.4%	88.4%	56.9%	0	
LCSD-020812	75.0%	79.4%	94.4%	72.8%	81.5%	78.8%	114%	76.7%	0	
C3/4-N2	40.8%	47.8%	50.6%	44.0%	49.7%	46.4%	65.9%	45.3%	0	
C3/4-N2 MS	47.8%	50.0%	61.0%	48.4%	57.7%	53.5%	68.8%	51.7%	0	
C3/4-N2 MSD	44.2%	56.0%	62.0%	43.2%	58.1%	46.0%	81.2%	47.6%	0	

LCS/MB LIMITS QC LIMITS

(NBZ) = d5-Nitrobenzene	(30-160)	(30-160)
(FBP) = 2-Fluorobiphenyl	(30-160)	(30-160)
(TPH) = d14-p-Terphenyl	(30-160)	(30-160)
(DCB) = d4-1,2-Dichlorobenzene	(30-160)	(30-160)
(PHL) = d5-Phenol	(30-160)	(30-160)
(2FP) = 2-Fluorophenol	(30-160)	(30-160)
(TBP) = 2,4,6-Tribromophenol	(30-160)	(30-160)
(2CP) = d4-2-Chlorophenol	(30-160)	(30-160)

Prep Method: SW3546
Log Number Range: 12-2074 to 12-2079

SW8270 SEMIVOLATILES SOIL/SEDIMENT SURROGATE RECOVERY SUMMARY

Matrix: Soil

QC Report No: UH13-Hart Crowser
Project: Terminal 2 Berth 205/206
15665-01

Client ID	NBZ	FBP	TPH	DCB	PHL	2FP	TBP	2CP	TOT	OUT
C1/2-N1	47.0%	44.8%	52.6%	46.8%	52.0%	49.1%	63.3%	47.9%	0	
C1/2-N2	49.4%	54.4%	57.4%	48.8%	56.8%	51.9%	74.5%	50.9%	0	
C3/4-N1	52.0%	52.8%	64.2%	50.6%	60.4%	55.5%	74.0%	54.0%	0	
MB-020812	71.8%	70.2%	80.4%	71.8%	74.1%	69.9%	99.3%	70.7%	0	
LCS-020812	57.0%	60.4%	70.0%	55.2%	60.7%	58.4%	88.4%	56.9%	0	
LCSD-020812	75.0%	79.4%	94.4%	72.8%	81.5%	78.8%	114%	76.7%	0	
C3/4-N2	40.8%	47.8%	50.6%	44.0%	49.7%	46.4%	65.9%	45.3%	0	
C3/4-N2 MS	47.8%	50.0%	61.0%	48.4%	57.7%	53.5%	68.8%	51.7%	0	
C3/4-N2 MSD	44.2%	56.0%	62.0%	43.2%	58.1%	46.0%	81.2%	47.6%	0	

	LCS/MB LIMITS	QC LIMITS
(NBZ) = d5-Nitrobenzene	(30-160)	(30-160)
(FBP) = 2-Fluorobiphenyl	(30-160)	(30-160)
(TPH) = d14-p-Terphenyl	(30-160)	(30-160)
(DCB) = d4-1,2-Dichlorobenzene	(30-160)	(30-160)
(PHL) = d5-Phenol	(30-160)	(30-160)
(2FP) = 2-Fluorophenol	(30-160)	(30-160)
(TBP) = 2,4,6-Tribromophenol	(30-160)	(30-160)
(2CP) = d4-2-Chlorophenol	(30-160)	(30-160)

Prep Method: SW3546
Log Number Range: 12-2076 to 12-2079

ORGANICS ANALYSIS DATA SHEET

PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: C3/4-N2

Page 1 of 1

MS/MSD

Lab Sample ID: UH13F


QC Report No: UH13-Hart Crowser

LIMS ID: 12-2079

Project: Terminal 2 Berth 205/206

Matrix: Soil

15665-01

Data Release Authorized: 

Date Sampled: 02/02/12

Reported: 02/18/12

Date Received: 02/03/12

Date Extracted MS/MSD: 02/08/12

Sample Amount MS: 10.6 g-dry-wt

MSD: 10.6 g-dry-wt

Date Analyzed MS: 02/10/12 23:17

Final Extract Volume MS: 1.0 mL

MSD: 02/14/12 13:22

MSD: 1.0 mL

Instrument/Analyst MS: NT10/YZ

Dilution Factor MS: 1.00

MSD: NT10/YZ

MSD: 1.00

GPC Cleanup: No

Percent Moisture: 47.6 %

Analyte	Sample	MS	Spike Added-MS	MS Recovery	MSD	Spike Added-MSD	MSD Recovery	RPD
Phenol	176	373	473	41.6%	326	473	31.7%	13.4%
Benzyl Alcohol	133 Q	527	473	83.3%	503	473	78.2%	4.7%
2,4-Dimethylphenol	< 37.7 U	916	1420	64.5%	861	1420	60.6%	6.2%
Benzoic Acid	138 J	1730	2600	61.2%	1850	2600	65.8%	6.7%
bis(2-Ethylhexyl)phthalate	60.4 B	364 B	473	64.2%	410 B	473	73.9%	11.9%

Reported in µg/kg (ppb)

RPD calculated using sample concentrations per SW846.

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS
 Page 1 of 1

Sample ID: C3/4-N2
MATRIX SPIKE

Lab Sample ID: UH13F
 LIMS ID: 12-2079
 Matrix: Soil
 Data Release Authorized: *VJD*
 Reported: 02/18/12

QC Report No: UH13-Hart Crowser
 Project: Terminal 2 Berth 205/206
 15665-01
 Date Sampled: 02/02/12
 Date Received: 02/03/12

Date Extracted: 02/08/12
 Date Analyzed: 02/10/12 23:17
 Instrument/Analyst: NT10/YZ
 GPC Cleanup: No

Sample Amount: 10.6 g-dry-wt
 Final Extract Volume: 1.0 mL
 Dilution Factor: 1.00
 Percent Moisture: 47.6%

CAS Number	Analyte	MDL	RL	Result
108-95-2	Phenol	8.2	19	---
100-51-6	Benzyl Alcohol	5.8	19	---
105-67-9	2,4-Dimethylphenol	3.3	38	---
65-85-0	Benzoic Acid	96	380	---
117-81-7	bis(2-Ethylhexyl)phthalate	14	24	---

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	47.8%	2-Fluorobiphenyl	50.0%
d14-p-Terphenyl	61.0%	d4-1,2-Dichlorobenzene	48.4%
d5-Phenol	57.7%	2-Fluorophenol	53.5%
2,4,6-Tribromophenol	68.8%	d4-2-Chlorophenol	51.7%

ORGANICS ANALYSIS DATA SHEET

PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: C3/4-N2

MATRIX SPIKE DUPLICATE

Page 1 of 1

Lab Sample ID: UH13F

QC Report No: UH13-Hart Crowser

LIMS ID: 12-2079

Project: Terminal 2 Berth 205/206

Matrix: Soil

15665-01

Data Release Authorized: *VIB*

Date Sampled: 02/02/12

Reported: 02/18/12

Date Received: 02/03/12

Date Extracted: 02/08/12

Sample Amount: 10.6 g-dry-wt

Date Analyzed: 02/14/12 13:22

Final Extract Volume: 1.0 mL

Instrument/Analyst: NT10/YZ

Dilution Factor: 1.00

GPC Cleanup: No

Percent Moisture: 47.6%

CAS Number	Analyte	MDL	RL	Result
108-95-2	Phenol	8.2	19	---
100-51-6	Benzyl Alcohol	5.8	19	---
105-67-9	2,4-Dimethylphenol	3.3	38	---
65-85-0	Benzoic Acid	96	380	---
117-81-7	bis(2-Ethylhexyl)phthalate	14	24	---

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	44.2%	2-Fluorobiphenyl	56.0%
d14-p-Terphenyl	62.0%	d4-1,2-Dichlorobenzene	43.2%
d5-Phenol	58.1%	2-Fluorophenol	46.0%
2,4,6-Tribromophenol	81.2%	d4-2-Chlorophenol	47.6%

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS
 Page 1 of 2

Sample ID: LCS-020812
LCS/LCSD

Lab Sample ID: LCS-020812
 LIMS ID: 12-2074
 Matrix: Soil
 Data Release Authorized: *A*
 Reported: 02/15/12

QC Report No: UH13-Hart Crowser
 Project: Terminal 2 Berth 205/206
 15665-01
 Date Sampled: 02/02/12
 Date Received: 02/03/12

Date Extracted LCS/LCSD: 02/08/12

Sample Amount LCS: 10.0 g

Date Analyzed LCS: 02/10/12 18:43
 LCSD: 02/10/12 19:17

Final Extract Volume LCS: 1.0 mL
 LCSD: 1.0 mL

Instrument/Analyst LCS: NT10/YZ
 LCSD: NT10/YZ

Dilution Factor LCS: 1.00
 LCSD: 1.00

GPC Cleanup: No

Percent Moisture: NA

Analyte	Spike			LCSD			RPD
	LCS	Added-LCS	Recovery	LCS	Added-LCSD	Recovery	
Phenol	241	500	48.2%	338	500	67.6%	33.5%
1,3-Dichlorobenzene	264	500	52.8%	366	500	73.2%	32.4%
1,4-Dichlorobenzene	263	500	52.6%	371	500	74.2%	34.1%
Benzyl Alcohol	418 Q	500	83.6%	576 Q	500	115%	31.8%
1,2-Dichlorobenzene	271	500	54.2%	372	500	74.4%	31.4%
2-Methylphenol	255	500	51.0%	359	500	71.8%	33.9%
4-Methylphenol	645	1000	64.5%	835	1000	83.5%	25.7%
Hexachloroethane	254	500	50.8%	352	500	70.4%	32.3%
2,4-Dimethylphenol	761	1500	50.7%	1110	1500	74.0%	37.3%
Benzoic Acid	1520	2750	55.3%	2070	2750	75.3%	30.6%
1,2,4-Trichlorobenzene	306	500	61.2%	409	500	81.8%	28.8%
Naphthalene	290	500	58.0%	398	500	79.6%	31.4%
Hexachlorobutadiene	325	500	65.0%	447	500	89.4%	31.6%
2-Methylnaphthalene	298	500	59.6%	415	500	83.0%	32.8%
Dimethylphthalate	392	500	78.4%	536	500	107%	31.0%
Acenaphthylene	318	500	63.6%	432	500	86.4%	30.4%
Acenaphthene	322	500	64.4%	441	500	88.2%	31.2%
Dibenzofuran	319	500	63.8%	441	500	88.2%	32.1%
Diethylphthalate	375	500	75.0%	517	500	103%	31.8%
Fluorene	336	500	67.2%	454	500	90.8%	29.9%
N-Nitrosodiphenylamine	340	500	68.0%	470	500	94.0%	32.1%
Hexachlorobenzene	379	500	75.8%	545	500	109%	35.9%
Pentachlorophenol	1320	1500	88.0%	1780	1500	119%	29.7%
Phenanthrene	354	500	70.8%	501	500	100%	34.4%
Anthracene	362	500	72.4%	508	500	102%	33.6%
Di-n-Butylphthalate	392	500	78.4%	562	500	112%	35.6%
Fluoranthene	386	500	77.2%	549	500	110%	34.9%
Pyrene	354	500	70.8%	509	500	102%	35.9%
Butylbenzylphthalate	424	500	84.8%	613	500	123%	36.5%
Benzo(a)anthracene	357	500	71.4%	505	500	101%	34.3%
bis(2-Ethylhexyl)phthalate	378 B	500	75.6%	543 B	500	109%	35.8%
Chrysene	366	500	73.2%	519	500	104%	34.6%
Di-n-Octyl phthalate	368	500	73.6%	532	500	106%	36.4%
Benzo(a)pyrene	368	500	73.6%	523	500	105%	34.8%

ORGANICS ANALYSIS DATA SHEET

PSDDA Semivolatiles by SW8270D GC/MS

Page 2 of 2

Sample ID: LCSD-020812

LCS/LCSD

Lab Sample ID: LCS-020812

QC Report No: UH13-Hart Crowser

LIMS ID: 12-2074

Project: Terminal 2 Berth 205/206

Matrix: Soil

15665-01

Date Analyzed LCS: 02/10/12 18:43

LCSD: 02/10/12 19:17

Analyte	LCS			LCSD			RPD
	LCS	Spike Added-LCS	LCS Recovery	LCS	Spike Added-LCSD	LCSD Recovery	
Indeno(1,2,3-cd)pyrene	334	500	66.8%	477	500	95.4%	35.3%
Dibenz(a,h)anthracene	343	500	68.6%	487	500	97.4%	34.7%
Benzo(g,h,i)perylene	337	500	67.4%	481	500	96.2%	35.2%
1-Methylnaphthalene	290	500	58.0%	400	500	80.0%	31.9%
Total Benzofluoranthenes	696	1000	69.6%	1010	1000	101%	36.8%

Semivolatile Surrogate Recovery

	LCS	LCSD
d5-Nitrobenzene	57.0%	75.0%
2-Fluorobiphenyl	60.4%	79.4%
d14-p-Terphenyl	70.0%	94.4%
d4-1,2-Dichlorobenzene	55.2%	72.8%
d5-Phenol	60.7%	81.5%
2-Fluorophenol	58.4%	78.8%
2,4,6-Tribromophenol	88.4%	114%
d4-2-Chlorophenol	56.9%	76.7%

Reported in µg/kg (ppb)

RPD calculated using sample concentrations per SW846.

ORGANICS ANALYSIS DATA SHEET

PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: LCS-020812

Page 1 of 1

LCS/LCSD

Lab Sample ID: LCS-020812


QC Report No: UH13-Hart Crowser

LIMS ID: 12-2079

Project: Terminal 2 Berth 205/206

Matrix: Soil

15665-01

Data Release Authorized: 

Date Sampled: 02/02/12

Reported: 02/18/12

Date Received: 02/03/12

Date Extracted LCS/LCSD: 02/08/12

Sample Amount LCS: 10.0 g

LCSD: 10.0 g

Date Analyzed LCS: 02/10/12 18:43

Final Extract Volume LCS: 1.0 mL

LCSD: 02/10/12 19:17

LCSD: 1.0 mL

Instrument/Analyst LCS: NT10/YZ

Dilution Factor LCS: 1.00

LCSD: NT10/YZ

LCSD: 1.00

GPC Cleanup: No

Percent Moisture: NA

Analyte	Spike		LCS		Spike		LCSD		RPD
	LCS	Added-LCS	Recovery	LCSD	Added-LCSD	Recovery	LCSD		
Phenol	241	500	48.2%	338	500	67.6%	33.5%		
Benzyl Alcohol	418 Q	500	83.6%	576 Q	500	115%	31.8%		
2,4-Dimethylphenol	761	1500	50.7%	1110	1500	74.0%	37.3%		
Benzoic Acid	1520	2750	55.3%	2070	2750	75.3%	30.6%		
bis(2-Ethylhexyl)phthalate	378 B	500	75.6%	543 B	500	109%	35.8%		

Semivolatile Surrogate Recovery

	LCS	LCSD
d5-Nitrobenzene	57.0%	75.0%
2-Fluorobiphenyl	60.4%	79.4%
d14-p-Terphenyl	70.0%	94.4%
d4-1,2-Dichlorobenzene	55.2%	72.8%
d5-Phenol	60.7%	81.5%
2-Fluorophenol	58.4%	78.8%
2,4,6-Tribromophenol	88.4%	114%
d4-2-Chlorophenol	56.9%	76.7%

Reported in µg/kg (ppb)

RPD calculated using sample concentrations per SW846.

4B
SEMIVOLATILE METHOD BLANK SUMMARY

BLANK NO.

UH13MBS1

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No: UH13

Project: TERMINAL 2 BERTH 205

Lab File ID: UH13MB

Date Extracted: 02/08/12

Instrument ID: NT10

Date Analyzed: 02/10/12

Matrix: SOLID

Time Analyzed: 1809

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	=====	=====	=====	=====
01	UH13LCSS1	UH13LCSS1	UH13SB	02/10/12
02	UH13LCSDS1	UH13LCSDS1	UH13SBD	02/10/12
03	C1/2-DP	UH13A	UH13A	02/10/12
04	C3/4-DP	UH13B	UH13B	02/10/12
05	C1/2-N1	UH13C	UH13C	02/10/12
06	C1/2-N2	UH13D	UH13D	02/10/12
07	C3/4-N1	UH13E	UH13E	02/10/12
08	C3/4-N2	UH13F	UH13F	02/10/12
09	C3/4-N2 MS	UH13FMS	UH13FMS	02/10/12
10	C3/4-N2 MSD	UH13FMSD	UH13FMSD	02/14/12
11				
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ORGANICS ANALYSIS DATA SHEET

PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: MB-020812

Page 1 of 1

METHOD BLANK

Lab Sample ID: MB-020812

QC Report No: UH13-Hart Crowser

LIMS ID: 12-2074

Project: Terminal 2 Berth 205/206

Matrix: Soil

15665-01

Data Release Authorized: *[Signature]*

Date Sampled: NA

Reported: 02/15/12

Date Received: NA

Date Extracted: 02/08/12

Sample Amount: 10.0 g

Date Analyzed: 02/10/12 18:09

Final Extract Volume: 1.0 mL

Instrument/Analyst: NT10/YZ

Dilution Factor: 1.00

GPC Cleanup: No

Percent Moisture: NA

CAS Number	Analyte	MDL	RL	Result
108-95-2	Phenol	8.6	20	< 20 U
541-73-1	1,3-Dichlorobenzene	2.6	20	< 20 U
106-46-7	1,4-Dichlorobenzene	2.9	20	< 20 U
100-51-6	Benzyl Alcohol	6.1	20	< 20 U
95-50-1	1,2-Dichlorobenzene	2.5	20	< 20 U
95-48-7	2-Methylphenol	5.2	20	< 20 U
106-44-5	4-Methylphenol	6.6	40	< 40 U
67-72-1	Hexachloroethane	2.9	20	< 20 U
105-67-9	2,4-Dimethylphenol	3.5	40	< 40 U
65-85-0	Benzoic Acid	100	400	< 400 U
120-82-1	1,2,4-Trichlorobenzene	3.5	20	< 20 U
91-20-3	Naphthalene	2.8	20	< 20 U
87-68-3	Hexachlorobutadiene	4.6	100	< 100 U
91-57-6	2-Methylnaphthalene	3.1	20	< 20 U
131-11-3	Dimethylphthalate	2.9	20	< 20 U
208-96-8	Acenaphthylene	5.7	20	< 20 U
83-32-9	Acenaphthene	3.3	20	< 20 U
132-64-9	Dibenzofuran	4.1	20	< 20 U
84-66-2	Diethylphthalate	37	50	< 50 U
86-73-7	Fluorene	4.4	20	< 20 U
86-30-6	N-Nitrosodiphenylamine	5.4	20	< 20 U
118-74-1	Hexachlorobenzene	4.3	20	< 20 U
87-86-5	Pentachlorophenol	48	200	< 200 U
85-01-8	Phenanthrene	3.6	20	< 20 U
120-12-7	Anthracene	4.5	20	< 20 U
84-74-2	Di-n-Butylphthalate	8.2	20	< 20 U
206-44-0	Fluoranthene	2.9	20	< 20 U
129-00-0	Pyrene	1.9	20	< 20 U
85-68-7	Butylbenzylphthalate	6.1	20	< 20 U
56-55-3	Benzo(a)anthracene	3.3	20	< 20 U
117-81-7	bis(2-Ethylhexyl)phthalate	15	25	21 J
218-01-9	Chrysene	3.8	20	< 20 U
117-84-0	Di-n-Octyl phthalate	5.8	20	< 20 U
50-32-8	Benzo(a)pyrene	5.4	20	< 20 U
193-39-5	Indeno(1,2,3-cd)pyrene	4.7	20	< 20 U
53-70-3	Dibenz(a,h)anthracene	4.3	20	< 20 U
191-24-2	Benzo(g,h,i)perylene	4.4	20	< 20 U
90-12-0	1-Methylnaphthalene	2.7	20	< 20 U
TOTBFA	Total Benzofluoranthenes	2.8	20	< 20 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	71.8%	2-Fluorobiphenyl	70.2%
d14-p-Terphenyl	80.4%	d4-1,2-Dichlorobenzene	71.8%
d5-Phenol	74.1%	2-Fluorophenol	69.9%
2,4,6-Tribromophenol	99.3%	d4-2-Chlorophenol	70.7%

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS
Page 1 of 1

Sample ID: MB-020812
METHOD BLANK

Lab Sample ID: MB-020812
LIMS ID: 12-2079
Matrix: Soil
Data Release Authorized: *VN*
Reported: 02/18/12

QC Report No: UH13-Hart Crowser
Project: Terminal 2 Berth 205/206
15665-01
Date Sampled: NA
Date Received: NA

Date Extracted: 02/08/12
Date Analyzed: 02/10/12 18:09
Instrument/Analyst: NT10/YZ
GPC Cleanup: No

Sample Amount: 10.0 g
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Percent Moisture: NA

CAS Number	Analyte	MDL	RL	Result
108-95-2	Phenol	8.6	20	< 20 U
100-51-6	Benzyl Alcohol	6.1	20	< 20 U
105-67-9	2,4-Dimethylphenol	3.5	40	< 40 U
65-85-0	Benzoic Acid	100	400	< 400 U
117-81-7	bis (2-Ethylhexyl)phthalate	15	25	21 J

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	71.8%	2-Fluorobiphenyl	70.2%
d14-p-Terphenyl	80.4%	d4-1,2-Dichlorobenzene	71.8%
d5-Phenol	74.1%	2-Fluorophenol	69.9%
2,4,6-Tribromophenol	99.3%	d4-2-Chlorophenol	70.7%

5B
SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

Instrument ID: NT10

Project: TERMINAL 2 BERTH205/206

DFTPP Injection Date: 12/19/11

DFTPP Injection Time: 1441

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	10.0 - 80.0% of mass 198	27.1
68	Less than 2.0% of mass 69	0.6 (1.4)1
69	Mass 69 relative abundance	42.3
70	Less than 2.0% of mass 69	0.2 (0.4)1
127	10.0 - 80.0% of mass 198	49.2
197	Less than 2.0% of mass 198	0.0
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	6.8
275	10.0 - 60.0% of mass 198	25.2
365	Greater than 1.0% of mass 198	3.14
441	0.0 - 24.0% of mass 442	12.2 (15.6)2
442	50.0 - 200.0% of mass 198	78.1
443	15.0 - 24.0% of mass 442	15.5 (19.8)2

1-Value is % mass 69

2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01		IC1219A5	IC1219A	12/19/11	1459
02		IC1219B20	IC1219B	12/19/11	1533
03		IC1219C0.2	IC1219C	12/19/11	1607
04		IC1219D10	IC1219D	12/19/11	1641
05		IC1219F2.5	IC1219F	12/19/11	1750
06		IC1219H1.0	IC1219H	12/19/11	1857
07		IC1219I0.5	IC1219I	12/19/11	1931
08					
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22					

5B
SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

Instrument ID: NT10

Project: TERMINAL 2 BERTH205/206

DFTPP Injection Date: 02/10/12

DFTPP Injection Time: 1135

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	10.0 - 80.0% of mass 198	26.8
68	Less than 2.0% of mass 69	0.6 (1.4)1
69	Mass 69 relative abundance	42.3
70	Less than 2.0% of mass 69	0.2 (0.4)1
127	10.0 - 80.0% of mass 198	48.2
197	Less than 2.0% of mass 198	0.5
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	6.7
275	10.0 - 60.0% of mass 198	25.9
365	Greater than 1.0% of mass 198	3.45
441	0.0 - 24.0% of mass 442	13.8 (15.5)2
442	50.0 - 200.0% of mass 198	88.7
443	15.0 - 24.0% of mass 442	17.5 (19.7)2

1-Value is % mass 69

2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01		CC0210	CC0210	02/10/12	1149
02	UH13MBS1	UH13MBS1	UH13MB	02/10/12	1809
03	UH13LCSS1	UH13LCSS1	UH13SB	02/10/12	1843
04	UH13LCSDS1	UH13LCSDS1	UH13SBD	02/10/12	1917
05	C1/2-DP	UH13A	UH13A	02/10/12	1952
06	C3/4-DP	UH13B	UH13B	02/10/12	2026
07	C1/2-N1	UH13C	UH13C	02/10/12	2100
08	C1/2-N2	UH13D	UH13D	02/10/12	2134
09	C3/4-N1	UH13E	UH13E	02/10/12	2208
10	C3/4-N2	UH13F	UH13F	02/10/12	2243
11	C3/4-N2 MS	UH13FMS	UH13FMS	02/10/12	2317
12					
13					
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22					

5B
SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

Instrument ID: NT10

Project: TERMINAL 2 BERTH205/206

DFTPP Injection Date: 02/14/12

DFTPP Injection Time: 1148

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	10.0 - 80.0% of mass 198	26.0
68	Less than 2.0% of mass 69	0.6 (1.4)1
69	Mass 69 relative abundance	40.5
70	Less than 2.0% of mass 69	0.2 (0.5)1
127	10.0 - 80.0% of mass 198	47.0
197	Less than 2.0% of mass 198	0.0
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	6.8
275	10.0 - 60.0% of mass 198	25.8
365	Greater than 1.0% of mass 198	3.51
441	0.0 - 24.0% of mass 442	14.2 (15.5)2
442	50.0 - 200.0% of mass 198	91.1
443	15.0 - 24.0% of mass 442	17.8 (19.5)2

1-Value is % mass 69

2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01		CC0214	CC0214	02/14/12	1213
02	C3/4-N2 MSD	UH13FMSD	UH13FMSD	02/14/12	1322
03					
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6B
SEMIVOLATILE 8270-D INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No: UH13

Project: TERMINAL 2 BERTH205/206

Instrument ID: NT10

Calibration Date: 12/19/11

LAB FILE ID:	RRF0.2=IC1219C	RRF0.5=IC1219I	RRF1 =IC1219H						
	RRF2.5=IC1219F	RRF5 =IC1219A	RRF10 =IC1219D						
	RRF20 =IC1219B								
COMPOUND	RRF 0.2	RRF 0.5	RRF 1	RRF 2.5	RRF 5	RRF 10	RRF 20	RRF	%RSD /R^2
Phenol	2.781	2.644	2.596	2.484	2.342	2.210	2.214	2.467	8.9
Bis(2-Chloroethyl) ether	2.021	1.862	1.829	1.720	1.635	1.543	1.610	1.746	9.6
2-Chlorophenol	1.956	2.120	2.071	2.007	1.920	1.805	1.877	1.965	5.6
1,3-Dichlorobenzene	2.104	2.005	1.998	1.865	1.780	1.668	1.711	1.876	8.8
1,4-Dichlorobenzene	2.086	1.927	1.910	1.825	1.762	1.640	1.711	1.837	8.2
1,2-Dichlorobenzene	2.020	1.889	1.859	1.769	1.710	1.592	1.630	1.781	8.5
Benzyl alcohol	0.664	0.651	0.703	0.857	0.754	0.875	0.937	0.777	14.5
2,2'-oxybis(1-Chloropropane)	0.655	0.753	0.732	0.689	0.648	0.607	0.625	0.673	8.1
2-Methylphenol	2.029	1.730	1.704	1.651	1.578	1.478	1.548	1.674	10.7
Hexachloroethane	0.828	0.786	0.770	0.748	0.709	0.677	0.721	0.748	6.8
N-Nitroso-di-n-propylamine	1.296	1.241	1.224	1.175	1.082	1.030	1.063	1.159	8.8
4-Methylphenol	1.739	1.573	1.595	1.537	1.502	1.415	1.491	1.550	6.6
Nitrobenzene	0.476	0.448	0.441	0.427	0.416	0.402	0.422	0.433	5.6
Isophorone	0.855	0.844	0.840	0.805	0.795	0.772	0.811	0.817	3.7
2-Nitrophenol	0.311	0.273	0.264	0.280	0.272	0.271	0.290	0.280	5.7
2,4-Dimethylphenol	0.422	0.398	0.408	0.389	0.382	0.362	0.371	0.390	5.4
Bis(2-Chloroethoxy)methane	0.569	0.543	0.530	0.506	0.487	0.469	0.491	0.514	6.9
2,4-Dichlorophenol		0.364	0.374	0.369	0.356	0.335	0.345	0.357	4.2
1,2,4-Trichlorobenzene	0.426	0.394	0.390	0.366	0.362	0.335	0.344	0.374	8.5
Naphthalene	1.307	1.242	1.203	1.162	1.138	1.084	1.124	1.180	6.5
Benzoic acid		0.099	0.147	0.208	0.275	0.276	0.282	0.214	0.998
4-Chloroaniline		0.506	0.509	0.543	0.505	0.524	0.502	0.515	3.1
Hexachlorobutadiene	0.230	0.222	0.220	0.209	0.203	0.192	0.198	0.210	6.6
4-Chloro-3-methylphenol		0.321	0.340	0.339	0.343	0.337	0.356	0.339	3.3
2-Methylnaphthalene	0.878	0.807	0.805	0.786	0.782	0.750	0.784	0.799	5.0
Hexachlorocyclopentadiene		0.034	0.077	0.163	0.242	0.286	0.356	0.193	0.998
2,4,6-Trichlorophenol		0.376	0.390	0.403	0.435	0.403	0.444	0.408	6.4
2,4,5-Trichlorophenol		0.341	0.389	0.418	0.458	0.431	0.469	0.418	11.3
2-Chloronaphthalene	1.498	1.417	1.383	1.336	1.362	1.261	1.336	1.370	5.4
2-Nitroaniline		0.344	0.348	0.351	0.358	0.342	0.355	0.350	1.7
Acenaphthylene	2.384	2.148	2.130	2.037	2.079	1.882	1.980	2.091	7.6
Dimethylphthalate	1.643	1.489	1.481	1.408	1.424	1.277	1.288	1.430	8.8
2,6-Dinitrotoluene		0.324	0.328	0.324	0.338	0.313	0.324	0.325	2.4
Acenaphthene	1.400	1.302	1.285	1.232	1.269	1.182	1.253	1.275	5.3
3-Nitroaniline		0.365	0.376	0.369	0.382	0.361	0.374	0.371	2.0
2,4-Dinitrophenol		0.033	0.066	0.110	0.159	0.169	0.201	0.123	0.998
Dibenzofuran	2.045	1.906	1.851	1.785	1.819	1.669	1.720	1.828	6.8

<- Outside QC limits: %RSD <20% or R^2 > 0.990

6B
SEMIVOLATILE 8270-D INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No: UH13

Project: TERMINAL 2 BERTH205/206

Instrument ID: NT10

Calibration Date: 12/19/11

LAB FILE ID: RRF0.2=IC1219C RRF0.5=IC1219I RRF1 =IC1219H									
RRF2.5=IC1219F RRF5 =IC1219A RRF10 =IC1219D									
RRF20 =IC1219B									
COMPOUND	RRF 0.2	RRF 0.5	RRF 1	RRF 2.5	RRF 5	RRF 10	RRF 20	RRF	%RSD /R^2
4-Nitrophenol		0.088	0.091	0.112	0.132	0.129	0.138	0.115	18.8
2,4-Dinitrotoluene	0.396	0.400	0.428	0.444	0.466	0.433	0.444	0.430	5.9
Fluorene	1.585	1.488	1.437	1.385	1.388	1.275	1.294	1.407	7.7
4-Chlorophenyl-phenylether	0.941	0.888	0.858	0.818	0.792	0.750	0.762	0.830	8.4
Diethylphthalate	1.578	1.442	1.440	1.385	1.399	1.261	1.255	1.394	8.0
4-Nitroaniline		0.356	0.352	0.367	0.392	0.355	0.377	0.366	4.3
4,6-Dinitro-2-methylphenol		0.106	0.131	0.149	0.166	0.165	0.181	0.150	18.3
N-Nitrosodiphenylamine (1)	0.699	0.650	0.644	0.611	0.603	0.544	0.564	0.616	8.6
4-Bromophenyl-phenylether	0.274	0.268	0.268	0.256	0.261	0.244	0.261	0.262	3.7
Hexachlorobenzene	0.342	0.326	0.323	0.297	0.298	0.272	0.283	0.306	8.2
Pentachlorophenol	0.027	0.039	0.057	0.082	0.114	0.115	0.137	0.082	0.998
Phenanthrene	1.341	1.249	1.265	1.200	1.218	1.132	1.235	1.234	5.2
Anthracene	1.306	1.242	1.255	1.214	1.253	1.171	1.242	1.240	3.3
Carbazole	1.275	1.197	1.153	0.938	1.024	0.998	1.114	1.100	10.9
Di-n-butylphthalate	1.580	1.478	1.524	1.512	1.599	1.536	1.635	1.552	3.5
Fluoranthene	1.432	1.362	1.391	1.340	1.402	1.310	1.428	1.381	3.3
Pyrene	1.489	1.364	1.411	1.342	1.387	1.279	1.348	1.374	4.8
Butylbenzylphthalate	0.667	0.607	0.639	0.613	0.625	0.574	0.610	0.619	4.7
Benzo(a)anthracene	1.394	1.252	1.290	1.233	1.254	1.184	1.242	1.264	5.2
3,3'-Dichlorobenzidine		0.679	0.597	0.455	0.462	0.502	0.608	0.550	16.5
Chrysene	1.211	1.126	1.137	1.076	1.092	1.014	1.094	1.107	5.5
bis(2-Ethylhexyl)phthalate	0.738	0.642	0.644	0.616	0.632	0.580	0.624	0.639	7.6
Di-n-octylphthalate	1.262	1.197	1.182	1.110	1.112	1.025	1.096	1.140	6.9
Benzo(b)fluoranthene	1.458	1.524	1.499	1.450	1.505	1.357	1.349	1.449	4.9
Benzo(k)fluoranthene	1.566	1.335	1.330	1.289	1.302	1.270	1.421	1.359	7.6
Benzo(a)pyrene	1.242	1.100	1.106	1.067	1.116	1.046	1.107	1.112	5.6
Indeno(1,2,3-cd)pyrene	1.584	1.442	1.460	1.386	1.428	1.333	1.414	1.435	5.4
Dibenzo(a,h)anthracene	1.307	1.162	1.174	1.109	1.136	1.059	1.127	1.153	6.7
Benzo(g,h,i)perylene	1.384	1.240	1.230	1.193	1.232	1.158	1.211	1.235	5.8
N-Nitrosodimethylamine	1.212	1.180	1.155	1.086	1.032	0.960	0.975	1.086	9.2
Aniline	5.588	5.327	5.328	4.954	4.672	4.395	4.454	4.960	9.5
Benzidine	0.582	0.536	0.498	0.376	0.475	0.556	0.657	0.526	16.9
Perylene	1.251	1.112	1.103	1.051	1.086	1.010	1.084	1.100	6.9
Pyridine		1.035	0.995	0.895	0.825	0.848	0.850	0.908	9.6
1-methylnaphthalene	0.882	0.836	0.832	0.806	0.791	0.760	0.796	0.815	4.8
Azobenzene (1,2-DP-Hydrazine	1.683	1.617	1.576	1.516	1.482	1.396	1.395	1.524	7.2
Total Benzofluoranthenes	1.429	1.328	1.316	1.275	1.300	1.218	1.279	1.306	5.0

(1) Cannot be separated from Diphenylamine

<- Outside QC limits: %RSD <20% or R^2 > 0.990

SEMIVOLATILE 8270-D CONTINUING CALIBRATION CHECK

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No: UH13

Project: TERMINAL 2 BERTH205/206

Instrument ID: NT10

Cont. Calib. Date: 02/10/12

Init. Calib. Date: 12/19/11

Cont. Calib. Time: 1149

COMPOUND	CalAmt or ARF	CC Amt or RF	MIN RRF	CURVE TYPE	%D or Drift
Phenol	2.467	2.094	0.800	AVRG	-15.1
Bis(2-Chloroethyl) ether	1.746	1.522	0.700	AVRG	-12.8
2-Chlorophenol	1.965	1.623	0.800	AVRG	-17.4
1,3-Dichlorobenzene	1.876	1.699	0.010	AVRG	-9.4
1,4-Dichlorobenzene	1.837	1.664	0.010	AVRG	-9.4
1,2-Dichlorobenzene	1.781	1.629	0.010	AVRG	-8.5
Benzyl alcohol	0.777	0.982	0.010	AVRG	26.4 <-
2,2'-oxybis(1-Chloropropane)	0.673	0.519	0.010	AVRG	-22.9 <-
2-Methylphenol	1.674	1.571	0.700	AVRG	-6.2
Hexachloroethane	0.748	0.672	0.300	AVRG	-10.2
N-Nitroso-di-n-propylamine	1.159	1.272	0.500	AVRG	9.7
4-Methylphenol	1.550	1.599	0.600	AVRG	3.2
Nitrobenzene	0.433	0.407	0.200	AVRG	-6.0
Isophorone	0.817	0.772	0.400	AVRG	-5.5
2-Nitrophenol	0.280	0.226	0.100	AVRG	-19.3
2,4-Dimethylphenol	0.390	0.405	0.200	AVRG	3.8
Bis(2-Chloroethoxy)methane	0.514	0.453	0.300	AVRG	-11.9
2,4-Dichlorophenol	0.357	0.339	0.200	AVRG	-5.0
1,2,4-Trichlorobenzene	0.374	0.379	0.010	AVRG	1.3
Naphthalene	1.180	1.038	0.700	AVRG	-12.0
Benzoic acid	20.00	18.68	0.010	2ORDR	-6.6
4-Chloroaniline	0.515	0.462	0.010	AVRG	-10.3
Hexachlorobutadiene	0.210	0.186	0.010	AVRG	-11.4
4-Chloro-3-methylphenol	0.339	0.331	0.200	AVRG	-2.4
2-Methylnaphthalene	0.799	0.735	0.400	AVRG	-8.0
Hexachlorocyclopentadiene	10.00	3.931	0.050	2ORDR	-60.7 <-
2,4,6-Trichlorophenol	0.408	0.388	0.200	AVRG	-4.9
2,4,5-Trichlorophenol	0.418	0.424	0.200	AVRG	1.4
2-Chloronaphthalene	1.370	1.206	0.800	AVRG	-12.0
2-Nitroaniline	0.350	0.350	0.010	AVRG	0.0
Acenaphthylene	2.091	1.834	0.900	AVRG	-12.3
Dimethylphthalate	1.430	1.272	0.010	AVRG	-11.0
2,6-Dinitrotoluene	0.325	0.307	0.200	AVRG	-5.5
Acenaphthene	1.275	1.105	0.900	AVRG	-13.3
3-Nitroaniline	0.371	0.322	0.010	AVRG	-13.2
2,4-Dinitrophenol	20.00	17.23	0.010	2ORDR	-13.8
Dibenzofuran	1.828	1.646	0.800	AVRG	-10.0

<- Exceeds QC limit of 20% D

* RF less than minimum RF

SEMIVOLATILE 8270-D CONTINUING CALIBRATION CHECK

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No: UH13

Project: TERMINAL 2 BERTH205/206

Instrument ID: NT10

Cont. Calib. Date: 02/10/12

Init. Calib. Date: 12/19/11

Cont. Calib. Time: 1149

COMPOUND	CalAmt or ARF	CC Amt or RF	MIN RRF	CURVE TYPE	%D or Drift
4-Nitrophenol	0.115	0.104	0.010	AVRG	-9.6
2,4-Dinitrotoluene	0.430	0.426	0.200	AVRG	-0.9
Fluorene	1.407	1.193	0.900	AVRG	-15.2
4-Chlorophenyl-phenylether	0.830	0.587	0.400	AVRG	-29.3 <-
Diethylphthalate	1.394	1.261	0.010	AVRG	-9.5
4-Nitroaniline	0.366	0.268	0.010	AVRG	-26.8 <-
4,6-Dinitro-2-methylphenol	0.150	0.157	0.010	AVRG	4.7
N-Nitrosodiphenylamine(1)	0.616	0.532	0.010	AVRG	-13.6
4-Bromophenyl-phenylether	0.262	0.225	0.100	AVRG	-14.1
Hexachlorobenzene	0.306	0.312	0.100	AVRG	2.0
Pentachlorophenol	10.00	8.627	0.050	2ORDR	-13.7
Phenanthrene	1.234	1.034	0.700	AVRG	-16.2
Anthracene	1.240	1.127	0.700	AVRG	-9.1
Carbazole	1.100	0.789	0.010	AVRG	-28.3 <-
Di-n-butylphthalate	1.552	1.463	0.010	AVRG	-5.7
Fluoranthene	1.381	1.217	0.600	AVRG	-11.9
Pyrene	1.374	1.199	0.600	AVRG	-12.7
Butylbenzylphthalate	0.619	0.646	0.010	AVRG	4.4
Benzo(a)anthracene	1.264	1.083	0.800	AVRG	-14.3
3,3'-Dichlorobenzidine	0.550	0.393	0.010	AVRG	-28.5 <-
Chrysene	1.107	0.961	0.700	AVRG	-13.2
bis(2-Ethylhexyl)phthalate	0.639	0.560	0.010	AVRG	-12.4
Di-n-octylphthalate	1.140	0.982	0.010	AVRG	-13.8
Benzo(b)fluoranthene	1.449	1.295	0.700	AVRG	-10.6
Benzo(k)fluoranthene	1.359	1.122	0.700	AVRG	-17.4
Benzo(a)pyrene	1.112	1.024	0.700	AVRG	-7.9
Indeno(1,2,3-cd)pyrene	1.435	1.230	0.500	AVRG	-14.3
Dibenzo(a,h)anthracene	1.153	0.964	0.400	AVRG	-16.4
Benzo(g,h,i)perylene	1.235	1.037	0.500	AVRG	-16.0
N-Nitrosodimethylamine	1.086	1.008	0.010	AVRG	-7.2
Aniline	4.960	4.977	0.010	AVRG	0.3
Benzidine	0.526	0.332	0.010	AVRG	-36.9 <-
Perylene	1.100	1.019	0.010	AVRG	-7.4
Pyridine	0.908	0.887	0.010	AVRG	-2.3
1-methylnaphthalene	0.815	0.757	0.010	AVRG	-7.1
Azobenzene (1,2-DP-Hydrazine)	1.524	1.399	0.010	AVRG	-8.2

(1) Cannot be separated from Diphenylamine

<- Exceeds QC limit of 20% D

* RF less than minimum RF

SEMIVOLATILE 8270-D CONTINUING CALIBRATION CHECK

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No: UH13

Project: TERMINAL 2 BERTH205/206

Instrument ID: NT10

Cont. Calib. Date: 02/10/12

Init. Calib. Date: 12/19/11

Cont. Calib. Time: 1149

COMPOUND	CalAmt or ARF	CC Amt or RF	MIN RRF	CURVE TYPE	%D or Drift
===== Total Benzofluoranthenes =====	1.306	1.114	0.010	AVRG	-14.7
===== 2-Fluorophenol =====	1.660	1.564	0.010	AVRG	-5.8
Phenol-d5	2.102	1.938	0.010	AVRG	-7.8
2-Chlorophenol-d4	1.829	1.596	0.010	AVRG	-12.7
1,2-Dichlorobenzene-d4	1.174	1.043	0.010	AVRG	-11.2
Nitrobenzene-d5	0.450	0.410	0.010	AVRG	-8.9
2-Fluorobiphenyl	1.637	1.422	0.010	AVRG	-13.1
2,4,6-Tribromophenol	0.202	0.194	0.010	AVRG	-4.0
Terphenyl-d14	0.896	0.761	0.010	AVRG	-15.1

<- Exceeds QC limit of 20% D

* RF less than minimum RF

7B
SEMIVOLATILE 8270-D CONTINUING CALIBRATION CHECK

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No: UH13

Project: TERMINAL 2 BERTH205/206

Instrument ID: NT10

Cont. Calib. Date: 02/14/12

Init. Calib. Date: 12/19/11

Cont. Calib. Time: 1213

COMPOUND	CalAmt or ARF	CC Amt or RF	MIN RRF	CURVE TYPE	%D or Drift
Phenol	2.467	1.979	0.800	AVRG	-19.8
Bis(2-Chloroethyl) ether	1.746	1.504	0.700	AVRG	-13.9
2-Chlorophenol	1.965	1.601	0.800	AVRG	-18.5
1,3-Dichlorobenzene	1.876	1.665	0.010	AVRG	-11.2
1,4-Dichlorobenzene	1.837	1.635	0.010	AVRG	-11.0
1,2-Dichlorobenzene	1.781	1.596	0.010	AVRG	-10.4
Benzyl alcohol	0.777	0.999	0.010	AVRG	28.6 <-
2,2'-oxybis(1-Chloropropane)	0.673	0.518	0.010	AVRG	-23.0 <-
2-Methylphenol	1.674	1.556	0.700	AVRG	-7.0
Hexachloroethane	0.748	0.669	0.300	AVRG	-10.6
N-Nitroso-di-n-propylamine	1.159	1.098	0.500	AVRG	-5.3
4-Methylphenol	1.550	1.617	0.600	AVRG	4.3
Nitrobenzene	0.433	0.406	0.200	AVRG	-6.2
Isophorone	0.817	0.762	0.400	AVRG	-6.7
2-Nitrophenol	0.280	0.267	0.100	AVRG	-4.6
2,4-Dimethylphenol	0.390	0.364	0.200	AVRG	-6.7
Bis(2-Chloroethoxy)methane	0.514	0.454	0.300	AVRG	-11.7
2,4-Dichlorophenol	0.357	0.346	0.200	AVRG	-3.1
1,2,4-Trichlorobenzene	0.374	0.324	0.010	AVRG	-13.4
Naphthalene	1.180	1.042	0.700	AVRG	-11.7
Benzoic acid	20.00	21.68	0.010	2ORDR	8.4
4-Chloroaniline	0.515	0.514	0.010	AVRG	-0.2
Hexachlorobutadiene	0.210	0.184	0.010	AVRG	-12.4
4-Chloro-3-methylphenol	0.339	0.332	0.200	AVRG	-2.1
2-Methylnaphthalene	0.799	0.731	0.400	AVRG	-8.5
Hexachlorocyclopentadiene	10.00	4.721	0.050	2ORDR	-52.8 <-
2,4,6-Trichlorophenol	0.408	0.398	0.200	AVRG	-2.4
2,4,5-Trichlorophenol	0.418	0.442	0.200	AVRG	5.7
2-Chloronaphthalene	1.370	1.228	0.800	AVRG	-10.4
2-Nitroaniline	0.350	0.359	0.010	AVRG	2.6
Acenaphthylene	2.091	1.816	0.900	AVRG	-13.2
Dimethylphthalate	1.430	1.249	0.010	AVRG	-12.6
2,6-Dinitrotoluene	0.325	0.311	0.200	AVRG	-4.3
Acenaphthene	1.275	1.112	0.900	AVRG	-12.8
3-Nitroaniline	0.371	0.345	0.010	AVRG	-7.0
2,4-Dinitrophenol	20.00	20.25	0.010	2ORDR	1.2
Dibenzofuran	1.828	1.690	0.800	AVRG	-7.5

<- Exceeds QC limit of 20% D
* RF less than minimum RF

SEMIVOLATILE 8270-D CONTINUING CALIBRATION CHECK

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No: UH13

Project: TERMINAL 2 BERTH205/206

Instrument ID: NT10

Cont. Calib. Date: 02/14/12

Init. Calib. Date: 12/19/11

Cont. Calib. Time: 1213

COMPOUND	CalAmt or ARF	CC Amt or RF	MIN RRF	CURVE TYPE	%D or Drift
4-Nitrophenol	0.115	0.116	0.010	AVRG	0.9
2,4-Dinitrotoluene	0.430	0.421	0.200	AVRG	-2.1
Fluorene	1.407	1.204	0.900	AVRG	-14.4
4-Chlorophenyl-phenylether	0.830	0.616	0.400	AVRG	-25.8
Diethylphthalate	1.394	1.268	0.010	AVRG	-9.0
4-Nitroaniline	0.366	0.342	0.010	AVRG	-6.6
4,6-Dinitro-2-methylphenol	0.150	0.158	0.010	AVRG	5.3
N-Nitrosodiphenylamine (1)	0.616	0.532	0.010	AVRG	-13.6
4-Bromophenyl-phenylether	0.262	0.228	0.100	AVRG	-13.0
Hexachlorobenzene	0.306	0.268	0.100	AVRG	-12.4
Pentachlorophenol	10.00	8.689	0.050	2ORDR	-13.1
Phenanthrene	1.234	1.026	0.700	AVRG	-16.8
Anthracene	1.240	1.111	0.700	AVRG	-10.4
Carbazole	1.100	0.977	0.010	AVRG	-11.2
Di-n-butylphthalate	1.552	1.418	0.010	AVRG	-8.6
Fluoranthene	1.381	1.176	0.600	AVRG	-14.8
Pyrene	1.374	1.239	0.600	AVRG	-9.8
Butylbenzylphthalate	0.619	0.568	0.010	AVRG	-8.2
Benzo(a)anthracene	1.264	1.100	0.800	AVRG	-13.0
3,3'-Dichlorobenzidine	0.550	0.372	0.010	AVRG	-32.4
Chrysene	1.107	0.963	0.700	AVRG	-13.0
bis(2-Ethylhexyl)phthalate	0.639	0.570	0.010	AVRG	-10.8
Di-n-octylphthalate	1.140	0.981	0.010	AVRG	-13.9
Benzo(b)fluoranthene	1.449	1.241	0.700	AVRG	-14.4
Benzo(k)fluoranthene	1.359	1.174	0.700	AVRG	-13.6
Benzo(a)pyrene	1.112	1.016	0.700	AVRG	-8.6
Indeno(1,2,3-cd)pyrene	1.435	1.245	0.500	AVRG	-13.2
Dibenzo(a,h)anthracene	1.153	0.972	0.400	AVRG	-15.7
Benzo(g,h,i)perylene	1.235	1.076	0.500	AVRG	-12.9
N-Nitrosodimethylamine	1.086	1.007	0.010	AVRG	-7.3
Aniline	4.960	4.900	0.010	AVRG	-1.2
Benzidine	0.526	0.372	0.010	AVRG	-29.3
Perylene	1.100	1.028	0.010	AVRG	-6.5
Pyridine	0.908	0.875	0.010	AVRG	-3.6
1-methylnaphthalene	0.815	0.748	0.010	AVRG	-8.2
Azobenzene (1,2-DP-Hydrazine)	1.524	1.410	0.010	AVRG	-7.5

(1) Cannot be separated from Diphenylamine

<- Exceeds QC limit of 20% D

* RF less than minimum RF

SEMIVOLATILE 8270-D CONTINUING CALIBRATION CHECK

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No: UH13

Project: TERMINAL 2 BERTH205/206

Instrument ID: NT10

Cont. Calib. Date: 02/14/12

Init. Calib. Date: 12/19/11

Cont. Calib. Time: 1213

COMPOUND	CalAmt or ARF	CC Amt or RF	MIN RRF	CURVE TYPE	%D or Drift
===== Total Benzofluoranthenes =====	1.306	1.115	0.010	AVRG	-14.6
===== 2-Fluorophenol =====	1.660	1.553	0.010	AVRG	-6.4
Phenol-d5	2.102	1.963	0.010	AVRG	-6.6
2-Chlorophenol-d4	1.829	1.595	0.010	AVRG	-12.8
1,2-Dichlorobenzene-d4	1.174	1.048	0.010	AVRG	-10.7
Nitrobenzene-d5	0.450	0.415	0.010	AVRG	-7.8
2-Fluorobiphenyl	1.637	1.443	0.010	AVRG	-11.8
2,4,6-Tribromophenol	0.202	0.202	0.010	AVRG	0.0
Terphenyl-d14	0.896	0.791	0.010	AVRG	-11.7

<- Exceeds QC limit of 20% D

* RF less than minimum RF

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No: UH13

Project: TERMINAL 2 BERTH205/206

Ical Midpoint ID: IC1219A

Ical Date: 12/19/11

Instrument ID: NT10

Cont. Cal Date: 02/10/12

	IS1 (DCB) AREA #	RT #	IS2 (NPT) AREA #	RT #	IS3 (ANT) AREA #	RT #
ICAL MIDPT	170659	7.85	654145	10.28	358397	13.81
UPPER LIMIT	341318		1308290		716794	
LOWER LIMIT	85330		327072		179198	
CCAL	154259	7.38	611037	9.78	348335	13.30
UPPER LIMIT		7.88		10.28		13.80
LOWER LIMIT		6.88		9.28		12.80
01 UH13MBS1	151385	7.38	589374	9.79	330713	13.30
02 UH13LCSS1	175573	7.38	684650	9.78	386723	13.30
03 UH13LCSDS1	129632	7.38	515146	9.78	293742	13.30
04 C1/2-DP	179166	7.38	717938	9.78	447450	13.29
05 C3/4-DP	173159	7.38	698505	9.78	431733	13.29
06 C1/2-N1	174498	7.38	697750	9.78	437676	13.29
07 C1/2-N2	184794	7.38	734467	9.78	413547	13.30
08 C3/4-N1	176302	7.38	713195	9.78	443877	13.30
09 C3/4-N2	186774	7.38	735329	9.78	414837	13.30
10 C3/4-N2 MS	175710	7.38	688916	9.79	435563	13.30
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						

IS1 = 1,4-Dichlorobenzene-d4

IS2 = Naphthalene-d8

IS3 = Acenaphthene-d10

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint

AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint

RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Cont. Cal

RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Cont. Cal

* Values outside of QC limits.

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No: UH13

Project: TERMINAL 2 BERTH205/206

Ical Midpoint ID: IC1219A

Ical Date: 12/19/11

Instrument ID: NT10

Cont. Cal Date: 02/10/12

	IS4 (PHN) AREA #	RT #	IS5 (CRY) AREA #	RT #	IS6 (PRY) AREA #	RT #
=====	=====	=====	=====	=====	=====	=====
ICAL MIDPT	576873	16.78	603333	21.66	585579	23.91
UPPER LIMIT	1153746		1206666		1171158	
LOWER LIMIT	288436		301666		292790	
=====	=====	=====	=====	=====	=====	=====
CCAL	549171	16.25	580312	21.18	557152	23.42
UPPER LIMIT		16.75		21.68		23.92
LOWER LIMIT		15.75		20.68		22.92
01 UH13MBS1	541323	16.25	568562	21.18	563883	23.42
02 UH13LCSS1	613313	16.25	674165	21.18	663770	23.42
03 UH13LCSDS1	459631	16.25	504159	21.18	490426	23.42
04 C1/2-DP	658206	16.25	697713	21.18	666668	23.42
05 C3/4-DP	633689	16.25	677443	21.18	635585	23.42
06 C1/2-N1	638977	16.25	678906	21.18	632679	23.42
07 C1/2-N2	691015	16.25	728761	21.19	666953	23.43
08 C3/4-N1	653132	16.25	689017	21.19	601663	23.43
09 C3/4-N2	666941	16.25	716264	21.19	623566	23.43
10 C3/4-N2 MS	629337	16.25	682537	21.19	582320	23.43
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						

IS4 = Phenanthrene-d10

IS5 = Chrysene-d12

IS6 = Perylene-d12

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint

AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint

RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Cont. Cal

RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Cont. Cal

* Values outside of QC limits.

8B
SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC
ARI Job No: UH13
Ical Midpoint ID: IC1219A
Instrument ID: NT10

Client: HART CROWSER
Project: TERMINAL 2 BERTH205/206
Ical Date: 12/19/11
Cont. Cal Date: 02/10/12

	IS7 AREA #	RT #	AREA #	RT #	AREA #	RT #
=====	=====	=====	=====	=====	=====	=====
ICAL MIDPT	889322	22.81				
UPPER LIMIT	1778644					
LOWER LIMIT	444661					
=====	=====	=====	=====	=====	=====	=====
CCAL	861241	22.37				
UPPER LIMIT		22.87				
LOWER LIMIT		21.87				
01 UH13MBS1	820867	22.37				
02 UH13LCSS1	981129	22.37				
03 UH13LCSDS1	719065	22.37				
04 C1/2-DP	1030859	22.38				
05 C3/4-DP	982926	22.37				
06 C1/2-N1	992226	22.38				
07 C1/2-N2	1064521	22.38				
08 C3/4-N1	1014849	22.38				
09 C3/4-N2	1055183	22.37				
10 C3/4-N2 MS	1014241	22.38				
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						

IS7 = Di-n-octylphthalate-d4

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
 AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
 RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Cont. Cal
 RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Cont. Cal

* Values outside of QC limits.

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No: UH13

Project: TERMINAL 2 BERTH205/206

Ical Midpoint ID: IC1219A

Ical Date: 12/19/11

Instrument ID: NT10

Cont. Cal Date: 02/14/12

	IS1 (DCB) AREA #	RT #	IS2 (NPT) AREA #	RT #	IS3 (ANT) AREA #	RT #
=====	=====	=====	=====	=====	=====	=====
ICAL MIDPT	170659	7.85	654145	10.28	358397	13.81
UPPER LIMIT	341318		1308290		716794	
LOWER LIMIT	85330		327072		179198	
=====	=====	=====	=====	=====	=====	=====
CCAL	171863	7.24	677384	9.64	380090	13.14
UPPER LIMIT		7.74		10.14		13.64
LOWER LIMIT		6.74		9.14		12.64
01 C3/4-N2 MSD	162386	7.23	663783	9.62	373207	13.13
02						
03						
04						
05						
06						
07						
08						
09						
10						
11						
12						
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20						
21						
22						
23						
24						
25						

IS1 = 1,4-Dichlorobenzene-d4

IS2 = Naphthalene-d8

IS3 = Acenaphthene-d10

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint

AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint

RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Cont. Cal

RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Cont. Cal

* Values outside of QC limits.

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No: UH13

Project: TERMINAL 2 BERTH205/206

Ical Midpoint ID: IC1219A

Ical Date: 12/19/11

Instrument ID: NT10

Cont. Cal Date: 02/14/12

	IS4 (PHN) AREA #	RT #	IS5 (CRY) AREA #	RT #	IS6 (PRY) AREA #	RT #
=====	=====	=====	=====	=====	=====	=====
ICAL MIDPT	576873	16.78	603333	21.66	585579	23.91
UPPER LIMIT	1153746		1206666		1171158	
LOWER LIMIT	288436		301666		292790	
=====	=====	=====	=====	=====	=====	=====
CCAL	601653	16.08	594807	21.03	576526	23.26
UPPER LIMIT		16.58		21.53		23.76
LOWER LIMIT		15.58		20.53		22.76
01 C3/4-N2 MSD	600498	16.06	665057	21.01	632556	23.25
02						
03						
04						
05						
06						
07						
08						
09						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						

IS4 = Phenanthrene-d10

IS5 = Chrysene-d12

IS6 = Perylene-d12

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint

AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint

RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Cont. Cal

RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Cont. Cal

* Values outside of QC limits.

8B
SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No: UH13

Project: TERMINAL 2 BERTH205/206

Ical Midpoint ID: IC1219A

Ical Date: 12/19/11

Instrument ID: NT10

Cont. Cal Date: 02/14/12

	IS7 AREA #	RT #	AREA #	RT #	AREA #	RT #
=====	=====	=====	=====	=====	=====	=====
ICAL MIDPT	889322	22.81				
UPPER LIMIT	1778644					
LOWER LIMIT	444661					
=====	=====	=====	=====	=====	=====	=====
CCAL	902576	22.23				
UPPER LIMIT		22.73				
LOWER LIMIT		21.73				
01 C3/4-N2 MSD	979994	22.22				
02						
03						
04						
05						
06						
07						
08						
09						
10						
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12						
13						
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20						
21						
22						
23						
24						
25						

IS7 = Di-n-octylphthalate-d4

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
 AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
 RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Cont. Cal
 RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Cont. Cal


* Values outside of QC limits.

**SIM PAH Analysis
Report and Summary QC Forms**

ARI Job ID: UH13

ORGANICS ANALYSIS DATA SHEET
PNAs by SIM SW8270D-SIM GC/MS
Page 1 of 1

Sample ID: C1/2-DP
SAMPLE

Lab Sample ID: UH13A
LIMS ID: 12-2074
Matrix: Soil
Data Release Authorized: 
Reported: 02/14/12

QC Report No: UH13-Hart Crowser
Project: Terminal 2 Berth 205/206
15665-01
Date Sampled: 02/02/12
Date Received: 02/03/12

Date Extracted: 02/09/12
Date Analyzed: 02/13/12 14:15
Instrument/Analyst: NT4/JZ
GPC Cleanup: No

Sample Amount: 10.5 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: 52.5 %

CAS Number	Analyte	LOD	LOQ	Result
91-20-3	Naphthalene	2.5	4.8	13
91-57-6	2-Methylnaphthalene	1.4	4.8	4.2 J
90-12-0	1-Methylnaphthalene	1.6	4.8	3.8 J
208-96-8	Acenaphthylene	1.2	4.8	3.2 J
83-32-9	Acenaphthene	1.3	4.8	3.1 J
86-73-7	Fluorene	1.2	4.8	4.1 J
85-01-8	Phenanthrene	1.9	4.8	25
120-12-7	Anthracene	1.4	4.8	4.9
206-44-0	Fluoranthene	1.7	4.8	40
129-00-0	Pyrene	2.1	4.8	32
56-55-3	Benzo (a) anthracene	1.5	4.8	11
218-01-9	Chrysene	1.8	4.8	17
50-32-8	Benzo (a) pyrene	1.7	4.8	13
193-39-5	Indeno (1,2,3-cd) pyrene	3.3	4.8	8.1
53-70-3	Dibenz (a,h) anthracene	2.3	4.8	2.7 J
191-24-2	Benzo (g,h,i) perylene	2.9	4.8	9.5
132-64-9	Dibenzofuran	1.4	4.8	3.5 J
TOTBFA	Total Benzofluoranthenes	1.8	4.8	24

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene 62.7%
d14-Dibenzo(a,h)anthracen 86.7%

ORGANICS ANALYSIS DATA SHEET
PNAs by SIM SW8270D-SIM GC/MS
Page 1 of 1

Sample ID: C3/4-DP
SAMPLE

Lab Sample ID: UH13B
LIMS ID: 12-2075
Matrix: Soil
Data Release Authorized: *S*
Reported: 02/14/12

QC Report No: UH13-Hart Crowser
Project: Terminal 2 Berth 205/206
15665-01
Date Sampled: 02/02/12
Date Received: 02/03/12

Date Extracted: 02/09/12
Date Analyzed: 02/13/12 14:39
Instrument/Analyst: NT4/JZ
GPC Cleanup: No

Sample Amount: 10.3 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: 53.9 %

CAS Number	Analyte	LOD	LOQ	Result
91-20-3	Naphthalene	2.6	4.9	21
91-57-6	2-Methylnaphthalene	1.5	4.9	4.7 J
90-12-0	1-Methylnaphthalene	1.7	4.9	4.3 J
208-96-8	Acenaphthylene	1.2	4.9	3.2 J
83-32-9	Acenaphthene	1.3	4.9	6.0
86-73-7	Fluorene	1.3	4.9	10
85-01-8	Phenanthrene	1.9	4.9	46
120-12-7	Anthracene	1.4	4.9	13
206-44-0	Fluoranthene	1.7	4.9	47
129-00-0	Pyrene	2.2	4.9	40
56-55-3	Benzo (a) anthracene	1.6	4.9	15
218-01-9	Chrysene	1.8	4.9	21
50-32-8	Benzo (a) pyrene	1.7	4.9	17
193-39-5	Indeno (1,2,3-cd) pyrene	3.4	4.9	10
53-70-3	Dibenz (a,h) anthracene	2.3	4.9	2.7 J
191-24-2	Benzo (g,h,i) perylene	3.0	4.9	16
132-64-9	Dibenzofuran	1.5	4.9	6.5
TOTBFA	Total Benzofluoranthenes	1.8	4.9	32

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene 65.0%
d14-Dibenzo(a,h)anthracene 89.7%

SIM SW8270 SURROGATE RECOVERY SUMMARY

Matrix: Soil

QC Report No: UH13-Hart Crowser
Project: Terminal 2 Berth 205/206
15665-01

<u>Client ID</u>	<u>MNP</u>	<u>DBA</u>	<u>TOT OUT</u>
MB-020912	54.3%	79.7%	0
LCS-020912	54.0%	78.3%	0
LCSD-020912	52.7%	92.3%	0
C1/2-DP	62.7%	86.7%	0
C3/4-DP	65.0%	89.7%	0

LCS/MB LIMITS QC LIMITS

(MNP) = d10-2-Methylnaphthalene (35-100) (34-100)
(DBA) = d14-Dibenzo(a,h)anthracene (37-120) (10-117)

Prep Method: SW3546
Log Number Range: 12-2074 to 12-2075

ORGANICS ANALYSIS DATA SHEET

PNAs by SW8270D-SIM GC/MS

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Sample ID: LCS-020912

LAB CONTROL SAMPLE

Lab Sample ID: LCS-020912

LIMS ID: 12-2074

Matrix: Soil

Data Release Authorized:

Reported: 02/14/12

QC Report No: UH13-Hart Crowser

Project: Terminal 2 Berth 205/206

Event: 15665-01

Date Sampled: NA

Date Received: NA

Date Extracted: 02/09/12

Sample Amount LCS: 10.0 g-dry-wt

LCS D: 10.0 g-dry-wt

Date Analyzed LCS: 02/13/12 13:00

Final Extract Volume LCS: 0.50 mL

LCS D: 02/13/12 13:25

LCS D: 0.50 mL

Instrument/Analyst LCS: NT4/JZ

Dilution Factor LCS: 1.00

LCS D: NT4/JZ

LCS D: 1.00

Analyte	LCS	Spike		LCS D	Spike		RPD
		Added-LCS	Recovery		Added-LCS D	Recovery	
Naphthalene	74.6	150	49.7%	72.0	150	48.0%	3.5%
2-Methylnaphthalene	72.6	150	48.4%	71.2	150	47.5%	1.9%
1-Methylnaphthalene	74.4	150	49.6%	76.4	150	50.9%	2.7%
Acenaphthylene	69.0	150	46.0%	75.3	150	50.2%	8.7%
Acenaphthene	73.4	150	48.9%	80.6	150	53.7%	9.4%
Fluorene	81.3	150	54.2%	88.0	150	58.7%	7.9%
Phenanthrene	88.9	150	59.3%	101	150	67.3%	12.7%
Anthracene	85.8	150	57.2%	94.8	150	63.2%	10.0%
Fluoranthene	97.8	150	65.2%	115	150	76.7%	16.2%
Pyrene	95.6	150	63.7%	107	150	71.3%	11.3%
Benzo(a)anthracene	87.2	150	58.1%	103	150	68.7%	16.6%
Chrysene	98.4	150	65.6%	109	150	72.7%	10.2%
Benzo(a)pyrene	89.2	150	59.5%	107	150	71.3%	18.1%
Indeno(1,2,3-cd)pyrene	99.8	150	66.5%	114	150	76.0%	13.3%
Dibenz(a,h)anthracene	98.4	150	65.6%	115	150	76.7%	15.6%
Benzo(g,h,i)perylene	101	150	67.3%	114	150	76.0%	12.1%
Dibenzofuran	77.4	150	51.6%	83.2	150	55.5%	7.2%
Total Benzofluoranthenes	226	300	75.3%	245	300	81.7%	8.1%

Reported in µg/kg (ppb)

RPD calculated using sample concentrations per SW846.

SIM Semivolatile Surrogate Recovery

	LCS	LCS D
d10-2-Methylnaphthalene	54.0%	52.7%
d14-Dibenzo(a,h)anthracen	78.3%	92.3%

4B
SEMIVOLATILE METHOD BLANK SUMMARY

BLANK NO.

UH13MBS1

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No: UH13

Project: TERMINAL 2 BERTH 205

Lab File ID: 02131203

Date Extracted: 02/09/12

Instrument ID: NT4

Date Analyzed: 02/13/12

Matrix: SOLID

Time Analyzed: 1235

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	=====	=====	=====	=====
01	UH13LCSS1	UH13LCSS1	02131204	02/13/12
02	UH13LCSDS1	UH13LCSDS1	02131205	02/13/12
03	C1/2-DP	UH13A	02131207	02/13/12
04	C3/4-DP	UH13B	02131208	02/13/12
05				
06				
07				
08				
09				
10				
11				
12				
13				
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30				

ORGANICS ANALYSIS DATA SHEET

PNAs by SIM SW8270D-SIM GC/MS

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Sample ID: MB-020912

METHOD BLANK

Lab Sample ID: MB-020912

LIMS ID: 12-2074

Matrix: Soil

Data Release Authorized: *[Signature]*

Reported: 02/14/12

QC Report No: UH13-Hart Crowser

Project: Terminal 2 Berth 205/206

15665-01

Date Sampled: NA

Date Received: NA

Date Extracted: 02/09/12

Date Analyzed: 02/13/12 12:35

Instrument/Analyst: NT4/JZ

GPC Cleanup: No

Sample Amount: 10.0 g-dry-wt

Final Extract Volume: 0.50 mL

Dilution Factor: 1.00

Percent Moisture: NA

CAS Number	Analyte	LOD	LOQ	Result
91-20-3	Naphthalene	2.6	5.0	< 5.0 U
91-57-6	2-Methylnaphthalene	1.5	5.0	< 5.0 U
90-12-0	1-Methylnaphthalene	1.7	5.0	< 5.0 U
208-96-8	Acenaphthylene	1.3	5.0	< 5.0 U
83-32-9	Acenaphthene	1.3	5.0	< 5.0 U
86-73-7	Fluorene	1.3	5.0	< 5.0 U
85-01-8	Phenanthrene	2.0	5.0	< 5.0 U
120-12-7	Anthracene	1.5	5.0	< 5.0 U
206-44-0	Fluoranthene	1.8	5.0	< 5.0 U
129-00-0	Pyrene	2.2	5.0	< 5.0 U
56-55-3	Benzo(a)anthracene	1.6	5.0	< 5.0 U
218-01-9	Chrysene	1.9	5.0	< 5.0 U
50-32-8	Benzo(a)pyrene	1.8	5.0	< 5.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	3.5	5.0	< 5.0 U
53-70-3	Dibenz(a,h)anthracene	2.4	5.0	< 5.0 U
191-24-2	Benzo(g,h,i)perylene	3.0	5.0	< 5.0 U
132-64-9	Dibenzofuran	1.5	5.0	< 5.0 U
TOTBFA	Total Benzofluoranthenes	1.8	5.0	< 5.0 U

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene 54.3%

d14-Dibenzo(a,h)anthracen 79.7%

5B
SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

Instrument ID: NT4

Project: TERMINAL 2 BERTH 205/206

DFTPP Injection Date: 11/21/11

DFTPP Injection Time: 0937

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	10.0 - 80.0% of mass 198	29.1
68	Less than 2.0% of mass 69	0.0 (0.0)1
69	Mass 69 relative abundance	33.8
70	Less than 2.0% of mass 69	0.1 (0.4)1
127	10.0 - 80.0% of mass 198	47.1
197	Less than 2.0% of mass 198	0.0
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	6.8
275	10.0 - 60.0% of mass 198	30.3
365	Greater than 1.0% of mass 198	4.03
441	0.0 - 24.0% of mass 442	22.6 (15.5)2
442	50.0 - 200.0% of mass 198	145.7
443	15.0 - 24.0% of mass 442	29.5 (20.2)2

1-Value is % mass 69

2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	IC251121	IC251121	11211102	11/21/11	1109
02	IC011121	IC011121	11211103	11/21/11	1138
03	IC051121	IC051121	11211104	11/21/11	1206
04	IC111121	IC111121	11211105	11/21/11	1233
05	IC511121	IC511121	11211106	11/21/11	1301
06	IC101121	IC101121	11211107	11/21/11	1329
07					
08					
09					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					

5B
SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

Instrument ID: NT4

Project: TERMINAL 2 BERTH 205/206

DFTPP Injection Date: 02/13/12

DFTPP Injection Time: 1020

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	10.0 - 80.0% of mass 198	24.0
68	Less than 2.0% of mass 69	0.0 (0.0)1
69	Mass 69 relative abundance	28.0
70	Less than 2.0% of mass 69	0.1 (0.2)1
127	10.0 - 80.0% of mass 198	41.5
197	Less than 2.0% of mass 198	0.0
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	6.9
275	10.0 - 60.0% of mass 198	32.7
365	Greater than 1.0% of mass 198	4.54
441	0.0 - 24.0% of mass 442	26.8 (14.5)2
442	50.0 - 200.0% of mass 198	185.0
443	15.0 - 24.0% of mass 442	35.4 (19.1)2

1-Value is % mass 69

2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	CC0213	CC0213	02131202	02/13/12	1201
02	UH13MBS1	UH13MBS1	02131203	02/13/12	1235
03	UH13LCSS1	UH13LCSS1	02131204	02/13/12	1300
04	UH13LCSDS1	UH13LCSDS1	02131205	02/13/12	1325
05	C1/2-DP	UH13A	02131207	02/13/12	1415
06	C3/4-DP	UH13B	02131208	02/13/12	1439
07					
08					
09					
10					
11					
12					
13					
14					
15					
16					
17					
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19					
20					
21					
22					

SEMIVOLATILE 8270-D CONTINUING CALIBRATION CHECK

Lab Name: ANALYTICAL RESOURCES INC.

Client: HART CROWSER

ARI Job No: UH13

Project: TERMINAL 2 BERTH 205/206

Instrument ID: NT4

Cont. Calib. Date: 02/13/12

Init. Calib. Date: 11/21/11

Cont. Calib. Time: 1201

COMPOUND	CalAmt or ARF	CC Amt or RF	MIN RRF	CURVE TYPE	%D or Drift
Naphthalene	0.966	0.956	0.700	AVRG	-1.0
2-Methylnaphthalene	0.560	0.542	0.400	AVRG	-3.2
Acenaphthylene	1.534	1.360	0.900	AVRG	-11.3
Acenaphthene	1.064	0.990	0.900	AVRG	-7.0
Dibenzofuran	1.520	1.507	0.800	AVRG	-0.8
Fluorene	1.201	1.098	0.900	AVRG	-8.6
Phenanthrene	1.054	0.992	0.700	AVRG	-5.9
Anthracene	0.989	0.891	0.700	AVRG	-9.9
Fluoranthene	1.152	1.012	0.600	AVRG	-12.2
Pyrene	1.018	0.925	0.600	AVRG	-9.1
Benzo(a)anthracene	0.943	0.768	0.800	AVRG	-18.6 *
Chrysene	0.984	0.935	0.700	AVRG	-5.0
Benzo(b)fluoranthene	1.024	0.870	0.700	AVRG	-15.0
Benzo(k)fluoranthene	1.009	1.016	0.700	AVRG	0.7
Benzo(j)fluoranthene	0.888	0.914	0.010	AVRG	2.9
Benzo(a)pyrene	0.872	0.876	0.700	AVRG	0.4
Indeno(1,2,3-cd)pyrene	1.159	1.154	0.500	AVRG	-0.4
Dibenzo(a,h)anthracene	0.895	0.891	0.400	AVRG	-0.4
Benzo(g,h,i)perylene	1.094	0.990	0.500	AVRG	-9.5
1-methylnaphthalene	0.548	0.515	0.010	AVRG	-6.0
Perylene	0.971	0.989	0.010	AVRG	1.8
2-Methylnaphthalene-d10	0.606	0.582	0.010	AVRG	-4.0
Dibenzo(a,h)anthracene-d14	0.703	0.762	0.010	AVRG	8.4

<- Exceeds QC limit of 20% D

* RF less than minimum RF

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No: UH13

Project: TERMINAL 2 BERTH 205/206

Ical Midpoint ID: 11211102

Ical Date: 11/21/11

Instrument ID: NT4

Cont. Cal Date: 02/13/12

	IS1 (NPT) AREA #	RT #	IS2 (ANT) AREA #	RT #	IS3 (PHN) AREA #	RT #
=====	=====	=====	=====	=====	=====	=====
ICAL MIDPT	343604	5.50	195804	7.79	321226	9.76
UPPER LIMIT	687208		391608		642452	
LOWER LIMIT	171802		97902		160613	
=====	=====	=====	=====	=====	=====	=====
CCAL	259705	4.21	151384	6.43	259616	8.34
UPPER LIMIT		4.71		6.93		8.84
LOWER LIMIT		3.71		5.93		7.84
01 UH13MBS1	259896	4.22	145631	6.43	255859	8.34
02 UH13LCSS1	208059	4.21	119585	6.42	200671	8.34
03 UH13LCSDS1	264022	4.21	149609	6.43	252690	8.34
04 C1/2-DP	268721	4.21	164157	6.43	284845	8.34
05 C3/4-DP	277232	4.21	169729	6.42	289346	8.34
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IS1 = Naphthalene-d8

IS2 = Acenaphthene-d10

IS3 = Phenanthrene-d10

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint

AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint

RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Cont. Cal

RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Cont. Cal

* Values outside of QC limits.

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No: UH13

Project: TERMINAL 2 BERTH 205/206

Ical Midpoint ID: 11211102

Ical Date: 11/21/11

Instrument ID: NT4

Cont. Cal Date: 02/13/12

	IS4 (CRY) AREA #	RT #	IS5 (PRY) AREA #	RT #	AREA #	RT #
=====	=====	=====	=====	=====	=====	=====
ICAL MIDPT	375207	15.01	400310	18.86		
UPPER LIMIT	750414		800620			
LOWER LIMIT	187604		200155			
=====	=====	=====	=====	=====	=====	=====
CCAL	302446	12.53	290380	15.95		
UPPER LIMIT		13.03		16.45		
LOWER LIMIT		12.03		15.45		
01 UH13MBS1	286199	12.54	246344	15.96		
02 UH13LCSS1	238656	12.53	207462	15.95		
03 UH13LCSDS1	313776	12.53	280559	15.95		
04 C1/2-DP	363573	12.53	408274	15.95		
05 C3/4-DP	367016	12.53	400215	15.95		
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IS4 = Chrysene-d12
IS5 = Perylene-d12

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
 AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
 RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Cont. Cal
 RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Cont. Cal

* Values outside of QC limits.

**Butyl Tin Analysis
Report and Summary QC Forms**

ARI Job ID: UH13

ORGANICS ANALYSIS DATA SHEET
Tributyl Tins by Krone 1988 SIM GC/MS
 Page 1 of 1

**Sample ID: C1/2-DP
SAMPLE**

Lab Sample ID: UH13A
 LIMS ID: 12-2074
 Matrix: Soil
 Data Release Authorized: *B*
 Reported: 02/14/12

QC Report No: UH13-Hart Crowser
 Project: Terminal 2 Berth 205/206
 Event: 15665-01
 Date Sampled: 02/02/12
 Date Received: 02/03/12

Date Extracted: 02/08/12
 Date Analyzed: 02/11/12 12:58
 Instrument/Analyst: NT12/VTS
 Silica Gel Cleanup: No

Sample Amount: 5.33 g-dry-wt
 Final Extract Volume: 0.50 mL
 Dilution Factor: 1.00
 Alumina Cleanup: Yes
 Moisture: 52.5%

CAS Number	Analyte	LOD	LOQ	Result	Q
36643-28-4	Tributyltin Ion	1.0	3.6	< 3.6	U
14488-53-0	Dibutyltin Ion	3.6	5.4	< 5.4	U
78763-54-9	Butyltin Ion	2.2	3.8	< 3.8	U

Reported in µg/kg (ppb)

TBT Surrogate Recovery

Tripropyl Tin Chloride	48.2%
Tripentyl Tin Chloride	75.6%

ORGANICS ANALYSIS DATA SHEET

Tributyl Tins by Krone 1988 SIM GC/MS

Page 1 of 1

**Sample ID: C3/4-DP
SAMPLE**

Lab Sample ID: UH13B

LIMS ID: 12-2075

Matrix: Soil

Data Release Authorized: *MB*

Reported: 02/14/12

QC Report No: UH13-Hart Crowser

Project: Terminal 2 Berth 205/206

Event: 15665-01

Date Sampled: 02/02/12

Date Received: 02/03/12

Date Extracted: 02/08/12

Date Analyzed: 02/11/12 13:11

Instrument/Analyst: NT12/VTS

Silica Gel Cleanup: No

Sample Amount: 5.11 g-dry-wt

Final Extract Volume: 0.50 mL

Dilution Factor: 1.00

Alumina Cleanup: Yes

Moisture: 53.9%

CAS Number	Analyte	LOD	LOQ	Result	Q
36643-28-4	Tributyltin Ion	1.0	3.8	< 3.8	U
14488-53-0	Dibutyltin Ion	3.7	5.6	< 5.6	U
78763-54-9	Butyltin Ion	2.3	4.0	< 4.0	U

Reported in µg/kg (ppb)

TBT Surrogate Recovery

Tripropyl Tin Chloride	49.9%
Tripenyl Tin Chloride	71.7%

TBT SURROGATE RECOVERY SUMMARY

Matrix: Soil

QC Report No: UH13-Hart Crowser
Project: Terminal 2 Berth 205/206
Event: 15665-01

<u>Client ID</u>	<u>TPRT</u>	<u>TPNT</u>	<u>TOT OUT</u>
MB-020812	66.4%	93.0%	0
LCS-020812	65.9%	90.2%	0
LCSD-020812	59.4%	89.3%	0
C1/2-DP	48.2%	75.6%	0
C3/4-DP	49.9%	71.7%	0

	LCS/MB LIMITS	QC LIMITS
(TPRT) = Tripropyl Tin Chloride	(28-106)	(32-104)
(TPNT) = Tripentyl Tin Chloride	(35-130)	(25-140)

(TPRT) = Tripropyl Tin Chloride
(TPNT) = Tripentyl Tin Chloride

Prep Method: SW3546
Analytical Method: TBT (Hexyl) Krone 1988
Log Number Range: 12-2074 to 12-2075

ORGANICS ANALYSIS DATA SHEET
Tributyl Tins by Krone 1988 SIM GC/MS
 Page 1 of 1

Sample ID: LCS-020812
LAB CONTROL SAMPLE

Lab Sample ID: LCS-020812
 LIMS ID: 12-2074
 Matrix: Soil
 Data Release Authorized: *[Signature]*
 Reported: 02/14/12

QC Report No: UH13-Hart Crowser
 Project: Terminal 2 Berth 205/206
 15665-01
 Date Sampled: NA
 Date Received: NA

Date Extracted LCS: 02/08/12
 Date Analyzed LCS: 02/11/12 12:03
 LCSD: 02/11/12 12:16
 Instrument/Analyst LCS: NT12/VTS
 LCSD: NT12/VTS
 Silica Gel Cleanup: No

Sample Amount LCS: 5.00 g-dry-wt
 LCSD: 5.00 g-dry-wt
 Final Extract Volume LCS: 0.50 mL
 LCSD: 0.50 mL
 Dilution Factor LCS: 1.00
 LCSD: 1.00
 Alumina Cleanup: Yes

Analyte	LCS	Spike	LCS	LCSD	Spike	LCSD	RPD
		Added-LCS	Recovery		Added-LCSD	Recovery	
Tributyltin Ion	36.9	44.6	82.7%	35.7	44.6	80.0%	3.3%
Dibutyltin Ion	30.9	38.4	80.5%	34.8	38.4	90.6%	11.9%
Butyltin Ion	22.0	31.2	70.5%	23.2	31.2	74.4%	5.3%

Reported in µg/kg (ppb)

RPD calculated using sample concentrations per SW846.

TBT Surrogate Recovery

	LCS	LCSD
Tripropyl Tin Chloride	65.9%	59.4%
Triphenyl Tin Chloride	90.2%	89.3%

4B
SEMIVOLATILE METHOD BLANK SUMMARY

BLANK NO.

UH13MBS1

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No: UH13

Project: TERMINAL 2 BERTH 205

Lab File ID: UH13MB

Date Extracted: 02/08/12

Instrument ID: NT12

Date Analyzed: 02/11/12

Matrix: SOLID

Time Analyzed: 1150

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	=====	=====	=====	=====
01	UH13LCSS1	UH13LCSS1	UH13SB	02/11/12
02	UH13LCSDS1	UH13LCSDS1	UH13SBD	02/11/12
03	C1/2-DP	UH13A	UH13A	02/11/12
04	C3/4-DP	UH13B	UH13B	02/11/12
05				
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ORGANICS ANALYSIS DATA SHEET
Tributyl Tins by Krone 1988 SIM GC/MS
 Page 1 of 1

Sample ID: MB-020812
METHOD BLANK

Lab Sample ID: MB-020812
 LIMS ID: 12-2074
 Matrix: Soil
 Data Release Authorized: *B*
 Reported: 02/14/12

QC Report No: UH13-Hart Crowser
 Project: Terminal 2 Berth 205/206
 Event: 15665-01
 Date Sampled: NA
 Date Received: NA

Date Extracted: 02/08/12
 Date Analyzed: 02/11/12 11:50
 Instrument/Analyst: NT12/VTS
 Silica Gel Cleanup: No

Sample Amount: 5.00 g-dry-wt
 Final Extract Volume: 0.50 mL
 Dilution Factor: 1.00
 Alumina Cleanup: Yes

CAS Number	Analyte	LOD	LOQ	Result	Q
36643-28-4	Tributyltin Ion	1.0	3.9	< 3.9	U
14488-53-0	Dibutyltin Ion	3.8	5.8	< 5.8	U
78763-54-9	Butyltin Ion	2.3	4.1	< 4.1	U

Reported in µg/kg (ppb)

TBT Surrogate Recovery

Tripropyl Tin Chloride	66.4%
Triphenyl Tin Chloride	93.0%

5B
SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

Instrument ID: NT12

Project: TERMINAL 2 BERTH

DFTPP Injection Date: 12/10/11

DFTPP Injection Time: 1111

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	10.0 - 80.0% of mass 198	24.5
68	Less than 2.0% of mass 69	0.0 (0.0)1
69	Mass 69 relative abundance	82.6
70	Less than 2.0% of mass 69	0.2 (0.3)1
127	10.0 - 80.0% of mass 198	58.8
197	Less than 2.0% of mass 198	0.4
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	7.2
275	10.0 - 60.0% of mass 198	29.0
365	Greater than 1.0% of mass 198	4.40
441	0.0 - 24.0% of mass 442	16.9 (15.7)2
442	50.0 - 200.0% of mass 198	107.4
443	15.0 - 24.0% of mass 442	22.1 (20.5)2

1-Value is % mass 69

2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01		BTS 1	IC1210A	12/10/11	1124
02		BTS 4	IC1210B	12/10/11	1143
03		BTS .05	IC1210C	12/10/11	1157
04		BTS 2	IC1210D	12/10/11	1211
05		BTS .2	IC1210E	12/10/11	1225
06		BTS .5	IC1210F	12/10/11	1239
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5B
SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

Instrument ID: NT12

Project: TERMINAL 2 BERTH

DFTPP Injection Date: 02/11/12

DFTPP Injection Time: 1119

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	10.0 - 80.0% of mass 198	27.8
68	Less than 2.0% of mass 69	0.0 (0.0)1
69	Mass 69 relative abundance	86.3
70	Less than 2.0% of mass 69	0.4 (0.5)1
127	10.0 - 80.0% of mass 198	61.1
197	Less than 2.0% of mass 198	0.5
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	7.4
275	10.0 - 60.0% of mass 198	28.4
365	Greater than 1.0% of mass 198	4.57
441	0.0 - 24.0% of mass 442	14.3 (14.6)2
442	50.0 - 200.0% of mass 198	98.1
443	15.0 - 24.0% of mass 442	18.9 (19.3)2

1-Value is % mass 69

2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01		CC0211	CC0211	02/11/12	1132
02	UH13MBS1	UH13MBS1	UH13MB	02/11/12	1150
03	UH13LCSS1	UH13LCSS1	UH13SB	02/11/12	1203
04	UH13LCSDS1	UH13LCSDS1	UH13SBD	02/11/12	1216
05	C1/2-DP	UH13A	UH13A	02/11/12	1258
06	C3/4-DP	UH13B	UH13B	02/11/12	1311
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22					

SEMIVOLATILE 8270-D CONTINUING CALIBRATION CHECK

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No: UH13

Project: TERMINAL 2 BERTH

Instrument ID: NT12

Cont. Calib. Date: 02/11/12

Init. Calib. Date: 12/10/11

Cont. Calib. Time: 1132

COMPOUND	CalAmt or ARF	CC Amt or RF	MIN RRF	CURVE TYPE	%D or Drift
===== Tributyl Tin (Hexyl) _____	0.712	0.810	0.010	AVRG	13.8
Dibutyl Tin (Hexyl) _____	0.046	0.051	0.010	AVRG	10.9
Butyl Tin (Hexyl) _____	0.070	0.081	0.010	AVRG	15.7
Tetrabutyl Tin _____	0.863	1.010	0.010	AVRG	17.0
===== Tripropyl Tin (Hexyl) _____	0.957	1.014	0.010	AVRG	6.0
Tripentyl Tin (Hexyl) _____	0.062	0.073	0.010	AVRG	17.7

<- Exceeds QC limit of 20% D

* RF less than minimum RF

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No: UH13

Project: TERMINAL 2 BERTH

Ical Midpoint ID: IC1210A

Ical Date: 12/10/11

Instrument ID: NT12

Cont. Cal Date: 02/11/12

	IS1 AREA #	RT #	IS2 AREA #	RT #	AREA #	RT #
=====	=====	=====	=====	=====	=====	=====
ICAL MIDPT	112960	6.83	124766	7.70		
UPPER LIMIT	225920		249532			
LOWER LIMIT	56480		62383			
=====	=====	=====	=====	=====	=====	=====
CCAL	129212	6.72	148514	7.58		
UPPER LIMIT		7.22		8.08		
LOWER LIMIT		6.22		7.08		
01 UH13MBS1	115671	6.72	115634	7.58		
02 UH13LCSS1	124499	6.71	125424	7.58		
03 UH13LCSDS1	134174	6.71	122126	7.58		
04 C1/2-DP	122994	6.72	120829	7.58		
05 C3/4-DP	128742	6.72	124522	7.58		
06						
07						
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22						
23						
24						
25						

IS1 = Tetrapentyl Tin

IS2 = p-Terphenyl-d14

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint

AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint

RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Cont. Cal

RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Cont. Cal

* Values outside of QC limits.

**Pesticide Analysis
Report and Summary QC Forms**

ARI Job ID: UH13

ORGANICS ANALYSIS DATA SHEET
PSDDA Pesticides/PCB by GC/ECD
 Page 1 of 1

**Sample ID: C1/2-DP
 SAMPLE**

Lab Sample ID: UH13A
 LIMS ID: 12-2074
 Matrix: Soil
 Data Release Authorized: *[Signature]*
 Reported: 02/13/12

QC Report No: UH13-Hart Crowser
 Project: Terminal 2 Berth 205/206
 15665-01
 Date Sampled: 02/02/12
 Date Received: 02/03/12

Date Extracted: 02/09/12
 Date Analyzed: 02/10/12 23:11
 Instrument/Analyst: ECD6/AAR
 GPC Cleanup: No
 Sulfur Cleanup: Yes
 Florisil Cleanup: No

Sample Amount: 12.9 g-dry-wt
 Final Extract Volume: 2.5 mL
 Dilution Factor: 1.00
 Silica Gel: Yes
 Percent Moisture: 52.5%

CAS Number	Analyte	MDL	RL	Result
58-89-9	gamma-BHC (Lindane)	0.047	0.48	< 0.48 U
76-44-8	Heptachlor	0.13	0.48	< 0.48 U
309-00-2	Aldrin	0.053	0.48	< 0.48 U
60-57-1	Dieldrin	0.097	0.97	< 0.97 U
72-55-9	4,4'-DDE	0.12	0.97	1.9
72-54-8	4,4'-DDD	0.13	2.8	< 2.8 Y
50-29-3	4,4'-DDT	0.19	2.7	< 2.7 Y
5103-74-2	trans-Chlordane	0.075	5.7	< 5.7 Y
5103-71-9	cis-Chlordane	0.049	0.48	< 0.48 U

Reported in µg/kg (ppb)

Pest/PCB Surrogate Recovery

Decachlorobiphenyl	102%
Tetrachlorometaxylene	105%

This analyte (CAS registry No. 5103-74-2) is named trans-Chlordane in EPA Method 8081B(Feb 2007). It has also been named gamma-Chlordane and beta-Chlordane.

\$ This analyte (CAS registry No. 5103-71-9) is named cis-Chlordane in EPA Method 8081B(Feb 2007). It has also been named alpha-Chlordane.

ORGANICS ANALYSIS DATA SHEET
PSDDA Pesticides/PCB by GC/ECD
 Page 1 of 1

**Sample ID: C3/4-DP
 SAMPLE**

Lab Sample ID: UH13B
 LIMS ID: 12-2075
 Matrix: Soil
 Data Release Authorized: *[Signature]*
 Reported: 02/13/12

QC Report No: UH13-Hart Crowser
 Project: Terminal 2 Berth 205/206
 15665-01
 Date Sampled: 02/02/12
 Date Received: 02/03/12

Date Extracted: 02/09/12
 Date Analyzed: 02/10/12 23:29
 Instrument/Analyst: ECD6/AAR
 GPC Cleanup: No
 Sulfur Cleanup: Yes
 Florisil Cleanup: No

Sample Amount: 13.0 g-dry-wt
 Final Extract Volume: 2.5 mL
 Dilution Factor: 1.00
 Silica Gel: Yes
 Percent Moisture: 53.9%

CAS Number	Analyte	MDL	RL	Result
58-89-9	gamma-BHC (Lindane)	0.046	0.48	< 0.48 U
76-44-8	Heptachlor	0.13	0.48	< 0.48 U
309-00-2	Aldrin	0.053	0.48	< 0.48 U
60-57-1	Dieldrin	0.096	0.96	< 0.96 U
72-55-9	4,4'-DDE	0.12	0.96	1.9
72-54-8	4,4'-DDD	0.13	3.0	< 3.0 Y
50-29-3	4,4'-DDT	0.18	0.96	< 0.96 U
5103-74-2	trans-Chlordane	0.074	4.3	< 4.3 Y
5103-71-9	cis-Chlordane	0.049	0.48	< 0.48 U

Reported in µg/kg (ppb)

Pest/PCB Surrogate Recovery

Decachlorobiphenyl	102%
Tetrachlorometaxylene	99.5%

This analyte (CAS registry No. 5103-74-2) is named trans-Chlordane in EPA Method 8081B(Feb 2007). It has also been named gamma-Chlordane and beta-Chlordane.

\$ This analyte (CAS registry No. 5103-71-9) is named cis-Chlordane in EPA Method 8081B(Feb 2007). It has also been named alpha-Chlordane.

SW8081 PESTICIDE SOIL/SEDIMENT SURROGATE RECOVERY SUMMARY

Matrix: Soil

QC Report No: UH13-Hart Crowser
Project: Terminal 2 Berth 205/206
15665-01

<u>Client ID</u>	<u>DCBP</u>	<u>TCMX</u>	<u>TOT</u>	<u>OUT</u>
MB-020912	128%*	97.2%	1	
LCS-020912	115%	79.0%	0	
LCSD-020912	114%	85.2%	0	
C1/2-DP	102%	105%	0	
C3/4-DP	102%	99.5%	0	

	LCS/MB LIMITS	QC LIMITS
(DCBP) = Decachlorobiphenyl	(59-123)	(22-156)
(TCMX) = Tetrachlorometaxylene	(42-112)	(29-142)

Prep Method: SW3546
Log Number Range: 12-2074 to 12-2075

ORGANICS ANALYSIS DATA SHEET
PSDDA Pesticides/PCB by GC/ECD
 Page 1 of 1

Sample ID: LCS-020912
LCS/LCSD

Lab Sample ID: LCS-020912
 LIMS ID: 12-2074
 Matrix: Soil
 Data Release Authorized: *[Signature]*
 Reported: 02/13/12

QC Report No: UH13-Hart Crowser
 Project: Terminal 2 Berth 205/206
 15665-01
 Date Sampled: 02/02/12
 Date Received: 02/03/12

Date Extracted LCS/LCSD: 02/09/12

Sample Amount LCS: 12.5 g-dry-wt
 LCSD: 12.5 g-dry-wt

Date Analyzed LCS: 02/10/12 18:09
 LCSD: 02/10/12 18:27

Final Extract Volume LCS: 2.5 mL
 LCSD: 2.5 mL

Instrument/Analyst LCS: ECD6/AAR
 LCSD: ECD6/AAR

Dilution Factor LCS: 1.00
 LCSD: 1.00

GPC Cleanup: No
 Sulfur Cleanup: Yes
 Florisil Cleanup: No
 Acid Cleanup: No

Silica Gel: Yes

Percent Moisture: NA

Analyte	LCS			LCSD			RPD
	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	
gamma-BHC (Lindane)	4.16	4.00	104%	5.40	4.00	135%	25.9%
Heptachlor	3.66	4.00	91.5%	3.90	4.00	97.5%	6.3%
Aldrin	3.68	4.00	92.0%	3.78	4.00	94.5%	2.7%
Dieldrin	7.86	8.00	98.2%	8.02	8.00	100%	2.0%
4,4'-DDE	8.02	8.00	100%	7.76	8.00	97.0%	3.3%
4,4'-DDD	8.24	8.00	103%	8.24	8.00	103%	0.0%
4,4'-DDT	9.00	8.00	112%	8.90	8.00	111%	1.1%
trans-Chlordane	4.12	4.00	103%	4.08	4.00	102%	1.0%
cis-Chlordane	3.94	4.00	98.5%	4.06	4.00	102%	3.0%

Pest/PCB Surrogate Recovery

	LCS	LCSD
Decachlorobiphenyl	115%	114%
Tetrachlorometaxylene	79.0%	85.2%

Reported in µg/kg (ppb)
 RPD calculated using sample concentrations per SW846.

FORM 4
PESTICIDE METHOD BLANK SUMMARY

BLANK NO.

UH13MBS1

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No.: UH13

Project: TERMINAL 2 BERTH 205

Lab Sample ID: UH13MBS1

Lab File ID: 0210A012

Date Extracted: 02/09/12

Matrix: SOLID

Date Analyzed: 02/10/12

Instrument ID: ECD6

Time Analyzed: 1751

GC Columns: STX-CLP1/STX-CLP2

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED
	=====	=====	=====
01	UH13LCSS1	UH13LCSS1	02/10/12
02	UH13LCSDS1	UH13LCSDS1	02/10/12
03	C1/2-DP	UH13A	02/10/12
04	C3/4-DP	UH13B	02/10/12

ALL RUNS ARE DUAL COLUMN



ORGANICS ANALYSIS DATA SHEET
 PSDDA Pesticides/PCB by GC/ECD
 Page 1 of 1

Sample ID: MB-020912
 METHOD BLANK

Lab Sample ID: MB-020912
 LIMS ID: 12-2074
 Matrix: Soil
 Data Release Authorized: *[Signature]*
 Reported: 02/13/12

QC Report No: UH13-Hart Crowser
 Project: Terminal 2 Berth 205/206
 15665-01
 Date Sampled: NA
 Date Received: NA

Date Extracted: 02/09/12
 Date Analyzed: 02/10/12 17:51
 Instrument/Analyst: ECD6/AAR
 GPC Cleanup: No
 Sulfur Cleanup: Yes
 Florisil Cleanup: No

Sample Amount: 12.5 g
 Final Extract Volume: 2.5 mL
 Dilution Factor: 1.00
 Silica Gel: Yes
 Percent Moisture: NA

CAS Number	Analyte	MDL	RL	Result
58-89-9	gamma-BHC (Lindane)	0.048	0.50	< 0.50 U
76-44-8	Heptachlor	0.13	0.50	< 0.50 U
309-00-2	Aldrin	0.055	0.50	< 0.50 U
60-57-1	Dieldrin	0.10	1.0	< 1.0 U
72-55-9	4,4'-DDE	0.12	1.0	< 1.0 U
72-54-8	4,4'-DDD	0.14	1.0	< 1.0 U
50-29-3	4,4'-DDT	0.19	1.0	< 1.0 U
5103-74-2	trans-Chlordane	0.077	0.50	< 0.50 U
5103-71-9	cis-Chlordane	0.051	0.50	< 0.50 U

Reported in µg/kg (ppb)

Pest/PCB Surrogate Recovery

Decachlorobiphenyl	128%
Tetrachlorometaxylene	97.2%

6D
8081 INITIAL CALIBRATION RETENTION TIMES

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No.: UH13

Project: TERMINAL 2 BERTH 205/206

GC Column: STX-CLP1 ID: 0.53 (mm)

Instrument ID: ECD6

Calibration Date: 01/23/12

COMPOUND	RT OF STANDARDS							MEAN RT	RT WINDOW	
	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6	LVL 7		FROM	TO
alpha-BHC	3.88	3.88	3.88	3.88	3.88	3.88	3.88	3.88	3.83	3.93
beta-BHC	4.24	4.24	4.24	4.24	4.23	4.23	4.22	4.23	4.17	4.27
delta-BHC	4.40	4.40	4.39	4.39	4.39	4.39	4.38	4.39	4.33	4.43
gamma-BHC (Lindane)	4.14	4.14	4.14	4.14	4.14	4.14	4.14	4.14	4.09	4.19
Heptachlor	4.56	4.56	4.56	4.56	4.55	4.55	4.56	4.56	4.50	4.61
Aldrin	4.83	4.83	4.83	4.83	4.83	4.83	4.83	4.83	4.78	4.88
Heptachlor epoxide b	5.39	5.39	5.39	5.39	5.39	5.39	5.39	5.39	5.34	5.44
Endosulfan I	5.77	5.77	5.77	5.77	5.77	5.77	5.77	5.77	5.72	5.82
Dieldrin	5.99	5.99	5.99	5.99	5.99	5.99	5.99	5.99	5.94	6.04
4,4'-DDE	5.73	5.73	5.73	5.73	5.72	5.72	5.72	5.73	5.67	5.77
Endrin	6.21	6.21	6.21	6.21	6.21	6.21	6.21	6.21	6.16	6.26
Endosulfan II	6.42	6.42	6.42	6.42	6.42	6.42	6.42	6.42	6.37	6.47
4,4'-DDD	6.29	6.29	6.29	6.29	6.28	6.28	6.28	6.29	6.22	6.33
Endosulfan sulfate	7.19	7.19	7.19	7.19	7.19	7.19	7.19	7.19	7.13	7.24
4,4'-DDT	6.54	6.54	6.54	6.54	6.53	6.53	6.53	6.54	6.48	6.58
Methoxychlor	6.97	6.98	6.97	6.97	6.97	6.97	6.97	6.97	6.92	7.02
Endrin ketone	7.44	7.44	7.44	7.44	7.44	7.44	7.44	7.44	7.39	7.49
Endrin aldehyde	6.80	6.80	6.80	6.80	6.80	6.80	6.80	6.80	6.75	6.84
gamma-Chlordane	5.52	5.52	5.52	5.51	5.51	5.51	5.51	5.51	5.46	5.56
alpha-Chlordane	5.64	5.64	5.64	5.64	5.64	5.64	5.64	5.64	5.59	5.69
Hexachlorobutadiene	2.08	2.08	2.09	2.08	2.08	2.08	2.08	2.08	2.04	2.13
Hexachlorobenzene	3.77	3.78	3.77	3.76	3.76	3.75	3.75	3.76	3.70	3.80
Tetrachloro-m-xylene	3.44	3.44	3.44	3.44	3.44	3.44	3.44	3.44	3.39	3.49
Decachlorobiphenyl	8.30	8.30	8.29	8.30	8.29	8.29	8.29	8.29	8.24	8.34

6D
8081 INITIAL CALIBRATION RETENTION TIMES

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No.: UH13

Project: TERMINAL 2 BERTH 205/206

GC Column: STX-CLP2 ID: 0.53 (mm)

Instrument ID: ECD6

Calibration Date: 01/23/12

COMPOUND	RT OF STANDARDS							MEAN RT	RT WINDOW	
	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6	LVL 7		FROM	TO
alpha-BHC	4.16	4.16	4.16	4.16	4.16	4.16	4.16	4.16	4.11	4.21
beta-BHC	4.57	4.57	4.57	4.57	4.56	4.56	4.56	4.57	4.52	4.62
delta-BHC	4.85	4.85	4.85	4.85	4.85	4.85	4.85	4.85	4.80	4.90
gamma-BHC (Lindane)	4.48	4.48	4.48	4.48	4.48	4.48	4.49	4.48	4.43	4.53
Heptachlor	4.91	4.91	4.91	4.91	4.91	4.91	4.91	4.91	4.86	4.96
Aldrin	5.23	5.23	5.23	5.23	5.23	5.23	5.23	5.23	5.18	5.28
Heptachlor epoxide b	5.80	5.80	5.80	5.80	5.80	5.80	5.80	5.80	5.75	5.85
Endosulfan I	6.18	6.18	6.18	6.18	6.18	6.18	6.18	6.18	6.13	6.23
Dieldrin	6.44	6.44	6.44	6.44	6.44	6.44	6.44	6.44	6.39	6.49
4,4'-DDE	6.28	6.28	6.28	6.28	6.28	6.28	6.28	6.28	6.23	6.33
Endrin	6.73	6.73	6.73	6.73	6.73	6.73	6.73	6.73	6.68	6.78
Endosulfan II	6.93	6.93	6.92	6.92	6.92	6.92	6.92	6.92	6.88	6.97
4,4'-DDD	6.82	6.82	6.82	6.82	6.81	6.82	6.81	6.82	6.77	6.87
Endosulfan sulfate	7.47	7.47	7.47	7.47	7.47	7.47	7.47	7.47	7.42	7.52
4,4'-DDT	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.05	7.15
Methoxychlor	7.70	7.70	7.70	7.70	7.69	7.69	7.69	7.70	7.65	7.75
Endrin ketone	7.95	7.95	7.95	7.95	7.95	7.95	7.95	7.95	7.90	8.00
Endrin aldehyde	7.23	7.23	7.23	7.23	7.23	7.23	7.23	7.23	7.18	7.28
gamma-Chlordane	5.98	5.98	5.98	5.98	5.98	5.98	5.98	5.98	5.93	6.04
alpha-Chlordane	6.12	6.12	6.12	6.12	6.12	6.12	6.12	6.12	6.07	6.17
Hexachlorobutadiene	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.10	2.20
Hexachlorobenzene	4.06	4.06	4.06	4.05	4.05	4.05	4.05	4.05	4.01	4.11
Tetrachloro-m-xylene	3.64	3.64	3.64	3.63	3.63	3.63	3.63	3.63	3.59	3.69
Decachlorobiphenyl	8.98	8.98	8.98	8.98	8.98	8.98	8.98	8.98	8.93	9.03

6E
8081 PESTICIDE INITIAL CALIBRATION

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No.: UH13

Project: TERMINAL 2 BERTH 205/206

GC Column: STX-CLP1 ID: 0.53 (mm)

Instrument ID: ECD6

Calibration Date: 01/23/12

COMPOUND	CALIBRATION FACTORS							MEAN	R ² %RSD
	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6	LVL 7		
alpha-BHC	1.1325	1.1594	1.2087	1.2346	1.2445	1.3450	1.3516	1.2395	6.8
beta-BHC	0.5358	0.5201	0.5272	0.5110	0.5029	0.5175	0.5114	0.5180	2.1
delta-BHC	0.9342	0.8475	0.8719	0.8081	0.8814	0.9195	1.0020	0.8949	7.1
gamma-BHC (Lindane)	1.1565	1.0121	1.0327	1.0243	1.0608	1.1036	1.1147	1.0721	5.0
Heptachlor	1.4001	1.3237	1.3368	1.3332	1.3071	1.3631	1.3087	1.3390	2.5
Aldrin	1.1898	1.1338	1.1772	1.2198	1.1876	1.2644	1.2237	1.1995	3.4
Heptachlor epoxide b	1.5338	1.2606	1.1986	1.1861	1.1627	1.1714	1.1048	1.2311	11.5
Endosulfan I	1.6201	1.5860	1.5307	1.5742	1.2975	1.4969	1.3659	1.4959	8.1
Dieldrin	1.2243	1.1868	1.2192	1.2280	1.1675	1.2231	1.1675	1.2023	2.3
4,4'-DDE	0.6944	0.5883	0.6834	0.6652	0.8704	0.7938	0.8411	0.7338	14.0
Endrin	0.9024	0.8092	0.8579	0.8691	0.8833	0.8471	0.7974	0.8523	4.5
Endosulfan II	0.8734	0.7925	0.8341	0.8403	0.8133	0.8334	0.7920	0.8256	3.5
4,4'-DDD	0.6573	0.5811	0.6283	0.6250	0.6752	0.6780	0.6791	0.6463	5.7
Endosulfan sulfate	0.8062	0.7299	0.7501	0.7411	0.7278	0.7303	0.6980	0.7405	4.5
4,4'-DDT	0.7154	0.6452	0.7044	0.7076	0.7576	0.7639	0.7582	0.7218	5.9
Methoxychlor	0.4949	0.4335	0.4391	0.4164	0.4065	0.3900	0.3708	0.4216	9.5
Endrin ketone	1.1884	0.9899	0.9951	0.9545	0.9251	0.9030	0.8535	0.9728	11.0
Endrin aldehyde	0.7497	0.6592	0.6535	0.6542	0.6473	0.6579	0.6373	0.6656	5.7
gamma-Chlordane	1.2871	1.1645	1.1800	1.1594	1.1444	1.1916	1.1624	1.1842	4.0
alpha-Chlordane	1.2338	1.1504	1.1322	1.1302	1.0347	1.1412	1.1129	1.1336	5.2
Hexachlorobutadiene	2.5442	2.1384	1.7912	1.6788	1.5439	1.5475	1.4566	1.8144	0.9979
Hexachlorobenzene	1.0672	1.0504	1.0397	0.9856	0.9803	0.9503	0.9201	0.9991	5.5
Tetrachloro-m-xylene	1.0272	0.9016	0.9189	0.9222	0.8395	0.8916	0.8446	0.9065	6.9
Decachlorobiphenyl	1.1100	1.1418	0.9050	0.8289	0.7805	0.7273	0.6722	0.8808	0.9948

6E
8081 PESTICIDE INITIAL CALIBRATION

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No.: UH13

Project: TERMINAL 2 BERTH 205/206

GC Column: STX-CLP2 ID: 0.53 (mm)

Instrument ID: ECD6

Calibration Date: 01/23/12

COMPOUND	CALIBRATION FACTORS							R ²	
	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6	LVL 7	MEAN	%RSD
alpha-BHC	1.3803	1.2645	1.2374	1.2078	1.1260	1.1829	1.1087	1.2154	7.6
beta-BHC	0.8184	0.6356	0.6091	0.5481	0.4764	0.4762	0.4376	0.5716	0.9956
delta-BHC	0.8980	0.7668	0.7896	0.7221	0.7781	0.7501	0.7648	0.7814	7.1
gamma-BHC (Lindane)	1.4262	1.1874	1.0930	1.0262	0.9782	0.9835	0.9243	1.0884	15.8
Heptachlor	1.4008	1.2793	1.2593	1.1950	1.0291	1.0610	0.9456	1.1672	13.8
Aldrin	1.1945	1.1134	1.0787	1.0376	0.9436	0.9432	0.8475	1.0226	11.6
Heptachlor epoxide b	1.3642	1.1551	1.1416	1.0319	0.9692	0.8892	0.8004	1.0502	17.9
Endosulfan I	1.2227	0.9911	1.0240	0.9195	0.8592	0.8072	0.7201	0.9348	17.6
Dieldrin	1.0694	0.9701	1.0228	0.9661	0.8786	0.8520	0.7511	0.9300	11.8
4,4'-DDE	0.8733	0.7528	0.8664	0.7811	0.7845	0.7153	0.6559	0.7756	10.0
Endrin	1.6927	1.4075	1.4095	1.2765	1.2476	1.1212	0.9954	1.3072	17.3
Endosulfan II	1.4340	1.2495	1.3684	1.2530	1.1970	1.1489	1.0220	1.2390	11.0
4,4'-DDD	1.1572	0.9610	1.1040	0.9804	1.0075	0.9157	0.8637	0.9985	10.3
Endosulfan sulfate	1.2683	1.0219	1.2347	1.0859	1.0664	0.9387	0.8601	1.0680	13.8
4,4'-DDT	1.1520	1.0496	1.1782	1.0428	1.0784	0.9737	0.9068	1.0545	9.0
Methoxychlor	0.6449	0.5451	0.5601	0.4887	0.4565	0.3947	0.3296	0.4885	17.0
Endrin ketone	1.8035	1.3988	1.6118	1.3813	1.3805	1.1953	1.0611	1.4046	17.6
Endrin aldehyde	1.0798	1.0283	1.0707	0.9694	0.9164	0.8689	0.8005	0.9620	11.0
gamma-Chlordane	1.0838	0.9736	1.0623	0.9830	0.8920	0.8703	0.7980	0.9518	10.9
alpha-Chlordane	0.9405	0.8576	0.9423	0.8788	0.8037	0.8074	0.7416	0.8531	8.7
Hexachlorobutadiene	1.6579	1.5300	1.6190	1.5867	1.3054	1.3265	1.1890	1.4592	12.5
Hexachlorobenzene	1.4795	1.2757	1.2634	1.1913	1.1308	1.0930	1.0020	1.2051	12.8
Tetrachloro-m-xylene	1.1582	0.9639	0.8972	0.8601	0.7915	0.7834	0.7400	0.8849	16.1
Decachlorobiphenyl	1.1978	1.1165	1.0710	0.9617	0.8892	0.8371	0.7677	0.9773	16.1

AR 2/10/2012

7E

8081 DDT/ENDRIN BREAKDOWN VERIFICATION SUMMARY

Lab ID: DS

ARI Job No.: 20120123PEST

Analysis Date: 10-FEB-2012 16:58

Init. Calib. Date: 23-JAN-2012

GC Column: STX-CLP1 ID: 0.53(mm)

COMPOUND	RT	AREA
4,4'-DDE	5.757	60211
Endrin	6.213	2537930
4,4'-DDD	6.290	89893
4,4'-DDT	6.552	2340743
Endrin ketone	7.442	176649
Endrin aldehyde	6.805	176384

DDT Percent Breakdown = 6.0 % /
 $((60211+89893) * 100) / (60211+89893+2340743)$

Endrin Percent Breakdown = 12.2 % /
 $((176384+176649) * 100) / (176384+176649+2537930)$

GC Column: STX-CLP2 ID: 0.53(mm)

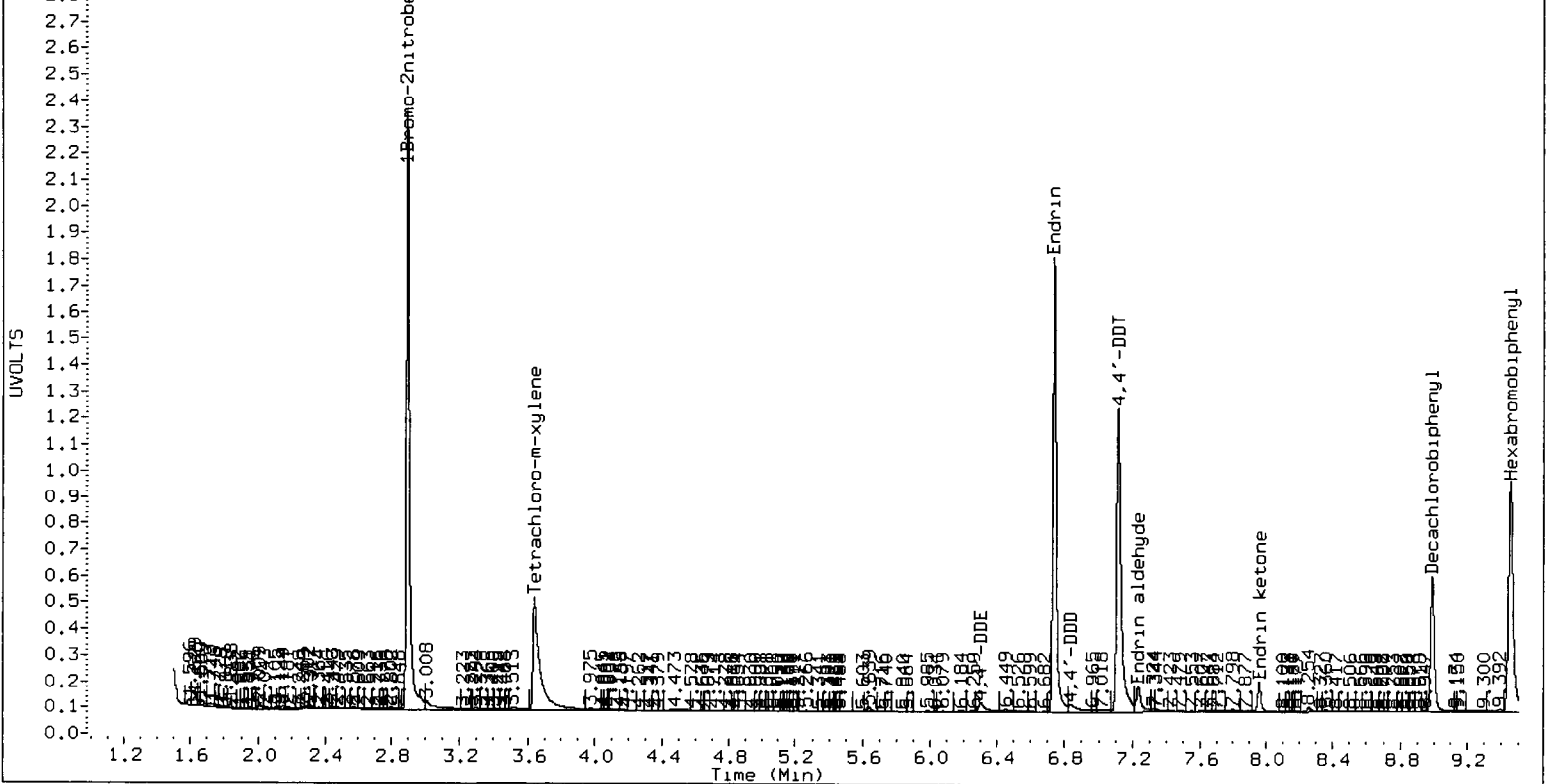
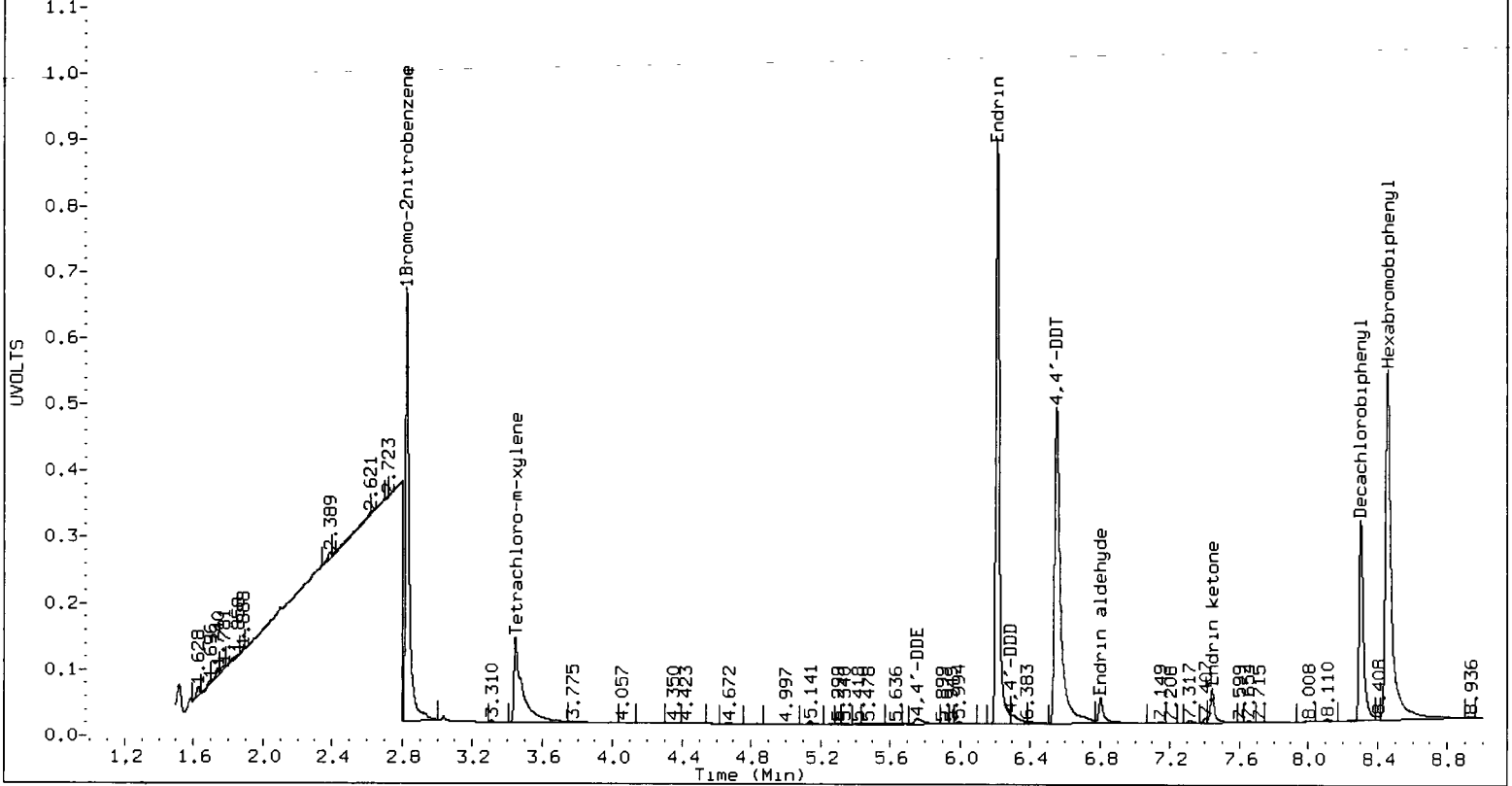
COMPOUND	RT	AREA
4,4'-DDE	6.299	220122
Endrin	6.738	4842983
4,4'-DDD	6.834	251539
4,4'-DDT	7.116	4321426
Endrin ketone	7.957	346394
Endrin aldehyde	7.234	416976

DDT Percent Breakdown = 9.8 % /
 $((220122+251539) * 100) / (220122+251539+4321426)$

Endrin Percent Breakdown = 13.6 % /
 $((416976+346394) * 100) / (416976+346394+4842983)$

Form VII Pest-1

UH13:00104



8081 PESTICIDE CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No.: UH13

Project: TERMINAL 2 BERTH 205/206

GC Column: STX-CLP1 ID: 0.53 (mm)

Init. Calib. Date: 01/23/12

Lab Ccal ID: INDAE

Date/Time Analyzed: 02/10/12,1733

PEST MIX COMPOUND	RT	RT WINDOW		CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
		FROM	TO			
alpha-BHC	3.89	3.83	3.93	22.5	20.0	12.4
beta-BHC	4.25	4.17	4.27	22.3	20.0	11.3
delta-BHC	4.41	4.33	4.43	19.2	20.0	-3.8
gamma-BHC (Lindane)	4.15	4.09	4.19	19.2	20.0	-4.1
Heptachlor	4.56	4.50	4.61	21.9	20.0	9.4
Aldrin	4.83	4.78	4.88	21.2	20.0	5.9
Heptachlor epoxide b	5.40	5.34	5.44	19.4	20.0	-3.2
Endosulfan I	5.77	5.72	5.82	22.1	20.0	10.4
Dieldrin	6.00	5.94	6.04	40.9	40.0	2.4
4,4'-DDE	5.74	5.67	5.77	33.0	40.0	-17.4
Endrin	6.21	6.16	6.26	37.1	40.0	-7.2
Endosulfan II	6.42	6.37	6.47	39.7	40.0	-0.7
4,4'-DDD	6.30	6.22	6.33	38.1	40.0	-4.7
Endosulfan sulfate	7.19	7.13	7.24	39.1	40.0	-2.2
4,4'-DDT	6.54	6.48	6.58	41.2	40.0	2.9
Methoxychlor	6.98	6.92	7.02	190.9	200.0	-4.5
Endrin ketone	7.44	7.39	7.49	40.0	40.0	0.0
Endrin aldehyde	6.80	6.75	6.84	39.9	40.0	-0.2
gamma-Chlordane	5.52	5.46	5.56	19.2	20.0	-3.9
alpha-Chlordane	5.64	5.59	5.69	17.8	20.0	-11.2
Hexachlorobutadiene	2.09	2.04	2.13	22.1	20.0	10.2
Hexachlorobenzene	3.78	3.70	3.80	18.5	20.0	-7.6
Tetrachloro-m-xylene	3.45	3.39	3.49	41.4	40.0	3.6
Decachlorobiphenyl	8.30	8.24	8.34	44.5	40.0	11.3

8081 PESTICIDE CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No.: UH13

Project: TERMINAL 2 BERTH 205/206

GC Column: STX-CLP2 ID: 0.53 (mm)

Init. Calib. Date: 01/23/12

Lab Ccal ID: INDAE

Date/Time Analyzed: 02/10/12,1733

PEST MIX COMPOUND	RT	RT WINDOW		CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
		FROM	TO			
alpha-BHC	4.16	4.11	4.21	20.1	20.0	0.6
beta-BHC	4.58	4.52	4.62	22.8	20.0	14.2
delta-BHC	4.86	4.80	4.90	14.6	20.0	-27.0
gamma-BHC (Lindane)	4.49	4.43	4.53	17.4	20.0	-13.2
Heptachlor	4.91	4.86	4.96	21.6	20.0	7.8
Aldrin	5.24	5.18	5.28	20.1	20.0	0.5
Heptachlor epoxide b	5.81	5.75	5.85	18.2	20.0	-9.0
Endosulfan I	6.19	6.13	6.23	18.4	20.0	-7.8
Dieldrin	6.45	6.39	6.49	39.0	40.0	-2.6
4,4'-DDE	6.29	6.23	6.33	37.8	40.0	-5.5
Endrin	6.74	6.68	6.78	35.1	40.0	-12.1
Endosulfan II	6.93	6.88	6.97	39.3	40.0	-1.7
4,4'-DDD	6.83	6.77	6.87	37.2	40.0	-6.9
Endosulfan sulfate	7.48	7.42	7.52	37.7	40.0	-5.9
4,4'-DDT	7.11	7.05	7.15	40.5	40.0	1.3
Methoxychlor	7.70	7.65	7.75	178.0	200.0	-11.0
Endrin ketone	7.96	7.90	8.00	38.2	40.0	-4.5
Endrin aldehyde	7.23	7.18	7.28	38.8	40.0	-3.0
gamma-Chlordane	5.99	5.93	6.04	19.8	20.0	-0.8
alpha-Chlordane	6.13	6.07	6.17	18.8	20.0	-5.8
Hexachlorobutadiene	2.15	2.10	2.20	16.3	20.0	-18.6
Hexachlorobenzene	4.07	4.01	4.11	17.0	20.0	-15.0
Tetrachloro-m-xylene	3.64	3.59	3.69	34.6	40.0	-13.5
Decachlorobiphenyl	8.99	8.93	9.03	38.0	40.0	-4.9

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8081 DDT/ENDRIN BREAKDOWN VERIFICATION SUMMARY

Lab ID: DS

ARI Job No.: 20120123PEST

Analysis Date: 10-FEB-2012 20:14

Init. Calib. Date: 23-JAN-2012

GC Column: STX-CLP1 ID: 0.53 (mm)

COMPOUND	RT	AREA
4,4'-DDE	5.752	59000
Endrin	6.212	2285466
4,4'-DDD	6.291	71508
4,4'-DDT	6.549	2108421
Endrin ketone	7.442	164749
Endrin aldehyde	6.804	157452

DDT Percent Breakdown = 5.8 %
 $((59000+71508) * 100) / (59000+71508+2108421)$

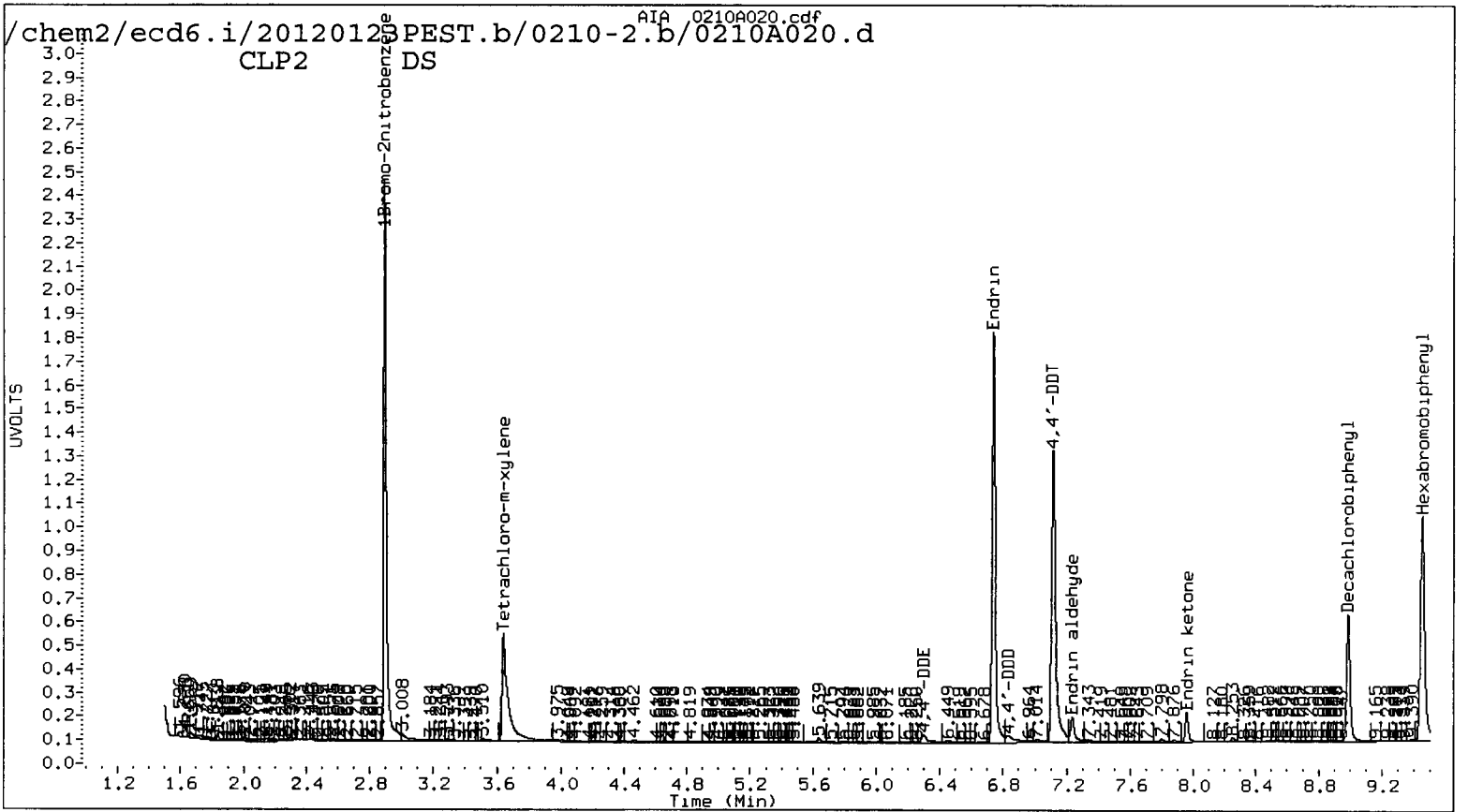
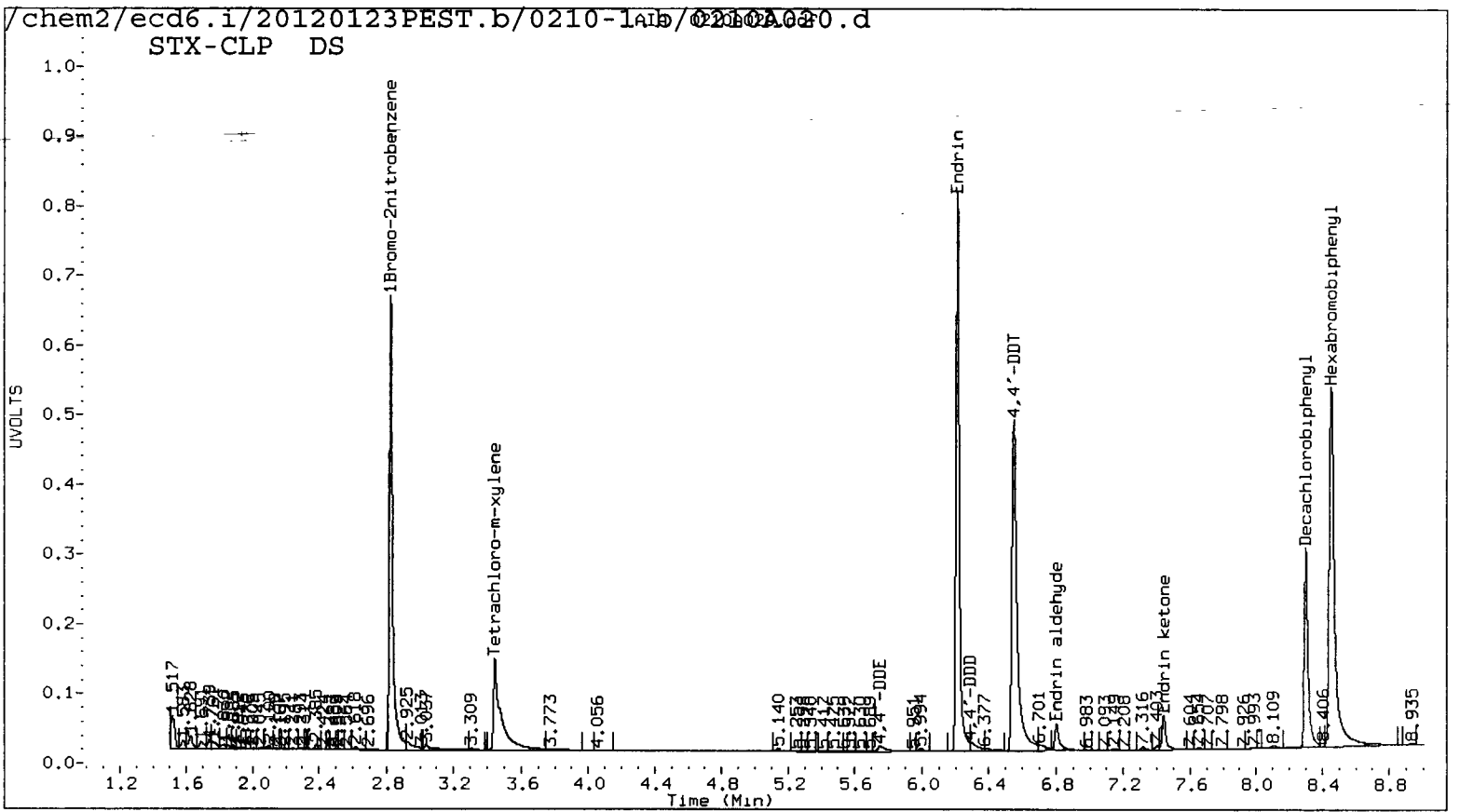
Endrin Percent Breakdown = 12.4 %
 $((157452+164749) * 100) / (157452+164749+2285466)$

GC Column: STX-CLP2 ID: 0.53 (mm)

COMPOUND	RT	AREA
4,4'-DDE	6.297	221607
Endrin	6.739	4818309
4,4'-DDD	6.832	248765
4,4'-DDT	7.115	4399632
Endrin ketone	7.958	372718
Endrin aldehyde	7.234	421676

DDT Percent Breakdown = 9.7 %
 $((221607+248765) * 100) / (221607+248765+4399632)$

Endrin Percent Breakdown = 14.2 %
 $((421676+372718) * 100) / (421676+372718+4818309)$



8081 PESTICIDE CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No.: UH13

Project: TERMINAL 2 BERTH 205/206

GC Column: STX-CLP1 ID: 0.53 (mm)

Init. Calib. Date: 01/23/12

Lab Ccal ID: INDAE

Date/Time Analyzed: 02/10/12,2031

PEST MIX COMPOUND	RT	RT WINDOW		CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
		FROM	TO			
alpha-BHC	3.89	3.83	3.93	22.0	20.0	10.2
beta-BHC	4.25	4.17	4.27	22.2	20.0	11.0
delta-BHC	4.41	4.33	4.43	19.4	20.0	-3.2
gamma-BHC (Lindane)	4.15	4.09	4.19	19.2	20.0	-4.2
Heptachlor	4.56	4.50	4.61	20.9	20.0	4.4
Aldrin	4.83	4.78	4.88	20.9	20.0	4.7
Heptachlor epoxide b	5.40	5.34	5.44	19.5	20.0	-2.5
Endosulfan I	5.77	5.72	5.82	21.7	20.0	8.4
Dieldrin	6.00	5.94	6.04	41.0	40.0	2.4
4,4'-DDE	5.74	5.67	5.77	37.6	40.0	-6.0
Endrin	6.21	6.16	6.26	38.0	40.0	-5.0
Endosulfan II	6.42	6.37	6.47	40.6	40.0	1.5
4,4'-DDD	6.29	6.22	6.33	39.9	40.0	-0.4
Endosulfan sulfate	7.19	7.13	7.24	40.3	40.0	0.6
4,4'-DDT	6.54	6.48	6.58	43.0	40.0	7.6
Methoxychlor	6.98	6.92	7.02	197.2	200.0	-1.4
Endrin ketone	7.44	7.39	7.49	41.2	40.0	3.1
Endrin aldehyde	6.80	6.75	6.84	41.1	40.0	2.8
gamma-Chlordane	5.52	5.46	5.56	19.9	20.0	-0.3
alpha-Chlordane	5.64	5.59	5.69	18.0	20.0	-10.0
Hexachlorobutadiene	2.08	2.04	2.13	22.0	20.0	9.9
Hexachlorobenzene	3.78	3.70	3.80	19.0	20.0	-5.1
Tetrachloro-m-xylene	3.45	3.39	3.49	41.3	40.0	3.4
Decachlorobiphenyl	8.30	8.24	8.34	45.8	40.0	14.4

8081 PESTICIDE CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No.: UH13

Project: TERMINAL 2 BERTH 205/206

GC Column: STX-CLP2 ID: 0.53 (mm)

Init. Calib. Date: 01/23/12

Lab Ccal ID: INDAE

Date/Time Analyzed: 02/10/12,2031

PEST MIX COMPOUND	RT	RT WINDOW		CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
		FROM	TO			
alpha-BHC	4.16	4.11	4.21	20.4	20.0	1.8
beta-BHC	4.58	4.52	4.62	23.3	20.0	16.6
delta-BHC	4.86	4.80	4.90	16.0	20.0	-19.9
gamma-BHC (Lindane)	4.49	4.43	4.53	17.8	20.0	-10.9
Heptachlor	4.92	4.86	4.96	22.3	20.0	11.3
Aldrin	5.24	5.18	5.28	20.4	20.0	1.9
Heptachlor epoxide b	5.81	5.75	5.85	18.9	20.0	-5.7
Endosulfan I	6.19	6.13	6.23	18.6	20.0	-7.0
Dieldrin	6.45	6.39	6.49	39.3	40.0	-1.8
4,4'-DDE	6.29	6.23	6.33	38.6	40.0	-3.6
Endrin	6.74	6.68	6.78	35.1	40.0	-12.2
Endosulfan II	6.93	6.88	6.97	39.0	40.0	-2.4
4,4'-DDD	6.83	6.77	6.87	38.0	40.0	-5.0
Endosulfan sulfate	7.48	7.42	7.52	37.0	40.0	-7.6
4,4'-DDT	7.11	7.05	7.15	40.6	40.0	1.4
Methoxychlor	7.70	7.65	7.75	178.1	200.0	-11.0
Endrin ketone	7.96	7.90	8.00	38.3	40.0	-4.2
Endrin aldehyde	7.23	7.18	7.28	38.6	40.0	-3.6
gamma-Chlordane	5.99	5.93	6.04	20.2	20.0	0.9
alpha-Chlordane	6.13	6.07	6.17	18.9	20.0	-5.6
Hexachlorobutadiene	2.15	2.10	2.20	16.3	20.0	-18.7
Hexachlorobenzene	4.07	4.01	4.11	17.8	20.0	-10.8
Tetrachloro-m-xylene	3.64	3.59	3.69	35.5	40.0	-11.2
Decachlorobiphenyl	8.99	8.93	9.03	37.4	40.0	-6.5

7E

8081 DDT/ENDRIN BREAKDOWN VERIFICATION SUMMARY

Lab ID: DS

ARI Job No.: 20120123PEST

Analysis Date: 10-FEB-2012 22:36

Init. Calib. Date: 23-JAN-2012

GC Column: STX-CLP1 ID: 0.53 (mm)

COMPOUND	RT	AREA
4,4'-DDE	5.748	54308
Endrin	6.213	2255993
4,4'-DDD	6.282	71448
4,4'-DDT	6.547	2110763
Endrin ketone	7.442	168042
Endrin aldehyde	6.803	159130

DDT Percent Breakdown = 5.6 %
((54308+71448) * 100)/(54308+71448+2110763)

Endrin Percent Breakdown = 12.7 %
((159130+168042) * 100)/(159130+168042+2255993)

GC Column: STX-CLP2 ID: 0.53 (mm)

COMPOUND	RT	AREA
4,4'-DDE	6.295	207617
Endrin	6.739	4844429
4,4'-DDD	6.832	209626
4,4'-DDT	7.114	4455723
Endrin ketone	7.958	389470
Endrin aldehyde	7.234	429466

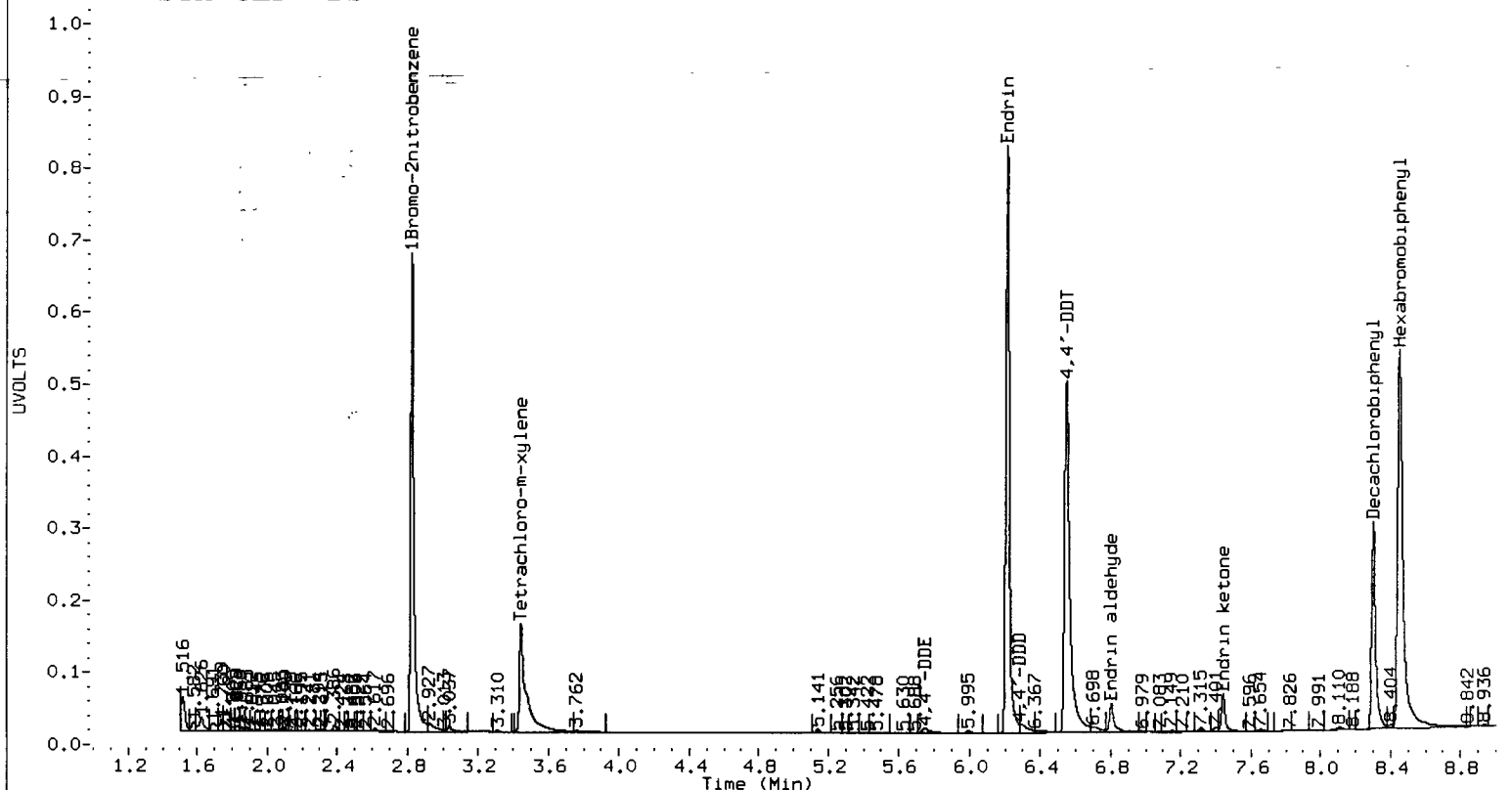
DDT Percent Breakdown = 8.6 %
((207617+209626) * 100)/(207617+209626+4455723)

Endrin Percent Breakdown = 14.5 %
((429466+389470) * 100)/(429466+389470+4844429)

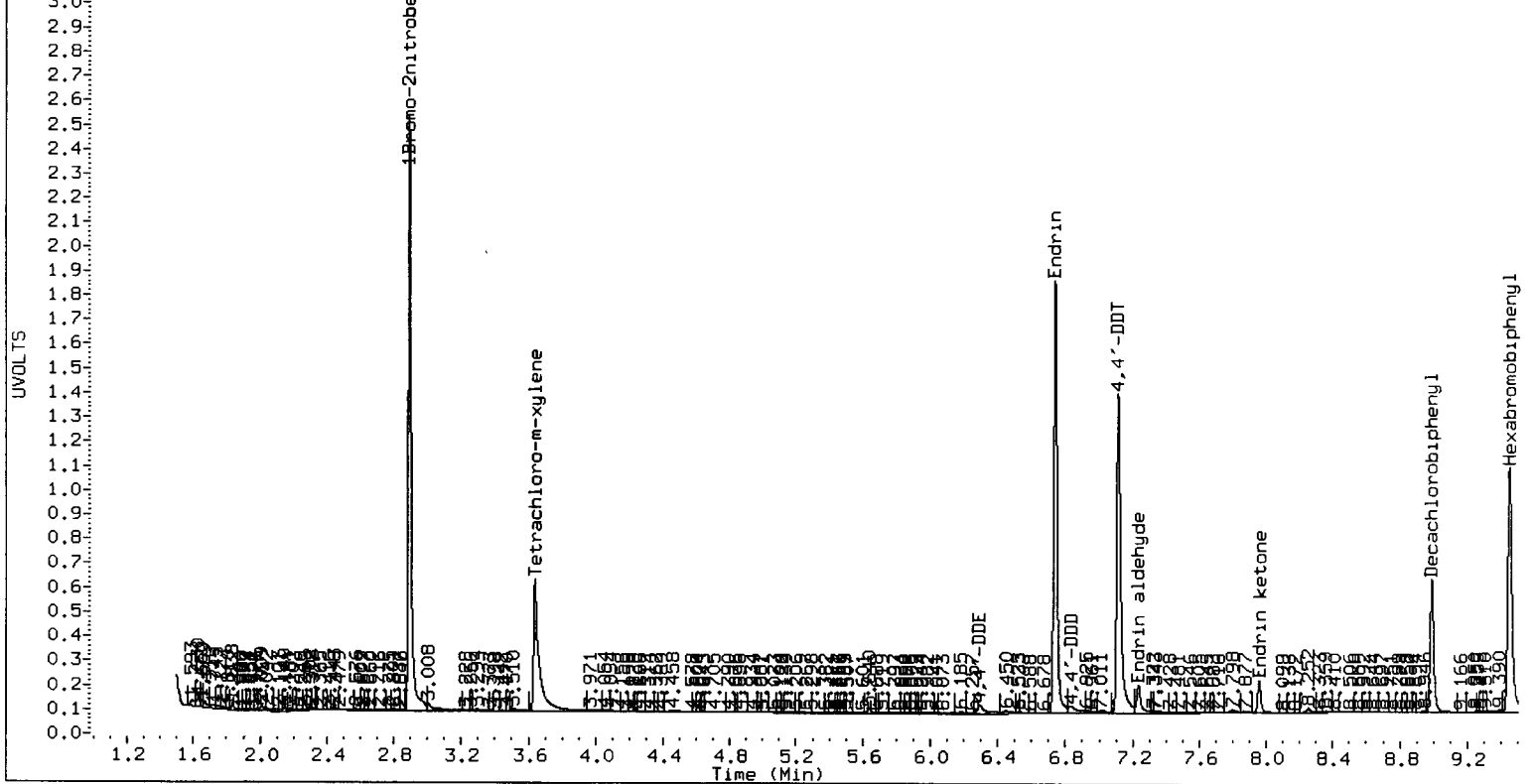
Form VII Pest-1

UH13:00112

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STX-CLP DS



/chem2/ecd6.i/20120123PEST.b/0210-2.b/0210A028.d
CLP2 DS



8081 PESTICIDE CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No.: UH13

Project: TERMINAL 2 BERTH 205/206

GC Column: STX-CLP1 ID: 0.53 (mm)

Init. Calib. Date: 01/23/12

Lab Ccal ID: INDAE

Date/Time Analyzed: 02/10/12,2254

PEST MIX COMPOUND	RT	RT WINDOW		CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
		FROM	TO			
alpha-BHC	3.88	3.83	3.93	22.0	20.0	10.2
beta-BHC	4.24	4.17	4.27	22.1	20.0	10.6
delta-BHC	4.40	4.33	4.43	20.1	20.0	0.3
gamma-BHC (Lindane)	4.15	4.09	4.19	19.9	20.0	-0.7
Heptachlor	4.56	4.50	4.61	21.0	20.0	4.9
Aldrin	4.83	4.78	4.88	21.1	20.0	5.6
Heptachlor epoxide b	5.39	5.34	5.44	19.9	20.0	-0.6
Endosulfan I	5.77	5.72	5.82	20.9	20.0	4.7
Dieldrin	5.99	5.94	6.04	41.3	40.0	3.3
4,4'-DDE	5.73	5.67	5.77	41.2	40.0	3.0
Endrin	6.21	6.16	6.26	37.1	40.0	-7.2
Endosulfan II	6.42	6.37	6.47	39.2	40.0	-2.1
4,4'-DDD	6.29	6.22	6.33	39.3	40.0	-1.7
Endosulfan sulfate	7.19	7.13	7.24	39.3	40.0	-1.9
4,4'-DDT	6.54	6.48	6.58	42.3	40.0	5.8
Methoxychlor	6.98	6.92	7.02	191.5	200.0	-4.3
Endrin ketone	7.44	7.39	7.49	39.9	40.0	-0.2
Endrin aldehyde	6.80	6.75	6.84	39.5	40.0	-1.1
gamma-Chlordane	5.52	5.46	5.56	20.4	20.0	2.1
alpha-Chlordane	5.64	5.59	5.69	18.0	20.0	-10.1
Hexachlorobutadiene	2.08	2.04	2.13	22.2	20.0	11.0
Hexachlorobenzene	3.78	3.70	3.80	19.6	20.0	-1.9
Tetrachloro-m-xylene	3.45	3.39	3.49	41.6	40.0	4.0
Decachlorobiphenyl	8.30	8.24	8.34	45.4	40.0	13.4

8081 PESTICIDE CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No.: UH13

Project: TERMINAL 2 BERTH 205/206

GC Column: STX-CLP2 ID: 0.53 (mm)

Init. Calib. Date: 01/23/12

Lab Ccal ID: INDAE

Date/Time Analyzed: 02/10/12,2254

PEST MIX COMPOUND	RT	RT WINDOW		CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
		FROM	TO			
alpha-BHC	4.16	4.11	4.21	20.2	20.0	1.1
beta-BHC	4.57	4.52	4.62	23.4	20.0	16.8
delta-BHC	4.86	4.80	4.90	17.4	20.0	-13.1
gamma-BHC (Lindane)	4.49	4.43	4.53	18.2	20.0	-9.2
Heptachlor	4.91	4.86	4.96	20.5	20.0	2.6
Aldrin	5.24	5.18	5.28	20.5	20.0	2.4
Heptachlor epoxide b	5.80	5.75	5.85	19.1	20.0	-4.3
Endosulfan I	6.19	6.13	6.23	18.5	20.0	-7.4
Dieldrin	6.45	6.39	6.49	39.2	40.0	-2.1
4,4'-DDE	6.29	6.23	6.33	39.1	40.0	-2.4
Endrin	6.74	6.68	6.78	34.7	40.0	-13.2
Endosulfan II	6.93	6.88	6.97	40.0	40.0	-0.0
4,4'-DDD	6.83	6.77	6.87	38.0	40.0	-5.0
Endosulfan sulfate	7.48	7.42	7.52	36.7	40.0	-8.2
4,4'-DDT	7.11	7.05	7.15	40.6	40.0	1.4
Methoxychlor	7.70	7.65	7.75	175.6	200.0	-12.2
Endrin ketone	7.96	7.90	8.00	37.6	40.0	-6.0
Endrin aldehyde	7.23	7.18	7.28	37.8	40.0	-5.4
gamma-Chlordane	5.99	5.93	6.04	20.5	20.0	2.5
alpha-Chlordane	6.13	6.07	6.17	19.1	20.0	-4.6
Hexachlorobutadiene	2.15	2.10	2.20	16.1	20.0	-19.4
Hexachlorobenzene	4.06	4.01	4.11	18.3	20.0	-8.2
Tetrachloro-m-xylene	3.64	3.59	3.69	36.0	40.0	-10.0
Decachlorobiphenyl	8.99	8.93	9.03	36.7	40.0	-8.3

7E
8081 DDT/ENDRIN BREAKDOWN VERIFICATION SUMMARY

Lab ID: DS

ARI Job No.: 20120123PEST

Analysis Date: 11-FEB-2012 01:51

Init. Calib. Date: 23-JAN-2012

GC Column: STX-CLP1 ID: 0.53(mm)

COMPOUND	RT	AREA
4,4'-DDE	5.735	36237
Endrin	6.212	2290687
4,4'-DDD	6.288	121552
4,4'-DDT	6.538	2068430
Endrin ketone	7.440	149918
Endrin aldehyde	6.801	132884

DDT Percent Breakdown = 7.1 %
 $((36237+121552) * 100) / (36237+121552+2068430)$

Endrin Percent Breakdown = 11.0 %
 $((132884+149918) * 100) / (132884+149918+2290687)$

GC Column: STX-CLP2 ID: 0.53(mm)

COMPOUND	RT	AREA
4,4'-DDE	6.287	140063
Endrin	6.738	4865420
4,4'-DDD	6.826	295570
4,4'-DDT	7.109	4265321
Endrin ketone	7.957	362060
Endrin aldehyde	7.233	349164

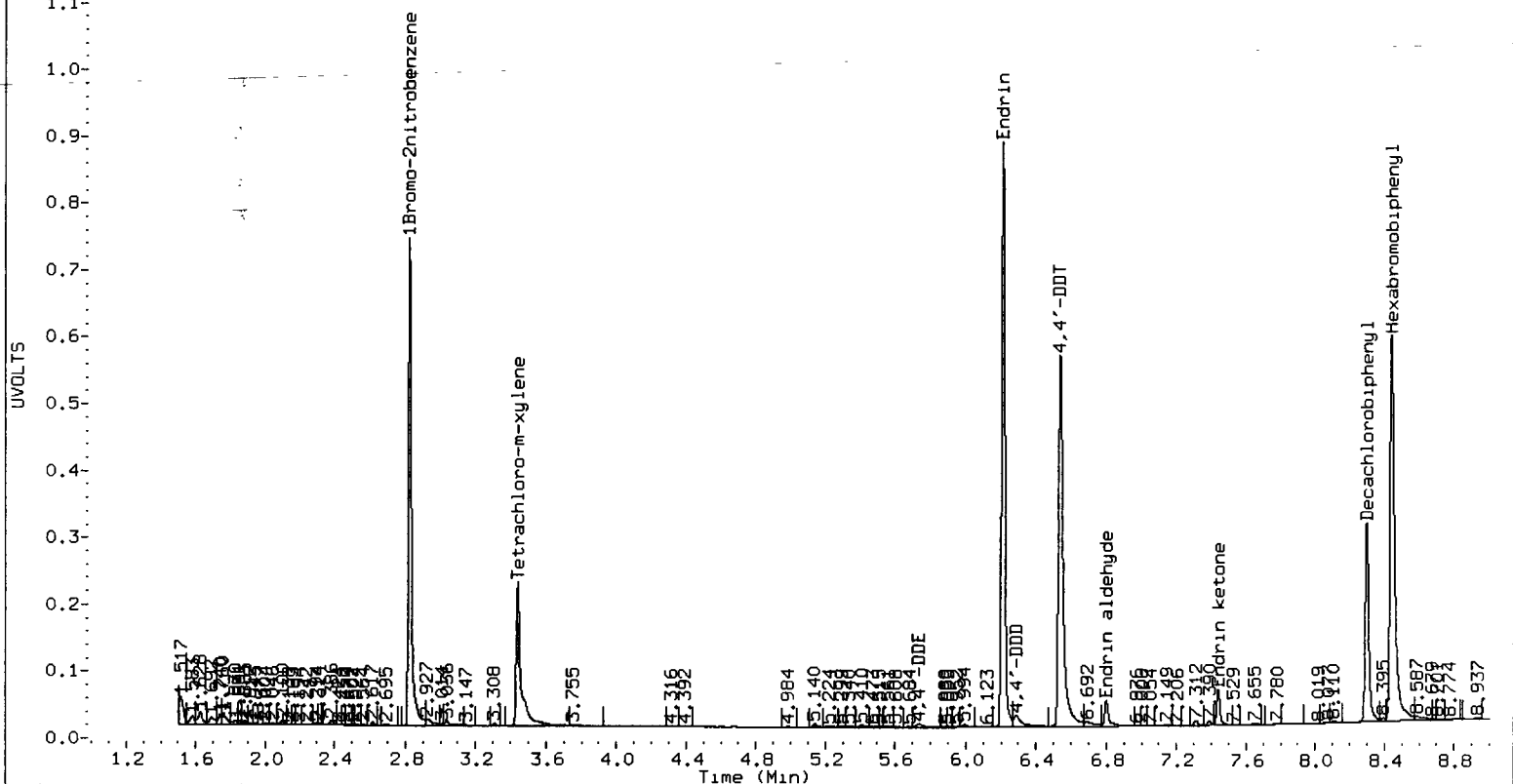
DDT Percent Breakdown = 9.3 %
 $((140063+295570) * 100) / (140063+295570+4265321)$

Endrin Percent Breakdown = 12.8 %
 $((349164+362060) * 100) / (349164+362060+4865420)$

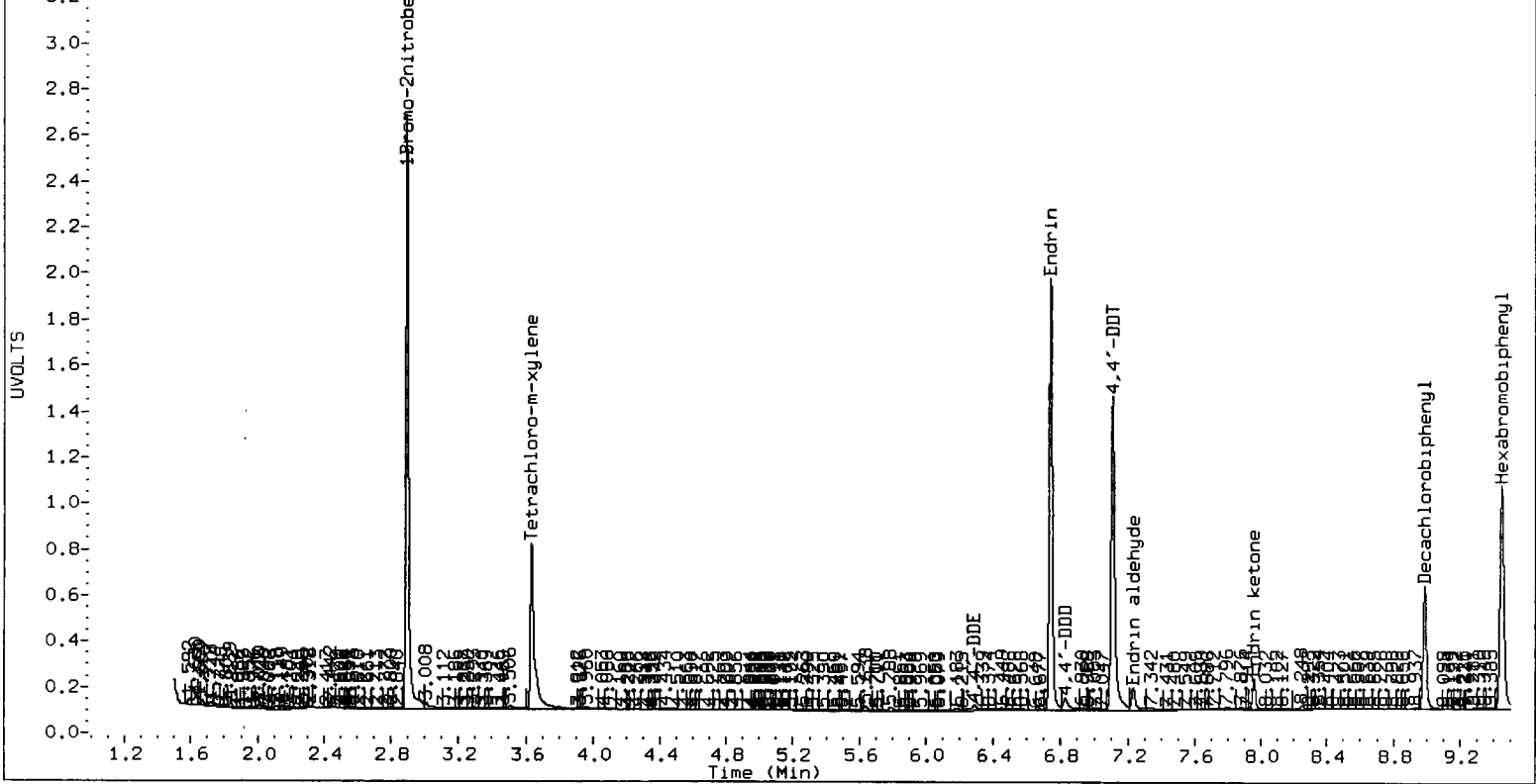
Form VII Pest-1

UH13:00116

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STX-CLP DS



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CLP2 DS



8081 PESTICIDE CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No.: UH13

Project: TERMINAL 2 BERTH 205/206

GC Column: STX-CLP1 ID: 0.53 (mm)

Init. Calib. Date: 01/23/12

Lab Ccal ID: INDAE

Date/Time Analyzed: 02/11/12,0209

PEST MIX COMPOUND	RT	RT WINDOW		CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
		FROM	TO			
alpha-BHC	3.88	3.83	3.93	22.3	20.0	11.4
beta-BHC	4.23	4.17	4.27	22.1	20.0	10.4
delta-BHC	4.39	4.33	4.43	22.0	20.0	9.8
gamma-BHC (Lindane)	4.15	4.09	4.19	21.3	20.0	6.7
Heptachlor	4.56	4.50	4.61	20.9	20.0	4.5
Aldrin	4.83	4.78	4.88	21.4	20.0	6.8
Heptachlor epoxide b	5.39	5.34	5.44	20.0	20.0	0.2
Endosulfan I	5.77	5.72	5.82	19.4	20.0	-3.0
Dieldrin	5.99	5.94	6.04	41.5	40.0	3.6
4,4'-DDE	5.73	5.67	5.77	45.8	40.0	14.5
Endrin	6.21	6.16	6.26	38.1	40.0	-4.7
Endosulfan II	6.42	6.37	6.47	39.2	40.0	-1.9
4,4'-DDD	6.28	6.22	6.33	42.2	40.0	5.4
Endosulfan sulfate	7.19	7.13	7.24	40.1	40.0	0.3
4,4'-DDT	6.54	6.48	6.58	41.3	40.0	3.2
Methoxychlor	6.97	6.92	7.02	188.3	200.0	-5.8
Endrin ketone	7.44	7.39	7.49	39.2	40.0	-2.0
Endrin aldehyde	6.80	6.75	6.84	39.4	40.0	-1.5
gamma-Chlordane	5.52	5.46	5.56	20.7	20.0	3.5
alpha-Chlordane	5.64	5.59	5.69	18.3	20.0	-8.7
Hexachlorobutadiene	2.09	2.04	2.13	21.7	20.0	8.3
Hexachlorobenzene	3.76	3.70	3.80	21.1	20.0	5.3
Tetrachloro-m-xylene	3.44	3.39	3.49	42.1	40.0	5.3
Decachlorobiphenyl	8.30	8.24	8.34	44.1	40.0	10.2

8081 PESTICIDE CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No.: UH13

Project: TERMINAL 2 BERTH 205/206

GC Column: STX-CLP2 ID: 0.53 (mm)

Init. Calib. Date: 01/23/12

Lab Ccal ID: INDAE

Date/Time Analyzed: 02/11/12,0209

PEST MIX COMPOUND	RT	RT WINDOW		CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
		FROM	TO			
alpha-BHC	4.16	4.11	4.21	21.0	20.0	4.9
beta-BHC	4.57	4.52	4.62	24.2	20.0	21.2
delta-BHC	4.85	4.80	4.90	21.4	20.0	6.9
gamma-BHC (Lindane)	4.49	4.43	4.53	19.6	20.0	-2.0
Heptachlor	4.91	4.86	4.96	20.4	20.0	2.2
Aldrin	5.24	5.18	5.28	21.0	20.0	5.1
Heptachlor epoxide b	5.80	5.75	5.85	20.1	20.0	0.7
Endosulfan I	6.19	6.13	6.23	19.1	20.0	-4.4
Dieldrin	6.45	6.39	6.49	39.6	40.0	-0.9
4,4'-DDE	6.28	6.23	6.33	41.4	40.0	3.6
Endrin	6.74	6.68	6.78	37.4	40.0	-6.5
Endosulfan II	6.93	6.88	6.97	42.6	40.0	6.5
4,4'-DDD	6.82	6.77	6.87	42.5	40.0	6.1
Endosulfan sulfate	7.48	7.42	7.52	37.9	40.0	-5.4
4,4'-DDT	7.11	7.05	7.15	41.3	40.0	3.3
Methoxychlor	7.70	7.65	7.75	177.4	200.0	-11.3
Endrin ketone	7.96	7.90	8.00	38.4	40.0	-4.0
Endrin aldehyde	7.23	7.18	7.28	39.5	40.0	-1.2
gamma-Chlordane	5.99	5.93	6.04	21.0	20.0	4.8
alpha-Chlordane	6.13	6.07	6.17	20.3	20.0	1.5
Hexachlorobutadiene	2.15	2.10	2.20	16.2	20.0	-19.2
Hexachlorobenzene	4.05	4.01	4.11	20.1	20.0	0.2
Tetrachloro-m-xylene	3.64	3.59	3.69	38.0	40.0	-4.9
Decachlorobiphenyl	8.99	8.93	9.03	36.3	40.0	-9.3

FORM 8
PESTICIDE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No.: UH13

Project: TERMINAL 2 BERTH 205/206

GC Column: STX-CLP1 ID: 0.53 (mm)

Instrument ID: ECD6

Init. Calib. Date: 01/23/12

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS,
SAMPLES, AND STANDARDS IS GIVEN BELOW:

				IS1		IS2		
				AREA	RT	AREA	RT	
=====				=====	=====	=====	=====	
ICAL MIDPT				1839597	2.824	2275632	8.436	
UPPER LIMIT				3679194	2.874	4551264	8.486	
LOWER LIMIT				919798	2.774	1137816	8.386	
=====				=====	=====	=====	=====	
CLIENT	LAB	DATE	TIME	IS1		IS2		
SAMPLE NO.	SAMPLE ID	ANALYZED		AREA	RT	AREA	RT	
=====	=====	=====	=====	=====	=====	=====	=====	
01		DS	01/23/12	1247	1858000	2.823	2334567	8.432
02	ZZZZZ	ZZZZZ	01/23/12	1305	2151816	2.824	2691987	8.434
03		INDAE	01/23/12	1323	1839597	2.824	2275632	8.436
04		INDAA	01/23/12	1341	2325896	2.824	2792031	8.438
05		INDAB	01/23/12	1359	1690544	2.824	2161026	8.440
06		INDAC	01/23/12	1416	2138393	2.824	2698863	8.440
07		INDAD	01/23/12	1434	2254260	2.824	2833889	8.440
08		INDAF	01/23/12	1452	2219543	2.823	2812901	8.442
09		INDAG	01/23/12	1510	2512795	2.824	3199021	8.441
10	ZZZZZ	ZZZZZ	01/23/12	1528	2158464	2.824	2857983	8.433
11	ZZZZZ	ZZZZZ	01/23/12	1545	2283438	2.823	2926740	8.429
12		TOXAPH 2500	01/23/12	1603	1983361	2.824	2566651	8.443
13	ZZZZZ	ZZZZZ	01/23/12	1621	2232340	2.824	2800689	8.445
14		WNDE	01/23/12	1639	2461252	2.824	3126635	8.444
15		WNDA	01/23/12	1656	2370739	2.824	3005741	8.445
16		WNDB	01/23/12	1714	2457109	2.825	3148064	8.444
17		WNDC	01/23/12	1732	2411138	2.824	3141455	8.444
18		WNDD	01/23/12	1750	2408638	2.824	3077719	8.445
19		WNDF	01/23/12	1808	2367291	2.824	2961508	8.444
20		WNDG	01/23/12	1825	2381634	2.824	2986233	8.445
21	ZZZZZ	ZZZZZ	01/23/12	1843	2097000	2.824	2622424	8.446
22	ZZZZZ	ZZZZZ	01/23/12	1901	1887927	2.824	2440534	8.442
23	ZZZZZ	ZZZZZ	01/23/12	1919	2122993	2.824	2608442	8.448
24	ZZZZZ	ZZZZZ	01/23/12	1936	1983929	2.824	2846722	8.437
25		DS	02/10/12	1658	1945005	2.826	2568496	8.457
26	ZZZZZ	ZZZZZ	02/10/12	1716	2406770	2.826	3034829	8.456
27		INDAE	02/10/12	1733	1978001	2.826	2629391	8.456
28	UH13MBS1	UH13MBS1	02/10/12	1751	2565985	2.823	3279333	8.435
29	UH13LCSS1	UH13LCSS1	02/10/12	1809	2682966	2.823	3365961	8.434
30	UH13LCSDS1	UH13LCSDS1	02/10/12	1827	2679609	2.823	3420621	8.435
31	ZZZZZ	ZZZZZ	02/10/12	1845	2617790	2.824	3394396	8.434
32	ZZZZZ	ZZZZZ	02/10/12	1902			12190*	8.457
33	ZZZZZ	ZZZZZ	02/10/12	1920	2050496	2.826	2624830	8.453
34	ZZZZZ	ZZZZZ	02/10/12	1938	2355820	2.826	3163737	8.449
35	ZZZZZ	ZZZZZ	02/10/12	1956	2100888	2.826	2833627	8.454

IS1 = 1-Bromo-2-Nitrobenzene
IS2 = Hexabromobiphenyl

RT Window = RT +/- .05 min

UH13:00120

FORM 8
PESTICIDE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No.: UH13

Project: TERMINAL 2 BERTH 205/206

GC Column: STX-CLP1 ID: 0.53 (mm)

Instrument ID: ECD6

Init. Calib. Date: 01/23/12

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS,
SAMPLES, AND STANDARDS IS GIVEN BELOW:

				IS1 AREA	RT	IS2 AREA	RT
=====				=====	=====	=====	=====
ICAL MIDPT				1839597	2.824	2275632	8.436
UPPER LIMIT				3679194	2.874	4551264	8.486
LOWER LIMIT				919798	2.774	1137816	8.386
=====				=====	=====	=====	=====
CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME	IS1 AREA	RT	IS2 AREA	RT
=====	=====	=====	=====	=====	=====	=====	=====
36	DS	02/10/12	2014	1762755	2.826	2378748	8.454
37	INDAE	02/10/12	2031	1822308	2.826	2327143	8.453
38	DS	02/10/12	2236	1731803	2.826	2370781	8.452
39	INDAE	02/10/12	2254	1771336	2.826	2360545	8.449
40	C1/2-DP	02/10/12	2311	2456693	2.823	3253476	8.434
41	C3/4-DP	02/10/12	2329	2438406	2.822	3134956	8.433
42	ZZZZZ	02/10/12	2347			61891*	8.467
43	ZZZZZ	02/11/12	0005			253811*	8.461
44	ZZZZZ	02/11/12	0022			151731*	8.450
45	ZZZZZ	02/11/12	0040			55950*	8.454
46	ZZZZZ	02/11/12	0058	1976787	2.825	2463769	8.441
47	ZZZZZ	02/11/12	0116	2275359	2.825	2997923	8.439
48	DS	02/11/12	0151	1708704	2.825	2211832	8.442
49	INDAE	02/11/12	0209	1764339	2.826	2298948	8.442

IS1 = 1-Bromo-2-Nitrobenzene RT Window = RT +/- .05 min
IS2 = Hexabromobiphenyl

* Indicates value outside QC Limits

FORM 8
PESTICIDE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No.: UH13

Project: TERMINAL 2 BERTH 205/206

GC Column: STX-CLP2 ID: 0.53(mm)

Instrument ID: ECD6

Init. Calib. Date: 01/23/12

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS,
SAMPLES, AND STANDARDS IS GIVEN BELOW:

				IS1 AREA	RT	IS2 AREA	RT	
=====				=====	=====	=====	=====	
ICAL MIDPT				5716021	2.891	3512534	9.438	
UPPER LIMIT				11432042	2.941	7025068	9.488	
LOWER LIMIT				2858010	2.841	1756267	9.388	
=====				=====	=====	=====	=====	
CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME	IS1 AREA	RT	IS2 AREA	RT	
=====	=====	=====	=====	=====	=====	=====	=====	
01		DS	01/23/12	1247	5850373	2.890	3571201	9.434
02	ZZZZZ	ZZZZZ	01/23/12	1305	6627578	2.891	4105135	9.436
03		INDAE	01/23/12	1323	5716021	2.891	3512534	9.438
04		INDAA	01/23/12	1341	7149978	2.891	4091284	9.439
05		INDAB	01/23/12	1359	5256685	2.891	3296803	9.440
06		INDAC	01/23/12	1416	6581899	2.892	4100568	9.438
07		INDAD	01/23/12	1434	6872747	2.891	4364102	9.440
08		INDAF	01/23/12	1452	6808652	2.891	4322320	9.441
09		INDAG	01/23/12	1510	7940347	2.892	4948953	9.441
10	ZZZZZ	ZZZZZ	01/23/12	1528	6567912	2.892	4339835	9.436
11	ZZZZZ	ZZZZZ	01/23/12	1545	6991040	2.891	4482711	9.434
12		TOXAPH 2500	01/23/12	1603	6173624	2.891	3933130	9.442
13	ZZZZZ	ZZZZZ	01/23/12	1621	6745103	2.891	4352902	9.442
14		WNDE	01/23/12	1639	7589769	2.891	4971303	9.442
15		WNDA	01/23/12	1656	7272130	2.891	4786324	9.443
16		WNDB	01/23/12	1714	7923425	2.892	5018196	9.443
17		WNDC	01/23/12	1732	7556144	2.892	4967455	9.443
18		WNDD	01/23/12	1750	7575425	2.892	5016853	9.444
19		WNDF	01/23/12	1808	7487656	2.892	4981753	9.444
20		WNDG	01/23/12	1825	7611906	2.892	5056086	9.444
21	ZZZZZ	ZZZZZ	01/23/12	1843	6824889	2.892	4445124	9.444
22	ZZZZZ	ZZZZZ	01/23/12	1901	6194846	2.892	4125662	9.442
23	ZZZZZ	ZZZZZ	01/23/12	1919	6834065	2.892	4554100	9.445
24	ZZZZZ	ZZZZZ	01/23/12	1936	6669239	2.892	4750072	9.440
25		DS	02/10/12	1658	5765007	2.894	3509559	9.453
26	ZZZZZ	ZZZZZ	02/10/12	1716	6869664	2.894	4181634	9.453
27		INDAE	02/10/12	1733	5983229	2.894	3671820	9.453
28	UH13MBS1	UH13MBS1	02/10/12	1751	7085305	2.892	4394023	9.443
29	UH13LCSS1	UH13LCSS1	02/10/12	1809	7605232	2.892	4668266	9.442
30	UH13LCSDS1	UH13LCSDS1	02/10/12	1827	7914193	2.892	4744889	9.443
31	ZZZZZ	ZZZZZ	02/10/12	1845	7691456	2.893	4713078	9.441
32	ZZZZZ	ZZZZZ	02/10/12	1902			51298*	9.454
33	ZZZZZ	ZZZZZ	02/10/12	1920	6316693	2.894	5985353	9.453
34	ZZZZZ	ZZZZZ	02/10/12	1938	7608796	2.894	4841585	9.449
35	ZZZZZ	ZZZZZ	02/10/12	1956	6712729	2.894	4262245	9.452

IS1 = 1-Bromo-2-Nitrobenzene
IS2 = Hexabromobiphenyl

RT Window = RT +/- .05 min

UH13: 00122

FORM 8
PESTICIDE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No.: UH13

Project: TERMINAL 2 BERTH 205/206

GC Column: STX-CLP2 ID: 0.53 (mm)

Instrument ID: ECD6

Init. Calib. Date: 01/23/12

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS,
SAMPLES, AND STANDARDS IS GIVEN BELOW:

				IS1 AREA	RT	IS2 AREA	RT	
=====				=====	=====	=====	=====	
				ICAL MIDPT	5716021	2.891	3512534	9.438
				UPPER LIMIT	11432042	2.941	7025068	9.488
				LOWER LIMIT	2858010	2.841	1756267	9.388
CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME	IS1 AREA	RT	IS2 AREA	RT	
=====	=====	=====	=====	=====	=====	=====	=====	
36	DS	02/10/12	2014	5690658	2.894	3627557	9.452	
37	INDAE	02/10/12	2031	5949366	2.894	3674729	9.452	
38	DS	02/10/12	2236	5777647	2.894	3640241	9.452	
39	INDAE	02/10/12	2254	6009178	2.894	3750288	9.450	
40	C1/2-DP	02/10/12	2311	6626949	2.892	2549976	9.443	
41	C3/4-DP	02/10/12	2329	6275886	2.892	2393513	9.443	
42	ZZZZZ	02/10/12	2347			12549*	9.448	
43	ZZZZZ	02/11/12	0005			29672*	9.449	
44	ZZZZZ	02/11/12	0022	433534*	2.890	40455*	9.450	
45	ZZZZZ	02/11/12	0040	899730*	2.886	16825*	9.451	
46	ZZZZZ	02/11/12	0058	6247985	2.893	4298580	9.447	
47	ZZZZZ	02/11/12	0116	7244604	2.894	4459953	9.447	
48	DS	02/11/12	0151	5682984	2.893	3400739	9.448	
49	INDAE	02/11/12	0209	5854154	2.893	3508511	9.447	

IS1 = 1-Bromo-2-Nitrobenzene RT Window = RT +/- .05 min
IS2 = Hexabromobiphenyl

* Indicates value outside QC Limits

**PCB Analysis
Report and Summary QC Forms**

ARI Job ID: UH13

ORGANICS ANALYSIS DATA SHEET

PSDDA PCB by GC/ECD

Page 1 of 1

Sample ID: C1/2-DP
SAMPLE

Lab Sample ID: UH13A
LIMS ID: 12-2074
Matrix: Soil
Data Release Authorized: *B*
Reported: 02/13/12

QC Report No: UH13-Hart Crowser
Project: Terminal 2 Berth 205/206
15665-01
Date Sampled: 02/02/12
Date Received: 02/03/12

Date Extracted: 02/09/12
Date Analyzed: 02/11/12 13:12
Instrument/Analyst: ECD5/AAR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes

Sample Amount: 12.9 g-dry-wt
Final Extract Volume: 2.5 mL
Dilution Factor: 1.00
Silica Gel: Yes
Percent Moisture: 52.5%

CAS Number	Analyte	MDL	RL	Result
12674-11-2	Aroclor 1016	0.99	3.9	< 3.9 U
53469-21-9	Aroclor 1242	1.3	3.9	< 3.9 U
12672-29-6	Aroclor 1248	1.3	4.8	< 4.8 Y
11097-69-1	Aroclor 1254	1.3	3.9	10
11096-82-5	Aroclor 1260	1.3	3.9	7.5
11104-28-2	Aroclor 1221	1.3	3.9	< 3.9 U
11141-16-5	Aroclor 1232	1.3	3.9	< 3.9 U
37324-23-5	Aroclor 1262	1.3	5.0	< 5.0 Y
11100-14-4	Aroclor 1268	1.3	3.9	< 3.9 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	69.8%
Tetrachlorometaxylene	68.8%

ORGANICS ANALYSIS DATA SHEET

PSDDA PCB by GC/ECD

Page 1 of 1

Sample ID: C3/4-DP
SAMPLE

Lab Sample ID: UH13B

LIMS ID: 12-2075

Matrix: Soil

Data Release Authorized: *[Signature]*

Reported: 02/13/12

QC Report No: UH13-Hart Crowser

Project: Terminal 2 Berth 205/206

15665-01

Date Sampled: 02/02/12

Date Received: 02/03/12

Date Extracted: 02/09/12

Date Analyzed: 02/11/12 13:31

Instrument/Analyst: ECD5/AAR

GPC Cleanup: No

Sulfur Cleanup: Yes

Acid Cleanup: Yes

Sample Amount: 13.0 g-dry-wt

Final Extract Volume: 2.5 mL

Dilution Factor: 1.00

Silica Gel: Yes

Percent Moisture: 53.9%

CAS Number	Analyte	MDL	RL	Result
12674-11-2	Aroclor 1016	0.98	3.9	< 3.9 U
53469-21-9	Aroclor 1242	1.3	3.9	< 3.9 U
12672-29-6	Aroclor 1248	1.3	3.9	< 3.9 U
11097-69-1	Aroclor 1254	1.3	3.9	5.1
11096-82-5	Aroclor 1260	1.3	3.9	5.3
11104-28-2	Aroclor 1221	1.3	3.9	< 3.9 U
11141-16-5	Aroclor 1232	1.3	3.9	< 3.9 U
37324-23-5	Aroclor 1262	1.3	3.9	< 3.9 U
11100-14-4	Aroclor 1268	1.3	3.9	< 3.9 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	62.2%
Tetrachlorometaxylene	63.8%

SW8082/PCB SOIL/SEDIMENT SURROGATE RECOVERY SUMMARY

Matrix: Soil

QC Report No: UH13-Hart Crowser
Project: Terminal 2 Berth 205/206
15665-01

<u>Client ID</u>	<u>DCBP % REC</u>	<u>DCBP LCL-UCL</u>	<u>TCMX % REC</u>	<u>TCMX LCL-UCL</u>	<u>TOT OUT</u>
MB-020912	81.0%	48-123	69.2%	43-107	0
LCS-020912	81.2%	48-123	67.0%	43-107	0
LCSD-020912	81.2%	48-123	66.2%	43-107	0
C1/2-DP	69.8%	24-127	68.8%	34-109	0
C3/4-DP	62.2%	24-127	63.8%	34-109	0

Microwave (MARS) Control Limits PCBSMM

Prep Method: SW3546

Log Number Range: 12-2074 to 12-2075



ORGANICS ANALYSIS DATA SHEET

PSDDA PCB by GC/ECD

Page 1 of 1

Sample ID: LCS-020912

LCS/LCSD

Lab Sample ID: LCS-020912

LIMS ID: 12-2074

Matrix: Soil

Data Release Authorized: *B*

Reported: 02/13/12

QC Report No: UH13-Hart Crowser

Project: Terminal 2 Berth 205/206

15665-01

Date Sampled: NA

Date Received: NA

Date Extracted LCS/LCSD: 02/09/12

Sample Amount LCS: 12.5 g-dry-wt

LCSD: 12.5 g-dry-wt

Date Analyzed LCS: 02/11/12 12:16

Final Extract Volume LCS: 2.50 mL

LCSD: 02/11/12 12:35

LCSD: 2.50 mL

Instrument/Analyst LCS: ECD5/AAR

Dilution Factor LCS: 1.00

LCSD: ECD5/AAR

LCSD: 1.00

GPC Cleanup: No

Silica Gel: Yes

Sulfur Cleanup: Yes

Percent Moisture: NA

Acid Cleanup: Yes

Florisil Cleanup: No

Analyte	LCS			LCSD			RPD
	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	
Aroclor 1016	74.5	101	73.8%	74.2	101	73.5%	0.4%
Aroclor 1260	79.7	101	78.9%	81.0	101	80.2%	1.6%

PCB Surrogate Recovery

	LCS	LCSD
Decachlorobiphenyl	81.2%	81.2%
Tetrachlorometaxylene	67.0%	66.2%

Results reported in µg/kg (ppb)

RPD calculated using sample concentrations per SW846.

4
PCB METHOD BLANK SUMMARY

BLANK NO.

UH13MBS1

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No.: UH13

Project: TERMINAL 2 BERTH 205

Lab Sample ID: UH13MBS1

Lab File ID: 0210B093

Date Extracted: 02/09/12

Matrix: SOLID

Date Analyzed: 02/11/12

Instrument ID: ECD5

Time Analyzed: 1157

GC Columns: ZB5/ZB35

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED
01	UH13LCSS1	UH13LCSS1	02/11/12
02	UH13LCSDS1	UH13LCSDS1	02/11/12
03	C1/2-DP	UH13A	02/11/12
04	C3/4-DP	UH13B	02/11/12

ALL RUNS ARE DUAL COLUMN

ORGANICS ANALYSIS DATA SHEET

PSDDA PCB by GC/ECD

Page 1 of 1

Sample ID: MB-020912

METHOD BLANK

Lab Sample ID: MB-020912

LIMS ID: 12-2074

Matrix: Soil

Data Release Authorized: *[Signature]*

Reported: 02/13/12

QC Report No: UH13-Hart Crowser

Project: Terminal 2 Berth 205/206

15665-01

Date Sampled: NA

Date Received: NA

Date Extracted: 02/09/12

Date Analyzed: 02/11/12 11:57

Instrument/Analyst: ECD5/AAR

GPC Cleanup: No

Sulfur Cleanup: Yes

Acid Cleanup: Yes

Sample Amount: 12.5 g

Final Extract Volume: 2.5 mL

Dilution Factor: 1.00

Silica Gel: Yes

Percent Moisture: NA

CAS Number	Analyte	MDL	RL	Result
12674-11-2	Aroclor 1016	1.0	4.0	< 4.0 U
53469-21-9	Aroclor 1242	1.4	4.0	< 4.0 U
12672-29-6	Aroclor 1248	1.4	4.0	< 4.0 U
11097-69-1	Aroclor 1254	1.4	4.0	< 4.0 U
11096-82-5	Aroclor 1260	1.4	4.0	< 4.0 U
11104-28-2	Aroclor 1221	1.4	4.0	< 4.0 U
11141-16-5	Aroclor 1232	1.4	4.0	< 4.0 U
37324-23-5	Aroclor 1262	1.4	4.0	< 4.0 U
11100-14-4	Aroclor 1268	1.4	4.0	< 4.0 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	81.0%
Tetrachlorometaxylene	69.2%

6F
8082 INITIAL CALIBRATION OF AROCLOR 1016/1260

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No.: UH13

Project: TERMINAL 2 BERTH 205/206

GC Column: ZB5

Instrument ID: ECD5

Calibration Date: 01/13/12

SURROGATES

	RT WIN	LVL1	LVL2	LVL3	LVL4	LVL5	LVL6	MEAN	%RSD
TCX	4.53- 4.73	1.3078	1.2230	1.2895	1.2500	1.2003	1.1323	1.2338	5.2
DCB	12.91-13.11	1.4065	1.2060	1.2077	1.1539	1.0753	1.0359	1.1809	11.1

Aroclor-1016	Peak	RT WIN	LVL1	LVL2	LVL3	LVL4	LVL5	LVL6	MEAN	%RSD
			.02	0.05	0.1	.25	0.5	1.0		R ²
1	6.16-	6.36	0.0410	0.0345	0.0350	0.0314	0.0302	0.0274	0.0333	14.2
2	6.56-	6.76	0.1338	0.1142	0.1155	0.1033	0.0977	0.0891	0.1089	14.5
3	6.71-	6.91	0.0567	0.0475	0.0478	0.0427	0.0408	0.0371	0.0454	15.1
4	6.82-	7.02	0.0398	0.0341	0.0348	0.0314	0.0304	0.0280	0.0331	12.4

AROCLOR AVERAGE %RSD = 14.0

Aroclor-1260	Peak	RT WIN	LVL1	LVL2	LVL3	LVL4	LVL5	LVL6	MEAN	%RSD
			.02	0.05	0.1	.25	0.5	1.0		R ²
1	10.36-	10.56	0.0562	0.0490	0.0495	0.0454	0.0430	0.0405	0.0473	11.8
2	10.74-	10.94	0.1548	0.1161	0.1175	0.1082	0.1027	0.0993	0.1164	17.3
3	11.14-	11.34	0.0692	0.0611	0.0632	0.0590	0.0563	0.0536	0.0604	9.1
4	11.25-	11.45	0.0285	0.0255	0.0263	0.0246	0.0236	0.0224	0.0252	8.6
5	11.33-	11.53	0.0322	0.0299	0.0313	0.0297	0.0286	0.0273	0.0298	5.9

AROCLOR AVERAGE %RSD = 10.5

6F
8082 INITIAL CALIBRATION OF AROCLOR 1016/1260

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No.: UH13

Project: TERMINAL 2 BERTH 205/206

GC Column: ZB35

Instrument ID: ECD5

Calibration Date: 01/13/12

SURROGATES

	RT WIN	LVL1	LVL2	LVL3	LVL4	LVL5	LVL6	MEAN	%RSD
TCX	4.53- 4.73	1.1601	1.0834	1.1576	1.1343	1.0722	1.0083	1.1026	5.4
DCB	13.28-13.48	1.2477	1.1518	1.1376	1.0656	1.0018	0.9750	1.0966	9.3

Aroclor-1016		LVL1	LVL2	LVL3	LVL4	LVL5	LVL6	MEAN	%RSD
Peak	RT WIN	.02	0.05	0.1	.25	0.5	1.0		R ²
1	6.26- 6.46	0.0525	0.0447	0.0454	0.0406	0.0369	0.0329	0.0422	16.4
2	6.89- 7.09	0.1045	0.0912	0.0937	0.0859	0.0801	0.0733	0.0881	12.4
3	7.10- 7.30	0.0349	0.0311	0.0323	0.0300	0.0286	0.0304	0.0312	7.0
4	8.38- 8.58	0.0226	0.0183	0.0184	0.0166	0.0158	0.0149	0.0178	15.4

AROCLOR AVERAGE %RSD = 12.8

Aroclor-1260		LVL1	LVL2	LVL3	LVL4	LVL5	LVL6	MEAN	%RSD
Peak	RT WIN	.02	0.05	0.1	.25	0.5	1.0		R ²
1	10.34-10.54	0.0593	0.0512	0.0516	0.0480	0.0455	0.0436	0.0499	11.2
2	10.79-10.99	0.0762	0.0637	0.0635	0.0592	0.0563	0.0543	0.0622	12.6
3	11.06-11.26	0.1389	0.1224	0.1256	0.1180	0.1134	0.1104	0.1215	8.4
4	11.58-11.78	0.0404	0.0359	0.0357	0.0333	0.0321	0.0310	0.0347	9.8

AROCLOR AVERAGE %RSD = 10.5

6G
8082 INITIAL CALIBRATION OF SINGLE POINT PCBs

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No.: UH13

Project: TERMINAL 2 BERTH 205/206

GC Column: ZB5

Instrument ID: ECD5

Calibration Date: 01/13/12

Aroclor-1221				Cal Factor
Peak	RT	RT WIN		
1	4.995	4.90-	5.10	0.01300
2	5.175	5.07-	5.27	0.00915
3	5.279	5.18-	5.38	0.03057
Aroclor-1232				Cal Factor
Peak	RT	RT WIN		
1	6.257	6.16-	6.36	0.01443
2	6.657	6.56-	6.76	0.04707
3	6.806	6.71-	6.91	0.01964
4	7.999	7.90-	8.10	0.01766
Aroclor-1242				Cal Factor
Peak	RT	RT WIN		
1	6.260	6.16-	6.36	0.02577
2	6.660	6.56-	6.76	0.08429
3	6.808	6.71-	6.91	0.03501
4	8.000	7.90-	8.10	0.02990
Aroclor-1248				Cal Factor
Peak	RT	RT WIN		
1	6.656	6.56-	6.76	0.05362
2	7.455	7.35-	7.55	0.04091
3	8.000	7.90-	8.10	0.05041
4	8.291	8.19-	8.39	0.05033

6G
8082 INITIAL CALIBRATION OF SINGLE POINT PCBs

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No.: UH13

Project: TERMINAL 2 BERTH 205/206

GC Column: ZB5

Instrument ID: ECD5

Calibration Date: 01/13/12

Aroclor-1254			
Peak	RT	RT WIN	Cal Factor
1	8.373	8.27- 8.47	0.07352
2	8.744	8.64- 8.84	0.04821
3	8.881	8.78- 8.98	0.08869
4	9.229	9.13- 9.33	0.09772
5	9.591	9.49- 9.69	0.06384
Aroclor-1262			
Peak	RT	RT WIN	Cal Factor
1	10.148	10.05-10.25	0.07216
2	10.465	10.36-10.56	0.05353
3	10.839	10.74-10.94	0.14088
4	11.356	11.26-11.46	0.04930
5	11.429	11.33-11.53	0.05577
Aroclor-1268			
Peak	RT	RT WIN	Cal Factor
1	11.358	11.26-11.46	0.14389
2	11.429	11.33-11.53	0.14277
3	11.815	11.72-11.92	0.12009
4	12.606	12.51-12.71	0.36842

6G
8082 INITIAL CALIBRATION OF SINGLE POINT PCBs

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No.: UH13

Project: TERMINAL 2 BERTH 205/206

GC Column: ZB35

Instrument ID: ECD5

Calibration Date: 01/13/12

Aroclor-1221				Cal Factor
Peak	RT	RT WIN		
1	5.316	5.22-	5.42	0.01288
2	5.560	5.46-	5.66	0.00766
3	5.672	5.57-	5.77	0.02344
4	5.740	5.64-	5.84	0.00392

Aroclor-1232				Cal Factor
Peak	RT	RT WIN		
1	6.366	6.27-	6.47	0.01997
2	6.993	6.89-	7.09	0.03895
3	7.201	7.10-	7.30	0.01346
4	8.345	8.24-	8.44	0.01409

Aroclor-1242				Cal Factor
Peak	RT	RT WIN		
1	6.365	6.27-	6.47	0.03288
2	6.991	6.89-	7.09	0.06966
3	7.200	7.10-	7.30	0.02765
4	8.343	8.24-	8.44	0.02347

Aroclor-1248				Cal Factor
Peak	RT	RT WIN		
1	6.985	6.89-	7.09	0.04419
2	7.891	7.79-	7.99	0.03456
3	8.342	8.24-	8.44	0.04007
4	8.764	8.66-	8.86	0.04330

6G
8082 INITIAL CALIBRATION OF SINGLE POINT PCBs

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No.: UH13

Project: TERMINAL 2 BERTH 205/206

GC Column: ZB35

Instrument ID: ECD5

Calibration Date: 01/13/12

Aroclor-1254			
Peak	RT	RT WIN	Cal Factor
1	8.482	8.38- 8.58	0.03288
2	8.654	8.55- 8.75	0.04212
3	9.177	9.08- 9.28	0.03260
4	9.327	9.23- 9.43	0.07051
5	10.109	10.01-10.21	0.04382
Aroclor-1262			
Peak	RT	RT WIN	Cal Factor
1	10.442	10.34-10.54	0.07868
2	10.893	10.79-10.99	0.06742
3	11.165	11.07-11.27	0.15076
4	11.688	11.59-11.79	0.05859
5	12.486	12.39-12.59	0.05294
Aroclor-1268			
Peak	RT	RT WIN	Cal Factor
1	11.688	11.59-11.79	0.15827
2	11.747	11.65-11.85	0.14705
3	12.152	12.05-12.25	0.12195
4	12.973	12.87-13.07	0.35947

7F
PCB CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No.: UH13

Project: TERMINAL 2 BERTH 205/206

GC Column: ZB5

Intrument: ECD5

Init. Calib. Date: 01/13/12

Date Analyzed :02/11/12

Lab Standard ID: AR1242

Time Analyzed :1119

COMPOUND/PEAK NO.	RT	RT WINDOW		CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
		FROM	TO			
=====	=====	=====	=====	=====	=====	=====
Aroclor-1242-1	6.26	6.16	6.36	272.8	250.0	9.1
Aroclor-1242-2	6.66	6.56	6.76	282.9	250.0	13.2
Aroclor-1242-3	6.81	6.71	6.91	276.8	250.0	10.7
Aroclor-1242-4	8.00	7.90	8.10	297.3	250.0	18.9

AVERAGE %D = 13.0

7F
PCB CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No.: UH13

Project: TERMINAL 2 BERTH 205/206

GC Column: ZB35

Intrument: ECD5

Init. Calib. Date: 01/13/12

Date Analyzed :02/11/12

Lab Standard ID: AR1242

Time Analyzed :1119

COMPOUND/PEAK NO.	RT	RT WINDOW		CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
		FROM	TO			
Aroclor-1242-1	6.37	6.27	6.47	255.6	250.0	2.2
Aroclor-1242-2	6.99	6.89	7.09	273.9	250.0	9.6
Aroclor-1242-3	7.20	7.10	7.30	238.8	250.0	-4.5
Aroclor-1242-4	8.34	8.24	8.44	296.3	250.0	18.5

AVERAGE %D = 8.7

7F
PCB CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No.: UH13

Project: TERMINAL 2 BERTH 205/206

GC Column: ZB5

Intrument: ECD5

Init. Calib. Date: 01/13/12

Date Analyzed :02/11/12

Lab Standard ID: AR1660

Time Analyzed :1138

COMPOUND/PEAK NO.	RT	RT WINDOW		CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
		FROM	TO			
Aroclor-1016-1	6.26	6.16	6.36	232.9	250.0	-6.8
Aroclor-1016-2	6.66	6.56	6.76	241.0	250.0	-3.6
Aroclor-1016-3	6.81	6.71	6.91	235.6	250.0	-5.7
Aroclor-1016-4	6.92	6.82	7.02	246.8	250.0	-1.3

AVERAGE %D = 4.4

Date Analyzed :02/11/12

Lab Standard ID: AR1660

Time Analyzed :1138

COMPOUND/PEAK NO.	RT	RT WINDOW		CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
		FROM	TO			
Aroclor-1260-1	10.46	10.36	10.56	238.7	250.0	-4.5
Aroclor-1260-2	10.84	10.74	10.94	229.0	250.0	-8.4
Aroclor-1260-3	11.24	11.14	11.34	246.7	250.0	-1.3
Aroclor-1260-4	11.35	11.25	11.45	250.4	250.0	0.2
Aroclor-1260-5	11.43	11.33	11.53	254.6	250.0	1.8

AVERAGE %D = 3.2

7F
PCB CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No.: UH13

Project: TERMINAL 2 BERTH 205/206

GC Column: ZB35

Intrument: ECD5

Init. Calib. Date: 01/13/12

Date Analyzed :02/11/12

Lab Standard ID: AR1660

Time Analyzed :1138

COMPOUND/PEAK NO.	RT	RT WINDOW		CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
		FROM	TO			
Aroclor-1016-1	6.37	6.26	6.46	238.3	250.0	-4.7
Aroclor-1016-2	6.99	6.89	7.09	262.6	250.0	5.0
Aroclor-1016-3	7.20	7.10	7.30	254.8	250.0	1.9
Aroclor-1016-4	8.48	8.38	8.58	272.6	250.0	9.0

AVERAGE %D = 5.2

Date Analyzed :02/11/12

Lab Standard ID: AR1660

Time Analyzed :1138

COMPOUND/PEAK NO.	RT	RT WINDOW		CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
		FROM	TO			
Aroclor-1260-1	10.44	10.34	10.54	241.6	250.0	-3.3
Aroclor-1260-2	10.89	10.79	10.99	239.8	250.0	-4.1
Aroclor-1260-3	11.16	11.06	11.26	250.8	250.0	0.3
Aroclor-1260-4	11.68	11.58	11.78	253.9	250.0	1.6

AVERAGE %D = 2.3

7F
PCB CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No.: UH13

Project: TERMINAL 2 BERTH 205/206

GC Column: ZB5

Intrument: ECD5

Init. Calib. Date: 01/13/12

Date Analyzed :02/11/12

Lab Standard ID: AR1248

Time Analyzed :1350

COMPOUND/PEAK NO.	RT	RT WINDOW		CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
		FROM	TO			
=====	=====	=====	=====	=====	=====	=====
Aroclor-1248-1	6.66	6.56	6.76	258.5	250.0	3.4
Aroclor-1248-2	7.45	7.35	7.55	251.1	250.0	0.4
Aroclor-1248-3	8.00	7.90	8.10	261.3	250.0	4.5
Aroclor-1248-4	8.29	8.19	8.39	264.6	250.0	5.8

AVERAGE %D = 3.5

7F
PCB CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No.: UH13

Project: TERMINAL 2 BERTH 205/206

GC Column: ZB35

Intrument: ECD5

Init. Calib. Date: 01/13/12

Date Analyzed :02/11/12

Lab Standard ID: AR1248

Time Analyzed :1350

COMPOUND/PEAK NO.	RT	RT WINDOW		CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
		FROM	TO			
=====	=====	=====	=====	=====	=====	=====
Aroclor-1248-1	6.99	6.89	7.09	268.1	250.0	7.2
Aroclor-1248-2	7.89	7.79	7.99	273.9	250.0	9.6
Aroclor-1248-3	8.34	8.24	8.44	284.4	250.0	13.8
Aroclor-1248-4	8.77	8.66	8.86	285.6	250.0	14.2

AVERAGE %D = 11.2

7F
PCB CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No.: UH13

Project: TERMINAL 2 BERTH 205/206

GC Column: ZB5

Intrument: ECD5

Init. Calib. Date: 01/13/12

Date Analyzed :02/11/12

Lab Standard ID: AR1660

Time Analyzed :1409

COMPOUND/PEAK NO.	RT	RT WINDOW		CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
		FROM	TO			
Aroclor-1016-1	6.26	6.16	6.36	234.4	250.0	-6.2
Aroclor-1016-2	6.66	6.56	6.76	240.8	250.0	-3.7
Aroclor-1016-3	6.81	6.71	6.91	235.7	250.0	-5.7
Aroclor-1016-4	6.92	6.82	7.02	245.8	250.0	-1.7

AVERAGE %D = 4.3

Date Analyzed :02/11/12

Lab Standard ID: AR1660

Time Analyzed :1409

COMPOUND/PEAK NO.	RT	RT WINDOW		CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
		FROM	TO			
Aroclor-1260-1	10.46	10.36	10.56	243.0	250.0	-2.8
Aroclor-1260-2	10.84	10.74	10.94	231.3	250.0	-7.5
Aroclor-1260-3	11.24	11.14	11.34	249.6	250.0	-0.2
Aroclor-1260-4	11.35	11.25	11.45	253.2	250.0	1.3
Aroclor-1260-5	11.43	11.33	11.53	256.8	250.0	2.7

AVERAGE %D = 2.9

7F
PCB CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No.: UH13

Project: TERMINAL 2 BERTH 205/206

GC Column: ZB35

Intrument: ECD5

Init. Calib. Date: 01/13/12

Date Analyzed :02/11/12

Lab Standard ID: AR1660

Time Analyzed :1409

COMPOUND/PEAK NO.	RT	RT WINDOW		CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
		FROM	TO			
Aroclor-1016-1	6.37	6.26	6.46	240.2	250.0	-3.9
Aroclor-1016-2	6.99	6.89	7.09	263.8	250.0	5.5
Aroclor-1016-3	7.20	7.10	7.30	255.9	250.0	2.4
Aroclor-1016-4	8.48	8.38	8.58	270.0	250.0	8.0

AVERAGE %D = 5.0

Date Analyzed :02/11/12

Lab Standard ID: AR1660

Time Analyzed :1409

COMPOUND/PEAK NO.	RT	RT WINDOW		CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
		FROM	TO			
Aroclor-1260-1	10.44	10.34	10.54	249.7	250.0	-0.1
Aroclor-1260-2	10.89	10.79	10.99	248.3	250.0	-0.7
Aroclor-1260-3	11.16	11.06	11.26	257.1	250.0	2.8
Aroclor-1260-4	11.69	11.58	11.78	256.9	250.0	2.8

AVERAGE %D = 1.6

FORM 8
PCB INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No.: UH13

Project: TERMINAL 2 BERTH 205/206

GC Column: ZB5 ID: 0.53 (mm)

Instrument ID: ECD5

Init. Calib. Date: 01/13/12

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS,
SAMPLES, AND STANDARDS IS GIVEN BELOW:

				IS1 AREA	RT	IS2 AREA	RT	
=====				=====	=====	=====	=====	
ICAL MIDPT				150027830	2.423	177047641	13.374	
UPPER LIMIT				300055660	2.523	354095282	13.474	
LOWER LIMIT				75013915	2.323	88523820	13.274	
=====				=====	=====	=====	=====	
CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME	IS1 AREA	RT	IS2 AREA	RT	
=====	=====	=====	=====	=====	=====	=====	=====	
01	ZZZZZ	ZZZZZ	01/13/12	1356	149487327	2.422	176923703	13.373
02		0.25 PPM AR1	01/13/12	1415	150027830	2.423	177047641	13.374
03		0.02 PPM AR1	01/13/12	1434	150698722	2.422	178652300	13.374
04		0.05 PPM AR1	01/13/12	1453	153616235	2.422	183078134	13.373
05		1 PPM AR1660	01/13/12	1512	144198911	2.424	178562043	13.375
06		0.1 PPM AR16	01/13/12	1531	155434407	2.423	188704106	13.374
07		0.5 PPM AR16	01/13/12	1550	145660715	2.423	181282092	13.373
08		AR1242	01/13/12	1609	148498302	2.423	182160776	13.375
09		AR1248	01/13/12	1628	152710193	2.423	188436290	13.375
10		AR1254	01/13/12	1647	151997349	2.423	188235236	13.375
11		AR2162	01/13/12	1706	153459427	2.423	191276496	13.374
12		AR3268	01/13/12	1725	150219798	2.423	186502777	13.375
13	ZZZZZ	ZZZZZ	01/13/12	1744	158210471	2.423	199135529	13.375
14	ZZZZZ	ZZZZZ	01/13/12	1803	154687896	2.423	193079617	13.374
15	ZZZZZ	ZZZZZ	01/13/12	1822	154597821	2.423	193511220	13.374
16	ZZZZZ	ZZZZZ	01/13/12	1841	153956100	2.422	193283758	13.374
17	ZZZZZ	ZZZZZ	01/13/12	1900	157548448	2.423	199608158	13.374
18	ZZZZZ	ZZZZZ	01/13/12	1919	153303748	2.424	193460017	13.374
19		AR1242	02/11/12	1119	179169528	2.425	260090228	13.374
20		AR1660	02/11/12	1138	185254310	2.424	269782066	13.373
21	UH13MBS1	UH13MBS1	02/11/12	1157	169457856	2.423	250688671	13.373
22	UH13LCSS1	UH13LCSS1	02/11/12	1216	170347739	2.425	254826670	13.373
23	UH13LCSDS1	UH13LCSDS1	02/11/12	1235	180173163	2.425	269713345	13.374
24	ZZZZZ	ZZZZZ	02/11/12	1254	170506426	2.425	257574166	13.373
25	C1/2-DP	UH13A	02/11/12	1312	154418830	2.424	206102475	13.372
26	C3/4-DP	UH13B	02/11/12	1331	162651067	2.424	207697858	13.373
27		AR1248	02/11/12	1350	163570236	2.424	211902635	13.374
28		AR1660	02/11/12	1409	188891981	2.425	261298831	13.373

IS1 = 1-Bromo-2-Nitrobenzene RT Window = RT +/- 0.1 min
IS2 = Hexabromobiphenyl

* Indicates value outside QC Limits

FORM 8
PCB INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No.: UH13

Project: TERMINAL 2 BERTH 205/206

GC Column: ZB35 ID: 0.53 (mm)

Instrument ID: ECD5

Init. Calib. Date: 01/13/12

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS,
SAMPLES, AND STANDARDS IS GIVEN BELOW:

				IS1 AREA	RT	IS2 AREA	RT	
=====				=====	=====	=====	=====	
ICAL MIDPT				100894736	2.910	72939043	14.257	
UPPER LIMIT				201789472	3.010	145878086	14.357	
LOWER LIMIT				50447368	2.810	36469522	14.157	
				IS1 AREA	RT	IS2 AREA	RT	
CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME	IS1 AREA	RT	IS2 AREA	RT	
=====	=====	=====	=====	=====	=====	=====	=====	
01	ZZZZZ	ZZZZZ	01/13/12	1356	101243716	2.909	72572054	14.258
02		0.25 PPM AR1	01/13/12	1415	100894736	2.910	72939043	14.257
03		0.02 PPM AR1	01/13/12	1434	101618525	2.910	73651906	14.257
04		0.05 PPM AR1	01/13/12	1453	103626555	2.911	75505238	14.258
05		1 PPM AR1660	01/13/12	1512	100543259	2.911	73649989	14.258
06		0.1 PPM AR16	01/13/12	1531	105478761	2.911	78107675	14.258
07		0.5 PPM AR16	01/13/12	1550	101938890	2.911	75160456	14.256
08		AR1242	01/13/12	1609	101559697	2.912	75547211	14.259
09		AR1248	01/13/12	1628	104807881	2.911	78295360	14.258
10		AR1254	01/13/12	1647	103252698	2.911	78100698	14.257
11		AR2162	01/13/12	1706	102202356	2.912	78934656	14.259
12		AR3268	01/13/12	1725	101217749	2.911	77537147	14.258
13	ZZZZZ	ZZZZZ	01/13/12	1744	109423168	2.911	82761173	14.258
14	ZZZZZ	ZZZZZ	01/13/12	1803	106204059	2.912	80141802	14.257
15	ZZZZZ	ZZZZZ	01/13/12	1822	105460387	2.912	80002249	14.257
16	ZZZZZ	ZZZZZ	01/13/12	1841	105040324	2.911	79640095	14.258
17	ZZZZZ	ZZZZZ	01/13/12	1900	104671916	2.911	82435948	14.258
18	ZZZZZ	ZZZZZ	01/13/12	1919	102115935	2.912	80421851	14.258
19		AR1242	02/11/12	1119	137280294	2.910	120740273	14.255
20		AR1660	02/11/12	1138	131174609	2.910	119908501	14.255
21	UH13MBS1	UH13MBS1	02/11/12	1157	120086382	2.911	112476895	14.255
22	UH13LCSS1	UH13LCSS1	02/11/12	1216	120611740	2.911	113044759	14.255
23	UH13LCSDS1	UH13LCSDS1	02/11/12	1235	129259205	2.911	120083265	14.255
24	ZZZZZ	ZZZZZ	02/11/12	1254	121349667	2.912	114603122	14.254
25	C1/2-DP	UH13A	02/11/12	1312	110542414	2.912	107561638	14.255
26	C3/4-DP	UH13B	02/11/12	1331	111188246	2.912	104553528	14.255
27		AR1248	02/11/12	1350	117070079	2.910	95050862	14.255
28		AR1660	02/11/12	1409	132833269	2.912	115260777	14.254

IS1 = 1-Bromo-2-Nitrobenzene RT Window = RT +/- 0.1 min
IS2 = Hexabromobiphenyl

* Indicates value outside QC Limits

**TPHD Analysis
Report and Summary QC Forms**

ARI Job ID: UH13

ORGANICS ANALYSIS DATA SHEET

TOTAL DIESEL RANGE HYDROCARBONS

NWTPHD by GC/FID-Silica and Acid Cleaned
Page 1 of 1
Matrix: Soil

QC Report No: UH13-Hart Crowser
Project: Terminal 2 Berth 205/206
15665-01

Data Release Authorized: *TMW*
Reported: 02/09/12

ARI ID	Sample ID	Extraction Date	Analysis Date	EFV DL	Range	MDL	RL	Result
MB-020612 12-2074	Method Blank HC ID: ---	02/06/12	02/07/12 FID3B	1.00 1.0	Diesel	1.3	5.0	< 5.0 U
					Motor Oil	1.6	10	< 10 U
					o-Terphenyl			96.6%
UH13A 12-2074	C1/2-DP HC ID: RRO	02/06/12	02/07/12 FID3B	1.00 1.0	Diesel	2.7	10	< 10 U
					Motor Oil	3.3	21	24
					o-Terphenyl			88.4%
UH13B 12-2075	C3/4-DP HC ID: ---	02/06/12	02/07/12 FID3B	1.00 1.0	Diesel	2.8	11	< 11 U
					Motor Oil	3.4	22	< 22 U
					o-Terphenyl			94.1%

Reported in mg/kg (ppm)

EFV-Effective Final Volume in mL.
DL-Dilution of extract prior to analysis.
RL-Reporting limit.

Diesel quantitation on total peaks in the range from C12 to C24.
Motor Oil quantitation on total peaks in the range from C24 to C38.
HC ID: DRO/RRO indicate results of organics or additional hydrocarbons in ranges are not identifiable.

CLEANED TPHD SURROGATE RECOVERY SUMMARY

Matrix: Soil

QC Report No: UH13-Hart Crowser
Project: Terminal 2 Berth 205/206
15665-01

<u>Client ID</u>	<u>OTER</u>	<u>TOT OUT</u>
MB-020612	96.6%	0
LCS-020612	89.9%	0
LCSD-020612	88.1%	0
C1/2-DP	88.4%	0
C3/4-DP	94.1%	0

	LCS/MB LIMITS	QC LIMITS
(OTER) = o-Terphenyl	(50-150)	(50-150)

Prep Method: SW3546
Log Number Range: 12-2074 to 12-2075

TOTAL DIESEL RANGE HYDROCARBONS-EXTRACTION REPORT

Matrix: Soil
Date Received: 02/03/12

ARI Job: UH13
Project: Terminal 2 Berth 205/206
15665-01

ARI ID	Client ID	Client Amt	Final Vol	Basis	Prep Date
12-2074-020612MB1	Method Blank	10.0 g	1.00 mL	-	02/06/12
12-2074-020612LCS1	Lab Control	10.0 g	1.00 mL	-	02/06/12
12-2074-020612LCSD1	Lab Control Dup	100 g	1.00 mL	-	02/06/12
12-2074-UH13A	C1/2-DP	4.81 g	1.00 mL	D	02/06/12
12-2075-UH13B	C3/4-DP	4.64 g	1.00 mL	D	02/06/12

4
TPH METHOD BLANK SUMMARY

BLANK NO.

UH13MBS1

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

SDG No.: UH13

Project No.: TERMINAL 2 BERTH 205/206G

Date Extracted: 02/06/12

Matrix: SOLID

Date Analyzed : 02/07/12

Instrument ID : FID3B

Time Analyzed : 1723

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS, and MSD:

	CLIENT SAMPLE NO. =====	LAB SAMPLE ID =====	DATE ANALYZED =====
01	UH13LCSS1	UH13LCSS1	02/07/12
02	UH13LCSDS1	UH13LCSDS1	02/07/12
03	C1/2-DP	UH13A	02/07/12
04	C3/4-DP	UH13B	02/07/12
05			

6a
DIESEL INITIAL CALIBRATION

Lab Name: ANALYTICAL RESOURCES, INC.

Client: HART CROWSER

Instrument: FID3B.I

Project: TERMINAL 2 BERTH 205/2

Calibration Date: 06-FEB-2012

SDG No.: UH13

Diesel Range	RF1 50	RF2 100	RF3 250	RF4 500	RF5 1000	RF6 2500	Ave RF	%RSD
WA Diesel	12919	13265	12330	12089	11476	14583	12777	8.5
AK Diesel	17273	16635	15009	14498	13725	16832	15662	9.2
OR Diesel	17644	16884	15083	14566	13791	16894	15810	9.7
Cal Diesel	17220	16499	14947	14441	13682	16784	15596	9.2
o-Terph	16603	15552	14464	13913	13099	*****	14726	9.35

<- Indicates %RSD outside limits
Surrogate areas are not included in Diesel RF calculation.

Quant Ranges : WA Diesel C12-C24 (4.251-8.590)
 AK Diesel C10-C25 (3.233-8.958)
 OR Diesel C10-C28 (3.233-9.996)
 Cal Diesel C10-C24 (3.233-8.590)

Calibration Files Analysis Time

0206b013.d	06-FEB-2012 14:56
0206b012.d	06-FEB-2012 14:29
0206b011.d	06-FEB-2012 14:02
0206b010.d	06-FEB-2012 13:35
0206b009.d	06-FEB-2012 13:08
0206b008.d	06-FEB-2012 12:41

UH13:00153

6a
NW MOTOR OIL RANGE INITIAL CALIBRATION

Lab Name: ANALYTICAL RESOURCES, INC.

Client: HART CROWSER

Instrument: FID3B.I

Project: TERMINAL 2 BERTH 205/2

Calibration Date: 06-FEB-2012

SDG No.: UH13

Product Range	RF1 100	RF2 250	RF3 500	RF4 1000	RF5 2500	RF6 5000	Ave RF	%RSD
WA M.Oil C24-C38	11354	11582	11673	11465	11254	10986	11386	2.2
Triac Surr	14710	15416	15940	15722	14828	*****	15323	3.53

<- Indicates %RSD outside limits
Surrogate areas are not included in Motor Oil RF calculation.

Calibration Files Analysis Time

0206b020.d	06-FEB-2012 18:05
0206b019.d	06-FEB-2012 17:39
0206b018.d	06-FEB-2012 17:12
0206b017.d	06-FEB-2012 16:45
0206b016.d	06-FEB-2012 16:18
0206b015.d	06-FEB-2012 15:51

7a
DIESEL CONTINUING CALIBRATION VERIFICATION

Lab Name: ANALYTICAL RESOURCES, INC. Client: HART CROWSER
 ICal Date: 06-FEB-2012 Project: TERMINAL 2 BERTH 20
 CCal Date: 07-FEB-2012 SDG No.: UH13
 Analysis Time: 16:28 Lab ID: DIESEL #2
 Instrument: FID3B.I Lab File Name: 0207b019.d

Diesel Range	Area*	CalcAmt	NomAmt	% D
WADies (C12-C24)	3175050	248.5	250	-0.6
AK102 (C10-C25)	3874145	247.4	250	-1.1
Terphenyl	697247	47.3	45	5.2

* Surrogate areas are subtracted from range areas
 <- Indicates a %D outside QC limits

Quant Ranges : WA Diesel C12-C24
 AK Diesel C10-C25

MOTOR OIL CONTINUING CALIBRATION VERIFICATION

Lab Name: ANALYTICAL RESOURCES, INC.

Client: HART CROWSER

ICal Date: 06-FEB-2012

Project: TERMINAL 2 BERTH 20

CCal Date: 07-FEB-2012

SDG No.: UH13

Analysis Time: 16:55

Lab ID: MOIL #2

Instrument: FID3B.I

Lab File Name: 0207b020.d

M.oil Range	Area*	CalcAmnt	NomAmnt	% D
WAMoil (C24-C38)	5646019	495.9	500	-0.8
AK103 (C25-C36)	4843278	554.9	500	11.0
n-Triacontane	732380	47.8	45	6.2

* Surrogate areas are subtracted from range areas
 <- Indicates a %D outside QC limits

Quant Ranges : WA M.Oil C24-C38
 AK M.Oil C25-C36

7a
DIESEL CONTINUING CALIBRATION VERIFICATION

Lab Name: ANALYTICAL RESOURCES, INC.

Client: HART CROWSER

ICal Date: 06-FEB-2012

Project: TERMINAL 2 BERTH 20

CCal Date: 07-FEB-2012

SDG No.: UH13

Analysis Time: 21:50

Lab ID: DIESEL #3

Instrument: FID3B.I

Lab File Name: 0207b031.d

Diesel Range	Area*	CalcAmnt	NomAmnt	% D
WADies (C12-C24)	3241497	253.7	250	1.5
AK102 (C10-C25)	3920031	250.3	250	0.1
Terphenyl	699220	47.5	45	5.5

* Surrogate areas are subtracted from range areas
 <- Indicates a %D outside QC limits

Quant Ranges : WA Diesel C12-C24
 AK Diesel C10-C25

7a
MOTOR OIL CONTINUING CALIBRATION VERIFICATION

Lab Name: ANALYTICAL RESOURCES, INC. Client: HART CROWSER
 ICal Date: 06-FEB-2012 Project: TERMINAL 2 BERTH 20
 CCal Date: 07-FEB-2012 SDG No.: UH13
 Analysis Time: 22:16 Lab ID: MOIL #3
 Instrument: FID3B.I Lab File Name: 0207b032.d

M.oil Range	Area*	CalcAmnt	NomAmnt	% D
WAMoil (C24-C38)	5683549	499.2	500	-0.2
AK103 (C25-C36)	4864919	557.4	500	11.5
n-Triacontane	736929	48.1	45	6.9

* Surrogate areas are subtracted from range areas
 <- Indicates a %D outside QC limits

Quant Ranges : WA M.Oil C24-C38
 AK M.Oil C25-C36

8
TPH ANALYTICAL SEQUENCE

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

SDG No.: UH13

Project: TERMINAL 2 BERTH 205/206

Instrument ID: FID3B

GC Column: RTX-1

Run Date: 02/06/12

THE ANALYTICAL SEQUENCE OF BLANKS, SAMPLES, AND STANDARDS,
IS GIVEN BELOW:

SURROGATE RT FROM DAILY STANDARD					
		TERPH: 6.48	TRIAC: 10.65		
CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED	TERPH RT #	TRIAC RT #

01	RINSE	02/06/12	0929	6.48	10.65
02	RT	02/06/12	0955	6.48	10.65
03	IB	02/06/12	1022	6.48	10.65
04	DIESEL #1	02/06/12	1049	6.49	10.66
05	MOIL #1	02/06/12	1116	6.49	10.66
06	DIESEL #1	02/06/12	1144	6.49	10.67
07	MOIL #1	02/06/12	1211	6.49	10.66
08	DIESEL 2500	02/06/12	1241		10.64
09	DIESEL 1000	02/06/12	1308	6.51	10.66
10	DIESEL 500	02/06/12	1335	6.50	10.66
11	DIESEL 250	02/06/12	1402	6.49	10.66
12	DIESEL 100	02/06/12	1429	6.48	10.67
13	DIESEL 50	02/06/12	1456	6.48	10.65
14	DIESEL ICV	02/06/12	1523	6.49	10.64
15	MOIL 5000	02/06/12	1551	6.49	
16	MOIL 2500	02/06/12	1618	6.48	10.71*
17	MOIL 1000	02/06/12	1645	6.49	10.68
18	MOIL 500	02/06/12	1712	6.48	10.66
19	MOIL 250	02/06/12	1739	6.48	10.65
20	MOIL 100	02/06/12	1805	6.49	10.64
21	MOIL ICV	02/06/12	1832	6.48	10.65

TERPH = o-terph
TRIAC = Triacon Surr

QC LIMITS
(+/- 0.05 MINUTES)
(+/- 0.05 MINUTES)

* Values outside of QC limits.

8
TPH ANALYTICAL SEQUENCE

Lab Name: ANALYTICAL RESOURCES INC
SDG No.: UH13
Instrument ID: FID3B
Run Date: 02/06/12

Client: HART CROWSER
Project: TERMINAL 2 BERTH 205/206GROU
GC Column: RTX-1

THE ANALYTICAL SEQUENCE OF BLANKS, SAMPLES, AND STANDARDS,
IS GIVEN BELOW:

SURROGATE RT FROM DAILY STANDARD						
		TERPH: 6.48		TRIAC: 10.65		
CLIENT	LAB	DATE	TIME	TERPH	TRIAC	
SAMPLE NO.	SAMPLE ID	ANALYZED	ANALYZED	RT #	RT #	
=====	=====	=====	=====	=====	=====	=====
01	ZZZZZ	ZZZZZ	02/07/12	0756	6.47	10.64
02		RT	02/07/12	0822	6.48	10.65
03		IB	02/07/12	0848	6.48	10.65
04	ZZZZZ	ZZZZZ	02/07/12	0914	6.49	10.65
05	ZZZZZ	ZZZZZ	02/07/12	0941	6.49	10.66
06	ZZZZZ	ZZZZZ	02/07/12	1033	6.48	10.65
07	ZZZZZ	ZZZZZ	02/07/12	1059	6.48	10.65
08	ZZZZZ	ZZZZZ	02/07/12	1126	6.49	10.65
09	ZZZZZ	ZZZZZ	02/07/12	1153	6.48	10.65
10	ZZZZZ	ZZZZZ	02/07/12	1220	6.48	10.65
11	ZZZZZ	ZZZZZ	02/07/12	1247	6.48	10.65
12	ZZZZZ	ZZZZZ	02/07/12	1315	6.49	10.65
13	ZZZZZ	ZZZZZ	02/07/12	1342	6.49	10.65
14	ZZZZZ	ZZZZZ	02/07/12	1410	6.48	10.65
15	ZZZZZ	ZZZZZ	02/07/12	1438	6.49	10.66
16	ZZZZZ	ZZZZZ	02/07/12	1505	6.48	10.65
17	ZZZZZ	ZZZZZ	02/07/12	1533	6.48	10.65
18	ZZZZZ	ZZZZZ	02/07/12	1600	6.49	10.66
19	TERMINAL 2 B	DIESEL #2	02/07/12	1628	6.49	10.65
20	TERMINAL 2 B	MOIL #2	02/07/12	1655	6.48	10.66
21	UH13MBS1	UH13MBS1	02/07/12	1723	6.48	10.65
22	UH13LCSS1	UH13LCSS1	02/07/12	1750	6.49	10.65
23	UH13LCSDS1	UH13LCSDS1	02/07/12	1816	6.49	10.65
24	ZZZZZ	ZZZZZ	02/07/12	1843	6.48	10.65
25	C1/2-DP	UH13A	02/07/12	1910	6.48	10.65
26	C3/4-DP	UH13B	02/07/12	1937	6.49	10.65
27	ZZZZZ	ZZZZZ	02/07/12	2004	6.49	10.65
28	ZZZZZ	ZZZZZ	02/07/12	2030	6.49	10.65
29	ZZZZZ	ZZZZZ	02/07/12	2057	6.49	10.65
30	ZZZZZ	ZZZZZ	02/07/12	2124	6.48	10.65
31	TERMINAL 2 B	DIESEL #3	02/07/12	2150	6.48	10.65
32	TERMINAL 2 B	MOIL #3	02/07/12	2216	6.49	10.66

QC LIMITS
TERPH = o-terph (+/- 0.05 MINUTES)
TRIAC = Triacon Surr (+/- 0.05 MINUTES)

* Values outside of QC limits.

**Metals Analysis
Report and Summary QC Forms**

ARI Job ID: UH13

Cover Page

INORGANIC ANALYSIS DATA PACKAGE



CLIENT: Hart Crowser

PROJECT: Terminal 2 Berth 205

SDG: UH13

CLIENT ID	ARI ID	ARI LIMS ID	REPREP
C1/2-DP	UH13A	12-2074	
C1/2-DPD	UH13ADUP	12-2074	
C1/2-DPS	UH13ASPK	12-2074	
C3/4-DP	UH13B	12-2075	
PBS	UH13MB1	12-2075	
LCSS	UH13MB1SPK	12-2075	

Were ICP interelement corrections applied ? Yes/No YES
Were ICP background corrections applied ? Yes/No YES
If yes - were raw data generated before
application of background corrections ? Yes/No NO

Comments: _____

THIS DATA PACKAGE HAS BEEN REVIEWED AND AUTHORIZED FOR RELEASE BY:

Signature: *Jay Kuhn, M.D. C.M.P.* Name: Jay Kuhn

Date: 2/10/12 Title: Inorganics Director



INORGANICS ANALYSIS DATA SHEET

TOTAL METALS


Page 1 of 1

Sample ID: C1/2-DP
SAMPLE

Lab Sample ID: UH13A

LIMS ID: 12-2074

Matrix: Soil

Data Release Authorized: 

Reported: 02/10/12

QC Report No: UH13-Hart Crowser

Project: Terminal 2 Berth 205/206
15665-01

Date Sampled: 02/02/12

Date Received: 02/03/12

Percent Total Solids: 49.2%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	MDL	RL	Result	Q
3050B	02/07/12	6010B	02/09/12	7440-36-0	Antimony	0.60	9	9	U
3050B	02/07/12	200.8	02/08/12	7440-38-2	Arsenic	0.18	0.4	3.9	
3050B	02/07/12	6010B	02/09/12	7440-43-9	Cadmium	0.21	0.4	0.6	
3050B	02/07/12	6010B	02/09/12	7440-47-3	Chromium	0.51	0.9	37.8	
3050B	02/07/12	6010B	02/09/12	7440-50-8	Copper	0.095	0.4	46.3	
3050B	02/07/12	6010B	02/09/12	7439-92-1	Lead	0.25	4	13	
CLP	02/07/12	7471A	02/09/12	7439-97-6	Mercury	0.0020	0.04	0.06	
3050B	02/07/12	6010B	02/09/12	7440-02-0	Nickel	0.57	2	28	
3050B	02/07/12	6010B	02/09/12	7440-22-4	Silver	0.057	0.6	0.6	U
3050B	02/07/12	6010B	02/09/12	7440-66-6	Zinc	0.23	2	104	

Reported in mg/kg-dry (ppm).

U-Analyte undetected at given RL

RL-Reporting Limit

INORGANICS ANALYSIS DATA SHEET

TOTAL METALS

Page 1 of 1

Sample ID: C3/4-DP
SAMPLE

Lab Sample ID: UH13B


QC Report No: UH13-Hart Crowser

LIMS ID: 12-2075

Project: Terminal 2 Berth 205/206

Matrix: Soil

15665-01

Data Release Authorized: 

Date Sampled: 02/02/12

Reported: 02/10/12

Date Received: 02/03/12

Percent Total Solids: 44.5%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	MDL	RL	Result	Q
3050B	02/07/12	6010B	02/09/12	7440-36-0	Antimony	0.69	10	10	U
3050B	02/07/12	200.8	02/08/12	7440-38-2	Arsenic	0.19	0.4	4.1	
3050B	02/07/12	6010B	02/09/12	7440-43-9	Cadmium	0.24	0.4	0.6	
3050B	02/07/12	6010B	02/09/12	7440-47-3	Chromium	0.58	1	38	
3050B	02/07/12	6010B	02/09/12	7440-50-8	Copper	0.11	0.4	47.6	
3050B	02/07/12	6010B	02/09/12	7439-92-1	Lead	0.28	4	13	
CLP	02/07/12	7471A	02/09/12	7439-97-6	Mercury	0.0025	0.05	0.07	
3050B	02/07/12	6010B	02/09/12	7440-02-0	Nickel	0.65	2	29	
3050B	02/07/12	6010B	02/09/12	7440-22-4	Silver	0.065	0.6	0.6	U
3050B	02/07/12	6010B	02/09/12	7440-66-6	Zinc	0.26	2	107	

Reported in mg/kg-dry (ppm).

U-Analyte undetected at given RL

RL-Reporting Limit

INORGANICS ANALYSIS DATA SHEET

TOTAL METALS

Page 1 of 1

Sample ID: C1/2-DP

MATRIX SPIKE

Lab Sample ID: UH13A

QC Report No: UH13-Hart Crowser

LIMS ID: 12-2074

Project: Terminal 2 Berth 205/206

Matrix: Soil

15665-01

Data Release Authorized:

Date Sampled: 02/02/12

Reported: 02/10/12

Date Received: 02/03/12

MATRIX SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Spike	Spike Added	% Recovery	Q
Antimony	6010B	9 U	82	379	21.6%	N
Arsenic	200.8	3.9	49.5	50.4	90.5%	
Cadmium	6010B	0.6	94.4	94.7	99.0%	
Chromium	6010B	37.8	128	94.7	95.2%	
Copper	6010B	46.3	137	94.7	95.8%	
Lead	6010B	13	370	379	94.2%	
Mercury	7471A	0.06	0.44	0.394	96.4%	
Nickel	6010B	28	113	94.7	89.8%	
Silver	6010B	0.6 U	89.2	94.7	94.2%	
Zinc	6010B	104	189	94.7	89.8%	

Reported in mg/kg-dry

N-Control Limit Not Met

H-% Recovery Not Applicable, Sample Concentration Too High

NA-Not Applicable, Analyte Not Spiked

Percent Recovery Limits: 75-125%

INORGANICS ANALYSIS DATA SHEET

TOTAL METALS

Page 1 of 1

Sample ID: C1/2-DP
DUPLICATE

Lab Sample ID: UH13A


QC Report No: UH13-Hart Crowser

LIMS ID: -12-2074

Project: Terminal 2 Berth 205/206

Matrix: Soil

15665-01

Data Release Authorized: 

Date Sampled: 02/02/12

Reported: 02/10/12

Date Received: 02/03/12

MATRIX DUPLICATE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Duplicate	RPD	Control Limit	Q
Antimony	6010B	9 U	9 U	0.0%	+/- 9	L
Arsenic	200.8	3.9	4.1	5.0%	+/- 20%	
Cadmium	6010B	0.6	0.6	0.0%	+/- 0.4	L
Chromium	6010B	37.8	35.8	5.4%	+/- 20%	
Copper	6010B	46.3	46.1	0.4%	+/- 20%	
Lead	6010B	13	14	7.4%	+/- 4	L
Mercury	7471A	0.06	0.06	0.0%	+/- 0.04	L
Nickel	6010B	28	27	3.6%	+/- 20%	
Silver	6010B	0.6 U	0.6 U	0.0%	+/- 0.6	L
Zinc	6010B	104	105	1.0%	+/- 20%	

Reported in mg/kg-dry

*-Control Limit Not Met

L-RPD Invalid, Limit = Detection Limit

INORGANICS ANALYSIS DATA SHEET

TOTAL METALS

Page 1 of 1

Sample ID: LAB CONTROL

Lab Sample ID: UH13LCS


QC Report No: UH13-Hart Crowser

LIMS ID: 12-2075

Project: Terminal-2 Berth 205/206

Matrix: Soil

15665-01

Data Release Authorized: 

Date Sampled: NA

Reported: 02/10/12

Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike Found	Spike Added	% Recovery	Q
Antimony	6010B	201	200	100%	
Arsenic	200.8	27.7	25.0	111%	
Cadmium	6010B	49.9	50.0	99.8%	
Chromium	6010B	50.6	50.0	101%	
Copper	6010B	50.1	50.0	100%	
Lead	6010B	195	200	97.5%	
Mercury	7471A	0.54	0.50	108%	
Nickel	6010B	47	50	94.0%	
Silver	6010B	50.7	50.0	101%	
Zinc	6010B	48	50	96.0%	

Reported in mg/kg-dry

N-Control limit not met

NA-Not Applicable, Analyte Not Spiked

Control Limits: 80-120%

INORGANICS ANALYSIS DATA SHEET

TOTAL METALS

Sample ID: METHOD BLANK

Page 1 of 1

Lab Sample ID: UH13MB

QC Report No: UH13-Hart Crowser

LIMS ID: 12-2075

- Project: Terminal 2-Berth 205/206

Matrix: Soil

15665-01

Data Release Authorized:

Date Sampled: NA

Reported: 02/10/12

Date Received: NA

Percent Total Solids: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	MDL	RL	Result	Q
3050B	02/07/12	6010B	02/09/12	7440-36-0	Antimony	0.32	5	5	U
3050B	02/07/12	200.8	02/08/12	7440-38-2	Arsenic	0.087	0.2	0.2	U
3050B	02/07/12	6010B	02/09/12	7440-43-9	Cadmium	0.11	0.2	0.2	U
3050B	02/07/12	6010B	02/09/12	7440-47-3	Chromium	0.27	0.5	0.5	U
3050B	02/07/12	6010B	02/09/12	7440-50-8	Copper	0.050	0.2	0.2	U
3050B	02/07/12	6010B	02/09/12	7439-92-1	Lead	0.13	2	2	U
CLP	02/07/12	7471A	02/09/12	7439-97-6	Mercury	0.0013	0.02	0.02	U
3050B	02/07/12	6010B	02/09/12	7440-02-0	Nickel	0.30	1	1	U
3050B	02/07/12	6010B	02/09/12	7440-22-4	Silver	0.030	0.3	0.3	U
3050B	02/07/12	6010B	02/09/12	7440-66-6	Zinc	0.12	1	1	U

Reported in mg/kg (ppm).

U-Analyte undetected at given RL

RL-Reporting Limit

Calibration Verification



CLIENT: Hart Crowser

PROJECT: Terminal 2 Berth 205

UNITS: ug/L

SDG: UH13

ANALYTE	EL	M	RUN	ICVTV	ICV	%R	CCVTV	CCV1	%R	CCV2	%R	CCV3	%R	CCV4	%R	CCV5	%R
Antimony	SB	ICP	IP020971	2000.0	2039.24	102.0	2000.0	2080.55	104.0	2061.47	103.1	2033.57	101.7	2050.13	102.5	2045.74	102.3
Arsenic	AS	PMS	MS020811	50.0	51.72	103.4	50.0	50.53	101.1	49.88	99.8	48.89	97.8	49.66	99.3	48.09	96.2
Cadmium	CD	ICP	IP020971	1000.0	1038.74	103.9	1000.0	1054.97	105.5	1046.22	104.6	1050.96	105.1	1062.00	106.2	1042.99	104.3
Chromium	CR	ICP	IP020971	1000.0	1022.74	102.3	1000.0	1031.93	103.2	1012.64	101.3	1015.87	101.6	1014.18	101.4	1011.03	101.1
Copper	CU	ICP	IP020971	1000.0	1014.32	101.4	1000.0	1031.92	103.2	1019.97	102.0	1026.41	102.6	1031.03	103.1	1021.75	102.2
Lead	PB	ICP	IP020971	2000.0	2024.85	101.2	2000.0	2051.10	102.6	2012.13	100.6	2015.26	100.8	2032.14	101.6	2028.03	101.4
Mercury	HG	CVA	HG020901	8.0	8.22	102.8	4.0	4.23	105.8	4.26	106.5	4.23	105.8	4.25	106.3	4.26	106.5
Nickel	NI	ICP	IP020971	1000.0	1008.58	100.9	1000.0	1016.85	101.7	988.83	98.9	991.72	99.2	991.39	99.1	988.31	98.8
Silver	AG	ICP	IP020971	1000.0	1031.77	103.2	1000.0	1040.15	104.0	1020.67	102.1	1022.12	102.2	1174.97	117.5	1024.63	102.5
Zinc	ZN	ICP	IP020971	1000.0	995.35	99.5	1000.0	1005.97	100.6	982.29	98.2	984.71	98.5	983.22	98.3	980.06	98.0

Control Limits: Mercury 80-120; Other Metals 90-110

UH13:00169

Calibration Verification



CLIENT: Hart Crowser

PROJECT: Terminal 2 Berth 205

SDG: UH13

UNITS: ug/L

ANALYTE	EL	M	RUN	CCVTV	CCV6	%R	CCV7	%R	CCV8	%R	CCV9	%R	CCV10	%R	CCV11	%R
Antimony	SB	ICP	IP020971	2000.0	2054.84	102.7	2089.15	104.5	2069.41	103.5						
Arsenic	AS	PMS	MS020811	50.0	50.28	100.6	48.69	97.4	50.41	100.8	50.39	100.8	49.84	99.7	49.81	99.6
Cadmium	CD	ICP	IP020971	1000.0	1056.38	105.6	1062.99	106.3	1053.89	105.4						
Chromium	CR	ICP	IP020971	1000.0	1020.85	102.1	1026.09	102.6	1019.49	101.9						
Copper	CU	ICP	IP020971	1000.0	1028.76	102.9	1040.94	104.1	1025.57	102.6						
Lead	PB	ICP	IP020971	2000.0	2038.53	101.9	2074.83	103.7	2040.79	102.0						
Mercury	HG	CVA	HG020901	4.0	4.28	107.0										
Nickel	NI	ICP	IP020971	1000.0	1002.76	100.3	1009.44	100.9	1003.61	100.4						
Silver	AG	ICP	IP020971	1000.0	1037.37	103.7	1052.44	105.2	1034.53	103.5						
Zinc	ZN	ICP	IP020971	1000.0	988.93	98.9	998.38	99.8	993.50	99.4						

Control Limits: Mercury 80-120; Other Metals 90-110

UH13:00170

Calibration Verification



CLIENT: Hart Crowser

PROJECT: Terminal 2 Berth 205

UNITS: ug/L

SDG: UH13

ANALYTE	EL	M	RUN	CCVTV	CCV12	%R	CCV13	%R	CCV14	%R	CCV15	%R	CCV16	%R	CCV17	%R
Antimony	SB	ICP	IP020971	2000.0												
Arsenic	AS	PMS	MS020811	50.0	48.96	97.9										
Cadmium	CD	ICP	IP020971	1000.0												
Chromium	CR	ICP	IP020971	1000.0												
Copper	CU	ICP	IP020971	1000.0												
Lead	PB	ICP	IP020971	2000.0												
Mercury	HG	CVA	HG020901	4.0												
Nickel	NI	ICP	IP020971	1000.0												
Silver	AG	ICP	IP020971	1000.0												
Zinc	ZN	ICP	IP020971	1000.0												

Control Limits: Mercury 80-120; Other Metals 90-110

UH13:00171

CRDL Standard



CLIENT: Hart Crowser

PROJECT: Terminal 2 Berth 205

SDG: UH13

UNITS: ug/L

ANALYTE	EL	M	RUN	CRA/I TV	CR-1	%R	CR-2	%R	CR-3	%R	CR-4	%R	CR-5	%R	CR-6	%R
Antimony	SB	ICP	IP020971	50.0	52.28	104.6	49.78	99.6								
Arsenic	AS	PMS	MS020811	0.2	0.20	100.0										
Cadmium	CD	ICP	IP020971	2.0	2.22	111.0	2.00	100.0								
Chromium	CR	ICP	IP020971	5.0	5.39	107.8	5.96	119.2								
Copper	CU	ICP	IP020971	2.0	2.37	118.5	2.08	104.0								
Lead	PB	ICP	IP020971	20.0	20.01	100.1	20.55	102.8								
Mercury	HG	CVA	HG020901	0.1	0.10	100.0										
Nickel	NI	ICP	IP020971	10.0	10.45	104.5	10.14	101.4								
Silver	AG	ICP	IP020971	3.0	3.08	102.7	3.18	106.0								
Zinc	ZN	ICP	IP020971	10.0	9.39	93.9	9.36	93.6								

Control Limits: no control limits have been established by the EPA at this time.

UH13:00172

Calibration Blanks



CLIENT: Hart Crowser

PROJECT: Terminal 2 Berth 205

SDG: UH13

UNITS: ug/L

ANALYTE	EL	METH	RUN	CRDL	IDL	ICB	C	CCB1	C	CCB2	C	CCB3	C	CCB4	C	CCB5	C
Antimony	SB	ICP	IP020971	60.0	50.0	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U
Arsenic	AS	PMS	MS020811	10.0	0.2	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Cadmium	CD	ICP	IP020971	5.0	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
Chromium	CR	ICP	IP020971	10.0	5.0	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
Copper	CU	ICP	IP020971	25.0	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
Lead	PB	ICP	IP020971	3.0	20.0	20.0	U	20.0	U	20.0	U	20.0	U	20.0	U	20.0	U
Mercury	HG	CVA	HG020901	0.2	0.1	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U
Nickel	NI	ICP	IP020971	40.0	10.0	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U
Silver	AG	ICP	IP020971	10.0	3.0	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U
Zinc	ZN	ICP	IP020971	20.0	10.0	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U

UH13:00173

Calibration Blanks



CLIENT: Hart Crowser

PROJECT: Terminal 2 Berth 205

SDG: UH13

UNITS: ug/L

ANALYTE	EL	METH	RUN	CRDL	IDL	CCB6	C	CCB7	C	CCB8	C	CCB9	C	CCB10	C	CCB11	C
Antimony	SB	ICP	IP020971	60.0	50.0	50.0	U	50.0	U	50.0	U						
Arsenic	AS	PMS	MS020811	10.0	0.2	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Cadmium	CD	ICP	IP020971	5.0	2.0	2.0	U	2.0	U	2.0	U						
Chromium	CR	ICP	IP020971	10.0	5.0	5.0	U	5.0	U	5.0	U						
Copper	CU	ICP	IP020971	25.0	2.0	2.0	U	2.0	U	2.0	U						
Lead	PB	ICP	IP020971	3.0	20.0	20.0	U	20.0	U	20.0	U						
Mercury	HG	CVA	HG020901	0.2	0.1	0.1	U										
Nickel	NI	ICP	IP020971	40.0	10.0	10.0	U	10.0	U	10.0	U						
Silver	AG	ICP	IP020971	10.0	3.0	3.0	U	3.0	U	3.0	U						
Zinc	ZN	ICP	IP020971	20.0	10.0	10.0	U	10.0	U	10.0	U						

UH13: 00174

Calibration Blanks



CLIENT: Hart Crowser

PROJECT: Terminal 2 Berth 205

SDG: UH13

UNITS: ug/L

ANALYTE	EL	METH	RUN	CRDL	IDL	CCB12	C	CCB13	C	CCB14	C	CCB15	C	CCB16	C	CCB17	C
Antimony	SB	ICP	IP020971	60.0	50.0												
Arsenic	AS	PMS	MS020811	10.0	0.2	0.2	U										
Cadmium	CD	ICP	IP020971	5.0	2.0												
Chromium	CR	ICP	IP020971	10.0	5.0												
Copper	CU	ICP	IP020971	25.0	2.0												
Lead	PB	ICP	IP020971	3.0	20.0												
Mercury	HG	CVA	HG020901	0.2	0.1												
Nickel	NI	ICP	IP020971	40.0	10.0												
Silver	AG	ICP	IP020971	10.0	3.0												
Zinc	ZN	ICP	IP020971	20.0	10.0												

UH13:00175

ICP Interference Check Sample



CLIENT: Hart Crowser

ICS SOURCE: I.V.

PROJECT: Terminal 2 Berth 205

RUNID: IP020971

SDG: UH13

INSTRUMENT ID: OPTIMA ICP 2

UNITS: ug/L

ANALYTE	ICSA TV	ICSAB TV	ICSA1	ICSAB1	%R	ICSA2	ICSAB2	%R	ICSA3	ICSAB3	%R
Aluminum	200000	200000	195685.5	196134.2	98.1	195613.5	195673.4	97.8			
Antimony		1000	-9.0	949.1	94.9	-12.4	944.3	94.4			
Arsenic		1000	6.1	1017.1	101.7	7.7	1011.4	101.1			
Barium		1000	0.8	1006.3	100.6	1.1	1000.9	100.1			
Beryllium		1000	0.0	985.4	98.5	0.0	980.1	98.0			
Boron			-10.4	-10.2		-10.0	-10.6				
Cadmium		1000	2.0	1038.1	103.8	2.1	1041.2	104.1			
Calcium	100000	100000	101799.3	100840.9	100.8	101744.1	100702.7	100.7			
Chromium		1000	0.1	1021.5	102.2	0.8	1014.8	101.5			
Cobalt		1000	1.5	967.4	96.7	1.7	969.1	96.9			
Copper		1000	-2.9	1064.8	106.5	-2.8	1069.7	107.0			
Iron	200000	200000	196151.0	195231.6	97.6	196813.2	194306.6	97.2			
Lead		1000	0.1	1010.0	101.0	0.2	1007.4	100.7			
Magnesium	100000	100000	100829.9	96598.9	96.6	100728.8	96341.0	96.3			
Manganese		1000	0.2	949.4	94.9	0.4	942.3	94.2			
Molybdenum			6.8	7.1		7.1	6.8				
Nickel		1000	0.4	956.5	95.7	0.4	954.3	95.4			
Potassium			60.4	242.5		46.4	247.2				
Selenium		1000	17.3	1025.6	102.6	16.8	1034.4	103.4			
Silicon			-16.4	-16.8		-15.2	-14.3				
Silver		1000	-1.1	1072.1	107.2	-1.0	1073.9	107.4			
Sodium			8.1	0.5		6.4	1.3				
Strontium			10.5	10.4		10.5	10.4				
Thallium		1000	14.9	982.3	98.2	16.2	979.3	97.9			
Tin			-14.3	-15.3		-14.3	-15.1				
Titanium			3.3	3.0		3.0	3.2				
Vanadium		1000	9.1	998.2	99.8	8.8	998.6	99.9			
Zinc		1000	-6.7	938.5	93.9	-6.3	931.8	93.2			

UH13:00176

ICP Interference Check Sample



CLIENT: Hart Crowser

ICS SOURCE: I.V.

PROJECT: Terminal 2 Berth 205

RUNID: MS020811

SDG: UH13

INSTRUMENT ID: NEXION 300D

UNITS: ug/L

ANALYTE	ICSA TV	ICSAB TV	ICSA1	ICSAB1	%R	ICSA2	ICSAB2	%R	ICSA3	ICSAB3	%R
Antimony			0.1	0.1							
Arsenic		20	0.0	18.9	94.5						
Cadmium		20	0.2	19.4	97.0						
Chromium		20	0.8	20.4	102.0						
Cobalt		20	0.0	18.7	93.5						
Copper		20	1.0	21.1	105.5						
Manganese		20	0.1	18.3	91.5						
Molybdenum	400	400	421.2	413.8	103.5						
Nickel		20	0.4	20.3	101.5						
Selenium			-0.1	-0.1							
Silver		20	0.0	19.3	96.5						
Vanadium			0.1	0.1							
Zinc		20	0.8	19.4	97.0						

UH13:00177

Post Digest Spike Sample Recovery



CLIENT: Hart Crowser

PROJECT: Terminal 2 Berth 205

ANALYSIS METHOD: ICP

SDG: UH13

UNITS: ug/L

ANALYTE	CLIENT ID	ARI ID	RUNID	SPIKED SAMPLE RESULT C	SAMPLE RESULT C	SPIKE ADDED	MATRIX	%R
Antimony	C1/2-DPA	UH13APOST	IP020971	4033.47	100.00U	4000	Soil	100.8

ICP Serial Dilutions



CLIENT: Hart Crowser

PROJECT: Terminal 2 Berth 205

ANALYSIS METHOD: ICP

SDG: UH13

UNITS: ug/L

ANALYTE	CLIENT ID	ARI ID	MATRIX	RUNID	INITIAL SAMPLE RESULT		SERIAL DILUTION RESULT		% DIFFERENCE	Q
					(I)	C	(S)	C		
Antimony	C1/2-DPL	UH13A-L	Soil	IP020971	50.00	U	250.00	U		
Cadmium	C1/2-DPL	UH13A-L	Soil	IP020971	2.97	B	10.00	U	100.0	
Chromium	C1/2-DPL	UH13A-L	Soil	IP020971	199.74		209.70		5.0	
Copper	C1/2-DPL	UH13A-L	Soil	IP020971	245.09		246.70		0.7	
Lead	C1/2-DPL	UH13A-L	Soil	IP020971	69.95		100.00	U	100.0	
Nickel	C1/2-DPL	UH13A-L	Soil	IP020971	149.47		154.35	B	3.3	
Silver	C1/2-DPL	UH13A-L	Soil	IP020971	3.00	U	15.00	U		
Zinc	C1/2-DPL	UH13A-L	Soil	IP020971	551.44		578.35		4.9	

ICP Serial Dilutions



CLIENT: Hart Crowser

PROJECT: Terminal 2 Berth 205

ANALYSIS METHOD: PMS

SDG: UH13

UNITS: ug/L

ANALYTE	CLIENT ID	ARI ID	MATRIX	RUNID	INITIAL SAMPLE RESULT (I)	C	SERIAL DILUTION RESULT (S)	C	% DIFFER- ENCE	Q
Arsenic	C1/2-DPL	UH13A-L	Soil	MS020811	1.96	B	2.15	B	9.7	

IDLs and ICP Linear Ranges



CLIENT: Hart Crowser

PROJECT: Terminal 2 Berth 205

SDG: UH13

UNITS: ug/L

ANALYTE	EL	METH	INSTRUMENT	WAVELENGTH (nm)	GFA BACK- GROUND	CLP CRDL	RL	RL DATE	ICP LINEAR RANGE (ug/L)	ICP LR DATE
Antimony	SB	ICP	OPTIMA ICP 2	206.84		60	50.0	4/1/2011	30000.0	8/3/2011
Arsenic	AS	PMS	NEXION 300D MS	0.00		10	0.2	4/1/2011		
Cadmium	CD	ICP	OPTIMA ICP 2	228.80		5	2.0	4/1/2011	20000.0	8/3/2011
Chromium	CR	ICP	OPTIMA ICP 2	267.72		10	5.0	4/1/2011	100000.0	8/3/2011
Copper	CU	ICP	OPTIMA ICP 2	324.75		25	2.0	4/1/2011	40000.0	8/3/2011
Lead	PB	ICP	OPTIMA ICP 2	220.35		3	20.0	4/1/2011	300000.0	8/3/2011
Mercury	HG	CVA	CETAC MERCURY	253.70		0.2	0.1	4/1/2011		
Nickel	NI	ICP	OPTIMA ICP 2	231.60		40	10.0	4/1/2011	100000.0	8/3/2011
Silver	AG	ICP	OPTIMA ICP 2	328.07		10	3.0	4/1/2011	5000.0	8/3/2011
Zinc	ZN	ICP	OPTIMA ICP 2	213.86		20	10.0	4/1/2011	100000.0	8/3/2011

ICP Interelement Correction Factors



CLIENT: Hart Crowser

PROJECT: Terminal 2 Berth 205

IEC DATE: 11/29/2011

SDG: UH13

INSTRUMENT ID: OPTIMA ICP 2

ANALYTE	WAVELENGTH	AL	AS	BA	BE	CA	CD	CO	CR	CU	FE
Aluminum	308.22	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
Antimony	206.84	0.3891270	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	10.6149000	0.000000	0.1208350
Arsenic	188.98	0.000000	0.000000	0.000000	0.000000	0.0339516	0.000000	-0.8345790	1.1215100	0.000000	0.000000
Barium	233.53	0.000000	0.000000	0.000000	0.000000	-0.0076716	0.000000	-0.1892080	0.000000	0.000000	0.0522067
Beryllium	313.04	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
Cadmium	228.80	0.000000	5.2418600	0.000000	0.000000	0.000000	0.000000	0.1195910	0.000000	0.000000	0.000000
Calcium	317.93	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.5252460	0.000000	0.000000
Chromium	267.72	0.000000	0.000000	0.000000	0.000000	0.0242504	0.000000	0.000000	0.000000	0.000000	-0.0377814
Cobalt	228.62	0.000000	0.000000	0.1238430	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
Copper	324.75	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	-0.2279050	-0.0318969	0.000000	-0.0584929
Iron	273.96	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	-1.6163900	0.000000	0.000000
Lead	220.35	-0.2018030	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	-2.3072100	1.2452600	0.0540270
Magnesium	279.08	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	-1.6380600	-1.2519300	0.000000	0.5652870
Manganese	257.61	0.0071394	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	-0.0051324
Molybdenum	202.03	0.000000	0.000000	0.000000	0.000000	0.0123608	0.000000	0.000000	0.000000	0.000000	0.000000
Nickel	231.60	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
Potassium	766.49	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
Selenium	196.03	-0.2053280	0.000000	0.000000	0.000000	0.000000	0.000000	0.3514040	0.000000	0.000000	-0.1233420
Silicon	288.16	0.000000	0.000000	0.000000	0.000000	0.000000	-3.4885200	0.000000	0.000000	0.000000	0.000000
Silver	328.07	0.000000	0.000000	0.000000	0.000000	0.0108199	0.000000	0.000000	0.000000	0.000000	0.000000
Sodium	589.59	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
Thallium	190.80	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	1.7836600	0.3510820	0.000000	-0.1141760
Tin	189.93	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
Titanium	334.90	0.000000	0.000000	0.000000	0.000000	0.0387268	0.000000	0.000000	0.1632010	0.000000	0.000000
Vanadium	292.40	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	-3.9361800	0.000000	0.0730907
Zinc	206.20	0.000000	0.000000	0.000000	0.000000	0.0258303	0.000000	0.000000	-0.1475900	0.000000	0.000000

UH13:00182

ICP Interelement Correction Factors



CLIENT: Hart Crowser

PROJECT: Terminal 2 Berth 205

SDG: UH13

IEC DATE: 11/29/2011

INSTRUMENT ID: OPTIMA ICP 2

ANALYTE	WAVELENGTH	MG	MN	MO	NI	PB	SB	TI	TL	V	ZN
Aluminum	308.22	0.0000000	0.0000000	15.3131000	0.0000000	0.0000000	0.0000000	1.5167500	0.0000000	17.6996000	0.0000000
Antimony	206.84	0.0000000	0.0000000	0.0000000	-0.4730780	0.0000000	0.0000000	-0.8897510	0.0000000	-3.3546800	0.0000000
Arsenic	188.98	0.0000000	0.0000000	2.3330800	0.0000000	0.0000000	0.0000000	-5.4412000	0.0000000	0.0000000	0.0000000
Barium	233.53	0.0000000	0.0000000	0.0000000	0.0766262	0.0000000	0.0000000	0.0000000	0.0000000	0.6419380	0.0000000
Beryllium	313.04	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.2960780	0.0000000
Cadmium	228.80	0.0000000	0.0000000	0.0000000	-0.7324130	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Calcium	317.93	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.0405628	0.0000000	0.1395070	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.2773470	0.0000000
Cobalt	228.62	0.0000000	0.0000000	-0.1579570	0.1588330	0.0000000	0.0000000	1.8115900	0.0000000	0.0000000	0.0000000
Copper	324.75	0.0057432	0.0000000	0.2688440	0.0000000	0.0000000	0.0000000	0.2461180	0.0000000	0.0000000	0.0000000
Iron	273.96	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	8.4403600	0.0000000
Lead	220.35	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Magnesium	279.08	0.0000000	0.0000000	-4.6256200	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Manganese	257.61	0.0041261	0.0000000	0.0000000	0.0000000	-0.2175850	0.0000000	0.0000000	0.0000000	-0.0271775	0.0000000
Molybdenum	202.03	0.0107429	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Nickel	231.60	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-0.7744280	0.0000000	0.0000000	0.0000000	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0736777	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Silicon	288.16	0.0000000	0.0000000	-2.7358100	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Silver	328.07	0.0000000	0.2442620	0.2419260	0.0000000	0.0000000	0.0000000	-0.0470302	0.0000000	-0.2758080	0.0000000
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	242.4230000	0.0000000	0.0000000	18.1570000
Thallium	190.80	0.0000000	-1.4179000	1.9562000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	1.2892100	0.0000000
Tin	189.93	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-0.5848020	-0.3044710	0.0000000	0.0000000	0.0000000
Titanium	334.90	0.0000000	0.0000000	0.9873960	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Vanadium	292.40	0.0000000	-0.1398510	-0.6804250	0.0000000	0.0000000	0.0000000	0.6004670	0.0000000	0.0000000	0.0000000
Zinc	206.20	0.0000000	0.0000000	0.2377960	0.0000000	-0.0708227	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000

UH13:00183

Preparation Log



CLIENT: Hart Crowser

ANALYSIS METHOD: ICP

PROJECT: Terminal 2 Berth 205

ARI PREP CODE: SWC

SDG: UH13

PREPDATE: 2/7/2012

CLIENT ID	ARI ID	MASS (g)	INITIAL VOLUME (mL)	FINAL VOLUME (mL)
C1/2-DP	UH13A	1.075	0.0	50.0
C1/2-DPD	UH13ADUP	1.078	0.0	50.0
C1/2-DPS	UH13ASPK	1.073	0.0	50.0
C3/4-DP	UH13B	1.039	0.0	50.0
PBS	UH13MB1	1.000	0.0	50.0
LCSS	UH13MB1SPK	1.000	0.0	50.0

Preparation Log



CLIENT: Hart Crowser

ANALYSIS METHOD: PMS

PROJECT: Terminal 2 Berth 205

ARI PREP CODE: SWN

SDG: UH13

PREPDATE: 2/7/2012

CLIENT ID	ARI ID	MASS (g)	INITIAL VOLUME (mL)	FINAL VOLUME (mL)
C1/2-DP	UH13A	1.009	0.0	50.0
C1/2-DPD	UH13ADUP	1.010	0.0	50.0
C1/2-DPS	UH13ASPK	1.008	0.0	50.0
C3/4-DP	UH13B	1.053	0.0	50.0
PBS	UH13MB1	1.000	0.0	50.0
LCSS	UH13MB1SPK	1.000	0.0	50.0

Preparation Log



CLIENT: Hart Crowser

ANALYSIS METHOD: CVA

PROJECT: Terminal 2 Berth 205

ARI PREP CODE: SMM

SDG: UH13

PREPDATE: 2/7/2012

CLIENT ID	ARI ID	MASS (g)	INITIAL VOLUME (mL)	FINAL VOLUME (mL)
C1/2-DP	UH13A	0.259	0.0	50.0
C1/2-DPD	UH13ADUP	0.258	0.0	50.0
C1/2-DPS	UH13ASPK	0.258	0.0	50.0
C3/4-DP	UH13B	0.236	0.0	50.0
PBS	UH13MB1	0.200	0.0	50.0
LCSW	UH13MB1SPK	0.200	0.0	50.0

Analysis Run Log



CLIENT: Hart Crowser

PROJECT: Terminal 2 Berth 205

INSTRUMENT ID: OPTIMA ICP 2

START DATE: 2/9/2012

SDG: UH13

RUNID: IP020971 METHOD: ICP

END DATE: 2/9/2012

CLIENT ID	ARI ID	DIL.	TIME	%R	AG	AL	AS	B	BA	BE	CA	CD	CO	CR	CU	FE	HG	K	MG	MN	MO	NA	NI	PB	SB	SE	SI	SN	TI	TL	U	V	ZN		
S0	S0	1.00	10374		X							X		X	X									X	X	X							X		
S2	S2	1.00	10420									X		X	X																			X	
S3	S3	1.00	10434		X																			X	X									X	
S4	S4	1.00	10461																							X									
S5	S5	1.00	10482																																
ICV	ICV	1.00	10525		X							X		X	X									X	X	X								X	
ICB	ICB	1.00	10565		X							X		X	X									X	X	X								X	
CRI	CRII	1.00	11010		X							X		X	X									X	X	X								X	
ICSA	ICSAI	1.00	11052		X							X		X	X									X	X	X								X	
ICSAB	ICSABI	1.00	11093		X							X		X	X									X	X	X								X	
CCV	CCV1	1.00	11133		X							X		X	X									X	X	X								X	
CCB	CCB1	1.00	11173		X							X		X	X									X	X	X								X	
PBS	UH13MB1	2.00	11214		X							X		X	X									X	X	X								X	
C1/2-DPL	UH13A-L	10.00	11255		X							X		X	X									X	X	X								X	
C1/2-DP	UH13A	2.00	11295		X							X		X	X									X	X	X								X	
C1/2-DPD	UH13ADUP	2.00	11335		X							X		X	X									X	X	X								X	
C1/2-DPS	UH13ASPK	2.00	11375		X							X		X	X									X	X	X								X	
C1/2-DPA	UH13APOST	2.00	11405																							X									
C3/4-DP	UH13B	2.00	11435		X							X		X	X									X	X	X								X	
ZZZZZZ	UH16A	2.00	11475																																
ZZZZZZ	UH16B	2.00	11515																																
LCSS	UH13MB1SPK	2.00	11555		X							X		X	X									X	X	X								X	
CCV	CCV2	1.00	11595		X							X		X	X									X	X	X								X	
CCB	CCB2	1.00	12035		X							X		X	X									X	X	X								X	
ZZZZZZ	UH31MB2	5.00	12080																																
ZZZZZZ	UH31AtDUP	5.00	12123																																
ZZZZZZ	UH31At	5.00	12170																																
ZZZZZZ	UH31AtSPK	5.00	12213																																
ZZZZZZ	UG94B	1.00	12255																																
ZZZZZZ	UG94C	1.00	12300																																
ZZZZZZ	UG94D	1.00	12341																																
ZZZZZZ	UH11A	1.00	12383																																
ZZZZZZ	UH11ASPK	1.00	12424																																
ZZZZZZ	UH11MBSPK	1.00	12470																																
CCV	CCV3	1.00	12505		X							X		X	X									X	X	X								X	

UH13: 06187

Analysis Run Log



CLIENT: Hart Crowser

PROJECT: Terminal 2 Berth 205

INSTRUMENT ID: OPTIMA ICP 2

START DATE: 2/9/2012

SDG: UH13

RUNID: IP020971 METHOD: ICP

END DATE: 2/9/2012

CLIENT ID	ARI ID	DIL.	TIME	%R	AG	AL	AS	B	BA	BE	CA	CD	CO	CR	CU	FE	HG	K	MG	MN	MO	NA	NI	PB	SB	SE	SI	SN	TI	TL	U	V	ZN		
CCB	CCB3	1.00	12545		X									X	X	X																		X	
ZZZZZZ	UG94MB	1.00	12591																																
ZZZZZZ	UG94E	1.00	13032																																
ZZZZZZ	UG94F	1.00	13073																																
ZZZZZZ	UG94G	1.00	13114																																
ZZZZZZ	UG94H	1.00	13160																																
ZZZZZZ	UG94I	1.00	13201																																
ZZZZZZ	UG94ADUP	1.00	13242																																
ZZZZZZ	UG94A	1.00	13284																																
ZZZZZZ	UG94ASPK	1.00	13325																																
ZZZZZZ	UG94MBSPK	1.00	13371																																
CCV	CCV4	1.00	13410		X								X	X	X									X	X	X								X	
CCB	CCB4	1.00	13450		X								X	X	X									X	X	X									X
CCV	CCV5	1.00	13492		X								X	X	X									X	X	X									X
CCB	CCB5	1.00	13532		X								X	X	X									X	X	X									X
ZZZZZZ	UH16MB1	2.00	13573																																
ZZZZZZ	UH16H-L	10.00	14014																																
ZZZZZZ	UH16H	2.00	14054																																
ZZZZZZ	UH16HDUP	2.00	14095																																
ZZZZZZ	UH16HSPK	2.00	14141																																
ZZZZZZ	ZZZZZZ	2.00	14171																																
ZZZZZZ	UH16C	2.00	14201																																
ZZZZZZ	UH16D	2.00	14241																																
ZZZZZZ	UH16REF1	2.00	14281																																
ZZZZZZ	UH16MB1SPK	2.00	14321																																
CCV	CCV6	1.00	14361		X								X	X	X									X	X	X									X
CCB	CCB6	1.00	14401		X								X	X	X									X	X	X									X
ZZZZZZ	UH11MB	1.00	14442																																
ZZZZZZ	UG81MB	1.00	14483																																
ZZZZZZ	UG81A	1.00	14525																																
ZZZZZZ	UH16E	2.00	14570																																
ZZZZZZ	UH16F	2.00	15010																																
ZZZZZZ	UH16G	2.00	15051																																
ZZZZZZ	UH16I	2.00	15092																																
ZZZZZZ	UH16J	2.00	15134																																

UH13:00188

Analysis Run Log



CLIENT: Hart Crowser

PROJECT: Terminal 2 Berth 205

INSTRUMENT ID: OPTIMA ICP 2

START DATE: 2/9/2012

SDG: UH13

RUNID: IP020971 METHOD: ICP

END DATE: 2/9/2012

CLIENT ID	ARI ID	DIL.	TIME	%R	AG	AL	AS	B	BA	BE	CA	CD	CO	CR	CU	FE	HG	K	MG	MN	MO	NA	NI	PB	SB	SE	SI	SN	TI	TL	U	V	ZN	
ZZZZZZ	UG86MB1SPK	1.00	15174																															
ZZZZZZ	UG81MBSPK	1.00	15213																															
CCV	CCV7	1.00	15253		X							X		X	X									X	X	X								X
CCB	CCB7	1.00	15293		X							X		X	X									X	X	X								X
CRI	CRIF	1.00	15335		X							X		X	X									X	X	X								X
ICSA	ICSAF	1.00	15380		X							X		X	X									X	X	X								X
ICSAB	ICSABF	1.00	15421		X							X		X	X									X	X	X								X
CCV	CCV8	1.00	15461		X							X		X	X									X	X	X								X
CCB	CCB8	1.00	15501		X							X		X	X									X	X	X								X

UH13:00189

Analysis Run Log



CLIENT: Hart Crowser

PROJECT: Terminal 2 Berth 205

INSTRUMENT ID: NEXION 300D MS

START DATE: 2/8/2012

SDG: UH13

RUNID: MS020811 METHOD: PMS

END DATE: 2/8/2012

CLIENT ID	ARI ID	DIL.	TIME	%R	AG	AL	AS	B	BA	BE	CA	CD	CO	CR	CU	FE	HG	K	MG	MN	MO	NA	NI	PB	SB	SE	SI	SN	TI	TL	U	V	ZN
S0	S0	1.00	10330				X																										
S1	S1	1.00	10370				X																										
S2	S2	1.00	10410				X																										
S3	S3	1.00	10450				X																										
S4	S4	1.00	10500				X																										
S5	S5	1.00	10550																														
ZZZZZZ	Rinse sampl	1.00	11000																														
ICV	MICV	1.00	11110				X																										
ICB	ICB	1.00	11160				X																										
CCV	MCCV1	1.00	11200				X																										
CCB	CCB1	1.00	11250				X																										
CRI	MCRI	1.00	11290				X																										
ICSA	ICSAI	1.00	11340				X																										
ICSAB	ICSABI	1.00	11380				X																										
ZZZZZZ	LR200	1.00	11430																														
ZZZZZZ	LR300	1.00	11480																														
ZZZZZZ	B1	1.00	11540																														
CCV	MCCV2	1.00	11580				X																										
CCB	CCB2	1.00	12030				X																										
ZZZZZZ	UF78MB1	2.00	12100																														
ZZZZZZ	UF78MB1SPK	2.00	12140																														
ZZZZZZ	UF78A-L	10.00	12180																														
ZZZZZZ	UF78A	2.00	12220																														
ZZZZZZ	UF78ADUP	2.00	12260																														
ZZZZZZ	UF78ASPK	2.00	12310																														
ZZZZZZ	UF78E	2.00	12350																														
ZZZZZZ	UF78F	50.00	12390																														
ZZZZZZ	UF78F	2.00	12430																														
CCV	MCCV3	1.00	12480				X																										
CCB	CCB3	1.00	12530				X																										
ZZZZZZ	UH27MB1	2.00	13000																														
ZZZZZZ	UH27MB2	2.00	13040																														
ZZZZZZ	UH27MB1SPK	2.00	13090																														
ZZZZZZ	UH27MB2SPK	2.00	13130																														
ZZZZZZ	UH27ADUP	10.00	13170																														

UH13: 00190

Analysis Run Log



CLIENT: Hart Crowser

PROJECT: Terminal 2 Berth 205

INSTRUMENT ID: NEXION 300D MS

START DATE: 2/8/2012

SDG: UH13

RUNID: MS020811 METHOD: PMS

END DATE: 2/8/2012

CLIENT ID	ARI ID	DIL.	TIME	%R	AG	AL	AS	B	BA	BE	CA	CD	CO	CR	CU	FE	HG	K	MG	MN	MO	NA	NI	PB	SB	SE	SI	SN	TI	TL	U	V	ZN
ZZZZZZ	UH27A	10.00	13210																														
ZZZZZZ	UH27ASPK	10.00	13250																														
ZZZZZZ	ZZZZZZ	2.00	13290																														
ZZZZZZ	UH27C	2.00	13330																														
ZZZZZZ	UH27D	2.00	13380																														
CCV	MCCV4	1.00	13420																														
CCB	CCB4	1.00	13470																														
S0	S0	1.00	13520																														
CCV	MCCV5	1.00	13590																														
CCB	CCB5	1.00	14040																														
ZZZZZZ	UG14B	2.00	14080																														
ZZZZZZ	UG14M	2.00	14130																														
ZZZZZZ	UG14G	2.00	14170																														
ZZZZZZ	UG14R	2.00	14210																														
ZZZZZZ	UG14A	2.00	14250																														
ZZZZZZ	UG14L	2.00	14290																														
ZZZZZZ	UG14I	2.00	14330																														
ZZZZZZ	UG14T	2.00	14370																														
ZZZZZZ	ZZZZZZ	5.00	14420																														
ZZZZZZ	ZZZZZZ	5.00	14460																														
CCV	MCCV6	1.00	14510																														
CCB	CCB6	1.00	14550																														
ZZZZZZ	UG39MB1	2.00	15130																														
ZZZZZZ	UG39MB1SPK	2.00	15170																														
ZZZZZZ	UG39ADUP	2.00	15210																														
ZZZZZZ	UG39A	2.00	15250																														
ZZZZZZ	UG39ASPK	2.00	15290																														
ZZZZZZ	UG39B	2.00	15340																														
ZZZZZZ	UG39D	2.00	15380																														
ZZZZZZ	UG39H	2.00	15420																														
ZZZZZZ	UG71A	2.00	15460																														
ZZZZZZ	UH27B	2.00	15500																														
CCV	MCCV7	1.00	15550																														
CCB	CCB7	1.00	16000																														
ZZZZZZ	UG82MB1	2.00	16040																														

UH13:00191

Analysis Run Log



CLIENT: Hart Crowser

PROJECT: Terminal 2 Berth 205

INSTRUMENT ID: NEXION 300D MS

START DATE: 2/8/2012

SDG: UH13

RUNID: MS020811 METHOD: PMS

END DATE: 2/8/2012

CLIENT ID	ARI ID	DIL.	TIME	%R	AG	AL	AS	B	BA	BE	CA	CD	CO	CR	CU	FE	HG	K	MG	MN	MO	NA	NI	PB	SB	SE	SI	SN	TI	TL	U	V	ZN
ZZZZZZ	UG82MB1SPK	2.00	16080																														
ZZZZZZ	UG82ADUP	2.00	16120																														
ZZZZZZ	UG82A	2.00	16170																														
ZZZZZZ	UG82ASPK	2.00	16210																														
ZZZZZZ	UG82B	2.00	16250																														
ZZZZZZ	UG87A	20.00	16290																														
ZZZZZZ	UG87B	20.00	16330																														
ZZZZZZ	UG87C	20.00	16370																														
ZZZZZZ	UG87D	20.00	16410																														
CCV	MCCV8	1.00	16460																														
CCB	CCB8	1.00	16510																														
ZZZZZZ	UG87MB1	20.00	16550																														
ZZZZZZ	UG87MB1SPK	20.00	16590																														
ZZZZZZ	UG87REF1	20.00	17040																														
ZZZZZZ	UG87H-L	100.00	17080																														
ZZZZZZ	UG87H	20.00	17120																														
ZZZZZZ	UG87HDUP	20.00	17160																														
ZZZZZZ	UG87HSPK	20.00	17200																														
ZZZZZZ	ZZZZZZ	20.00	17240																														
ZZZZZZ	UG87F	20.00	17280																														
ZZZZZZ	UG87G	20.00	17330																														
CCV	MCCV9	1.00	17370																														
CCB	CCB9	1.00	17420																														
ZZZZZZ	UH01MB1	20.00	17460																														
ZZZZZZ	UH01MB1SPK	20.00	17510																														
ZZZZZZ	UH01F-L	100.00	17550																														
ZZZZZZ	UH01F	20.00	17590																														
ZZZZZZ	UH01FDUP	20.00	18030																														
ZZZZZZ	UH01FSPK	20.00	18070																														
ZZZZZZ	ZZZZZZ	20.00	18110																														
ZZZZZZ	UG87I	20.00	18150																														
ZZZZZZ	UG87J	20.00	18200																														
ZZZZZZ	UG87K	20.00	18240																														
CCV	MCCV10	1.00	18290																														
CCB	CCB10	1.00	18340																														

UH13: 00192

Analysis Run Log



CLIENT: Hart Crowser

PROJECT: Terminal 2 Berth 205

INSTRUMENT ID: CETAC MERCURY

START DATE: 2/9/2012

SDG: UH13

RUNID: HG020901 METHOD: CVA

END DATE: 2/9/2012

CLIENT ID	ARI ID	DIL.	TIME	%R	AG	AL	AS	B	BA	BE	CA	CD	CO	CR	CU	FE	HG	K	MG	MN	MO	NA	NI	PB	SB	SE	SI	SN	TI	TL	U	V	ZN
S0	S0	1.00	11104														X																
S0.1	S0.1	1.00	11122														X																
S0.5	S0.5	1.00	11135														X																
S1	S1	1.00	11153														X																
S2	S2	1.00	11171														X																
S5	S5	1.00	11185														X																
S10	S10	1.00	11202														X																
ICV	AICV	1.00	11244														X																
ICB	ICB	1.00	11261														X																
CCV	ACCV1	1.00	11275														X																
CCB	CCB1	1.00	11293														X																
CRA	CRA	1.00	11311														X																
ZZZZZZ	UH06MB1	1.00	11325																														
ZZZZZZ	UH06MB1SPK	1.00	11342																														
ZZZZZZ	UH06A	1.00	11360																														
ZZZZZZ	UH06B	1.00	11373																														
ZZZZZZ	UH06C	1.00	11391																														
ZZZZZZ	UH06D	1.00	11405																														
ZZZZZZ	UH06E	1.00	11422																														
ZZZZZZ	UH06F	1.00	11440																														
ZZZZZZ	UH06G	1.00	11454																														
CCV	ACCV2	1.00	11472														X																
CCB	CCB2	1.00	11490														X																
ZZZZZZ	UH06H	1.00	11504																														
ZZZZZZ	UH06I	1.00	11521																														
ZZZZZZ	UH06J	1.00	11535																														
ZZZZZZ	UH06K	1.00	11552																														
ZZZZZZ	UH06L	1.00	11570																														
ZZZZZZ	UH06M	1.00	11584																														
ZZZZZZ	UH06N	1.00	12001																														
ZZZZZZ	UH06O	1.00	12015																														
ZZZZZZ	UH06P	1.00	12033																														
ZZZZZZ	UH06Q	1.00	12051																														
CCV	ACCV3	1.00	12065														X																
CCB	CCB3	1.00	12083														X																

UH13: 00194

Analysis Run Log



CLIENT: Hart Crowser

PROJECT: Terminal 2 Berth 205

INSTRUMENT ID: CETAC MERCURY

START DATE: 2/9/2012

SDG: UH13

RUNID: HG020901 METHOD: CVA

END DATE: 2/9/2012

CLIENT ID	ARI ID	DIL.	TIME	%R	AG	AL	AS	B	BA	BE	CA	CD	CO	CR	CU	FE	HG	K	MG	MN	MO	NA	NI	PB	SB	SE	SI	SN	TI	TL	U	V	ZN
ZZZZZZ	UH06R	1.00	12100																														
ZZZZZZ	UH06S	1.00	12114																														
ZZZZZZ	UH06SDUP	1.00	12132																														
ZZZZZZ	UH06SSPK	1.00	12150																														
ZZZZZZ	UH06T	1.00	12163																														
ZZZZZZ	UH06REF1	5.00	12181																														
ZZZZZZ	UH16MB1	1.00	12194																														
ZZZZZZ	UH16MB1SPK	1.00	12212																														
ZZZZZZ	UH16A	1.00	12230																														
ZZZZZZ	UH16B	1.00	12243																														
CCV	ACCV4	1.00	12261																														
CCB	CCB4	1.00	12275																														
ZZZZZZ	UH16C	1.00	12293																														
ZZZZZZ	UH16D	1.00	12311																														
ZZZZZZ	UH16E	1.00	12325																														
ZZZZZZ	UH16F	1.00	12343																														
ZZZZZZ	UH16G	1.00	12361																														
ZZZZZZ	UH16H	1.00	12374																														
ZZZZZZ	UH16HDUP	1.00	12392																														
ZZZZZZ	UH16HSPK	1.00	12405																														
ZZZZZZ	UH16I	1.00	12423																														
ZZZZZZ	UH16J	1.00	12441																														
CCV	ACCV5	1.00	12455																														
CCB	CCB5	1.00	12473																														
ZZZZZZ	UH16REF1	5.00	12491																														
PBW	UH13MB1	1.00	12504																														
LCSW	UH13MB1SPK	1.00	12522																														
C1/2-DP	UH13A	1.00	12540																														
C1/2-DPD	UH13ADUP	1.00	12554																														
C1/2-DPS	UH13ASPK	1.00	12572																														
C3/4-DP	UH13B	1.00	12590																														
CCV	ACCV6	1.00	13004																														
CCB	CCB6	1.00	13022																														


UH13:00195

**General Chemistry Analysis
Report and Summary QC Forms**

ARI Job ID: UH13

SAMPLE RESULTS-CONVENTIONALS
UH13-Hart Crowser



Matrix: Soil
Data Release Authorized: 
Reported: 02/14/12

Project: Terminal 2 Berth 205/206
Event: 15665-01
Date Sampled: 02/02/12
Date Received: 02/03/12

Client ID: C1/2-DP
ARI ID: 12-2074 UH13A

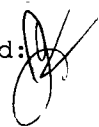
Analyte	Date	Method	Units	RL	Sample
Total Solids	02/03/12 020312#1	EPA 160.3	Percent	0.01	48.50
Preserved Total Solids	02/03/12 020312#1	EPA 160.3	Percent	0.01	43.20
N-Ammonia	02/06/12 020612#1	EPA 350.1M	mg-N/kg	3.75	206
Sulfide	02/09/12 020912#1	EPA 376.2	mg/kg	2.24	14.3
Total Organic Carbon	02/08/12 020812#1	Plumb,1981	Percent	0.020	2.40

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
UH13-Hart Crowser



Matrix: Soil
Data Release Authorized: 
Reported: 02/14/12

Project: Terminal 2 Berth 205/206
Event: 15665-01
Date Sampled: 02/02/12
Date Received: 02/03/12

Client ID: C3/4-DP
ARI ID: 12-2075 UH13B

Analyte	Date	Method	Units	RL	Sample
Total Solids	02/03/12 020312#1	EPA 160.3	Percent	0.01	47.20
Preserved Total Solids	02/03/12 020312#1	EPA 160.3	Percent	0.01	40.30
N-Ammonia	02/06/12 020612#1	EPA 350.1M	mg-N/kg	4.12	311
Sulfide	02/09/12 020912#1	EPA 376.2	mg/kg	2.48	27.9
Total Organic Carbon	02/08/12 020812#1	Plumb,1981	Percent	0.020	2.21

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
UH13-Hart Crowser



Matrix: Soil
Data Release Authorized:
Reported: 02/14/12

A handwritten signature in black ink, appearing to be 'G. J.', is written over the 'Data Release Authorized' text.

Project: Terminal 2 Berth 205/206
Event: 15665-01
Date Sampled: 02/02/12
Date Received: 02/03/12

Client ID: C1/2-N1
ARI ID: 12-2076 UH13C


Analyte	Date	Method	Units	RL	Sample
Total Solids	02/03/12 020312#1	EPA 160.3	Percent	0.01	57.70
Preserved Total Solids	02/03/12 020312#1	EPA 160.3	Percent	0.01	48.40
N-Ammonia	02/06/12 020612#1	EPA 350.1M	mg-N/kg	3.36	252
Sulfide	02/09/12 020912#1	EPA 376.2	mg/kg	4.07	47.6

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
UH13-Hart Crowser



Matrix: Soil
Data Release Authorized 
Reported: 02/14/12

Project: Terminal 2 Berth 205/206
Event: 15665-01
Date Sampled: 02/02/12
Date Received: 02/03/12

Client ID: C1/2-N2
ARI ID: 12-2077 UH13D


Analyte	Date	Method	Units	RL	Sample
Total Solids	02/03/12 020312#1	EPA 160.3	Percent	0.01	55.80
Preserved Total Solids	02/03/12 020312#1	EPA 160.3	Percent	0.01	51.80
N-Ammonia	02/06/12 020612#1	EPA 350.1M	mg-N/kg	3.49	269
Sulfide	02/09/12 020912#1	EPA 376.2	mg/kg	1.90	10.8

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
UH13-Hart Crowser



Matrix: Soil
Data Release Authorized: 
Reported: 02/14/12

Project: Terminal 2 Berth 205/206
Event: 15665-01
Date Sampled: 02/02/12
Date Received: 02/03/12

Client ID: C3/4-N1
ARI ID: 12-2078 UH13E

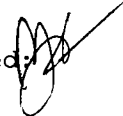
Analyte	Date	Method	Units	RL	Sample
Total Solids	02/03/12 020312#1	EPA 160.3	Percent	0.01	50.60
Preserved Total Solids	02/03/12 020312#1	EPA 160.3	Percent	0.01	46.20
N-Ammonia	02/06/12 020612#1	EPA 350.1M	mg-N/kg	3.80	274
Sulfide	02/09/12 020912#1	EPA 376.2	mg/kg	2.13	< 2.13 U

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
UH13-Hart Crowser



Matrix: Soil
Data Release Authorized: 
Reported: 02/14/12

Project: Terminal 2 Berth 205/206
Event: 15665-01
Date Sampled: 02/02/12
Date Received: 02/03/12

Client ID: C3/4-N2
ARI ID: 12-2079 UH13F

Analyte	Date	Method	Units	RL	Sample
Total Solids	02/03/12 020312#1	EPA 160.3	Percent	0.01	52.10
Preserved Total Solids	02/03/12 020312#1	EPA 160.3	Percent	0.01	46.80
N-Ammonia	02/06/12 020612#1	EPA 350.1M	mg-N/kg	3.68	285
Sulfide	02/09/12 020912#1	EPA 376.2	mg/kg	2.11	19.8

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
UH13-Hart Crowser



Matrix: Soil
Data Release Authorized
Reported: 02/14/12

A handwritten signature in black ink, appearing to be 'MS', written over the 'Data Release Authorized' text.

Project: Terminal 2 Berth 205/206
Event: 15665-01
Date Sampled: 02/01/12
Date Received: 02/03/12

Client ID: Reference 1
ARI ID: 12-2080 UH13G


Analyte	Date	Method	Units	RL	Sample
Total Solids	02/03/12 020312#1	EPA 160.3	Percent	0.01	59.50
Preserved Total Solids	02/03/12 020312#1	EPA 160.3	Percent	0.01	58.00
N-Ammonia	02/06/12 020612#1	EPA 350.1M	mg-N/kg	0.33	17.1
Sulfide	02/09/12 020912#1	EPA 376.2	mg/kg	1.70	< 1.70 U

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

MS/MSD RESULTS-CONVENTIONALS
UH13-Hart Crowser



Matrix: Soil
Data Release Authorized: 
Reported: 02/14/12

Project: Terminal 2 Berth 205/206
Event: 15665-01
Date Sampled: 02/02/12
Date Received: 02/03/12

Analyte	Date	Units	Sample	Spike	Spike Added	Recovery
ARI ID: UH13A Client ID: C1/2-DP						
N-Ammonia	02/06/12	mg-N/kg	206	403	200	98.7%
Sulfide	02/09/12	mg/kg	14.3	330	564	56.0%
Total Organic Carbon	02/08/12	Percent	2.40	4.77	2.64	89.7%

REPLICATE RESULTS-CONVENTIONALS
UH13-Hart Crowser



Matrix: Soil
Data Release Authorized
Reported: 02/14/12

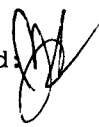
A handwritten signature in black ink, appearing to be 'J. Crowser', is written over the 'Data Release Authorized' text.

Project: Terminal 2 Berth 205/206
Event: 15665-01
Date Sampled: 02/02/12
Date Received: 02/03/12

Analyte	Date	Units	Sample	Replicate (s)	RPD/RSD
ARI ID: UH13A Client ID: C1/2-DP					
Total Solids	02/03/12	Percent	48.50	48.80 48.70	0.3%
Preserved Total Solids	02/03/12	Percent	43.20	43.10 43.10	0.1%
N-Ammonia	02/06/12	mg-N/kg	206	209 187	5.9%
Sulfide	02/09/12	mg/kg	14.3	19.6	31.3%
Total Organic Carbon	02/08/12	Percent	2.40	2.19 2.24	4.8%

LAB CONTROL RESULTS-CONVENTIONALS
UH13-Hart Crowser




Matrix: Soil
Data Release Authorized: 
Reported: 02/14/12

Project: Terminal 2 Berth 205/206
Event: 15665-01
Date Sampled: NA
Date Received: NA

Analyte/Method	QC ID	Date	Units	LCS	Spike Added	Recovery
Sulfide EPA 376.2	PREP	02/09/12	mg/kg	5.41	6.35	85.2%
Total Organic Carbon Plumb,1981	ICVL	02/08/12	Percent	0.092	0.100	92.0%

METHOD BLANK RESULTS-CONVENTIONALS
UH13-Hart Crowser




Matrix: Soil
Data Release Authorized: 
Reported: 02/14/12

Project: Terminal 2 Berth 205/206
Event: 15665-01
Date Sampled: NA
Date Received: NA

Analyte	Date	Units	Blank
Total Solids	02/03/12	Percent	< 0.01 U
Preserved Total Solids	02/03/12	Percent	< 0.01 U
N-Ammonia	02/06/12	mg-N/kg	< 0.10 U
Sulfide	02/09/12	mg/kg	< 1.00 U
Total Organic Carbon	02/08/12	Percent	< 0.020 U

STANDARD REFERENCE RESULTS-CONVENTIONALS
UH13-Hart Crowser



Matrix: Soil
Data Release Authorized: 
Reported: 02/14/12

Project: Terminal 2 Berth 205/206
Event: 15665-01
Date Sampled: NA
Date Received: NA

Analyte/SRM ID	Date	Units	SRM	True Value	Recovery
N-Ammonia ERA 160510	02/06/12	mg-N/kg	101	100	101.0%
Total Organic Carbon NIST 1941B	02/08/12	Percent	2.88	2.99	96.3%

**Geotechnical Analysis
Report and Summary QC Forms**

ARI Job ID: UH13

Hart Crowser
Terminal 2 Berth 205/206
15665-01

Apparent Grain Size Distribution Summary
Percent Finer Than Indicated Size

Sample No.	Gravel			Very Coarse Sand	Coarse Sand	Medium Sand	Fine Sand	Very Fine Sand	Silt				Clay	
	-3	-2	-1						0	1	2	3	4	5
Phi Size	-3	-2	-1	0	1	2	3	4	5	6	7	8	9	10
Sieve Size (microns)	3/8"	#4 (4750)	#10 (2000)	#18 (1000)	#35 (500)	#60 (250)	#120 (125)	#230 (63)	31.00	15.60	7.80	3.90	2.00	1.00
C1/2-DP	100.0	100.0	100.0	99.0	98.1	97.0	93.2	80.7	56.5	35.4	24.5	17.0	11.6	7.0
	100.0	100.0	100.0	99.3	98.0	96.9	92.9	80.5	55.5	34.8	23.9	16.0	11.2	6.7
	100.0	100.0	100.0	99.1	98.3	97.2	93.3	80.8	58.0	36.9	25.3	17.1	12.1	7.3
C3/4-DP	100.0	100.0	100.0	99.0	98.0	97.2	93.2	81.1	55.9	34.8	22.6	14.1	9.8	5.9

Notes to the Testing:

1. Organic matter was not removed prior to testing, thus the reported values are the "apparent" grain size distribution. See narrative for discussion of the testing.

UH13:00210

Hart Crowser
Terminal 2 Berth 205/206
15665-01

Apparent Grain Size Distribution Summary
Percent Retained in Each Size Fraction

Sample No.	Gravel	Very Coarse Sand	Coarse Sand	Medium Sand	Fine Sand	Very Fine Sand	Coarse Silt	Medium Silt	Fine Silt	Very Fine Silt	Clay			Total Fines
											8 to 9	9 to 10	< 10	
Phi Size	> -1	-1 to 0	0 to 1	1 to 2	2 to 3	3 to 4	4 to 5	5 to 6	6 to 7	7 to 8	8 to 9	9 to 10	< 10	<4
Sieve Size (microns)	> #10 (2000)	10 to 18 (2000-1000)	18-35 (1000-500)	35-60 (500-250)	60-120 (250-125)	120-230 (125-62)	62.5-31.0	31.0-15.6	15.6-7.8	7.8-3.9	3.9-2.0	2.0-1.0	<1.0	<230 (<62)
C1/2-DP	0.0	1.0	0.8	1.1	3.8	12.5	24.1	21.2	10.9	7.5	5.4	4.6	7.0	80.7
	0.0	0.7	1.3	1.1	4.1	12.3	25.0	20.6	10.9	7.9	4.8	4.5	6.7	80.5
	0.0	0.9	0.7	1.1	3.9	12.6	22.8	21.0	11.6	8.2	5.0	4.8	7.3	80.8
C3/4-DP	0.0	1.0	1.0	0.8	4.0	12.0	25.3	21.1	12.2	8.4	4.3	3.9	5.9	81.1

Notes to the Testing:

1. Organic matter was not removed prior to testing, thus the reported values are the "apparent" grain size distribution. See narrative for discussion of the testing.

UH13 00211

QA SUMMARY

Client:	Hart Crowser	Client Project No.:	Terminal 2 Berth 205/206
ARI Trip. Sample ID:	UH13 A	Client Project Batch No.:	15665-01 UH13-1
Client Trip. Sample ID:	C1/2-DP	Page:	1 of 1

Relative Standard Deviation, By Phi Size

Sample ID	-3	-2	-1	0	1	2	3	4	5	6	7	8	9	10
C1/2-DP	100.0	100.0	100.0	99.0	98.1	97.0	93.2	80.7	56.5	35.4	24.5	17.0	11.6	7.0
	100.0	100.0	100.0	99.3	98.0	96.9	92.9	80.5	55.5	34.8	23.9	16.0	11.2	6.7
	100.0	100.0	100.0	99.1	98.3	97.2	93.3	80.8	58.0	36.9	25.3	17.1	12.1	7.3
AVE	NA	100.00	99.99	99.10	98.15	97.03	93.12	80.65	56.66	35.72	24.57	16.69	11.63	7.00
STDEV	NA	0.00	0.02	0.17	0.17	0.13	0.23	0.11	1.24	1.08	0.70	0.57	0.44	0.28
%RSD	NA	0.00	0.02	0.17	0.17	0.13	0.25	0.14	2.19	3.04	2.85	3.44	3.79	3.95

The Triplicate Applies To The Following Samples

Client ID	Date Sampled	Date Extracted	Date Complete	QA Ratio (95-105)	Data Qualifiers	Pipette Portion (5.0-25.0g)
C1/2-DP	2/2/2012	2/7/2012	2/14/2012	98.8		12.4
	2/2/2012	2/7/2012	2/14/2012	95.6		12.8
	2/2/2012	2/7/2012	2/14/2012	101.1		12.6
C3/4-DP	2/2/2012	2/7/2012	2/14/2012	99.7		16.1

* ARI Internal QA limits = 95-105%

Notes to the Testing:

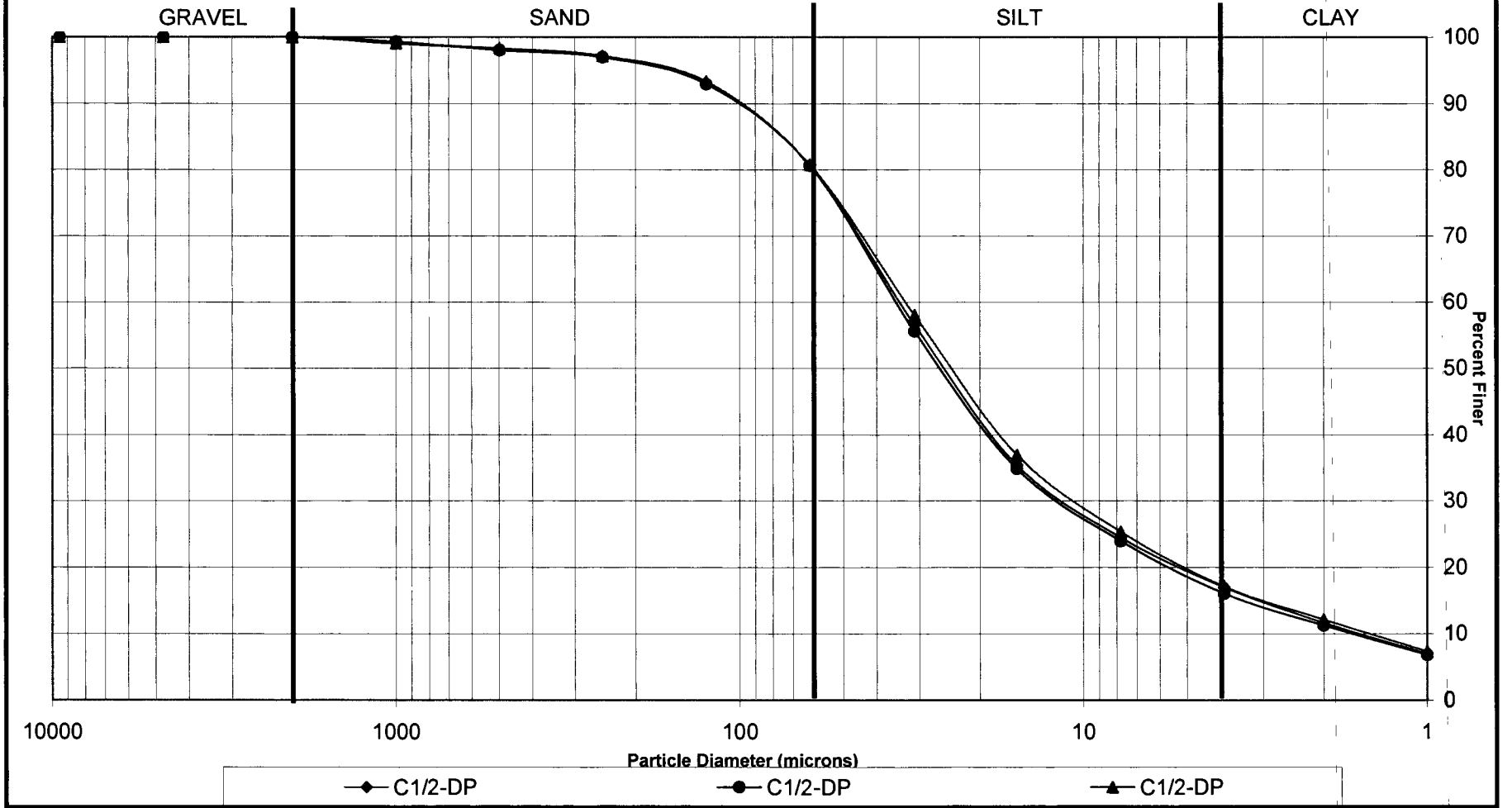
- Organic matter was not removed prior to testing, thus the reported values are the "apparent" grain size distribution. See narrative for discussion of the testing.

UH13

UH13:00212

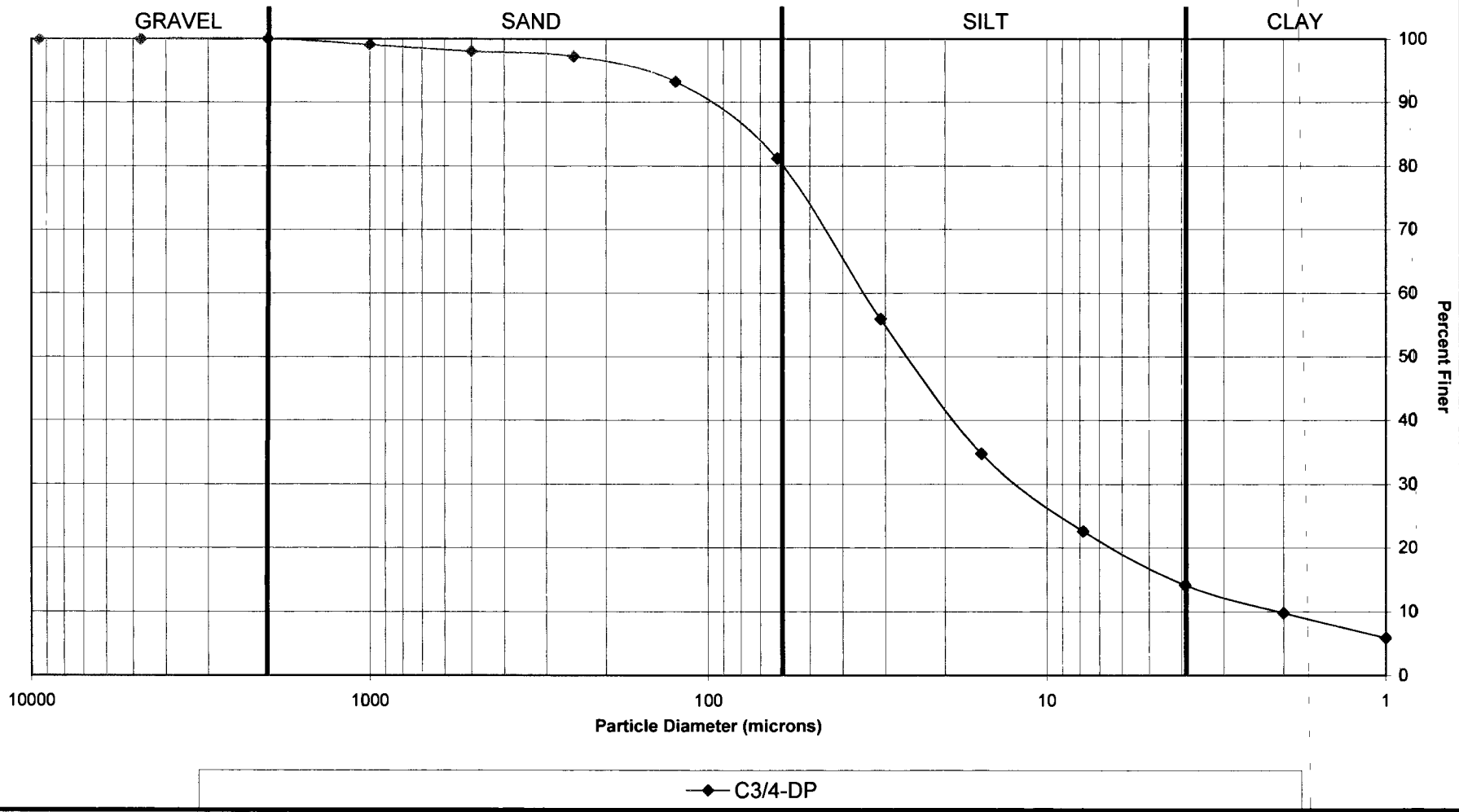
PSEP Grain Size Distribution

Triplicate Sample Plot



U113:00213

PSEP Grain Size Distribution



UHS:00214

Total Solids

ARI Job ID: UH13

Extractions Total Solids-exttts
Data By: Woo suk Chang
Created: 2/ 3/12

Worklist: 3130
Analyst: RVR
Comments:

Oven ID: _____

Balance ID: _____

Samples In: Date: _____ Time: _____ Temp: _____ Analyst: _____

Samples Out: Date: _____ Time: _____ Temp: _____ Analyst: _____

ARI ID CLIENT ID	Tare Wt (g)	Wet Wt (g)	Dry Wt (g)	% Solids	pH
1. UH13A 12-2074 C1/2-DP	1.15	13.47	7.00	47.5	NR
2. UH13B 12-2075 C3/4-DP	1.14	12.84	6.53	46.1	NR
3. UH13C 12-2076 C1/2-N1	1.13	11.39	6.85	55.8	NR
4. UH13D 12-2077 C1/2-N2	1.13	11.52	6.90	55.5	NR
5. UH13E 12-2078 C3/4-N1	1.14	11.75	6.36	49.2	NR
6. UH13F 12-2079 C3/4-N2	1.14	12.45	7.07	52.4	NR

Extractions Total Solids-exttts
Data By: Woo suk Chang
Created: 2/ 3/12

Worklist: 3130
Analyst: WC
Comments:

Oven ID: 015

Balance ID: B139298002

Samples In: Date: 2/3/12 Time: 19:15 Temp: 106 Analyst: WC

Samples Out: Date: 2/10/12 Time: 06:20 Temp: 101° Analyst: RR

ARI-ID CLIENT ID	Tare Wt (g)	Wet Wt (g)	Dry Wt (g)	% Solids	pH
1. UH13A 12-2074 C1/2-DP	1.15g	13.47g	7.00		NR
2. UH13B 12-2075 C3/4-DP	1.14g	12.84g	6.53		NR
3. UH13C 12-2076 C1/2-N1	1.13g	11.79g	6.85		NR
4. UH13D 12-2077 C1/2-N2	1.13g	11.52g	6.90		NR
5. UH13E 12-2078 C3/4-N1	1.14g	11.75g	6.36		NR
6. UH13F 12-2079 C3/4-N2	1.14g	12.45g	7.07		NR

Solids Data Entry Report
Date: 02/08/12

Checked by: WJ
Data Analyst: DM

Date: 02/08/12

Solids Determination performed on 02/07/12 by DM

JOB	SAMPLE	CLIENTID	TAREWEIGHT	SAMPDISH	DRYWEIGHT	SOLIDS
UH13	A	C1/2-DP	0.987	10.363	5.601	49.21
UH13	B	C3/4-DP	0.985	10.635	5.278	44.49

Extractions Total Solids-extts
Data By: Yen Luu
Created: 1/31/12

Worklist: 1824
Analyst: RVR
Comments:

Oven ID: _____

Balance ID: _____

Samples In: Date: _____ Time: _____ Temp: _____ Analyst: _____

Samples Out: Date: _____ Time: _____ Temp: _____ Analyst: _____

ARI ID CLIENT ID	Tare Wt (g)	Wet Wt (g)	Dry Wt (g)	% Solids	pH
1. UG48A 12-1637 LSB-SB-01-0-4.4	1.14	11.67	7.85	63.7	NR
2. UG48F 12-1642 LSB-SB-02-0-5.5	1.15	11.06	7.62	65.3	NR
3. UG48K 12-1647 LSB-SB-03-0-2.7	1.14	11.49	7.72	63.6	NR
4. UG48N 12-1650 LSB-SB-04-0-2.3	1.14	11.18	8.39	72.2	NR

Extractions Total Solids-exttts
Data By: Yen Luu
Created: 1/31/12

Worklist: 1824
Analyst: YL
Comments:

Oven ID: 615

Balance ID: B14642614

Samples In: Date: 1/31/12 Time: 2:10 Temp: 102 Analyst: WC

Samples Out: Date: 2/1/12 Time: 10:20 Temp: 103 Analyst: RR

ARI ID CLIENT ID	Tare Wt (g)	Wet Wt (g)	Dry Wt (g)	% Solids	pH
1. UG48A 12-1637 LSB-SB-01-0-4.4	1.14g	11.67g	7.85		NR
2. UG48F 12-1642 LSB-SB-02-0-5.5	1.15g	11.06g	7.62		NR
3. UG48K 12-1647 LSB-SB-03-0-2.7	1.14g	11.49g	7.72		NR
4. UG48N 12-1650 LSB-SB-04-0-2.3	1.14g	11.18g	8.39		NR

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Project: 15665-01 Port of Portland

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 Signature

February-28-2012

 Date



Analytical Resources, Incorporated
Analytical Chemists and Consultants

February 29, 2012

Mr. Rick Ernst
Hart Crowser, Inc.
5 Centerpointe Dr #240
Lake Oswego, OR 97035

RE: Project: 15665-01 Terminal 2 Berth 205/206, Port of Portland
ARI Job No: UJ37

Dear Mr. Ernst:

Please find enclosed the Chain-of-Custody (COC) record, sample receipt documentation, and the analytical results for samples from the project referenced above. Analytical Resources, Inc. (ARI) accepted seven soil samples on February 3, 2012. The samples were received in good condition. There were no discrepancies between the sample containers' labels and the COC.

Please reference the Case Narrative for analytical details associated with this project.

An electronic copy of this data package will remain on file with ARI. If you have any questions or require additional information, please contact me at your convenience.

Respectfully,

ANALYTICAL RESOURCES, INC.

Cheronne Oreiro
Project Manager

-For-

Kelly Bottem
Client Services Manager
kellyb@arilabs.com
206/695-6211

Enclosures

cc: files UJ37

Chain of Custody Documentation

ARI Job ID: UJ37

Chain of Custody Record & Laboratory Analysis Request



Analytical Resources, Incorporated
 Analytical Chemists and Consultants
 4611 South 134th Place, Suite 100
 Tukwila, WA 98168
 206-695-6200 206-695-6201 (fax)

ARI Assigned Number: UH13	Turn-around Requested: Standard	Page: 1 of 1
ARI Client Company: Hart Crowser	Phone: 503-620-7284	Date: 02/02/2012
Client Contact: Rick Ernst	503-620-7284	Ice Present?
Client Project Name: Terminal 2 - Berth 205/206 (Port of Portland)	Client Project #: 15665-01	No. of Coolers: 2
Samplers: Jason Miles/Chris Martz		Cooler Temps:

Sample ID	Date	Time	Matrix	No Containers	Analysis Requested								Notes/Comments			
					Grain size	Total Solids	TOC	Total Solids	Ammonia	TPH as DPOT	Metals Antimony, Ar, Cd, Cr, Cu, Pb, Hg, Ni, Zn	TSS		SVOCs - Phenols PAHs, phthalates, etc. Inconclusive to PCBs	Pesticides	PCBS
C1/2-DP	02/02/12	11:11	Soil	6	X	X	X	X	X	X	X	X	X	X	X	X
C1/2-N1 ✓		11:25		6		X		X	X				X			
C1/2-N2 ✓		11:45		6		X		X	X				X			
C3/4-DP		14:00		6	X	X	X	X	X	X	X	X	X	X	X	X
C3/4-N1 ✓		14:15		6		X		X	X				X			
C3/4-N2 ✓		14:35		6		X		X	X				X			
Reference 1	02/01/12	14:02		3		X		X	X							

Comments/Special Instructions FOI C1/2-N1, C1/2-N2, C3/4-N1, and C3/4-N2 SVOCs are to determine benzoic acid and DEHP concentrations.	Relinquished by (Signature) <i>[Signature]</i>	Received by (Signature) <i>[Signature]</i>	Relinquished by (Signature)	Received by (Signature)
	Printed Name Jason R Miles	Printed Name A. Vekjardsen	Printed Name	Printed Name
	Company Hart Crowser, Inc	Company ARI	Company	Company
	Date & Time 02/02/2012 / 15:45	Date & Time 2/3/12	Date & Time	Date & Time

Limits of Liability: ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, notwithstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

✓ UH13:00000



Cooler Receipt Form

ARI Client Halt + Krause

Project Name Terminal 2-Berth 2LS/XC

COC No(s) _____ (NA)

Delivered by Fed-Ex (UPS Courier Hand Delivered Other _____)

Assigned ARI Job No UH13

Tracking No 1Z97XK471349276530 NA

Preliminary Examination Phase:

1297x2471346569145

Were intact, properly signed and dated custody seals attached to the outside of to cooler? YES NO

Were custody papers included with the cooler? YES NO

Were custody papers properly filled out (ink, signed, etc.) YES NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry) 1.6 C.6

If cooler temperature is out of compliance fill out form 00070F Temp Gun ID# 90877952

Cooler Accepted by AV Date 2/3/12 Time 1100

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler? YES NO

What kind of packing material was used? Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other _____

Was sufficient ice used (if appropriate)? YES NO NA

Were all bottles sealed in individual plastic bags? YES NO

Did all bottles arrive in good condition (unbroken)? YES NO

Were all bottle labels complete and legible? YES NO

Did the number of containers listed on COC match with the number of containers received? YES NO

Did all bottle labels and tags agree with custody papers? YES NO

Were all bottles used correct for the requested analyses? YES NO

Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs) NA YES NO

Were all VOC vials free of air bubbles? NA YES NO

Was sufficient amount of sample sent in each bottle? YES NO

Date VOC Trip Blank was made at ARI. NA

Was Sample Split by ARI NA YES Date/Time _____ Equipment _____ Split by _____

Samples Logged by AV Date 2/3/12 Time 1250

**** Notify Project Manager of discrepancies or concerns ****

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Additional Notes, Discrepancies, & Resolutions:

By _____ Date _____

			Small → "sm"
			Peabubbles → "pb"
			Large → "lg"
			Headspace → "hs"

RE: Are you ready for me to write the report? No more changes?

Subject: RE: Are you ready for me to write the report? No more changes?

From: Rick Ernst <rick.ernst@hartcrowser.com>

Date: Thu, 23 Feb 2012 14:00:17 -0800

To: Kelly Bottem <kellyb@arilabs.com>

PSDDA

Okay, got word to run pesticides. Only report DDT, DDE, and DDD (for now). Port checking if they want a 1 week turn.

-----Original Message-----

From: Kelly Bottem [mailto:kellyb@arilabs.com]

Sent: Thursday, February 23, 2012 1:47 PM

To: Rick Ernst

Subject: Re: Are you ready for me to write the report? No more changes?

Damn! I am getting good at knowing you are going to change stuff.

K

On 2/23/2012 1:43 PM, Rick Ernst wrote:

You knew it was coming - please add PCBs to UH13C, UH13D, UH13E and UH13F.
Checking on if we'll need DDE.

PSDDA

-----Original Message-----

From: Kelly Bottem [mailto:kellyb@arilabs.com]

Sent: Tuesday, February 21, 2012 2:38 PM

To: Rick Ernst

Subject: Re: Are you ready for me to write the report? No more changes?

OK. I am just holding on to this in case you change your mind about something.

K

On 2/21/2012 2:28 PM, Rick Ernst wrote:

Not yet. Will be discussing with the Port today.

--

Kelly Frances Bottem, Client Services Manager Analytical Resources, Inc.
4611 S. 134th Place, Suite 100
Tukwila, WA 98168-3240
Website: <http://www.arilabs.com>
Direct Phone: 206-695-6211
E-Mail: kellyb@arilabs.com
Fax: 206-695-6201
Cell: 206-228-1385

"Never interrupt someone doing something you said couldn't be done" - Amelia Earhart

***Before printing, think about ENVIRONMENTAL responsibility

This correspondence contains confidential information from Analytical Resources, Inc. (ARI) The information contained herein is intended solely for the use of the individual(s) named above. If you are

RE: Are you ready for me to write the report? No more changes?

not the intended recipient, any copying, distribution, disclosure, or use of the text and/or attached document(s) is strictly prohibited.

If you have received this correspondence in error, please notify sender immediately. Thank you.

Case Narrative, Data Qualifiers, Control Limits

ARI Job ID: UJ37

**Case Narrative****Hart Crowser****15665-01 Terminal 2 Berth 205/206, Port of Portland****ARI Job: UJ37****February 29, 2012****Sample Receipt:**

Analytical Resources, Inc. (ARI) initially accepted seven soil samples in good condition on February 3, 2012 under Sample Delivery Group (SDG) UH13. The samples were received with cooler temperatures of 0.6 and 1.6°C. Select sample containers were archived upon receipt. On February 23, 2012, four soil samples were removed from archive and analyzed for Pesticides and PCBs as requested under SDG UJ37. For details regarding sample receipt please refer to the Cooler Receipt Form.

Pesticides Analysis (PSDDA):

The samples were extracted on 2/25/12 and the extracts were analyzed on 2/28/12 within the method recommended holding times for samples stored frozen.

Initial calibration (s): All analytes were within method acceptance criteria.

Continuing calibration (s): The first and second continuing calibrations (CCALs) were outside the 20% control limit high for 4,4'-DDD on the first column, but were within the control limit on the second column. The third CCAL was outside the control limit high for 4,4'-DDE on the first column and outside the control limit high for 4,4'-DDD on the second column. No corrective action was taken.

Method Blank (s): The method blank was free of contamination

Surrogate(s): The surrogate percent recoveries of Decachlorobiphenyl were outside the control limits high for MB-020912 and LCS-022512. The LCS percent recoveries were within control limits and the method blank was undetected for requested compounds. No corrective action was taken.

Samples: There were no anomalies associated with the samples.

LCS/LCSD (s): All percent recoveries were within control limits.

PCBs Analysis (PSDDA):

The samples were extracted on 2/25/12 and the extracts were analyzed on 2/27/12 within the method recommended holding times for samples stored frozen.

Initial calibration (s): All analytes were within method acceptance criteria.

Continuing calibration (s): All analytes of interest were within method acceptance criteria for the associated analyses.



Case Narrative

Hart Crowser

15665-01 Terminal 2 Berth 205/206, Port of Portland

ARI Job: UJ37

February 29, 2012

Method Blank (s): The method blank was free of contamination

Surrogate(s): All surrogate recoveries were within control limits.

Samples: There were no anomalies associated with the samples.

LCS/LCSD (s): All percent recoveries and RPDs were in control.

Sample ID Cross Reference Report



ARI Job No: UJ37
Client: Hart Crowser
Project Event: 15665-01
Project Name: Port of Portland

Sample ID	ARI Lab ID	ARI LIMS ID	Matrix	Sample Date/Time	VTSR
1. C1/2-N1	UJ37A	12-3221	Soil	02/02/12 11:25	02/03/12 11:00
2. C1/2-N2	UJ37B	12-3222	Soil	02/02/12 11:45	02/03/12 11:00
3. C3/4-N1	UJ37C	12-3223	Soil	02/02/12 14:15	02/03/12 11:00
4. C3/4-N2	UJ37D	12-3224	Soil	02/02/12 14:35	02/03/12 11:00



Data Reporting Qualifiers

Effective 2/14/2011

Inorganic Data

- U Indicates that the target analyte was not detected at the reported concentration
- * Duplicate RPD is not within established control limits
- B Reported value is less than the CRDL but \geq the Reporting Limit
- N Matrix Spike recovery not within established control limits
- NA Not Applicable, analyte not spiked
- H The natural concentration of the spiked element is so much greater than the concentration spiked that an accurate determination of spike recovery is not possible
- L Analyte concentration is ≤ 5 times the Reporting Limit and the replicate control limit defaults to ± 1 RL instead of the normal 20% RPD

Organic Data

- U Indicates that the target analyte was not detected at the reported concentration
- * Flagged value is not within established control limits
- B Analyte detected in an associated Method Blank at a concentration greater than one-half of ARI's Reporting Limit or 5% of the regulatory limit or 5% of the analyte concentration in the sample.
- J Estimated concentration when the value is less than ARI's established reporting limits
- D The spiked compound was not detected due to sample extract dilution
- E Estimated concentration calculated for an analyte response above the valid instrument calibration range. A dilution is required to obtain an accurate quantification of the analyte.
- Q Indicates a detected analyte with an initial or continuing calibration that does not meet established acceptance criteria ($< 20\%$ RSD, $< 20\%$ Drift or minimum RRF).



- S Indicates an analyte response that has saturated the detector. The calculated concentration is not valid; a dilution is required to obtain valid quantification of the analyte
- NA The flagged analyte was not analyzed for
- NR Spiked compound recovery is not reported due to chromatographic interference
- NS The flagged analyte was not spiked into the sample
- M Estimated value for an analyte detected and confirmed by an analyst but with low spectral match parameters. This flag is used only for GC-MS analyses
- M2 The sample contains PCB congeners that do not match any standard Aroclor pattern. The PCBs are identified and quantified as the Aroclor whose pattern most closely matches that of the sample. The reported value is an estimate.
- N The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification"
- Y The analyte is not detected at or above the reported concentration. The reporting limit is raised due to chromatographic interference. The Y flag is equivalent to the U flag with a raised reporting limit.
- EMPC Estimated Maximum Possible Concentration (EMPC) defined in EPA Statement of Work DLM02.2 as a value "calculated for 2,3,7,8-substituted isomers for which the quantitation and /or confirmation ion(s) has signal to noise in excess of 2.5, but does not meet identification criteria" **(Dioxin/Furan analysis only)**
- C The analyte was positively identified on only one of two chromatographic columns. Chromatographic interference prevented a positive identification on the second column
- P The analyte was detected on both chromatographic columns but the quantified values differ by $\geq 40\%$ RPD with no obvious chromatographic interference
- X Analyte signal includes interference from polychlorinated diphenyl ethers. **(Dioxin/Furan analysis only)**
- Z Analyte signal includes interference from the sample matrix or perfluorokerosene ions. **(Dioxin/Furan analysis only)**



Geotechnical Data

- A The total of all fines fractions. This flag is used to report total fines when only sieve analysis is requested and balances total grain size with sample weight.

- F Samples were frozen prior to particle size determination

- SM Sample matrix was not appropriate for the requested analysis. This normally refers to samples contaminated with an organic product that interferes with the sieving process and/or moisture content, porosity and saturation calculations

- SS Sample did not contain the proportion of "fines" required to perform the pipette portion of the grain size analysis

- W Weight of sample in some pipette aliquots was below the level required for accurate weighting

SURRE SOLUTIONS

LABEL	SOLN ID	TEST	CONC. UG/ML	SOLVENT	EXP.
A	1920-1	ABN	100/150	MEOH	06/09/12
B	1917-2	SIM PNA	15/75	ACETONE	05/30/12
C	NA	SIM ABN	25/37.5	MEOH	NA
D	1925-5	LOW PCB	0.2	ACETONE	05/28/12
E	1900-2	HERB	62.5	MEOH	10/06/12
F	1919-5	PCP	12.5	ACETONE	12/09/12
G	1906-3	d8-DIOXANE	100	MEOH	04/30/12
H	1847-2	OP-PEST	25	ACETONE	03/23/12
I	1896-3	LOW S. PNA	1.5	ACETONE	09/22/12
J	1915-4	TBT-PORE	0.125	MECL2	11/23/12
K	1925-4	MED PCB	20	ACETONE	05/28/12
L	1915-3	TBT	2.5	MECL2	11/23/12
M	1888-4	EPH	1500	MECL2	04/04/12
N	1914-2	PCB	2	ACETONE	05/28/12
O	1947-2	TPH	450	MECL2	09/28/12
P	1948-3	HCID	2250	MECL2	09/28/12
Q	NA	EDB	1	MEOH	NA
R	1886-3	RESIN ACID	250	ACETONE	02/19/12
S	1864-1	PBDE	.5	MEOH	05/21/12
T	1884-2	ALKYL PNA	10	MEOH	07/15/12
U	NA	CONGENER	2.5	ACETONE	NA
V	1925-2	LOW PCP	1.25	ACETONE	12/09/12

LCS SOLUTIONS

LABL SOLN ID	TEST	CONC. UG/ML	SOLVENT	EXP.	
1	1907-1	PCB 1660	20	ACETONE	11/01/12
2#		BCOC PEST	10	ACETONE	NA
3	1922-2	PEST	01/02/10	ACETONE	12/13/12
4	1922-3	LOW PEST	.1/.2/1	ACETONE	12/13/12
5	1902-4	EPH	1500	MECL2	10/04/12
6	1919-2	PCP	12.5/125	ACETONE	10/15/12
7	1926-2	ABN	100	MEOH	05/31/12
8	1916-2	TBT	2.5	MECL2	11/23/12
9	1918-2	PORE TBT	.125/.25	MECL2	11/23/12
10					
11	1860-4	TPHD	15000	ACETONE	05/12/12
12					
13	1948-1	LOW PCB	2	ACETONE	11/01/12
14					
15	1929-1	SIM PNA	15/75	MEOH	06/21/12
16	1906-4	1,4-DIOXANE	100	MEOH	04/30/12
17	1869-4	1248 PCB	10	ACETONE	06/14/12
18	1927-2	LOW SIM PNA	1.5	ACETONE	06/20/12
19	1931-1	AK103	7500	ACETONE	05/17/12
20	1930-1	PNA	100	ACETONE	06/23/12
21	1943-2	SKY/BHT	100	MEOH	07/27/12
22	1852-1	HERB	04 to 5000	MEOH	03/03/12
23	1887-2	EXTRA PNA	15	ACETONE	08/25/12
24					
25#		DIPHENYL	100	MEOH	NA
26	1904-2	OP-PEST	25	MEOH	02/10/12
27		STEROLS	200	MEOH	NA
28#		ADD. PEST	2	ACETONE	NA
29#		DECANES	100	MEOH	NA

LCS SOLUTIONS

30		EDB/DBCP	0.2	MEOH	NA
31	1944-1	TERPINEOL	100	MEOH	07/27/12
32	1876-1	GUAIACOL	50-200	ACETONE	01/05/12
33		RETENE	100	MEOH	NA
34	1867-3	CONGENERS	0.5	ACETONE	03/14/12
35	1875-3	ALKYL PNA A	10	MEOH	07/18/12
36		ALKYL PNA B	10	MEOH	NA
37		CAR/PERY	100	ACETONE	NA
38	1926-3	ABN ACID	200-450	MEOH	06/19/12
39	1853-4	BENZIDINE	500	MEOH	04/30/12
40	1851-3	PBDE	0.5	MEOH	04/22/12
50	1900-1	FULL RESIN	250	ACETONE	08/12/12
51		DDTS	0.01	ACETONE	NA
52		1232 PCB	20	ACETONE	NA
53	1919-1	DALAPON	50	MEOH	08/22/12
54		T-CHLORDANE	10	ACETONE	NA
55		TOXAPHENE	50	ACETONE	NA
56	1917-1	ABN BASE	50-200	MEOH	05/31/12
#=PROJECT SPECIFIC SOLUTION					



Spike Recovery Control Limits for Chlorinated Pesticides
EPA Method SW-846-8081B Analysis of Soil / Sediment Samples ^(1,2)
Effective 10/25/11

Control limits are updated periodically. Assure that you have ARI's current control limits by downloading the files at the time of use. <http://www.arilabs.com/portal/downloads/ARI-CLs.zip>

Sample Dry Weight / Final Vol.	12.5 g to 2.5 mL	
Extraction Method	Microwave EPA Method 3546	
<i>alpha</i> -BHC	49 - 111	39 - 121
<i>beta</i> -BHC	54 - 107	45 - 116
<i>delta</i> -BHC	72 - 112	65 - 119
<i>gamma</i> -BHC (Lindane)	54 - 115	44 - 125
Heptachlor	45 - 133	30 - 148
Aldrin	53 - 114	43 - 124
Hepachlor Epoxide	60 - 121	50 - 131
Endosulfan I	40 - 129	25 - 144
Dieldrin	68 - 123	59 - 132
4,4'-DDE	66 - 124	56 - 134
Endrin	60 - 135	48 - 148
Endosulfan II	46 - 130	32 - 144
4,4'-DDD	54 - 129	42 - 142
Endosulfan Sulfate	36 - 110	24 - 122
4,4'-DDT	50 - 133	36 - 147
Methoxychlor	46 - 138	31 - 153
Endrin Ketone	45 - 131	31 - 145
Endrin Aldehyde	25 - 100	13 - 113
<i>trans</i> -Chlordane (<i>beta</i> -Chlordane, <i>gamma</i> -Chlordane)	66 - 119	57 - 128
<i>cis</i> -Chlordane (<i>alpha</i> -chlordane)	62 - 119	53 - 129
Hexachlorobenzene	41 - 108	30 - 119
Hexachlorobutadiene	39 - 100	29 - 110
Tetrachloro- <i>m</i> -xylene (TCMX)	42 - 112	(4)
Decachlorobiphenyl	59 - 123	(4)
Tetrachloro-xylene (TCMX)	29 - 142	(4)
Decachlorobiphenyl	22 - 156	(4)

(1) Control limits calculated using all available spike recovery data from 1/1/11 to 10/1/11.

(2) Highlighted control limits (**bold font**) adjusted to demonstrate that ARI does not use control limits < 10 for the lower limit or < 100 for the upper limit.

(3) **ME = A marginal exceedance** defined in the NELAC Standard ⁽⁶⁾ as beyond the LCS-CL but still within the ME limits. ME limits are between 3 and 4 standard deviations around the mean. A maximum of one marginal exceedance is acceptable. Two or more marginal exceedances require corrective action.

(4) Marginal Exceedances not allowed for a surrogate standard.

(5) Laboratory Control Sample (LCS) spike recovery control limits also used as advisory control limits for sample matrix spike (MS) analyzes. MS recovery values are advisory and not used to assess the acceptability of an analytical batch.

(6) 2003 NELAC Standard (EPA/600/R-04/003), July 2003, Chapter 5, pages 251-252.



Quality Control Criteria for Analysis of Solid Matrix Samples for Aroclors (Polychlorinated Biphenyls – PCB) EPA Method 8082B

Analysis Code	Extraction	DL ¹ (ppb)	LOD ¹ (ppb)	LOQ ¹ (ppb)	Analyte	Spike Recovery Control Limits (%) ^{2,3,8}			RPD ⁴
						LCS	MB/LCS Surrogate	Sample Surrogate	
Soil / Sediment Samples (Microwave Extraction – EPA Method 3546)									
PCBSMI 15-3067F	12g to 4 mL	9.83	17	33	Aroclor 1016	55 – 109	--	--	≤ 40
		7.06	17	33	Aroclor 1260	50 – 125	--	--	
PCBSCI 08-3025F		--	--	--	TCMX	--	53 – 108	39 – 122	
		--	--	--	DCBP	--	49 – 126	31 – 140	
PCBDMP20 05-3017F	12.5 g to 2.5 mL ⁶	9.33	10	20 ⁶	Aroclor 1016	46 – 110	--	--	≤ 40
		10.82	15	20 ⁶	Aroclor 1260	47 – 124	--	--	
PCBDMP20 06-3026F		--	--	--	TCMX	--	43 – 107	34 – 109	
		--	--	--	DCBP	--	48 – 123	24 – 127	
PCBDMP10 05-3017F	12.5 g to 2.5 mL ⁶	0.759	5	10 ⁶	Aroclor 1016	46 – 110	--	--	≤ 40
		1.066	5	10 ⁶	Aroclor 1260	47 – 124	--	--	
PCBDMP10 06-3026F		--	--	--	TCMX	--	43 – 107	34 – 109	
		--	--	--	DCBP	--	48 – 123	24 – 127	
PCBDMP4 05-3017F	12.5 g to 2.5 mL ⁶	0.577	2	4 ⁶	Aroclor 1016	46 – 110	--	--	≤ 40
		0.610	2	4 ⁶	Aroclor 1260	47 – 124	--	--	
PCBDMP4 06-3026F		--	--	--	TCMX	--	43 – 107	34 – 109	
		--	--	--	DCBP	--	48 – 123	24 – 127	
Soil / Sediment Samples Medium Level (Vortex Extraction – EPA Method 3546)									
PCBSVX 12-3019F	5 g to 40 mL	109 ⁷	400	800	Aroclor 1016	30 – 160	--	--	≤ 40
		192 ⁷	400	800	Aroclor 1260	30 – 160	--	--	
		--	--	--	TCMX	--	30 – 160	30 – 160	
		--	--	--	DCBP	--	30 – 160	30 – 160	

(1) Detection Limit (DL), Limit of Detection (LOD) & Limit of Quantitation (LOQ) are defined in ARI SOP 1018S.

(2) Highlighted control limits (**bold font**) are adjusted from the calculated values to reflect that ARI does not use control limits < 10 for the lower limit or < 100 for the upper limit.

(3) 30 – 160 are default limits used when there is insufficient data to calculate historic control limits

(4) Acceptance criteria for the relative percent difference (RPD) between analytes in replicate analyzes. If C_o and C_d are the concentrations of the original and duplicate respectively then

$$RPD = \frac{|C_o - C_d|}{\frac{C_o + C_d}{2}} \times 100$$

(6) LOQ determined by lowest concentration used to calibrate the GC-ECD instrument.

(7) MDL Study PC66 6/24/09

(8) Control Limits calculated using all data generated between 1/1/11 and 11/30/11

**Pesticide Analysis
Report and Summary QC Forms**

ARI Job ID: UJ37

ORGANICS ANALYSIS DATA SHEET
PSDDA Pesticides/PCB by GC/ECD
 Page 1 of 1

Sample ID: C1/2-N1
SAMPLE

Lab Sample ID: UJ37A
 LIMS ID: 12-3221
 Matrix: Soil
 Data Release Authorized: **VTB**
 Reported: 03/15/12

QC Report No: UJ37-Hart Crowser
 Project: Port of Portland
 15665-01
 Date Sampled: 02/02/12
 Date Received: 02/03/12

Date Extracted: 02/25/12
 Date Analyzed: 02/28/12 03:46
 Instrument/Analyst: ECD6/AAR
 GPC Cleanup: No
 Sulfur Cleanup: Yes
 Florisil Cleanup: No

Sample Amount: 12.9 g-dry-wt
 Final Extract Volume: 2.5 mL
 Dilution Factor: 1.00
 Silica Gel: Yes
 Percent Moisture: 42.7%

CAS Number	Analyte	MDL	RL	Result
72-55-9	4,4'-DDE	0.12	0.97	1.8
72-54-8	4,4'-DDD	0.13	0.97	0.97 J
50-29-3	4,4'-DDT	0.19	0.97	< 0.97 U

Reported in µg/kg (ppb)

Pest/PCB Surrogate Recovery

Decachlorobiphenyl	84.8%
Tetrachlorometaxylene	75.5%

ORGANICS ANALYSIS DATA SHEET
PSDDA Pesticides/PCB by GC/ECD
 Page 1 of 1

Sample ID: C1/2-N2
SAMPLE

Lab Sample ID: UJ37B
 LIMS ID: 12-3222
 Matrix: Soil
 Data Release Authorized: **VR**
 Reported: 03/15/12

QC Report No: UJ37-Hart Crowser
 Project: Port of Portland
 15665-01
 Date Sampled: 02/02/12
 Date Received: 02/03/12

Date Extracted: 02/25/12
 Date Analyzed: 02/28/12 04:04
 Instrument/Analyst: ECD6/AAR
 GPC Cleanup: No
 Sulfur Cleanup: Yes
 Florisil Cleanup: No

Sample Amount: 12.7 g-dry-wt
 Final Extract Volume: 2.5 mL
 Dilution Factor: 1.00
 Silica Gel: Yes
 Percent Moisture: 45.2%

CAS Number	Analyte	MDL	RL	Result
72-55-9	4,4'-DDE	0.12	0.98	2.0 P
72-54-8	4,4'-DDD	0.13	0.98	1.4
50-29-3	4,4'-DDT	0.19	0.98	< 0.98 U

Reported in µg/kg (ppb)

Pest/PCB Surrogate Recovery

Decachlorobiphenyl	92.0%
Tetrachlorometaxylene	88.5%

ORGANICS ANALYSIS DATA SHEET
PSDDA Pesticides/PCB by GC/ECD
 Page 1 of 1

Sample ID: C3/4-N1
SAMPLE

Lab Sample ID: UJ37C
 LIMS ID: 12-3223
 Matrix: Soil
 Data Release Authorized: **VD**
 Reported: 03/15/12

QC Report No: UJ37-Hart Crowser
 Project: Port of Portland
 15665-01
 Date Sampled: 02/02/12
 Date Received: 02/03/12

Date Extracted: 02/25/12
 Date Analyzed: 02/28/12 04:22
 Instrument/Analyst: ECD6/AAR
 GPC Cleanup: No
 Sulfur Cleanup: Yes
 Florisil Cleanup: No

Sample Amount: 12.9 g-dry-wt
 Final Extract Volume: 2.5 mL
 Dilution Factor: 1.00
 Silica Gel: Yes
 Percent Moisture: 48.8%

CAS Number	Analyte	MDL	RL	Result
72-55-9	4,4'-DDE	0.12	0.97	1.5 P
72-54-8	4,4'-DDD	0.13	0.97	0.97 J
50-29-3	4,4'-DDT	0.19	0.97	< 0.97 U

Reported in µg/kg (ppb)

Pest/PCB Surrogate Recovery

Decachlorobiphenyl	98.8%
Tetrachlorometaxylene	88.2%

ORGANICS ANALYSIS DATA SHEET
PSDDA Pesticides/PCB by GC/ECD
 Page 1 of 1

Sample ID: C3/4-N2
SAMPLE

Lab Sample ID: UJ37D
 LIMS ID: 12-3224
 Matrix: Soil
 Data Release Authorized: **VB**
 Reported: 03/15/12

QC Report No: UJ37-Hart Crowser
 Project: Port of Portland
 15665-01
 Date Sampled: 02/02/12
 Date Received: 02/03/12

Date Extracted: 02/25/12
 Date Analyzed: 02/28/12 04:39
 Instrument/Analyst: ECD6/AAR
 GPC Cleanup: No
 Sulfur Cleanup: Yes
 Florisil Cleanup: No

Sample Amount: 13.1 g-dry-wt
 Final Extract Volume: 2.5 mL
 Dilution Factor: 1.00
 Silica Gel: Yes
 Percent Moisture: 45.8%

CAS Number	Analyte	MDL	RL	Result
72-55-9	4,4'-DDE	0.12	0.95	1.7 P
72-54-8	4,4'-DDD	0.13	0.95	1.0
50-29-3	4,4'-DDT	0.18	0.95	< 0.95 U

Reported in µg/kg (ppb)

Pest/PCB Surrogate Recovery

Decachlorobiphenyl	89.5%
Tetrachlorometaxylene	85.0%

SW8081 PESTICIDE SOIL/SEDIMENT SURROGATE RECOVERY SUMMARY

Matrix: Soil

QC Report No: UJ37-Hart Crowser
Project: Port of Portland
15665-01

<u>Client ID</u>	<u>DCBP</u>	<u>TCMX</u>	<u>TOT OUT</u>
MB-022512	126%*	98.5%	1
LCS-022512	126%*	84.8%	1
LCSD-022512	122%	86.8%	0
C1/2-N1	84.8%	75.5%	0
C1/2-N2	92.0%	88.5%	0
C3/4-N1	98.8%	88.2%	0
C3/4-N2	89.5%	85.0%	0

LCS/MB LIMITS QC LIMITS

(DCBP) = Decachlorobiphenyl	(59-123)	(22-156)
(TCMX) = Tetrachlorometaxylene	(42-112)	(29-142)

Prep Method: SW3546
Log Number Range: 12-3221 to 12-3224

ORGANICS ANALYSIS DATA SHEET
PSDDA Pesticides/PCB by GC/ECD
 Page 1 of 1

Sample ID: LCS-022512
 LCS/LCSD

Lab Sample ID: LCS-022512
 LIMS ID: 12-3221
 Matrix: Soil
 Data Release Authorized: *MW*
 Reported: 02/29/12

QC Report No: UJ37-Hart Crowser
 Project: Port of Portland
 15665-01
 Date Sampled: 02/02/12
 Date Received: 02/03/12

Date Extracted LCS/LCSD: 02/25/12

Sample Amount LCS: 12.5 g-dry-wt
 LCSD: 12.5 g-dry-wt

Date Analyzed LCS: 02/28/12 00:30
 LCSD: 02/28/12 00:48

Final Extract Volume LCS: 2.5 mL
 LCSD: 2.5 mL

Instrument/Analyst LCS: ECD6/AAR
 LCSD: ECD6/AAR

Dilution Factor LCS: 1.00
 LCSD: 1.00

GPC Cleanup: No
 Sulfur Cleanup: Yes
 Florisil Cleanup: No
 Acid Cleanup: No

Silica Gel: Yes

Percent Moisture: NA

Analyte	LCS			LCSD			RPD
	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	
4,4'-DDE	8.18	8.00	102%	8.72	8.00	109%	6.4%
4,4'-DDD	9.58	8.00	120%	9.66	8.00	121%	0.8%
4,4'-DDT	9.30	8.00	116%	9.32	8.00	116%	0.2%

Pest/PCB Surrogate Recovery

	LCS	LCSD
Decachlorobiphenyl	126%	122%
Tetrachlorometaxylene	84.8%	86.8%

Reported in µg/kg (ppb)

RPD calculated using sample concentrations per SW846.

FORM 4
PESTICIDE METHOD BLANK SUMMARY

BLANK NO.

UJ37MBS1

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No.: UJ37

Project: PORT OF PORTLAND

Lab Sample ID: UJ37MBS1

Lab File ID: 0227A034

Date Extracted: 02/25/12

Matrix: SOLID

Date Analyzed: 02/28/12

Instrument ID: ECD6

Time Analyzed: 0013

GC Columns: STX-CLP1/STX-CLP2

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED
01	UJ37LCSS1	UJ37LCSS1	02/28/12
02	UJ37LCSDS1	UJ37LCSDS1	02/28/12
03	C1/2-N1	UJ37A	02/28/12
04	C1/2-N2	UJ37B	02/28/12
05	C3/4-N1	UJ37C	02/28/12
06	C3/4-N2	UJ37D	02/28/12

ALL RUNS ARE DUAL COLUMN

ORGANICS ANALYSIS DATA SHEET
PSDDA Pesticides/PCB by GC/ECD
 Page 1 of 1

Sample ID: MB-022512
METHOD BLANK

Lab Sample ID: MB-022512
 LIMS ID: 12-3221
 Matrix: Soil
 Data Release Authorized: *MMW*
 Reported: 02/29/12

QC Report No: UJ37-Hart Crowser
 Project: Port of Portland
 15665-01
 Date Sampled: NA
 Date Received: NA

Date Extracted: 02/25/12
 Date Analyzed: 02/28/12 00:13
 Instrument/Analyst: ECD6/AAR
 GPC Cleanup: No
 Sulfur Cleanup: Yes
 Florisil Cleanup: No

Sample Amount: 12.5 g
 Final Extract Volume: 2.5 mL
 Dilution Factor: 1.00
 Silica Gel: Yes
 Percent Moisture: NA

CAS Number	Analyte	MDL	RL	Result
72-55-9	4,4'-DDE	0.12	1.0	< 1.0 U
72-54-8	4,4'-DDD	0.14	1.0	< 1.0 U
50-29-3	4,4'-DDT	0.19	1.0	< 1.0 U

Reported in µg/kg (ppb)

Pest/PCB Surrogate Recovery

Decachlorobiphenyl	126%
Tetrachlorometaxylene	98.5%



GC Analyst Notes / Corrective Action Log

ARI Project ID: UJ37 Client ID: Hart Crowser

ARI SOP: 403S(PCB) 405S(Herb) 407S(TPH-D) 409S(HCID) 412S(PCP) 423S(Pest)
427S(Dir Inj) 428S(EPH) 432S(EDB) Other

Parameter(s): _____

Instrument: FID-3A FID-3B FID-4A FID-4B FID-5 FID-7 FID-8
FID-9 ECD-1 ECD-5 ECD-6 ECD-7

Dates: _____ Curve: _____ Analysis Start: _____

Endrin/DDT Breakdown <15%? YES / NO / NA Method Blank In Control? YES / NO
ICal Meets RF & %RSD Criteria? YES / NO LCS/LCSD Recovery In Control? YES / NO
CCal Meets RF & %RSD Criteria? YES / NO Surrogate Recovery In Control? YES / NO
Manual Integrations for ICal? YES / NO Manual Integrations for Samples? YES / NO
Internal Standard Meets Criteria? YES / NO / NA Special Analysis Criteria Met? YES / NO / NA

Detail problems, corrective actions and/or other pertinent information below (use reverse side when necessary):

- Lims system is designed to use higher of two values reported. In this instance the larger values for both DDD and PDE came from the column that was >20% D and not used. The lower value must be entered into both fields which also eliminates the RPD calculation and P flag addition which must be manually entered. J flag must be used to report lower value (when <5) or hit will not be reported if either column shows < R.L.

Additional Details on Reverse: Yes / No

Analyst: VID Date: 3.15.12

Reviewer: _____ Date: _____

6D
8081 INITIAL CALIBRATION RETENTION TIMES

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No.: UJ37

Project: PORT OF PORTLAND

GC Column: STX-CLP1 ID: 0.53 (mm)

Instrument ID: ECD6

Calibration Date: 01/23/12

COMPOUND	RT OF STANDARDS							MEAN RT	RT WINDOW	
	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6	LVL 7		FROM	TO
alpha-BHC	3.88	3.88	3.88	3.88	3.88	3.88	3.88	3.88	3.83	3.93
beta-BHC	4.24	4.24	4.24	4.24	4.23	4.23	4.22	4.23	4.17	4.27
delta-BHC	4.40	4.40	4.39	4.39	4.39	4.39	4.38	4.39	4.33	4.43
gamma-BHC (Lindane)	4.14	4.14	4.14	4.14	4.14	4.14	4.14	4.14	4.09	4.19
Heptachlor	4.56	4.56	4.56	4.56	4.55	4.55	4.56	4.56	4.50	4.61
Aldrin	4.83	4.83	4.83	4.83	4.83	4.83	4.83	4.83	4.78	4.88
Heptachlor epoxide b	5.39	5.39	5.39	5.39	5.39	5.39	5.39	5.39	5.34	5.44
Endosulfan I	5.77	5.77	5.77	5.77	5.77	5.77	5.77	5.77	5.72	5.82
Dieldrin	5.99	5.99	5.99	5.99	5.99	5.99	5.99	5.99	5.94	6.04
4,4'-DDE	5.73	5.73	5.73	5.73	5.72	5.72	5.72	5.73	5.67	5.77
Endrin	6.21	6.21	6.21	6.21	6.21	6.21	6.21	6.21	6.16	6.26
Endosulfan II	6.42	6.42	6.42	6.42	6.42	6.42	6.42	6.42	6.37	6.47
4,4'-DDD	6.29	6.29	6.29	6.29	6.28	6.28	6.28	6.29	6.22	6.33
Endosulfan sulfate	7.19	7.19	7.19	7.19	7.19	7.19	7.19	7.19	7.13	7.24
4,4'-DDT	6.54	6.54	6.54	6.54	6.53	6.53	6.53	6.54	6.48	6.58
Methoxychlor	6.97	6.98	6.97	6.97	6.97	6.97	6.97	6.97	6.92	7.02
Endrin ketone	7.44	7.44	7.44	7.44	7.44	7.44	7.44	7.44	7.39	7.49
Endrin aldehyde	6.80	6.80	6.80	6.80	6.80	6.80	6.80	6.80	6.75	6.84
gamma-Chlordane	5.52	5.52	5.52	5.51	5.51	5.51	5.51	5.51	5.46	5.56
alpha-Chlordane	5.64	5.64	5.64	5.64	5.64	5.64	5.64	5.64	5.59	5.69
Hexachlorobutadiene	2.08	2.08	2.09	2.08	2.08	2.08	2.08	2.08	2.04	2.13
Hexachlorobenzene	3.77	3.78	3.77	3.76	3.76	3.75	3.75	3.76	3.70	3.80
Tetrachloro-m-xylene	3.44	3.44	3.44	3.44	3.44	3.44	3.44	3.44	3.39	3.49
Decachlorobiphenyl	8.30	8.30	8.29	8.30	8.29	8.29	8.29	8.29	8.24	8.34

6D
8081 INITIAL CALIBRATION RETENTION TIMES

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No.: UJ37

Project: PORT OF PORTLAND

GC Column: STX-CLP2 ID: 0.53 (mm)

Instrument ID: ECD6

Calibration Date: 01/23/12

COMPOUND	RT OF STANDARDS							MEAN RT	RT WINDOW	
	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6	LVL 7		FROM	TO
alpha-BHC	4.16	4.16	4.16	4.16	4.16	4.16	4.16	4.16	4.11	4.21
beta-BHC	4.57	4.57	4.57	4.57	4.56	4.56	4.56	4.57	4.52	4.62
delta-BHC	4.85	4.85	4.85	4.85	4.85	4.85	4.85	4.85	4.80	4.90
gamma-BHC (Lindane)	4.48	4.48	4.48	4.48	4.48	4.48	4.49	4.48	4.43	4.53
Heptachlor	4.91	4.91	4.91	4.91	4.91	4.91	4.91	4.91	4.86	4.96
Aldrin	5.23	5.23	5.23	5.23	5.23	5.23	5.23	5.23	5.18	5.28
Heptachlor epoxide b	5.80	5.80	5.80	5.80	5.80	5.80	5.80	5.80	5.75	5.85
Endosulfan I	6.18	6.18	6.18	6.18	6.18	6.18	6.18	6.18	6.13	6.23
Dieldrin	6.44	6.44	6.44	6.44	6.44	6.44	6.44	6.44	6.39	6.49
4,4'-DDE	6.28	6.28	6.28	6.28	6.28	6.28	6.28	6.28	6.23	6.33
Endrin	6.73	6.73	6.73	6.73	6.73	6.73	6.73	6.73	6.68	6.78
Endosulfan II	6.93	6.93	6.92	6.92	6.92	6.92	6.92	6.92	6.88	6.97
4,4'-DDD	6.82	6.82	6.82	6.82	6.81	6.82	6.81	6.82	6.77	6.87
Endosulfan sulfate	7.47	7.47	7.47	7.47	7.47	7.47	7.47	7.47	7.42	7.52
4,4'-DDT	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.05	7.15
Methoxychlor	7.70	7.70	7.70	7.70	7.69	7.69	7.69	7.70	7.65	7.75
Endrin ketone	7.95	7.95	7.95	7.95	7.95	7.95	7.95	7.95	7.90	8.00
Endrin aldehyde	7.23	7.23	7.23	7.23	7.23	7.23	7.23	7.23	7.18	7.28
gamma-Chlordane	5.98	5.98	5.98	5.98	5.98	5.98	5.98	5.98	5.93	6.04
alpha-Chlordane	6.12	6.12	6.12	6.12	6.12	6.12	6.12	6.12	6.07	6.17
Hexachlorobutadiene	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.10	2.20
Hexachlorobenzene	4.06	4.06	4.06	4.05	4.05	4.05	4.05	4.05	4.01	4.11
Tetrachloro-m-xylene	3.64	3.64	3.64	3.63	3.63	3.63	3.63	3.63	3.59	3.69
Decachlorobiphenyl	8.98	8.98	8.98	8.98	8.98	8.98	8.98	8.98	8.93	9.03

6E
8081 PESTICIDE INITIAL CALIBRATION

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No.: UJ37

Project: PORT OF PORTLAND

GC Column: STX-CLP1 ID: 0.53 (mm)

Instrument ID: ECD6

Calibration Date: 01/23/12

COMPOUND	CALIBRATION FACTORS							MEAN	R ²
	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6	LVL 7		
alpha-BHC	1.1325	1.1594	1.2087	1.2346	1.2445	1.3450	1.3516	1.2395	6.8
beta-BHC	0.5358	0.5201	0.5272	0.5110	0.5029	0.5175	0.5114	0.5180	2.1
delta-BHC	0.9342	0.8475	0.8719	0.8081	0.8814	0.9195	1.0020	0.8949	7.1
gamma-BHC (Lindane)	1.1565	1.0121	1.0327	1.0243	1.0608	1.1036	1.1147	1.0721	5.0
Heptachlor	1.4001	1.3237	1.3368	1.3332	1.3071	1.3631	1.3087	1.3390	2.5
Aldrin	1.1898	1.1338	1.1772	1.2198	1.1876	1.2644	1.2237	1.1995	3.4
Heptachlor epoxide b	1.5338	1.2606	1.1986	1.1861	1.1627	1.1714	1.1048	1.2311	11.5
Endosulfan I	1.6201	1.5860	1.5307	1.5742	1.2975	1.4969	1.3659	1.4959	8.1
Dieldrin	1.2243	1.1868	1.2192	1.2280	1.1675	1.2231	1.1675	1.2023	2.3
4,4'-DDE	0.6944	0.5883	0.6834	0.6652	0.8704	0.7938	0.8411	0.7338	14.0
Endrin	0.9024	0.8092	0.8579	0.8691	0.8833	0.8471	0.7974	0.8523	4.5
Endosulfan II	0.8734	0.7925	0.8341	0.8403	0.8133	0.8334	0.7920	0.8256	3.5
4,4'-DDD	0.6573	0.5811	0.6283	0.6250	0.6752	0.6780	0.6791	0.6463	5.7
Endosulfan sulfate	0.8062	0.7299	0.7501	0.7411	0.7278	0.7303	0.6980	0.7405	4.5
4,4'-DDT	0.7154	0.6452	0.7044	0.7076	0.7576	0.7639	0.7582	0.7218	5.9
Methoxychlor	0.4949	0.4335	0.4391	0.4164	0.4065	0.3900	0.3708	0.4216	9.5
Endrin ketone	1.1884	0.9899	0.9951	0.9545	0.9251	0.9030	0.8535	0.9728	11.0
Endrin aldehyde	0.7497	0.6592	0.6535	0.6542	0.6473	0.6579	0.6373	0.6656	5.7
gamma-Chlordane	1.2871	1.1645	1.1800	1.1594	1.1444	1.1916	1.1624	1.1842	4.0
alpha-Chlordane	1.2338	1.1504	1.1322	1.1302	1.0347	1.1412	1.1129	1.1336	5.2
Hexachlorobutadiene	2.5442	2.1384	1.7912	1.6788	1.5439	1.5475	1.4566	1.8144	0.9979
Hexachlorobenzene	1.0672	1.0504	1.0397	0.9856	0.9803	0.9503	0.9201	0.9991	5.5
Tetrachloro-m-xylene	1.0272	0.9016	0.9189	0.9222	0.8395	0.8916	0.8446	0.9065	6.9
Decachlorobiphenyl	1.1100	1.1418	0.9050	0.8289	0.7805	0.7273	0.6722	0.8808	0.9948

6E
8081 PESTICIDE INITIAL CALIBRATION

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No.: UJ37

Project: PORT OF PORTLAND

GC Column: STX-CLP2 ID: 0.53 (mm)

Instrument ID: ECD6

Calibration Date: 01/23/12

COMPOUND	CALIBRATION FACTORS							MEAN	R ²
	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6	LVL 7		
alpha-BHC	1.3803	1.2645	1.2374	1.2078	1.1260	1.1829	1.1087	1.2154	7.6
beta-BHC	0.8184	0.6356	0.6091	0.5481	0.4764	0.4762	0.4376	0.5716	0.9956
delta-BHC	0.8980	0.7668	0.7896	0.7221	0.7781	0.7501	0.7648	0.7814	7.1
gamma-BHC (Lindane)	1.4262	1.1874	1.0930	1.0262	0.9782	0.9835	0.9243	1.0884	15.8
Heptachlor	1.4008	1.2793	1.2593	1.1950	1.0291	1.0610	0.9456	1.1672	13.8
Aldrin	1.1945	1.1134	1.0787	1.0376	0.9436	0.9432	0.8475	1.0226	11.6
Heptachlor epoxide b	1.3642	1.1551	1.1416	1.0319	0.9692	0.8892	0.8004	1.0502	17.9
Endosulfan I	1.2227	0.9911	1.0240	0.9195	0.8592	0.8072	0.7201	0.9348	17.6
Dieldrin	1.0694	0.9701	1.0228	0.9661	0.8786	0.8520	0.7511	0.9300	11.8
4,4'-DDE	0.8733	0.7528	0.8664	0.7811	0.7845	0.7153	0.6559	0.7756	10.0
Endrin	1.6927	1.4075	1.4095	1.2765	1.2476	1.1212	0.9954	1.3072	17.3
Endosulfan II	1.4340	1.2495	1.3684	1.2530	1.1970	1.1489	1.0220	1.2390	11.0
4,4'-DDD	1.1572	0.9610	1.1040	0.9804	1.0075	0.9157	0.8637	0.9985	10.3
Endosulfan sulfate	1.2683	1.0219	1.2347	1.0859	1.0664	0.9387	0.8601	1.0680	13.8
4,4'-DDT	1.1520	1.0496	1.1782	1.0428	1.0784	0.9737	0.9068	1.0545	9.0
Methoxychlor	0.6449	0.5451	0.5601	0.4887	0.4565	0.3947	0.3296	0.4885	17.0
Endrin ketone	1.8035	1.3988	1.6118	1.3813	1.3805	1.1953	1.0611	1.4046	17.6
Endrin aldehyde	1.0798	1.0283	1.0707	0.9694	0.9164	0.8689	0.8005	0.9620	11.0
gamma-Chlordane	1.0838	0.9736	1.0623	0.9830	0.8920	0.8703	0.7980	0.9518	10.9
alpha-Chlordane	0.9405	0.8576	0.9423	0.8788	0.8037	0.8074	0.7416	0.8531	8.7
Hexachlorobutadiene	1.6579	1.5300	1.6190	1.5867	1.3054	1.3265	1.1890	1.4592	12.5
Hexachlorobenzene	1.4795	1.2757	1.2634	1.1913	1.1308	1.0930	1.0020	1.2051	12.8
Tetrachloro-m-xylene	1.1582	0.9639	0.8972	0.8601	0.7915	0.7834	0.7400	0.8849	16.1
Decachlorobiphenyl	1.1978	1.1165	1.0710	0.9617	0.8892	0.8371	0.7677	0.9773	16.1

8081 DDT/ENDRIN BREAKDOWN VERIFICATION SUMMARY

Lab ID: DS

ARI Job No.: 20120123PEST

Analysis Date: 27-FEB-2012 23:37

Init. Calib. Date: 23-JAN-2012

GC Column: STX-CLP1 ID: 0.53 (mm)

COMPOUND	RT	AREA
4,4'-DDE	5.716	12029
Endrin	6.209	1699434
4,4'-DDD	6.274	51554
4,4'-DDT	6.528	1655217
Endrin ketone	7.437	156588
Endrin aldehyde	6.797	79712

DDT Percent Breakdown = 3.7 % ✓
 $((12029+51554) * 100) / (12029+51554+1655217)$

Endrin Percent Breakdown = 12.2 % ✓
 $((79712+156588) * 100) / (79712+156588+1699434)$

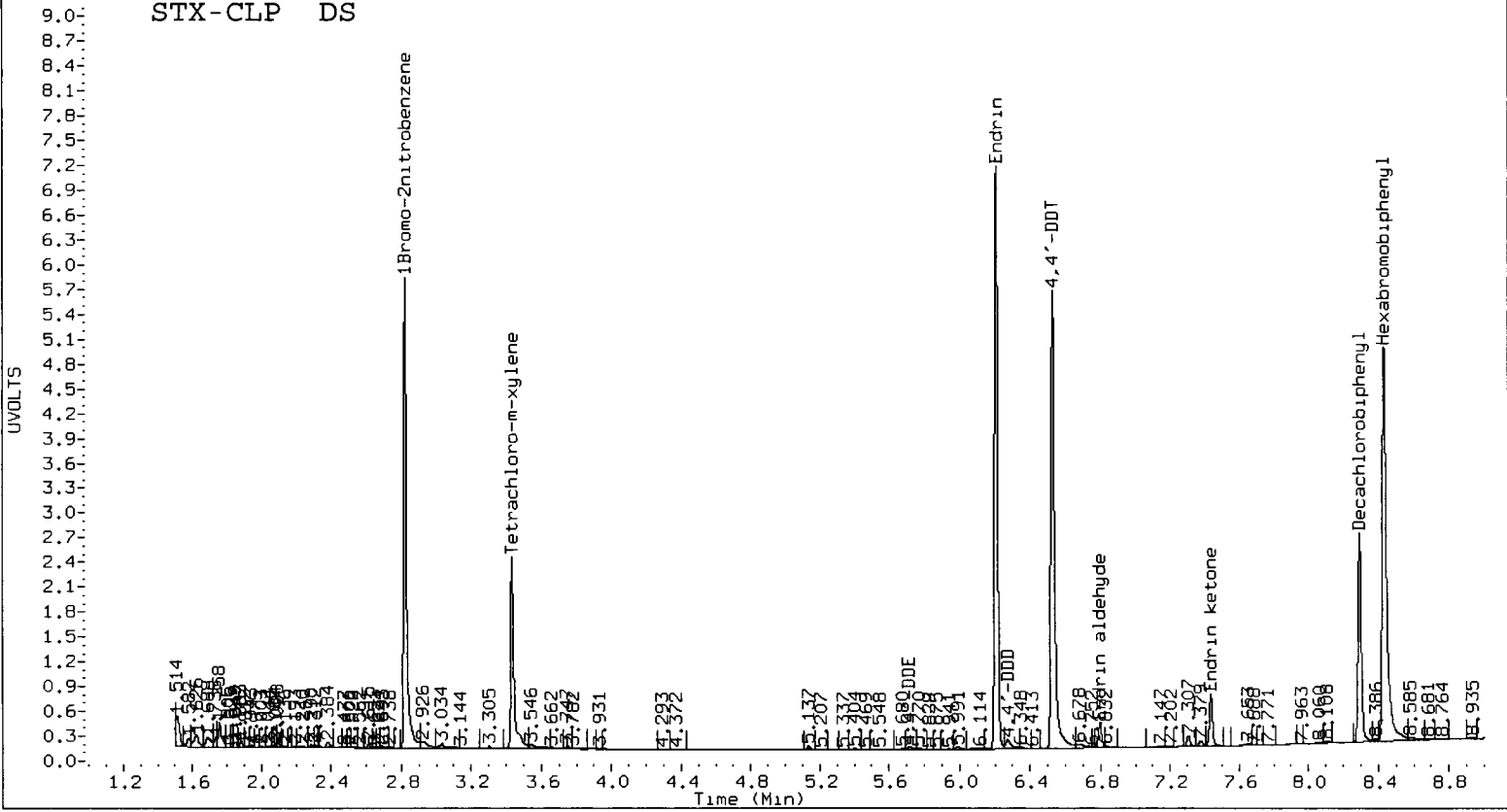
GC Column: STX-CLP2 ID: 0.53 (mm)

COMPOUND	RT	AREA
4,4'-DDE	6.275	114118
Endrin	6.734	4275516
4,4'-DDD	6.816	328839
4,4'-DDT	7.101	3949098
Endrin ketone	7.952	395200
Endrin aldehyde	7.227	247615

DDT Percent Breakdown = 10.1 % ✓
 $((114118+328839) * 100) / (114118+328839+3949098)$

Endrin Percent Breakdown = 13.1 % ✓
 $((247615+395200) * 100) / (247615+395200+4275516)$

Form VII Pest-1



8081 PESTICIDE CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No.: UJ37

Project: PORT OF PORTLAND

GC Column: STX-CLP1 ID: 0.53 (mm)

Init. Calib. Date: 01/23/12

Lab Ccal ID: INDAE

Date/Time Analyzed: 02/27/12,2355

PEST MIX COMPOUND	RT	RT WINDOW		CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
		FROM	TO			
alpha-BHC	3.88	3.83	3.93	23.9	20.0	19.7
beta-BHC	4.22	4.17	4.27	20.0	20.0	-0.2
delta-BHC	4.38	4.33	4.43	21.5	20.0	7.4
gamma-BHC (Lindane)	4.14	4.09	4.19	23.4	20.0	17.1
Heptachlor	4.56	4.50	4.61	21.9	20.0	9.5
Aldrin	4.83	4.78	4.88	22.9	20.0	14.3
Heptachlor epoxide b	5.39	5.34	5.44	20.5	20.0	2.7
Endosulfan I	5.77	5.72	5.82	18.4	20.0	-8.1
Dieldrin	5.99	5.94	6.04	44.8	40.0	11.9
4,4'-DDE	5.72	5.67	5.77	50.3	40.0	25.8
Endrin	6.21	6.16	6.26	36.4	40.0	-9.1
Endosulfan II	6.42	6.37	6.47	39.7	40.0	-0.7
4,4'-DDD	6.27	6.22	6.33	41.8	40.0	4.6
Endosulfan sulfate	7.19	7.13	7.24	40.2	40.0	0.4
4,4'-DDT	6.53	6.48	6.58	42.3	40.0	5.8
Methoxychlor	6.97	6.92	7.02	189.8	200.0	-5.1
Endrin ketone	7.44	7.39	7.49	40.4	40.0	1.0
Endrin aldehyde	6.80	6.75	6.84	33.5	40.0	-16.3
gamma-Chlordane	5.51	5.46	5.56	22.4	20.0	12.2
alpha-Chlordane	5.64	5.59	5.69	19.7	20.0	-1.6
Hexachlorobutadiene	2.08	2.04	2.13	22.1	20.0	10.6
Hexachlorobenzene	3.75	3.70	3.80	23.3	20.0	16.7
Tetrachloro-m-xylene	3.44	3.39	3.49	37.6	40.0	-5.9
Decachlorobiphenyl	8.29	8.24	8.34	44.6	40.0	11.6

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8081 PESTICIDE CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No.: UJ37

Project: PORT OF PORTLAND

GC Column: STX-CLP2 ID: 0.53 (mm)

Init. Calib. Date: 01/23/12

Lab Ccal ID: INDAE

Date/Time Analyzed: 02/27/12,2355

PEST MIX COMPOUND	RT	RT WINDOW		CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
		FROM	TO			
=====	=====	=====	=====	=====	=====	=====
alpha-BHC	4.16	4.11	4.21	20.9	20.0	4.7
beta-BHC	4.56	4.52	4.62	20.6	20.0	3.2
delta-BHC	4.84	4.80	4.90	25.1	20.0	25.3
gamma-BHC (Lindane)	4.49	4.43	4.53	20.2	20.0	0.8
Heptachlor	4.91	4.86	4.96	18.6	20.0	-7.1
Aldrin	5.24	5.18	5.28	19.6	20.0	-2.2
Heptachlor epoxide b	5.80	5.75	5.85	20.1	20.0	0.3
Endosulfan I	6.19	6.13	6.23	20.2	20.0	1.1
Dieldrin	6.45	6.39	6.49	41.4	40.0	3.4
4,4'-DDE	6.28	6.23	6.33	44.3	40.0	10.8
Endrin	6.73	6.68	6.78	37.6	40.0	-6.0
Endosulfan II	6.93	6.88	6.97	41.9	40.0	4.7
4,4'-DDD	6.82	6.77	6.87	45.0	40.0	12.6
Endosulfan sulfate	7.47	7.42	7.52	38.8	40.0	-2.9
4,4'-DDT	7.10	7.05	7.15	44.6	40.0	11.4
Methoxychlor	7.70	7.65	7.75	185.5	200.0	-7.2
Endrin ketone	7.95	7.90	8.00	40.5	40.0	1.3
Endrin aldehyde	7.23	7.18	7.28	36.3	40.0	-9.2
gamma-Chlordane	5.99	5.93	6.04	21.2	20.0	5.8
alpha-Chlordane	6.13	6.07	6.17	21.7	20.0	8.3
Hexachlorobutadiene	2.15	2.10	2.20	16.5	20.0	-17.6
Hexachlorobenzene	4.04	4.01	4.11	20.6	20.0	3.2
Tetrachloro-m-xylene	3.63	3.59	3.69	39.4	40.0	-1.5
Decachlorobiphenyl	8.98	8.93	9.03	36.6	40.0	-8.4

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8081 DDT/ENDRIN BREAKDOWN VERIFICATION SUMMARY

Lab ID: DS

ARI Job No.: 20120123PEST

Analysis Date: 28-FEB-2012 03:10

Init. Calib. Date: 23-JAN-2012

GC Column: STX-CLP1 ID: 0.53 (mm)

COMPOUND	RT	AREA
4,4'-DDE	5.717	16846
Endrin	6.209	1765583
4,4'-DDD	6.275	74339
4,4'-DDT	6.528	1678998
Endrin ketone	7.437	162152
Endrin aldehyde	6.797	86909

DDT Percent Breakdown = 5.2 % ✓
 $((16846+74339) * 100) / (16846+74339+1678998)$

Endrin Percent Breakdown = 12.4 % ✓
 $((86909+162152) * 100) / (86909+162152+1765583)$

GC Column: STX-CLP2 ID: 0.53 (mm)

COMPOUND	RT	AREA
4,4'-DDE	6.276	125882
Endrin	6.734	4461604
4,4'-DDD	6.816	272343
4,4'-DDT	7.101	4184370
Endrin ketone	7.952	440399
Endrin aldehyde	7.228	308941

DDT Percent Breakdown = 8.7 % ✓
 $((125882+272343) * 100) / (125882+272343+4184370)$

Endrin Percent Breakdown = 14.4 % ✓
 $((308941+440399) * 100) / (308941+440399+4461604)$

Form VII Pest-1

8081 PESTICIDE CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No.: UJ37

Project: PORT OF PORTLAND

GC Column: STX-CLP1 ID: 0.53 (mm)

Init. Calib. Date: 01/23/12

Lab Ccal ID: INDAE

Date/Time Analyzed: 02/28/12,0328

PEST MIX COMPOUND	RT	RT WINDOW		CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
		FROM	TO			
alpha-BHC	3.88	3.83	3.93	23.9	20.0	19.6
beta-BHC	4.22	4.17	4.27	19.9	20.0	-0.5
delta-BHC	4.38	4.33	4.43	20.8	20.0	4.1
gamma-BHC (Lindane)	4.14	4.09	4.19	23.3	20.0	16.7
Heptachlor	4.55	4.50	4.61	21.8	20.0	8.8
Aldrin	4.83	4.78	4.88	22.9	20.0	14.6
Heptachlor epoxide b	5.39	5.34	5.44	20.7	20.0	3.5
Endosulfan I	5.77	5.72	5.82	18.1	20.0	-9.6
Dieldrin	5.99	5.94	6.04	45.0	40.0	12.6
4,4'-DDE	5.71	5.67	5.77	50.8	40.0	26.9
Endrin	6.21	6.16	6.26	36.7	40.0	-8.2
Endosulfan II	6.42	6.37	6.47	40.0	40.0	-0.1
4,4'-DDD	6.27	6.22	6.33	42.4	40.0	6.1
Endosulfan sulfate	7.19	7.13	7.24	40.3	40.0	0.8
4,4'-DDT	6.53	6.48	6.58	41.8	40.0	4.4
Methoxychlor	6.97	6.92	7.02	187.6	200.0	-6.2
Endrin ketone	7.44	7.39	7.49	40.8	40.0	2.0
Endrin aldehyde	6.80	6.75	6.84	34.7	40.0	-13.3
gamma-Chlordane	5.51	5.46	5.56	22.5	20.0	12.4
alpha-Chlordane	5.64	5.59	5.69	19.6	20.0	-1.8
Hexachlorobutadiene	2.08	2.04	2.13	22.1	20.0	10.6
Hexachlorobenzene	3.75	3.70	3.80	23.3	20.0	16.4
Tetrachloro-m-xylene	3.44	3.39	3.49	42.2	40.0	5.6
Decachlorobiphenyl	8.29	8.24	8.34	44.4	40.0	10.9

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8081 PESTICIDE CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No.: UJ37

Project: PORT OF PORTLAND

GC Column: STX-CLP2 ID: 0.53 (mm)

Init. Calib. Date: 01/23/12

Lab Ccal ID: INDAE

Date/Time Analyzed: 02/28/12,0328

PEST MIX COMPOUND	RT	RT WINDOW		CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
		FROM	TO			
alpha-BHC	4.16	4.11	4.21	21.1	20.0	5.5
beta-BHC	4.56	4.52	4.62	20.5	20.0	2.5
delta-BHC	4.84	4.80	4.90	24.8	20.0	24.2
gamma-BHC (Lindane)	4.48	4.43	4.53	20.1	20.0	0.6
Heptachlor	4.91	4.86	4.96	19.0	20.0	-4.9
Aldrin	5.24	5.18	5.28	19.7	20.0	-1.4
Heptachlor epoxide b	5.80	5.75	5.85	20.2	20.0	0.8
Endosulfan I	6.19	6.13	6.23	20.4	20.0	1.9
Dieldrin	6.44	6.39	6.49	41.8	40.0	4.5
4,4'-DDE	6.27	6.23	6.33	45.0	40.0	12.4
Endrin	6.73	6.68	6.78	37.2	40.0	-7.1
Endosulfan II	6.93	6.88	6.97	41.4	40.0	3.5
4,4'-DDD	6.81	6.77	6.87	44.9	40.0	12.2
Endosulfan sulfate	7.47	7.42	7.52	38.9	40.0	-2.7
4,4'-DDT	7.10	7.05	7.15	43.8	40.0	9.6
Methoxychlor	7.70	7.65	7.75	180.7	200.0	-9.6
Endrin ketone	7.95	7.90	8.00	40.5	40.0	1.2
Endrin aldehyde	7.23	7.18	7.28	37.3	40.0	-6.8
gamma-Chlordane	5.99	5.93	6.04	21.5	20.0	7.6
alpha-Chlordane	6.12	6.07	6.17	22.0	20.0	9.8
Hexachlorobutadiene	2.15	2.10	2.20	16.5	20.0	-17.7
Hexachlorobenzene	4.04	4.01	4.11	20.7	20.0	3.4
Tetrachloro-m-xylene	3.63	3.59	3.69	39.4	40.0	-1.5
Decachlorobiphenyl	8.98	8.93	9.03	36.7	40.0	-8.2

7E

8081 DDT/ENDRIN BREAKDOWN VERIFICATION SUMMARY

Lab ID: DS

ARI Job No.: 20120123PEST

Analysis Date: 28-FEB-2012 05:51

Init. Calib. Date: 23-JAN-2012

GC Column: STX-CLP1 ID: 0.53 (mm)

COMPOUND	RT	AREA
4,4'-DDE	5.716	13196
Endrin	6.209	1800505
4,4'-DDD	6.274	121370
4,4'-DDT	6.528	1539253
Endrin ketone	7.437	138832
Endrin aldehyde	6.797	64568

DDT Percent Breakdown = 8.0 %
 $((13196+121370) * 100) / (13196+121370+1539253)$

Endrin Percent Breakdown = 10.2 %
 $((64568+138832) * 100) / (64568+138832+1800505)$

GC Column: STX-CLP2 ID: 0.53 (mm)

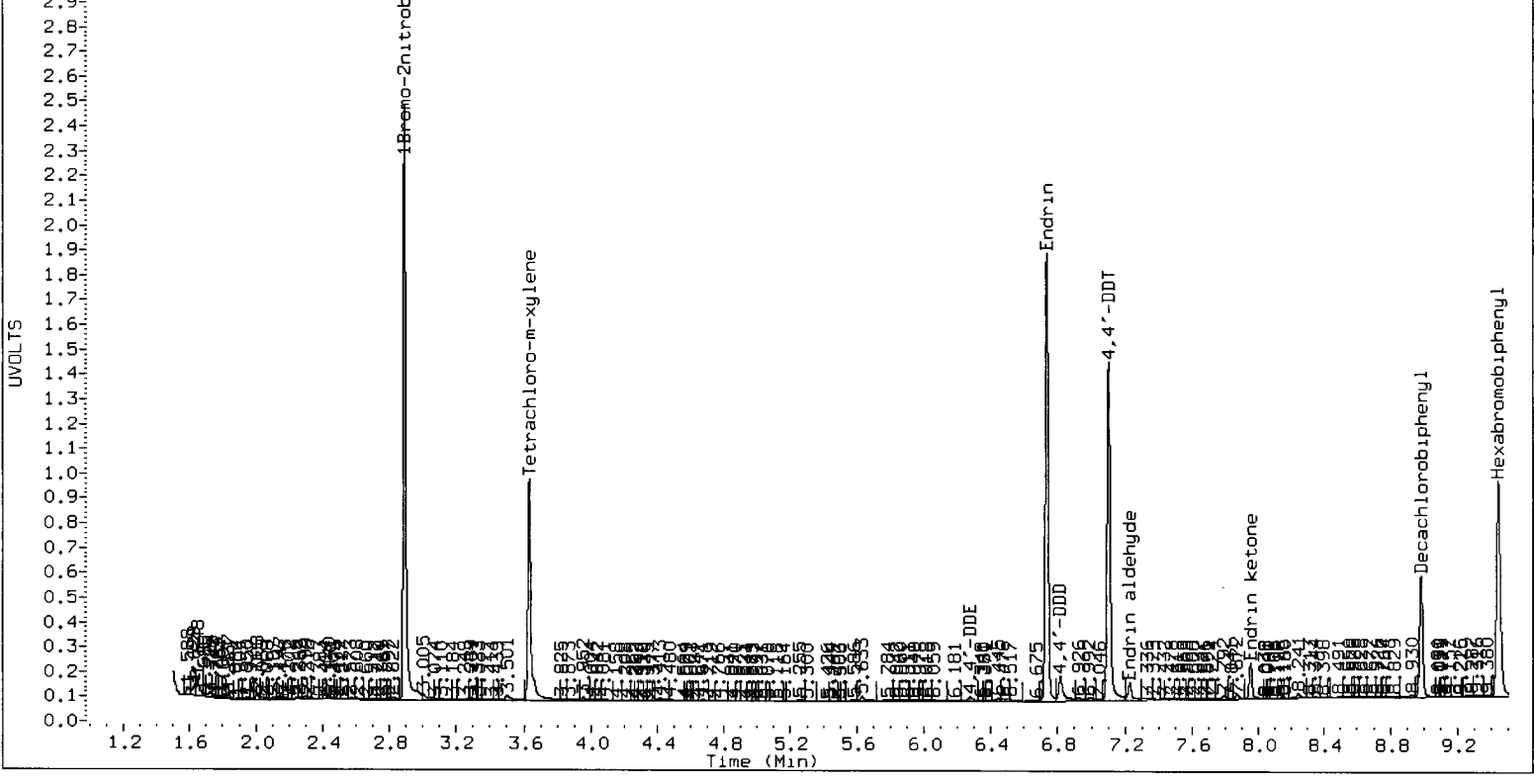
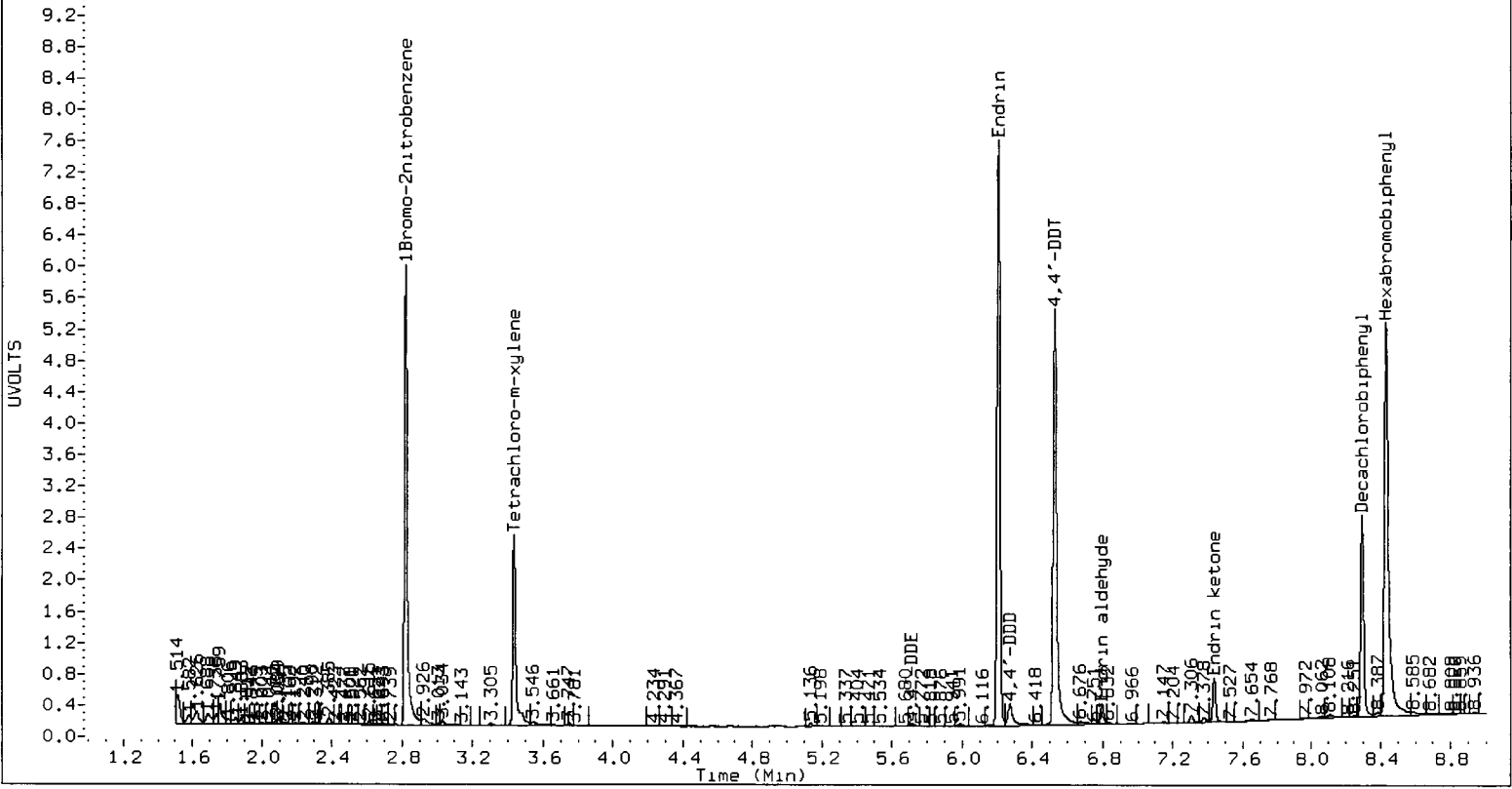
COMPOUND	RT	AREA
4,4'-DDE	6.274	108119
Endrin	6.734	4426589
4,4'-DDD	6.815	403686
4,4'-DDT	7.101	3653781
Endrin ketone	7.953	363606
Endrin aldehyde	7.228	236380

DDT Percent Breakdown = 12.3 %
 $((108119+403686) * 100) / (108119+403686+3653781)$

Endrin Percent Breakdown = 11.9 %
 $((236380+363606) * 100) / (236380+363606+4426589)$

Form VII Pest-1

UJ37.00040



8081 PESTICIDE CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No.: UJ37

Project: PORT OF PORTLAND

GC Column: STX-CLP1 ID: 0.53 (mm)

Init. Calib. Date: 01/23/12

Lab Ccal ID: INDAE

Date/Time Analyzed: 02/28/12,0608

PEST MIX COMPOUND	RT	RT WINDOW		CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
		FROM	TO			
alpha-BHC	3.88	3.83	3.93	24.0	20.0	19.8
beta-BHC	4.22	4.17	4.27	20.0	20.0	0.2
delta-BHC	4.37	4.33	4.43	21.9	20.0	9.7
gamma-BHC (Lindane)	4.14	4.09	4.19	23.5	20.0	17.5
Heptachlor	4.55	4.50	4.61	21.5	20.0	7.5
Aldrin	4.83	4.78	4.88	22.9	20.0	14.6
Heptachlor epoxide b	5.39	5.34	5.44	20.4	20.0	2.1
Endosulfan I	5.77	5.72	5.82	18.2	20.0	-8.8
Dieldrin	5.99	5.94	6.04	44.4	40.0	11.0
4,4'-DDE	5.71	5.67	5.77	51.8	40.0	29.6
Endrin	6.21	6.16	6.26	38.9	40.0	-2.7
Endosulfan II	6.42	6.37	6.47	40.6	40.0	1.4
4,4'-DDD	6.27	6.22	6.33	45.5	40.0	13.7
Endosulfan sulfate	7.19	7.13	7.24	40.5	40.0	1.2
4,4'-DDT	6.53	6.48	6.58	39.6	40.0	-1.1
Methoxychlor	6.97	6.92	7.02	181.9	200.0	-9.0
Endrin ketone	7.44	7.39	7.49	40.1	40.0	0.2
Endrin aldehyde	6.80	6.75	6.84	35.1	40.0	-12.2
gamma-Chlordane	5.51	5.46	5.56	22.5	20.0	12.2
alpha-Chlordane	5.64	5.59	5.69	19.7	20.0	-1.6
Hexachlorobutadiene	2.08	2.04	2.13	22.1	20.0	10.4
Hexachlorobenzene	3.75	3.70	3.80	23.5	20.0	17.4
Tetrachloro-m-xylene	3.43	3.39	3.49	37.8	40.0	-5.5
Decachlorobiphenyl	8.29	8.24	8.34	43.8	40.0	9.6

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8081 PESTICIDE CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No.: UJ37

Project: PORT OF PORTLAND

GC Column: STX-CLP2 ID: 0.53 (mm)

Init. Calib. Date: 01/23/12

Lab Ccal ID: INDAE

Date/Time Analyzed: 02/28/12,0608

PEST MIX COMPOUND	RT	RT WINDOW		CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
		FROM	TO			
=====	=====	=====	=====	=====	=====	=====
alpha-BHC	4.16	4.11	4.21	21.1	20.0	5.6
beta-BHC	4.56	4.52	4.62	20.7	20.0	3.5
delta-BHC	4.84	4.80	4.90	25.5	20.0	27.5
gamma-BHC (Lindane)	4.48	4.43	4.53	20.2	20.0	1.1
Heptachlor	4.91	4.86	4.96	18.5	20.0	-7.6
Aldrin	5.24	5.18	5.28	19.5	20.0	-2.3
Heptachlor epoxide b	5.80	5.75	5.85	19.9	20.0	-0.4
Endosulfan I	6.19	6.13	6.23	19.7	20.0	-1.3
Dieldrin	6.45	6.39	6.49	41.0	40.0	2.4
4,4'-DDE	6.27	6.23	6.33	44.2	40.0	10.5
Endrin	6.73	6.68	6.78	39.7	40.0	-0.8
Endosulfan II	6.93	6.88	6.97	42.9	40.0	7.2
4,4'-DDD	6.81	6.77	6.87	48.1	40.0	20.2
Endosulfan sulfate	7.47	7.42	7.52	39.6	40.0	-1.0
4,4'-DDT	7.10	7.05	7.15	42.0	40.0	5.0
Methoxychlor	7.69	7.65	7.75	177.1	200.0	-11.5
Endrin ketone	7.95	7.90	8.00	38.8	40.0	-2.9
Endrin aldehyde	7.23	7.18	7.28	37.8	40.0	-5.5
gamma-Chlordane	5.98	5.93	6.04	20.9	20.0	4.7
alpha-Chlordane	6.12	6.07	6.17	21.4	20.0	7.2
Hexachlorobutadiene	2.15	2.10	2.20	16.5	20.0	-17.6
Hexachlorobenzene	4.04	4.01	4.11	20.8	20.0	4.1
Tetrachloro-m-xylene	3.63	3.59	3.69	39.5	40.0	-1.2
Decachlorobiphenyl	8.98	8.93	9.03	37.3	40.0	-6.7

FORM 8
PESTICIDE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No.: UJ37

Project: PORT OF PORTLAND

GC Column: STX-CLP1 ID: 0.53 (mm)

Instrument ID: ECD6

Init. Calib. Date: 01/23/12

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS,
SAMPLES, AND STANDARDS IS GIVEN BELOW:

					IS1 AREA	RT	IS2 AREA	RT
=====					=====	=====	=====	=====
ICAL MIDPT					1839597	2.824	2275632	8.436
UPPER LIMIT					3679194	2.874	4551264	8.486
LOWER LIMIT					919798	2.774	1137816	8.386
=====					=====	=====	=====	=====
CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME	IS1 AREA	RT	IS2 AREA	RT	
=====	=====	=====	=====	=====	=====	=====	=====	
01	DS	01/23/12	1247	1858000	2.823	2334567	8.432	
02	ZZZZZ	01/23/12	1305	2151816	2.824	2691987	8.434	
03	INDAE	01/23/12	1323	1839597	2.824	2275632	8.436	
04	INDAA	01/23/12	1341	2325896	2.824	2792031	8.438	
05	INDAB	01/23/12	1359	1690544	2.824	2161026	8.440	
06	INDAC	01/23/12	1416	2138393	2.824	2698863	8.440	
07	INDAD	01/23/12	1434	2254260	2.824	2833889	8.440	
08	INDAF	01/23/12	1452	2219543	2.823	2812901	8.442	
09	INDAG	01/23/12	1510	2512795	2.824	3199021	8.441	
10	ZZZZZ	01/23/12	1528	2158464	2.824	2857983	8.433	
11	ZZZZZ	01/23/12	1545	2283438	2.823	2926740	8.429	
12	TOXAPH 2500	01/23/12	1603	1983361	2.824	2566651	8.443	
13	ZZZZZ	01/23/12	1621	2232340	2.824	2800689	8.445	
14	WNDE	01/23/12	1639	2461252	2.824	3126635	8.444	
15	WNDA	01/23/12	1656	2370739	2.824	3005741	8.445	
16	WNDB	01/23/12	1714	2457109	2.825	3148064	8.444	
17	WNDC	01/23/12	1732	2411138	2.824	3141455	8.444	
18	WNDD	01/23/12	1750	2408638	2.824	3077719	8.445	
19	WNDF	01/23/12	1808	2367291	2.824	2961508	8.444	
20	WNDG	01/23/12	1825	2381634	2.824	2986233	8.445	
21	ZZZZZ	01/23/12	1843	2097000	2.824	2622424	8.446	
22	ZZZZZ	01/23/12	1901	1887927	2.824	2440534	8.442	
23	ZZZZZ	01/23/12	1919	2122993	2.824	2608442	8.448	
24	ZZZZZ	01/23/12	1936	1983929	2.824	2846722	8.437	
25	DS	02/27/12	2337	1259385	2.823	1643010	8.434	
26	INDAE	02/27/12	2355	1286178	2.823	1806521	8.433	
27	UJ37MBS1	02/28/12	0013	1920932	2.822	2414452	8.431	
28	UJ37LCSS1	02/28/12	0030	2007708	2.822	2507887	8.431	
29	UJ37LCSDS1	02/28/12	0048	1937377	2.822	2453473	8.430	
30	DS	02/28/12	0310	1282134	2.823	1761673	8.434	
31	INDAE	02/28/12	0328	1321853	2.823	1860019	8.433	
32	C1/2-N1	02/28/12	0346	2078538	2.821	2561609	8.429	
33	C1/2-N2	02/28/12	0404	1922481	2.821	2453305	8.431	
34	C3/4-N1	02/28/12	0422	1962317	2.821	2441292	8.431	
35	C3/4-N2	02/28/12	0439	1998721	2.821	2585727	8.431	

IS1 = 1-Bromo-2-Nitrobenzene
IS2 = Hexabromobiphenyl

RT Window = RT +/- .05 min

UJ37 : 00044

FORM 8
PESTICIDE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No.: UJ37

Project: PORT OF PORTLAND

GC Column: STX-CLP1 ID: 0.53(mm)

Instrument ID: ECD6

Init. Calib. Date: 01/23/12

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS,
SAMPLES, AND STANDARDS IS GIVEN BELOW:

				IS1 AREA	RT	IS2 AREA	RT
=====				=====	=====	=====	=====
ICAL MIDPT				1839597	2.824	2275632	8.436
UPPER LIMIT				3679194	2.874	4551264	8.486
LOWER LIMIT				919798	2.774	1137816	8.386
				IS1 AREA	RT	IS2 AREA	RT
CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME	IS1 AREA	RT	IS2 AREA	RT
=====	=====	=====	=====	=====	=====	=====	=====
36	ZZZZZ	02/28/12	0457	1711818	2.823	2256327	8.432
37	ZZZZZ	02/28/12	0515	1625879	2.822	2281416	8.432
38	ZZZZZ	02/28/12	0533	1521403	2.823	2026574	8.431
39	DS	02/28/12	0551	1275197	2.822	1715664	8.433
40	INDAE	02/28/12	0608	1340090	2.822	1828341	8.432

IS1 = 1-Bromo-2-Nitrobenzene RT Window = RT +/- .05 min

IS2 = Hexabromobiphenyl

* Indicates value outside QC Limits

FORM 8
PESTICIDE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No.: UJ37

Project: PORT OF PORTLAND

GC Column: STX-CLP2 ID: 0.53(mm)

Instrument ID: ECD6

Init. Calib. Date: 01/23/12

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS,
SAMPLES, AND STANDARDS IS GIVEN BELOW:

				IS1 AREA	RT	IS2 AREA	RT	
=====				=====	=====	=====	=====	
				ICAL MIDPT	5716021	2.891	3512534	9.438
				UPPER LIMIT	11432042	2.941	7025068	9.488
				LOWER LIMIT	2858010	2.841	1756267	9.388
=====				=====	=====	=====	=====	
CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME	IS1 AREA	RT	IS2 AREA	RT	
=====	=====	=====	=====	=====	=====	=====	=====	
01	DS	01/23/12	1247	5850373	2.890	3571201	9.434	
02	ZZZZZ	01/23/12	1305	6627578	2.891	4105135	9.436	
03	INDAE	01/23/12	1323	5716021	2.891	3512534	9.438	
04	INDAA	01/23/12	1341	7149978	2.891	4091284	9.439	
05	INDAB	01/23/12	1359	5256685	2.891	3296803	9.440	
06	INDAC	01/23/12	1416	6581899	2.892	4100568	9.438	
07	INDAD	01/23/12	1434	6872747	2.891	4364102	9.440	
08	INDAF	01/23/12	1452	6808652	2.891	4322320	9.441	
09	INDAG	01/23/12	1510	7940347	2.892	4948953	9.441	
10	ZZZZZ	01/23/12	1528	6567912	2.892	4339835	9.436	
11	ZZZZZ	01/23/12	1545	6991040	2.891	4482711	9.434	
12	TOXAPH 2500	01/23/12	1603	6173624	2.891	3933130	9.442	
13	ZZZZZ	01/23/12	1621	6745103	2.891	4352902	9.442	
14	WNDE	01/23/12	1639	7589769	2.891	4971303	9.442	
15	WNDA	01/23/12	1656	7272130	2.891	4786324	9.443	
16	WNDB	01/23/12	1714	7923425	2.892	5018196	9.443	
17	WNDC	01/23/12	1732	7556144	2.892	4967455	9.443	
18	WNDD	01/23/12	1750	7575425	2.892	5016853	9.444	
19	WNDF	01/23/12	1808	7487656	2.892	4981753	9.444	
20	WNDG	01/23/12	1825	7611906	2.892	5056086	9.444	
21	ZZZZZ	01/23/12	1843	6824889	2.892	4445124	9.444	
22	ZZZZZ	01/23/12	1901	6194846	2.892	4125662	9.442	
23	ZZZZZ	01/23/12	1919	6834065	2.892	4554100	9.445	
24	ZZZZZ	01/23/12	1936	6669239	2.892	4750072	9.440	
25	DS	02/27/12	2337	4950591	2.891	2863774	9.441	
26	INDAE	02/27/12	2355	5130290	2.891	3090819	9.441	
27	UJ37MBS1	02/28/12	0013	7363310	2.891	4046842	9.439	
28	UJ37LCSS1	02/28/12	0030	7615932	2.890	4273715	9.439	
29	UJ37LCSDS1	02/28/12	0048	7418873	2.890	4236240	9.439	
30	DS	02/28/12	0310	5092668	2.891	3099391	9.442	
31	INDAE	02/28/12	0328	5265955	2.891	3292271	9.441	
32	C1/2-N1	02/28/12	0346	6685025	2.890	2877921	9.439	
33	C1/2-N2	02/28/12	0404	6380380	2.889	2478867	9.440	
34	C3/4-N1	02/28/12	0422	6516434	2.890	2507982	9.440	
35	C3/4-N2	02/28/12	0439	6596403	2.890	2530598	9.440	

IS1 = 1-Bromo-2-Nitrobenzene
IS2 = Hexabromobiphenyl

RT Window = RT +/- .05 min

UJ37: 00046

FORM 8
 PESTICIDE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No.: UJ37

Project: PORT OF PORTLAND

GC Column: STX-CLP2 ID: 0.53 (mm)

Instrument ID: ECD6

Init. Calib. Date: 01/23/12

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS,
 SAMPLES, AND STANDARDS IS GIVEN BELOW:

	IS1 AREA	RT	IS2 AREA	RT
ICAL MIDPT	5716021	2.891	3512534	9.438
UPPER LIMIT	11432042	2.941	7025068	9.488
LOWER LIMIT	2858010	2.841	1756267	9.388

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME	IS1 AREA	RT	IS2 AREA	RT
36	ZZZZZ	ZZZZZ	02/28/12	0457	6478508	2.891	2958830	9.440
37	ZZZZZ	ZZZZZ	02/28/12	0515	6345854	2.890	3497221	9.440
38	ZZZZZ	ZZZZZ	02/28/12	0533	5672782	2.891	3292093	9.440
39		DS	02/28/12	0551	5020995	2.890	2871916	9.441
40		INDAE	02/28/12	0608	5312879	2.890	3105431	9.440

IS1 = 1-Bromo-2-Nitrobenzene RT Window = RT +/- .05 min
 IS2 = Hexabromobiphenyl

* Indicates value outside QC Limits

**PCB Analysis
Report and Summary QC Forms**

ARI Job ID: UJ37

ORGANICS ANALYSIS DATA SHEET

PSDDA PCB by GC/ECD

Page 1 of 1

Sample ID: C1/2-N1
SAMPLE

Lab Sample ID: UJ37A
LIMS ID: 12-3221
Matrix: Soil
Data Release Authorized: *RB*
Reported: 02/28/12

QC Report No: UJ37-Hart Crowser
Project: Port of Portland
15665-01
Date Sampled: 02/02/12
Date Received: 02/03/12

Date Extracted: 02/25/12
Date Analyzed: 02/27/12 15:55
Instrument/Analyst: ECD7/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes

Sample Amount: 12.6 g-dry-wt
Final Extract Volume: 2.5 mL
Dilution Factor: 1.00
Silica Gel: Yes
Percent Moisture: 42.7%

CAS Number	Analyte	MDL	RL	Result
12674-11-2	Aroclor 1016	1.0	4.0	< 4.0 U
53469-21-9	Aroclor 1242	1.3	4.0	< 4.0 U
12672-29-6	Aroclor 1248	1.3	4.0	5.1
11097-69-1	Aroclor 1254	1.3	4.0	8.2
11096-82-5	Aroclor 1260	1.3	4.0	8.2
11104-28-2	Aroclor 1221	1.3	4.0	< 4.0 U
11141-16-5	Aroclor 1232	1.3	4.0	< 4.0 U
37324-23-5	Aroclor 1262	1.3	4.0	< 4.0 U
11100-14-4	Aroclor 1268	1.3	4.0	< 4.0 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	104%
Tetrachlorometaxylene	102%

ORGANICS ANALYSIS DATA SHEET

PSDDA PCB by GC/ECD

Page 1 of 1

Sample ID: C1/2-N2
SAMPLE

Lab Sample ID: UJ37B
LIMS ID: 12-3222
Matrix: Soil
Data Release Authorized: *B*
Reported: 02/28/12

QC Report No: UJ37-Hart Crowser
Project: Port of Portland
15665-01
Date Sampled: 02/02/12
Date Received: 02/03/12

Date Extracted: 02/25/12
Date Analyzed: 02/27/12 16:16
Instrument/Analyst: ECD7/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes

Sample Amount: 12.7 g-dry-wt
Final Extract Volume: 2.5 mL
Dilution Factor: 1.00
Silica Gel: Yes
Percent Moisture: 45.2%

CAS Number	Analyte	MDL	RL	Result
12674-11-2	Aroclor 1016	1.0	3.9	< 3.9 U
53469-21-9	Aroclor 1242	1.3	3.9	< 3.9 U
12672-29-6	Aroclor 1248	1.3	3.9	5.4
11097-69-1	Aroclor 1254	1.3	3.9	8.5
11096-82-5	Aroclor 1260	1.3	3.9	9.2
11104-28-2	Aroclor 1221	1.3	3.9	< 3.9 U
11141-16-5	Aroclor 1232	1.3	3.9	< 3.9 U
37324-23-5	Aroclor 1262	1.3	3.9	< 3.9 U
11100-14-4	Aroclor 1268	1.3	3.9	< 3.9 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	94.0%
Tetrachlorometaxylene	90.5%

ORGANICS ANALYSIS DATA SHEET

PSDDA PCB by GC/ECD

Page 1 of 1

Sample ID: C3/4-N1
SAMPLE

Lab Sample ID: UJ37C

LIMS ID: 12-3223

Matrix: Soil

Data Release Authorized: *AB*

Reported: 02/28/12

QC Report No: UJ37-Hart Crowser

Project: Port of Portland

15665-01

Date Sampled: 02/02/12

Date Received: 02/03/12

Date Extracted: 02/25/12

Date Analyzed: 02/27/12 16:37

Instrument/Analyst: ECD7/JGR

GPC Cleanup: No

Sulfur Cleanup: Yes

Acid Cleanup: Yes

Sample Amount: 12.8 g-dry-wt

Final Extract Volume: 2.5 mL

Dilution Factor: 1.00

Silica Gel: Yes

Percent Moisture: 48.8%

CAS Number	Analyte	MDL	RL	Result
12674-11-2	Aroclor 1016	0.99	3.9	< 3.9 U
53469-21-9	Aroclor 1242	1.3	3.9	< 3.9 U
12672-29-6	Aroclor 1248	1.3	3.9	< 3.9 U
11097-69-1	Aroclor 1254	1.3	3.9	< 3.9 U
11096-82-5	Aroclor 1260	1.3	3.9	< 3.9 U
11104-28-2	Aroclor 1221	1.3	3.9	< 3.9 U
11141-16-5	Aroclor 1232	1.3	3.9	< 3.9 U
37324-23-5	Aroclor 1262	1.3	3.9	< 3.9 U
11100-14-4	Aroclor 1268	1.3	3.9	< 3.9 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	62.0%
Tetrachlorometaxylene	59.8%

ORGANICS ANALYSIS DATA SHEET

PSDDA PCB by GC/ECD

Page 1 of 1

Sample ID: C3/4-N2

SAMPLE

Lab Sample ID: UJ37D

LIMS ID: 12-3224

Matrix: Soil

Data Release Authorized: *AB*

Reported: 02/28/12

QC Report No: UJ37-Hart Crowser

Project: Port of Portland

15665-01

Date Sampled: 02/02/12

Date Received: 02/03/12

Date Extracted: 02/25/12

Date Analyzed: 02/27/12 16:58

Instrument/Analyst: ECD7/JGR

GPC Cleanup: No

Sulfur Cleanup: Yes

Acid Cleanup: Yes

Sample Amount: 13.1 g-dry-wt

Final Extract Volume: 2.5 mL

Dilution Factor: 1.00

Silica Gel: Yes

Percent Moisture: 45.8%

CAS Number	Analyte	MDL	RL	Result
12674-11-2	Aroclor 1016	0.98	3.8	< 3.8 U
53469-21-9	Aroclor 1242	1.3	3.8	< 3.8 U
12672-29-6	Aroclor 1248	1.3	3.8	< 3.8 U
11097-69-1	Aroclor 1254	1.3	3.8	< 3.8 U
11096-82-5	Aroclor 1260	1.3	3.8	4.6
11104-28-2	Aroclor 1221	1.3	3.8	< 3.8 U
11141-16-5	Aroclor 1232	1.3	5.8	< 5.8 Y
37324-23-5	Aroclor 1262	1.3	3.8	< 3.8 U
11100-14-4	Aroclor 1268	1.3	3.8	< 3.8 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	50.0%
Tetrachlorometaxylene	45.5%

SW8082/PCB SOIL/SEDIMENT SURROGATE RECOVERY SUMMARY

Matrix: Soil

QC Report No: UJ37-Hart Crowser
Project: Port of Portland
15665-01

<u>Client ID</u>	<u>DCBP % REC</u>	<u>DCBP LCL-UCL</u>	<u>TCMX % REC</u>	<u>TCMX LCL-UCL</u>	<u>TOT OUT</u>
MB-022512	99.5%	48-123	87.5%	43-107	0
LCS-022512	89.2%	48-123	73.5%	43-107	0
LCSD-022512	94.8%	48-123	82.2%	43-107	0
C1/2-N1	104%	24-127	102%	34-109	0
C1/2-N2	94.0%	24-127	90.5%	34-109	0
C3/4-N1	62.0%	24-127	59.8%	34-109	0
C3/4-N2	50.0%	24-127	45.5%	34-109	0

Microwave (MARS) Control Limits PCBSMM
Prep Method: SW3546
Log Number Range: 12-3221 to 12-3224

ORGANICS ANALYSIS DATA SHEET

PSDDA PCB by GC/ECD

Page 1 of 1

Sample ID: LCS-022512

LCS/LCSD

Lab Sample ID: LCS-022512

LIMS ID: 12-3221

Matrix: Soil

Data Release Authorized: *AB*

Reported: 02/28/12

QC Report No: UJ37-Hart Crowser

Project: Port of Portland

15665-01

Date Sampled: NA

Date Received: NA

Date Extracted LCS/LCSD: 02/25/12

Sample Amount LCS: 12.5 g-dry-wt

LCSD: 12.5 g-dry-wt

Date Analyzed LCS: 02/27/12 15:13

Final Extract Volume LCS: 2.50 mL

LCSD: 02/27/12 15:34

LCSD: 2.50 mL

Instrument/Analyst LCS: ECD7/JGR

Dilution Factor LCS: 1.00

LCSD: ECD7/JGR

LCSD: 1.00

GPC Cleanup: No

Silica Gel: Yes

Sulfur Cleanup: Yes

Percent Moisture: NA

Acid Cleanup: Yes

Florisil Cleanup: No

Analyte	Spike		LCS		Spike		LCSD	
	LCS	Added-LCS	Recovery	LCSD	Added-LCSD	Recovery	RPD	
Aroclor 1016	78.1	101	77.3%	86.8	101	85.9%	10.6%	
Aroclor 1260	84.5	101	83.7%	90.6	101	89.7%	7.0%	

PCB Surrogate Recovery

	LCS	LCSD
Decachlorobiphenyl	89.2%	94.8%
Tetrachlorometaxylene	73.5%	82.2%

Results reported in µg/kg (ppb)

RPD calculated using sample concentrations per SW846.

4
PCB METHOD BLANK SUMMARY

BLANK NO.

UJ37MBS1

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No.: UJ37

Project: PORT OF PORTLAND

Lab Sample ID: UJ37MBS1

Lab File ID: 0227A017

Date Extracted: 02/25/12

Matrix: SOLID

Date Analyzed: 02/27/12

Instrument ID: ECD7

Time Analyzed: 1451

GC Columns: ZB5/ZB35

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED
01	UJ37LCSS1	UJ37LCSS1	02/27/12
02	UJ37LCSDS1	UJ37LCSDS1	02/27/12
03	C1/2-N1	UJ37A	02/27/12
04	C1/2-N2	UJ37B	02/27/12
05	C3/4-N1	UJ37C	02/27/12
06	C3/4-N2	UJ37D	02/27/12

ALL RUNS ARE DUAL COLUMN

ORGANICS ANALYSIS DATA SHEET

PSDDA PCB by GC/ECD

Page 1 of 1

Sample ID: MB-022512

METHOD BLANK

Lab Sample ID: MB-022512

LIMS ID: 12-3221

Matrix: Soil

Data Release Authorized: *[Signature]*

Reported: 02/28/12

QC Report No: UJ37-Hart Crowser

Project: Port of Portland

15665-01

Date Sampled: NA

Date Received: NA

Date Extracted: 02/25/12

Date Analyzed: 02/27/12 14:51

Instrument/Analyst: ECD7/JGR

GPC Cleanup: No

Sulfur Cleanup: Yes

Acid Cleanup: Yes

Sample Amount: 12.5 g

Final Extract Volume: 2.5 mL

Dilution Factor: 1.00

Silica Gel: Yes

Percent Moisture: NA

CAS Number	Analyte	MDL	RL	Result
12674-11-2	Aroclor 1016	1.0	4.0	< 4.0 U
53469-21-9	Aroclor 1242	1.4	4.0	< 4.0 U
12672-29-6	Aroclor 1248	1.4	4.0	< 4.0 U
11097-69-1	Aroclor 1254	1.4	4.0	< 4.0 U
11096-82-5	Aroclor 1260	1.4	4.0	< 4.0 U
11104-28-2	Aroclor 1221	1.4	4.0	< 4.0 U
11141-16-5	Aroclor 1232	1.4	4.0	< 4.0 U
37324-23-5	Aroclor 1262	1.4	4.0	< 4.0 U
11100-14-4	Aroclor 1268	1.4	4.0	< 4.0 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	99.5%
Tetrachlorometaxylene	87.5%

6F
8082 INITIAL CALIBRATION OF AROCLOR 1016/1260

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No.: UJ37

Project: PORT OF PORTLAND

GC Column: ZB5

Instrument ID: ECD7

Calibration Date: 02/23/12

SURROGATES

	RT WIN	LVL1	LVL2	LVL3	LVL4	LVL5	LVL6	MEAN	%RSD
TCX	6.24- 6.44	0.8668	0.9127	0.9881	1.0342	1.0503	1.0554	0.9846	8.0
DCB	14.79-14.99	0.9249	0.9445	1.0174	1.0181	1.0163	1.0088	0.9883	4.3

Aroclor-1016		LVL1	LVL2	LVL3	LVL4	LVL5	LVL6	MEAN	%RSD
Peak	RT WIN	.02	0.05	0.1	.25	0.5	1.0		R ²
1	8.25- 8.45	0.0243	0.0233	0.0246	0.0242	0.0238	0.0233	0.0239	2.2
2	8.73- 8.93	0.0754	0.0743	0.0785	0.0790	0.0788	0.0782	0.0774	2.6
3	8.91- 9.11	0.0324	0.0316	0.0331	0.0322	0.0317	0.0310	0.0320	2.3
4	9.03- 9.23	0.0238	0.0225	0.0234	0.0228	0.0224	0.0221	0.0228	2.9

AROCLOR AVERAGE %RSD = 2.5

Aroclor-1260		LVL1	LVL2	LVL3	LVL4	LVL5	LVL6	MEAN	%RSD
Peak	RT WIN	.02	0.05	0.1	.25	0.5	1.0		R ²
1	11.78-11.98	0.0594	0.0583	0.0617	0.0609	0.0610	0.0602	0.0602	2.1
2	12.38-12.58	0.0414	0.0406	0.0432	0.0423	0.0420	0.0413	0.0418	2.2
3	12.69-12.89	0.0405	0.0400	0.0430	0.0427	0.0429	0.0424	0.0419	3.2
4	13.42-13.62	0.0499	0.0497	0.0540	0.0548	0.0557	0.0559	0.0533	5.3
5	13.52-13.72	0.0212	0.0211	0.0225	0.0221	0.0221	0.0221	0.0219	2.5

AROCLOR AVERAGE %RSD = 3.0

6F
8082 INITIAL CALIBRATION OF AROCLOR 1016/1260

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No.: UJ37

Project: PORT OF PORTLAND

GC Column: ZB35

Instrument ID: ECD7

Calibration Date: 02/23/12

SURROGATES

	RT WIN	LVL1	LVL2	LVL3	LVL4	LVL5	LVL6	MEAN	%RSD
TCX	6.37- 6.57	1.0515	1.0128	1.0614	1.0635	1.0602	1.0478	1.0495	1.8
DCB	15.12-15.32	1.1826	1.0692	1.0646	0.9906	0.9619	0.9529	1.0370	8.4

Aroclor-1016		LVL1	LVL2	LVL3	LVL4	LVL5	LVL6	MEAN	%RSD
Peak	RT WIN	.02	0.05	0.1	.25	0.5	1.0		R ²
1	8.49- 8.69	0.0502	0.0461	0.0454	0.0401	0.0392	0.0358	0.0428	12.5
2	9.22- 9.42	0.0937	0.0911	0.0910	0.0860	0.0824	0.0790	0.0872	6.6
3	9.65- 9.85	0.0200	0.0228	0.0230	0.0219	0.0211	0.0201	0.0215	6.1
4	9.75- 9.95	0.0266	0.0287	0.0282	0.0256	0.0243	0.0228	0.0260	8.8

AROCLOR AVERAGE %RSD = 8.5

Aroclor-1260		LVL1	LVL2	LVL3	LVL4	LVL5	LVL6	MEAN	%RSD
Peak	RT WIN	.02	0.05	0.1	.25	0.5	1.0		R ²
1	12.76-12.96	0.0596	0.0530	0.0513	0.0456	0.0425	0.0403	0.0487	14.9
2	13.44-13.64	0.1315	0.1189	0.1190	0.1107	0.1062	0.1046	0.1152	8.8
3	13.93-14.13	0.0945	0.0851	0.0836	0.0760	0.0724	0.0703	0.0803	11.4
4	14.49-14.69	0.0352	0.0323	0.0316	0.0293	0.0275	0.0259	0.0303	11.2

AROCLOR AVERAGE %RSD = 11.6

6G
8082 INITIAL CALIBRATION OF SINGLE POINT PCBs

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No.: UJ37

Project: PORT OF PORTLAND

GC Column: ZB5

Instrument ID: ECD7

Calibration Date: 02/23/12

Aroclor-1221			
Peak	RT	RT WIN	Cal Factor
1	6.796	6.70- 6.90	0.01046
2	7.007	6.91- 7.11	0.00777
3	7.131	7.03- 7.23	0.02607
Aroclor-1232			
Peak	RT	RT WIN	Cal Factor
1	8.352	8.25- 8.45	0.01002
2	8.837	8.74- 8.94	0.03189
3	9.010	8.91- 9.11	0.01334
4	10.317	10.22-10.42	0.01027
Aroclor-1242			
Peak	RT	RT WIN	Cal Factor
1	8.331	8.23- 8.43	0.01925
2	8.819	8.72- 8.92	0.06206
3	8.991	8.89- 9.09	0.02565
4	10.608	10.51-10.71	0.02020
Aroclor-1248			
Peak	RT	RT WIN	Cal Factor
1	9.399	9.30- 9.50	0.02539
2	9.729	9.63- 9.83	0.03256
3	10.312	10.21-10.41	0.03408
4	10.617	10.52-10.72	0.03243

6G
8082 INITIAL CALIBRATION OF SINGLE POINT PCBs

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No.: UJ37

Project: PORT OF PORTLAND

GC Column: ZB5

Instrument ID: ECD7

Calibration Date: 02/23/12

Aroclor-1254			
Peak	RT	RT WIN	Cal Factor
1	10.377	10.28-10.48	0.04350
2	10.698	10.60-10.80	0.05727
3	11.081	10.98-11.18	0.03519
4	11.219	11.12-11.32	0.07125
5	11.933	11.83-12.03	0.04476
Aroclor-1262			
Peak	RT	RT WIN	Cal Factor
1	12.481	12.38-12.58	0.07348
2	12.796	12.70-12.90	0.05325
3	13.157	13.06-13.26	0.14774
4	13.623	13.52-13.72	0.04989
5	13.687	13.59-13.79	0.05371
Aroclor-1268			
Peak	RT	RT WIN	Cal Factor
1	13.623	13.52-13.72	0.15386
2	13.686	13.59-13.79	0.14426
3	14.006	13.91-14.11	0.12192
4	14.605	14.51-14.71	0.37052

6G
8082 INITIAL CALIBRATION OF SINGLE POINT PCBs

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No.: UJ37

Project: PORT OF PORTLAND

GC Column: ZB35

Instrument ID: ECD7

Calibration Date: 02/23/12

Aroclor-1221				Cal
Peak	RT	RT WIN		Factor
1	7.293	7.19-	7.39	0.01260
2	7.593	7.49-	7.69	0.00746
3	7.732	7.63-	7.83	0.02242
4	7.819	7.72-	7.92	0.00381
Aroclor-1232				Cal
Peak	RT	RT WIN		Factor
1	8.597	8.50-	8.70	0.01953
2	9.324	9.22-	9.42	0.03716
3	9.748	9.65-	9.85	0.00978
4	11.208	11.11-	11.31	0.01601
Aroclor-1242				Cal
Peak	RT	RT WIN		Factor
1	8.561	8.46-	8.66	0.03313
2	9.293	9.19-	9.39	0.06890
3	9.721	9.62-	9.82	0.01802
4	11.186	11.09-	11.29	0.02834
Aroclor-1248				Cal
Peak	RT	RT WIN		Factor
1	9.851	9.75-	9.95	0.03200
2	10.296	10.20-	10.40	0.03448
3	10.844	10.74-	10.94	0.03489
4	11.204	11.10-	11.30	0.04692

6G
8082 INITIAL CALIBRATION OF SINGLE POINT PCBs

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No.: UJ37

Project: PORT OF PORTLAND

GC Column: ZB35

Instrument ID: ECD7

Calibration Date: 02/23/12

Aroclor-1254			Cal
Peak	RT	RT WIN	Factor
1	10.910	10.81-11.01	0.03649
2	11.080	10.98-11.18	0.04557
3	11.615	11.52-11.72	0.03578
4	11.767	11.67-11.87	0.07664
5	12.553	12.45-12.65	0.04405

Aroclor-1262			Cal
Peak	RT	RT WIN	Factor
1	12.866	12.77-12.97	0.07579
2	13.307	13.21-13.41	0.06434
3	13.544	13.44-13.64	0.14571
4	13.985	13.89-14.09	0.05619
5	14.037	13.94-14.14	0.09349

Aroclor-1268			Cal
Peak	RT	RT WIN	Factor
1	13.983	13.88-14.08	0.14658
2	14.038	13.94-14.14	0.14312
3	14.349	14.25-14.45	0.11598
4	14.936	14.84-15.04	0.35383

7F
PCB CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No.: UJ37

Project: PORT OF PORTLAND

GC Column: ZB5

Intrument: ECD7

Init. Calib. Date: 02/23/12

Date Analyzed :02/27/12

Lab Standard ID: AR1248

Time Analyzed :1348

COMPOUND/PEAK NO.	RT	RT WINDOW		CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
		FROM	TO			
=====	=====	=====	=====	=====	=====	=====
Aroclor-1248-1	9.40	9.30	9.50	247.3	250.0	-1.1
Aroclor-1248-2	9.73	9.63	9.83	232.1	250.0	-7.1
Aroclor-1248-3	10.31	10.21	10.41	253.6	250.0	1.4
Aroclor-1248-4	10.62	10.52	10.72	253.4	250.0	1.4

AVERAGE %D = 2.8

7F
PCB CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No.: UJ37

Project: PORT OF PORTLAND

GC Column: ZB35

Intrument: ECD7

Init. Calib. Date: 02/23/12

Date Analyzed :02/27/12

Lab Standard ID: AR1248

Time Analyzed :1348

COMPOUND/PEAK NO.	RT	RT WINDOW		CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
		FROM	TO			
=====	=====	=====	=====	=====	=====	=====
Aroclor-1248-1	9.85	9.75	9.95	249.2	250.0	-0.3
Aroclor-1248-2	10.30	10.20	10.40	239.5	250.0	-4.2
Aroclor-1248-3	10.84	10.74	10.94	249.7	250.0	-0.1
Aroclor-1248-4	11.20	11.10	11.30	246.9	250.0	-1.2

AVERAGE %D = 1.4

7F
PCB CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No.: UJ37

Project: PORT OF PORTLAND

GC Column: ZB5

Intrument: ECD7

Init. Calib. Date: 02/23/12

Date Analyzed :02/27/12

Lab Standard ID: AR1660

Time Analyzed :1409

COMPOUND/PEAK NO.	RT	RT WINDOW		CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
		FROM	TO			
=====	=====	=====	=====	=====	=====	=====
Aroclor-1016-1	8.35	8.25	8.45	253.5	250.0	1.4
Aroclor-1016-2	8.83	8.73	8.93	257.8	250.0	3.1
Aroclor-1016-3	9.01	8.91	9.11	253.8	250.0	1.5
Aroclor-1016-4	9.13	9.03	9.23	250.5	250.0	0.2

AVERAGE %D = 1.6

Date Analyzed :02/27/12

Lab Standard ID: AR1660

Time Analyzed :1409

COMPOUND/PEAK NO.	RT	RT WINDOW		CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
		FROM	TO			
=====	=====	=====	=====	=====	=====	=====
Aroclor-1260-1	11.88	11.78	11.98	257.1	250.0	2.8
Aroclor-1260-2	12.48	12.38	12.58	255.8	250.0	2.3
Aroclor-1260-3	12.79	12.69	12.89	257.8	250.0	3.1
Aroclor-1260-4	13.52	13.42	13.62	260.6	250.0	4.2
Aroclor-1260-5	13.62	13.52	13.72	254.0	250.0	1.6

AVERAGE %D = 2.8

7F
PCB CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No.: UJ37

Project: PORT OF PORTLAND

GC Column: ZB35

Intrument: ECD7

Init. Calib. Date: 02/23/12

Date Analyzed :02/27/12

Lab Standard ID: AR1660

Time Analyzed :1409

COMPOUND/PEAK NO.	RT	RT WINDOW		CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
		FROM	TO			
=====	=====	=====	=====	=====	=====	=====
Aroclor-1016-1	8.59	8.49	8.69	244.5	250.0	-2.2
Aroclor-1016-2	9.32	9.22	9.42	249.1	250.0	-0.3
Aroclor-1016-3	9.75	9.65	9.85	260.6	250.0	4.2
Aroclor-1016-4	9.85	9.75	9.95	250.3	250.0	0.1

AVERAGE %D = 1.7

Date Analyzed :02/27/12

Lab Standard ID: AR1660

Time Analyzed :1409

COMPOUND/PEAK NO.	RT	RT WINDOW		CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
		FROM	TO			
=====	=====	=====	=====	=====	=====	=====
Aroclor-1260-1	12.86	12.76	12.96	235.3	250.0	-5.9
Aroclor-1260-2	13.54	13.44	13.64	240.4	250.0	-3.8
Aroclor-1260-3	14.03	13.93	14.13	237.2	250.0	-5.1
Aroclor-1260-4	14.59	14.49	14.69	249.2	250.0	-0.3

AVERAGE %D = 3.8

7F
PCB CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No.: UJ37

Project: PORT OF PORTLAND

GC Column: ZB5

Intrument: ECD7

Init. Calib. Date: 02/23/12

Date Analyzed :02/27/12

Lab Standard ID: AR1254

Time Analyzed :1719

COMPOUND/PEAK NO.	RT	RT WINDOW		CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
		FROM	TO			
=====	=====	=====	=====	=====	=====	=====
Aroclor-1254-1	10.38	10.28	10.48	241.1	250.0	-3.5
Aroclor-1254-2	10.70	10.60	10.80	239.9	250.0	-4.0
Aroclor-1254-3	11.08	10.98	11.18	238.6	250.0	-4.5
Aroclor-1254-4	11.22	11.12	11.32	236.9	250.0	-5.2
Aroclor-1254-5	11.93	11.83	12.03	236.2	250.0	-5.5

AVERAGE %D = 4.5

7F
PCB CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No.: UJ37

Project: PORT OF PORTLAND

GC Column: ZB35

Intrument: ECD7

Init. Calib. Date: 02/23/12

Date Analyzed :02/27/12

Lab Standard ID: AR1254

Time Analyzed :1719

COMPOUND/PEAK NO.	RT	RT WINDOW		CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
		FROM	TO			
=====	=====	=====	=====	=====	=====	=====
Aroclor-1254-1	10.91	10.81	11.01	235.0	250.0	-6.0
Aroclor-1254-2	11.08	10.98	11.18	234.7	250.0	-6.1
Aroclor-1254-3	11.62	11.52	11.72	231.0	250.0	-7.6
Aroclor-1254-4	11.77	11.67	11.87	232.2	250.0	-7.1
Aroclor-1254-5	12.55	12.45	12.65	229.3	250.0	-8.3

AVERAGE %D = 7.0

7F
PCB CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No.: UJ37

Project: PORT OF PORTLAND

GC Column: ZB5

Intrument: ECD7

Init. Calib. Date: 02/23/12

Date Analyzed :02/27/12

Lab Standard ID: AR1660

Time Analyzed :1740

COMPOUND/PEAK NO.	RT	RT WINDOW		CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
		FROM	TO			
Aroclor-1016-1	8.35	8.25	8.45	250.9	250.0	0.3
Aroclor-1016-2	8.83	8.73	8.93	253.5	250.0	1.4
Aroclor-1016-3	9.01	8.91	9.11	250.6	250.0	0.2
Aroclor-1016-4	9.13	9.03	9.23	248.7	250.0	-0.5

AVERAGE %D = 0.6

Date Analyzed :02/27/12

Lab Standard ID: AR1660

Time Analyzed :1740

COMPOUND/PEAK NO.	RT	RT WINDOW		CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
		FROM	TO			
Aroclor-1260-1	11.88	11.78	11.98	260.6	250.0	4.2
Aroclor-1260-2	12.48	12.38	12.58	259.3	250.0	3.7
Aroclor-1260-3	12.79	12.69	12.89	260.3	250.0	4.1
Aroclor-1260-4	13.52	13.42	13.62	258.2	250.0	3.3
Aroclor-1260-5	13.62	13.52	13.72	254.6	250.0	1.8

AVERAGE %D = 3.4

7F
PCB CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No.: UJ37

Project: PORT OF PORTLAND

GC Column: ZB35

Intrument: ECD7

Init. Calib. Date: 02/23/12

Date Analyzed :02/27/12

Lab Standard ID: AR1660

Time Analyzed :1740

COMPOUND/PEAK NO.	RT	RT WINDOW		CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
		FROM	TO			
Aroclor-1016-1	8.59	8.49	8.69	243.0	250.0	-2.8
Aroclor-1016-2	9.32	9.22	9.42	246.7	250.0	-1.3
Aroclor-1016-3	9.75	9.65	9.85	257.1	250.0	2.8
Aroclor-1016-4	9.85	9.75	9.95	247.6	250.0	-1.0

AVERAGE %D = 2.0

Date Analyzed :02/27/12

Lab Standard ID: AR1660

Time Analyzed :1740

COMPOUND/PEAK NO.	RT	RT WINDOW		CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
		FROM	TO			
Aroclor-1260-1	12.86	12.76	12.96	235.6	250.0	-5.8
Aroclor-1260-2	13.54	13.44	13.64	237.5	250.0	-5.0
Aroclor-1260-3	14.03	13.93	14.13	233.5	250.0	-6.6
Aroclor-1260-4	14.59	14.49	14.69	241.4	250.0	-3.4

AVERAGE %D = 5.2

FORM 8
PCB INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No.: UJ37

Project: PORT OF PORTLAND

GC Column: ZB5 | ID: 0.53 (mm)

Instrument ID: ECD7

Init. Calib. Date: 02/23/12

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS,
SAMPLES, AND STANDARDS IS GIVEN BELOW:

				IS1	RT	IS2	RT	
				AREA		AREA		
=====				=====	=====	=====	=====	
ICAL MIDPT				4868383	3.358	4695689	15.154	
UPPER LIMIT				9736766	3.458	9391378	15.254	
LOWER LIMIT				2434192	3.258	2347844	15.054	
=====				=====	=====	=====	=====	
CLIENT	LAB	DATE	TIME	IS1	RT	IS2	RT	
SAMPLE NO.	SAMPLE ID	ANALYZED		AREA		AREA		
=====	=====	=====	=====	=====	=====	=====	=====	
01	ZZZZZ	ZZZZZ	02/23/12	1445	4793709	3.357	4647996	15.153
02		0.25 PPM AR1	02/23/12	1506	4868383	3.358	4695689	15.154
03		0.02 PPM AR1	02/23/12	1527	4950464	3.360	4704671	15.154
04		0.05 PPM AR1	02/23/12	1548	5035603	3.359	4803180	15.154
05		1 PPM AR1660	02/23/12	1609	4734415	3.361	4564829	15.153
06		0.1 PPM AR16	02/23/12	1630	4920377	3.361	4672280	15.155
07		0.5 PPM AR16	02/23/12	1651	4799284	3.361	4613696	15.154
08		AR1242	02/23/12	1712	4892648	3.359	4682457	15.154
09		AR1248	02/23/12	1733	4933104	3.358	4759250	15.155
10		AR1254	02/23/12	1754	4889248	3.361	4689966	15.154
11		AR2162	02/23/12	1815	4897273	3.358	4717217	15.153
12		AR3268	02/23/12	1837	5015877	3.361	4801741	15.154
13	ZZZZZ	ZZZZZ	02/23/12	1858	5001144	3.361	4793731	15.154
14	ZZZZZ	ZZZZZ	02/23/12	1919	5004203	3.359	4788227	15.154
15	ZZZZZ	ZZZZZ	02/23/12	1940	5051026	3.360	4815370	15.154
16	ZZZZZ	ZZZZZ	02/23/12	2001	5064799	3.356	4876622	15.154
17	ZZZZZ	ZZZZZ	02/23/12	2022	5072095	3.356	4853784	15.154
18	ZZZZZ	ZZZZZ	02/23/12	2043	5105859	3.359	4858248	15.153
19		AR1248	02/27/12	1348	5208627	3.355	4983601	15.153
20		AR1660	02/27/12	1409	5000243	3.359	4790531	15.153
21	ZZZZZ	ZZZZZ	02/27/12	1430	4926419	3.360	4879085	15.153
22	UJ37MBS1	UJ37MBS1	02/27/12	1451	4943775	3.360	4918662	15.151
23	UJ37LCSS1	UJ37LCSS1	02/27/12	1513	5460188	3.359	5392273	15.151
24	UJ37LCSDS1	UJ37LCSDS1	02/27/12	1534	5271500	3.359	5288141	15.150
25	C1/2-N1	UJ37A	02/27/12	1555	4190499	3.360	3592371	15.149
26	C1/2-N2	UJ37B	02/27/12	1616	4292316	3.360	3649203	15.148
27	C3/4-N1	UJ37C	02/27/12	1637	5336233	3.357	4577088	15.149
28	C3/4-N2	UJ37D	02/27/12	1658	5302432	3.356	4303557	15.149
29		AR1254	02/27/12	1719	5452934	3.359	4805141	15.153
30		AR1660	02/27/12	1740	5107044	3.357	4674625	15.152

IS1 = 1-Bromo-2-Nitrobenzene RT Window = RT +/- 0.1 min
IS2 = Hexabromobiphenyl

* Indicates value outside QC Limits

FORM 8
PCB INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No.: UJ37

Project: PORT OF PORTLAND

GC Column: ZB35 ID: 0.53 (mm)

Instrument ID: ECD7

Init. Calib. Date: 02/23/12

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS,
SAMPLES, AND STANDARDS IS GIVEN BELOW:

				IS1 AREA	RT	IS2 AREA	RT	
=====				=====	=====	=====	=====	
				ICAL MIDPT	7775611	4.213	6770044	15.805
				UPPER LIMIT	15551222	4.313	13540088	15.905
				LOWER LIMIT	3887806	4.113	3385022	15.705
=====				=====	=====	=====	=====	
CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME	IS1 AREA	RT	IS2 AREA	RT	
=====	=====	=====	=====	=====	=====	=====	=====	
01	ZZZZZ	ZZZZZ	02/23/12	1445	7572449	4.211	6648647	15.805
02		0.25 PPM AR1	02/23/12	1506	7775611	4.213	6770044	15.805
03		0.02 PPM AR1	02/23/12	1527	7862532	4.214	6864750	15.806
04		0.05 PPM AR1	02/23/12	1548	8046223	4.216	6940638	15.805
05		1 PPM AR1660	02/23/12	1609	7431739	4.217	6608452	15.805
06		0.1 PPM AR16	02/23/12	1630	7725702	4.217	6714371	15.805
07		0.5 PPM AR16	02/23/12	1651	7512150	4.217	6647022	15.805
08		AR1242	02/23/12	1712	7734309	4.215	6723051	15.805
09		AR1248	02/23/12	1733	7849584	4.214	6855035	15.805
10		AR1254	02/23/12	1754	7737056	4.217	6653370	15.805
11		AR2162	02/23/12	1815	7704209	4.215	6767996	15.805
12		AR3268	02/23/12	1837	7855578	4.216	6897939	15.805
13	ZZZZZ	ZZZZZ	02/23/12	1858	7910220	4.216	6884041	15.806
14	ZZZZZ	ZZZZZ	02/23/12	1919	7897446	4.215	6878272	15.805
15	ZZZZZ	ZZZZZ	02/23/12	1940	7961070	4.216	6915434	15.805
16	ZZZZZ	ZZZZZ	02/23/12	2001	8033723	4.212	6970484	15.805
17	ZZZZZ	ZZZZZ	02/23/12	2022	7972122	4.213	6971552	15.806
18	ZZZZZ	ZZZZZ	02/23/12	2043	7974568	4.215	7014108	15.806
19		AR1248	02/27/12	1348	8123694	4.212	6927889	15.804
20		AR1660	02/27/12	1409	7835463	4.214	6651872	15.804
21	ZZZZZ	ZZZZZ	02/27/12	1430	7643835	4.215	6744190	15.804
22	UJ37MBS1	UJ37MBS1	02/27/12	1451	7718165	4.215	6665756	15.804
23	UJ37LCSS1	UJ37LCSS1	02/27/12	1513	8291402	4.213	7289749	15.804
24	UJ37LCSDS1	UJ37LCSDS1	02/27/12	1534	8053575	4.214	7184043	15.803
25	C1/2-N1	UJ37A	02/27/12	1555	6351087	4.215	5415387	15.802
26	C1/2-N2	UJ37B	02/27/12	1616	6627860	4.215	5519982	15.803
27	C3/4-N1	UJ37C	02/27/12	1637	8173156	4.214	6833575	15.802
28	C3/4-N2	UJ37D	02/27/12	1658	8022900	4.212	6594490	15.802
29		AR1254	02/27/12	1719	8523978	4.213	6830939	15.804
30		AR1660	02/27/12	1740	8021951	4.212	6610017	15.804

IS1 = 1-Bromo-2-Nitrobenzene RT Window = RT +/- 0.1 min
IS2 = Hexabromobiphenyl

* Indicates value outside QC Limits

Total Solids

ARI Job ID: UJ37

Extractions Total Solids-exttts
Data By: Woo suk Chang
Created: 2/24/12

Worklist: 8862
Analyst: WC
Comments:

Oven ID: _____

Balance ID: _____

Samples In: Date: _____ Time: _____ Temp: _____ Analyst: _____

Samples Out: Date: _____ Time: _____ Temp: _____ Analyst: _____

	ARI ID CLIENT ID	Tare Wt (g)	Wet Wt (g)	Dry Wt (g)	% Solids	pH
1.	UJ37A 12-3221 C1/2-N1	1.16	13.09	8.00	57.3	NR
2.	UJ37B 12-3222 C1/2-N2	1.16	12.03	7.12	54.8	NR
3.	UJ37C 12-3223 C3/4-N1	1.15	11.51	6.45	51.2	NR
4.	UJ37D 12-3224 C3/4-N2	1.14	13.18	7.67	54.2	NR

Extractions Total Solids-exttts
Data By: Woo suk Chang
Created: 2/24/12

Worklist: 8862
Analyst: WC
Comments:

Oven ID: 015

Balance ID: B139298602

Samples In: Date: 2/24/12 Time: 16:10 Temp: 102 Analyst: WC

Samples Out: Date: 2/25/12 Time: 06:45 Temp: 99 Analyst: SC

ARI ID CLIENT ID	Tare Wt (g)	Wet Wt (g)	Dry Wt (g)	% Solids	pH
1. UJ37A 12-3221 C1/2-N1	<u>1.16g</u>	<u>13.09g</u>	<u>8.00</u>		NR
2. UJ37B 12-3222 C1/2-N2	<u>1.16g</u>	<u>12.03g</u>	<u>7.12</u>		NR
3. UJ37C 12-3223 C3/4-N1	<u>1.15g</u>	<u>11.51g</u>	<u>6.45</u>		NR
4. UJ37D 12-3224 C3/4-N2	<u>1.14g</u>	<u>13.18g</u>	<u>7.67</u>		NR