PORT GAMBLE BAY WIDE REMEDIAL INVESTIGATION
TABLE OF CONTENTS

CONTENTS (Continued)

TABLES

CONTENTS (Continued)

Page

TABLES (Continued)

FIGURES

CONTENTS (Continued)

Page

CONTENTS (Continued)

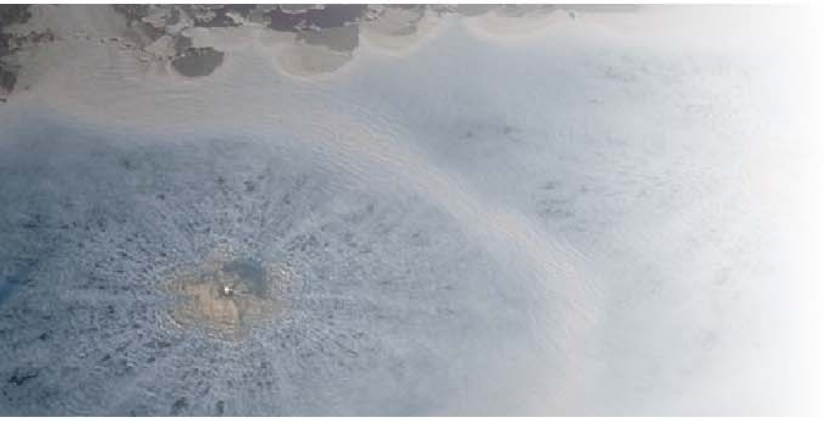
TABLES

CONTENTS (Continued)

Page

TABLES (Continued)

FIGURES



Remedial Investigation
Port Gamble Bay
Port Gamble, Washington

Prepared for
Washington State
Department of Ecology

February 11, 2011
17330-14

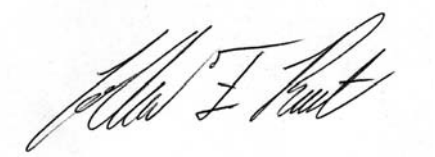
HARTCROWSER

Remedial Investigation
Port Gamble Bay
Port Gamble, Washington

Prepared for
Washington State
Department of Ecology

February 11, 2011
17330-14

Prepared by
Hart Crowser, Inc.



Colleen Rust
Senior Staff
Hydrogeologist

Roger McGinnis, PhD
Senior Associate
Environmental Chemist

Anne Conrad
Senior Staff
Geochemist

1700 Westlake Avenue North, Suite 200
Seattle, Washington 98109-6212
Fax 206.328.5581
Tel 206.324.9530

CONTENTS Page

CONTENTS (Continued) Page

TABLES

CONTENTS (Continued)

Page

TABLES (Continued)

FIGURES

CONTENTS (Continued) Page

CONTENTS (Continued) Page

CONTENTS (Continued)

Page

TABLES (Continued)

FIGURES

REMEDIAL INVESTIGATION
PORT GAMBLE BAY
PORT GAMBLE, WASHINGTON

1.0 INTRODUCTION

This report presents the results of the sediment remedial investigation (RI) performed for the Washington State Department of Ecology (Ecology) at Port Gamble Bay in Port Gamble, Washington (Figure 1). Under the Ecology Toxics Cleanup Program's Puget Sound Initiative, Port Gamble Bay is among seven original sites identified for focused sediment investigation to inform cleanup and restoration decisions, identify potential areas of sediment contamination, and confirm the priority areas for cleanup. The RI was conducted to evaluate potential sediment impacts from wood waste associated with historical log rafting, transfer, and milling operations. The investigation initially focused on the former log transfer facility (FLTF) and the former DNR lease area (FLA) located along the west side of the bay south of the former mill. Based on historical photographs documenting the widespread extent of operations and evidence of more widely distributed wood waste, the investigation was expanded to a bay-wide study. Results presented are based on field and laboratory work completed for Ecology by Hart Crowser between November 2008 and April 2009. Additional characterization and monitoring of the former mill area is being performed as a joint, cooperative effort with Ecology, the Washington State Department of Natural Resources (DNR), and Pope Resources with additional actions being addressed separately and, therefore, not completed as part of the current RI.

Specific tasks included:

- Collecting information to support RI efforts for the Former Lease Area (FLA) and Former Log Transfer Facility (FLTF);
- Evaluating potential environmental impacts and cleanup responses on a bay-wide scale;
- Evaluating potential environmental impacts and support cleanup responses on a bay-wide scale;
- Collecting data to characterize sediment quality at the FLA and FLTF areas, and on a bay-wide scale;
- Determining extent of wood waste in the FLA and FLTF areas and on a bay-wide scale;

- Performing sediment chemical and bioassay testing to determine possible adverse affects to sediment and biota due to the presence of wood waste and other contaminants; and

- Analyzing tissue samples collected by the Port Gamble S'Klallam Tribe as part of the current project.

1.1 Remedial Investigation Approach

Sediment investigation tasks for this RI included a variety of exploration and testing methods appropriate for the conditions and setting of Port Gamble Bay. As a general mapping tool, a Sediment Profile Image (SPI) and plan view photography survey of the entire bay were initially completed to identify the general distribution of wood waste in surface and near-surface (0 to 8 inches) sediments. Using information from this survey, sediment cores were collected and visually examined at selected FLA, FLTF, and bay-wide locations for physical characterization purposes, and to determine the general extent and depth of visible wood waste and benthos. Surface sediment grab samples were collected at selected locations for chemical and biological testing. In addition, biota were collected with support from the Port Gamble S'Klallam Tribe for chemical analysis of tissues to determine the presence and concentrations of bioaccummulative chemicals. Two sediment cores were submitted for radiometric dating to determine the rate of sediment deposition within the bay. Laboratory analytical data from sediment sample testing provide key information for evaluating sediment chemical properties, physical properties, and presence of wood waste. Sampling and testing protocols are discussed further in the October 2008 Sampling and Analysis Plan (SAP) for the project (Hart Crowser 2008a), as approved by Ecology.

2.0 SITE SETTING AND HISTORY

The following section highlights site setting and history elements, as adapted from discussion in the 2008 project SAP. The SAP should be consulted for additional details regarding the various environmental assessments and wood waste surveys completed, and associated data gaps to be addressed as part of the current investigation.

Port Gamble Bay is located in Kitsap County and encompasses more than 2 square miles of subtidal and shallow intertidal habitat just south of the Strait of Juan de Fuca (Figure 1). The FLA, leased from DNR by Pope & Talbot and used for in-water log storage, and the FLTF, where logs were transferred into the bay, are also shown on Figure 1. The bay and surrounding area support diverse

aquatic and upland habitats, as well as resources for fishing, shellfish harvesting, and many other aquatic uses. The area surrounding the bay remains rural in nature although the northwestern corner of the bay was the site of the former Pope & Talbot sawmill. The Port Gamble S'Klallam Tribal Reservation is located east of the bay, with extensive use of the bay by the Tribe for shellfish harvesting, fishing, and other resources.

2.1 Historical Summary

Pope & Talbot operated the sawmill at the northwest shore of the bay from 1853 to 1995, with log transfer and rafting activities occurring at various locations on the bay. Based on historical photographs, it has been reported that a hog fuel burner was located on the upland area. Pope & Talbot reportedly leased the 72-acre portion of the FLA (Figure 2) from 1970 to 2001 for temporary log storage and transfer purposes (Parametrix 2002). Log rafting ceased in 1995 when the sawmill closed, and Pope & Talbot removed pilings from the lease area in 1996. Log rafting and sawmill activities were not conducted at the FLTF and FLA after Pope & Talbot removed the pilings in 1996. The FLTF log sort yard and ramp reportedly operated from 1970 to 1995 and consisted of dock, pilings, and an access road (Parametrix 2003).

Log rafting operations resulted in accumulations of wood waste on the bed of Port Gamble Bay near the sawmill. In addition, wood accumulations were suspected at both the FLTF and FLA based on the historical use of these areas (Figure 2). Temporary log storage and transfer within the 72-acre portion of the FLA and FLTF lease area were reported from 1970 to 2001 (Parametrix 2002); however, historical log rafting activities also occurred much earlier in this area based on review of aerial photographs.

As a consultant to Pope & Talbot, Parametrix conducted a series of investigations in Port Gamble Bay from 1999 to 2004 to identify chemical and wood waste impacts from sawmill operations (Parametrix 2003). In 2006, Anchor Environmental prepared a report compiling existing data for sediment in the vicinity of the former mill site and proposed a supplemental sediment investigation (Anchor 2006a). While much of this supplemental investigation has been performed, results have not yet been published. A Biological Evaluation (BE) was also prepared (Anchor 2006b) as part of a cooperative interim sediment cleanup action involving approximately 16,500 cubic yards of subtidal sediment, as discussed further below.

2.2 Previous Dredging Activities

Historical dredging likely occurred episodically near the mill area to maintain navigational depth and access. More recently, Pope and Talbot dredged approximately 13,500 cubic yards of sediment with abundant wood waste from nearshore areas adjacent to the former sawmill in 2003. The 2003 dredging occurred over an elevation range of about –12 to –15 feet mean lower low water (MLLW) and was conducted to remove accumulated wood waste that reduced navigation access near shore.

An additional Interim Remedial Action dredging was performed in 2007 in the area to the east of the 2003 dredging area. Approximately 16,500 cubic yards of sediment with abundant wood waste were removed from nearshore areas adjacent to the former sawmill. The 2007 dredging occurred over an elevation range of about –10 to –28 feet MLLW and was completed as a cooperative effort under MTCA by Ecology, DNR, Pope & Talbot, and Pope Resources (Hart Crowser 2008b).

2.3 Extent of Wood Waste

Much of the previous site investigation work was concentrated in the aquatic areas near the sawmill, with only limited delineation of wood waste elsewhere in other locations such as the FLTF and FLA. Prior to the current investigation, the areal and vertical extent of wood waste were not well defined for the purposes of evaluating impacts and potential remediation measures. In addition to the location, thickness, extent, and percentage by volume of wood waste, chemical and biological quality were only sparsely characterized beyond the aquatic areas near the mill. Thus, the relative lack of information on the extent of wood waste in the FLA and FLTF and on a bay-wide scale represented a primary data gap to be addressed during the current project.

3.0 SEDIMENT AND BIOTA SAMPLING

Sediment sampling, collection, handling, and analysis were performed in general accordance with the 2008 project SAP. Sampling and testing activities were conducted in general accordance with the protocols established in Ecology's Sediment Management Standards (SMS; Chapter 173-204 WAC), and Puget Sound Estuary Program (PSEP 1997a, 1997b, and 1997c), as referenced in Ecology's Sediment Sampling and Analysis Plan Appendix (SAPA; Ecology 2008). The samples collected were acceptable for chemical, physical, and bioassay analysis.

The number and type of samples collected are summarized in Table 1. A summary of sediment samples and associated analyses are presented in Table 2. The sampling grid used for the Port Gamble Bay investigation is shown on Figure 2. The locations and type of samples collected from each area are presented on Figure 3.

3.1 Deviations from the 2008 SAP

Minor deviations from the SAP were made to adjust and optimize the number and type of samples collected to obtain the most usable results for the investigation. SAP modifications were also made, as necessary, based on adaptations to the field conditions encountered, and to deal with minor equipment malfunctions. Modifications to the tissue sampling program were also made following discussions between Ecology and Tribal representatives.

Deviations from the Ecology-approved SAP for the Port Gamble investigation are summarized below and are discussed in more detail in the applicable report sections.

- Based on field observations and consultation with the Ecology Project Manager, 17 additional SPI/plan view locations were added to the proposed grid transects to fill in nearshore data gaps. The additional SPI locations 00A, 14A, 21A, 21B, 29A, 38A, 46A, 47A, 55A, 55B, 62A, 62B, 69A, 69B, 77A, 83A, and 101 are shown on Figures 2 and 3.

- During the SPI/plan view investigation, 26 locations at the north area of the site and outside the mouth of the bay were not photographed by the plan view camera due to a camera malfunction that was not detected until after the film was developed. At three locations, the images were obscured due to sediment suspension.

- Based on field observations and consultation with Ecology, three additional vibracore sampling locations were added to fill in nearshore and bayward data gaps. The additional vibracore sample locations 14A, 38A, and 62B are shown on Figure 3.

- Based on field observations and consultation with Ecology, 10 additional surface sediment sample locations were added to fill in nearshore and bayward data gaps. The additional surface sediment sample locations 14A, 21A, 21B, 29A, 38A, 47A, 62A, 62B, 77A, and Geo 3 are shown on Figure 3.

- Based on consultation with Ecology, only 38 vibracore samples (rather than the 50 proposed in the SAP) were collected. Ten locations were cored in

the FLA, rather than the 15 proposed. Cores were collected for visual examination to determine the presence, depth, and thickness of wood waste. In addition to visual examination, one core (42) was submitted for conventional parameter analysis and two cores (22B and 51B) were submitted for radiometric age dating.

- Vibracore recoveries for locations 14A, 29, 38A, 55, 71, 75, 77, and 82 were below the SAP criterion of 75 percent due to difficult coring conditions and crimping of the lexan core tubes. Cores from these locations were still used to evaluate the presence of wood waste.

- Vibracore sample location 4 was shifted 108 meters to the east of the proposed location due to heavy winds and rough water conditions, which prevented sampling at the originally proposed location.

- Vibracore sample locations 77 and 82 were shifted 30 to 50 meters bayward due to shallow water adjacent to the shoreline, which prevented sampling at the originally proposed locations.

- A Young grab was used for surface sediment collection rather than a Van Veen sampler. Due to soft sediment in the southern half of the bay, 83 percent of the surface sediment grab samples overpenetrated even after removing all the weights from the sampler. Two additional (52 rather than the 50 proposed in the SAP) surface sediment samples were collected.

- Based on conversations with Tribal representatives, Ecology suggested collecting littleneck clams, rather than cockles, in an e-mail dated December 5, 2008.

- Each biota sample was to be collected in triplicate and processed with one of the triplicate samples being analyzed and the other two archived for potential additional analysis. However, due to the smaller number of organisms collected by the Tribe from fewer locations than originally planned, geoducks were the only organisms collected in sufficient numbers to allow archiving of two replicate samples. The following changes were made:

    - Oysters were collected from only two locations rather than the three locations planned; therefore, only two oyster samples were analyzed. There was only sufficient sample volume to archive one replicate of each sample.

- Littleneck clams were collected from two locations rather than the one location planned and both samples were analyzed. There was insufficient sample volume to archive replicate samples.

- There were insufficient Dungeness crabs collected to archive replicate samples.

- The Ecology onboard representative and Hart Crowser field staff performed wet sieving of 6 vibracore and 57 surface sediment samples using 0.5 mm and/or 1.0 mm sieves of the top foot of sediment. Wet sieving was done to determine whether wood waste that was too small to be observed in the bulk sample sediment, was present in the surface sediment.

3.2 Sample Location Control

A differential global positioning system (DGPS) was used aboard the sampling vessel for location positioning for SPI, vibracore, and surface sediment grab sampling. The DGPS receiver was placed on the sampling device deployment boom to accurately record the sampling location position. Once the SPI unit or sampler was deployed, the actual position was recorded when the sampler was on the bottom and the deployment cable was in a vertical position. State Plane (Northing and Easting) coordinates for the proposed and actual photographic and sampling locations are presented in Table A-1 in Appendix A. The *R/V Kittiwake* operated by Bio-Marine Enterprises under subcontract to Hart Crowser, was the sampling vessel for the SPI/plan view, vibracore, and surface sediment grab sample activities.

3.3 SPI/Plan View Images

Sediment profile images (SPI) were collected from 120 subtidal locations in Port Gamble Bay and outside the mouth of the bay (Figure 3) by Science Applications International Corporation (SAIC) of Bothell, Washington, under subcontract to Hart Crowser. Plan view (surface) photographs were collected at the majority of the locations. Samples were collected along multiple transects. Several locations were added to the original proposed locations along the shore of the bay to better delineate transitional areas and boundaries of potentially impacted sediments.

Three SPI images up to 20 cm (~8 inches) depth were collected at each location. Plan view images of the surface (20 by 30 cm area) were attempted at each location. Both SPI and plan view images were evaluated for the presence of wood waste and benthic organisms.

Thirty-five locations were in the FLA and FLTF (29 percent). The SPI report and SPI data are provided in Appendix D.

3.4 Sediment Core Sampling

Thirty-eight sediment cores were collected from subtidal locations within Port Gamble Bay (Figure 3). Twenty core locations were selected based on SPI image interpretation (six within the FLA/FLTF). Eighteen additional core locations were selected during the sampling event (four within the FLA/FLTF). A total of ten cores were collected in the FLA and FLTF since, based on historical log rafting practices, that was the area of primary concern.

Sediment core samples were collected using a vibracore sampling device. The vibracore device uses a vibration source to drive a core tube or sample barrel into unconsolidated water-saturated sediments. The core tube was constructed of rigid, clear; 4-inch-diameter Lexan (polycarbonate) in which the sediment sample is recovered. A Lexan core catcher attached to the end of the barrel was used to hold the undisturbed sediment inside the barrel when withdrawn from the seafloor sediments.

During sampling, a core tube was driven below the sediment surface with the vibracore device until the desired penetration was achieved. Sediment cores were collected to a depth of up to 8 feet below the sediment-water interface. Upon retrieval of the core, the acceptability was assessed relative to the criteria established in the SAP.

After sample collection, the outer core tube was cleaned and visually examined. Sediments from the cores were extruded on the vessel. Each core was visually examined in general accordance with ASTM D 2488, Standard Practice for the Classification of Soils (Visual-Manual Procedure). Each core was photographed and visual observations and soil descriptions were documented on core logs presented in Appendix A. Selected, representative photographs are presented in Appendix F.

Two sediment core samples, 22B and 51B, were selected for radiometric dating. Radiometric dating sediment core samples were sectioned into two 4-foot sub-sections, capped and placed on ice for transport. The cores were submitted for analysis to Battelle Marine Sciences Laboratory (Battelle), of Sequim, Washington.

One sediment core (42) was selected for chemical analysis. Four sub-samples (0 to 0.5 foot, 1.5 to 2 foot, 3.5 to 4 foot, and 6.5 to 7 foot) were individually homogenized, placed in designated containers, and submitted to Analytical

Resources, Inc. (ARI) of Tukwila, Washington, for analysis of grain size and conventional parameters.

3.5 Surface Sediment Grab Sampling

Fifty surface sediment grab samples were collected from subtidal locations within Port Gamble Bay and two sediment grab samples were collected outside Port Gamble Bay (Figure 3). Thirty-three sediment grab locations were collocated with core locations (nine within the FLA/FLTF). Three sediment grab samples (locations 73, 80, and GEO3) were collected at the same location as organisms collected for tissue analysis. Two sediment grab samples (22B and 51B) were collocated with the radiometric dating cores. Eighteen of the sediment grab sample locations were in the FLA and FLTF.

Surface sediment grab samples were collected using a 0.7 square meters (m^2) Young grab sampler. Samples from each surface grab location were collected from the 0- to 10-cm-depth interval and homogenized and submitted for chemical and bioassay laboratory testing. If necessary, multiple grabs were collected to provide sufficient sediment volume for chemistry and bioassays. Descriptions for surface sediment grab samples are presented in Table A-2 in Appendix A. The Young grab sampler was decontaminated between sampling locations following the procedure in the SAP.

Upon retrieval of the surface sediment grab samples, the acceptability of each grab was assessed relative to the criteria established in the SAP. At the first location (PGSS-8), the initial grab overpenetrated and was rejected. After removing the weights from the Young grab sampler, a second grab was attempted, which overpenetrated and was rejected. A third grab attempt was made, which also overpenetrated, due to the soft substrate. As no more weights could be removed from the sampler, and the other sampler available was heavier, the on-board Ecology representative decided to accept the grab sample. Most grab samples collected during the bay-wide sampling event overpenetrated (83 percent) due to the soft sediment substrate in the southern half of the bay.

Wet sieving was performed in the field for surface sediment grab samples using a 63-micron (No. 230) sieve and a graduated cylinder to estimate the fine and coarse fraction of the sediments following PSEP protocols. Wet sieving was completed to obtain similar grain size distribution between Port Gamble Bay sediment samples and Carr Inlet reference sediment samples for bioassay testing.

Three Carr Inlet reference samples were collected by Bio-Marine Enterprises using a 0.1m^2 double Van Veen grab sampler after Port Gamble Bay sediment

sampling was completed. Carr Inlet reference sample coordinates and descriptions are presented in Table A-2, in Appendix A.

Sediment from the fifty-two surface sediment grab samples and three reference surface sediment grab samples were submitted to ARI for chemical analysis. Sediment from thirty-two surface sediment grab samples and three reference sediment grab samples were submitted to Northwest Aquatic Sciences, Inc., in Newport, Oregon, for bioassay toxicity testing.

3.6 Sieve Samples to Evaluate Presence of Wood Material

The Ecology field representative and Hart Crowser field staff performed sieving on sub-samples from 6 cores and 51 surface sediment samples (Table 2) using 0.5 mm and/or 1.0 mm sieves to determine whether wood waste, which was too small to be otherwise observed in bulk sediment, was present.

Eight- to 16-ounce jars of homogenized sediment were washed through 0.5-mm or 1-mm sieves and the amount of fine wood was visually estimated. Macrofauna and large polychaete tubes were removed from the sieve samples to facilitate more accurate estimate of wood waste volumes. The sieved samples were stored in ziplock bags and transported to ARI for archiving. The sieved samples were subsequently weighed, transferred to glass jars, and preserved with isopropyl alcohol. The preserved samples were then shipped to Ecology for additional microscopic examination.

3.7 Biota Sampling

Biota sample locations were selected based on known areas where the Port Gamble S'Klallam Tribe collects shellfish for consumption and sale (Figure 3). Biota samples were collected by the Port Gamble S'Klallam Tribe Natural Resources Department using divers, traps, and hand collection. Proposed sample coordinates were provided to the Tribe, and actual sample collection coordinates are listed in Table A-1 in Appendix A. The following organisms were collected:

- Geoducks (35 total) were collected at three subtidal sample locations near locations 73 and 80 (Geoduck 1 and 2, respectively), and location Geoduck 3.

- A crab trap was placed overnight to collect Dungeness crabs (8 collected) near location 80.

- Oysters (45 total) and Littleneck Clams (60 total) were hand collected from intertidal sample locations near locations 76 and 87.

No biota tissue samples were collected within the FLA/FLTF. After collection by the Tribe, biota samples were transferred to Hart Crowser and transported live to ARI for tissue processing following chain of custody protocols detailed in the SAP.

4.0 SEDIMENT AND BIOTA TESTING AND ANALYSIS

4.1 Sediment Chemical Analysis

Sediment samples and associated analyses are summarized in Table 2. Samples for chemical analysis were selected in consultation with the Ecology project manager based upon evaluation of the SPI and core samples and locations relative to the FLA and FLTF. Samples were submitted to ARI for analysis of conventional parameters and SMS chemicals. Analysis for conventional chemicals and resin acids were conducted on 52 sediment samples. Chemical analysis of semivolatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), and SMS metals were conducted on 40 samples. Grain size analysis were performed on 32 sediment samples. Analysis for conventional chemicals and grain size were performed on three reference sediment samples. No field duplicates or equipment rinse blanks were collected for analysis.

Selected samples were analyzed for one or more of the following:

- SMS metals (arsenic, cadmium, chromium, copper, lead, silver, and zinc) by EPA Method 6010B, and mercury by EPA Method 7471A;

- SVOCs including retene and guaiacol by EPA Method 8270D;

- Resin acids and fatty acids associated with wood by EPA Method 8270D;

- PCBs by EPA Method 8082.

- Conventional parameters including:

    - Grain size;
    - Total organic carbon (TOC) following Plumb, 1981;
    - Ammonia by EPA Method 350.1 modified;
    - Sulfide by EPA method 376.2;

- Total volatile solids (TVS) by EPA Method 160.4; and
- Total solids and total preserved solids by EPA Method 160.3 modified.

- Dioxin/furan analysis was subcontracted to SGS Environmental Services, Inc. (SGS), in Wilmington, North Carolina, for analysis by EPA Method 1613.

Analytical results are discussed in Section 6. Sample analyses are summarized in Tables 3 through 8 for both organic carbon-normalized and dry weight results. Organic carbon-normalized results for non-ionizable SVOCs and PCBs were compared to SMS criteria as an overall evaluation of sediment quality at each of the selected sampling locations. The dry-weight normalized results were also compared to the dry weight equivalents of the SMS, sediment quality standard (SQS), and cleanup screening level (CSL) (i.e., Lowest Apparent Effects Threshold (LAET) and Second Lowest Apparent Effects Threshold (2LAET), respectively).

4.2 Radiometric Dating

Radiometric dating was performed to determine sedimentation rates within the bay. Sedimentation rates were used to estimate the amount of deposition since mill operations began and to evaluate whether natural recovery is a viable restoration alternative. Analysis was performed by Battelle Marine Sciences Laboratory of Sequim, Washington. Cores were sub-sectioned into 80 2-cm-thick sections and selected samples were analyzed for Lead-210 and Cesium-137.

4.2.1 Lead-210 Dating

Lead-210, produced by radioactive decay of radon, falls to earth with dust and rain and adsorbs to sediment particles. The half-life for lead-210 is 22.3 years, allowing dating of approximately the last 100 to 150 years. When applying the lead-210 technique, it is assumed that sediments are receiving a constant input of lead-210 from the atmosphere. Based on its half-life, lead-210 that was incorporated into the sediments 22.3 years ago will be only one half as radioactive as when initially deposited. This logic can be extended to calculate the age of sediments at other depths in the sediment column and/or the rate of sediment accumulation.

If the logarithm of excess polonium-210 activity above background is plotted as a function of accumulated dry weight of sediment, the line through the data should be a straight line with:

slope = – (lead-210 decay constant)/(dry mass sediment accumulation rate)

where the mass sediment accumulation rate is in units of grams/cm^2-year.

The sedimentation rate for any given depth interval is calculated by dividing the mass accumulation rate by the sediment dry density. In general, the calculated apparent sedimentation rate decreases with depth because the deeper, consolidated sediments have higher density than surface sediment.

4.2.2 Cesium-137 Dating

The Cesiums-137 data are generally interpreted on the basis of the 1959 and 1963 major input peaks of the isotope due to the start and maximum of atmospheric thermonuclear testing. Cesium results give a "point-in-time" date and are used to corroborate the lead-210 results, i.e., the sediment depth interval exhibiting Cesium-137 activity should correspond to a lead-210 derived date between approximately 1952 and 1965.

4.3 Biota Tissue Testing

Three geoduck samples, two oyster samples, two clam samples, and one crab sample (muscle tissue and hepatopancreas analyzed separately) were analyzed for percent lipids, metals, PCBs, and dioxins/furans to determine chemical concentrations in shellfish harvested for Tribal consumption and commercial sale.

Tissue processing for biota samples was performed at ARI. Two clam samples of 30 clams apiece were shucked and homogenized. The eight crabs were shelled, and the meat and hepatopancreas were separately homogenized for chemical analysis. Two oyster samples and two replicates (archive samples) of fifteen oysters each were shucked and homogenized.

Three geoduck samples and two replicates of each sample (three geoducks each) were shelled and homogenized. The skins on the necks of the geoducks were removed and archived. The gut ball was included in the meat composite.

Following discussions with Ecology with input from the Port Gamble S'Klallam Tribe, the preparation and homogenization steps described above were intended to provide the most representative tissue for testing purposes.

4.4 Bioassay Toxicity Testing

Ecology has not proposed specific numerical criteria for wood or wood indicator surrogates (such as TOC or TVS) above which cleanup would be required. Rather, sediment impacts due to wood waste and wood degradation products

are assessed through biological testing procedures listed in the SMS. Therefore, sediment toxicity testing was an important component of the RI to characterize the extent of wood waste impacts.

Microtox 100 percent pore water testing was initially performed on a wider distribution of 52 stations and three reference stations in order to assess its utility as a screening tool for wood waste sites. A full suite of bioassay toxicity testing was performed on 32 surface sediment samples and three reference samples. Both chronic and acute bioassay tests were performed as described in the SAP. The acute tests conducted included the 10-day amphipod survival test using *Eohaustorius estuarius and* the larval development test using *Mytilus galloprovincialis*. The chronic tests included the 20-day polychaete survival and growth test using *Neanthes arenaceodentata* and the Microtox 100 percent pore water luminescence test using *Vibrio fisheri.* The bioassay samples were submitted to Northwestern Aquatic Sciences of Newport, Oregon, for analysis, except for Microtox testing which was conducted by Nautilus Environmental of Tacoma, Washington.

Reference samples were collected from Carr Inlet for statistical comparison of test results. Biological endpoint data for each test were compared against those in the reference and control sediment. Data interpretation was conducted based on guidelines in Ecology's SAPA (Ecology 2008). These criteria are based on both statistical significance (a statistical comparison) and the degree of biological response (a numerical comparison). The SMS criteria are derived from Chapter 173-204 WAC and the Ecology SAPA. Two numerical comparisons are made under SMS based on the sediment quality standard (SQS) and the cleanup screening level (CSL) criteria.

5.0 SEDIMENT PHYSICAL CHARACTERISTICS AND OBSERVATIONS

Surface sediment samples and sediment cores were photographed and visual observations and soil descriptions were documented on core logs presented in Appendix A. The reference sample description was determined from the bioassay containers received prior to submittal to the testing laboratory. Visual sample descriptions of surface sediment grabs are presented in Table A-2 in Appendix A.

5.1 Grain Size

The bay-wide distribution of sediment grain size ranged from very soft, clayey Silt in low energy areas to very dense, coarse Sand in high energy areas of the bay near the Port Gamble Bay entrance. Bay-wide distribution of sediment grain

size was based on all available data including SPI images, surface sediment grab samples, and vibracores. Bay-wide grain size distribution is presented on Figure 4. The grain size distribution reported in Table 9 is subsequently reported as an apparent grain size. Laboratory certificates of analysis are presented in Appendix B.

In the southern and central portion of the bay, sediments generally consisted of very soft, clayey Silt (85 to 95 percent fines), indicating a low energy depositional environment. Sediments near the shoreline along the edges of the bay consisted of silty Sand to sandy Silt in the shallow subtidal zones and transitioned to slightly silty Sand to fine Sand in the intertidal zones, indicating higher energy due to current and wave activity. Sediments near and within the northern bay entrance contained a higher proportion of coarse Sand or Gravel, reflecting the presence of strong tidal currents.

This grain size distribution may explain why the preferred geoduck habitat lies in the northern portion of the bay. Geoducks are typically associated with habitat types characterized by fine Sand to silty, fine Sand sediments (Dethier 2006; U.S. Fish and Wildlife 1989). Hart Crowser surveys from other marine projects have shown that organism densities tend to decrease rapidly as sediment trends toward clay and silt. Tidal flushing may also be a contributing factor, but general experience is that geoduck occurrence is most commonly correlated with substrate type.

The laboratory also noted that 13 samples contained shells or shell hash, and/or organic matter or wood waste (PGSS-16, PGSS-21B, PGSS-29A, PGSS-38A, PGSS-39, PGSS-47, PGSS-51, PGSS-53, PGSS-56, PGSS-62, PGSS-73, PGSS-75, and PGSS-92). The shells or shell hash and/or organic material or wood waste were not removed prior to the grain size analysis.

5.2 Apparent Redox Potential Discontinuity

The apparent redox potential discontinuity (RPD) depth estimates the depth of oxygenation in the upper sediment column and generally reflects the degree of biogenic sediment mixing. As interpreted by SPI images, the distribution of mean apparent RPD depths in Port Gamble Bay ranged from 0.0 cm at station PG88, near the former mill site, to a high of 5.53 cm at station PG19, in the fine-grained southern portion of the bay (Figure 16). The mean apparent RPD depth for Port Gamble Bay was 2.77 cm. Relatively shallow apparent RPD depths (less than 2.0 cm) were generally measured in areas close to shore. At station 88 near the former mill site, SPI images show the accumulation of wood chips on the sediment surface (see Appendix D, Figure 10). The deepest RPD depths (about 3 to 5 cm) were measured in fine-grained sediments present in the

southern portion of the bay (see Appendix D). At nine locations in the southern bay, the apparent RPD depth could not be measured due to overpenetration by the camera prism. However, apparent RPD depths at these locations are likely similar to surrounding RPD measurements.

5.3 Radiometric Dating Results

Dating sediment cores makes use of radioisotopes lead-210 and Cesium-137. Lead-210 is formed by the decay of gaseous radon-222 and has a half-life of 22.3 years. Binding strongly to sediment, sedimentation dates are determined by the decrease in lead-210 activity. Cesium-137 owes its presences in the atmosphere to anthropogenic thermonuclear activities. Cesium-137 deposition began around 1952 and peaked around 1963–1964. The sediment depth interval exhibiting cesium-137 activity should correspond to a lead-210 derived date between approximately 1952 and 1965.

Two sediment cores (locations 22 and 51) were submitted to Battelle for radiometric dating. Figure 5 presents calculated year versus depth of sediment. Based on Lead-210 dating results at both core locations 22 and 51, a sediment depth of approximately 50 to 55 cm (1.6 to 1.8 feet) would correspond to the year 1853, when sawmill operations started. Wood waste identified shallower than this depth, therefore, may be associated with historical mill operations and log rafting activities.

Lead-210 dating at location 22, toward the shore in the FLA, indicates an overall sediment accumulation rate of 0.21g/cm^2-year calculated. Sediment accumulation rates cannot be calculated for shallower, more recent sediment due to surface mixing or from deeper, older sediment due to constant radioactivity levels from migration of radon from the earth. This accumulation rate corresponds to a sedimentation rate of 0.22 to 0.26 cm/year in sediment deeper than 60 cm and 0.43 to 0.48 cm/year in shallow (0 to 10 cm) sediment. This decrease in apparent sedimentation with depth is due to consolidation and increased density of deeper sediments. The mixed layer at core location 22, as deduced from the Lead-210 data, appears to be from 0 to 14 cm depth. Lead-210 derived dates corresponding to the Cesium-137 maximum peak ranged from 1947 to 1960. Assuming that sediment mixing or diffusion of cesium occurred, the dates estimated from cesium analysis demonstrate reasonable agreement with the Lead-210 results.

For location 51, located in the center of Port Gamble Bay, the results of Lead-210 dating indicate a sedimentation rate of 0.28g/cm^2-year. This accumulation rate corresponds to a sedimentation rate of 0.31 to 0.33 cm/year in sediment deeper than 30 cm and 0.40 to 0.44 cm/year in shallow (0 to 10 cm) sediment.

There was no apparent mixed layer in this core. Lead-210 derived dates corresponding to the Cesium-137 maximum peak ranged from 1955 to the present.

The radiometric dating report and supporting data are presented in Appendix E.

5.4 Distribution and Estimated Percentage of Wood Waste

SPI images, surface sediment grab samples, sediment core samples, and Ecology wet sieve samples from each location within the Port Gamble grid were observed for the presence of wood waste. Identification of wood waste was based on visual interpretation of SPI photographs and field interpretations and is subjective. For purposes of this report, wood waste included bark, wood chips, wood particles, as well as terrestrial wood debris (i.e., twigs and pine cones). The bay-wide distribution of wood waste is presented on Figures 6 and 7 and the estimated percentage of wood waste for sediment samples are summarized in Table 3. Figure 6 presents near-surface wood waste distribution based on SPI and plan view image analysis, and Figure 7 presents combined near-surface and subsurface distribution based on SPI, plan view analysis, vibracores, and surface sediment samples.

Surface sediment grab samples and sediment core samples were evaluated in the field for the presence of wood waste. A summary of the surface sediment grab samples are provided in Table A-2, and sediment core sample bore logs are presented in Appendix A. While wood waste was widely distributed, less than 5 percent by volume was estimated at most locations (Table 3). Greater amounts of bark material (visual estimates of up to about 50 percent) were generally observed at the base of the slope around the FLTF and FLA areas where historical log rafting and transfer occurred.

Ecology and Hart Crowser field representatives also performed wet sieving on samples from the upper 10 cm of sediment from 51 surface sediment samples and 6 sediment core samples using 0.5 mm and/or 1.0 mm sieves to determine whether wood waste that was too small to be observed in bulk sediment, was present. Sub-samples from the upper 10 cm of sediment contained approximately 5 percent by volume fine wood and wood fragments that were not otherwise visually obvious in the bulk sediment.

Wood waste was identified in:

- Either the plan view or SPI images in 28 of the 120 subtidal locations (approximately 23 percent);

- Eight of the 52 subtidal surface sediment sample locations (approximately 15 percent);

- Thirty of the 38 subtidal sediment core samples (approximately 79 percent); and

- All of the (51 of 51) wet sieve surface sediment samples and six of the six wet sieve sediment core samples (100 percent of samples contained fine wood material).

Wood waste was observed with the highest accumulations (15 to 50 percent cover) near the former sawmill operations at the mouth of the bay and near the shore within the FLA/FLTF. In many cases, these relatively high accumulations consisted of a single piece of wood. In contrast, wood waste was observed with trace accumulations (1 to 7 percent) in the northern and central portions of the bay.

A summary of the SPI observations and interpretation relative to the presence of near-surface wood waste is presented in SAIC's SPI Survey Report in Appendix D and on Figure 6. Identification of sawdust and wood chips in SPI images was based on visual interpretation of photographs and is subjective. Wood waste was identified in either the plan view or SPI images in 28 of the 120 subtidal locations (approximately 23 percent). SPI observations and interpretation of the presence of wood waste were further used to collocate surface sediment grab and sediment core sample locations.

5.5 Distribution of Benthic Organisms

Marine biological organisms, including macroalgae and invertebrates, were identified at most of the locations. Marine animals, macroalgae, or burrows were identified at 89 percent of the locations, based on reviews of the SPI and plan view images, and sediment core and grab sample observations.

Marine Organisms

The majority of organisms were observed and identified in the sediment surface grab samples. Small fish were present in four grab samples. Sipunculids (peanut worms) were present at the bottom of three grab samples at approximately 1 foot below mudline. Other worms, including polychaetes, nemerteans, and worm tubes were identified in 37 grab samples. Cnidarians, including sea whips, sea pens, and a sea anemone, were identified in four grab samples. Arthropods, including shrimp, crabs, and barnacles were identified in twelve grab samples. Mollusks, including clams, a nudibranch, a limpet, and a piece of geoduck

siphon, were present in eight grab samples. Shells, shell fragments, and shell hash were described in 32 grab samples. Echinoderms, including a sea cucumber and brittle stars, were observed in two grab samples, while sand dollars were identified in photographic images. Additionally, a tunicate (sea squirt) was caught on the Young grab sampler frame (Table A-2).

The distribution of benthic organisms generally followed the bottom substrate types and grain size distribution in Port Gamble Bay. Geoducks and other organisms favoring sandy bottom conditions were generally present in shoreline areas and the northern half of the bay. Infaunal deposit-feeding organisms associated with fine-grained, unconsolidated soft bottom classifications were generally observed in the southern end of the bay.

Infaunal transitional organisms, including shallow-dwelling bivalves or tube-dwelling amphipods, were also observed in the middle portion of the bay, where transition from fine-grain unconsolidated sediments to more consolidated sandy sediment occurs. Infaunal high energy organisms, including tubicolous and surface-dwelling polychaetes, were observed in the northern portion of the bay, where hard sandy consolidated sediment with higher bottom current energy are present. Intact eelgrass beds were observed in locations north of the bay entrance and just south of the entrance along the eastern shore. Additionally, sea pens and sea whips were observed in the northern reaches of Port Gamble Bay, where higher bottom currents are present.

Benthic Habitat Type

The benthic habitat classifications in Port Gamble Bay generally followed the grain size major mode distribution measured from SPI images (Appendix D). The highest number of locations consisted of a hard, fine sandy bottom. Medium sandy hard bottom and medium sandy hard bottom with gravel were observed at four percent and two percent of the locations, respectively. The two stations with sandy hard bottom and gravel were located within the entrance channel to Port Gamble Bay. Hard sandy bottom classifications were generally found in shoreline areas and the northern half of Port Gamble Bay. One location within the entrance channel to the bay (location 89) consists of a hard rock or gravel bottom. Location 88, near the former mill site, did not have a benthic habitat classification due to the high accumulations of wood debris on the sediment surface.

The second most predominant habitat classification (33 percent of locations) was an unconsolidated soft bottom with very soft silts/clays. Silty unconsolidated soft bottom and sandy/silty unconsolidated soft bottom were also observed at 11 percent and 7 percent of the locations, respectively. The

unconsolidated soft bottom classification was predominant in the southern reaches of Port Gamble Bay (see Appendix D).

Several locations in Port Gamble Bay also exhibited the presence of eelgrass (*Zostera* sp.) and other macrofauna such as sea pens (*Ptilosarcus gurneyi*) and sea whips (order Pennatulacea). Intact eelgrass beds were observed in locations north of the bay entrance (94, 97, 98, and 100), and just south of the entrance along the eastern shore (locations 82, 86, and 87), as noted in Appendix D, Figure 20. Eelgrass detritus (i.e., decomposing eelgrass blades, loose strands) was observed at locations 54 and 88. Sea pens and sea whips were observed at several locations in the northern portions of Port Gamble Bay. These organisms are known to position themselves in the path of currents, in order to ensure a steady supply of food (e.g., plankton).

Infaunal Successional Stage

The majority of infaunal successional stages observed in SPI images collected in Port Gamble Bay were Stage I (65 percent). Stage I infauna are typically the first organisms to colonize the sediment surface. These opportunistic organisms may include small, tubicolous, surface-dwelling polychaetes.

Stage III or Stage I on III comprised 31 percent) of SPI locations mainly associated with the more sandy substrate in the northern half of the bay (Appendix D). Stage III is a high-order successional stage consisting of long-lived, infaunal deposit-feeding organisms. Stage III invertebrates may feed at depth in a head-down orientation and create distinctive feeding voids visible in SPI images. Stage I taxa can persist in these areas, as they are opportunistic feeders, and are commonly associated with a Stage III community (Rhoads and Germano 1986).

Infaunal successional stage was indeterminate at five locations (4 percent) due to camera prism overpenetration or the presence of abundant wood debris.

In sandy substrates, such as the areas along the shoreline and the northern portion of Port Gamble Bay, the climax communities consisted primarily of surface dwellers (e.g., amphipods) that reside in the upper 1 cm of the sediment, as well as filter feeders including clams and geoducks not observed in the SPI images. These community types are classified as Stage I communities and are reflective of an area influenced by physical factors and the presence of a sandy substrate.

A higher order successional stage would typically be assigned to a climax community in a depositional environment consisting of a silt/clay substrate, such

as areas in southern Port Gamble Bay. Localized feeding of large, deep-burrowing infauna (Stage III taxa) in these depositional environments result in distinctive excavations called feeding voids. Location 18 provides a representative example of feeding voids visible in southern Port Gamble Bay (Appendix D).

6.0 SEDIMENT CHEMICAL ANALYSIS RESULTS

This section presents analytical results for sediment samples collected as part of the RI. Results of the sediment chemical analysis of organic carbon-normalized data were compared to applicable SMS marine criteria, including SQS and CSL thresholds, as described in WAC 173-204-320 and WAC 173-204-520.

The marine SQS and LAET numerical chemical concentration criteria define the degree of sediment quality that is expected to cause no adverse effects to biological resources in marine sediments. At concentrations at or below the CSL or 2LAET, effects to biota are expected to be minor. CSL and 2LAET represent the upper bound of the minor adverse effects and above these concentrations, effects are anticipated to be significant.

6.1 Data Quality Review Summary

Overall, the data quality objectives (DQOs), as set forth in the SAP, were achieved, and the data for this project are acceptable for use, as qualified. However, neoabietic acid non-detected results for 22 samples were rejected as a result of the QA/QC review. Results for other chemicals associated with wood waste were acceptable so there is no significant impact to the data. Results for several analytes were qualified as estimated concentrations based on minor exceedances of quality control criteria. A detailed chemical data quality review and chemical laboratory certificates of analysis are presented in Appendix B.

In some samples, reporting limits for chlorinated benzenes, hexachlorobutadiene butylbenzylphthalate, phenol and 2,4-dimethylphenol were above SQS and/or dry weight equivalent criteria. When analytes were present, the laboratory reported estimated results to the method detection limit, which was below SQS and dry weight criteria for all analytes.

6.2 Conventional Parameters

Analytical results for sediment conventional parameters are presented in Tables 4 and 8, and summarized below.

TOC

Total organic carbon concentrations in surface sediment samples ranged from 0.285 to 4.73 percent. TOC values in the vibracore sample ranged from 2.81 percent for the 0- to 0.5-foot-depth interval to 1.46 percent for the 6.5- to 7-foot-depth interval. The maximum TOC concentration (4.73 percent) was reported in surface sediment sample PGSS-29A, located in the northwest corner of the FLA.

TVS

Total volatile solids concentrations ranged from 0.78 to 12.68 percent in the samples. As for TOC, the maximum TVS concentration was also reported in surface sediment sample PGSS-29A, located in the northwest corner of the FLA.

Specific numerical criteria are not established for wood or wood indicator surrogates (such as TOC or TVS) above which cleanup would be required. Rather, wood waste and wood degradation products are commonly assessed through biological testing procedures listed in the SMS (see Section 7).

Another indicator of the presence of organic loading such as wood waste and the overall "availability" of organic matter contained in sediment is the TVS/TOC ratio. Typical, unimpacted marine sediment has a TVS/TOC ratio less than about 2 based on discussion with Jack Word of NewFields Northwest (personal communication). Conversely, ratios greater than 2 are often indicative of labile organic matter such as wood waste that is available for chemical or microbial breakdown. This often results in anaerobic conditions and elevated concentrations of sulfides (Figure 8). TVS/TOC ratios for Port Gamble Bay sediment samples are presented on Figure 9. Samples containing the highest TVS/TOC ratio are located toward the middle of the bay adjacent to the FLTF and FLA.

Sulfide

Total sulfide concentrations in the sediment surface samples ranged from 1.19 to 1,120 mg/kg with the highest concentration detected in surface sediment sample PGSS-40, located near the FLTF and FLA (Figure 10). In core sample PGSC-42 near the center of the bay, total sulfide was highest in the 0- to 0.5-foot-depth interval (82.9 mg/kg). Elevated sulfide concentrations are indicative of organic-rich, anaerobic sediment and may be associated with low oxygen due to degradation of wood waste. Samples containing the highest sulfide concentrations are located toward the central portion of the bay and within the

FLTF and FLA (Figure 10). Sulfide is generally collocated with visual wood waste presence and locations with higher TVS/TOC ratios.

Ammonia

Ammonia concentrations in the sediment surface samples ranged from 2.35 to 53.6 mg/kg with the highest concentration detected in surface sediment sample PGSS-16 near the eastern boundary of the FLA. In the core samples, ammonia was highest in the 6.5- to 7-foot-depth interval (164 mg/kg). Elevated ammonia concentrations are also indicative of organic-rich, anaerobic sediment and may be associated with low oxygen due to degradation of wood waste, even though wood itself contains very little nitrogen.

Samples containing the highest ammonia concentrations are generally correlated with sulfide and collocated with visual wood waste presence and higher TVS/TOC (Figure 11).

6.3 Fatty and Resin Acids

Both fatty acids (oleic and linolenic) and resin acids (abietic acids, pimaric acids, and palustric acid) associated with wood waste were analyzed. The distributions of total fatty and resin acids in sediment samples are shown on Figures 12 and 13, respectively.

Oleic acid was detected in every sample at concentrations ranging from 370 to 8,400 ug/kg. Linolenic acid was detected in 30 of 52 samples analyzed at concentrations ranging from 100 to 1,500 ug/kg. Resin acids were detected in 20 of 52 samples analyzed. Total detected resin acid concentrations ranged from 110 to 4,880 ug/kg. Higher concentrations of fatty acids and resin acids appeared to be somewhat correlated though fatty acids were more widely distributed throughout the bay. Highest concentrations of oleic and linolenic acid were found in samples collected from the FLTF, immediately north of the FTLF, and east of the FTLF throughout the width of the bay to the opposite shore. Highest concentrations of resin acids were found in the same locations.

Oleic and linolenic acids also naturally occur in blue-green algae (Ikawa 2004) though typical concentrations ranges were not reported. Douglas Fir also contains oleic and linolenic acid (Foster et al., 1980). Reported fatty acid concentrations in Douglas Fir are approximately 100 mg/kg based on the analysis of the ether extractable fraction of wood with oleic acid comprising 20 to 30 percent of the total and linolenic acid comprising 6 to 10 percent of the total fatty acids.

Resin acid concentrations in Douglas Fir are approximately 2,000 to 2,700 mg/kg based on the analysis of the ether extractable fraction of wood with concentrations decreasing in the following order:

isopimaric > palustric > abietic > neoabietic > dehydroabietic

Palustic acid and isopimaric acid each constitute about 20 to 30 percent of the total resin acids in Douglas Fir.

Based on the distribution of fatty and resin acids combined with SPI images and visual observations of sediment samples, resin acids appear to be a good indication of wood waste. Fatty acids may reflect the presence of both wood waste and naturally occurring algae.

6.4 Total Metals

All metal concentrations were below applicable SQS screening criteria. Samples with the highest metal concentrations were generally from the southern half of the bay and the higher metals concentrations may be associated with the fine-grained silt and clay or ephemeral stream inputs present in this area.

6.5 Semivolatile Organic Compounds

Non-Polar Semivolatile Organic Compounds

Except for five locations (PGSS-8, PGSS-29A, PGSS-30, PGSS-75, and PGSS-80), sample TOC concentrations were within the 0.5 to 3.5 percent range for organic carbon normalization of non-polar organics. Sediment dry-weight analyte concentrations compared to AET values are presented in Table 5. Sediment organic carbon normalized results compared to SMS criteria are presented in Table 6.

None of the samples analyzed exceeded SMS organic carbon normalized criteria or AET dry-weight screening values for non-polar organic compounds. No phthalates or chlorinated benzenes were detected in any of the samples.

Low concentrations of PAHs were detected in all but six samples analyzed. In general, samples with highest concentrations of PAHs were along the western part of the bay. PAHs are often associated with creosote, coal tar, petroleum, road runoff, and incomplete combustion of organic matter. PAHs may be associated with treated pilings and structures along the shoreline or runoff from the highway along the western part of the bay.

Ionizable Semivolatile Organic Compounds

Phenol was the most commonly detected ionizable SVOC found in 17 of 40 samples analyzed (Figure 14). Two samples within the FLA, PGSS-8 AND PGSS-22, exceeded the SQS screening level of 420 mg/kg and one sample collected just east of the FLTF, PGSS-58, also exceeded the SQS criterion. Most other phenol detections were in samples collected from the western edge of the bay between the FLTF and the former mill. Distribution of phenol concentrations is presented on Figure 14. Phenol is generally correlated with the presence of wood, high TVS/TOC ratio, sulfide, and ammonia. Phenol is a product of wood degradation and is also a component of creosote and coal tar.

In addition to phenol, 4-methylphenol was detected in three samples (PGSS-8, PGSS-51, PGSS-62A) at concentrations below SQS. This compound is also often associated with wood waste as well as creosote and coal tar.

6.6 Polychlorinated Biphenyls

PCBs were detected in only two surface sediment samples at concentrations below the SQS screening criteria of 12 mg/kg OC. Aroclor 1254 was found in sample PGSS-38A, located at the south end of the FLTF, at a relatively low concentration of 16 ug/kg (0.47 mg/kg OC). Aroclor 1254 was also present in sample PGSS-44, located approximately 1,500 feet from the east shore along the same transect as PGSS-38A, at a low concentration of 4.3 ug/kg (0.16 mg/kg OC).

6.7 Dioxins/Furans

Analytical results for dioxins/furans expressed as 2,3,7,8-TCDD toxic equivalents (TEQs) are presented in Table 7 and on Figure 15. TEQs were calculated using the World Health Organization (WHO) 2005 toxic equivalency factors (TEF) for mammals. Total dioxin TEQs are reported using two conventions: adding only detected congeners, and using 1/2 the detection limit for non-detected congeners. The latter made a significant difference in reported totals since concentrations for many congeners were below detection limits (Table 7). For the presentation of data on Figure 15, the values were calculated using 1/2 the detection limit for non-detected results.

Dioxin/furan congeners were detected in all samples. The total TEQ concentrations ranged from 0.344 to 2.48 ng/kg (parts per trillion), with a mean concentration of 1.06 ng/kg. The highest concentration was in sample PGSS-92, located outside the mouth of the bay, within a vessel docking area (Figure 15). If the samples located outside the bay proper are excluded (PGSS-92 and PGSS-

GEO-3), the total TEQ ranges from 0.344 to 1.812 ng/kg, with a mean concentration of 0.945 ng/kg. The highest concentration within the bay, 1.812 ng/kg, was in sample PGSS-8, located in the FLA. Analytical results for dioxins/furans are presented in Table 7.

Dioxin/furan concentrations do not have numerical criteria under SMS for marine sediments. However, for comparative purposes, the detected TEQ concentrations are similar to Puget Sound background concentrations, as reported in EPA's 2008 Puget Sound Background Study (EPA 2008b). TEQ concentrations in the Puget Sound study ranged from 0.24 to 11.63 ng/kg with a lognormal mean of 1.35 and a median of 1.0 ng/kg. The detected concentrations from Port Gamble Bay sediments are well within this background range.

In addition, with the exception of locations PGSS-75 and PGSS-80 that had fewer dioxins detected, the relative congener ratios in sediment samples collected from Port Gamble Bay were similar to Puget Sound background concentrations in the DMMP study (Figure 16). The Port Gamble Bay congener ratios are more variable than Puget Sound background due to the larger number of non-detected results in Port Gamble Bay samples. The octachlorodibenzodioxin (OCDD) relative ratio is excluded from Figure 16 because the OCDD congener is typically present at much higher concentrations than other congeners, regardless of dioxin source, and dominates the relative fraction.

7.0 SEDIMENT TOXICITY TESTING RESULTS

Sediment quality was evaluated based on biological criteria as established in the SMS, which serve to confirm the designation of sediment quality. These criteria are based on both statistical significance (a statistical comparison) and the degree of biological response (a numerical comparison). As for chemical parameters, the SMS establishes SQS (concentration at or below which no adverse effects are expected) and CSL (concentration at or below which no significant adverse effects are expected) criteria for evaluating sediment quality. The SQS is more stringent than the CSL and allows for less biological response in the test treatments.

Bioassay pass/fail test results relative to SQS and CSL criteria are based on a comparison of responses observed in the test sediment compared to those in the reference sediment. Reference and test sediment are matched based on sediment grain size with the difference between reference and test sediment percent fines being less than or equal to 20 percent. Based on similarity in grain size, the following reference and test sediment comparisons were performed:

- Carr Inlet reference sediment CR20W (79.7 percent fines): test sediment locations 8, 15, 16, 18, 20, 22, 30, 31, 33, 35, 39, 40, 42, 44, 45, 51, 53, 54, and 58.

- Carr Inlet reference sediment MSMP43 (6.4 percent fines): test sediment locations 47, 56, 62, 67, 73, 75, 77A, and 92.

- Carr Inlet reference sediment CR23Mod (51.6 percent fines): test sediment locations 21B, 29A, 38A, 63, and 64.

The acute tests conducted included the 10-day amphipod survival test using *Eohaustorius estuarius*, the larval development test using *Mytilus galloprovincialis*, and the Microtox 100 percent porewater luminescence test using *Vibrio fisheri*. The chronic 20-day polychaete survival and growth test was conducted using *Neanthes arenaceodentata*. The bioassay samples were submitted to Northwestern Aquatic Sciences of Newport, Oregon, for analysis, except for Microtox testing which was conducted by Nautilus Environmental of Tacoma, Washington. Laboratory results and sediment bioassay summary are provided in Appendix C.

7.1 Amphipod Test Results

Under the SMS program, a test treatment fails SQS if the mean mortality is statistically significantly higher than that of the reference sediment, and the mean mortality in the test sediment is greater than 25 percent. Tests fail the CSL if the test treatment mortality is both statistically significantly higher and 30 percent greater than the reference sediment.

All 32 amphipod test results passed SQS criteria. While 17 of the test samples had mortality significantly higher than the associated reference sediment samples, the percent difference between test and reference survival was less than the 25 percent threshold that would result in SQS failures. Amphipod test results for each location are shown on Figure 17.

7.2 Juvenile Polychaete Test Results

The juvenile polychaete test is based on mean individual growth (MIG) rates. A test fails SQS if the MIG is statistically different in the test sediment as compared to the reference, and the MIG in the test sediment is less than 70 percent of the reference. The treatments fail CSL if MIG is statistically different from the reference sediment and is less than 50 percent of the reference.

All 32 polychaete test results passed SQS criteria when compared to reference sediment results. While seven of the test samples had growth rates significantly lower than the associated reference sediment samples, the percent difference between test and reference growth did not exceed SQS criteria.

The growth rate for reference sample CR 20W for laboratory test batch 780-2 was only 71.2 percent of the control, less than the 80 percent performance criterion. While SMS does not provide explicit guidance when reference samples fail performance criteria, associated samples were compared to control results, and 14 of the test samples had growth rates statistically lower than reference (or control) MIG rates. Five of these samples (PGSS-18, PGSS-29A, PGSS-33, PGSS-39, and PGSS-40) had MIG rates less than 70 percent of control rate and, therefore, test results are considered SQS failures. Polychaete test results based on this interpretation are shown on Figure 17. If results are compared to reference sample CR23MOD (51.6 percent fines) rather than CR20W (79.7 percent fines), only sample PGSS-30 would fail the SQS criterion.

7.3 Larval Test Results

For the larval test, sediment fails SQS if the combined mortality and abnormality (CMA) of larvae in the test treatment is significantly different than that of the reference, and is less than 85 percent of the reference sediment. Tests fail CSL if the CMA is significantly different than the reference sediment, and is less than 70 percent of the reference sediment.

When compared to reference sediment results, 22 samples had CMA significantly different than their associate reference samples and 16 of these samples failed the SQS criterion. In addition, seven of these samples also failed the CSL criterion.

The CMA for reference sample CR23MOD was 47.8 percent in laboratory batch 780-3, greater than the Ecology QA/QC guidance of 35 percent. Three test samples (PGSS-21B, PGSS-29A, and PGSS-38A) were associated with reference CR23MOD. While SMS does not provide explicit guidance when reference samples fail performance criteria, results for these three test samples were compared to seawater controls and all three failed the CSL criterion. Larval test results based on this interpretation are shown on Figure 17. If test results are compared to CR20W (79.7 percent fines) rather than CR23MOD (51.6 percent fines), samples PGSS-21B and PGSS-38A still fail the CSL criterion while sample PGSS-29A only fails the SQS criterion.

As presented on Figure 18, Mytilus failures are somewhat correlated with sulfide and the TVS/TOC ratio. At TVS/TOC ratios greater than approximately 2.5 both

sulfide concentrations and mytilus failure rate increases. A similar relationship is observed with ammonia concentration, TVS/TOC ratio and mytilus failure (Figure 19).

7.4 Microtox Test Results

Fifty-two sediment surface samples and three reference samples were submitted to Nautilus Environmental for Microtox analyses. Six samples: PGSS-16, PGSS-62B, PGSS-51, PGSS-58, PGSS-63, and PGSS-69 exceeded the SQS criteria of mean test sediment light output less than 80 percent of the reference and statistically different. Microtox test results for each location are shown on Figure 17.

The laboratory noted that sample PGSS-16 had low salinity (9 parts per thousand) and turbidity greater than 100 NTU. Due to the high turbidity, the transmission of light from the bacteria may have been inhibited, and the result may be an artifact of the testing, not an indication of toxicity. This interpretation is supported by the observation that sample PGSS-16 passed the other bioassay tests.

Reference sample CR23MOD did not meet the acceptability criteria relative to the control sample in Test Batches 10 and 11 and associated samples were subsequently compared to the control. Only one sample, PGSS-63, failed the comparison to the control, so was designated an SQS level hit. However, sample PGSS-63 passed the other bioassay tests.

7.5 SMS Interpretation

The SQS are exceeded if one of the sediment biological tests fail the specified criteria. The CSL is exceeded if one test fails its CSL criteria or if two tests fail their SQS criteria. Ten locations exceeded SQS criteria and 14 additional locations exceeded CSL criteria. Toxicity test results are summarized in Table 10 with interpretation related to SQS and CSL failures. Overall test results are presented graphically on Figure 17.

7.6 Evaluation of Factors Contributing to SMS Failures

As discussed previously, the presence of wood waste can impact sediment quality by releasing toxic wood-associated chemicals not typically tested for as part of the SMS suite of analytes and by creating anaerobic conditions that can adversely affect benthic organisms. In addition, the presence of wood waste can create a sediment substrate not conducive to colonization by a diverse array of benthic organisms.

Table 13 summarizes analytical results for conventional sediment parameters as well as neanthes and mytilus test results. There appears to be a fairly strong general correlation between the TVS/TOC ratio and the larval and polychaete bioassay failures. TVS/TOC ratios greater than approximately 2.4 have elevated concentrations of sulfide and ammonia compared to sediment with a TVS/TOC ratio of less than 2.4.

Neanthes and/or mytilus bioassay failures were found in 13 of the 20 samples tested (65 percent) that had a TVS/TOC ratio greater than 2.4. For the 11 samples with a TVS/TOC ratio greater than 3.0 submitted for bioassay testing, Neanthes and/or mytilus bioassay failures were found in 9 samples (82 percent). In contrast, neanthes and/or mytilus tests failed in only 3 of 12 sediment samples tested that had a TVS/TOC ratio less than 2.4.

A multivariate statistical method, principal components analysis (PCA), was performed to further evaluate factors that may contribute to sediment toxicity. PCA is a technique to combine variables in a dataset and create a new, reduced set of variables (factors) that are linear combinations of the original variables. PCA factor loading plots are used to evaluate correlations among variables and PCA factor score plots are used to evaluate similarities and differences among samples.

The factor loading plot for Port Gamble data is shown on Figure 20. Based on their proximity in space, neanthes and mytilus test failures appear to be correlated with the sediment TVS/TOC ratio, sulfide, ammonia, total resin acids, and percent fines. There appears to be little or no correlation with percent solids.

The PCA factor scores plot, coded to show toxicity test results, is presented on Figure 21. Samples that plot closely to one another in the 3-dimensional plot have similar chemical and physical characteristics while samples that plot further apart have less similar characteristics. Most of the samples that failed one or more of the bioassay tests are clustered together with "Factor 1" values greater than 0.5. As shown on Figure 20, Factor 1 is influenced primarily by TVS/TOC ratio, sulfide, ammonia, and percent fines. Associated sediment samples that tended to fail bioassay tests had the following similarities:

- Higher TVS/TOC ratios;
- Higher sulfide and ammonia concentrations; and
- Higher percentage of fine grained material.

These factors are likely interrelated. Wood waste would contribute to higher TVS while degradation of wood would create anaerobic conditions leading to formation of sulfide and ammonia in the sediment.

Samples that generally passed toxicity tests tend to cluster in the area with Factor 1 scores less than 0.0 and have lower TVS/TOC ratios, lower concentrations of sulfide, ammonia, and resin acids, and contain more coarse grained material.

8.0 TISSUE TESTING RESULTS

The tissue samples collected by Port Gamble S'Klallam Tribal representatives were analyzed for percent lipids, total metals, dioxins/furans, and PCBs. Analytical results for chemistry in the biota samples are presented in Table 11. Analytical results for dioxins/furans in the biota samples are presented in Table 12. The sample locations listed below for tissue testing results are identified on Figure 2. Analytical results for dioxins/furans expressed as 2,3,7,8-TCDD TEQs and were calculated using the WHO 2005 TEFs for mammals. Non-detected results were assigned a concentration of both zero and one-half the laboratory reporting limit and TEQs are calculated using both conventions.

8.1 Geoducks

Nine geoducks were collected from each of three locations (Geoduck 1, 2, and 3). Geoducks were shucked and the neck skin was removed. Three geoducks from each location were homogenized (including the gut ball) and submitted for analysis. Remaining geoducks were homogenized and frozen, in the event that additional analysis was required.

Lipids in the three geoduck samples ranged from 0.426 to 0.823 percent on a wet weight basis with an average of 0.577 percent. For comparison, Sample Geoduck 3 collected from outside of Port Gamble Bay had both higher percent lipids and metals compared to the geoducks collected within the bay. The lipid concentration in sample Geoduck 3 was approximately twice as high as those in samples Geoduck 1 and Geoduck 2. Chromium, copper, mercury, and zinc concentrations in sample Geoduck 3, while still relatively low, were approximately twice as high as in geoducks collected from within the bay.

Calculated tissue dioxin TEQ concentrations ranged from 0.00032 to 0.00077 ng/kg when zero was substituted for non-detected compounds. When one-half the quantification limit was substituted for non-detects, calculated TEQ concentrations ranged from 0.337 to 0.349 ng/kg.

For comparison, average and maximum dioxin TEQs in geoducks collected from Lower Elwha Klallam fishing grounds near Port Angeles were 0.027 and 0.034 ng/kg respectively (1/2 DL substituted for non-detects) and, substituting 0 for non-detects, 0.019 and 0.023 ng/kg (ATSDR 2005). Reference geoduck samples collected from Dungeness Bay and Freshwater Bay had dioxin TEQ concentrations of 0.071 and 0.041 ng/kg, respectively so when 1/2 DL was substituted for non-detects. Results are not directly comparable because the gutball was not included in the Port Angeles samples but was homogenized as part of the Port Gamble geoduck samples. In addition, detection limits may have been higher for Port Gamble samples resulting in higher TEQs when 1/2 DL was substituted for non-detected analytes.

PCB Aroclors were not detected in any of the geoduck tissue samples.

8.2 Dungeness Crabs

Eight adult male Dungeness crabs were collected to obtain sample Crab 1. The muscle tissue and hepatopancreas were separated during tissue preparation. Muscle and hepatopancreas were homogenized and a composite of each was analyzed separately. Unused tissue was frozen in the event that additional analysis was required.

The lipid concentration was 0.208 percent in the muscle and 3.01 percent in the hepatopancreas.

Metals

Arsenic and zinc concentrations were higher in muscle tissue while copper and cadmium concentrations were higher in the hepatopancreas. No lead was detected in either sample. Other metal concentrations were comparable.

PCBs

No PCB Aroclors were detected in the muscle tissue. Aroclor 1260 was reported in the hepatopancreas at an estimated concentration of 15 ug/kg.

Muscle tissue results are comparable to those in samples collected from Fidalgo Bay (SAIC 2008a) where PCBs were also not detected in crab muscle tissue. Hepatopancreas PCB concentrations were higher in Fidalgo Bay samples. Aroclor 1260 was detected at 110 ug/kg in one crab hepatopancreas sample, and was not detected in five other hepatopancreas samples from Fidalgo Bay. However, laboratory detection limits were elevated compared to detection limits for Port Gamble samples.

PCBs were not detected in muscle tissue of crabs collected from Port Gardner (SAIC 2009). Hepatopancreas concentrations in crabs collected from Port Gardner were higher than found in Port Gamble with concentrations ranging from 93 to 260 ug/kg of Aroclor 1254 and 1260.

Dioxins

The muscle dioxin TEQ concentration was 0.022 ng/kg when zero was substituted for non-detected compounds and 0.370 ng/kg when one-half the detection limit was used for non-detects.

As expected, due to the higher lipid content, higher dioxin concentrations were detected in the hepatopancreas sample. The TEQ concentration was 0.791 ng/kg when zero was substituted for non-detected compounds and 0.940 ng/kg when one-half the detection limit was used for non-detects. Crab hepatopancreas tissue has higher relative ratios of less chlorinated dioxins and furans (i.e., tetra- and hexachlorodibenzodioxins and tetra-, penta-, and hexachlorodibenzofurans than those in sediment samples (Figure 16).

In comparison to other sites in Puget Sound, the muscle tissue dioxin TEQ is higher than reported for Fidalgo Bay (0.0366 to 0.18 ng/kg) (SAIC 2008a). However, this may be an artifact of substituting one-half the laboratory detection limits for non-detected compounds. The hepatopancreas TEQ is at the low range of concentrations found in samples from Fidalgo Bay (0.611 to 10.5 ng/kg).

The Port Gamble muscle tissue dioxin TEQ is also higher than reported for Port Gardner (0.0886 to 0.155 ng/kg) (SAIC 2009) though this may be an artifact of substituting one-half the laboratory detection limits for non-detected compounds. Hepatopancreas TEQs in the Port Gamble crab sample are lower than concentrations found in samples from Port Gardner (3.48 to 4.38 ng/kg).

Port Gamble crab tissue dioxin TEQs are comparable to those reported from reference areas in the Strait of Juan de Fuca. Dungeness crabs collected from Dungeness Bay (PTI 1991) had a muscle tissue TEQ of 0.3 ng/kg while the hepatopancreas had a TEQ of 1.6 ng/kg). Crab tissue dioxin TEQs are also comparable to two Dungeness crab samples collected from reference areas in Dungeness Bay and Freshwater Bay, which had dioxin TEQ concentrations of 0.043 and 0.033 ng/kg in muscle tissue and 0.50 and 0.74 ng/kg in the hepatopancreas (1/2 DL for non-detects). Substituting 0 for non-detects, Dungeness Bay and Freshwater Bay muscle tissue TEQs were 0.016 and 0.005 ng/kg while hepatopancreas TEQs were 0.47 and 0.72 ng/kg (ATSDR 2005).

Whole-body dioxin TEQ concentrations in Dungeness crabs collected from Lower Elwha Tribe fishing grounds near Port Angeles averaged 0.18 ng/kg with a maximum of 0.32 ng/kg (ATSDR 2005).

8.3 Oysters

Thirty oysters were hand collected from each of two intertidal locations to obtain samples Oyster 1 and Oyster 2. Fifteen of the oysters from each location were shucked, homogenized and submitted for analysis while the remaining oysters were shucked, homogenized, and frozen in the event that additional analysis was required.

The lipid concentration was 1.97 percent in both samples.

Metals

While zinc concentrations (101 and 124 mg/kg) were higher than those in other biota samples, concentrations were in the range reported for oysters from an early 20th century document (Hiltner 1919). Other metal concentrations were low or non-detected.

PCBs

PCB Aroclors were not detected in either sample.

Dioxins

All dioxins detected in oyster tissue samples were below the practical quantitation limit. Tissue dioxin TEQ concentrations were 0.000 and 0.038 ng/kg when zero was substituted for non-detected compounds. When one-half the detection limit was used for non-detects, TEQ concentrations were 0.367 and 0.373 ng/kg. No dioxin background or reference concentration data for comparison were found for oysters.

8.4 Clams

Thirty littleneck clams were hand collected from each of two intertidal locations to obtain Samples Clam 1 and Clam 2. Clams were shucked, homogenized and submitted for analysis.

The lipid concentrations were 0.232 and 0.487 percent.

Metals

Lead and mercury were non-detected in both samples. Concentrations of other metals were low and were comparable in the two samples.

PCBs

No PCB Aroclors were detected in the samples.

Dioxins

There were no detections for dioxins in the clam samples. Dioxin TEQ concentrations using one-half the detection limit for non-detects, were 0.350 and 0.368 ng/kg. Dioxin TEQ concentrations are lower than found in littleneck clams collected from Budd Inlet where concentrations ranged from 0.20 to 1.58 ng/kg with an average of 0.488 ng/kg (SAIC 2008b). Port Gamble clam dioxin concentrations are comparable to those for littleneck clams collected from a background location in Padilla Bay where dioxins were not detected in any of the tissue samples (DMMP 2009).

9.0 SUMMARY AND CONCLUSIONS OF REMEDIAL INVESTIGATION

Sediment quality and biota tissue sampling and testing data presented in this RI report provide a substantial baseline for characterizing environmental conditions in Port Gamble Bay. This investigation included a bay-wide assessment of wood waste impacts from historical log handling and milling operations. Assessment work also focused on specific locations of interest associated with the FLTF and FLA.

RI investigation methods included a wide array of assessment and testing techniques to determine the extent of wood waste impacts associated with the historical activities. Initial SPI and plan view photography proved quite useful for selecting subsequent surface sediment sampling and coring locations. In turn, the sediment samples were evaluated for a general suite of conventional parameters to guide further chemical analysis testing including SMS constituents, dioxins, and fatty and resin acids associated with woody material. The RI data set also included results from biological testing, radiometric dating of selected sediment cores, and chemical testing of tissues samples from geoducks, crabs, clams, and oysters collected from Port Gamble Bay by the Port Gamble S'Klallam Tribe.

A number of key conclusions are summarized below based on the sampling and testing results presented in this RI.

9.1 Wood Waste Occurrence and Distribution

Wood waste was observed in 44 percent of the combined SPI and plan view images, and sediment samples obtained (Figure 7). Although widely distributed throughout the bay, the highest accumulations of wood waste were along the west side of the bay from south of the former mill through the FLTF and the FLA. In addition, wood waste was found along the shore on the east side of the bay, near a former rail line along Little Boston Road that continued to a log dump area at the edge of the bay.

Wood waste was observed in a wide range of sizes, but most commonly occurred as finely divided particles of millimeter size and smaller. Wet sieving on surface sediment samples was useful for identifying finely divided wood waste that was otherwise difficult to see. Where wet sieving was performed, visually estimated wood waste typically amounted approximately 5 to 10 percent of the sample volume. Coarser chip-like chunks of wood waste were prevalent near the mill, as expected. Scattered small twigs and branches were observed in samples throughout the bay, but in relatively low quantities in comparison to the finely divided particles. In most of the bay little bark material was noted that could be conclusively identified. Greater amounts of bark material (up to 50 percent visual coverage) were generally observed at the base of the slope around the FLTF and FLA areas were historical log rafting and transfer occurred.

Radiometric dating of sediment core material from locations 22 and 51 indicates a sediment accumulation depth of approximately 50 to 55 cm (1.6 to 1.8 feet) since about 1853, the year sawmill operations started. Wood waste identified within this depth range, therefore, may be associated with historical mill operations and log rafting activities. The observed wood distribution and prevalence generally decreased below this depth.

9.2 Conventional Chemical Testing Conclusions

There appears to be a general spatial correlation between the presence of visual wood (Figure 7), the TVS/TOC ratio (Figure 9), sulfide concentration (Figure 10), ammonia concentration (Figure 11), phenol concentration (Figure 14). Bioassay testing results also appear to spatially correlate with these other parameters (Figures 20 and 21), as discussed below. Based on the general collocated nature of these parameters the weight of evidence indicates that sediment toxicity

impacts are likely due to wood waste or anaerobic conditions resulting from decomposition of wood waste.

9.3 Organic and Metals Testing Conclusions

Analytical testing results indicate that Port Gamble Bay sediments have not been significantly impacted by chemical constituents with SMS criteria. Phenol was the only chemical that exceeded SQS criteria in two samples collected from the FLA and in one sample collected east of the FLTA. No sediment samples exceeded CSL chemical criteria. Dioxin TEQ sediment concentrations and congener patterns were within the range found for Puget Sound non-urban background sediment samples. Higher concentrations of fatty acids tended to generally be associated with elevated concentrations of resin acids, conventional constituents, and bioassay failures.

9.4 Biological Testing Conclusions

Bioassay testing shows apparent impacts to surface sediment quality at locations near the FLA, FLTF, and central portion of the bay to the east (Figure 17). Ten surface sediment samples exceeded SQS criteria, and 14 additional locations exceeded CSL criteria (including 2-hit SQS failures). The spatial pattern of CSL and SQS failures is generally consistent with observed wood, TVS/TOC ratios greater than about 2, and elevated sulfide, ammonia, and phenol concentrations.

9.5 Biological Tissue Sampling

Biological tissue samples from geoducks, crabs, clams, and oysters were analyzed for percent lipids, total metals, dioxins/furans, and PCBs. Metals concentrations were either non-detect or very low. Dioxins were detected at very low estimated concentrations below the laboratory practical quantitation limits. For the crab tissue samples, dioxin TEQ concentrations calculated using one-half detection limit values or 0 for non-detections were comparable to concentrations from Dungeness crabs collected from Dungeness Bay (PTI 1991). No PCBs were only detected in the crab tissue sample at a relatively low concentration of 15 ug/kg.

9.6 Conclusions

Weight of evidence conclusions indicate that impacts to Port Gamble Bay sediments are attributable to wood waste or wood waste decomposition. As illustrated on site figures, sediment impacts are most prevalent at locations associated with the FLA and FLTF, locations near the central portion of the bay, and some locations toward the eastern shoreline of the bay. Impacts appear to

be most prominently associated with the uppermost 50 to 55 cm (1.6 to 1.8 feet) sediment depth interval at these locations, corresponding to the operational period of the mill and related log handling and rafting operations since 1853. The sediment characterization data and related conclusions from this RI provide key information to inform cleanup and restoration decisions to be evaluated as part of a follow-on Feasibility Study for Port Gamble Bay and focus areas. The FS will confirm the priority areas and evaluate appropriate alternatives for cleanup and restoration.

10.0 REFERENCES

Anchor 2006a. Existing Data Compilation Report, Former Mill Site Sediments, Port Gamble, Washington. Prepared for Pope & Talbot, Inc. by Anchor Environmental, LLC. April 2006.

Anchor 2006b. Biological Evaluation, Former Port Gamble Mill Site, Interim Sediment Cleanup Action. Prepared for Washington Department of Ecology and Pope & Talbot, Inc. by Anchor Environmental, LLC. July 2006.

ATDSR 2005. Health Consultation. Rayonier Mill Site Exposure Investigation. Evaluation of Dioxins in Crab and Geoduck Tissue from a Lower Elwha Klallam Tribe Fishing Area near Port Angeles, Washington. U.S. Department of Health and Human Services, Agency for Toxic Substances and Disease Registry, Atlanta, Georgia. February 28, 2005.

Bligh, E.G. and W.J. Dyer 1959. "A rapid method for total lipid extraction and purification," *Can.J.Biochem.Physiol.* 37:911–91.

Dethier, Dr. Megan 2006. Native Shellfish in nearshore Ecosystems of Puget Sound. Puget Sound Nearshore Partnership Technical Report 2006-04.

DMMP 2009. Proposal to Revise the Open-water Disposal Guidelines for Dioxins in Dredged Material, Appendix 3. DMMP Issue Paper 2009 SMARM. May 2009.

Ecology 1995. Sediment Management Standards (SMS), Chapter 173-204 WAC, Publication No. 960252, Olympia, WA.

Ecology 2008. Sediment Sampling and Analysis Plan Appendix. Guidance on the Development of Sediment Sampling and Analysis Plans Meeting the Requirements of the Sediment Management Standards (Chapter 173-203 WAC). Ecology Publication No. 03-09-043.

EPA 1983. U.S. Environmental Protection Agency Methods for Chemical Analysis of Water and Wastes. EPA-600/4-79-020.

EPA 1990. U.S. Environmental Protection Agency, Region 10, Recommended Protocols for Conducting Laboratory Bioassays on Puget Sound Sediments, April 1990.

EPA 1999. USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review. EPA540/R-99/008, October 1999.

EPA 2001. Guidance on Environmental Data Verification and Validation. EPA QA/G-8.

EPA 2004. USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review. EPA 540-R-04-004, October, 2004.

EPA 2008a. Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 4th Update.

EPA 2008b. OSV Bold Survey Report, Puget Sound Sediment PCB and Dioxin 2008 Survey. September 11, 2008.

Foster, D.O., D.F. Zinkel, and A.H. Conner 1980. Tall Oil Precursors of Douglas Fir. TAPPI, Vol 63, No. 12, 103–105. December 1980.

Hart Crowser 2008a. Sampling and Analysis Plan, FLA & FLTF and Bay-wide Investigations, Port Gamble, Washington. Job No. 17330-14. October 2008.

Hart Crowser 2008b. Construction Completion Report, Port Gamble Interim Remedial Action, Woodwaste Removal Project, Port Gamble, Washington. Job No. 17318-01. June 2008.

Hilter, R.S. and H.J Wichman 1919. Zinc in Oysters. The Journal of Biological Chemistry, Vol 38, No. 2, pp 205–221, 1919.

Ikawa, Miyoshi 2004. Algal polyunsaturated fatty acids and effects on plankton ecology and other organisms. UNH Center for Freshwater Biology Research, Vol 6, No. 2, pp 17 – 44, 2004.

Kendall, David and Teresa Michelsen 1997. Management of Wood Waste Under Dredged Material Management Programs and the Sediment Management Standards Cleanup Program, DMMP Clarification Paper/SMS Technical Information Memorandum. September 30, 1997 SMARM.

Parametrix 2002. Sediment Data Summary and Cleanup Study Plan, Former Pope & Talbot, Inc. Site, Port Gamble Bay, Washington, DRAFT, dated April 2002.

Parametrix 2003. Sediment Characterization Report, Former Pope & Talbot, Inc., Department of Natural Resources Aquatic Land Lease No. 20-012795, dated April 2003.

Plumb, R.H., Jr., 1981. Procedure for Handling and Chemical Analysis of Sediment and Water Samples. Technical Report EPA/CE-81-1. US EPA and US Army Corps of Engineers, Waterways Experiment Station, Vicksburg, MS.

PSEP 1986. Recommended Protocols for Measuring Conventional Sediment Variables in Puget Sound. Final Report. Prepared for U.S. Environmental Protection Agency, Seattle, WA.

PSEP 1997a. Recommended Protocols for Measuring Metals in Puget Sound Marine Water, Sediment, and Tissue Samples. Final Report. Prepared for U.S. Environmental Protection Agency, Seattle, WA.

PSEP 1997b. Recommended Guidelines for Measuring Organic Compounds in Puget Sound Water, Sediment, and Tissue Samples. Final Report. Prepared for U.S. Environmental Protection Agency, Seattle, WA.

PSEP 1997c. Recommended Guidelines for Sampling Marine Sediment, Water Column, and Tissue in Puget Sound. Final Report. Prepared for U.S. Environmental Protection Agency, Seattle, WA.

PTI 1991. Draft Dioxin and Furan Concentrations in Puget Sound Crabs. Prepared for US EPA Region 10. As cited in Appendix A-2, Analysis to Support Suitability Determination of Dredged Material with Polychlorinated Dibenzo-p-dioxins and Furans for Disposal at the Anderson-Ketron Dredged Material Disposal Site. Puget Sound Dredged Materials Management Program. September 212, 2006.

SAIC 2008a. Fidalgo Bay Sediment Investigation, Fidalgo Bay, WA. Archived Sediment and Tissue Analytical Results Data Report Addendum. September 2008.

SAIC 2008c. Sediment Characterization Study, Budd Inlet, Olympia, WA. Final Data Report. March 12, 2008.

SAIC 2009. Sediment Characterization Study in Port Gardner and Lower Snohomish Estuary, Port Gardner, WA. Final Data Report. April 21, 2009

USACE 2008. Dredged Materials Evaluation and Disposal Procedures, A User's Manual for the Puget Sound Dredged Disposal Analysis (PSDDA) Program. February 2000.

U.S. Fish and Wildlife Service 1989. Species Profiles: Life Histories and Environmental Requirements of Coastal Fishes and Invertebrates (Pacific Northwest), Pacific Geoduck Clam. Biological Report 82(11.120), December 1989.

11.0 LIMITATIONS

Work for this project was performed, and this report prepared, in general accordance with generally accepted professional practices for the nature and conditions of the work completed in the same or similar localities, at the time the work was performed. It is intended for the exclusive use of Ecology for specific application to the referenced property. This report is not meant to represent a legal opinion. No other warranty, express or implied, is made.

J:\Jobs\1733014\RI Report\Final Port Gamble RI Report.doc

Table 1 - Sediment Sample Collection Data

Site	Vibracore Locations	Vibracore Sediment Samples	Radiometric Dating Samples	Surface Sediment Locations	Surface Sediment Samples	Biota Locations	Biota Samples	SPI
Port Gamble Bay	38 (a)	1 (b)	2	52	52	8	8	120
Carr Inlet Reference	0	0	0	3	3	0	0	0
Proposed SAP Samples	50	--	--	50	50	9	9	120

(a) Two vibracore samples were collected for radiometric dating at Stations 21B and 51B.
(b) Samples were collected and analyzed from Station 42 at depths of 0 to 0.5, 1.5 to 2.0, 3.5 to 4.0, and 6.5 to 7.0 feet.
(c) Deviations from the Ecology-approved SAP for the Port Gamble investigation are discussed in Section 3.

Table 2 - Sediment Sample Testing Summary

Sample Number	ARI Job No.	SGS Project No.	SMS Metals [a]	SVOCs [b]	Resin Acids (Wood Chemicals)	PCBs	Ammonia	Total Solids	TVS	TOC	Total Sulfides	Dioxins/Furans	Grain Size	Microtox	Bioassay	% Lipids	Radiometric Dating	Sieve Samples
Port Gamble Bay																		
Surface Sediment Samples																		
PGSS- 8	OD15, OH13	G1040-3	X	X	X	X	X	X	X	X	X	X	X	X	X			X
PGSS-14A	OD15		X	X	X	X	X	X	X	X	X			X				X
PGSS-15	OD15, OH13		X	X	X	X	X	X	X	X	X		X	X	X			X
PGSS-16	OD15, OH13		X	X	X	X	X	X	X	X	X		X	X	X			X
PGSS-18	OD15, OH13		X	X	X	X	X	X	X	X	X		X	X	X			X
PGSS-20	OD15, OH13				X		X	X	X	X	X		X	X	X			X
PGSS-21A	OD15		X	X	X	X	X	X	X	X	X			X				
PGSS-21B	OD15, OH13		X	X	X	X	X	X	X	X	X		X	X	X			X
PGSS-22	OD15, OH13	G1040-3	X	X	X	X	X	X	X	X	X	X	X	X	X			X
PGSS-29	OD15		X	X	X	X	X	X	X	X	X			X				X
PGSS-29A	OD15, OH13		X	X	X	X	X	X	X	X	X		X	X	X			X
PGSS-30	OD15, OH13		X	X	X	X	X	X	X	X	X		X	X	X			X
PGSS-31	OD15, OH13		X	X	X	X	X	X	X	X	X		X	X	X			X
PGSS-33	OD15, OH13				X		X	X	X	X	X		X	X	X			X
PGSS-35	OD15, OH13				X		X	X	X	X	X		X	X	X			X
PGSS-38	OD15		X	X	X	X	X	X	X	X	X			X				X
PGSS-38A	OD15, OH13		X	X	X	X	X	X	X	X	X		X	X	X			X
PGSS-39	OD15, OH13		X	X	X	X	X	X	X	X	X		X	X	X			X
PGSS-40	OD15, OH13		X	X	X	X	X	X	X	X	X		X	X	X			X
PGSS-42	OD15, OH13		X	X	X	X	X	X	X	X	X		X	X	X			X
PGSS-44	OD15, OH13		X	X	X	X	X	X	X	X	X		X	X	X			X
PGSS-45	OD92, OH02, OH08				X		X	X	X	X	X		X	X	X			X
PGSS-46	OD92				X		X	X	X	X	X			X				X
PGSS-47	OD92, OH02, OH08		X	X	X	X	X	X	X	X	X		X	X	X			X
PGSS-47A	OD92		X	X	X	X	X	X	X	X	X			X				X
PGSS-51	OD92, OH02, OH08	G1040-2	X	X	X	X	X	X	X	X	X	X	X	X	X			X
PGSS-53	OD92, OH02, OH08		X	X	X	X	X	X	X	X	X		X	X	X			X
PGSS-54	OD92, OH02, OH08		X	X	X	X	X	X	X	X	X		X	X	X			X
PGSS-55	OD92		X	X	X	X	X	X	X	X	X			X				X
PGSS-56	OD92, OH02, OH08		X	X	X	X	X	X	X	X	X		X	X	X			X
PGSS-58	OD92, OH02, OH08		X	X	X	X	X	X	X	X	X		X	X	X			X
PGSS-61	OD92, OH02				X		X	X	X	X	X			X				X
PGSS-62	OD92, OH08				X		X	X	X	X	X		X	X	X			X
PGSS-62A	OD92		X	X	X	X	X	X	X	X	X			X				X
PGSS-62B	OD92		X	X	X	X	X	X	X	X	X			X				X
PGSS-63	OD92, OH02, OH08		X	X	X	X	X	X	X	X	X		X	X	X			X
PGSS-64	OD92, OH02, OH08	G1040-2	X	X	X	X	X	X	X	X	X	X	X	X	X			X
PGSS-67	OD92, OH02, OH08				X		X	X	X	X	X		X	X	X			X

Table 2 - Sediment Sample Testing Summary

Sample Number	ARI Job No.	SGS Project No.	SMS Metals [a]	SVOCs [b]	Resin Acids (Wood Chemicals)	PCBs	Ammonia	Total Solids	TVS	TOC	Total Sulfides	Dioxins/Furans	Grain Size	Microtox	Bioassay	% Lipids	Radiometric Dating	Sieve Samples
PGSS-68	OD92				X		X	X	X	X	X			X				X
PGSS-69	OD92		X	X	X	X	X	X	X	X	X			X				X
PGSS-70	OD92		X	X	X	X	X	X	X	X	X			X				X
PGSS-71	OD93				X		X	X	X	X	X			X				X
PGSS-73	OD93, OH02, OH08	G1040-2	X	X	X	X	X	X	X	X	X	X	X	X	X			X
PGSS-75	OD93, OH02, OH08	G1040-2	X	X	X	X	X	X	X	X	X	X	X	X	X			X
PGSS-77	OD93		X	X	X	X	X	X	X	X	X			X				X
PGSS-77A	OD93, OH01	G1040-1	X	X	X	X	X	X	X	X	X	X	X	X	X			X
PGSS-78	OD93				X		X	X	X	X	X			X				X
PGSS-80	OD93, OH01	G1040-1	X	X	X	X	X	X	X	X	X	X		X				X
PGSS-82	OD93				X		X	X	X	X	X			X				X
PGSS-83	OD93		X	X	X	X	X	X	X	X	X			X				X
PGSS-92	OD93, OH01	G1040-1	X	X	X	X	X	X	X	X	X	X	X	X	X			X
PGSS-GEO-3	OD93, OH01	G1040-1	X	X	X	X	X	X	X	X	X	X		X				X
Sediment Core Samples																		
Station-42 S-1	OC77						X	X	X	X	X		X					X
Station-42 S-2	OC77						X	X	X	X	X		X					X
Station-42 S-3	OC77						X	X	X	X	X		X					X
Station-42 S-4	OC77						X	X	X	X	X		X					X
Radiometric Dating Samples																		
Station-22B S-1																	X	
Station-51B S-1																	X	
Biota Samples																		
Oyster #1A	OG44	G1040-4	X			X						X				X		
Oyster #2A	OG44	G1040-4	X			X						X				X		
Clam #1A	OG45	G1040-5	X			X						X				X		
Clam 2A	OG45	G1040-5	X			X						X				X		
GD Station #1A (PGSS-73)	OG88	G1040-7	X			X						X				X		
GD Station #2A (PGSS-80)	OG88	G1040-7	X			X						X				X		
GD Station #3A (PGSS-GEO-3)	OG88	G1040-7	X			X						X				X		
Crab 1-A Muscle Tissue	OG53	G1040-6	X			X						X				X		
Crab 1-A Pan2 (Hepatopancreas)	OG53	G1040-6	X			X						X				X		
Carr Inlet Reference																		
MSMP 43	OH45, OJ67						X	X	X	X	X		X	X	X			
CR-20W	OH45, OJ67						X	X	X	X	X		X	X	X			
CR-23Mod	OH45, OJ67						X	X	X	X	X		X	X	X			

a Metals analysis include the SMS Metals: arsenic, cadmium, chromium, copper, lead, mercury, silver, and zinc.

b SVOCs include SMS SVOCs, guaicol, and retene.

Table 3 - Presence and Estimated Percentage of Wood Material in Sediment Samples

Station	Estimated Percentage	Depth Beneath Sediment Surface in Feet			Notes
SPI Plan View					
Station - 47	1%	0			Leaf litter, stick upper right
SPI Image					
Station - 14A	2%	0.66			Wood waste (particles)
Station - 20	1%	0.66			Wood waste (particles)
Station - 21B	5%	0.66			Wood waste (particles)
Station - 24	2%	0.66			Wood waste (particles)
Station - 27	1%	0.66			Wood waste (particles)
Station - 28	7%	0.66			Wood waste (particles)
Station - 29A	50%	0.66			Large piece of wood waste on surface
Station - 30	3%	0.66			Wood waste (particles)
Station - 38	1%	0.66			Wood waste (particles)
Station - 46A	25%	0.66			Wood waste on surface
Station - 52	1%	0.66			Wood waste (particles)
Station - 55	1%	0.66			Wood waste (particles)
Station - 55C	2%	0.66			Wood waste (particles)
Station - 62	5%	0.66			Wood waste (particles), twig
Station - 62A	2%	0.66			Wood waste (particles)
Station - 62B	30%	0.66			Large piece of wood waste on surface
Station - 67	1%	0.66			Wood waste (particles)
Station - 71	2%	0.66			Wood waste (particles)
Station - 72	2%	0.66			Wood waste (particles)
Station - 73	15%	0.66			Large piece of wood waste on surface
Station - 81	3%	0.66			Wood waste (particles)
Station - 83A	20%	0.66			Large piece of wood waste on surface
Station - 88	30%	0.66			Large piece of wood waste on surface, leaves
Station - 90	5%	0.66			Wood Chips 1 cm
Station - 92	15%	0.66			Wood waste (particles)
Station - 95	5%	0.66			Wood waste (particles)
Station - 97	2%	0.66			Wood waste (particles)
Sediment Core Samples					
Station - 8	5%	0-0.5	0.5 to 2.0		Wood waste (bark, wood chips)
Station - 16	1%	1	4.5		Bark piece, twig
Station - 22	5%	0 to 1			Wood waste (bark)
Station - 29	20%	0.5 to 1.6			Wood waste (bark, wood chips)
Station - 31	1%	3			Bark piece
Station - 33	1%	3.5			Twig
Station - 38A	20%	0 to 2.2			Wood waste (bark, wood chips)
Station - 40	5%	0 to 0.5	1.0 to 1.5		Wood waste (wood chips)
Station - 42	5%	0 to 0.5	1.5 to 2.0	6.5 to 7	Wood waste (bark, wood chips), twig and pine cone
Station - 44	1%	0 to 0.5			Wood waste (bark, wood chips), twigs
Station - 46	2%	0 to 0.5	2		Wood waste (bark, wood chips)
Station - 47	20%	0 to 1			Wood waste (bark)
Station - 49	1%	2.3 to 2.5	7		Wood waste (bark)
Station - 51	1%	3.7	5.5	6.5	Wood waste (bark)
Station - 53	1%	1.5 to 2			Wood waste (wood chips)
Station - 55	20%	1.2 to 2.0	2.2		Wood waste (bark, wood chips)
Station - 61	5%	0 to 1.1	2.6		Wood waste (wood chips), twig
Station - 62	1%	0 to 0.3			Wood waste
Station - 62B	5%	0.5	1		Wood waste (bark, wood chips)
Station - 64	1%	1.5	2.2		Wood waste
Station - 65	1%	1.5 to 2			Wood waste (wood chips)
Station - 67	5%	0.30	1.3 to 2.1	3.7 to 6.4	Wood waste (bark, wood chips), twigs

Table 3 - Presence and Estimated Percentage of Wood Material in Sediment Samples

Station	Estimated Percentage	Depth Beneath Sediment Surface in Feet			Notes
Station - 69	5%	1.3 to 1.8			Wood waste (bark, wood chips), twigs
Station - 71	5%	0 to 0.5	0.5 to 1		Wood waste (bark, wood chips)
Station - 73	20%	0 to 0.5	1	2	Wood waste (bark, wood chips)
Station - 75	20%	0.4	1.5		Wood waste (bark, wood chips)
Station - 77	15%	0 to 0.5	0.5 to 1		Wood waste (bark, wood chips)
Station - 78	1%	0			Wood waste (bark, wood chips)
Station - 80	1%	0	0 to 0.5		Wood waste (bark)
Station - 82	2%	0 to 0.5	1.3 to 1.6		Wood waste (bark, wood chips)
Surface Sediment Samples					
Station - 21A	*1%*	0.66			Twig
Station - 21B	25-50%	0.66			Wood waste (bark)
Station - 29A	5%	0.66			Wood waste (bark, wood chips), twig
Station - 38A	5%	0.66			Wood waste (bark)
Station - 61	1%	0.66			Twig
Station - 73	5%	0.66			Wood waste (bark, wood chips)
Station - 83	5%	0.66			Wood waste (bark)
Station - 92	5%	0.66			Wood waste (bark, wood chips)

Table 4 - Analytical Results for Resin Acids and Conventional Parameters in Sediment Samples

Sample ID	PGSS-8	PGSS-14A	PGSS-15	PGSS-16	PGSS-18	PGSS-20	PGSS-21A
Sampling Date	12/4/2008	12/4/2008	12/4/2008	12/4/2008	12/4/2008	12/4/2008	12/4/2008
Conventionals in mg/kg							
Sulfide	485 J	125	243	1060	113	158	71.6
N-Ammonia	24.3	3.52	22.5	53.6	3.05	7.66	3.26
Conventionals in %							
Preserved Total Solids	31.9	73.1	78.2	27.4	34.1	40.7	77.7
Total Organic Carbon	3.93	1.46	3.46	2.6	2.49	3.65	1.33
Total Solids	33.9	72.7	32.2	27.2	35.8	43.1	81.8
Total Volatile Solids	10.43	2	10.24	9.19	8.78	6.67	2.36
Resin Acids in ug/kg							
9,10-Dichlorostearic Acid	98 U	98 U	98 U	98 U	99 U	99 U	97 U
Abietic Acid	98 U	98 U	98 U	98 U	99 U	99 U	97 U
Dehydroabietic Acid	98 U	98 U	98 U	98 U	99 U	99 U	97 U
Isopimaric Acid	98 U	98 U	98 U	98 U	99 U	99 U	97 U
Linolenic Acid	110	130	98 U	98 U	99 U	99 U	110
Neoabietic Acid	98 UJ	98 UJ	98 UJ	98 UJ	99 UJ	99 UJ	97 UJ
Oleic Acid	1300	1700	780	430	620	650	1300
Palustric Acid	98 U	98 U	98 U	98 U	99 U	99 U	97 UJ
Pimaric Acid	98 U	98 U	98 U	98 U	99 U	99 U	97 U
Sandaracopimaric Acid	98 U	98 U	98 U	98 U	99 U	99 U	97 U

Table 4 - Analytical Results for Resin Acids and Conventional Parameters in Sediment Samples

Sample ID	PGSS-21B	PGSS-22	PGSS-29	PGSS-29A	PGSS-30	PGSS-31	PGSS-33
Sampling Date	12/4/2008	12/4/2008	12/4/2008	12/4/2008	12/5/2008	12/5/2008	12/5/2008
Conventionals in mg/kg							
Sulfide	468	640	167	419	697	608	372
N-Ammonia	7.75	34.9	2.75	16.3	12.3	5.37	12.1
Conventionals in %							
Preserved Total Solids	37.5	30.7	70.2	36.4	32.6	36.8	38.7
Total Organic Carbon	3.02	3.21	1.83	4.73	3.65	2.23	2.41
Total Solids	45.4	31.5	70.6	37.9	35.4	38.8	39.9
Total Volatile Solids	11.22	9.29	3.11	12.68	8.89	8.96	8.41
Resin Acids in ug/kg							
9,10-Dichlorostearic Acid	98 U	100 U	97 U	99 U	100 U	98 U	98 U
Abietic Acid	1100	100 U	160	440	100 U	98 U	98 U
Dehydroabietic Acid	950	100 U	200	340	100 U	98 U	98 U
Isopimaric Acid	160	100 U	97 U	99 U	100 U	98 U	98 U
Linolenic Acid	98 U	100 U	110	110	100 U	98 U	98 U
Neoabietic Acid	98 UJ	100 UJ	97 UJ	99 UJ	100 UJ	98 UJ	98 UJ
Oleic Acid	1200	710	1400	950	660	670	640
Palustric Acid	98 U	100 U	97 U	99 U	100 U	98 U	98 U
Pimaric Acid	98 U	100 U	97 U	99 U	100 U	98 U	98 U
Sandaracopimaric Acid	98 U	100 U	97 U	99 U	100 U	98 U	98 U

Table 4 - Analytical Results for Resin Acids and Conventional Parameters in Sediment Samples

Sample ID	PGSS-35	PGSS-38	PGSS-38A	PGSS-39	PGSS-40	PGSS-42	PGSS-44
Sampling Date	12/5/2008	12/5/2008	12/5/2008	12/5/2008	12/5/2008	12/5/2008	12/5/2008
Conventionals in mg/kg							
Sulfide	459	142	382	693	1120	1060	691
N-Ammonia	26.4	3.85	4.11	14.6	6.81	5.7	9.37
Conventionals in %							
Preserved Total Solids	31.5	71.2	52	33.3	36	37.6	32.3
Total Organic Carbon	2.52	2	3.4	2.98	2.99	2.11	2.67
Total Solids	34.2	59.6	42.7	35.6	39.2	40.5	36.4
Total Volatile Solids	8.62	2.38	5.7	8.81	9.09	8.12	8.14
Resin Acids in ug/kg							
9,10-Dichlorostearic Acid	99 U	97 U	98 U	99 U	100 U	98 U	99 U
Abietic Acid	99 U	97 U	98 U	99 U	100 U	98 U	330
Dehydroabietic Acid	99 U	97 U	98 U	120	100 U	98 U	100
Isopimaric Acid	99 U	97 U	98 U	99 U	100 U	98 U	99 U
Linolenic Acid	99 U	97 U	98 U	99 U	100 U	98 U	140
Neoabietic Acid	99 UJ	97 UJ	98 UJ	99 UJ	100 UJ	98 UJ	99 UJ
Oleic Acid	370	1200	790	530	1100	1500	1400
Palustric Acid	99 U	97 U	98 U	99 U	100 U	98 U	99 U
Pimaric Acid	99 U	97 U	98 U	99 U	100 U	98 U	99 U
Sandaracopimaric Acid	99 U	97 U	98 U	99 U	100 U	98 U	99 U

Table 4 - Analytical Results for Resin Acids and Conventional Parameters in Sediment Samples

Sample ID	PGSS-45	PGSS-46	PGSS-47	PGSS-47A	PGSS-51	PGSS-53	PGSS-54
Sampling Date	12/8/2008	12/8/2008	12/8/2008	12/8/2008	12/8/2008	12/8/2008	12/8/2008
Conventionals in mg/kg							
Sulfide	685 J	228	281	462	775	709	667
N-Ammonia	39.9	2.83	6.05	4.84	8.43	4.81	9.26
Conventionals in %							
Preserved Total Solids	36.4	71.3	65.5	54.6	42	46.3	48.8
Total Organic Carbon	2.85	1.27	2.39	1.84	2.24	2.5	1.78
Total Solids	35.4	72.2	64.5	57.9	41.7	46	49.5
Total Volatile Solids	7.6	1.88	3.8	3.84	7.49	6.34	5.6
Resin Acids in ug/kg							
9,10-Dichlorostearic Acid	98 U	98 U	98 U	98 U	98 U	99 U	98 U
Abietic Acid	98 U	98 U	440	1600	4400	890	620
Dehydroabietic Acid	140	98 U	250	690	480	300	240
Isopimaric Acid	98 U	98 U	98 U	98 U	98 U	99 U	98 U
Linolenic Acid	830	430	510	540	490	370	400
Neoabietic Acid	98 R	98 R	98 R	98 R	98 R	99 R	98 R
Oleic Acid	7500	3500	3600	5100	8400	6100	7000
Palustric Acid	98 U	98 U	98 U	98 U	98 U	99 U	98 U
Pimaric Acid	98 U	98 U	98 U	98 U	98 U	99 U	98 U
Sandaracopimaric Acid	98 U	98 U	98 U	98 U	98 U	99 U	98 U

Table 4 - Analytical Results for Resin Acids and Conventional Parameters in Sediment Samples

Sample ID	PGSS-55	PGSS-56	PGSS-58	PGSS-61	PGSS-62	PGSS-62A	PGSS-62B
Sampling Date	12/8/2008	12/8/2008	12/9/2008	12/9/2008	12/9/2008	12/9/2008	12/9/2008
Conventionals in mg/kg							
Sulfide	176	212	524	245	79.4	176	155
N-Ammonia	4.39	4.04	22.7	3.59	7.08	8.86	6.24
Conventionals in %							
Preserved Total Solids	72.1	68.1	36.7	65.1	75.2	76	63.8
Total Organic Carbon	0.878	1.64	3.14	1.82	0.699	1.07	1.31
Total Solids	72.4	70.5	32.8	67.9	78.8	75	67.8
Total Volatile Solids	1.97	1.76	8.75	2.55	1.06	1.94	2.56
Resin Acids in ug/kg							
9,10-Dichlorostearic Acid	96 U	97 U	99 U	97 U	98 U	96 U	95 U
Abietic Acid	96 U	160	740	97 U	98 U	96 U	95 U
Dehydroabietic Acid	96 U	97 U	310	97 U	98 U	120	95 U
Isopimaric Acid	96 U	97 U	99 U	97 U	98 U	96 U	95 U
Linolenic Acid	170	200	580	230	110	270	420
Neoabietic Acid	96 R	97 R	99 R	97 R	98 R	96 R	95 R
Oleic Acid	1900	2300	5700	2900	1500	3700	3600
Palustric Acid	96 U	97 U	99 U	97 U	98 U	96 U	95 U
Pimaric Acid	96 U	97 U	99 U	97 U	98 U	96 U	95 U
Sandaracopimaric Acid	96 U	97 U	99 U	97 U	98 U	96 U	95 U

Table 4 - Analytical Results for Resin Acids and Conventional Parameters in Sediment Samples

Sample ID	PGSS-63	PGSS-64	PGSS-67	PGSS-68	PGSS-69	PGSS-70	PGSS-71
Sampling Date	12/9/2008	12/9/2008	12/9/2008	12/9/2008	12/9/2008	12/9/2008	12/9/2008
Conventionals in mg/kg							
Sulfide	235	278	21.4	16.1	24.4	24.7	67.5 J
N-Ammonia	3.95	5.02	4.54	3.27	3.71	4.01	3.46
Conventionals in %							
Preserved Total Solids	68.1	66	68.8	75.6	68.4	72.3	76
Total Organic Carbon	1.99	2.36	1.75	1.3	0.955	1.54	1.57
Total Solids	67.9	64.3	68.5	74.2	84.2	71.6	74.7
Total Volatile Solids	2.87	2.95	2.32	1.45	1.95	2.15	1.53
Resin Acids in ug/kg							
9,10-Dichlorostearic Acid	98 U	96 U	98 U	96 U	97 U	97 U	98 U
Abietic Acid	98 U	96 U	98 U	96 U	97 U	97 U	98 U
Dehydroabietic Acid	110	96 U	110	96 U	97 U	97 U	98 U
Isopimaric Acid	98 U	96 U	98 U	96 U	97 U	97 U	98 U
Linolenic Acid	210	180	290	140	310	150	98 U
Neoabietic Acid	98 R	96 R	98 R	96 R	97 R	97 R	98 UJ
Oleic Acid	3000	3000	2200	1700	2800	2000	960
Palustric Acid	98 U	96 U	98 U	96 U	97 U	97 UJ	98 U
Pimaric Acid	98 U	96 U	98 U	96 U	97 U	97 U	98 U
Sandaracopimaric Acid	98 U	96 U	98 U	96 U	97 U	97 U	98 U

Table 4 - Analytical Results for Resin Acids and Conventional Parameters in Sediment Samples

Sample ID	PGSS-73	PGSS-75	PGSS-77	PGSS-77A	PGSS-78	PGSS-80	PGSS-82	PGSS-83
Sampling Date	12/9/2008	12/9/2008	12/9/2008	12/9/2008	12/10/2008	12/10/2008	12/10/2008	12/10/2008
Conventionals in mg/kg								
Sulfide	43.4	19.6	171	210	10.6	1.19 U	40.4	136
N-Ammonia	2.72	3.49	5.65	3.65	8.26	2.35	3.2	6.11
Conventionals in %								
Preserved Total Solids	73.5	80.3	67.7	64.3	77.6	79.5	79.1	71.1
Total Organic Carbon	0.998	0.475	1.88	2.38	1.53	0.285	0.879	1.87
Total Solids	75.3	79.1	66	68.2	78.9	82.1	75.6	71.1
Total Volatile Solids	1.28	0.84	3.1	3.16	1.46	0.78	1	2.34
Resin Acids in ug/kg								
9,10-Dichlorostearic Acid	97 U	96 U	98 U	98 U	98 U	98 U	97 U	97 U
Abietic Acid	97 U	96 U	98 U	410	98 U	98 U	97 U	110 J
Dehydroabietic Acid	97 U	96 U	98 U	130	98 U	98 U	97 U	97 U
Isopimaric Acid	97 U	96 U	98 U	98 U	98 U	98 U	97 U	97 U
Linolenic Acid	97 U	96 U	120	98 U	98 U	98 U	100	110
Neoabietic Acid	97 UJ	96 UJ	98 UJ	98 UJ	98 UJ	98 UJ	97 UJ	97 UJ
Oleic Acid	920	550	1700	1100	770	620	1300	1600
Palustric Acid	97 U	96 U	98 U	98 U	98 U	98 UJ	97 U	97 U
Pimaric Acid	97 U	96 U	98 U	98 U	98 U	98 U	97 U	97 U
Sandaracopimaric Acid	97 U	96 U	98 U	98 U	98 U	98 U	97 U	97 U

Table 4 - Analytical Results for Resin Acids and Conventional Parameters in Sediment Samples

Sample ID	PGSS-92	PGSS-GEO-3	STATION 42 S-1	STATION 42 S-2	STATION 42 S-3	STATION 42 S-4
Sampling Date	12/10/2008	12/10/2008	12/3/2008	12/3/2008	12/3/2008	12/3/2008
Conventionals in mg/kg						
Sulfide	547	114 J	82.9	35.4	74.7	1.92 U
N-Ammonia	7.07	10.4 J	2.48	19.2	73.9	154
Conventionals in %						
Preserved Total Solids	56	71.9	53.3	45.7	46.8	51.4
Total Organic Carbon	3.01	1.78	2.81 J	1.74	1.87	1.46
Total Solids	66.7	70.9	50	45.8	46.1	53.2
Total Volatile Solids	4.22	1.74	6.78	5.37	5.39	5.13
Resin Acids in ug/kg						
9,10-Dichlorostearic Acid	99 U	97 U				
Abietic Acid	99 U	97 U				
Dehydroabietic Acid	210	97 U				
Isopimaric Acid	99 U	97 U				
Linolenic Acid	170	97 U				
Neoabietic Acid	99 UJ	97 R				
Oleic Acid	4600	900				
Palustric Acid	99 U	97 R				
Pimaric Acid	99 U	97 U				
Sandaracopimaric Acid	99 U	97 U				

U = Not detected at reporting limit indicated.
J = Estimated value.
R = Rejected.
Blank indicates sample not analyzed for specific analyte.

Table 5 - Analytical Results for Sediment Samples - Compared to AET Dry-Weight Sediment Quality Criteria

Sample ID	AETs		PGSS-8	PGSS-14A	PGSS-15	PGSS-16
Sampling Date	LAET	2LAET	12/4/2008	12/4/2008	12/4/2008	12/4/2008
Metals in mg/kg						
Arsenic	57	93	10 U	7 U	10 U	20 U
Cadmium	5.1	6.7	2.2	0.4	2.1	2.1
Chromium	260	270	42	15.7	48	52
Copper	390	390	32.2	8	38.5	40.2
Lead	450	530	10	3 U	15	15
Silver	6.1	6.1	0.8 U	0.4 U	0.8 U	1 U
Zinc	410	960	78	25	89	90
Mercury	0.41	0.59	0.1 UJ	0.05 UJ	0.1 J	0.1 J
PCBs in ug/kg						
Aroclor 1016			4 U	3.9 U	5.6 U	6 U
Aroclor 1221			4 U	3.9 U	5.6 U	6 U
Aroclor 1232			8 U	3.9 U	5.6 U	6 U
Aroclor 1242			4 U	3.9 U	5.6 U	6 U
Aroclor 1248			4 U	3.9 U	5.6 U	6 U
Aroclor 1254			4 U	3.9 U	5.6 U	6 U
Aroclor 1260			4 U	3.9 U	5.6 U	6 U
Aroclor 1262			4 U	3.9 U	5.6 U	6 U
Aroclor 1268			4 U	3.9 U	5.6 U	6 U
Total PCBs	130	1000	8 U	3.9 U	5.6 U	6 U
PAHs in ug/kg						
Naphthalene	2100	2400	15 T	19 U	20 U	20 U
Acenaphthylene	1300	1300	20 U	19 U	20 U	20 U
Acenaphthene	500	730	20 U	19 U	20 U	20 U
Fluorene	540	1000	20 U	19 U	20 U	20 U
Phenanthrene	1500	5400	23	19 U	11 T	12 T
Anthracene	960	4400	12 T	19 U	20 U	20 U
2-Methylnaphthalene	670	1400	20 U	19 U	20 U	20 U
1-Methylnaphthalene			20 U	19 U	20 U	20 U
Total LPAHs	5200	13000	50 J	19 U	11 J	12 J
Fluoranthene	1700	2500	45	11 T	31	31
Pyrene	2600	3300	40	12 T	30	34
Benzo(a)anthracene	1300	1600	23	19 U	17 T	18 T
Chrysene	1400	2800	41	19 U	26	26
Benzo(b)fluoranthene			32	19 U	27	28
Benzo(k)fluoranthene			17 T	19 U	18 T	16 T
Total Benzofluoranthenes	3200	3600	49 J	19 U	45 J	44 J
Benzo(a)pyrene	1600	3000	20	19 U	19 T	17 T
Indeno(1,2,3-cd)pyrene	600	690	11 T	19 U	11 T	11 T
Dibenz(a,h)anthracene	230	540	20 U	19 U	20 U	20 U
Benzo(g,h,i)perylene	670	720	14 T	19 U	13 T	15 T
Total HPAHs	12000	17000	243 J	23 J	192 J	196 J
Chlorinated Benzenes in ug/kg						
1,2-Dichlorobenzene	35	50	20 U	19 U	20 U	20 U
1,3-Dichlorobenzene	170	170	20 U	19 U	20 U	20 U
1,4-Dichlorobenzene	110	120	20 U	19 U	20 U	20 U
1,2,4-Trichlorobenzene	31	51	20 U	19 U	20 U	20 U

Table 5 - Analytical Results for Sediment Samples - Compared to AET Dry-Weight Sediment Quality Criteria

Sample ID	AETs		PGSS-8	PGSS-14A	PGSS-15	PGSS-16
Sampling Date	LAET	2LAET	12/4/2008	12/4/2008	12/4/2008	12/4/2008
Hexachlorobenzene	22	70	20 U	19 U	20 U	20 U
Phthalate Esters in ug/kg						
Dimethylphthalate	71	160	20 U	19 U	20 U	20 U
Diethylphthalate	200	200	20 U	19 U	20 U	20 U
Di-n-Butylphthalate	1400	1400	20 U	19 U	20 U	20 U
Butylbenzylphthalate	63	900	20 U	19 U	20 U	20 U
bis(2-Ethylhexyl)phthalate	1300	1900	20 U	19 U	50	20 U
Di-n-Octyl phthalate	6200	6200	20 U	19 U	20 U	20 U
Miscellaneous Compounds in ug/kg						
Dibenzofuran	540	700	20 U	19 U	20 U	20 U
Hexachlorobutadiene	11	120	*20 U*	*19 U*	*20 U*	*20 U*
N-Nitrosodiphenylamine	28	40	20 U	19 U	20 U	20 U
Guaiacol			20 U	19 U	20 U	20 U
Retene			20 U	19 U	20 U	10
Ionizable Organic Compounds in ug/kg						
Phenol	420	1200	720	19 UJ	20 UJ	20 UJ
2-Methylphenol	63	63	20 U	19 U	20 U	20 U
4-Methylphenol	670	670	47	19 U	20 U	20 U
2,4-Dimethylphenol	29	29	20 U	19 U	20 U	20 U
Pentachlorophenol	360	690	100 U	95 U	99 U	99 U
Benzyl Alcohol	57	73	20 U	19 U	20 U	20 U
Benzoic Acid	650	650	200 U	190 U	200 U	200 U

Table 5 - Analytical Results for Sediment Samples - Compared to AET Dry-Weight Sediment Quality Criteria

Sample ID	AETs		PGSS-18	PGSS-21A	PGSS-21B	PGSS-22
Sampling Date	LAET	2LAET	12/4/2008	12/4/2008	12/4/2008	12/4/2008
Metals in mg/kg						
Arsenic	57	93	10 U	6 U	10 U	10 U
Cadmium	5.1	6.7	2.3	0.4	1.3	1.9
Chromium	260	270	49	15.1	25	42
Copper	390	390	37.8	7.9	18.9	31.9
Lead	450	530	14	2 U	8	9
Silver	6.1	6.1	0.8 U	0.4 U	0.6 U	0.8 U
Zinc	410	960	83	33	59	72
Mercury	0.41	0.59	0.13 J	0.05 UJ	0.09 J	0.1 UJ
PCBs in ug/kg						
Aroclor 1016			4 U	3.9 U	4 U	3.9 U
Aroclor 1221			4 U	3.9 U	4 U	3.9 U
Aroclor 1232			4 U	3.9 U	4 U	3.9 U
Aroclor 1242			4 U	3.9 U	4 U	3.9 U
Aroclor 1248			4 U	3.9 U	4 U	3.9 U
Aroclor 1254			4 U	3.9 U	4 U	3.9 U
Aroclor 1260			4 U	3.9 U	4 U	3.9 U
Aroclor 1262			4 U	3.9 U	4 U	3.9 U
Aroclor 1268			4 U	3.9 U	4 U	3.9 U
Total PCBs	130	1000	4 U	3.9 U	4 U	3.9 U
PAHs in ug/kg						
Naphthalene	2100	2400	20 U	20 U	20 U	20 U
Acenaphthylene	1300	1300	20 U	20 U	20 U	20 U
Acenaphthene	500	730	20 U	20 U	20 U	20 U
Fluorene	540	1000	20 U	20 U	20 U	20 U
Phenanthrene	1500	5400	20 U	20 U	12 T	20 U
Anthracene	960	4400	20 U	20 U	11 T	20 U
2-Methylnaphthalene	670	1400	20 U	20 U	20 U	20 U
1-Methylnaphthalene			20 U	20 U	20 U	20 U
Total LPAHs	5200	13000	20 U	20 U	23 J	20 U
Fluoranthene	1700	2500	21	20 U	26	16 T
Pyrene	2600	3300	21	20 U	30	18 T
Benzo(a)anthracene	1300	1600	10 T	20 U	23	10 T
Chrysene	1400	2800	13 T	20 U	60	16 T
Benzo(b)fluoranthene			14 T	20 U	27	13 T
Benzo(k)fluoranthene			12 T	20 U	28	13 T
Total Benzofluoranthenes	3200	3600	26 J	20 U	55	26 J
Benzo(a)pyrene	1600	3000	9.9 T	20 U	19 T	10 T
Indeno(1,2,3-cd)pyrene	600	690	20 U	20 U	20 U	20 U
Dibenz(a,h)anthracene	230	540	20 U	20 U	20 U	20 U
Benzo(g,h,i)perylene	670	720	20 U	20 U	11 T	20 U
Total HPAHs	12000	17000	100.9 J	20 U	224 J	96 J
Chlorinated Benzenes in ug/kg						
1,2-Dichlorobenzene	35	50	20 U	20 U	20 U	20 U
1,3-Dichlorobenzene	170	170	20 U	20 U	20 U	20 U
1,4-Dichlorobenzene	110	120	20 U	20 U	20 U	20 U
1,2,4-Trichlorobenzene	31	51	20 U	20 U	20 U	20 U

Table 5 - Analytical Results for Sediment Samples - Compared to AET Dry-Weight Sediment Quality Criteria

Sample ID	AETs		PGSS-18	PGSS-21A	PGSS-21B	PGSS-22
Sampling Date	LAET	2LAET	12/4/2008	12/4/2008	12/4/2008	12/4/2008
Hexachlorobenzene	22	70	20 U	20 U	20 U	20 U
Phthalate Esters in ug/kg						
Dimethylphthalate	71	160	20 U	20 U	20 U	20 U
Diethylphthalate	200	200	20 U	20 U	20 U	20 U
Di-n-Butylphthalate	1400	1400	20 U	20 U	20 U	20 U
Butylbenzylphthalate	63	900	20 U	20 U	20 U	20 U
bis(2-Ethylhexyl)phthalate	1300	1900	20 U	20 U	20 U	20 U
Di-n-Octyl phthalate	6200	6200	20 U	20 U	20 U	20 U
Miscellaneous Compounds in ug/kg						
Dibenzofuran	540	700	20 U	20 U	20 U	20 U
Hexachlorobutadiene	11	120	*20 U*	*20 U*	*20 U*	*20 U*
N-Nitrosodiphenylamine	28	40	20 U	20 U	20 U	20 U
Guaiacol			20 U	20 U	20 U	20 U
Retene			20 U	20 U	20 U	20 U
Ionizable Organic Compounds in ug/kg						
Phenol	420	1200	20 UJ	20 UJ	20 UJ	610
2-Methylphenol	63	63	20 U	20 U	20 U	20 U
4-Methylphenol	670	670	20 U	20 U	20 U	20 U
2,4-Dimethylphenol	29	29	20 U	20 U	20 U	20 U
Pentachlorophenol	360	690	99 U	98 U	99 U	98 U
Benzyl Alcohol	57	73	20 U	20 U	20 U	20 U
Benzoic Acid	650	650	200 U	200 U	200 U	200 U

Table 5 - Analytical Results for Sediment Samples - Compared to AET Dry-Weight Sediment Quality Criteria

Sample ID	AETs		PGSS-29	PGSS-29A	PGSS-30	PGSS-31
Sampling Date	LAET	2LAET	12/4/2008	12/4/2008	12/4/2008	12/5/2008
Metals in mg/kg						
Arsenic	57	93	7 U	10 U	10 U	10 U
Cadmium	5.1	6.7	0.6	1.8	1.7	1.5
Chromium	260	270	17.5	41	48	49
Copper	390	390	9.2	32	36.9	37.3
Lead	450	530	3	13	13	14
Silver	6.1	6.1	0.4 U	0.8 U	0.8 U	0.7 U
Zinc	410	960	39	94	93	91
Mercury	0.41	0.59	0.06 UJ	0.1 J	0.1 J	0.12 J
PCBs in ug/kg						
Aroclor 1016			3.9 U	4 U	4 U	3.9 U
Aroclor 1221			3.9 U	4 U	4 U	3.9 U
Aroclor 1232			3.9 U	4 U	4 U	3.9 U
Aroclor 1242			3.9 U	4 U	4 U	3.9 U
Aroclor 1248			3.9 U	4 U	4 U	3.9 U
Aroclor 1254			3.9 U	4 U	4 U	3.9 U
Aroclor 1260			3.9 U	4 U	4 U	3.9 U
Aroclor 1262			3.9 U	4 U	4 U	3.9 U
Aroclor 1268			3.9 U	4 U	4 U	3.9 U
Total PCBs	130	1000	3.9 U	4 U	4 U	3.9 U
PAHs in ug/kg						
Naphthalene	2100	2400	19 U	20 U	20 U	20 U
Acenaphthylene	1300	1300	19 U	20 U	20 U	20 U
Acenaphthene	500	730	19 U	20 U	20 U	20 U
Fluorene	540	1000	19 U	20 U	20 U	20 U
Phenanthrene	1500	5400	19 U	17 T	27	13 T
Anthracene	960	4400	19 U	20 U	10 T	20 U
2-Methylnaphthalene	670	1400	19 U	20 U	20 U	20 U
1-Methylnaphthalene			19 U	20 U	20 U	20 U
Total LPAHs	5200	13000	19 U	17 J	37 J	13 J
Fluoranthene	1700	2500	13 T	26	40	24
Pyrene	2600	3300	13 T	26	37	23
Benzo(a)anthracene	1300	1600	19 U	17 T	21	14 T
Chrysene	1400	2800	17 T	30	33	22
Benzo(b)fluoranthene			19 U	24	25	17 T
Benzo(k)fluoranthene			19 U	20 T	22	15 T
Total Benzofluoranthenes	3200	3600	19 U	44 J	47	32 J
Benzo(a)pyrene	1600	3000	19 U	18 T	21	14 T
Indeno(1,2,3-cd)pyrene	600	690	19 U	20 U	12 T	20 U
Dibenz(a,h)anthracene	230	540	19 U	20 U	20 U	20 U
Benzo(g,h,i)perylene	670	720	19 U	12 T	13 T	20 U
Total HPAHs	12000	17000	43 J	173 J	224 J	129 J
Chlorinated Benzenes in ug/kg						
1,2-Dichlorobenzene	35	50	19 U	20 U	20 U	20 U
1,3-Dichlorobenzene	170	170	19 U	20 U	20 U	20 U
1,4-Dichlorobenzene	110	120	19 U	20 U	20 U	20 U
1,2,4-Trichlorobenzene	31	51	19 U	20 U	20 U	20 U

Table 5 - Analytical Results for Sediment Samples - Compared to AET Dry-Weight Sediment Quality Criteria

Sample ID	AETs		PGSS-29	PGSS-29A	PGSS-30	PGSS-31
Sampling Date	LAET	2LAET	12/4/2008	12/4/2008	12/4/2008	12/5/2008
Hexachlorobenzene	22	70	19 U	20 U	20 U	20 U
Phthalate Esters in ug/kg						
Dimethylphthalate	71	160	19 U	20 U	20 U	20 U
Diethylphthalate	200	200	19 U	20 U	20 U	20 U
Di-n-Butylphthalate	1400	1400	19 U	20 U	20 U	20 U
Butylbenzylphthalate	63	900	19 U	20 U	20 U	20 U
bis(2-Ethylhexyl)phthalate	1300	1900	19 U	20 U	20 U	20 U
Di-n-Octyl phthalate	6200	6200	19 U	20 U	20 U	20 U
Miscellaneous Compounds in ug/kg						
Dibenzofuran	540	700	19 U	20 U	20 U	20 U
Hexachlorobutadiene	11	120	*19 U*	*20 U*	*20 U*	*20 U*
N-Nitrosodiphenylamine	28	40	19 U	20 U	20 U	20 U
Guaiacol			19 U	20 U	20 U	20 U
Retene			19 U	20 U	20 U	20 U
Ionizable Organic Compounds in ug/kg						
Phenol	420	1200	19 UJ	20 UJ	20 UJ	20 UJ
2-Methylphenol	63	63	19 U	20 U	20 U	20 U
4-Methylphenol	670	670	19 U	20 U	20 U	20 U
2,4-Dimethylphenol	29	29	19 U	20 U	20 U	20 U
Pentachlorophenol	360	690	97 U	99 U	99 U	98 U
Benzyl Alcohol	57	73	19 U	20 U	20 U	20 U
Benzoic Acid	650	650	190 U	200 U	200 U	200 U

Table 5 - Analytical Results for Sediment Samples - Compared to AET Dry-Weight Sediment Quality Criteria

Sample ID	AETs		PGSS-33	PGSS-35	PGSS-38	PGSS-38A
Sampling Date	LAET	2LAET	12/5/2008	12/5/2008	12/5/2008	12/5/2008
Metals in mg/kg						
Arsenic	57	93	10 U	10 U	6 U	9 U
Cadmium	5.1	6.7	1.5	2.3	0.5	1
Chromium	260	270	49	45	16.5	32.7
Copper	390	390	38.2	36	8.8	21.7
Lead	450	530	12	11	3	8
Silver	6.1	6.1	0.7 U	0.8 U	0.4 U	0.5 U
Zinc	410	960	83	77	35	56
Mercury	0.41	0.59	0.12 J	0.1 J	0.05 UJ	0.08 J
PCBs in ug/kg						
Aroclor 1016			4 U	4 U	3.9 U	3.9 U
Aroclor 1221			4 U	4 U	3.9 U	3.9 U
Aroclor 1232			4 U	4 U	3.9 U	3.9 U
Aroclor 1242			4 U	4 U	3.9 U	3.9 U
Aroclor 1248			4 U	4 U	3.9 U	3.9 U
Aroclor 1254			4 U	4 U	3.9 U	16
Aroclor 1260			4 U	4 U	3.9 U	3.9 U
Aroclor 1262			4 U	4 U	3.9 U	3.9 U
Aroclor 1268			4 U	4 U	3.9 U	3.9 U
Total PCBs	130	1000	4 U	4 U	3.9 U	16
PAHs in ug/kg						
Naphthalene	2100	2400	20 U	20 U	11 T	20 U
Acenaphthylene	1300	1300	20 U	20 U	20 U	20 U
Acenaphthene	500	730	20 U	20 U	20 U	20 U
Fluorene	540	1000	20 U	20 U	20 U	20 U
Phenanthrene	1500	5400	33	20 U	20 U	20 U
Anthracene	960	4400	29	20 U	20 U	20 U
2-Methylnaphthalene	670	1400	20 U	20 U	20 U	20 U
1-Methylnaphthalene			20 U	20 U	20 U	20 U
Total LPAHs	5200	13000	62	20 U	11 J	20 U
Fluoranthene	1700	2500	32	29	16 T	13 T
Pyrene	2600	3300	26	23	16 T	12 T
Benzo(a)anthracene	1300	1600	21	14 T	20 U	20 U
Chrysene	1400	2800	38	20 T	20 U	14 T
Benzo(b)fluoranthene			26	18 T	20 U	20 U
Benzo(k)fluoranthene			23	16 T	20 U	20 U
Total Benzofluoranthenes	3200	3600	49	34 J	20 U	20 U
Benzo(a)pyrene	1600	3000	21	15 T	20 U	20 U
Indeno(1,2,3-cd)pyrene	600	690	10 T	20 U	20 U	20 U
Dibenz(a,h)anthracene	230	540	20 U	20 U	20 U	20 U
Benzo(g,h,i)perylene	670	720	12 T	20 U	20 U	20 U
Total HPAHs	12000	17000	209 J	135 J	32 J	39 J
Chlorinated Benzenes in ug/kg						
1,2-Dichlorobenzene	35	50	20 U	20 U	20 U	20 U
1,3-Dichlorobenzene	170	170	20 U	20 U	20 U	20 U
1,4-Dichlorobenzene	110	120	20 U	20 U	20 U	20 U
1,2,4-Trichlorobenzene	31	51	20 U	20 U	20 U	20 U

Table 5 - Analytical Results for Sediment Samples - Compared to AET Dry-Weight Sediment Quality Criteria

Sample ID	AETs		PGSS-33	PGSS-35	PGSS-38	PGSS-38A
Sampling Date	LAET	2LAET	12/5/2008	12/5/2008	12/5/2008	12/5/2008
Hexachlorobenzene	22	70	20 U	20 U	20 U	20 U
Phthalate Esters in ug/kg						
Dimethylphthalate	71	160	20 U	20 U	20 U	20 U
Diethylphthalate	200	200	20 U	20 U	20 U	20 U
Di-n-Butylphthalate	1400	1400	20 U	20 U	20 U	20 U
Butylbenzylphthalate	63	900	20 U	20 U	20 U	20 U
bis(2-Ethylhexyl)phthalate	1300	1900	18 J	20 U	20 U	20 U
Di-n-Octyl phthalate	6200	6200	20 U	20 U	20 U	20 U
Miscellaneous Compounds in ug/kg						
Dibenzofuran	540	700	20 U	20 U	20 U	20 U
Hexachlorobutadiene	11	120	*20 U*	*20 U*	*20 U*	*20 U*
N-Nitrosodiphenylamine	28	40	20 U	20 U	20 U	20 U
Guaiacol			20 U	20 U	20 U	20 U
Retene			20 U	20 U	20 U	20 U
Ionizable Organic Compounds in ug/kg						
Phenol	420	1200	20 UJ	20 UJ	20 UJ	20 UJ
2-Methylphenol	63	63	20 U	20 U	20 U	20 U
4-Methylphenol	670	670	20 U	20 U	20 U	20 U
2,4-Dimethylphenol	29	29	20 U	20 U	20 U	20 U
Pentachlorophenol	360	690	99 U	99 U	98 U	98 U
Benzyl Alcohol	57	73	20 UJ	20 UJ	20 U	20 U
Benzoic Acid	650	650	180 T	200 U	200 U	200 U

Table 5 - Analytical Results for Sediment Samples - Compared to AET Dry-Weight Sediment Quality Criteria

Sample ID	AETs		PGSS-39	PGSS-40	PGSS-42	PGSS-44
Sampling Date	LAET	2LAET	12/5/2008	12/5/2008	12/5/2008	12/5/2008
Metals in mg/kg						
Arsenic	57	93	10 U	10 U	10 U	10 U
Cadmium	5.1	6.7	1.5	1.4	1.4	2
Chromium	260	270	46	45	46	46
Copper	390	390	35.4	34.4	34.6	34.8
Lead	450	530	13	13	13	13
Silver	6.1	6.1	0.8 U	0.7 U	0.7 U	0.7 U
Zinc	410	960	90	84	83	94
Mercury	0.41	0.59	0.1 J	0.11 J	0.11 J	0.11 J
PCBs in ug/kg						
Aroclor 1016			4 U	4 U	3.9 U	6.1 U
Aroclor 1221			4 U	4 U	3.9 U	6.1 U
Aroclor 1232			4 U	4 U	3.9 U	6.1 U
Aroclor 1242			4 U	4 U	3.9 U	6.1 U
Aroclor 1248			4 U	4 U	3.9 U	6.1 U
Aroclor 1254			4 U	4 U	3.9 U	4.3 T
Aroclor 1260			4 U	4 U	3.9 U	6.1 U
Aroclor 1262			4 U	4 U	3.9 U	6.1 U
Aroclor 1268			4 U	4 U	3.9 U	6.1 U
Total PCBs	130	1000	4 U	4 U	3.9 U	4.3 J
PAHs in ug/kg						
Naphthalene	2100	2400	20 U	20 U	20 U	20 U
Acenaphthylene	1300	1300	20 U	20 U	20 U	20 U
Acenaphthene	500	730	20 U	20 U	20 U	20 U
Fluorene	540	1000	20 U	20 U	20 U	20 U
Phenanthrene	1500	5400	14 T	20 U	20 U	20 U
Anthracene	960	4400	91	20 U	20 U	20 U
2-Methylnaphthalene	670	1400	20 U	20 U	20 U	20 U
1-Methylnaphthalene			20 U	20 U	20 U	20 U
Total LPAHs	5200	13000	105 J	20 U	20 U	20 U
Fluoranthene	1700	2500	23	13 T	16 T	13 T
Pyrene	2600	3300	20 T	11 T	13 T	12 T
Benzo(a)anthracene	1300	1600	17 T	13 T	20 U	20 U
Chrysene	1400	2800	140	19 T	10 T	20 U
Benzo(b)fluoranthene			20	13 T	20 U	20 U
Benzo(k)fluoranthene			14 T	12 T	20 U	20 U
Total Benzofluoranthenes	3200	3600	34 J	25 J	20 U	20 U
Benzo(a)pyrene	1600	3000	13 T	20 U	20 U	20 U
Indeno(1,2,3-cd)pyrene	600	690	20 U	20 U	20 U	20 U
Dibenz(a,h)anthracene	230	540	20 U	20 U	20 U	20 U
Benzo(g,h,i)perylene	670	720	20 U	20 U	20 U	20 U
Total HPAHs	12000	17000	247 J	81 J	39 J	25 J
Chlorinated Benzenes in ug/kg						
1,2-Dichlorobenzene	35	50	20 U	20 U	20 U	20 U
1,3-Dichlorobenzene	170	170	20 U	20 U	20 U	20 U
1,4-Dichlorobenzene	110	120	20 U	20 U	20 U	20 U
1,2,4-Trichlorobenzene	31	51	20 U	20 U	20 U	20 U

Table 5 - Analytical Results for Sediment Samples - Compared to AET Dry-Weight Sediment Quality Criteria

Sample ID	AETs		PGSS-39	PGSS-40	PGSS-42	PGSS-44
Sampling Date	LAET	2LAET	12/5/2008	12/5/2008	12/5/2008	12/5/2008
Hexachlorobenzene	22	70	20 U	20 U	20 U	20 U
Phthalate Esters in ug/kg						
Dimethylphthalate	71	160	20 U	20 U	20 U	20 U
Diethylphthalate	200	200	20 U	20 U	20 U	20 U
Di-n-Butylphthalate	1400	1400	20 U	20 U	20 U	20 U
Butylbenzylphthalate	63	900	20 U	20 U	20 U	20 U
bis(2-Ethylhexyl)phthalate	1300	1900	20 U	20 U	11 T	20 U
Di-n-Octyl phthalate	6200	6200	20 U	20 U	20 U	20 U
Miscellaneous Compounds in ug/kg						
Dibenzofuran	540	700	20 U	20 U	20 U	20 U
Hexachlorobutadiene	11	120	*20 U*	*20 U*	*20 U*	*20 U*
N-Nitrosodiphenylamine	28	40	20 U	20 U	20 U	20 U
Guaiacol			20 U	20 U	20 U	20 U
Retene			20 U	20 U	20 U	20 U
Ionizable Organic Compounds in ug/kg						
Phenol	420	1200	20 UJ	20 UJ	20 UJ	20 U
2-Methylphenol	63	63	20 U	20 U	20 U	20 U
4-Methylphenol	670	670	20 U	20 U	20 U	20 U
2,4-Dimethylphenol	29	29	20 U	20 U	20 U	20 U
Pentachlorophenol	360	690	99 U	99 U	98 U	99 U
Benzyl Alcohol	57	73	20 U	20 U	20 U	20 UJ
Benzoic Acid	650	650	200 U	200 U	200 U	200 UJ

Table 5 - Analytical Results for Sediment Samples - Compared to AET Dry-Weight Sediment Quality Criteria

Sample ID	AETs		PGSS-47	PGSS-47A	PGSS-51	PGSS-53
Sampling Date	LAET	2LAET	12/8/2008	12/8/2008	12/8/2008	12/8/2008
Metals in mg/kg						
Arsenic	57	93	7 U	8 U	10 U	10 U
Cadmium	5.1	6.7	0.8	0.3 U	1.2	1.5
Chromium	260	270	19.6	7.3	34	40
Copper	390	390	11.5	5	25.5	29.1
Lead	450	530	5	3 U	8	10
Silver	6.1	6.1	0.4 U	0.5 U	0.6 U	0.6 U
Zinc	410	960	39	16	61	79
Mercury	0.41	0.59	0.06 UJ	0.06 J	0.1 UJ	0.09 J
PCBs in ug/kg						
Aroclor 1016			3.9 U	3.9 U	4 U	3.9 U
Aroclor 1221			3.9 U	3.9 U	4 U	3.9 U
Aroclor 1232			3.9 U	3.9 U	4 U	3.9 U
Aroclor 1242			3.9 U	3.9 U	4 U	3.9 U
Aroclor 1248			3.9 U	3.9 U	4 U	3.9 U
Aroclor 1254			3.9 U	3.9 U	4 U	3.9 U
Aroclor 1260			3.9 U	3.9 U	4 U	3.9 U
Aroclor 1262			3.9 U	3.9 U	4 U	3.9 U
Aroclor 1268			3.9 U	3.9 U	4 U	3.9 U
Total PCBs	130	1000	3.9 U	3.9 U	4 U	3.9 U
PAHs in ug/kg						
Naphthalene	2100	2400	20 U	20 U	14 T	20 U
Acenaphthylene	1300	1300	20 U	20 U	20 U	20 U
Acenaphthene	500	730	20 U	20 U	20 U	20 U
Fluorene	540	1000	20 U	20 U	20 U	20 U
Phenanthrene	1500	5400	20 U	11 T	32	14 T
Anthracene	960	4400	20 U	20 U	12 T	20 U
2-Methylnaphthalene	670	1400	20 U	20 U	20 U	20 U
1-Methylnaphthalene			20 U	20 U	20 U	20 U
Total LPAHs	5200	13000	20 U	11 J	58 J	14 J
Fluoranthene	1700	2500	12 T	18 T	47	21
Pyrene	2600	3300	11 T	15 T	48	18 T
Benzo(a)anthracene	1300	1600	20 U	20 U	25	14 T
Chrysene	1400	2800	12 T	18 T	40	21
Benzo(b)fluoranthene			20 U	20 U	26	14 T
Benzo(k)fluoranthene			20 U	10 T	24	16 T
Total Benzofluoranthenes	3200	3600	20 U	10 J	50	30 J
Benzo(a)pyrene	1600	3000	20 U	20 U	17 T	12 T
Indeno(1,2,3-cd)pyrene	600	690	20 U	20 U	9.9 T	20 U
Dibenz(a,h)anthracene	230	540	20 U	20 U	20 U	20 U
Benzo(g,h,i)perylene	670	720	20 U	20 U	12 T	20 U
Total HPAHs	12000	17000	35 J	71 J	248.9 J	116 J
Chlorinated Benzenes in ug/kg						
1,2-Dichlorobenzene	35	50	20 U	20 U	20 U	20 U
1,3-Dichlorobenzene	170	170	20 U	20 U	20 U	20 U
1,4-Dichlorobenzene	110	120	20 U	20 U	20 U	20 U
1,2,4-Trichlorobenzene	31	51	20 U	20 U	20 U	20 U

Table 5 - Analytical Results for Sediment Samples - Compared to AET Dry-Weight Sediment Quality Criteria

Sample ID	AETs		PGSS-47	PGSS-47A	PGSS-51	PGSS-53
Sampling Date	LAET	2LAET	12/8/2008	12/8/2008	12/8/2008	12/8/2008
Hexachlorobenzene	22	70	20 U	20 U	20 U	20 U
Phthalate Esters in ug/kg						
Dimethylphthalate	71	160	20 U	20 U	20 U	20 U
Diethylphthalate	200	200	20 U	20 U	20 U	20 U
Di-n-Butylphthalate	1400	1400	20 U	20 U	20 U	20 U
Butylbenzylphthalate	63	900	20 U	20 U	20 U	20 U
bis(2-Ethylhexyl)phthalate	1300	1900	20 U	20 U	20 U	20 U
Di-n-Octyl phthalate	6200	6200	20 U	20 U	20 U	20 U
Miscellaneous Compounds in ug/kg						
Dibenzofuran	540	700	20 U	20 U	20 U	20 U
Hexachlorobutadiene	11	120	*20 U*	*20 U*	*20 U*	*20 U*
N-Nitrosodiphenylamine	28	40	20 U	20 U	20 U	20 U
Guaiacol			20 U	20 U	20 U	20 U
Retene			20 U	20 U	20 U	20 U
Ionizable Organic Compounds in ug/kg						
Phenol	420	1200	20 U	20 U	280	20 U
2-Methylphenol	63	63	20 U	20 U	20 U	20 U
4-Methylphenol	670	670	20 U	20 U	18 T	20 U
2,4-Dimethylphenol	29	29	20 U	20 U	20 U	20 U
Pentachlorophenol	360	690	99 U	100 U	99 U	98 U
Benzyl Alcohol	57	73	20 UJ	20 UJ	20 U	20 UJ
Benzoic Acid	650	650	200 UJ	200 UJ	200 U	200 UJ

Table 5 - Analytical Results for Sediment Samples - Compared to AET Dry-Weight Sediment Quality Criteria

Sample ID	AETs		PGSS-54	PGSS-55	PGSS-56	PGSS-58
Sampling Date	LAET	2LAET	12/8/2008	12/8/2008	12/8/2008	12/9/2008
Metals in mg/kg						
Arsenic	57	93	9 U	7 U	7 U	10 U
Cadmium	5.1	6.7	1.3	0.5	0.4	1.4
Chromium	260	270	34.7	20.2	16.6	41
Copper	390	390	25.6	10.4	9.4	32.9
Lead	450	530	9	3	3	12
Silver	6.1	6.1	0.6 U	0.4 U	0.4 U	0.8 U
Zinc	410	960	68	31	39	91
Mercury	0.41	0.59	0.09 J	0.05 UJ	0.05 UJ	0.1 J
PCBs in ug/kg						
Aroclor 1016			3.9 U	3.9 U	3.9 U	4 U
Aroclor 1221			3.9 U	3.9 U	3.9 U	12 U
Aroclor 1232			3.9 U	3.9 U	3.9 U	8 U
Aroclor 1242			3.9 U	3.9 U	3.9 U	4 U
Aroclor 1248			3.9 U	3.9 U	3.9 U	4 U
Aroclor 1254			3.9 U	3.9 U	3.9 U	4 U
Aroclor 1260			3.9 U	3.9 U	3.9 U	4 U
Aroclor 1262			3.9 U	3.9 U	3.9 U	4 U
Aroclor 1268			3.9 U	3.9 U	3.9 U	4 U
Total PCBs	130	1000	3.9 U	3.9 U	3.9 U	12 U
PAHs in ug/kg						
Naphthalene	2100	2400	20 U	19 U	20 U	40 U
Acenaphthylene	1300	1300	20 U	19 U	20 U	40 U
Acenaphthene	500	730	20 U	19 U	20 U	40 U
Fluorene	540	1000	20 U	19 U	20 U	40 U
Phenanthrene	1500	5400	11 T	19 U	20 U	40 U
Anthracene	960	4400	20 U	19 U	20 U	40 U
2-Methylnaphthalene	670	1400	20 U	19 U	20 U	40 U
1-Methylnaphthalene			20 U	19 U	20 U	40 U
Total LPAHs	5200	13000	11 J	19 U	20 U	40 U
Fluoranthene	1700	2500	18 T	9.7 T	19 T	25 T
Pyrene	2600	3300	15 T	19 U	13 T	40 U
Benzo(a)anthracene	1300	1600	20 U	19 U	20 U	40 U
Chrysene	1400	2800	15 T	19 U	13 T	27 T
Benzo(b)fluoranthene			10 T	19 U	10 T	40 U
Benzo(k)fluoranthene			10 T	19 U	12 T	40 U
Total Benzofluoranthenes	3200	3600	20 J	19 U	22 J	40 U
Benzo(a)pyrene	1600	3000	20 U	19 U	20 U	40 U
Indeno(1,2,3-cd)pyrene	600	690	20 U	19 U	20 U	40 U
Dibenz(a,h)anthracene	230	540	20 U	19 U	20 U	40 U
Benzo(g,h,i)perylene	670	720	20 U	19 U	20 U	40 U
Total HPAHs	12000	17000	68 J	9.7 J	67 J	52 J
Chlorinated Benzenes in ug/kg						
1,2-Dichlorobenzene	35	50	20 U	19 U	20 U	*40 U*
1,3-Dichlorobenzene	170	170	20 U	19 U	20 U	40 U
1,4-Dichlorobenzene	110	120	20 U	19 U	20 U	40 U
1,2,4-Trichlorobenzene	31	51	20 U	19 U	20 U	*40 U*

Table 5 - Analytical Results for Sediment Samples - Compared to AET Dry-Weight Sediment Quality Criteria

Sample ID	AETs		PGSS-54	PGSS-55	PGSS-56	PGSS-58
Sampling Date	LAET	2LAET	12/8/2008	12/8/2008	12/8/2008	12/9/2008
Hexachlorobenzene	22	70	20 U	19 U	20 U	*40 U*
Phthalate Esters in ug/kg						
Dimethylphthalate	71	160	20 U	19 U	20 U	40 U
Diethylphthalate	200	200	20 U	19 U	20 U	40 U
Di-n-Butylphthalate	1400	1400	20 U	19 U	20 U	40 U
Butylbenzylphthalate	63	900	20 U	19 U	20 U	40 U
bis(2-Ethylhexyl)phthalate	1300	1900	20 U	19 U	12 T	40 U
Di-n-Octyl phthalate	6200	6200	20 U	19 U	20 U	40 U
Miscellaneous Compounds in ug/kg						
Dibenzofuran	540	700	20 U	19 U	20 U	40 U
Hexachlorobutadiene	11	120	*20 U*	*19 U*	*20 U*	*40 U*
N-Nitrosodiphenylamine	28	40	20 U	19 U	20 U	*40 U*
Guaiacol			20 U	19 U	20 U	40 U
Retene			20 U	19 U	20 U	40 U
Ionizable Organic Compounds in ug/kg						
Phenol	420	1200	20 U	88 J	140 J	520 J
2-Methylphenol	63	63	20 U	19 U	20 U	40 U
4-Methylphenol	670	670	20 U	19 U	20 U	40 U
2,4-Dimethylphenol	29	29	20 U	19 U	20 U	*40 U*
Pentachlorophenol	360	690	98 U	95 U	98 U	200 U
Benzyl Alcohol	57	73	20 UJ	19 U	20 U	40 U
Benzoic Acid	650	650	200 UJ	190 U	200 U	400 U

Table 5 - Analytical Results for Sediment Samples - Compared to AET Dry-Weight Sediment Quality Criteria

Sample ID	AETs		PGSS-62A	PGSS-62B	PGSS-63	PGSS-64
Sampling Date	LAET	2LAET	12/9/2008	12/9/2008	12/9/2008	12/9/2008
Metals in mg/kg						
Arsenic	57	93	6 U	7 U	7 U	7 U
Cadmium	5.1	6.7	0.3 U	0.7	0.4	0.6
Chromium	260	270	22.1	19.9	27.2	22.5
Copper	390	390	13.3	11.7	14.6	12.6
Lead	450	530	3	4	5	4
Silver	6.1	6.1	0.4 U	0.4 U	0.4 U	0.4 U
Zinc	410	960	49	45	50	37
Mercury	0.41	0.59	0.05 UJ	0.05 J	0.06 UJ	0.05 UJ
PCBs in ug/kg						
Aroclor 1016			3.9 U	3.9 U	3.9 U	3.9 U
Aroclor 1221			3.9 U	3.9 U	3.9 U	3.9 U
Aroclor 1232			3.9 U	3.9 U	3.9 U	3.9 U
Aroclor 1242			3.9 U	3.9 U	3.9 U	3.9 U
Aroclor 1248			3.9 U	3.9 U	3.9 U	3.9 U
Aroclor 1254			3.9 U	3.9 U	3.9 U	3.9 U
Aroclor 1260			3.9 U	3.9 U	3.9 U	3.9 U
Aroclor 1262			3.9 U	3.9 U	3.9 U	3.9 U
Aroclor 1268			3.9 U	3.9 U	3.9 U	3.9 U
Total PCBs	130	1000	3.9 U	3.9 U	3.9 U	3.9 U
PAHs in ug/kg						
Naphthalene	2100	2400	39 U	20 U	20 U	18 T
Acenaphthylene	1300	1300	39 U	20 U	20 U	20 U
Acenaphthene	500	730	39 U	20 U	20 U	20 U
Fluorene	540	1000	39 U	20 U	20 U	20 U
Phenanthrene	1500	5400	39 U	20 U	15 T	13 T
Anthracene	960	4400	39 U	20 U	20 U	20 U
2-Methylnaphthalene	670	1400	39 U	20 U	20 U	20 U
1-Methylnaphthalene			39 U	20 U	20 U	20 U
Total LPAHs	5200	13000	39 U	20 U	15 J	31 J
Fluoranthene	1700	2500	39 U	23	36	19 T
Pyrene	2600	3300	39 U	13 T	22	18 T
Benzo(a)anthracene	1300	1600	39 U	20 U	18 T	9.9 T
Chrysene	1400	2800	39 U	11 T	33	16 T
Benzo(b)fluoranthene			39 U	11 T	21	12 T
Benzo(k)fluoranthene			39 U	20 U	17 T	11 T
Total Benzofluoranthenes	3200	3600	39 U	11 J	38 J	23 J
Benzo(a)pyrene	1600	3000	39 U	20 U	15 T	10 T
Indeno(1,2,3-cd)pyrene	600	690	39 U	20 U	20 U	20 U
Dibenz(a,h)anthracene	230	540	39 U	20 U	20 U	20 U
Benzo(g,h,i)perylene	670	720	39 U	20 U	20 U	20 U
Total HPAHs	12000	17000	39 U	58 J	162 J	95.9 J
Chlorinated Benzenes in ug/kg						
1,2-Dichlorobenzene	35	50	*39 U*	20 U	20 U	20 U
1,3-Dichlorobenzene	170	170	39 U	20 U	20 U	20 U
1,4-Dichlorobenzene	110	120	39 U	20 U	20 U	20 U
1,2,4-Trichlorobenzene	31	51	*39 U*	20 U	20 U	20 U

Table 5 - Analytical Results for Sediment Samples - Compared to AET Dry-Weight Sediment Quality Criteria

Sample ID	AETs		PGSS-62A	PGSS-62B	PGSS-63	PGSS-64
Sampling Date	LAET	2LAET	12/9/2008	12/9/2008	12/9/2008	12/9/2008
Hexachlorobenzene	22	70	*39 U*	20 U	20 U	20 U
Phthalate Esters in ug/kg						
Dimethylphthalate	71	160	39 U	20 U	20 U	20 U
Diethylphthalate	200	200	39 U	20 U	20 U	20 U
Di-n-Butylphthalate	1400	1400	39 U	20 U	20 U	20 U
Butylbenzylphthalate	63	900	39 U	20 U	20 U	20 U
bis(2-Ethylhexyl)phthalate	1300	1900	39 U	20 U	20 U	20 U
Di-n-Octyl phthalate	6200	6200	39 U	20 U	20 U	20 U
Miscellaneous Compounds in ug/kg						
Dibenzofuran	540	700	39 U	20 U	20 U	20 U
Hexachlorobutadiene	11	120	*39 U*	*20 U*	*20 U*	*20 U*
N-Nitrosodiphenylamine	28	40	*39 U*	20 U	20 U	20 U
Guaiacol			39 U	20 U	20 U	20 U
Retene			53	20 U	20 U	20 U
Ionizable Organic Compounds in ug/kg						
Phenol	420	1200	240 J	82 J	170 J	42
2-Methylphenol	63	63	39 U	20 U	20 U	20 U
4-Methylphenol	670	670	66	20 U	20 U	20 U
2,4-Dimethylphenol	29	29	*39 U*	20 U	20 U	20 U
Pentachlorophenol	360	690	200 U	98 U	98 U	97 U
Benzyl Alcohol	57	73	39 UJ	20 U	20 U	20 U
Benzoic Acid	650	650	390 U	200 U	200 U	200 U

Table 5 - Analytical Results for Sediment Samples - Compared to AET Dry-Weight Sediment Quality Criteria

Sample ID	AETs		PGSS-69	PGSS-70	PGSS-73	PGSS-75
Sampling Date	LAET	2LAET	12/9/2008	12/9/2008	12/9/2008	12/9/2008
Metals in mg/kg						
Arsenic	57	93	6 U	7 U	6 U	6 U
Cadmium	5.1	6.7	0.6	0.4	0.3	0.2 U
Chromium	260	270	16.2	20.3	16.2	11.2
Copper	390	390	8.3	11	6.8	3.4
Lead	450	530	3 U	6	2 U	2 U
Silver	6.1	6.1	0.4 U	0.4 U	0.4 U	0.4 U
Zinc	410	960	38	47	28	17
Mercury	0.41	0.59	0.05 UJ	0.06 UJ	0.05 UJ	0.05 UJ
PCBs in ug/kg						
Aroclor 1016			3.8 U	3.9 U	3.9 U	3.9 U
Aroclor 1221			3.8 U	3.9 U	3.9 U	3.9 U
Aroclor 1232			3.8 U	3.9 U	3.9 U	3.9 U
Aroclor 1242			3.8 U	3.9 U	3.9 U	3.9 U
Aroclor 1248			3.8 U	3.9 U	3.9 U	3.9 U
Aroclor 1254			3.8 U	3.9 U	3.9 U	3.9 U
Aroclor 1260			3.8 U	3.9 U	3.9 U	3.9 U
Aroclor 1262			3.8 U	3.9 U	3.9 U	3.9 U
Aroclor 1268			3.8 U	3.9 U	3.9 U	3.9 U
Total PCBs	130	1000	3.8 U	3.9 U	3.9 U	3.9 U
PAHs in ug/kg						
Naphthalene	2100	2400	19 U	20 U	20 U	20 U
Acenaphthylene	1300	1300	19 U	20 U	20 U	20 U
Acenaphthene	500	730	19 U	20 U	20 U	20 U
Fluorene	540	1000	19 U	20 U	20 U	20 U
Phenanthrene	1500	5400	19 U	54	20 U	20 U
Anthracene	960	4400	19 U	21	20 U	20 U
2-Methylnaphthalene	670	1400	19 U	20 U	20 U	20 U
1-Methylnaphthalene			19 U	20 U	20 U	20 U
Total LPAHs	5200	13000	19 U	75	20 U	20 U
Fluoranthene	1700	2500	19 U	130	20 U	20 U
Pyrene	2600	3300	19 U	74	20 U	20 U
Benzo(a)anthracene	1300	1600	19 U	52	20 U	20 U
Chrysene	1400	2800	19 U	64	20 U	20 U
Benzo(b)fluoranthene			19 U	48	20 U	20 U
Benzo(k)fluoranthene			19 U	57	20 U	20 U
Total Benzofluoranthenes	3200	3600	19 U	105	20 U	20 U
Benzo(a)pyrene	1600	3000	19 U	42	20 U	20 U
Indeno(1,2,3-cd)pyrene	600	690	19 U	11 T	20 U	20 U
Dibenz(a,h)anthracene	230	540	19 U	20 U	20 U	20 U
Benzo(g,h,i)perylene	670	720	19 U	10 T	20 U	20 U
Total HPAHs	12000	17000	19 U	488 J	20 U	20 U
Chlorinated Benzenes in ug/kg						
1,2-Dichlorobenzene	35	50	19 U	20 U	20 U	20 U
1,3-Dichlorobenzene	170	170	19 U	20 U	20 U	20 U
1,4-Dichlorobenzene	110	120	19 U	20 U	20 U	20 U
1,2,4-Trichlorobenzene	31	51	19 U	20 U	20 U	20 U

Table 5 - Analytical Results for Sediment Samples - Compared to AET Dry-Weight Sediment Quality Criteria

Sample ID	AETs		PGSS-69	PGSS-70	PGSS-73	PGSS-75
Sampling Date	LAET	2LAET	12/9/2008	12/9/2008	12/9/2008	12/9/2008
Hexachlorobenzene	22	70	19 U	20 U	20 U	20 U
Phthalate Esters in ug/kg						
Dimethylphthalate	71	160	19 U	20 U	20 U	20 U
Diethylphthalate	200	200	19 U	20 U	20 U	20 U
Di-n-Butylphthalate	1400	1400	19 U	20 U	20 U	20 U
Butylbenzylphthalate	63	900	19 U	20 U	20 U	20 U
bis(2-Ethylhexyl)phthalate	1300	1900	19 U	20 U	20 U	20 U
Di-n-Octyl phthalate	6200	6200	19 U	20 U	20 U	20 U
Miscellaneous Compounds in ug/kg						
Dibenzofuran	540	700	19 U	20 U	20 U	20 U
Hexachlorobutadiene	11	120	*19 U*	*20 U*	*20 U*	*20 U*
N-Nitrosodiphenylamine	28	40	19 U	20 U	20 U	20 U
Guaiacol			19 U	20 U	20 U	20 U
Retene			19 U	20 U	110	20 U
Ionizable Organic Compounds in ug/kg						
Phenol	420	1200	110 J	71 J	20 U	25
2-Methylphenol	63	63	19 U	20 U	20 U	20 U
4-Methylphenol	670	670	19 U	20 U	20 U	20 U
2,4-Dimethylphenol	29	29	19 U	20 U	20 U	20 U
Pentachlorophenol	360	690	97 U	98 U	99 U	99 U
Benzyl Alcohol	57	73	19 U	20 U	20 U	20 U
Benzoic Acid	650	650	190 U	200 U	200 U	120 T

Table 5 - Analytical Results for Sediment Samples - Compared to AET Dry-Weight Sediment Quality Criteria

Sample ID	AETs		PGSS-77	PGSS-77A	PGSS-80	PGSS-83
Sampling Date	LAET	2LAET	12/9/2008	12/9/2008	12/10/2008	12/10/2008
Metals in mg/kg						
Arsenic	57	93	7 U	6 U	6 U	6 U
Cadmium	5.1	6.7	0.5	0.5	0.2 U	0.3
Chromium	260	270	22.1	22.7	20.1	21.4
Copper	390	390	12.9	12.8	7	11.5
Lead	450	530	5	4	2 U	3
Silver	6.1	6.1	0.4 U	0.4 U	0.3 U	0.4 U
Zinc	410	960	42	39	26	46
Mercury	0.41	0.59	0.05 J	0.05 UJ	0.06 UJ	0.06 UJ
PCBs in ug/kg						
Aroclor 1016			3.9 U	4 U	3.9 U	3.9 U
Aroclor 1221			3.9 U	4 U	3.9 U	3.9 U
Aroclor 1232			3.9 U	4 U	3.9 U	3.9 U
Aroclor 1242			3.9 U	4 U	3.9 U	3.9 U
Aroclor 1248			3.9 U	4 U	3.9 U	3.9 U
Aroclor 1254			3.9 U	4 U	3.9 U	3.9 U
Aroclor 1260			3.9 U	4 U	3.9 U	3.9 U
Aroclor 1262			3.9 U	4 U	3.9 U	3.9 U
Aroclor 1268			3.9 U	4 U	3.9 U	3.9 U
Total PCBs	130	1000	3.9 U	4 U	3.9 U	3.9 U
PAHs in ug/kg						
Naphthalene	2100	2400	20 U	37	20 U	19 U
Acenaphthylene	1300	1300	20 U	20 U	20 U	19 U
Acenaphthene	500	730	20 U	20 U	20 U	19 U
Fluorene	540	1000	20 U	20 U	20 U	19 U
Phenanthrene	1500	5400	15 T	49	20 U	19
Anthracene	960	4400	20 U	18 T	20 U	19 U
2-Methylnaphthalene	670	1400	20 U	20 U	20 U	19 U
1-Methylnaphthalene			20 U	20 U	20 U	19 U
Total LPAHs	5200	13000	15 J	104 J	20 U	19
Fluoranthene	1700	2500	40	53	20 U	58
Pyrene	2600	3300	26	54	20 U	32
Benzo(a)anthracene	1300	1600	16 T	29	20 U	17 T
Chrysene	1400	2800	31	40	20 U	42
Benzo(b)fluoranthene			34	38	20 U	23
Benzo(k)fluoranthene			26	22	20 U	20
Total Benzofluoranthenes	3200	3600	60	60	20 U	43
Benzo(a)pyrene	1600	3000	22	22	20 U	13 T
Indeno(1,2,3-cd)pyrene	600	690	20 U	13 T	20 U	19 U
Dibenz(a,h)anthracene	230	540	20 U	20 U	20 U	19 U
Benzo(g,h,i)perylene	670	720	20 U	18 T	20 U	19 U
Total HPAHs	12000	17000	195 J	289 J	20 U	205 J
Chlorinated Benzenes in ug/kg						
1,2-Dichlorobenzene	35	50	20 U	20 U	20 U	19 U
1,3-Dichlorobenzene	170	170	20 U	20 U	20 U	19 U
1,4-Dichlorobenzene	110	120	20 U	20 U	20 U	19 U
1,2,4-Trichlorobenzene	31	51	20 U	20 U	20 U	19 U

Table 5 - Analytical Results for Sediment Samples - Compared to AET Dry-Weight Sediment Quality Criteria

Sample ID	AETs		PGSS-77	PGSS-77A	PGSS-80	PGSS-83
Sampling Date	LAET	2LAET	12/9/2008	12/9/2008	12/10/2008	12/10/2008
Hexachlorobenzene	22	70	20 U	20 U	20 U	19 U
Phthalate Esters in ug/kg						
Dimethylphthalate	71	160	20 U	20 U	20 U	19 U
Diethylphthalate	200	200	20 U	20 U	20 U	19 U
Di-n-Butylphthalate	1400	1400	20 U	20 U	20 U	19 U
Butylbenzylphthalate	63	900	20 U	20 U	20 U	19 U
bis(2-Ethylhexyl)phthalate	1300	1900	20 U	20 U	20 U	19 U
Di-n-Octyl phthalate	6200	6200	20 U	20 U	20 U	19 U
Miscellaneous Compounds in ug/kg						
Dibenzofuran	540	700	20 U	20 U	20 U	19 U
Hexachlorobutadiene	11	120	*20 U*	*20 U*	*20 U*	*19 U*
N-Nitrosodiphenylamine	28	40	20 U	20 U	20 U	19 U
Guaiacol			20 U	20 U	20 U	19 U
Retene			20 U	14	20 U	19 U
Ionizable Organic Compounds in ug/kg						
Phenol	420	1200	220 J	110	31	36 J
2-Methylphenol	63	63	20 U	20 U	20 U	19 U
4-Methylphenol	670	670	70	20 U	20 U	19 U
2,4-Dimethylphenol	29	29	20 U	20 U	20 U	19 U
Pentachlorophenol	360	690	98 U	99 U	99 U	97 U
Benzyl Alcohol	57	73	20 U	20 U	20 U	19 U
Benzoic Acid	650	650	200 U	200 U	200 U	190 U

Table 5 - Analytical Results for Sediment Samples - Compared to AET Dry-Weight Sediment Quality Criteria

Sample ID	AETs		PGSS-92	PGSS-GEO-3
Sampling Date	LAET	2LAET	12/10/2008	12/10/2008
Metals in mg/kg				
Arsenic	57	93	8 U	7 U
Cadmium	5.1	6.7	0.7	0.3 U
Chromium	260	270	25.9	16.8
Copper	390	390	22.1	5.9
Lead	450	530	6	3 U
Silver	6.1	6.1	0.5 U	0.4 U
Zinc	410	960	49	28
Mercury	0.41	0.59	0.07 UJ	0.06 UJ
PCBs in ug/kg				
Aroclor 1016			3.9 U	4 U
Aroclor 1221			3.9 U	4 U
Aroclor 1232			3.9 U	4 U
Aroclor 1242			3.9 U	4 U
Aroclor 1248			3.9 U	4 U
Aroclor 1254			3.9 U	4 U
Aroclor 1260			3.9 U	4 U
Aroclor 1262			3.9 U	
Aroclor 1268			3.9 U	
Total PCBs	130	1000	3.9 U	4 U
PAHs in ug/kg				
Naphthalene	2100	2400	20 U	20 U
Acenaphthylene	1300	1300	20 U	20 U
Acenaphthene	500	730	20 U	20 U
Fluorene	540	1000	20 U	20 U
Phenanthrene	1500	5400	30	26
Anthracene	960	4400	20 U	20 U
2-Methylnaphthalene	670	1400	20 U	20 U
1-Methylnaphthalene			20 U	20 U
Total LPAHs	5200	13000	30	26
Fluoranthene	1700	2500	30	34
Pyrene	2600	3300	35	42
Benzo(a)anthracene	1300	1600	12 T	12 T
Chrysene	1400	2800	12 T	15 T
Benzo(b)fluoranthene			20 U	11 T
Benzo(k)fluoranthene			20 U	12 T
Total Benzofluoranthenes	3200	3600	20 U	23 J
Benzo(a)pyrene	1600	3000	11 T	13 T
Indeno(1,2,3-cd)pyrene	600	690	20 U	20 U
Dibenz(a,h)anthracene	230	540	20 U	20 U
Benzo(g,h,i)perylene	670	720	20 U	20 U
Total HPAHs	12000	17000	100 J	139 J
Chlorinated Benzenes in ug/kg				
1,2-Dichlorobenzene	35	50	20 U	20 U
1,3-Dichlorobenzene	170	170	20 U	20 U
1,4-Dichlorobenzene	110	120	20 U	20 U
1,2,4-Trichlorobenzene	31	51	20 U	20 U

Table 5 - Analytical Results for Sediment Samples - Compared to AET Dry-Weight Sediment Quality Criteria

Sample ID	AETs		PGSS-92	PGSS-GEO-3
Sampling Date	LAET	2LAET	12/10/2008	12/10/2008
Hexachlorobenzene	22	70	20 U	20 U
Phthalate Esters in ug/kg				
Dimethylphthalate	71	160	20 U	20 U
Diethylphthalate	200	200	20 U	20 U
Di-n-Butylphthalate	1400	1400	20 U	20 U
Butylbenzylphthalate	63	900	20 U	20 U
bis(2-Ethylhexyl)phthalate	1300	1900	20 U	20 U
Di-n-Octyl phthalate	6200	6200	20 U	20 U
Miscellaneous Compounds in ug/kg				
Dibenzofuran	540	700	20 U	20 U
Hexachlorobutadiene	11	120	*20 U*	*20 U*
N-Nitrosodiphenylamine	28	40	20 U	20 U
Guaiacol			20 U	20 U
Retene			20 U	20 U
Ionizable Organic Compounds in ug/kg				
Phenol	420	1200	42	20 U
2-Methylphenol	63	63	20 U	20 U
4-Methylphenol	670	670	20 U	20 U
2,4-Dimethylphenol	29	29	20 U	20 U
Pentachlorophenol	360	690	99 U	100 U
Benzyl Alcohol	57	73	20 U	20 U
Benzoic Acid	650	650	200 U	200 U

Table 6 - Analytical Results for Sediment Samples - Compared to SMS Sediment Quality Criteria

Sample ID	SMS		PGSS-8 (a)	PGSS-14A	PGSS-15	PGSS-16
Sampling Date	SQS	CSL	12/4/2008	12/4/2008	12/4/2008	12/4/2008
Total Organic Carbon in %			3.93	1.46	3.46	2.6
Metals in mg/kg						
Arsenic	57	93	10 U	7 U	10 U	20 U
Cadmium	5.1	6.7	2.2	0.4	2.1	2.1
Chromium	260	270	42	15.7	48	52
Copper	390	390	32.2	8	38.5	40.2
Lead	450	530	10	3 U	15	15
Silver	6.1	6.1	0.8 U	0.4 U	0.8 U	1 U
Zinc	410	960	78	25	89	90
Mercury	0.41	0.59	0.1 UJ	0.05 UJ	0.1 J	0.1 J
PCBs in mg/kg OC						
Aroclor 1016			0.10 U	0.27 U	0.16 U	0.23 U
Aroclor 1221			0.10 U	0.27 U	0.16 U	0.23 U
Aroclor 1232			0.20 U	0.27 U	0.16 U	0.23 U
Aroclor 1242			0.10 U	0.27 U	0.16 U	0.23 U
Aroclor 1248			0.10 U	0.27 U	0.16 U	0.23 U
Aroclor 1254			0.10 U	0.27 U	0.16 U	0.23 U
Aroclor 1260			0.10 U	0.27 U	0.16 U	0.23 U
Aroclor 1262			0.10 U	0.27 U	0.16 U	0.23 U
Aroclor 1268			0.10 U	0.27 U	0.16 U	0.23 U
Total PCBs	12	65	0.20 U	0.27 U	0.16 U	0.23 U
PAHs in mg/kg OC						
Naphthalene	99	170	0.38 T	1.30 U	0.58 U	0.77 U
Acenaphthylene	66	66	0.51 U	1.30 U	0.58 U	0.77 U
Acenaphthene	16	57	0.51 U	1.30 U	0.58 U	0.77 U
Fluorene	23	79	0.51 U	1.30 U	0.58 U	0.77 U
Phenanthrene	100	480	0.59	1.30 U	0.32 T	0.46 T
Anthracene	220	1200	0.31 T	1.30 U	0.58 U	0.77 U
2-Methylnaphthalene	38	64	0.51 U	1.30 U	0.58 U	0.77 U
1-Methylnaphthalene			0.51 U	1.30 U	0.58 U	0.77 U
Total LPAHs	370	780	1.27 J	1.30 U	0.32 J	0.46 J
Fluoranthene	160	1200	1.15	0.75 T	0.90	1.19
Pyrene	1000	1400	1.02	0.82 T	0.87	1.31
Benzo(a)anthracene	110	270	0.59	1.30 U	0.49 T	0.69 T
Chrysene	110	460	1.04	1.30 U	0.75	1.00
Benzo(b)fluoranthene			0.81	1.30 U	0.78	1.08
Benzo(k)fluoranthene			0.43 T	1.30 U	0.52 T	0.62 T
Total Benzofluoranthenes	230	450	1.25 J	1.30 U	1.30 J	1.69 J
Benzo(a)pyrene	99	210	0.51	1.30 U	0.55 T	0.65 T
Indeno(1,2,3-cd)pyrene	34	88	0.28 T	1.30 U	0.32 T	0.42 T
Dibenz(a,h)anthracene	12	33	0.51 U	1.30 U	0.58 U	0.77 U
Benzo(g,h,i)perylene	31	78	0.36 T	1.30 U	0.38 T	0.58 T
Total HPAHs	960	5300	6.18 J	1.58 J	5.55 J	7.54 J
Chlorinated Benzenes in mg/kg OC						
1,2-Dichlorobenzene	2.3	2.3	0.51 U	1.30 U	0.58 U	0.77 U
1,3-Dichlorobenzene			0.51 U	1.30 U	0.58 U	0.77 U

Table 6 - Analytical Results for Sediment Samples - Compared to SMS Sediment Quality Criteria

Sample ID	SMS		PGSS-8 (a)	PGSS-14A	PGSS-15	PGSS-16
Sampling Date	SQS	CSL	12/4/2008	12/4/2008	12/4/2008	12/4/2008
1,4-Dichlorobenzene	3.1	9	0.51 U	1.30 U	0.58 U	0.77 U
1,2,4-Trichlorobenzene	0.81	1.8	0.51 U	*1.30 U*	0.58 U	0.77 U
Hexachlorobenzene	0.38	2.3	*0.51 U*	*1.30 U*	*0.58 U*	*0.77 U*
Phthalate Esters in mg/kg OC						
Dimethylphthalate	53	53	0.51 U	1.30 U	0.58 U	0.77 U
Diethylphthalate	61	110	0.51 U	1.30 U	0.58 U	0.77 U
Di-n-Butylphthalate	220	1700	0.51 U	1.30 U	0.58 U	0.77 U
Butylbenzylphthalate	4.9	64	0.51 U	1.30 U	0.58 U	0.77 U
bis(2-Ethylhexyl)phthalate	47	78	0.51 U	1.30 U	1.45	0.77 U
Di-n-Octyl phthalate	58	4500	0.51 U	1.30 U	0.58 U	0.77 U
Miscellaneous Compounds in mg/kg OC						
Dibenzofuran	15	58	0.51 U	1.30 U	0.58 U	0.77 U
Hexachlorobutadiene	3.9	6.2	0.51 U	1.30 U	0.58 U	0.77 U
N-Nitrosodiphenylamine	11	11	0.51 U	1.30 U	0.58 U	0.77 U
Guaiacol			0.51 U	1.30 U	0.58 U	0.77 U
Retene			0.51 U	1.30 U	0.58 U	0.38
Ionizable Organic Compounds in ug/kg						
Phenol	420	1200	720	19 UJ	20 UJ	20 UJ
2-Methylphenol	63	63	20 U	19 U	20 U	20 U
4-Methylphenol	670	670	47	19 U	20 U	20 U
2,4-Dimethylphenol	29	29	20 U	19 U	20 U	20 U
Pentachlorophenol	360	690	100 U	95 U	99 U	99 U
Benzyl Alcohol	57	73	20 U	19 U	20 U	20 U
Benzoic Acid	650	650	200 U	190 U	200 U	200 U

Table 6 - Analytical Results for Sediment Samples - Compared to SMS Sediment Quality Criteria

Sample ID	SMS		PGSS-18	PGSS-21A	PGSS-21B	PGSS-22
Sampling Date	SQS	CSL	12/4/2008	12/4/2008	12/4/2008	12/4/2008
Total Organic Carbon in %			2.49	1.33	3.02	3.21
Metals in mg/kg						
Arsenic	57	93	10 U	6 U	10 U	10 U
Cadmium	5.1	6.7	2.3	0.4	1.3	1.9
Chromium	260	270	49	15.1	25	42
Copper	390	390	37.8	7.9	18.9	31.9
Lead	450	530	14	2 U	8	9
Silver	6.1	6.1	0.8 U	0.4 U	0.6 U	0.8 U
Zinc	410	960	83	33	59	72
Mercury	0.41	0.59	0.13 J	0.05 UJ	0.09 J	0.1 UJ
PCBs in mg/kg OC						
Aroclor 1016			0.16 U	0.29 U	0.13 U	0.12 U
Aroclor 1221			0.16 U	0.29 U	0.13 U	0.12 U
Aroclor 1232			0.16 U	0.29 U	0.13 U	0.12 U
Aroclor 1242			0.16 U	0.29 U	0.13 U	0.12 U
Aroclor 1248			0.16 U	0.29 U	0.13 U	0.12 U
Aroclor 1254			0.16 U	0.29 U	0.13 U	0.12 U
Aroclor 1260			0.16 U	0.29 U	0.13 U	0.12 U
Aroclor 1262			0.16 U	0.29 U	0.13 U	0.12 U
Aroclor 1268			0.16 U	0.29 U	0.13 U	0.12 U
Total PCBs	12	65	0.16 U	0.29 U	0.13 U	0.12 U
PAHs in mg/kg OC						
Naphthalene	99	170	0.80 U	1.50 U	0.66 U	0.62 U
Acenaphthylene	66	66	0.80 U	1.50 U	0.66 U	0.62 U
Acenaphthene	16	57	0.80 U	1.50 U	0.66 U	0.62 U
Fluorene	23	79	0.80 U	1.50 U	0.66 U	0.62 U
Phenanthrene	100	480	0.80 U	1.50 U	0.40 T	0.62 U
Anthracene	220	1200	0.80 U	1.50 U	0.36 T	0.62 U
2-Methylnaphthalene	38	64	0.80 U	1.50 U	0.66 U	0.62 U
1-Methylnaphthalene			0.80 U	1.50 U	0.66 U	0.62 U
Total LPAHs	370	780	0.80 U	1.50 U	0.76 J	0.62 U
Fluoranthene	160	1200	0.84	1.50 U	0.86	0.50 T
Pyrene	1000	1400	0.84	1.50 U	0.99	0.56 T
Benzo(a)anthracene	110	270	0.40 T	1.50 U	0.76	0.31 T
Chrysene	110	460	0.52 T	1.50 U	1.99	0.50 T
Benzo(b)fluoranthene			0.56 T	1.50 U	0.89	0.40 T
Benzo(k)fluoranthene			0.48 T	1.50 U	0.93	0.40 T
Total Benzofluoranthenes	230	450	1.04 J	1.50 U	1.82	0.81 J
Benzo(a)pyrene	99	210	0.40 T	1.50 U	0.63 T	0.31 T
Indeno(1,2,3-cd)pyrene	34	88	0.80 U	1.50 U	0.66 U	0.62 U
Dibenz(a,h)anthracene	12	33	0.80 U	1.50 U	0.66 U	0.62 U
Benzo(g,h,i)perylene	31	78	0.80 U	1.50 U	0.36 T	0.62 U
Total HPAHs	960	5300	4.05 J	1.50 U	7.42 J	2.99 J
Chlorinated Benzenes in mg/kg OC						
1,2-Dichlorobenzene	2.3	2.3	0.80 U	1.50 U	0.66 U	0.62 U
1,3-Dichlorobenzene			0.80 U	1.50 U	0.66 U	0.62 U

Table 6 - Analytical Results for Sediment Samples - Compared to SMS Sediment Quality Criteria

Sample ID	SMS		PGSS-18	PGSS-21A	PGSS-21B	PGSS-22
Sampling Date	SQS	CSL	12/4/2008	12/4/2008	12/4/2008	12/4/2008
1,4-Dichlorobenzene	3.1	9	0.80 U	1.50 U	0.66 U	0.62 U
1,2,4-Trichlorobenzene	0.81	1.8	0.80 U	*1.50 U*	0.66 U	0.62 U
Hexachlorobenzene	0.38	2.3	*0.80 U*	*1.50 U*	*0.66 U*	*0.62 U*
Phthalate Esters in mg/kg OC						
Dimethylphthalate	53	53	0.80 U	1.50 U	0.66 U	0.62 U
Diethylphthalate	61	110	0.80 U	1.50 U	0.66 U	0.62 U
Di-n-Butylphthalate	220	1700	0.80 U	1.50 U	0.66 U	0.62 U
Butylbenzylphthalate	4.9	64	0.80 U	1.50 U	0.66 U	0.62 U
bis(2-Ethylhexyl)phthalate	47	78	0.80 U	1.50 U	0.66 U	0.62 U
Di-n-Octyl phthalate	58	4500	0.80 U	1.50 U	0.66 U	0.62 U
Miscellaneous Compounds in mg/kg OC						
Dibenzofuran	15	58	0.80 U	1.50 U	0.66 U	0.62 U
Hexachlorobutadiene	3.9	6.2	0.80 U	1.50 U	0.66 U	0.62 U
N-Nitrosodiphenylamine	11	11	0.80 U	1.50 U	0.66 U	0.62 U
Guaiacol			0.80 U	1.50 U	0.66 U	0.62 U
Retene			0.80 U	1.50 U	0.66 U	0.62 U
Ionizable Organic Compounds in ug/kg						
Phenol	420	1200	20 UJ	20 UJ	20 UJ	610
2-Methylphenol	63	63	20 U	20 U	20 U	20 U
4-Methylphenol	670	670	20 U	20 U	20 U	20 U
2,4-Dimethylphenol	29	29	20 U	20 U	20 U	20 U
Pentachlorophenol	360	690	99 U	98 U	99 U	98 U
Benzyl Alcohol	57	73	20 U	20 U	20 U	20 U
Benzoic Acid	650	650	200 U	200 U	200 U	200 U

Table 6 - Analytical Results for Sediment Samples - Compared to SMS Sediment Quality Criteria

Sample ID	SMS		PGSS-29	PGSS-29A (a)	PGSS-30 (a)	PGSS-31
Sampling Date	SQS	CSL	12/4/2008	12/4/2008	12/4/2008	12/5/2008
Total Organic Carbon in %			1.83	4.73	3.65	2.23
Metals in mg/kg						
Arsenic	57	93	7 U	10 U	10 U	10 U
Cadmium	5.1	6.7	0.6	1.8	1.7	1.5
Chromium	260	270	17.5	41	48	49
Copper	390	390	9.2	32	36.9	37.3
Lead	450	530	3	13	13	14
Silver	6.1	6.1	0.4 U	0.8 U	0.8 U	0.7 U
Zinc	410	960	39	94	93	91
Mercury	0.41	0.59	0.06 UJ	0.1 J	0.1 J	0.12 J
PCBs in mg/kg OC						
Aroclor 1016			0.21 U	0.08 U	0.11 U	0.17 U
Aroclor 1221			0.21 U	0.08 U	0.11 U	0.17 U
Aroclor 1232			0.21 U	0.08 U	0.11 U	0.17 U
Aroclor 1242			0.21 U	0.08 U	0.11 U	0.17 U
Aroclor 1248			0.21 U	0.08 U	0.11 U	0.17 U
Aroclor 1254			0.21 U	0.08 U	0.11 U	0.17 U
Aroclor 1260			0.21 U	0.08 U	0.11 U	0.17 U
Aroclor 1262			0.21 U	0.08 U	0.11 U	0.17 U
Aroclor 1268			0.21 U	0.08 U	0.11 U	0.17 U
Total PCBs	12	65	0.21 U	0.08 U	0.11 U	0.17 U
PAHs in mg/kg OC						
Naphthalene	99	170	1.04 U	0.42 U	0.55 U	0.90 U
Acenaphthylene	66	66	1.04 U	0.42 U	0.55 U	0.90 U
Acenaphthene	16	57	1.04 U	0.42 U	0.55 U	0.90 U
Fluorene	23	79	1.04 U	0.42 U	0.55 U	0.90 U
Phenanthrene	100	480	1.04 U	0.36 T	0.74	0.58 T
Anthracene	220	1200	1.04 U	0.42 U	0.27 T	0.90 U
2-Methylnaphthalene	38	64	1.04 U	0.42 U	0.55 U	0.90 U
1-Methylnaphthalene			1.04 U	0.42 U	0.55 U	0.90 U
Total LPAHs	370	780	1.04 U	0.36 J	1.01 J	0.58 J
Fluoranthene	160	1200	0.71 T	0.55	1.10	1.08
Pyrene	1000	1400	0.71 T	0.55	1.01	1.03
Benzo(a)anthracene	110	270	1.04 U	0.36 T	0.58	0.63 T
Chrysene	110	460	0.93 T	0.63	0.90	0.99
Benzo(b)fluoranthene			1.04 U	0.51	0.68	0.76 T
Benzo(k)fluoranthene			1.04 U	0.42 T	0.60	0.67 T
Total Benzofluoranthenes	230	450	1.04 U	0.93 J	1.29	1.43 J
Benzo(a)pyrene	99	210	1.04 U	0.38 T	0.58	0.63 T
Indeno(1,2,3-cd)pyrene	34	88	1.04 U	0.42 U	0.33 T	0.90 U
Dibenz(a,h)anthracene	12	33	1.04 U	0.42 U	0.55 U	0.90 U
Benzo(g,h,i)perylene	31	78	1.04 U	0.25 T	0.36 T	0.90 U
Total HPAHs	960	5300	2.35 J	3.66 J	6.14 J	5.78 J
Chlorinated Benzenes in mg/kg OC						
1,2-Dichlorobenzene	2.3	2.3	1.04 U	0.42 U	0.55 U	0.90 U
1,3-Dichlorobenzene			1.04 U	0.42 U	0.55 U	0.90 U

Table 6 - Analytical Results for Sediment Samples - Compared to SMS Sediment Quality Criteria

Sample ID Sampling Date	SMS SQS	 CSL	PGSS-29 12/4/2008	PGSS-29A (a) 12/4/2008	PGSS-30 (a) 12/4/2008	PGSS-31 12/5/2008
1,4-Dichlorobenzene	3.1	9	1.04 U	0.42 U	0.55 U	0.90 U
1,2,4-Trichlorobenzene	0.81	1.8	*1.04 U*	0.42 U	0.55 U	*0.90 U*
Hexachlorobenzene	0.38	2.3	*1.04 U*	*0.42 U*	*0.55 U*	*0.90 U*
Phthalate Esters in mg/kg OC						
Dimethylphthalate	53	53	1.04 U	0.42 U	0.55 U	0.90 U
Diethylphthalate	61	110	1.04 U	0.42 U	0.55 U	0.90 U
Di-n-Butylphthalate	220	1700	1.04 U	0.42 U	0.55 U	0.90 U
Butylbenzylphthalate	4.9	64	1.04 U	0.42 U	0.55 U	0.90 U
bis(2-Ethylhexyl)phthalate	47	78	1.04 U	0.42 U	0.55 U	0.90 U
Di-n-Octyl phthalate	58	4500	1.04 U	0.42 U	0.55 U	0.90 U
Miscellaneous Compounds in mg/kg OC						
Dibenzofuran	15	58	1.04 U	0.42 U	0.55 U	0.90 U
Hexachlorobutadiene	3.9	6.2	1.04 U	0.42 U	0.55 U	0.90 U
N-Nitrosodiphenylamine	11	11	1.04 U	0.42 U	0.55 U	0.90 U
Guaiacol			1.04 U	0.42 U	0.55 U	0.90 U
Retene			1.04 U	0.42 U	0.55 U	0.90 U
Ionizable Organic Compounds in ug/kg						
Phenol	420	1200	19 UJ	20 UJ	20 UJ	20 UJ
2-Methylphenol	63	63	19 U	20 U	20 U	20 U
4-Methylphenol	670	670	19 U	20 U	20 U	20 U
2,4-Dimethylphenol	29	29	19 U	20 U	20 U	20 U
Pentachlorophenol	360	690	97 U	99 U	99 U	98 U
Benzyl Alcohol	57	73	19 U	20 U	20 U	20 U
Benzoic Acid	650	650	190 U	200 U	200 U	200 U

Table 6 - Analytical Results for Sediment Samples - Compared to SMS Sediment Quality Criteria

Sample ID	SMS		PGSS-33	PGSS-35	PGSS-38	PGSS-38A
Sampling Date	SQS	CSL	12/5/2008	12/5/2008	12/5/2008	12/5/2008
Total Organic Carbon in %			2.41	2.52	2	3.4
Metals in mg/kg						
Arsenic	57	93	10 U	10 U	6 U	9 U
Cadmium	5.1	6.7	1.5	2.3	0.5	1
Chromium	260	270	49	45	16.5	32.7
Copper	390	390	38.2	36	8.8	21.7
Lead	450	530	12	11	3	8
Silver	6.1	6.1	0.7 U	0.8 U	0.4 U	0.5 U
Zinc	410	960	83	77	35	56
Mercury	0.41	0.59	0.12 J	0.1 J	0.05 UJ	0.08 J
PCBs in mg/kg OC						
Aroclor 1016			0.17 U	0.16 U	0.20 U	0.11 U
Aroclor 1221			0.17 U	0.16 U	0.20 U	0.11 U
Aroclor 1232			0.17 U	0.16 U	0.20 U	0.11 U
Aroclor 1242			0.17 U	0.16 U	0.20 U	0.11 U
Aroclor 1248			0.17 U	0.16 U	0.20 U	0.11 U
Aroclor 1254			0.17 U	0.16 U	0.20 U	0.47
Aroclor 1260			0.17 U	0.16 U	0.20 U	0.11 U
Aroclor 1262			0.17 U	0.16 U	0.20 U	0.11 U
Aroclor 1268			0.17 U	0.16 U	0.20 U	0.11 U
Total PCBs	12	65	0.17 U	0.16 U	0.20 U	0.47
PAHs in mg/kg OC						
Naphthalene	99	170	0.83 U	0.79 U	0.55 T	0.59 U
Acenaphthylene	66	66	0.83 U	0.79 U	1.00 U	0.59 U
Acenaphthene	16	57	0.83 U	0.79 U	1.00 U	0.59 U
Fluorene	23	79	0.83 U	0.79 U	1.00 U	0.59 U
Phenanthrene	100	480	1.37	0.79 U	1.00 U	0.59 U
Anthracene	220	1200	1.20	0.79 U	1.00 U	0.59 U
2-Methylnaphthalene	38	64	0.83 U	0.79 U	1.00 U	0.59 U
1-Methylnaphthalene			0.83 U	0.79 U	1.00 U	0.59 U
Total LPAHs	370	780	2.57	0.79 U	0.55 J	0.59 U
Fluoranthene	160	1200	1.33	1.15	0.80 T	0.38 T
Pyrene	1000	1400	1.08	0.91	0.80 T	0.35 T
Benzo(a)anthracene	110	270	0.87	0.56 T	1.00 U	0.59 U
Chrysene	110	460	1.58	0.79 T	1.00 U	0.41 T
Benzo(b)fluoranthene			1.08	0.71 T	1.00 U	0.59 U
Benzo(k)fluoranthene			0.95	0.63 T	1.00 U	0.59 U
Total Benzofluoranthenes	230	450	2.03	1.35 J	1.00 U	0.59 U
Benzo(a)pyrene	99	210	0.87	0.60 T	1.00 U	0.59 U
Indeno(1,2,3-cd)pyrene	34	88	0.41 T	0.79 U	1.00 U	0.59 U
Dibenz(a,h)anthracene	12	33	0.83 U	0.79 U	1.00 U	0.59 U
Benzo(g,h,i)perylene	31	78	0.50 T	0.79 U	1.00 U	0.59 U
Total HPAHs	960	5300	8.67 J	5.36 J	1.60 J	1.15 J
Chlorinated Benzenes in mg/kg OC						
1,2-Dichlorobenzene	2.3	2.3	0.83 U	0.79 U	1.00 U	0.59 U
1,3-Dichlorobenzene			0.83 U	0.79 U	1.00 U	0.59 U

Table 6 - Analytical Results for Sediment Samples - Compared to SMS Sediment Quality Criteria

Sample ID	SMS		PGSS-33	PGSS-35	PGSS-38	PGSS-38A
Sampling Date	SQS	CSL	12/5/2008	12/5/2008	12/5/2008	12/5/2008
1,4-Dichlorobenzene	3.1	9	0.83 U	0.79 U	1.00 U	0.59 U
1,2,4-Trichlorobenzene	0.81	1.8	*0.83 U*	0.79 U	*1.00 U*	0.59 U
Hexachlorobenzene	0.38	2.3	*0.83 U*	*0.79 U*	*1.00 U*	*0.59 U*
Phthalate Esters in mg/kg OC						
Dimethylphthalate	53	53	0.83 U	0.79 U	1.00 U	0.59 U
Diethylphthalate	61	110	0.83 U	0.79 U	1.00 U	0.59 U
Di-n-Butylphthalate	220	1700	0.83 U	0.79 U	1.00 U	0.59 U
Butylbenzylphthalate	4.9	64	0.83 U	0.79 U	1.00 U	0.59 U
bis(2-Ethylhexyl)phthalate	47	78	0.75 J	0.79 U	1.00 U	0.59 U
Di-n-Octyl phthalate	58	4500	0.83 U	0.79 U	1.00 U	0.59 U
Miscellaneous Compounds in mg/kg OC						
Dibenzofuran	15	58	0.83 U	0.79 U	1.00 U	0.59 U
Hexachlorobutadiene	3.9	6.2	0.83 U	0.79 U	1.00 U	0.59 U
N-Nitrosodiphenylamine	11	11	0.83 U	0.79 U	1.00 U	0.59 U
Guaiacol			0.83 U	0.79 U	1.00 U	0.59 U
Retene			0.83 U	0.79 U	1.00 U	0.59 U
Ionizable Organic Compounds in ug/kg						
Phenol	420	1200	20 UJ	20 UJ	20 UJ	20 UJ
2-Methylphenol	63	63	20 U	20 U	20 U	20 U
4-Methylphenol	670	670	20 U	20 U	20 U	20 U
2,4-Dimethylphenol	29	29	20 U	20 U	20 U	20 U
Pentachlorophenol	360	690	99 U	99 U	98 U	98 U
Benzyl Alcohol	57	73	20 UJ	20 UJ	20 U	20 U
Benzoic Acid	650	650	180 T	200 U	200 U	200 U

Table 6 - Analytical Results for Sediment Samples - Compared to SMS Sediment Quality Criteria

Sample ID	SMS		PGSS-39	PGSS-40	PGSS-42	PGSS-44
Sampling Date	SQS	CSL	12/5/2008	12/5/2008	12/5/2008	12/5/2008
Total Organic Carbon in %			2.98	2.99	2.11	2.67
Metals in mg/kg						
Arsenic	57	93	10 U	10 U	10 U	10 U
Cadmium	5.1	6.7	1.5	1.4	1.4	2
Chromium	260	270	46	45	46	46
Copper	390	390	35.4	34.4	34.6	34.8
Lead	450	530	13	13	13	13
Silver	6.1	6.1	0.8 U	0.7 U	0.7 U	0.7 U
Zinc	410	960	90	84	83	94
Mercury	0.41	0.59	0.1 J	0.11 J	0.11 J	0.11 J
PCBs in mg/kg OC						
Aroclor 1016			0.13 U	0.13 U	0.18 U	0.23 U
Aroclor 1221			0.13 U	0.13 U	0.18 U	0.23 U
Aroclor 1232			0.13 U	0.13 U	0.18 U	0.23 U
Aroclor 1242			0.13 U	0.13 U	0.18 U	0.23 U
Aroclor 1248			0.13 U	0.13 U	0.18 U	0.23 U
Aroclor 1254			0.13 U	0.13 U	0.18 U	0.16 T
Aroclor 1260			0.13 U	0.13 U	0.18 U	0.23 U
Aroclor 1262			0.13 U	0.13 U	0.18 U	0.23 U
Aroclor 1268			0.13 U	0.13 U	0.18 U	0.23 U
Total PCBs	12	65	0.13 U	0.13 U	0.18 U	0.16 J
PAHs in mg/kg OC						
Naphthalene	99	170	0.67 U	0.67 U	0.95 U	0.75 U
Acenaphthylene	66	66	0.67 U	0.67 U	0.95 U	0.75 U
Acenaphthene	16	57	0.67 U	0.67 U	0.95 U	0.75 U
Fluorene	23	79	0.67 U	0.67 U	0.95 U	0.75 U
Phenanthrene	100	480	0.47 T	0.67 U	0.95 U	0.75 U
Anthracene	220	1200	3.05	0.67 U	0.95 U	0.75 U
2-Methylnaphthalene	38	64	0.67 U	0.67 U	0.95 U	0.75 U
1-Methylnaphthalene			0.67 U	0.67 U	0.95 U	0.75 U
Total LPAHs	370	780	3.52 J	0.67 U	0.95 U	0.75 U
Fluoranthene	160	1200	0.77	0.43 T	0.76 T	0.49 T
Pyrene	1000	1400	0.67 T	0.37 T	0.62 T	0.45 T
Benzo(a)anthracene	110	270	0.57 T	0.43 T	0.95 U	0.75 U
Chrysene	110	460	4.70	0.64 T	0.47 T	0.75 U
Benzo(b)fluoranthene			0.67	0.43 T	0.95 U	0.75 U
Benzo(k)fluoranthene			0.47 T	0.40 T	0.95 U	0.75 U
Total Benzofluoranthenes	230	450	1.14 J	0.84 J	0.95 U	0.75 U
Benzo(a)pyrene	99	210	0.44 T	0.67 U	0.95 U	0.75 U
Indeno(1,2,3-cd)pyrene	34	88	0.67 U	0.67 U	0.95 U	0.75 U
Dibenz(a,h)anthracene	12	33	0.67 U	0.67 U	0.95 U	0.75 U
Benzo(g,h,i)perylene	31	78	0.67 U	0.67 U	0.95 U	0.75 U
Total HPAHs	960	5300	8.29 J	2.71 J	1.85 J	0.94 J
Chlorinated Benzenes in mg/kg OC						
1,2-Dichlorobenzene	2.3	2.3	0.67 U	0.67 U	0.95 U	0.75 U
1,3-Dichlorobenzene			0.67 U	0.67 U	0.95 U	0.75 U

Table 6 - Analytical Results for Sediment Samples - Compared to SMS Sediment Quality Criteria

Sample ID	SMS		PGSS-39	PGSS-40	PGSS-42	PGSS-44
Sampling Date	SQS	CSL	12/5/2008	12/5/2008	12/5/2008	12/5/2008
1,4-Dichlorobenzene	3.1	9	0.67 U	0.67 U	0.95 U	0.75 U
1,2,4-Trichlorobenzene	0.81	1.8	0.67 U	0.67 U	*0.95 U*	0.75 U
Hexachlorobenzene	0.38	2.3	*0.67 U*	*0.67 U*	*0.95 U*	*0.75 U*
Phthalate Esters in mg/kg OC						
Dimethylphthalate	53	53	0.67 U	0.67 U	0.95 U	0.75 U
Diethylphthalate	61	110	0.67 U	0.67 U	0.95 U	0.75 U
Di-n-Butylphthalate	220	1700	0.67 U	0.67 U	0.95 U	0.75 U
Butylbenzylphthalate	4.9	64	0.67 U	0.67 U	0.95 U	0.75 U
bis(2-Ethylhexyl)phthalate	47	78	0.67 U	0.67 U	0.52 T	0.75 U
Di-n-Octyl phthalate	58	4500	0.67 U	0.67 U	0.95 U	0.75 U
Miscellaneous Compounds in mg/kg OC						
Dibenzofuran	15	58	0.67 U	0.67 U	0.95 U	0.75 U
Hexachlorobutadiene	3.9	6.2	0.67 U	0.67 U	0.95 U	0.75 U
N-Nitrosodiphenylamine	11	11	0.67 U	0.67 U	0.95 U	0.75 U
Guaiacol			0.67 U	0.67 U	0.95 U	0.75 U
Retene			0.67 U	0.67 U	0.95 U	0.75 U
Ionizable Organic Compounds in ug/kg						
Phenol	420	1200	20 UJ	20 UJ	20 UJ	20 U
2-Methylphenol	63	63	20 U	20 U	20 U	20 U
4-Methylphenol	670	670	20 U	20 U	20 U	20 U
2,4-Dimethylphenol	29	29	20 U	20 U	20 U	20 U
Pentachlorophenol	360	690	99 U	99 U	98 U	99 U
Benzyl Alcohol	57	73	20 U	20 U	20 U	20 UJ
Benzoic Acid	650	650	200 U	200 U	200 U	200 UJ

Table 6 - Analytical Results for Sediment Samples - Compared to SMS Sediment Quality Criteria

Sample ID	SMS		PGSS-47	PGSS-47A	PGSS-51	PGSS-53
Sampling Date	SQS	CSL	12/8/2008	12/8/2008	12/8/2008	12/8/2008
Total Organic Carbon in %			2.39	1.84	2.24	2.5
Metals in mg/kg						
Arsenic	57	93	7 U	8 U	10 U	10 U
Cadmium	5.1	6.7	0.8	0.3 U	1.2	1.5
Chromium	260	270	19.6	7.3	34	40
Copper	390	390	11.5	5	25.5	29.1
Lead	450	530	5	3 U	8	10
Silver	6.1	6.1	0.4 U	0.5 U	0.6 U	0.6 U
Zinc	410	960	39	16	61	79
Mercury	0.41	0.59	0.06 UJ	0.06 J	0.1 UJ	0.09 J
PCBs in mg/kg OC						
Aroclor 1016			0.16 U	0.21 U	0.18 U	0.16 U
Aroclor 1221			0.16 U	0.21 U	0.18 U	0.16 U
Aroclor 1232			0.16 U	0.21 U	0.18 U	0.16 U
Aroclor 1242			0.16 U	0.21 U	0.18 U	0.16 U
Aroclor 1248			0.16 U	0.21 U	0.18 U	0.16 U
Aroclor 1254			0.16 U	0.21 U	0.18 U	0.16 U
Aroclor 1260			0.16 U	0.21 U	0.18 U	0.16 U
Aroclor 1262			0.16 U	0.21 U	0.18 U	0.16 U
Aroclor 1268			0.16 U	0.21 U	0.18 U	0.16 U
Total PCBs	12	65	0.16 U	0.21 U	0.18 U	0.16 U
PAHs in mg/kg OC						
Naphthalene	99	170	0.84 U	1.09 U	0.63 T	0.80 U
Acenaphthylene	66	66	0.84 U	1.09 U	0.89 U	0.80 U
Acenaphthene	16	57	0.84 U	1.09 U	0.89 U	0.80 U
Fluorene	23	79	0.84 U	1.09 U	0.89 U	0.80 U
Phenanthrene	100	480	0.84 U	0.60 T	1.43	0.56 T
Anthracene	220	1200	0.84 U	1.09 U	0.54 T	0.80 U
2-Methylnaphthalene	38	64	0.84 U	1.09 U	0.89 U	0.80 U
1-Methylnaphthalene			0.84 U	1.09 U	0.89 U	0.80 U
Total LPAHs	370	780	0.84 U	0.60 J	2.59	0.56 J
Fluoranthene	160	1200	0.50 T	0.98 T	2.10	0.84
Pyrene	1000	1400	0.46 T	0.82 T	2.14	0.72 T
Benzo(a)anthracene	110	270	0.84 U	1.09 U	1.12	0.56 T
Chrysene	110	460	0.50 T	0.98 T	1.79	0.84
Benzo(b)fluoranthene			0.84 U	1.09 U	1.16	0.56 T
Benzo(k)fluoranthene			0.84 U	0.54 T	1.07	0.64 T
Total Benzofluoranthenes	230	450	0.84 U	0.54 J	2.23	1.20 J
Benzo(a)pyrene	99	210	0.84 U	1.09 U	0.76 T	0.48 T
Indeno(1,2,3-cd)pyrene	34	88	0.84 U	1.09 U	0.44 T	0.80 U
Dibenz(a,h)anthracene	12	33	0.84 U	1.09 U	0.89 U	0.80 U
Benzo(g,h,i)perylene	31	78	0.84 U	1.09 U	0.54 T	0.80 U
Total HPAHs	960	5300	1.46 J	3.86 J	11.11 J	4.64 J
Chlorinated Benzenes in mg/kg OC						
1,2-Dichlorobenzene	2.3	2.3	0.84 U	1.09 U	0.89 U	0.80 U
1,3-Dichlorobenzene			0.84 U	1.09 U	0.89 U	0.80 U

Table 6 - Analytical Results for Sediment Samples - Compared to SMS Sediment Quality Criteria

Sample ID	SMS		PGSS-47	PGSS-47A	PGSS-51	PGSS-53
Sampling Date	SQS	CSL	12/8/2008	12/8/2008	12/8/2008	12/8/2008
1,4-Dichlorobenzene	3.1	9	0.84 U	1.09 U	0.89 U	0.80 U
1,2,4-Trichlorobenzene	0.81	1.8	*0.84 U*	*1.09 U*	*0.89 U*	0.80 U
Hexachlorobenzene	0.38	2.3	*0.84 U*	*1.09 U*	*0.89 U*	*0.80 U*
Phthalate Esters in mg/kg OC						
Dimethylphthalate	53	53	0.84 U	1.09 U	0.89 U	0.80 U
Diethylphthalate	61	110	0.84 U	1.09 U	0.89 U	0.80 U
Di-n-Butylphthalate	220	1700	0.84 U	1.09 U	0.89 U	0.80 U
Butylbenzylphthalate	4.9	64	0.84 U	1.09 U	0.89 U	0.80 U
bis(2-Ethylhexyl)phthalate	47	78	0.84 U	1.09 U	0.89 U	0.80 U
Di-n-Octyl phthalate	58	4500	0.84 U	1.09 U	0.89 U	0.80 U
Miscellaneous Compounds in mg/kg OC						
Dibenzofuran	15	58	0.84 U	1.09 U	0.89 U	0.80 U
Hexachlorobutadiene	3.9	6.2	0.84 U	1.09 U	0.89 U	0.80 U
N-Nitrosodiphenylamine	11	11	0.84 U	1.09 U	0.89 U	0.80 U
Guaiacol			0.84 U	1.09 U	0.89 U	0.80 U
Retene			0.84 U	1.09 U	0.89 U	0.80 U
Ionizable Organic Compounds in ug/kg						
Phenol	420	1200	20 U	20 U	280	20 U
2-Methylphenol	63	63	20 U	20 U	20 U	20 U
4-Methylphenol	670	670	20 U	20 U	18 T	20 U
2,4-Dimethylphenol	29	29	20 U	20 U	20 U	20 U
Pentachlorophenol	360	690	99 U	100 U	99 U	98 U
Benzyl Alcohol	57	73	20 UJ	20 UJ	20 U	20 UJ
Benzoic Acid	650	650	200 UJ	200 UJ	200 U	200 UJ

Table 6 - Analytical Results for Sediment Samples - Compared to SMS Sediment Quality Criteria

Sample ID	SMS		PGSS-54	PGSS-55	PGSS-56	PGSS-58
Sampling Date	SQS	CSL	12/8/2008	12/8/2008	12/8/2008	12/9/2008
Total Organic Carbon in %			1.78	0.878	1.64	3.14
Metals in mg/kg						
Arsenic	57	93	9 U	7 U	7 U	10 U
Cadmium	5.1	6.7	1.3	0.5	0.4	1.4
Chromium	260	270	34.7	20.2	16.6	41
Copper	390	390	25.6	10.4	9.4	32.9
Lead	450	530	9	3	3	12
Silver	6.1	6.1	0.6 U	0.4 U	0.4 U	0.8 U
Zinc	410	960	68	31	39	91
Mercury	0.41	0.59	0.09 J	0.05 UJ	0.05 UJ	0.1 J
PCBs in mg/kg OC						
Aroclor 1016			0.22 U	0.44 U	0.24 U	0.13 U
Aroclor 1221			0.22 U	0.44 U	0.24 U	0.38 U
Aroclor 1232			0.22 U	0.44 U	0.24 U	0.25 U
Aroclor 1242			0.22 U	0.44 U	0.24 U	0.13 U
Aroclor 1248			0.22 U	0.44 U	0.24 U	0.13 U
Aroclor 1254			0.22 U	0.44 U	0.24 U	0.13 U
Aroclor 1260			0.22 U	0.44 U	0.24 U	0.13 U
Aroclor 1262			0.22 U	0.44 U	0.24 U	0.13 U
Aroclor 1268			0.22 U	0.44 U	0.24 U	0.13 U
Total PCBs	12	65	0.22 U	0.44 U	0.24 U	0.38 U
PAHs in mg/kg OC						
Naphthalene	99	170	1.12 U	2.16 U	1.22 U	1.27 U
Acenaphthylene	66	66	1.12 U	2.16 U	1.22 U	1.27 U
Acenaphthene	16	57	1.12 U	2.16 U	1.22 U	1.27 U
Fluorene	23	79	1.12 U	2.16 U	1.22 U	1.27 U
Phenanthrene	100	480	0.62 T	2.16 U	1.22 U	1.27 U
Anthracene	220	1200	1.12 U	2.16 U	1.22 U	1.27 U
2-Methylnaphthalene	38	64	1.12 U	2.16 U	1.22 U	1.27 U
1-Methylnaphthalene			1.12 U	2.16 U	1.22 U	1.27 U
Total LPAHs	370	780	0.62 J	2.16 U	1.22 U	1.27 U
Fluoranthene	160	1200	1.01 T	1.10 T	1.16 T	0.80 T
Pyrene	1000	1400	0.84 T	2.16 U	0.79 T	1.27 U
Benzo(a)anthracene	110	270	1.12 U	2.16 U	1.22 U	1.27 U
Chrysene	110	460	0.84 T	2.16 U	0.79 T	0.86 T
Benzo(b)fluoranthene			0.56 T	2.16 U	0.61 T	1.27 U
Benzo(k)fluoranthene			0.56 T	2.16 U	0.73 T	1.27 U
Total Benzofluoranthenes	230	450	1.12 J	2.16 U	1.34 J	1.27 U
Benzo(a)pyrene	99	210	1.12 U	2.16 U	1.22 U	1.27 U
Indeno(1,2,3-cd)pyrene	34	88	1.12 U	2.16 U	1.22 U	1.27 U
Dibenz(a,h)anthracene	12	33	1.12 U	2.16 U	1.22 U	1.27 U
Benzo(g,h,i)perylene	31	78	1.12 U	2.16 U	1.22 U	1.27 U
Total HPAHs	960	5300	3.82 J	1.10 J	4.09 J	1.66 J
Chlorinated Benzenes in mg/kg OC						
1,2-Dichlorobenzene	2.3	2.3	1.12 U	2.16 U	1.22 U	1.27 U
1,3-Dichlorobenzene			1.12 U	2.16 U	1.22 U	1.27 U

Table 6 - Analytical Results for Sediment Samples - Compared to SMS Sediment Quality Criteria

Sample ID	SMS		PGSS-54	PGSS-55	PGSS-56	PGSS-58
Sampling Date	SQS	CSL	12/8/2008	12/8/2008	12/8/2008	12/9/2008
1,4-Dichlorobenzene	3.1	9	1.12 U	2.16 U	1.22 U	1.27 U
1,2,4-Trichlorobenzene	0.81	1.8	*1.12 U*	*2.16 U*	*1.22 U*	*1.27 U*
Hexachlorobenzene	0.38	2.3	*1.12 U*	*2.16 U*	*1.22 U*	*1.27 U*
Phthalate Esters in mg/kg OC						
Dimethylphthalate	53	53	1.12 U	2.16 U	1.22 U	1.27 U
Diethylphthalate	61	110	1.12 U	2.16 U	1.22 U	1.27 U
Di-n-Butylphthalate	220	1700	1.12 U	2.16 U	1.22 U	1.27 U
Butylbenzylphthalate	4.9	64	1.12 U	2.16 U	1.22 U	1.27 U
bis(2-Ethylhexyl)phthalate	47	78	1.12 U	2.16 U	0.73 T	1.27 U
Di-n-Octyl phthalate	58	4500	1.12 U	2.16 U	1.22 U	1.27 U
Miscellaneous Compounds in mg/kg OC						
Dibenzofuran	15	58	1.12 U	2.16 U	1.22 U	1.27 U
Hexachlorobutadiene	3.9	6.2	1.12 U	2.16 U	1.22 U	1.27 U
N-Nitrosodiphenylamine	11	11	1.12 U	2.16 U	1.22 U	1.27 U
Guaiacol			1.12 U	2.16 U	1.22 U	1.27 U
Retene			1.12 U	2.16 U	1.22 U	1.27 U
Ionizable Organic Compounds in ug/kg						
Phenol	420	1200	20 U	88 J	140 J	520 J
2-Methylphenol	63	63	20 U	19 U	20 U	40 U
4-Methylphenol	670	670	20 U	19 U	20 U	40 U
2,4-Dimethylphenol	29	29	20 U	19 U	20 U	40 U
Pentachlorophenol	360	690	98 U	95 U	98 U	200 U
Benzyl Alcohol	57	73	20 UJ	19 U	20 U	40 U
Benzoic Acid	650	650	200 UJ	190 U	200 U	400 U

Table 6 - Analytical Results for Sediment Samples - Compared to SMS Sediment Quality Criteria

Sample ID	SMS		PGSS-62A	PGSS-62B	PGSS-63	PGSS-64
Sampling Date	SQS	CSL	12/9/2008	12/9/2008	12/9/2008	12/9/2008
Total Organic Carbon in %			1.07	1.31	1.99	2.36
Metals in mg/kg						
Arsenic	57	93	6 U	7 U	7 U	7 U
Cadmium	5.1	6.7	0.3 U	0.7	0.4	0.6
Chromium	260	270	22.1	19.9	27.2	22.5
Copper	390	390	13.3	11.7	14.6	12.6
Lead	450	530	3	4	5	4
Silver	6.1	6.1	0.4 U	0.4 U	0.4 U	0.4 U
Zinc	410	960	49	45	50	37
Mercury	0.41	0.59	0.05 UJ	0.05 J	0.06 UJ	0.05 UJ
PCBs in mg/kg OC						
Aroclor 1016			0.36 U	0.30 U	0.20 U	0.17 U
Aroclor 1221			0.36 U	0.30 U	0.20 U	0.17 U
Aroclor 1232			0.36 U	0.30 U	0.20 U	0.17 U
Aroclor 1242			0.36 U	0.30 U	0.20 U	0.17 U
Aroclor 1248			0.36 U	0.30 U	0.20 U	0.17 U
Aroclor 1254			0.36 U	0.30 U	0.20 U	0.17 U
Aroclor 1260			0.36 U	0.30 U	0.20 U	0.17 U
Aroclor 1262			0.36 U	0.30 U	0.20 U	0.17 U
Aroclor 1268			0.36 U	0.30 U	0.20 U	0.17 U
Total PCBs	12	65	0.36 U	0.30 U	0.20 U	0.17 U
PAHs in mg/kg OC						
Naphthalene	99	170	3.64 U	1.53 U	1.01 U	0.76 T
Acenaphthylene	66	66	3.64 U	1.53 U	1.01 U	0.85 U
Acenaphthene	16	57	3.64 U	1.53 U	1.01 U	0.85 U
Fluorene	23	79	3.64 U	1.53 U	1.01 U	0.85 U
Phenanthrene	100	480	3.64 U	1.53 U	0.75 T	0.55 T
Anthracene	220	1200	3.64 U	1.53 U	1.01 U	0.85 U
2-Methylnaphthalene	38	64	3.64 U	1.53 U	1.01 U	0.85 U
1-Methylnaphthalene			3.64 U	1.53 U	1.01 U	0.85 U
Total LPAHs	370	780	3.64 U	1.53 U	0.75 J	1.31 J
Fluoranthene	160	1200	3.64 U	1.76	1.81	0.81 T
Pyrene	1000	1400	3.64 U	0.99 T	1.11	0.76 T
Benzo(a)anthracene	110	270	3.64 U	1.53 U	0.90 T	0.42 T
Chrysene	110	460	3.64 U	0.84 T	1.66	0.68 T
Benzo(b)fluoranthene			3.64 U	0.84 T	1.06	0.51 T
Benzo(k)fluoranthene			3.64 U	1.53 U	0.85 T	0.47 T
Total Benzofluoranthenes	230	450	3.64 U	0.84 J	1.91 J	0.97 J
Benzo(a)pyrene	99	210	3.64 U	1.53 U	0.75 T	0.42 T
Indeno(1,2,3-cd)pyrene	34	88	3.64 U	1.53 U	1.01 U	0.85 U
Dibenz(a,h)anthracene	12	33	3.64 U	1.53 U	1.01 U	0.85 U
Benzo(g,h,i)perylene	31	78	3.64 U	1.53 U	1.01 U	0.85 U
Total HPAHs	960	5300	3.64 U	4.43 J	8.14 J	4.06 J
Chlorinated Benzenes in mg/kg OC						
1,2-Dichlorobenzene	2.3	2.3	*3.64 U*	1.53 U	1.01 U	0.85 U
1,3-Dichlorobenzene			3.64 U	1.53 U	1.01 U	0.85 U

Table 6 - Analytical Results for Sediment Samples - Compared to SMS Sediment Quality Criteria

Sample ID	SMS		PGSS-62A	PGSS-62B	PGSS-63	PGSS-64
Sampling Date	SQS	CSL	12/9/2008	12/9/2008	12/9/2008	12/9/2008
1,4-Dichlorobenzene	3.1	9	*3.64 U*	1.53 U	1.01 U	0.85 U
1,2,4-Trichlorobenzene	0.81	1.8	*3.64 U*	*1.53 U*	*1.01 U*	*0.85 U*
Hexachlorobenzene	0.38	2.3	*3.64 U*	*1.53 U*	*1.01 U*	*0.85 U*
Phthalate Esters in mg/kg OC						
Dimethylphthalate	53	53	3.64 U	1.53 U	1.01 U	0.85 U
Diethylphthalate	61	110	3.64 U	1.53 U	1.01 U	0.85 U
Di-n-Butylphthalate	220	1700	3.64 U	1.53 U	1.01 U	0.85 U
Butylbenzylphthalate	4.9	64	3.64 U	1.53 U	1.01 U	0.85 U
bis(2-Ethylhexyl)phthalate	47	78	3.64 U	1.53 U	1.01 U	0.85 U
Di-n-Octyl phthalate	58	4500	3.64 U	1.53 U	1.01 U	0.85 U
Miscellaneous Compounds in mg/kg OC						
Dibenzofuran	15	58	3.64 U	1.53 U	1.01 U	0.85 U
Hexachlorobutadiene	3.9	6.2	3.64 U	1.53 U	1.01 U	0.85 U
N-Nitrosodiphenylamine	11	11	3.64 U	1.53 U	1.01 U	0.85 U
Guaiacol			3.64 U	1.53 U	1.01 U	0.85 U
Retene			4.95	1.53 U	1.01 U	0.85 U
Ionizable Organic Compounds in ug/kg						
Phenol	420	1200	240 J	82 J	170 J	42
2-Methylphenol	63	63	39 U	20 U	20 U	20 U
4-Methylphenol	670	670	66	20 U	20 U	20 U
2,4-Dimethylphenol	29	29	39 U	20 U	20 U	20 U
Pentachlorophenol	360	690	200 U	98 U	98 U	97 U
Benzyl Alcohol	57	73	39 UJ	20 U	20 U	20 U
Benzoic Acid	650	650	390 U	200 U	200 U	200 U

Table 6 - Analytical Results for Sediment Samples - Compared to SMS Sediment Quality Criteria

Sample ID	SMS		PGSS-69	PGSS-70	PGSS-73	PGSS-75 (a)
Sampling Date	SQS	CSL	12/9/2008	12/9/2008	12/9/2008	12/9/2008
Total Organic Carbon in %			0.955	1.54	0.998	0.475
Metals in mg/kg						
Arsenic	57	93	6 U	7 U	6 U	6 U
Cadmium	5.1	6.7	0.6	0.4	0.3	0.2 U
Chromium	260	270	16.2	20.3	16.2	11.2
Copper	390	390	8.3	11	6.8	3.4
Lead	450	530	3 U	6	2 U	2 U
Silver	6.1	6.1	0.4 U	0.4 U	0.4 U	0.4 U
Zinc	410	960	38	47	28	17
Mercury	0.41	0.59	0.05 UJ	0.06 UJ	0.05 UJ	0.05 UJ
PCBs in mg/kg OC						
Aroclor 1016			0.40 U	0.25 U	0.39 U	0.82 U
Aroclor 1221			0.40 U	0.25 U	0.39 U	0.82 U
Aroclor 1232			0.40 U	0.25 U	0.39 U	0.82 U
Aroclor 1242			0.40 U	0.25 U	0.39 U	0.82 U
Aroclor 1248			0.40 U	0.25 U	0.39 U	0.82 U
Aroclor 1254			0.40 U	0.25 U	0.39 U	0.82 U
Aroclor 1260			0.40 U	0.25 U	0.39 U	0.82 U
Aroclor 1262			0.40 U	0.25 U	0.39 U	0.82 U
Aroclor 1268			0.40 U	0.25 U	0.39 U	0.82 U
Total PCBs	12	65	0.40 U	0.25 U	0.39 U	0.82 U
PAHs in mg/kg OC						
Naphthalene	99	170	1.99 U	1.30 U	2.00 U	4.21 U
Acenaphthylene	66	66	1.99 U	1.30 U	2.00 U	4.21 U
Acenaphthene	16	57	1.99 U	1.30 U	2.00 U	4.21 U
Fluorene	23	79	1.99 U	1.30 U	2.00 U	4.21 U
Phenanthrene	100	480	1.99 U	3.51	2.00 U	4.21 U
Anthracene	220	1200	1.99 U	1.36	2.00 U	4.21 U
2-Methylnaphthalene	38	64	1.99 U	1.30 U	2.00 U	4.21 U
1-Methylnaphthalene			1.99 U	1.30 U	2.00 U	4.21 U
Total LPAHs	370	780	1.99 U	4.87	2.00 U	4.21 U
Fluoranthene	160	1200	1.99 U	8.44	2.00 U	4.21 U
Pyrene	1000	1400	1.99 U	4.81	2.00 U	4.21 U
Benzo(a)anthracene	110	270	1.99 U	3.38	2.00 U	4.21 U
Chrysene	110	460	1.99 U	4.16	2.00 U	4.21 U
Benzo(b)fluoranthene			1.99 U	3.12	2.00 U	4.21 U
Benzo(k)fluoranthene			1.99 U	3.70	2.00 U	4.21 U
Total Benzofluoranthenes	230	450	1.99 U	6.82	2.00 U	4.21 U
Benzo(a)pyrene	99	210	1.99 U	2.73	2.00 U	4.21 U
Indeno(1,2,3-cd)pyrene	34	88	1.99 U	0.71 T	2.00 U	4.21 U
Dibenz(a,h)anthracene	12	33	1.99 U	1.30 U	2.00 U	4.21 U
Benzo(g,h,i)perylene	31	78	1.99 U	0.65 T	2.00 U	4.21 U
Total HPAHs	960	5300	1.99 U	31.69 J	2.00 U	4.21 U
Chlorinated Benzenes in mg/kg OC						
1,2-Dichlorobenzene	2.3	2.3	1.99 U	1.30 U	2.00 U	*4.21 U*
1,3-Dichlorobenzene			1.99 U	1.30 U	2.00 U	4.21 U

Table 6 - Analytical Results for Sediment Samples - Compared to SMS Sediment Quality Criteria

Sample ID	SMS		PGSS-69	PGSS-70	PGSS-73	PGSS-75 (a)
Sampling Date	SQS	CSL	12/9/2008	12/9/2008	12/9/2008	12/9/2008
1,4-Dichlorobenzene	3.1	9	1.99 U	1.30 U	2.00 U	*4.21 U*
1,2,4-Trichlorobenzene	0.81	1.8	*1.99 U*	*1.30 U*	*2.00 U*	*4.21 U*
Hexachlorobenzene	0.38	2.3	*1.99 U*	*1.30 U*	*2.00 U*	*4.21 U*
Phthalate Esters in mg/kg OC						
Dimethylphthalate	53	53	1.99 U	1.30 U	2.00 U	4.21 U
Diethylphthalate	61	110	1.99 U	1.30 U	2.00 U	4.21 U
Di-n-Butylphthalate	220	1700	1.99 U	1.30 U	2.00 U	4.21 U
Butylbenzylphthalate	4.9	64	1.99 U	1.30 U	2.00 U	4.21 U
bis(2-Ethylhexyl)phthalate	47	78	1.99 U	1.30 U	2.00 U	4.21 U
Di-n-Octyl phthalate	58	4500	1.99 U	1.30 U	2.00 U	4.21 U
Miscellaneous Compounds in mg/kg OC						
Dibenzofuran	15	58	1.99 U	1.30 U	2.00 U	4.21 U
Hexachlorobutadiene	3.9	6.2	1.99 U	1.30 U	2.00 U	*4.21 U*
N-Nitrosodiphenylamine	11	11	1.99 U	1.30 U	2.00 U	4.21 U
Guaiacol			1.99 U	1.30 U	2.00 U	4.21 U
Retene			1.99 U	1.30 U	11.02	4.21 U
Ionizable Organic Compounds in ug/kg						
Phenol	420	1200	110 J	71 J	20 U	25
2-Methylphenol	63	63	19 U	20 U	20 U	20 U
4-Methylphenol	670	670	19 U	20 U	20 U	20 U
2,4-Dimethylphenol	29	29	19 U	20 U	20 U	20 U
Pentachlorophenol	360	690	97 U	98 U	99 U	99 U
Benzyl Alcohol	57	73	19 U	20 U	20 U	20 U
Benzoic Acid	650	650	190 U	200 U	200 U	120 T

Table 6 - Analytical Results for Sediment Samples - Compared to SMS Sediment Quality Criteria

Sample ID	SMS		PGSS-77	PGSS-77A	PGSS-80 (a)	PGSS-83
Sampling Date	SQS	CSL	12/9/2008	12/9/2008	12/10/2008	12/10/2008
Total Organic Carbon in %			1.88	2.38	0.285	1.87
Metals in mg/kg						
Arsenic	57	93	7 U	6 U	6 U	6 U
Cadmium	5.1	6.7	0.5	0.5	0.2 U	0.3
Chromium	260	270	22.1	22.7	20.1	21.4
Copper	390	390	12.9	12.8	7	11.5
Lead	450	530	5	4	2 U	3
Silver	6.1	6.1	0.4 U	0.4 U	0.3 U	0.4 U
Zinc	410	960	42	39	26	46
Mercury	0.41	0.59	0.05 J	0.05 UJ	0.06 UJ	0.06 UJ
PCBs in mg/kg OC						
Aroclor 1016			0.21 U	0.17 U	1.37 U	0.21 U
Aroclor 1221			0.21 U	0.17 U	1.37 U	0.21 U
Aroclor 1232			0.21 U	0.17 U	1.37 U	0.21 U
Aroclor 1242			0.21 U	0.17 U	1.37 U	0.21 U
Aroclor 1248			0.21 U	0.17 U	1.37 U	0.21 U
Aroclor 1254			0.21 U	0.17 U	1.37 U	0.21 U
Aroclor 1260			0.21 U	0.17 U	1.37 U	0.21 U
Aroclor 1262			0.21 U	0.17 U	1.37 U	0.21 U
Aroclor 1268			0.21 U	0.17 U	1.37 U	0.21 U
Total PCBs	12	65	0.21 U	0.17 U	1.37 U	0.21 U
PAHs in mg/kg OC						
Naphthalene	99	170	1.06 U	1.55	7.02 U	1.02 U
Acenaphthylene	66	66	1.06 U	0.84 U	7.02 U	1.02 U
Acenaphthene	16	57	1.06 U	0.84 U	7.02 U	1.02 U
Fluorene	23	79	1.06 U	0.84 U	7.02 U	1.02 U
Phenanthrene	100	480	0.80 T	2.06	7.02 U	1.02
Anthracene	220	1200	1.06 U	0.76 T	7.02 U	1.02 U
2-Methylnaphthalene	38	64	1.06 U	0.84 U	7.02 U	1.02 U
1-Methylnaphthalene			1.06 U	0.84 U	7.02 U	1.02 U
Total LPAHs	370	780	0.80 J	4.37 J	7.02 U	1.02
Fluoranthene	160	1200	2.13	2.23	7.02 U	3.10
Pyrene	1000	1400	1.38	2.27	7.02 U	1.71
Benzo(a)anthracene	110	270	0.85 T	1.22	7.02 U	0.91 T
Chrysene	110	460	1.65	1.68	7.02 U	2.25
Benzo(b)fluoranthene			1.81	1.60	7.02 U	1.23
Benzo(k)fluoranthene			1.38	0.92	7.02 U	1.07
Total Benzofluoranthenes	230	450	3.19	2.52	7.02 U	2.30
Benzo(a)pyrene	99	210	1.17	0.92	7.02 U	0.70 T
Indeno(1,2,3-cd)pyrene	34	88	1.06 U	0.55 T	7.02 U	1.02 U
Dibenz(a,h)anthracene	12	33	1.06 U	0.84 U	7.02 U	1.02 U
Benzo(g,h,i)perylene	31	78	1.06 U	0.76 T	7.02 U	1.02 U
Total HPAHs	960	5300	10.37 J	12.14 J	7.02 U	10.96 J
Chlorinated Benzenes in mg/kg OC						
1,2-Dichlorobenzene	2.3	2.3	1.06 U	0.84 U	7.02 U	1.02 U
1,3-Dichlorobenzene			1.06 U	0.84 U	7.02 U	1.02 U

Table 6 - Analytical Results for Sediment Samples - Compared to SMS Sediment Quality Criteria

Sample ID	SMS		PGSS-77	PGSS-77A	PGSS-80 (a)	PGSS-83
Sampling Date	SQS	CSL	12/9/2008	12/9/2008	12/10/2008	12/10/2008
1,4-Dichlorobenzene	3.1	9	1.06 U	0.84 U	*7.02 U*	1.02 U
1,2,4-Trichlorobenzene	0.81	1.8	*1.06 U*	*0.84 U*	*7.02 U*	*1.02 U*
Hexachlorobenzene	0.38	2.3	*1.06 U*	*0.84 U*	*7.02 U*	*1.02 U*
Phthalate Esters in mg/kg OC						
Dimethylphthalate	53	53	1.06 U	0.84 U	7.02 U	1.02 U
Diethylphthalate	61	110	1.06 U	0.84 U	7.02 U	1.02 U
Di-n-Butylphthalate	220	1700	1.06 U	0.84 U	7.02 U	1.02 U
Butylbenzylphthalate	4.9	64	1.06 U	0.84 U	7.02 U	1.02 U
bis(2-Ethylhexyl)phthalate	47	78	1.06 U	0.84 U	7.02 U	1.02 U
Di-n-Octyl phthalate	58	4500	1.06 U	0.84 U	7.02 U	1.02 U
Miscellaneous Compounds in mg/kg OC						
Dibenzofuran	15	58	1.06 U	0.84 U	7.02 U	1.02 U
Hexachlorobutadiene	3.9	6.2	1.06 U	0.84 U	*7.02 U*	1.02 U
N-Nitrosodiphenylamine	11	11	1.06 U	0.84 U	7.02 U	1.02 U
Guaiacol			1.06 U	0.84 U	7.02 U	1.02 U
Retene			1.06 U	0.59	7.02 U	1.02 U
Ionizable Organic Compounds in ug/kg						
Phenol	420	1200	220 J	110	31	36 J
2-Methylphenol	63	63	20 U	20 U	20 U	19 U
4-Methylphenol	670	670	70	20 U	20 U	19 U
2,4-Dimethylphenol	29	29	20 U	20 U	20 U	19 U
Pentachlorophenol	360	690	98 U	99 U	99 U	97 U
Benzyl Alcohol	57	73	20 U	20 U	20 U	19 U
Benzoic Acid	650	650	200 U	200 U	200 U	190 U

Table 6 - Analytical Results for Sediment Samples - Compared to SMS Sediment Quality Criteria

Sample ID	SMS		PGSS-92	PGSS-GEO-3
Sampling Date	SQS	CSL	12/10/2008	12/10/2008
Total Organic Carbon in %			3.01	1.78
Metals in mg/kg				
Arsenic	57	93	8 U	7 U
Cadmium	5.1	6.7	0.7	0.3 U
Chromium	260	270	25.9	16.8
Copper	390	390	22.1	5.9
Lead	450	530	6	3 U
Silver	6.1	6.1	0.5 U	0.4 U
Zinc	410	960	49	28
Mercury	0.41	0.59	0.07 UJ	0.06 UJ
PCBs in mg/kg OC				
Aroclor 1016			0.13 U	0.22 U
Aroclor 1221			0.13 U	0.22 U
Aroclor 1232			0.13 U	0.22 U
Aroclor 1242			0.13 U	0.22 U
Aroclor 1248			0.13 U	0.22 U
Aroclor 1254			0.13 U	0.22 U
Aroclor 1260			0.13 U	0.22 U
Aroclor 1262			0.13 U	
Aroclor 1268			0.13 U	
Total PCBs	12	65	0.13 U	0.22 U
PAHs in mg/kg OC				
Naphthalene	99	170	0.66 U	1.12 U
Acenaphthylene	66	66	0.66 U	1.12 U
Acenaphthene	16	57	0.66 U	1.12 U
Fluorene	23	79	0.66 U	1.12 U
Phenanthrene	100	480	1.00	1.46
Anthracene	220	1200	0.66 U	1.12 U
2-Methylnaphthalene	38	64	0.66 U	1.12 U
1-Methylnaphthalene			0.66 U	1.12 U
Total LPAHs	370	780	1.00	1.46
Fluoranthene	160	1200	1.00	1.91
Pyrene	1000	1400	1.16	2.36
Benzo(a)anthracene	110	270	0.40 T	0.67 T
Chrysene	110	460	0.40 T	0.84 T
Benzo(b)fluoranthene			0.66 U	0.62 T
Benzo(k)fluoranthene			0.66 U	0.67 T
Total Benzofluoranthenes	230	450	0.66 U	1.29 J
Benzo(a)pyrene	99	210	0.37 T	0.73 T
Indeno(1,2,3-cd)pyrene	34	88	0.66 U	1.12 U
Dibenz(a,h)anthracene	12	33	0.66 U	1.12 U
Benzo(g,h,i)perylene	31	78	0.66 U	1.12 U
Total HPAHs	960	5300	3.32 J	7.81 J
Chlorinated Benzenes in mg/kg OC				
1,2-Dichlorobenzene	2.3	2.3	0.66 U	1.12 U
1,3-Dichlorobenzene			0.66 U	1.12 U

Table 6 - Analytical Results for Sediment Samples - Compared to SMS Sediment Quality Criteria

Sample ID	SMS		PGSS-92	PGSS-GEO-3
Sampling Date	SQS	CSL	12/10/2008	12/10/2008
1,4-Dichlorobenzene	3.1	9	0.66 U	1.12 U
1,2,4-Trichlorobenzene	0.81	1.8	0.66 U	*1.12 U*
Hexachlorobenzene	0.38	2.3	*0.66 U*	*1.12 U*
Phthalate Esters in mg/kg OC				
Dimethylphthalate	53	53	0.66 U	1.12 U
Diethylphthalate	61	110	0.66 U	1.12 U
Di-n-Butylphthalate	220	1700	0.66 U	1.12 U
Butylbenzylphthalate	4.9	64	0.66 U	1.12 U
bis(2-Ethylhexyl)phthalate	47	78	0.66 U	1.12 U
Di-n-Octyl phthalate	58	4500	0.66 U	1.12 U
Miscellaneous Compounds in mg/kg OC				
Dibenzofuran	15	58	0.66 U	1.12 U
Hexachlorobutadiene	3.9	6.2	0.66 U	1.12 U
N-Nitrosodiphenylamine	11	11	0.66 U	1.12 U
Guaiacol			0.66 U	1.12 U
Retene			0.66 U	1.12 U
Ionizable Organic Compounds in ug/kg				
Phenol	420	1200	42	20 U
2-Methylphenol	63	63	20 U	20 U
4-Methylphenol	670	670	20 U	20 U
2,4-Dimethylphenol	29	29	20 U	20 U
Pentachlorophenol	360	690	99 U	100 U
Benzyl Alcohol	57	73	20 U	20 U
Benzoic Acid	650	650	200 U	200 U

(a) TOC concentration outside of range (0.5 to 3.5%) for OC normalization.

Table 7 - Analytical Results and TCDD TEQs for Sediment Samples

Sample ID	PGSS-8	PGSS-22	PGSS-51	PGSS-64	PGSS-73	PGSS-75	PGSS-77A
Sampling Date	12/04/2008	12/04/2008	12/08/2008	12/09/2008	12/09/2008	12/09/2008	12/09/2008
SDG	G1040-3	G1040-3	G1040-2	G1040-2	G1040-2	G1040-2	G1040-1
Dioxins in ng/kg							
2,3,7,8-TCDD	0.144 U	0.155 U	0.115 U	0.108 U	0.104 U	0.104 U	0.108 U
1,2,3,7,8-PeCDD	1.31 T	0.36 U	0.267 U	0.251 U	0.242 U	0.242 U	0.251 U
1,2,3,4,7,8-HxCDD	0.494 U	0.529 U	0.392 U	0.369 U	0.356 U	0.356 U	0.369 U
1,2,3,6,7,8-HxCDD	1.09 T	1.32 T	0.413 U	0.97 T	0.376 U	0.376 U	0.837 T
1,2,3,7,8,9-HxCDD	0.286 U	0.83 T	1.41 T	0.213 U	0.206 U	0.206 U	0.214 U
1,2,3,4,6,7,8-HpCDD	9.5	23.8	48.3	16.4	5.85	3.03 J	20.1
OCDD	70.6	223	449	135	48.5	22.8	199
2,3,7,8-TCDF	0.137 U	1.16 T	1.86	1.05	0.334 T	0.099 U	0.862 T
1,2,3,7,8-PeCDF	0.387 U	0.46 T	0.657 T	0.419 T	0.279 U	0.279 U	0.294 T
2,3,4,7,8-PeCDF	0.317 U	0.58 T	0.972 T	0.508 T	0.228 U	0.228 U	0.237 U
1,2,3,4,7,8-HxCDF	0.696 U	0.746 U	0.582 T	0.52 U	0.502 U	0.502 U	0.52 U
1,2,3,6,7,8-HxCDF	0.167 U	0.179 U	0.132 U	0.125 U	0.12 U	0.12 U	0.125 U
1,2,3,7,8,9-HxCDF	0.321 U	0.344 U	0.255 U	0.24 U	0.232 U	0.232 U	0.24 U
2,3,4,6,7,8-HxCDF	0.379 U	0.407 U	0.612 T	0.283 U	0.274 U	0.274 U	0.284 U
1,2,3,4,6,7,8-HpCDF	2.22 T	3.08 T	5.7	2.44 T	1.12 T	4.51	2.51 T
1,2,3,4,7,8,9-HpCDF	0.72 U	0.771 U	0.571 U	0.538 U	0.519 U	0.519 U	0.538 U
OCDF	5.35 T	6.95 T	13.8	5.49 T	2.38 T	13	6.8 T
Total TCDD	6.51	23.7	24	8.74	4.32	0.392 T	23.7
Total PeCDD	12.4 J	15.7 J	15.7 J	6.37 J	3.17 JT	0.332 JT	9.83
Total HxCDD	13.3	24.2	37.4	14.5	5.35	1.79 T	16.2
Total HpCDD	34.1	134	286	80	27.2	13	126
Total TCDF	2.38 J	13.6 J	28.8 J	16.7 J	2.91 J	0.099 UJ	12 J
Total PeCDF	1.5 T	5.79 JT	10.2 J	6.17 J	0.465 T	0.228 UJ	4.08 JT
Total HxCDF	2.39 T	2.23 T	8.59	3.14 T	0.684 T	2.92 T	2.77 T
Total HpCDF	5.77 T	8.55	16	6.64	2.75 T	18.8	7.24
TEQ (ND=0)	1.559	0.857	1.437	0.598	0.118	0.086	0.372
TEQ (ND=½)	1.812	1.228	1.690	0.867	0.436	0.408	0.772

Table 7 - Analytical Results and TCDD TEQs for Sediment Samples

Sample ID	PGSS-80	PGSS-92	PGSS-GEO-3
Sampling Date	12/10/2008	12/10/2008	12/10/2008
SDG	G1040-1	G1040-1	G1040-1
Dioxins in ng/kg			
2,3,7,8-TCDD	0.105 U	0.11 U	0.106 U
1,2,3,7,8-PeCDD	0.243 U	0.555 T	0.247 U
1,2,3,4,7,8-HxCDD	0.357 U	0.375 U	0.362 U
1,2,3,6,7,8-HxCDD	0.377 U	2.38 T	0.607 T
1,2,3,7,8,9-HxCDD	0.207 U	1.17 T	0.21 U
1,2,3,4,6,7,8-HpCDD	1.42 J	89.8	5.9
OCDD	10.5	922	43.6
2,3,7,8-TCDF	0.0995 U	0.832 T	0.625 T
1,2,3,7,8-PeCDF	0.28 U	0.413 T	0.284 U
2,3,4,7,8-PeCDF	0.229 U	0.241 U	0.308 T
1,2,3,4,7,8-HxCDF	0.504 U	0.529 U	0.511 U
1,2,3,6,7,8-HxCDF	0.121 U	0.127 U	0.123 U
1,2,3,7,8,9-HxCDF	0.233 U	0.244 U	0.236 U
2,3,4,6,7,8-HxCDF	0.275 U	0.537 T	0.278 U
1,2,3,4,6,7,8-HpCDF	0.504 U	8.08	1.3 T
1,2,3,4,7,8,9-HpCDF	0.521 U	0.547 U	0.528 U
OCDF	0.649 U	26	2.5 T
Total TCDD	0.105 U	11	4.37
Total PeCDD	0.243 U	10.7 J	4.02 T
Total HxCDD	0.207 U	51.1	7.17
Total HpCDD	5.91	563	21.3
Total TCDF	0.0995 U	13.3 J	7.03 J
Total PeCDF	0.229 U	5.22 J	2.92 T
Total HxCDF	0.121 U	10.7	1.57 T
Total HpCDF	0.504 U	26	2.85 T
TEQ (ND=0)	0.017	2.322	0.301
TEQ (ND=½)	0.344	2.480	0.571

U = Not detected at reporting limit indicated.
J = Estimated value.
T = Value is between the MDL and MRL.

Table 8- Analytical Results for Carr Inlet Reference Samples

Sample ID	CR20W	CR23MOD	MSMP43
Sampling Date	1/9/2009	1/9/2009	1/9/2009
Conventionals in mg/kg			
Sulfide	32.5	111	1.35 U
N-Ammonia	6.83	4.90	3.02
Conventionals in %			
Preserved Total Solids	65.10	59.00	72.90
Total Organic Carbon	0.679	0.628	0.534
Total Solids	63.20	66.20	74.10
Total Volatile Solids	2.52	2.12	0.92

U = Not detected at reporting limit indicated.

Table 9 - Apparent Grain Size for Sediment and Carr Inlet Reference Samples

Sample ID	PGSS-8	PGSS-15	PGSS-16	PGSS-18	PGSS-20	PGSS-21B	PGSS-22	PGSS-29A
Sampling Date	12/4/2008	12/4/2008	12/4/2008	12/4/2008	12/4/2008	12/4/2008	12/4/2008	12/4/2008
Grain Size in %								
Gravel	0.2	< 0.1	< 0.1	< 0.1	< 0.1	1.3	0.1	1.5
Very Coarse Sand	1.3	0.7	0.6	0.3	0.3	2	0.5	2
Coarse Sand	1.2	0.8	1.1	1.1	0.5	2.8	0.7	2.5
Medium Sand	1.3	1	0.8	0.9	0.6	8.4	0.8	4.3
Fine Sand	2.9	1.5	0.7	0.7	0.7	19.1	1.3	7.7
Very Fine Sand	5.1	3.3	2.3	2.3	4.3	16.2	4.4	12.1
Coarse Silt	10.6	9.5	7.6	7.7	15.4	11.9	10.6	13.7
Medium Silt	20.9	19.5	17	21.1	25.4	9.6	17.4	14
Fine Silt	16.8	17.4	17.9	18.9	18.2	7.5	16.7	11
Very Fine Silt	11.8	12.9	15.8	13.3	11.2	5.7	13.4	8.3
8-9 Phi Clay	7.5	9.2	12.2	9.8	6.5	4.2	10.4	6.2
9-10 Phi Clay	6.8	8.6	9.2	8.6	5.5	3.6	7.9	5.2
< 10 Phi Clay	13.5	15.7	14.8	15.5	11.4	7.9	15.8	11.6
Total Fines	87.9	92.7	94.4	94.8	93.6	50.2	92.2	69.9

Sample ID	PGSS-30	PGSS-31	PGSS-33	PGSS-35	PGSS-38A	PGSS-39	PGSS-40	PGSS-42
Sampling Date	12/5/2008	12/5/2008	12/5/2008	12/5/2008	12/5/2008	12/5/2008	12/5/2008	12/5/2008
Grain Size in %								
Gravel	0.1	0.1	< 0.1	< 0.1	0.1	0.1	< 0.1	< 0.1
Very Coarse Sand	1.1	0.9	0.7	0.3	0.6	0.8	0.9	0.9
Coarse Sand	1.4	1.1	1.1	1	1.9	1.1	0.9	1.2
Medium Sand	1.5	1.2	1.1	1.1	9.8	1.1	1.2	1.5
Fine Sand	2.1	1.7	2	1.3	20.2	1.7	3.1	4.7
Very Fine Sand	6.2	6.4	8.1	5.3	15	6.5	9.9	14.2
Coarse Silt	12.2	13.1	14.5	9.7	11	13.2	14.1	16.1
Medium Silt	13.6	14.9	15.4	14.4	9.9	15	15.1	9.9
Fine Silt	14.8	14.9	15.2	17.4	9	13.7	12.4	11.4
Very Fine Silt	13.3	12.3	11.2	15.9	9.2	13.2	11.6	10.3
8-9 Phi Clay	9.3	9.9	8.5	10.6	4.4	9.8	9.3	8.7
9-10 Phi Clay	8.4	8.2	7.7	7.8	3	8.6	7.2	7.7
< 10 Phi Clay	16	15.3	14.6	15.2	5.8	15.3	14.3	13.3
Total Fines	87.6	88.6	87	91	52.4	88.7	84.1	77.4

Table 9 - Apparent Grain Size for Sediment and Carr Inlet Reference Samples

Sample ID	PGSS-44	PGSS-45	PGSS-47	PGSS-51	PGSS-53	PGSS-54	PGSS-56	PGSS-58
Sampling Date	12/5/2008	12/8/2008	12/8/2008	12/8/2008	12/8/2008	12/8/2008	12/8/2008	12/9/2008
Grain Size in %								
Gravel	< 0.1	0.4	0.2	0.3	0.2	0.2	< 0.1	0.6
Very Coarse Sand	0.7	2.9	1.1	1.3	0.9	0.9	0.1	3.4
Coarse Sand	1.3	2.3	4.6	1.8	1.7	1.1	3.2	3.9
Medium Sand	1.3	1.5	23.7	3.3	3.4	3.3	26.2	3.1
Fine Sand	2.6	1.7	35.1	9	12.7	12.5	47.2	7.2
Very Fine Sand	8.7	5.4	13.2	18.9	22.1	21.3	10.7	11.4
Coarse Silt	11.4	11.7	5.3	10	10.1	12.5	2.3	9.9
Medium Silt	12.9	21.7	3.5	8.6	9.2	10.4	1.8	12.8
Fine Silt	14.4	14.8	3	12.4	8.7	8.6	1.4	11
Very Fine Silt	13.5	10.6	1.9	7.8	7	6.2	1.4	8.7
8-9 Phi Clay	9.7	7.2	1.7	7	6.2	6.2	1.2	7.6
9-10 Phi Clay	8.3	6.1	2.1	6.7	5.5	5.2	1.5	6.9
< 10 Phi Clay	15.2	13.7	4.5	12.7	12.2	11.7	3.1	13.6
Total Fines	85.4	85.8	22	65.3	58.9	60.8	12.6	70.5

Sample ID	PGSS-62	PGSS-63	PGSS-64	PGSS-67	PGSS-73	PGSS-75	PGSS-77A	PGSS-92
Sampling Date	12/9/2008	12/9/2008	12/9/2008	12/9/2008	12/9/2008	12/9/2008	12/9/2008	12/10/2008
Grain Size in %								
Gravel	< 0.1	1	< 0.1	< 0.1	0.2	< 0.1	0.1	24.1
Very Coarse Sand	0.2	2.9	0.3	0.1	0.1	0.3	1	7.4
Coarse Sand	4.8	8.5	2	1	4.7	6.1	6.9	7.9
Medium Sand	33.6	25.3	20.6	10.3	49.1	39.2	31.5	17.8
Fine Sand	45	28.6	47.4	61.3	37.1	44.3	33.6	15.8
Very Fine Sand	9.6	11.8	6.5	11.9	2.6	6.2	8.5	9.1
Coarse Silt	1.8	5.5	4.2	2.1	0.8	1.3	3.9	4.1
Medium Silt	0.6	2.8	3	1.5	0.5	0.2	3	3.4
Fine Silt	0.6	2.5	3.3	2	0.6	0.3	2.2	2.3
Very Fine Silt	0.6	2.1	2.7	2	0.7	0.3	2	2
8-9 Phi Clay	0.7	2	2.1	1.7	0.8	0.3	1.6	1.4
9-10 Phi Clay	0.7	1.9	2.4	2.1	0.9	0.3	2.1	1.5
< 10 Phi Clay	1.7	5.1	5.5	3.9	1.8	1.2	3.8	3.4
Total Fines	6.7	21.8	23.2	15.3	6.1	3.9	18.5	18

Table 9 - Apparent Grain Size for Sediment and Carr Inlet Reference Samples

Sample ID	STATION 42 S-1	STATION 42 S-2	STATION 42 S-3	STATION 42 S-4	CR20W	CR23MOD	MSMP43
Sampling Date	12/3/2008	12/3/2008	12/3/2008	12/3/2008	1/9/2009	1/9/2009	1/9/2009
Grain Size in %							
Gravel	0.4	0.4	< 0.1	0.2	< 0.1	< 0.1	< 0.1
Very Coarse Sand	1.6	0.6	0.2	0.7	0.1	0.2	0.1
Coarse Sand	2.6	1.4	0.5	1	0.3	0.6	1
Medium Sand	2.8	2.4	1	2.4	0.6	1.4	19.5
Fine Sand	7.6	5.2	2.7	4.7	1.6	7.2	60.2
Very Fine Sand	19.7	15.3	11.1	14.3	17.7	39.1	12.7
Coarse Silt	14.9	14.2	14.5	13.5	37	24.8	1.1
Medium Silt	12.4	12.7	16.1	14.1	23.8	13	0.6
Fine Silt	9.8	11.4	13.2	12.7	7	4.4	0.5
Very Fine Silt	6.8	8.4	9.8	8.4	2.1	1.7	0.6
8-9 Phi Clay	6	7.7	7.1	7	1.9	1.8	0.8
9-10 Phi Clay	5.8	7.6	7.3	6.8	1.5	1.3	1.1
< 10 Phi Clay	9.8	12.8	16.5	14.2	6.4	4.6	1.7
Total Fines	65.5	74.8	84.4	76.8	79.7	51.6	6.4

Table 10 - Toxicity Testing Summary Results

Location	Microtox Bioluminescence	Amphipod Mortality	Larval Development	Juvenile Polychaete Growth	SMS Interpretation
08	PASS	PASS	PASS	PASS	PASS
14A	PASS				
15	PASS	PASS	PASS	PASS	PASS
16	FAIL SQS	PASS	PASS	PASS	FAIL SQS
18	PASS	PASS	FAIL SQS	FAIL SQS[a]	FAIL CSL
20	PASS	PASS	PASS	PASS	PASS
21A	PASS				
21B	PASS[a]	PASS	FAIL CSL[b,c]	PASS	FAIL CSL
22	PASS	PASS	FAIL CSL	PASS	FAIL CSL
29	PASS				
29A	PASS[a]	PASS	FAIL CSL[b,c]	PASS	FAIL CSL
30	PASS	PASS	FAIL SQS	FAIL SQS[a]	FAIL CSL
31	PASS	PASS	FAIL SQS	PASS	FAIL SQS
33	PASS	PASS	FAIL SQS	FAIL SQS[a]	FAIL CSL
35	PASS	PASS	FAIL SQS	PASS	FAIL SQS
38	PASS				
38A	PASS[a]	PASS	FAIL CSL[b,c]	PASS	FAIL CSL
39	PASS	PASS	FAIL CSL	FAIL SQS[a]	FAIL CSL
40	PASS	PASS	FAIL CSL	FAIL SQS[a]	FAIL CSL
42	PASS	PASS	FAIL CSL	PASS	FAIL CSL
44	PASS	PASS	FAIL SQS	PASS	FAIL SQS
45	PASS	PASS	PASS	PASS	PASS
46	PASS				
47	PASS	PASS	FAIL SQS	PASS	FAIL SQS
47A	PASS[a]				
51	FAIL SQS	PASS	FAIL SQS	PASS	FAIL CSL
53	PASS	PASS	FAIL SQS	PASS	FAIL SQS
54	PASS	PASS	FAIL CSL	PASS	FAIL CSL
55	PASS[a]				
56	PASS	PASS	FAIL CSL	PASS	FAIL CSL
58	FAIL SQS	PASS	PASS	PASS	FAIL SQS
61	PASS				
62	PASS	PASS	PASS	PASS	PASS
62A	PASS				
62B	FAIL SQS	PASS	PASS	PASS	FAIL SQS
63	FAIL SQS[a]	PASS	PASS	PASS	FAIL SQS
64	PASS[a]	PASS	FAIL CSL	PASS	FAIL CSL
67	PASS	PASS	PASS	PASS	PASS
68	PASS				
69	FAIL SQS	PASS	PASS	PASS	FAIL SQS
70	PASS				
71	PASS				
73 (geoduck 1)	PASS	PASS	PASS	PASS	PASS
75 (near clam2/oyster2)	PASS	PASS	PASS	PASS	PASS
77	PASS[a]				
77A	PASS	PASS	PASS	PASS	PASS
78	PASS				
80 (geoduck 2)	PASS				
82	PASS				
83	PASS				
92	PASS	PASS	PASS	PASS	PASS
Geo 03	PASS				

Blank indicates analysis not performed

a - Reference sediment failed performance criteria. Test sediment compared to control.

b - Reference sediment (CR23Mod) failed performance criteria. Test sediment compared to control even though control is seawater rather than sediment.

c - Test sediment also failed when compared to reference sediment CR20W, which passed performance criteria.

Table 11 - Analytical Results for Biota Samples

Sample ID	CLAM #1A	CLAM 2A	CRAB1-A MEAT	CRAB1-A PAN2	OYSTER #1A	OYSTER #2A
Sampling Date	12/15/2008	12/15/2008	12/23/2008	12/23/2008	12/15/2008	12/15/2008
Percent Lipids-Wet Wt	0.232	0.487	0.208	3.01	1.97	1.97
Metals in mg/kg-wet wt.						
Arsenic	2	2	7	4	1 U	1
Cadmium	0.36	0.24	0.04	0.34	0.99	0.96
Chromium	0.3	0.3	0.1	0.1	0.1	0.2
Copper	1.37	1.02	8.65	19.2	3.98	4.45
Lead	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
Silver	0.12	0.09	0.19	0.5	0.1	0.1
Zinc	10.1	10.5	50.2	15.1	101	124
Mercury	0.01 U	0.01 U	0.047	0.03	0.01	0.01
PCBs in ug/kg-wet wt.						
Aroclor 1016	8 U	8 U	8 U	8 U	8 U	8 U
Aroclor 1221	8 U	8 U	8 U	8 U	8 U	8 U
Aroclor 1232	8 U	8 U	8 U	8 U	8 U	8 U
Aroclor 1242	8 U	8 U	8 U	8 U	8 U	8 U
Aroclor 1248	12 U	8 U	8 U	8 U	8 U	8 U
Aroclor 1254	8 U	8 U	8 U	20 U	8 U	8 U
Aroclor 1260	8 U	8 U	8 U	15 J	8 U	8 U
Aroclor 1262	8 U	8 U	8 U	8 U	8 U	8 U
Aroclor 1268	8 U	8 U	8 U	8 U	8 U	8 U

Table 11 - Analytical Results for Biota Samples

Sample ID	GD STATION #1A	GD STATION #2A	GD STATION #3A
Sampling Date	12/16/2008	12/16/2008	12/16/2008
Percent Lipids-Wet Wt	0.481	0.426	0.823
Metals in mg/kg-wet wt.			
Arsenic	1	2	2
Cadmium	0.19	0.19	0.26
Chromium	0.1	0.1	0.2
Copper	3.25	2.85	6.29
Lead	0.4 U	0.4 U	0.4 U
Silver	0.93	1.15	1.47
Zinc	16.5	14.5	30.8
Mercury	0.01	0.01	0.02
PCBs in ug/kg-wet wt.			
Aroclor 1016	4 U	4 U	4 U
Aroclor 1221	4 U	4 U	4 U
Aroclor 1232	4 U	4 U	4 U
Aroclor 1242	4 U	4 U	4 U
Aroclor 1248	4 U	4 U	4 U
Aroclor 1254	4 U	4 U	4 U
Aroclor 1260	4 U	4 U	4 U
Aroclor 1262	4 U	4 U	4 U
Aroclor 1268	4 U	4 U	4 U

U = Not detected at reporting limit indicated.
J = Estimated value.

Table 12 - Analytical Results and TCDD TEQs for Tissue Samples

Sample ID	CLAM #1A	CLAM #2A	CRAB1-A MEAT	CRAB1-A PAN2	GD STATION #1A
Sampling Date	12/15/2008	12/15/2008	12/23/2008	12/23/2008	12/16/2008
SDG	G1040-5	G1040-5	G1040-6	G1040-6	G1040-7
Dioxins in ng/kg-wet wt.					
2,3,7,8-TCDD	0.111 U	0.117 U	0.112 U	0.106 U	0.111 U
1,2,3,7,8-PeCDD	0.26 U	0.273 U	0.262 U	0.428 T	0.258 U
1,2,3,4,7,8-HxCDD	0.381 U	0.4 U	0.384 U	0.364 U	0.378 U
1,2,3,6,7,8-HxCDD	0.402 U	0.423 U	0.406 U	1.05 T	0.399 U
1,2,3,7,8,9-HxCDD	0.221 U	0.232 U	0.223 U	0.211 U	0.219 U
1,2,3,4,6,7,8-HpCDD	0.402 U	0.422 U	0.406 U	1.8 T	0.399 U
OCDD	0.779 U	0.818 U	0.786 U	2.3 T	2.58 T
2,3,7,8-TCDF	0.106 U	0.111 U	0.223 T	1.03	0.105 U
1,2,3,7,8-PeCDF	0.299 U	0.314 U	0.301 U	0.286 U	0.297 U
2,3,4,7,8-PeCDF	0.245 U	0.257 U	0.247 U	0.455 T	0.243 U
1,2,3,4,7,8-HxCDF	0.537 U	0.564 U	0.542 U	0.513 U	0.533 U
1,2,3,6,7,8-HxCDF	0.129 U	0.135 U	0.13 U	0.123 U	0.128 U
1,2,3,7,8,9-HxCDF	0.248 U	0.261 U	0.25 U	0.237 U	0.246 U
2,3,4,6,7,8-HxCDF	0.293 U	0.308 U	0.296 U	0.28 U	0.291 U
1,2,3,4,6,7,8-HpCDF	0.537 U	0.564 U	0.542 U	0.513 U	0.533 U
1,2,3,4,7,8,9-HpCDF	0.556 U	0.584 U	0.561 U	0.531 U	0.552 U
OCDF	0.692 U	0.727 U	0.698 U	0.661 U	0.687 U
Total TCDD	0.111 U	0.117 U	0.112 U	0.786 T	0.111 U
Total PeCDD	0.26 U	0.273 U	0.262 U	1.41 T	0.258 U
Total HxCDD	0.221 U	0.232 U	0.429 T	4.69	0.219 U
Total HpCDD	0.402 U	0.422 U	0.406 U	5.89	0.768 T
Total TCDF	0.106 U	0.111 U	0.223 JT	4.19 J	0.105 U
Total PeCDF	0.245 U	0.257 U	0.247 U	3.8 T	0.243 U
Total HxCDF	0.129 U	0.135 U	0.13 U	1.78 T	0.128 U
Total HpCDF	0.537 U	0.564 U	0.542 U	0.513 U	0.533 U
TEQ (ND=0)	0.000	0.000	0.022	0.791	0.0008
TEQ (ND=½)	0.350	0.368	0.370	0.940	0.349

Table 12 - Analytical Results and TCDD TEQs for Tissue Samples

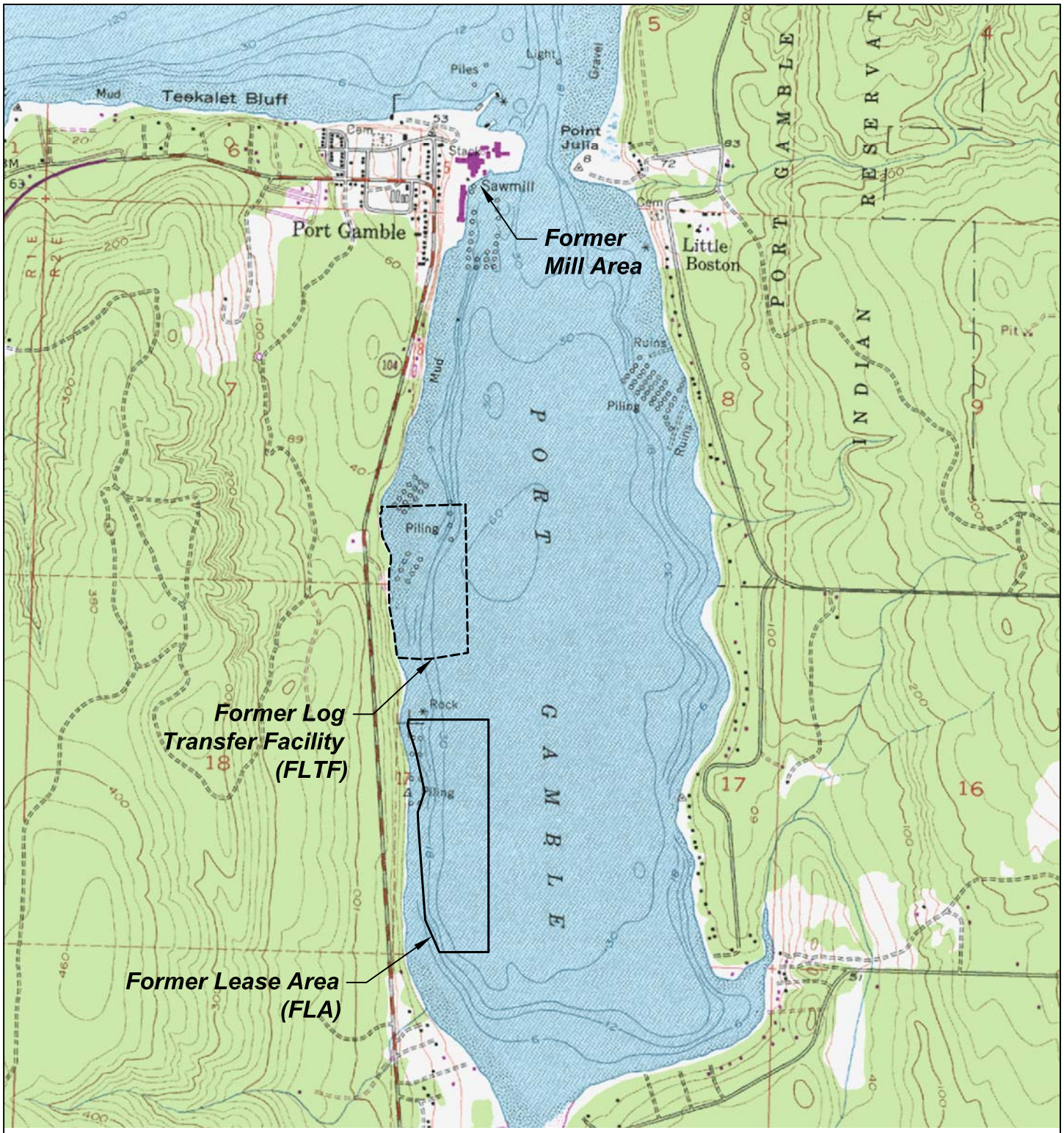
Sample ID	GD STATION #2A	GD STATION #3A	OYSTER #1A	OYSTER #2A
Sampling Date	12/16/2008	12/16/2008	12/15/2008	12/15/2008
SDG	G1040-7	G1040-7	G1040-4	G1040-4
Dioxins in ng/kg-wet wt.				
2,3,7,8-TCDD	0.107 U	0.107 U	0.117 U	0.108 U
1,2,3,7,8-PeCDD	0.25 U	0.25 U	0.272 U	0.252 U
1,2,3,4,7,8-HxCDD	0.367 U	0.367 U	0.399 U	0.37 U
1,2,3,6,7,8-HxCDD	0.387 U	0.387 U	0.421 U	0.391 U
1,2,3,7,8,9-HxCDD	0.212 U	0.212 U	0.231 U	0.214 U
1,2,3,4,6,7,8-HpCDD	0.387 U	0.387 U	0.421 U	0.391 U
OCDD	1.51 T	1.05 T	0.816 U	1.78 T
2,3,7,8-TCDF	0.102 U	0.102 U	0.111 U	0.375 T
1,2,3,7,8-PeCDF	0.288 U	0.288 U	0.313 U	0.29 U
2,3,4,7,8-PeCDF	0.235 U	0.235 U	0.256 U	0.237 U
1,2,3,4,7,8-HxCDF	0.517 U	0.517 U	0.563 U	0.522 U
1,2,3,6,7,8-HxCDF	0.124 U	0.124 U	0.135 U	0.125 U
1,2,3,7,8,9-HxCDF	0.239 U	0.239 U	0.26 U	0.241 U
2,3,4,6,7,8-HxCDF	0.282 U	0.282 U	0.307 U	0.285 U
1,2,3,4,6,7,8-HpCDF	0.517 U	0.517 U	0.562 U	0.521 U
1,2,3,4,7,8,9-HpCDF	0.535 U	0.535 U	0.582 U	0.54 U
OCDF	0.666 U	0.666 U	0.725 U	0.672 U
Total TCDD	0.107 U	0.107 U	0.117 U	0.108 U
Total PeCDD	0.25 U	0.25 U	0.272 U	0.252 U
Total HxCDD	0.212 U	0.212 U	0.231 U	0.214 U
Total HpCDD	0.528 T	0.387 U	0.421 U	0.735 T
Total TCDF	0.102 UJ	0.102 U	0.111 UJ	0.375 JT
Total PeCDF	0.235 U	0.235 U	0.256 U	0.264 T
Total HxCDF	0.124 U	0.124 U	0.135 U	0.125 U
Total HpCDF	0.517 U	0.517 U	0.562 U	0.521 U
TEQ (ND=0)	0.00045	0.00032	0.000	0.038
TEQ (ND=½)	0.337	0.337	0.367	0.373

U = Not detected at reporting limit indicated.
J = Estimated value.
T = Value is between the MDL and MRL.

Table 13 - Conventional Sediment Parameter Concentrations Compared to Mytilus and Neanthes Test Results

Sample Location	Total Solids	Percent Fines	TOC in percent	TVS in percent	TVS/TOC Ratio	NH3 in mg/Kg	Sulfide in mg/Kg	Resin Acids in ug/kg	Larval Percent Abnormality and Mortality[b]	Decreased Growth Percent[b]
Geo-3	70.9%	18%	1.78%	1.74%	0.98	10.4	114	900		
SS-08	33.9%	85%	3.93%	10.43%	2.65	24.3	485	1410	10.5	4.8
SS-14A	72.9%	21%	1.46%	2.00%	1.37	3.52	125	1830		
SS-15	32.2%	86%	3.46%	10.24%	2.96	22.5	243	780	12.7	25.0
SS-16	27.2%	87%	2.65%	9.19%	3.53	53.6	1060	430	14.4	19.2
SS-18	35.8%	82%	2.49%	8.78%	3.53	3.05	113	620	**22.7**	**32.7**
SS-20	43.1%	81%	3.65%	6.67%	1.83	7.66	158	650	11.4	-7.0
SS-21A	81.8%	8%	1.33%	2.36%	1.77	3.26	71.6	1410		
SS-21B	45.4%	45%	3.02%	11.22%	3.72	7.75	468	3410	**31.9[a]**	29.8
SS-22	31.5%	82%	3.21%	9.29%	2.89	34.9	640	710	**38.9**	14.4
SS-29	70.6%	17%	1.83%	3.11%	1.70	2.75	167	1870		
SS-29A	37.9%	57%	4.73%	12.68%	2.68	16.3	419	1840	**22.7[a]**	26.0
SS-30	35.4%	74%	3.65%	8.89%	2.44	12.3	697	660	**24.0**	**40.4**
SS-31	38.8%	76%	2.23%	8.96%	4.02	5.37	608	670	**24.9**	24.0
SS-33	39.9%	76%	2.41%	8.41%	3.49	12.1	372	640	**19.2**	**34.6**
SS-35	34.2%	81%	2.52%	8.62%	3.42	26.4	459	370	**16.2**	18.3
SS-38	59.6%	20%	2.00%	2.38%	1.19	3.85	142	1200		
SS-38A	42.7%	64%	3.40%	5.70%	1.68	4.11	382	790	**33.2[a]**	27.9
SS-39	35.6%	73%	2.98%	8.81%	2.96	14.6	693	650	**30.6**	**31.7**
SS-40	39.2%	68%	2.99%	9.09%	3.04	6.81	1120	1100	**31.4**	**37.5**
SS-42	40.5%	72%	2.11%	8.12%	3.85	5.7	1060	1500	**44.1**	26.0
SS-44	36.4%	70%	2.67%	8.14%	3.05	9.37	691	1970	**19.4**	27.4
SS-45	35.4%	85%	2.85%	7.60%	2.67	39.9	685	8470	13.3	16.0
SS-46	72.2%	19%	1.27%	1.88%	1.48	2.83	228	3930		
SS-47	64.5%	24%	2.39%	3.80%	1.59	6.05	281	4800	**19.7**	-8.0
SS-47A	57.9%	50%	1.84%	3.84%	2.09	4.84	462	8930		
SS-51	41.7%	69%	2.24%	7.49%	3.34	8.43	775	13770	**15.7**	17.0
SS-53	46.0%	67%	2.50%	6.34%	2.54	4.81	709	7660	**19.8**	20.8
SS-54	49.5%	70%	1.78%	5.60%	3.15	9.26	667	8260	**42.7**	23.6
SS-55	72.4%	33%	0.88%	1.97%	2.24	4.39	176	2070		
SS-56	70.5%	23%	1.64%	1.76%	1.07	4.04	212	2660	**36.9**	-17.0
SS-58	32.8%	68%	3.14%	8.75%	2.79	22.7	524	7330	12.9	21.7
SS-61	67.9%	27%	1.82%	2.55%	1.40	3.59	245	3130		
SS-62	78.8%	6%	0.70%	1.06%	1.52	7.08	79.4	1610	-20.0	-20.0
SS-62A	75.0%	29%	1.07%	1.94%	1.81	8.86	176	4090		
SS-62B	67.8%	33%	1.31%	2.56%	1.95	6.24	155	4020		
SS-63	67.9%	14%	1.99%	2.87%	1.44	3.95	235	3320	9.3	15.2
SS-64	64.3%	39%	2.36%	2.95%	1.25	5.02	278	3180	**30.6**	16.2
SS-67	68.5%	26%	1.75%	2.32%	1.33	4.54	21.4	2600	7.4	-9.0
SS-68	74.2%	14%	1.30%	1.45%	1.12	3.27	16.1	1840		
SS-69	84.2%	25%	0.96%	1.95%	2.04	3.71	24.4	3110		
SS-70	71.6%	21%	1.54%	2.15%	1.40	4.01	24.7	2150		
SS-71	74.7%	11%	1.57%	1.53%	0.97	3.46	67.5	960		
SS-73	75.3%	8%	1.00%	1.28%	1.28	2.72	43.4	920	-8.0	-17.0
SS-75	79.1%	4%	0.48%	0.84%	1.77	3.49	19.6	550	-7.0	-6.0
SS-77	66.0%	31%	1.88%	3.10%	1.65	5.65	171	1640		
SS-77A	68.2%	22%	2.38%	3.16%	1.33	3.65	210	1820	-5.0	9.3
SS-78	78.9%	9%	1.53%	1.46%	0.95	8.26	10.6	770		
SS-80	82.1%	1%	2.85%	0.78%	0.27	2.35	0	620		
SS-82	75.6%	5%	0.88%	1.00%	1.14	3.2	40.4	1400		
SS-83	71.1%	8%	1.87%	2.34%	1.25	6.11	136	1820		
SS-92	66.7%	22%	3.01%	4.22%	1.40	7.07	547	4980	2.5	-3.0

Blank indicates no measurement or data
ND - not detected
Bold indicates test failed SQS
Box indicates test failed CSL
a - reference failed performance criteria; results compared to alternate reference or control.
b - More positive values indicate higher mortality or lower growth compared to reference.



0 2000 4000

Scale in Feet

N

Note: Base map prepared from USGS 7.5 minute quadrangle map of Port Gamble, WA.

Port Gamble Bay
Port Gamble, Washington

Vicinity Map

17330-14 8/09

HARTCROWSER

Figure 1

JAB 08/20/09 1733014-001.dwg

JAB 08/20/09 1733014-011 (Site Plan-Rep).dwg

Former Log Transfer Facility (FLTF)

Former Lease Area (FLA)

10 • RI Sampling Grid Location and Number

N

0 1,500 3,000

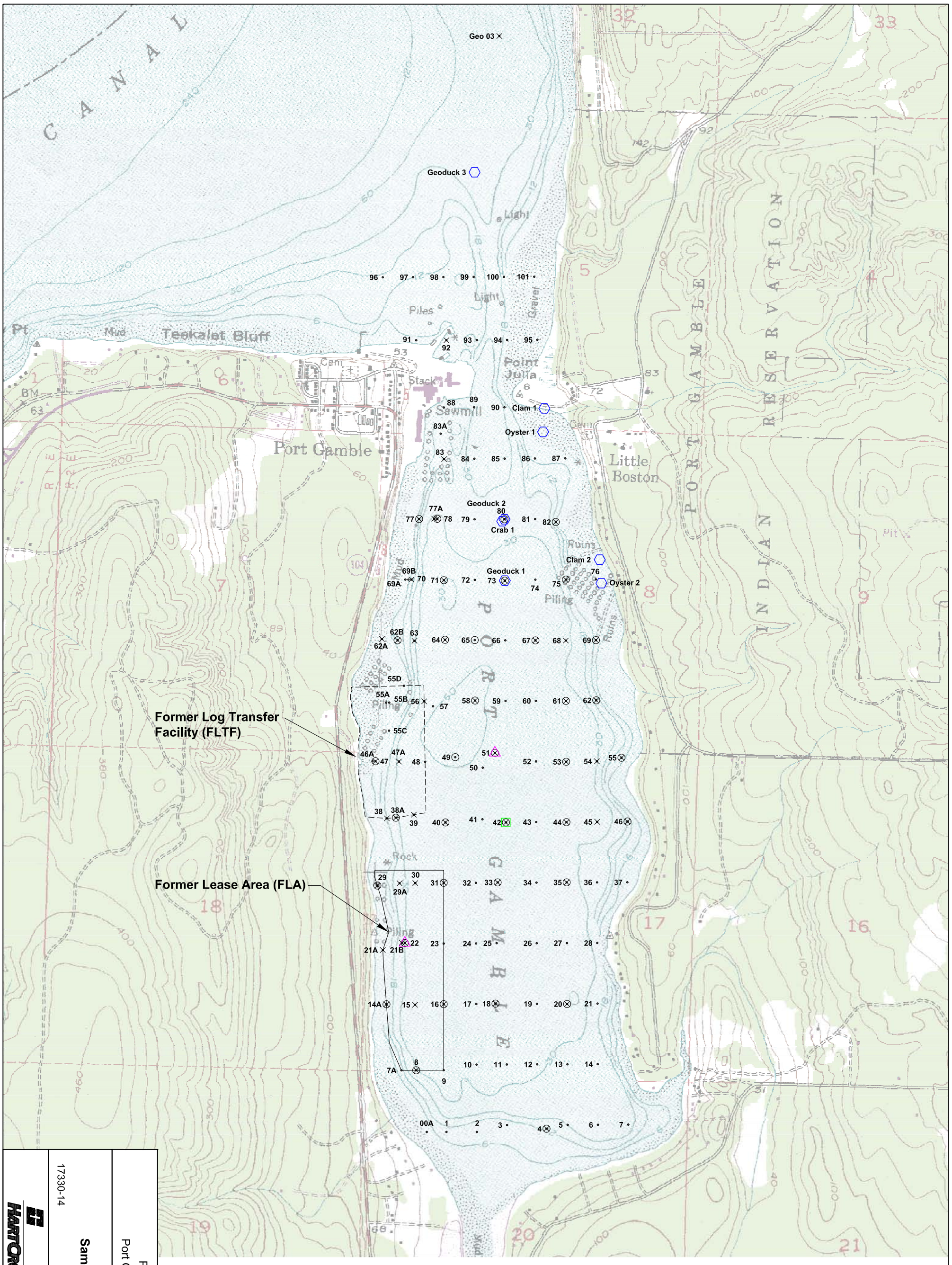
Scale in Feet

Source: Base map prepared from USGS 7.5 minute quadrangle map of Port Gamble, WA.

Port Gamble Bay Port Gamble, Washington	**Site Plan**	Figure **2**
	17330-14	8/09

HARTCROWSER

JAB 08/20/09 1733014-012 (Sample Plan-Rep).dwg



Exploration Location and Number

- 10 • Sediment Profile Imaging (SPI) and Plan View Photography Survey
- ○ Vibracore Sample
- × Surface Sediment Grab Sample
- △ Radiometric Vibracore Sample
- □ Chemistry Vibracore Sample
- ⬡ Biota Tissue Sample

N

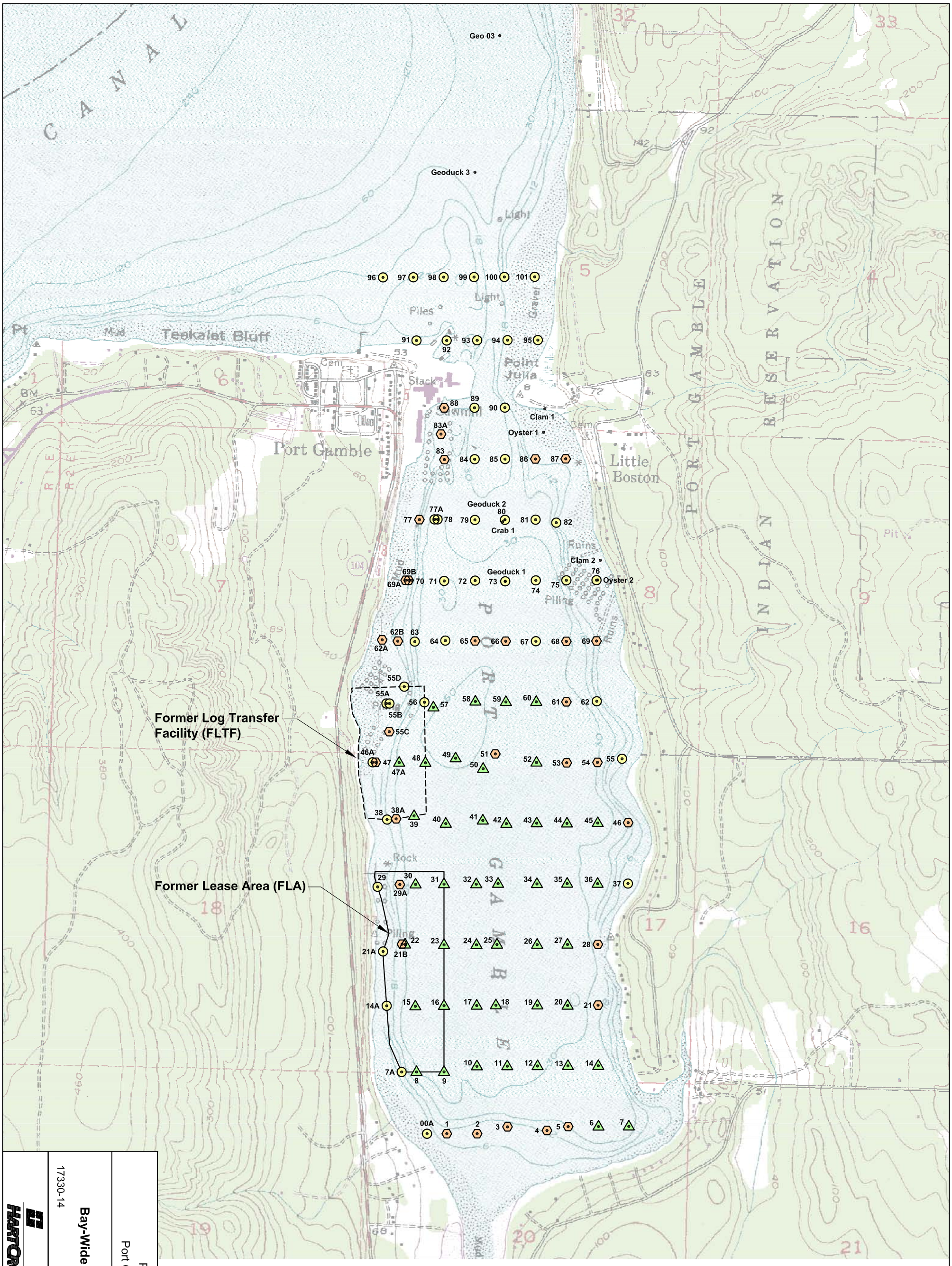
0 1,500 3,000

Scale in Feet

Source: Base map prepared from USGS 7.5 minute quadrangle map of Port Gamble, WA.

HARTCROWSER	**Sample Location Plan**	Port Gamble Bay Port Gamble, Washington
Figure 3	17330-14 8/09	

JAB 08/20/09 1733014-013 (Grain Size-Rep).dwg



10 • RI Sampling Grid Location and Number

Grain Size

- SAND to slightly silty SAND
- Sandy SILT to silty SAND
- Clayey SILT

Note: Grain size is estimated based on available data, including field observations and grainsize analysis.

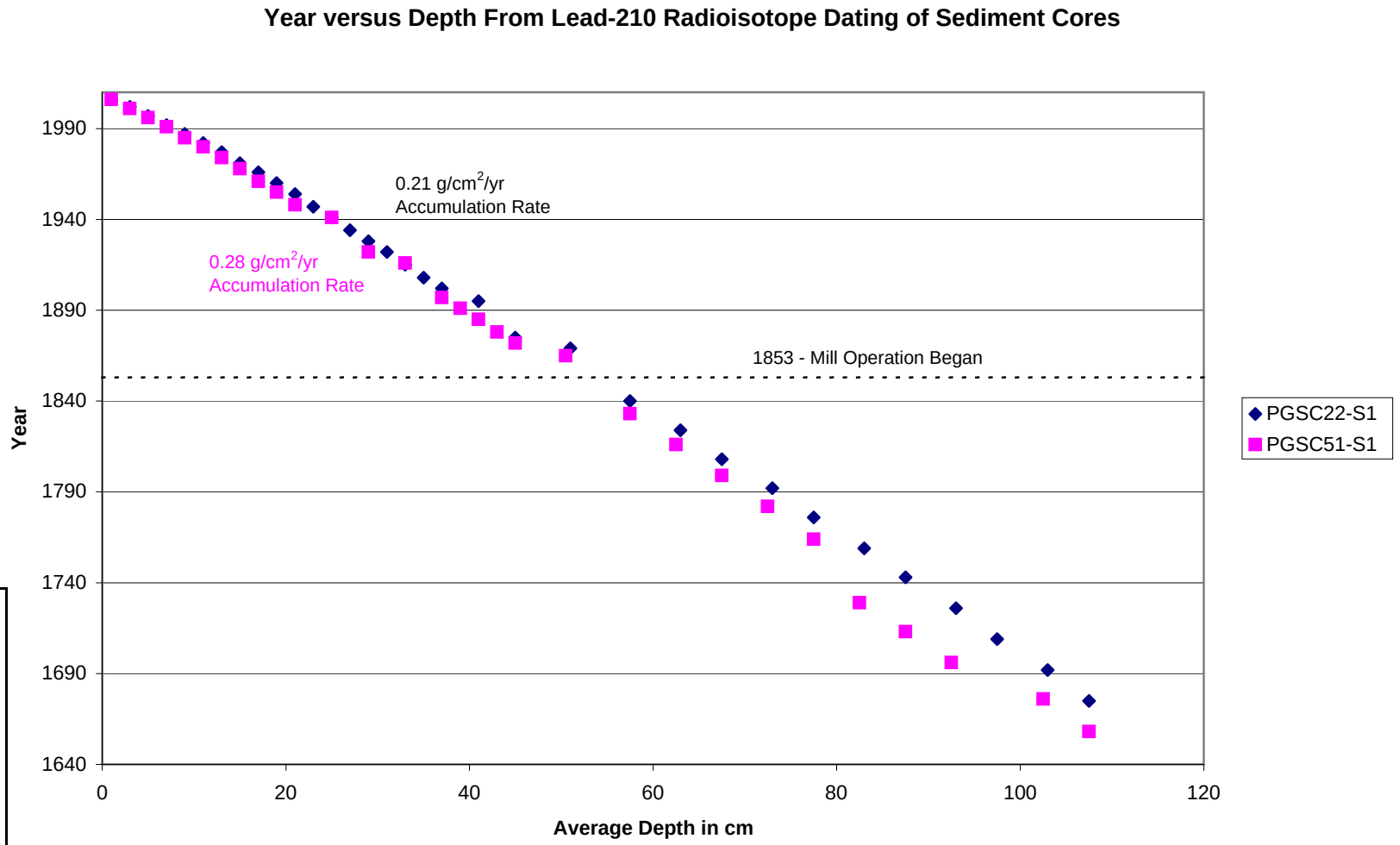
N

0 1,500 3,000

Scale in Feet

Source: Base map prepared from USGS 7.5 minute quadrangle map of Port Gamble, WA.

Port Gamble Bay Port Gamble, Washington	**Bay-Wide Grain Size Distribution** 17330-14 8/09	HARTCROWSER Figure 4



Port Gamble Bay
Port Gamble, Washington

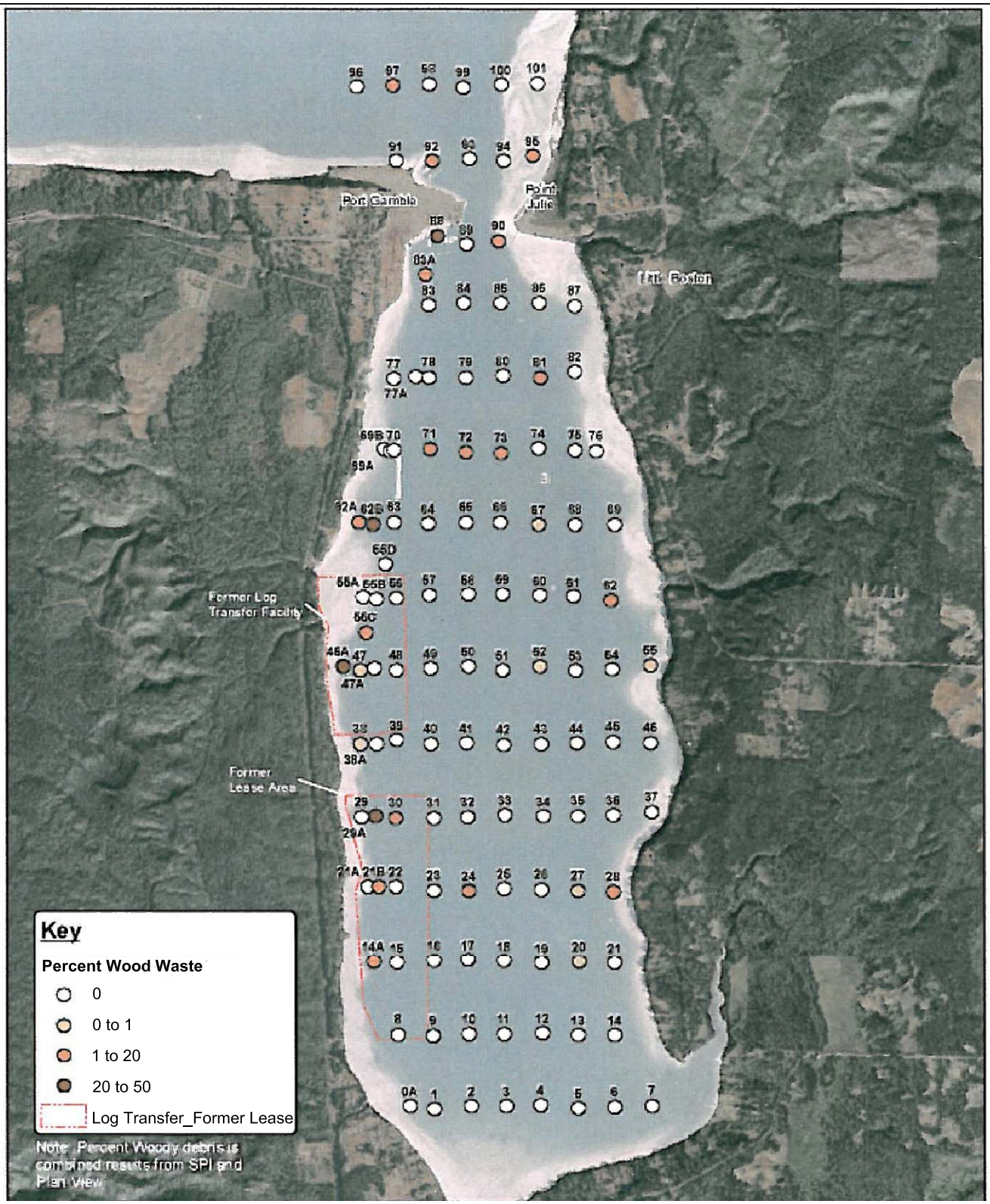
Year versus Depth From Lead-210 Radioisotope Dating of Sediment Cores

17330-14

8/09

Figure **5**

HARTCROWSER



Note: Base map prepared from SAIC Figure 5.

0 2,000 4,000

Scale in Feet

N

Port Gamble Bay
Port Gamble, Washington

Distribution of Visual, Near-Surface Wood Waste Based on SPI and Plan View Image Analysis

17330-14 8/09

HARTCROWSER

Figure **6**

JAB 08/20/09 1733014-015 (Wood Distrib-SPI_Planview-Rep).dwg

JAB 08/20/09 1733014-014 (Wood Distrib-Rep).dwg

Former Log Transfer Facility (FLTF)

Former Lease Area (FLA)

10 • Grid Location and Number

Presence and Percentage of Observed Near-Surface and Subsurface Wood Waste

- • 0
- ○ 0 to 1
- ○ 1 to 20
- ● 20 to 50

Note: Distribution of observed wood material is estimated based on available data, including SPI & plan view images, vibracores, and surface sediment samples.

Source: Base map prepared from USGS 7.5 minute quadrangle map of Port Gamble, WA.

N

0 1,500 3,000

Scale in Feet

Distribution of Observed Near-Surface and Subsurface Wood Waste

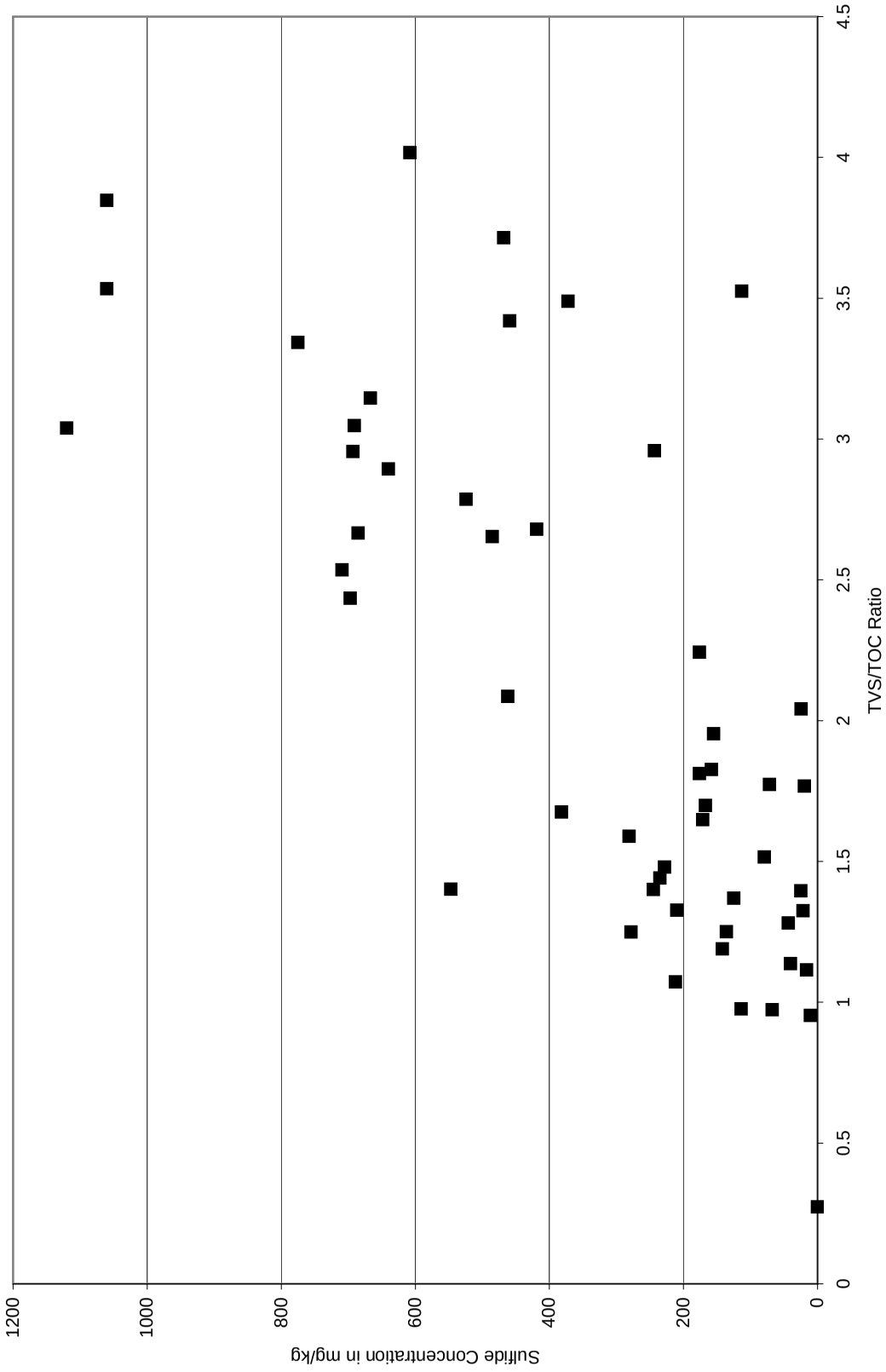
17330-14

8/09

Figure **7**

HARTCROWSER

Port Gamble Bay
Port Gamble, Washington



Port Gamble Bay
Port Gamble, Washington

Sulfide Concentration Compared to TVS/TOC Ratios

17330-14 8/09

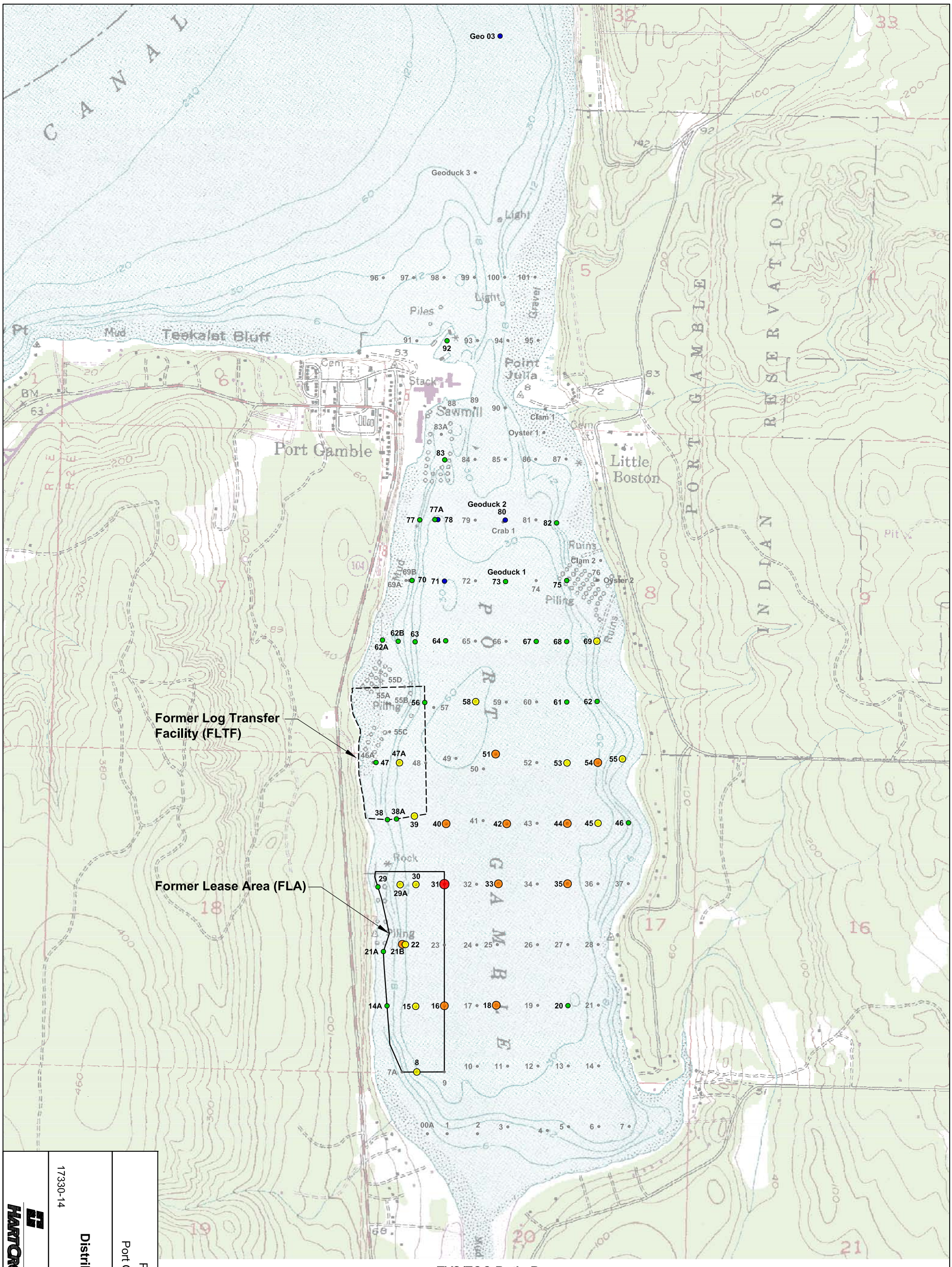
HARTCROWSER

Figure

8

JAB 08/20/09 1733014-020 (Sulfide Ratios).xls

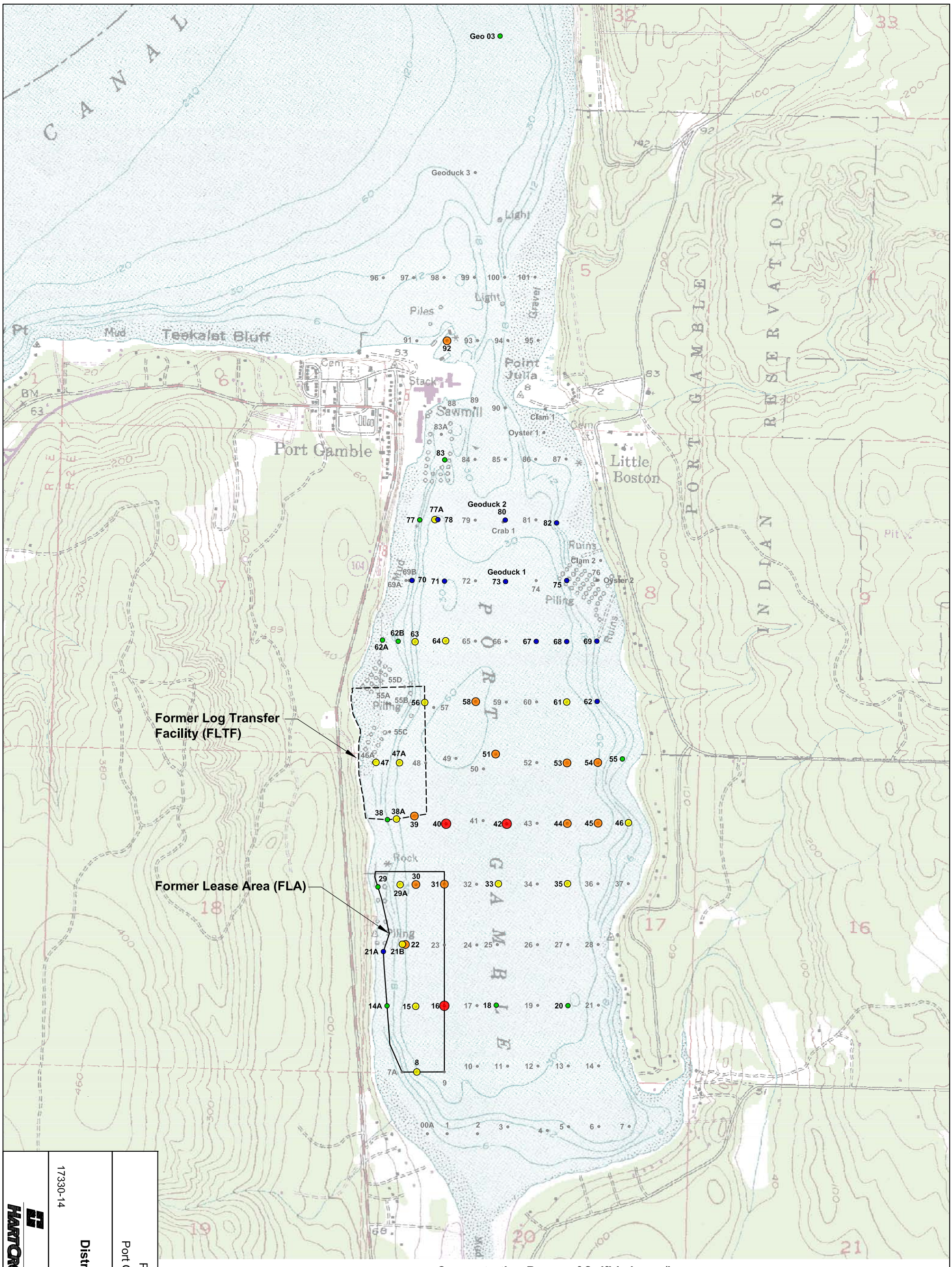
EAL 08/20/09 1733014-022.dwg



Source: Base map prepared from USGS 7.5 minute quadrangle map of Port Gamble, WA.

Port Gamble Bay Port Gamble, Washington	**Distribution of TVS/TOC**	HARTCROWSER Figure **9**
	17330-14 8/09	

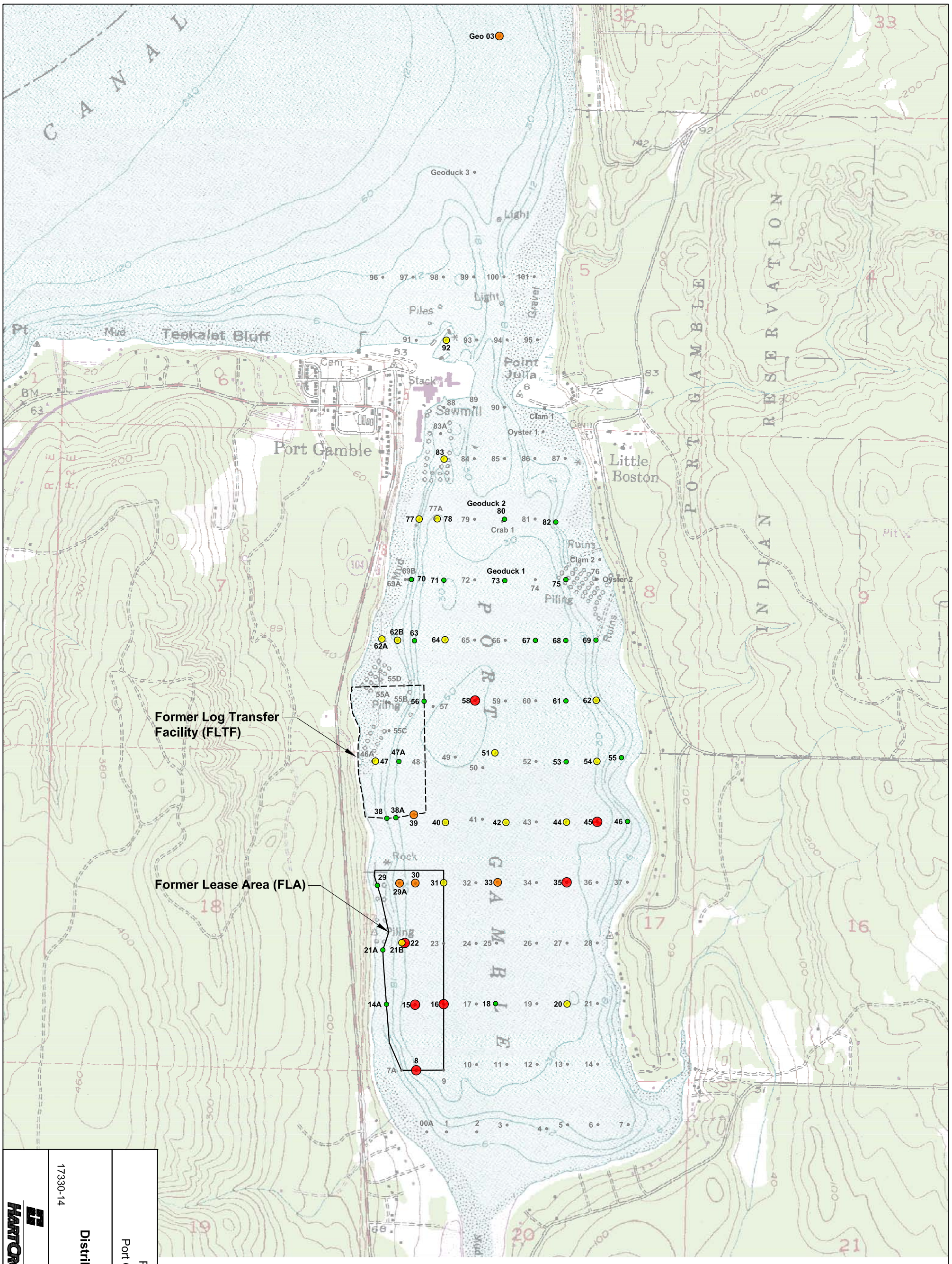
EAL 08/20/09 1733014-021.dwg



Source: Base map prepared from USGS 7.5 minute quadrangle map of Port Gamble, WA.

HARTCROWSER	**Distribution of Sulfide**	Port Gamble Bay Port Gamble, Washington
Figure 10	17330-14 8/09	

EAL 08/20/09 1733014-020.dwg



Concentration Range of Ammonia in mg/kg

- 0 to 5
- 5 to 10
- 10 to 20
- > 20

10 • Grid Location and Number

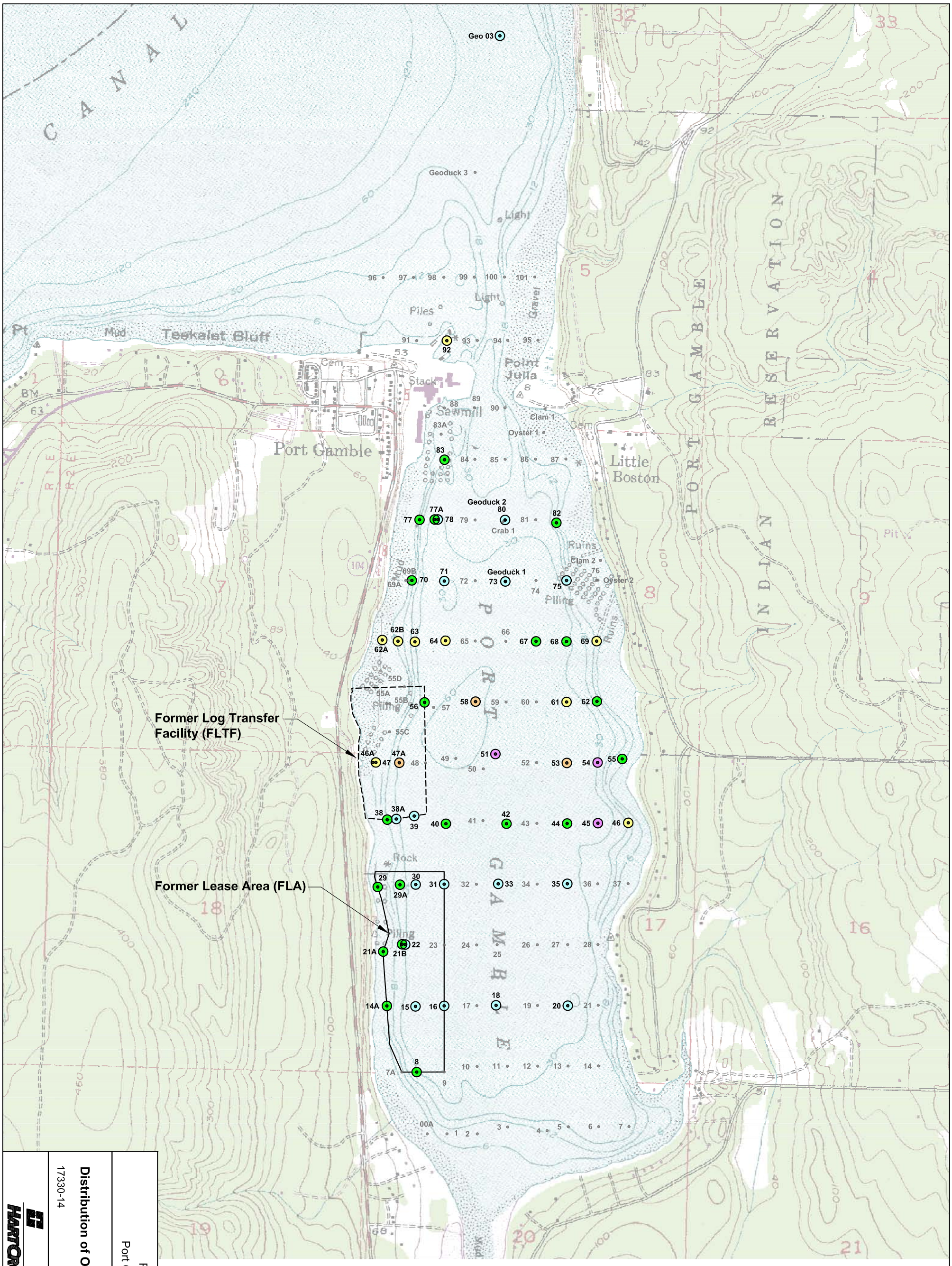
N

0 1,500 3,000

Scale in Feet

Source: Base map prepared from USGS 7.5 minute quadrangle map of Port Gamble, WA.

HARTCROWSER	**Distribution of Ammonia**	Port Gamble Bay Port Gamble, Washington
Figure **11**	17330-14 8/09	



10 • Grid Location and Number

Concentration Range of Total Fatty Acids in µg/kg

- 370 to 1,000
- 1,000 to 3,000
- 3,000 to 5,000
- 5,000 to 7,000
- 7,000 to 9,000

Note: Total fatty acids include linolenic and oleic acids.

N

0 1,500 3,000

Scale in Feet

Source: Base map prepared from USGS 7.5 minute quadrangle map of Port Gamble, WA.

Distribution of Oleic and Linolenic Fatty Acids

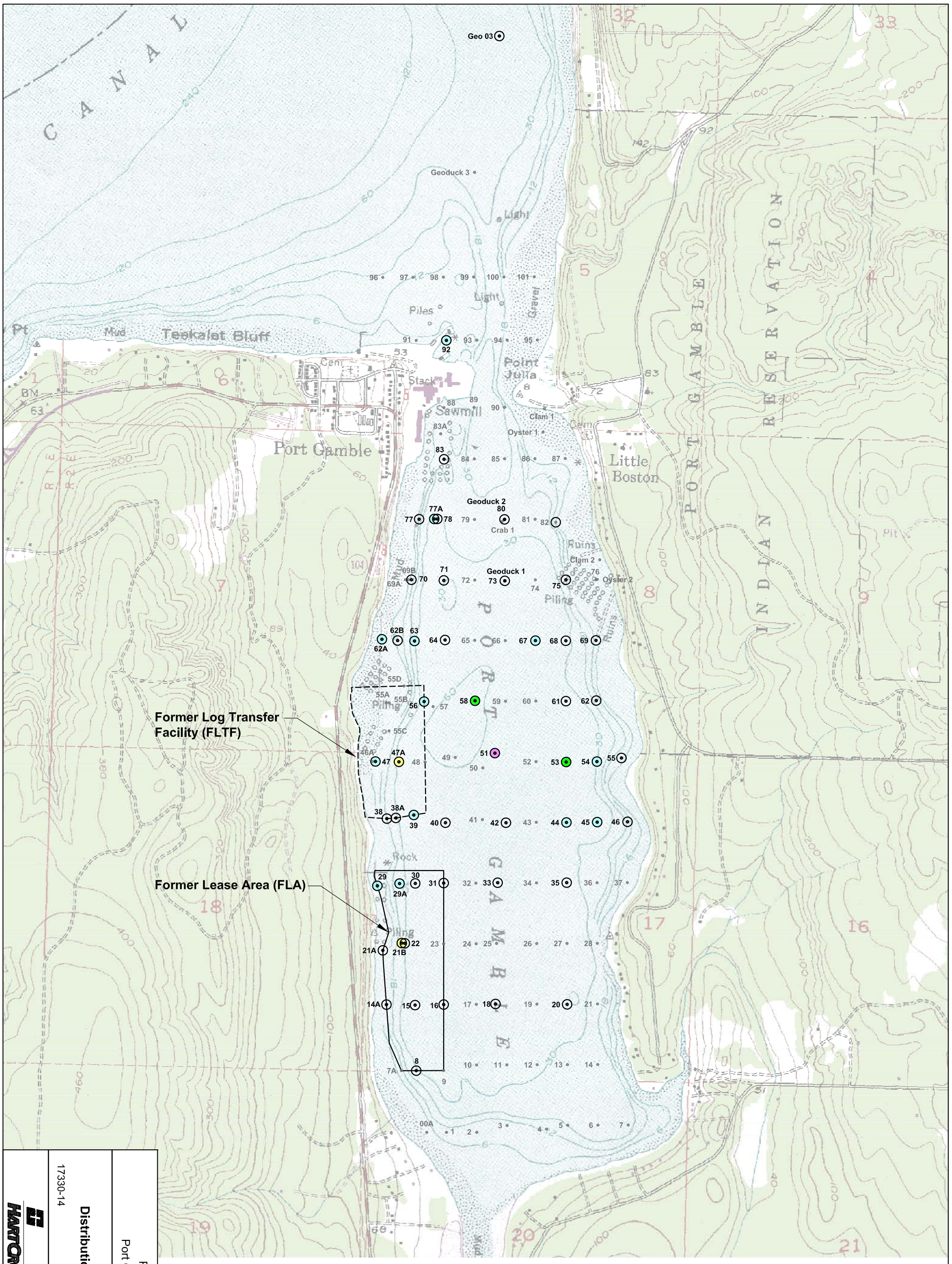
17330-14

8/09

Port Gamble Bay
Port Gamble, Washington

HARTCROWSER

Figure
12



10 • Grid Location and Number

Concentration Range of Total Resin Acids in µg/kg

- 0 to 110
- 110 to 1,000
- 1,000 to 2,000
- 2,000 to 3,000
- 3,000 to 4,000
- 4,000 to 5,000

Note: Total resin acids include 9, 10-dichlorostearic, abietic, dehydroabietic, isopimaric, neoabietic, palustric, pimaric, and sandaracopimaric acids.

N

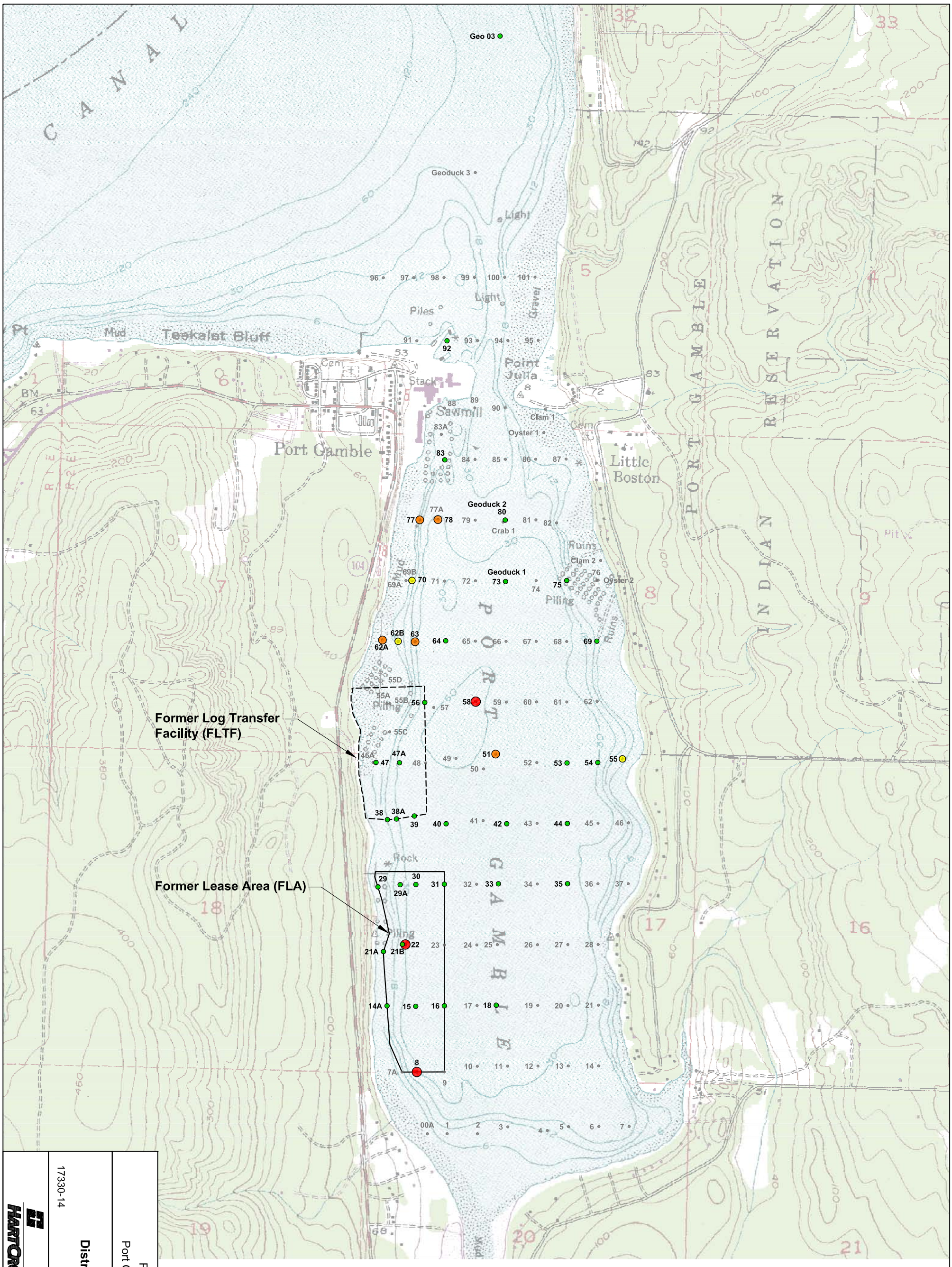
0 1,500 3,000

Scale in Feet

Source: Base map prepared from USGS 7.5 minute quadrangle map of Port Gamble, WA.

Port Gamble Bay Port Gamble, Washington	**Distribution of Total Resin Acids** 17330-14 8/09	HARTCROWSER Figure **13**

EAL 07/15/09 1733014-019.dwg



HARTCROWSER	Distribution of Phenol	Port Gamble Bay Port Gamble, Washington
Figure 14	17330-14 7/09	

JAB 08/19/09 1733014-018 (Dioxin TEQ-Rep).dwg

Former Log Transfer Facility (FLTF)

Former Lease Area (FLA)

10 • Grid Location and Number

0.571 Dioxin TEQ in ng/kg (ppt)

Note: Undetected congeners are included in the TEQ summation at one half the detection limit.

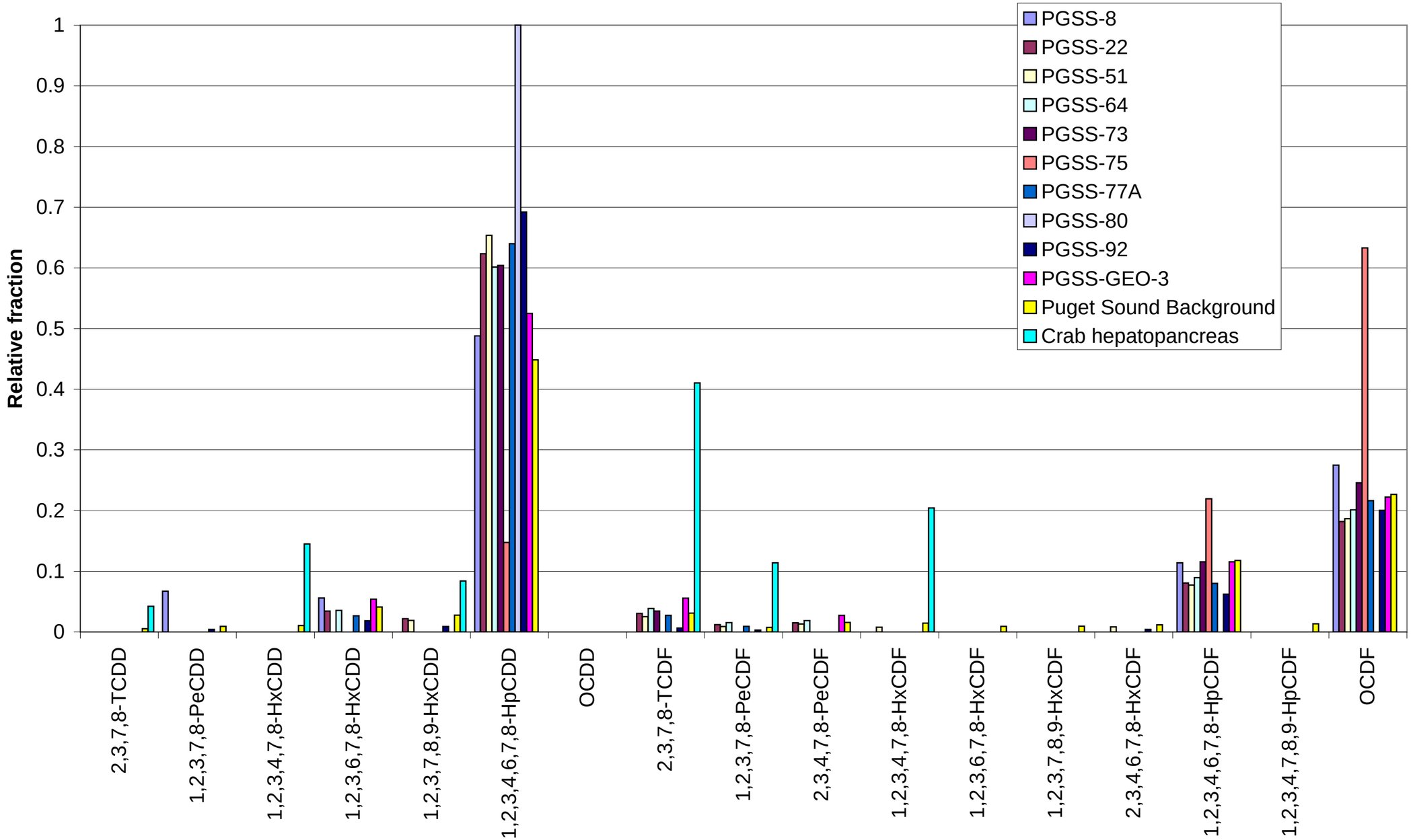
N

0 1,500 3,000

Scale in Feet

Source: Base map prepared from USGS 7.5 minute quadrangle map of Port Gamble, WA.

HARTCROWSER	**Distribution of Dioxin TEQs**	Port Gamble Bay Port Gamble, Washington
Figure 15	17330-14 8/09	



Notes:
1.) Excludes OCDD.
2.) Non-detects = 0.

Port Gamble Bay
Port Gamble, Washington

Dioxin Congener Relative Ratios

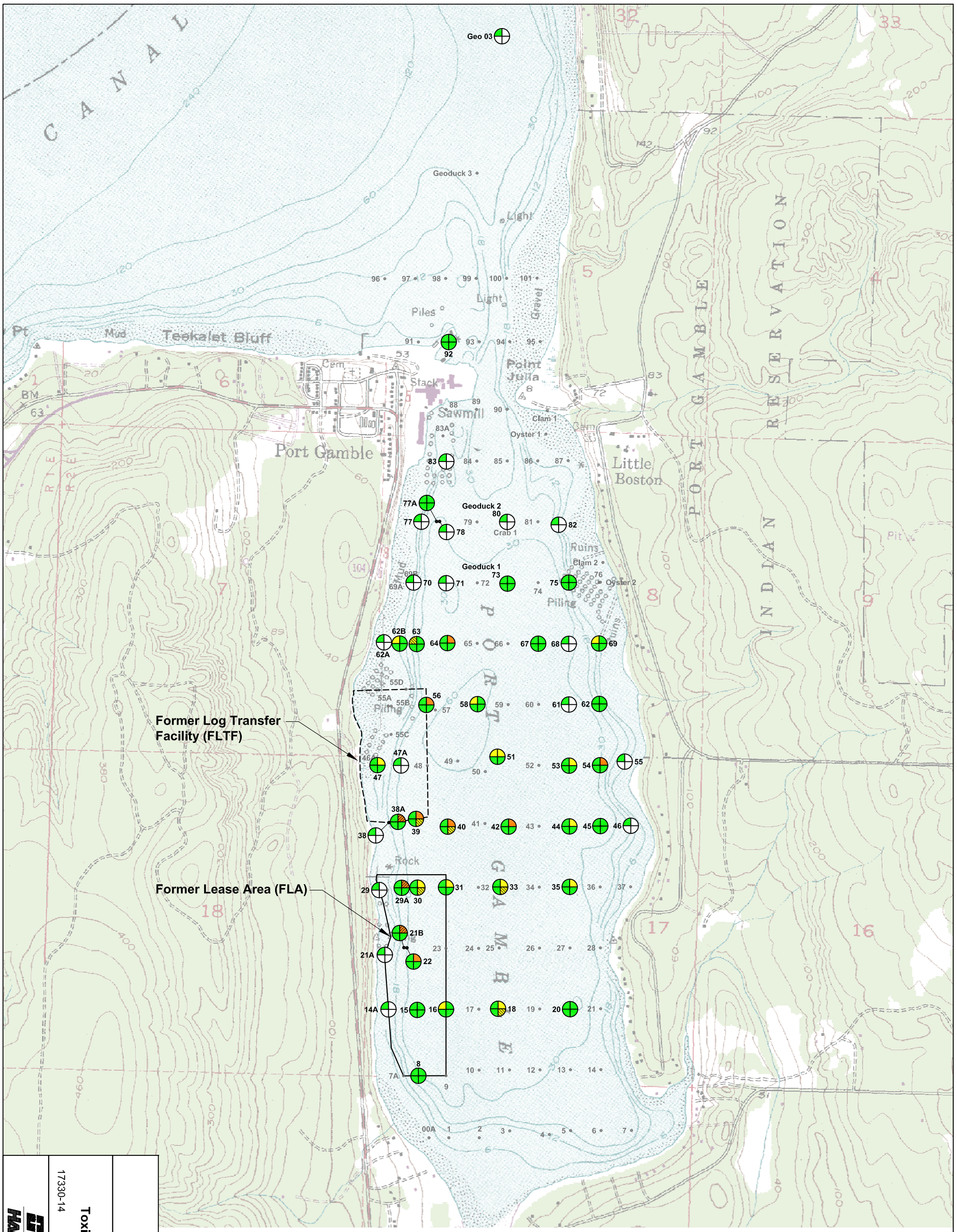
17330-14 8/09

HARTCROWSER

Figure
16

JAB 08/20/09 1733014-019 (Dioxin Relative Ratios).xls

EAL 08/20/09 1733014-023.dwg



10 • Grid Location and Number

MT: Microtox
LD: Larval Development
AM: Amphipod
PG: Juvenile Polychaete Growth

Test Sediment Compared to Alternate Reference or Control

Pass

Fail SQS*

Fail CSL (Excluding 2-Hit SQS Failures)

N

0 1,500 3,000

Scale in Feet

Note: "2-Hit" SQS failures also fail CSL.

Source: Base map prepared from USGS 7.5 minute quadrangle map of Port Gamble, WA.

Toxicity Testing Summary Results

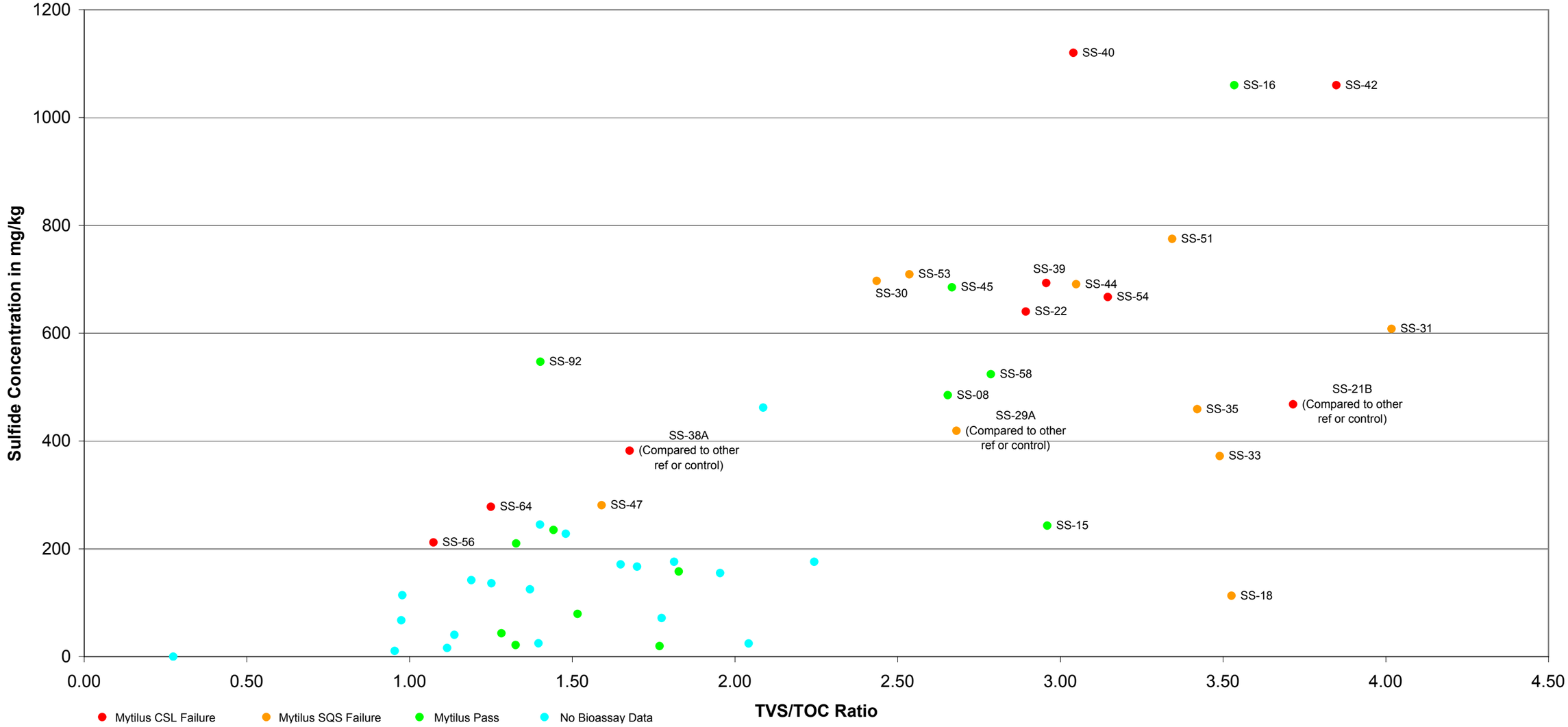
17330-14

8/09

Figure **17**

Port Gamble Bay
Port Gamble, Washington

HARTCROWSER



JAB 8/20/09 1733014-19 (TVS-TOC Ratios)1.xls

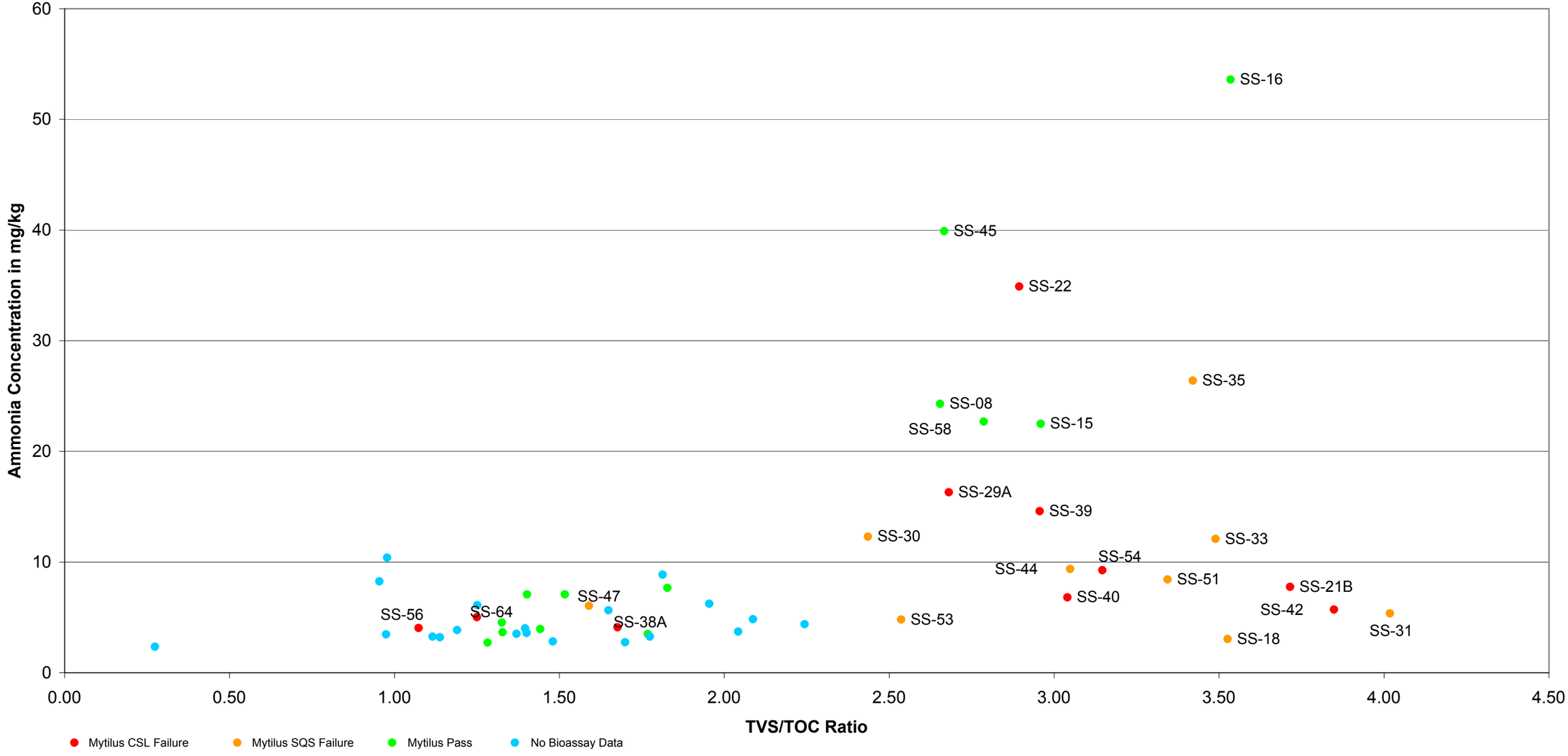
Port Gamble Bay
Port Gamble, Washington

Sulfide and Mytilus Bioassay Results Compared to TVS/TOC Ratio

17330-14 8/09

HARTCROWSER

Figure
18



JAB 8/20/09 1733014-19 (TVS-TOC Ratios)1.xls

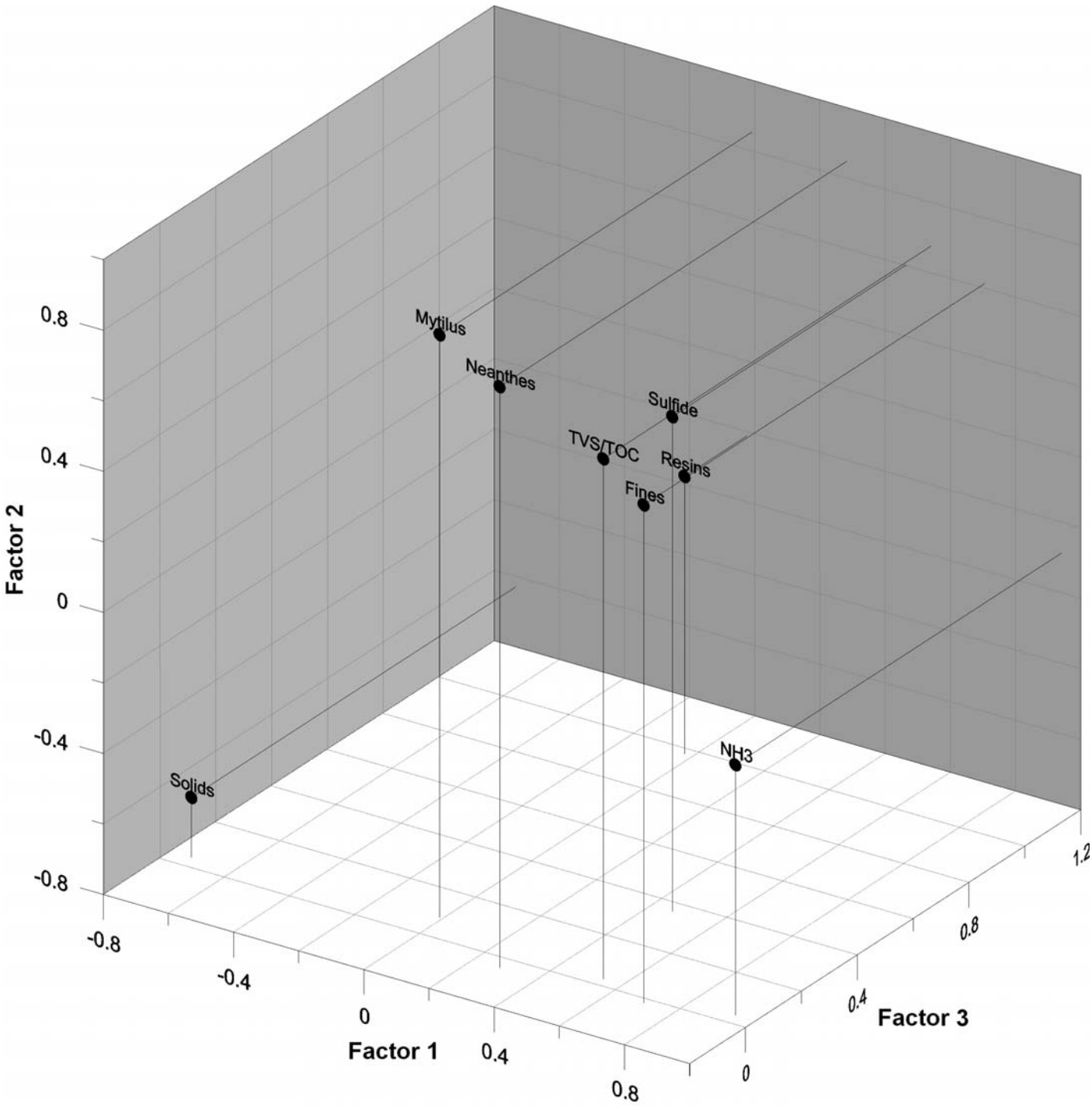
Port Gamble Bay
Port Gamble, Washington

Ammonia and Mytilus Bioassay Results Compared to TVS/TOC Ratio

17330-14 8/09

HARTCROWSER

Figure
19



Port Gamble Bay
Port Gamble, Washington

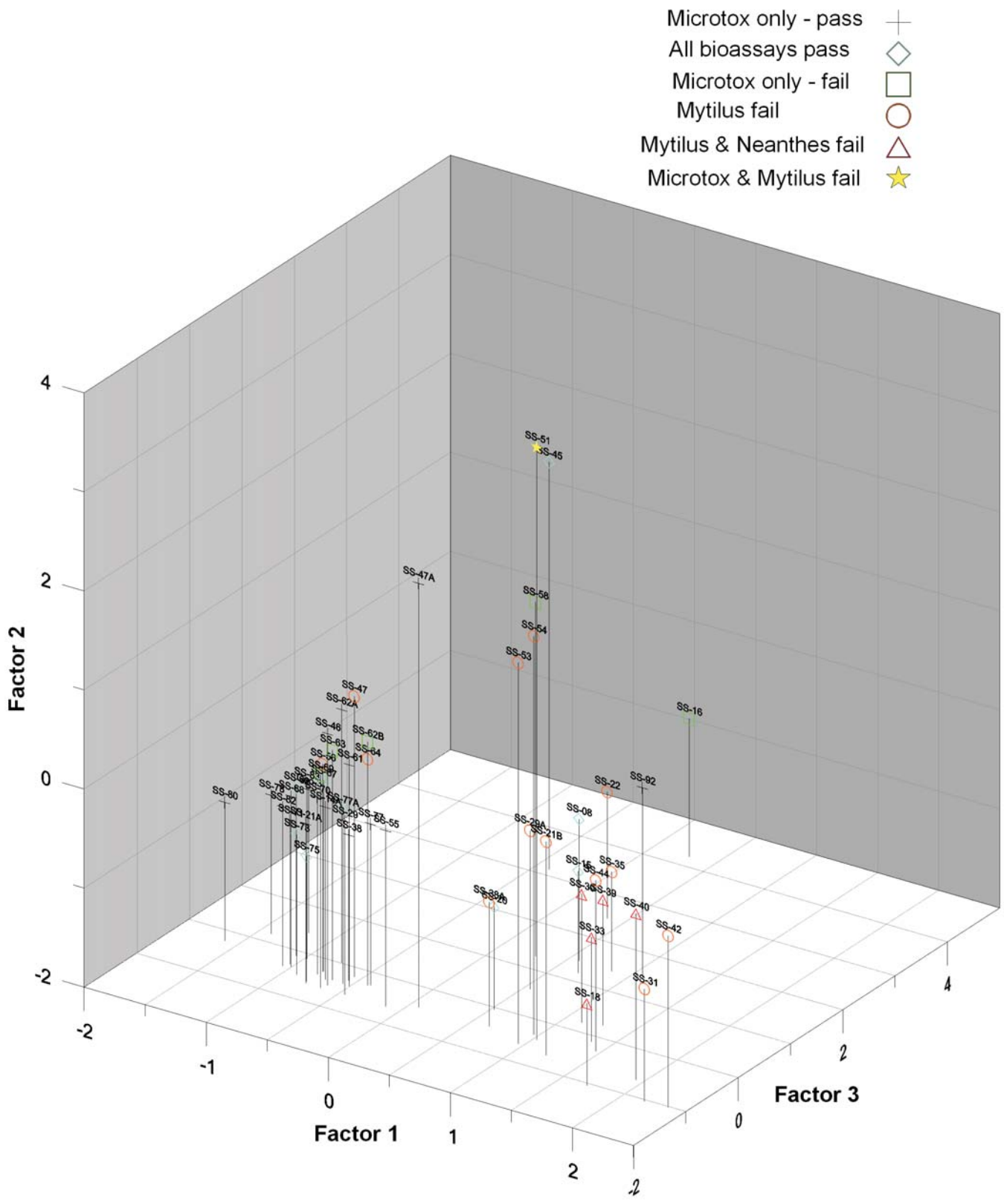
Principal Components Analysis Factor Loadings

17330-14 8/09

HARTCROWSER

Figure
20

EAL 08/11/09 1733014-AD.cdr



Port Gamble Bay
Port Gamble, Washington

Principal Components Analysis Factor Scores

17330-14 8/09

HARTCROWSER

Figure
21

EAL 08/10/09 1733014-AA.cdr

APPENDIX A
FIELD DOCUMENTATION

VIBRACORE LOGS

Table A-1 - Sample Location Coordinates

Location	Actual NAD 1983, SPCS, WA. N. Northing	Actual NAD 1983, SPCS, WA. N. Easting	Mudline Elevation in Feet (MLLW)
Port Gamble Bay			
Surface Sediment Samples			
PGSS- 8	305614.9	1211006.0	-8.88
PGSS-14A	306628.6	1210686.7	-3.53
PGSS-15	306607.8	1210987.2	-9.69
PGSS-16	306616.8	1211499.7	-9.4
PGSS-18	306622.8	1212494.9	-9.26
PGSS-20	306619.7	1213496.1	-8.93
PGSS-21A	307631.5	1210599.3	-2.14
PGSS-21B	307625.3	1210766.2	-8.68
PGSS-22	307614.0	1210994.5	-9.97
PGSS-29	308616.0	1210495.6	-4.09
PGSS-29A	308612.4	1210731.4	-9.21
PGSS-30	308615.1	1210990.6	-10.55
PGSS-31	308620.6	1211494.8	-10.08
PGSS-33	308623.9	1212505.0	-9.57
PGSS-35	308627.8	1213489.0	-9.48
PGSS-38	309613.5	1210485.9	-4.8
PGSS-38A	309614.9	1210719.4	-9.87
PGSS-39	309622.8	1210986.1	-11.35
PGSS-40	309616.3	1211488.3	-11.52
PGSS-42	309616.1	1212486.9	-10.64
PGSS-44	309620.3	1213485.2	-9.86
PGSS-45	309625.9	1213992.2	-10.18
PGSS-46	309631.6	1214493.1	-4.95
PGSS-47	310614.0	1210478.0	-5.16
PGSS-47A	310620.7	1210720.5	-9.77
PGSS-51	310621.5	1212478.2	-12.99
PGSS-53	310617.7	1213480.7	-10.8
PGSS-54	310624.5	1213987.8	-8.98
PGSS-55	310684.0	1214393.2	-2.37
PGSS-56	311612.0	1210983.4	-7.97
PGSS-58	311627.7	1211976.5	-19.46
PGSS-61	311621.8	1213476.4	-11.91
PGSS-62	311631.1	1213976.5	-4.95
PGSS-62A	312642.3	1210440.2	-0.92
PGSS- 62B	312621.8	1210698.5	-3.25
PGSS-63	312613.7	1210977.5	-10.53
PGSS-64	312630.2	1211481.4	-12.98
PGSS-67	312620.1	1212973.3	-15.53
PGSS-68	312617.9	1213475.2	-11.06
PGSS-69	312623.7	1213971.9	-3.32
PGSS-70	313616.1	1210966.3	-7.33
PGSS-71	313613.3	1211462.0	-9.3
PGSS-73	313606.3	1212468.0	-12.63
PGSS-75	313623.7	1213475.8	-5.19
PGSS-77	314622.3	1211054.3	-5.84
PGSS-77A	314627.0	1211303.7	-11.01
PGSS-78	314620.8	1211468.5	-7.13

Table A-1 - Sample Location Coordinates

	Actual		
	NAD 1983, SPCS, WA. N.		Mudline Elevation
Location	Northing	Easting	in Feet (MLLW)
PGSS-80	314619.5	1212463.1	-8.44
PGSS-82	314573.0	1213309.0	-4.42
PGSS-83	315611.5	1211465.6	-6.46
PGSS-92	317573.0	1211503.6	-3.49
PGSS-Geo 03	322593.1	1212377.8	-11.88
Sediment Core Samples			
Station-4	304562.2	1213155.9	-4.5
Station-8	305618.6	1211004.4	-8.5
Station-14A	306640.8	1210686.1	-4.1
Station-16	306619.2	1211502.6	-9.7
Station-18	306614.3	1212494.3	-9.3
Station-20	306628.4	1213486.4	-8.9
Station-22	307613.4	1210994.9	-9.8
Station-29	308611.9	1210488.5	-3.7
Station-31	308615.1	1211498.3	-9.8
Station-33	308617.0	1212488.0	-9.8
Station-35	308625.9	1213490.6	-9.3
Station-38A	309609.4	1210718.4	-9.8
Station-40	309622.0	1211476.6	-10.8
Station-42	309617.9	1212490.2	-10.8
Station-44	309625.2	1213481.7	-9.5
Station-46	309627.9	1214493.0	-4.6
Station-47	310616.5	1210477.6	-5.8
Station-49	310620.4	1211483.3	-17.7
Station-51	310621.0	1212474.9	-13.2
Station-53	310625.5	1213482.6	-11.1
Station-55	310687.7	1214392.0	-2.2
Station-58	311614.1	1211988.9	-18.5
Station-61	311621.7	1213480.5	-11.8
Station-62	311627.3	1213984.2	-5.0
Station-62B	312622.5	1210696.0	-3.2
Station-64	312618.6	1211481.5	-13.0
Station-65	312625.8	1211971.3	-13.4
Station-67	312619.6	1212966.4	-15.2
Station-69	312627.2	1213976.0	-3.2
Station-71	313610.8	1211467.6	-9.1
Station-73	313606.1	1212477.4	-12.1
Station-75	313627.2	1213478.7	-4.4
Station-77	314620.5	1211054.2	-5.8
Station-78	314620.8	1211468.5	-6.9
Station-80	314626.9	1212487.0	-7.9
Station-82	314571.2	1213309.3	-4.1

Table A-1 - Sample Location Coordinates

	Actual		
	NAD 1983, SPCS, WA. N.		Mudline Elevation
Location	Northing	Easting	in Feet (MLLW)
Radiometric Dating Samples			
Station-22B	307615.2	1210994.9	-9.8
Station-51B	310620.1	1212485.5	-11.5
Biota Samples			
Oyster 1	316060.93	1213099.891	NA
Oyster 2	313629.004	1213992.928	NA
Clam 1	316447.211	1213120.908	NA
Clam 2	313952.791	1214034.622	NA
Geoduck 1 (PGSS-73)	313619.603	1212472.391	NA
Geoduck 2 (PGSS-80)	314619.484	1212465.569	NA
Geoduck 3 (PGSS-Geo 03)	320227.759	1211968.987	NA
Crab 1	314438.116	1212257.613	NA
Carr Inlet Reference Samples			
MSMP 43	114506.413	1166734.03	-18.8
CR-20 W	127020.174	1184727.203	-14.0
CR-23 Mod	126949.252	1183497.239	-14.7

Notes:
Coordinates are in Washington State Plane North NAD83.
NA - Not collected by the Port Gamble S'Klallam Tribe Natural Resources Department during sample collection.

Table A-2 - Surface Sediment Grab Sample Descriptions

Sample Number	Collection Date	Visual Sediment Description	Comments
Port Gamble Bay			
PGSS-8	12/4/2008	Very soft, saturated, gray-black, slightly sandy SILT (ML).	Overpenetrated. Small shell (1-mm). Strong sulfide-like odor.
PGSS-14A	12/4/2008	Very loose, saturated, gray-black, silty SAND (SM).	Overpenetrated. Surface leaves, shells, red algae, shrimp, polychaete tube, fish. Moderate sulfide-like odor.
PGSS-15	12/4/2008	Very soft, saturated, gray-green, slightly sandy SILT (ML).	Overpenetrated. Moderate sulfide-like odor.
PGSS-16	12/4/2008	Very soft, saturated, gray-green SILT (ML).	Overpenetrated. Shell fragments, polychaete worm. Sulfide-like odor.
PGSS-18	12/4/2008	Very soft, saturated, gray-black SILT (ML).	Overpenetrated. Polychaete worms caught in grab, crab (1.5-inch), shells, *Echiura sp*. Strong sulfide-like odor.
PGSS-20	12/4/2008	Very soft, saturated, gray-black SILT (ML).	Overpenetrated. Sulfide-like odor.
PGSS-21A	12/4/2008	Very loose, saturated, gray-black, slightly silty SAND (SM).	Shell fragments. Zooplankton, algae, tree branch.
PGSS-21B	12/4/2008	Very soft, saturated, gray-green, slightly sandy SILT (ML).	Combined two grabs. Overpenetrated on one grab. Small shell fragments, moderate to abundant bark pieces (25 to 50%, 2- to 6-inch).
PGSS-22	12/4/2008	Very soft, saturated, gray-black SILT (ML).	Overpenetrated. Strong sulfide-like odor.
PGSS-29	12/4/2008	Very soft, saturated, gray-black SILT (ML) (1-cm lens) over silty SAND (SM).	Overpenetrated. Shell fragments (0.5-inch), polychaete tubes (5- to 7-inch). Slight sulfide-like odor.
PGSS-29A	12/4/2008	Very soft, saturated, gray-green, sandy SILT (ML) with a layer of wood chips and bark (1- to 5-inch) at 10-cm below surface.	Overpenetrated. Worms, polychaete tubes. Strong sulfide-like odor. Wood debris including woodchips, bark (1- to 5-inch), stick.
PGSS-30	12/5/2008	Very soft, saturated, gray-green, slightly sandy SILT (ML).	Overpenetrated. Trace small shell fragments.
PGSS-31	12/5/2008	Very soft, saturated, gray-black SILT (ML) with trace of sand.	Overpenetrated. Shell fragments, polychaete tube worms.
PGSS-33	12/5/2008	Very soft, saturated, light gray to gray-black, slightly sandy SILT (ML).	Overpenetrated. Sea pen, sea whip, Nemertean. Slight sulfide-like odor.
PGSS-35	12/5/2008	Very soft, saturated, slightly sandy SILT (ML).	Overpenetrated. Leaf on sample surface. Strong sulfide-like odor.
PGSS-38	12/5/2008	Very soft, saturated, gray-black, sandy SILT (ML).	Overpenetrated. Leaf on surface, small clams (1-mm), polychaete tubes, shell fragments. Very slight sulfide-like odor.
PGSS-38A	12/5/2008	Very soft, saturated, gray-black, slightly sandy SILT (ML).	Overpenetrated. Pieces of bark 10-cm below surface.
PGSS-39	12/5/2008	Very soft, saturated, gray-black, slightly sandy SILT (ML).	Overpenetrated. Worm. Strong sulfide-like odor.
PGSS-40	12/5/2008	Very soft, saturated SILT (ML) with trace of sand.	Overpenetrated. Worm, shell hash. Strong sulfide-like odor.
PGSS-42	12/5/2008	Very soft, saturated, slightly sandy SILT (ML).	Overpenetrated. Large shell (2-inch) with barnacles on surface, worms. Sulfide-like odor.
PGSS-44	12/5/2008	Very soft, saturated, slightly sandy SILT (ML).	Overpenetrated. Shell hash on sample surface. Strong sulfide-like odor.

Table A-2 - Surface Sediment Grab Sample Descriptions

Sample Number	Collection Date	Visual Sediment Description	Comments
Port Gamble Bay			
PGSS-45	12/8/2008	Very loose, saturated, gray-green, silty SAND (SM).	Overpenetrated. Strong sulfide-like odor.
PGSS-46	12/8/2008	Very loose, saturated, gray-green, silty SAND (SM).	Overpenetrated. Geoduck siphon (2- to 3-inch piece), shell with barnacles, red algae, hermit crab, polychaete tubes.
PGSS-47	12/8/2008	Very loose, saturated, brown, silty SAND (SM).	Overpenetrated. Crab, leaves, shell, polychaete tubes.
PGSS-47A	12/8/2008	Very soft, saturated, brown-green to black-green, sandy SILT (ML).	Overpenetrated. Worm. Slight sulfide-like odor.
PGSS-51	12/8/2008	Very soft, saturated, light green to black-brown, sandy SILT (ML).	Overpenetrated. Worm, sea whip. Slight sulfide-like odor. Eelgrass on sampler frame.
PGSS-53	12/8/2008	Very soft, saturated, brown-green to black-green, sandy SILT (ML).	Overpenetrated. Worms, polychaete tubes. Slight sulfide-like odor.
PGSS-54	12/8/2008	Very soft, saturated, black-green, sandy SILT (ML).	Overpenetrated. Worms, nudibranch, leaf, red algae, polychaete tubes, shells.
PGSS-55	12/8/2008	Very loose, saturated, black-brown-green, silty SAND (SM).	Overpenetrated. Leaves, shell fragments, worms, polychaete tubes. Slight sulfide-like odor.
PGSS-56	12/8/2008	Very loose, saturated, brown, silty SAND (SM).	Overpenetrated. Shell fragments, worm, red algae, polychaete tubes.
PGSS-58	12/9/2008	Very soft, saturated, black-brown SILT (ML).	Overpenetrated. Sulfide-like odor.
PGSS-61	12/9/2008	Very loose, saturated, black-brown, silty SAND (SM).	Overpenetrated. Worms, shells, twigs, polychaete tubes.
PGSS-62	12/9/2008	Very loose, saturated, brown to black-brown, silty SAND (SM).	Overpenetrated. Polychaete tubes, green algae.
PGSS-62A	12/9/2008	Very loose, saturated, brown-green to black-brown, silty SAND (SM).	Shell hash, worms.
PGSS-62B	12/9/2008	Very loose, saturated, brown-green to black-brown, silty SAND (SM).	Red and brown algae on surface.
PGSS-63	12/9/2008	Very loose, saturated, brown-green to black-brown, silty SAND (SM).	Overpenetrated. Worms, shell fragments, brittle stars, polychaete tubes.
PGSS-64	12/9/2008	Very soft, saturated, brown-green to black-brown, sandy SILT (ML).	Overpenetrated. One-half jackknife clam, worms, nemerteans.
PGSS-67	12/9/2008	Very loose, saturated, brown, silty SAND (SM).	Overpenetrated. Worms. Pieces of bark 10-cm below surface.
PGSS-68	12/9/2008	Very loose, saturated, light brown to dark brown, silty SAND (SM).	Overpenetrated. Shell fragments.
PGSS-69	12/9/2008	Very soft, saturated, brown-green SILT (ML) over black-brown silty SAND (SM).	Overpenetrated. Red algae, polychaete tubes. Sulfide-like odor.
PGSS-70	12/9/2008	Very loose, saturated, brown-green to black-brown, silty SAND (SM).	Overpenetrated. Shrimp, shell fragments, polychaete tubes, worms.
PGSS-71	12/9/2008	Very loose, saturated, brown-green to black-brown, silty SAND (SM).	Overpenetrated on one side. *Sipunchulids*, shore crab, shell fragments, jackknife clams, worms, polychaete tubes, sea pen.
PGSS-73 (Geoduck 1)	12/9/2008	Very loose, saturated, brown-green to black-brown, silty SAND (SM).	Overpenetrated. Shell with barnacles, polychaete tubes, part of jackknife clam. Wood debris (bark) in upper 10 cm.

Table A-2 - Surface Sediment Grab Sample Descriptions

Sample Number	Collection Date	Visual Sediment Description	Comments
Port Gamble Bay			
PGSS-75 (near Clam 2/ Oyster 2)	12/9/2008	Very loose, saturated, light brown, fine SAND (SM).	Shell fragments, polychaete tubes, worms.
PGSS-77	12/9/2008	Very soft, saturated, black-brown, sandy SILT (ML).	Overpenetrated. Shrimp, red and brown algae, limpet, worms, shell fragments, polychaete tubes, crab, blenny fish.
PGSS-77A	12/9/2008	Very soft, saturated, black-brown, sandy SILT (ML).	Overpenetrated. Shell fragments. *Sipunchulids* at bottom of grab.
PGSS-78	12/10/2008	Very loose, saturated, brown-green SAND (SM).	Overpenetrated on one side. Hermit crab, shrimp, *ulva sp*, leaf stem, red algae, polychaete tubes, *sipunchulids*, jackknife clam, sea cucumber, shell hash.
PGSS-80 (Geoduck 2)	12/10/2008	Very loose, saturated, light brown, coarse SAND (SM) with shell hash.	Bark on surface. *Ulva sp.*, shrimp, worms, sand lance fish, shell hash.
PGSS-82	12/10/2008	Very loose, saturated, light brown, silty SAND (SM).	Red algae, polychaete tubes, shells and shell fragments, polychaetes, nemertean.
PGSS-83	12/10/2008	Very loose, saturated, brown-green to black-brown, silty SAND (SM).	Bark on surface. Shell fragments, worms, polychaete tubes. Slight sulfide-like odor. Red algae and tunicate on sampler frame.
PGSS-92	12/10/2008	Very soft, saturated, dark brown to black-brown, sandy SILT (ML).	Overpenetrated on one side. Doors did not completely close due to rock. Wood chips on surface, shell fragments, leaf, worms, polychaete tubes. Strong sulfide-like odor.
PGSS-GEO-3	12/10/2008	Very loose, saturated, brown-green to black-brown, fine SAND (SM).	Hermit crab, algae holdfasts, crabs, fish, polychaete tubes, shrimp, sea pen, partial sea anemone.
MSMP43	1/9/2009	Very loose, saturated, black, silty SAND (SM).	Carr Inlet reference sample. Few small shells.
CR20W	1/9/2009	Very soft, saturated, black, slightly sandy SILT (ML).	Carr Inlet reference sample. Brittle stars (0.5 to 1 inch) at surface. Slight sulfide-like odor.
CR23Mod	1/9/2009	Very soft, saturated, black, sandy SILT (ML).	Carr Inlet reference sample. Strong sulfide-like odor.

Note: All surface sediment grab samples were collected using a Young grab sampler.

PGSS- Port Gamble Sediment Sample

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.

Soil descriptions consist of the following:
Density/consistency, moisture, color, minor constituents, MAJOR CONSTITUENT, additional remarks.

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	Approximate Shear Strength in TSF
Very loose	0 to 4	Very soft	0 to 2	<0.125
Loose	4 to 10	Soft	2 to 4	0.125 to 0.25
Medium dense	10 to 30	Medium stiff	4 to 8	0.25 to 0.5
Dense	30 to 50	Stiff	8 to 15	0.5 to 1.0
Very dense	>50	Very stiff	15 to 30	1.0 to 2.0
		Hard	>30	>2.0

Sampling Test Symbols

- 1.5" I.D. Split Spoon
- Grab (Jar)
- 3.0" I.D. Split Spoon
- Shelby Tube (Pushed)
- Bag
- Cuttings
- Core Run

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

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

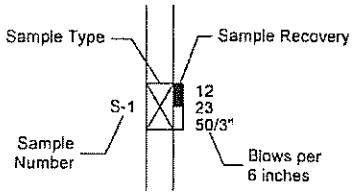
Laboratory Test Symbols

GS	Grain Size Classification
CN	Consolidation
UU	Unconsolidated Undrained Triaxial
CU	Consolidated Undrained Triaxial
CD	Consolidated Drained Triaxial
QU	Unconfined Compression
DS	Direct Shear
K	Permeability
PP	Pocket Penetrometer Approximate Compressive Strength in TSF
TV	Torvane Approximate Shear Strength in TSF
CBR	California Bearing Ratio
MD	Moisture Density Relationship
AL	Atterberg Limits
	Water Content in Percent Liquid Limit Natural Plastic Limit
PID	Photoionization Detector Reading
CA	Chemical Analysis
DT	In Situ Density in PCF
OT	Tests by Others

Groundwater Indicators

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

Sample Key



SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
				GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
	MORE THAN 50% OF COARSE FRACTION RETAINED ON NO 4 SIEVE	GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	SAND AND SANDY SOILS	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
				SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
	MORE THAN 50% OF COARSE FRACTION PASSING ON NO 4 SIEVE	SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES
				SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS	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
MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	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

KEY SHEET 1733014-VC.GPJ HC_CORP.GDT 7/16/09

HARTCROWSER

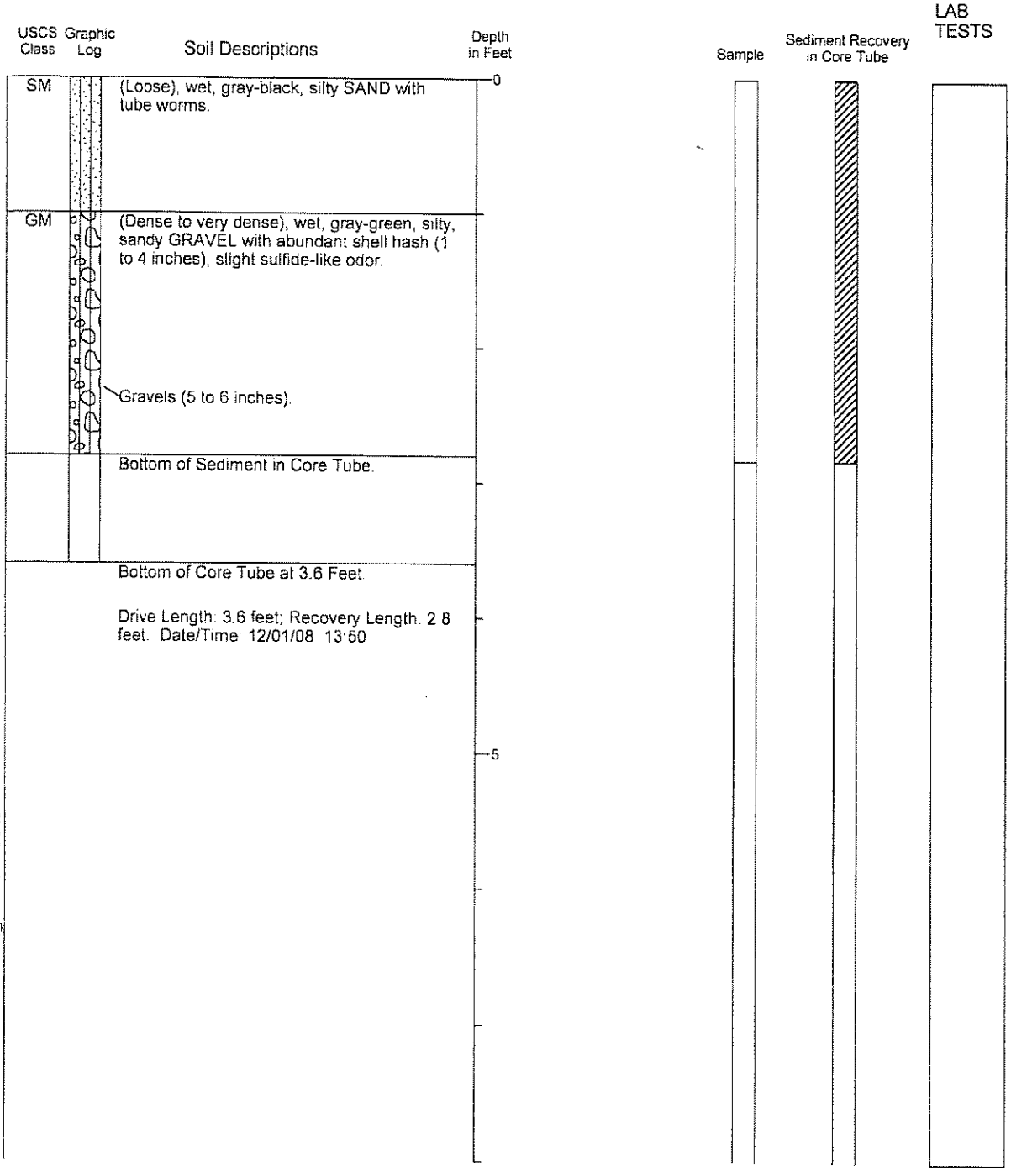
17330-14 12/08

Figure A-1

Vibracore Log Station 04

Location: See Figure 2.
Mudline Elevation in Feet (MLLW): 14.9 Feet
Water Depth in Feet: 6.8 Feet

Type of Sample: Vibracore
Core Diameter: 4 inches
Northing: 1213155.9
Easting: 304562.2
Logged By: C. Rust Reviewed By: G. Both



VIBROCORE LOG 1733014-VC.GPJ HC_CORP.GDT 5/5/09

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. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

HARTCROWSER

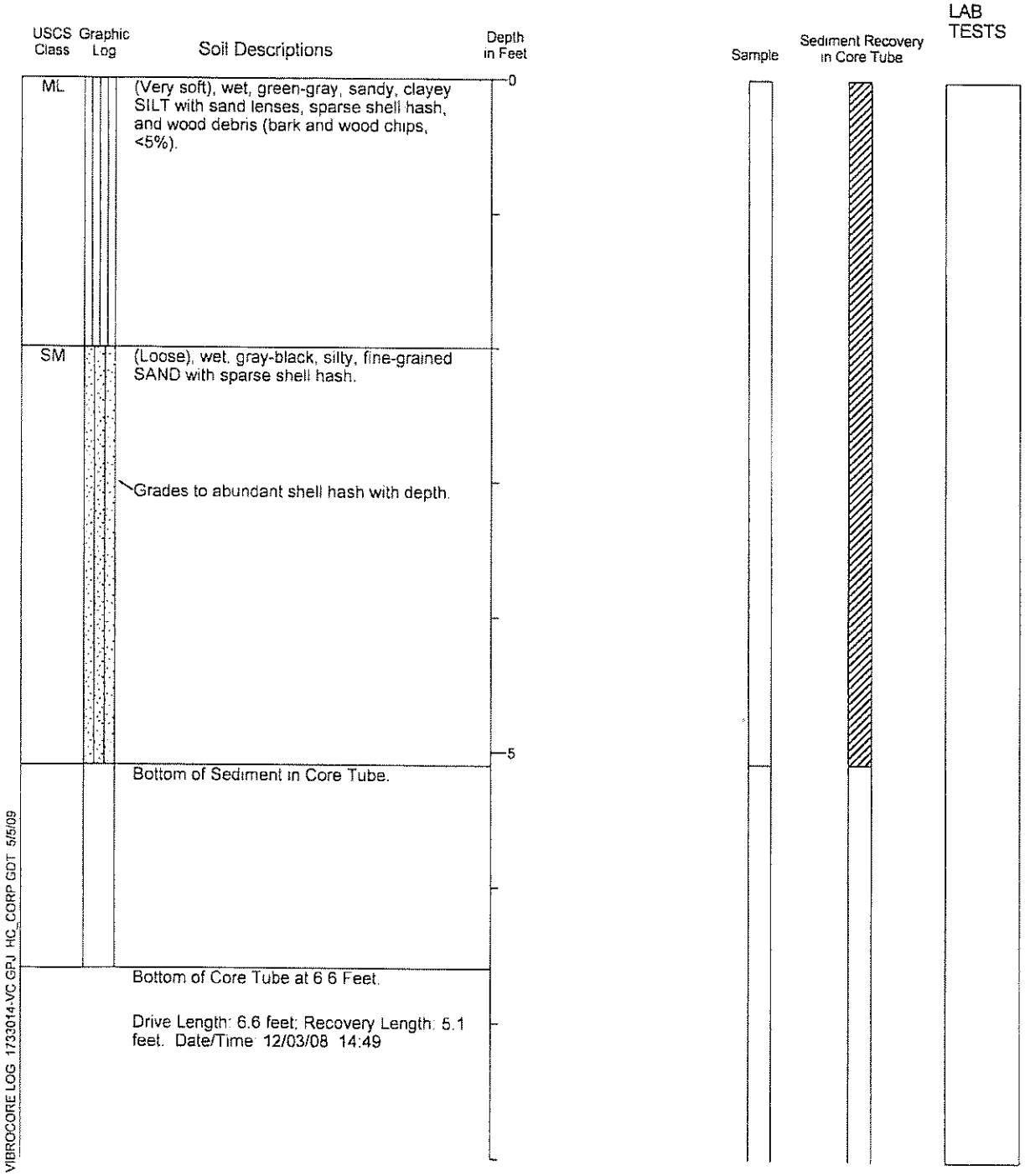
17330-14 *12/08*

Figure A-2

Vibracore Log Station 08

Location: See Figure 2.
Mudline Elevation in Feet (MLLW): 27.8 Feet
Water Depth in Feet: 10.5 Feet

Type of Sample: Vibracore
Core Diameter: 4 inches
Northing: 1211004.4
Easting: 305618.6
Logged By: C. Rust Reviewed By: G. Both



VIBROCORE LOG 1733014-VC.GPJ HC_CORP.GDT 5/5/09

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. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

HARTCROWSER

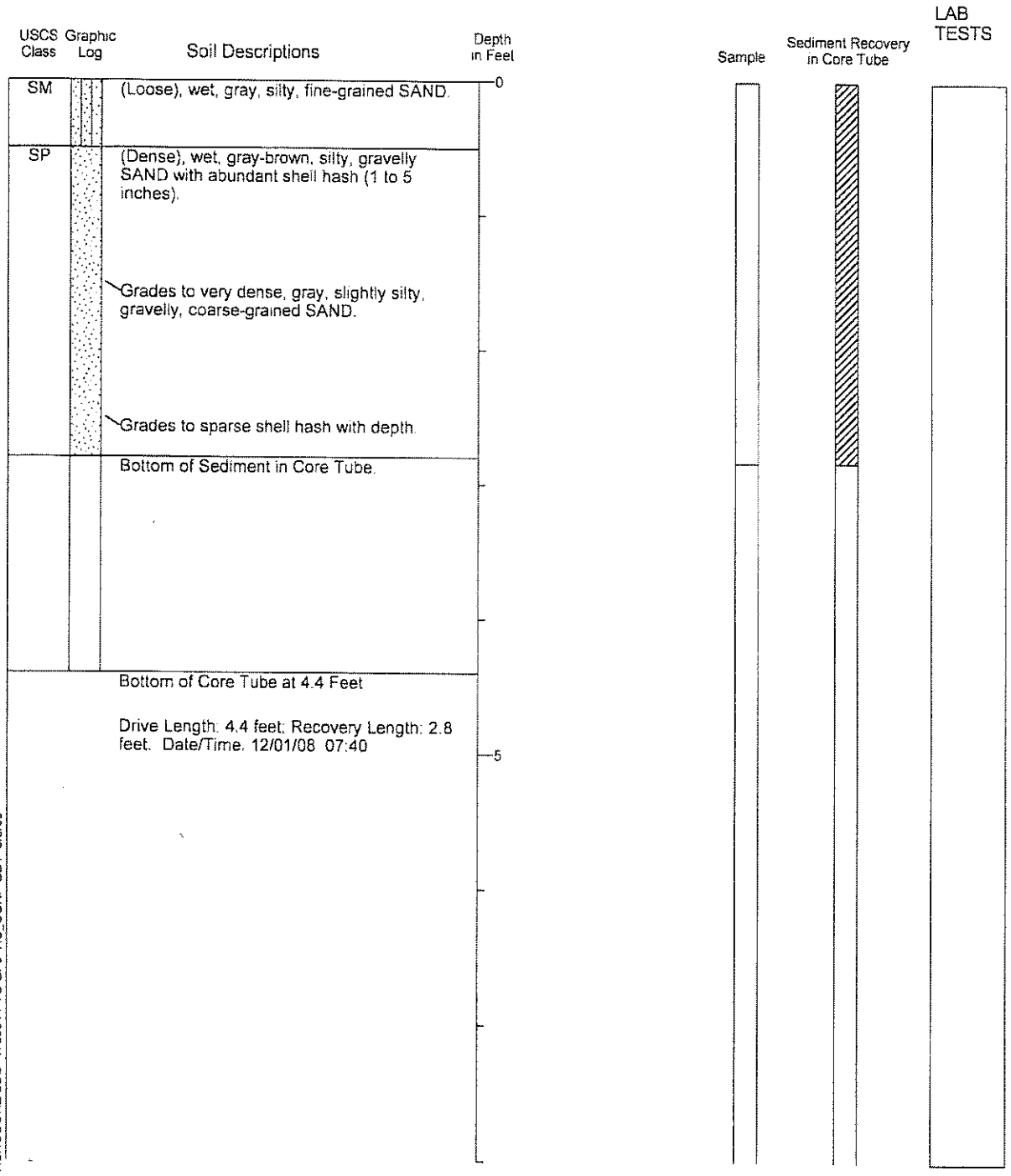
17330-14 *12/08*

Figure A-3

Vibracore Log Station 14A

Location: See Figure 2.
Mudline Elevation in Feet (MLLW): 13.4 Feet
Water Depth in Feet: 6.4 Feet

Type of Sample: Vibracore
Core Diameter: 4 inches
Northing: 1210686.1
Easting: 306640.8
Logged By: C. Rust Reviewed By: G. Both



VIBROCORE LOG 1733014.VC.GPJ HC_CORP.GDT 5/6/09

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. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

HARTCROWSER

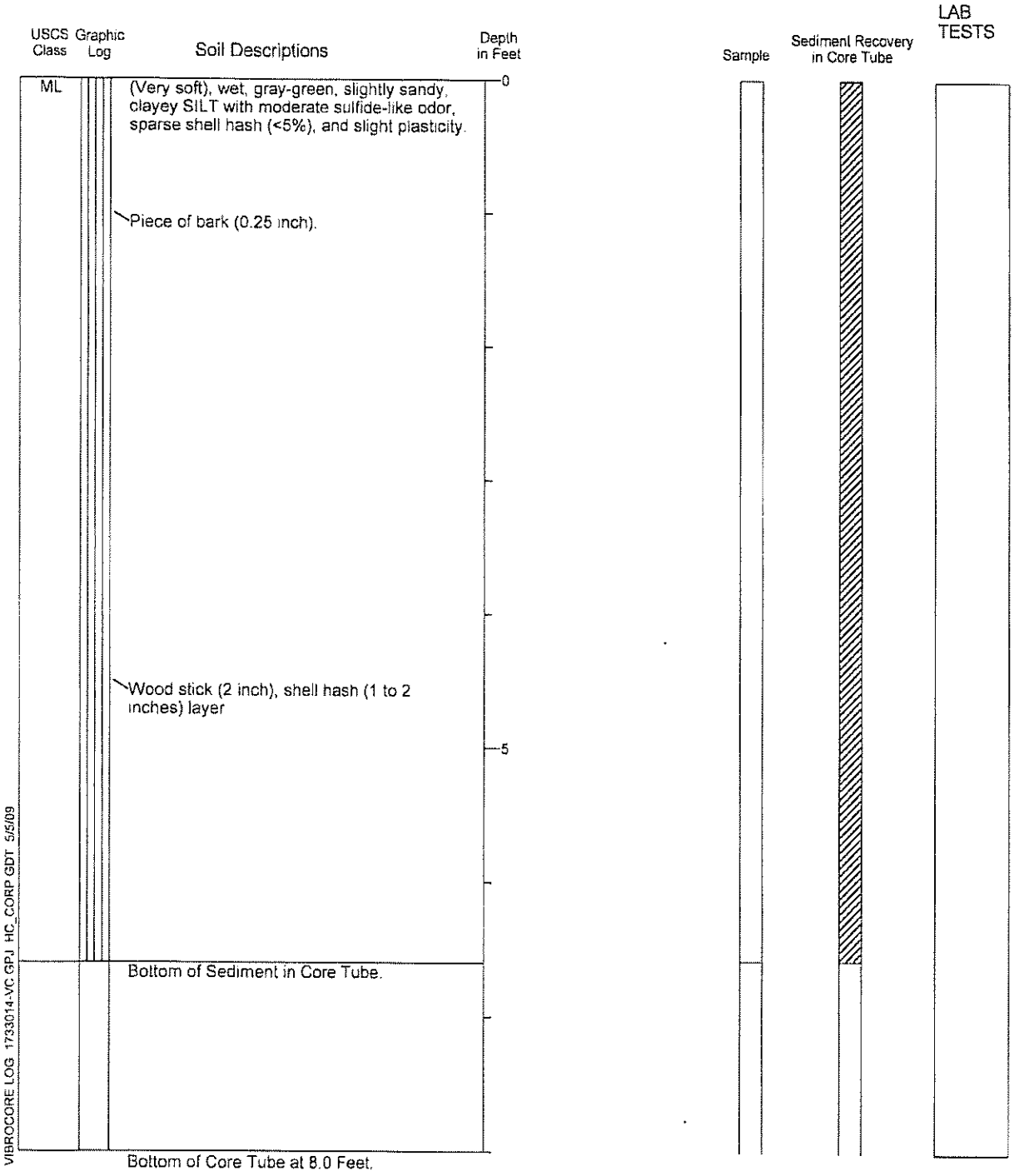
17330-14 *12/08*

Figure A-4

Vibracore Log Station 16

Location: See Figure 2
Mudline Elevation in Feet (MLLW): 31.9 Feet
Water Depth in Feet: 12.9 Feet

Type of Sample: Vibracore
Core Diameter: 4 inches
Northing: 1211502.6
Easting: 306619.2
Logged By: C. Rust Reviewed By: G. Both



Drive Length: 8.0 feet; Recovery Length: 6.6 feet. Date/Time: 12/02/08 08:04

VIBROCORE LOG 1733014-VC.GPJ HC_CORP.GDT 5/5/09

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. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

HARTCROWSER

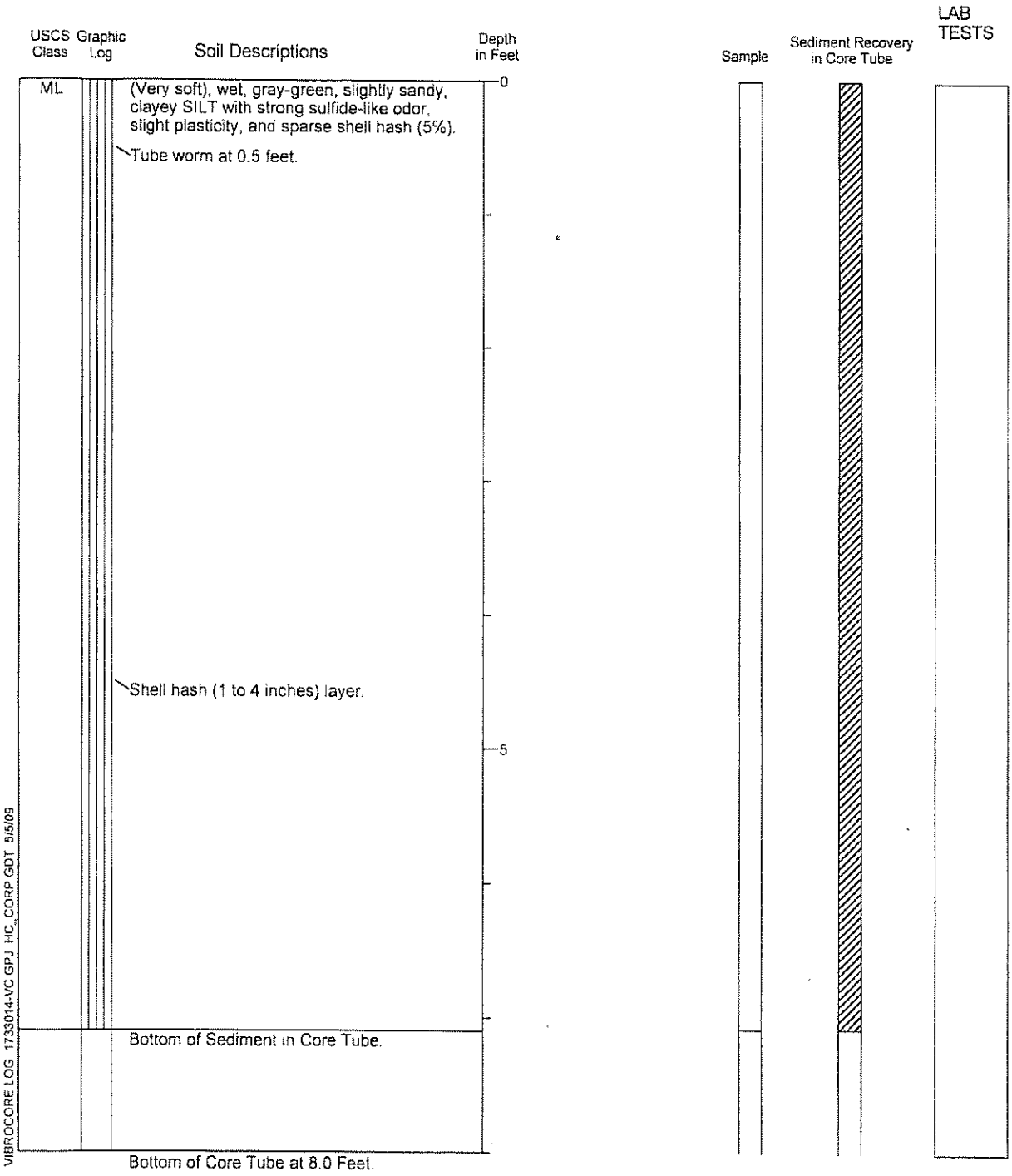
17330-14 *12/08*

Figure A-5

Vibracore Log Station 18

Location: See Figure 2.
Mudline Elevation in Feet (MLLW): 30.6 Feet
Water Depth in Feet: 12.5 Feet

Type of Sample: Vibracore
Core Diameter: 4 inches
Northing: 1212494.3
Easting: 306614.3
Logged By: C. Rust Reviewed By: G. Both



Drive Length: 8.0 feet; Recovery Length: 7.1 feet. Date/Time: 12/02/08 08:25

VIBROCORE LOG 1733014-VC.GPJ HC_CORP.GDT 5/5/09

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. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

HARTCROWSER

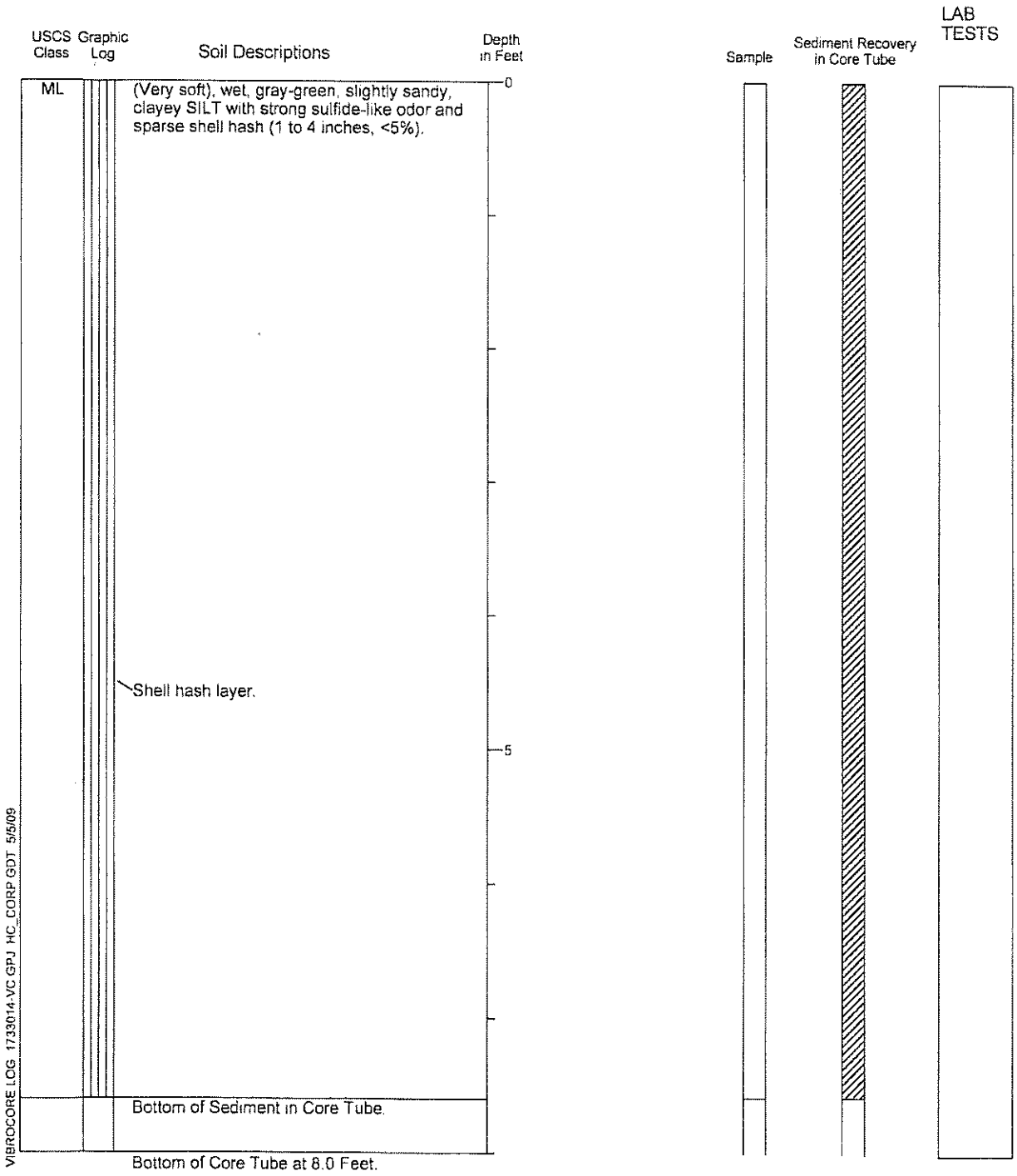
17330-14 *12/08*

Figure A-6

Vibracore Log Station 20

Location: See Figure 2.
Mudline Elevation in Feet (MLLW): 29.1 Feet
Water Depth in Feet: 12.1 Feet

Type of Sample: Vibracore
Core Diameter: 4 inches
Northing: 1213486.4
Easting: 306628.4
Logged By: C. Rust Reviewed By: G. Both



VIBROCORE LOG 1733014-VC.GPJ HC_CORP.GDT 5/5/09

Drive Length: 8.0 feet; Recovery Length: 7.6 feet. Date/Time: 12/02/08 08:47

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. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

HARTCROWSER

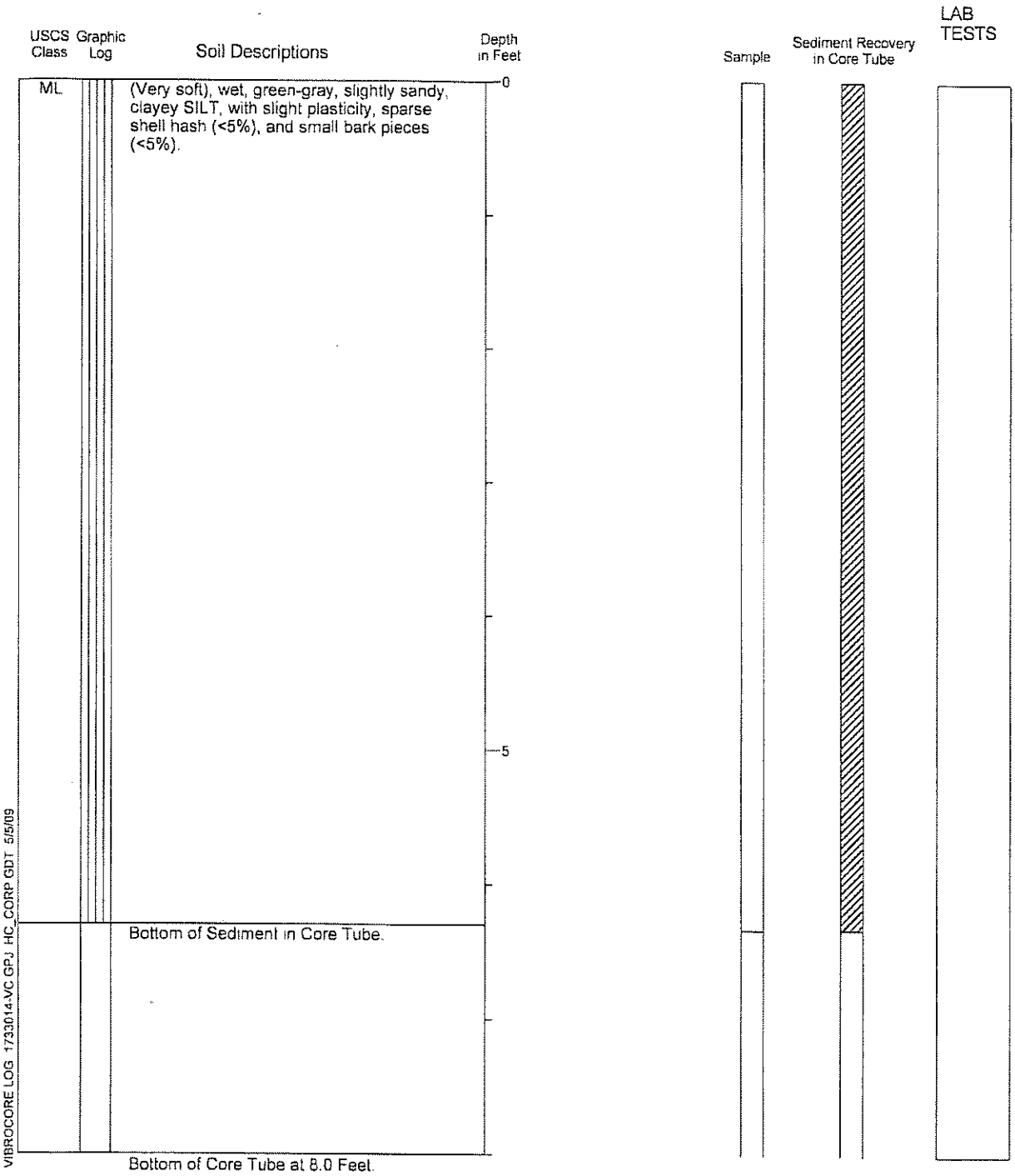
17330-14 *12/08*

Figure A-7

Vibracore Log Station 22

Location: See Figure 2.
Mudline Elevation in Feet (MLLW): 32.1 Feet
Water Depth in Feet: 12 Feet

Type of Sample: Vibracore
Core Diameter: 4 inches
Northing: 1210994.9
Easting: 307613.4
Logged By: C. Rust Reviewed By: G. Both



Drive Length: 8.0 feet; Recovery Length: 6.3 feet. Date/Time: 12/02/08 09.09

VIBROCORE LOG 1733014-VC.GPJ HC_CORP.GDT 5/5/09

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. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

HARTCROWSER

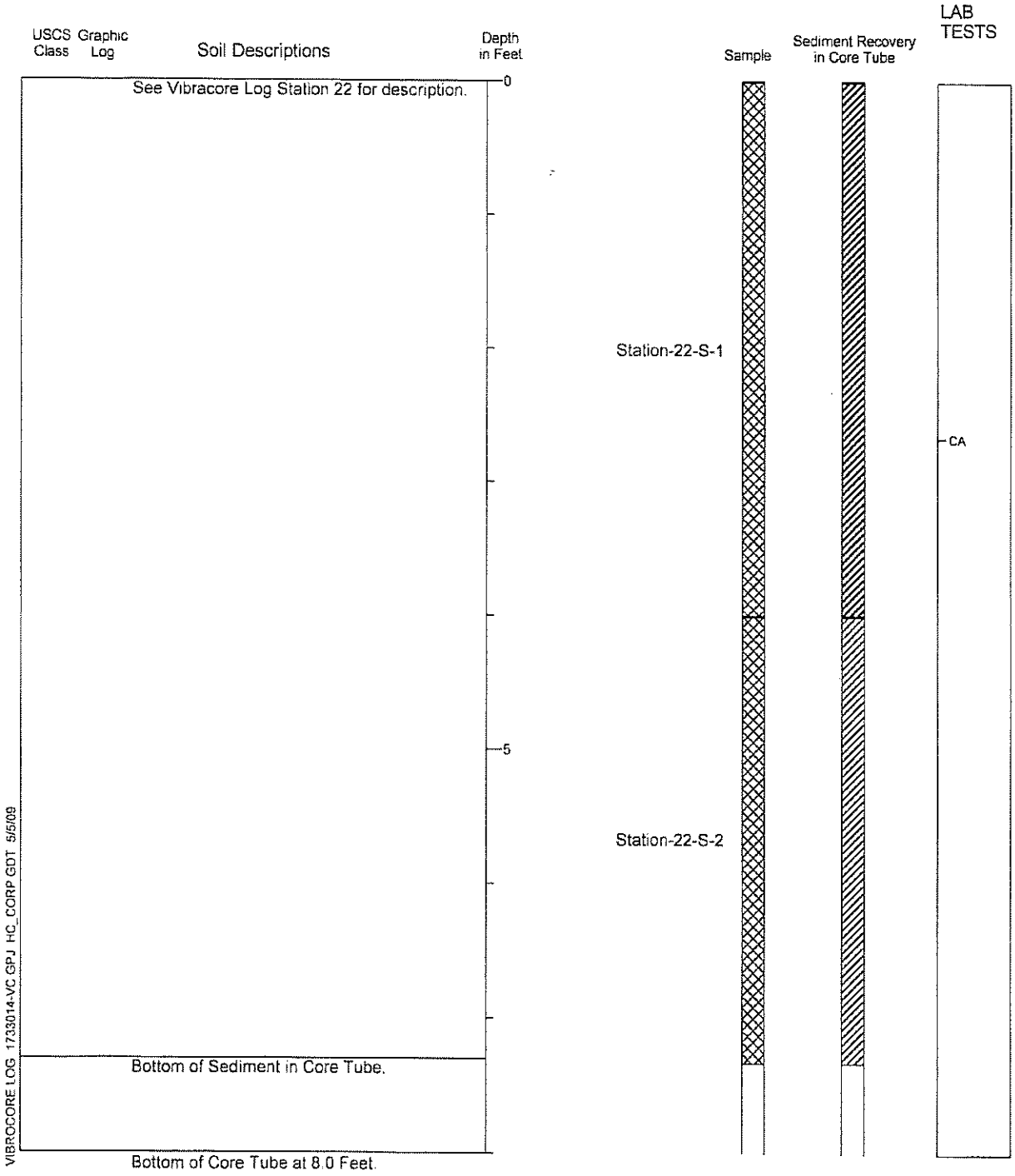
17330-14 *12/08*

Figure A-8

Vibracore Log Station 22B

Location: See Figure 2.
Mudline Elevation in Feet (MLLW): 32.1 Feet
Water Depth in Feet: 11.8 Feet

Type of Sample: Vibracore
Core Diameter: 4 inches
Northing: 1210994.9
Easting: 307615.2
Logged By: C. Rust Reviewed By: G. Both



Drive Length: 8.0 feet; Recovery Length. 7.3 feet. Date/Time: 12/03/08 09:29

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. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

HARTCROWSER

17330-14 *12/08*

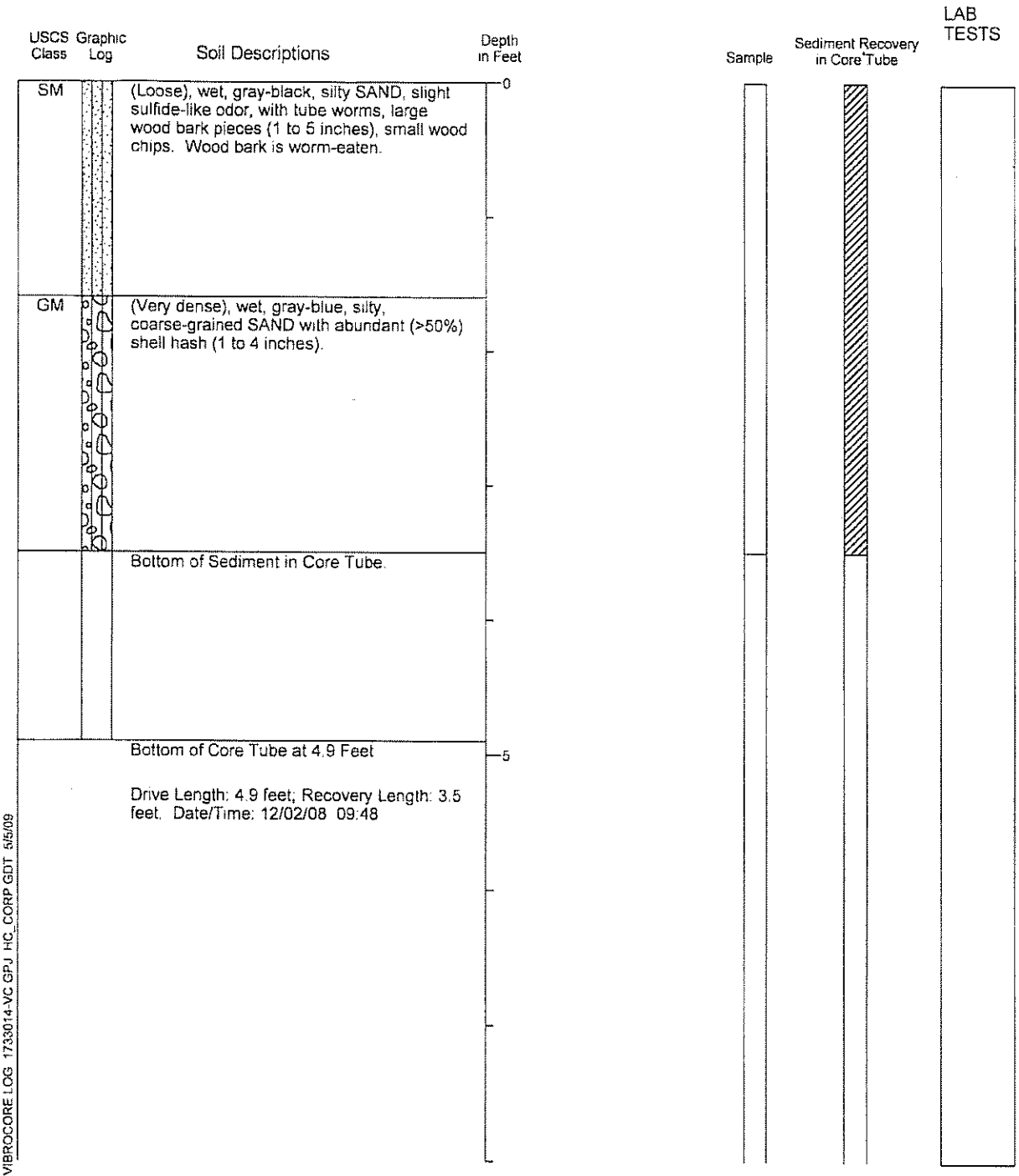
Figure A-9

VIBROCORE LOG 1733014-VC.GPJ HC_CORP.GDT 5/5/09

Vibracore Log Station 29

Location: See Figure 2.
Mudline Elevation in Feet (MLLW): 12.1 Feet
Water Depth in Feet: 6.8 Feet

Type of Sample. Vibracore
Core Diameter: 4 inches
Northing: 1210488.5
Easting: 308611.9
Logged By: C. Rust Reviewed By. G. Both



VIBROCORE LOG 1733014-VC.GPJ HC_CORP.GDT 5/5/09

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. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

HARTCROWSER

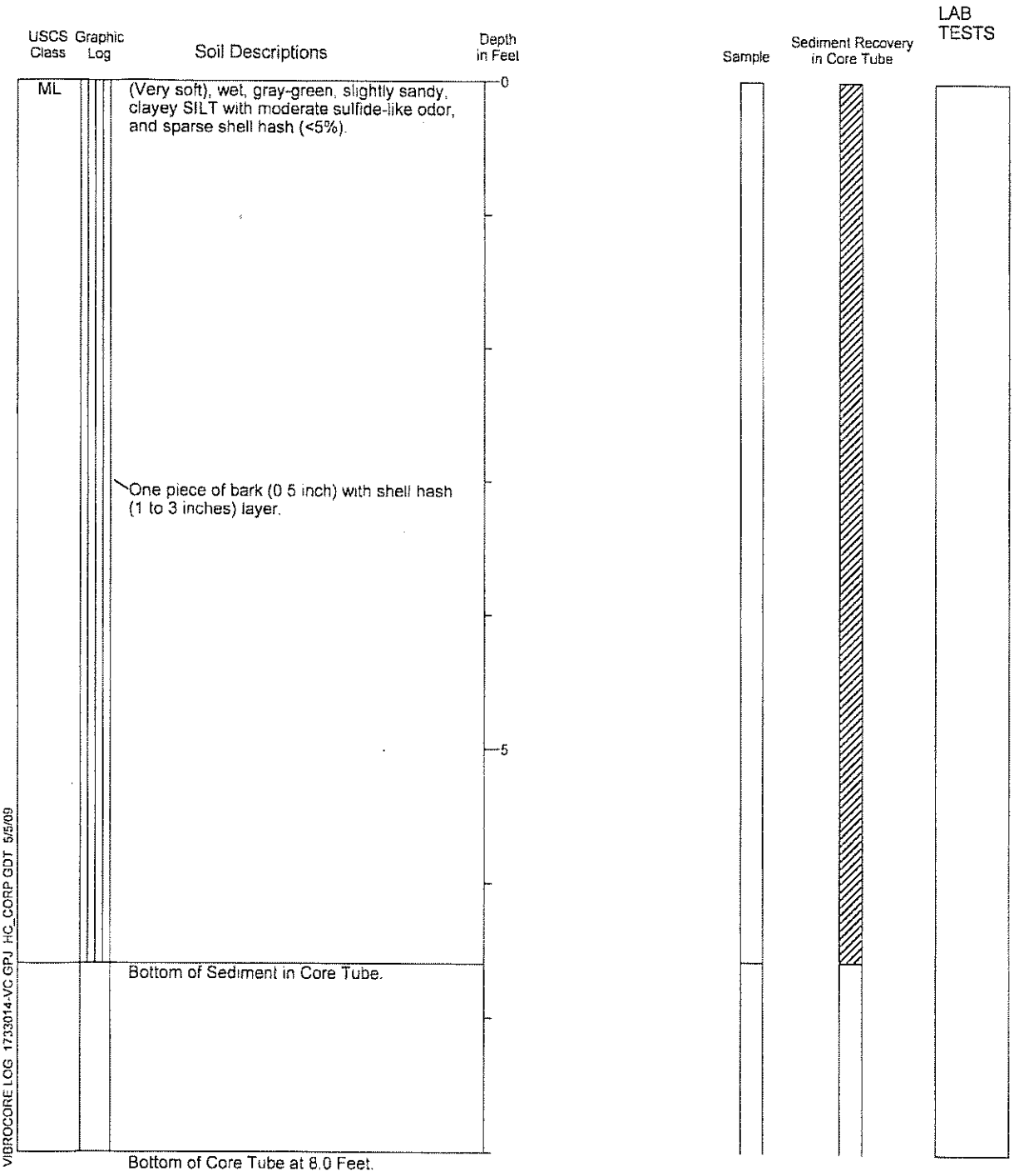
17330-14 *12/08*

Figure A-10

Vibracore Log Station 31

Location: See Figure 2.
Mudline Elevation in Feet (MLLW): 32.1 Feet
Water Depth in Feet: 13 Feet

Type of Sample: Vibracore
Core Diameter: 4 inches
Northing: 1211498.3
Easting: 308615.1
Logged By: C. Rust Reviewed By G. Both



VIBROCORE LOG 1733014-VC.GPJ HC_CORP.GDT 5/5/09

Drive Length: 8.0 feet; Recovery Length. 6.6 feet. Date/Time. 12/02/08 10:14

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. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

HARTCROWSER

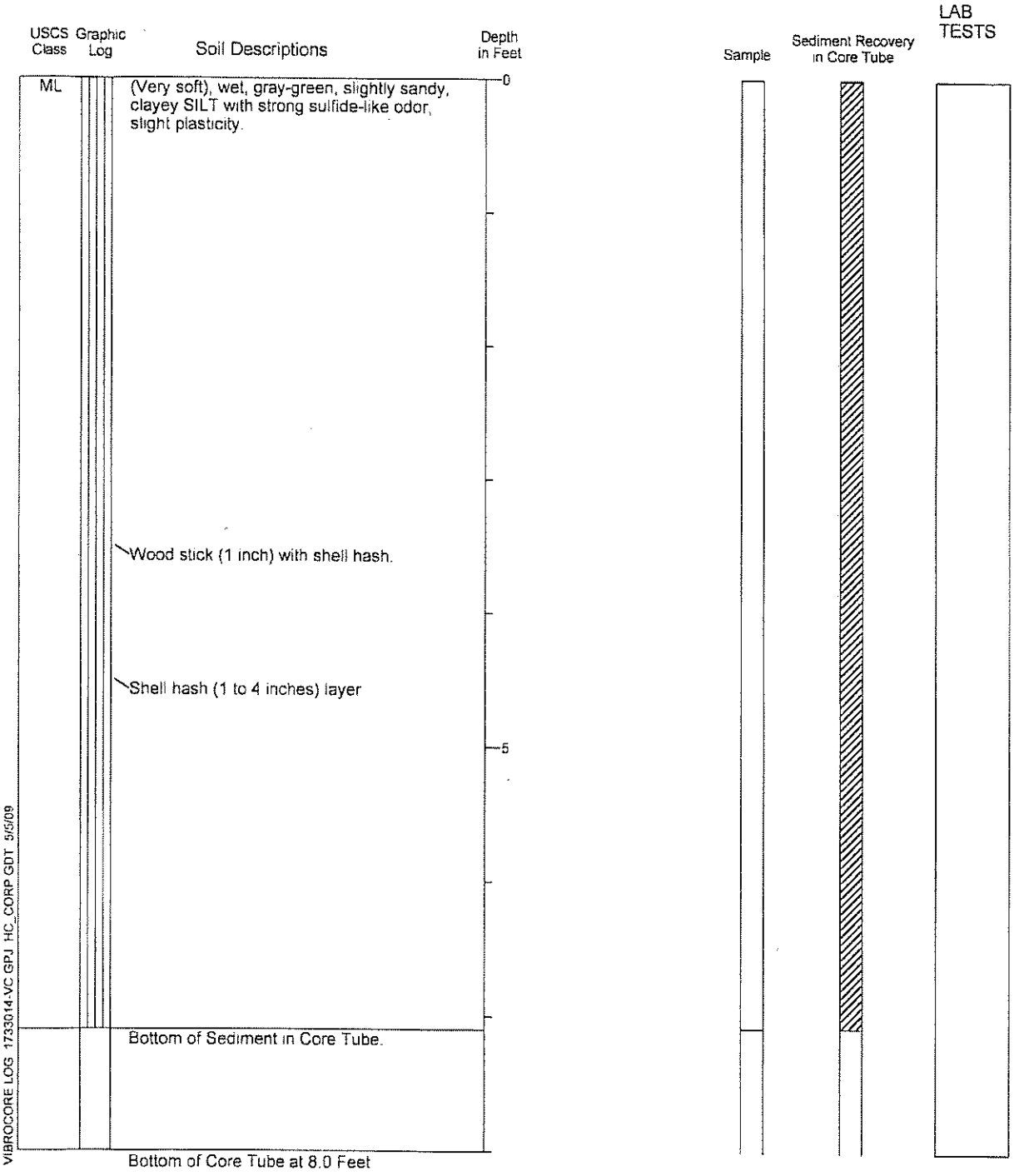
17330-14 *12/08*

Figure A-11

Vibracore Log Station 33

Location: See Figure 2.
Mudline Elevation in Feet (MLLW): 32.0 Feet
Water Depth in Feet: 13 Feet

Type of Sample: Vibracore
Core Diameter: 4 inches
Northing: 1212488
Easting: 308617
Logged By: C. Rust Reviewed By: G. Both



VIBROCORE LOG 1733014-VC.GPJ HC_CORP.GDT 5/5/09

Drive Length: 8.0 feet, Recovery Length: 7.1 feet. Date/Time: 12/02/08 10:50

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. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

HARTCROWSER

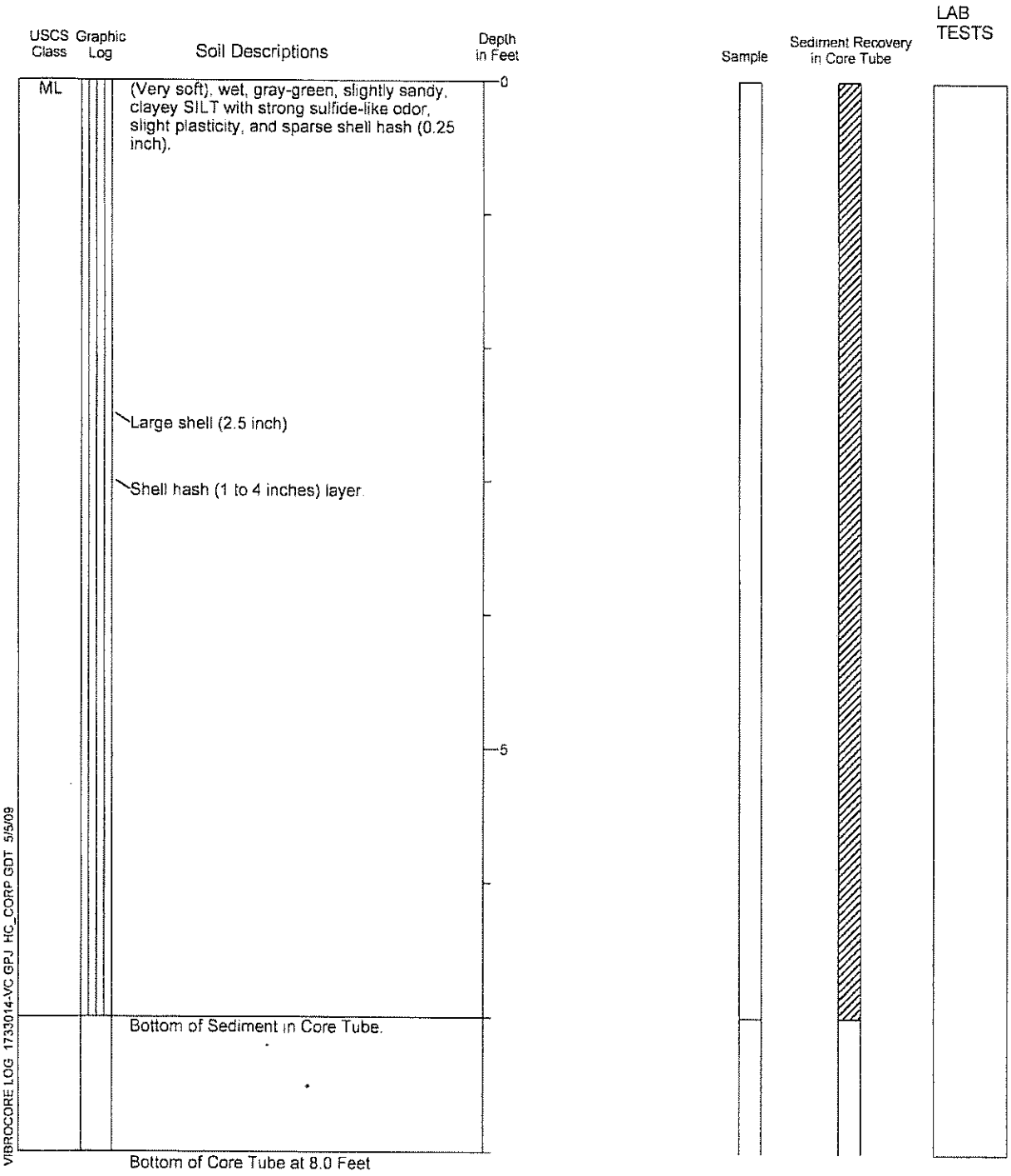
17330-14 *12/08*

Figure A-12

Vibracore Log Station 35

Location: See Figure 2.
Mudline Elevation in Feet (MLLW): 30.4 Feet
Water Depth in Feet: 12.5 Feet

Type of Sample: Vibracore
Core Diameter: 4 inches
Northing: 1213490.6
Easting: 308625.9
Logged By: C. Rust Reviewed By: G. Both



Drive Length: 8.0 feet, Recovery Length: 7.0 feet. Date/Time: 12/02/08 11:08

VIBROCORE LOG 1733014-VC.GPJ HC_CORP.GDT 5/5/09

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. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

HARTCROWSER

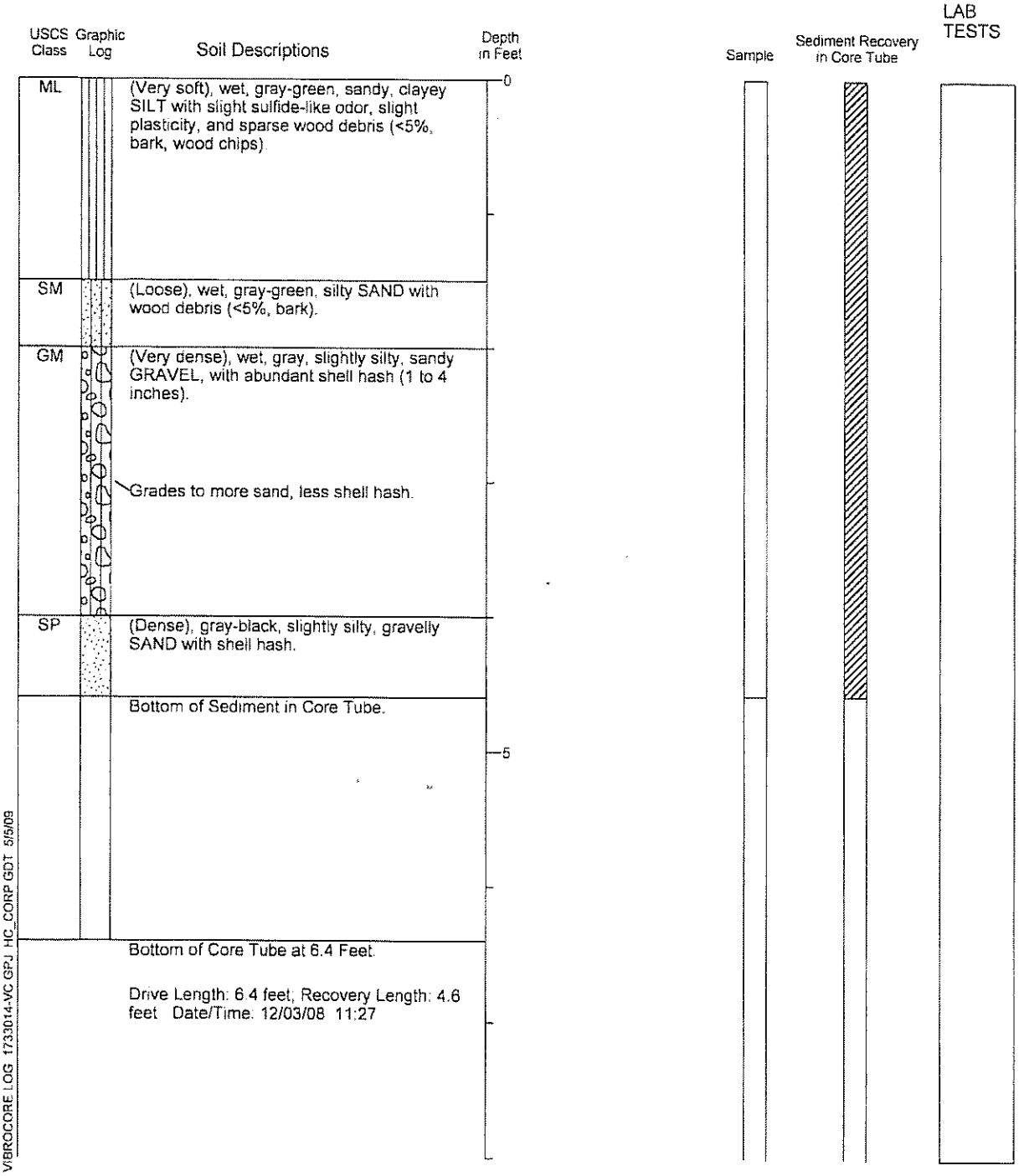
17330-14 *12/08*

Figure A-13

Vibracore Log Station 38A

Location: See Figure 2.
Mudline Elevation in Feet (MLLW): 32.1 Feet
Water Depth in Feet: 13 Feet

Type of Sample: Vibracore
Core Diameter 4 inches
Northing: 1210718.4
Easting: 309609.4
Logged By: C. Rust Reviewed By: G. Both



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. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

HARTCROWSER

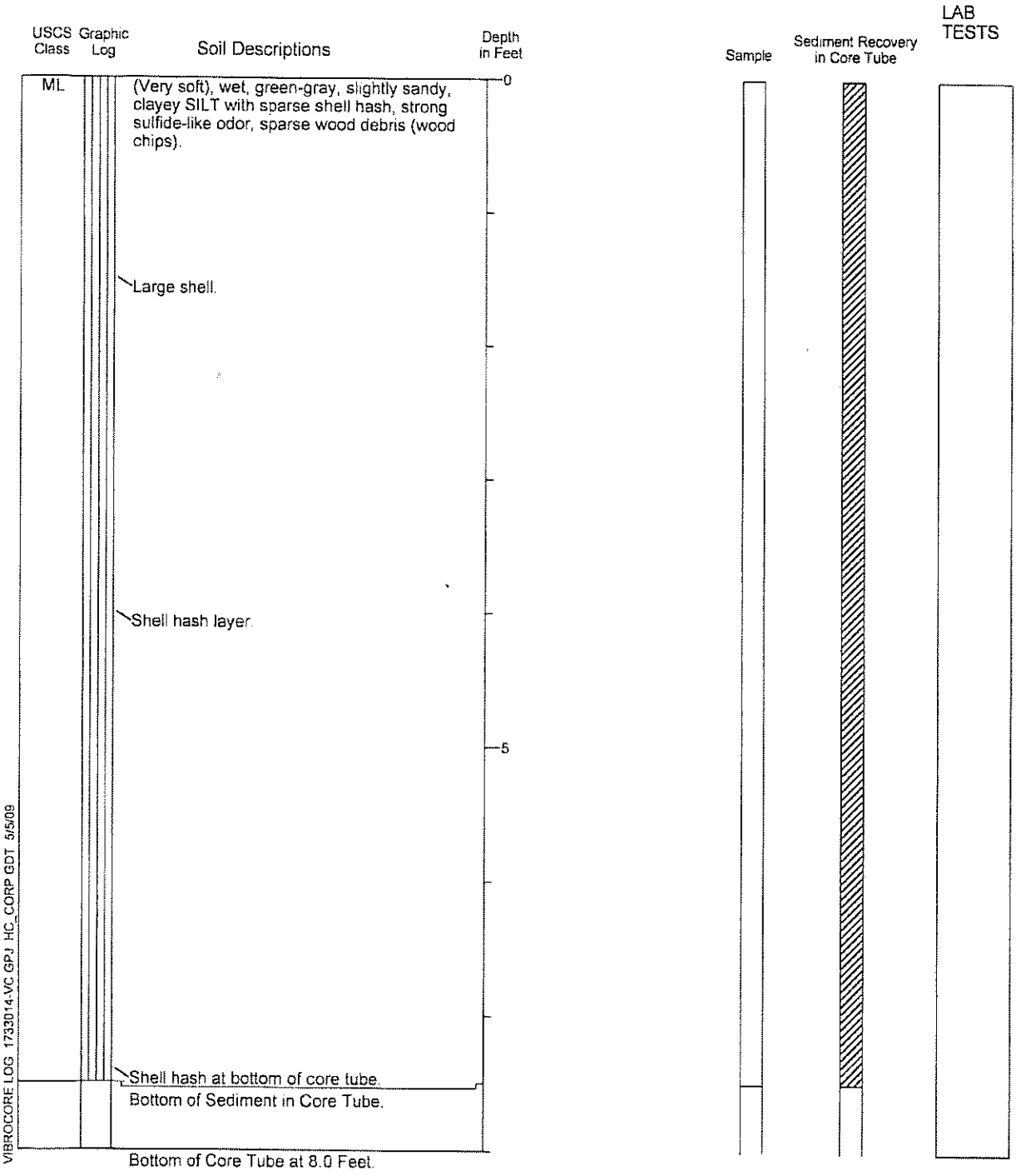
17330-14 *12/08*

Figure A-14

Vibracore Log Station 40

Location: See Figure 2.
Mudline Elevation in Feet (MLLW): 35.3 Feet
Water Depth in Feet: 14 Feet

Type of Sample: Vibracore
Core Diameter: 4 inches
Northing: 1211476.6
Easting: 309622
Logged By: C. Rust Reviewed By: G. Both



Drive Length: 8.0 feet; Recovery Length. 7.5 feet. Date/Time: 12/03/08 12.23

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. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

HARTCROWSER

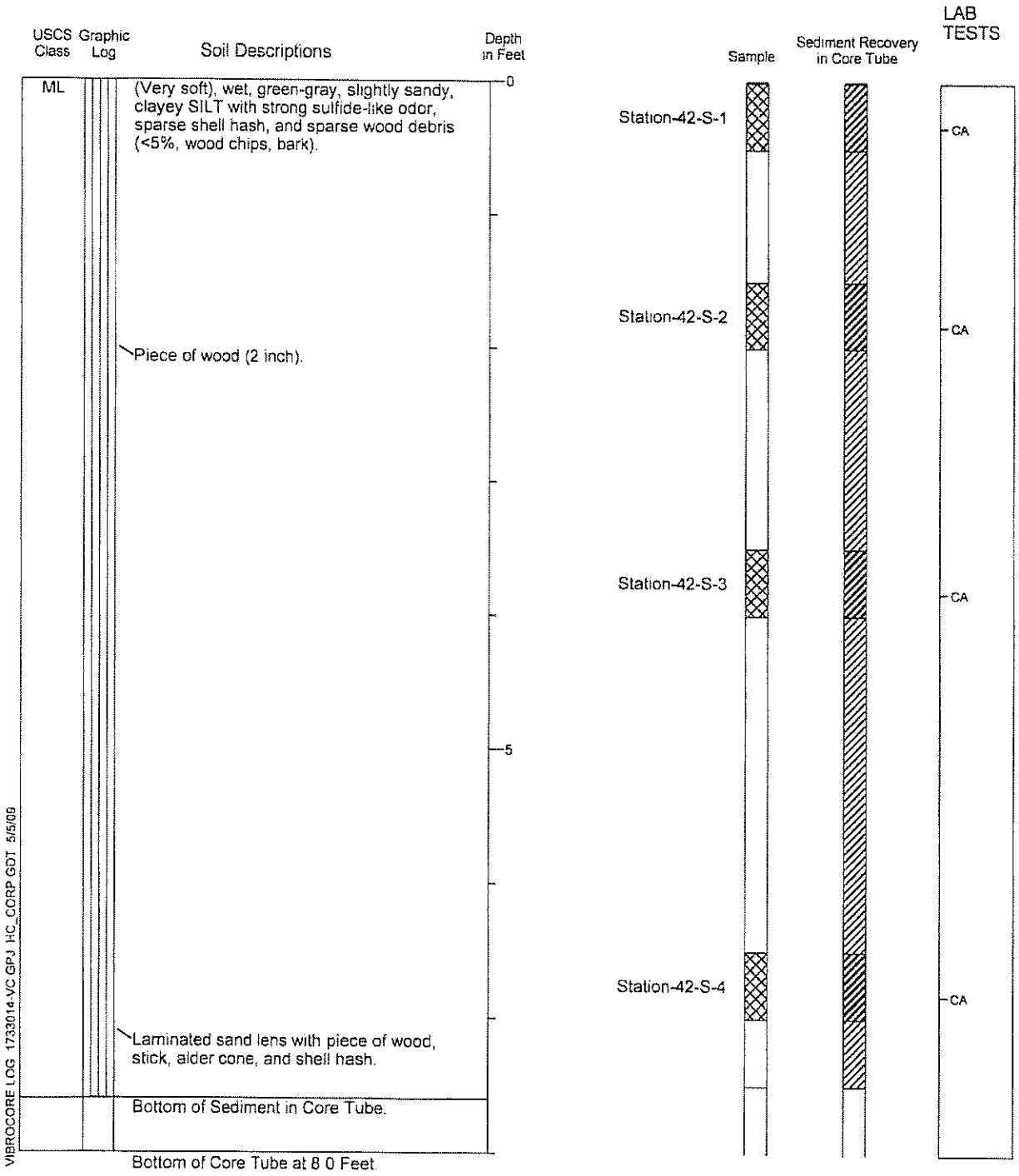
17330-14 *12/08*

Figure A-15

Vibracore Log Station 42

Location: See Figure 2.
Mudline Elevation in Feet (MLLW): 35.5 Feet
Water Depth in Feet: 14 Feet

Type of Sample: Vibracore
Core Diameter: 4 inches
Northing: 1212490.2
Easting: 309617.9
Logged By: C. Rust Reviewed By: G. Both



VIBROCORE LOG 1733014-VC GPJ HC_CORP GDT 5/5/09

Drive Length: 8.0 feet; Recovery Length: 7.6 feet. Date/Time 12/03/08 12:40

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. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

HARTCROWSER

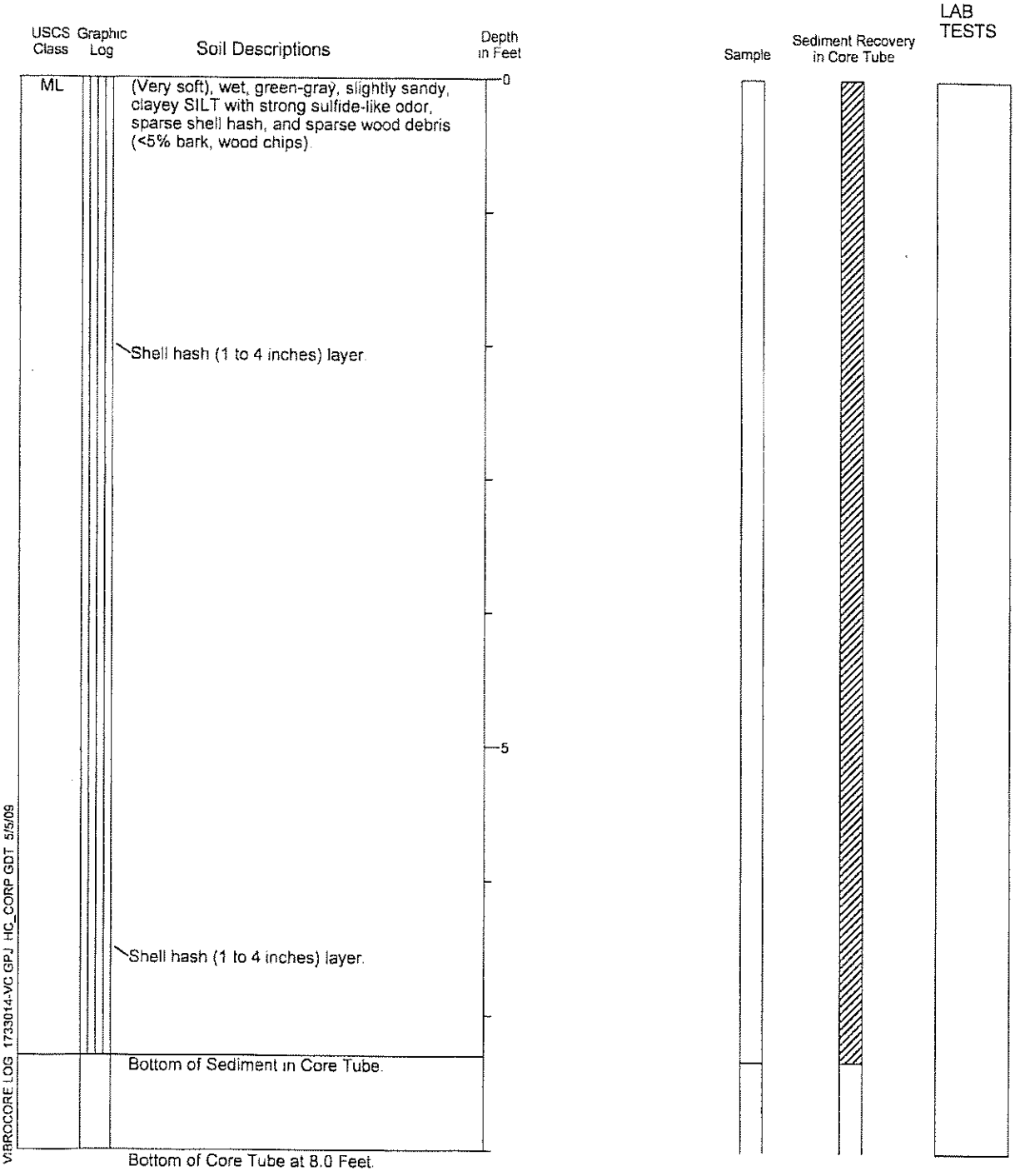
17330-14 *12/08*

Figure A-16

Vibracore Log Station 44

Location: See Figure 2.
Mudline Elevation in Feet (MLLW): 31.2 Feet
Water Depth in Feet: 12.5 Feet

Type of Sample: Vibracore
Core Diameter: 4 inches
Northing: 1213481.7
Easting: 309625.2
Logged By: C. Rust Reviewed By: G. Both



Drive Length: 8.0 feet; Recovery Length: 7.3 feet Date/Time: 12/03/08 12.59

VIBROCORE LOG 1733014-VC.GPJ HC_CORP.GDT 5/5/09

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. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

HARTCROWSER

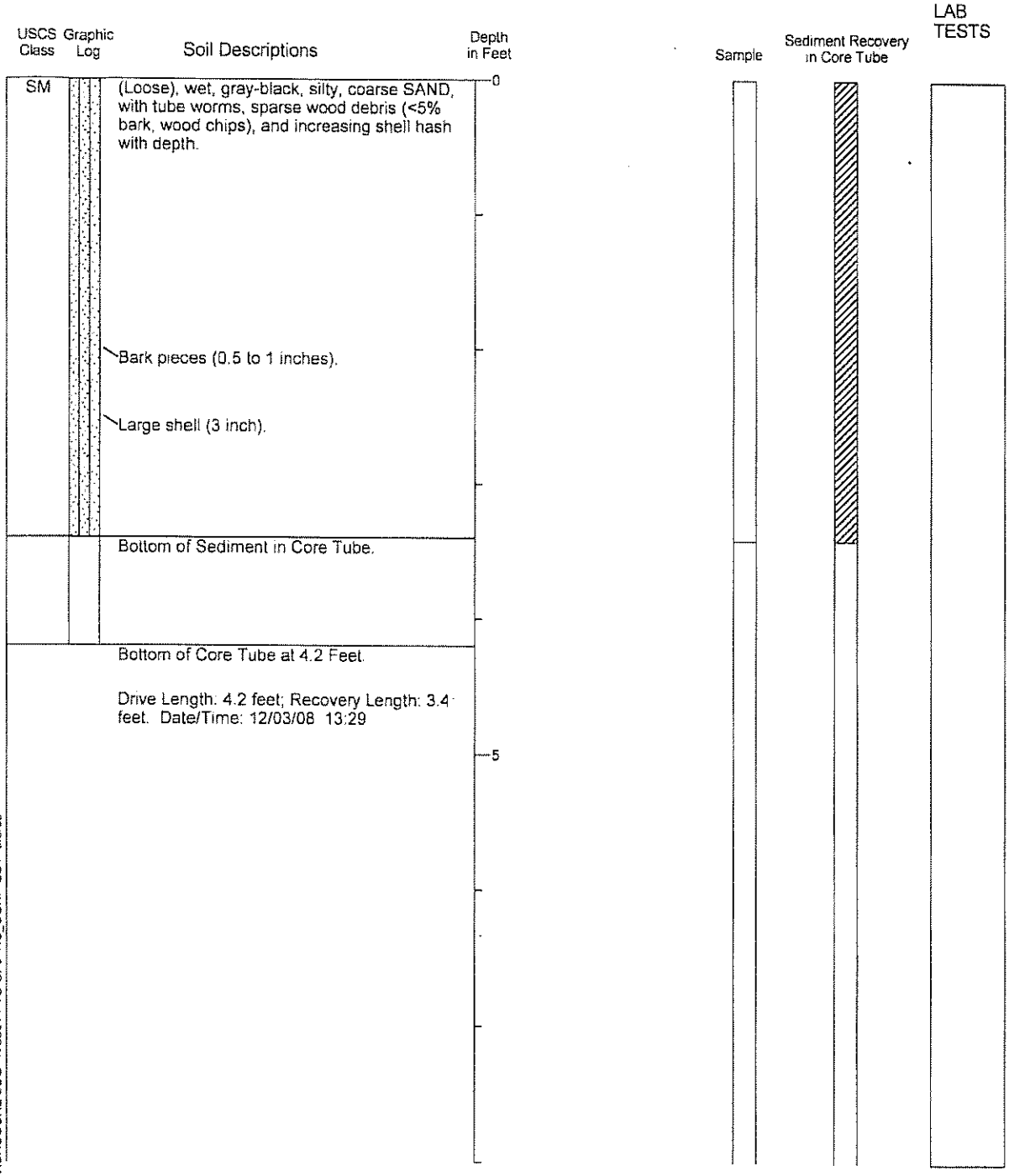
17330-14 *12/08*

Figure A-17

Vibracore Log Station 46

Location: See Figure 2.
Mudline Elevation in Feet (MLLW): 15 2 Feet
Water Depth in Feet: 7.5 Feet

Type of Sample: Vibracore
Core Diameter: 4 inches
Northing: 1214493
Easting: 309627.9
Logged By: C. Rust Reviewed By: G. Both



VIBROCORE LOG 1733014-VC.GPJ HC_CORP.GDT 5/5/09

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. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

HARTCROWSER

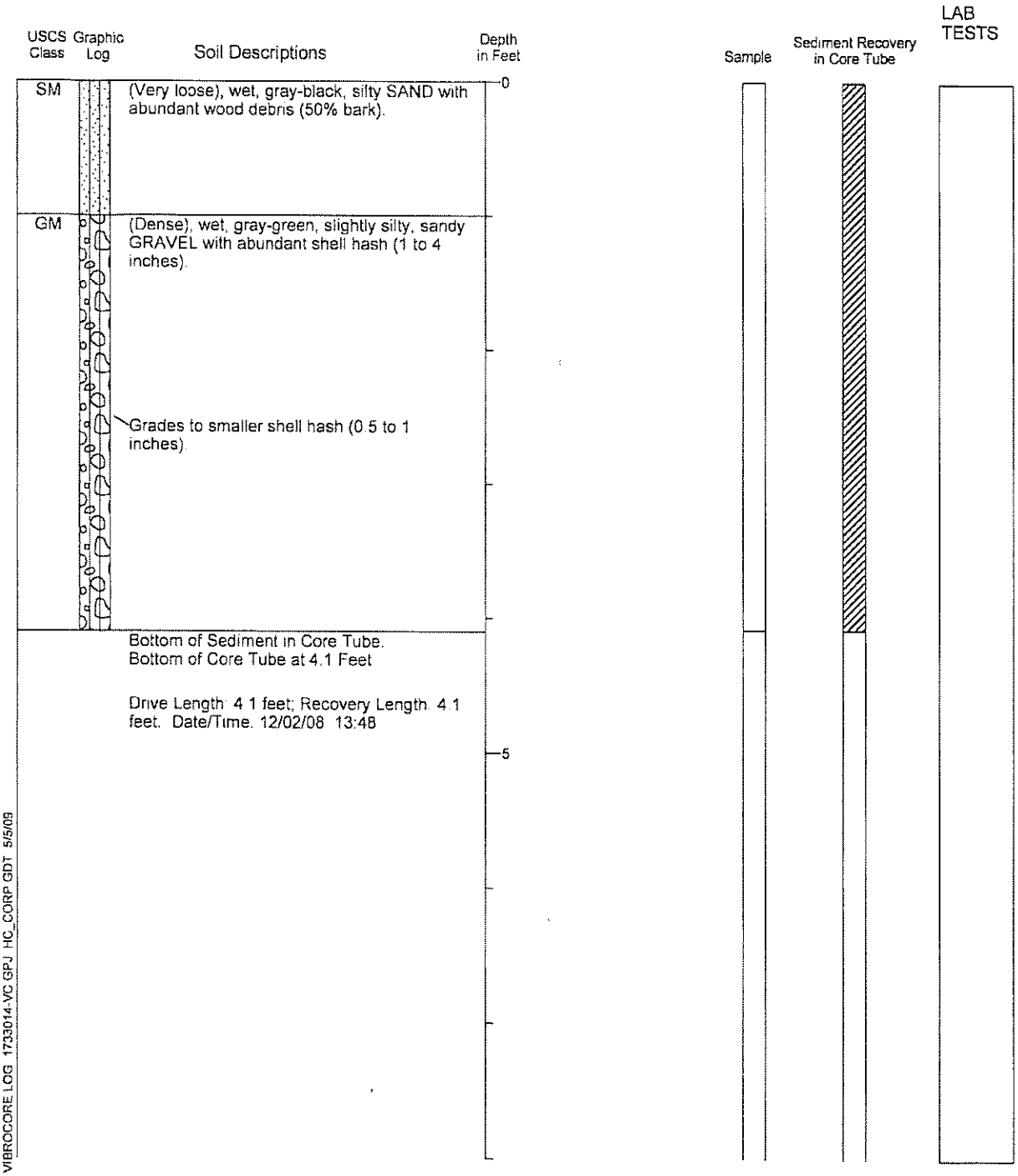
17330-14 *12/08*

Figure A-18

Vibracore Log Station 47

Location: See Figure 2.
Mudline Elevation in Feet (MLLW) 19.1 Feet
Water Depth in Feet: 8 Feet

Type of Sample: Vibracore
Core Diameter: 4 inches
Northing: 1210477.6
Easting: 310616.5
Logged By: C. Rust Reviewed By: G. Both



VIBROCORE LOG 1733014-VC.GPJ HC_CORP.GDT 5/5/09

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. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

HARTCROWSER

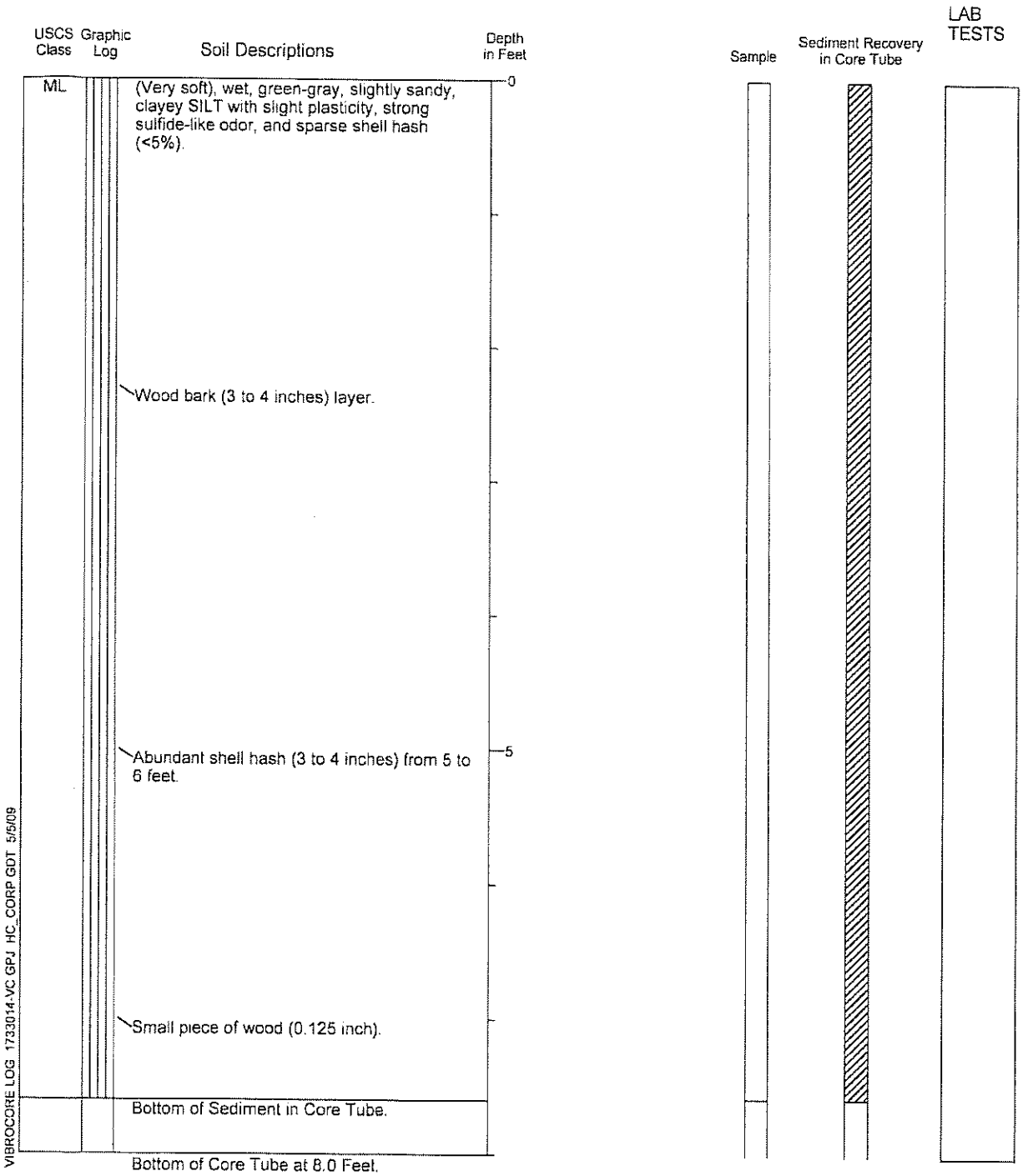
17330-14 *12/08*

Figure A-19

Vibracore Log Station 49

Location: See Figure 2
Mudline Elevation in Feet (MLLW): 58.0 Feet
Water Depth in Feet: 20.4 Feet

Type of Sample: Vibracore
Core Diameter: 4 inches
Northing: 1211483.3
Easting: 310620.4
Logged By: C. Rust Reviewed By: G. Both



Drive Length: 8.0 feet; Recovery Length: 7.6 feet. Date/Time: 12/02/08 14:08

VIBROCORE LOG 1733014-VC.GPJ HC_CORP.GDT 5/5/09

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. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

HARTCROWSER

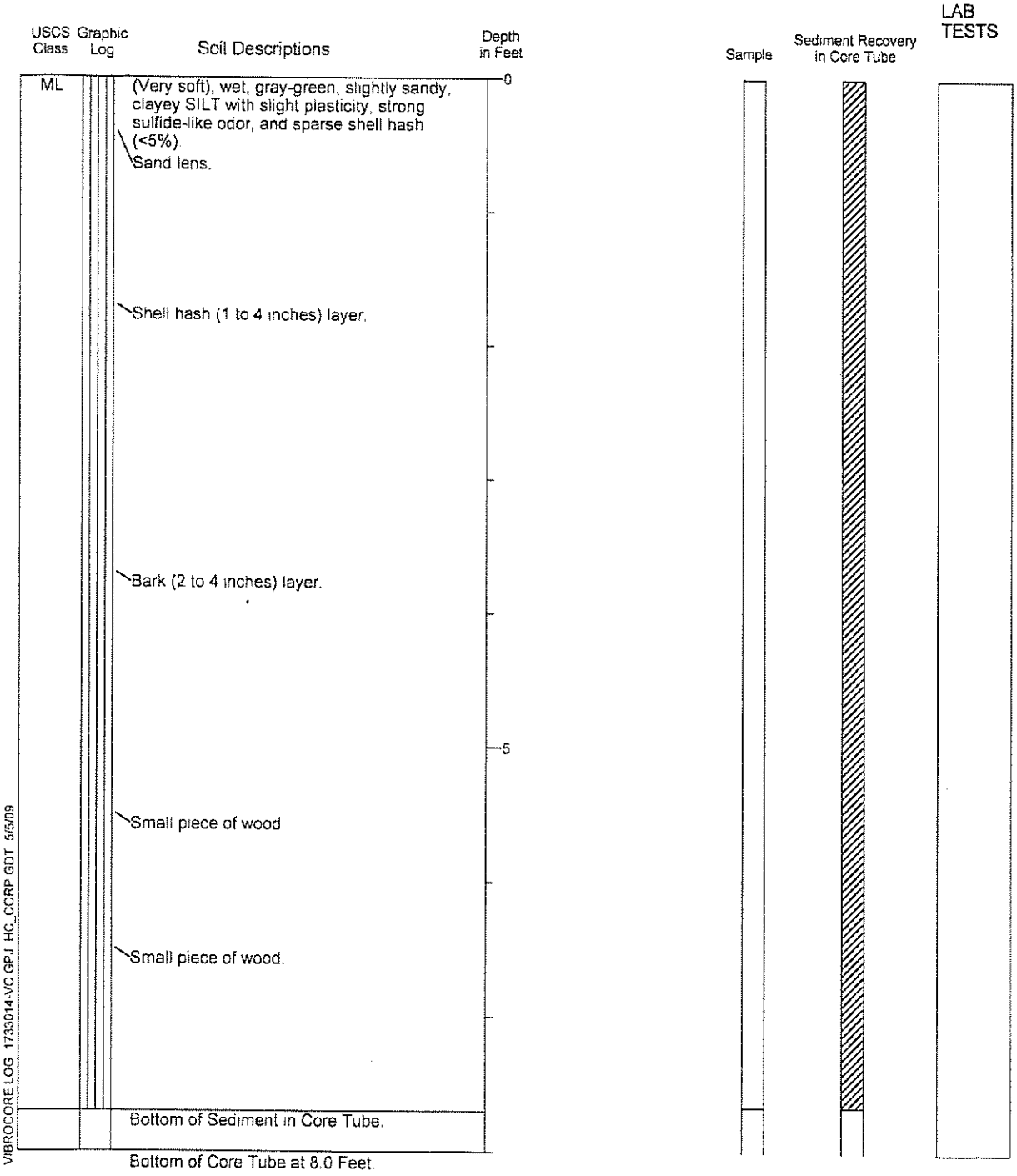
17330-14 *12/08*

Figure A-20

Vibracore Log Station 51

Location: See Figure 2.
Mudline Elevation in Feet (MLLW): 43.3 Feet
Water Depth in Feet: 16 Feet

Type of Sample: Vibracore
Core Diameter: 4 inches
Northing: 1212474.9
Easting: 310621
Logged By: C. Rust Reviewed By: G. Both



Drive Length: 8.0 feet; Recovery Length: 7 7 feet. Date/Time: 12/02/08 14:25

VIBROCORE LOG 1733014-VC GPJ HC_CORP GDT 5/5/09

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. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

HARTCROWSER

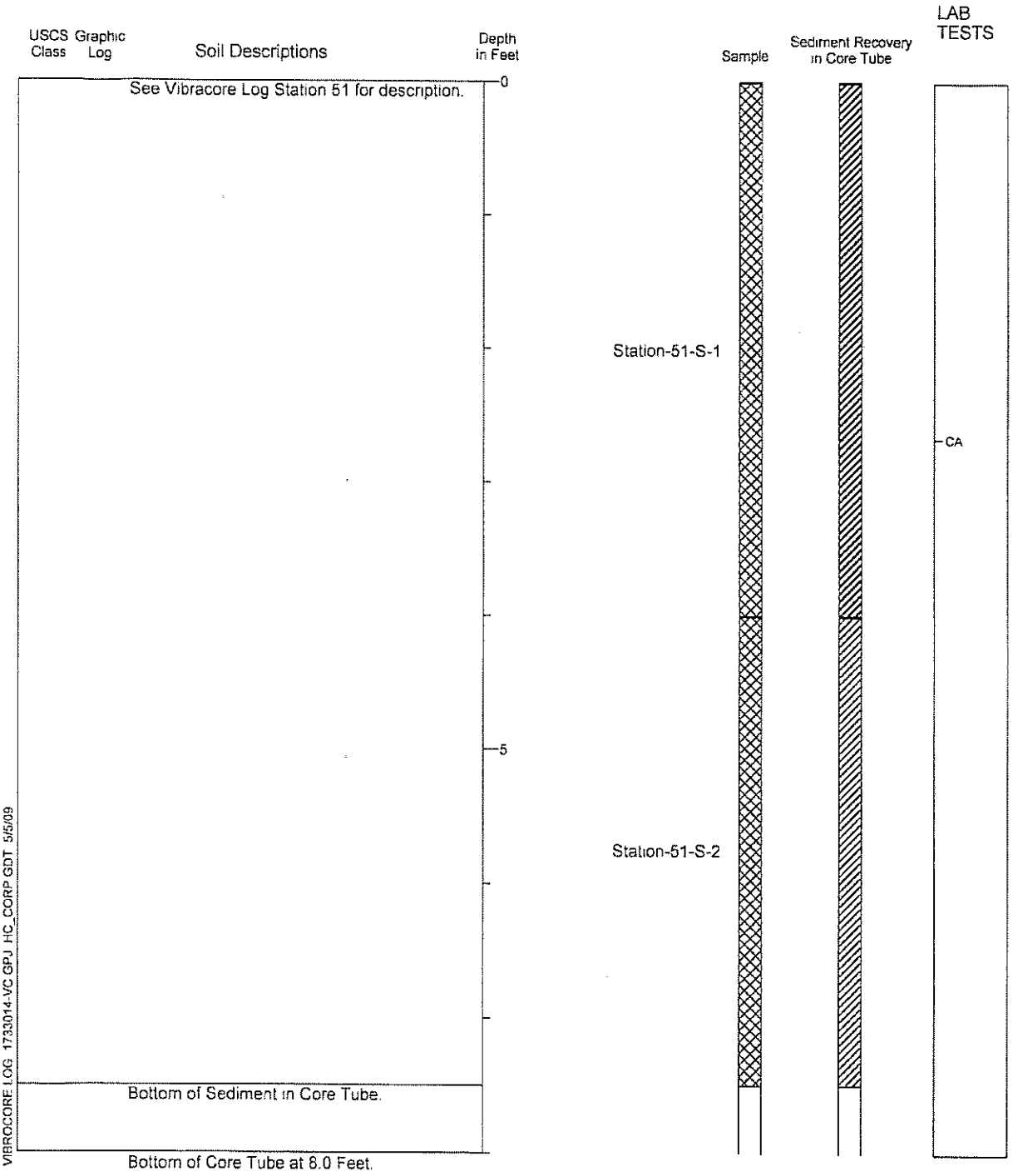
17330-14 *12/08*

Figure A-21

Vibracore Log Station 51B

Location: See Figure 2.
Mudline Elevation in Feet (MLLW): 37.6 Feet
Water Depth in Feet: 13.5 Feet

Type of Sample: Vibracore
Core Diameter: 4 inches
Northing: 1212485.5
Easting: 310620.1
Logged By: C. Rust Reviewed By: G. Both



Drive Length: 8.0 feet; Recovery Length: 7.5 feet. Date/Time: 12/03/08 15:02

VIBROCORE LOG 1733014-VC.GPJ HC_CORP.GDT 5/5/09

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. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

HARTCROWSER

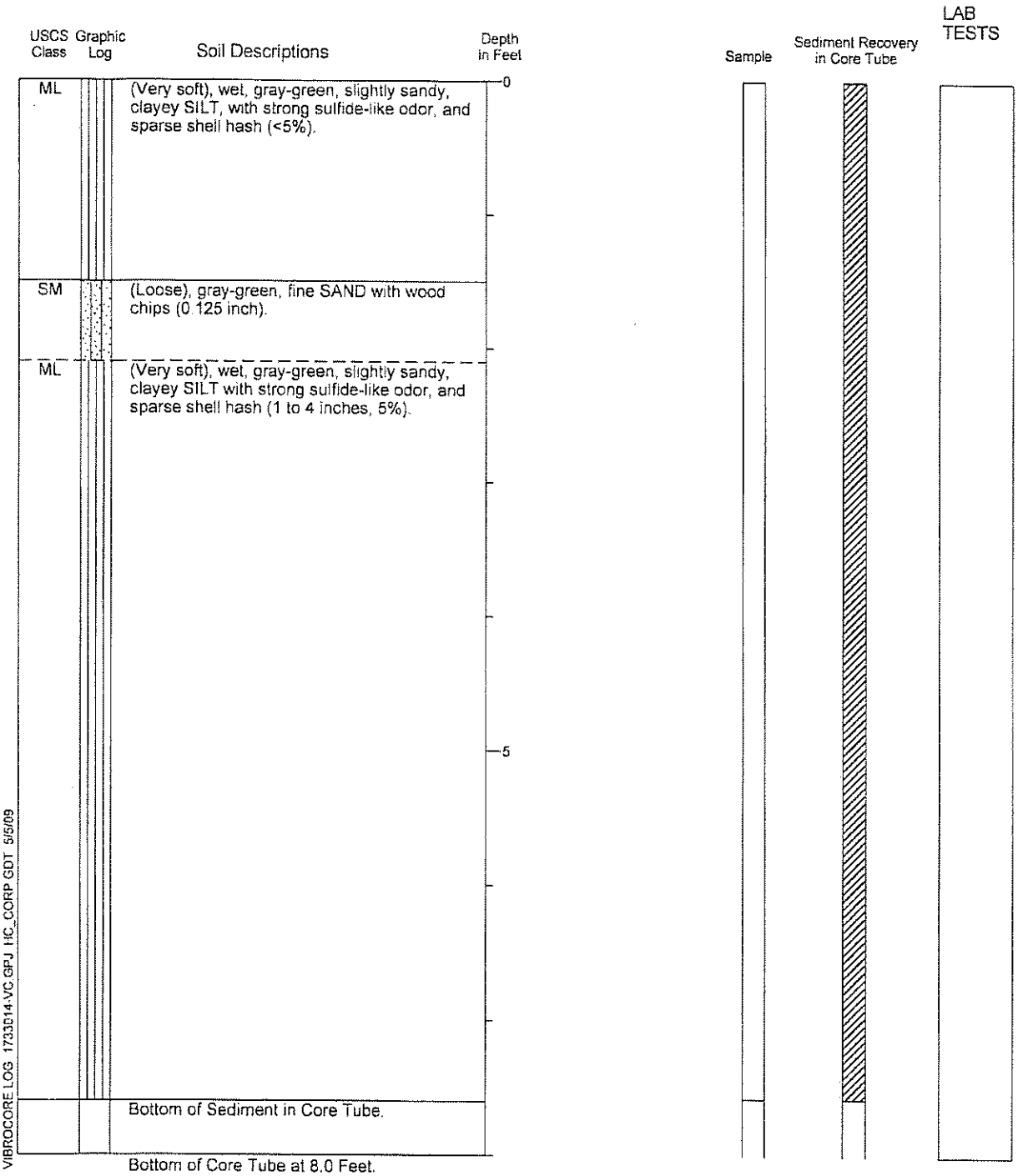
17330-14 *12/08*

Figure A-22

Vibracore Log Station 53

Location: See Figure 2.
Mudline Elevation in Feet (MLLW): 36.5 Feet
Water Depth in Feet: 14 Feet

Type of Sample: Vibracore
Core Diameter: 4 inches
Northing: 1213482.6
Easting: 310625.5
Logged By: C. Rust Reviewed By: G. Both



Drive Length: 8.0 feet; Recovery Length: 7.6 feet. Date/Time: 12/02/08 15:26

VIBROCORE LOG 173014-VC.GPJ HC_CORP.GDT 5/5/09

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. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

HARTCROWSER

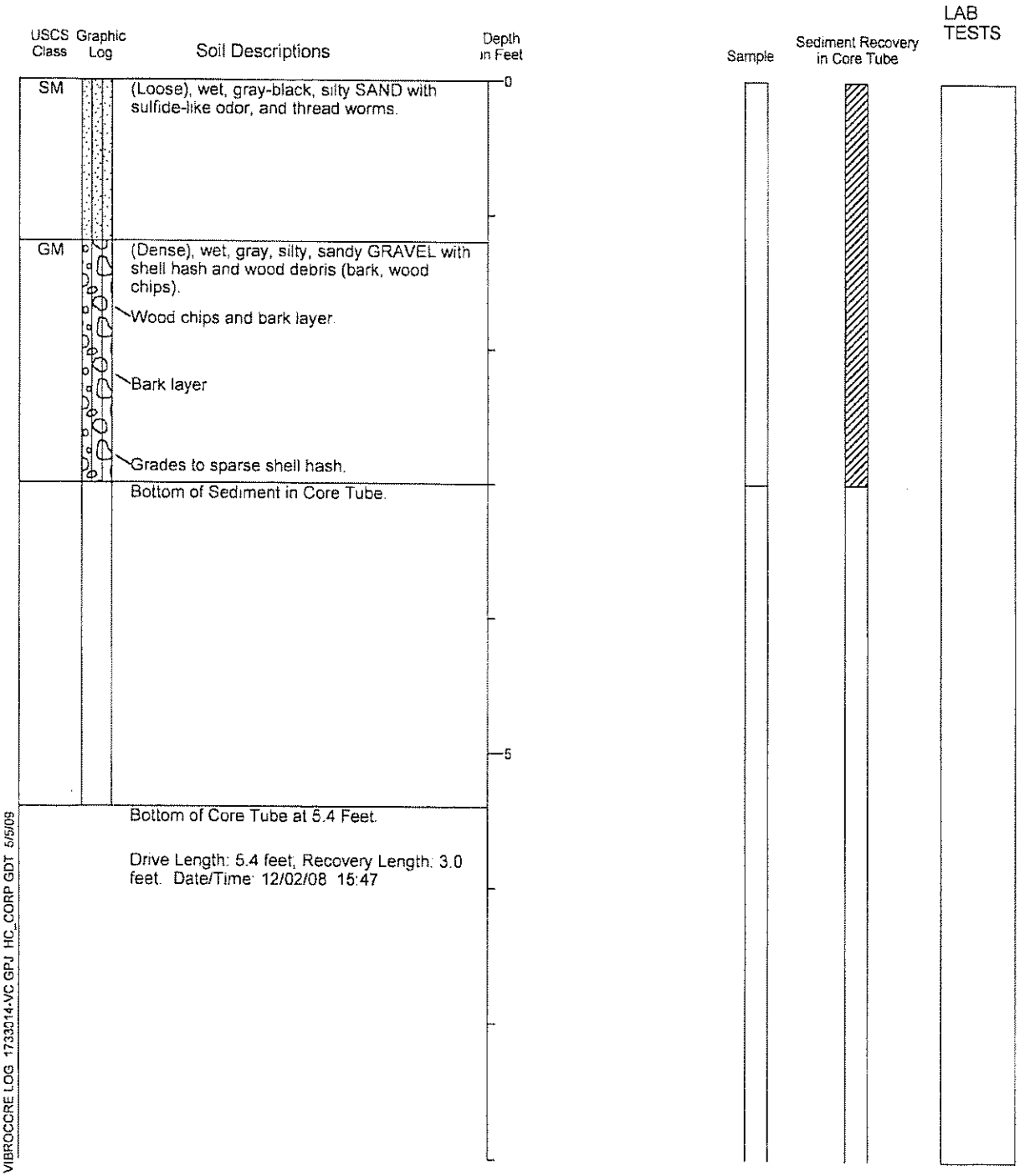
17330-14 *12/08*

Figure A-23

Vibracore Log Station 55

Location: See Figure 2.
Mudline Elevation in Feet (MLLW): 7.2 Feet
Water Depth in Feet: 5.2 Feet

Type of Sample: Vibracore
Core Diameter: 4 inches
Northing: 1214392
Easting: 310687.7
Logged By: C. Rust Reviewed By: G. Both



VIBROCCRE LOG 1733014-VC.GPJ HC_CORP.GDT 5/5/09

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. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

HARTCROWSER

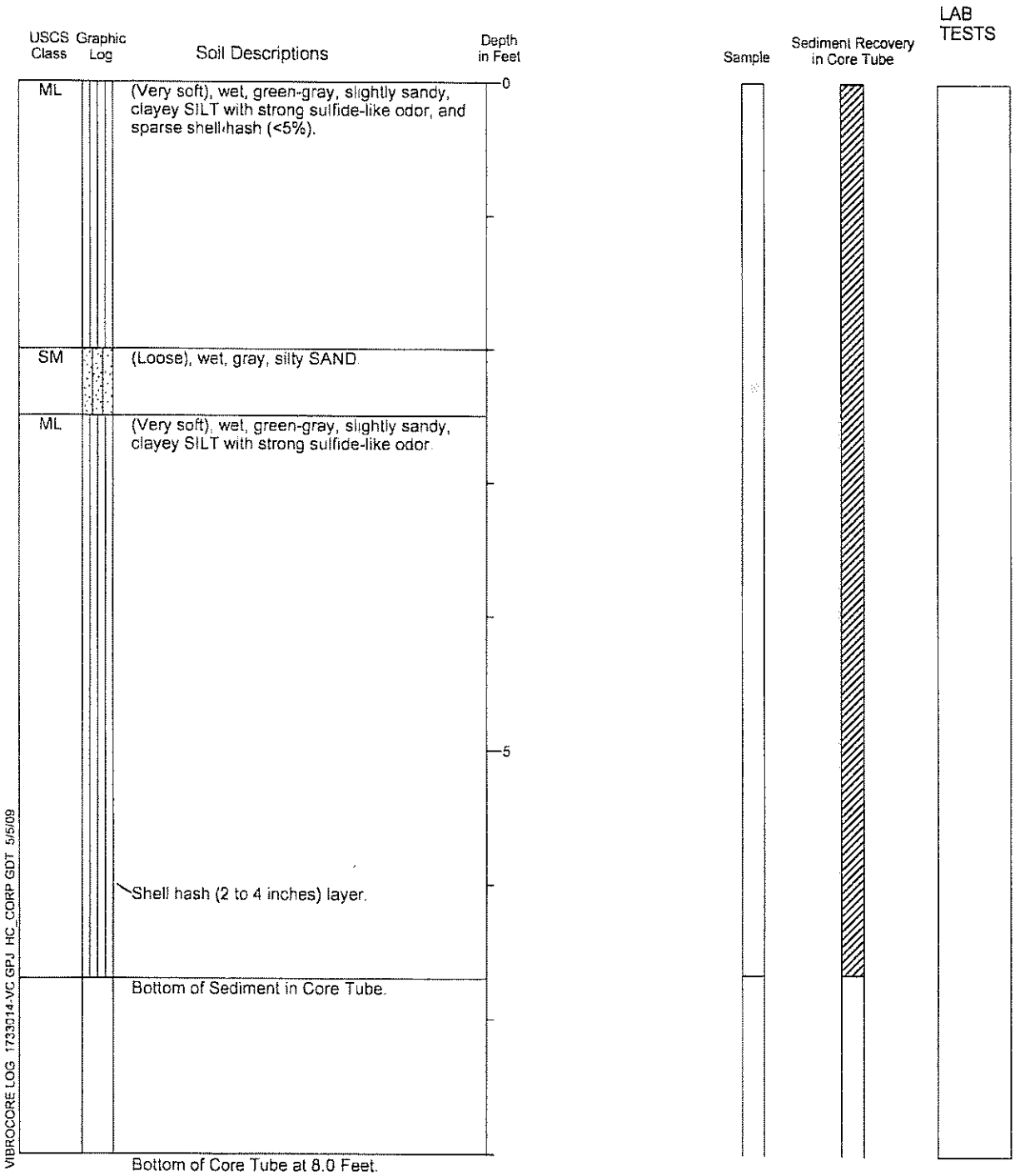
17330-14 *12/08*

Figure A-24

Vibracore Log Station 58

Location: See Figure 2.
Mudline Elevation in Feet (MLLW): 60.6 Feet
Water Depth in Feet: 20.7 Feet

Type of Sample: Vibracore
Core Diameter: 4 inches
Northing: 1211988.9
Easting: 311614.1
Logged By: C. Rust Reviewed By: G. Both



Drive Length: 8.0 feet; Recovery Length: 6.7 feet. Date/Time: 12/02/08 08:34

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. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

HARTCROWSER

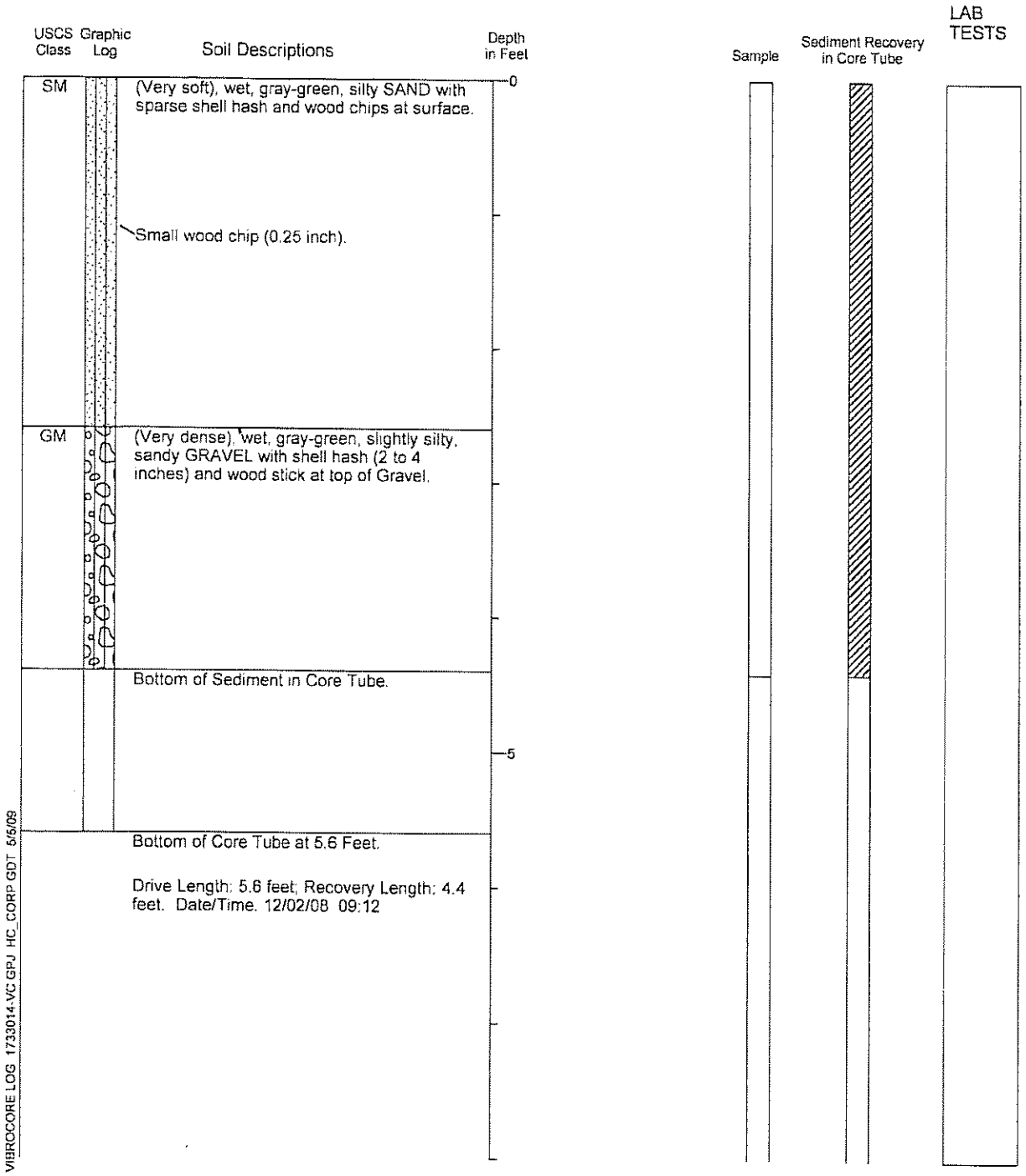
17330-14 *12/08*

Figure A-25

Vibracore Log Station 61

Location: See Figure 2.
Mudline Elevation in Feet (MLLW): 38.8 Feet
Water Depth in Feet: 14 Feet

Type of Sample: Vibracore
Core Diameter: 4 inches
Northing: 1213480.5
Easting: 311621.7
Logged By: C. Rust Reviewed By: G. Both



VIBROCORE LOG 1733014-VC.GPJ HC_CORP.GDT 5/5/09

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. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

HARTCROWSER

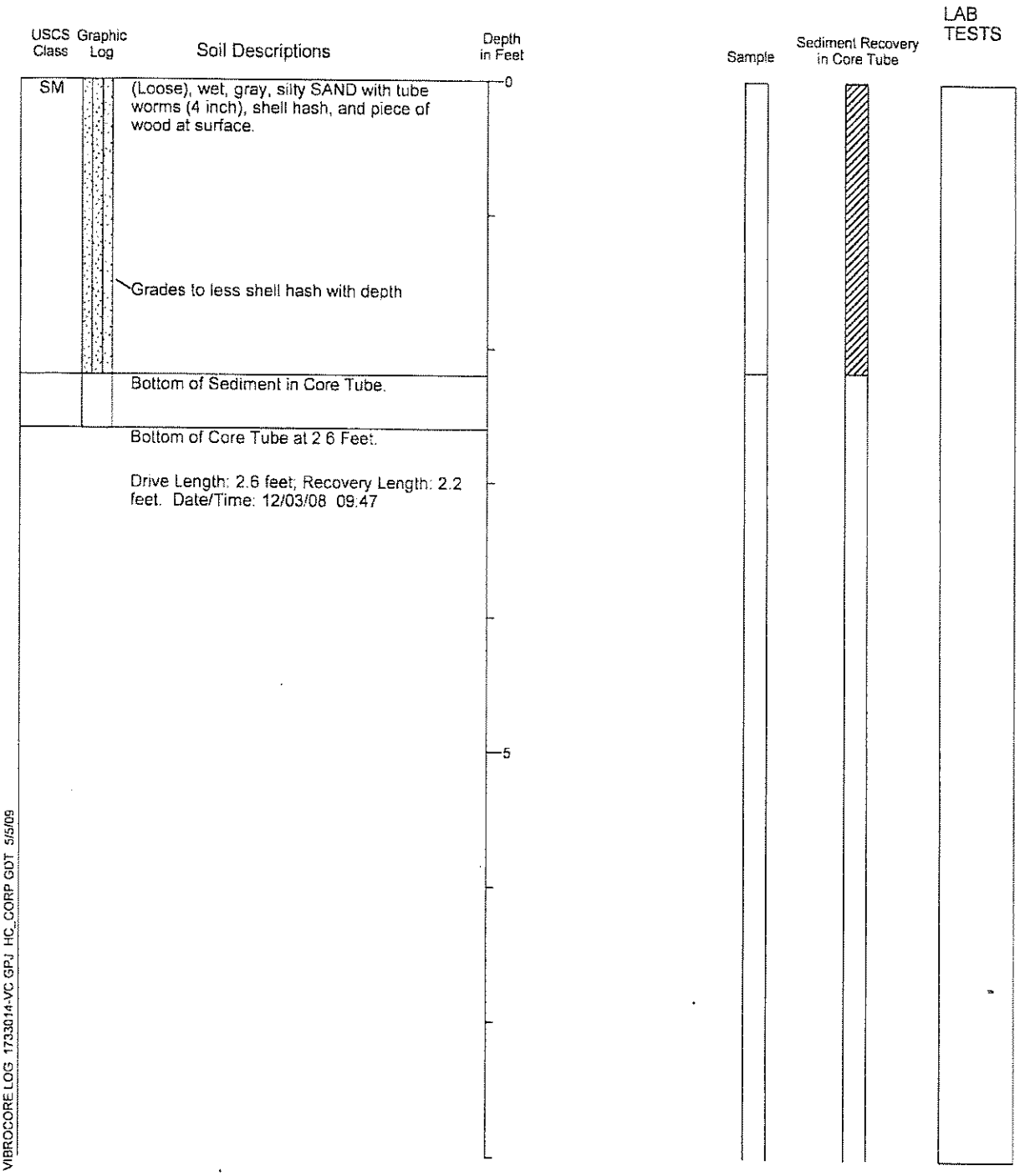
17330-14 *12/08*

Figure A-26

Vibracore Log Station 62

Location: See Figure 2.
Mudline Elevation in Feet (MLLW): 16.5 Feet
Water Depth in Feet: 7.5 Feet

Type of Sample: Vibracore
Core Diameter. 4 inches
Northing: 1213984.2
Easting. 311627.3
Logged By: C. Rust Reviewed By: G. Both



VIBROCORE LOG 1733014-VC GPJ HC_CORP GDT 5/5/09

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. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

HARTCROWSER

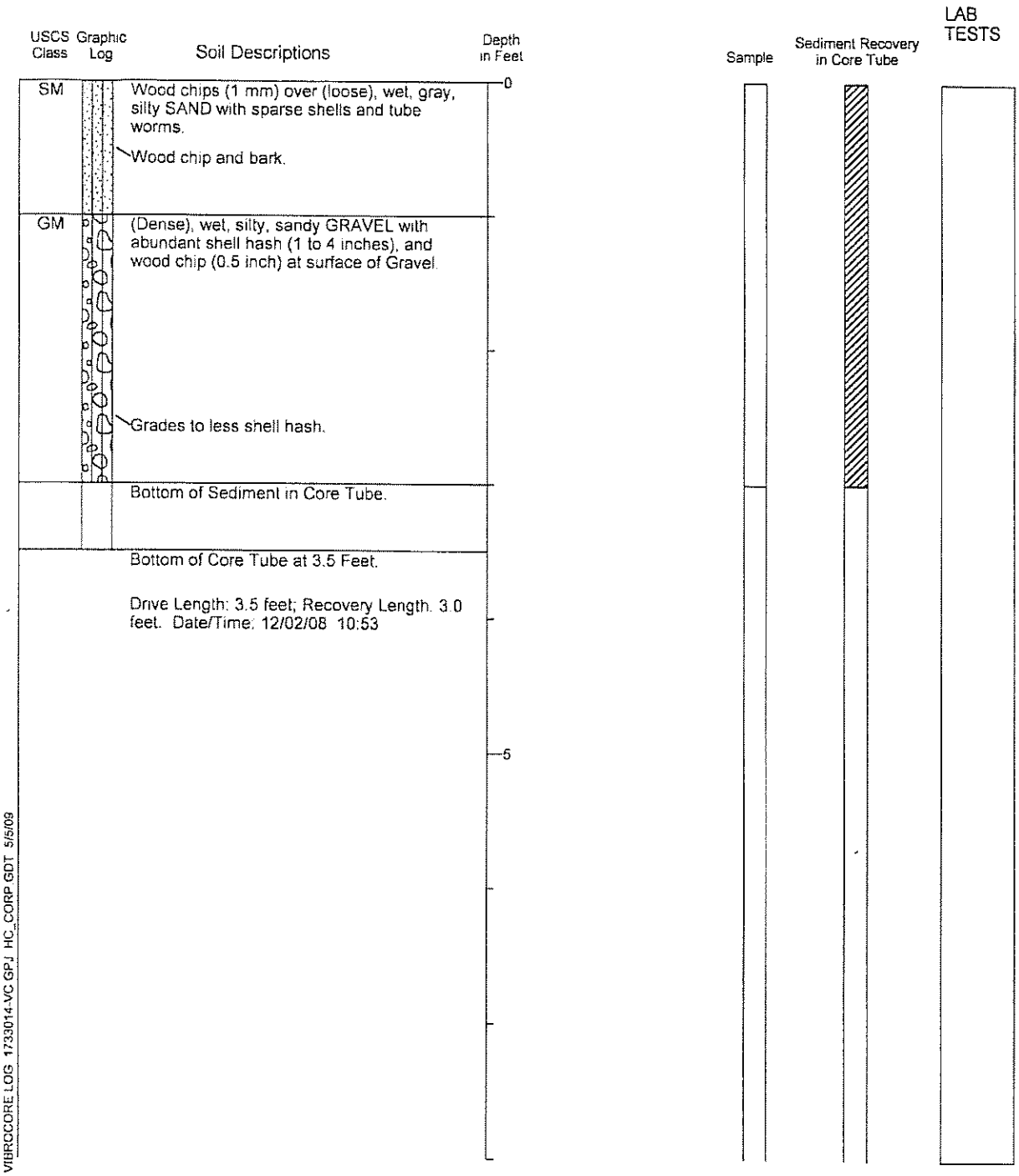
17330-14 *12/08*

Figure A-27

Vibracore Log Station 62B

Location: See Figure 2.
Mudline Elevation in Feet (MLLW): 10.6 Feet
Water Depth in Feet: 5.4 Feet

Type of Sample: Vibracore
Core Diameter: 4 inches
Northing: 1210696
Easting: 312622.5
Logged By: C. Rust Reviewed By: G. Both



VIBROCORE LOG 1733014-VC.GPJ HC_CORP.GDT 5/5/09

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. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

HARTCROWSER

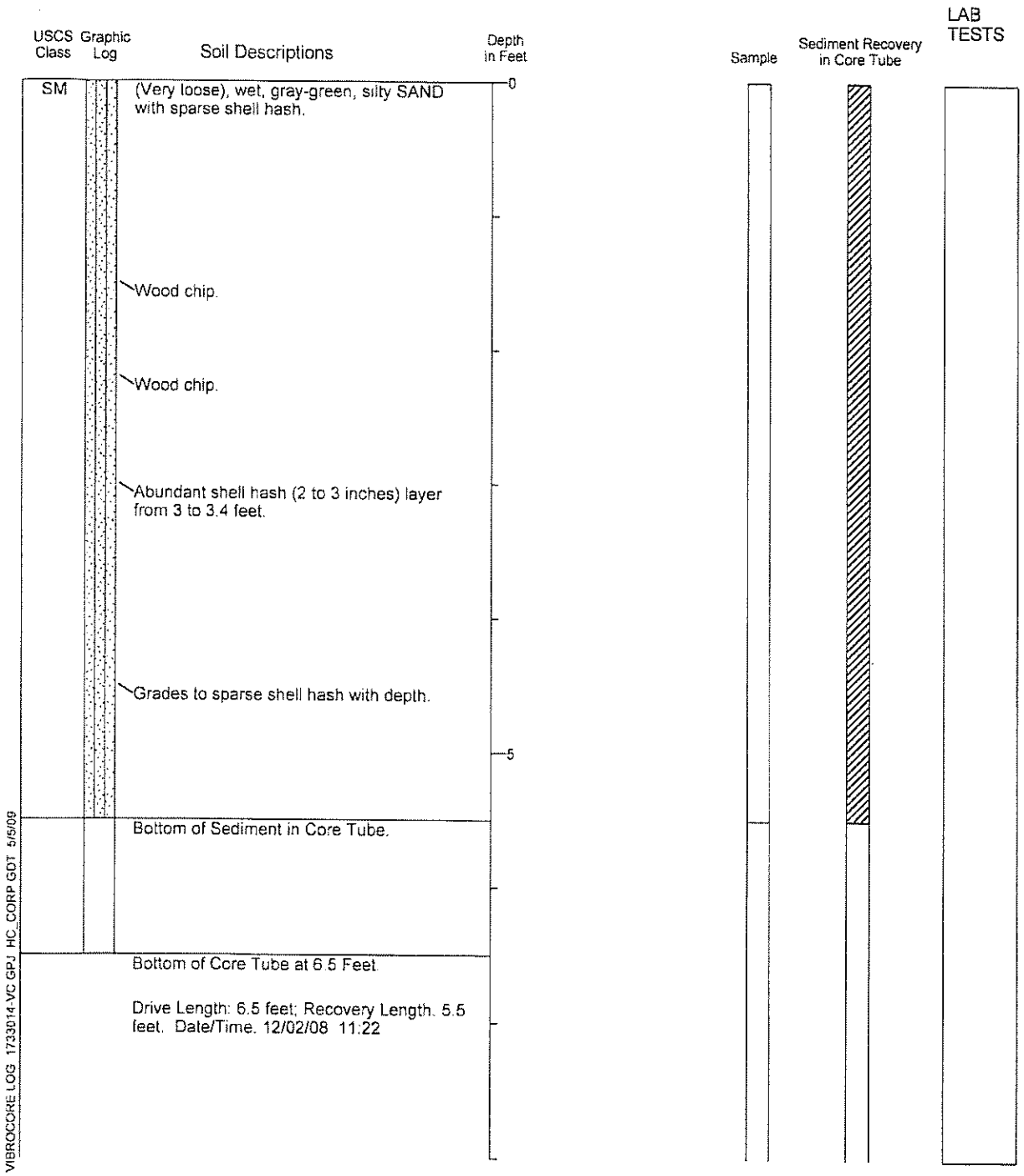
17330-14 *12/08*

Figure A-28

Vibracore Log Station 64

Location: See Figure 2.
Mudline Elevation in Feet (MLLW): 42.5 Feet
Water Depth in Feet: 15.4 Feet

Type of Sample: Vibracore
Core Diameter: 4 inches
Northing: 1211481.5
Easting: 312618.6
Logged By: C. Rust Reviewed By: G. Both



VIBROCORE LOG 1733014-VC.GPJ HC_CORP.GDT 5/5/09

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. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

HARTCROWSER

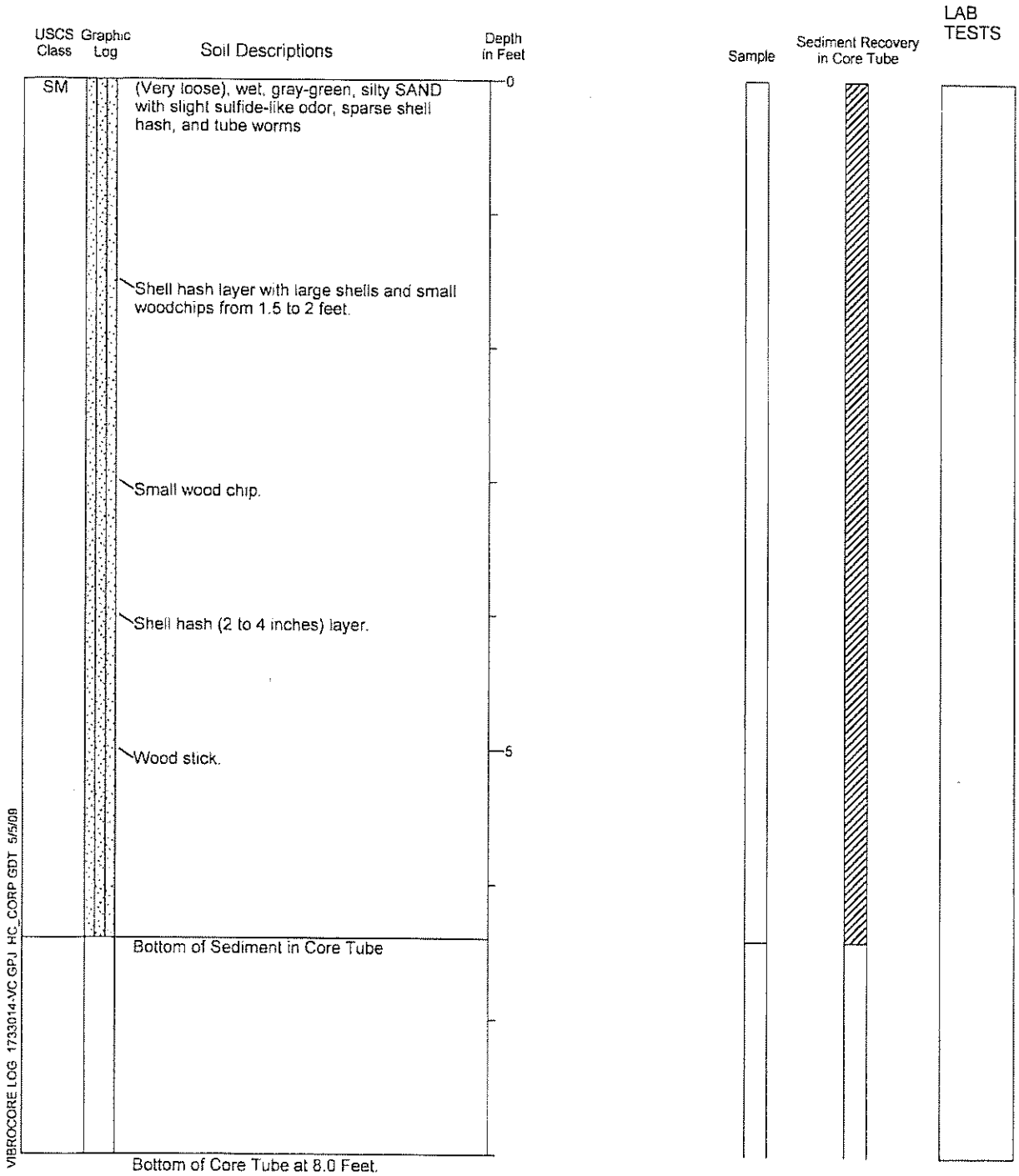
17330-14 *12/08*

Figure A-29

Vibracore Log Station 65

Location: See Figure 2.
Mudline Elevation in Feet (MLLW): 44.0 Feet
Water Depth in Feet. 15.8 Feet

Type of Sample: Vibracore
Core Diameter: 4 inches
Northing: 1211971.3
Easting: 312625.8
Logged By: C. Rust Reviewed By: G. Both



Drive Length: 8.0 feet; Recovery Length: 6.4 feet. Date/Time: 12/02/08 12:40

VIBROCORE LOG 1733014-VC.GPJ HC_CORP.GDT 5/5/09

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. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

HARTCROWSER

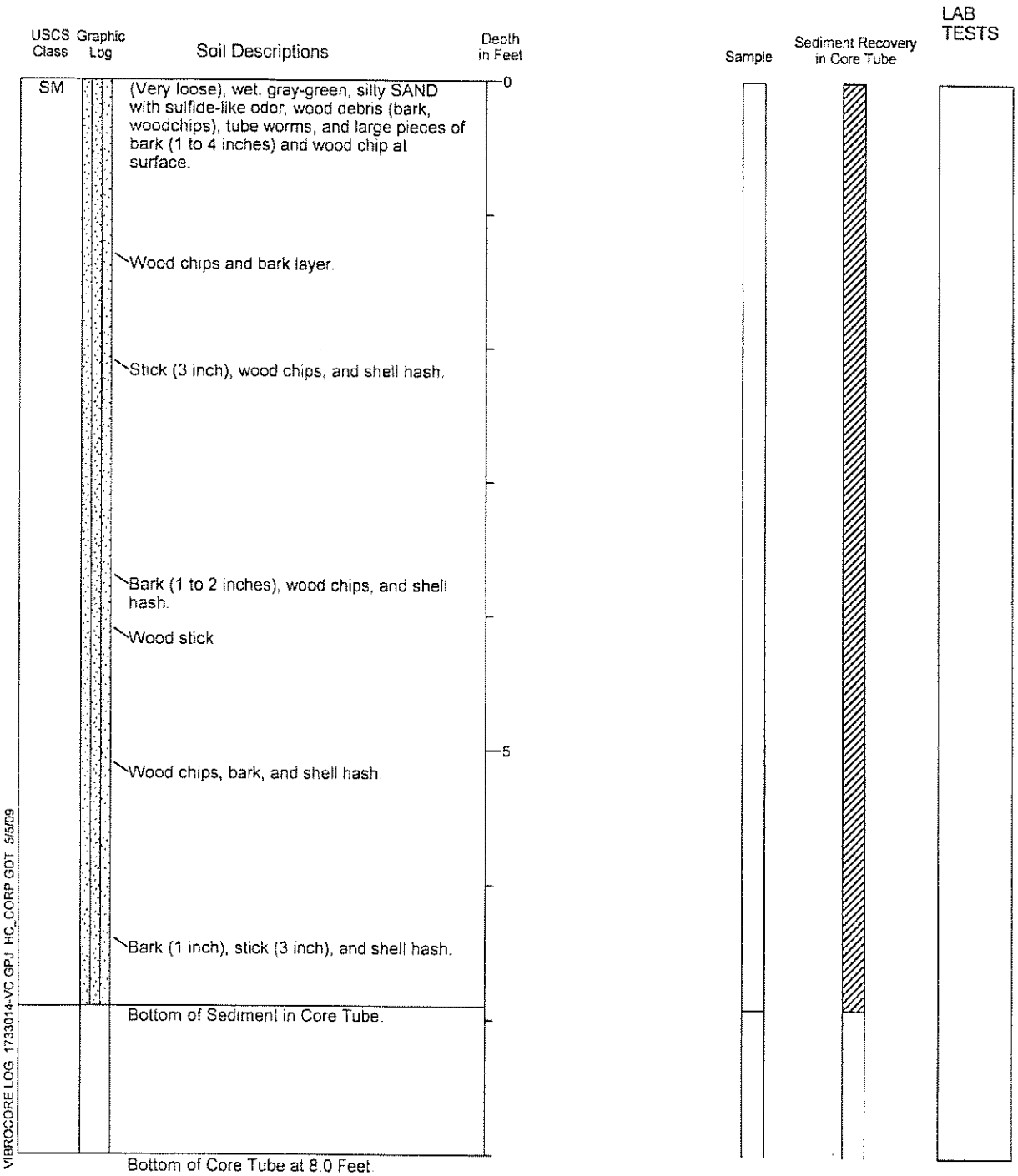
17330-14 *12/08*

Figure A-30

Vibracore Log Station 67

Location: See Figure 2.
Mudline Elevation in Feet (MLLW): 49.8 Feet
Water Depth in Feet: 17.5 Feet

Type of Sample: Vibracore
Core Diameter: 4 inches
Northing: 1212966 4
Easting: 312619.6
Logged By: C. Rust Reviewed By: G. Both



Drive Length: 8.0 feet, Recovery Length: 6.9 feet. Date/Time: 12/02/08 13:09

VIBROCORE LOG 173014-VC.GPJ HC_CORP.GDT 5/5/09

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. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

HARTCROWSER

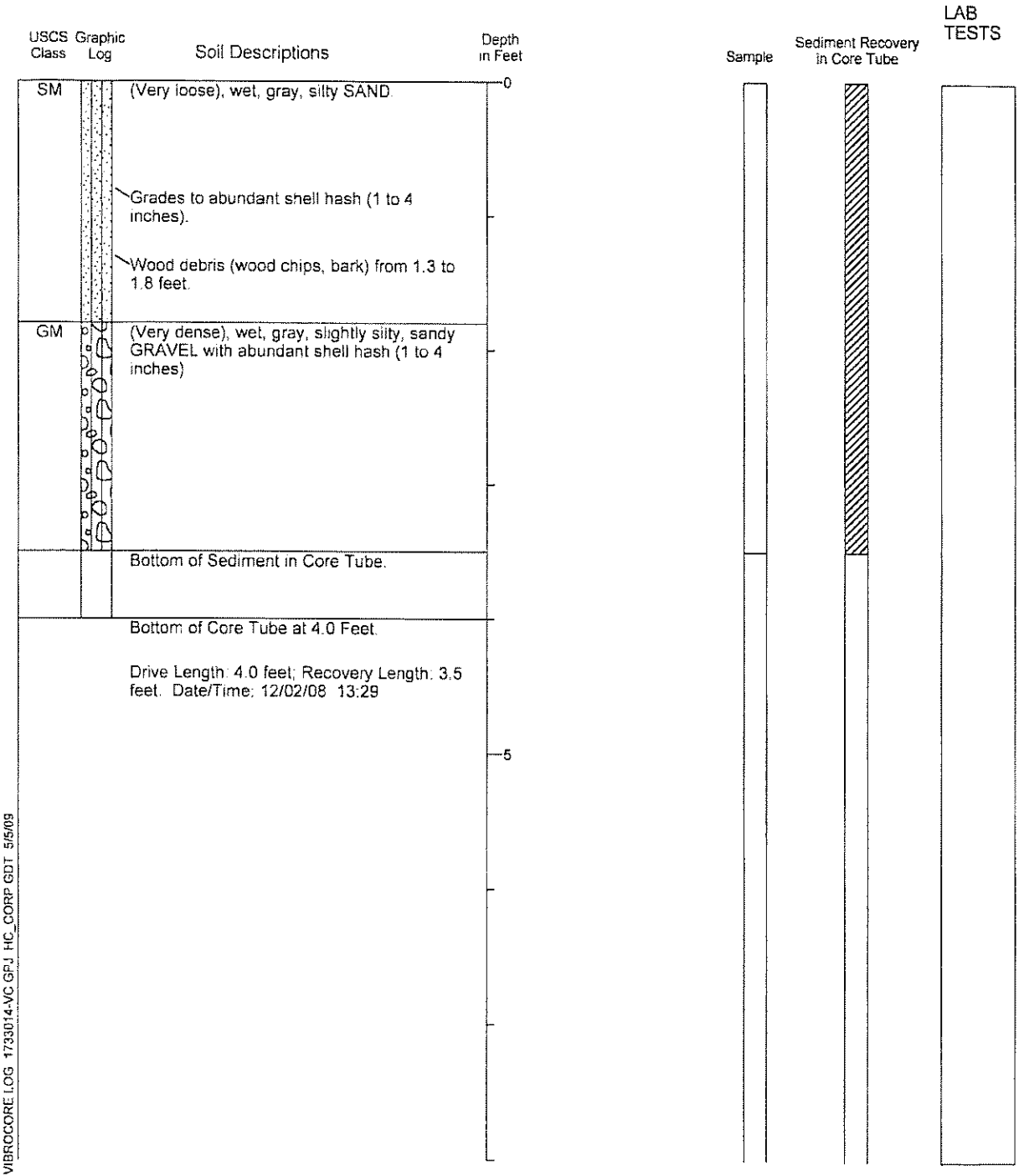
17330-14 *12/08*

Figure A-31

Vibracore Log Station 69

Location: See Figure 2
Mudline Elevation in Feet (MLLW): 10.5 Feet
Water Depth in Feet: 5.4 Feet

Type of Sample: Vibracore
Core Diameter: 4 inches
Northing: 1213976
Easting: 312627.2
Logged By: C. Rust Reviewed By: G. Both



VIBROCORE LOG 1733014-VC GPJ HC_CORP GDT 5/5/09

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. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

HARTCROWSER

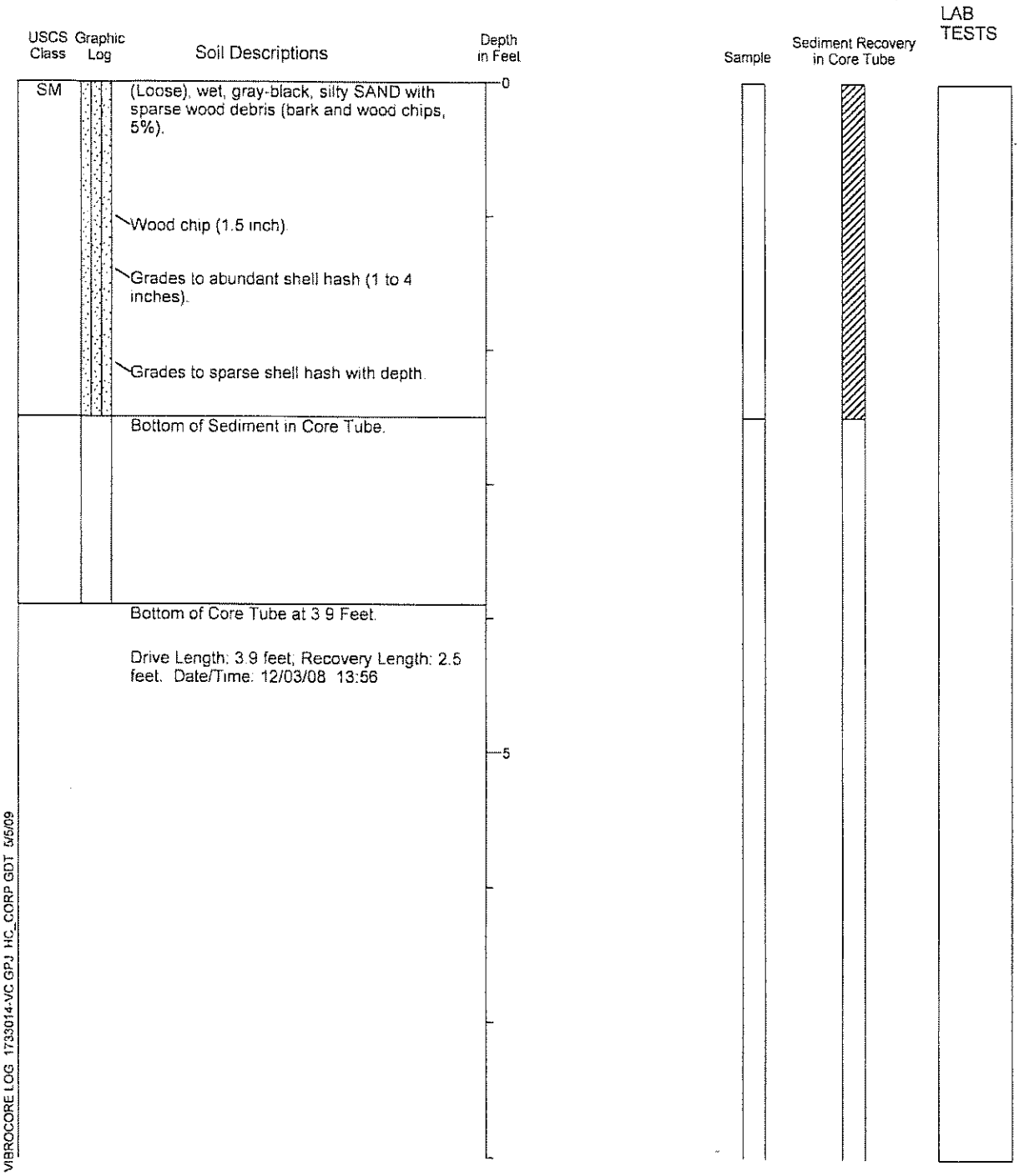
17330-14 *12/08*

Figure A-32

Vibracore Log Station 71

Location: See Figure 2.
Mudline Elevation in Feet (MLLW): 29.7 Feet
Water Depth in Feet: 11.3 Feet

Type of Sample: Vibracore
Core Diameter: 4 inches
Northing: 1211467.6
Easting: 313610.8
Logged By: C. Rust Reviewed By: G. Both



VIBROCORE LOG 1733014-VC.GPJ HC_CORP.GDT 5/6/09

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. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

HARTCROWSER

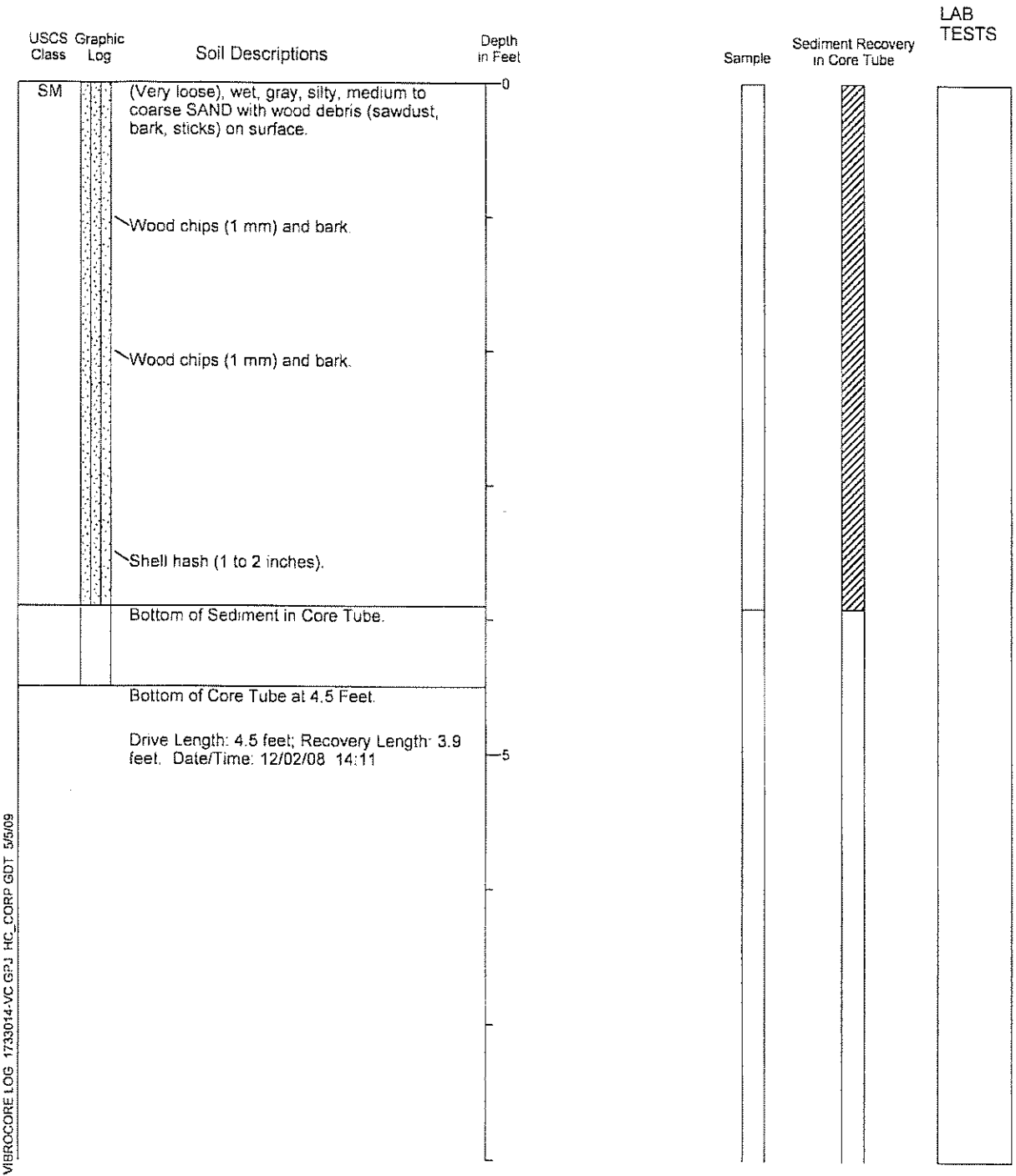
17330-14 *12/08*

Figure A-33

Vibracore Log Station 73

Location: See Figure 2.
Mudline Elevation in Feet (MLLW): 39.6 Feet
Water Depth in Feet: 14.3 Feet

Type of Sample: Vibracore
Core Diameter: 4 inches
Northing: 1212477.4
Easting: 313606.1
Logged By: C. Rust Reviewed By: G. Both



VIBROCORE LOG 1733014-VC.GPJ HC_CORP.GDT 5/5/09

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. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

HARTCROWSER

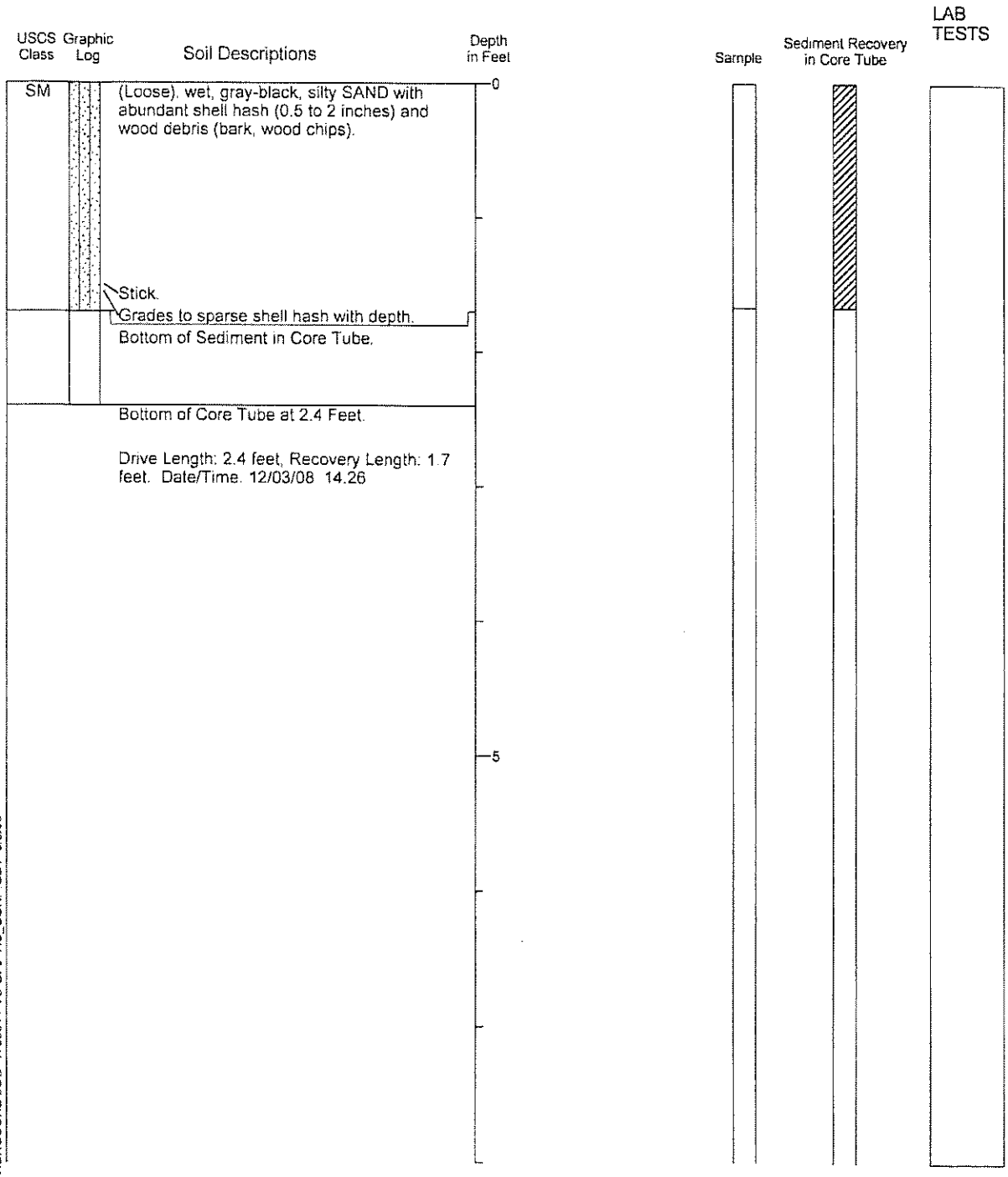
17330-14 *12/08*

Figure A-34

Vibracore Log Station 75

Location: See Figure 2.
Mudline Elevation in Feet (MLLW): 14.3 Feet
Water Depth in Feet: 6.7 Feet

Type of Sample: Vibracore
Core Diameter: 4 inches
Northing: 1213478.7
Easting: 313627.2
Logged By: C. Rust Reviewed By: G. Both



VIBROCORE LOG 173014-VC.GPJ HC_CORP.GDT 5/5/09

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. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

HARTCROWSER

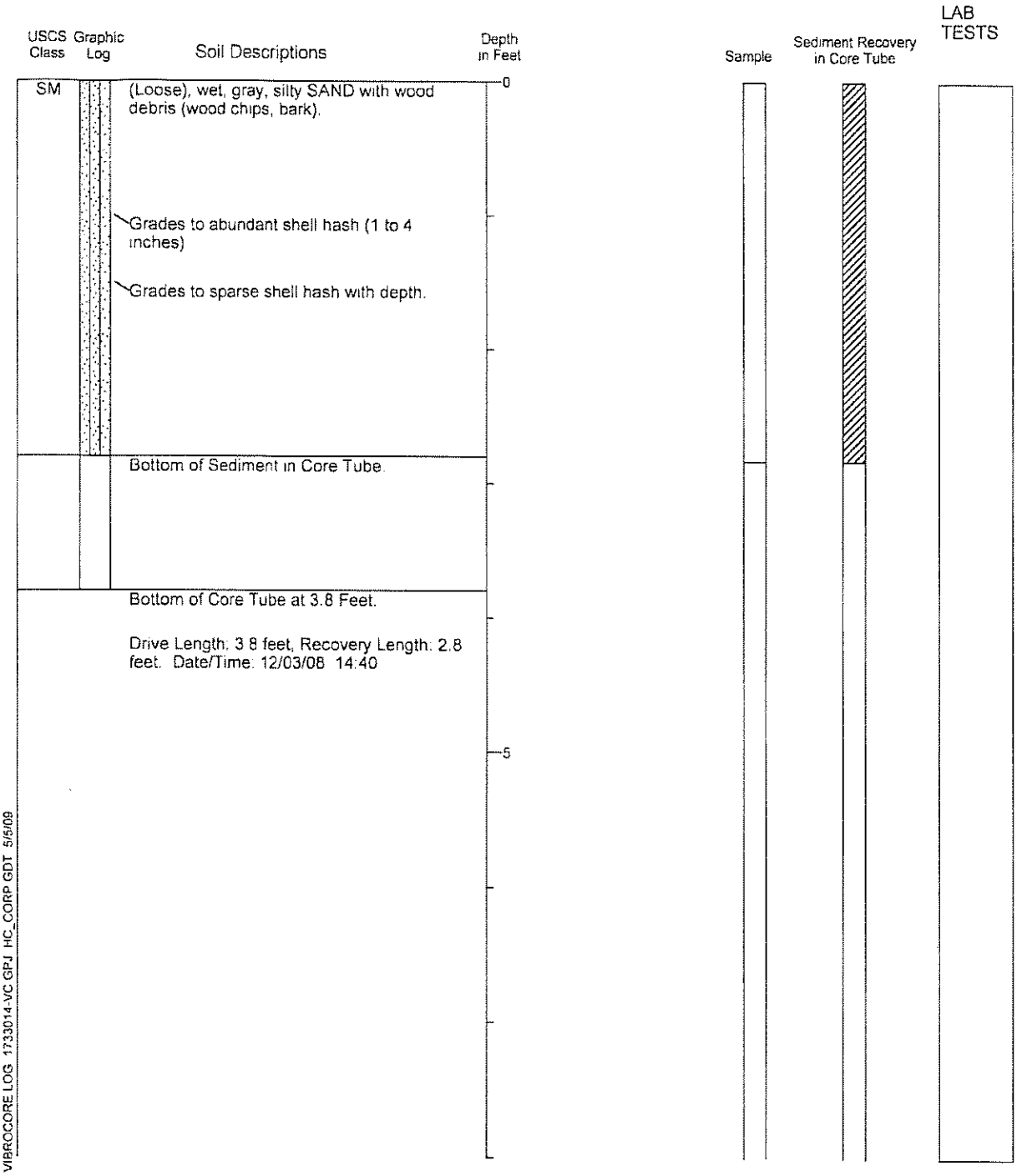
17330-14 *12/08*

Figure A-35

Vibracore Log Station 77

Location: See Figure 2.
Mudline Elevation in Feet (MLLW): 19.2 Feet
Water Depth in Feet: 8 Feet

Type of Sample: Vibracore
Core Diameter: 4 inches
Northing: 1211054.2
Easting: 314620.5
Logged By: C. Rust Reviewed By: G. Both



VIBROCORE LOG 1733014-VC.GPJ HC_CORP.GDT 5/5/09

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. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

HARTCROWSER

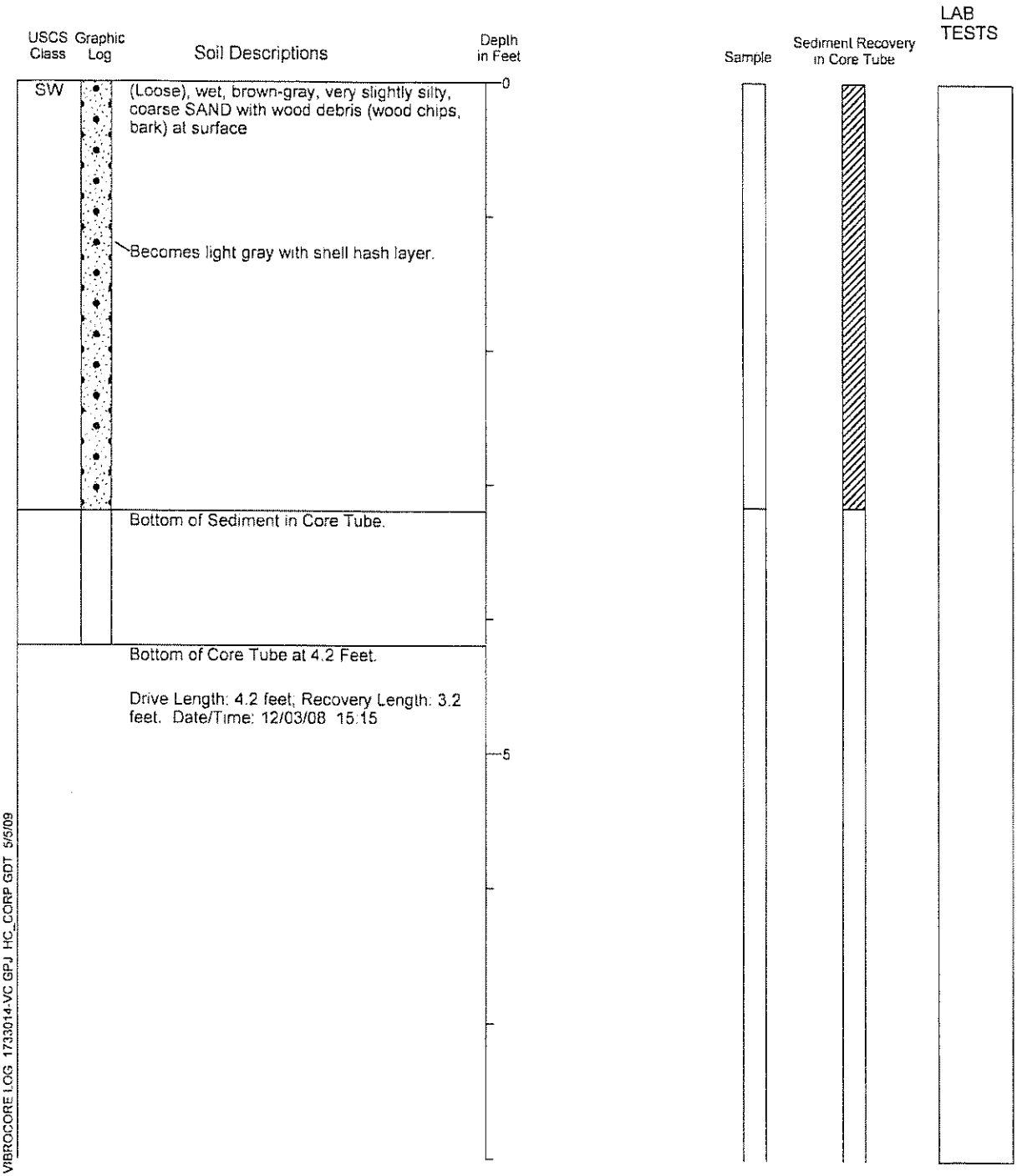
17330-14 *12/08*

Figure A-36

Vibracore Log Station 78

Location: See Figure 2.
Mudline Elevation in Feet (MLLW): 22 6 Feet
Water Depth in Feet: 9 Feet

Type of Sample: Vibracore
Core Diameter: 4 inches
Northing: 1211468.5
Easting: 614620.8
Logged By: C. Rust Reviewed By: G. Both



VIBROCORE LOG 1733014-VC.GPJ HC_CORP.GDT 5/5/09

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. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

HARTCROWSER

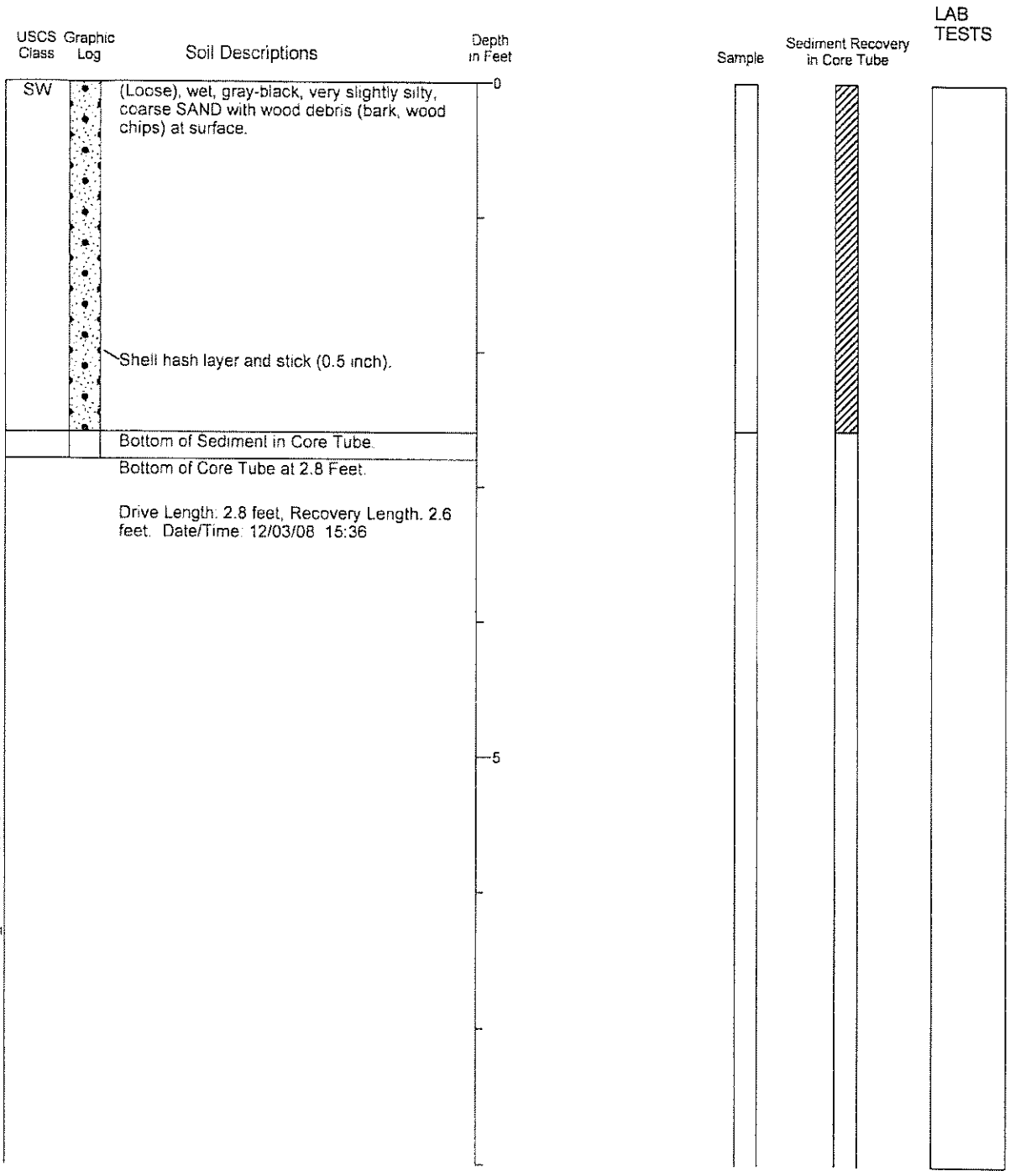
17330-14 *12/08*

Figure A-37

Vibracore Log Station 80

Location: See Figure 2.
Mudline Elevation in Feet (MLLW): 26.0 Feet
Water Depth in Feet: 10 Feet

Type of Sample: Vibracore
Core Diameter: 4 inches
Northing: 1212487
Easting: 314626.9
Logged By: C. Rust Reviewed By: G. Both



VIBROCORE LOG 1739014-VC.GPJ HC_CORP.GDT 5/5/09

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. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

HARTCROWSER

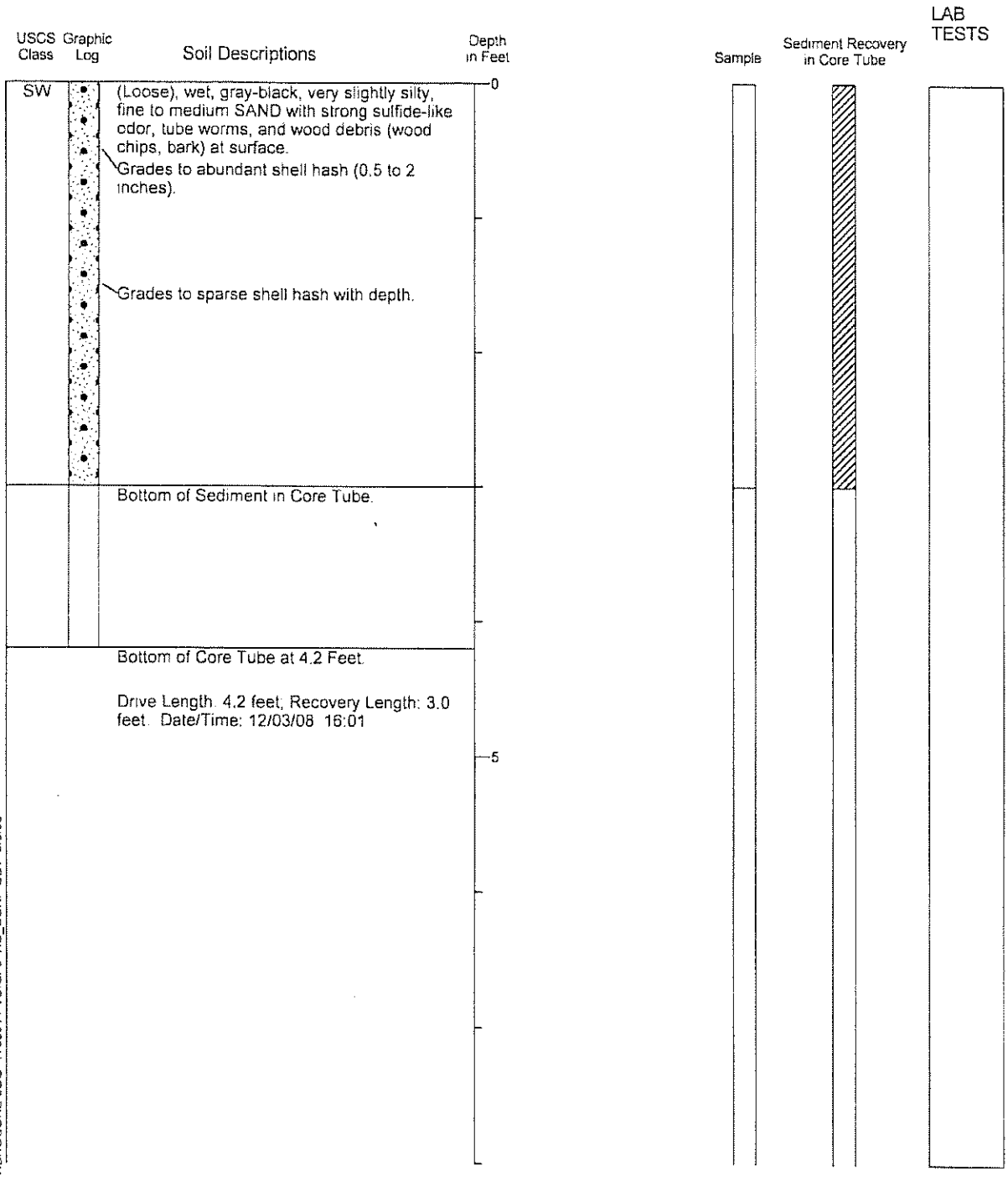
17330-14 *12/08*

Figure A-38

Vibracore Log Station 82

Location: See Figure 2.
Mudline Elevation in Feet (MLLW): 13.3 Feet
Water Depth in Feet: 6.1 Feet

Type of Sample: Vibracore
Core Diameter: 4 inches
Northing: 1213309.3
Easting: 314571.2
Logged By: C. Rust Reviewed By: G. Both



VIBROCORE LOG 1733014-VC.GPJ HC_CORP.GDT 5/5/09

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. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

HARTCROWSER

17330-14 *12/08*

Figure A-39

APPENDIX B
CHEMICAL DATA QUALITY REVIEW AND CERTIFICATES OF ANALYSIS

APPENDIX B-1
CHEMICAL DATA QUALITY REVIEW AND CERTIFICATES OF ANALYSIS

Chemical Data Quality Review for Sediment Samples

Fifty-two surface sediment samples and four sediment core samples were collected from Port Gamble Bay on December 3, 4, 5, 8, 9, and 10, 2008. The samples were submitted to Analytical Resources, Inc. (ARI), in Tukwila, WA for analysis. Samples for dioxins/furans were subcontracted to SGS Environmental in Wilmington, NC. Sample identifications, laboratory job numbers, and analytical tests are summarized in Table 2.

The samples were received at the laboratory with temperatures ranging from 0.2°C to 6°C. As sediment samples were frozen upon arrival, no results were qualified.

Quality assurance/quality control (QA/QC) reviews of laboratory procedures were performed on an ongoing basis by the laboratory. Hart Crowser performed the data review, using laboratory quality control results summary sheets and raw data, as required, to ensure they met data quality objectives for the project. Data review followed the format outlined in the National Functional Guidelines for Organic Data Review (EPA 1999) and the National Functional Guidelines for Inorganic Data Review (EPA 2004) modified to include specific criteria of the individual analytical methods. The following criteria were evaluated in the standard data quality review process:

- Holding times;
- Method blanks;
- Surrogate recoveries;
- Laboratory control sample/laboratory control sample duplicate (LCS/LCSD) recoveries;
- Matrix spike/matrix spike duplicate (MS/MSD) recoveries;
- Laboratory duplicate relative percent differences (RPDs);
- Internal standard (IS) recoveries (where applicable);
- Calibration criteria (where applicable); and
- Reporting limits (RL).

The majority of the data were determined to be acceptable for use, as qualified. Several resin acid results were rejected due to failing LCS recoveries. Full laboratory results are presented at the end of this appendix. Results of the data reviews, organized by analysis class, follow.

Polychlorinated Biphenyls (PCBs)

Analytical Methods

The samples were extracted and the extracts were acid and sulfur cleaned. The samples were analyzed by gas chromatography with an electron capture detector (GC/ECD) following EPA Method 8082.

Sample Holding Times

The samples were prepared and analyzed within holding time limits for frozen samples.

Laboratory Detection Limits

Reported detection limits and analytical results were adjusted for moisture content and any required dilution factors. The reporting limits for Aroclor 1232 was elevated in PGSS-8 due to matrix interferences. The reporting limit for Aroclor 1221 was elevated in PGSS-58 due to matrix interferences. The laboratory "Y" qualifier was changed to "U."

Blank Contamination

No target analytes were detected in laboratory blanks.

Surrogate Recovery

Surrogate recoveries were within laboratory control limits.

Laboratory Control Sample (LCS) Recovery

Laboratory control sample recoveries were within laboratory control limits.

Matrix Spike (MS) Recovery

MS and MSD recoveries were within laboratory control limits.

Initial Calibration Curves and Continuing Calibration Verification Checks (CCVs)

The initial calibration curves and CCVs were within acceptance criteria.

Resin Acids

Analytical Methods

The samples were extracted for resin acids by EPA Method 3550B (sonication) following PSEP modifications to attain lower reporting limits. The samples were analyzed by gas chromatography/mass spectrometry (GC/MS) following EPA Method 8270D.

Sample Holding Times

The samples were prepared and analyzed within the holding time limits of 6 months for frozen samples.

Laboratory Detection Limits

Reported detection limits and analytical results were adjusted for moisture content and any required dilution factors. Detections that fell between the reporting limit and the MDL were qualified by the laboratory as "J." The laboratory "J" qualifier was changed to "T" to be consistent with Ecology's EIM database.

The result for abietic acid in PGSS-83 was qualified by the laboratory due to low spectral match parameters. The laboratory "M" qualifier was changed to "J."

Blank Contamination

The method blanks were non-detect.

Surrogate Recovery

Surrogate recoveries were within laboratory control limits.

Laboratory Control Sample (LCS) Recovery

Default laboratory control limits of 30 to 160 percent were used for the majority of resin acids. LCS/LCSD recoveries that fell below 10 percent led to qualification of the associated sample results as rejected (R). LCS/LCSD recoveries that were around 10 percent (e.g., 9 to 11 percent) led to qualification of the associated sample results as estimated (J) as insufficient data are available to determine valid laboratory control limits.

Laboratory control sample recoveries were within default laboratory control limits with the following exceptions:

- For LCS-121708, the recoveries for neoabietic acid were below the default control limits in the LCS and LCSD. Results for neoabietic acid in the associated samples, (PGSS-44, PGSS-71, PGSS-73, PGSS-75, PGSS-77, PGSS-77A, PGSS-78, PGSS-80, PGSS-82, PGSS-83, and PGSS-92), were qualified as estimated (J).
- For LCS-121808, the recoveries for neoabietic acid were below the default control limits in the LCS and LCSD. The results for neoabietic acid in the associated samples (PGSS-8, PGSS-14A, PGSS-15, PGSS-16, PGSS-18, PGSS-20, PGSS-22, PGSS-21B, PGSS-21A, PGSS-29, PGSS-29A, PGSS-30, PGSS-31, PGSS-33, PGSS-35, PGSS-38, PGSS-38A, PGSS-39, PGSS-40, and PGSS-42) were qualified as estimated (J).
- For LCS-122008, the recoveries for dehydroabietic acid exceeded the control limit in the LCSD, but were within the control limit in the LCS. Results for dehydroabietic acid were not qualified. The recoveries for neoabietic acid were below 10 percent in the LCS and LCSD. The results for neoabietic acid in the associated samples (PGSS-45, PGSS-46, PGSS-47, PGSS-51, PGSS-47A, PGSS-53, PGSS-54, PGSS-55, PGSS-56, PGSS-58, PGSS-61, PGSS-62, PGSS-62A, PGSS-62B, PGSS-63, PGSS-64, PGSS-67, PGSS-68, PGSS-69, and PGSS-70) were rejected (R).
- For LCS-011409, palustric acid did not recover in the LCS and LCSD. The result for palustric acid in the associated sample, PGSS-GEO-3, was rejected (R). The recoveries for neoabietic acid were below 10 percent in the LCS and LCSD. The result for neoabietic acid in the associated sample, PGSS-GEO-3, was rejected (R). The recoveries for abietic acid exceeded 300 percent in the LCS and LCSD. Results in the associated sample, PGSS-GEO-3, were non-detect and no qualification was made.

Matrix Spike (MS) Recovery

The MS recovery were within default laboratory control limits with the following exceptions:

- For PGSS-70 MS/MSD, palustric acid did not recover in the MS/MSD. Neoabietic acid recovered below 10 percent in the MS and MSD. Dehydroabietic acid exceeded control limits in the MSD, within control limits in the MS. Oleic acid exceeded the Marginal Exceedance (ME) limits in the MSD due to high levels in the source sample; oleic acid recovery in the MS was within control limits. Results for palustric acid were qualified as estimated in the source sample, as results were within control limits in the LCS and LCSD. Results for neoabietic acid were rejected (R) due to failing

LCS and LCSD recoveries. Results for dehydroabietic acid and oleic acid were not qualified.

- For PGSS-80 MS/MSD, palustric acid did not recover in the MS and MSD. Neoabietic acid recovered below 10 percent in the MS and MSD. The results for palustric acid in PGSS-80 were qualified as estimated (J), as results were within control limits in the LCS and LCSD. The results for neoabietic acid in PGSS-80 were qualified as estimated (J) due to low recoveries in the LCS and LCSD.
- For PGSS-GEO-3 MS/MSD, palustric acid and neoabietic acid did not recover in the MS or MSD. The results for palustric acid and neoabietic acid in PGSS-GEO-3 were rejected (R) due to failing LCS and LCSD recoveries.
- For PGSS-21A, palustric acid did not recover in the MS or MSD. Neoabietic acid recovered below 10 percent in the MS and MSD. Oleic acid was below the control limits in the MSD, within control limits in the MS. Linoleic acid were below the control limits in the MS, within control limits in the MSD. The results for palustric acid and neoabietic acid in PGSS-21A were qualified as estimated (J). Results for oleic acid and linoleic acid were not qualified.

Internal Standards (IS) Recovery

Internal standards were within acceptance criteria.

Initial Calibration Curves and Continuing Calibration Verification Checks (CCVs)

The initial calibration curves were within acceptance criteria. The CCVs were within acceptance criteria with the following exceptions:

Semivolatile Organic Compounds (SVOCs)

Analytical Methods

The samples were extracted by EPA Method 3550B (sonication) following PSEP modifications to attain lower reporting limits. The samples were analyzed by GC/MS following EPA Method 8270D. The target analytes guaiacol and retene were determined concurrently with samples analyzed for SMS SVOC compounds.

Sample Holding Times

The samples were prepared and analyzed within the holding time limits of 6 months for frozen samples.

Laboratory Detection Limits

Reported detection limits and analytical results were adjusted for moisture content and any required dilution factors. Detections that fell between the reporting limit and the MDL were qualified by the laboratory as "J." The laboratory "J" qualifier was changed to "T" to be consistent with Ecology's EIM database.

Blank Contamination

The method blanks were non-detect.

Surrogate Recovery

Surrogate recoveries were within laboratory control limits with the following exception:

- PGSS-GEO-3. The surrogate d14-p-terphenyl exceeded the control limit, but fell within 20 percent of the true value. Other surrogates were within control, and no results were qualified.

Laboratory Control Sample (LCS) Recovery

Laboratory control sample recoveries were within laboratory control limits with the following exception:

- For LCS-011509 for SVOCs, the recovery for benzyl alcohol was below the control limits in the LCSD. The recovery was within control limits in the LCS, and results were not qualified.

Matrix Spike (MS) Recovery

The MS were within laboratory control limits.

Internal Standards (IS) Recovery

Internal standards were within acceptance criteria.

Initial Calibration Curves and Continuing Calibration Verification Checks (CCVs)

The initial calibration curves and CCVs were within acceptance criteria.

Total Metals

Analytical Methods

Sediment samples for mercury were prepared and analyzed following EPA Method 7471A. Sediment samples for arsenic, cadmium, chromium, copper, lead, silver, and zinc were analyzed following EPA Method 6010B.

Sample Holding Times

The samples were prepared and analyzed within holding time limits with the following exceptions. Samples PGSS-8, PGSS-22, PGSS-51, PGSS-64, PGSS-73, PGSS-75, PGSS-77A, PGSS-80, PGSS-GEO-3, and PGSS-92 were prepared and analyzed for mercury past the 28-day method holding time. Mercury results for those samples were qualified as estimated (J).

Laboratory Detection Limits

Reported detection limits and analytical results were adjusted for moisture content and any required dilution factors.

Blank Contamination

No target analytes were detected in laboratory blanks.

Laboratory Control Sample (LCS) Recovery

Laboratory control sample recoveries were within QC limits of 80 to 120 percent.

Matrix Spike (MS) Recovery

Matrix spike recoveries met QC limits of 75 to 125 percent.

Laboratory Duplicate Sample Analysis

The RPD between replicate measurements met QC limits.

Initial Calibration Curves and Continuing Calibration Verification Checks (CCVs)

The initial calibration curves and CCVs were within acceptance criteria.

Conventional Sediment Parameters

Analytical Methods

Total solids and total preserved solids were determined by modified EPA Method 160.3. Total volatile solids (TVS) was determined by EPA Method 160.4. Total organic carbon (TOC) was determined by Plumb (1981). Ammonia, as nitrogen, was determined by EPA Method 350.1 modified. Sulfide was determined by EPA Method 376.2.

Sample Holding Times

The samples met holding time limits for total solids, total preserved solids, TOC, TVS, ammonia, and sulfide with the following exceptions.

- Sample PGSS-GEO-3 was prepared and analyzed past the holding time for ammonia and sulfide. Results for ammonia and sulfide in PGSS-GEO-3 were qualified as estimated (J).

The preservative zinc acetate was added to samples Station 42 S-1, Station 42 S-2, Station 42 S-3, and Station 42 S-4 one day after collection. Sample results were not qualified, as distillation started within holding time.

Laboratory Detection Limits

Reported detection limits were acceptable. Reported detection limits and analytical results were adjusted for moisture content and any required dilution factors.

Blank Contamination

No target analytes were detected in laboratory blanks.

Laboratory Control Sample (LCS) Recovery

LCS recoveries for sulfide and TOC were within QC limits.

Matrix Spike (MS) Recovery

MS recoveries for ammonia, sulfide and TOC were within QC limits with the following exception.

- MS recovery for sulfide was below QC limits for PGSS-45 due to matrix effects. The sample was prepared three times with similar results. The result for sulfide in PGSS-45 was qualified as estimated (J).

Laboratory Replicate Sample Analysis

The RPD between replicate measurements met quality control limits for total solids, total preserved solids, TVS, ammonia, sulfide, and TOC with the following exceptions.

- The RPD for TOC for Station 42 S-1 exceeded the control limits. TOC results in Station 42 S-1 were qualified as estimated (J).
- The RPD for sulfide for PGSS-8 exceeded the control limits. Sulfide results in PGSS-8 were qualified as estimated (J).
- The RPD for sulfide for PGSS-71 exceeded the control limits. Sulfide results in PGSS-71 were qualified as estimated (J).

Standard Reference Material (SRM) Recovery

SRM recoveries for ammonia and TOC were within QC limits.

Dioxins/Furans

Analytical Methods

Sediment samples for dioxins/furans analysis were prepared and analyzed by EPA Method 1613.

Sample Holding Times

The samples were prepared and analyzed within holding time limits.

Laboratory Detection Limits

Reported detection limits and analytical results were adjusted for moisture content and any required dilution factors. Detections that fell between the reporting limit and the MDL were qualified by the laboratory as "J." The laboratory "J" qualifier was changed to "T" to be consistent with Ecology's EIM database.

Blank Contamination

The method blank was non-detect.

Surrogate Recovery

Surrogate recoveries were within QC limits.

Ongoing Precision Result/Laboratory Control Sample Recovery

OPR/LCS recoveries were within QC limits.

Internal Standard (IS) Recoveries

IS recoveries were within QC limits.

Initial Calibration Curves and Continuing Calibration Verification Checks (CCVs)

The initial calibration curves and CCVs were within acceptance criteria.

Samples PGSS-8, PGSS-22, PGSS-51, PGSS-64, PGSS-73, PGSS-75, PGSS-77A, PGSS-GEO-3, and PGSS-92 had the Total TCDF and/or Total PeCDF qualified by the laboratory due to peaks that could cause false positives. The results were reported by the laboratory and flagged as "DPE." The DPE qualifier was removed and the results were qualified as estimated (J).

Samples PGSS-8, PGSS-22, PGSS-51, PGSS-64, PGSS-73, PGSS-75, and PGSS-92 had the Total PeCDD, Total TCDF, and/or Total PeCDF qualified by the laboratory due to interference. The results were reported by the laboratory and flagged as "Q." The Q qualifier was removed and the results were qualified as estimated (J).

J:\Jobs\1733014\RI Report\Final Port Gamble RI Report.doc

APPENDIX B-2
CHEMICAL DATA QUALITY REVIEW AND CERTIFICATES OF ANALYSIS

Chemical Data Quality Review for Reference Samples

Three surface sediment samples were collected from Carr Inlet on January 9, 2009. The samples were submitted to Analytical Resources, Inc., (ARI) in Tukwila, WA for analysis. Sample identifications, laboratory job numbers, and analytical tests are summarized in Table 2.

The samples were received at the laboratory with temperatures ranging from 0.2°C to 6°C. As sediment samples were frozen upon arrival, no results were qualified.

Quality assurance/quality control (QA/QC) reviews of laboratory procedures were performed on an ongoing basis by the laboratory. Hart Crowser performed the data review, using laboratory quality control results summary sheets and raw data, as required, to ensure they met data quality objectives for the project. Data review followed the format outlined in the National Functional Guidelines for Inorganic Data Review (EPA 2004) modified to include specific criteria of the individual analytical methods. The following criteria were evaluated in the standard data quality review process:

- Holding times;
- Method blanks;
- Laboratory control sample/laboratory control sample duplicate (LCS/LCSD) recoveries;
- Matrix spike/matrix spike duplicate (MS/MSD) recoveries;
- Laboratory duplicate relative percent differences (RPDs); and
- Reporting limits (RL).

The data were determined to be acceptable for use without qualification. Full laboratory results are presented at the end of this appendix. Results of the data review follows.

Conventional Sediment Analyses

Analytical Methods

Total solids and total preserved solids were determined by EPA Method 160.3 modified. Total volatile solids (TVS) were determined by EPA Method 160.4.

Ammonia was determined by EPA Method 350.1. Total sulfide was determined by EPA Method 376.2. TOC was determined by Plumb (1981).

Sample Holding Times

The samples were prepared and analyzed within holding time limits.

Laboratory Detection Limits

Reported detection limits were acceptable. Reported detection limits and analytical results were adjusted for moisture content and any required dilution factors.

Blank Contamination

No target analytes were detected in laboratory blanks.

Laboratory Control Sample (LCS) Recovery

LCS recoveries for sulfide and TOC were within QC limits.

Matrix Spike (MS) Recovery

MS recoveries for ammonia, sulfide, and TOC were within QC limits.

Laboratory Replicate Sample Analysis

The RPD between replicate measurements met QC limits for total solids, total preserved solids, TVS, ammonia, sulfide, and TOC.

Standard Reference Material (SRM) Recovery

SRM recovery for ammonia and TOC were within QC limits.

J:\Jobs\1733014\RI Report\Final Port Gamble RI Report.doc

APPENDIX B-3
CHEMICAL DATA QUALITY REVIEW AND CERTIFICATES OF ANALYSIS

Chemical Data Quality Review for Biota

Clams, oysters, geoducks, and crabs were collected from Port Gamble Bay on December 15, 16, and 23, 2008. The samples were submitted to Analytical Resources, Inc. (ARI), in Tukwila, WA for tissue preparation and chemical analysis. Tissue samples were subcontracted to SGS Environmental of Wilmington, NC for dioxin/furan analyses. Sample identifications, laboratory job numbers, and analytical tests are summarized in Table 2.

The samples were received at the laboratory alive. Following tissue preparation, including compositing and homogenization, the samples were frozen prior to analysis.

Quality assurance/quality control (QA/QC) reviews of laboratory procedures were performed on an ongoing basis by the laboratory. Hart Crowser performed the data review, using laboratory quality control results summary sheets and raw data, as required, to ensure they met data quality objectives for the project. Data review followed the format outlined in the National Functional Guidelines for Organic Data Review (EPA 1999) and the National Functional Guidelines for Inorganic Data Review (EPA 2004) modified to include specific criteria of the individual analytical methods. The following criteria were evaluated in the standard data quality review process:

- Holding times;
- Method blanks;
- Surrogate recoveries;
- Laboratory control sample/laboratory control sample duplicate (LCS/LCSD) recoveries;
- Internal standard (IS) recoveries (where applicable);
- Calibration criteria (where applicable); and
- Reporting limits (RL).

The data were determined to be acceptable for use, as qualified. Full laboratory results are presented at the end of this appendix. Results of the data reviews, organized by analysis class, follow.

Polychlorinated Biphenyls (PCBs)

Analytical Methods

The tissue samples were extracted and the extracts were acid cleaned. The samples were analyzed by gas chromatography with an electron capture detector (GC/ECD) following EPA Method 8082.

Sample Holding Times

The samples were prepared and analyzed within holding time limits for frozen samples.

Laboratory Detection Limits

Reported detection limits and analytical results were adjusted for any required dilution factors. The reporting limits for Aroclor 1254 was elevated in Crab1-A Pan2 due to matrix interferences. The reporting limit for Aroclor 1248 was elevated in Clam #1A due to matrix interferences. The laboratory "Y" qualifier was changed to "U."

Blank Contamination

No target analytes were detected in laboratory blanks.

Surrogate Recovery

Surrogate recoveries were within laboratory control limits.

Laboratory Control Sample (LCS) Recovery

Laboratory control sample recoveries were within laboratory control limits.

Initial Calibration Curves and Continuing Calibration Verification Checks (CCVs)

The initial calibration curves and CCVs were within acceptance criteria.

Total Metals

Analytical Methods

Tissue samples for mercury were prepared and analyzed by EPA Method 7471A. Tissue samples for arsenic, cadmium, chromium, copper, lead, silver, and zinc were analyzed by EPA Method 6010B.

Sample Holding Times

The samples were prepared and analyzed within holding time limits.

Laboratory Detection Limits

Reported detection limits and analytical results were adjusted for any required dilution factors.

Blank Contamination

No target analytes were detected in laboratory blanks.

Laboratory Control Sample (LCS) Recovery

Laboratory control sample recoveries were within QC limits of 80 to 120 percent.

Initial Calibration Curves and Continuing Calibration Verification Checks (CCVs)

The initial calibration curves and CCVs were within acceptance criteria.

Percent Lipids

Analytical Methods

Percent lipids were determined following the Bligh and Dyer method.

Sample Holding Times

The samples met holding time limits.

Laboratory Detection Limits

Reported detection limits were acceptable.

Blank Contamination

No target analytes were detected in laboratory blanks.

Dioxins/Furans

Analytical Methods

Tissue samples for dioxins/furans were prepared and analyzed by EPA Method 1613.

Sample Holding Times

The samples were prepared and analyzed within holding time limits.

Laboratory Detection Limits

Reported detection limits and analytical results were adjusted for any required dilution factors. Detections that fell between the reporting limit and the MDL were qualified by the laboratory as "J." The laboratory "J" qualifier was changed to "T" to be consistent with Ecology's EIM database.

Blank Contamination

The method blank was non-detect.

Surrogate Recovery

Surrogate recoveries were within QC limits.

Ongoing Precision Result/Laboratory Control Sample Recovery

OPR/LCS recoveries were within QC limits.

Internal Standard (IS) Recoveries

IS recoveries were within QC limits.

Initial Calibration Curves and Continuing Calibration Verification Checks (CCVs)

The initial calibration curves and CCVs were within acceptance criteria.

Samples Oyster #1A, Oyster #2A, Crab1-A Meat, Crab1-A Pan2, and GD Station #2A had the Total TCDF qualified by the laboratory due to peaks that could cause false positives. The results were reported by the laboratory and flagged as "DPE." The DPE qualifier was removed and the results were qualified as estimated (J).

J:\Jobs\1733014\RI Report\Final Port Gamble RI Report.doc

CERTIFICATES OF ANALYSIS
ANALYTICAL RESOURCES, INC.
SGS ENVIRONMENTAL

(see attached DVD)

Analytical Resources, Incorporated
Analytical Chemists and Consultants

January 16, 2009

Mr. Roger McGinnis
Hart Crowser, Inc.
1700 Westlake Avenue North Suite 200
Seattle, WA 98109-3056

RE: Project: Port Gamble, 17330-14
ARI Job No.: OC77

Dear Mr. McGinnis:

Please find enclosed the original Chain-of-Custody (COC) records, sample receipt documentation, and the final data package for the samples from the project referenced above.

The samples were analyzed for resin acids and various conventional parameters, as requested.

Sample receipt and details of these analyses are discussed in the Case Narrative.

An electronic copy of this data package and the supporting data 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.

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

Enclosures

cc: files OC77

KB/co

Chain of Custody
Documentation

prepared
for

HART CROWSER, INC.

Project: PORT GAMBLE

ARI JOB NO: OC77

prepared
by

Analytical Resources, Inc.

Sample Custody Record

1 of 1

Samples Shipped to: _____

HARTCROWSER

Hart Crowser, Inc.
1910 Fairview Avenue East
Seattle, Washington 98102-3699
Phone: 206-324-9530 FAX: 206-328-5581

JOB 17330-14 LAB NUMBER _____

PROJECT NAME PORT GAMBLE

HART CROWSER CONTACT ROGER MCGINNIS

SAMPLED BY: CFR/CWU

LAB NO.	SAMPLE ID	DESCRIPTION	DATE	TIME	MATRIX	REQUESTED ANALYSIS: TOC	TOTAL SOLIDS	TVS	AMMONIA	SULFIDES	GRAIN SIZE	NO. OF CONTAINERS	OBSERVATIONS/COMMENTS/ COMPOSITING INSTRUCTIONS
STATION	42 S-1	GRAB	12/3/08	1020	SEDIMENT	X	X	X	X	X	X		0-0.5' bgs
STATION	42 S-2	↓	↓	1025	↓	↓	↓	↓	↓	↓	↓		1.5-2' bgs
STATION	42 S-3			1030									3.5-4' bgs
STATION	42 S-4			1035									6.5-7.0' bgs

ALL ANALYSES ON SURFACES ON 12/5/08

RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE	12/4/08	SIGNATURE	12/4/08
PRINT NAME Colleen Rust	TIME	PRINT NAME Anne Comes	TIME
COMPANY HC	8:30	COMPANY HC	8:30
RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE	12/5/08	SIGNATURE Jonathon Walter	12/4/08
PRINT NAME Anne Comes	TIME	PRINT NAME ARI	TIME
COMPANY HC	1130	COMPANY	1130

SPECIAL SHIPMENT HANDLING OR STORAGE REQUIREMENTS:

TOTAL NUMBER OF CONTAINERS

SAMPLE RECEIPT INFORMATION
CUSTODY SEALS: ☐YES ☐NO ☐N/A
GOOD CONDITION ☐YES ☐NO
TEMPERATURE _____
SHIPMENT METHOD: ☐HAND ☐COURIER ☐OVERNIGHT

COOLER NO.: STORAGE LOCATION:

See Lab Work Order No. _____ for Other Contract Requirements

TURNAROUND TIME:
☐ 24 HOURS ☐ 1 WEEK
☐ 48 HOURS ☒ STANDARD
☐ 72 HOURS OTHER _____

White and Yellow Copies to Lab Pink to Project Manager Lab to Return White Copy to Hart Crowser Gold to Sample Custodian

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Hart Crowser
Project Name: Port Gamble
COC No:
Delivered by: Hand
Assigned ARI Job No: OC77
Tracking No:

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
Record cooler temperature (recommended 2.0-6.0 °C for chemistry	3.8	°C

Cooler Accepted by: JW Date: 12/4/08 Time: 1130

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?		ICE	
Was sufficient ice used (if appropriate)?		(YES)	NO
Were all bottles sealed in individual plastic bags?		(YES)	NO
Did all bottle arrive in good condition (unbroken)?		(YES)	NO
Were all bottle labels complete and legible?		(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 checklist)		YES	(NO)
Were all VOC vials free of air bubbles?	(NA)	YES	NO
Was sufficient amount of sample sent in each bottle?		(YES)	NO

Samples Logged by: JW Date: 12/6/08 Time: 905

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

Explain discrepancies or negative responses:

By: Date:

Case Narrative

prepared
for

HART CROWSER, INC.

Project: PORT GAMBLE

ARI JOB NO: OC77

prepared
by

Analytical Resources, Inc.

Case Narrative
Hart Crowser
Port Gamble, 17330-14
ARI Job: OC77
January 16, 2009

Sample Receipt

Analytical Resources Inc. (ARI) accepted four sediment samples in good condition on December 4, 2008 under the ARI job number OC77. The cooler temperature measured by IR thermometer following ARI SOP was 3.8°C and the samples were well iced. Please note that several sample containers were archived up receipt as requested on the COC. All samples were frozen to protect holding times. For further detail regarding sample receipt, please refer to the Cooer Receipt Form.

Conventional Parameters:

All samples were prepared and analyzed on within the method recommended holding times for frozen samples.

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

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

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

LCS(s): All LCS percent recoveries were within control limits.

SRM(s): All SRM percent recoveries were within control limits.

Replicate(s): The replicate RPD for TOC was outside the control limit for sample **STATION 42-S-1.** All other quality control parameters were met for sulfide for this sample.

Matrix Spike/ Matrix Spike Duplicate: Are in control.

Grain Size:

The case narrative is included in this data package.

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Client: Hart Crowser, Inc.	Project No.: OC77
Client Project: Port Gamble 17330-14	

Case Narrative

1. Four samples were submitted for grain size analysis according to PSEP methodology.
2. The samples were run in a single batch, and sample STATION 42 S-3 was chosen for triplicate analysis. The triplicate data is reported on the QA summary.
3. Sample STATION 42 S-2 contained woody or other organic matter, which may have broken down during the sieving process, affecting grain size analysis.
4. Sample STATION 42 S-4 contained shells and/or fragments of shells.
5. The data is provided in summary tables and plots.
6. There were no other noted anomalies in this project.

Approved by: _____ Date: Jan 13, 2009
Lead Technician

Data Reporting Qualifiers

Effective 12/28/04

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 ≥ 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
NR	Spiked compound recovery is not reported due to chromatographic interference
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.
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
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.

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 ≥40% RPD with no obvious chromatographic interference

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

Data Summary Package

prepared
for

HART CROWSER, INC.

Project: PORT GAMBLE

ARI JOB NO: OC77

prepared
by

Analytical Resources, Inc.

GENERAL CHEMISTRY

SAMPLE RESULTS-CONVENTIONALS
OC77-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized: MB
Reported: 12/26/08

Project: PORT GAMBLE
Event: 17330-14
Date Sampled: 12/03/08
Date Received: 12/04/08

Client ID: STATION 42 S-1
ARI ID: 08-32686 OC77A

Analyte	Date	Method	Units	RL	Sample
Total Solids	12/08/08 120808#3	EPA 160.3	Percent	0.01	50.00
Preserved Total Solids	12/09/08 120908#2	EPA 160.3	Percent	0.01	53.30
Total Volatile Solids	12/08/08 120808#1	EPA 160.4	Percent	0.01	6.78
N-Ammonia	12/10/08 121008#2	EPA 350.1M	mg-N/kg	0.19	2.48
Sulfide	12/11/08 121108#1	EPA 376.2	mg/kg	18.5	82.9
Total Organic Carbon	12/10/08 121008#1	Plumb,1981	Percent	0.020	2.81

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
OC77-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 12/26/08

Project: PORT GAMBLE
Event: 17330-14
Date Sampled: 12/03/08
Date Received: 12/04/08

Client ID: STATION 42 S-2
ARI ID: 08-32687 OC77B

Analyte	Date	Method	Units	RL	Sample
Total Solids	12/08/08 120808#3	EPA 160.3	Percent	0.01	45.80
Preserved Total Solids	12/09/08 120908#2	EPA 160.3	Percent	0.01	45.70
Total Volatile Solids	12/08/08 120808#1	EPA 160.4	Percent	0.01	5.37
N-Ammonia	12/10/08 121008#1	EPA 350.1M	mg-N/kg	0.43	19.2
Sulfide	12/08/08 120808#1	EPA 376.2	mg/kg	2.21	35.4
Total Organic Carbon	12/10/08 121008#1	Plumb,1981	Percent	0.020	1.74

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
OC77-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized: MR
Reported: 12/26/08

Project: PORT GAMBLE
Event: 17330-14
Date Sampled: 12/03/08
Date Received: 12/04/08

Client ID: STATION 42 S-3
ARI ID: 08-32688 OC77C

Analyte	Date	Method	Units	RL	Sample
Total Solids	12/08/08 120808#3	EPA 160.3	Percent	0.01	46.10
Preserved Total Solids	12/09/08 120908#2	EPA 160.3	Percent	0.01	46.80
Total Volatile Solids	12/08/08 120808#1	EPA 160.4	Percent	0.01	5.39
N-Ammonia	12/10/08 121008#1	EPA 350.1M	mg-N/kg	2.12	73.9
Sulfide	12/08/08 120808#1	EPA 376.2	mg/kg	4.26	74.7
Total Organic Carbon	12/10/08 121008#1	Plumb,1981	Percent	0.020	1.87

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
OC77-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 12/26/08

Project: PORT GAMBLE
Event: 17330-14
Date Sampled: 12/03/08
Date Received: 12/04/08

Client ID: STATION 42 S-4
ARI ID: 08-32689 OC77D

Analyte	Date	Method	Units	RL	Sample
Total Solids	12/08/08 120808#3	EPA 160.3	Percent	0.01	53.20
Preserved Total Solids	12/09/08 120908#2	EPA 160.3	Percent	0.01	51.40
Total Volatile Solids	12/08/08 120808#1	EPA 160.4	Percent	0.01	5.13
N-Ammonia	12/10/08 121008#2	EPA 350.1M	mg-N/kg	3.68	154
Sulfide	12/08/08 120808#1	EPA 376.2	mg/kg	1.92	< 1.92 U
Total Organic Carbon	12/10/08 121008#1	Plumb,1981	Percent	0.020	1.46

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

MS/MSD RESULTS-CONVENTIONALS
OC77-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 12/26/08

Project: PORT GAMBLE
Event: 17330-14
Date Sampled: 12/03/08
Date Received: 12/04/08

Analyte	Date	Units	Sample	Spike	Spike Added	Recovery
ARI ID: OC77A Client ID: STATION 42 S-1						
N-Ammonia	12/10/08	mg-N/kg	2.48	165	184	88.4%
Sulfide	12/11/08	mg/kg	82.9	354	249	108.9%
Total Organic Carbon	12/10/08	Percent	2.81	5.41	3.33	78.0%

REPLICATE RESULTS-CONVENTIONALS
OC77-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 12/26/08

Project: PORT GAMBLE
Event: 17330-14
Date Sampled: 12/03/08
Date Received: 12/04/08

Analyte	Date	Units	Sample	Replicate(s)	RPD/RSD
ARI ID: OC77A Client ID: STATION 42 S-1					
Total Solids	12/08/08	Percent	50.00	50.00 50.00	0.0%
Preserved Total Solids	12/09/08	Percent	53.30	53.30 53.20	0.1%
Total Volatile Solids	12/08/08	Percent	6.78	6.81 7.23	3.6%
N-Ammonia	12/10/08	mg-N/kg	2.48	2.29 2.44	4.2%
Sulfide	12/11/08	mg/kg	82.9	91.0	9.3%
Total Organic Carbon	12/10/08	Percent	2.81	2.34 4.24	31.6%

LAB CONTROL RESULTS-CONVENTIONALS
OC77-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 12/26/08

Project: PORT GAMBLE
Event: 17330-14
Date Sampled: NA
Date Received: NA

Analyte	Date	Units	LCS	Spike Added	Recovery
Sulfide	12/08/08	mg/kg	119	114	104.8%
	12/11/08		128	134	95.5%
Total Organic Carbon	12/10/08	Percent	0.509	0.500	101.8%

METHOD BLANK RESULTS-CONVENTIONALS
OC77-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 12/26/08

Project: PORT GAMBLE
Event: 17330-14
Date Sampled: NA
Date Received: NA

Analyte	Date	Units	Blank
Total Solids	12/08/08	Percent	< 0.01 U
Preserved Total Solids	12/09/08	Percent	< 0.01 U
Total Volatile Solids	12/08/08	Percent	< 0.01 U
N-Ammonia	12/10/08	mg-N/kg	< 0.10 U
	12/10/08		< 0.10 U
Sulfide	12/08/08	mg/kg	< 1.00 U
	12/11/08		< 1.00 U
Total Organic Carbon	12/10/08	Percent	< 0.020 U

STANDARD REFERENCE RESULTS-CONVENTIONALS
OC77-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 12/26/08

Project: PORT GAMBLE
Event: 17330-14
Date Sampled: NA
Date Received: NA

Analyte/SRM ID	Date	Units	SRM	True Value	Recovery
N-Ammonia	12/10/08	mg-N/kg	98.6	100	98.6%
SPEX 28-24AS	12/10/08		102	100	102.0%
Total Organic Carbon NIST #8704	12/10/08	Percent	3.36	3.35	100.3%

GEOTECH

Hart Crowser, Inc.
Port Gamble 17330-14

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	
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
STATION 42 S-3	100.0	100.0	100.0	99.8	99.3	98.3	95.5	84.4	69.9	53.8	40.6	30.8	23.8	16.5
STATION 42 S-3	100.0	100.0	99.9	99.6	99.1	98.2	95.4	83.8	69.5	54.0	40.5	31.1	23.4	16.4
STATION 42 S-3	100.0	100.0	99.9	99.8	99.4	98.5	95.7	84.1	69.0	54.3	41.0	30.7	23.3	16.2
STATION 42 S-1	100.0	100.0	99.6	98.0	95.5	92.7	85.1	65.5	50.6	38.1	28.3	21.5	15.5	9.8
STATION 42 S-2	100.0	100.0	99.6	99.0	97.6	95.2	90.0	74.8	60.6	47.9	36.6	28.2	20.4	12.8
STATION 42 S-4	100.0	100.0	99.8	99.0	98.1	95.7	91.0	76.8	63.3	49.1	36.4	28.0	21.0	14.2

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.

OC77

Hart Crowser, Inc.
Port Gamble 17330-14

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
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)
STATION 42 S-3	0.0	0.2	0.5	1.0	2.7	11.1	14.5	16.1	13.2	9.8	7.1	7.3	16.5	84.4
STATION 42 S-3	0.1	0.3	0.5	0.9	2.8	11.6	14.3	15.5	13.5	9.4	7.8	7.0	16.4	83.8
STATION 42 S-3	0.1	0.1	0.4	0.9	2.8	11.6	15.2	14.7	13.2	10.3	7.5	7.1	16.2	84.1
STATION 42 S-1	0.4	1.6	2.6	2.8	7.6	19.7	14.9	12.4	9.8	6.8	6.0	5.8	9.8	65.5
STATION 42 S-2	0.4	0.6	1.4	2.4	5.2	15.3	14.2	12.7	11.4	8.4	7.7	7.6	12.8	74.8
STATION 42 S-4	0.2	0.7	1.0	2.4	4.7	14.3	13.5	14.1	12.7	8.4	7.0	6.8	14.2	76.8

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.

QA SUMMARY

Client:	Hart Crowser, Inc.	Project No.:	Port Gamble 17330-14
ARI Trip. Sample ID:	OC77C	Batch No.:	OC77-1
Client Trip. Sample ID:	STATION 42 S-3	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
TATION 42 S-	100.0	100.0	100.0	99.8	99.3	98.3	95.5	84.4	69.9	53.8	40.6	30.8	23.8	16.5
TATION 42 S-	100.0	100.0	99.9	99.6	99.1	98.2	95.4	83.8	69.5	54.0	40.5	31.1	23.4	16.4
TATION 42 S-	100.0	100.0	99.9	99.8	99.4	98.5	95.7	84.1	69.0	54.3	41.0	30.7	23.3	16.2
AVE	NA	100.00	99.94	99.74	99.25	98.32	95.55	84.12	69.45	54.00	40.72	30.91	23.48	16.36
STDEV	NA	0.00	0.03	0.08	0.14	0.17	0.16	0.29	0.46	0.24	0.28	0.20	0.25	0.15
%RSD	NA	0.00	0.03	0.08	0.14	0.18	0.17	0.35	0.67	0.44	0.68	0.64	1.07	0.92

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)
STATION 42 S-3	12/3/2008	12/31/2008	1/8/2009	100.2		13.1
STATION 42 S-3	12/3/2008	12/31/2008	1/8/2009	99.9		13.1
STATION 42 S-3	12/3/2008	12/31/2008	1/8/2009	101.2		13.1
STATION 42 S-1	12/3/2008	12/31/2008	1/8/2009	100.6		11.6
STATION 42 S-2	12/3/2008	12/31/2008	1/8/2009	101.2		10.7
STATION 42 S-4	12/3/2008	12/31/2008	1/8/2009	102.4		14.4

* ARI Internal QA limits = 95-105%

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.

Laboratory Data Package

prepared
for

HART CROWSER, INC.

Project: PORT GAMBLE

ARI JOB NO: OC77

prepared
by

Analytical Resources, Inc.

General Chemistry Analysis
QC Summary Data

prepared
for

HART CROWSER, INC.

Project: PORT GAMBLE

ARI JOB NO: OC77

prepared
by

Analytical Resources, Inc.

MS/MSD RESULTS-CONVENTIONALS
OC77-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 12/26/08

Project: PORT GAMBLE
Event: 17330-14
Date Sampled: 12/03/08
Date Received: 12/04/08

Analyte	Date	Units	Sample	Spike	Spike Added	Recovery
ARI ID: OC77A Client ID: STATION 42 S-1						
N-Ammonia	12/10/08	mg-N/kg	2.48	165	184	88.4%
Sulfide	12/11/08	mg/kg	82.9	354	249	108.9%
Total Organic Carbon	12/10/08	Percent	2.81	5.41	3.33	78.0%

REPLICATE RESULTS-CONVENTIONALS
OC77-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 12/26/08

Project: PORT GAMBLE
Event: 17330-14
Date Sampled: 12/03/08
Date Received: 12/04/08

Analyte	Date	Units	Sample	Replicate(s)	RPD/RSD
ARI ID: OC77A Client ID: STATION 42 S-1					
Total Solids	12/08/08	Percent	50.00	50.00 50.00	0.0%
Preserved Total Solids	12/09/08	Percent	53.30	53.30 53.20	0.1%
Total Volatile Solids	12/08/08	Percent	6.78	6.81 7.23	3.6%
N-Ammonia	12/10/08	mg-N/kg	2.48	2.29 2.44	4.2%
Sulfide	12/11/08	mg/kg	82.9	91.0	9.3%
Total Organic Carbon	12/10/08	Percent	2.81	2.34 4.24	31.6%

LAB CONTROL RESULTS-CONVENTIONALS
OC77-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 12/26/08

Project: PORT GAMBLE
Event: 17330-14
Date Sampled: NA
Date Received: NA

Analyte	Date	Units	LCS	Spike Added	Recovery
Sulfide	12/08/08	mg/kg	119	114	104.8%
	12/11/08		128	134	95.5%
Total Organic Carbon	12/10/08	Percent	0.509	0.500	101.8%

METHOD BLANK RESULTS-CONVENTIONALS
OC77-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 12/26/08

Project: PORT GAMBLE
Event: 17330-14
Date Sampled: NA
Date Received: NA

Analyte	Date	Units	Blank
Total Solids	12/08/08	Percent	< 0.01 U
Preserved Total Solids	12/09/08	Percent	< 0.01 U
Total Volatile Solids	12/08/08	Percent	< 0.01 U
N-Ammonia	12/10/08	mg-N/kg	< 0.10 U
	12/10/08		< 0.10 U
Sulfide	12/08/08	mg/kg	< 1.00 U
	12/11/08		< 1.00 U
Total Organic Carbon	12/10/08	Percent	< 0.020 U

STANDARD REFERENCE RESULTS-CONVENTIONALS
OC77-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 12/26/08

Project: PORT GAMBLE
Event: 17330-14
Date Sampled: NA
Date Received: NA

Analyte/SRM ID	Date	Units	SRM	True Value	Recovery
N-Ammonia	12/10/08	mg-N/kg	98.6	100	98.6%
SPEX 28-24AS	12/10/08		102	100	102.0%
Total Organic Carbon NIST #8704	12/10/08	Percent	3.36	3.35	100.3%

General Chemistry Analysis
Sample Data

prepared
for

HART CROWSER, INC.

Project: PORT GAMBLE

ARI JOB NO: OC77

prepared
by

Analytical Resources, Inc.

SAMPLE RESULTS-CONVENTIONALS
OC77-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized: MF
Reported: 12/26/08

Project: PORT GAMBLE
Event: 17330-14
Date Sampled: 12/03/08
Date Received: 12/04/08

Client ID: STATION 42 S-1
ARI ID: 08-32686 OC77A

Analyte	Date	Method	Units	RL	Sample
Total Solids	12/08/08 120808#3	EPA 160.3	Percent	0.01	50.00
Preserved Total Solids	12/09/08 120908#2	EPA 160.3	Percent	0.01	53.30
Total Volatile Solids	12/08/08 120808#1	EPA 160.4	Percent	0.01	6.78
N-Ammonia	12/10/08 121008#2	EPA 350.1M	mg-N/kg	0.19	2.48
Sulfide	12/11/08 121108#1	EPA 376.2	mg/kg	18.5	82.9
Total Organic Carbon	12/10/08 121008#1	Plumb,1981	Percent	0.020	2.81

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
OC77-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized: JMB
Reported: 12/26/08

Project: PORT GAMBLE
Event: 17330-14
Date Sampled: 12/03/08
Date Received: 12/04/08

Client ID: STATION 42 S-2
ARI ID: 08-32687 OC77B

Analyte	Date	Method	Units	RL	Sample
Total Solids	12/08/08 120808#3	EPA 160.3	Percent	0.01	45.80
Preserved Total Solids	12/09/08 120908#2	EPA 160.3	Percent	0.01	45.70
Total Volatile Solids	12/08/08 120808#1	EPA 160.4	Percent	0.01	5.37
N-Ammonia	12/10/08 121008#1	EPA 350.1M	mg-N/kg	0.43	19.2
Sulfide	12/08/08 120808#1	EPA 376.2	mg/kg	2.21	35.4
Total Organic Carbon	12/10/08 121008#1	Plumb,1981	Percent	0.020	1.74

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
OC77-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized: MB
Reported: 12/26/08

Project: PORT GAMBLE
Event: 17330-14
Date Sampled: 12/03/08
Date Received: 12/04/08

Client ID: STATION 42 S-3
ARI ID: 08-32688 OC77C

Analyte	Date	Method	Units	RL	Sample
Total Solids	12/08/08 120808#3	EPA 160.3	Percent	0.01	46.10
Preserved Total Solids	12/09/08 120908#2	EPA 160.3	Percent	0.01	46.80
Total Volatile Solids	12/08/08 120808#1	EPA 160.4	Percent	0.01	5.39
N-Ammonia	12/10/08 121008#1	EPA 350.1M	mg-N/kg	2.12	73.9
Sulfide	12/08/08 120808#1	EPA 376.2	mg/kg	4.26	74.7
Total Organic Carbon	12/10/08 121008#1	Plumb,1981	Percent	0.020	1.87

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
OC77-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized: MB
Reported: 12/26/08

Project: PORT GAMBLE
Event: 17330-14
Date Sampled: 12/03/08
Date Received: 12/04/08

Client ID: STATION 42 S-4
ARI ID: 08-32689 OC77D

Analyte	Date	Method	Units	RL	Sample
Total Solids	12/08/08 120808#3	EPA 160.3	Percent	0.01	53.20
Preserved Total Solids	12/09/08 120908#2	EPA 160.3	Percent	0.01	51.40
Total Volatile Solids	12/08/08 120808#1	EPA 160.4	Percent	0.01	5.13
N-Ammonia	12/10/08 121008#2	EPA 350.1M	mg-N/kg	3.68	154
Sulfide	12/08/08 120808#1	EPA 376.2	mg/kg	1.92	< 1.92 U
Total Organic Carbon	12/10/08 121008#1	Plumb,1981	Percent	0.020	1.46

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

General Chemistry Analysis
Instrument Raw Data

prepared
for

HART CROWSER, INC.

Project: PORT GAMBLE

ARI JOB NO: OC77

prepared
by

Analytical Resources, Inc.

CORRECTIVE ACTIONS - Inorganic Analyses

ANALYTICAL RESOURCES INCORPORATED

Criteria Flagged

ARI Project No.: 0C77 Client Name: Hart Crowser

Date of Out-of-Control Event: 12-9-08 Method/Element: Sulfide

Unacceptable Blank	
Unacceptable Duplicate	
Unacceptable Spike	X
Unacceptable Reference	X

Prep Code:

Other:

Details of Problem/Recommended Corrective Action:

0C77 A1 had a high RPD. Sample was redistilled while still within holding time. An acceptable RPD was achieved for the redistillation.

Samples Affected: 0C77 A1

Corrective Action Taken: redistilled 0C77 A1 within holding time

Analyst: AA Supervisor: W

Date: 12-11-08 Date: 12-15-08

OC77

w
12-9-08

TOTAL SOLIDS/VOLATILE SOLIDS (TS / TVS) BENCHSHEET

SOLIDS *(dry at 104 (12-24 hr) then combust at 550 (30 min))*

DATE: 12/8/2005
ANALYST: CDE 17:02

Batch drying time
record times as mm/dd/yy hh:mm
12/8/2008 17:02 time in oven CDE
12/9/2008 9:48 time out CDE
elapsed hrs = 16.8

TS (%) calculated as:
Final dry wt (g) = (Dry Wt - Tare Wt)
TS = (Final Dry Wt)/ (grams Sample-Tare)

TVS (mg/kg dry wt) calculated as:
Final ash wt (g) = (min ash wt - tare wt)
*TVS (mg/kg) = [(Dry wt-Ash wt)/ (dry weight)] *1,000,000*
if ash wt > dry wt, "Chk for Err"
*if dry wt-ash wt < 0.001 g, "< (1/dry wt)*1,000,000*

SAMPLE ID	DISH #	SAMPLE (grams)	TARE WT (grams)	DRY WT 104C (grams) 1			dry Wt (g)	TS (%)	ASH WT 550C (grams) 1	2		Ash Wt (g)	TVS (mg/kg)	(%)
Cal Date -->		12/8/2008	12/8/2008	12/9/2008					12/9/2008	12/9/2008				
Time & Initials -->		16:14 CDE	15:59 CDE	10:06 CDE					11:45 CDE	12:31 CDE				
Cal Wt (g)	10.0000	10.0001	10.0001	10.0001					10.0001	12.0001				
record weights to 4 places		Cal OK!	Cal OK!	Cal OK!					Cal OK!	Cal Err!				
Blank		0.0000	1.0866	1.0867			0.00		1.0867	1.0866	OK	0.00		
OC77 A2		4.8070	1.1162	2.9624			1.85	50.0%	2.8391	2.8372	OK	1.72	67,815	6.78%
OC77 A2 dup		4.4399	1.1167	2.7782			1.66	50.0%	2.6663	2.6651	OK	1.55	68,071	6.81%
							RPD =	0.05%				RPD =	0.38%	
OC77 A2 trp		4.3916	1.1005	2.7456			1.65	50.0%	2.6278	2.6267	OK	1.53	72,275	7.23%
							RSD =	0.04%				RSD =	3.61%	
OC77 B2		5.9687	1.0979	3.3308			2.23	45.8%	3.2118	3.2109	OK	2.11	53,697	5.37%
OC77 C2		6.0771	1.1433	3.4179			2.27	46.1%	3.2953	3.2954	OK	2.15	53,900	5.39%
OC77 D2		4.7332	1.0971	3.0331			1.94	53.2%	2.9337	2.9337	OK	1.84	51,343	5.13%
OC80 A3		3.9024	1.1128	3.4732			2.36	84.6%						
OC80 A3 dup		4.7926	1.1102	4.1984			3.09	83.9%						
							RPD =	0.89%				RPD =	NA	
OC80 A3 trp		5.2062	1.0844	4.5357			3.45	83.7%						
							RSD =	0.57%				RSD =	NA	
OC80 B3		4.2409	1.1040	3.9375			2.83	90.3%						
OC80 C3		5.1885	1.0559	4.7474			3.69	89.3%						
OC80 D3		6.2771	1.1398	5.5901			4.45	86.6%						
OC96 A4		4.1262	1.1063	3.4216			2.32	76.7%						
OC96 A4 dup		3.5823	1.0904	2.9896			1.90	76.2%						
							RPD =	0.59%				RPD =	NA	
OC96 A4 trp		5.4407	1.0693	4.4299			3.36	76.9%						
							RSD =	0.44%				RSD =	NA	
OC94 A1		5.0713	1.0813	4.3129			3.23	81.0%						
OC94 A1 dup		4.8538	1.1734	4.1332			2.96	80.4%						

TOTAL SOLIDS/VOLATILE SOLIDS (TS / TVS) BENCHSHEET

SOLIDS *(dry at 104 (12-24 hr) then combust at 550 (30 min))*

DATE: 12/8/2005

ANALYST: CDE 17:02

Batch drying time		
record times as mm/dd/yy hh:mm		
12/8/2008 17:02	time in oven	CDE
12/9/2008 9:48	time out	CDE
elapsed hrs =	16.8	

TS (%) calculated as:
Final dry wt (g) = (Dry Wt - Tare Wt)
TS = (Final Dry Wt)/ (grams Sample-Tare)

TVS (mg/kg dry wt) calculated as:
Final ash wt (g) = (min ash wt - tare wt)
*TVS (mg/kg) = [(Dry wt-Ash wt)/ (dry weight)] *1,000,000*
if ash wt > dry wt, "Chk for Err"
*if dry wt-ash wt < 0.001 g, "< (1/dry wt)*1,000,000*

SAMPLE ID	DISH #	SAMPLE (grams)	TARE WT (grams)	DRY WT 104C (grams) 1			dry Wt (g)	TS (%)	ASH WT 550C (grams) 1	2		Ash Wt (g)	TVS (mg/kg)	(%)
							RPD =	0.71%				RPD =	NA	
OC94 A1 trp		5.6751	1.0959	4.8044			3.71	81.0%						
							RSD =	0.41%				RSD =	NA	
OC94 B1		3.9184	1.0944	3.3933			2.30	81.4%						
OC94 C1		3.6640	1.1384	3.2088			2.07	82.0%						
OC94 D1		5.2003	1.1108	4.5175			3.41	83.3%						
OC94 E1		3.8581	1.1301	3.4938			2.36	86.6%						
OC94 F1		4.2016	1.0648	3.8406			2.78	88.5%						

@ 12-9-08 CDE

TOTAL SOLIDS/VOLATILE SOLIDS (TS / TVS) BENCHSHEET

SOLIDS *(dry at 104 (12-24 hr) then combust at 550 (30 min))*

DATE: 12-8-08

ANALYST: CDE 17:02

Batch drying time			TS (%) calculated as:	TVS (mg/kg dry wt) calculated as:
record times as mm/dd/yy hh:mm			Final dry wt (g) = (Dry Wt - Tare Wt)	Final ash wt (g) = (min ash wt - tare wt)
12-8-08 1702	time in oven	CDE	TS = (Final Dry Wt)/ (grams Sample-Tare)	TVS (mg/kg) = [(Dry wt-Ash wt)/ (dry weight)] *1,000,000
12-9-08 9:48	time out	CDE		if ash wt > dry wt, "Chk for Err"
elapsed hrs = 0.0	< 12 hr			if dry wt-ash wt < 0.001 g, "< (1/dry wt)*1,000,000

SAMPLE ID	DISH #	SAMPLE (grams)	TARE WT (grams)	DRY WT 104C (grams) 1			dry Wt (g)	TS (%)	ASH WT 550C (grams) 1	2	3	Ash Wt (g)	TVS (mg/kg)	TVS (%)
Cal Date -->		12-8-08	12-8-08	12-9-08					12-9-08	12-9-08				
Time & Initials -->		1614 CDE	1559 CDE	1006 CDE					1145 CDE	1238 CDE				
Cal Wt (g)	10.0000	10.0000	10.0001	10.0001					10.0001	10.0001				
record weights to 4 places														
Blank	46	Ø	1.0866	1.0867					1.0867	1.0866				
OC77A2	47	4.8070	1.1162	2.9624					2.8391	2.8372				
DP A2	48	4.4399	1.1167	2.7782					2.6663	2.6651				
TP A2	49	4.3916	1.1005	2.7456					Ø 2.6278	2.6267				
B2	50	5.9687	1.0979	3.3308					3.2118	3.2109				
C2	51	6.0721	1.1433	3.4179					3.2953	3.2954				
D2	52	4.7332	1.0971	3.0331					2.9337	2.9356 Ø	2.9337			
OC80A3	53	3.9024	1.1128	3.4732										
DP A3	54	4.7926	1.1102	4.1984										
TP A3	55	5.2062	1.0844	4.5357										
B3	56	4.2409	1.1040	3.9375										
C3	57	5.1885	1.0559	4.7474										
D3	58	6.2771	1.1398	5.5901										
OC96A4	59	4.1262	1.1063	3.4216										
DP A4	60	3.5823	1.0904	2.9896										
TP A4	61	5.4407	1.0693	4.4299										
OC94A1	62	5.0713	1.0813	4.3129										
DP A1	63	4.8538	1.1734	4.1332										
TP A1	64	5.6751	1.0959	4.8044										
B1	65	3.9184	1.0944	3.3933										
C1	66	3.6640	1.1384	3.2089										
D1	67	5.2003	1.1108	4.5175										
E1	68	3.8581	1.1301	3.4938										
F1	69	4.2016	1.0648	3.8406										

W

12-11-08

TOC Solids Prep Log

DATE: 12/8/2008

ANALYST: CDE

acid purging to remove IC and drying at 70°C for TOC analysis

General notes regarding prep method and samples (identify the acid used)

make no entry to shaded cells, they are calculated

Sample ID		IC Test	Gravimetric Data (grams)			%	*Sample description & notes*
ARI #	Client	+ / -	Tare Wt.	Wet wt.	70°C dry wt	Solids	*(homogeneity and exclusions)*
Blank			12.6867		12.6870	0.3 mg	
OC83 Q1		-	12.7627	19.0490	17.8644	81.16%	
OC83 Q1 DUP		-	12.6990	16.4870	15.8424	82.98%	
OC83 Q1 TRIP		-	12.7258	18.4544	17.4084	81.74%	
OC77 A2		-	12.7769	17.1793	15.1606	54.15%	
OC77 A2 DUP		-	12.7774	16.4941	14.8239	55.06%	
OC77 A2 TRIP		-	12.7964	16.5609	14.8278	53.96%	
OC77 B2		-	12.7840	16.7268	14.7643	50.23%	
OC77 C2		-	12.7017	17.3037	14.9903	49.73%	
OC77 D2		-	12.6894	17.7216	15.5268	56.38%	
OC80 A3		+-	12.7805	17.8123	17.2095	88.02%	
OC80 A3 DUP		+-	12.6865	18.1350	17.4379	87.21%	
OC80 A3 TRIP		+-	12.6669	18.1949	17.5203	87.80%	
OC80 B3		+-	12.6987	18.6127	18.2400	93.70%	
OC80 C3		+-	12.6874	18.1255	17.6438	91.14%	
OC80 D3		+-	12.7777	18.3692	17.7515	88.95%	

12-8-08 CDE

Analytical Resources, Incorporated
Analytical Chemists and Consultants

TOC Solids Preparation Log

Acid purge to remove IC and drying 70 ℃ for TOC anal ysis
Add general notes regarding samples and preparation and identify the acid used

Analyst CDE Date 12-8-08 17:32

Sample Idenification		IC	Gravimetric Data			% Solids	Sample description & notes
ARI #	Client ID	Test	Tare	Wet	70 ℃		
Blank			12.6867	Ø	12.6870		
OC 83Q'		-	12.7627	19.0490	17.8644		Mud / clay
DP Q'		-	12.6990	16.4870	15.8424		
TP Q'		-	12.7258	18.4544	17.4084		
OC 77 A^2		-	12.7769	17.1793	15.1606		
DP A^2		-	12.7774	16.4941	14.8239		
TP A^2		-	12.7964	16.5609	14.8278		
B^2		-	12.7840	16.7268	14.7843		
C^2		-	12.7017	17.3037	14.9903		
D^2		-	12.6894	17.7216	15.5268		
OC 80 A^3		+-	12.7805	17.8123	17.2095		Sand
DP A^3		+-	12.6865	~~18.8235~~	18.1350	17.4379	
TP A^3		+-	12.6669	18.1949	17.5203		
B^3		+-	12.6987	18.6127	18.2400		Sand w/shells
C^3		+-	12.6874	18.1255	17.6438		
D^3		+-	12.7777	18.3692	17.7515		

OC77

12-12-08

TOC, Solids Data Analysis, DC-190

Mode: NPOC Inlet: Boat

Spike Std = 2,000 ppm C

DATE: 12/10/08 0:00

ANALYST: KE 10:28

Calibration Data

Calibration Standard Source: ARI # 0088 - 5 Conc (ppm): 2,000

Observed Values (µg/g)			mean	Cal Factor
1,657	1,647	1,637	1,647	1.214

Verification Standard Source: ERA 0528 - 08 - 02 Conc (ppm): 5,000

Standard Reference Material Source: NIST 8704 Conc (ppm): 33,510

Blank Data

System Blanks (enter "observed C")

Replicate Determinations						Mean	condition
Replicate	1	2	3	4	5		
ppm	7.45	30.78	2.12			13.45	OK !

Historical Blank Limits: mean 17.8, stdev 7.23, LBL -3.9, UBL 39.5

Silica Blanks (enter "corrected C" at end of run)

Replicate	1	2	3	4	5	Mean	condition

Sample Data *(Entered data must match the Dohrmann output report !)*

"Corrected C" (no dilution) = "Observed C" - Mean Blank

*"Corrected C" (with dilution) = ("Observed C" - (Mean silica Blank * %Silica)) * Dilution Factor*

Sample ID	Dilution Data: Sample wt. (mg)	Final wt. (mg)	Silica (%)	Dilution Factor	Spike (µL Std)	Combustion Data: Burn wt. (mg)	Observed C (ppm C)	Corrected C (ppm C)	
~~ICV~~			-	~~1.00~~		~~10.0~~	~~4478~~	~~4,465~~	~~89.29%~~
ICV				1.00		10.0	5099	5,086	101.71%
Blank				1.00		10.0	7.445		Blank OK
NIST 8704				1.00		3.2	33600	33,587	100.23%
OC83 Q1				1.00		4.9	3594	3,581	Range OK!
~~OC83 Q1 dup~~				~~1.00~~		~~4.9~~	~~12860~~	~~12,847~~	~~RPD=112.8%~~
OC83 Q1 dup				1.00		4.9	4056	4,043	RPD=12.1%
OC83 Q1 trp				1.00		4.8	3421	3,408	RSD=8.9%
OC83 Q1 ms				1.00	10	4.8	8152	8,139	Range OK!
Spike =	*0.02*	*mg C to*	*4.8*	*mg samp=*	*4,167*	*ppm*		*109%*	
OC77 A2				1.00		2.2	26000	25,987	Range OK!
OC77 A2 dup				1.00		2.3	21610	21,597	RPD=18.5%
OC77 A2 trp				1.00		2.2	39130	39,117	RSD=31.5%
OC77 A2 ms				1.00	20	1.3	50010	49,997	Range OK!
Spike =	*0.04*	*mg C to*	*1.3*	*mg samp=*	*30,769*	*ppm*		*78%*	
CCV				1.00		10.0	4801	4,788	95.75%
Blank				1.00		10.0	30.78		Blank OK
OC77 B2				1.00		2.4	15860	15,847	Range OK!
~~OC77 C2~~			-	~~1.00~~		~~1.6~~	~~6822~~	~~6,809~~	~~T_O_ERROR~~
~~OC77 C2~~			-	~~1.00~~		~~2.1~~	~~883.6~~	~~870~~	~~T_O_ERROR~~
~~OC77 C2~~			-	~~1.00~~		~~1.8~~	~~0~~	~~-13~~	~~NO PEAK!~~
OC77 C2				1.00		2.7	17350	17,337	Range OK!
~~OC77 D2~~			-	~~1.00~~		~~3.3~~	~~976.9~~	~~963~~	~~BOAT TIPPED~~
OC77 D2				1.00		2.1	13770	13,757	Range OK!
~~NIST 8704~~			-	~~1.00~~		~~3.9~~	~~24230~~	~~24,217~~	~~72.27%~~
NIST 8704				1.00		3.6	30560	30,547	91.16%
CCV				1.00		10.0	5078	5,065	101.29%
Blank				1.00		10.0	2.122		Blank OK

Analytical Resources, Incorporated
Analytical Chemists and Consultants

①12-10-08 Ⓦ

TOC Solids Sample Run Log

Set-Up Parameters MODE: NPOC			INLET: BOAT
Standards:	**Source**	**Conc (ppm)**	
Calibration:	ARI	2000	12:10
Verification:	ERA	5000	
SRM:	NBS 8704	33510	

Sample Sequence:

Sample ID	Dilution Data (mg)		Burn Wt	Matrix Spike Data		Comments
	Sample	+ Silica Gel	mg	mg/L	µL added	
ICV			10/10			2 injects
ICB			10			
NBS 8704			3.2			
OC83 Q1			4.9			
DP Q1			4.9			lost air flow
DP Q1			4.9			
TP Q1			4.8			
MS Q1			4.8	2000	10	
OC27 A2			2.2			
DP A2			2.3			
TP A2			2.2			
MS A2			1.3	2000	20	
CCV			10			
CCB			10			
OC27 B2			2.4 ⓧ No Peak			ⓧ Time out Error
C2			ⓧ 1.6/2.1/1.8/2.7			4 injects (Base Line Droped)
D2			ⓧ 3.3 2.1			ⓧ Boat typed
NBS 8704			3.9/3.6			2 injects
CCV			10			
CCB			10			

Power Plus Pulled out Ⓦ 12-10-08 First 3 Injects No good

12-10-08 Ⓦ

12-10-08(W)

14:25:58 Wed Dec 10, 2008

Operating Parameters

Analysis set-up 1
NPOC Analysis
Boat mode
Sample size 10.
Calibration factor 1.21441
System blank 0.
Std. concentration =2000.
Sample mass (mg) = 10.
1. NPOC = 4478. ug/g
14:32:19 Wed Dec 10, 2008
Sample mass (mg) = 10.
1. NPOC = 5099. ug/g
14:36:33 Wed Dec 10, 2008
Sample mass (mg) = 10.
1. NPOC = 7.445 ug/g
14:45:06 Wed Dec 10, 2008
S 1. NPOC = 33600. ug/g Sample Mass (mg) = 3.2 (W) 12-10-08 (W)
14:55:13 Wed Dec 10, 2008
Sample mass (mg) = 4.9
1. NPOC = 3594. ug/g
15:01:56 Wed Dec 10, 2008
Sample mass (mg) = 4.9
1. NPOC = 12860. ug/g
15:08:24 Wed Dec 10, 2008
Sample mass (mg) = 4.9
1. NPOC = 4056. ug/g
15:15:15 Wed Dec 10, 2008
Sample mass (mg) = 4.8
1. NPOC = 3421. ug/g
15:22:53 Wed Dec 10, 2008
Sample mass (mg) = 4.8
1. NPOC = 8152. ug/g
16:02:23 Wed Dec 10, 2008
Sample mass (mg) = 2.2
1. NPOC = 26000. ug/g
16:07:40 Wed Dec 10, 2008
Sample mass (mg) = 2.3
1. NPOC = 21610. ug/g
16:18:00 Wed Dec 10, 2008
Sample mass (mg) = 2.2
1. NPOC = 39130. ug/g
16:26:29 Wed Dec 10, 2008
Sample mass (mg) = 1.3
1. NPOC = 50010. ug/g
16:34:11 Wed Dec 10, 2008
Sample mass (mg) = 10.
1. NPOC = 4801. ug/g
16:59:44 Wed Dec 10, 2008
Sample mass (mg) = 10.
1. NPOC = 30.78 ug/g
17:18:42 Wed Dec 10, 2008
Sample mass (mg) = 2.4
1. NPOC = 15860. ug/g
17:48:49 Wed Dec 10, 2008
Sample mass (mg) = 1.6
1. NPOC = 6822. ug/g Time-Out Error!
18:01:55 Wed Dec 10, 2008
Sample mass (mg) = 2.1
1. NPOC = 883.6 ug/g Time-Out Error!

Power Plug Pulled out caused these (W) 12-10-08 3 injects no good

18:24:06 Wed Dec 10, 2008
Sample mass (mg) = 1.8
1. NPOC = 0. ug/g No Peak!!

18:46:25 Wed Dec 10, 2008
Sample mass (mg) = 2.7
1. NPOC = 17350. ug/g
19:04:52 Wed Dec 10, 2008
Sample mass (mg) = 3.3

1. NPOC = 976.9 ug/g
19:09:35 Wed Dec 10, 2008
Sample mass (mg) = 2.1
1. NPOC = 13770. ug/g
19:15:48 Wed Dec 10, 2008
Sample mass (mg) = 3.9
1. NPOC = 24230. ug/g
19:25:21 Wed Dec 10, 2008
Sample mass (mg) = 3.6
1. NPOC = 30560. ug/g
19:30:34 Wed Dec 10, 2008
Sample mass (mg) = 10.
1. NPOC = 5078. ug/g
19:33:59 Wed Dec 10, 2008
Sample mass (mg) = 10.
1. NPOC = 2.122 ug/g
19:36:34 Wed Dec 10, 2008

Original Run Filename: OM_12-10-2008_04-07-05PM.OMN created 12/10/2008 4:07:05 PM
Original Run Author's Signature: UW
Current Run Filename: 121008NH3A.omn last modified 12/10/2008 6:11:01 PM
Description: LACHAT 2
Standards made from ARI Stock#:0078-2

12/12/08

Sample	Rep.	Cup No.	Channel 1 NH3 Conc. (mg N/L)	Channel 1 NH3 Area (V.s)	Detection Time	MANUAL DILUTION FACTOR	
NH3 STD 1.00	1	S1	1.0000	6.1555	12/10/2008@4:08:06 PM		
NH3 STD 0.8	1	S2	0.8000	4.8793	12/10/2008@4:09:18 PM		
NH3 STD 0.5	1	S3	0.5000	2.857	12/10/2008@4:10:29 PM		
NH3 STD 0.2	1	S4	0.2000	1.0821	12/10/2008@4:11:41 PM		
NH3 STD 0.05	1	S5	0.0500	0.2306	12/10/2008@4:12:51 PM		
NH3 STD 0.02	1	S6	0.0200	0.0521	12/10/2008@4:14:03 PM		
NH3 STD 0.01	1	S7	0.0100	-0.0369	12/10/2008@4:15:15 PM		
Blank	1	S8	0.0000	-0.0393	12/10/2008@4:16:27 PM		
NH3 ICV ERA 06107	1	9	0.5218	3.133	12/10/2008@4:17:38 PM		% R = 104.36
Known Conc:			0.5000				
Calibration:			Table/Fig. 1				
ICB	1	10	0.0047	-0.0729	12/10/2008@4:18:49 PM		
Known Conc:			0.0000				
NH3 LOW	1	11	0.0111	0.0907	12/10/2008@4:21:58 PM		% R = 111
Known Conc:			0.0100				
~~PREP BLK~~	~~1~~	~~12~~	~~0.0152~~	~~-0.0073~~	12/10/2008@4:25:06 PM		
PREP CHK 12/09/08	1	13	9.8621	2.9553	12/10/2008@4:26:18 PM	20	% R = 98.62 0.4 ml * 1000 ppm / 40 ml
OC77 A2	1	14	0.1283	0.6934	12/10/2008@4:27:29 PM		
OC77 A2 DUP	1	15	0.1199	0.6418	12/10/2008@4:28:41 PM		
OC77 A2 TRP	1	16	0.1284	0.6945	12/10/2008@4:29:53 PM		
OC77 A2 MS	1	17	8.9570	2.6747	12/10/2008@4:31:05 PM	20	% R = 88.29 0.4 ml * 1000 ppm / 40 ml
PREP BLK 12/09/08	1	18	0.0050	-0.0707	12/10/2008@4:32:16 PM		

OC77 B2	1	19	0.9000	2.6882	12/10/2008@4:33:28 PM	2	
NH3 CCV	1	20	0.5195	3.1188	12/10/2008@4:34:40 PM		% R = 103.9
Known Conc:			0.5000				
CCB	1	21	-0.0046	-0.1306	12/10/2008@4:37:49 PM		
Known Conc:			0.0000				
OC77 C2	1	22	3.4924	2.0634	12/10/2008@4:40:57 PM	10	
~~OC77 D2~~	~~1~~	~~23~~	~~7.8379~~	~~48.4909~~	12/10/2008@4:42:10 PM		
PREP BLK 12/10/08	1	24	-0.0011	-0.1087	12/10/2008@4:43:21 PM		
PREP CHK 12/10/08	1	25	10.1839	3.055	12/10/2008@4:44:34 PM	20	% R = 101.84 0.4 ml * 1000 ppm / 40 ml
OD15 A1	1	26	0.8438	5.1298	12/10/2008@4:45:46 PM		
OD15 A1 DUP	1	27	0.8540	5.1927	12/10/2008@4:46:57 PM		
OD15 A1 TRP	1	28	0.8512	5.1754	12/10/2008@4:48:09 PM		
OD15 A1 MS	1	29	9.4201	2.8182	12/10/2008@4:49:21 PM	20	% R = 85.76 0.4 ml * 1000 ppm / 40 ml
OD15 B1	1	30	0.2591	1.5048	12/10/2008@4:50:34 PM		
OC77 D2	1	31	8.3644	2.491	12/10/2008@4:51:45 PM	20	
NH3 CCV	1	20	0.5258	3.1579	12/10/2008@4:52:57 PM		% R = 105.16
Known Conc:			0.5000				
~~CCB~~	~~1~~	~~21~~	~~0.0134~~	~~-0.0191~~	12/10/2008@4:56:06 PM		
~~Known Conc:~~			~~0.0000~~				
~~OD15 C1~~	~~1~~	~~32~~	~~0.7374~~	~~4.47~~	12/10/2008@4:59:15 PM		
CCB	1	21	0.0065	-0.0613	12/10/2008@5:00:27 PM		
Known Conc:			0.0000				
OD15 C1	1	32	0.7409	4.4915	12/10/2008@5:03:39 PM		
~~OD15 D1~~	~~1~~	~~33~~	~~1.5498~~	~~9.5062~~	12/10/2008@5:04:51 PM		
OD15 E1	1	34	0.1165	0.6202	12/10/2008@5:06:03 PM		
OD15 F1	1	35	0.3513	2.0762	12/10/2008@5:07:15 PM		
~~OD15 G1~~	~~1~~	~~36~~	~~1.1562~~	~~7.066~~	12/10/2008@5:08:26 PM		
OD15 H1	1	37	0.3815	2.2636	12/10/2008@5:09:38 PM		

OD15 I1	1	38	0.2949	1.7267	12/10/2008@5:10:51 PM	
OD15 J1	1	39	0.2035	1.16	12/10/2008@5:12:03 PM	
NH3 CCV	1	20	0.5214	3.1308	12/10/2008@5:13:14 PM	
Known Conc:			0.5000			
CCB	1	21	-0.0040	-0.1265	12/10/2008@5:16:23 PM	
Known Conc:			0.0000			
OD15 K1	1	40	0.6750	4.0829	12/10/2008@5:19:32 PM	
OD15 L1	1	41	0.4598	2.7489	12/10/2008@5:20:44 PM	
OD15 M1	1	42	0.2137	1.2232	12/10/2008@5:21:56 PM	
OD15 N1	1	43	0.4866	2.9151	12/10/2008@5:23:08 PM	
OD15 O1	1	44	0.9650	5.8811	12/10/2008@5:24:21 PM	
OD15 P1	1	45	0.2555	1.4824	12/10/2008@5:25:33 PM	
OD15 Q1	1	46	0.1881	1.0644	12/10/2008@5:26:45 PM	
OD15 R1	1	47	0.5677	3.4179	12/10/2008@5:27:57 PM	
OD15 S1	1	48	0.2774	1.6178	12/10/2008@5:29:10 PM	
OD15 T1	1	49	0.2359	1.3607	12/10/2008@5:30:22 PM	
NH3 CCV	1	20	0.5274	3.1681	12/10/2008@5:31:34 PM	
Known Conc:			0.5000			
~~CCB~~	~~1~~	~~21~~	~~0.0101~~	~~-0.0392~~	12/10/2008@5:34:43 PM	
~~Known Conc:~~			~~0.0000~~			
~~OD15 U1~~	~~1~~	~~50~~	~~0.3563~~	~~2.1073~~	12/10/2008@5:37:52 PM	
~~OD15 U1 DUP~~	~~1~~	~~51~~	~~0.3410~~	~~2.0124~~	12/10/2008@5:39:04 PM	
CCB	1	21	0.0081	-0.0517	12/10/2008@5:40:16 PM	
Known Conc:			0.0000			
OD15 U1 TRP	1	52	0.3911	2.3229	12/10/2008@5:45:10 PM	
OD15 U1	1	50	0.3545	2.0961	12/10/2008@5:46:23 PM	
OD15 U1 DUP	1	51	0.3468	2.0481	12/10/2008@5:47:36 PM	
~~OD15 U1 MS~~	~~1~~	~~53~~	~~18.5298~~	~~5.6421~~	12/10/2008@5:48:48 PM	20

% R = 104.28

% R = 105.48

OD15 D1	1	54	1.5254	4.6268	12/10/2008@5:50:00 PM	2
OD15 G1	1	55	1.1279	3.3944	12/10/2008@5:51:14 PM	2
~~KCL~~	~~1~~	~~56~~	~~-0.0019~~	~~-0.1139~~	12/10/2008@5:52:26 PM	
NH3 CCV	1	20	0.5172	3.1047	12/10/2008@5:53:39 PM	
Known Conc:			0.5000			
CCB	1	21	0.0031	-0.0829	12/10/2008@5:56:47 PM	
Known Conc:			0.0000			
OD15 U1 MS	1	57	9.7066	2.9071	12/10/2008@5:59:56 PM	20
~~KCL~~	~~1~~	~~58~~	~~0.0440~~	~~0.1712~~	12/10/2008@6:03:36 PM	
NH3 CCV	1	20	0.5274	3.1679	12/10/2008@6:04:48 PM	
Known Conc:			0.5000			
CCB	1	21	0.0065	-0.0614	12/10/2008@6:07:56 PM	
Known Conc:			0.0000			

% R = 103.44

% R = 93.52

0.4 ml * 1000 ppm / 40 ml

% R = 105.48

Author: UW

Date : 12/10/2008

Original Run Filename: OM_12-10-2008_04-07-05PM.OMN created 12/10/2008 4:07:05 PM
Original Run Author's Signature: [Omnion User]
Current Run Filename: 121008NH3A.omn last modified 12/10/2008 6:11:01 PM
Current Run Author's Signature: [Omnion User]
Description: Default New Run

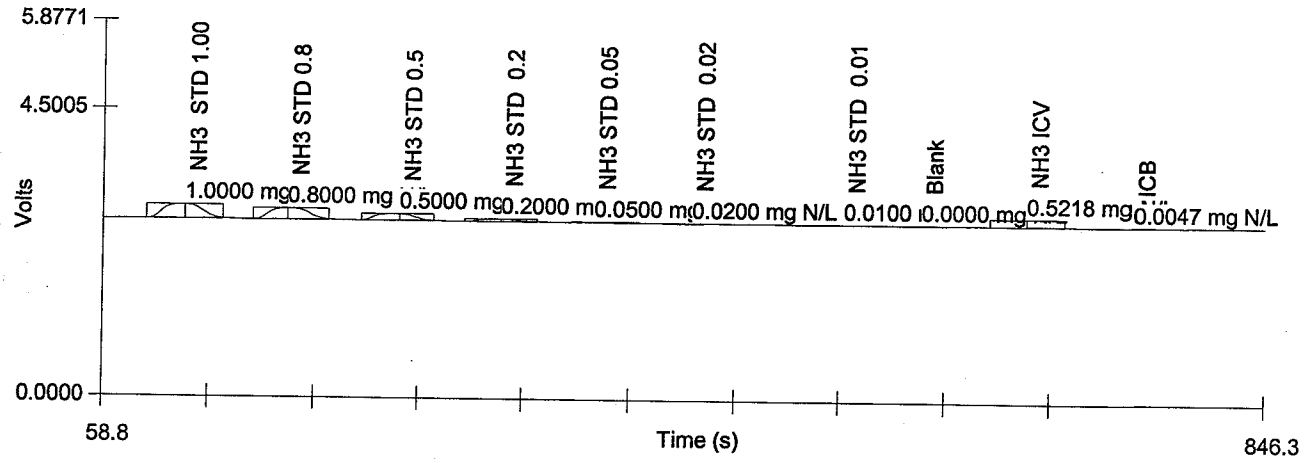
Sample	Rep.	Cup No.	Channel 1 NH3 Conc. (mg N/L)	Channel 1 NH3 Area (V.s)	Detection Time	MDF
NH3 STD 1.00	1	S1	1.0000	6.1555	12/10/2008@4:08:06 PM	
NH3 STD 0.8	1	S2	0.8000	4.8793	12/10/2008@4:09:18 PM	
NH3 STD 0.5	1	S3	0.5000	2.8570	12/10/2008@4:10:29 PM	
NH3 STD 0.2	1	S4	0.2000	1.0821	12/10/2008@4:11:41 PM	
NH3 STD 0.05	1	S5	0.0500	0.2306	12/10/2008@4:12:51 PM	
NH3 STD 0.02	1	S6	0.0200	0.0521	12/10/2008@4:14:03 PM	
NH3 STD 0.01	1	S7	0.0100	-0.0369	12/10/2008@4:15:15 PM	
Blank	1	S8	0.0000	-0.0393	12/10/2008@4:16:27 PM	
NH3 ICV	1	9	0.5218	3.1330	12/10/2008@4:17:38 PM	
Known Conc:			0.5000			
Calibration:			Table/Fig. 1			
ICB	1	10	0.0047	-0.0729	12/10/2008@4:18:49 PM	
Known Conc:			0.0000			
NH3 LOW	1	11	0.0111	0.0907	12/10/2008@4:21:58 PM	
Known Conc:			0.0100			
PREP BLK	1	12	0.0152	-0.0073	12/10/2008@4:25:06 PM	
PREP CHK	1	13	9.8621	2.9553	12/10/2008@4:26:18 PM	20.00
OC77 A2	1	14	0.1283	0.6934	12/10/2008@4:27:29 PM	
OC77 A2 DUP	1	15	0.1199	0.6418	12/10/2008@4:28:41 PM	
OC77 A2 TRP	1	16	0.1284	0.6945	12/10/2008@4:29:53 PM	
OC77 A2 MS	1	17	8.9570	2.6747	12/10/2008@4:31:05 PM	20.00
PREP BLK	1	18	0.0050	-0.0707	12/10/2008@4:32:16 PM	
OC77 B2	1	19	0.9000	2.6882	12/10/2008@4:33:28 PM	2.00
NH3 CCV	1	20	0.5195	3.1188	12/10/2008@4:34:40 PM	
Known Conc:			0.5000			
CCB	1	21	-0.0046	-0.1306	12/10/2008@4:37:49 PM	
Known Conc:			0.0000			
OC77 C2	1	22	3.4924	2.0634	12/10/2008@4:40:57 PM	10.00
OC77 D2	1	23	7.8379	48.4909	12/10/2008@4:42:10 PM	
PREP BLK	1	24	-0.0011	-0.1087	12/10/2008@4:43:21 PM	
PREP CHK	1	25	10.1839	3.0550	12/10/2008@4:44:34 PM	20.00
OD15 A1	1	26	0.8438	5.1298	12/10/2008@4:45:46 PM	
OD15 A1 DUP	1	27	0.8540	5.1927	12/10/2008@4:46:57 PM	
OD15 A1 TRP	1	28	0.8512	5.1754	12/10/2008@4:48:09 PM	
OD15 A1 MS	1	29	9.4201	2.8182	12/10/2008@4:49:21 PM	20.00
OD15 B1	1	30	0.2591	1.5048	12/10/2008@4:50:34 PM	
OC77 D2	1	31	8.3644	2.4910	12/10/2008@4:51:45 PM	20.00
NH3 CCV	1	20	0.5258	3.1579	12/10/2008@4:52:57 PM	
Known Conc:			0.5000			
CCB	1	21	0.0134	-0.0191	12/10/2008@4:56:06 PM	
Known Conc:			0.0000			
OD15 C1	1	32	0.7374	4.4700	12/10/2008@4:59:15 PM	
CCB	1	21	0.0065	-0.0613	12/10/2008@5:00:27 PM	
Known Conc:			0.0000			
OD15 C1	1	32	0.7409	4.4915	12/10/2008@5:03:39 PM	
OD15 D1	1	33	1.5498	9.5062	12/10/2008@5:04:51 PM	
OD15 E1	1	34	0.1165	0.6202	12/10/2008@5:06:03 PM	
OD15 F1	1	35	0.3513	2.0762	12/10/2008@5:07:15 PM	
OD15 G1	1	36	1.1562	7.0660	12/10/2008@5:08:26 PM	
OD15 H1	1	37	0.3815	2.2636	12/10/2008@5:09:38 PM	
OD15 I1	1	38	0.2949	1.7267	12/10/2008@5:10:51 PM	
OD15 J1	1	39	0.2035	1.1600	12/10/2008@5:12:03 PM	
NH3 CCV	1	20	0.5214	3.1308	12/10/2008@5:13:14 PM	
Known Conc:			0.5000			
CCB	1	21	-0.0040	-0.1265	12/10/2008@5:16:23 PM	
Known Conc:			0.0000			
OD15 K1	1	40	0.6750	4.0829	12/10/2008@5:19:32 PM	
OD15 L1	1	41	0.4598	2.7489	12/10/2008@5:20:44 PM	

Author: UW

Date : 12/10/2008

OD15 M1	1	42	0.2137	1.2232	12/10/2008@5:21:56 PM	
OD15 N1	1	43	0.4866	2.9151	12/10/2008@5:23:08 PM	
OD15 O1	1	44	0.9650	5.8811	12/10/2008@5:24:21 PM	
OD15 P1	1	45	0.2555	1.4824	12/10/2008@5:25:33 PM	
OD15 Q1	1	46	0.1881	1.0644	12/10/2008@5:26:45 PM	
OD15 R1	1	47	0.5677	3.4179	12/10/2008@5:27:57 PM	
OD15 S1	1	48	0.2774	1.6178	12/10/2008@5:29:10 PM	
OD15 T1	1	49	0.2359	1.3607	12/10/2008@5:30:22 PM	
NH3 CCV	1	20	0.5274	3.1681	12/10/2008@5:31:34 PM	
	Known Conc:		0.5000			
CCB	1	21	0.0101	-0.0392	12/10/2008@5:34:43 PM	
	Known Conc:		0.0000			
OD15 U1	1	50	0.3563	2.1073	12/10/2008@5:37:52 PM	
OD15 U1 DUP	1	51	0.3410	2.0124	12/10/2008@5:39:04 PM	
CCB	1	21	0.0081	-0.0517	12/10/2008@5:40:16 PM	
	Known Conc:		0.0000			
OD15 U1 TRP	1	52	0.3911	2.3229	12/10/2008@5:45:10 PM	
OD15 U1	1	50	0.3545	2.0961	12/10/2008@5:46:23 PM	
OD15 U1 DUP	1	51	0.3468	2.0481	12/10/2008@5:47:36 PM	
OD15 U1 MS	1	53	18.5298	5.6421	12/10/2008@5:48:48 PM	20.00
OD15 D1	1	54	1.5254	4.6268	12/10/2008@5:50:00 PM	2.00
OD15 G1	1	55	1.1279	3.3944	12/10/2008@5:51:14 PM	2.00
KCL	1	56	-0.0019	-0.1139	12/10/2008@5:52:26 PM	
NH3 CCV	1	20	0.5172	3.1047	12/10/2008@5:53:39 PM	
	Known Conc:		0.5000			
CCB	1	21	0.0031	-0.0829	12/10/2008@5:56:47 PM	
	Known Conc:		0.0000			
OD15 U1 MS	1	57	9.7066	2.9071	12/10/2008@5:59:56 PM	20.00
KCL	1	58	0.0440	0.1712	12/10/2008@6:03:36 PM	
NH3 CCV	1	20	0.5274	3.1679	12/10/2008@6:04:48 PM	
	Known Conc:		0.5000			
CCB	1	21	0.0065	-0.0614	12/10/2008@6:07:56 PM	
	Known Conc:		0.0000			

Channel 1: Set 1 of 8

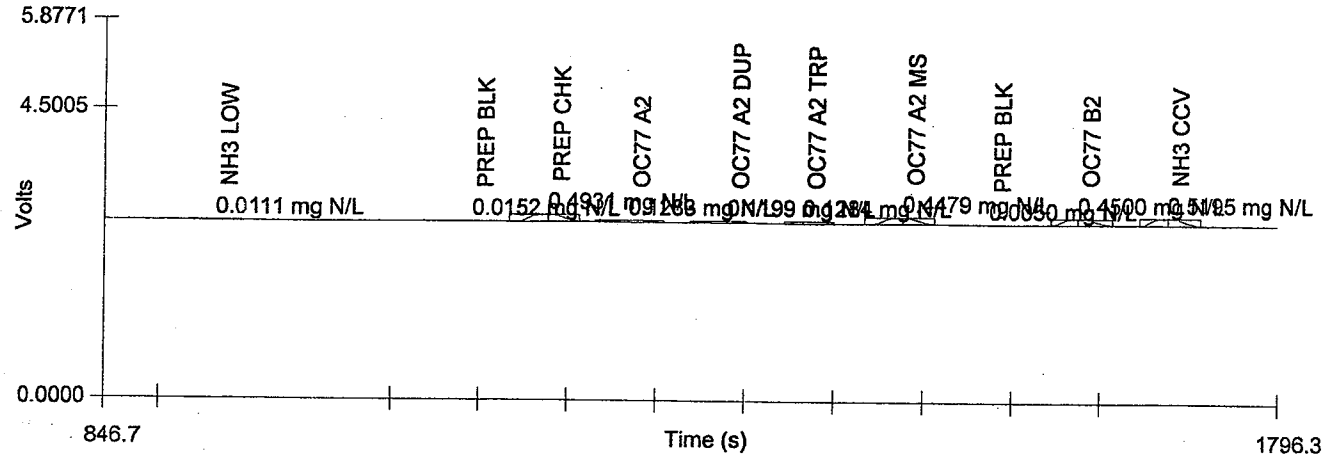


121008NH3A

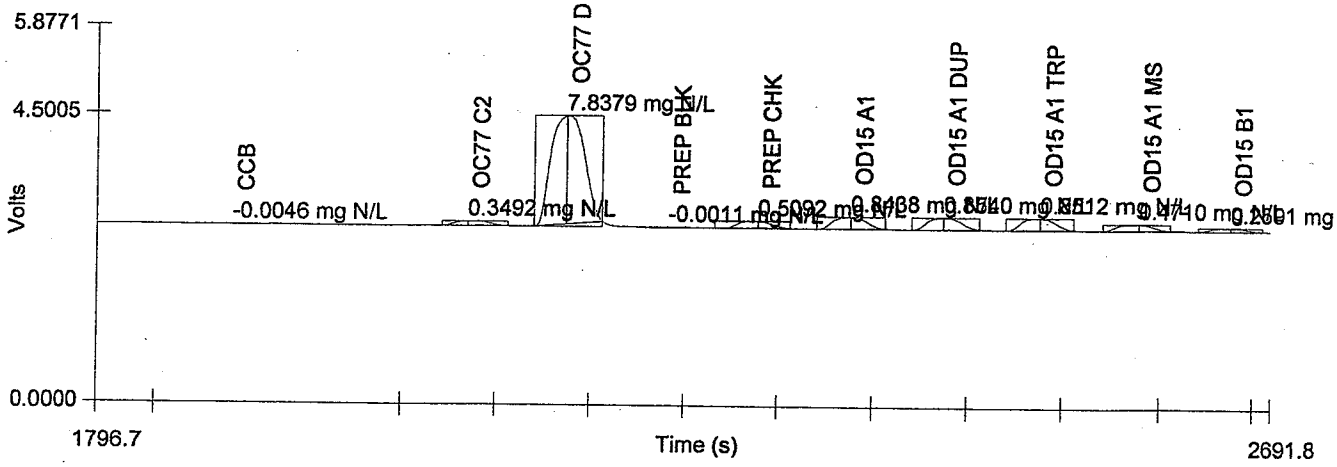
Author: UW

Date : 12/10/2008

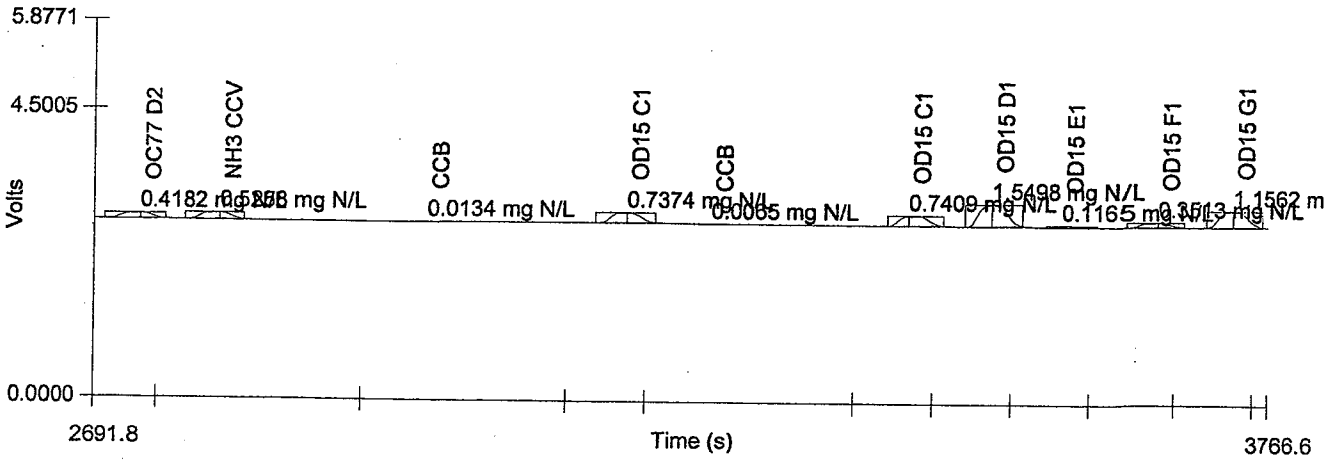
Channel 1: Set 2 of 8



Channel 1: Set 3 of 8



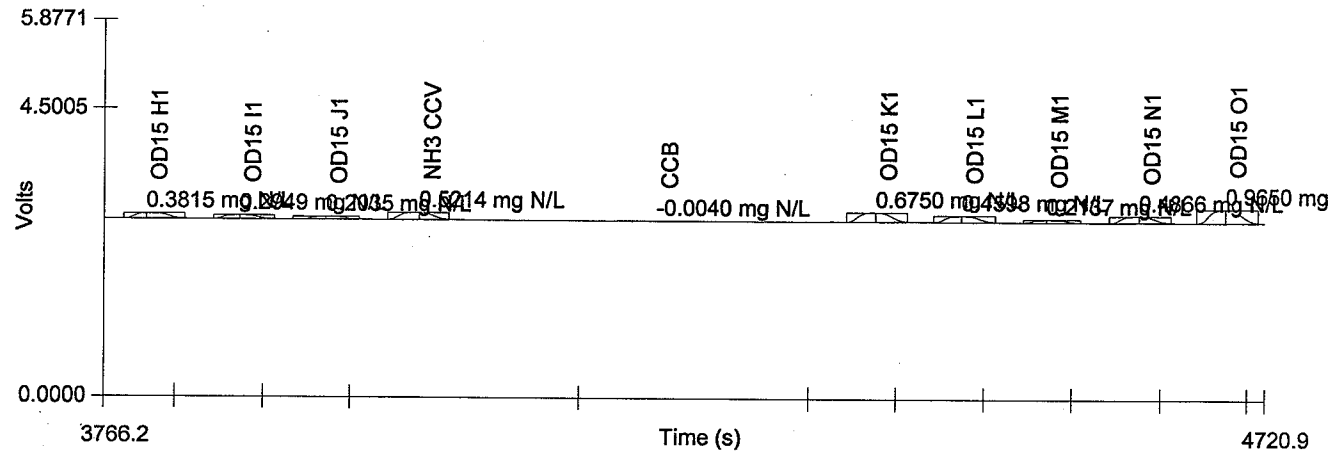
Channel 1: Set 4 of 8



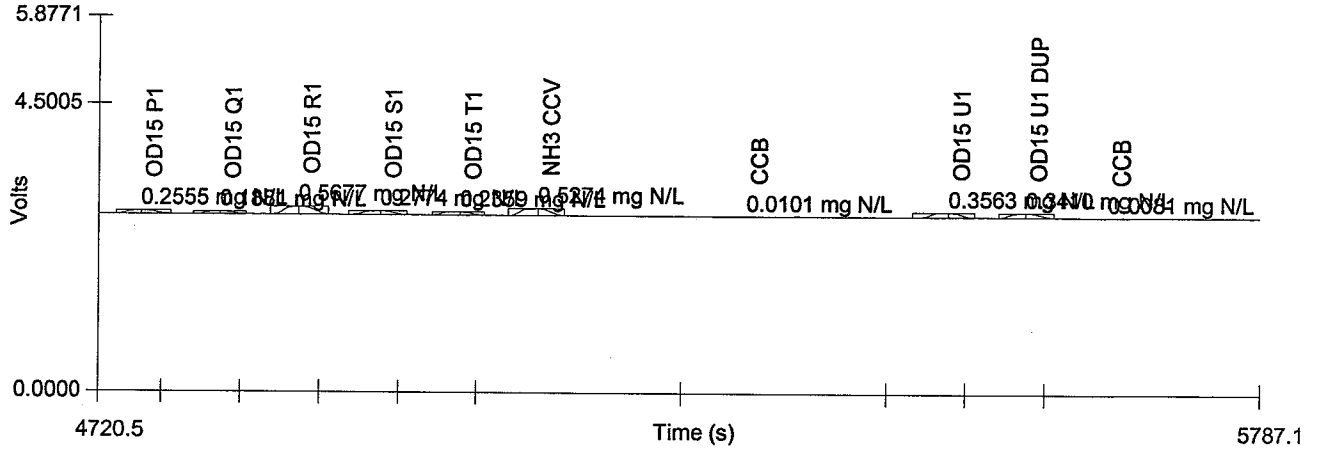
Author: UW

Date : 12/10/2008

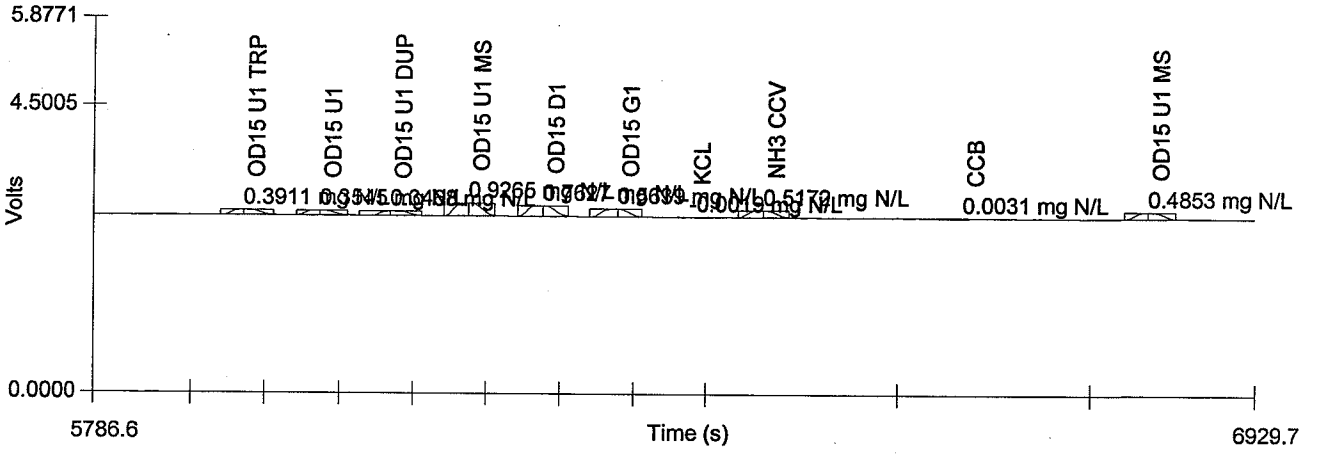
Channel 1: Set 5 of 8



Channel 1: Set 6 of 8



Channel 1: Set 7 of 8



Author: UW

Date : 12/10/2008

Channel 1: Set 8 of 8

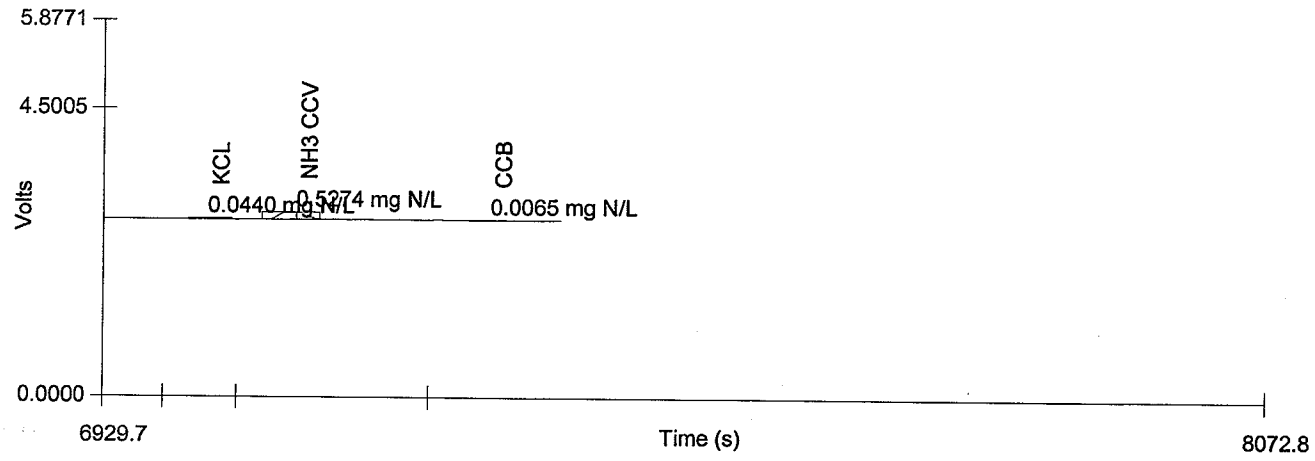
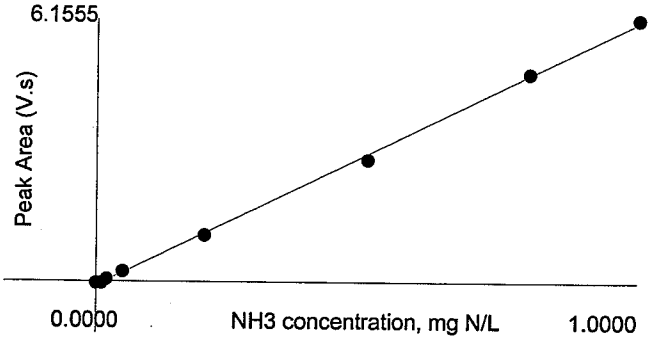


Table 1: NH3

	Known Conc. (mg N/L)	Rep	Peak Area (V.s)	Peak Height (V)	% RSD	% Residual	Det. Conc. (mg N/L)	Detection Date	Detection Time
1	1.0000	1	6.1555	0.2144	0.0	-1.0	1.0093	12/10/2008	4:08:06 PM
2	0.8000	1	4.8793	0.1720	0.0	-0.5	0.8034	12/10/2008	4:09:18 PM
3	0.5000	1	2.8570	0.1004	0.0	4.7	0.4773	12/10/2008	4:10:29 PM
4	0.2000	1	1.0821	0.0398	0.0	5.0	0.1910	12/10/2008	4:11:41 PM
5	0.0500	1	0.2306	0.0091	0.0	-10.1	0.0536	12/10/2008	4:12:51 PM
6	0.0200	1	0.0521	0.0052	0.0	-121.0	0.0248	12/10/2008	4:14:03 PM
7	0.0100	1	-0.0369	-0.0038	0.0	3.9	0.0105	12/10/2008	4:15:15 PM
8	0.0000	1	-0.0393	-0.0028			0.0101	12/10/2008	4:16:27 PM

Figure 1: NH3



Soil Extraction Log

Parameter:

Date: 12-9-08

Analyst: W

Extraction Procedure: 4g sample in 40 mL 2N KCl, shaken 1 hr and filtered.

Time	Sample ID	Sample Wt (grams)	Extract Vol (mL)	Spikes and Standards: Vol added (mL)	Spikes and Standards: Conc of Std (mg/L)	Spikes and Standards: Conc in Extract (mg/L)	Notes & Comments
12:10	PrepBlk	—	40				
↓	PrepCtrl	—	↓	0.4	1,000	10	ERA 06107
	OC77A2	4.13					
	A2dup	4.20					
	A2trip	4.20					
	A2ms	4.35		0.4	1,000	10	ARI 00872
	B2	4.10					
	C2	4.10					
↓	D2	4.09	↓				

12-9-08 W

OC77

W
12-10-08

TOTAL SOLIDS/VOLATILE SOLIDS (TS / TVS) BENCHSHEET

SOLIDS *(dry at 104 (12-24 hr) then combust at 550 (30 min))*

DATE: 12/9/2008
ANALYST: CDE 16:46

Batch drying time		
record times as mm/dd/yy hh:mm		
12/9/2008 16:46	time in oven	CDE
12/10/2008 10:16	time out	CDE
elapsed hrs =	17.5	

TS (%) calculated as:
Final dry wt (g) = (Dry Wt - Tare Wt)
TS = (Final Dry Wt)/ (grams Sample-Tare)

TVS (mg/kg dry wt) calculated as:
Final ash wt (g) = (min ash wt - tare wt)
*TVS (mg/kg) = [(Dry wt-Ash wt)/ (dry weight)] *1,000,000*
if ash wt > dry wt, "Chk for Err"
*if dry wt-ash wt < 0.001 g, "< (1/dry wt)*1,000,000*

ZnOAC Preserved

SAMPLE ID	DISH #	SAMPLE (grams)	TARE WT (grams)	DRY WT 104C (grams) 1			dry Wt (g)	TS (%)	ASH WT 550C (grams) 1	2		Ash Wt (g)	TVS (mg/kg)	TVS (%)
Cal Date -->		12/9/2008	12/9/2008	12/10/2008										
Time & Initials -->		15:57 CDE	13:07 CDE	10:37 CDE										
Cal Wt (g)	10.0000	10.0001	10.0001	10.0001										
record weights to 4 places		Cal OK!	Cal OK!	Cal OK!										
Blank		0.0000	1.1665	1.1664			0.00							
OC80 A1		3.8886	1.1543	3.4176			2.26	82.8%						
OC80 A1 dup		4.4084	1.1512	3.8579			2.71	83.1%						
							RPD =	0.39%				RPD =	NA	
OC80 A1 trp		5.8023	1.1923	5.0313			3.84	83.3%						
							RSD =	0.31%				RSD =	NA	
OC80 B1		3.8481	1.1513	3.3616			2.21	82.0%						
OC80 C1		5.4560	1.1405	4.7478			3.61	83.6%						
OC80 D1		6.2142	1.1549	5.4912			4.34	85.7%						
OC66 L3		4.5420	1.0770	3.3497			2.27	65.6%						
OC66 L3 dup		4.3747	1.1049	3.2521			2.15	65.7%						
							RPD =	0.12%				RPD =	NA	
OC66 L3 trp		4.9187	1.0980	3.6207			2.52	66.0%						
							RSD =	0.35%				RSD =	NA	
OC66 G3		5.1351	1.1094	4.5404			3.43	85.2%						
OC77 A1		3.8062	1.1243	2.5528			1.43	53.3%						
OC77 A1 dup		4.3168	1.1848	2.8555			1.67	53.3%						
							RPD =	0.15%				RPD =	NA	
OC77 A1 trp		3.4943	1.1508	2.3973			1.25	53.2%						
							RSD =	0.14%				RSD =	NA	
OC77 B1		4.7203	1.1404	2.7754			1.64	45.7%						
OC77 C1		4.4830	1.1432	2.7064			1.56	46.8%						
OC77 D1		5.4700	1.1593	3.3735			2.21	51.4%						
OC94 A1		4.0570	1.1184	3.3090			2.19	74.5%						

TOTAL SOLIDS/VOLATILE SOLIDS (TS / TVS) BENCHSHEET

SOLIDS *(dry at 104 (12-24 hr) then combust at 550 (30 min))*

DATE: 12/9/2008

ANALYST: CDE 16:46

Batch drying time

record times as mm/dd/yy hh:mm

12/9/2008 16:46 time in oven CDE

12/10/2008 10:16 time out CDE

elapsed hrs = 17.5

TS (%) calculated as:
Final dry wt (g) = (Dry Wt - Tare Wt)
TS = (Final Dry Wt)/ (grams Sample-Tare)

TVS (mg/kg dry wt) calculated as:
Final ash wt (g) = (min ash wt - tare wt)
*TVS (mg/kg) = [(Dry wt-Ash wt)/ (dry weight)] *1,000,000*
if ash wt > dry wt, "Chk for Err"
*if dry wt-ash wt < 0.001 g, "< (1/dry wt)*1,000,000*

ZnOAC Preserved

SAMPLE ID	DISH #	SAMPLE (grams)	TARE WT (grams)	DRY WT 104C (grams) 1			dry Wt (g)	TS (%)	ASH WT 550C (grams) 1	2		Ash Wt (g)	TVS (mg/kg)	(%)
OC94 B1		4.1486	1.1195	3.3803			2.26	74.6%						
OC94 B1 dup		3.8469	1.0773	3.1922			2.11	76.4%						
							RPD =	2.29%				RPD =	NA	
OC94 B1 trp		4.1386	1.1575	3.4254			2.27	76.1%						
							RSD =	1.22%				RSD =	NA	
OC94 C1		2.8389	1.1927	2.4463			1.25	76.2%						
OC94 D1		5.1434	1.1687	4.2688			3.10	78.0%						
OC94 E1		5.0419	1.1556	4.2675			3.11	80.1%						
OC94 F1		6.7679	1.1697	5.7757			4.61	82.3%						
OD15 U2		3.9223	1.0937	2.0072			0.91	32.3%						
OD15 U2 dup		4.5288	1.1159	2.2214			1.11	32.4%						
							RPD =	0.30%				RPD =	NA	
OD15 U2 trp		3.6383	1.0772	1.9066			0.83	32.4%						
							RSD =	0.17%				RSD =	NA	

TOTAL SOLIDS/VOLATILE SOLIDS (TS / TVS) BENCHSHEET

SOLIDS *(dry at 104 (12-24 hr) then combust at 550 (30 min))*

DATE: 12-9-08

ANALYST: CDC 16:46

Batch drying time

record times as mm/dd/yy hh:mm

12-9-08 1646 time in oven CDC

12-10-08 1016 time out CDC

elapsed hrs = 0.0 < 12 hr

TS (%) calculated as:

Final dry wt (g) = (Dry Wt - Tare Wt)

TS = (Final Dry Wt)/ (grams Sample-Tare)

ZnOAc Preserved

TVS (mg/kg dry wt) calculated as:

Final ash wt (g) = (min ash wt - tare wt)

*TVS (mg/kg) = [(Dry wt-Ash wt)/ (dry weight)] *1,000,000*

if ash wt > dry wt, "Chk for Err"

*if dry wt-ash wt < 0.001 g, "< (1/dry wt)*1,000,000*

SAMPLE ID	DISH #	SAMPLE (grams)	TARE WT (grams)	DRY WT 104C (grams) 1			dry Wt (g)	TS (%)	ASH WT 550C (grams) 1	2	3	Ash Wt (g)	TVS (mg/kg)	(%)
Cal Date -->		12-9-08	12-4-08	12-10-08										
Time & Initials -->		15:57 CDC	13:07 CDC	10:37 CDC										
Cal Wt (g)	10.0000	10.0001	10.0001	10.0001										
record weights to 4 places														
Blank	24	Ø	1.1665	1.1664										
OC80 A1	25	3.8886	1.1543	3.4176										
DP A1	26	4.4084	1.1512	3.8579										
TP A1	27	5.8023	1.1923	5.0313										
B1	28	3.8481	1.1513	3.3616										
C1	29	5.4560	1.1405	4.7478										
D1	30	6.2142	1.1549	5.4912										
OC66 L3	31	4.5420	1.0770	3.3497										
DP L3	32	4.3747	1.1049	3.2521										
TP L3	33	4.9187	1.0980	3.6207										
G3	34	5.1351	1.1094	4.5404										
OC77 A1	35	3.8062	1.1243	2.5528										
DP A1	36	4.3168	1.1848	2.8555										
TP A1	37	3.4943	1.1508	2.3973										
B1	38	4.7203	1.1404	2.7754										
C1	39	4.4830	1.1432	2.7064										
D1	40	5.4700	1.1593	3.3735										
OC94 A1	41	4.0570	1.1184	3.3090										
B1	42	4.1486	1.1195	3.3803										
DP B1	43	3.8469	1.0773	3.1922										
TP B1	44	4.1386	1.1575	3.4254										
C1	45	2.8389	1.1927	2.4463										
D1	46	5.1434	1.1687	4.2688										

TOTAL SOLIDS/VOLATILE SOLIDS (TS / TVS) BENCHSHEET

SOLIDS *(dry at 104 (12-24 hr) then combust at 550 (30 min))*

DATE: 12-9-08

ANALYST: MS 16:46

Batch drying time	TS (%) calculated as:	TVS (mg/kg dry wt) calculated as:
record times as mm/dd/yy hh:mm	Final dry wt (g) = (Dry Wt - Tare Wt)	Final ash wt (g) = (min ash wt - tare wt)
time in oven	TS = (Final Dry Wt)/ (grams Sample-Tare)	TVS (mg/kg) = [(Dry wt-Ash wt)/ (dry weight)] *1,000,000
time out		if ash wt > dry wt, "Chk for Err"
elapsed hrs = 0.0 < 12 hr		if dry wt-ash wt < 0.001 g, "< (1/dry wt)*1,000,000

SAMPLE ID	DISH #	SAMPLE (grams)	TARE WT (grams)	DRY WT 104C (grams) 1			dry Wt (g)	TS (%)	ASH WT 550C (grams) 1	2		Ash Wt (g)	TVS (mg/kg)	(%)
Cal Date -->														
Time & Initials -->														
Cal Wt (g) 10.0000														
record weights to 4 places														
OC94 f1	47	5.0419	1.1556	4.2675										
↓ f1	48	6.7679	1.1697	5.7757										
OD15 U2	49	3.9223	1.0937	2.0672										
↓ OP U2	50	4.5288	1.1159	2.2214										
↓ TP U2	51	3.6383	1.0772	1.9066										

12

12-15-C

SULFIDE BENCHSHEET (Spectrophotometric, EPA 376.2)
Soils, sediments and solid phase samples

	Date Time	Analyst
Distillation	12/10/08 10:00	AF
Finish	12/11/08 12:00	AF

If distilled, specify Procedure: **PSEP**

1. Standardization of sodium thiosulfate titrant

Buret used for titrations:

Thiosulfate ID: **6752C**
Bi-iodate ID: **0086-10**
Stock bi-iodate = **0.8125** *grams to* 1000 *mL*
Normality = **0.025**

Titration of bi-iodate with thiosulfate

mL bi-iodate =	3.000	3.000	3.000	
mL thiosulfate =	3.04	3.04	3.04	*nthio*
*Normality thiosulfate = (mL bi-iodate*normbio) / mL thiosulfate =*	0.025	0.025	0.025	**0.025**

2. Normality of Iodine

Iodine ID: **6637C**

Titration of Iodine with thiosulfate

mL iodine =	3.000	3.000	3.000	
mL thiosulfate =	2.780	2.800	2.780	*ni*
*Normality iodine = (mL thiosulfate*nthio) / mL iodine=*	0.023	0.023	0.023	**0.023**

3. Standardization of Sodium Sulfide Stock

Stock ID = **0088-6**
Approx conc in 100ml
g Na2S = 0.5552 *mg /mL =* 0.741

Titration of standard with thiosulfate

mL Standard =	1.00	1.00	1.00	
mL iodine =	3.00	3.00	3.00	
mL thiosulfate =	1.09	1.09	1.09	*stkconc (mg/mL)*
*Sulfide (mg/mL) = {[(mL iodine*ni)-(mL thio *nthio)]*16} / mL standard =*	0.670	0.670	0.670	**0.670**

Intermediate Standard
Add 9.35 *mL stk to* 250 *mL 0.01M NaOH =* **0.025** ***mg/mL***

4. Calibratio 3 *spectrophotometer used:*

Inter Std Volume (mL)	Final Volume (mL)	Calc Conc (mg S/L)	Absorbance @650 nm 1	2	AVG ABS	mg/L
0.00	50	0.000	0.000		0.000	*0.008*
0.10	50	0.050	0.030		0.030	*0.053*
0.25	50	0.125	0.079		0.079	*0.126*
0.50	50	0.251	0.163		0.163	*0.252*
1.00	50	0.501	0.312		0.312	*0.475*
2.00	50	1.002	0.673		0.673	*1.015*
Calib Verif Std =	1	*ml int to*	50	*ml ZnOAc=*		0.501 *mg/l*
Distillation Std =	1	*ml stk to*	100	=		6.70 *mg/l*

RegressionData

intercept = -0.006
slope = 0.669
r = 0.9994

Comment: Calibration OK!

maxabs = 0.673

SAMPLE DATA

enter dilution as mL final/mL sample

	Distillation Data			Spectrophotometric Data				SAMPLE DATA	
SAMPLE ID	SAMPLE SIZE	% Solids	TRAP VOLUME (ml)	Dilution Factor	Abs @ 650 nm Sample	Bkg	regressed Conc (mg S/L)	CORR CONC (ppm)	
ICB		na	na	1.00	0.000		0.008	< 0.05	*OK*
ICV		na	na	1.00	0.334		0.508	0.508	*101%*
Distilled samples									
Dist Blk	100.0	100%	100	1.00	0.000		0.008	< 0.05	*OK*
Dist Chk	100.0	100%	100	10.00	0.422		0.639	6.392	*95%*
Soil Samples	**(grams)**	**% Solids**	**(mL)**		**Sample**	**Bkg**	**(mg/L)**	**mg/kg**	
OC77 A1	5.069	53.30%	100	10.00	0.144		0.224	82.745	
OC77 A1 dup	5.011	53.30%	100	10.00	0.157		0.243	90.981	*RPD=9.48%*
OC77 A1 ms	5.045	53.30%	100	20.00	0.312		0.475	353.120	*108.54%*
		Spike at	*1.00*	*ml stock to*	*2.689*	*g dry wt =*		*249.105*	*mg/kg*
~~OD15 A2~~	~~5.035~~	~~31.90%~~	~~100~~	~~20.00~~	~~0.272~~		0.415	516.704	
~~OD15 A2 dup~~	~~5.022~~	~~31.90%~~	~~100~~	~~20.00~~	~~0.341~~		0.518	646.848	*RPD=22.37%*
~~OD15 A2 ms~~	~~5.033~~	~~31.90%~~	~~100~~	~~20.00~~	~~0.559~~		0.844	1051.497	*128.18%*
		~~*Spike at*~~	~~*1.00*~~	~~*ml stock to*~~	~~*1.606*~~	~~*g dry wt =*~~		~~*417.209*~~	~~*mg/kg*~~
Cal Blk		na	na	1.00	0.000		0.008	< 0.05	*OK*
CCV		na	na	1.00	0.306		0.466	0.466	*93%*
OD15 B2	5.029	73.10%	100	10.00	0.303		0.461	125.486	
OD15 C2	4.967	78.20%	100	10.00	0.626		0.944	243.110	
~~OD15 D2~~	~~4.968~~	~~27.40%~~	~~100~~	~~10.00~~	~~0.949~~		1.427	1048.510	~~*offscale*~~
~~OD15 E2~~	~~5.096~~	~~34.10%~~	~~100~~	~~1.00~~	~~1.226~~		1.841	105.969	~~*offscale*~~

SAMPLE DATA

enter dilution as mL final/mL sample

	Distillation Data			Spectrophotometric Data				SAMPLE DATA	
SAMPLE ID	SAMPLE SIZE	% Solids	TRAP VOLUME (ml)	Dilution Factor	Abs @ 650 nm Sample	Bkg	regressed Conc (mg S/L)	CORR CONC (ppm)	
~~OD15 F2~~	~~5.011~~	~~40.70%~~	~~100~~	~~1.00~~	~~1.835~~		~~2.752~~	~~134.941~~	~~offscale~~
OD15 G2	5.090	30.70%	100	10.00	0.666		1.004	642.570	
OD15 H2	5.066	37.50%	100	10.00	0.590		0.890	468.724	
~~OD15 I2~~	~~5.003~~	~~77.70%~~	~~100~~	~~1.00~~	~~1.626~~		~~2.440~~	~~62.757~~	~~offscale~~
OD15 J2	5.096	70.20%	100	10.00	0.394		0.597	166.988	
OD15 K2	5.003	36.40%	100	10.00	0.505		0.763	419.176	
Cal Blk		na	na	1.00	0.000		0.008	< 0.05	OK
CCV		na	na	1.00	0.312		0.475	0.475	95%
~~OD15 L2~~	~~5.010~~	~~32.60%~~	~~100~~	~~10.00~~	~~0.703~~		~~1.059~~	~~648.657~~	~~offscale~~
OD15 M2	5.074	36.80%	100	20.00	0.374		0.567	607.825	
OD15 N2	5.094	38.70%	100	10.00	0.484		0.732	371.292	
OD15 O2	5.047	31.50%	100	10.00	0.483		0.730	459.466	
OD15 P2	4.929	71.20%	100	10.00	0.329		0.500	142.526	
OD15 Q2	4.998	52.00%	100	10.00	0.659		0.994	382.319	
OD15 R2	5.089	33.30%	100	20.00	0.387		0.587	692.673	
~~OD15 S2~~	~~4.991~~	~~36.00%~~	~~100~~	~~10.00~~	~~1.177~~		~~1.768~~	~~984.100~~	~~offscale~~
Cal Blk		na	na	1.00	0.000		0.008	< 0.05	OK
CCV		na	na	1.00	0.325		0.494	0.494	99%
OD15 T2	5.083	37.60%	100	50.00	0.265		0.404	1058.203	
OD15 U2	5.006	32.30%	100	20.00	0.368		0.559	690.817	
OD15 U2 dup	5.013	32.30%	100	20.00	0.389		0.590	728.638	RPD=5.33%
OD15 U2 ms	5.020	32.30%	100	50.00	0.227		0.348	1072.084	92.29%
		Spike at	*1.00*	*ml stock to*	*1.621*	*g dry wt =*		*413.109*	*mg/kg*
~~OC96 A~~	~~5.083~~	~~37.60%~~	~~100~~	~~20.00~~	~~0.257~~		~~0.393~~	~~410.763~~	
OD15 A2	5.035	31.90%	100	20.00	0.255		0.390	485.052	
OD15 A2 dup	5.022	31.90%	100	20.00	0.322		0.490	611.380	RPD=23.04%
OD15 A2 ms	5.033	31.90%	100	20.00	0.519		0.784	976.990	117.91%
		Spike at	*1.00*	*ml stock to*	*1.606*	*g dry wt =*		*417.209*	*mg/kg*
OD15 D2	4.968	27.40%	100	20.00	0.479		0.724	1064.449	
OD15 E2	5.096	34.10%	100	5.00	0.258		0.394	113.372	
Cal Blk		na	na	1.00	0.000		0.008	< 0.05	OK
CCV		na	na	1.00	0.330		0.502	0.502	100%
OD15 F2	5.011	40.70%	100	5.00	0.426		0.645	158.185	
OD15 I2	5.003	77.70%	100	5.00	0.366		0.556	71.452	
OD15 L2	5.010	32.60%	100	20.00	0.375		0.569	696.730	
OD15 S2	4.991	36.00%	100	20.00	0.668		1.007	1121.007	
Cal Blk		na	na	1.00	0.000		0.008	< 0.05	OK
CCV		na	na	1.00	0.328		0.499	0.499	100%

SULFIDE BENCHSHEET (Spectrophotometric, EPA 376.2)
Soils, sediments and solid phase samples

	Date Time	Analyst
Distillation	12-10-08 10:00	al
Finish	12-11-08 12:00	al

If distilled, specify Procedure: PSEP

1. Standardization of sodium thiosulfate titrant

Buret used for titrations: _____

Thiosulfate ID: 6752C
Bi-iodate ID: 0086-16
Stock bi-iodate = 0.8125 *grams to* 1000 *mL*
Normality = _____

Titration of bi-iodate with thiosulfate			
mL bi-iodate =	3.00 ~~2.000~~	3.00 ~~2.000~~	3.00 ~~2.000~~
mL thiosulfate =	3.04	3.04	3.04
Normality thiosulfate = (mL bi-iodate*normbio) / mL thiosulfate =			

nthio

2. Normality of Iodine

Iodine ID: 6637C

Titration of Iodine with thiosulfate			
mL iodine =	3.000	3.000	3.000
mL thiosulfate =	2.78	2.80	2.78
Normality iodine = (mL thiosulfate*nthio) / mL iodine=			

ni

3. Standardization of Sodium Sulfide Stock

Stock ID = 0088-6
Approx conc in 100ml
g Na2S = 0.5552 *mg /mL =* _____

Titration of standard with thiosulfate			
mL Standard =	1.00	1.00	1.00
mL iodine =	3.00	3.00	3.00
mL thiosulfate =	1.09	1.09	1.09
Sulfide (mg/mL) = {[(mL iodine*ni)-(mL thio *nthio)]*16} / mL standard =			

stkconc (mg/mL)

Intermediate Standard
Add 9.35 *mL stk to* 250 *mL 0.01M NaOH =* _____ ***mg/mL***

4. Calibration Standard Curve

spectrophotometer used:

Inter Std Volume (mL)	Final Volume (mL)	Calc Conc (mg S/L)	Absorbance @650 nm 1	Absorbance @650 nm 2	AVG ABS	mg/L
0.00	50		0.000			
0.10	50		0.030			
0.25	50		0.079			
0.50	50		0.163			
1.00	50		0.312			
2.00	50		0.673			
Calib Verif Std =	0.5	*ml int to*	50	*ml ZnOAc=*		*mg/l*
Distillation Std =	1	*ml stk to*	100	=		*mg/l*

RegressionData
intercept = _____
slope = _____
r = _____
Comment: _____
maxabs = _____

SAMPLE DATA

enter dilution as mL final/mL sample

	Distillation Data			Spectrophotometric Data				SAMPLE DATA	
SAMPLE ID	SAMPLE SIZE	% Solids	TRAP VOLUME (ml)	Dilution Factor	Abs @ 650 nm Sample	Abs @ 650 nm Bkg	regressed Conc (mg S/L)	CORR CONC (ppm)	
ICB		na	na	1.00	0.000				
ICV		na	na	1.00	6.334				
Distilled samples									
Dist Blk	100.0	100%	100	1.00	0.000				
Dist Chk	100.0	100%	100	10X ~~1.00~~	0.422				
Soil Samples	***(grams)***	***% Solids***	***(mL)***		***Sample***	***Bkg***	***(mg/L)***	***mg/kg***	
~~Blank~~			~~100~~	~~1.00~~					
~~LCS~~			100	1.00					
OC77 A1	5.069	53.3	100	10 1.00	0.144				
↓ dup A1	5.011	↓	100	10 1.00	0.157				
↓ SpK A1	5.045	↓	100	20 X ~~1.00~~	0.312				
ODI5 A2	5.035	31.9	100	20 1.00	0.272				
↓ Dup A2	5.022	↓	100	20 1.00	0.341				
↓ SpK A2	5.033	↓	100	~~10~~ X ~~1.00~~	0.559				
~~Cal Blk~~		na	na	~~1.00~~					
CCV		na	na	1.00					
			100	1.00					
			~~100~~	1.00					
			100	1.00					
			100	1.00					

SAMPLE DATA

enter dilution as mL final/mL sample

	Distillation Data			Spectrophotometric Data				SAMPLE DATA	
SAMPLE ID	SAMPLE SIZE	% Solids	TRAP VOLUME (ml)	Dilution Factor	Abs @ 650 nm Sample	Bkg	regressed Conc (mg S/L)	CORR CONC (ppm)	
ICB		na	na	1.00	0.000				
ICV		na	na	1.00	0.306				
ODIS B2	5.029	73.1	100	10x ~~1.00~~	0.303				
C2	4.967	~~78.2~~	100	10x ~~1.00~~	0.626				
D2	4.968	27.4	100	10x ~~1.00~~	0.949				
E2	5.096	34.1	100	1.00	1.226				
F2	5.011	40.7	100	1.00	1.835				
G2	5.090	30.7	100	10x ~~1.00~~	0.666				
H2	5.066	37.5	100	10x ~~1.00~~	0.590				
I2	5.003	77.7	100	1.00	1.626				
J2	5.096	70.2	100	10 x ~~1.00~~	0.394				
K2	5.003	36.4	100	10x ~~1.00~~	0.505				
Cal Blk		na	na	1.00	0.006				
CCV		na	na	1.00	0.312				
ODIS L2	5.010	32.6	100	10x ~~1.00~~	0.703				
M2	5.074	36.8	100	20x ~~1.00~~	0.374				
N2	5.054	38.7	100	10x 1.00	0.484				
O2	5.047	31.5	100	10x ~~1.00~~	0.483				
P2	4.929	71.2	100	10x 1.00	0.329				
Q2	4.998	52.0	100	10x ~~1.00~~	0.659				
R2	5.089	33.3	100	20x 1.00	0.387				
S2	4.991	36.0	100	10x ~~1.00~~	1.177				
Cal Blk		na	na	1.00	0.000				
CCV		na	na	1.00	0.325				
ODIS T2	5.083	37.6	100	~~50x~~ x ~~1.00~~	0.265				
U2	5.006	32.3	100	20x 1.00	0.368				
dup U2	5.013		100	20x ~~1.00~~	0.389				
SPK U2	5.020		100	~~50x~~ ~~1.00~~	0.227				
OC96 A	5.083	37.6	100	~~50x~~ x 1.00	0.257				
ODIS A2	5.035	31.9	100	20x ~~1.00~~	0.255				
dup A2	5.022		100	20x ~~1.00~~	~~0.514~~ 0.322				
SPK A2	5.033		100	20 ~~1.00~~	0.519				
ODIS D2	4.968	27.4	100	20 ~~1.00~~	0.479				
E2	5.096	34.1	100	5 ~~1.00~~	0.258				
Cal Blk		na	na	1.00	0.000				
CCV		na	na	1.00	0.330				

running set T2 info

SAMPLE DATA

enter dilution as mL final/mL sample

	Distillation Data			Spectrophotometric Data				SAMPLE DATA	
SAMPLE ID	SAMPLE SIZE	% Solids	TRAP VOLUME (ml)	Dilution Factor	Abs @ 650 nm Sample	Abs @ 650 nm Bkg	regressed Conc (mg S/L)	CORR CONC (ppm)	
~~ICB~~		~~na~~	~~na~~	~~1.00~~					
~~ICV~~		~~na~~	~~na~~	~~1.00~~					
0015 F2	5.011	~~40.7~~	100	5 ~~1.00~~	0.426				
F2	5.003	~~77.7~~	100	5 ~~1.00~~	0.366				
L2	5.01	~~32.6~~	100	20 ~~1.00~~	0.375				
S2	4.991	~~36.0~~	100	20 ~~1.00~~	0.668				
CCB			100	1.00	0.000				
CCV			100	1.00	0.328				
			100	1.00					
			100	1.00					
			100	1.00					
			100	1.00					
Cal Blk		na	na	1.00					
CCV		na	na	1.00					
			100	1.00					
			100	1.00					
			100	1.00					
			100	1.00					
			100	1.00					
			100	1.00					
			100	1.00					
			100	1.00					
Cal Blk		na	na	1.00					
CCV		na	na	1.00					
			100	1.00					
			100	1.00					
			100	1.00					
			100	1.00					
			100	1.00					
			100	1.00					
			100	1.00					
			100	1.00					
			100	1.00					
			100	1.00					
			100	1.00					
Cal Blk		na	na	1.00					
CCV		na	na	1.00					

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Sulfide Digestion Log

			Pretreatment Data							Sample Extraction Data					
Sample ID	% Solids	% Water	Date	Sample Weight	Extract Method*	Acid	Required pH	mL DI Water	Observed mL acid	Date	Sample Weight	mL Acid Required	mL DI Water Required	Trap Volume (mL)	
Blank			12-10-08	NA	PSEP	1+1 HCl	<2	NA	NA	12-10-08	100 ml	NA	100ml	100ml	
LCS											↓		↓		1ml spk
OC77 A1											5.069		50 ml		
dup A1											5.011				
spk A1											5.045				
OD15 B2											5.029				1 ml spk
A2											5.035				
dup A2											5.022				
spk A2											5.033				1 ml spk
C2											4.967				
D2											~~4.989~~	4.968			
E2											5.096				
~~OD15 A2 spk2~~											5.011				~~1 ml spk~~
F2											5.089				
G2											5.090				
H2											5.066				
I2											5.003				
J2											5.096				
K2											5.003				
L2											5.010				

* Extarct Methods: **PSEP** = PSEP; **9030A** = 9030A Acid Soluble; **9030AI** = 9030A acid insoluble; **AVS** = Acid Volatile; **Reactive** = SW-846 reactive

Analyst Name: M Date: ~~12-9~~ 12-10-08 Time: 10:00

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Sulfide Digestion Log

Sample ID	% Solids	% Water	Pretreatment Data: Date	Sample Weight	Extract Method*	Acid	Required pH	mL DI Water	Observed mL acid	Sample Extraction Data: Date	Sample Weight	mL Acid Required	mL DI Water Required	Trap Volume (mL)
0015 M2											5.074			
N2											5.094			
O2											5.047			
P2											4.929			
Q2											4.998			
R2											5.089			
S2											4.991			
T2											5.083			
U2											5.006			
dup U2											~~5.013~~	5.013		
spk U2											5.020			1 ml spk
~~training test~~ sample same as DIST2 OC96 A											5.083			

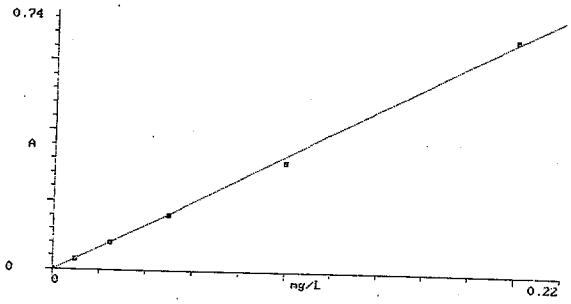
* Extarct Methods: **PSEP** = PSEP; **9030A** = 9030A Acid Soluble; **9030AI** = 9030A acid insoluble; **AVS** = Acid Volatile; **Reactive** = SW-846 reactive

Analyst Name: at Date: 12-10-08 Time: 10:00

12-10-08 at

TEST SETUP
GENESYS 10 v2.100 2D7H048001

Standard Curve	2:38pm 11Dec08
Test Name	SULFIDE
Date Standards Measured	11Dec08
Wavelength	650nm
Ref. Wavelength Correction	Off
Curve Fit	Linear
Number of Standards	6
Units	mg/L
ID# (0=OFF)	1
Low/High Limits	-9999/9999
Statistics	Off
Auto Print	On



Curve Fit	Linear
Slope	3.35
Intercept	-0.00551
Std Dev	0.010
Corr Coeff	0.999

Std #	Conc. mg/L	Abs 650nm
1	0.000	0.000
2	0.010	0.030
3	0.025	0.079
4	0.050	0.163
5	0.100	0.312
6	0.200	0.673

12-11-08 mf

TEST SETUP
GENESYS 10 v2.100 2D7H048001

Advanced A-%T-C	2:40pm 11Dec08
Test Name	SULFIDE[Saved]
Measurement Mode	Absorbance
Wavelength	650nm
Ref. Wavelength Correction	Off
Delay Time (min:sec)	0:00
ID# (0=OFF)	1
Low/High Limits	0.050/1.000
Statistics	Off
Auto Print	On

ID#	Abs 650nm	
1	0.000	Low
2	0.334	

Statistics
Auto Print

Utt
On

ID#	Abs 650nm	
1	0.000	Low
2	0.334	
3	0.000	Low
4	0.422	
5	0.144	
6	0.157	
7	0.312	
8	0.272	
9	0.341	
10	0.559	
~~11~~	~~0.512~~	
12	0.000	Low
13	0.306	
14	0.303	
15	0.626	
16	0.949	
17	1.226	High
18	1.835	High
19	0.666	
20	0.590	
21	1.626	High
22	0.394	
23	0.505	

24	0.000	Low
25	0.312	
26	0.703	
27	0.374	
28	0.484	
29	0.483	
30	0.329	
31	0.659	
32	0.387	
33	1.177	High
34	0.000	Low
35	0.325	
36	0.265	
37	0.368	
38	0.389	
39	0.227	
40	0.257	
41	0.255	
42	0.322	
43	0.519	
44	0.479	
45	0.258	
46	0.000	Low
47	0.330	
48	0.426	
49	0.366	

37	0.368	
38	0.389	
39	0.227	
40	0.257	
41	0.255	
42	0.322	
43	0.519	
44	0.479	
45	0.258	
46	0.000	Low
47	0.330	
48	0.426	
49	0.366	
50	0.375	
51	0.668	
~~52~~	~~0.004~~	~~Low~~
53	0.000	Low
54	0.328	

W
12-16-08

SULFIDE BENCHSHEET (Spectrophotometric, EPA 376.2)
Soils, sediments and solid phase samples

	Date Time	Analyst
Distillation	12/8/08 8:30	CLH/AF
Finish	12/9/08 14:00	AF

If distilled, specify Procedure: **PSEP**

1. Standardization of sodium thiosulfate titrant

Buret used for titrations:

Thiosulfate ID: **6752C**
Bi-iodate ID: **0086-10**
Stock bi-iodate = **0.8125** *grams to* 1000 *mL*
Normality = **0.025**

Titration of bi-iodate with thiosulfate

mL bi-iodate =	3.000	3.000	3.000	
mL thiosulfate =	3.09	3.04	3.07	*nthio*
*Normality thiosulfate = (mL bi-iodate*normbio) / mL thiosulfate =*	0.024	0.025	0.024	**0.024**

2. Normality of Iodine

Iodine ID: **6637C**

Titration of Iodine with thiosulfate

mL iodine =	3.000	3.000	3.000	
mL thiosulfate =	2.790	2.800	2.790	*ni*
*Normality iodine = (mL thiosulfate*nthio) / mL iodine=*	0.023	0.023	0.023	**0.023**

3. Standardization of Sodium Sulfide Stock

Stock ID = **0088-2**
Approx conc in 100ml
g Na2S = 0.5840 *mg /mL =* 0.780

Titration of standard with thiosulfate

mL Standard =	1.00	1.00	1.00	
mL iodine =	3.00	3.00	3.00	
mL thiosulfate =	1.34	1.33	1.36	*stkconc (mg/mL)*
*Sulfide (mg/mL) = {[(mL iodine*ni)-(mL thio *nthio)]*16} / mL standard =*	0.569	0.573	0.561	**0.568**

Intermediate Standard

Add 8.8 *mL stk to* 200 *mL 0.01M NaOH =* **0.025** ***mg/mL***

4. Calibration Standard Curve

spectrophotometer used:

Inter Std Volume (mL)	Final Volume (mL)	Calc Conc (mg S/L)	Absorbance @650 nm 1	Absorbance @650 nm 2	AVG ABS	mg/L
0.00	50	0.000	0.000		0.000	*0.002*
0.10	50	0.050	0.024		0.024	*0.051*
0.25	50	0.125	0.062		0.062	*0.130*
0.50	50	0.250	0.122		0.122	*0.253*
1.00	50	0.499	0.232		0.232	*0.480*
2.00	50	0.999	0.488		0.488	*1.007*
Calib Verif Std =	1	*ml int to*	50	*ml ZnOAc=*		0.499 *mg/l*
Distillation Std =	1	*ml stk to*	100	=		5.68 *mg/l*

RegressionData

intercept = -0.001
slope = 0.485
r = 0.9997

Comment: Calibration OK!

maxabs = 0.488

SAMPLE DATA

enter dilution as mL final/mL sample

	Distillation Data			Spectrophotometric Data				SAMPLE DATA	
SAMPLE ID	SAMPLE SIZE	% Solids	TRAP VOLUME (ml)	Dilution Factor	Abs @ 650 nm Sample	Abs @ 650 nm Bkg	regressed Conc (mg S/L)	CORR CONC (ppm)	
ICB		na	na	1.00	0.000		0.002	< 0.05	*OK*
ICV		na	na	1.00	0.249		0.515	0.515	*103%*
Distilled samples									
Dist Blk	100.0	100%	100	1.00	-0.005		-0.008	< 0.05	*OK*
~~Dist Chk~~	~~100.0~~	~~100%~~	~~100~~	~~1.00~~	~~2.492~~		~~5.135~~	~~5.135~~	~~offscale~~
Soil Samples	**(grams)**	**% Solids**	**(mL)**		**Sample**	**Bkg**	**(mg/L)**	**mg/kg**	
~~OC34 N2~~	~~4.999~~	~~84.40%~~	~~100~~	~~1.00~~	~~2.693~~		~~5.549~~	~~131.528~~	~~offscale~~
~~OC46 A4~~	~~4.916~~	~~82.70%~~	~~100~~	~~10.00~~	~~-0.006~~		~~-0.011~~	~~< 12.284~~	-
OC46 B4	4.977	82.00%	100	1.00	0.012		0.027	< 1.224	
OC66 G3	4.875	85.20%	100	1.00	0.006		0.014	< 1.202	
OC66 L3	5.097	65.60%	100	1.00	0.222		0.459	13.732	
~~OC77 A1~~	~~5.053~~	~~53.30%~~	~~100~~	~~1.00~~	~~0.152~~		~~0.315~~	~~11.694~~	-
Cal Blk		na	na	1.00	0.000		0.002	< 0.05	*OK*
CCV		na	na	1.00	0.236		0.488	0.488	*98%*
~~OC77 A1 dup~~	~~5.015~~	~~53.30%~~	~~100~~	~~1.00~~	~~0.897~~		~~1.850~~	~~69.197~~	~~offscale~~
~~OC77 A1 ms~~	~~4.977~~	~~53.30%~~	~~100~~	~~10.00~~	~~0.404~~		~~0.834~~	~~314.419~~	~~141.51%~~
		~~*Spike at*~~	~~*1.00*~~	~~*ml stock to*~~	~~2.653~~	~~*g dry wt =*~~		~~*213.931*~~	~~*mg/kg*~~
OC77 B1	4.961	45.70%	100	1.00	0.389		0.803	35.426	
~~OC77 C1~~	~~5.015~~	~~46.80%~~	~~100~~	~~1.00~~	~~0.825~~		~~1.701~~	~~72.489~~	~~offscale~~
OC77 D1	5.074	51.40%	100	1.00	0.011		0.024	< 1.915	

SAMPLE DATA

enter dilution as mL final/mL sample

	Distillation Data			Spectrophotometric Data				SAMPLE DATA	
SAMPLE ID	SAMPLE SIZE	% Solids	TRAP VOLUME (ml)	Dilution Factor	Abs @ 650 nm Sample	Bkg	regressed Conc (mg S/L)	CORR CONC (ppm)	
~~OC80 A1~~	~~5.133~~	~~82.80%~~	~~100~~	~~1.00~~	~~0.154~~		~~0.319~~	~~7.507~~	-
~~OC80 A1 dup~~	~~5.030~~	~~82.80%~~	~~100~~	~~1.00~~	~~0.062~~		~~0.130~~	~~3.111~~	~~RPD=82.81%~~
~~OC80 A1 ms~~	~~5.048~~	~~82.80%~~	~~100~~	~~10.00~~	~~0.286~~		~~0.591~~	~~141.395~~	~~98.61%~~
		~~Spike at~~	~~1.00~~	~~ml stock to~~	~~4.180~~	~~g dry wt =~~		~~135.775~~	~~mg/kg~~
OC80 B1	5.079	82.00%	100	1.00	0.002		0.006	< 1.199	
OC80 C1	5.163	83.60%	100	1.00	0.010		0.022	< 1.157	
OC80 D1	5.075	85.70%	100	1.00	0.089		0.185	4.258	
Dist Chk	100.000	100%	100	10.00	0.288		0.595	5.951	105%
OC46 A4	4.916	82.70%	100	1.00	0.005		0.012	< 1.228	
~~OC77 A1~~	~~5.053~~	~~53.30%~~	~~100~~	~~1.00~~	~~0.173~~		~~0.358~~	~~13.301~~	-
~~OC77 A1 dup~~	~~5.015~~	~~53.30%~~	~~100~~	~~2.00~~	~~0.442~~		~~0.912~~	~~68.264~~	~~RPD=134.77%~~
~~OC77 A1 ms~~	~~4.977~~	~~53.30%~~	~~100~~	~~10.00~~	~~0.395~~		~~0.816~~	~~307.430~~	~~137.49%~~
		~~Spike at~~	~~1.00~~	~~ml stock to~~	~~2.653~~	~~g dry wt =~~		~~213.931~~	~~mg/kg~~
OC77 C1	5.015	46.80%	100	2.00	0.425		0.877	74.761	
OC80 A1	5.133	82.80%	100	1.00	0.155		0.321	7.556	
OC80 A1 dup	5.030	82.80%	100	1.00	0.060		0.125	3.012	RPD=86%
OC80 A1 ms	5.048	82.80%	100	10.00	0.282		0.583	139.424	97.12%
		Spike at	1.00	ml stock to	4.180	g dry wt =		135.775	mg/kg
Cal Blk		na	na	1.00	0.000		0.002	< 0.05	OK
CCV		na	na	1.00	0.232		0.480	0.480	96%

SULFIDE BENCHSHEET (Spectrophotometric, EPA 376.2)	Date / Time	Analyst
Aqueous Samples — Distillation	12-8-08 8:30	CLH / af
Finish	12-9-08 14:00	af

If distilled, specify procedure: 9030 B / PSEP

1. Standardization of sodium thiosulfate titrant — Buret used for titrations: ______

Thiosulfate ID: 6752C

Bi-iodate ID: 0086-10

Stock bi-iodate = 0.4065 grams to 500 mL

Normality = 0.025

Titration of bi-iodate with thiosulfate				
ml bi-iodate =	3.00 ~~2.000~~	3.00 ~~2.000~~	3.00 ~~2.000~~	
ml thiosulfate =	3.09	3.04	3.07	nthio
Normality thiosulfate = (mL bi-iodate*normality) / mL thiosulfate =				

2. Normality of Iodine

Iodine ID: 6637C

Titration of iodine with thiosulfate				
mL Iodine =	3.000	3.000	3.000	
mL thiosulfate =	2.79	2.80	2.79	ni
Normality iodine = (mL thiosulfate*normality) / mL iodine=				

3. Standardization of sodium sulfide stock

Stock ID = 0088-2

Approx conc in 100ml

g Na2S 0.5840 mg/ mL =

Titration of standard with Thiosulfate				
mL Standard =	1.00	1.00	1.00	
mL Iodine =	3.00	3.00	3.00	
mL thiosulfate =	1.34	1.33	1.36	stkconc (mg/mL)
Sulfide (mg/mL) = {[(mL iodine*ni)-(mL thio *nthio)]*16} / mL standard =				

Intermediate Standard

Add 8.80 ml stk to ______ ml 0.01 M NaOH = ______ mg/mL

5.0 Calibration Standard Curve — spectrophotometer used

Volume Intermediate (ml)	FINAL VOLUME (ml)	CONC (mg S/L)	ABSORBANCE @ 650 nm 1	2	Avg
0.00	50		0.000		
0.10	50	#VALUE!	0.024		
0.25	50	#VALUE!	0.062		
0.50	50	#VALUE!	0.122		
1.00	50	#VALUE!	0.232		
2.00	50	#VALUE!	0.488		

REGRESSION DATA

intercept

slope

r=

Comment:

maxabs =

Calib Verif Std = 1 ml int to 50 ml ZnOAc = #VALUE! mg/L

Distillation Std = 0.5 ml Stk to 50 = #VALUE! mg/L

SAMPLE DATA — enter dilution factor as ml final/mL sample

% solids	SAMPLE ID	DISTILL DATA: Sample Volume	Distill Volume (mL)	SPECTROPHOTOMETRIC DATA: Dilution factor	ABS @ 650 nm	~~BKG ABS~~ Sample Weight	Regressed Conc (mg S/L)	SAMPLE DATA: Final Conc mg S/L
	Cal Blk		n/a	1.00	0.000	NA		
	ICV		n/a	1.00	0.249			
Na	Blank	100 ~~50.0~~	100	1.00	-0.003			distilled waters
	LCS	100 ~~50.0~~		10X ~~1.00~~	0.343			
	OC48 A7	50.0		5X ~~1.00~~	0.446			
	B7	50.0		1.00	0.019			
	C7	50.0		1.00	0.014			
	OC65A18	50.0		1.00	0.038			
	OC69 C6	50.0		1.00	1.170			
	dup C6	50.0		1.00	0.939			
	spk C6	50.0		10X ~~1.00~~	0.425			
	OC69 d6	50.0		1.00	0.021			
	Cal Blk	50.0	n/a	1.00	0.000			
	CCV	50.0	n/a	1.00	0.227			
	OC69 E5	50.0	100	1.00	-0.020			non-distilled water
remaining sample for ame...	OC95 A5	50.0		1.00	-0.019			
	Blank	50.0		1.00	-0.005			distilled soils
	LCS	50.0		1.00	2.492			
84.4	OC34 N2	50.0		1.00	2.693	4.999		
82.7	OC46 A4	50.0		10X ~~1.00~~	-0.006	4.916		
82.0	B4	50.0		1.00	0.012	4.977		
85.2	OC66 G3	50.0		1.00	0.006	4.875		
65.6	L3	50.0		1.00	0.222	5.097		
53.3	OC77 A1	50.0		1.00	0.152	5.053		
	Cal Blk	50.0	n/a	1.00	0.000	NA		
	CCV	50.0	n/a	1.00	0.236	NA		

SULFIDE BENCHSHEET (Spectrophotometric, EPA 376.2)
Aqueous Samples

	Date / Time	Analyst
Distillation		
Finish		

If distilled, specify procedure: _____

1. Standardization of sodium thiosulfate titrant — *Buret used for titrations:* _____

Thiosulfate ID: _____
Bi-iodate ID: _____
Stock bi-iodate = 0.4065 *grams to* 500 *mL*
Normality = 0.025

Titration of bi-iodate with thiosulfate				
ml bi-iodate =	2.000	2.000	2.000	
ml thiosulfate =				nthio
Normality thiosulfate = (mL bi-iodate*normality) / mL thiosulfate =				

2. Normality of Iodine
Iodine ID: _____

Titration of Iodine with thiosulfate				
mL Iodine =	3.000	3.000	3.000	
mL thiosulfate =				ni
Normality iodine = (mL thiosulfate*normality) / mL iodine=				

3. Standardization of sodium sulfide stock
Stock ID = _____
Approx conc in 100ml
g Na2S _____ *mg/ mL =* _____

Titration of standard with Thiosulfate				
mL Standard =	1.00	1.00	1.00	
mL Iodine =	3.00	3.00	3.00	
mL thiosulfate =				stkconc (mg/mL)
Sulfide (mg/mL) = {[(mL iodine*ni)-(mL thio *nthio)]*16} / mL standard =				

Intermediate Standard
Add _____ *ml stk to* _____ *ml 0.01 M NaOH =* _____ **mg/mL**

5.0 Calibration Standard Curve — *spectrophotometer used*

Volume Intermediate (ml)	FINAL VOLUME (ml)	CONC (mg S/L)	ABSORBANCE @ 650 nm 1	2	Avg	
0.00	50					
0.10	50	#VALUE!				
0.25	50	#VALUE!				
0.50	50	#VALUE!				
1.00	50	#VALUE!				
2.00	50	#VALUE!				

REGRESSION DATA
Intercept
slope
r=
Comment:
maxabs =

Calib Verif Std =	*1*	*ml int to*	*50*	*ml ZnOAc =*	**#VALUE!** *mg/L*
Distillation Std =	*0.5*	*ml Stk to*	*50*	*=*	**#VALUE!** *mg/L*

SAMPLE DATA — *enter dilution factor as ml final/mL sample*

SAMPLE ID	DISTILL DATA Sample Volume	Distill Volume (mL)	SPECTROPHOTOMETRIC DATA Dilution factor	ABS @ 650 nm	BKG ABS (Sample Without)	Regressed Conc (mg S/L)	SAMPLE DATA Final Conc mg S/L
~~Cal Blk~~		~~n/a~~	~~1.00~~		~~NA~~		
~~ICV~~		~~n/a~~	~~1.00~~		~~NA~~		
OC77 A1	50.0	10	1.00	0.897	5.015		dissolved solids
~~Spk~~ A1	50.0		~~10X 1.00~~	0.404	4.977		
B1	50.0		1.00	0.389	4.961		
C1	50.0		1.00	0.825	5.015		
d1	50.0		1.00	0.011	5.074		
OC80 A1	50.0		1.00	0.154	~~5.135~~	133	
dup A1	50.0		1.00	0.062	5.030		
SpK A1	50.0		~~10X 1.00~~	0.286	5.048		
B1	50.0		1.00	0.002	5.079		
C1	50.0		1.00	0.010	5.163		
~~Cal Blk~~	~~50.0~~	~~n/a~~	~~1.00~~		~~NA~~		
~~CCV~~	~~50.0~~	~~n/a~~	~~1.00~~		~~NA~~		
~~OC80 d1~~	50.0		~~10 1.00~~				
~~OC64 C1~~	50.0		~~1X 5X 1.00~~				
~~dup C1~~	50.0		~~5X 1.00~~				
~~dup spk C1~~	50.0		~~10X 1.00~~				
~~Spk A1~~	50.0		1.00				
	50.0		1.00				
	50.0		1.00				
	50.0		1.00				
	50.0		1.00				
	50.0		1.00				
Cal Blk	50.0	n/a	1.00				
CCV	50.0	n/a	1.00				

% solids
53.3 dup
53.3
45.7
46.8
51.4
82.8
82.0
83.6
LCS
OC46
OC77 A1
A1
A1

SULFIDE BENCHSHEET (Spectrophotometric, EPA 376.2) | Date / Time | Analyst
Aqueous Samples — *Distillation* | | | *Finish* | | |

If distilled, specify procedure: _____

1. Standardization of sodium thiosulfate titrant — *Buret used for titrations:* _____

Thiosulfate ID: _____
Bi-iodate ID: _____

Stock bi-iodate = 0.4065 *grams to* 500 *mL* — *Normality =* 0.025

*Normality thiosulfate = (mL bi-iodate*normality) / mL thiosulfate =*

	Titration of bi-iodate with thiosulfate			
ml bi-iodate =	2.000	2.000	2.000	
ml thiosulfate =				*nthio*

2. Normality of Iodine

Iodine ID: _____

*Normality iodine = (mL thiosulfate*normality) / mL iodine=*

	Titration of Iodine with thiosulfate			
mL Iodine =	3.000	3.000	3.000	
mL thiosulfate =				*ni*

3. Standardization of sodium sulfide stock

Stock ID = _____
Approx conc in 100ml
g Na2S _____ *mg/ mL =*

*Sulfide (mg/mL) = {[(mL iodine*ni)-(mL thio *nthio)]*16} / mL standard =*

	Titration of standard with Thiosulfate			
mL Standard =	1.00	1.00	1.00	
mL iodine =	3.00	3.00	3.00	
mL thiosulfate =				*stkconc (mg/mL)*

Intermediate Standard

Add _____ *ml stk to* _____ *ml 0.01 M NaOH =* _____ **mg/mL**

5.0 Calibration Standard Curve — *spectrophotometer used*

Volume Intermediate (ml)	FINAL VOLUME (ml)	CONC (mg S/L)	ABSORBANCE @ 650 nm 1	2	Avg	
0.00	50					
0.10	50	#VALUE!				
0.25	50	#VALUE!				
0.50	50	#VALUE!				
1.00	50	#VALUE!				
2.00	50	#VALUE!				

REGRESSION DATA

intercept
slope
r=
Comment:
maxabs =

Calib Verif Std =	*1*	*ml int to*	*50*	*ml ZnOAc =*	***#VALUE!***	*mg/L*
Distillation Std =	*0.5*	*ml Stk to*	*50*	*=*	***#VALUE!***	*mg/L*

SAMPLE DATA — *enter dilution factor as ml final/mL sample*

	DISTILL DATA		SPECTROPHOTOMETRIC DATA				SAMPLE DATA
SAMPLE ID	Sample Volume	Distill Volume (mL)	Dilution factor	ABS @ 650 nm	BKG ABS (Sample weighted)	Regressed Conc (mg S/L)	Final Conc mg S/L
Cal Blk		n/a	1.00		NA		
ICV		n/a	1.00		NA		
OC80 d1	50.0	100	1.00	0.089	5.075		distilled soils
LCS	50.0		10X 1.00	0.288	NA		
OC46 A4	50.0		1X 1.00	0.005	4.916		
OC77 A1	50.0		1X 1.00	0.173	5.053		
dup A1	50.0		2X 1.00	0.442	5.015		
spk A1	50.0		10X 1.00	0.395	4.977		
OC77 C1	50.0		2X 1.00	0.425	5.015		
OC80 A1	50.0		1.00	0.155	5.133		
dup A1	50.0		1.00	0.060	5.030		
spk A1	50.0		10X 1.00	0.282	5.048		
Cal Blk	50.0	n/a	1.00	0.000	NA		
CCV	50.0	n/a	1.00	0.232	NA		
LCS	50.0	100	1.00	0.320	NA		distilled waters
OC64 C6	50.0		10X 1.00	0.129			
dup C6	50.0		10X 1.00	0.097			
spk C6	50.0		10X 10X 1.00	0.411			
CCB	50.0		1.00	0.000	NA		
CCV	50.0		1.00	0.229	NA		
	50.0		1.00				
	50.0		1.00				
	50.0		1.00				
	50.0		1.00				
Cal Blk	50.0	n/a	1.00				
CCV	50.0	n/a	1.00				

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Sulfide Digestion Log

Sample ID	% Solids	% Water	Pretreatment Data: Date	Sample Weight	Extract Method*	Acid	Required pH	mL DI Water	Observed mL acid	Sample Extraction Data: Date	Sample Weight	mL Acid Required	mL DI Water Required	Trap Volume (mL)
Blank			12-8-06	NA	9030B	H_2SO_4	2.2	NA	NA	12-8-06	100 mL	2.0	50	100
LCS												2.0		
OC65A18														
OC69C6														
dup														
MS														
OC48 A7														
B7									.1			2.4		
C7									.2			2.8		
OC69 d6					PSEP	HCl			.2			2.8		
Blank									.3			3.2		
LCS									NA			NA		
OC80 c1														
d1											5.163			
OC80 A1											5.075			
dup A1											5.133			
Spk A1											5.030			
B1											5.048			
OC34N2											5.079			
OC66G3											4.999			
											4.875			

Water

1 ml spk

1 ml spk

Soil

1 ml spk

* Extarct Methods: **PSEP** = PSEP; **9030A** = 9030A Acid Soluble; **9030AI** = 9030A acid insoluble; **AVS** = Acid Volatile; **Reactive** = SW-846 reactive

Analyst Name: ~~KJ 8.06~~ MA Date: 12-8-06 Time: 8:30

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Sulfide Digestion Log

Sample ID	% Solids	% Water	Pretreatment Data: Date	Sample Weight	Extract Method*	Acid	Required pH	mL DI Water	Observed mL acid	Sample Extraction Data: Date	Sample Weight	mL Acid Required	mL DI Water Required	Trap Volume (mL)
OC66L3			12-8-08	NA	PSEP	~~HCl~~ AA	<2	NA	NA	12-8-08	5.097	NA	50	100
OC46 A4											4.916			
B4											4.977			
OC77 B1											4.961			
C1											5.045			
d1											5.074			
~~OC77~~ ~~A1~~											5.053			
OC77 dup A1											5.015			
spk A1											4.977			

1ml spk

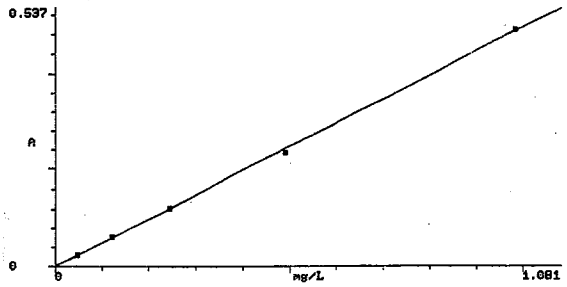
12-8-08 at

* Extarct Methods: **PSEP** = PSEP; **9030A** = 9030A Acid Soluble; **9030AI** = 9030A acid insoluble; **AVS** = Acid Volatile; **Reactive** = SW-846 reactive

Analyst Name: at Date: 12-8-08 Time: 8:30

TEST SETUP
GENESYS 10 v2.021 2G2G048006

Standard Curve	16:19 9Dec08
Test Name	SULFIDE
Date Standards Measured	9Dec08
Wavelength	650nm
Ref. Wavelength Correction	Off
Curve Fit	Linear
Number of Standards	6
Units	mg/L
ID# (0=OFF)	Off
Low/High Limits	0.050/1.000
Statistics	Off
Auto Print	On



Curve Fit	Linear
Slope	0.493
Intercept	-0.000893
Std Dev	0.005
Corr Coeff	1.000

Conc. mg/L	Abs 650nm
0.000	0.000
0.049	0.024
0.123	0.062
0.246	0.122
0.491	0.232
0.983	0.488

TEST SETUP
GENESYS 10 v2.021 2G2G048006

Advanced A-%T-C	16:22 9Dec08
Test Name	SULFIDE[Saved]
Measurement Mode	Absorbance
Wavelength	650nm
Ref. Wavelength Correction	Off
Delay Time (min:sec)	0:00
ID# (0=OFF)	1
Low/High Limits	0.000/1.000
Statistics	Off
Auto Print	On

ID#	Abs 650nm
1	0.000
2	0.249
3	-0.003

Prep Blk

1	0.000	
2	0.249	
3	-0.003	Prep Blk
4	0.343	LCS
5	0.446	~~soil~~ water
6	0.019	
7	0.014	
8	0.038	
9	1.170	
10	0.939	
11	0.425	
12	0.021	
13	0.000	CCB
14	0.227	CCV

14	0.227	ccv
~~15~~	~~-0.020~~	
16	-0.020	training
17	-0.019	water
18	-0.005	soils
19	2.492	
20	2.693	
21	-0.006	
22	0.012	
23	0.006	
24	0.222	
25	0.152	
26	0.000	ccb
27	0.236	ccv
28	0.897	soil

26	0.000	CCB
27	0.236	CCV
28	0.897	SOIL
29	0.404	
30	0.389	
31	0.825	
32	0.011	
33	0.154	
34	0.062	
35	0.286	
36	0.002	
37	0.010	
38	0.089	
39	0.288	
40	0.005	

39	0.288	
40	0.005	
41	0.173	
42	0.442	
43	0.395	
44	0.425	
45	0.155	
46	0.060	
47	0.282	
48	~~-0.048~~	
49	0.000	CCB
50	0.232	CCV
51	0.320	LCS water
52	0.129	

45 0.155

46 0.060

47 0.282

48 ~~-0.018~~

49 0.000 CCB

50 0.232 CCV

51 0.320 LCS water

52 0.129

~~53 0.097~~

54 0.097

55 0.411

56 0.000 CCB

57 0.229 CCV

Geotech Analysis

prepared
for

HART CROWSER, INC.

Project: PORT GAMBLE

ARI JOB NO: OC77

prepared
by

Analytical Resources, Inc.

Hart Crowser, Inc.
Port Gamble 17330-14

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	
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
STATION 42 S-3	100.0	100.0	100.0	99.8	99.3	98.3	95.5	84.4	69.9	53.8	40.6	30.8	23.8	16.5
STATION 42 S-3	100.0	100.0	99.9	99.6	99.1	98.2	95.4	83.8	69.5	54.0	40.5	31.1	23.4	16.4
STATION 42 S-3	100.0	100.0	99.9	99.8	99.4	98.5	95.7	84.1	69.0	54.3	41.0	30.7	23.3	16.2
STATION 42 S-1	100.0	100.0	99.6	98.0	95.5	92.7	85.1	65.5	50.6	38.1	28.3	21.5	15.5	9.8
STATION 42 S-2	100.0	100.0	99.6	99.0	97.6	95.2	90.0	74.8	60.6	47.9	36.6	28.2	20.4	12.8
STATION 42 S-4	100.0	100.0	99.8	99.0	98.1	95.7	91.0	76.8	63.3	49.1	36.4	28.0	21.0	14.2

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.

OC77

Hart Crowser, Inc.
Port Gamble 17330-14

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
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)
STATION 42 S-3	0.0	0.2	0.5	1.0	2.7	11.1	14.5	16.1	13.2	9.8	7.1	7.3	16.5	84.4
STATION 42 S-3	0.1	0.3	0.5	0.9	2.8	11.6	14.3	15.5	13.5	9.4	7.8	7.0	16.4	83.8
STATION 42 S-3	0.1	0.1	0.4	0.9	2.8	11.6	15.2	14.7	13.2	10.3	7.5	7.1	16.2	84.1
STATION 42 S-1	0.4	1.6	2.6	2.8	7.6	19.7	14.9	12.4	9.8	6.8	6.0	5.8	9.8	65.5
STATION 42 S-2	0.4	0.6	1.4	2.4	5.2	15.3	14.2	12.7	11.4	8.4	7.7	7.6	12.8	74.8
STATION 42 S-4	0.2	0.7	1.0	2.4	4.7	14.3	13.5	14.1	12.7	8.4	7.0	6.8	14.2	76.8

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.

QA SUMMARY

Client:	Hart Crowser, Inc.	Project No.:	Port Gamble 17330-14
ARI Trip. Sample ID:	OC77C	Batch No.:	OC77-1
Client Trip. Sample ID:	STATION 42 S-3	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
TATION 42 S-	100.0	100.0	100.0	99.8	99.3	98.3	95.5	84.4	69.9	53.8	40.6	30.8	23.8	16.5
TATION 42 S-	100.0	100.0	99.9	99.6	99.1	98.2	95.4	83.8	69.5	54.0	40.5	31.1	23.4	16.4
TATION 42 S-	100.0	100.0	99.9	99.8	99.4	98.5	95.7	84.1	69.0	54.3	41.0	30.7	23.3	16.2
AVE	NA	100.00	99.94	99.74	99.25	98.32	95.55	84.12	69.45	54.00	40.72	30.91	23.48	16.36
STDEV	NA	0.00	0.03	0.08	0.14	0.17	0.16	0.29	0.46	0.24	0.28	0.20	0.25	0.15
%RSD	NA	0.00	0.03	0.08	0.14	0.18	0.17	0.35	0.67	0.44	0.68	0.64	1.07	0.92

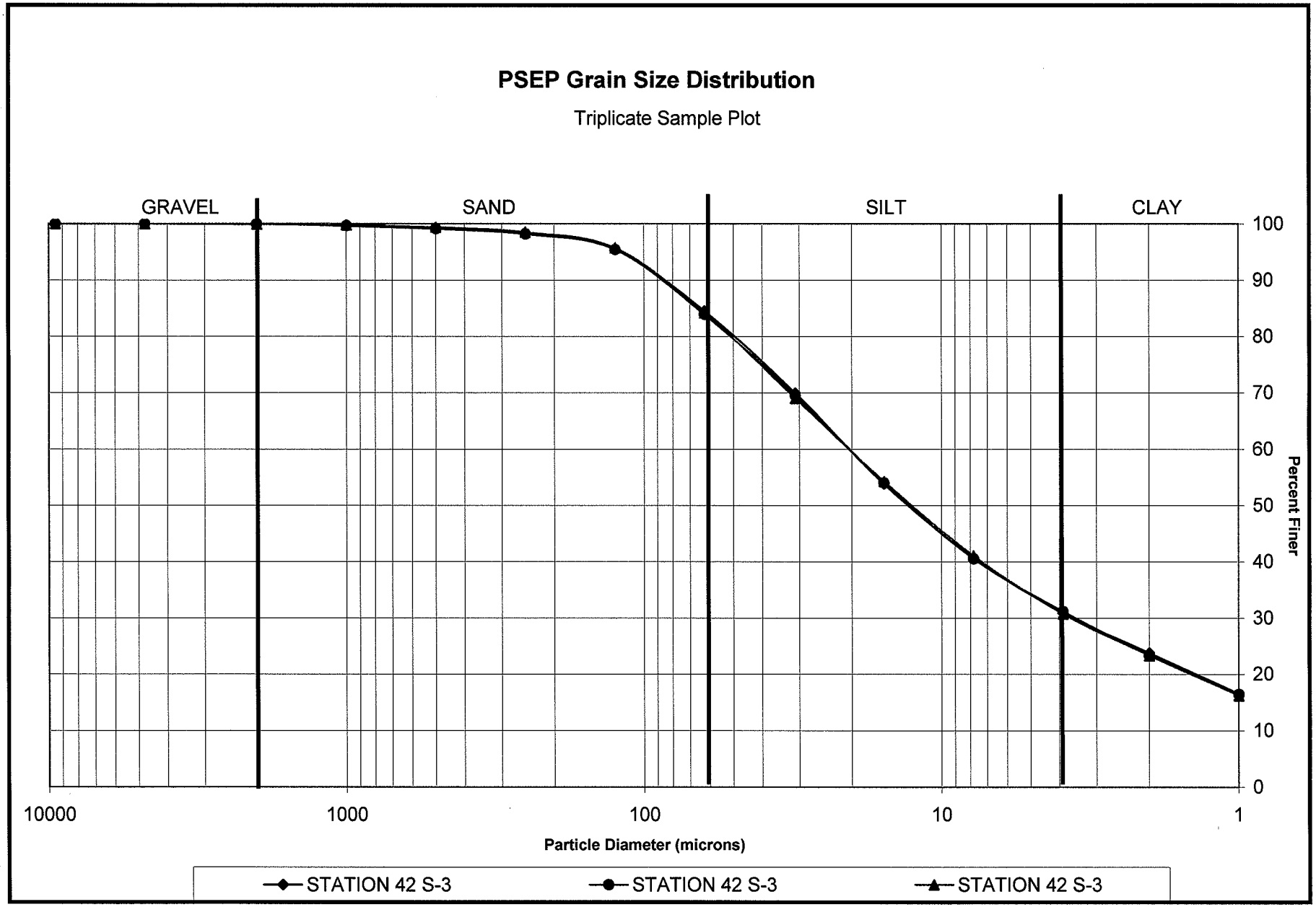
The Triplicate Applies To The Following Samples

Client ID	Date Sampled	Date Extracted	Date Complete	QA Ratio (95-105)	Data Qualifiers	Pipette Portion (5.0-25.0g)
STATION 42 S-3	12/3/2008	12/31/2008	1/8/2009	100.2		13.1
STATION 42 S-3	12/3/2008	12/31/2008	1/8/2009	99.9		13.1
STATION 42 S-3	12/3/2008	12/31/2008	1/8/2009	101.2		13.1
STATION 42 S-1	12/3/2008	12/31/2008	1/8/2009	100.6		11.6
STATION 42 S-2	12/3/2008	12/31/2008	1/8/2009	101.2		10.7
STATION 42 S-4	12/3/2008	12/31/2008	1/8/2009	102.4		14.4

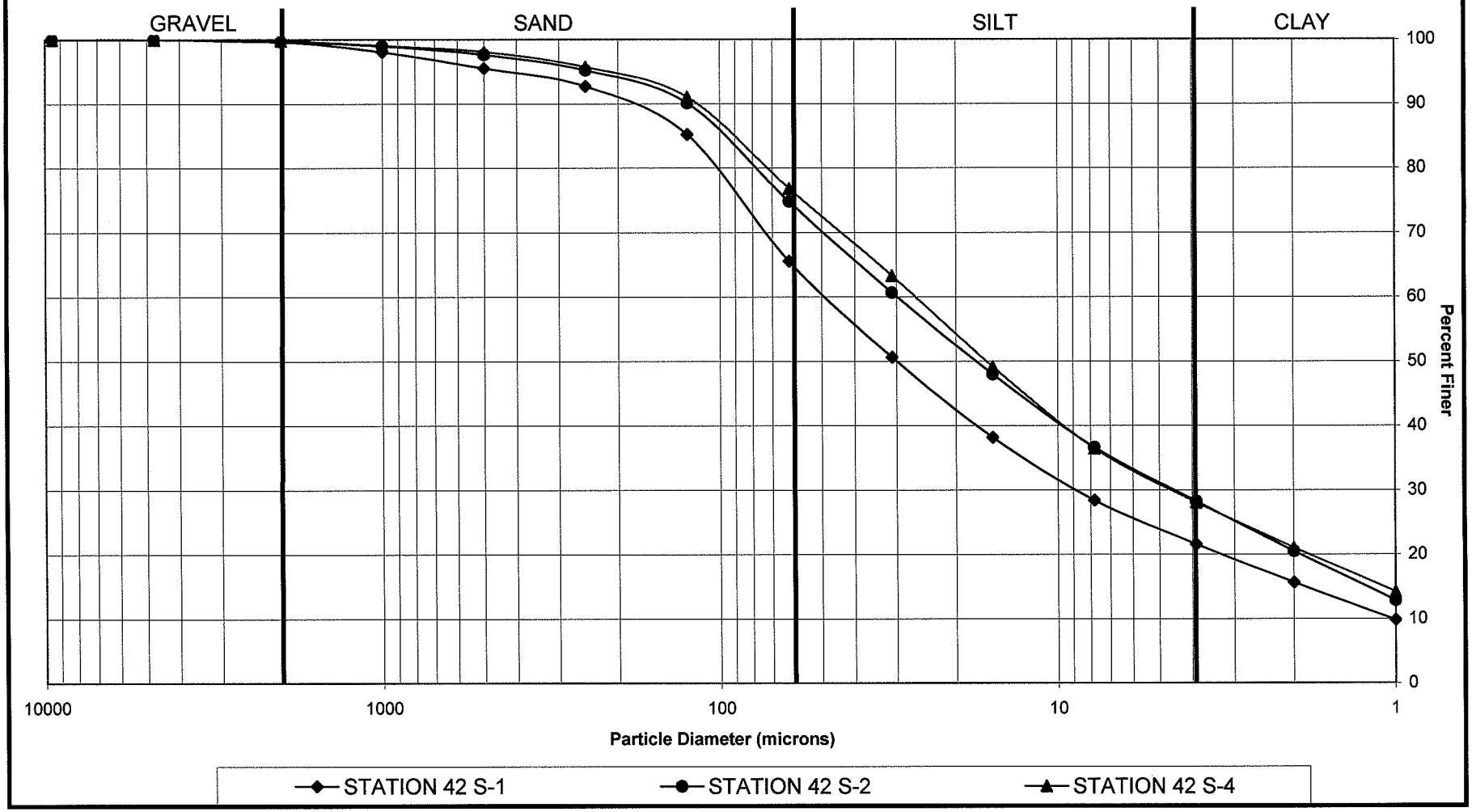
* ARI Internal QA limits = 95-105%

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.


PSEP Grain Size Distribution
Triplicate Sample Plot
GRAVEL
SAND
SILT
CLAY
100
90
80
70
60
50
40
30
20
10
0
Percent Finer
10000
1000
100
10
1
Particle Diameter (microns)
STATION 42 S-3
STATION 42 S-3
STATION 42 S-3

PSEP Grain Size Distribution



PSEP GRAIN SIZE ANALYSIS

Job No. OC77 ARI Sample No. C-1 Client Sample No. STATION 42 S-3

Set-up Date: 12-31-08 Sample Description: Silty Clay

Calgon Batch # 193 Sieve Set # 1 Date Sieved: 1/5/09

SOLIDS CONTENT

Moisture Content	Initials BR
Container No.	100
Tare Weight	1.5058
Wet Weight + Tare	17.3700
Dry Weight + Tare	8.9772

Test Sample	Initials BR
Container No.	100
Tare Weight	51.4082
Wet Weight + Tare	84.2865
Dry Weight + Tare	55.5458

SIEVE ANALYSIS
Initials AR

Sieve Size	Weight Retained
Tare	51.4121
4	
10	51.4163
18	51.4453
35	51.5272
60	51.6796
120	52.1050
230	53.8255
PAN	1.7957

1/7/2009
Temp:23

Correction	
Wt.	
+ Dry Sample	
Correction (x 50)	

PIPETTE ANALYSIS
Initials BR

Tare ID	Tare Wt	Dry Wt & Tare	TIME
C-1-1	1.4731	1.7430	10:10:00
C-1-2	1.4781	1.7032	10:11:46
C-1-3	1.4756	1.6509	10:17:05
C-1-4	1.5071	1.6417	10:38:18
C-1-5	1.4938	1.5982	12:03:00
C-1-6	1.4876	1.5701	15:36:00
C-1-7	1.4842	1.5442	8:46:00

PSEP GRAIN SIZE ANALYSIS

Job No. OC77 ARI Sample No. C-2 Client Sample No. S

Set-up Date: 12-31-08 Sample Description:

Calgon Batch # 193 Sieve Set # 2 Date Sieved: 1/5/09

SOLIDS CONTENT

Moisture Content	Initials BR
Container No.	137
Tare Weight	1.5030
Wet Weight + Tare	20.8392
Dry Weight + Tare	10.6097

Test Sample	Initials BR
Container No.	137
Tare Weight	51.0562
Wet Weight + Tare	84.2961
Dry Weight + Tare	55.8026

SIEVE ANALYSIS

Initials AR

Sieve Size	Weight Retained
Tare	51.0616
4	
10	51.0695
18	51.1172
35	51.2014
60	51.3471
120	51.7803
230	53.5937
PAN	2.2756

1/7/2009

Temp:23

Correction	
Wt.	
+ Dry Sample	
Correction (x 50)	

PIPETTE ANALYSIS

Initials BR

Tare ID	Tare Wt	Dry Wt & Tare	TIME
C-2-1	1.4908	1.7626	10:13:00
C-2-2	1.4994	1.7262	10:13:20
C-2-3	1.5046	1.6828	10:14:46
C-2-4	1.5157	1.6517	10:20:05
C-2-5	1.5046	1.6112	10:41:18
C-2-6	1.4925	1.5748	12:06:00
C-2-7	1.4887	1.5492	15:39:00
			8:49:00

PSEP GRAIN SIZE ANALYSIS

Job No. 0C77 ARI Sample No. C-3 Client Sample No. _____

Set-up Date: 12.31.08 Sample Description: _____

Calgon Batch # 193 Sieve Set # 1 Date Sieved: 1/5/09

SOLIDS CONTENT

Moisture Content	Initials BM
Container No.	138
Tare Weight	1.4892
Wet Weight + Tare	21.8790
Dry Weight + Tare	11.0950

Test Sample	Initials BL
Container No.	138
Tare Weight	50.7757
Wet Weight + Tare	83.7605
Dry Weight + Tare	55.0103

SIEVE ANALYSIS

Initials AR

Sieve Size	Weight Retained
Tare	50.7836
4	
10	50.7981
18	50.8160
35	50.8781
60	51.0143
120	51.4480
230	53.2496
PAN	1.7667

PIPETTE ANALYSIS

Initials BL

1/7/2009

Temp:23

Tare ID	Tare Wt	Dry Wt & Tare	TIME
C-3-1	1.5021	1.7690	10:16:00
C-3-2	1.4961	1.7170	10:16:20
C-3-3	1.5058	1.6815	10:17:46
C-3-4	1.4887	1.6238	10:23:05
C-3-5	1.4969	1.6004	10:44:18
C-3-6	1.4720	1.5526	12:09:00
C-3-7	1.4890	1.5478	15:42:00
			8:52:00

Correction	
Wt.	
+ Dry Sample	
Correction (x 50)	

PSEP GRAIN SIZE ANALYSIS

Job No. CC77 ARI Sample No. A Client Sample No. STATION 42 S-1

Set-up Date: 12-31-08 Sample Description: Silty Clay

Calgon Batch # 193 Sieve Set # 2 Date Sieved: 1/5/09

SOLIDS CONTENT

Moisture Content	Initials ____
Container No.	191
Tare Weight	1.4940
Wet Weight + Tare	16.9354
Dry Weight + Tare	9.3441

Test Sample	Initials _____
Container No.	191
Tare Weight	49.7125
Wet Weight + Tare	84.4539
Dry Weight + Tare	57.6050

SIEVE ANALYSIS
Initials AK

Sieve Size	Weight Retained
Tare	49.7229
4	
10	49.7900
18	50.0723
35	50.5247
60	51.0143
120	52.3501
230	55.8240
PAN	1.8086

1/7/2009
Temp:23

Correction	
Wt.	
+ Dry Sample	
Correction (x 50)	

PIPETTE ANALYSIS
Initials BL

Tare ID	Tare Wt	Dry Wt & Tare	TIME
A-1	1.4856	1.7236	10:19:00
A-2	1.4717	1.6582	10:19:20
A-3	1.4728	1.6157	10:20:46
A-4	1.5470	1.6555	10:26:05
A-5	1.4811	1.5656	10:47:18
A-6	1.4873	1.5509	12:12:00
A-7	1.4791	1.5225	15:45:00
			8:55:00

PSEP GRAIN SIZE ANALYSIS

Job No. OC77 ARI Sample No. B Client Sample No. STATION 42 S.2

Set-up Date: 12-31-08 Sample Description: Sandy Silty Clay, Large Organic Debris (excluded)

Calgon Batch # 193 Sieve Set # 1 Date Sieved: 1/5/09

SOLIDS CONTENT

Moisture Content	Initials BL
Container No.	192
Tare Weight	1.4955
Wet Weight + Tare	14.5344
Dry Weight + Tare	7.5825

Test Sample	Initials BL
Container No.	192
Tare Weight	50.3620
Wet Weight + Tare	81.0201
Dry Weight + Tare	55.5837

SIEVE ANALYSIS

Initials AR

Sieve Size	Weight Retained
Tare	50.3662
4	
10	50.4185
18	50.5094
35	50.7072
60	51.0535
120	51.7914
230	53.9793
PAN	1.6107

PIPETTE ANALYSIS

Initials BL

1/7/2009

Temp:23

Tare ID	Tare Wt	Dry Wt & Tare	TIME
B-1	1.4808	1.7005	10:22:00
B-2	1.5212	1.7017	10:22:20
B-3	1.5308	1.6755	10:23:46
B-4	1.5010	1.6135	10:29:05
B-5	1.5156	1.6044	10:50:18
B-6	1.5060	1.5729	12:15:00
B-7	1.5057	1.5510	15:48:00
			8:58:00

Correction	
Wt.	
+ Dry Sample	
Correction (x 50)	

PSEP GRAIN SIZE ANALYSIS

Job No. 0C77 ARI Sample No. D Client Sample No. STATION 42 S-4

Set-up Date: 12-31-08 Sample Description: Silty Clay, Shells

Calgon Batch # 193 Sieve Set # 2 Date Sieved: 1/5/09

SOLIDS CONTENT

Moisture Content	Initials BL
Container No.	201
Tare Weight	1.5086
Wet Weight + Tare	21.7290
Dry Weight + Tare	12.3869

Test Sample	Initials BL
Container No.	201
Tare Weight	50.1611
Wet Weight + Tare	84.9390
Dry Weight + Tare	56.5876

SIEVE ANALYSIS
Initials AR

Sieve Size	Weight Retained
Tare	50.1713
4	
10	50.2109
18	50.3495
35	50.5301
60	50.9719
120	51.6492
230	54.5179
PAN	2.0775

1/7/2009
Temp:23

Correction	
Wt.	
+ Dry Sample	
Correction (x 50)	

PIPETTE ANALYSIS
Initials BL

Tare ID	Tare Wt	Dry Wt & Tare	TIME
D-1	1.5005	1.7884	10:25:00
D-2	1.5407	1.7812	10:25:20
D-3	1.5002	1.6890	10:26:46
D-4	1.4989	1.6412	10:32:05
D-5	1.4964	1.6080	10:53:18
D-6	1.5130	1.5989	12:18:00
D-7	1.4935	1.5544	15:51:00
			9:01:00

Analytical Resources, Incorporated
Analytical Chemists and Consultants

January 9, 2009

Mr. Roger McGinnis
Hart Crowser, Inc.
1700 Westlake Avenue North Suite 200
Seattle, WA 98109-3056

RE: Project: Port Gamble, 17330-14
ARI Job No: OD15

Dear Mr. McGinnis:

Please find enclosed the original Chain-of-Custody (COC) record, sample receipt documentation, and the final data package for the samples from the project referenced above.

The samples were analyzed for resin acids and various conventional parameters, as requested.

Sample receipt and details of these analyses are discussed in the Case Narrative.

An electronic copy of this data package and the supporting data 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.

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

Enclosures

cc: files OD15

KB/co

Case Narrative
Hart Crowser
Port Gamble, 17330-14
ARI Job: OD15
January 9, 2009

Sample Receipt

Analytical Resources Inc. (ARI) accepted twenty-one sediment samples in good condition on December 8, 2008 under the ARI job OD15. The cooler temperatures measured by IR thermometer following ARI SOP ranged between 0.2 and 7.6°C and the samples were well iced. For further detail regarding sample receipt, please refer to the Cooer Receipt Form. All samples were frozen to protect holding times.

Resin Acids by by Method 8270D:

The samples were extracted and analyzed within the method recommended holding times.

Initial calibration(s): All compounds of interest were within method acceptance criteria.

Continuing calibration(s): Are in control.

Samples: There were no anomalies associated with these samples.

Surrogates: Are in control.

LCS/LCSD(s): The LCS and LCSD percent recoveries of Neoabietic Acid fell outside the advisory control limits for both **LCS-121708** and **LCS-121808**. All samples were undetected for this compound. No further corrective action is required for these outliers as the control limits are advisory.

Method Blank: The method blanks were free of contamination.

MS/MSD(s): Several matrix spike and matrix spike duplicate percent recoveries fell outside the advisory control limits for sample **PGSS-21A**. No further corrective action is required for these outliers as the control limits are advisory.

Conventional Parameters:

All samples were prepared and analyzed on 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.

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

LCS(s): All LCS percent recoveries were within control limits.

Case Narrative
Hart Crowser
Port Gamble, 17330-14
ARI Job: OD15
January 9, 2009

SRM(s): All SRM percent recoveries were within control limits.

Replicate(s): The replicate RPD of sulfide was outside the control limit for sample **PGSS-44**. All other quality control parameters were met for sulfide. No further corrective action was required.

MS(s): All MS percent recoveries were within control limits.

Chain of Custody
Documentation

prepared
for

HART CROWSER, INC.

Project: Port Gamble, 17330-14

ARI JOB NO: OD15

prepared
by

Analytical Resources, Inc.

Sample Custody Record

1 of 2

Samples Shipped to: ARI

Hart Crowser, Inc.
1910 Fairview Avenue East
Seattle, Washington 98102-3699
Phone: 206-324-9530 FAX: 206-328-5581

JOB 17330-14 LAB NUMBER

PROJECT NAME PORT GAMBLE

HART CROWSER CONTACT ROGER MCGINNIS

SAMPLED BY: CFR, CWU

LAB NO.	SAMPLE ID	DESCRIPTION	DATE	TIME	MATRIX	SMS Metals *	SVOCs **	PCBs	Ammonia	Total Volatile Solids	TOC	Total Sulfides	Dioxins/Furans	Grain Size	Microtox	Bioassay	NO. OF CONTAINERS	OBSERVATIONS/COMMENTS/ COMPOSITING INSTRUCTIONS
PGSS-8		SEDIMENT	12/4/08	955	SEDIMENT				X	X	X	X						LOW VOLUME
PGSS-14A			12/4/08	1040														LOW VOLUME
PGSS-15				1112														LOW VOLUME
PGSS-16				1145														LOW VOLUME
PGSS-18				1255														LOW VOLUME
PGSS-20				1320														LOW VOLUME
PGSS-22				1348														LOW VOLUME
PGSS-21B				1415														
PGSS-21A				1520														
PGSS-29				1550														
PGSS-29A				1620														
PGSS-30			12/5/08	807														

RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE	12/8/08	SIGNATURE	12/8/08
PRINT NAME Eileen Rust	TIME	PRINT NAME A. Volgardsen	TIME
COMPANY HC	1400	COMPANY ARI	1400
RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE	TIME	SIGNATURE	TIME
PRINT NAME		PRINT NAME	
COMPANY		COMPANY	

SPECIAL SHIPMENT HANDLING OR STORAGE REQUIREMENTS:
LOW VOLUME, LAB NEEDS TO MODIFY SAMPLE VOLUMES FOR PGSS-8, 14A, 15, 16, 18, 20, 22.

* ARSENIC, CADMIUM, CHROMIUM, COPPER, LEAD, MERCURY, NICKEL, SILVER, ZINC.

TOTAL NUMBER OF CONTAINERS

SAMPLE RECEIPT INFORMATION
CUSTODY SEALS: ☐YES ☐NO ☐N/A
GOOD CONDITION ☐YES ☐NO
TEMPERATURE
SHIPMENT METHOD: ☐HAND ☐COURIER ☐OVERNIGHT

COOLER NO.: STORAGE LOCATION:

See Lab Work Order No. for Other Contract Requirements

TURNAROUND TIME:
☐ 24 HOURS ☐ 1 WEEK
☐ 48 HOURS ☒ STANDARD
☐ 72 HOURS OTHER

White and Yellow Copies to Lab Pink to Project Manager Lab to Return White Copy to Hart Crowser Gold to Sample Custodian

Sample Custody Record

OBLS

Samples Shipped to: ARI

2 OF 2

HART CROWSER

Hart Crowser, Inc.
1910 Fairview Avenue East
Seattle, Washington 98102-3699
Phone: 206-324-9530 FAX: 206-328-5581

JOB 17330-14 LAB NUMBER

PROJECT NAME PORT GAMBLE

HART CROWSER CONTACT ROGER MCGINNIS

SAMPLED BY: CFR/CWJ

LAB NO.	SAMPLE ID	DESCRIPTION	DATE	TIME	MATRIX	SMS Metals *	SVOCs **	PCBs	Ammonia	TVS	TOC	Total Sulfides	Dioxin/Furans	Grain Size	Microtox	Bioassay		NO. OF CONTAINERS	OBSERVATIONS/COMMENTS/ COMPOSITING INSTRUCTIONS
P6SS-31		SEDIMENT	12/5/08	850	SEDIMENT				X	X	X	X							
P6SS-33				920					↓	↓	↓	↓							
P6SS-35				1020															
P6SS-38				1045															
P6SS-38A				1120															
P6SS-39				1245															
P6SS-40				1310															
P6SS-42				1345															
P6SS-44				1410															

RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE	12/8/08	SIGNATURE	12/8/08
PRINT NAME Elloon Rust	TIME	PRINT NAME A. Volgardsen	TIME
COMPANY HC	1400	COMPANY ARI	1400
RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE	TIME	SIGNATURE	TIME
PRINT NAME		PRINT NAME	
COMPANY		COMPANY	

SPECIAL SHIPMENT HANDLING OR STORAGE REQUIREMENTS:

** SVOCs will include SMS SVOCs, Guaicol, Retene, + Resin Acids.

TOTAL NUMBER OF CONTAINERS

SAMPLE RECEIPT INFORMATION
CUSTODY SEALS: ☐YES ☐NO ☐N/A
GOOD CONDITION ☐YES ☐NO
TEMPERATURE
SHIPMENT METHOD: ☐HAND ☐COURIER ☐OVERNIGHT

COOLER NO.: STORAGE LOCATION:

See Lab Work Order No. for Other Contract Requirements

TURNAROUND TIME:
☐ 24 HOURS ☐ 1 WEEK
☐ 48 HOURS ☒ STANDARD
☐ 72 HOURS OTHER

White and Yellow Copies to Lab Pink to Project Manager Lab to Return White Copy to Hart Crowser Gold to Sample Custodian

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: HC Project Name: Port Gamble

COC No: NA Delivered by: Hand

Assigned ARI Job No: ODI5 Tracking No: NA

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

Record cooler temperature (recommended 2.0-6.0 °C for chemistry 0.2, 1.2, 2.0, 2.6, 1.6, 1.6, °C
5.2, 5.4, 1.2, 2.4, 1.0

Cooler Accepted by: JH Date: 12/8/08 Time: 14:00

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?	Ice	
Was sufficient ice used (if appropriate)?	(YES)	NO
Were all bottles sealed in individual plastic bags?	(YES)	~~NO~~
Did all bottle arrive in good condition (unbroken)?	(YES)	NO
Were all bottle labels complete and legible?	(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 checklist)	YES	(NO)
Were all VOC vials free of air bubbles? (NA)	YES	NO
Was sufficient amount of sample sent in each bottle?	(YES)	NO

Samples Logged by: JH Date: 12/8/08 Time: 1600

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

Explain discrepancies or negative responses:

By: Date:

Case Narrative

prepared
for

HART CROWSER, INC.

Project: Port Gamble, 17330-14

ARI JOB NO: OD15

prepared
by

Analytical Resources, Inc.

Data Reporting Qualifiers

Effective 12/28/04

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 ≥ 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
NR	Spiked compound recovery is not reported due to chromatographic interference
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.
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
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.

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 ≥40% RPD with no obvious chromatographic interference

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

LCS SOLUTIONS

12/30/08

LABE	SOLN ID	TEST	CONC. UG/ML	SOLVENT	EXP.
1	1549-3	PCB	20	ACETONE	10/10/09
2	1472-3	BCOC PEST	10	ACETONE	07/20/08
3	1517-1	PEST	02/04/20	ACETONE	05/15/09
4	1561-2	LOW PEST	0.2/0.4/2	ACETONE	05/15/09
5	1537-1	EPH	1500	MECL2	08/16/09
6	1559-2	PCP	12.5/125	ACETONE	11/05/09
7	1573-1	ABN	100	ACETONE	08/01/09
8	1566-1	TBT	2.5	MECL2	12/04/09
9	1567-3	PORE TBT	.125/.25	MECL2	12/04/09
10	1554-3	ABN ACID	100/200	MEOH	10/21/09
11	1563-3	TPHD	15000	ACETONE	11/20/09
12	1563-1	ABN BASE	200	ACETONE	06/30/09
13	1573-2	LOW PCB	2	ACETONE	10/10/09
14	1547-1	LOW ABN ACID	10/20	MEOH	04/10/09
15*	1452-1	SIM PNA	15/75	MEOH	04/09/09
16	1502-2	DIOXANE	100	MEOH	02/20/09
17	1516-2	1248 PCB	20	ACETONE	05/07/09
18	1514-4	LOW SIM PNA	1.5/7.5	ACETONE	04/24/09
19	1517-3	AK103	7500	MECL2	12/29/08
20	1572-2	PNA	100	ACETONE	12/26/09
21*	1414-4	SKY/BHT	100	MEOH	04/08/09
22	1570-1	HERB	12.5/12500	MEOH	02/19/09
23	1505-1	LOW ABN BASE	20	MEOH	03/20/09
24	1541-4	LOW ABN	10	ACETONE	08/01/09
25	1481-1	DIPHENYL	100	MEOH	07/20/08
26	1545-2	OP-PEST	25	MEOH	02/14/09
27	1495-1	STEROLS	200	MEOH	12/29/08
28	1494-1	ADD. PEST	4	ACETONE	01/23/09
29	1496-3	DECANES	100	MEOH	02/12/09
30	1497-2	EDB/DBCP	2	ACETONE	02/12/09
31	1510-3	TERPINEOL	100	MEOH	03/21/09

LCS SOLUTIONS

12/30/08

32	1545-3	GUAIACOL	50-200	ACETONE	06/05/09
33	1522-1	RESIN ACID	250	ACETONE	06/11/09
34	1530-2	CONGENERS	1	ACETONE	07/23/09
50	1571-1	FULL RESIN	250	ACETONE	06/10/09
*=REVERIFIED SOLUTION					

SURR SOLUTIONS

12/30/08

LABEL	SOLN ID	TEST	CONC. UG/ML	SOLVENT	EXP.
A	1559-5	ABN	100/150	MEOH	03/13/09
B	1572-1	SIM PNA	15/75	MEOH	08/28/09
C	1559-1	SIM ABN	25/37.5	MEOH	03/13/09
D	1561-3	LOW PCB	0.2	ACETONE	07/31/09
E*	1478-1	HERB	62.5	MEOH	09/21/09
F	1520-3	PCP	12.5	ACETONE	04/18/09
G	1534-1	1,4DIOXANE	100	MEOH	02/20/09
H	1545-1	OP-PEST	25	MEOH	02/14/09
I	1559-4	LOW S. PNA	1.5	MEOH	08/28/09
J	1566-5	TBT-PORE	0.125	MECL2	12/04/09
K	1538-1	MED PCB	20	ACETONE	07/31/09
L	1566-4	TBT	2.5	MECL2	12/04/09
M	1558-2	EPH	1500	MECL2	09/24/09
N	1538-2	PCB	2	ACETONE	07/31/09
O	1567-4	TPH	450	MECL2	09/24/09
P	1560-3	HCID	2250	MECL2	09/24/09
Q	1497-3	EDB	2	ACETONE	02/12/09
R	1521-4	RESIN ACID	250	ACETONE	06/11/09
S	1568-5	PBDE	.25	MEOH	12/11/09
T	*reverified	solution			
U					
V					
W					
X					
Y					
Z					

Data Summary Package

prepared
for

HART CROWSER, INC.

Project: Port Gamble, 17330-14

ARI JOB NO: OD15

prepared
by

Analytical Resources, Inc.

RESIN ACIDS

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: PGSS-8
SAMPLE

Lab Sample ID: OD15A
LIMS ID: 08-32998
Matrix: Sediment
Data Release Authorized:
Reported: 01/07/09

QC Report No: OD15-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/04/08
Date Received: 12/08/08

Date Extracted: 12/18/08
Date Analyzed: 01/03/09 12:51
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 25.5 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: 68.0%

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	98	< 98 U
471-74-9	Sandaracopimaric Acid	98	< 98 U
5835-26-7	Isopimaric Acid	98	< 98 U
1945-53-5	Palustric Acid	98	< 98 U
1740-19-8	Dehydroabietic Acid	98	< 98 U
514-10-3	Abietic Acid	98	< 98 U
471-77-2	Neoabietic Acid	98	< 98 U
5829-48-1	9,10-Dichlorostearic Acid	98	< 98 U
112-80-1	**Oleic Acid**	**98**	**1,300**
463-40-1	**Linolenic Acid**	**98**	**110**

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	52.8%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: PGSS-14A
SAMPLE

Lab Sample ID: OD15B
LIMS ID: 08-32999
Matrix: Sediment
Data Release Authorized:
Reported: 01/07/09

QC Report No: OD15-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/04/08
Date Received: 12/08/08

Date Extracted: 12/18/08
Date Analyzed: 01/03/09 13:06
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 25.6 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: 32.1%

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	98	< 98 U
471-74-9	Sandaracopimaric Acid	98	< 98 U
5835-26-7	Isopimaric Acid	98	< 98 U
1945-53-5	Palustric Acid	98	< 98 U
1740-19-8	Dehydroabietic Acid	98	< 98 U
514-10-3	Abietic Acid	98	< 98 U
471-77-2	Neoabietic Acid	98	< 98 U
5829-48-1	9,10-Dichlorostearic Acid	98	< 98 U
112-80-1	**Oleic Acid**	**98**	**1,700**
463-40-1	**Linolenic Acid**	**98**	**130**

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	60.6%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: PGSS-15
SAMPLE

Lab Sample ID: OD15C
LIMS ID: 08-33000
Matrix: Sediment
Data Release Authorized:
Reported: 01/07/09

QC Report No: OD15-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/04/08
Date Received: 12/08/08

Date Extracted: 12/18/08
Date Analyzed: 01/03/09 13:21
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 25.4 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: 70.6%

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	98	< 98 U
471-74-9	Sandaracopimaric Acid	98	< 98 U
5835-26-7	Isopimaric Acid	98	< 98 U
1945-53-5	Palustric Acid	98	< 98 U
1740-19-8	Dehydroabietic Acid	98	< 98 U
514-10-3	Abietic Acid	98	< 98 U
471-77-2	Neoabietic Acid	98	< 98 U
5829-48-1	9,10-Dichlorostearic Acid	98	< 98 U
112-80-1	**Oleic Acid**	**98**	**780**
463-40-1	Linolenic Acid	98	< 98 U

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	54.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: PGSS-16
SAMPLE

Lab Sample ID: OD15D
LIMS ID: 08-33001
Matrix: Sediment
Data Release Authorized:
Reported: 01/07/09

QC Report No: OD15-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/04/08
Date Received: 12/08/08

Date Extracted: 12/18/08
Date Analyzed: 01/03/09 13:36
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 25.5 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: 72.9%

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	98	< 98 U
471-74-9	Sandaracopimaric Acid	98	< 98 U
5835-26-7	Isopimaric Acid	98	< 98 U
1945-53-5	Palustric Acid	98	< 98 U
1740-19-8	Dehydroabietic Acid	98	< 98 U
514-10-3	Abietic Acid	98	< 98 U
471-77-2	Neoabietic Acid	98	< 98 U
5829-48-1	9,10-Dichlorostearic Acid	98	< 98 U
112-80-1	**Oleic Acid**	**98**	**430**
463-40-1	Linolenic Acid	98	< 98 U

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	58.6%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: PGSS-18
SAMPLE

Lab Sample ID: OD15E
LIMS ID: 08-33002
Matrix: Sediment
Data Release Authorized:
Reported: 01/07/09

QC Report No: OD15-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/04/08
Date Received: 12/08/08

Date Extracted: 12/18/08
Date Analyzed: 01/03/09 13:51
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 25.2 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: 65.7%

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	99	< 99 U
471-74-9	Sandaracopimaric Acid	99	< 99 U
5835-26-7	Isopimaric Acid	99	< 99 U
1945-53-5	Palustric Acid	99	< 99 U
1740-19-8	Dehydroabietic Acid	99	< 99 U
514-10-3	Abietic Acid	99	< 99 U
471-77-2	Neoabietic Acid	99	< 99 U
5829-48-1	9,10-Dichlorostearic Acid	99	< 99 U
112-80-1	**Oleic Acid**	**99**	**620**
463-40-1	Linolenic Acid	99	< 99 U

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	60.4%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: PGSS-20
SAMPLE

Lab Sample ID: OD15F
LIMS ID: 08-33003
Matrix: Sediment
Data Release Authorized:
Reported: 01/07/09

QC Report No: OD15-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/04/08
Date Received: 12/08/08

Date Extracted: 12/18/08
Date Analyzed: 01/03/09 14:06
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 25.2 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: 57.5%

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	99	< 99 U
471-74-9	Sandaracopimaric Acid	99	< 99 U
5835-26-7	Isopimaric Acid	99	< 99 U
1945-53-5	Palustric Acid	99	< 99 U
1740-19-8	Dehydroabietic Acid	99	< 99 U
514-10-3	Abietic Acid	99	< 99 U
471-77-2	Neoabietic Acid	99	< 99 U
5829-48-1	9,10-Dichlorostearic Acid	99	< 99 U
112-80-1	**Oleic Acid**	**99**	**650**
463-40-1	Linolenic Acid	99	< 99 U

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	56.4%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: PGSS-22
SAMPLE

Lab Sample ID: OD15G
LIMS ID: 08-33004
Matrix: Sediment
Data Release Authorized:
Reported: 01/07/09

QC Report No: OD15-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/04/08
Date Received: 12/08/08

Date Extracted: 12/18/08
Date Analyzed: 01/03/09 14:22
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 25.1 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: 69.5%

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	100	< 100 U
471-74-9	Sandaracopimaric Acid	100	< 100 U
5835-26-7	Isopimaric Acid	100	< 100 U
1945-53-5	Palustric Acid	100	< 100 U
1740-19-8	Dehydroabietic Acid	100	< 100 U
514-10-3	Abietic Acid	100	< 100 U
471-77-2	Neoabietic Acid	100	< 100 U
5829-48-1	9,10-Dichlorostearic Acid	100	< 100 U
112-80-1	**Oleic Acid**	**100**	**710**
463-40-1	Linolenic Acid	100	< 100 U

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	59.8%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: PGSS-21B
SAMPLE

Lab Sample ID: OD15H
LIMS ID: 08-33005
Matrix: Sediment
Data Release Authorized:
Reported: 01/07/09

QC Report No: OD15-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/04/08
Date Received: 12/08/08

Date Extracted: 12/18/08
Date Analyzed: 01/03/09 14:49
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 25.4 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: 55.8%

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	98	< 98 U
471-74-9	Sandaracopimaric Acid	98	< 98 U
5835-26-7	**Isopimaric Acid**	**98**	**160**
1945-53-5	Palustric Acid	98	< 98 U
1740-19-8	**Dehydroabietic Acid**	**98**	**950**
514-10-3	**Abietic Acid**	**98**	**1,100**
471-77-2	Neoabietic Acid	98	< 98 U
5829-48-1	9,10-Dichlorostearic Acid	98	< 98 U
112-80-1	**Oleic Acid**	**98**	**1,200**
463-40-1	Linolenic Acid	98	< 98 U

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	56.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: PGSS-21A
SAMPLE

Lab Sample ID: OD15I
LIMS ID: 08-33006
Matrix: Sediment
Data Release Authorized:
Reported: 01/07/09

QC Report No: OD15-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/04/08
Date Received: 12/08/08

Date Extracted: 12/18/08
Date Analyzed: 01/03/09 15:04
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 25.7 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: 18.6%

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	97	< 97 U
471-74-9	Sandaracopimaric Acid	97	< 97 U
5835-26-7	Isopimaric Acid	97	< 97 U
1945-53-5	Palustric Acid	97	< 97 U
1740-19-8	Dehydroabietic Acid	97	< 97 U
514-10-3	Abietic Acid	97	< 97 U
471-77-2	Neoabietic Acid	97	< 97 U
5829-48-1	9,10-Dichlorostearic Acid	97	< 97 U
112-80-1	**Oleic Acid**	**97**	**1,300**
463-40-1	**Linolenic Acid**	**97**	**110**

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	57.6%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: PGSS-29
SAMPLE

Lab Sample ID: OD15J
LIMS ID: 08-33007
Matrix: Sediment
Data Release Authorized:
Reported: 01/07/09

QC Report No: OD15-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/04/08
Date Received: 12/08/08

Date Extracted: 12/18/08
Date Analyzed: 01/03/09 15:49
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 25.9 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: 31.3%

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	97	< 97 U
471-74-9	Sandaracopimaric Acid	97	< 97 U
5835-26-7	Isopimaric Acid	97	< 97 U
1945-53-5	Palustric Acid	97	< 97 U
1740-19-8	**Dehydroabietic Acid**	**97**	**200**
514-10-3	**Abietic Acid**	**97**	**160**
471-77-2	Neoabietic Acid	97	< 97 U
5829-48-1	9,10-Dichlorostearic Acid	97	< 97 U
112-80-1	**Oleic Acid**	**97**	**1,400**
463-40-1	**Linolenic Acid**	**97**	**110**

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	55.6%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: PGSS-29A
SAMPLE

Lab Sample ID: OD15K
LIMS ID: 08-33008
Matrix: Sediment
Data Release Authorized:
Reported: 01/07/09

QC Report No: OD15-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/04/08
Date Received: 12/08/08

Date Extracted: 12/18/08
Date Analyzed: 01/03/09 16:04
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 25.3 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: 64.0%

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	99	< 99 U
471-74-9	Sandaracopimaric Acid	99	< 99 U
5835-26-7	Isopimaric Acid	99	< 99 U
1945-53-5	Palustric Acid	99	< 99 U
1740-19-8	**Dehydroabietic Acid**	**99**	**340**
514-10-3	**Abietic Acid**	**99**	**440**
471-77-2	Neoabietic Acid	99	< 99 U
5829-48-1	9,10-Dichlorostearic Acid	99	< 99 U
112-80-1	**Oleic Acid**	**99**	**950**
463-40-1	**Linolenic Acid**	**99**	**110**

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	53.4%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: PGSS-30
SAMPLE

Lab Sample ID: OD15L
LIMS ID: 08-33009
Matrix: Sediment
Data Release Authorized:
Reported: 01/07/09

QC Report No: OD15-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/05/08
Date Received: 12/08/08

Date Extracted: 12/18/08
Date Analyzed: 01/03/09 16:19
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 25.1 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: 67.9%

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	100	< 100 U
471-74-9	Sandaracopimaric Acid	100	< 100 U
5835-26-7	Isopimaric Acid	100	< 100 U
1945-53-5	Palustric Acid	100	< 100 U
1740-19-8	Dehydroabietic Acid	100	< 100 U
514-10-3	Abietic Acid	100	< 100 U
471-77-2	Neoabietic Acid	100	< 100 U
5829-48-1	9,10-Dichlorostearic Acid	100	< 100 U
112-80-1	**Oleic Acid**	**100**	**660**
463-40-1	Linolenic Acid	100	< 100 U

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	54.6%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: PGSS-31
SAMPLE

Lab Sample ID: OD15M
LIMS ID: 08-33010
Matrix: Sediment
Data Release Authorized:
Reported: 01/07/09

QC Report No: OD15-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/05/08
Date Received: 12/08/08

Date Extracted: 12/18/08
Date Analyzed: 01/03/09 16:35
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 25.4 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: 63.5%

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	98	< 98 U
471-74-9	Sandaracopimaric Acid	98	< 98 U
5835-26-7	Isopimaric Acid	98	< 98 U
1945-53-5	Palustric Acid	98	< 98 U
1740-19-8	Dehydroabietic Acid	98	< 98 U
514-10-3	Abietic Acid	98	< 98 U
471-77-2	Neoabietic Acid	98	< 98 U
5829-48-1	9,10-Dichlorostearic Acid	98	< 98 U
112-80-1	**Oleic Acid**	**98**	**670**
463-40-1	Linolenic Acid	98	< 98 U

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	48.8%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: PGSS-33
SAMPLE

Lab Sample ID: OD15N
LIMS ID: 08-33011
Matrix: Sediment
Data Release Authorized:
Reported: 01/07/09

QC Report No: OD15-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/05/08
Date Received: 12/08/08

Date Extracted: 12/18/08
Date Analyzed: 01/03/09 16:50
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 25.4 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: 60.6%

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	98	< 98 U
471-74-9	Sandaracopimaric Acid	98	< 98 U
5835-26-7	Isopimaric Acid	98	< 98 U
1945-53-5	Palustric Acid	98	< 98 U
1740-19-8	Dehydroabietic Acid	98	< 98 U
514-10-3	Abietic Acid	98	< 98 U
471-77-2	Neoabietic Acid	98	< 98 U
5829-48-1	9,10-Dichlorostearic Acid	98	< 98 U
112-80-1	**Oleic Acid**	**98**	**640**
463-40-1	Linolenic Acid	98	< 98 U

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	55.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: PGSS-35
SAMPLE

Lab Sample ID: OD15O
LIMS ID: 08-33012
Matrix: Sediment
Data Release Authorized:
Reported: 01/07/09

QC Report No: OD15-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/05/08
Date Received: 12/08/08

Date Extracted: 12/18/08
Date Analyzed: 01/03/09 17:05
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 25.3 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: 69.4%

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	99	< 99 U
471-74-9	Sandaracopimaric Acid	99	< 99 U
5835-26-7	Isopimaric Acid	99	< 99 U
1945-53-5	Palustric Acid	99	< 99 U
1740-19-8	Dehydroabietic Acid	99	< 99 U
514-10-3	Abietic Acid	99	< 99 U
471-77-2	Neoabietic Acid	99	< 99 U
5829-48-1	9,10-Dichlorostearic Acid	99	< 99 U
112-80-1	**Oleic Acid**	**99**	**370**
463-40-1	Linolenic Acid	99	< 99 U

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	50.4%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: PGSS-38
SAMPLE

Lab Sample ID: OD15P
LIMS ID: 08-33013
Matrix: Sediment
Data Release Authorized:
Reported: 01/07/09

QC Report No: OD15-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/05/08
Date Received: 12/08/08

Date Extracted: 12/18/08
Date Analyzed: 01/03/09 17:20
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 25.8 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: 29.9%

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	97	< 97 U
471-74-9	Sandaracopimaric Acid	97	< 97 U
5835-26-7	Isopimaric Acid	97	< 97 U
1945-53-5	Palustric Acid	97	< 97 U
1740-19-8	Dehydroabietic Acid	97	< 97 U
514-10-3	Abietic Acid	97	< 97 U
471-77-2	Neoabietic Acid	97	< 97 U
5829-48-1	9,10-Dichlorostearic Acid	97	< 97 U
112-80-1	**Oleic Acid**	**97**	**1,200**
463-40-1	Linolenic Acid	97	< 97 U

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	48.8%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: PGSS-38A
SAMPLE

Lab Sample ID: OD15Q
LIMS ID: 08-33014
Matrix: Sediment
Data Release Authorized:
Reported: 01/07/09

QC Report No: OD15-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/05/08
Date Received: 12/08/08

Date Extracted: 12/18/08
Date Analyzed: 01/03/09 17:35
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 25.4 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: 51.4%

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	98	< 98 U
471-74-9	Sandaracopimaric Acid	98	< 98 U
5835-26-7	Isopimaric Acid	98	< 98 U
1945-53-5	Palustric Acid	98	< 98 U
1740-19-8	Dehydroabietic Acid	98	< 98 U
514-10-3	Abietic Acid	98	< 98 U
471-77-2	Neoabietic Acid	98	< 98 U
5829-48-1	9,10-Dichlorostearic Acid	98	< 98 U
112-80-1	**Oleic Acid**	**98**	**790**
463-40-1	Linolenic Acid	98	< 98 U

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	53.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: PGSS-39
SAMPLE

Lab Sample ID: OD15R
LIMS ID: 08-33015
Matrix: Sediment
Data Release Authorized:
Reported: 01/07/09

QC Report No: OD15-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/05/08
Date Received: 12/08/08

Date Extracted: 12/18/08
Date Analyzed: 01/03/09 17:50
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 25.2 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: 67.1%

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	99	< 99 U
471-74-9	Sandaracopimaric Acid	99	< 99 U
5835-26-7	Isopimaric Acid	99	< 99 U
1945-53-5	Palustric Acid	99	< 99 U
1740-19-8	**Dehydroabietic Acid**	**99**	**120**
514-10-3	Abietic Acid	99	< 99 U
471-77-2	Neoabietic Acid	99	< 99 U
5829-48-1	9,10-Dichlorostearic Acid	99	< 99 U
112-80-1	**Oleic Acid**	**99**	**530**
463-40-1	Linolenic Acid	99	< 99 U

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	51.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: PGSS-40
SAMPLE

Lab Sample ID: OD15S
LIMS ID: 08-33016
Matrix: Sediment
Data Release Authorized:
Reported: 01/07/09

QC Report No: OD15-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/05/08
Date Received: 12/08/08

Date Extracted: 12/18/08
Date Analyzed: 01/03/09 18:05
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 25.1 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: 63.2%

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	100	< 100 U
471-74-9	Sandaracopimaric Acid	100	< 100 U
5835-26-7	Isopimaric Acid	100	< 100 U
1945-53-5	Palustric Acid	100	< 100 U
1740-19-8	Dehydroabietic Acid	100	< 100 U
514-10-3	Abietic Acid	100	< 100 U
471-77-2	Neoabietic Acid	100	< 100 U
5829-48-1	9,10-Dichlorostearic Acid	100	< 100 U
112-80-1	**Oleic Acid**	**100**	**1,100**
463-40-1	Linolenic Acid	100	< 100 U

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	48.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: PGSS-42
SAMPLE

Lab Sample ID: OD15T
LIMS ID: 08-33017
Matrix: Sediment
Data Release Authorized:
Reported: 01/07/09

QC Report No: OD15-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/05/08
Date Received: 12/08/08

Date Extracted: 12/18/08
Date Analyzed: 01/03/09 18:20
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 25.4 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: 62.0%

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	98	< 98 U
471-74-9	Sandaracopimaric Acid	98	< 98 U
5835-26-7	Isopimaric Acid	98	< 98 U
1945-53-5	Palustric Acid	98	< 98 U
1740-19-8	Dehydroabietic Acid	98	< 98 U
514-10-3	Abietic Acid	98	< 98 U
471-77-2	Neoabietic Acid	98	< 98 U
5829-48-1	9,10-Dichlorostearic Acid	98	< 98 U
112-80-1	**Oleic Acid**	**98**	**1,500**
463-40-1	Linolenic Acid	98	< 98 U

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	49.8%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: PGSS-44
SAMPLE

Lab Sample ID: OD15U
LIMS ID: 08-33018
Matrix: Sediment
Data Release Authorized:
Reported: 01/07/09

QC Report No: OD15-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/05/08
Date Received: 12/08/08

Date Extracted: 12/17/08
Date Analyzed: 01/03/09 19:36
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 25.3 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: 65.4%

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	99	< 99 U
471-74-9	Sandaracopimaric Acid	99	< 99 U
5835-26-7	Isopimaric Acid	99	< 99 U
1945-53-5	Palustric Acid	99	< 99 U
1740-19-8	**Dehydroabietic Acid**	**99**	**100**
514-10-3	**Abietic Acid**	**99**	**330**
471-77-2	Neoabietic Acid	99	< 99 U
5829-48-1	9,10-Dichlorostearic Acid	99	< 99 U
112-80-1	**Oleic Acid**	**99**	**1,400**
463-40-1	**Linolenic Acid**	**99**	**140**

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	51.2%

ANALYTICAL RESOURCES INCORPORATED

SW8270 RESIN ACIDS SOIL/SEDIMENT SURROGATE RECOVERY SUMMARY

Matrix: Sediment

QC Report No: OD15-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14

Client ID	MPA	TOT OUT
PGSS-8	52.8%	0
PGSS-14A	60.6%	0
PGSS-15	54.2%	0
PGSS-16	58.6%	0
PGSS-18	60.4%	0
PGSS-20	56.4%	0
PGSS-22	59.8%	0
PGSS-21B	56.2%	0
MB-121808	70.4%	0
LCS-121808	69.8%	0
LCSD-121808	71.8%	0
PGSS-21A	57.6%	0
PGSS-21A MS	57.6%	0
PGSS-21A MSD	59.8%	0
PGSS-29	55.6%	0
PGSS-29A	53.4%	0
PGSS-30	54.6%	0
PGSS-31	48.8%	0
PGSS-33	55.2%	0
PGSS-35	50.4%	0
PGSS-38	48.8%	0
PGSS-38A	53.0%	0
PGSS-39	51.2%	0
PGSS-40	48.2%	0
PGSS-42	49.8%	0
MB-121708	51.4%	0
LCS-121708	53.8%	0
LCSD-121708	55.4%	0
PGSS-44	51.2%	0

	LCS/MB LIMITS	QC LIMITS
(MPA) = O-Methyl Podocarpic Acid	(28-120)	(19-114)

Prep Method: SW3550B
Log Number Range: 08-32998 to 08-33018

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: PGSS-21A
MATRIX SPIKE

Lab Sample ID: OD15I
LIMS ID: 08-33006
Matrix: Sediment
Data Release Authorized:
Reported: 01/07/09

QC Report No: OD15-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/04/08
Date Received: 12/08/08

Date Extracted MS: 12/18/08

Date Analyzed MS: 01/03/09 15:19
MSD: 01/03/09 15:34
Instrument/Analyst MS: NT6/VTS
MSD: NT6/VTS

Sample Amount MS: 25.3 g-dry-wt
MSD: 25.4 g-dry-wt
Final Extract Volume MS: 0.5 mL
MSD: 0.5 mL
Dilution Factor MS: 1.00
MSD: 1.00
Moisture: 18.6%

Analyte	Sample	MS	Spike Added-MS	MS Recovery	MSD	Spike Added-MSD	MSD Recovery	RPD
Pimaric Acid	< 97.4 U	495	989	50.1%	522	982	53.2%	5.3%
Sandaracopimaric Acid	< 97.4 U	496	989	50.2%	543	982	55.3%	9.0%
Isopimaric Acid	< 97.4 U	255	989	25.8%	305	982	31.1%	17.9%
Palustric Acid	< 97.4 U	< 98.9 U	989	NA	< 98.2 U	982	NA	NA
Dehydroabietic Acid	< 97.4 U	606	989	61.3%	637	982	64.9%	5.0%
Abietic Acid	< 97.4 U	485	989	49.0%	545	982	55.5%	11.7%
Neoabietic Acid	< 97.4 U	65.6 J	989	6.6%	24.8 J	982	2.5%	90.3%
9,10-Dichlorostearic Acid	< 97.4 U	492	989	49.7%	498	982	50.7%	1.2%
Oleic Acid	1330	1610	989	28.3%	1470	982	14.3%	9.1%
Linolenic Acid	106	309	989	20.5%	410	982	31.0%	28.1%

Results reported in µg/kg
NA-No recovery due to high concentration of analyte in original sample and/or calculated negative recovery.
RPD calculated using sample concentrations per SW846.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: PGSS-21A
MATRIX SPIKE

Lab Sample ID: OD15I
LIMS ID: 08-33006
Matrix: Sediment
Data Release Authorized:
Reported: 01/07/09

QC Report No: OD15-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/04/08
Date Received: 12/08/08

Date Extracted: 12/18/08
Date Analyzed: 01/03/09 15:19
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 25.3 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: 18.6%

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	99	---
471-74-9	Sandaracopimaric Acid	99	---
5835-26-7	Isopimaric Acid	99	---
1945-53-5	Palustric Acid	99	---
1740-19-8	Dehydroabietic Acid	99	---
514-10-3	Abietic Acid	99	---
471-77-2	Neoabietic Acid	99	---
5829-48-1	9,10-Dichlorostearic Acid	99	---
112-80-1	Oleic Acid	99	---
463-40-1	Linolenic Acid	99	---

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	57.6%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: PGSS-21A
MATRIX SPIKE DUP

Lab Sample ID: OD15I
LIMS ID: 08-33006
Matrix: Sediment
Data Release Authorized:
Reported: 01/07/09

QC Report No: OD15-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/04/08
Date Received: 12/08/08

Date Extracted: 12/18/08
Date Analyzed: 01/03/09 15:34
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 25.4 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: 18.6%

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	98	---
471-74-9	Sandaracopimaric Acid	98	---
5835-26-7	Isopimaric Acid	98	---
1945-53-5	Palustric Acid	98	---
1740-19-8	Dehydroabietic Acid	98	---
514-10-3	Abietic Acid	98	---
471-77-2	Neoabietic Acid	98	---
5829-48-1	9,10-Dichlorostearic Acid	98	---
112-80-1	Oleic Acid	98	---
463-40-1	Linolenic Acid	98	---

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	59.8%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: LCS-121708
LAB CONTROL SAMPLE

Lab Sample ID: LCS-121708
LIMS ID: 08-33018
Matrix: Sediment
Data Release Authorized:
Reported: 01/07/09

QC Report No: OD15-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: NA
Date Received: NA

Date Extracted LCS: 12/17/08

Date Analyzed LCS: 01/03/09 19:06
LCSD: 01/03/09 19:21
Instrument/Analyst LCS: NT6/VTS
LCSD: NT6/VTS

Sample Amount LCS: 25.0 mL
LCSD: 25.0 mL
Final Extract Volume LCS: 0.50 mL
LCSD: 0.50 mL
Dilution Factor LCS: 1.00
LCSD: 1.00

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Pimaric Acid	483	1000	48.3%	519	1000	51.9%	7.2%
Sandaracopimaric Acid	500	1000	50.0%	528	1000	52.8%	5.4%
Isopimaric Acid	429	1000	42.9%	471	1000	47.1%	9.3%
Palustric Acid	375	1000	37.5%	397	1000	39.7%	5.7%
Dehydroabietic Acid	549	1000	54.9%	579	1000	57.9%	5.3%
Abietic Acid	457	1000	45.7%	602	1000	60.2%	27.4%
Neoabietic Acid	< 100 U	1000	NA	110	1000	11.0%	NA
9,10-Dichlorostearic Acid	447	1000	44.7%	481	1000	48.1%	7.3%
Oleic Acid	475	1000	47.5%	492	1000	49.2%	3.5%
Linolenic Acid	432	1000	43.2%	457	1000	45.7%	5.6%

Reported in µg/kg (ppb)

NA-No recovery due to high concentration of analyte in original sample, calculated negative recovery, or undetected spike.
RPD calculated using sample concentrations per SW846.

TBT Surrogate Recovery

	LCS	LCSD
O-Methyl Podocarpic Acid	53.8%	55.4%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: LCS-121808
LAB CONTROL SAMPLE

Lab Sample ID: LCS-121808
LIMS ID: 08-33006
Matrix: Sediment
Data Release Authorized:
Reported: 01/07/09

QC Report No: OD15-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: NA
Date Received: NA

Date Extracted LCS: 12/18/08

Date Analyzed LCS: 01/03/09 12:21
LCSD: 01/03/09 12:36
Instrument/Analyst LCS: NT6/VTS
LCSD: NT6/VTS

Sample Amount LCS: 25.0 mL
LCSD: 25.0 mL
Final Extract Volume LCS: 0.50 mL
LCSD: 0.50 mL
Dilution Factor LCS: 1.00
LCSD: 1.00

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Pimaric Acid	661	1000	66.1%	694	1000	69.4%	4.9%
Sandaracopimaric Acid	658	1000	65.8%	684	1000	68.4%	3.9%
Isopimaric Acid	616	1000	61.6%	634	1000	63.4%	2.9%
Palustric Acid	587	1000	58.7%	590	1000	59.0%	0.5%
Dehydroabietic Acid	662	1000	66.2%	724	1000	72.4%	8.9%
Abietic Acid	598	1000	59.8%	603	1000	60.3%	0.8%
Neoabietic Acid	152	1000	15.2%	99.2 J	1000	9.9%	42.0%
9,10-Dichlorostearic Acid	657	1000	65.7%	681	1000	68.1%	3.6%
Oleic Acid	649	1000	64.9%	727	1000	72.7%	11.3%
Linolenic Acid	643	1000	64.3%	664	1000	66.4%	3.2%

Reported in µg/kg (ppb)

RPD calculated using sample concentrations per SW846.

TBT Surrogate Recovery

	LCS	LCSD
O-Methyl Podocarpic Acid	69.8%	71.8%

4B

SEMIVOLATILE METHOD BLANK SUMMARY

BLANK NO.

OD15MBS1

Lab Name: ANALYTICAL RESOURCES, INC

Client: HART CROWSER, INC.

ARI Job No: OD15

Project: PORT GAMBLE

Lab File ID: OD15MB

Date Extracted: 12/18/08

Instrument ID: NT6

Date Analyzed: 01/03/09

Matrix: SOLID

Time Analyzed: 1206

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

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01	OD15LCSS1	OD15LCSS1	OD15SB	01/03/09
02	OD15LCSDS1	OD15LCSDS1	OD15SBD	01/03/09
03	PGSS-8	OD15A	OD15A	01/03/09
04	PGSS-14A	OD15B	OD15B	01/03/09
05	PGSS-15	OD15C	OD15C	01/03/09
06	PGSS-16	OD15D	OD15D	01/03/09
07	PGSS-18	OD15E	OD15E	01/03/09
08	PGSS-20	OD15F	OD15F	01/03/09
09	PGSS-22	OD15G	OD15G	01/03/09
10	PGSS-21B	OD15H	OD15H	01/03/09
11	PGSS-21A	OD15I	OD15I	01/03/09
12	PGSS-21A MS	OD15IMS	OD15IMS	01/03/09
13	PGSS-21A MSD	OD15IMSD	OD15IMSD	01/03/09
14	PGSS-29	OD15J	OD15J	01/03/09
15	PGSS-29A	OD15K	OD15K	01/03/09
16	PGSS-30	OD15L	OD15L	01/03/09
17	PGSS-31	OD15M	OD15M	01/03/09
18	PGSS-33	OD15N	OD15N	01/03/09
19	PGSS-35	OD15O	OD15O	01/03/09
20	PGSS-38	OD15P	OD15P	01/03/09
21	PGSS-38A	OD15Q	OD15Q	01/03/09
22	PGSS-39	OD15R	OD15R	01/03/09
23	PGSS-40	OD15S	OD15S	01/03/09
24	PGSS-42	OD15T	OD15T	01/03/09
25				
26				
27				
28				
29				
30				

COMMENTS:

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: MB-121808
METHOD BLANK

Lab Sample ID: MB-121808
LIMS ID: 08-33006
Matrix: Sediment
Data Release Authorized:
Reported: 01/07/09

QC Report No: OD15-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: NA
Date Received: NA

Date Extracted: 12/18/08
Date Analyzed: 01/03/09 12:06
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 25.0 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	100	< 100 U
471-74-9	Sandaracopimaric Acid	100	< 100 U
5835-26-7	Isopimaric Acid	100	< 100 U
1945-53-5	Palustric Acid	100	< 100 U
1740-19-8	Dehydroabietic Acid	100	< 100 U
514-10-3	Abietic Acid	100	< 100 U
471-77-2	Neoabietic Acid	100	< 100 U
5829-48-1	9,10-Dichlorostearic Acid	100	< 100 U
112-80-1	Oleic Acid	100	< 100 U
463-40-1	Linolenic Acid	100	< 100 U

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	70.4%

4B

SEMIVOLATILE METHOD BLANK SUMMARY

BLANK NO.

OD15MBS2

Lab Name: ANALYTICAL RESOURCES, INC

Client: HART CROWSER, INC.

ARI Job No: OD15

Project: PORT GAMBLE

Lab File ID: OD15MB2

Date Extracted: 12/17/08

Instrument ID: NT6

Date Analyzed: 01/03/09

Matrix: SOLID

Time Analyzed: 1850

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

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01	OD15LCSS2	OD15LCSS2	OD15SB2	01/03/09
02	OD15LCSDS2	OD15LCSDS2	OD15SBD2	01/03/09
03	PGSS-44	OD15U	OD15U	01/03/09
04				
05				
06				
07				
08				
09				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				

COMMENTS:

FORM IV SV

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: MB-121708
METHOD BLANK

Lab Sample ID: MB-121708
LIMS ID: 08-33018
Matrix: Sediment
Data Release Authorized:
Reported: 01/07/09

QC Report No: OD15-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: NA
Date Received: NA

Date Extracted: 12/17/08
Date Analyzed: 01/03/09 18:50
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 25.0 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	100	< 100 U
471-74-9	Sandaracopimaric Acid	100	< 100 U
5835-26-7	Isopimaric Acid	100	< 100 U
1945-53-5	Palustric Acid	100	< 100 U
1740-19-8	Dehydroabietic Acid	100	< 100 U
514-10-3	Abietic Acid	100	< 100 U
471-77-2	Neoabietic Acid	100	< 100 U
5829-48-1	9,10-Dichlorostearic Acid	100	< 100 U
112-80-1	Oleic Acid	100	< 100 U
463-40-1	Linolenic Acid	100	< 100 U

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	51.4%

GENERAL CHEMISTRY

SAMPLE RESULTS-CONVENTIONALS
OD15-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 12/16/08

Project: PORT GAMBLE
Event: 17330-14
Date Sampled: 12/04/08
Date Received: 12/08/08

Client ID: PGSS-8
ARI ID: 08-32998 OD15A

Analyte	Date	Method	Units	RL	Sample
Total Solids	12/10/08 121008#1	EPA 160.3	Percent	0.01	33.90
Preserved Total Solids	12/09/08 120908#1	EPA 160.3	Percent	0.01	31.90
Total Volatile Solids	12/10/08 121008#1	EPA 160.4	Percent	0.01	10.43
N-Ammonia	12/10/08 121008#2	EPA 350.1M	mg-N/kg	0.29	24.3
Sulfide	12/11/08 121108#1	EPA 376.2	mg/kg	62.2	485
Total Organic Carbon	12/11/08 121108#1	Plumb,1981	Percent	0.020	3.93

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
OD15-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 12/16/08

Project: PORT GAMBLE
Event: 17330-14
Date Sampled: 12/04/08
Date Received: 12/08/08

Client ID: PGSS-14A
ARI ID: 08-32999 OD15B

Analyte	Date	Method	Units	RL	Sample
Total Solids	12/10/08 121008#1	EPA 160.3	Percent	0.01	72.70
Preserved Total Solids	12/09/08 120908#1	EPA 160.3	Percent	0.01	73.10
Total Volatile Solids	12/10/08 121008#1	EPA 160.4	Percent	0.01	2.00
N-Ammonia	12/10/08 121008#2	EPA 350.1M	mg-N/kg	0.14	3.52
Sulfide	12/11/08 121108#1	EPA 376.2	mg/kg	13.6	125
Total Organic Carbon	12/11/08 121108#1	Plumb,1981	Percent	0.020	1.46

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
OD15-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 12/16/08

Project: PORT GAMBLE
Event: 17330-14
Date Sampled: 12/04/08
Date Received: 12/08/08

Client ID: PGSS-15
ARI ID: 08-33000 OD15C

Analyte	Date	Method	Units	RL	Sample
Total Solids	12/10/08 121008#1	EPA 160.3	Percent	0.01	32.20
Preserved Total Solids	12/09/08 120908#1	EPA 160.3	Percent	0.01	78.20
Total Volatile Solids	12/10/08 121008#1	EPA 160.4	Percent	0.01	10.24
N-Ammonia	12/10/08 121008#2	EPA 350.1M	mg-N/kg	0.30	22.5
Sulfide	12/11/08 121108#1	EPA 376.2	mg/kg	12.9	243
Total Organic Carbon	12/11/08 121108#1	Plumb,1981	Percent	0.020	3.46

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
OD15-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 12/16/08

Project: PORT GAMBLE
Event: 17330-14
Date Sampled: 12/04/08
Date Received: 12/08/08

Client ID: PGSS-16
ARI ID: 08-33001 OD15D

Analyte	Date	Method	Units	RL	Sample
Total Solids	12/10/08 121008#1	EPA 160.3	Percent	0.01	27.20
Preserved Total Solids	12/09/08 120908#1	EPA 160.3	Percent	0.01	27.40
Total Volatile Solids	12/10/08 121008#1	EPA 160.4	Percent	0.01	9.19
N-Ammonia	12/10/08 121008#2	EPA 350.1M	mg-N/kg	0.70	53.6
Sulfide	12/11/08 121108#1	EPA 376.2	mg/kg	73.4	1,060
Total Organic Carbon	12/11/08 121108#1	Plumb,1981	Percent	0.020	2.60

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
OD15-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 12/16/08

Project: PORT GAMBLE
Event: 17330-14
Date Sampled: 12/04/08
Date Received: 12/08/08

Client ID: PGSS-18
ARI ID: 08-33002 OD15E

Analyte	Date	Method	Units	RL	Sample
Total Solids	12/10/08 121008#1	EPA 160.3	Percent	0.01	35.80
Preserved Total Solids	12/09/08 120908#1	EPA 160.3	Percent	0.01	34.10
Total Volatile Solids	12/10/08 121008#1	EPA 160.4	Percent	0.01	8.78
N-Ammonia	12/10/08 121008#2	EPA 350.1M	mg-N/kg	0.26	3.05
Sulfide	12/11/08 121108#1	EPA 376.2	mg/kg	14.4	113
Total Organic Carbon	12/11/08 121108#1	Plumb,1981	Percent	0.020	2.49

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
OD15-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 12/16/08

Project: PORT GAMBLE
Event: 17330-14
Date Sampled: 12/04/08
Date Received: 12/08/08

Client ID: PGSS-20
ARI ID: 08-33003 OD15F

Analyte	Date	Method	Units	RL	Sample
Total Solids	12/10/08 121008#1	EPA 160.3	Percent	0.01	43.10
Preserved Total Solids	12/09/08 120908#1	EPA 160.3	Percent	0.01	40.70
Total Volatile Solids	12/10/08 121008#1	EPA 160.4	Percent	0.01	6.67
N-Ammonia	12/10/08 121008#2	EPA 350.1M	mg-N/kg	0.22	7.66
Sulfide	12/11/08 121108#1	EPA 376.2	mg/kg	12.3	158
Total Organic Carbon	12/11/08 121108#1	Plumb,1981	Percent	0.020	3.65

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
OD15-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 12/16/08

Project: PORT GAMBLE
Event: 17330-14
Date Sampled: 12/04/08
Date Received: 12/08/08

Client ID: PGSS-22
ARI ID: 08-33004 OD15G

Analyte	Date	Method	Units	RL	Sample
Total Solids	12/10/08 121008#1	EPA 160.3	Percent	0.01	31.50
Preserved Total Solids	12/09/08 120908#1	EPA 160.3	Percent	0.01	30.70
Total Volatile Solids	12/10/08 121008#1	EPA 160.4	Percent	0.01	9.29
N-Ammonia	12/10/08 121008#2	EPA 350.1M	mg-N/kg	0.62	34.9
Sulfide	12/11/08 121108#1	EPA 376.2	mg/kg	32.0	640
Total Organic Carbon	12/11/08 121108#1	Plumb,1981	Percent	0.020	3.21

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
OD15-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 12/16/08

Project: PORT GAMBLE
Event: 17330-14
Date Sampled: 12/04/08
Date Received: 12/08/08

Client ID: PGSS-21B
ARI ID: 08-33005 OD15H

Analyte	Date	Method	Units	RL	Sample
Total Solids	12/10/08 121008#1	EPA 160.3	Percent	0.01	45.40
Preserved Total Solids	12/09/08 120908#1	EPA 160.3	Percent	0.01	37.50
Total Volatile Solids	12/10/08 121008#1	EPA 160.4	Percent	0.01	11.22
N-Ammonia	12/10/08 121008#2	EPA 350.1M	mg-N/kg	0.20	7.75
Sulfide	12/11/08 121108#1	EPA 376.2	mg/kg	26.3	468
Total Organic Carbon	12/11/08 121108#1	Plumb,1981	Percent	0.020	3.02

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
OD15-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 12/16/08

Project: PORT GAMBLE
Event: 17330-14
Date Sampled: 12/04/08
Date Received: 12/08/08

Client ID: PGSS-21A
ARI ID: 08-33006 OD15I

Analyte	Date	Method	Units	RL	Sample
Total Solids	12/10/08 121008#1	EPA 160.3	Percent	0.01	81.80
Preserved Total Solids	12/09/08 120908#1	EPA 160.3	Percent	0.01	77.70
Total Volatile Solids	12/10/08 121008#1	EPA 160.4	Percent	0.01	2.36
N-Ammonia	12/10/08 121008#2	EPA 350.1M	mg-N/kg	0.11	3.26
Sulfide	12/11/08 121108#1	EPA 376.2	mg/kg	6.44	71.6
Total Organic Carbon	12/11/08 121108#1	Plumb,1981	Percent	0.020	1.33

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
OD15-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 12/16/08

Project: PORT GAMBLE
Event: 17330-14
Date Sampled: 12/04/08
Date Received: 12/08/08

Client ID: PGSS-29
ARI ID: 08-33007 OD15J

Analyte	Date	Method	Units	RL	Sample
Total Solids	12/10/08 121008#1	EPA 160.3	Percent	0.01	70.60
Preserved Total Solids	12/09/08 120908#1	EPA 160.3	Percent	0.01	70.20
Total Volatile Solids	12/10/08 121008#1	EPA 160.4	Percent	0.01	3.11
N-Ammonia	12/10/08 121008#2	EPA 350.1M	mg-N/kg	0.13	2.75
Sulfide	12/11/08 121108#1	EPA 376.2	mg/kg	14.0	167
Total Organic Carbon	12/11/08 121108#1	Plumb,1981	Percent	0.020	1.83

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
OD15-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 12/16/08

Project: PORT GAMBLE
Event: 17330-14
Date Sampled: 12/04/08
Date Received: 12/08/08

Client ID: PGSS-29A
ARI ID: 08-33008 OD15K

Analyte	Date	Method	Units	RL	Sample
Total Solids	12/10/08 121008#1	EPA 160.3	Percent	0.01	37.90
Preserved Total Solids	12/09/08 120908#1	EPA 160.3	Percent	0.01	36.40
Total Volatile Solids	12/10/08 121008#1	EPA 160.4	Percent	0.01	12.68
N-Ammonia	12/10/08 121008#2	EPA 350.1M	mg-N/kg	0.24	16.3
Sulfide	12/11/08 121108#1	EPA 376.2	mg/kg	27.5	419
Total Organic Carbon	12/11/08 121108#1	Plumb,1981	Percent	0.020	4.73

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
OD15-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 12/16/08

Project: PORT GAMBLE
Event: 17330-14
Date Sampled: 12/05/08
Date Received: 12/08/08

Client ID: PGSS-30
ARI ID: 08-33009 OD15L

Analyte	Date	Method	Units	RL	Sample
Total Solids	12/10/08 121008#1	EPA 160.3	Percent	0.01	35.40
Preserved Total Solids	12/09/08 120908#1	EPA 160.3	Percent	0.01	32.60
Total Volatile Solids	12/10/08 121008#1	EPA 160.4	Percent	0.01	8.89
N-Ammonia	12/10/08 121008#2	EPA 350.1M	mg-N/kg	0.27	12.3
Sulfide	12/11/08 121108#1	EPA 376.2	mg/kg	61.2	697
Total Organic Carbon	12/11/08 121108#1	Plumb,1981	Percent	0.020	3.65

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
OD15-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 12/16/08

Project: PORT GAMBLE
Event: 17330-14
Date Sampled: 12/05/08
Date Received: 12/08/08

Client ID: PGSS-31
ARI ID: 08-33010 OD15M

Analyte	Date	Method	Units	RL	Sample
Total Solids	12/10/08 121008#1	EPA 160.3	Percent	0.01	38.80
Preserved Total Solids	12/09/08 120908#1	EPA 160.3	Percent	0.01	36.80
Total Volatile Solids	12/10/08 121008#1	EPA 160.4	Percent	0.01	8.96
N-Ammonia	12/10/08 121008#2	EPA 350.1M	mg-N/kg	0.25	5.37
Sulfide	12/11/08 121108#1	EPA 376.2	mg/kg	53.6	608
Total Organic Carbon	12/11/08 121108#1	Plumb,1981	Percent	0.020	2.23

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
OD15-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 12/16/08

Project: PORT GAMBLE
Event: 17330-14
Date Sampled: 12/05/08
Date Received: 12/08/08

Client ID: PGSS-33
ARI ID: 08-33011 OD15N

Analyte	Date	Method	Units	RL	Sample
Total Solids	12/10/08 121008#1	EPA 160.3	Percent	0.01	39.90
Preserved Total Solids	12/09/08 120908#1	EPA 160.3	Percent	0.01	38.70
Total Volatile Solids	12/10/08 121008#1	EPA 160.4	Percent	0.01	8.41
N-Ammonia	12/10/08 121008#2	EPA 350.1M	mg-N/kg	0.25	12.1
Sulfide	12/11/08 121108#1	EPA 376.2	mg/kg	25.4	372
Total Organic Carbon	12/11/08 121108#1	Plumb,1981	Percent	0.020	2.41

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
OD15-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 12/16/08

Project: PORT GAMBLE
Event: 17330-14
Date Sampled: 12/05/08
Date Received: 12/08/08

Client ID: PGSS-35
ARI ID: 08-33012 OD15O

Analyte	Date	Method	Units	RL	Sample
Total Solids	12/10/08 121008#1	EPA 160.3	Percent	0.01	34.20
Preserved Total Solids	12/09/08 120908#1	EPA 160.3	Percent	0.01	31.50
Total Volatile Solids	12/10/08 121008#1	EPA 160.4	Percent	0.01	8.62
N-Ammonia	12/10/08 121008#2	EPA 350.1M	mg-N/kg	0.27	26.4
Sulfide	12/11/08 121108#1	EPA 376.2	mg/kg	31.4	459
Total Organic Carbon	12/11/08 121108#1	Plumb,1981	Percent	0.020	2.52

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
OD15-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 12/16/08

Project: PORT GAMBLE
Event: 17330-14
Date Sampled: 12/05/08
Date Received: 12/08/08

Client ID: PGSS-38
ARI ID: 08-33013 OD15P

Analyte	Date	Method	Units	RL	Sample
Total Solids	12/10/08 121008#1	EPA 160.3	Percent	0.01	59.60
Preserved Total Solids	12/09/08 120908#1	EPA 160.3	Percent	0.01	71.20
Total Volatile Solids	12/10/08 121008#1	EPA 160.4	Percent	0.01	2.38
N-Ammonia	12/10/08 121008#2	EPA 350.1M	mg-N/kg	0.15	3.85
Sulfide	12/11/08 121108#1	EPA 376.2	mg/kg	14.2	142
Total Organic Carbon	12/11/08 121108#1	Plumb,1981	Percent	0.020	2.00

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
OD15-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 12/16/08

Project: PORT GAMBLE
Event: 17330-14
Date Sampled: 12/05/08
Date Received: 12/08/08

Client ID: PGSS-38A
ARI ID: 08-33014 OD15Q

Analyte	Date	Method	Units	RL	Sample
Total Solids	12/10/08 121008#1	EPA 160.3	Percent	0.01	42.70
Preserved Total Solids	12/09/08 120908#1	EPA 160.3	Percent	0.01	52.00
Total Volatile Solids	12/10/08 121008#1	EPA 160.4	Percent	0.01	5.70
N-Ammonia	12/10/08 121008#2	EPA 350.1M	mg-N/kg	0.22	4.11
Sulfide	12/11/08 121108#1	EPA 376.2	mg/kg	19.2	382
Total Organic Carbon	12/11/08 121108#1	Plumb,1981	Percent	0.020	3.40

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
OD15-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 12/16/08

Project: PORT GAMBLE
Event: 17330-14
Date Sampled: 12/05/08
Date Received: 12/08/08

Client ID: PGSS-39
ARI ID: 08-33015 OD15R

Analyte	Date	Method	Units	RL	Sample
Total Solids	12/10/08 121008#1	EPA 160.3	Percent	0.01	35.60
Preserved Total Solids	12/09/08 120908#1	EPA 160.3	Percent	0.01	33.30
Total Volatile Solids	12/10/08 121008#1	EPA 160.4	Percent	0.01	8.81
N-Ammonia	12/10/08 121008#2	EPA 350.1M	mg-N/kg	0.26	14.6
Sulfide	12/11/08 121108#1	EPA 376.2	mg/kg	59.0	693
Total Organic Carbon	12/11/08 121108#1	Plumb,1981	Percent	0.020	2.98

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
OD15-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 12/16/08

Project: PORT GAMBLE
Event: 17330-14
Date Sampled: 12/05/08
Date Received: 12/08/08

Client ID: PGSS-40
ARI ID: 08-33016 OD15S

Analyte	Date	Method	Units	RL	Sample
Total Solids	12/10/08 121008#1	EPA 160.3	Percent	0.01	39.20
Preserved Total Solids	12/09/08 120908#1	EPA 160.3	Percent	0.01	36.00
Total Volatile Solids	12/10/08 121008#1	EPA 160.4	Percent	0.01	9.09
N-Ammonia	12/10/08 121008#2	EPA 350.1M	mg-N/kg	0.25	6.81
Sulfide	12/11/08 121108#1	EPA 376.2	mg/kg	55.7	1,120
Total Organic Carbon	12/12/08 121208#1	Plumb,1981	Percent	0.020	2.99

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
OD15-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 12/16/08

Project: PORT GAMBLE
Event: 17330-14
Date Sampled: 12/05/08
Date Received: 12/08/08

Client ID: PGSS-42
ARI ID: 08-33017 OD15T

Analyte	Date	Method	Units	RL	Sample
Total Solids	12/10/08 121008#1	EPA 160.3	Percent	0.01	40.50
Preserved Total Solids	12/09/08 120908#1	EPA 160.3	Percent	0.01	37.60
Total Volatile Solids	12/10/08 121008#1	EPA 160.4	Percent	0.01	8.12
N-Ammonia	12/10/08 121008#2	EPA 350.1M	mg-N/kg	0.24	5.70
Sulfide	12/11/08 121108#1	EPA 376.2	mg/kg	131	1,060
Total Organic Carbon	12/12/08 121208#1	Plumb,1981	Percent	0.020	2.11

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
OD15-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 12/16/08

Project: PORT GAMBLE
Event: 17330-14
Date Sampled: 12/05/08
Date Received: 12/08/08

Client ID: PGSS-44
ARI ID: 08-33018 OD15U

Analyte	Date	Method	Units	RL	Sample
Total Solids	12/10/08 121008#4	EPA 160.3	Percent	0.01	36.40
Preserved Total Solids	12/09/08 120908#2	EPA 160.3	Percent	0.01	32.30
Total Volatile Solids	12/10/08 121008#2	EPA 160.4	Percent	0.01	8.14
N-Ammonia	12/10/08 121008#2	EPA 350.1M	mg-N/kg	0.26	9.37
Sulfide	12/11/08 121108#1	EPA 376.2	mg/kg	61.8	691
Total Organic Carbon	12/12/08 121208#1	Plumb,1981	Percent	0.020	2.67

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

MS/MSD RESULTS-CONVENTIONALS
OD15-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 12/16/08

Project: PORT GAMBLE
Event: 17330-14
Date Sampled: 12/04/08
Date Received: 12/08/08

Analyte	Date	Units	Sample	Spike	Spike Added	Recovery
ARI ID: OD15A Client ID: PGSS-8						
N-Ammonia	12/10/08	mg-N/kg	24.3	260	276	85.5%
Sulfide	12/11/08	mg/kg	485	977	417	118.0%
Total Organic Carbon	12/11/08	Percent	3.93	7.22	4.33	75.9%
ARI ID: OD15U Client ID: PGSS-44						
N-Ammonia	12/10/08	mg-N/kg	9.37	260	267	93.7%
Sulfide	12/11/08	mg/kg	691	1,070	413	91.8%
Total Organic Carbon	12/12/08	Percent	2.67	5.21	2.70	94.0%

REPLICATE RESULTS-CONVENTIONALS
OD15-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 12/16/08

Project: PORT GAMBLE
Event: 17330-14
Date Sampled: 12/04/08
Date Received: 12/08/08

Analyte	Date	Units	Sample	Replicate(s)	RPD/RSD
ARI ID: OD15A Client ID: PGSS-8					
Total Solids	12/10/08	Percent	33.90	34.20 34.00	0.4%
Preserved Total Solids	12/09/08	Percent	31.90	31.90 31.80	0.2%
Total Volatile Solids	12/10/08	Percent	10.43	10.37 10.62	1.2%
N-Ammonia	12/10/08	mg-N/kg	24.3	23.8 24.1	1.0%
Sulfide	12/11/08	mg/kg	485	612	23.2%
Total Organic Carbon	12/11/08	Percent	3.93	3.91 4.93	13.7%
ARI ID: OD15U Client ID: PGSS-44					
Total Solids	12/10/08	Percent	36.40	36.30 36.50	0.3%
Preserved Total Solids	12/09/08	Percent	32.30	32.40 32.40	0.2%
Total Volatile Solids	12/10/08	Percent	8.14	8.46 8.91	4.5%
N-Ammonia	12/10/08	mg-N/kg	9.37	10.3 8.71	8.4%
Sulfide	12/11/08	mg/kg	691	729	5.4%
Total Organic Carbon	12/12/08	Percent	2.67	2.84 2.49	6.6%

LAB CONTROL RESULTS-CONVENTIONALS
OD15-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 12/16/08

Project: PORT GAMBLE
Event: 17330-14
Date Sampled: NA
Date Received: NA

Analyte	Date	Units	LCS	Spike Added	Recovery
Sulfide	12/11/08	mg/kg	128	134	95.5%
Total Organic Carbon	12/11/08	Percent	0.489	0.500	97.8%
	12/12/08		0.505	0.500	101.0%

METHOD BLANK RESULTS-CONVENTIONALS
OD15-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 12/16/08

Project: PORT GAMBLE
Event: 17330-14
Date Sampled: NA
Date Received: NA

Analyte	Date	Units	Blank
Total Solids	12/10/08	Percent	< 0.01 U
	12/10/08		< 0.01 U
Preserved Total Solids	12/09/08	Percent	< 0.01 U
	12/09/08		< 0.01 U
Total Volatile Solids	12/10/08	Percent	< 0.01 U
	12/10/08		< 0.01 U
N-Ammonia	12/10/08	mg-N/kg	< 0.10 U
	12/10/08		< 0.10 U
Sulfide	12/11/08	mg/kg	< 1.00 U
Total Organic Carbon	12/11/08	Percent	< 0.020 U
	12/12/08		< 0.020 U

STANDARD REFERENCE RESULTS-CONVENTIONALS
OD15-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 12/16/08

Project: PORT GAMBLE
Event: 17330-14
Date Sampled: NA
Date Received: NA

Analyte/SRM ID	Date	Units	SRM	True Value	Recovery
N-Ammonia	12/10/08	mg-N/kg	98.6	100	98.6%
SPEX 28-24AS	12/10/08		102	100	102.0%
Total Organic Carbon	12/11/08	Percent	3.04	3.35	90.7%
NIST #8704	12/12/08		3.18	3.35	94.9%

TOTAL SOLIDS

Extractions Total Solids-extts
Data By: Tae K. You
Created: 12/ 9/08

Worklist: 9824
Analyst: RVR
Comments:

	ARI ID CLIENT ID	Tare Wt (g)	Wet Wt (g)	Dry Wt (g)	% Solids	pH
1.	OD15A 08-32998 PGSS-8	1.18	11.21	4.39	32.0	NR
2.	OD15B 08-32999 PGSS-14A	1.17	12.34	8.75	67.9	NR
3.	OD15C 08-33000 PGSS-15	1.18	11.28	4.15	29.4	NR
4.	OD15D 08-33001 PGSS-16	1.16	11.98	4.09	27.1	NR
5.	OD15E 08-33002 PGSS-18	1.16	11.57	4.73	34.3	NR
6.	OD15F 08-33003 PGSS-20	1.17	12.71	6.07	42.5	NR
7.	OD15G 08-33004 PGSS-22	1.18	11.71	4.39	30.5	NR
8.	OD15H 08-33005 PGSS-21B	1.17	11.19	5.60	44.2	NR
9.	OD15I 08-33006 PGSS-21A	1.17	11.57	9.64	81.4	NR
10.	OD15J 08-33007 PGSS-29	1.18	11.25	8.10	68.7	NR
11.	OD15K 08-33008 PGSS-29A	1.16	12.50	5.24	36.0	NR
12.	OD15L 08-33009 PGSS-30	1.16	11.59	4.51	32.1	NR
13.	OD15M 08-33010 PGSS-31	1.17	11.18	4.82	36.5	NR
14.	OD15N 08-33011 PGSS-33	1.16	11.54	5.25	39.4	NR
15.	OD15O 08-33012 PGSS-35	1.18	11.60	4.37	30.6	NR

Extractions Total Solids-extts
Data By: Tae K. You
Created: 12/ 9/08

Worklist: 9824
Analyst: RVR
Comments:

	ARI ID CLIENT ID	Tare Wt (g)	Wet Wt (g)	Dry Wt (g)	% Solids	pH
16.	OD15P 08-33013 PGSS-38	1.16	12.35	9.00	70.1	NR
17.	OD15Q 08-33014 PGSS-38A	1.16	11.96	6.41	48.6	NR
18.	OD15R 08-33015 PGSS-39	1.16	11.33	4.51	32.9	NR
19.	OD15S 08-33016 PGSS-40	1.18	11.71	5.06	36.8	NR
20.	OD15T 08-33017 PGSS-42	1.18	11.41	5.07	38.0	NR
21.	OD15U 08-33018 PGSS-44	1.17	11.47	4.73	34.6	NR

Analytical Resources, Incorporated
Analytical Chemists and Consultants

January 9, 2009

Mr. Roger McGinnis
Hart Crowser, Inc.
1700 Westlake Avenue North Suite 200
Seattle, WA 98109-3056

RE: Project: Port Gamble, 17330-14
ARI Job No.: OD92 & OD93

Dear Mr. McGinnis:

Please find enclosed the original Chain-of-Custody (COC) records, sample receipt documentation, and the final data package for the samples from the project referenced above.

The samples were analyzed for resin acids and various conventional parameters, as requested.

Sample receipt and details of these analyses are discussed in the Case Narrative.

An electronic copy of this data package and the supporting data 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.

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

Enclosures

cc: files OD92, OD93

KB/co

Chain of Custody
Documentation

prepared
for

HART CROWSER, INC.

Project: Port Gamble, 17330-14

ARI JOB NO: OD92 & OD93

prepared
by

Analytical Resources, Inc.

Sample Custody Record

1 of 3

OD97

Samples Shipped to: ARI

HARTCROWSER

Hart Crowser, Inc.
1910 Fairview Avenue East
Seattle, Washington 98102-3699
Phone: 206-324-9530 FAX: 206-328-5581

JOB 1733014 LAB NUMBER

PROJECT NAME PORT GAMBLE

HART CROWSER CONTACT ROGER McGINNIS

ANNE CONRAD

SAMPLED BY: VP, CU

LAB NO.	SAMPLE ID	DESCRIPTION	DATE	TIME	MATRIX	TOTAL SULFIDES	TOC	TVS	AMMONIA	GRAIN SIZE	SMS SVOC	SMS METALS*	PCBs	MICROTOX	DIOXIN	RESIN ACIDS	GUAIACOL	RETENE	NO. OF CONTAINERS	OBSERVATIONS/COMMENTS/ COMPOSITING INSTRUCTIONS
	PGSS-45		12/8/08	1145	SED	X	X	X	X							X			6	*SMS METALS – As, Cd, Cr, Cu, Pb, Ag, Zn, Hg
	PGSS-46			1215															6	
	PGSS-47			1325															6	
	PGSS-47A			1400															6	HOLD
	PGSS-51			1425		X	X	X	X							X			6	
	PGSS-53			1508															6	
	PGSS-54			1534															6	
	PGSS-55			1600															6	
	PGSS-56			1626															6	
	PGSS-58		12/9/08	0727															6	
	PGSS-61			0757															6	
	PGSS-62			0821															6	

RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE: CU	12/11/08	SIGNATURE: Jami Hayes	12/11/08
PRINT NAME: Carl Ulberg	TIME	PRINT NAME: Jami Hayes	TIME
COMPANY: HC	1210	COMPANY: ARI	1210
RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE	TIME	SIGNATURE	TIME
PRINT NAME		PRINT NAME	
COMPANY		COMPANY	

SPECIAL SHIPMENT HANDLING OR STORAGE REQUIREMENTS:
FREEZE EXTRA SAMPLE VOLUME
FULL DATA PACKAGE

12 TOTAL NUMBER OF CONTAINERS

SAMPLE RECEIPT INFORMATION
CUSTODY SEALS: ☐YES ☐NO ☐N/A
GOOD CONDITION ☐YES ☐NO
TEMPERATURE
SHIPMENT METHOD: ☐HAND ☐COURIER ☐OVERNIGHT

COOLER NO.: STORAGE LOCATION:

See Lab Work Order No. for Other Contract Requirements

TURNAROUND TIME:
☐ 24 HOURS ☐ 1 WEEK
☐ 48 HOURS ☐ STANDARD
☐ 72 HOURS OTHER

White and Yellow Copies to Lab Pink to Project Manager Lab to Return White Copy to Hart Crowser Gold to Sample Custodian

Sample Custody Record

0092

Samples Shipped to: ARI

2 OF 3

HARTCROWSER

Hart Crowser, Inc.
1910 Fairview Avenue East
Seattle, Washington 98102-3699
Phone: 206-324-9530 FAX: 206-328-5581

JOB 17330-14 LAB NUMBER

PROJECT NAME PORT GAMBLE

HART CROWSER CONTACT ROGER McGINNIS
ANNE CONRAD

SAMPLED BY: VP, CV

LAB NO.	SAMPLE ID	DESCRIPTION	DATE	TIME	MATRIX	TOTAL SULFIDE	TOC	TVS	AMMONIA	GRAIN SIZE	SMS SVOCs	SMS METALS	PCBs	MICROTOX	DIOXIN	RESIN ACIDS	GUAIACOL	RETENE	NO. OF CONTAINERS	OBSERVATIONS/COMMENTS/ COMPOSITING INSTRUCTIONS
	PGSS-62A		12/9/08	1009	SED	X	X	X	X							X			6	*SMS METALS - As, Cd,
	PGSS-62B			0846															6	Cr, Cu, Pb, Ag, Zn, Hg
	PGSS-63			0913															6	
	PGSS-64			1035															6	
	PGSS-67			1101															6	
	PGSS-68			1212															6	
	PGSS-69			1236															6	
	PGSS-70			1301															6	
	PGSS-71			1332															6	
	PGSS-73			1428															6	
	PGSS-75			1458															6	
	PGSS-77			1530															6	

72 TOTAL NUMBER OF CONTAINERS

RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE: Carl Ulberg	12/11/08	SIGNATURE: Jami Hayes	12/11/08
PRINT NAME: Carl Ulberg	TIME	PRINT NAME: Jami Hayes	TIME
COMPANY: HC	1210	COMPANY: ARI	1210
RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE	TIME	SIGNATURE	TIME
PRINT NAME		PRINT NAME	
COMPANY		COMPANY	

SPECIAL SHIPMENT HANDLING OR STORAGE REQUIREMENTS:
FREEZE EXTRA SAMPLE VOLUME
FULL DATA PACKAGE

SAMPLE RECEIPT INFORMATION
CUSTODY SEALS: ☐YES ☐NO ☐N/A
GOOD CONDITION ☐YES ☐NO
TEMPERATURE
SHIPMENT METHOD: ☐HAND ☐COURIER ☐OVERNIGHT

COOLER NO.: STORAGE LOCATION:

See Lab Work Order No. for Other Contract Requirements

TURNAROUND TIME:
☐ 24 HOURS ☐ 1 WEEK
☐ 48 HOURS ☐ STANDARD
☐ 72 HOURS OTHER

White and Yellow Copies to Lab Pink to Project Manager Lab to Return White Copy to Hart Crowser Gold to Sample Custodian

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Hart Crowser | Project Name: _____

COC No: _____ | Delivered by: Hand

Assigned ARI Job No: OD92 | Tracking No: _____

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
Record cooler temperature (recommended 2.0-6.0 °C for chemistry)	0.8, -2.0, 1.2, 1.2, 0.6, 1.6, 1.2 °C	2.0, 1.2

Cooler Accepted by: JH Date: 12/11/08 Time: 1225

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?		Ice	
Was sufficient ice used (if appropriate)?		(YES)	NO
Were all bottles sealed in individual plastic bags?		(YES)	NO
Did all bottle arrive in good condition (unbroken)?		(YES)	NO
Were all bottle labels complete and legible?		(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 checklist)		YES	(NO)
Were all VOC vials free of air bubbles?	(NA)	YES	NO
Was sufficient amount of sample sent in each bottle?		(YES)	NO

Samples Logged by: JH Date: 12/12/08 Time: 14:17

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

Explain discrepancies or negative responses:

By: Date:

Sample Custody Record

Samples Shipped to: ARI

0093

2 OF 5

HARTCROWSER

Hart Crowser, Inc.
1910 Fairview Avenue East
Seattle, Washington 98102-3699
Phone: 206-324-9530 FAX: 206-328-5581

JOB 17330-14 LAB NUMBER

PROJECT NAME PORT GAMBLE

HART CROWSER CONTACT ROGER MCGINNIS
ANNE CONRAD

SAMPLED BY: VP, CU

LAB NO.	SAMPLE ID	DESCRIPTION	DATE	TIME	MATRIX	TOTAL SULFIDE	TOC	TVS	AMMONIA	GRAIN SIZE	SMS SVOCS	SMS METALS	PCBs	MICROTOX	DIOXIN	RESIN ACIDS	GUAIACOL	RETENE	NO. OF CONTAINERS	OBSERVATIONS/COMMENTS/ COMPOSITING INSTRUCTIONS
	PGSS-62A		12/9/08	1009	SED	X	X	X	X							X			6	*SMS METALS - As, Cd,
	PGSS-62B			0846															6	Cr, Cu, Pb, Ag, Zn, Hg
	PGSS-63			0913															6	
	PGSS-64			1035															6	
	PGSS-67			1101															6	
	PGSS-68			1212															6	
	PGSS-69			1236															6	
	PGSS-70			1301															6	
	PGSS-71			1332															6	
	PGSS-73			1428															6	
	PGSS-75			1458															6	
	PGSS-77			1530															6	

RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE Carl Ulberg	12/11/08	SIGNATURE Jami Hayes	12/11/08
PRINT NAME Carl Ulberg	TIME 1210	PRINT NAME Jami Hayes	TIME 1210
COMPANY HC		COMPANY ARI	
RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE	TIME	SIGNATURE	TIME
PRINT NAME		PRINT NAME	
COMPANY		COMPANY	

SPECIAL SHIPMENT HANDLING OR STORAGE REQUIREMENTS:

FREEZE EXTRA SAMPLE VOLUME

FULL DATA PACKAGE

72 TOTAL NUMBER OF CONTAINERS

SAMPLE RECEIPT INFORMATION:
CUSTODY SEALS ☐ YES ☐ NO ☐ N/A
GOOD CONDITION ☐ YES ☐ NO
TEMPERATURE
SHIPMENT METHOD ☐ HAND ☐ COURIER ☐ OVERNIGHT

COOLER NO.: STORAGE LOCATION:

See Lab Work Order No. _____
for Other Contract Requirements

TURNAROUND TIME:
☐ 24 HOURS ☐ 1 WEEK
☐ 48 HOURS ☐ STANDARD
☐ 72 HOURS OTHER _____

White and Yellow Copies to Lab Pink to Project Manager Lab to Return White Copy to Hart Crowser Gold to Sample Custodian

Sample Custody Record

0093

3 OF 3

Samples Shipped to: ARI

HARTCROWSER

Hart Crowser, Inc.
1910 Fairview Avenue East
Seattle, Washington 98102-3699
Phone: 206-324-9530 FAX: 206-328-5581

JOB 17330-14 LAB NUMBER

PROJECT NAME PORT GAMBLE

HART CROWSER CONTACT ROGER MC GINNIS

ANNE CONDAS

SAMPLED BY: VP/CV

REQUESTED ANALYSIS

LAB NO.	SAMPLE ID	DESCRIPTION	DATE	TIME	MATRIX	TOTAL SULFIDE	TOC	TVS	AMMONIA	GRAIN SIZE	SMS SVOC*	SMS METALS*	PCBs	MICROTOX	DIOXIN	RESIN ACIDS	GUAIACOL	RETENE	NO. OF CONTAINERS	OBSERVATIONS/COMMENTS/ COMPOSITING INSTRUCTIONS
	PGSS-77A		12/9/08	1603	SED	X	X	X	X							✓			6	*SMS METALS - As, Cd,
	PGSS-78		12/10/08	0754															6	Cr, Cu, Pb, Ag, Zn, Hg
	PGSS-80			0817															6	
	PGSS-82			0851															6	
	PGSS-83			0917															6	
	PGSS-92			1103															6	
	PGSS-GEO-3			1035															6	HOLD

RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE Carl Uberg	12/4/08	SIGNATURE Jami Hays	12/4/08
PRINT NAME	TIME 1210	PRINT NAME Jami Hays	TIME 1210
COMPANY HC		COMPANY ARI	
RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE	TIME	SIGNATURE	TIME
PRINT NAME		PRINT NAME	
COMPANY		COMPANY	

SPECIAL SHIPMENT HANDLING OR STORAGE REQUIREMENTS:
FREEZE EXTRA SAMPLE VOLUME
FULL DATA PACKAGE

42 TOTAL NUMBER OF CONTAINERS

SAMPLE RECEIPT INFORMATION
CUSTODY SEALS: ☐YES ☐NO ☐N/A
GOOD CONDITION ☐YES ☐NO
TEMPERATURE
SHIPMENT METHOD: ☐HAND ☐COURIER ☐OVERNIGHT

COOLER NO.: STORAGE LOCATION:

See Lab Work Order No. for Other Contract Requirements

TURNAROUND TIME:
☐ 24 HOURS ☐ 1 WEEK
☐ 48 HOURS ☐ STANDARD
☐ 72 HOURS OTHER

White and Yellow Copies to Lab Pink to Project Manager Lab to Return White Copy to Hart Crowser Gold to Sample Custodian

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Hart Crowser Project Name: _____

COC No: _____ Delivered by: Hand

Assigned ARI Job No: _____ Tracking No: _____

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

Record cooler temperature (recommended 2.0-6.0 °C for chemistry) 0.8, -2.0, 1.2, 1.2, 0.6, 1.6, 1.2 °C, 2.0, 1.2

Cooler Accepted by: JH Date: 12/11/08 Time: 1225

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?			
Was sufficient ice used (if appropriate)?		YES	NO
Were all bottles sealed in individual plastic bags?		YES	NO
Did all bottle arrive in good condition (unbroken)?		YES	NO
Were all bottle labels complete and legible?		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 checklist)		YES	NO
Were all VOC vials free of air bubbles?	NA	YES	NO
Was sufficient amount of sample sent in each bottle?		YES	NO

Samples Logged by: _____ Date: _____ Time: _____

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

Explain discrepancies or negative responses:

By: Date:

Case Narrative

prepared
for

HART CROWSER, INC.

Project: Port Gamble, 17330-14

ARI JOB NO: OD92 & OD93

prepared
by

Analytical Resources, Inc.

Case Narrative
Hart Crowser
Port Gamble, 17330-14
ARI Job: OD92 & OD93
January 9, 2009

Sample Receipt

Analytical Resources Inc. (ARI) accepted thirty-one sediment samples in good condition on December 11, 2008 under the ARI job numbers OD92 and OD93. The cooler temperatures measured by IR thermometer following ARI SOP ranged between -2.0 and 2.0°C and the samples were well iced. Please note that several sample containers were archived up receipt as requested on the COC. All samples were frozen to protect holding times. For further detail regarding sample receipt, please refer to the Cooer Receipt Form.

Resin Acids by by Method 8270D:

The samples were extracted and analyzed within the method recommended holding times.

Initial calibration(s): All compounds of interest were within method acceptance criteria.

Continuing calibration(s): Are in control.

Samples: There were no anomalies associated with these samples.

Surrogates: Are in control.

LCS/LCSD(s): The LCS and LCSD percent recoveries of Neoabietic Acid fell outside the advisory control limits for both **LCS-122008** and **LCS-121708**. All samples were undetected for this compound. No further corrective action is required for these outliers as the control limits are advisory.

Method Blank: The method blanks were free of contamination.

MS/MSD(s): Several matrix spike and matrix spike duplicate percent recoveries fell outside the advisory control limits for samples **PGSS-70** and **PGSS80**. No further corrective action is required for these outliers as the control limits are advisory.

Conventional Parameters:

All samples were prepared and analyzed on within the method recommended holding times for frozen samples.

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

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

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

Case Narrative
Hart Crowser
Port Gamble, 17330-14
ARI Job: OD92 & OD93
January 9, 2009

LCS(s): All LCS percent recoveries were within control limits.

SRM(s): All SRM percent recoveries were within control limits.

Replicate(s): The replicate RPD for sulfide was outside the control limit for sample **PGSS-71**. All other quality control parameters were met for sulfide for this sample.

MS(s): The matrix spike percent recovery of sulfide fell outside the control limits low for sample **PGSS-45** due to matrix interference. All other quality control parameters were met for sulfide for this sample.

Data Reporting Qualifiers

Effective 12/28/04

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 ≥ 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
NR	Spiked compound recovery is not reported due to chromatographic interference
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.
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
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.

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 ≥40% RPD with no obvious chromatographic interference

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

LCS SOLUTIONS

12/30/08

LABE	SOLN ID	TEST	CONC. UG/ML	SOLVENT	EXP.
1	1549-3	PCB	20	ACETONE	10/10/09
2	1472-3	BCOC PEST	10	ACETONE	07/20/08
3	1517-1	PEST	02/04/20	ACETONE	05/15/09
4	1561-2	LOW PEST	0.2/0.4/2	ACETONE	05/15/09
5	1537-1	EPH	1500	MECL2	08/16/09
6	1559-2	PCP	12.5/125	ACETONE	11/05/09
7	1573-1	ABN	100	ACETONE	08/01/09
8	1566-1	TBT	2.5	MECL2	12/04/09
9	1567-3	PORE TBT	.125/.25	MECL2	12/04/09
10	1554-3	ABN ACID	100/200	MEOH	10/21/09
11	1563-3	TPHD	15000	ACETONE	11/20/09
12	1563-1	ABN BASE	200	ACETONE	06/30/09
13	1573-2	LOW PCB	2	ACETONE	10/10/09
14	1547-1	LOW ABN ACID	10/20	MEOH	04/10/09
15*	1452-1	SIM PNA	15/75	MEOH	04/09/09
16	1502-2	DIOXANE	100	MEOH	02/20/09
17	1516-2	1248 PCB	20	ACETONE	05/07/09
18	1514-4	LOW SIM PNA	1.5/7.5	ACETONE	04/24/09
19	1517-3	AK103	7500	MECL2	12/29/08
20	1572-2	PNA	100	ACETONE	12/26/09
21*	1414-4	SKY/BHT	100	MEOH	04/08/09
22	1570-1	HERB	12.5/12500	MEOH	02/19/09
23	1505-1	LOW ABN BASE	20	MEOH	03/20/09
24	1541-4	LOW ABN	10	ACETONE	08/01/09
25	1481-1	DIPHENYL	100	MEOH	07/20/08
26	1545-2	OP-PEST	25	MEOH	02/14/09
27	1495-1	STEROLS	200	MEOH	12/29/08
28	1494-1	ADD. PEST	4	ACETONE	01/23/09
29	1496-3	DECANES	100	MEOH	02/12/09
30	1497-2	EDB/DBCP	2	ACETONE	02/12/09
31	1510-3	TERPINEOL	100	MEOH	03/21/09

LCS SOLUTIONS

12/30/08

32	1545-3	GUAIACOL	50-200	ACETONE	06/05/09
33	1522-1	RESIN ACID	250	ACETONE	06/11/09
34	1530-2	CONGENERS	1	ACETONE	07/23/09
50	1571-1	FULL RESIN	250	ACETONE	06/10/09
*=REVERIFIED SOLUTION					

SURR SOLUTIONS

12/30/08

LABEL	SOLN ID	TEST	CONC. UG/ML	SOLVENT	EXP.
A	1559-5	ABN	100/150	MEOH	03/13/09
B	1572-1	SIM PNA	15/75	MEOH	08/28/09
C	1559-1	SIM ABN	25/37.5	MEOH	03/13/09
D	1561-3	LOW PCB	0.2	ACETONE	07/31/09
E*	1478-1	HERB	62.5	MEOH	09/21/09
F	1520-3	PCP	12.5	ACETONE	04/18/09
G	1534-1	1,4DIOXANE	100	MEOH	02/20/09
H	1545-1	OP-PEST	25	MEOH	02/14/09
I	1559-4	LOW S. PNA	1.5	MEOH	08/28/09
J	1566-5	TBT-PORE	0.125	MECL2	12/04/09
K	1538-1	MED PCB	20	ACETONE	07/31/09
L	1566-4	TBT	2.5	MECL2	12/04/09
M	1558-2	EPH	1500	MECL2	09/24/09
N	1538-2	PCB	2	ACETONE	07/31/09
O	1567-4	TPH	450	MECL2	09/24/09
P	1560-3	HCID	2250	MECL2	09/24/09
Q	1497-3	EDB	2	ACETONE	02/12/09
R	1521-4	RESIN ACID	250	ACETONE	06/11/09
S	1568-5	PBDE	.25	MEOH	12/11/09
T	*reverified	solution			
U					
V					
W					
X					
Y					
Z					

Data Summary Package

prepared
for

HART CROWSER, INC.

Project: Port Gamble, 17330-14

ARI JOB NO: OD92 & OD93

prepared
by

Analytical Resources, Inc.

RESIN ACIDS

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: PGSS-45
SAMPLE

Lab Sample ID: OD92A
LIMS ID: 08-33486
Matrix: Sediment
Data Release Authorized: MW
Reported: 01/09/09

QC Report No: OD92-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/08/08
Date Received: 12/11/08

Date Extracted: 12/20/08
Date Analyzed: 01/06/09 17:04
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 25.4 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: 61.6%

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	98	< 98 U
471-74-9	Sandaracopimaric Acid	98	< 98 U
5835-26-7	Isopimaric Acid	98	< 98 U
1945-53-5	Palustric Acid	98	< 98 U
1740-19-8	**Dehydroabietic Acid**	**98**	**140**
514-10-3	Abietic Acid	98	< 98 U
471-77-2	Neoabietic Acid	98	< 98 U
5829-48-1	9,10-Dichlorostearic Acid	98	< 98 U
112-80-1	**Oleic Acid**	**98**	**7,500 E**
463-40-1	**Linolenic Acid**	**98**	**830**

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	83.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: PGSS-45
DILUTION

Lab Sample ID: OD92A
LIMS ID: 08-33486
Matrix: Sediment
Data Release Authorized:
Reported: 01/09/09

QC Report No: OD92-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/08/08
Date Received: 12/11/08

Date Extracted: 12/20/08
Date Analyzed: 01/07/09 11:43
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 25.4 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 10.0
Percent Moisture: 61.6%

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	980	< 980 U
471-74-9	Sandaracopimaric Acid	980	< 980 U
5835-26-7	Isopimaric Acid	980	< 980 U
1945-53-5	Palustric Acid	980	< 980 U
1740-19-8	Dehydroabietic Acid	980	< 980 U
514-10-3	Abietic Acid	980	< 980 U
471-77-2	Neoabietic Acid	980	< 980 U
5829-48-1	9,10-Dichlorostearic Acid	980	< 980 U
112-80-1	**Oleic Acid**	**980**	**7,500**
463-40-1	**Linolenic Acid**	**980**	**1,200**

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	84.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: PGSS-46
SAMPLE

Lab Sample ID: OD92B
LIMS ID: 08-33487
Matrix: Sediment
Data Release Authorized: MW
Reported: 01/09/09

QC Report No: OD92-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/08/08
Date Received: 12/11/08

Date Extracted: 12/20/08
Date Analyzed: 01/06/09 17:19
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 25.5 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: 23.4%

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	98	< 98 U
471-74-9	Sandaracopimaric Acid	98	< 98 U
5835-26-7	Isopimaric Acid	98	< 98 U
1945-53-5	Palustric Acid	98	< 98 U
1740-19-8	Dehydroabietic Acid	98	< 98 U
514-10-3	Abietic Acid	98	< 98 U
471-77-2	Neoabietic Acid	98	< 98 U
5829-48-1	9,10-Dichlorostearic Acid	98	< 98 U
112-80-1	**Oleic Acid**	**98**	**3,700 E**
463-40-1	**Linolenic Acid**	**98**	**430**

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	94.4%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: PGSS-46
DILUTION

Lab Sample ID: OD92B
LIMS ID: 08-33487
Matrix: Sediment
Data Release Authorized: MW
Reported: 01/09/09

QC Report No: OD92-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/08/08
Date Received: 12/11/08

Date Extracted: 12/20/08
Date Analyzed: 01/07/09 11:58
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 25.5 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 5.00
Percent Moisture: 23.4%

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	490	< 490 U
471-74-9	Sandaracopimaric Acid	490	< 490 U
5835-26-7	Isopimaric Acid	490	< 490 U
1945-53-5	Palustric Acid	490	< 490 U
1740-19-8	Dehydroabietic Acid	490	< 490 U
514-10-3	Abietic Acid	490	< 490 U
471-77-2	Neoabietic Acid	490	< 490 U
5829-48-1	9,10-Dichlorostearic Acid	490	< 490 U
112-80-1	**Oleic Acid**	**490**	**3,500**
463-40-1	Linolenic Acid	490	< 490 U

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	94.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: PGSS-47
SAMPLE

Lab Sample ID: OD92C
LIMS ID: 08-33488
Matrix: Sediment
Data Release Authorized: MW
Reported: 01/09/09

QC Report No: OD92-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/08/08
Date Received: 12/11/08

Date Extracted: 12/20/08
Date Analyzed: 01/06/09 17:34
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 25.6 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: 31.6%

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	98	< 98 U
471-74-9	Sandaracopimaric Acid	98	< 98 U
5835-26-7	Isopimaric Acid	98	< 98 U
1945-53-5	Palustric Acid	98	< 98 U
1740-19-8	**Dehydroabietic Acid**	**98**	**250**
514-10-3	**Abietic Acid**	**98**	**440**
471-77-2	Neoabietic Acid	98	< 98 U
5829-48-1	9,10-Dichlorostearic Acid	98	< 98 U
112-80-1	**Oleic Acid**	**98**	**3,700 E**
463-40-1	**Linolenic Acid**	**98**	**510**

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	84.6%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: PGSS-47
DILUTION

Lab Sample ID: OD92C
LIMS ID: 08-33488
Matrix: Sediment
Data Release Authorized: MW
Reported: 01/09/09

QC Report No: OD92-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/08/08
Date Received: 12/11/08

Date Extracted: 12/20/08
Date Analyzed: 01/07/09 12:13
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 25.6 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 5.00
Percent Moisture: 31.6%

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	490	< 490 U
471-74-9	Sandaracopimaric Acid	490	< 490 U
5835-26-7	Isopimaric Acid	490	< 490 U
1945-53-5	Palustric Acid	490	< 490 U
1740-19-8	Dehydroabietic Acid	490	< 490 U
514-10-3	Abietic Acid	490	< 490 U
471-77-2	Neoabietic Acid	490	< 490 U
5829-48-1	9,10-Dichlorostearic Acid	490	< 490 U
112-80-1	**Oleic Acid**	**490**	**3,600**
463-40-1	Linolenic Acid	490	< 490 U

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	83.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: PGSS-51
SAMPLE

Lab Sample ID: OD92D
LIMS ID: 08-33489
Matrix: Sediment
Data Release Authorized:
Reported: 01/09/09

QC Report No: OD92-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/08/08
Date Received: 12/11/08

Date Extracted: 12/20/08
Date Analyzed: 01/06/09 17:49
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 25.5 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: 56.2%

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	98	< 98 U
471-74-9	Sandaracopimaric Acid	98	< 98 U
5835-26-7	Isopimaric Acid	98	< 98 U
1945-53-5	Palustric Acid	98	< 98 U
1740-19-8	**Dehydroabietic Acid**	**98**	**480**
514-10-3	**Abietic Acid**	**98**	**2,400 E**
471-77-2	Neoabietic Acid	98	< 98 U
5829-48-1	9,10-Dichlorostearic Acid	98	< 98 U
112-80-1	**Oleic Acid**	**98**	**8,000 E**
463-40-1	**Linolenic Acid**	**98**	**490**

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	75.6%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: PGSS-51
DILUTION

Lab Sample ID: OD92D
LIMS ID: 08-33489
Matrix: Sediment
Data Release Authorized:
Reported: 01/09/09

QC Report No: OD92-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/08/08
Date Received: 12/11/08

Date Extracted: 12/20/08
Date Analyzed: 01/07/09 12:28
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 25.5 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 10.0
Percent Moisture: 56.2%

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	980	< 980 U
471-74-9	Sandaracopimaric Acid	980	< 980 U
5835-26-7	Isopimaric Acid	980	< 980 U
1945-53-5	Palustric Acid	980	< 980 U
1740-19-8	Dehydroabietic Acid	980	< 980 U
514-10-3	**Abietic Acid**	**980**	**4,400**
471-77-2	Neoabietic Acid	980	< 980 U
5829-48-1	9,10-Dichlorostearic Acid	980	< 980 U
112-80-1	**Oleic Acid**	**980**	**8,400**
463-40-1	Linolenic Acid	980	< 980 U

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	81.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: PGSS-47A
SAMPLE

Lab Sample ID: OD92E
LIMS ID: 08-33490
Matrix: Sediment
Data Release Authorized:
Reported: 01/09/09

QC Report No: OD92-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/08/08
Date Received: 12/11/08

Date Extracted: 12/20/08
Date Analyzed: 01/06/09 18:04
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 25.5 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: 45.1%

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	98	< 98 U
471-74-9	Sandaracopimaric Acid	98	< 98 U
5835-26-7	Isopimaric Acid	98	< 98 U
1945-53-5	Palustric Acid	98	< 98 U
1740-19-8	**Dehydroabietic Acid**	**98**	**690**
514-10-3	**Abietic Acid**	**98**	**1,600**
471-77-2	Neoabietic Acid	98	< 98 U
5829-48-1	9,10-Dichlorostearic Acid	98	< 98 U
112-80-1	**Oleic Acid**	**98**	**5,200 E**
463-40-1	**Linolenic Acid**	**98**	**540**

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	79.4%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: PGSS-47A
DILUTION

Lab Sample ID: OD92E
LIMS ID: 08-33490
Matrix: Sediment
Data Release Authorized:
Reported: 01/09/09

QC Report No: OD92-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/08/08
Date Received: 12/11/08

Date Extracted: 12/20/08
Date Analyzed: 01/07/09 12:43
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 25.5 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 10.0
Percent Moisture: 45.1%

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	980	< 980 U
471-74-9	Sandaracopimaric Acid	980	< 980 U
5835-26-7	Isopimaric Acid	980	< 980 U
1945-53-5	Palustric Acid	980	< 980 U
1740-19-8	Dehydroabietic Acid	980	< 980 U
514-10-3	**Abietic Acid**	**980**	**1,900**
471-77-2	Neoabietic Acid	980	< 980 U
5829-48-1	9,10-Dichlorostearic Acid	980	< 980 U
112-80-1	**Oleic Acid**	**980**	**5,100**
463-40-1	Linolenic Acid	980	< 980 U

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	83.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: PGSS-53
SAMPLE

Lab Sample ID: OD92F
LIMS ID: 08-33491
Matrix: Sediment
Data Release Authorized:
Reported: 01/09/09

QC Report No: OD92-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/08/08
Date Received: 12/11/08

Date Extracted: 12/20/08
Date Analyzed: 01/06/09 18:20
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 25.2 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: 55.2%

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	99	< 99 U
471-74-9	Sandaracopimaric Acid	99	< 99 U
5835-26-7	Isopimaric Acid	99	< 99 U
1945-53-5	Palustric Acid	99	< 99 U
1740-19-8	**Dehydroabietic Acid**	**99**	**300**
514-10-3	**Abietic Acid**	**99**	**890**
471-77-2	Neoabietic Acid	99	< 99 U
5829-48-1	9,10-Dichlorostearic Acid	99	< 99 U
112-80-1	**Oleic Acid**	**99**	**5,400 E**
463-40-1	**Linolenic Acid**	**99**	**370**

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	64.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS

Sample ID: PGSS-53
DILUTION

Lab Sample ID: OD92F
LIMS ID: 08-33491
Matrix: Sediment
Data Release Authorized:
Reported: 01/09/09

QC Report No: OD92-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/08/08
Date Received: 12/11/08

Date Extracted: 12/20/08
Date Analyzed: 01/07/09 13:23
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 25.2 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 10.0
Percent Moisture: 55.2%

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	990	< 990 U
471-74-9	Sandaracopimaric Acid	990	< 990 U
5835-26-7	Isopimaric Acid	990	< 990 U
1945-53-5	Palustric Acid	990	< 990 U
1740-19-8	Dehydroabietic Acid	990	< 990 U
514-10-3	**Abietic Acid**	**990**	**1,700**
471-77-2	Neoabietic Acid	990	< 990 U
5829-48-1	9,10-Dichlorostearic Acid	990	< 990 U
112-80-1	**Oleic Acid**	**990**	**6,100**
463-40-1	Linolenic Acid	990	< 990 U

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	68.6%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: PGSS-54
SAMPLE

Lab Sample ID: OD92G
LIMS ID: 08-33492
Matrix: Sediment
Data Release Authorized: MW
Reported: 01/09/09

QC Report No: OD92-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/08/08
Date Received: 12/11/08

Date Extracted: 12/20/08
Date Analyzed: 01/06/09 18:35
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 25.6 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: 48.6%

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	98	< 98 U
471-74-9	Sandaracopimaric Acid	98	< 98 U
5835-26-7	Isopimaric Acid	98	< 98 U
1945-53-5	Palustric Acid	98	< 98 U
1740-19-8	**Dehydroabietic Acid**	**98**	**240**
514-10-3	**Abietic Acid**	**98**	**620**
471-77-2	Neoabietic Acid	98	< 98 U
5829-48-1	9,10-Dichlorostearic Acid	98	< 98 U
112-80-1	**Oleic Acid**	**98**	**6,100 E**
463-40-1	**Linolenic Acid**	**98**	**400**

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	74.8%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: PGSS-54
DILUTION

Lab Sample ID: OD92G
LIMS ID: 08-33492
Matrix: Sediment
Data Release Authorized: MW
Reported: 01/09/09

QC Report No: OD92-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/08/08
Date Received: 12/11/08

Date Extracted: 12/20/08
Date Analyzed: 01/07/09 13:38
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 25.6 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 10.0
Percent Moisture: 48.6%

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	980	< 980 U
471-74-9	Sandaracopimaric Acid	980	< 980 U
5835-26-7	Isopimaric Acid	980	< 980 U
1945-53-5	Palustric Acid	980	< 980 U
1740-19-8	Dehydroabietic Acid	980	< 980 U
514-10-3	Abietic Acid	980	< 980 U
471-77-2	Neoabietic Acid	980	< 980 U
5829-48-1	9,10-Dichlorostearic Acid	980	< 980 U
112-80-1	**Oleic Acid**	**980**	**7,000**
463-40-1	Linolenic Acid	980	< 980 U

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	81.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: PGSS-55
SAMPLE

Lab Sample ID: OD92H
LIMS ID: 08-33493
Matrix: Sediment
Data Release Authorized: MW
Reported: 01/09/09

QC Report No: OD92-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/08/08
Date Received: 12/11/08

Date Extracted: 12/20/08
Date Analyzed: 01/06/09 18:50
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 25.9 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: 23.4%

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	96	< 96 U
471-74-9	Sandaracopimaric Acid	96	< 96 U
5835-26-7	Isopimaric Acid	96	< 96 U
1945-53-5	Palustric Acid	96	< 96 U
1740-19-8	Dehydroabietic Acid	96	< 96 U
514-10-3	Abietic Acid	96	< 96 U
471-77-2	Neoabietic Acid	96	< 96 U
5829-48-1	9,10-Dichlorostearic Acid	96	< 96 U
112-80-1	**Oleic Acid**	**96**	**2,200 E**
463-40-1	**Linolenic Acid**	**96**	**170**

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	79.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: PGSS-55
DILUTION

Lab Sample ID: OD92H
LIMS ID: 08-33493
Matrix: Sediment
Data Release Authorized: MW
Reported: 01/09/09

QC Report No: OD92-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/08/08
Date Received: 12/11/08

Date Extracted: 12/20/08
Date Analyzed: 01/07/09 13:53
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 25.9 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 2.00
Percent Moisture: 23.4%

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	190	< 190 U
471-74-9	Sandaracopimaric Acid	190	< 190 U
5835-26-7	Isopimaric Acid	190	< 190 U
1945-53-5	Palustric Acid	190	< 190 U
1740-19-8	Dehydroabietic Acid	190	< 190 U
514-10-3	Abietic Acid	190	< 190 U
471-77-2	Neoabietic Acid	190	< 190 U
5829-48-1	9,10-Dichlorostearic Acid	190	< 190 U
112-80-1	**Oleic Acid**	**190**	**1,900**
463-40-1	Linolenic Acid	190	< 190 U

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	73.6%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: PGSS-56
SAMPLE

Lab Sample ID: OD92I
LIMS ID: 08-33494
Matrix: Sediment
Data Release Authorized: MW
Reported: 01/09/09

QC Report No: OD92-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/08/08
Date Received: 12/11/08

Date Extracted: 12/20/08
Date Analyzed: 01/06/09 19:05
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 25.8 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: 24.3%

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	97	< 97 U
471-74-9	Sandaracopimaric Acid	97	< 97 U
5835-26-7	Isopimaric Acid	97	< 97 U
1945-53-5	Palustric Acid	97	< 97 U
1740-19-8	Dehydroabietic Acid	97	< 97 U
514-10-3	**Abietic Acid**	**97**	**160**
471-77-2	Neoabietic Acid	97	< 97 U
5829-48-1	9,10-Dichlorostearic Acid	97	< 97 U
112-80-1	**Oleic Acid**	**97**	**2,600 E**
463-40-1	**Linolenic Acid**	**97**	**200**

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	76.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS

Sample ID: PGSS-56
DILUTION

Lab Sample ID: OD92I
LIMS ID: 08-33494
Matrix: Sediment
Data Release Authorized: MW
Reported: 01/09/09

QC Report No: OD92-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/08/08
Date Received: 12/11/08

Date Extracted: 12/20/08
Date Analyzed: 01/07/09 14:08
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 25.8 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 2.00
Percent Moisture: 24.3%

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	190	< 190 U
471-74-9	Sandaracopimaric Acid	190	< 190 U
5835-26-7	Isopimaric Acid	190	< 190 U
1945-53-5	Palustric Acid	190	< 190 U
1740-19-8	Dehydroabietic Acid	190	< 190 U
514-10-3	Abietic Acid	190	< 190 U
471-77-2	Neoabietic Acid	190	< 190 U
5829-48-1	9,10-Dichlorostearic Acid	190	< 190 U
112-80-1	**Oleic Acid**	**190**	**2,300**
463-40-1	Linolenic Acid	190	< 190 U

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	72.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: PGSS-58
SAMPLE

Lab Sample ID: OD92J
LIMS ID: 08-33495
Matrix: Sediment
Data Release Authorized: MW
Reported: 01/09/09

QC Report No: OD92-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/09/08
Date Received: 12/11/08

Date Extracted: 12/20/08
Date Analyzed: 01/06/09 19:20
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 25.3 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: 63.0%

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	99	< 99 U
471-74-9	Sandaracopimaric Acid	99	< 99 U
5835-26-7	Isopimaric Acid	99	< 99 U
1945-53-5	Palustric Acid	99	< 99 U
1740-19-8	**Dehydroabietic Acid**	**99**	**310**
514-10-3	**Abietic Acid**	**99**	**740**
471-77-2	Neoabietic Acid	99	< 99 U
5829-48-1	9,10-Dichlorostearic Acid	99	< 99 U
112-80-1	**Oleic Acid**	**99**	**5,300 E**
463-40-1	**Linolenic Acid**	**99**	**580**

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	74.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: PGSS-58
DILUTION

Lab Sample ID: OD92J
LIMS ID: 08-33495
Matrix: Sediment
Data Release Authorized:
Reported: 01/09/09

QC Report No: OD92-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/09/08
Date Received: 12/11/08

Date Extracted: 12/20/08
Date Analyzed: 01/07/09 14:23
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 25.3 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 10.0
Percent Moisture: 63.0%

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	990	< 990 U
471-74-9	Sandaracopimaric Acid	990	< 990 U
5835-26-7	Isopimaric Acid	990	< 990 U
1945-53-5	Palustric Acid	990	< 990 U
1740-19-8	Dehydroabietic Acid	990	< 990 U
514-10-3	**Abietic Acid**	**990**	**1,100**
471-77-2	Neoabietic Acid	990	< 990 U
5829-48-1	9,10-Dichlorostearic Acid	990	< 990 U
112-80-1	**Oleic Acid**	**990**	**5,700**
463-40-1	**Linolenic Acid**	**990**	**1,200**

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	84.4%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: PGSS-61
SAMPLE

Lab Sample ID: OD92K
LIMS ID: 08-33496
Matrix: Sediment
Data Release Authorized:
Reported: 01/09/09

QC Report No: OD92-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/09/08
Date Received: 12/11/08

Date Extracted: 12/20/08
Date Analyzed: 01/06/09 19:35
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 25.7 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: 26.7%

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	97	< 97 U
471-74-9	Sandaracopimaric Acid	97	< 97 U
5835-26-7	Isopimaric Acid	97	< 97 U
1945-53-5	Palustric Acid	97	< 97 U
1740-19-8	Dehydroabietic Acid	97	< 97 U
514-10-3	Abietic Acid	97	< 97 U
471-77-2	Neoabietic Acid	97	< 97 U
5829-48-1	9,10-Dichlorostearic Acid	97	< 97 U
112-80-1	**Oleic Acid**	**97**	**2,700 E**
463-40-1	**Linolenic Acid**	**97**	**230**

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	83.8%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: PGSS-61
DILUTION

Lab Sample ID: OD92K
LIMS ID: 08-33496
Matrix: Sediment
Data Release Authorized: MW
Reported: 01/09/09

QC Report No: OD92-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/09/08
Date Received: 12/11/08

Date Extracted: 12/20/08
Date Analyzed: 01/07/09 14:55
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 25.7 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 5.00
Percent Moisture: 26.7%

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	490	< 490 U
471-74-9	Sandaracopimaric Acid	490	< 490 U
5835-26-7	Isopimaric Acid	490	< 490 U
1945-53-5	Palustric Acid	490	< 490 U
1740-19-8	Dehydroabietic Acid	490	< 490 U
514-10-3	Abietic Acid	490	< 490 U
471-77-2	Neoabietic Acid	490	< 490 U
5829-48-1	9,10-Dichlorostearic Acid	490	< 490 U
112-80-1	**Oleic Acid**	**490**	**2,900**
463-40-1	Linolenic Acid	490	< 490 U

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	83.6%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: PGSS-62
SAMPLE

Lab Sample ID: OD92L
LIMS ID: 08-33497
Matrix: Sediment
Data Release Authorized: MW
Reported: 01/09/09

QC Report No: OD92-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/09/08
Date Received: 12/11/08

Date Extracted: 12/20/08
Date Analyzed: 01/06/09 19:50
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 25.4 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: 18.8%

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	98	< 98 U
471-74-9	Sandaracopimaric Acid	98	< 98 U
5835-26-7	Isopimaric Acid	98	< 98 U
1945-53-5	Palustric Acid	98	< 98 U
1740-19-8	Dehydroabietic Acid	98	< 98 U
514-10-3	Abietic Acid	98	< 98 U
471-77-2	Neoabietic Acid	98	< 98 U
5829-48-1	9,10-Dichlorostearic Acid	98	< 98 U
112-80-1	**Oleic Acid**	**98**	**1,500**
463-40-1	**Linolenic Acid**	**98**	**110**

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	87.4%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: PGSS-62A
SAMPLE

Lab Sample ID: OD92M
LIMS ID: 08-33498
Matrix: Sediment
Data Release Authorized:
Reported: 01/09/09

QC Report No: OD92-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/09/08
Date Received: 12/11/08

Date Extracted: 12/20/08
Date Analyzed: 01/06/09 20:05
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 26.1 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: 22.4%

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	96	< 96 U
471-74-9	Sandaracopimaric Acid	96	< 96 U
5835-26-7	Isopimaric Acid	96	< 96 U
1945-53-5	Palustric Acid	96	< 96 U
1740-19-8	**Dehydroabietic Acid**	**96**	**120**
514-10-3	Abietic Acid	96	< 96 U
471-77-2	Neoabietic Acid	96	< 96 U
5829-48-1	9,10-Dichlorostearic Acid	96	< 96 U
112-80-1	**Oleic Acid**	**96**	**3,800 E**
463-40-1	**Linolenic Acid**	**96**	**270**

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	81.6%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: PGSS-62A
DILUTION

Lab Sample ID: OD92M
LIMS ID: 08-33498
Matrix: Sediment
Data Release Authorized:
Reported: 01/09/09

QC Report No: OD92-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/09/08
Date Received: 12/11/08

Date Extracted: 12/20/08
Date Analyzed: 01/07/09 15:11
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 26.1 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 5.00
Percent Moisture: 22.4%

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	480	< 480 U
471-74-9	Sandaracopimaric Acid	480	< 480 U
5835-26-7	Isopimaric Acid	480	< 480 U
1945-53-5	Palustric Acid	480	< 480 U
1740-19-8	Dehydroabietic Acid	480	< 480 U
514-10-3	Abietic Acid	480	< 480 U
471-77-2	Neoabietic Acid	480	< 480 U
5829-48-1	9,10-Dichlorostearic Acid	480	< 480 U
112-80-1	**Oleic Acid**	**480**	**3,700**
463-40-1	Linolenic Acid	480	< 480 U

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	79.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: PGSS-62B
SAMPLE

Lab Sample ID: OD92N
LIMS ID: 08-33499
Matrix: Sediment
Data Release Authorized:
Reported: 01/09/09

QC Report No: OD92-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/09/08
Date Received: 12/11/08

Date Extracted: 12/20/08
Date Analyzed: 01/06/09 20:20
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 26.3 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: 28.8%

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	95	< 95 U
471-74-9	Sandaracopimaric Acid	95	< 95 U
5835-26-7	Isopimaric Acid	95	< 95 U
1945-53-5	Palustric Acid	95	< 95 U
1740-19-8	Dehydroabietic Acid	95	< 95 U
514-10-3	Abietic Acid	95	< 95 U
471-77-2	Neoabietic Acid	95	< 95 U
5829-48-1	9,10-Dichlorostearic Acid	95	< 95 U
112-80-1	**Oleic Acid**	**95**	**3,600 E**
463-40-1	**Linolenic Acid**	**95**	**420**

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	76.4%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: PGSS-62B
DILUTION

Lab Sample ID: OD92N
LIMS ID: 08-33499
Matrix: Sediment
Data Release Authorized: MW
Reported: 01/09/09

QC Report No: OD92-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/09/08
Date Received: 12/11/08

Date Extracted: 12/20/08
Date Analyzed: 01/07/09 15:26
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 26.3 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 5.00
Percent Moisture: 28.8%

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	480	< 480 U
471-74-9	Sandaracopimaric Acid	480	< 480 U
5835-26-7	Isopimaric Acid	480	< 480 U
1945-53-5	Palustric Acid	480	< 480 U
1740-19-8	Dehydroabietic Acid	480	< 480 U
514-10-3	Abietic Acid	480	< 480 U
471-77-2	Neoabietic Acid	480	< 480 U
5829-48-1	9,10-Dichlorostearic Acid	480	< 480 U
112-80-1	**Oleic Acid**	**480**	**3,600**
463-40-1	Linolenic Acid	480	< 480 U

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	72.8%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: PGSS-63
SAMPLE

Lab Sample ID: OD920
LIMS ID: 08-33500
Matrix: Sediment
Data Release Authorized: MW
Reported: 01/09/09

QC Report No: OD92-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/09/08
Date Received: 12/11/08

Date Extracted: 12/20/08
Date Analyzed: 01/06/09 20:36
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 25.5 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: 29.4%

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	98	< 98 U
471-74-9	Sandaracopimaric Acid	98	< 98 U
5835-26-7	Isopimaric Acid	98	< 98 U
1945-53-5	Palustric Acid	98	< 98 U
1740-19-8	**Dehydroabietic Acid**	**98**	**110**
514-10-3	Abietic Acid	98	< 98 U
471-77-2	Neoabietic Acid	98	< 98 U
5829-48-1	9,10-Dichlorostearic Acid	98	< 98 U
112-80-1	**Oleic Acid**	**98**	**3,000 E**
463-40-1	**Linolenic Acid**	**98**	**210**

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	75.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS

Sample ID: PGSS-63
DILUTION

Lab Sample ID: OD92O
LIMS ID: 08-33500
Matrix: Sediment
Data Release Authorized: MW
Reported: 01/09/09

QC Report No: OD92-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/09/08
Date Received: 12/11/08

Date Extracted: 12/20/08
Date Analyzed: 01/07/09 15:41
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 25.5 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 5.00
Percent Moisture: 29.4%

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	490	< 490 U
471-74-9	Sandaracopimaric Acid	490	< 490 U
5835-26-7	Isopimaric Acid	490	< 490 U
1945-53-5	Palustric Acid	490	< 490 U
1740-19-8	Dehydroabietic Acid	490	< 490 U
514-10-3	Abietic Acid	490	< 490 U
471-77-2	Neoabietic Acid	490	< 490 U
5829-48-1	9,10-Dichlorostearic Acid	490	< 490 U
112-80-1	**Oleic Acid**	**490**	**3,000**
463-40-1	Linolenic Acid	490	< 490 U

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	70.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: PGSS-64
SAMPLE

Lab Sample ID: OD92P
LIMS ID: 08-33501
Matrix: Sediment
Data Release Authorized: mw
Reported: 01/09/09

QC Report No: OD92-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/09/08
Date Received: 12/11/08

Date Extracted: 12/20/08
Date Analyzed: 01/06/09 20:51
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 25.9 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: 31.2%

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	96	< 96 U
471-74-9	Sandaracopimaric Acid	96	< 96 U
5835-26-7	Isopimaric Acid	96	< 96 U
1945-53-5	Palustric Acid	96	< 96 U
1740-19-8	Dehydroabietic Acid	96	< 96 U
514-10-3	Abietic Acid	96	< 96 U
471-77-2	Neoabietic Acid	96	< 96 U
5829-48-1	9,10-Dichlorostearic Acid	96	< 96 U
112-80-1	**Oleic Acid**	**96**	**2,800 E**
463-40-1	**Linolenic Acid**	**96**	**180**

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	87.4%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: PGSS-64
DILUTION

Lab Sample ID: OD92P
LIMS ID: 08-33501
Matrix: Sediment
Data Release Authorized: MW
Reported: 01/09/09

QC Report No: OD92-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/09/08
Date Received: 12/11/08

Date Extracted: 12/20/08
Date Analyzed: 01/07/09 15:56
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 25.9 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 5.00
Percent Moisture: 31.2%

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	480	< 480 U
471-74-9	Sandaracopimaric Acid	480	< 480 U
5835-26-7	Isopimaric Acid	480	< 480 U
1945-53-5	Palustric Acid	480	< 480 U
1740-19-8	Dehydroabietic Acid	480	< 480 U
514-10-3	Abietic Acid	480	< 480 U
471-77-2	Neoabietic Acid	480	< 480 U
5829-48-1	9,10-Dichlorostearic Acid	480	< 480 U
112-80-1	**Oleic Acid**	**480**	**3,000**
463-40-1	Linolenic Acid	480	< 480 U

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	86.9%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: PGSS-67
SAMPLE

Lab Sample ID: OD92Q
LIMS ID: 08-33502
Matrix: Sediment
Data Release Authorized: MW
Reported: 01/09/09

QC Report No: OD92-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/09/08
Date Received: 12/11/08

Date Extracted: 12/20/08
Date Analyzed: 01/06/09 21:06
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 25.6 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: 27.1%

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	98	< 98 U
471-74-9	Sandaracopimaric Acid	98	< 98 U
5835-26-7	Isopimaric Acid	98	< 98 U
1945-53-5	Palustric Acid	98	< 98 U
1740-19-8	**Dehydroabietic Acid**	**98**	**110**
514-10-3	Abietic Acid	98	< 98 U
471-77-2	Neoabietic Acid	98	< 98 U
5829-48-1	9,10-Dichlorostearic Acid	98	< 98 U
112-80-1	**Oleic Acid**	**98**	**2,500 E**
463-40-1	**Linolenic Acid**	**98**	**290**

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	85.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: PGSS-67
DILUTION

Lab Sample ID: OD92Q
LIMS ID: 08-33502
Matrix: Sediment
Data Release Authorized: MW
Reported: 01/09/09

QC Report No: OD92-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/09/08
Date Received: 12/11/08

Date Extracted: 12/20/08
Date Analyzed: 01/07/09 16:11
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 25.6 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 2.00
Percent Moisture: 27.1%

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	200	< 200 U
471-74-9	Sandaracopimaric Acid	200	< 200 U
5835-26-7	Isopimaric Acid	200	< 200 U
1945-53-5	Palustric Acid	200	< 200 U
1740-19-8	Dehydroabietic Acid	200	< 200 U
514-10-3	Abietic Acid	200	< 200 U
471-77-2	Neoabietic Acid	200	< 200 U
5829-48-1	9,10-Dichlorostearic Acid	200	< 200 U
112-80-1	**Oleic Acid**	**200**	**2,200**
463-40-1	**Linolenic Acid**	**200**	**200**

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	73.6%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: PGSS-68
SAMPLE

Lab Sample ID: OD92R
LIMS ID: 08-33503
Matrix: Sediment
Data Release Authorized: MW
Reported: 01/09/09

QC Report No: OD92-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/09/08
Date Received: 12/11/08

Date Extracted: 12/20/08
Date Analyzed: 01/06/09 21:21
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 26.0 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: 20.1%

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	96	< 96 U
471-74-9	Sandaracopimaric Acid	96	< 96 U
5835-26-7	Isopimaric Acid	96	< 96 U
1945-53-5	Palustric Acid	96	< 96 U
1740-19-8	Dehydroabietic Acid	96	< 96 U
514-10-3	Abietic Acid	96	< 96 U
471-77-2	Neoabietic Acid	96	< 96 U
5829-48-1	9,10-Dichlorostearic Acid	96	< 96 U
112-80-1	**Oleic Acid**	**96**	**1,700**
463-40-1	**Linolenic Acid**	**96**	**140**

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery	
O-Methyl Podocarpic Acid	85.6%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: PGSS-69
SAMPLE

Lab Sample ID: OD92S
LIMS ID: 08-33504
Matrix: Sediment
Data Release Authorized: MW
Reported: 01/09/09

QC Report No: OD92-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/09/08
Date Received: 12/11/08

Date Extracted: 12/20/08
Date Analyzed: 01/06/09 21:36
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 25.8 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: 23.5%

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	97	< 97 U
471-74-9	Sandaracopimaric Acid	97	< 97 U
5835-26-7	Isopimaric Acid	97	< 97 U
1945-53-5	Palustric Acid	97	< 97 U
1740-19-8	Dehydroabietic Acid	97	< 97 U
514-10-3	Abietic Acid	97	< 97 U
471-77-2	Neoabietic Acid	97	< 97 U
5829-48-1	9,10-Dichlorostearic Acid	97	< 97 U
112-80-1	**Oleic Acid**	**97**	**2,900 E**
463-40-1	**Linolenic Acid**	**97**	**310**

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	85.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: PGSS-69
DILUTION

Lab Sample ID: OD92S
LIMS ID: 08-33504
Matrix: Sediment
Data Release Authorized: MW
Reported: 01/09/09

QC Report No: OD92-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/09/08
Date Received: 12/11/08

Date Extracted: 12/20/08
Date Analyzed: 01/07/09 16:26
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 25.8 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 5.00
Percent Moisture: 23.5%

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	480	< 480 U
471-74-9	Sandaracopimaric Acid	480	< 480 U
5835-26-7	Isopimaric Acid	480	< 480 U
1945-53-5	Palustric Acid	480	< 480 U
1740-19-8	Dehydroabietic Acid	480	< 480 U
514-10-3	Abietic Acid	480	< 480 U
471-77-2	Neoabietic Acid	480	< 480 U
5829-48-1	9,10-Dichlorostearic Acid	480	< 480 U
112-80-1	**Oleic Acid**	**480**	**2,800**
463-40-1	Linolenic Acid	480	< 480 U

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	78.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: PGSS-70
SAMPLE

Lab Sample ID: OD92T
LIMS ID: 08-33505
Matrix: Sediment
Data Release Authorized: MW
Reported: 01/09/09

QC Report No: OD92-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/09/08
Date Received: 12/11/08

Date Extracted: 12/20/08
Date Analyzed: 01/06/09 21:51
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 25.8 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: 23.5%

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	97	< 97 U
471-74-9	Sandaracopimaric Acid	97	< 97 U
5835-26-7	Isopimaric Acid	97	< 97 U
1945-53-5	Palustric Acid	97	< 97 U
1740-19-8	Dehydroabietic Acid	97	< 97 U
514-10-3	Abietic Acid	97	< 97 U
471-77-2	Neoabietic Acid	97	< 97 U
5829-48-1	9,10-Dichlorostearic Acid	97	< 97 U
112-80-1	**Oleic Acid**	**97**	**2,300 E**
463-40-1	**Linolenic Acid**	**97**	**150**

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	82.6%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: PGSS-70
DILUTION

Lab Sample ID: OD92T
LIMS ID: 08-33505
Matrix: Sediment
Data Release Authorized: MW
Reported: 01/09/09

QC Report No: OD92-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/09/08
Date Received: 12/11/08

Date Extracted: 12/20/08
Date Analyzed: 01/07/09 16:41
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 25.8 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 2.00
Percent Moisture: 23.5%

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	190	< 190 U
471-74-9	Sandaracopimaric Acid	190	< 190 U
5835-26-7	Isopimaric Acid	190	< 190 U
1945-53-5	Palustric Acid	190	< 190 U
1740-19-8	Dehydroabietic Acid	190	< 190 U
514-10-3	Abietic Acid	190	< 190 U
471-77-2	Neoabietic Acid	190	< 190 U
5829-48-1	9,10-Dichlorostearic Acid	190	< 190 U
112-80-1	**Oleic Acid**	**190**	**2,000**
463-40-1	Linolenic Acid	190	< 190 U

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery	
O-Methyl Podocarpic Acid	67.2%

ANALYTICAL RESOURCES INCORPORATED

SW8270 RESIN ACIDS SOIL/SEDIMENT SURROGATE RECOVERY SUMMARY

Matrix: Sediment

QC Report No: OD92-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014

Client ID	MPA	TOT OUT
PGSS-45	83.0%	0
PGSS-45	84.2%	0
PGSS-46	94.4%	0
PGSS-46	94.2%	0
PGSS-47	84.6%	0
PGSS-47	83.3%	0
PGSS-51	75.6%	0
PGSS-51	81.0%	0
PGSS-47A	79.4%	0
PGSS-47A	83.2%	0
PGSS-53	64.0%	0
PGSS-53	68.6%	0
PGSS-54	74.8%	0
PGSS-54	81.0%	0
PGSS-55	79.0%	0
PGSS-55	73.6%	0
PGSS-56	76.2%	0
PGSS-56	72.0%	0
PGSS-58	74.0%	0
PGSS-58	84.4%	0
PGSS-61	83.8%	0
PGSS-61	83.6%	0
PGSS-62	87.4%	0
PGSS-62A	81.6%	0
PGSS-62A	79.0%	0
PGSS-62B	76.4%	0
PGSS-62B	72.8%	0
PGSS-63	75.0%	0
PGSS-63	70.2%	0
PGSS-64	87.4%	0
PGSS-64	86.9%	0
PGSS-67	85.0%	0
PGSS-67	73.6%	0
PGSS-68	85.6%	0
PGSS-69	85.2%	0
PGSS-69	78.2%	0
MB-122008	97.6%	0
LCS-122008	99.0%	0
LCSD-122008	104%	0
PGSS-70	82.6%	0
PGSS-70	67.2%	0
PGSS-70 MS	86.2%	0
PGSS-70 MSD	91.8%	0

	LCS/MB LIMITS	QC LIMITS
(MPA) = O-Methyl Podocarpic Acid	(28-120)	(19-114)

Prep Method: SW3550B
Log Number Range: 08-33486 to 08-33505

FORM-II SW8270

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: PGSS-70
MATRIX SPIKE

Lab Sample ID: OD92T
LIMS ID: 08-33505
Matrix: Sediment
Data Release Authorized:
Reported: 01/09/09

QC Report No: OD92-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/09/08
Date Received: 12/11/08

Date Extracted MS: 12/20/08

Sample Amount MS: 25.4 g-dry-wt
MSD: 25.7 g-dry-wt

Date Analyzed MS: 01/06/09 22:06
MSD: 01/06/09 22:21

Final Extract Volume MS: 0.5 mL
MSD: 0.5 mL

Instrument/Analyst MS: NT6/VTS
MSD: NT6/VTS

Dilution Factor MS: 1.00
MSD: 1.00

Moisture: 23.5%

Analyte	Sample	MS	Spike Added-MS	MS Recovery	MSD	Spike Added-MSD	MSD Recovery	RPD
Pimaric Acid	< 96.9 U	727	985	73.8%	804	974	82.5%	10.1%
Sandaracopimaric Acid	< 96.9 U	720	985	73.1%	800	974	82.1%	10.5%
Isopimaric Acid	< 96.9 U	356	985	36.1%	409	974	42.0%	13.9%
Palustric Acid	< 96.9 U	< 98.5 U	985	NA	< 97.4 U	974	NA	NA
Dehydroabietic Acid	< 96.9 U	934	985	94.8%	1040	974	107%	10.7%
Abietic Acid	< 96.9 U	723	985	73.4%	779	974	80.0%	7.5%
Neoabietic Acid	< 96.9 U	81.2 J	985	8.2%	89.4 J	974	9.2%	9.6%
9,10-Dichlorostearic Acid	< 96.9 U	722	985	73.3%	788	974	80.9%	8.7%
Oleic Acid	2310 E	3320 E	985	103%	3690 E	974	142%	10.6%
Linolenic Acid	153	444	985	29.5%	549	974	40.7%	21.1%

Results reported in µg/kg
NA-No recovery due to high concentration of analyte in original sample and/or calculated negative recovery.
RPD calculated using sample concentrations per SW846.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: PGSS-70
MATRIX SPIKE

Lab Sample ID: OD92T
LIMS ID: 08-33505
Matrix: Sediment
Data Release Authorized:
Reported: 01/09/09

QC Report No: OD92-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/09/08
Date Received: 12/11/08

Date Extracted: 12/20/08
Date Analyzed: 01/06/09 22:06
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 25.4 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: 23.5%

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	98	---
471-74-9	Sandaracopimaric Acid	98	---
5835-26-7	Isopimaric Acid	98	---
1945-53-5	Palustric Acid	98	---
1740-19-8	Dehydroabietic Acid	98	---
514-10-3	Abietic Acid	98	---
471-77-2	Neoabietic Acid	98	---
5829-48-1	9,10-Dichlorostearic Acid	98	---
112-80-1	Oleic Acid	98	---
463-40-1	Linolenic Acid	98	---

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	86.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: PGSS-70
MATRIX SPIKE DUP

Lab Sample ID: OD92T
LIMS ID: 08-33505
Matrix: Sediment
Data Release Authorized: MW
Reported: 01/09/09

QC Report No: OD92-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/09/08
Date Received: 12/11/08

Date Extracted: 12/20/08
Date Analyzed: 01/06/09 22:21
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 25.7 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: 23.5%

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	97	---
471-74-9	Sandaracopimaric Acid	97	---
5835-26-7	Isopimaric Acid	97	---
1945-53-5	Palustric Acid	97	---
1740-19-8	Dehydroabietic Acid	97	---
514-10-3	Abietic Acid	97	---
471-77-2	Neoabietic Acid	97	---
5829-48-1	9,10-Dichlorostearic Acid	97	---
112-80-1	Oleic Acid	97	---
463-40-1	Linolenic Acid	97	---

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	91.8%

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

ANALYTICAL RESOURCES INCORPORATED

Sample ID: LCS-122008
LAB CONTROL SAMPLE

Lab Sample ID: LCS-122008
LIMS ID: 08-33505
Matrix: Sediment
Data Release Authorized: MW
Reported: 01/09/09

QC Report No: OD92-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: NA
Date Received: NA

Date Extracted LCS: 12/20/08

Date Analyzed LCS: 01/06/09 16:34
LCSD: 01/06/09 16:49
Instrument/Analyst LCS: NT6/VTS
LCSD: NT6/VTS

Sample Amount LCS: 25.0 mL
LCSD: 25.0 mL
Final Extract Volume LCS: 0.50 mL
LCSD: 0.50 mL
Dilution Factor LCS: 1.00
LCSD: 1.00

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Pimaric Acid	947	1000	94.7%	999	1000	99.9%	5.3%
Sandaracopimaric Acid	924	1000	92.4%	976	1000	97.6%	5.5%
Isopimaric Acid	780	1000	78.0%	850	1000	85.0%	8.6%
Palustric Acid	648	1000	64.8%	715	1000	71.5%	9.8%
Dehydroabietic Acid	1010	1000	101%	1080	1000	108%	6.7%
Abietic Acid	871	1000	87.1%	1070	1000	107%	20.5%
Neoabietic Acid	41.2 J	1000	4.1%	37.2 J	1000	3.7%	10.2%
9,10-Dichlorostearic Acid	961	1000	96.1%	1030	1000	103%	6.9%
Oleic Acid	987	1000	98.7%	1040	1000	104%	5.2%
Linolenic Acid	932	1000	93.2%	1000	1000	100%	7.0%

Reported in µg/kg (ppb)

RPD calculated using sample concentrations per SW846.

TBT Surrogate Recovery

	LCS	LCSD
O-Methyl Podocarpic Acid	99.0%	104%

4B

SEMIVOLATILE METHOD BLANK SUMMARY

BLANK NO.

OD92MBS1

Lab Name: ANALYTICAL RESOURCES, INC

Client: HART CROWSER, INC.

ARI Job No: OD92

Project: PORT GAMBLE

Lab File ID: OD92MB

Date Extracted: 12/20/08

Instrument ID: NT6

Date Analyzed: 01/06/09

Matrix: SOLID

Time Analyzed: 1619

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

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01	OD92LCSS1	OD92LCSS1	OD92SB	01/06/09
02	OD92LCSDS1	OD92LCSDS1	OD92SBD	01/06/09
03	PGSS-45	OD92A	OD92A	01/06/09
04	PGSS-46	OD92B	OD92B	01/06/09
05	PGSS-47	OD92C	OD92C	01/06/09
06	PGSS-51	OD92D	OD92D	01/06/09
07	PGSS-47A	OD92E	OD92E	01/06/09
08	PGSS-53	OD92F	OD92F	01/06/09
09	PGSS-54	OD92G	OD92G	01/06/09
10	PGSS-55	OD92H	OD92H	01/06/09
11	PGSS-56	OD92I	OD92I	01/06/09
12	PGSS-58	OD92J	OD92J	01/06/09
13	PGSS-61	OD92K	OD92K	01/06/09
14	PGSS-62	OD92L	OD92L	01/06/09
15	PGSS-62A	OD92M	OD92M	01/06/09
16	PGSS-62B	OD92N	OD92N	01/06/09
17	PGSS-63	OD92O	OD92O	01/06/09
18	PGSS-64	OD92P	OD92P	01/06/09
19	PGSS-67	OD92Q	OD92Q	01/06/09
20	PGSS-68	OD92R	OD92R	01/06/09
21	PGSS-69	OD92S	OD92S	01/06/09
22	PGSS-70	OD92T	OD92T	01/06/09
23	PGSS-70 MS	OD92TMS	OD92TMS	01/06/09
24	PGSS-70 MSD	OD92TMSD	OD92TMSD	01/06/09
25	PGSS-45	OD92A	OD92ADL	01/07/09
26	PGSS-46	OD92B	OD92BDL	01/07/09
27	PGSS-47	OD92C	OD92CDL	01/07/09
28	PGSS-51	OD92D	OD92DDL	01/07/09
29	PGSS-47A	OD92E	OD92EDL	01/07/09
30	PGSS-53	OD92F	OD92FDL	01/07/09

COMMENTS:

4B

SEMIVOLATILE METHOD BLANK SUMMARY

BLANK NO.

OD92MBS1

Lab Name: ANALYTICAL RESOURCES, INC

Client: HART CROWSER, INC.

ARI Job No: OD92

Project: PORT GAMBLE

Lab File ID: OD92MB

Date Extracted: 12/20/08

Instrument ID: NT6

Date Analyzed: 01/06/09

Matrix: SOLID

Time Analyzed: 1619

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

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01	PGSS-54	OD92G	OD92GDL	01/07/09
02	PGSS-55	OD92H	OD92HDL	01/07/09
03	PGSS-56	OD92I	OD92IDL	01/07/09
04	PGSS-58	OD92J	OD92JDL	01/07/09
05	PGSS-61	OD92K	OD92KDL	01/07/09
06	PGSS-62A	OD92M	OD92MDL	01/07/09
07	PGSS-62B	OD92N	OD92NDL	01/07/09
08	PGSS-63	OD92O	OD92ODL	01/07/09
09	PGSS-64	OD92P	OD92PDL	01/07/09
10	PGSS-67	OD92Q	OD92QDL	01/07/09
11	PGSS-69	OD92S	OD92SDL	01/07/09
12	PGSS-70	OD92T	OD92TDL	01/07/09
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				

COMMENTS:

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: MB-122008
METHOD BLANK

Lab Sample ID: MB-122008
LIMS ID: 08-33505
Matrix: Sediment
Data Release Authorized: YNW
Reported: 01/09/09

QC Report No: OD92-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: NA
Date Received: NA

Date Extracted: 12/20/08
Date Analyzed: 01/06/09 16:19
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 25.0 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	100	< 100 U
471-74-9	Sandaracopimaric Acid	100	< 100 U
5835-26-7	Isopimaric Acid	100	< 100 U
1945-53-5	Palustric Acid	100	< 100 U
1740-19-8	Dehydroabietic Acid	100	< 100 U
514-10-3	Abietic Acid	100	< 100 U
471-77-2	Neoabietic Acid	100	< 100 U
5829-48-1	9,10-Dichlorostearic Acid	100	< 100 U
112-80-1	Oleic Acid	100	< 100 U
463-40-1	Linolenic Acid	100	< 100 U

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	97.6%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: PGSS-71
SAMPLE

Lab Sample ID: OD93A
LIMS ID: 08-33506
Matrix: Sediment
Data Release Authorized: MW
Reported: 01/09/09

QC Report No: OD93-Hart Crowser, Inc.
Project: Port Gamble
17330-14
Date Sampled: 12/09/08
Date Received: 12/11/08

Date Extracted: 12/17/08
Date Analyzed: 01/03/09 19:51
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 25.6 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: 20.4%

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	98	< 98 U
471-74-9	Sandaracopimaric Acid	98	< 98 U
5835-26-7	Isopimaric Acid	98	< 98 U
1945-53-5	Palustric Acid	98	< 98 U
1740-19-8	Dehydroabietic Acid	98	< 98 U
514-10-3	Abietic Acid	98	< 98 U
471-77-2	Neoabietic Acid	98	< 98 U
5829-48-1	9,10-Dichlorostearic Acid	98	< 98 U
112-80-1	**Oleic Acid**	**98**	**960**
463-40-1	Linolenic Acid	98	< 98 U

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	50.4%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: PGSS-73
SAMPLE

Lab Sample ID: OD93B
LIMS ID: 08-33507
Matrix: Sediment
Data Release Authorized: MW
Reported: 01/09/09

QC Report No: OD93-Hart Crowser, Inc.
Project: Port Gamble
17330-14
Date Sampled: 12/09/08
Date Received: 12/11/08

Date Extracted: 12/17/08
Date Analyzed: 01/03/09 20:06
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 25.7 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: 19.8%

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	97	< 97 U
471-74-9	Sandaracopimaric Acid	97	< 97 U
5835-26-7	Isopimaric Acid	97	< 97 U
1945-53-5	Palustric Acid	97	< 97 U
1740-19-8	Dehydroabietic Acid	97	< 97 U
514-10-3	Abietic Acid	97	< 97 U
471-77-2	Neoabietic Acid	97	< 97 U
5829-48-1	9,10-Dichlorostearic Acid	97	< 97 U
112-80-1	**Oleic Acid**	**97**	**920**
463-40-1	Linolenic Acid	97	< 97 U

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	53.6%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: PGSS-75
SAMPLE

Lab Sample ID: OD93C
LIMS ID: 08-33508
Matrix: Sediment
Data Release Authorized: MW
Reported: 01/09/09

QC Report No: OD93-Hart Crowser, Inc.
Project: Port Gamble
17330-14
Date Sampled: 12/09/08
Date Received: 12/11/08

Date Extracted: 12/17/08
Date Analyzed: 01/03/09 20:21
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 26.0 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: 18.5%

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	96	< 96 U
471-74-9	Sandaracopimaric Acid	96	< 96 U
5835-26-7	Isopimaric Acid	96	< 96 U
1945-53-5	Palustric Acid	96	< 96 U
1740-19-8	Dehydroabietic Acid	96	< 96 U
514-10-3	Abietic Acid	96	< 96 U
471-77-2	Neoabietic Acid	96	< 96 U
5829-48-1	9,10-Dichlorostearic Acid	96	< 96 U
112-80-1	**Oleic Acid**	**96**	**550**
463-40-1	Linolenic Acid	96	< 96 U

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	51.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: PGSS-77
SAMPLE

Lab Sample ID: OD93D
LIMS ID: 08-33509
Matrix: Sediment
Data Release Authorized: MW
Reported: 01/09/09

QC Report No: OD93-Hart Crowser, Inc.
Project: Port Gamble
17330-14
Date Sampled: 12/09/08
Date Received: 12/11/08

Date Extracted: 12/17/08
Date Analyzed: 01/03/09 20:36
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 25.6 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: 29.3%

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	98	< 98 U
471-74-9	Sandaracopimaric Acid	98	< 98 U
5835-26-7	Isopimaric Acid	98	< 98 U
1945-53-5	Palustric Acid	98	< 98 U
1740-19-8	Dehydroabietic Acid	98	< 98 U
514-10-3	Abietic Acid	98	< 98 U
471-77-2	Neoabietic Acid	98	< 98 U
5829-48-1	9,10-Dichlorostearic Acid	98	< 98 U
112-80-1	**Oleic Acid**	**98**	**1,700**
463-40-1	**Linolenic Acid**	**98**	**120**

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	45.8%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: PGSS-77A
SAMPLE

Lab Sample ID: OD93E
LIMS ID: 08-33510
Matrix: Sediment
Data Release Authorized: MW
Reported: 01/09/09

QC Report No: OD93-Hart Crowser, Inc.
Project: Port Gamble
17330-14
Date Sampled: 12/09/08
Date Received: 12/11/08

Date Extracted: 12/17/08
Date Analyzed: 01/03/09 20:51
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 25.5 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: 27.8%

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	98	< 98 U
471-74-9	Sandaracopimaric Acid	98	< 98 U
5835-26-7	Isopimaric Acid	98	< 98 U
1945-53-5	Palustric Acid	98	< 98 U
1740-19-8	**Dehydroabietic Acid**	**98**	**130**
514-10-3	**Abietic Acid**	**98**	**410**
471-77-2	Neoabietic Acid	98	< 98 U
5829-48-1	9,10-Dichlorostearic Acid	98	< 98 U
112-80-1	**Oleic Acid**	**98**	**1,100**
463-40-1	Linolenic Acid	98	< 98 U

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	48.8%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: PGSS-78
SAMPLE

Lab Sample ID: OD93F
LIMS ID: 08-33511
Matrix: Sediment
Data Release Authorized: MW
Reported: 01/09/09

QC Report No: OD93-Hart Crowser, Inc.
Project: Port Gamble
17330-14
Date Sampled: 12/10/08
Date Received: 12/11/08

Date Extracted: 12/17/08
Date Analyzed: 01/03/09 21:06
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 25.4 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: 19.2%

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	98	< 98 U
471-74-9	Sandaracopimaric Acid	98	< 98 U
5835-26-7	Isopimaric Acid	98	< 98 U
1945-53-5	Palustric Acid	98	< 98 U
1740-19-8	Dehydroabietic Acid	98	< 98 U
514-10-3	Abietic Acid	98	< 98 U
471-77-2	Neoabietic Acid	98	< 98 U
5829-48-1	9,10-Dichlorostearic Acid	98	< 98 U
112-80-1	**Oleic Acid**	**98**	**770**
463-40-1	Linolenic Acid	98	< 98 U

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	49.8%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: PGSS-80
SAMPLE

Lab Sample ID: OD93G
LIMS ID: 08-33512
Matrix: Sediment
Data Release Authorized: MW
Reported: 01/09/09

QC Report No: OD93-Hart Crowser, Inc.
Project: Port Gamble
17330-14
Date Sampled: 12/10/08
Date Received: 12/11/08

Date Extracted: 12/17/08
Date Analyzed: 01/03/09 21:21
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 25.4 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: 19.1%

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	98	< 98 U
471-74-9	Sandaracopimaric Acid	98	< 98 U
5835-26-7	Isopimaric Acid	98	< 98 U
1945-53-5	Palustric Acid	98	< 98 U
1740-19-8	Dehydroabietic Acid	98	< 98 U
514-10-3	Abietic Acid	98	< 98 U
471-77-2	Neoabietic Acid	98	< 98 U
5829-48-1	9,10-Dichlorostearic Acid	98	< 98 U
112-80-1	**Oleic Acid**	**98**	**620**
463-40-1	Linolenic Acid	98	< 98 U

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	52.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: PGSS-82
SAMPLE

Lab Sample ID: OD93H
LIMS ID: 08-33513
Matrix: Sediment
Data Release Authorized:
Reported: 01/09/09

QC Report No: OD93-Hart Crowser, Inc.
Project: Port Gamble
17330-14
Date Sampled: 12/10/08
Date Received: 12/11/08

Date Extracted: 12/17/08
Date Analyzed: 01/05/09 15:49
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 25.8 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: 19.4%

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	97	< 97 U
471-74-9	Sandaracopimaric Acid	97	< 97 U
5835-26-7	Isopimaric Acid	97	< 97 U
1945-53-5	Palustric Acid	97	< 97 U
1740-19-8	Dehydroabietic Acid	97	< 97 U
514-10-3	Abietic Acid	97	< 97 U
471-77-2	Neoabietic Acid	97	< 97 U
5829-48-1	9,10-Dichlorostearic Acid	97	< 97 U
112-80-1	**Oleic Acid**	**97**	**1,300**
463-40-1	**Linolenic Acid**	**97**	**100**

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	62.4%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: PGSS-83
SAMPLE

Lab Sample ID: OD93I
LIMS ID: 08-33514
Matrix: Sediment
Data Release Authorized: MW
Reported: 01/09/09

QC Report No: OD93-Hart Crowser, Inc.
Project: Port Gamble
17330-14
Date Sampled: 12/10/08
Date Received: 12/11/08

Date Extracted: 12/17/08
Date Analyzed: 01/05/09 16:04
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 25.7 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: 22.4%

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	97	< 97 U
471-74-9	Sandaracopimaric Acid	97	< 97 U
5835-26-7	Isopimaric Acid	97	< 97 U
1945-53-5	Palustric Acid	97	< 97 U
1740-19-8	Dehydroabietic Acid	97	< 97 U
514-10-3	**Abietic Acid**	**97**	**110 M**
471-77-2	Neoabietic Acid	97	< 97 U
5829-48-1	9,10-Dichlorostearic Acid	97	< 97 U
112-80-1	**Oleic Acid**	**97**	**1,600**
463-40-1	**Linolenic Acid**	**97**	**110**

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	59.4%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: PGSS-92
SAMPLE

Lab Sample ID: OD93J
LIMS ID: 08-33515
Matrix: Sediment
Data Release Authorized: MW
Reported: 01/09/09

QC Report No: OD93-Hart Crowser, Inc.
Project: Port Gamble
17330-14
Date Sampled: 12/10/08
Date Received: 12/11/08

Date Extracted: 12/17/08
Date Analyzed: 01/05/09 16:19
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 25.3 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: 37.2%

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	99	< 99 U
471-74-9	Sandaracopimaric Acid	99	< 99 U
5835-26-7	Isopimaric Acid	99	< 99 U
1945-53-5	Palustric Acid	99	< 99 U
1740-19-8	**Dehydroabietic Acid**	**99**	**210**
514-10-3	Abietic Acid	99	< 99 U
471-77-2	Neoabietic Acid	99	< 99 U
5829-48-1	9,10-Dichlorostearic Acid	99	< 99 U
112-80-1	**Oleic Acid**	**99**	**2,900 E**
463-40-1	**Linolenic Acid**	**99**	**170**

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	52.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: PGSS-92
DILUTION

Lab Sample ID: OD93J
LIMS ID: 08-33515
Matrix: Sediment
Data Release Authorized: MW
Reported: 01/09/09

QC Report No: OD93-Hart Crowser, Inc.
Project: Port Gamble
17330-14
Date Sampled: 12/10/08
Date Received: 12/11/08

Date Extracted: 12/17/08
Date Analyzed: 01/07/09 16:56
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 25.3 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 5.00
Percent Moisture: 37.2%

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	500	< 500 U
471-74-9	Sandaracopimaric Acid	500	< 500 U
5835-26-7	Isopimaric Acid	500	< 500 U
1945-53-5	Palustric Acid	500	< 500 U
1740-19-8	Dehydroabietic Acid	500	< 500 U
514-10-3	Abietic Acid	500	< 500 U
471-77-2	Neoabietic Acid	500	< 500 U
5829-48-1	9,10-Dichlorostearic Acid	500	< 500 U
112-80-1	**Oleic Acid**	**500**	**4,600**
463-40-1	**Linolenic Acid**	**500**	**560**

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	70.6%

ANALYTICAL RESOURCES INCORPORATED

SW8270 RESIN ACIDS SOIL/SEDIMENT SURROGATE RECOVERY SUMMARY

Matrix: Sediment

QC Report No: OD93-Hart Crowser, Inc.
Project: Port Gamble
17330-14

Client ID	MPA	TOT OUT
PGSS-71	50.4%	0
PGSS-73	53.6%	0
PGSS-75	51.2%	0
PGSS-77	45.8%	0
PGSS-77A	48.8%	0
PGSS-78	49.8%	0
MB-121708	51.4%	0
LCS-121708	53.8%	0
LCSD-121708	55.4%	0
PGSS-80	52.2%	0
PGSS-80 MS	53.2%	0
PGSS-80 MSD	51.8%	0
PGSS-82	62.4%	0
PGSS-83	59.4%	0
PGSS-92	52.0%	0
PGSS-92	70.6%	0

	LCS/MB LIMITS	QC LIMITS
(MPA) = O-Methyl Podocarpic Acid	(28-120)	(19-114)

Prep Method: SW3550B
Log Number Range: 08-33506 to 08-33515

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: PGSS-80
MATRIX SPIKE

Lab Sample ID: OD93G
LIMS ID: 08-33512
Matrix: Sediment
Data Release Authorized:
Reported: 01/09/09

QC Report No: OD93-Hart Crowser, Inc.
Project: Port Gamble
17330-14
Date Sampled: 12/10/08
Date Received: 12/11/08

Date Extracted MS: 12/17/08

Sample Amount MS: 25.4 g-dry-wt
MSD: 25.2 g-dry-wt

Date Analyzed MS: 01/03/09 21:36
MSD: 01/03/09 21:52

Final Extract Volume MS: 0.5 mL
MSD: 0.5 mL

Instrument/Analyst MS: NT6/VTS
MSD: NT6/VTS

Dilution Factor MS: 1.00
MSD: 1.00

Moisture: 19.1%

Analyte	Sample	MS	Spike Added-MS	MS Recovery	MSD	Spike Added-MSD	MSD Recovery	RPD
Pimaric Acid	< 98.3 U	460	986	46.7%	466	992	47.0%	1.3%
Sandaracopimaric Acid	< 98.3 U	478	986	48.5%	483	992	48.7%	1.0%
Isopimaric Acid	< 98.3 U	275	986	27.9%	277	992	27.9%	0.7%
Palustric Acid	< 98.3 U	< 98.6 U	986	NA	< 99.2 U	992	NA	NA
Dehydroabietic Acid	< 98.3 U	524	986	53.1%	536	992	54.0%	2.3%
Abietic Acid	< 98.3 U	544	986	55.2%	533	992	53.7%	2.0%
Neoabietic Acid	< 98.3 U	74.2 J	986	7.5%	80.5 J	992	8.1%	8.1%
9,10-Dichlorostearic Acid	< 98.3 U	408	986	41.4%	427	992	43.0%	4.6%
Oleic Acid	625	1090	986	47.2%	1050	992	42.8%	3.7%
Linolenic Acid	< 98.3 U	539	986	54.7%	443	992	44.7%	19.6%

Results reported in µg/kg
NA-No recovery due to high concentration of analyte in original sample and/or calculated negative recovery.
RPD calculated using sample concentrations per SW846.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS

Sample ID: PGSS-80
MATRIX SPIKE

Lab Sample ID: OD93G
LIMS ID: 08-33512
Matrix: Sediment
Data Release Authorized: MW
Reported: 01/09/09

QC Report No: OD93-Hart Crowser, Inc.
Project: Port Gamble
17330-14
Date Sampled: 12/10/08
Date Received: 12/11/08

Date Extracted: 12/17/08
Date Analyzed: 01/03/09 21:36
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 25.4 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: 19.1%

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	99	---
471-74-9	Sandaracopimaric Acid	99	---
5835-26-7	Isopimaric Acid	99	---
1945-53-5	Palustric Acid	99	---
1740-19-8	Dehydroabietic Acid	99	---
514-10-3	Abietic Acid	99	---
471-77-2	Neoabietic Acid	99	---
5829-48-1	9,10-Dichlorostearic Acid	99	---
112-80-1	Oleic Acid	99	---
463-40-1	Linolenic Acid	99	---

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	53.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: PGSS-80
MATRIX SPIKE DUP

Lab Sample ID: OD93G
LIMS ID: 08-33512
Matrix: Sediment
Data Release Authorized: MW
Reported: 01/09/09

QC Report No: OD93-Hart Crowser, Inc.
Project: Port Gamble
17330-14
Date Sampled: 12/10/08
Date Received: 12/11/08

Date Extracted: 12/17/08
Date Analyzed: 01/03/09 21:52
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 25.2 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: 19.1%

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	99	---
471-74-9	Sandaracopimaric Acid	99	---
5835-26-7	Isopimaric Acid	99	---
1945-53-5	Palustric Acid	99	---
1740-19-8	Dehydroabietic Acid	99	---
514-10-3	Abietic Acid	99	---
471-77-2	Neoabietic Acid	99	---
5829-48-1	9,10-Dichlorostearic Acid	99	---
112-80-1	Oleic Acid	99	---
463-40-1	Linolenic Acid	99	---

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	51.8%

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS

ANALYTICAL RESOURCES INCORPORATED

Sample ID: LCS-121708
LAB CONTROL SAMPLE

Lab Sample ID: LCS-121708
LIMS ID: 08-33512
Matrix: Sediment
Data Release Authorized: MW
Reported: 01/09/09

QC Report No: OD93-Hart Crowser, Inc.
Project: Port Gamble
17330-14
Date Sampled: NA
Date Received: NA

Date Extracted LCS: 12/17/08

Date Analyzed LCS: 01/03/09 19:06
LCSD: 01/03/09 19:21
Instrument/Analyst LCS: NT6/VTS
LCSD: NT6/VTS

Sample Amount LCS: 25.0 mL
LCSD: 25.0 mL
Final Extract Volume LCS: 0.50 mL
LCSD: 0.50 mL
Dilution Factor LCS: 1.00
LCSD: 1.00

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Pimaric Acid	483	1000	48.3%	519	1000	51.9%	7.2%
Sandaracopimaric Acid	500	1000	50.0%	528	1000	52.8%	5.4%
Isopimaric Acid	429	1000	42.9%	471	1000	47.1%	9.3%
Palustric Acid	375	1000	37.5%	397	1000	39.7%	5.7%
Dehydroabietic Acid	549	1000	54.9%	579	1000	57.9%	5.3%
Abietic Acid	457	1000	45.7%	602	1000	60.2%	27.4%
Neoabietic Acid	81.4 J	1000	8.1%	110	1000	11.0%	29.9%
9,10-Dichlorostearic Acid	447	1000	44.7%	481	1000	48.1%	7.3%
Oleic Acid	475	1000	47.5%	492	1000	49.2%	3.5%
Linolenic Acid	432	1000	43.2%	457	1000	45.7%	5.6%

Reported in µg/kg (ppb)

RPD calculated using sample concentrations per SW846.

TBT Surrogate Recovery

	LCS	LCSD
O-Methyl Podocarpic Acid	53.8%	55.4%

4B

SEMIVOLATILE METHOD BLANK SUMMARY

BLANK NO.

OD15MBS2

Lab Name: ANALYTICAL RESOURCES, INC

Client: HART CROWSER, INC.

ARI Job No: OD93

Project: PORT GAMBLE

Lab File ID: OD15MB2

Date Extracted: 12/17/08

Instrument ID: NT6

Date Analyzed: 01/03/09

Matrix: SOLID

Time Analyzed: 1850

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

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01	OD15LCSS2	OD15LCSS2	OD15SB2	01/03/09
02	OD15LCSDS2	OD15LCSDS2	OD15SBD2	01/03/09
03	PGSS-71	OD93A	OD93A	01/03/09
04	PGSS-73	OD93B	OD93B	01/03/09
05	PGSS-75	OD93C	OD93C	01/03/09
06	PGSS-77	OD93D	OD93D	01/03/09
07	PGSS-77A	OD93E	OD93E	01/03/09
08	PGSS-78	OD93F	OD93F	01/03/09
09	PGSS-80	OD93G	OD93G	01/03/09
10	PGSS-80 MS	OD93GMS	OD93GMS	01/03/09
11	PGSS-80 MSD	OD93GMSD	OD93GMSD	01/03/09
12	PGSS-82	OD93H	OD93H2	01/05/09
13	PGSS-83	OD93I	OD93I2	01/05/09
14	PGSS-92	OD93J	OD93J2	01/05/09
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				

COMMENTS:

FORM IV SV

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS

Sample ID: MB-121708
METHOD BLANK

Lab Sample ID: MB-121708
LIMS ID: 08-33512
Matrix: Sediment
Data Release Authorized: MW
Reported: 01/09/09

QC Report No: OD93-Hart Crowser, Inc.
Project: Port Gamble
17330-14
Date Sampled: NA
Date Received: NA

Date Extracted: 12/17/08
Date Analyzed: 01/03/09 18:50
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 25.0 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	100	< 100 U
471-74-9	Sandaracopimaric Acid	100	< 100 U
5835-26-7	Isopimaric Acid	100	< 100 U
1945-53-5	Palustric Acid	100	< 100 U
1740-19-8	Dehydroabietic Acid	100	< 100 U
514-10-3	Abietic Acid	100	< 100 U
471-77-2	Neoabietic Acid	100	< 100 U
5829-48-1	9,10-Dichlorostearic Acid	100	< 100 U
112-80-1	Oleic Acid	100	< 100 U
463-40-1	Linolenic Acid	100	< 100 U

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	51.4%

GENERAL CHEMISTRY

SAMPLE RESULTS-CONVENTIONALS
OD92-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 12/31/08

Project: PORT GAMBLE
Event: 1733014
Date Sampled: 12/08/08
Date Received: 12/11/08

Client ID: PGSS-45
ARI ID: 08-33486 OD92A

Analyte	Date	Method	Units	RL	Sample
Total Solids	12/15/08 121508#2	EPA 160.3	Percent	0.01	35.40
Preserved Total Solids	12/15/08 121508#2	EPA 160.3	Percent	0.01	36.40
Total Volatile Solids	12/15/08 121508#2	EPA 160.4	Percent	0.01	7.60
N-Ammonia	12/16/08 121608#1	EPA 350.1M	mg-N/kg	0.53	39.9
Sulfide	12/16/08 121608#2	EPA 376.2	mg/kg	53.7	685
Total Organic Carbon	12/17/08 121708#1	Plumb,1981	Percent	0.020	2.85

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
OD92-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 12/31/08

Project: PORT GAMBLE
Event: 1733014
Date Sampled: 12/08/08
Date Received: 12/11/08

Client ID: PGSS-46
ARI ID: 08-33487 OD92B

Analyte	Date	Method	Units	RL	Sample
Total Solids	12/15/08 121508#2	EPA 160.3	Percent	0.01	72.20
Preserved Total Solids	12/15/08 121508#2	EPA 160.3	Percent	0.01	71.30
Total Volatile Solids	12/15/08 121508#2	EPA 160.4	Percent	0.01	1.88
N-Ammonia	12/16/08 121608#1	EPA 350.1M	mg-N/kg	0.13	2.83
Sulfide	12/16/08 121608#1	EPA 376.2	mg/kg	13.4	228
Total Organic Carbon	12/17/08 121708#1	Plumb,1981	Percent	0.020	1.27

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
OD92-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 12/31/08

Project: PORT GAMBLE
Event: 1733014
Date Sampled: 12/08/08
Date Received: 12/11/08

Client ID: PGSS-47
ARI ID: 08-33488 OD92C

Analyte	Date	Method	Units	RL	Sample
Total Solids	12/15/08 121508#2	EPA 160.3	Percent	0.01	64.50
Preserved Total Solids	12/15/08 121508#2	EPA 160.3	Percent	0.01	65.50
Total Volatile Solids	12/15/08 121508#2	EPA 160.4	Percent	0.01	3.80
N-Ammonia	12/16/08 121608#1	EPA 350.1M	mg-N/kg	0.14	6.05
Sulfide	12/16/08 121608#1	EPA 376.2	mg/kg	14.1	281
Total Organic Carbon	12/17/08 121708#1	Plumb,1981	Percent	0.020	2.39

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
OD92-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 12/31/08

Project: PORT GAMBLE
Event: 1733014
Date Sampled: 12/08/08
Date Received: 12/11/08

Client ID: PGSS-51
ARI ID: 08-33489 OD92D

Analyte	Date	Method	Units	RL	Sample
Total Solids	12/15/08 121508#2	EPA 160.3	Percent	0.01	41.70
Preserved Total Solids	12/15/08 121508#2	EPA 160.3	Percent	0.01	42.00
Total Volatile Solids	12/15/08 121508#2	EPA 160.4	Percent	0.01	7.49
N-Ammonia	12/16/08 121608#1	EPA 350.1M	mg-N/kg	0.22	8.43
Sulfide	12/16/08 121608#1	EPA 376.2	mg/kg	46.7	775
Total Organic Carbon	12/17/08 121708#1	Plumb,1981	Percent	0.020	2.24

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
OD92-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized: JB
Reported: 12/31/08

Project: PORT GAMBLE
Event: 1733014
Date Sampled: 12/08/08
Date Received: 12/11/08

Client ID: PGSS-47A
ARI ID: 08-33490 OD92E

Analyte	Date	Method	Units	RL	Sample
Total Solids	12/15/08 121508#2	EPA 160.3	Percent	0.01	57.90
Preserved Total Solids	12/15/08 121508#2	EPA 160.3	Percent	0.01	54.60
Total Volatile Solids	12/15/08 121508#2	EPA 160.4	Percent	0.01	3.84
N-Ammonia	12/16/08 121608#1	EPA 350.1M	mg-N/kg	0.17	4.84
Sulfide	12/16/08 121608#1	EPA 376.2	mg/kg	35.4	462
Total Organic Carbon	12/17/08 121708#1	Plumb,1981	Percent	0.020	1.84

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
OD92-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 12/31/08

Project: PORT GAMBLE
Event: 1733014
Date Sampled: 12/08/08
Date Received: 12/11/08

Client ID: PGSS-53
ARI ID: 08-33491 OD92F

Analyte	Date	Method	Units	RL	Sample
Total Solids	12/15/08 121508#2	EPA 160.3	Percent	0.01	46.00
Preserved Total Solids	12/15/08 121508#2	EPA 160.3	Percent	0.01	46.30
Total Volatile Solids	12/15/08 121508#2	EPA 160.4	Percent	0.01	6.34
N-Ammonia	12/16/08 121608#1	EPA 350.1M	mg-N/kg	0.20	4.81
Sulfide	12/16/08 121608#1	EPA 376.2	mg/kg	40.7	709
Total Organic Carbon	12/17/08 121708#1	Plumb,1981	Percent	0.020	2.50

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
OD92-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized: MR
Reported: 12/31/08

Project: PORT GAMBLE
Event: 1733014
Date Sampled: 12/08/08
Date Received: 12/11/08

Client ID: PGSS-54
ARI ID: 08-33492 OD92G

Analyte	Date	Method	Units	RL	Sample
Total Solids	12/15/08 121508#2	EPA 160.3	Percent	0.01	49.50
Preserved Total Solids	12/15/08 121508#2	EPA 160.3	Percent	0.01	48.80
Total Volatile Solids	12/15/08 121508#2	EPA 160.4	Percent	0.01	5.60
N-Ammonia	12/16/08 121608#1	EPA 350.1M	mg-N/kg	0.19	9.26
Sulfide	12/16/08 121608#1	EPA 376.2	mg/kg	40.1	667
Total Organic Carbon	12/17/08 121708#1	Plumb,1981	Percent	0.020	1.78

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
OD92-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 12/31/08

Project: PORT GAMBLE
Event: 1733014
Date Sampled: 12/08/08
Date Received: 12/11/08

Client ID: PGSS-55
ARI ID: 08-33493 OD92H

Analyte	Date	Method	Units	RL	Sample
Total Solids	12/15/08 121508#2	EPA 160.3	Percent	0.01	72.40
Preserved Total Solids	12/15/08 121508#2	EPA 160.3	Percent	0.01	72.10
Total Volatile Solids	12/15/08 121508#2	EPA 160.4	Percent	0.01	1.97
N-Ammonia	12/16/08 121608#1	EPA 350.1M	mg-N/kg	0.13	4.39
Sulfide	12/16/08 121608#1	EPA 376.2	mg/kg	27.6	176
Total Organic Carbon	12/17/08 121708#1	Plumb,1981	Percent	0.020	0.878

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
OD92-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized: MB
Reported: 12/31/08

Project: PORT GAMBLE
Event: 1733014
Date Sampled: 12/08/08
Date Received: 12/11/08

Client ID: PGSS-56
ARI ID: 08-33494 OD92I

Analyte	Date	Method	Units	RL	Sample
Total Solids	12/15/08 121508#2	EPA 160.3	Percent	0.01	70.50
Preserved Total Solids	12/15/08 121508#2	EPA 160.3	Percent	0.01	68.10
Total Volatile Solids	12/15/08 121508#2	EPA 160.4	Percent	0.01	1.76
N-Ammonia	12/16/08 121608#1	EPA 350.1M	mg-N/kg	0.14	4.04
Sulfide	12/16/08 121608#1	EPA 376.2	mg/kg	28.1	212
Total Organic Carbon	12/17/08 121708#1	Plumb,1981	Percent	0.020	1.64

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
OD92-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized: JWB
Reported: 12/31/08

Project: PORT GAMBLE
Event: 1733014
Date Sampled: 12/09/08
Date Received: 12/11/08

Client ID: PGSS-58
ARI ID: 08-33495 OD92J

Analyte	Date	Method	Units	RL	Sample
Total Solids	12/15/08 121508#2	EPA 160.3	Percent	0.01	32.80
Preserved Total Solids	12/15/08 121508#2	EPA 160.3	Percent	0.01	36.70
Total Volatile Solids	12/15/08 121508#2	EPA 160.4	Percent	0.01	8.75
N-Ammonia	12/16/08 121608#1	EPA 350.1M	mg-N/kg	0.28	22.7
Sulfide	12/16/08 121608#1	EPA 376.2	mg/kg	54.2	524
Total Organic Carbon	12/17/08 121708#1	Plumb,1981	Percent	0.020	3.14

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
OD92-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 12/31/08

Project: PORT GAMBLE
Event: 1733014
Date Sampled: 12/09/08
Date Received: 12/11/08

Client ID: PGSS-61
ARI ID: 08-33496 OD92K

Analyte	Date	Method	Units	RL	Sample
Total Solids	12/15/08 121508#2	EPA 160.3	Percent	0.01	67.90
Preserved Total Solids	12/15/08 121508#2	EPA 160.3	Percent	0.01	65.10
Total Volatile Solids	12/15/08 121508#2	EPA 160.4	Percent	0.01	2.55
N-Ammonia	12/16/08 121608#1	EPA 350.1M	mg-N/kg	0.13	3.59
Sulfide	12/16/08 121608#1	EPA 376.2	mg/kg	14.7	245
Total Organic Carbon	12/17/08 121708#1	Plumb,1981	Percent	0.020	1.82

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
OD92-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 12/31/08

Project: PORT GAMBLE
Event: 1733014
Date Sampled: 12/09/08
Date Received: 12/11/08

Client ID: PGSS-62
ARI ID: 08-33497 OD92L

Analyte	Date	Method	Units	RL	Sample
Total Solids	12/15/08 121508#2	EPA 160.3	Percent	0.01	78.80
Preserved Total Solids	12/15/08 121508#2	EPA 160.3	Percent	0.01	75.20
Total Volatile Solids	12/15/08 121508#2	EPA 160.4	Percent	0.01	1.06
N-Ammonia	12/16/08 121608#1	EPA 350.1M	mg-N/kg	0.12	7.08
Sulfide	12/16/08 121608#1	EPA 376.2	mg/kg	12.5	79.4
Total Organic Carbon	12/17/08 121708#1	Plumb,1981	Percent	0.020	0.699

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
OD92-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 12/31/08

Project: PORT GAMBLE
Event: 1733014
Date Sampled: 12/09/08
Date Received: 12/11/08

Client ID: PGSS-62A
ARI ID: 08-33498 OD92M

Analyte	Date	Method	Units	RL	Sample
Total Solids	12/15/08 121508#2	EPA 160.3	Percent	0.01	75.00
Preserved Total Solids	12/15/08 121508#2	EPA 160.3	Percent	0.01	76.00
Total Volatile Solids	12/15/08 121508#2	EPA 160.4	Percent	0.01	1.94
N-Ammonia	12/16/08 121608#1	EPA 350.1M	mg-N/kg	0.12	8.86
Sulfide	12/16/08 121608#1	EPA 376.2	mg/kg	12.5	176
Total Organic Carbon	12/17/08 121708#1	Plumb,1981	Percent	0.020	1.07

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
OD92-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized: NB
Reported: 12/31/08

Project: PORT GAMBLE
Event: 1733014
Date Sampled: 12/09/08
Date Received: 12/11/08

Client ID: PGSS-62B
ARI ID: 08-33499 OD92N

Analyte	Date	Method	Units	RL	Sample
Total Solids	12/15/08 121508#2	EPA 160.3	Percent	0.01	67.80
Preserved Total Solids	12/15/08 121508#2	EPA 160.3	Percent	0.01	63.80
Total Volatile Solids	12/15/08 121508#2	EPA 160.4	Percent	0.01	2.56
N-Ammonia	12/16/08 121608#1	EPA 350.1M	mg-N/kg	0.14	6.24
Sulfide	12/16/08 121608#1	EPA 376.2	mg/kg	15.2	155
Total Organic Carbon	12/17/08 121708#1	Plumb,1981	Percent	0.020	1.31

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
OD92-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 12/31/08

Project: PORT GAMBLE
Event: 1733014
Date Sampled: 12/09/08
Date Received: 12/11/08

Client ID: PGSS-63
ARI ID: 08-33500 OD92O

Analyte	Date	Method	Units	RL	Sample
Total Solids	12/15/08 121508#2	EPA 160.3	Percent	0.01	67.90
Preserved Total Solids	12/15/08 121508#2	EPA 160.3	Percent	0.01	68.10
Total Volatile Solids	12/15/08 121508#2	EPA 160.4	Percent	0.01	2.87
N-Ammonia	12/16/08 121608#1	EPA 350.1M	mg-N/kg	0.13	3.95
Sulfide	12/16/08 121608#1	EPA 376.2	mg/kg	14.0	235
Total Organic Carbon	12/17/08 121708#1	Plumb,1981	Percent	0.020	1.99

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
OD92-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 12/31/08

Project: PORT GAMBLE
Event: 1733014
Date Sampled: 12/09/08
Date Received: 12/11/08

Client ID: PGSS-64
ARI ID: 08-33501 OD92P

Analyte	Date	Method	Units	RL	Sample
Total Solids	12/15/08 121508#2	EPA 160.3	Percent	0.01	64.30
Preserved Total Solids	12/15/08 121508#2	EPA 160.3	Percent	0.01	66.00
Total Volatile Solids	12/15/08 121508#2	EPA 160.4	Percent	0.01	2.95
N-Ammonia	12/16/08 121608#1	EPA 350.1M	mg-N/kg	0.15	5.02
Sulfide	12/16/08 121608#1	EPA 376.2	mg/kg	14.8	278
Total Organic Carbon	12/16/08 121608#1	Plumb,1981	Percent	0.020	2.36

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
OD92-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 12/31/08

Project: PORT GAMBLE
Event: 1733014
Date Sampled: 12/09/08
Date Received: 12/11/08

Client ID: PGSS-67
ARI ID: 08-33502 OD92Q

Analyte	Date	Method	Units	RL	Sample
Total Solids	12/15/08 121508#2	EPA 160.3	Percent	0.01	68.50
Preserved Total Solids	12/15/08 121508#2	EPA 160.3	Percent	0.01	68.80
Total Volatile Solids	12/15/08 121508#2	EPA 160.4	Percent	0.01	2.32
N-Ammonia	12/16/08 121608#1	EPA 350.1M	mg-N/kg	0.14	4.54
Sulfide	12/16/08 121608#1	EPA 376.2	mg/kg	1.41	21.4
Total Organic Carbon	12/16/08 121608#1	Plumb,1981	Percent	0.020	1.75

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
OD92-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized: MP
Reported: 12/31/08

Project: PORT GAMBLE
Event: 1733014
Date Sampled: 12/09/08
Date Received: 12/11/08

Client ID: PGSS-68
ARI ID: 08-33503 OD92R

Analyte	Date	Method	Units	RL	Sample
Total Solids	12/15/08 121508#2	EPA 160.3	Percent	0.01	74.20
Preserved Total Solids	12/15/08 121508#2	EPA 160.3	Percent	0.01	75.60
Total Volatile Solids	12/15/08 121508#2	EPA 160.4	Percent	0.01	1.45
N-Ammonia	12/16/08 121608#1	EPA 350.1M	mg-N/kg	0.13	3.27
Sulfide	12/16/08 121608#1	EPA 376.2	mg/kg	1.28	16.1
Total Organic Carbon	12/16/08 121608#1	Plumb,1981	Percent	0.020	1.30

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
OD92-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized: JW
Reported: 12/31/08

Project: PORT GAMBLE
Event: 1733014
Date Sampled: 12/09/08
Date Received: 12/11/08

Client ID: PGSS-69
ARI ID: 08-33504 OD92S

Analyte	Date	Method	Units	RL	Sample
Total Solids	12/15/08 121508#2	EPA 160.3	Percent	0.01	84.20
Preserved Total Solids	12/15/08 121508#2	EPA 160.3	Percent	0.01	68.40
Total Volatile Solids	12/15/08 121508#2	EPA 160.4	Percent	0.01	1.95
N-Ammonia	12/16/08 121608#1	EPA 350.1M	mg-N/kg	0.12	3.71
Sulfide	12/16/08 121608#1	EPA 376.2	mg/kg	1.39	24.4
Total Organic Carbon	12/16/08 121608#1	Plumb,1981	Percent	0.020	0.955

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
OD92-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized: MB
Reported: 12/31/08

Project: PORT GAMBLE
Event: 1733014
Date Sampled: 12/09/08
Date Received: 12/11/08

Client ID: PGSS-70
ARI ID: 08-33505 OD92T

Analyte	Date	Method	Units	RL	Sample
Total Solids	12/15/08 121508#2	EPA 160.3	Percent	0.01	71.60
Preserved Total Solids	12/15/08 121508#2	EPA 160.3	Percent	0.01	72.30
Total Volatile Solids	12/15/08 121508#2	EPA 160.4	Percent	0.01	2.15
N-Ammonia	12/16/08 121608#1	EPA 350.1M	mg-N/kg	0.13	4.01
Sulfide	12/16/08 121608#1	EPA 376.2	mg/kg	1.31	24.7
Total Organic Carbon	12/16/08 121608#1	Plumb,1981	Percent	0.020	1.54

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

MS/MSD RESULTS-CONVENTIONALS
OD92-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 12/31/08

Project: PORT GAMBLE
Event: 1733014
Date Sampled: 12/08/08
Date Received: 12/11/08

Analyte	Date	Units	Sample	Spike	Spike Added	Recovery
ARI ID: OD92A Client ID: PGSS-45						
N-Ammonia	12/16/08	mg-N/kg	39.9	298	268	96.2%
Sulfide	12/16/08	mg/kg	685	806	304	39.8%
Total Organic Carbon	12/17/08	Percent	2.85	5.32	3.25	75.9%

REPLICATE RESULTS-CONVENTIONALS
OD92-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 12/31/08

Project: PORT GAMBLE
Event: 1733014
Date Sampled: 12/08/08
Date Received: 12/11/08

Analyte	Date	Units	Sample	Replicate(s)	RPD/RSD
ARI ID: OD92A Client ID: PGSS-45					
Total Solids	12/15/08	Percent	35.40	35.40 35.50	0.2%
Preserved Total Solids	12/15/08	Percent	36.40	36.60 36.90	0.7%
Total Volatile Solids	12/15/08	Percent	7.60	7.60 7.69	0.7%
N-Ammonia	12/16/08	mg-N/kg	39.9	42.3 41.2	2.9%
Sulfide	12/16/08	mg/kg	685	663	3.3%
Total Organic Carbon	12/17/08	Percent	2.85	2.71 2.99	4.9%

LAB CONTROL RESULTS-CONVENTIONALS
OD92-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 12/31/08

Project: PORT GAMBLE
Event: 1733014
Date Sampled: NA
Date Received: NA

Analyte	Date	Units	LCS	Spike Added	Recovery
Sulfide	12/16/08	mg/kg	6.42	5.77	111.3%
	12/16/08		5.68	5.77	98.4%
Total Organic Carbon	12/16/08	Percent	0.466	0.500	93.2%
	12/17/08		0.541	0.500	108.2%

METHOD BLANK RESULTS-CONVENTIONALS
OD92-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 12/31/08

Project: PORT GAMBLE
Event: 1733014
Date Sampled: NA
Date Received: NA

Analyte	Date	Units	Blank
Total Solids	12/15/08	Percent	< 0.01 U
Preserved Total Solids	12/15/08	Percent	< 0.01 U
Total Volatile Solids	12/15/08	Percent	< 0.01 U
N-Ammonia	12/16/08	mg-N/kg	< 0.10 U
	12/16/08		< 0.10 U
Sulfide	12/16/08	mg/kg	< 0.05 U
	12/16/08		< 0.05 U
Total Organic Carbon	12/16/08	Percent	< 0.020 U
	12/17/08		< 0.020 U

STANDARD REFERENCE RESULTS-CONVENTIONALS
OD92-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized: JWB
Reported: 12/31/08

Project: PORT GAMBLE
Event: 1733014
Date Sampled: NA
Date Received: NA

Analyte/SRM ID	Date	Units	SRM	True Value	Recovery
N-Ammonia	12/16/08	mg-N/kg	109	100	109.0%
SPEX 28-24AS	12/16/08		108	100	108.0%
Total Organic Carbon	12/16/08	Percent	3.00	3.35	89.6%
NIST #8704	12/17/08		3.30	3.35	98.5%

SAMPLE RESULTS-CONVENTIONALS
OD93-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized: JB
Reported: 12/31/08

Project: Port Gamble
Event: 17330-14
Date Sampled: 12/09/08
Date Received: 12/11/08

Client ID: PGSS-71
ARI ID: 08-33506 OD93A

Analyte	Date	Method	Units	RL	Sample
Total Solids	12/15/08 121508#1	EPA 160.3	Percent	0.01	74.70
Preserved Total Solids	12/15/08 121508#1	EPA 160.3	Percent	0.01	76.00
Total Volatile Solids	12/15/08 121508#1	EPA 160.4	Percent	0.01	1.53
N-Ammonia	12/16/08 121608#1	EPA 350.1M	mg-N/kg	0.13	3.46
Sulfide	12/16/08 121608#2	EPA 376.2	mg/kg	6.40	67.5
Total Organic Carbon	12/16/08 121608#1	Plumb,1981	Percent	0.020	1.57

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
OD93-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 12/31/08

Project: Port Gamble
Event: 17330-14
Date Sampled: 12/09/08
Date Received: 12/11/08

Client ID: PGSS-73
ARI ID: 08-33507 OD93B

Analyte	Date	Method	Units	RL	Sample
Total Solids	12/15/08 121508#1	EPA 160.3	Percent	0.01	75.30
Preserved Total Solids	12/15/08 121508#1	EPA 160.3	Percent	0.01	73.50
Total Volatile Solids	12/15/08 121508#1	EPA 160.4	Percent	0.01	1.28
N-Ammonia	12/16/08 121608#1	EPA 350.1M	mg-N/kg	0.13	2.72
Sulfide	12/16/08 121608#2	EPA 376.2	mg/kg	6.59	43.4
Total Organic Carbon	12/16/08 121608#1	Plumb,1981	Percent	0.020	0.998

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
OD93-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 12/31/08

Project: Port Gamble
Event: 17330-14
Date Sampled: 12/09/08
Date Received: 12/11/08

Client ID: PGSS-75
ARI ID: 08-33508 OD93C

Analyte	Date	Method	Units	RL	Sample
Total Solids	12/15/08 121508#1	EPA 160.3	Percent	0.01	79.10
Preserved Total Solids	12/15/08 121508#1	EPA 160.3	Percent	0.01	80.30
Total Volatile Solids	12/15/08 121508#1	EPA 160.4	Percent	0.01	0.84
N-Ammonia	12/16/08 121608#1	EPA 350.1M	mg-N/kg	0.11	3.49
Sulfide	12/16/08 121608#2	EPA 376.2	mg/kg	1.19	19.6
Total Organic Carbon	12/16/08 121608#1	Plumb,1981	Percent	0.020	0.475

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
OD93-Hart Crowser, Inc.

AI
RE
INC

Matrix: Sediment
Data Release Authorized:
Reported: 12/31/08

Project: Port Gamble
Event: 17330-14
Date Sampled: 12/09/08
Date Received: 12/11/08

Client ID: PGSS-77
ARI ID: 08-33509 OD93D

Analyte	Date	Method	Units	RL	Sample
Total Solids	12/15/08 121508#1	EPA 160.3	Percent	0.01	66.00
Preserved Total Solids	12/15/08 121508#1	EPA 160.3	Percent	0.01	67.70
Total Volatile Solids	12/15/08 121508#1	EPA 160.4	Percent	0.01	3.10
N-Ammonia	12/16/08 121608#1	EPA 350.1M	mg-N/kg	0.14	5.65
Sulfide	12/16/08 121608#2	EPA 376.2	mg/kg	14.0	171
Total Organic Carbon	12/16/08 121608#1	Plumb,1981	Percent	0.020	1.88

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
OD93-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 12/31/08

Project: Port Gamble
Event: 17330-14
Date Sampled: 12/09/08
Date Received: 12/11/08

Client ID: PGSS-77A
ARI ID: 08-33510 OD93E

Analyte	Date	Method	Units	RL	Sample
Total Solids	12/15/08 121508#1	EPA 160.3	Percent	0.01	68.20
Preserved Total Solids	12/15/08 121508#1	EPA 160.3	Percent	0.01	64.30
Total Volatile Solids	12/15/08 121508#1	EPA 160.4	Percent	0.01	3.16
N-Ammonia	12/16/08 121608#1	EPA 350.1M	mg-N/kg	0.15	3.65
Sulfide	12/16/08 121608#2	EPA 376.2	mg/kg	15.3	210
Total Organic Carbon	12/16/08 121608#1	Plumb,1981	Percent	0.020	2.38

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
OD93-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized: JB
Reported: 12/31/08

Project: Port Gamble
Event: 17330-14
Date Sampled: 12/10/08
Date Received: 12/11/08

Client ID: PGSS-78
ARI ID: 08-33511 OD93F

Analyte	Date	Method	Units	RL	Sample
Total Solids	12/15/08 121508#1	EPA 160.3	Percent	0.01	78.90
Preserved Total Solids	12/15/08 121508#1	EPA 160.3	Percent	0.01	77.60
Total Volatile Solids	12/15/08 121508#1	EPA 160.4	Percent	0.01	1.46
N-Ammonia	12/16/08 121608#1	EPA 350.1M	mg-N/kg	0.12	8.26
Sulfide	12/16/08 121608#2	EPA 376.2	mg/kg	1.28	10.6
Total Organic Carbon	12/16/08 121608#1	Plumb,1981	Percent	0.020	1.53

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
OD93-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized: JW
Reported: 12/31/08

Project: Port Gamble
Event: 17330-14
Date Sampled: 12/10/08
Date Received: 12/11/08

Client ID: PGSS-80
ARI ID: 08-33512 OD93G

Analyte	Date	Method	Units	RL	Sample
Total Solids	12/15/08 121508#1	EPA 160.3	Percent	0.01	82.10
Preserved Total Solids	12/15/08 121508#1	EPA 160.3	Percent	0.01	79.50
Total Volatile Solids	12/15/08 121508#1	EPA 160.4	Percent	0.01	0.78
N-Ammonia	12/16/08 121608#1	EPA 350.1M	mg-N/kg	0.11	2.35
Sulfide	12/16/08 121608#2	EPA 376.2	mg/kg	1.19	< 1.19 U
Total Organic Carbon	12/16/08 121608#1	Plumb,1981	Percent	0.020	0.285

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
OD93-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 12/31/08

Project: Port Gamble
Event: 17330-14
Date Sampled: 12/10/08
Date Received: 12/11/08

Client ID: PGSS-82
ARI ID: 08-33513 OD93H

Analyte	Date	Method	Units	RL	Sample
Total Solids	12/15/08 121508#1	EPA 160.3	Percent	0.01	75.60
Preserved Total Solids	12/15/08 121508#1	EPA 160.3	Percent	0.01	79.10
Total Volatile Solids	12/15/08 121508#1	EPA 160.4	Percent	0.01	1.00
N-Ammonia	12/16/08 121608#1	EPA 350.1M	mg-N/kg	0.12	3.20
Sulfide	12/16/08 121608#2	EPA 376.2	mg/kg	6.21	40.4
Total Organic Carbon	12/16/08 121608#1	Plumb,1981	Percent	0.020	0.879

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
OD93-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 12/31/08

Project: Port Gamble
Event: 17330-14
Date Sampled: 12/10/08
Date Received: 12/11/08

Client ID: PGSS-83
ARI ID: 08-33514 OD93I

Analyte	Date	Method	Units	RL	Sample
Total Solids	12/15/08 121508#1	EPA 160.3	Percent	0.01	71.10
Preserved Total Solids	12/15/08 121508#1	EPA 160.3	Percent	0.01	71.10
Total Volatile Solids	12/15/08 121508#1	EPA 160.4	Percent	0.01	2.34
N-Ammonia	12/16/08 121608#1	EPA 350.1M	mg-N/kg	0.13	6.11
Sulfide	12/16/08 121608#2	EPA 376.2	mg/kg	13.4	136
Total Organic Carbon	12/16/08 121608#1	Plumb,1981	Percent	0.020	1.87

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
OD93-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 12/31/08

Project: Port Gamble
Event: 17330-14
Date Sampled: 12/10/08
Date Received: 12/11/08

Client ID: PGSS-92
ARI ID: 08-33515 OD93J

Analyte	Date	Method	Units	RL	Sample
Total Solids	12/15/08 121508#1	EPA 160.3	Percent	0.01	66.70
Preserved Total Solids	12/15/08 121508#1	EPA 160.3	Percent	0.01	56.00
Total Volatile Solids	12/15/08 121508#1	EPA 160.4	Percent	0.01	4.22
N-Ammonia	12/16/08 121608#1	EPA 350.1M	mg-N/kg	0.14	7.07
Sulfide	12/16/08 121608#2	EPA 376.2	mg/kg	33.6	547
Total Organic Carbon	12/16/08 121608#1	Plumb,1981	Percent	0.020	3.01

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

MS/MSD RESULTS-CONVENTIONALS
OD93-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 12/31/08

Project: Port Gamble
Event: 17330-14
Date Sampled: 12/09/08
Date Received: 12/11/08

Analyte	Date	Units	Sample	Spike	Spike Added	Recovery
ARI ID: OD93A Client ID: PGSS-71						
N-Ammonia	12/16/08	mg-N/kg	3.46	128	125	100.0%
Sulfide	12/16/08	mg/kg	67.5	187	147	81.3%
Total Organic Carbon	12/16/08	Percent	1.57	3.22	1.89	87.4%

REPLICATE RESULTS-CONVENTIONALS
OD93-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized: NB
Reported: 12/31/08

Project: Port Gamble
Event: 17330-14
Date Sampled: 12/09/08
Date Received: 12/11/08

Analyte	Date	Units	Sample	Replicate(s)	RPD/RSD
ARI ID: OD93A Client ID: PGSS-71					
Total Solids	12/15/08	Percent	74.70	74.40 75.00	0.4%
Preserved Total Solids	12/15/08	Percent	76.00	75.30 75.80	0.5%
Total Volatile Solids	12/15/08	Percent	1.53	1.54 1.50	1.4%
N-Ammonia	12/16/08	mg-N/kg	3.46	3.46 3.48	0.3%
Sulfide	12/16/08	mg/kg	67.5	30.5	75.5%
Total Organic Carbon	12/16/08	Percent	1.57	1.55 2.00	14.9%

LAB CONTROL RESULTS-CONVENTIONALS
OD93-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 12/31/08

Project: Port Gamble
Event: 17330-14
Date Sampled: NA
Date Received: NA

Analyte	Date	Units	LCS	Spike Added	Recovery
Sulfide	12/16/08	mg/kg	6.42	5.77	111.3%
	12/16/08		5.68	5.77	98.4%
Total Organic Carbon	12/16/08	Percent	0.466	0.500	93.2%

METHOD BLANK RESULTS-CONVENTIONALS
OD93-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 12/31/08

Project: Port Gamble
Event: 17330-14
Date Sampled: NA
Date Received: NA

Analyte	Date	Units	Blank
Total Solids	12/15/08	Percent	< 0.01 U
Preserved Total Solids	12/15/08	Percent	< 0.01 U
Total Volatile Solids	12/15/08	Percent	< 0.01 U
N-Ammonia	12/16/08	mg-N/kg	< 0.10 U
	12/16/08		< 0.10 U
Sulfide	12/16/08	mg/kg	< 0.05 U
	12/16/08		< 0.05 U
Total Organic Carbon	12/16/08	Percent	< 0.020 U

STANDARD REFERENCE RESULTS-CONVENTIONALS
OD93-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 12/31/08

Project: Port Gamble
Event: 17330-14
Date Sampled: NA
Date Received: NA

Analyte/SRM ID	Date	Units	SRM	True Value	Recovery
N-Ammonia	12/16/08	mg-N/kg	109	100	109.0%
SPEX 28-24AS	12/16/08		108	100	108.0%
Total Organic Carbon NIST #8704	12/16/08	Percent	3.00	3.35	89.6%

TOTAL SOLIDS

Extractions Total Solids-extts
Data By: Tae K. You
Created: 12/16/08

Worklist: 2686
Analyst: RVR
Comments:

	ARI ID CLIENT ID	Tare Wt (g)	Wet Wt (g)	Dry Wt (g)	% Solids	pH
1.	OD92B 08-33487 PGSS-46	1.18	11.14	8.81	76.6	NR
2.	OD92C 08-33488 PGSS-47	1.17	11.75	8.41	68.4	NR
3.	OD92D 08-33489 PGSS-51	1.18	12.25	6.03	43.8	NR
4.	OD92F 08-33491 PGSS-53	1.16	11.48	5.78	44.8	NR
5.	OD92G 08-33492 PGSS-54	1.16	12.27	6.87	51.4	NR
6.	OD92H 08-33493 PGSS-55	1.19	11.30	8.93	76.6	NR
7.	OD92I 08-33494 PGSS-56	1.19	11.81	9.23	75.7	NR
8.	OD92J 08-33495 PGSS-58	1.16	11.19	4.87	37.0	NR
9.	OD92K 08-33496 PGSS-61	1.16	11.64	8.84	73.3	NR
10.	OD92L 08-33497 PGSS-62	1.18	11.86	9.85	81.2	NR
11.	OD92N 08-33499 PGSS-62B	1.18	11.48	8.51	71.2	NR
12.	OD92O 08-33500 PGSS-63	1.16	11.78	8.66	70.6	NR
13.	OD92P 08-33501 PGSS-64	1.17	12.56	9.01	68.8	NR
14.	OD92Q 08-33502 PGSS-67	1.18	12.85	9.69	72.9	NR
15.	OD92R 08-33503 PGSS-68	1.18	11.90	9.74	79.9	NR

Extractions Total Solids-extts
Data By: Tae K. You
Created: 12/16/08

Worklist: 2686
Analyst: RVR
Comments:

	ARI ID CLIENT ID	Tare Wt (g)	Wet Wt (g)	Dry Wt (g)	% Solids	pH
16.	OD92S 08-33504 PGSS-69	1.15	11.79	9.29	76.5	NR
17.	OD92T 08-33505 PGSS-70	1.18	12.00	9.46	76.5	NR

Extractions Total Solids-extts
Data By: Tae K. You
Created: 12/12/08

Worklist: 1709
Analyst: RVR
Comments:

	ARI ID CLIENT ID	Tare Wt (g)	Wet Wt (g)	Dry Wt (g)	% Solids	pH
1.	OD92A 08-33486 PGSS-45	1.18	11.54	5.16	38.4	NR
2.	OD92E 08-33490 PGSS-47A	1.18	11.90	7.07	54.9	NR
3.	OD92M 08-33498 PGSS-62A	1.19	11.32	9.05	77.6	NR

Extractions Total Solids-extts
Data By: Tae K. You
Created: 12/16/08

Worklist: 2687
Analyst: RVR
Comments:

	ARI ID CLIENT ID	Tare Wt (g)	Wet Wt (g)	Dry Wt (g)	% Solids	pH
1.	OD93A 08-33506 PGSS-71	1.19	11.17	9.13	79.6	NR
2.	OD93B 08-33507 PGSS-73	1.16	11.95	9.81	80.2	NR
3.	OD93C 08-33508 PGSS-75	1.18	11.95	9.96	81.5	NR
4.	OD93D 08-33509 PGSS-77	1.19	12.25	9.01	70.7	NR
5.	OD93E 08-33510 PGSS-77A	1.17	11.39	8.55	72.2	NR
6.	OD93F 08-33511 PGSS-78	1.18	11.96	9.89	80.8	NR
7.	OD93G 08-33512 PGSS-80	1.17	12.35	10.21	80.9	NR
8.	OD93H 08-33513 PGSS-82	1.14	12.27	10.11	80.6	NR
9.	OD93I 08-33514 PGSS-83	1.20	12.79	10.19	77.6	NR
10.	OD93J 08-33515 PGSS-92	1.19	11.21	7.48	62.8	NR

Analytical Resources, Incorporated
Analytical Chemists and Consultants

February 16, 2009

Mr. Roger McGinnis
Hart Crowser, Inc.
1700 Westlake Avenue North Suite 200
Seattle, WA 98109-3056

RE: Project: Port Gamble, 17330-14
ARI Job No.: OG44

Dear Mr. McGinnis:

Please find enclosed the original Chain-of-Custody (COC) records, sample receipt documentation, and the final data package for the samples from the project referenced above.

The samples were analyzed for Total Metals, % Lipids, PCBs and Dioxin Furans, as requested.

Sample receipt and details of these analyses are discussed in the Case Narrative.

An electronic copy of this data package and the supporting data 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.

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

Enclosures

cc: files OG44

KB/kb

Chain of Custody Documentation

prepared for

HART CROWSER, INC.

Project: Port Gamble, 17330-14

ARI JOB NO: OG44

prepared by

Analytical Resources, Inc.

Sample Custody Record

Samples Shipped to: ART

2 OF 2

HARTCROWSER

Hart Crowser, Inc.
1910 Fairview Avenue East
Seattle, Washington 98102-3699
Phone: 206-324-9530 FAX: 206-328-5581

JOB 17330-14 LAB NUMBER

PROJECT NAME PORT GAMBLE

HART CROWSER CONTACT ROGER MCGINNIS

SAMPLED BY: PORT GAMBLE S'KLALLAM TRIBE NATURAL RESOURCES DEPT.

REQUESTED ANALYSIS

LAB NO.	SAMPLE ID	DESCRIPTION	DATE	TIME	MATRIX	METALS	DIOXIN/FURANS	PCBs	% LIPIDS	NO. OF CONTAINERS	OBSERVATIONS/COMMENTS/ COMPOSITING INSTRUCTIONS
											CFR 12/17/08
GDSTATION #1	GD1 (A)	12.16.08	12-16-08	—	BIOTA	X	X	X	X	3	3 replicates INDIVIDUALS
GDSTATION #1	GD2 (B)	12.16.08	↓	—	↓					3	3 replicates " " HOLD
GDSTATION #1	GD3 (C)	12.16.08		—						3	3 replicates " " HOLD
GDSTATION #2	GD1	12.16.08		—		X	X	X	X	3	3 replicates " "
GDSTATION #2	GD2 (B)	12.16.08 CFR 12/17/08		—						3	3 replicates " " HOLD
GDSTATION #2	GD3 (C)	12.16.08		—						3	3 replicates " " HOLD
GDSTATION #3	GD1 (A)	12.16.08		—		X	X	X	X	3	3 replicates " "
GDSTATION #3	GD2 (B)	12.16.08		—						3	3 replicates " " HOLD
GDSTATION #3	GD3	12.16.08		—						3	3 replicates " " HOLD
~~GDSTATION #1~~	~~GDEXTRA~~	~~12.16.08~~		—			REMOVE				~~2 geoducks extra volume~~
~~GDSTATION #2~~	~~GDEXTRA~~	~~12.16.08~~		—			CFR 12/17/08			CFR 12/17/08	~~2 geoducks extra volume~~
~~GDSTATION #3~~	~~GDEXTRA~~	~~12.16.08~~	↓	—	↓						~~4 geoducks extra volume~~

RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE: [signature]	12/16/08	SIGNATURE: [signature]	12/16/08
PRINT NAME: Colleen Rust	TIME	PRINT NAME: Warren Woodard	TIME
COMPANY: HC	1830	COMPANY: Analytical Resources	18:30

RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE	TIME	SIGNATURE	TIME
PRINT NAME		PRINT NAME	
COMPANY		COMPANY	

SPECIAL SHIPMENT HANDLING OR STORAGE REQUIREMENTS:
SAMPLE ID = SITE + SAMPLE ID
SEE ATTACHED PAGES.
HOLD -B, -C SAMPLES

COOLER NO.: STORAGE LOCATION:

See Lab Work Order No. ______
for Other Contract Requirements

27 TOTAL NUMBER OF CONTAINERS

SAMPLE RECEIPT INFORMATION
CUSTODY SEALS: ☐YES ☐NO ☐N/A
GOOD CONDITION ☐YES ☐NO
TEMPERATURE ______
SHIPMENT METHOD: ☐HAND ☐COURIER ☐OVERNIGHT

TURNAROUND TIME:
☐ 24 HOURS ☐ 1 WEEK
☐ 48 HOURS ☒ STANDARD
☐ 72 HOURS OTHER ______

White and Yellow Copies to Lab Pink to Project Manager Lab to Return White Copy to Hart Crowser Gold to Sample Custodian

Sample Custody Record

2 of 2

Samples Shipped to: ARI

HART CROWSER

Hart Crowser, Inc.
1910 Fairview Avenue East
Seattle, Washington 98102-3699
Phone: 206-324-9530 FAX: 206-328-5581

JOB 17330-14 LAB NUMBER

PROJECT NAME PORT GAMBLE

HART CROWSER CONTACT ROGER MCGINNIS

SAMPLED BY: PORT GAMBLE S'KLALLAM TRIBE NATURAL RESOURCES DEPT.

LAB NO.	SAMPLE ID	DESCRIPTION	DATE	TIME	MATRIX	REQUESTED ANALYSIS: METALS	DIOXIN/FURANS	PCBS	% LIPIDS	NO. OF CONTAINERS	OBSERVATIONS/COMMENTS/ COMPOSITING INSTRUCTIONS
											CHR 12/17/08
CLAM #1	C_A_12.15.08		12-15-08	—	BIOTA	X	X	X	X	32	32 replicates INDIVIDUALS
CLAM #2	C_A_12.15.08			—		X	X	X	X	30	30 " " " "
OYSTER #1	O_A_12.15.08	CHR 12/17/08		—		X	X	X	X	15	15 " " " "
OYSTER #1	O_B_12.15.08			—						15	15 " " " " HOLD
OYSTER #2	O_A_12.15.08			—		X	X	X	X	15	15 " " " "
OYSTER #2	O_B_12.15.08		↓	—	↓					15	15 " " " " HOLD

RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE	12/16/08	SIGNATURE	12/16/08
PRINT NAME Colleen Rust	TIME	PRINT NAME Warren Woodard	TIME
COMPANY HC	1830	COMPANY Analytical Resources	18:30
RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE	TIME	SIGNATURE	TIME
PRINT NAME		PRINT NAME	
COMPANY		COMPANY	

SPECIAL SHIPMENT HANDLING OR STORAGE REQUIREMENTS:

SAMPLE ID = SITE + SAMPLE ID
SEE ATTACHED PAGES.
HOLD - B, C SAMPLES

122 TOTAL NUMBER OF CONTAINERS

SAMPLE RECEIPT INFORMATION
CUSTODY SEALS: ☐YES ☐NO ☐N/A
GOOD CONDITION ☐YES ☐NO
TEMPERATURE
SHIPMENT METHOD: ☐HAND ☐COURIER ☐OVERNIGHT

COOLER NO.: STORAGE LOCATION:

See Lab Work Order No. for Other Contract Requirements

TURNAROUND TIME:
☐ 24 HOURS ☐ 1 WEEK
☐ 48 HOURS ☒ STANDARD
☐ 72 HOURS OTHER

White and Yellow Copies to Lab — Pink to Project Manager — Lab to Return White Copy to Hart Crowser — Gold to Sample Custodian

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Hart Crowser Project Name: _____

COC No: _____ Delivered by: Hand

Assigned ARI Job No: _____ Tracking No: _____

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
Record cooler temperature (recommended 2.0-6.0 °C for chemistry	Alive	°C

Cooler Accepted by: JH Date: 12/23/08 Time: 16:56

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?	Wet	
Was sufficient ice used (if appropriate)?	YES	(NO)
Were all bottles sealed in individual plastic bags?	YES	(NO)
Did all bottle arrive in good condition (unbroken)?	(YES)	NO
Were all bottle labels complete and legible?	(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 checklist)	YES	(NO)
Were all VOC vials free of air bubbles? (NA)	YES	NO
Was sufficient amount of sample sent in each bottle?	(YES)	NO

Samples Logged by: JH Date: 1-5-09 Time: 12:34

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

Explain discrepancies or negative responses:

By: Date:

Case Narrative

prepared
for

HART CROWSER, INC.

Project: Port Gamble, 17330-14

ARI JOB NO: OG44

prepared
by

Analytical Resources, Inc.

Case Narrative
Hart Crowser
Port Gamble, 17330-14 (Oysters)
ARI Job: OG44
February 16, 2009

Sample Receipt

Analytical Resources Inc. (ARI) accepted fifteen tissue samples in good condition on December 16, 2008. The samples were logged under several different ARI SDGs based on sample preps. Please note that several sample containers were prepped and archived upon receipt as requested on the COC. All samples and preps were frozen to protect holding times. For further detail regarding sample receipt, please refer to the Cooer Receipt Form.

** Select samples were sent to SGS Environmental for Dioxin and Furans analysis. The data has been included in this data package.

PCBs Method 8082:

The samples were extracted on 1/9/09 and analyzed on 1/16/09 within the method recommended holding times for frozen samples.

Initial calibration(s): All compounds of interest were within method acceptance criteria.

Continuing calibration(s): Are in control.

Samples: There were no anomalies associated with these samples.

Surrogates: Are in control.

LCS/LCSD(s): Are in control.

Method Blank: The method blanks were free of contamination.

Total Metals:

All samples were prepared on 1/8/09 and analyzed between 1/14/09 and 1/21/09 within the method recommended holding times for frozen samples.

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

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

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

LCS(s): All LCS percent recoveries were within control limits.

MS(s): The matrix spike in is in control.

% Lipids: The data is included in this data package.

Data Reporting Qualifiers

Effective 12/28/04

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 ≥ 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
NR	Spiked compound recovery is not reported due to chromatographic interference
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.
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
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.

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 ≥40% RPD with no obvious chromatographic interference

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

LCS SOLUTIONS

12/30/08

LABE	SOLN ID	TEST	CONC. UG/ML	SOLVENT	EXP.
1	1549-3	PCB	20	ACETONE	10/10/09
2	1472-3	BCOC PEST	10	ACETONE	07/20/08
3	1517-1	PEST	02/04/20	ACETONE	05/15/09
4	1561-2	LOW PEST	0.2/0.4/2	ACETONE	05/15/09
5	1537-1	EPH	1500	MECL2	08/16/09
6	1559-2	PCP	12.5/125	ACETONE	11/05/09
7	1573-1	ABN	100	ACETONE	08/01/09
8	1566-1	TBT	2.5	MECL2	12/04/09
9	1567-3	PORE TBT	.125/.25	MECL2	12/04/09
10	1554-3	ABN ACID	100/200	MEOH	10/21/09
11	1563-3	TPHD	15000	ACETONE	11/20/09
12	1563-1	ABN BASE	200	ACETONE	06/30/09
13	1573-2	LOW PCB	2	ACETONE	10/10/09
14	1547-1	LOW ABN ACID	10/20	MEOH	04/10/09
15*	1452-1	SIM PNA	15/75	MEOH	04/09/09
16	1502-2	DIOXANE	100	MEOH	02/20/09
17	1516-2	1248 PCB	20	ACETONE	05/07/09
18	1514-4	LOW SIM PNA	1.5/7.5	ACETONE	04/24/09
19	1517-3	AK103	7500	MECL2	12/29/08
20	1572-2	PNA	100	ACETONE	12/26/09
21*	1414-4	SKY/BHT	100	MEOH	04/08/09
22	1570-1	HERB	12.5/12500	MEOH	02/19/09
23	1505-1	LOW ABN BASE	20	MEOH	03/20/09
24	1541-4	LOW ABN	10	ACETONE	08/01/09
25	1481-1	DIPHENYL	100	MEOH	07/20/08
26	1545-2	OP-PEST	25	MEOH	02/14/09
27	1495-1	STEROLS	200	MEOH	12/29/08
28	1494-1	ADD. PEST	4	ACETONE	01/23/09
29	1496-3	DECANES	100	MEOH	02/12/09
30	1497-2	EDB/DBCP	2	ACETONE	02/12/09
31	1510-3	TERPINEOL	100	MEOH	03/21/09

LCS SOLUTIONS

12/30/08

32	1545-3	GUAIACOL	50-200	ACETONE	06/05/09
33	1522-1	RESIN ACID	250	ACETONE	06/11/09
34	1530-2	CONGENERS	1	ACETONE	07/23/09
50	1571-1	FULL RESIN	250	ACETONE	06/10/09
*=REVERIFIED SOLUTION					

SURR SOLUTIONS

12/30/08

LABEL	SOLN ID	TEST	CONC. UG/ML	SOLVENT	EXP.
A	1559-5	ABN	100/150	MEOH	03/13/09
B	1572-1	SIM PNA	15/75	MEOH	08/28/09
C	1559-1	SIM ABN	25/37.5	MEOH	03/13/09
D	1561-3	LOW PCB	0.2	ACETONE	07/31/09
E*	1478-1	HERB	62.5	MEOH	09/21/09
F	1520-3	PCP	12.5	ACETONE	04/18/09
G	1534-1	1,4DIOXANE	100	MEOH	02/20/09
H	1545-1	OP-PEST	25	MEOH	02/14/09
I	1559-4	LOW S. PNA	1.5	MEOH	08/28/09
J	1566-5	TBT-PORE	0.125	MECL2	12/04/09
K	1538-1	MED PCB	20	ACETONE	07/31/09
L	1566-4	TBT	2.5	MECL2	12/04/09
M	1558-2	EPH	1500	MECL2	09/24/09
N	1538-2	PCB	2	ACETONE	07/31/09
O	1567-4	TPH	450	MECL2	09/24/09
P	1560-3	HCID	2250	MECL2	09/24/09
Q	1497-3	EDB	2	ACETONE	02/12/09
R	1521-4	RESIN ACID	250	ACETONE	06/11/09
S	1568-5	PBDE	.25	MEOH	12/11/09
T	*reverified	solution			
U					
V					
W					
X					
Y					
Z					

Data Summary Package

prepared
for

HART CROWSER, INC.

Project: Port Gamble, 17330-14

ARI JOB NO: OG44

prepared
by

Analytical Resources, Inc.

PCBS

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082
Page 1 of 1

Sample ID: OYSTER #1A
SAMPLE

Lab Sample ID: OG44A
LIMS ID: 09-348
Matrix: Tissue
Data Release Authorized:
Reported: 01/19/09

QC Report No: OG44-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/15/08
Date Received: 12/16/08

Date Extracted: 01/09/09
Date Analyzed: 01/16/09 18:01
Instrument/Analyst: ECD5/JGR
GPC Cleanup: Yes
Sulfur Cleanup: No
Acid Cleanup: yes
Florisil Cleanup: No

Sample Amount: 25.0 g-as-rec
Final Extract Volume: 2.0 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: NA

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	8.0	< 8.0 U
53469-21-9	Aroclor 1242	8.0	< 8.0 U
12672-29-6	Aroclor 1248	8.0	< 8.0 U
11097-69-1	Aroclor 1254	8.0	< 8.0 U
11096-82-5	Aroclor 1260	8.0	< 8.0 U
11104-28-2	Aroclor 1221	8.0	< 8.0 U
11141-16-5	Aroclor 1232	8.0	< 8.0 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	63.5%
Tetrachlorometaxylene	78.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082
Page 1 of 1

Sample ID: OYSTER #2A
SAMPLE

Lab Sample ID: OG44C
LIMS ID: 09-350
Matrix: Tissue
Data Release Authorized:
Reported: 01/19/09

QC Report No: OG44-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/15/08
Date Received: 12/16/08

Date Extracted: 01/09/09
Date Analyzed: 01/16/09 18:18
Instrument/Analyst: ECD5/JGR
GPC Cleanup: Yes
Sulfur Cleanup: No
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.0 g-as-rec
Final Extract Volume: 2.0 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: NA

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	8.0	< 8.0 U
53469-21-9	Aroclor 1242	8.0	< 8.0 U
12672-29-6	Aroclor 1248	8.0	< 8.0 U
11097-69-1	Aroclor 1254	8.0	< 8.0 U
11096-82-5	Aroclor 1260	8.0	< 8.0 U
11104-28-2	Aroclor 1221	8.0	< 8.0 U
11141-16-5	Aroclor 1232	8.0	< 8.0 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	62.5%
Tetrachlorometaxylene	77.2%

ANALYTICAL RESOURCES INCORPORATED

SW8082/PCB TISSUE SURROGATE RECOVERY SUMMARY

Matrix: Tissue

QC Report No: OG44-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14

Client ID	DCBP	TCMX	TOT OUT
MB-010909	76.5%	65.5%	0
LCS-010909	71.0%	67.2%	0
LCSD-010909	67.2%	65.8%	0
OYSTER #1A	63.5%	78.2%	0
OYSTER #2A	62.5%	77.2%	0

	LCS/MB LIMITS	QC LIMITS
(DCBP) = Decachlorobiphenyl	(36-130)	(33-149)
(TCMX) = Tetrachlorometaxylene	(30-119)	(32-121)

Prep Method: TissM
Log Number Range: 09-348 to 09-350

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082
Page 1 of 1

Sample ID: LCS-010909
LCS/LCSD

Lab Sample ID: LCS-010909
LIMS ID: 09-348
Matrix: Tissue
Data Release Authorized:
Reported: 01/19/09

QC Report No: OG44-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: NA
Date Received: NA

Date Extracted LCS/LCSD: 01/09/09
Date Analyzed LCS: 01/16/09 17:26
LCSD: 01/16/09 17:44
Instrument/Analyst LCS: ECD5/JGR
LCSD: ECD5/JGR
GPC Cleanup: Yes
Sulfur Cleanup: No
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount LCS: 25.0 g-as-rec
LCSD: 25.0 g-as-rec
Final Extract Volume LCS: 2.0 mL
LCSD: 2.0 mL
Dilution Factor LCS: 1.00
LCSD: 1.00
Silica Gel: No

Percent Moisture: NA

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Aroclor 1016	29.0	40.0	72.5%	30.2	40.0	75.5%	4.1%
Aroclor 1260	29.8	40.0	74.5%	28.9	40.0	72.2%	3.1%

PCB Surrogate Recovery

	LCS	LCSD
Decachlorobiphenyl	71.0%	67.2%
Tetrachlorometaxylene	67.2%	65.8%

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

PCB METHOD BLANK SUMMARY

BLANK NO.

OG44MBS1

Lab Name: ANALYTICAL RESOURCES, INC
Client: HART CROWSER, INC.

ARI Job No.: OG44
Project: PORT GAMBLE

Lab Sample ID: OG44MBS1
Lab File ID: 0116B007

Date Extracted: 01/09/09
Matrix: SOLID

Date Analyzed: 01/16/09
Instrument ID: ECD5

Time Analyzed: 1709
GC Columns: ZB5/ZB35

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

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED
01	OG44LCSS1	OG44LCSS1	01/16/09
02	OG44LCSDS1	OG44LCSDS1	01/16/09
03	OYSTER #1A	OG44A	01/16/09
04	OYSTER #2A	OG44C	01/16/09

ALL RUNS ARE DUAL COLUMN

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082
Page 1 of 1

Sample ID: MB-010909
METHOD BLANK

Lab Sample ID: MB-010909
LIMS ID: 09-348
Matrix: Tissue
Data Release Authorized:
Reported: 01/19/09

QC Report No: OG44-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: NA
Date Received: NA

Date Extracted: 01/09/09
Date Analyzed: 01/16/09 17:09
Instrument/Analyst: ECD5/JGR
GPC Cleanup: Yes
Sulfur Cleanup: No
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.0 g
Final Extract Volume: 2.0 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: NA

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	8.0	< 8.0 U
53469-21-9	Aroclor 1242	8.0	< 8.0 U
12672-29-6	Aroclor 1248	8.0	< 8.0 U
11097-69-1	Aroclor 1254	8.0	< 8.0 U
11096-82-5	Aroclor 1260	8.0	< 8.0 U
11104-28-2	Aroclor 1221	8.0	< 8.0 U
11141-16-5	Aroclor 1232	8.0	< 8.0 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery	
Decachlorobiphenyl	76.5%
Tetrachlorometaxylene	65.5%

METALS

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: OYSTER #1A SAMPLE

Lab Sample ID: OG44A
LIMS ID: 09-348
Matrix: Tissue
Data Release Authorized:
Reported: 01/22/09

QC Report No: OG44-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/15/08
Date Received: 12/16/08

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-as-rec	Q
3050B	01/08/09	6010B	01/21/09	7440-38-2	Arsenic	1	1	U
3050B	01/08/09	6010B	01/21/09	**7440-43-9**	**Cadmium**	0.04	**0.99**	
3050B	01/08/09	6010B	01/21/09	**7440-47-3**	**Chromium**	0.1	**0.1**	
3050B	01/08/09	6010B	01/21/09	**7440-50-8**	**Copper**	0.04	**3.98**	
3050B	01/08/09	6010B	01/21/09	7439-92-1	Lead	0.4	0.4	U
CLP-M	01/08/09	7471A	01/14/09	**7439-97-6**	**Mercury**	0.01	**0.01**	
3050B	01/08/09	6010B	01/21/09	**7440-22-4**	**Silver**	0.06	**0.10**	
3050B	01/08/09	6010B	01/21/09	**7440-66-6**	**Zinc**	0.2	**101**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: OYSTER #2A SAMPLE

Lab Sample ID: OG44C
LIMS ID: 09-350
Matrix: Tissue
Data Release Authorized:
Reported: 01/22/09

QC Report No: OG44-Hart Crowser, Inc.
Project: PORT GAMBLE 17330-14
Date Sampled: 12/15/08
Date Received: 12/16/08

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-as-rec	Q
3050B	01/08/09	6010B	01/21/09	**7440-38-2**	**Arsenic**	1	**1**	
3050B	01/08/09	6010B	01/21/09	**7440-43-9**	**Cadmium**	0.04	**0.96**	
3050B	01/08/09	6010B	01/21/09	**7440-47-3**	**Chromium**	0.1	**0.2**	
3050B	01/08/09	6010B	01/21/09	**7440-50-8**	**Copper**	0.04	**4.45**	
3050B	01/08/09	6010B	01/21/09	7439-92-1	Lead	0.4	0.4	U
CLP-M	01/08/09	7471A	01/14/09	**7439-97-6**	**Mercury**	0.009	**0.010**	
3050B	01/08/09	6010B	01/21/09	**7440-22-4**	**Silver**	0.06	**0.10**	
3050B	01/08/09	6010B	01/21/09	**7440-66-6**	**Zinc**	0.2	**124**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS **Sample ID: LAB CONTROL**

Lab Sample ID: OG44LCS
LIMS ID: 09-348
Matrix: Tissue
Data Release Authorized:
Reported: 01/22/09

QC Report No: OG44-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: NA
Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike Found	Spike Added	% Recovery	Q
Arsenic	6010B	80	80	100%	
Cadmium	6010B	20.3	20.0	102%	
Chromium	6010B	19.8	20.0	99.0%	
Copper	6010B	19.2	20.0	96.0%	
Lead	6010B	79.4	80.0	99.2%	
Mercury	7471A	0.21	0.20	105%	
Silver	6010B	20.3	20.0	102%	
Zinc	6010B	20.1	20.0	100%	

Reported in mg/kg-wet

N-Control limit not met
NA-Not Applicable, Analyte Not Spiked
Control Limits: 80-120%

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS **Sample ID: METHOD BLANK**

Lab Sample ID: OG44MB
LIMS ID: 09-348
Matrix: Tissue
Data Release Authorized:
Reported: 01/22/09

QC Report No: OG44-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: NA
Date Received: NA

Percent Total Solids: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-as-rec	Q
3050B	01/08/09	6010B	01/21/09	7440-38-2	Arsenic	1	1	U
3050B	01/08/09	6010B	01/21/09	7440-43-9	Cadmium	0.04	0.04	U
3050B	01/08/09	6010B	01/21/09	7440-47-3	Chromium	0.1	0.1	U
3050B	01/08/09	6010B	01/21/09	7440-50-8	Copper	0.04	0.04	U
3050B	01/08/09	6010B	01/21/09	7439-92-1	Lead	0.4	0.4	U
CLP-M	01/08/09	7471A	01/14/09	7439-97-6	Mercury	0.01	0.01	U
3050B	01/08/09	6010B	01/21/09	7440-22-4	Silver	0.06	0.06	U
3050B	01/08/09	6010B	01/21/09	7440-66-6	Zinc	0.2	0.2	U

U-Analyte undetected at given RL
RL-Reporting Limit

DIOXIN ANALYSIS

SGS

Laboratory Results

Ms. Kelly Bottem
Analytical Resources, Inc.
4611 S. 134th Place
Suite 100
Tukwila WA 98168-3240

Phone: 206-695-6211
Fax: 206-695-6201

Dear Ms. Bottem:

Enclosed is a full data package containing the final results for samples received by SGS Environmental Services, Inc. on January 15, 2009 under your project name "Port Gamble". The samples were analyzed by Method 1613 following SGS's Standard Operating Procedures and are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards.

Number of Samples Received:	2
Your Project Reference:	Port Gamble
SGS Project Number:	G1040-4

We appreciate your business and look forward to working with you again. Please contact me at 910-350-1903 if you have questions or need additional technical support.

Sincerely,

Jeannie Milholland

Jeannie Milholland
Project Manager

2-05-2009
Date

DC138.033007.7

SGS

Case Narrative
SGS Project: **G1040-4**
Project Name: **Port Gamble**

For Method: 1613

- The submitted samples were accepted into the lab on January 15th, 2009 and extracted on February 1st, 2009 by method 3540C. The sample extracts and associated QC extracts were then processed through clean-up as prescribed in the SGS standard operating procedures and analyzed by HRGC/HRMS for method 1613.
- No analytical issues were encountered.

Craig Tronzo 2/9/09

Craig R. Tronzo Date
Data Validation

SGS

Table of Contents

Section 1: Cover Letter/Case Narrative

Contains the Table of Contents, a project narrative, the client and SGS project identifiers, the number and type of samples, the methodology used to process the samples, and a summary table of sample results. A listing of current certifications by state, a table of abbreviations and qualifiers and the Toxic Equivalent Factors (TEF) are also supplied.

Section 2: Project Information

Contains the chain-of-custody(s), internal chain-of-custody(s) if applicable, sample login summary, sample receipt checklist, and any other project/client specific information.

Section 3: Sample Analytical Results

Contains results for client samples. Sample results include two pages of summarized analytical data and the associated raw data. The raw data includes a quantitation report from the instrumentation used that lists, ion areas, ratios, retention times, concentrations, and signal-to-noise ratios. It also has the selected ion current profiles (SICPs) for all homolog groups and any manual integrations.

Section 4: Quality Control Analytical Results

Contains results for each analytical workgroup associated with the submitted samples. A workgroup consists of the Lab Method Blank (LMB) and the Ongoing Precision and Recovery sample (OPR). All sample preparation data, including dry weight determinations, extraction logs, clean-up logs and observation notes are also documented. Any other supporting QC data will be documented here upon client request.

Section 5: Initial Calibration

Contains a table summarizing calibration data such as relative response factors, concentrations, and percent relative standard deviation. This section also contains related daily instrument QC information: GC performance data, mass resolution check, windows defining mix, and SICPs for all homolog groups and any manual integrations as well as the injection prep and instrument run logs.

Section 6: Continuing Calibration Data

Contains all daily instrument quality control information. This includes mass resolution checks, a table summarizing the window defining peaks, SICPs for the first and last eluters for each homolog group, SICPs documenting GC performance, a summary quantitation report showing RRFs for the Ccal and Ical, and SICPs for all homolog groups and any manual integrations, injection prep and instrumentation runlogs.

SGS

Data Qualifiers: PCB's

B	Analyte was detected in the Lab Method Blank (LMB) at a concentration greater than 20pg/L or 5 pg/g, and the concentration in the associated sample is less than 10 times the LMB concentration.
U	Identifies a compound as not being detected.
C	Data refers to the first of the co-eluting congeners.
Cx	Data is listed under the lowest numerical congener number in the group where 'x' references the lowest congener.
EDL	Estimated Detection Limit
T	Retention time shift.
ppt	Parts-per-trillion (pg/g; ng/L)
V	Recovery is below quality control limit. The data has been validated based on a favorable signal-to-noise and detection limit.

An average uncertainty of 30% can be routinely achieved as concluded from the evaluation of HRGC-HRMS standard operating procedures. The following flags warn the data user of situations where the uncertainty may be greater than stated.

A	Amount detected is less than the Lower Calibration Limit.
J	Amount detected is between the Method Detection Limit and the Lower Calibration Limit.
K	Data is being reported with a failing ratio and should be considered as an estimated value.
E	Amount detected is greater than the Upper Calibration Limit.
S	The amount of analyte present has saturated the detector. This situation results in an underestimation of the affected analyte(s).
Q	Indicates the presence of a quantitative interference. This situation generally results in an underestimation of the affected analyte(s).
I	Indicates the presence of a qualitative interference that could cause a false positive or an overestimation of the affected analyte(s).
#	Outside quality control limits
*	See case narrative

SGS

Toxic Equivalency Factors

Analyte	WHO* 1998	WHO* 2005	International-89	MADEP+
2,3,7,8-TCDD	1	1	1	1
1,2,3,7,8-PeCDD	1	1	0.5	0.5
1,2,3,4,7,8-HxCDD	0.1	0.1	0.1	0.1
1,2,3,6,7,8-HxCDD	0.1	0.1	0.1	0.1
1,2,3,7,8,9-HxCDD	0.1	0.1	0.1	0.1
1,2,3,4,6,7,8-HpCDD	0.01	0.01	0.01	0.1
OCDD	0.0001	0.0003	0.001	0.001
2,3,7,8-TCDF	0.1	0.1	0.1	0.1
1,2,3,7,8-PeCDF	0.05	0.03	0.05	0.5
2,3,4,7,8-PeCDF	0.5	0.3	0.5	0.5
1,2,3,4,7,8-HxCDF	0.1	0.1	0.1	0.1
1,2,3,6,7,8-HxCDF	0.1	0.1	0.1	0.1
2,3,4,6,7,8-HxCDF	0.1	0.1	0.1	0.1
1,2,3,7,8,9-HxCDF	0.1	0.1	0.1	0.1
1,2,3,4,6,7,8-HpCDF	0.01	0.01	0.01	0.1
1,2,3,4,7,8,9-HpCDF	0.01	0.01	0.01	0.1
OCDF	0.0001	0.0003	0.001	0.001

* World Health Organization
+ Massachusetts Department of Environmental Protection

SUBCONTRACTOR ANALYSIS REQUEST
CUSTODY TRANSFER 01/06/09

ANALYTICAL RESOURCES INCORPORATED

ARI Project: OG44

G1040-4

Laboratory: SGS ENVIROMENTAL SERVICES INC.
Lab Contact: TRENT TEMPERLY
Lab Address: 5500 BUSINESS DR.
WILMINGTON, NC 28405
Phone: 910-350-1903
Fax: 910-350-1557

ARI Client: Hart Crowser, Inc.
Project ID: PORT GAMBLE
ARI PM: Kelly Bottem
Phone: 206-695-6211
Fax: 206-695-6201

Analytical Protocol: In-house
Special Instructions:

Requested Turn Around: **01/20/09**
Fax Results (Y/N):

Limits of Liability. *Subcontractor is expected to perform all requested services in accordance with appropriate methodology following Standard Operating Procedures that meet standards for the industry. The total liability of ARI, its officers, agents, employees, or sucessors, arising out of or in connection with the requested services, shall not exceed the negotiated amount for said services. The agreement by the Subcontractor to perform services requested by ARI releases 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 Subcontractor.*

ARI ID	Client ID/ Add'l ID	Sampled	Matrix	Bottles	Analyses
09-348-OG44A	OYSTER #1A	12/15/08	Tissue	1	Dioxin/Furans 1613(Sub)
Special Instructions: None					
09-350-OG44C	OYSTER #2A	12/15/08	Tissue	1	Dioxin/Furans 1613(Sub)
Special Instructions: None					

Carrier UPS	Airbill 1Z 832 695 01 4592 5947		Date 1/14/09
Relinquished by	Company ARI	Date 1/14/09	Time 1600
Received by	Company SGS 3.5 no seal	Date 1/15/09	Time 10:15

Subcontractor Custody Form - **OG44**
Page 1 of 1

SGS Environmental Services, Inc.

Cust Proj ID: OG44
Client Name: Analytical Resources, Inc. PO:

G1040-4

Due Date: 2009-02-05 17:00:00
Login Date: 2009-01-16 11:23:27

Sample ID		Cust Sample ID	PRI	Date Collected	Date Received	Date Due	Matrix	LOC	Report	Analysis	Status
G1040-4-1	A	OYSTER #1A	STD	2008-12-15 00:00:00	2009-01-15	2009-02-05	Tissue	F2	Full	1613	LG::REVW
G1040-4-2	A	OYSTER #2A	STD	2008-12-15 00:00:00	2009-01-15	2009-02-05	Tissue	F2	Full	1613	LG::REVW

Sample Receipt Checklist (SRC)

SGS Environmetal Services Inc.

Client: **Analytical Resources, Inc.** Lab Proj. ID: **G1040-4**

Client Proj. ID: **OG44**

1. X Shipped
   __ Hand Delivered
   Notes:

2. X Proper, full, and complete documentation
   (unique sample identification on durable label with indelible ink, location of collection, date/time of collection, collector's name, preservation type, sample type (method/matrix))
   __ Acceptable documentation (but, incomplete)
   __ Unacceptable documentation
   Notes:

3. __ Custody Tape on Container
   X No Custody Tape
   Notes:

4. X Samples Intact*
   (are in appropriate container, are not damaged, and do not show signs of contamination)
   __ Samples Broken / Leaking
   __ VOA Vials Checked for Air Bubbles
   Notes:

5. x Chilled on Receipt* Actual Temp.(s) in °C: 3.5
   __ Ambient on Receipt
   __ Walk-in on Ice; Coming down to temp.
   __ Received out of temperature protocol
   Notes:

6. X Sufficient Sample Submitted
   __ Insufficient Sample Submitted
   Notes:

7. X Samples Preserved Correctly*
   (see preservative checklist where applicable)
   __ Improper Preservative(s)
   __ None recommended (N/A)
   Notes:

8. X Received Within Holding Time
   __ Not Received Within Holding Time
   __ N/A
   Notes:

9. X No Discrepancies Noted
   __ Discrepancies Noted
   Notes:

Comments: No collection Times.

* = Rejection of sample is required when not marked; Contact client services immediately for a resolution.

DC27.091503.3

Inspected and Logged in by:

Date / Time: Fri-1/16/09 11:23

Method 1613

OYSTER #1A

Analytical Resources, Inc.

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	RL (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	1.00			
1,2,3,7,8-PeCDD	ND	5.00			
1,2,3,4,7,8-HxCDD	ND	5.00			
1,2,3,6,7,8-HxCDD	ND	5.00			
1,2,3,7,8,9-HxCDD	ND	5.00			
1,2,3,4,6,7,8-HpCDD	ND	5.00			
OCDD	ND	10.0			
2,3,7,8-TCDF	ND	1.00			
1,2,3,7,8-PeCDF	ND	5.00			
2,3,4,7,8-PeCDF	ND	5.00			
1,2,3,4,7,8-HxCDF	ND	5.00			
1,2,3,6,7,8-HxCDF	ND	5.00			
2,3,4,6,7,8-HxCDF	ND	5.00			
1,2,3,7,8,9-HxCDF	ND	5.00			
1,2,3,4,6,7,8-HpCDF	ND	5.00			
1,2,3,4,7,8,9-HpCDF	ND	5.00			
OCDF	ND	10.0			
Total TCDDs	ND	1.00			
Total PeCDDs	ND	5.00			
Total HxCDDs	ND	5.00			
Total HpCDDs	ND	5.00			
Total TCDFs	ND	1.00			
Total PeCDFs	ND	5.00			
Total HxCDFs	ND	5.00			
Total HpCDFs	ND	5.00			
WHO-2005 TEQ (ND=0)	0.000				
WHO-2005 TEQ (ND=½)	5.70				

Client Information

Project Name:	Port Gamble
Sample ID:	OYSTER #1A

Laboratory Information

Project ID:	G1040-4	
Sample ID:	G1040-4-1B	
Collection Date:	15-Dec-08	
Receipt Date:	15-Jan-09	10:15
Extraction Date:	01-Feb-09	
Analysis Date:	04-Feb-09	14:23

Sample Information

Matrix:	Tissue	
Weight / Volume:	10.19	grams
Solids / Lipids:	NA	%
Original pH :	NA	
Batch ID:	WG16457	
Filename:	a27jan09a_17-14	
Retchk:	a27jan09a_17-1	
Begin ConCal:	a27jan09a_17-1	
Initial Cal:	m1613-100708a	

Method 1613

OYSTER #1A

Analytical Resources, Inc.

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
$^{13}C_{12}$-2,3,7,8-TCDD	2	1.42	70.9	31:27	0.78	
$^{13}C_{12}$-1,2,3,7,8-PeCDD	2	1.40	69.9	34:16	1.59	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	2	1.44	72.0	36:53	1.26	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	2	1.44	71.9	36:58	1.25	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	2	1.32	66.2	40:20	1.05	
$^{13}C_{12}$-OCDD	4	1.63	40.7	44:40	0.90	
$^{13}C_{12}$-2,3,7,8-TCDF	2	1.46	72.9	30:52	0.79	
$^{13}C_{12}$-1,2,3,7,8-PeCDF	2	1.57	78.3	33:28	1.58	
$^{13}C_{12}$-2,3,4,7,8-PeCDF	2	1.39	69.7	34:05	1.58	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	2	1.43	71.5	36:09	0.52	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	2	1.48	74.1	36:16	0.53	
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	2	1.46	73.2	36:45	0.52	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	2	1.42	70.8	37:33	0.53	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	2	1.31	65.3	39:03	0.46	
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	2	1.37	68.4	41:02	0.45	
Cleanup Standard						
$^{37}Cl_4$-2,3,7,8-TCDD	0.4	0.287	71.8	31:28		
Injection Standards						
$^{13}C_{12}$-1,2,3,4-TCDD	2			31:00	0.79	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	2			37:13	1.26	

Client Information			**Sample Information**	
Project Name:	Port Gamble			
			Matrix:	Tissue
Sample ID:	OYSTER #1A		Weight / Volume:	10.19 grams
			Solids / Lipids:	NA %
			Original pH :	NA
Laboratory Information			Batch ID:	WG16457
Project ID:	G1040-4			
Sample ID:	G1040-4-1B		Filename:	a27jan09a_17-14
Collection Date:	15-Dec-08		Retchk:	a27jan09a_17-1
Receipt Date:	15-Jan-09	10:15	Begin ConCal:	a27jan09a_17-1
Extraction Date:	01-Feb-09			
Analysis Date:	04-Feb-09	14:23	Initial Cal:	m1613-100708a

Analyzed by: JWD

Date: 020509

Reviewed by: NL

Date: 2/5/09

Form Version:[1613_HRMS12]Report

Filename ; a27jan09a_17
Sample ; 14
Acquired ; 4-FEB-09 14:23:37
Processed ; 4-FEB-09 17:08:51
Sample ID ; G1040-4-1B
Cal Table ; m1613-100708a
Results Table ; M1613-012709A_17
Comments ;

;*1613*

Ent;	Name;	Resp;	Ion 1;	Ion 2;	RA;?;	RT;	Conc;	EDL;	S/N1;?;	S/N2;?;M;	Signal1;	Noise 1;	Signal2;	Noise 2
1 ;	2,3,7,8-TCDD;	*;	*;	*;	*;n;	NotFnd;	*;	0.1707;	*;n;	*;n;n;	*;5.34e+03;		*;5.37e+03	
2 ;	1,2,3,7,8-PeCDD;	*;	*;	*;	*;n;	NotFnd;	*;	0.2624;	*;n;	*;n;n;	*;7.62e+03;		*;7.50e+03	
3 ;	1,2,3,4,7,8-HxCDD;	*;	*;	*;	*;n;	NotFnd;	*;	0.3513;	*;n;	*;n;n;	*;7.16e+03;		*;7.24e+03	
4 ;	1,2,3,6,7,8-HxCDD;	*;	*;	*;	*;n;	NotFnd;	*;	0.3481;	*;n;	*;n;n;	*;7.16e+03;		*;7.24e+03	
5 ;	1,2,3,7,8,9-HxCDD;	*;	*;	*;	*;n;	NotFnd;	*;	0.3521;	*;n;	*;n;n;	*;7.16e+03;		*;7.24e+03	
6 ;	1,2,3,4,6,7,8-HpCDD;	*;	*;	*;	*;n;	NotFnd;	*;	0.6111;	*;n;	*;n;n;	*;7.63e+03;		*;6.59e+03	
7 ;	OCDD;	4.53e+04;	1.02e+04;	3.52e+04;	0.29;n;	44:38;	0.294;	1.5946;	1;n;	2;n;n;	6.69e+03;	6.87e+03;	1.12e+04;	6.49e+03
8 ;	2,3,7,8-TCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.1989;	*;n;	*;n;n;	*;7.53e+03;		*;7.38e+03	
9 ;	1,2,3,7,8-PeCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.1573;	*;n;	*;n;n;	*;7.13e+03;		*;8.61e+03	
10 ;	2,3,4,7,8-PeCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.1716;	*;n;	*;n;n;	*;7.13e+03;		*;8.61e+03	
11 ;	1,2,3,4,7,8-HxCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.2135;	*;n;	*;n;n;	*;6.66e+03;		*;6.55e+03	
12 ;	1,2,3,6,7,8-HxCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.1922;	*;n;	*;n;n;	*;6.66e+03;		*;6.55e+03	
13 ;	2,3,4,6,7,8-HxCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.2081;	*;n;	*;n;n;	*;6.66e+03;		*;6.55e+03	
14 ;	1,2,3,7,8,9-HxCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.2871;	*;n;	*;n;n;	*;6.66e+03;		*;6.55e+03	
15 ;	1,2,3,4,6,7,8-HpCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.3378;	*;n;	*;n;n;	*;7.29e+03;		*;6.96e+03	
16 ;	1,2,3,4,7,8,9-HpCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.4844;	*;n;	*;n;n;	*;7.29e+03;		*;6.96e+03	
17 ;	OCDF;	*;	*;	*;	*;n;	NotFnd;	*;	1.2224;	*;n;	*;n;n;	*;5.26e+03;		*;6.91e+03	
Extraction Standards														
18 ;	13C-2,3,7,8-TCDD;	6.24e+07;	2.74e+07;	3.50e+07;	0.78;y;	31:27;	70.911;	0.2039;	1014;y;	1431;y;n;	8.24e+06;	8.12e+03;	1.04e+07;	7.27e+03
19 ;	13C-1,2,3,7,8-PeCDD;	4.50e+07;	2.76e+07;	1.74e+07;	1.59;y;	34:16;	69.829;	0.2128;	1778;y;	1045;y;n;	1.01e+07;	5.67e+03;	6.35e+06;	6.08e+03
20 ;	13C-1,2,3,4,7,8-HxCDD;	3.93e+07;	2.19e+07;	1.74e+07;	1.26;y;	36:53;	71.940;	0.2755;	849;y;	830;y;n;	6.70e+06;	7.89e+03;	5.24e+06;	6.30e+03
21 ;	13C-1,2,3,6,7,8-HxCDD;	4.27e+07;	2.37e+07;	1.90e+07;	1.25;y;	36:58;	71.922;	0.2536;	877;y;	887;y;n;	6.93e+06;	7.89e+03;	5.59e+06;	6.30e+03
22 ;	13C-1,2,3,4,6,7,8-HpCDD;	2.96e+07;	1.52e+07;	1.44e+07;	1.05;y;	40:20;	66.181;	0.3574;	440;y;	431;y;n;	3.40e+06;	7.72e+03;	3.18e+06;	7.37e+03
23 ;	13C-OCDD;	2.90e+07;	1.37e+07;	1.52e+07;	0.90;y;	44:40;	81.282;	0.4220;	331;y;	335;y;n;	2.23e+06;	6.74e+03;	2.49e+06;	7.44e+03
24 ;	13C-2,3,7,8-TCDF;	9.50e+07;	4.19e+07;	5.31e+07;	0.79;y;	30:52;	72.837;	0.1254;	1456;y;	1626;y;n;	9.57e+06;	6.57e+03;	1.21e+07;	7.46e+03
25 ;	13C-1,2,3,7,8-PeCDF;	8.26e+07;	5.06e+07;	3.20e+07;	1.58;y;	33:28;	78.320;	0.1728;	2553;y;	1413;y;n;	1.88e+07;	7.35e+03;	1.17e+07;	8.28e+03
26 ;	13C-2,3,4,7,8-PeCDF;	7.20e+07;	4.41e+07;	2.79e+07;	1.58;y;	34:05;	69.694;	0.1765;	2210;y;	1242;y;n;	1.62e+07;	7.35e+03;	1.03e+07;	8.28e+03
27 ;	13C-1,2,3,4,7,8-HxCDF;	5.04e+07;	1.73e+07;	3.31e+07;	0.52;y;	36:09;	71.481;	0.2188;	828;y;	1337;y;n;	5.52e+06;	6.66e+03;	1.06e+07;	7.90e+03
28 ;	13C-1,2,3,6,7,8-HxCDF;	5.77e+07;	2.00e+07;	3.77e+07;	0.53;y;	36:16;	74.114;	0.1983;	949;y;	1508;y;n;	6.32e+06;	6.66e+03;	1.19e+07;	7.90e+03
29 ;	13C-2,3,4,6,7,8-HxCDF;	5.36e+07;	1.83e+07;	3.52e+07;	0.52;y;	36:45;	73.169;	0.2108;	868;y;	1395;y;n;	5.78e+06;	6.66e+03;	1.10e+07;	7.90e+03
30 ;	13C-1,2,3,7,8,9-HxCDF;	4.62e+07;	1.60e+07;	3.01e+07;	0.53;y;	37:33;	70.775;	0.2367;	655;y;	1035;y;n;	4.36e+06;	6.66e+03;	8.18e+06;	7.90e+03
31 ;	13C-1,2,3,4,6,7,8-HpCDF;	3.65e+07;	1.15e+07;	2.50e+07;	0.46;y;	39:03;	65.241;	0.3863;	268;y;	660;y;n;	2.92e+06;	1.09e+04;	6.25e+06;	9.47e+03
32 ;	13C-1,2,3,4,7,8,9-HpCDF;	3.01e+07;	9.33e+06;	2.08e+07;	0.45;y;	41:02;	68.375;	0.4904;	186;y;	467;y;n;	2.03e+06;	1.09e+04;	4.43e+06;	9.47e+03
Injection Standards														
33 ;	13C-1,2,3,4-TCDD;	7.89e+07;	3.49e+07;	4.40e+07;	0.79;y;	31:00;	58.101;	-;	1109;y;	1553;y;n;	9.01e+06;	8.12e+03;	1.13e+07;	7.27e+03
34 ;	13C-1,2,3,7,8,9-HxCDD;	5.68e+07;	3.17e+07;	2.52e+07;	1.26;y;	37:13;	52.650;	-;	1131;y;	1134;y;n;	8.93e+06;	7.89e+03;	7.15e+06;	6.30e+03
Cleanup Standard														
35 ;	37Cl-2,3,7,8-TCDD;	1.35e+07;	1.35e+07;	-;	-;-;	31:28;	14.363;	0.0775;	660;y;	-;-;n;	4.12e+06;	6.24e+03;	-;	-

Totals Raw Data

	Conc	Empc	Flags
TCDF	0	0	FALSE
TCDD	0	0	FALSE
PeCDF	0	0	FALSE
PeCDD	0	0	FALSE
HxCDF	0	0	FALSE
HxCDD	0	0	FALSE
HpCDF	0	0	FALSE
HpCDD	0	0	FALSE

Filename:	a27jan09a_17	Name of Homolog Group:	Total Tetra-Furans		
Sample:	14	Number of Peaks Found:	2	0	
Acquired:	4-FEB-09 14:23:37	RRF Used For Totals:	1.0368		
Processed:	4-FEB-09 17:08:51	Detection Limit:	0.1989		RL=0.500 (pg/µL)
Sample ID:	G1040-4-1B	Noise Height Ion1/Ion2:	7528 / 7384		
Cal Table:	m1613-100708a	Begin Window:		26:14:00	
Results Table:	M1613-012709A_17	End Window:		33:07:00	

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	1.11E+05	69600	41300	1.68	n	29:32	0.113	S2N	2	n	1.8	n	n
	2	1.23E+05	57500	65500	0.88	y	31:08	0.125	S2N	2	n	2.5	n	n

Filename:	a27jan09a_17	Name of Homolog Group:	Total Tetra-Dioxins		
Sample:	14	Number of Peaks Found:	2	0	
Acquired:	4-FEB-09 14:23:37	RRF Used For Totals:	1.0087		
Processed:	4-FEB-09 17:08:51	Detection Limit:	0.1707		RL=0.500 (pg/µL)
Sample ID:	G1040-4-1B	Noise Height Ion1/Ion2:	5338 / 5372		
Cal Table:	m1613-100708a	Begin Window:		27:40:00	
Results Table:	M1613-012709A_17	End Window:		32:37:00	

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	2.04E+05	59400	144000	0.41	n	28:19	0.323	RL	3.2	y	6.2	y	n
	2	1.39E+05	79500	59300	1.34	n	31:18	0.22	RL	3.9	y	3.2	y	n

Filename:	a27jan09a_17	Name of Homolog Group:	Total Penta-Furans Fn1		
Sample:	14	Number of Peaks Found:	1	0	
Acquired:	4-FEB-09 14:23:37	RRF Used For Totals:	1.0121		
Processed:	4-FEB-09 17:08:51	Detection Limit:	0.1299		
Sample ID:	G1040-4-1B	Noise Height Ion1/Ion2:	7176 / 5300		
Cal Table:	m1613-100708a	Begin Window:		31:46:00	
Results Table:	M1613-012709A_17	End Window:		32:06:00	

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	1.06E+05	49800	56200	0.89	n	32:04	0.136	RL	2.5	n	4.8	y	n

Page 4 of 9

Filename:	a27jan09a_17		Name of Homolog Group:	Total Penta-Furans Fn2												
Sample:	14		Number of Peaks Found:	1	0											
Acquired:	4-FEB-09 14:23:37		RRF Used For Totals:	1.0121												
Processed:	4-FEB-09 17:08:51		Detection Limit:	0.1639						RL=2.500 (pg/µL)						
Sample ID:	G1040-4-1B		Noise Height Ion1/Ion2:	7128 / 8612												
Cal Table:	m1613-100708a		Begin Window:						31:43:00							
Results Table:	M1613-012709A_17		End Window:						34:52:00							
Name	#		Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?	
	1		7.23E+05	327000	396000	0.83	n	32:57	0.925	RL	13.4	y	13.4	y	n	

Page 5 of 9

Filename:	a27jan09a_17		Name of Homolog Group:	Total Penta-Dioxins												
Sample:	14		Number of Peaks Found:	0												
Acquired:	4-FEB-09 14:23:37		RRF Used For Totals:	1.0517												
Processed:	4-FEB-09 17:08:51		Detection Limit:	0.2624												
Sample ID:	G1040-4-1B		Noise Height Ion1/Ion2:	7620 / 7496												
Cal Table:	m1613-100708a		Begin Window:													
Results Table:	M1613-012709A_17		End Window:													
Name	#		Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?	
	1		*	*	*	*	n	NotFnd	*		*	n	*	n	n	

Page 6 of 9

Filename:	a27jan09a_17		Name of Homolog Group:	Total Hexa-Furans												
Sample:	14		Number of Peaks Found:	0												
Acquired:	4-FEB-09 14:23:37		RRF Used For Totals:	1.1305												
Processed:	4-FEB-09 17:08:51		Detection Limit:	0.2221												
Sample ID:	G1040-4-1B		Noise Height Ion1/Ion2:	6660 / 6552												
Cal Table:	m1613-100708a		Begin Window:													
Results Table:	M1613-012709A_17		End Window:													
Name	#		Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?	
	1		*	*	*	*	n	NotFnd	*		*	n	*	n	n	

Page 7 of 9

Filename:	a27jan09a_17		Name of Homolog Group:	Total Hexa-Dioxins												
Sample:	14		Number of Peaks Found:	0												
Acquired:	4-FEB-09 14:23:37		RRF Used For Totals:	1.0077												
Processed:	4-FEB-09 17:08:51		Detection Limit:	0.3507												
Sample ID:	G1040-4-1B		Noise Height Ion1/Ion2:	7160 / 7244												
Cal Table:	m1613-100708a		Begin Window:													

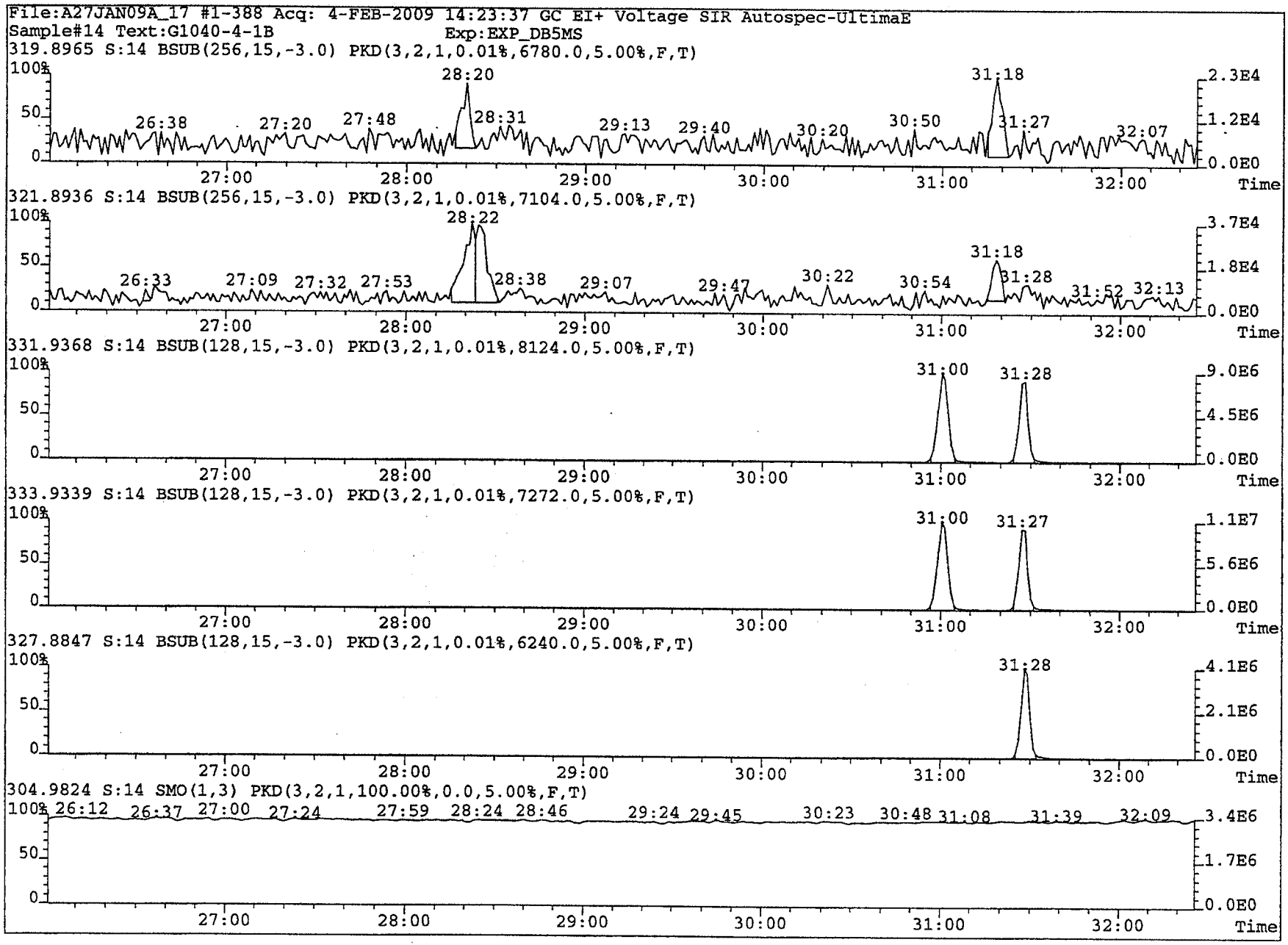
Results Table:	M1613-012709A_17	End Window:												
Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	*	*	*	*	n	NotFnd	*		*	n	*	n	n

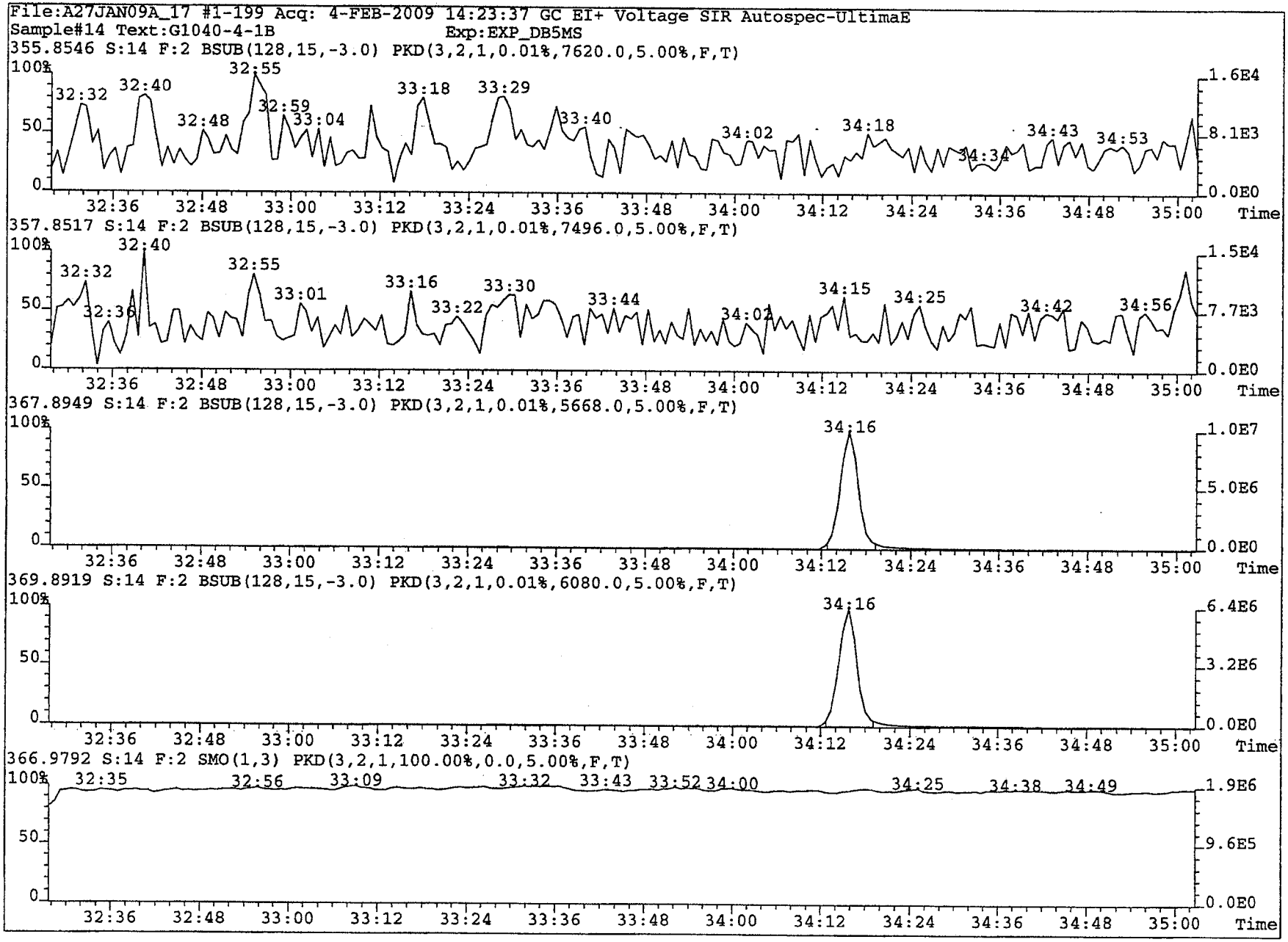
Filename:	a27jan09a_17	Name of Homolog Group:	Total Hepta-Furans
Sample:	14	Number of Peaks Found:	0
Acquired:	4-FEB-09 14:23:37	RRF Used For Totals:	1.3693
Processed:	4-FEB-09 17:08:51	Detection Limit:	0.4037
Sample ID:	G1040-4-1B	Noise Height Ion1/Ion2:	7288 / 6960
Cal Table:	m1613-100708a	Begin Window:	
Results Table:	M1613-012709A_17	End Window:	

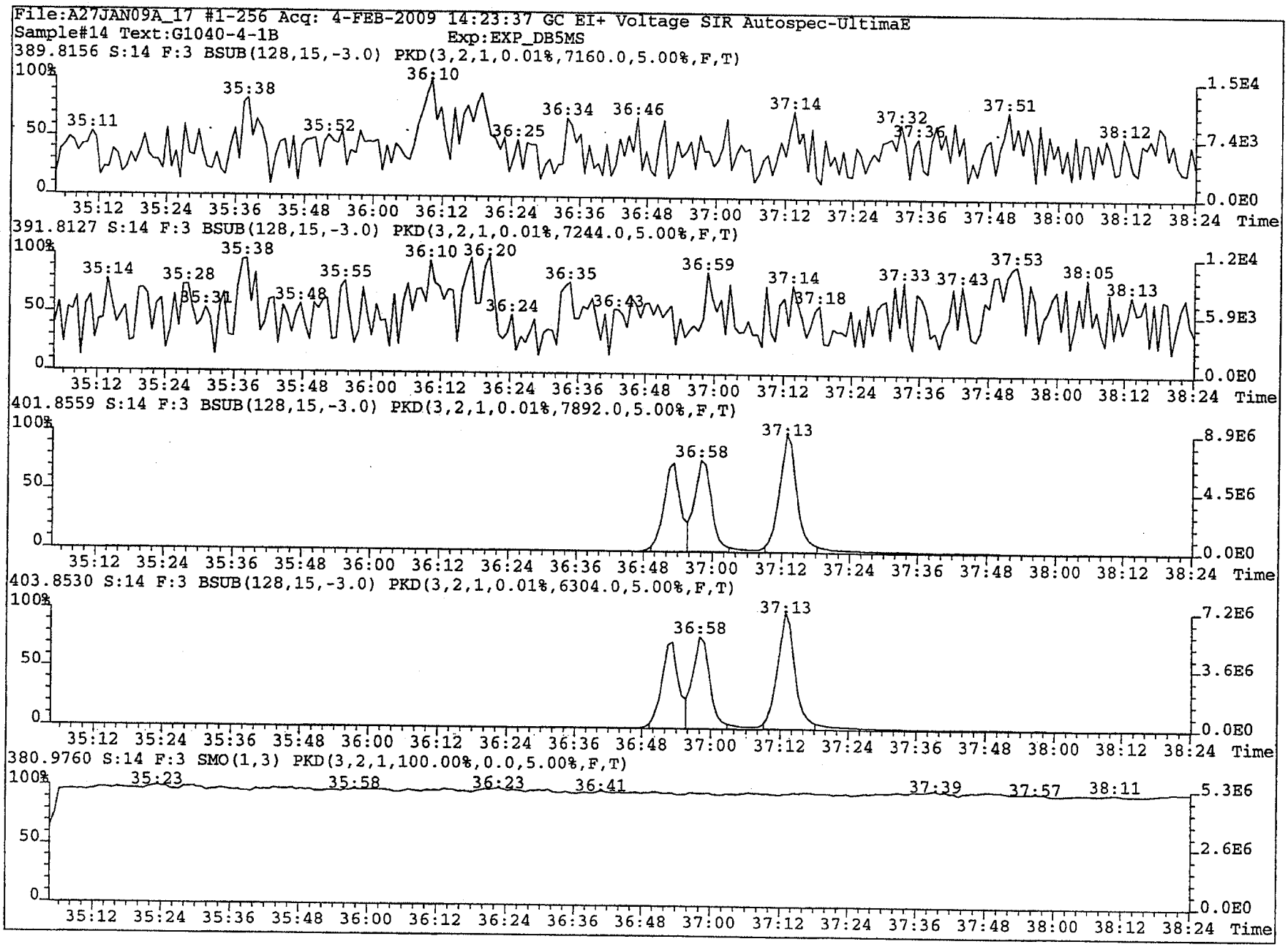
Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	*	*	*	*	n	NotFnd	*		*	n	*	n	n

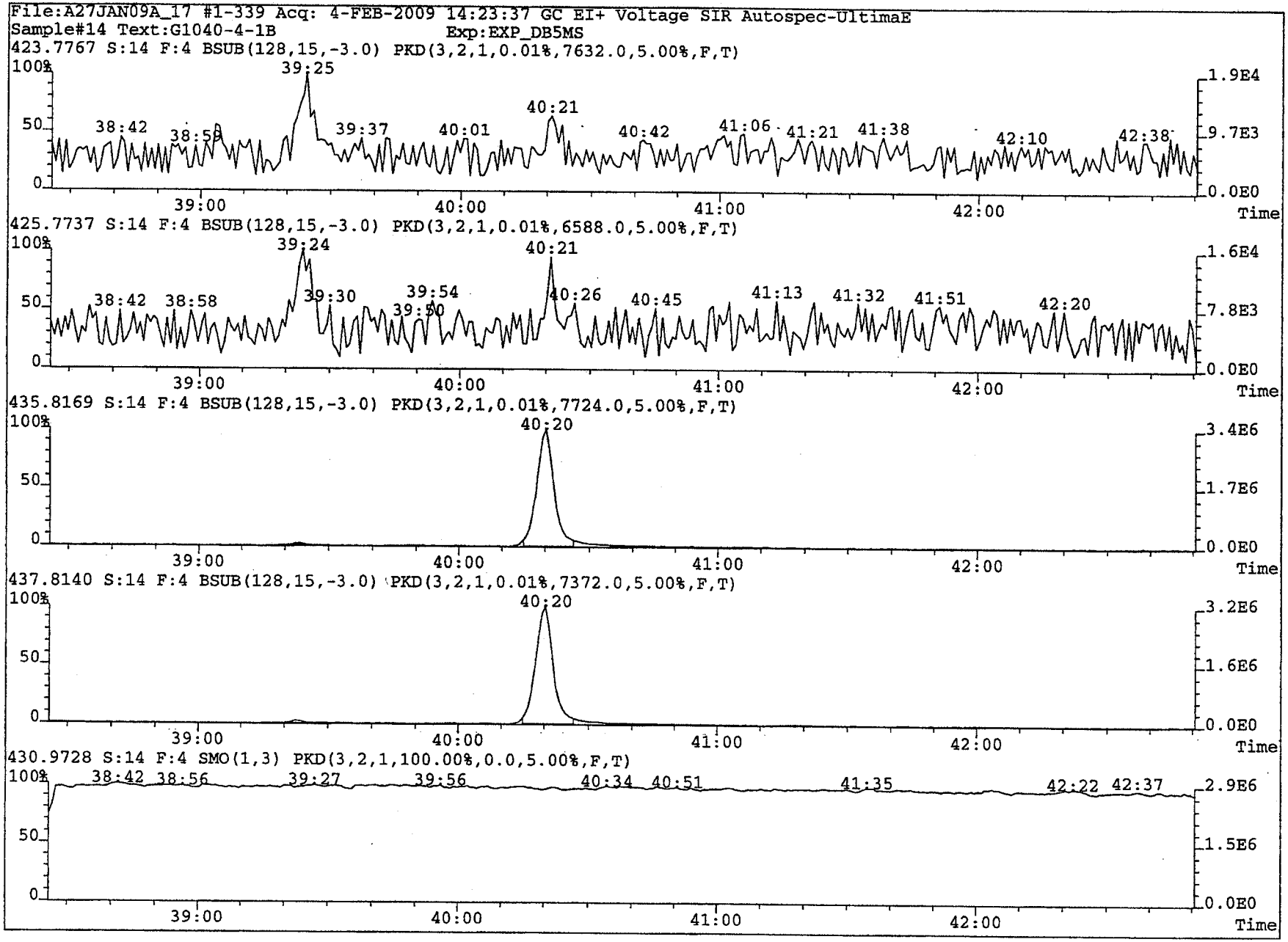
Filename:	a27jan09a_17	Name of Homolog Group:	Total Hepta-Dioxins
Sample:	14	Number of Peaks Found:	0
Acquired:	4-FEB-09 14:23:37	RRF Used For Totals:	1.0612
Processed:	4-FEB-09 17:08:51	Detection Limit:	0.6111
Sample ID:	G1040-4-1B	Noise Height Ion1/Ion2:	7632 / 6588
Cal Table:	m1613-100708a	Begin Window:	
Results Table:	M1613-012709A_17	End Window:	

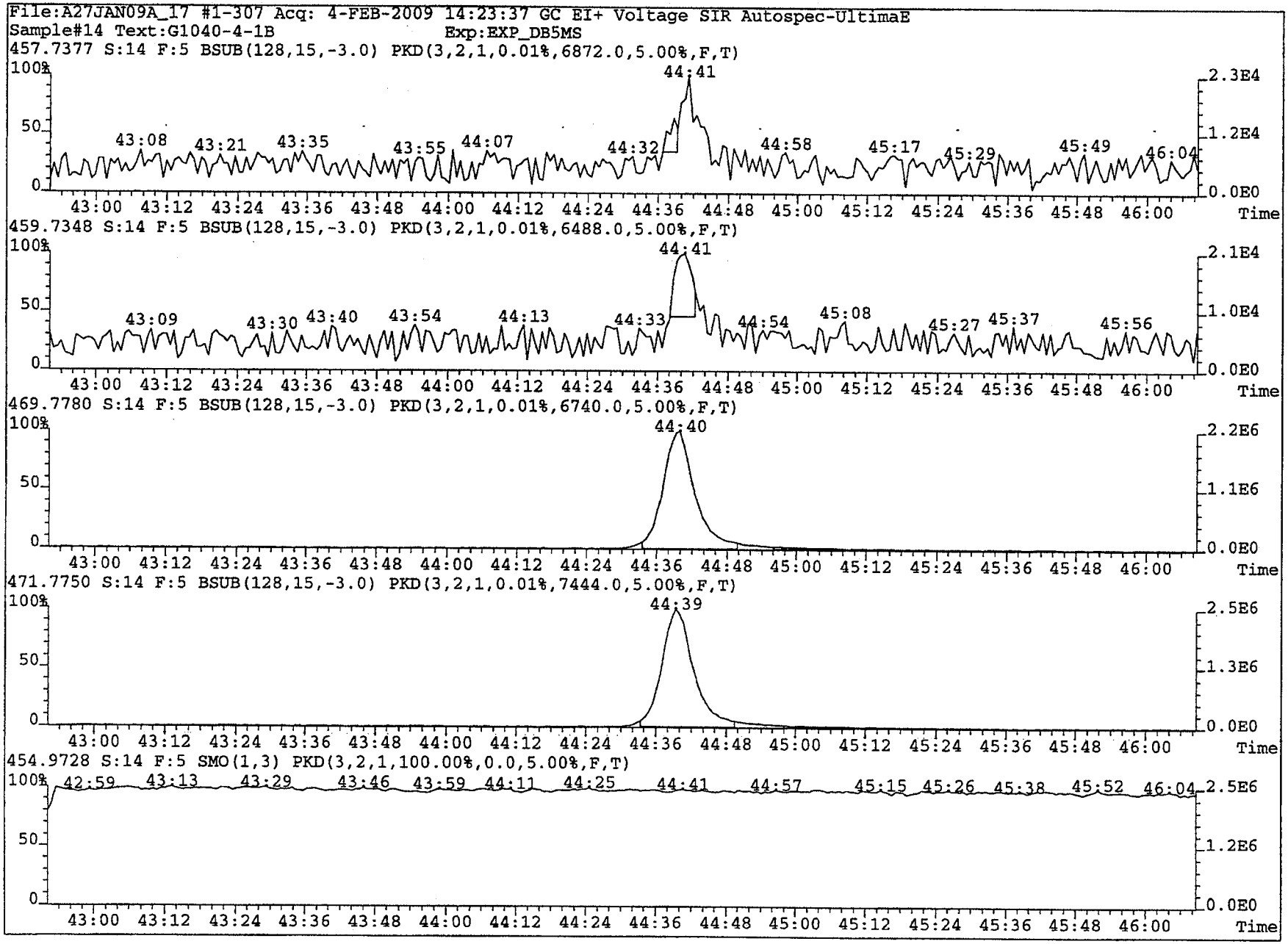
Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?

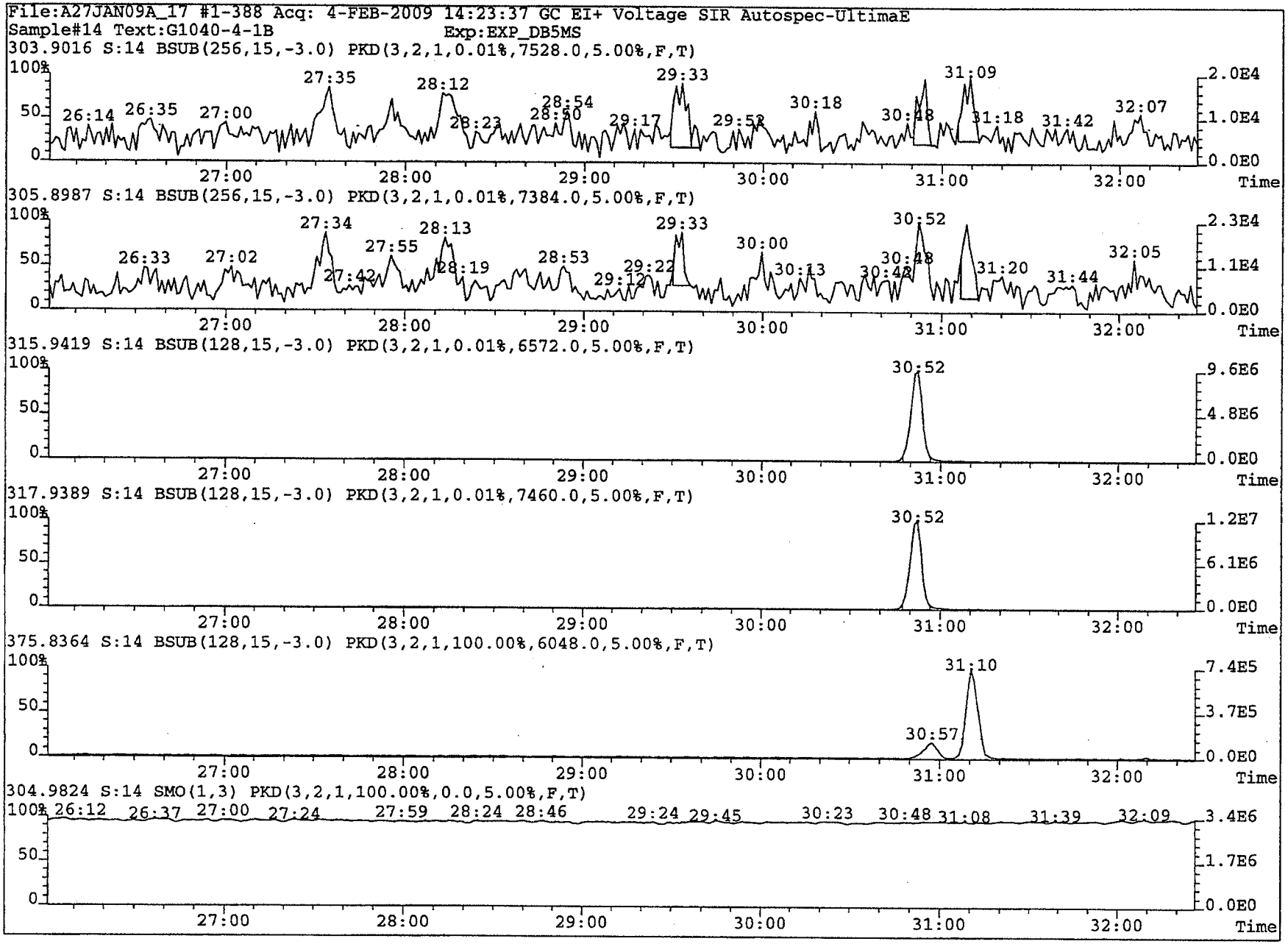

File:A27JAN09A_17 #1-388 Acq: 4-FEB-2009 14:23:37 GC EI+ Voltage SIR Autospec-UltimaE
Sample#14 Text:G1040-4-1B Exp:EXP_DB5MS
319.8965 S:14 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,6780.0,5.00%,F,T)
28:20
31:18
26:38
27:20
27:48
28:31
29:13
29:40
30:20
30:50
31:27
32:07
2.3E4
1.2E4
0.0E0
321.8936 S:14 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,7104.0,5.00%,F,T)
28:22
31:18
26:33
27:09
27:32
27:53
28:38
29:07
29:47
30:22
30:54
31:28
31:52
32:13
3.7E4
1.8E4
0.0E0
331.9368 S:14 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,8124.0,5.00%,F,T)
31:00
31:28
9.0E6
4.5E6
0.0E0
333.9339 S:14 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7272.0,5.00%,F,T)
31:00
31:27
1.1E7
5.6E6
0.0E0
327.8847 S:14 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6240.0,5.00%,F,T)
31:28
4.1E6
2.1E6
0.0E0
304.9824 S:14 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
26:12
26:37
27:00
27:24
27:59
28:24
28:46
29:24
29:45
30:23
30:48
31:08
31:39
32:09
3.4E6
1.7E6
0.0E0
100%
50
0
27:00
28:00
29:00
30:00
31:00
32:00
Time

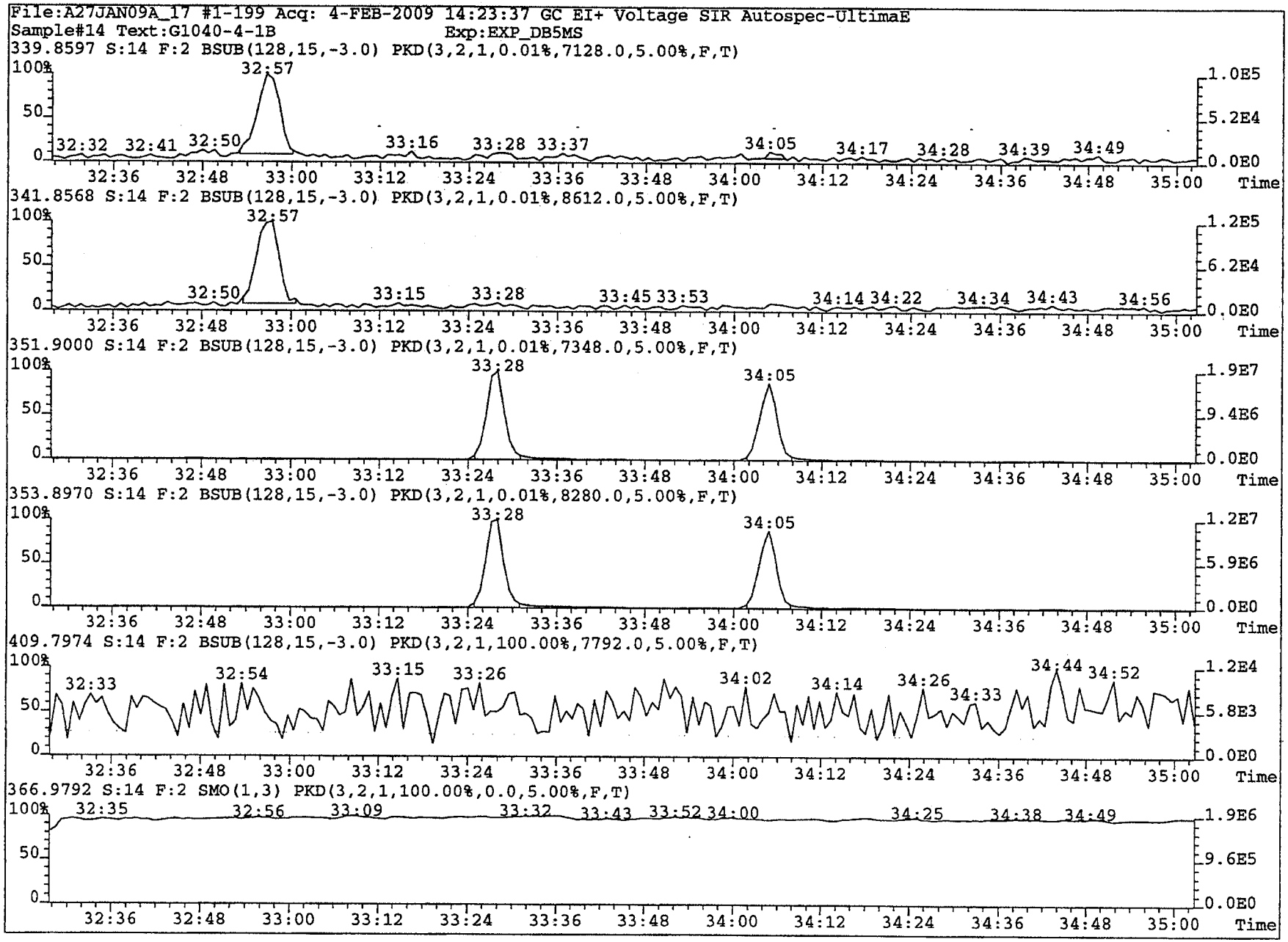

File:A27JAN09A_17 #1-199 Acq: 4-FEB-2009 14:23:37 GC EI+ Voltage SIR Autospec-UltimaE
Sample#14 Text:G1040-4-1B Exp:EXP_DB5MS
355.8546 S:14 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7620.0,5.00%,F,T)
357.8517 S:14 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7496.0,5.00%,F,T)
367.8949 S:14 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5668.0,5.00%,F,T)
369.8919 S:14 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6080.0,5.00%,F,T)
366.9792 S:14 F:2 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time

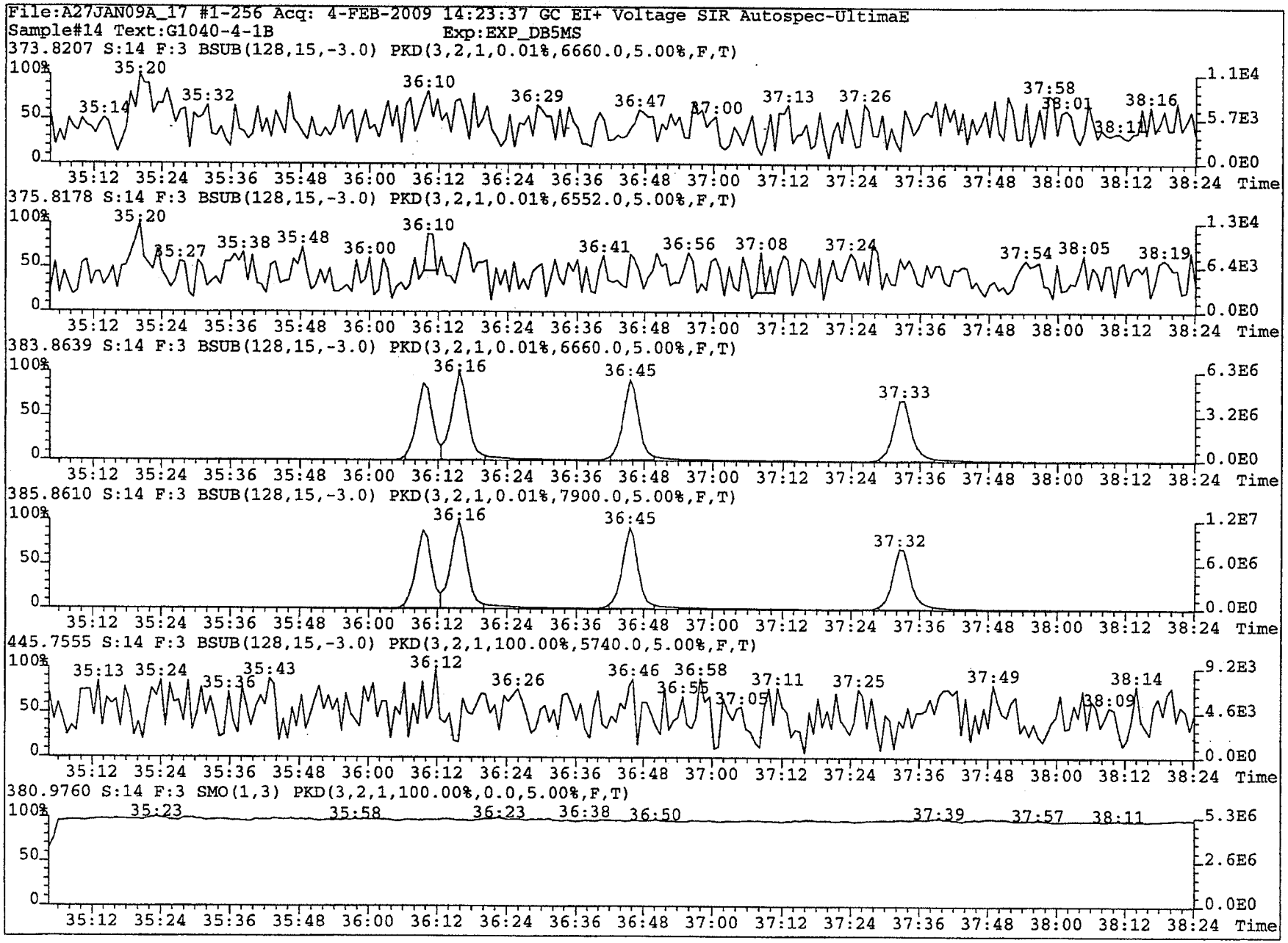

File:A27JAN09A_17 #1-256 Acq: 4-FEB-2009 14:23:37 GC EI+ Voltage SIR Autospec-UltimaE
Sample#14 Text:G1040-4-1B Exp:EXP_DB5MS
389.8156 S:14 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7160.0,5.00%,F,T)
391.8127 S:14 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7244.0,5.00%,F,T)
401.8559 S:14 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7892.0,5.00%,F,T)
403.8530 S:14 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6304.0,5.00%,F,T)
380.9760 S:14 F:3 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time

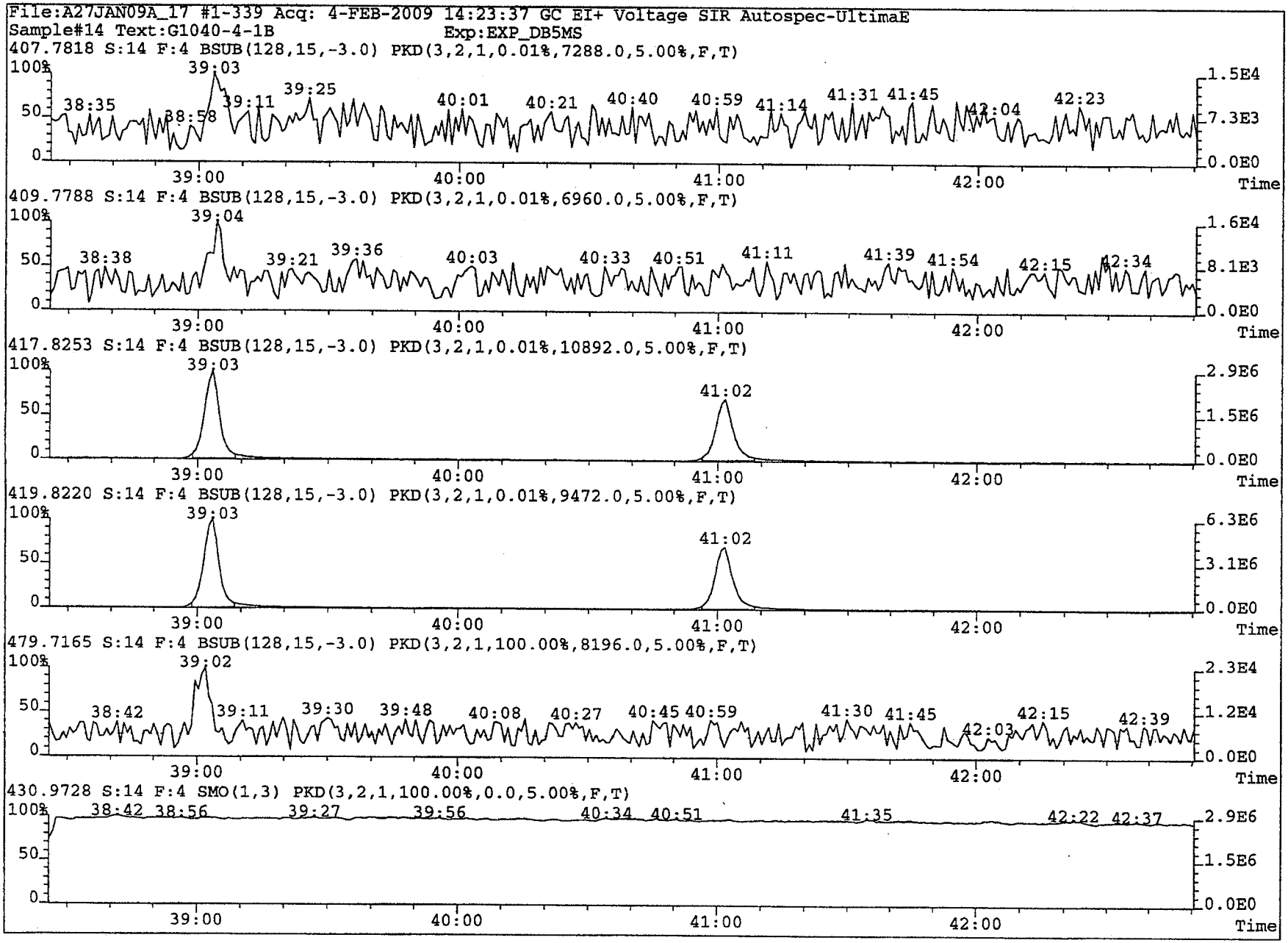

File:A27JAN09A_17 #1-339 Acq: 4-FEB-2009 14:23:37 GC EI+ Voltage SIR Autospec-UltimaE
Sample#14 Text:G1040-4-1B Exp:EXP_DB5MS
423.7767 S:14 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7632.0,5.00%,F,T)
425.7737 S:14 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6588.0,5.00%,F,T)
435.8169 S:14 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7724.0,5.00%,F,T)
437.8140 S:14 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7372.0,5.00%,F,T)
430.9728 S:14 F:4 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time

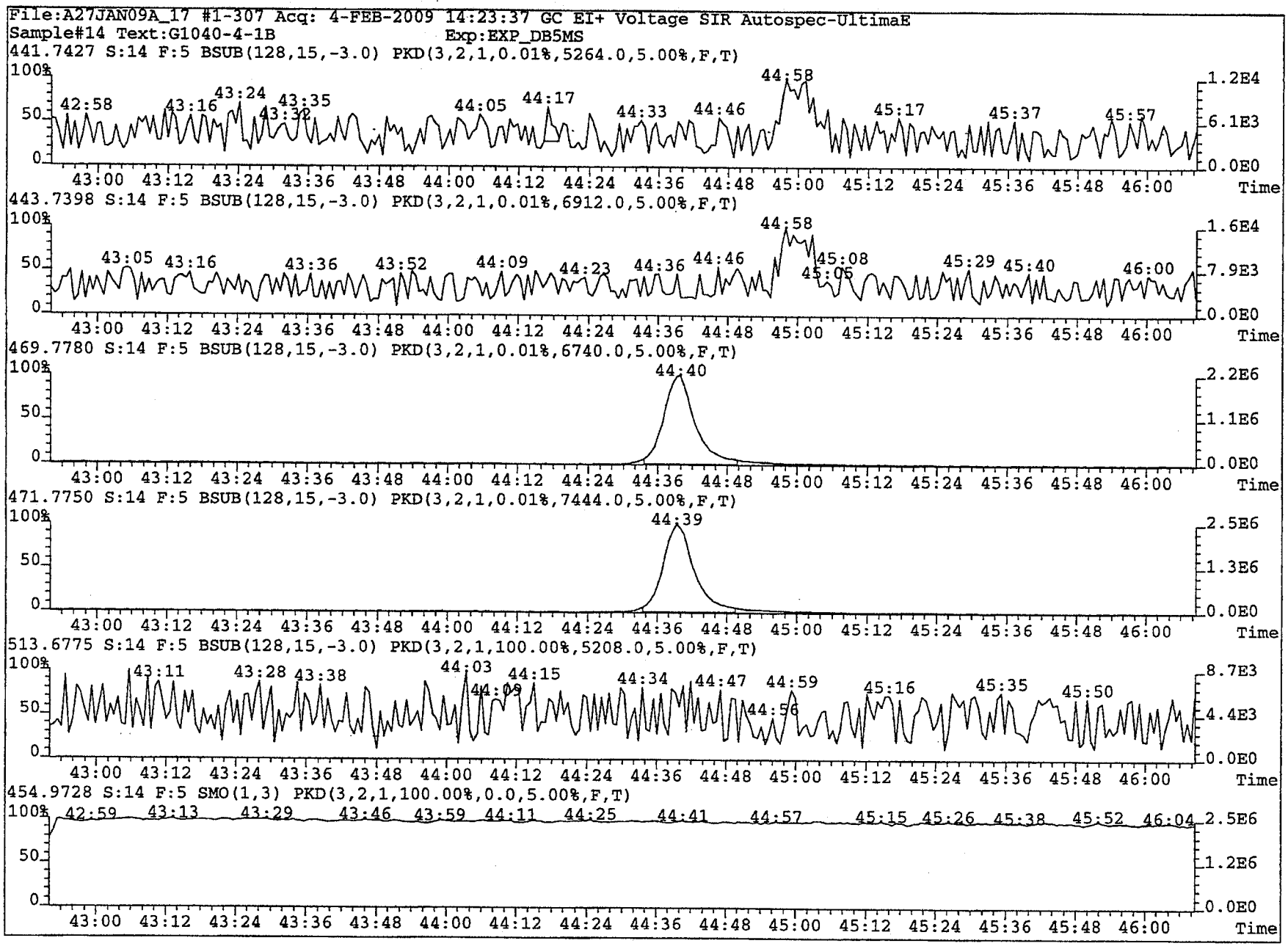

File:A27JAN09A_17 #1-307 Acq: 4-FEB-2009 14:23:37 GC EI+ Voltage SIR Autospec-UltimaE
Sample#14 Text:G1040-4-1B Exp:EXP_DB5MS
457.7377 S:14 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6872.0,5.00%,F,T)
459.7348 S:14 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6488.0,5.00%,F,T)
469.7780 S:14 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6740.0,5.00%,F,T)
471.7750 S:14 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7444.0,5.00%,F,T)
454.9728 S:14 F:5 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time

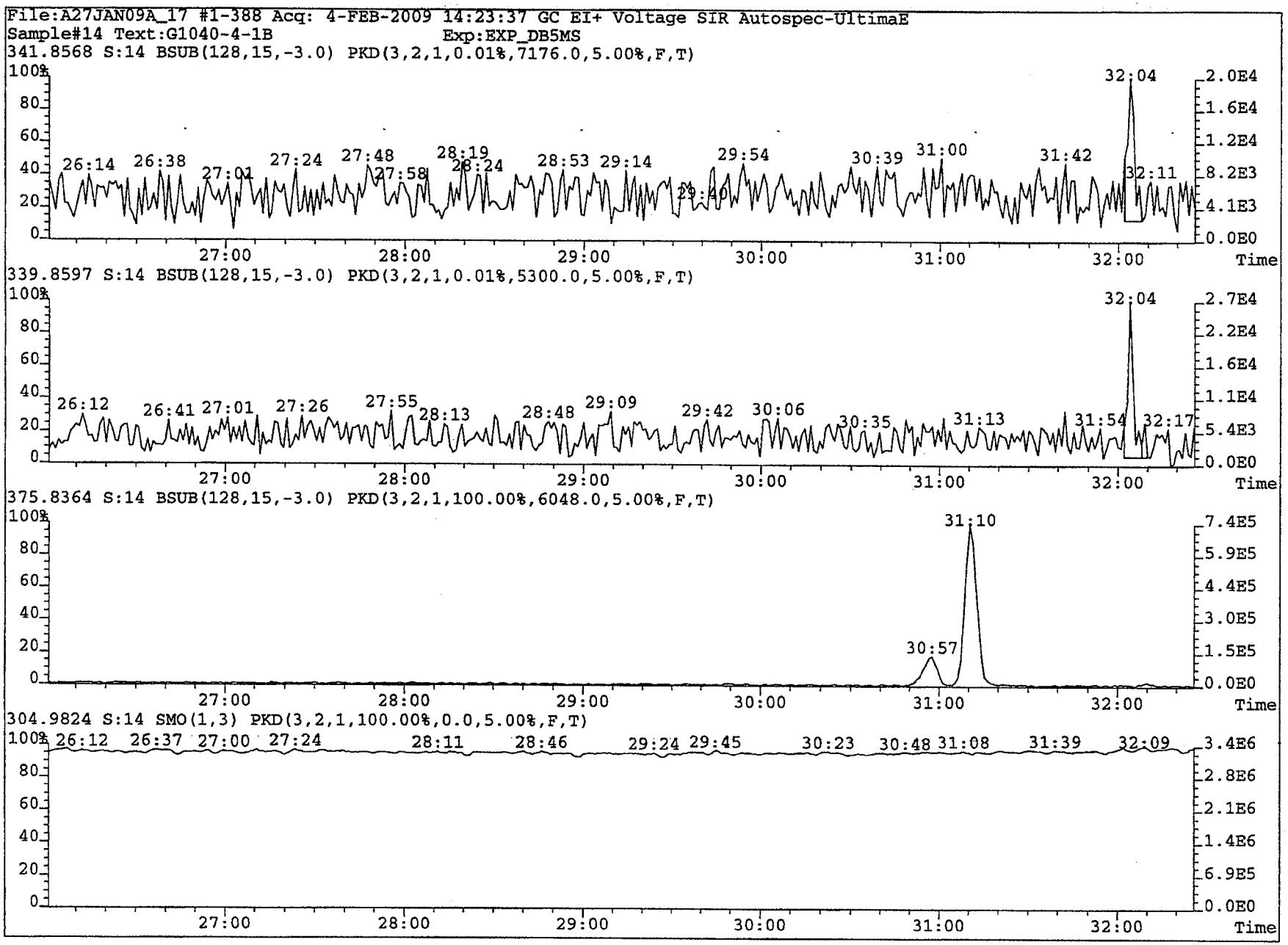

File:A27JAN09A_17 #1-388 Acq: 4-FEB-2009 14:23:37 GC EI+ Voltage SIR Autospec-UltimaE
Sample#14 Text:G1040-4-1B Exp:EXP_DB5MS
303.9016 S:14 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,7528.0,5.00%,F,T)
305.8987 S:14 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,7384.0,5.00%,F,T)
315.9419 S:14 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6572.0,5.00%,F,T)
317.9389 S:14 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7460.0,5.00%,F,T)
375.8364 S:14 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,6048.0,5.00%,F,T)
304.9824 S:14 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time


File:A27JAN09A_17 #1-199 Acq: 4-FEB-2009 14:23:37 GC EI+ Voltage SIR Autospec-UltimaE
Sample#14 Text:G1040-4-1B Exp:EXP_DB5MS
339.8597 S:14 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7128.0,5.00%,F,T)
341.8568 S:14 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,8612.0,5.00%,F,T)
351.9000 S:14 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7348.0,5.00%,F,T)
353.8970 S:14 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,8280.0,5.00%,F,T)
409.7974 S:14 F:2 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,7792.0,5.00%,F,T)
366.9792 S:14 F:2 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time


File:A27JAN09A_17 #1-256 Acq: 4-FEB-2009 14:23:37 GC EI+ Voltage SIR Autospec-UltimaE
Sample#14 Text:G1040-4-1B Exp:EXP_DB5MS
373.8207 S:14 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6660.0,5.00%,F,T)
375.8178 S:14 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6552.0,5.00%,F,T)
383.8639 S:14 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6660.0,5.00%,F,T)
385.8610 S:14 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7900.0,5.00%,F,T)
445.7555 S:14 F:3 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,5740.0,5.00%,F,T)
380.9760 S:14 F:3 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time


File:A27JAN09A_17 #1-339 Acq: 4-FEB-2009 14:23:37 GC EI+ Voltage SIR Autospec-UltimaE
Sample#14 Text:G1040-4-1B Exp:EXP_DB5MS
407.7818 S:14 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7288.0,5.00%,F,T)
409.7788 S:14 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6960.0,5.00%,F,T)
417.8253 S:14 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,10892.0,5.00%,F,T)
419.8220 S:14 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,9472.0,5.00%,F,T)
479.7165 S:14 F:4 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,8196.0,5.00%,F,T)
430.9728 S:14 F:4 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time


File:A27JAN09A_17 #1-307 Acq: 4-FEB-2009 14:23:37 GC EI+ Voltage SIR Autospec-UltimaE
Sample#14 Text:G1040-4-1B Exp:EXP_DB5MS
441.7427 S:14 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5264.0,5.00%,F,T)
443.7398 S:14 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6912.0,5.00%,F,T)
469.7780 S:14 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6740.0,5.00%,F,T)
471.7750 S:14 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7444.0,5.00%,F,T)
513.6775 S:14 F:5 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,5208.0,5.00%,F,T)
454.9728 S:14 F:5 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time


File:A27JAN09A_17 #1-388 Acq: 4-FEB-2009 14:23:37 GC EI+ Voltage SIR Autospec-UltimaE
Sample#14 Text:G1040-4-1B Exp:EXP_DB5MS
341.8568 S:14 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7176.0,5.00%,F,T)
339.8597 S:14 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5300.0,5.00%,F,T)
375.8364 S:14 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,6048.0,5.00%,F,T)
304.9824 S:14 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time

Method 1613

OYSTER #2A

Analytical Resources, Inc.

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	RL (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	1.00			
1,2,3,7,8-PeCDD	ND	5.00			
1,2,3,4,7,8-HxCDD	ND	5.00			
1,2,3,6,7,8-HxCDD	ND	5.00			
1,2,3,7,8,9-HxCDD	ND	5.00			
1,2,3,4,6,7,8-HpCDD	ND	5.00			
OCDD	ND	10.0			
2,3,7,8-TCDF	ND	1.00			
1,2,3,7,8-PeCDF	ND	5.00			
2,3,4,7,8-PeCDF	ND	5.00			
1,2,3,4,7,8-HxCDF	ND	5.00			
1,2,3,6,7,8-HxCDF	ND	5.00			
2,3,4,6,7,8-HxCDF	ND	5.00			
1,2,3,7,8,9-HxCDF	ND	5.00			
1,2,3,4,6,7,8-HpCDF	ND	5.00			
1,2,3,4,7,8,9-HpCDF	ND	5.00			
OCDF	ND	10.0			
Total TCDDs	ND	1.00			
Total PeCDDs	ND	5.00			
Total HxCDDs	ND	5.00			
Total HpCDDs	ND	5.00			
Total TCDFs	ND	1.00			
Total PeCDFs	ND	5.00			
Total HxCDFs	ND	5.00			
Total HpCDFs	ND	5.00			
WHO-2005 TEQ (ND=0)	0.000				
WHO-2005 TEQ (ND=½)	5.70				

Client Information

Project Name:	Port Gamble
Sample ID:	OYSTER #2A

Laboratory Information

Project ID:	G1040-4	
Sample ID:	G1040-4-2B	
Collection Date:	15-Dec-08	
Receipt Date:	15-Jan-09	10:15
Extraction Date:	01-Feb-09	
Analysis Date:	05-Feb-09	0:56

Sample Information

Matrix:	Tissue	
Weight / Volume:	10.99	grams
Solids / Lipids:	NA	%
Original pH :	NA	
Batch ID:	WG16457	
Filename:	a27jan09a_18-12	
Retchk:	a27jan09a_17-15	
Begin ConCal:	a27jan09a_17-15	
Initial Cal:	m1613-100708a	

Method 1613

OYSTER #2A

Analytical Resources, Inc.

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
$^{13}C_{12}$-2,3,7,8-TCDD	2	1.50	75.0	31:27	0.78	
$^{13}C_{12}$-1,2,3,7,8-PeCDD	2	1.55	77.3	34:16	1.58	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	2	1.56	78.0	36:53	1.37	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	2	1.60	80.1	36:58	1.16	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	2	1.46	73.1	40:20	1.06	
$^{13}C_{12}$-OCDD	4	2.13	53.3	44:39	0.90	
$^{13}C_{12}$-2,3,7,8-TCDF	2	1.49	74.6	30:51	0.79	
$^{13}C_{12}$-1,2,3,7,8-PeCDF	2	1.74	87.0	33:27	1.58	
$^{13}C_{12}$-2,3,4,7,8-PeCDF	2	1.54	77.0	34:05	1.57	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	2	1.63	81.5	36:09	0.52	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	2	1.64	82.2	36:16	0.52	
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	2	1.58	79.0	36:45	0.53	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	2	1.51	75.4	37:33	0.52	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	2	1.47	73.3	39:03	0.45	
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	2	1.45	72.4	41:01	0.45	
Cleanup Standard						
$^{37}Cl_4$-2,3,7,8-TCDD	0.4	0.335	83.8	31:28		
Injection Standards						
$^{13}C_{12}$-1,2,3,4-TCDD	2			31:00	0.79	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	2			37:13	1.25	

Client Information

Project Name:	Port Gamble
Sample ID:	OYSTER #2A

Laboratory Information

Project ID:	G1040-4	
Sample ID:	G1040-4-2B	
Collection Date:	15-Dec-08	
Receipt Date:	15-Jan-09	10:15
Extraction Date:	01-Feb-09	
Analysis Date:	05-Feb-09	0:56

Sample Information

Matrix:	Tissue	
Weight / Volume:	10.99	grams
Solids / Lipids:	NA	%
Original pH :	NA	
Batch ID:	WG16457	
Filename:	a27jan09a_18-12	
Retchk:	a27jan09a_17-15	
Begin ConCal:	a27jan09a_17-15	
Initial Cal:	m1613-100708a	

Analyzed by: _____ Date: 020509

Reviewed by: _____ Date: 2/05/09

Form Version:[1613_HRMS12]Repor

Filename ; a27jan09a_18 ;*1613*
Sample ; 12
Acquired ; 5-FEB-09 00:56:39
Processed ; 5-FEB-09 07:32:34
Sample ID ; G1040-4-2B
Cal Table ; m1613-100708a
Results Table ; M1613-012709A_18
Comments ;

Ent;	Name;	Resp;	Ion 1;	Ion 2;	RA;?;	RT;	Conc;	EDL;	S/N1;?;	S/N2;?;M;	Signal1;	Noise 1;	Signal2;	Noise 2
1 ;	2,3,7,8-TCDD;	*;	*;	*;	*;n;	NotFnd;	*;	0.1522;	*;n;	*;n;n;	*;4.92e+03;	*;5.50e+03		
2 ;	1,2,3,7,8-PeCDD;	*;	*;	*;	*;n;	NotFnd;	*;	0.2184;	*;n;	*;n;n;	*;7.32e+03;	*;6.70e+03		
3 ;	1,2,3,4,7,8-HxCDD;	*;	*;	*;	*;n;	NotFnd;	*;	0.2500;	*;n;	*;n;n;	*;5.56e+03;	*;6.03e+03		
4 ;	1,2,3,6,7,8-HxCDD;	*;	*;	*;	*;n;	NotFnd;	*;	0.2455;	*;n;	*;n;n;	*;5.56e+03;	*;6.03e+03		
5 ;	1,2,3,7,8,9-HxCDD;	*;	*;	*;	*;n;	NotFnd;	*;	0.2493;	*;n;	*;n;n;	*;5.56e+03;	*;6.03e+03		
6 ;	1,2,3,4,6,7,8-HpCDD;	*;	*;	*;	*;n;	NotFnd;	*;	0.3993;	*;n;	*;n;n;	*;5.06e+03;	*;5.82e+03		
7 ;	OCDD;	1.11e+05;	3.57e+04;	7.53e+04;	0.47;n;	44:38;	0.534;	0.8921;	3;n;	3;y;n;	1.23e+04;	4.68e+03;	1.81e+04;	5.64e+03
8 ;	2,3,7,8-TCDF;	1.73e+05;	7.25e+04;	1.01e+05;	0.72;y;	30:53;	0.170;	0.2088;	3;n;	4;y;n;	2.40e+04;	8.24e+03;	3.01e+04;	8.32e+03
9 ;	1,2,3,7,8-PeCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.1508;	*;n;	*;n;n;	*;8.50e+03;	*;8.03e+03		
10 ;	2,3,4,7,8-PeCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.1610;	*;n;	*;n;n;	*;8.50e+03;	*;8.03e+03		
11 ;	1,2,3,4,7,8-HxCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.1665;	*;n;	*;n;n;	*;5.90e+03;	*;5.76e+03		
12 ;	1,2,3,6,7,8-HxCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.1432;	*;n;	*;n;n;	*;5.90e+03;	*;5.76e+03		
13 ;	2,3,4,6,7,8-HxCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.1694;	*;n;	*;n;n;	*;5.90e+03;	*;5.76e+03		
14 ;	1,2,3,7,8,9-HxCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.2323;	*;n;	*;n;n;	*;5.90e+03;	*;5.76e+03		
15 ;	1,2,3,4,6,7,8-HpCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.2453;	*;n;	*;n;n;	*;6.73e+03;	*;5.43e+03		
16 ;	1,2,3,4,7,8,9-HpCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.3898;	*;n;	*;n;n;	*;6.73e+03;	*;5.43e+03		
17 ;	OCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.9514;	*;n;	*;n;n;	*;6.60e+03;	*;6.49e+03		
Extraction Standards														
18 ;	13C-2,3,7,8-TCDD;	6.66e+07;	2.91e+07;	3.75e+07;	0.78;y;	31:27;	74.940;	0.1983;	1317;y;	1567;y;n;	8.94e+06;	6.78e+03;	1.14e+07;	7.29e+03
19 ;	13C-1,2,3,7,8-PeCDD;	5.02e+07;	3.08e+07;	1.94e+07;	1.58;y;	34:16;	77.322;	0.2411;	2024;y;	1017;y;n;	1.12e+07;	5.54e+03;	7.08e+06;	6.96e+03
20 ;	13C-1,2,3,4,7,8-HxCDD;	4.38e+07;	2.53e+07;	1.85e+07;	1.37;y;	36:53;	77.970;	0.2435;	1052;y;	1013;y;n;	7.41e+06;	7.04e+03;	6.00e+06;	5.93e+03
21 ;	13C-1,2,3,6,7,8-HxCDD;	4.89e+07;	2.63e+07;	2.26e+07;	1.16;y;	36:58;	80.077;	0.2241;	1138;y;	1070;y;n;	8.01e+06;	7.04e+03;	6.34e+06;	5.93e+03
22 ;	13C-1,2,3,4,6,7,8-HpCDD;	3.37e+07;	1.73e+07;	1.64e+07;	1.06;y;	40:20;	73.067;	0.3020;	607;y;	562;y;n;	3.91e+06;	6.44e+03;	3.79e+06;	6.74e+03
23 ;	13C-OCDD;	3.91e+07;	1.86e+07;	2.05e+07;	0.90;y;	44:39;	106.626;	0.3944;	447;y;	506;y;n;	3.12e+06;	6.97e+03;	3.40e+06;	6.73e+03
24 ;	13C-2,3,7,8-TCDF;	9.82e+07;	4.34e+07;	5.48e+07;	0.79;y;	30:51;	74.525;	0.1261;	1581;y;	1872;y;n;	1.02e+07;	6.44e+03;	1.28e+07;	6.82e+03
25 ;	13C-1,2,3,7,8-PeCDF;	9.26e+07;	5.67e+07;	3.59e+07;	1.58;y;	33:27;	87.011;	0.1488;	2797;y;	2401;y;n;	2.02e+07;	7.22e+03;	1.30e+07;	5.43e+03
26 ;	13C-2,3,4,7,8-PeCDF;	8.02e+07;	4.90e+07;	3.12e+07;	1.57;y;	34:05;	76.983;	0.1520;	2538;y;	2105;y;n;	1.83e+07;	7.22e+03;	1.14e+07;	5.43e+03
27 ;	13C-1,2,3,4,7,8-HxCDF;	5.91e+07;	2.03e+07;	3.89e+07;	0.52;y;	36:09;	81.477;	0.1821;	1189;y;	1639;y;n;	6.26e+06;	5.26e+03;	1.19e+07;	7.26e+03
28 ;	13C-1,2,3,6,7,8-HxCDF;	6.58e+07;	2.26e+07;	4.32e+07;	0.52;y;	36:16;	82.144;	0.1650;	1409;y;	1955;y;n;	7.41e+06;	5.26e+03;	1.42e+07;	7.26e+03
29 ;	13C-2,3,4,6,7,8-HxCDF;	5.95e+07;	2.05e+07;	3.90e+07;	0.53;y;	36:45;	78.971;	0.1754;	1204;y;	1634;y;n;	6.33e+06;	5.26e+03;	1.19e+07;	7.26e+03
30 ;	13C-1,2,3,7,8,9-HxCDF;	5.06e+07;	1.74e+07;	3.32e+07;	0.52;y;	37:33;	75.378;	0.1969;	879;y;	1259;y;n;	4.62e+06;	5.26e+03;	9.14e+06;	7.26e+03
31 ;	13C-1,2,3,4,6,7,8-HpCDF;	4.21e+07;	1.30e+07;	2.91e+07;	0.45;y;	39:03;	73.305;	0.3248;	371;y;	861;y;n;	3.37e+06;	9.09e+03;	7.41e+06;	8.60e+03
32 ;	13C-1,2,3,4,7,8,9-HpCDF;	3.28e+07;	1.02e+07;	2.26e+07;	0.45;y;	41:01;	72.406;	0.4122;	235;y;	551;y;n;	2.14e+06;	9.09e+03;	4.74e+06;	8.60e+03
Injection Standards														
33 ;	13C-1,2,3,4-TCDD;	7.97e+07;	3.53e+07;	4.44e+07;	0.79;y;	31:00;	58.647;	-;	1240;y;	1466;y;n;	8.41e+06;	6.78e+03;	1.07e+07;	7.29e+03
34 ;	13C-1,2,3,7,8,9-HxCDD;	5.85e+07;	3.24e+07;	2.60e+07;	1.25;y;	37:13;	54.174;	-;	1317;y;	1242;y;n;	9.27e+06;	7.04e+03;	7.36e+06;	5.93e+03
Cleanup Standard														
35 ;	37Cl-2,3,7,8-TCDD;	1.59e+07;	1.59e+07;	-;	-;-;	31:28;	16.765;	0.0956;	699;y;	-;-;n;	5.05e+06;	7.23e+03;	-;	-

Totals Raw Data

	Conc	Empc	Flags
TCDF	0	0	FALSE
TCDD	0	0	FALSE
PeCDF	0	0	FALSE
PeCDD	0	0	FALSE
HxCDF	0	0	FALSE
HxCDD	0	0	FALSE
HpCDF	0	0	FALSE
HpCDD	0	0	FALSE

Filename:	a27jan09a_18	Name of Homolog Group:	Total Tetra-Furans		
Sample:	12	Number of Peaks Found:	3	0	
Acquired:	5-FEB-09 00:56:39	RRF Used For Totals:	1.0368		
Processed:	5-FEB-09 07:32:34	Detection Limit:	0.2088		RL=0.500 (pg/µL)
Sample ID:	G1040-4-2B	Noise Height Ion1/Ion2:	8244 / 8320		
Cal Table:	m1613-100708a	Begin Window:		26:13:00	
Results Table:	M1613-012709A_18	End Window:		33:06:00	

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	1.55E+05	51500	104000	0.5	n	27:33	0.152	S2N	1.8	n	2.8	n	n
2,3,7,8-TCDF	2	1.73E+05	72500	101000	0.72	y	30:53	0.17	RL	2.9	n	3.6	y	n
	3	1.31E+05	61200	69800	0.88	y	31:08	0.129	S2N	2	n	2.8	n	n

Filename:	a27jan09a_18	Name of Homolog Group:	Total Tetra-Dioxins		
Sample:	12	Number of Peaks Found:	1	0	
Acquired:	5-FEB-09 00:56:39	RRF Used For Totals:	1.0087		
Processed:	5-FEB-09 07:32:34	Detection Limit:	0.1522		RL=0.500 (pg/µL)
Sample ID:	G1040-4-2B	Noise Height Ion1/Ion2:	4923 / 5497		
Cal Table:	m1613-100708a	Begin Window:		27:40:00	
Results Table:	M1613-012709A_18	End Window:		32:37:00	

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	1.86E+05	85100	101000	0.85	y	31:18	0.277	RL	4.6	y	5.8	y	n

Filename:	a27jan09a_18	Name of Homolog Group:	Total Penta-Furans Fn1		
Sample:	12	Number of Peaks Found:	1	0	
Acquired:	5-FEB-09 00:56:39	RRF Used For Totals:	1.0121		
Processed:	5-FEB-09 07:32:34	Detection Limit:	0.1274		
Sample ID:	G1040-4-2B	Noise Height Ion1/Ion2:	6960 / 6584		
Cal Table:	m1613-100708a	Begin Window:		31:45:00	
Results Table:	M1613-012709A_18	End Window:		32:05:00	

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	1.27E+05	49200	77600	0.63	y	32:04	0.145	RL	2.6	n	3.9	y	n

Page 4 of 9

Filename:	a27jan09a_18		Name of Homolog Group:	Total Penta-Furans Fn2												
Sample:	12		Number of Peaks Found:	1	0											
Acquired:	5-FEB-09 00:56:39		RRF Used For Totals:	1.0121												
Processed:	5-FEB-09 07:32:34		Detection Limit:	0.1555						RL=2.500 (pg/µL)						
Sample ID:	G1040-4-2B		Noise Height Ion1/Ion2:	8496 / 8032												
Cal Table:	m1613-100708a		Begin Window:						31:42:00							
Results Table:	M1613-012709A_18		End Window:						34:51:00							
Name	#		Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?	
	1		6.89E+05	339000	350000	0.97	n	32:56	0.788	RL	10.6	y	12.5	y	n	

Page 5 of 9

Filename:	a27jan09a_18		Name of Homolog Group:	Total Penta-Dioxins												
Sample:	12		Number of Peaks Found:	1	0											
Acquired:	5-FEB-09 00:56:39		RRF Used For Totals:	1.0517												
Processed:	5-FEB-09 07:32:34		Detection Limit:	0.2184						RL=2.500 (pg/µL)						
Sample ID:	G1040-4-2B		Noise Height Ion1/Ion2:	7316 / 6696												
Cal Table:	m1613-100708a		Begin Window:						32:52:00							
Results Table:	M1613-012709A_18		End Window:						34:37:00							
Name	#		Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?	
	1		3.62E+04	25600	10600	2.4	n	33:36	0.069	S2N	2.3	n	1	n	n	

Page 6 of 9

Filename:	a27jan09a_18		Name of Homolog Group:	Total Hexa-Furans												
Sample:	12		Number of Peaks Found:	0												
Acquired:	5-FEB-09 00:56:39		RRF Used For Totals:	1.1305												
Processed:	5-FEB-09 07:32:34		Detection Limit:	0.1746												
Sample ID:	G1040-4-2B		Noise Height Ion1/Ion2:	5900 / 5760												
Cal Table:	m1613-100708a		Begin Window:													
Results Table:	M1613-012709A_18		End Window:													
Name	#		Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?	
	1		*	*	*	*	n	NotFnd	*		*	n	*	n	n	

Page 7 of 9

Filename:	a27jan09a_18		Name of Homolog Group:	Total Hexa-Dioxins												
Sample:	12		Number of Peaks Found:	1	0											
Acquired:	5-FEB-09 00:56:39		RRF Used For Totals:	1.0077												
Processed:	5-FEB-09 07:32:34		Detection Limit:	0.2483						RL=2.500 (pg/µL)						
Sample ID:	G1040-4-2B		Noise Height Ion1/Ion2:	5564 / 6028												
Cal Table:	m1613-100708a		Begin Window:						35:36:00							

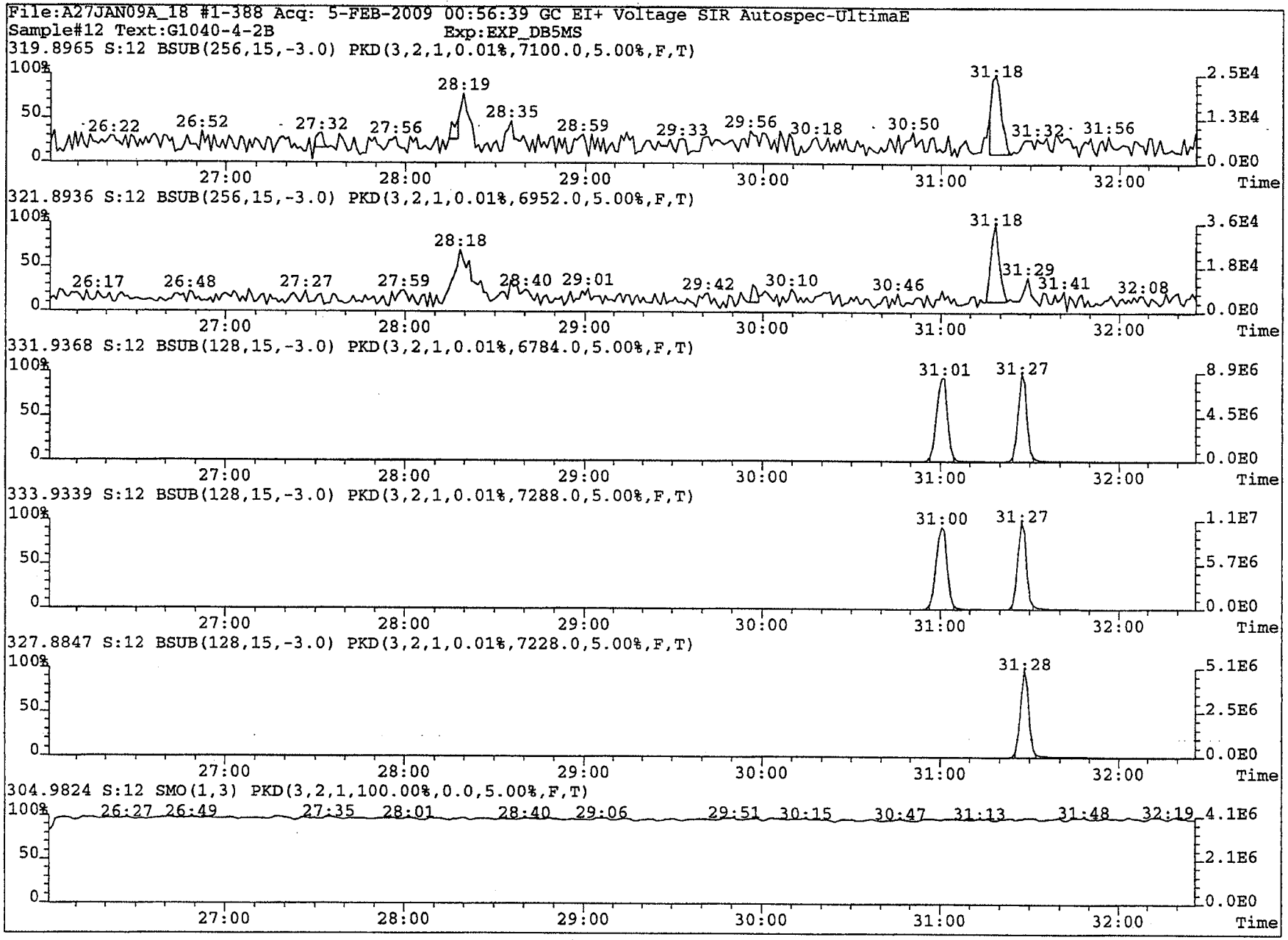
Results Table:	M1613-012709A_18	End Window:					37:17:00									
Name	#	Response		Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?	
	1		6.02E+04	28000	32100	0.87	n	36:19	0.129	S2N		2.6	n	1.9	n	n

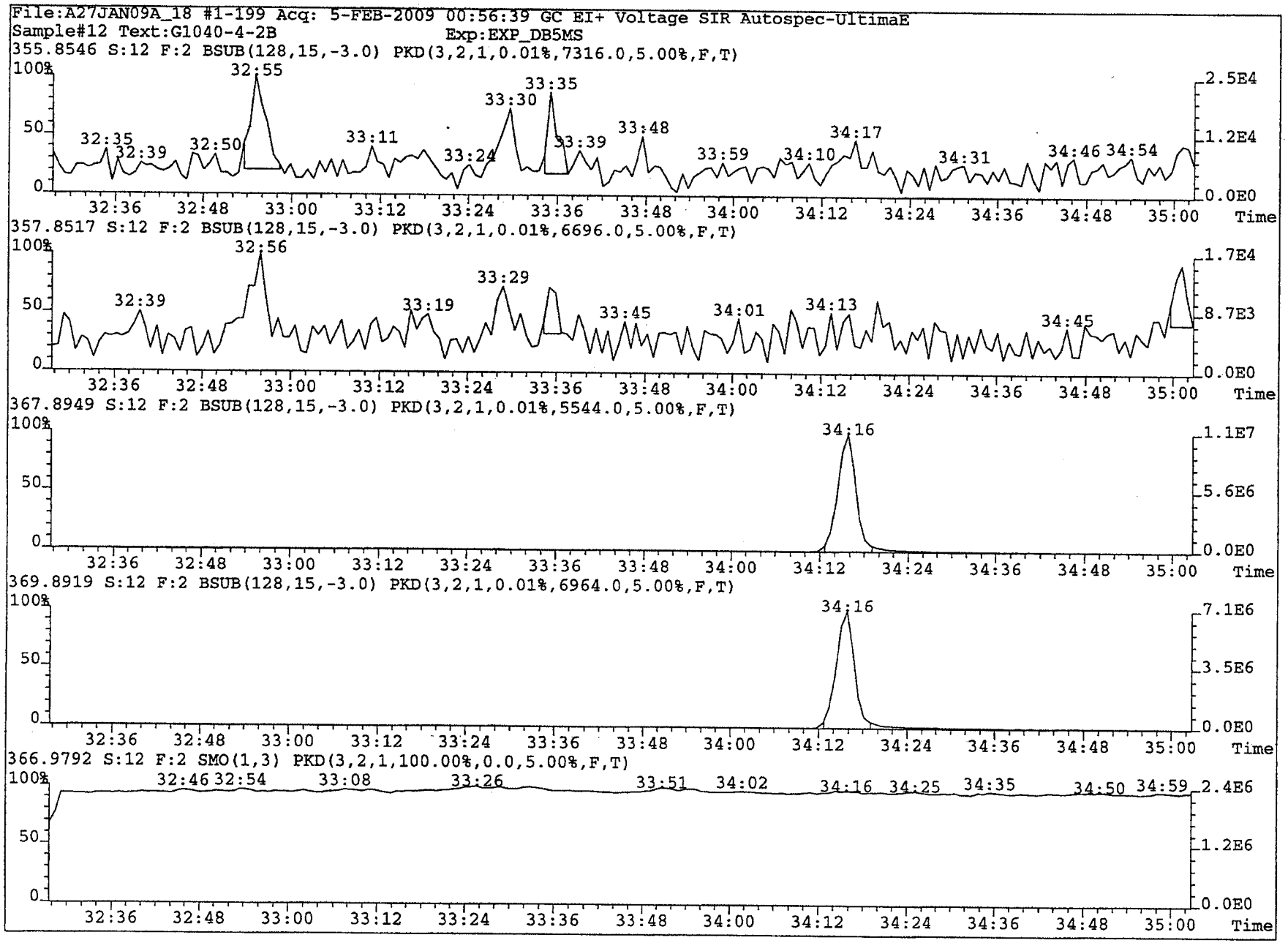
Filename:	a27jan09a_18	Name of Homolog Group:	Total Hepta-Furans
Sample:	12	Number of Peaks Found:	0
Acquired:	5-FEB-09 00:56:39	RRF Used For Totals:	1.3693
Processed:	5-FEB-09 07:32:34	Detection Limit:	0.3082
Sample ID:	G1040-4-2B	Noise Height Ion1/Ion2:	6732 / 5428
Cal Table:	m1613-100708a	Begin Window:	
Results Table:	M1613-012709A_18	End Window:	

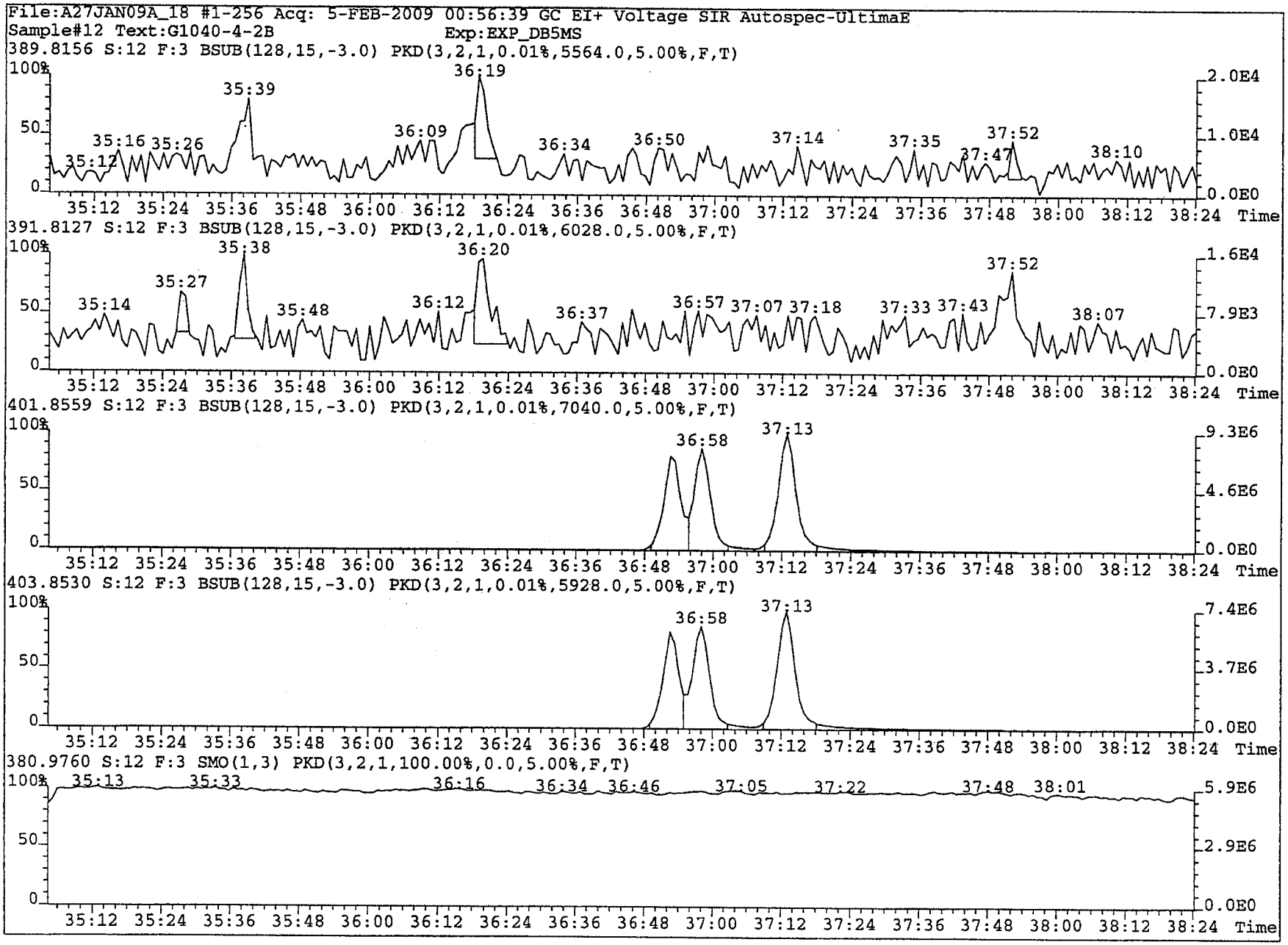
Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	*	*	*	*	n	NotFnd	*		*	n	*	n	n

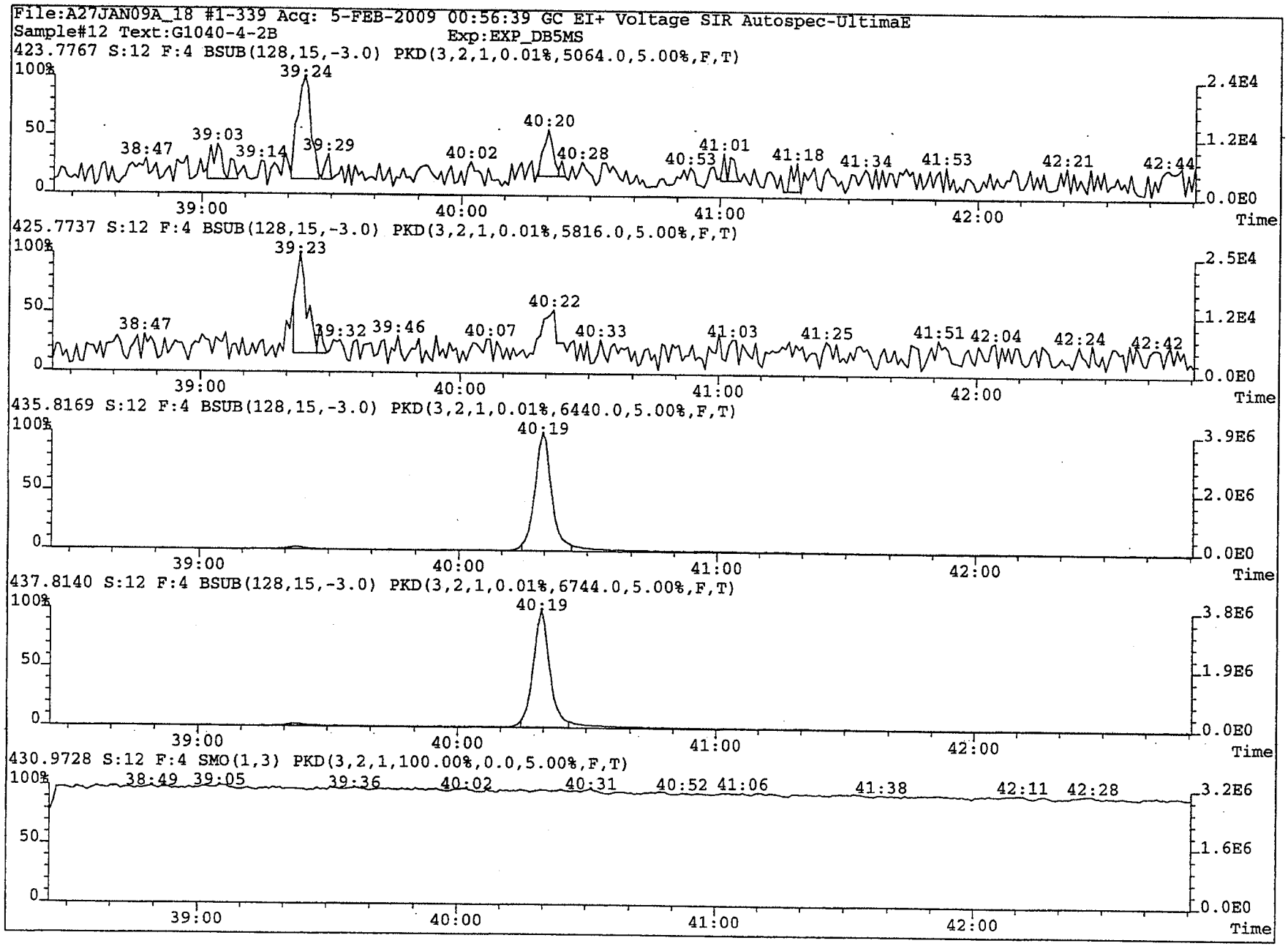
Filename:	a27jan09a_18	Name of Homolog Group:	Total Hepta-Dioxins		
Sample:	12	Number of Peaks Found:	2	0	
Acquired:	5-FEB-09 00:56:39	RRF Used For Totals:	1.0612		
Processed:	5-FEB-09 07:32:34	Detection Limit:	0.3993		RL=2.500 (pg/µL)
Sample ID:	G1040-4-2B	Noise Height Ion1/Ion2:	5064 / 5816		
Cal Table:	m1613-100708a	Begin Window:		39:18:00	
Results Table:	M1613-012709A_18	End Window:		40:30:00	

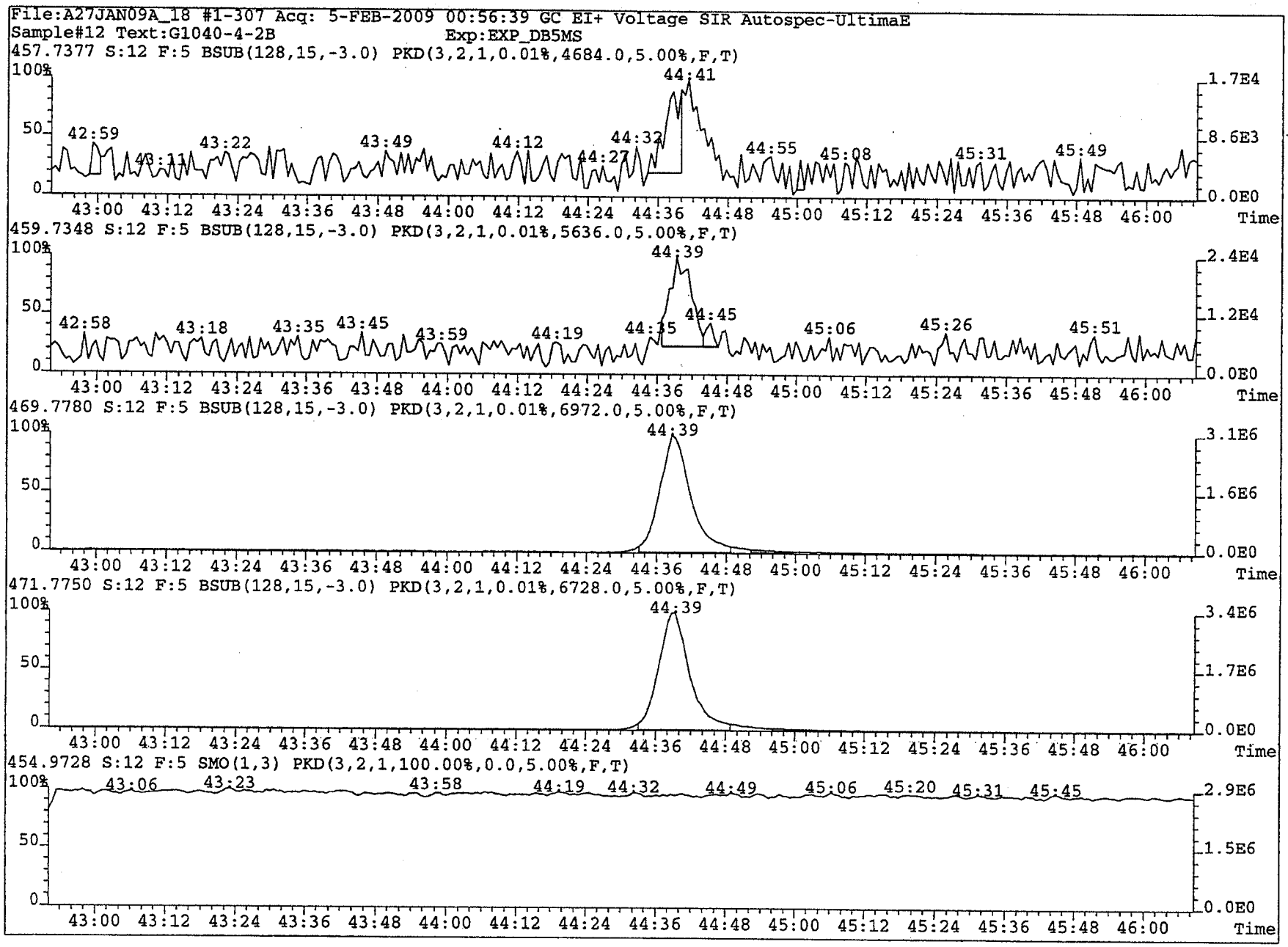
Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	1.40E+05	77400	62500	1.24	n	39:24	0.391	RL		4.2	y	3.6	y	n
	2	1.30E+04	6520	6490	1	y	39:29	0.036	S2N		1	n	1	n	n

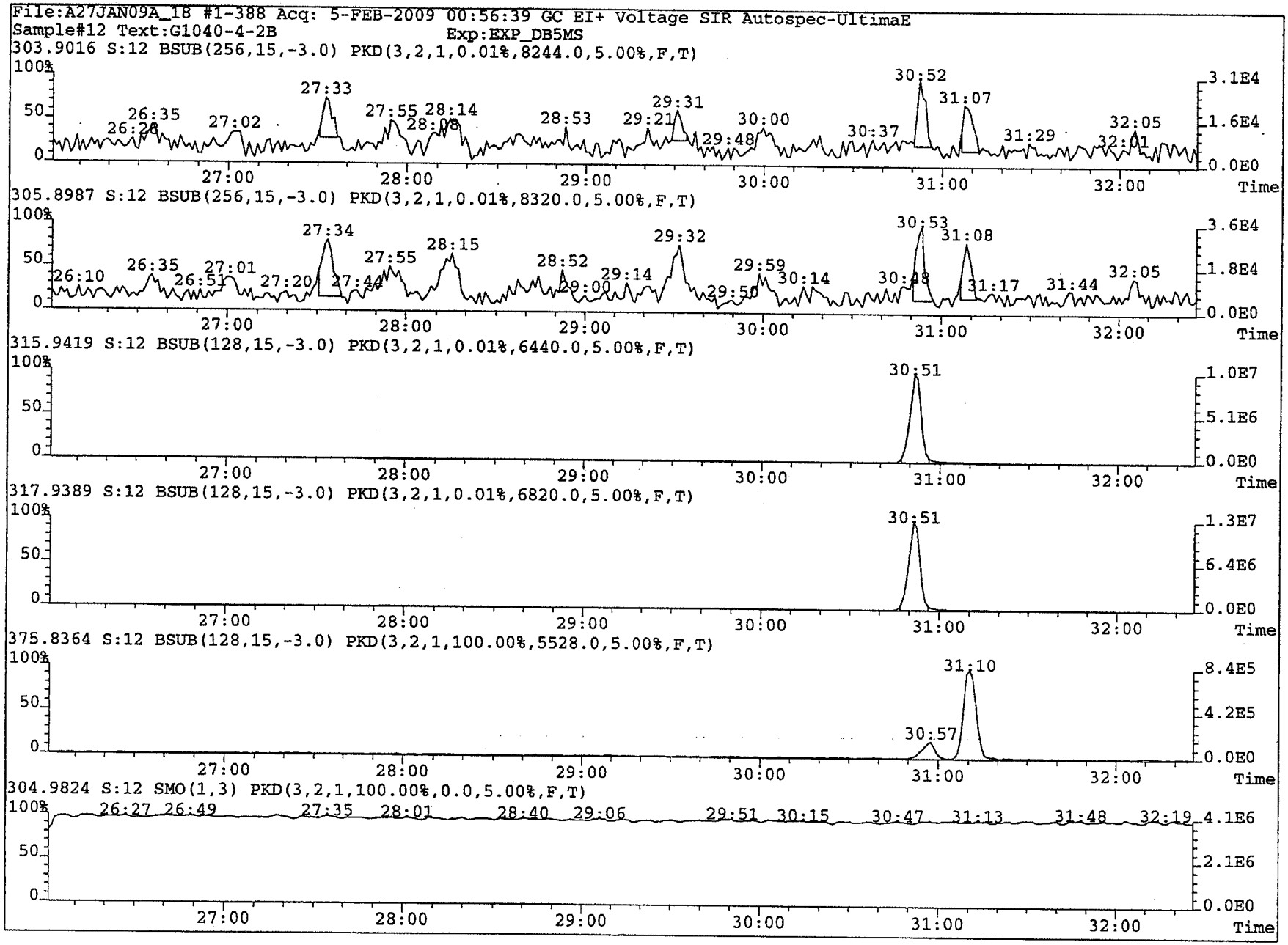

File:A27JAN09A_18 #1-388 Acq: 5-FEB-2009 00:56:39 GC EI+ Voltage SIR Autospec-UltimaE
Sample#12 Text:G1040-4-2B Exp:EXP_DB5MS
319.8965 S:12 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,7100.0,5.00%,F,T)
28:19
31:18
26:22
26:52
27:32
27:56
28:35
28:59
29:33
29:56
30:18
30:50
31:32
31:56
2.5E4
1.3E4
0.0E0
321.8936 S:12 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,6952.0,5.00%,F,T)
28:18
31:18
31:29
26:17
26:48
27:27
27:59
28:40
29:01
29:42
30:10
30:46
31:41
32:08
3.6E4
1.8E4
0.0E0
331.9368 S:12 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6784.0,5.00%,F,T)
31:01
31:27
8.9E6
4.5E6
0.0E0
333.9339 S:12 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7288.0,5.00%,F,T)
31:00
31:27
1.1E7
5.7E6
0.0E0
327.8847 S:12 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7228.0,5.00%,F,T)
31:28
5.1E6
2.5E6
0.0E0
304.9824 S:12 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
26:27
26:49
27:35
28:01
28:40
29:06
29:51
30:15
30:47
31:13
31:48
32:19
4.1E6
2.1E6
0.0E0
100%
50
0
27:00
28:00
29:00
30:00
31:00
32:00
Time

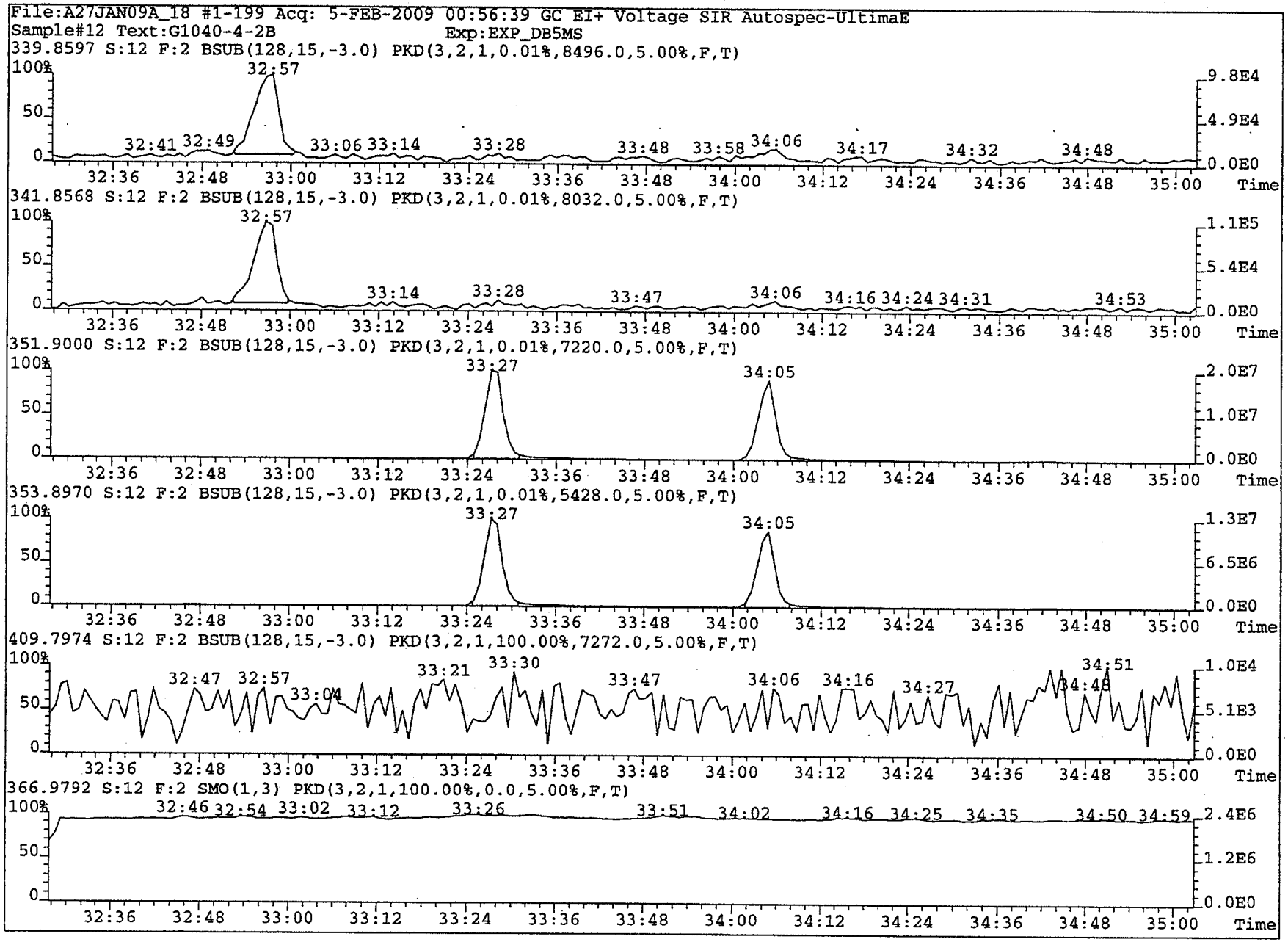

File:A27JAN09A_18 #1-199 Acq: 5-FEB-2009 00:56:39 GC EI+ Voltage SIR Autospec-UltimaE
Sample#12 Text:G1040-4-2B Exp:EXP_DB5MS
355.8546 S:12 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7316.0,5.00%,F,T)
357.8517 S:12 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6696.0,5.00%,F,T)
367.8949 S:12 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5544.0,5.00%,F,T)
369.8919 S:12 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6964.0,5.00%,F,T)
366.9792 S:12 F:2 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time

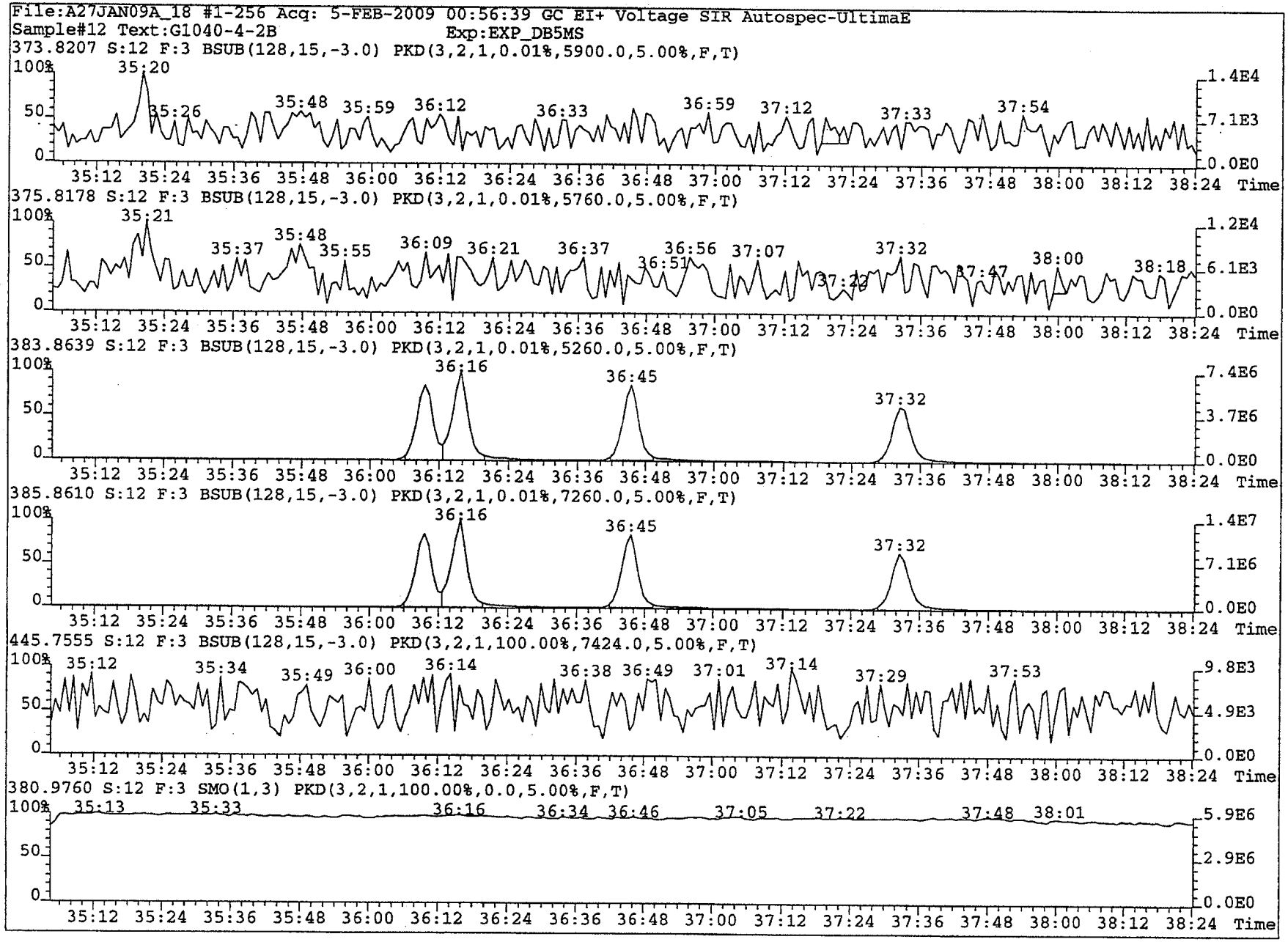

File:A27JAN09A_18 #1-256 Acq: 5-FEB-2009 00:56:39 GC EI+ Voltage SIR Autospec-UltimaE
Sample#12 Text:G1040-4-2B Exp:EXP_DB5MS
389.8156 S:12 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5564.0,5.00%,F,T)
391.8127 S:12 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6028.0,5.00%,F,T)
401.8559 S:12 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7040.0,5.00%,F,T)
403.8530 S:12 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5928.0,5.00%,F,T)
380.9760 S:12 F:3 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time

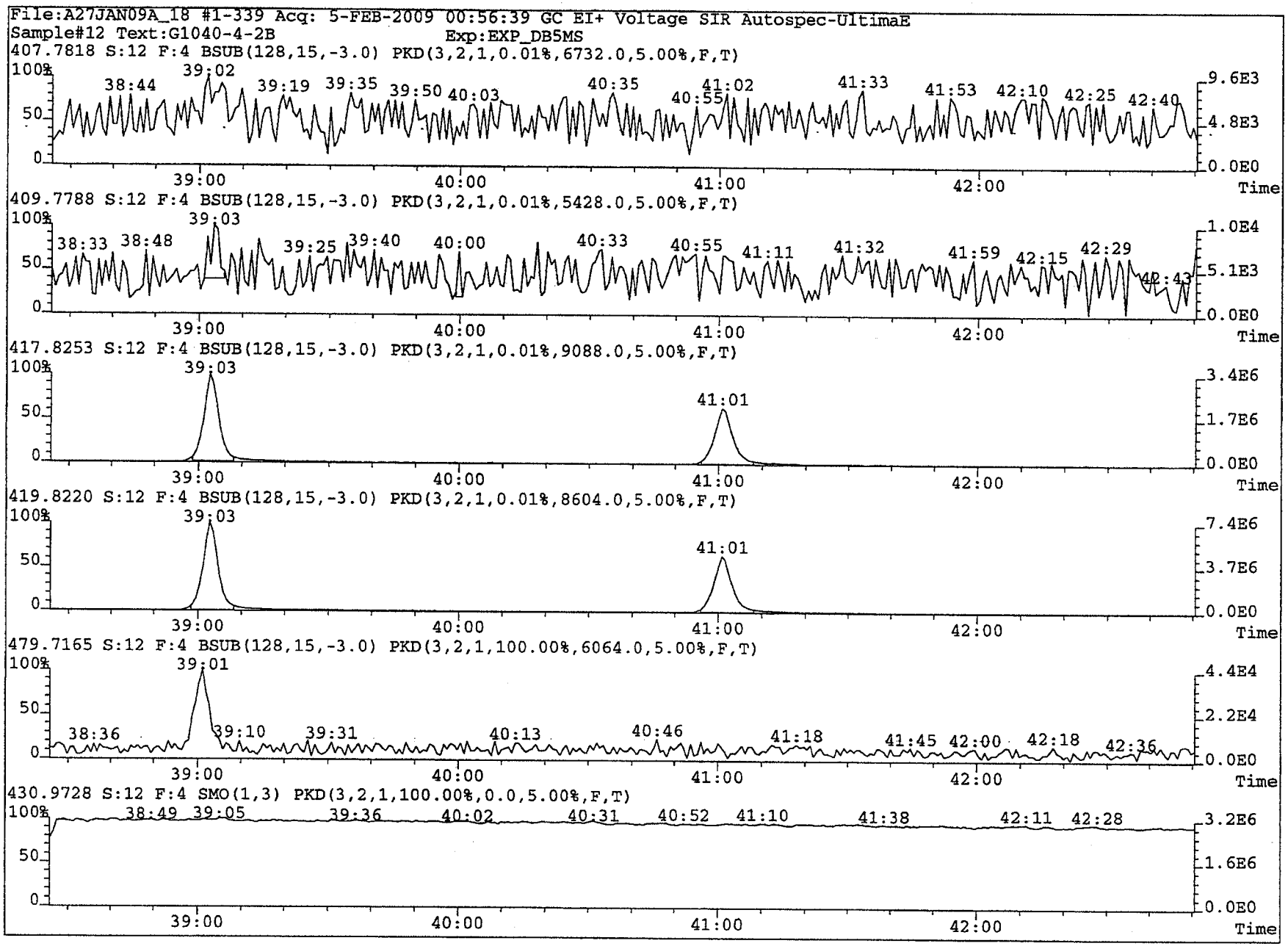

File:A27JAN09A_18 #1-339 Acq: 5-FEB-2009 00:56:39 GC EI+ Voltage SIR Autospec-UltimaE
Sample#12 Text:G1040-4-2B
Exp:EXP_DB5MS
423.7767 S:12 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5064.0,5.00%,F,T)
39:24
40:20
38:47
39:03
39:14
39:29
40:02
40:28
40:53
41:01
41:18
41:34
41:53
42:21
42:44
2.4E4
1.2E4
0.0E0
425.7737 S:12 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5816.0,5.00%,F,T)
39:23
40:22
38:47
39:32
39:46
40:07
40:33
41:03
41:25
41:51
42:04
42:24
42:42
2.5E4
1.2E4
0.0E0
435.8169 S:12 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6440.0,5.00%,F,T)
40:19
3.9E6
2.0E6
0.0E0
437.8140 S:12 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6744.0,5.00%,F,T)
40:19
3.8E6
1.9E6
0.0E0
430.9728 S:12 F:4 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
38:49
39:05
39:36
40:02
40:31
40:52
41:06
41:38
42:11
42:28
3.2E6
1.6E6
0.0E0
100%
50
0
39:00
40:00
41:00
42:00
Time

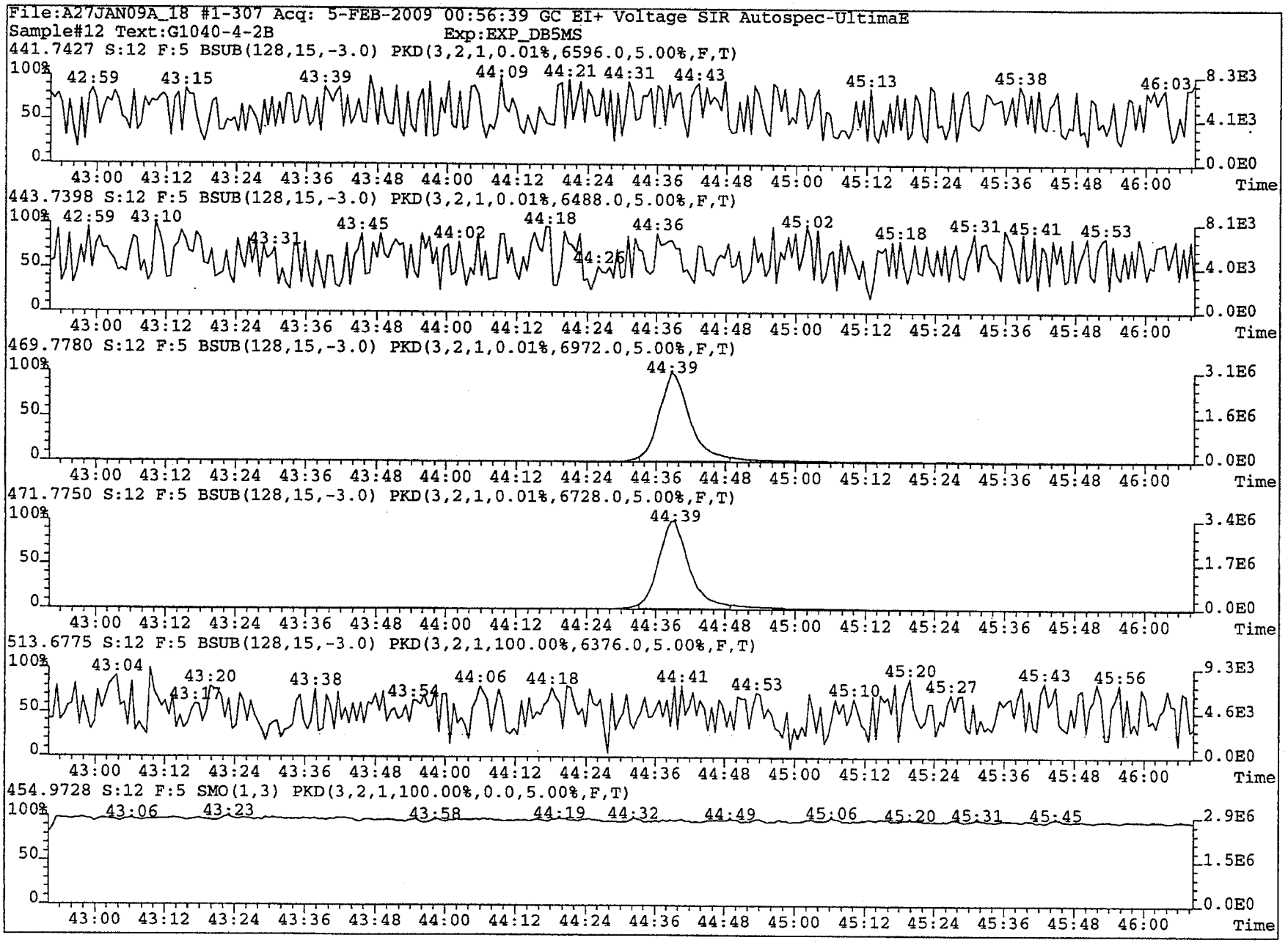

File:A27JAN09A_18 #1-307 Acq: 5-FEB-2009 00:56:39 GC EI+ Voltage SIR Autospec-UltimaE
Sample#12 Text:G1040-4-2B Exp:EXP_DB5MS
457.7377 S:12 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,4684.0,5.00%,F,T)
459.7348 S:12 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5636.0,5.00%,F,T)
469.7780 S:12 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6972.0,5.00%,F,T)
471.7750 S:12 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6728.0,5.00%,F,T)
454.9728 S:12 F:5 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time

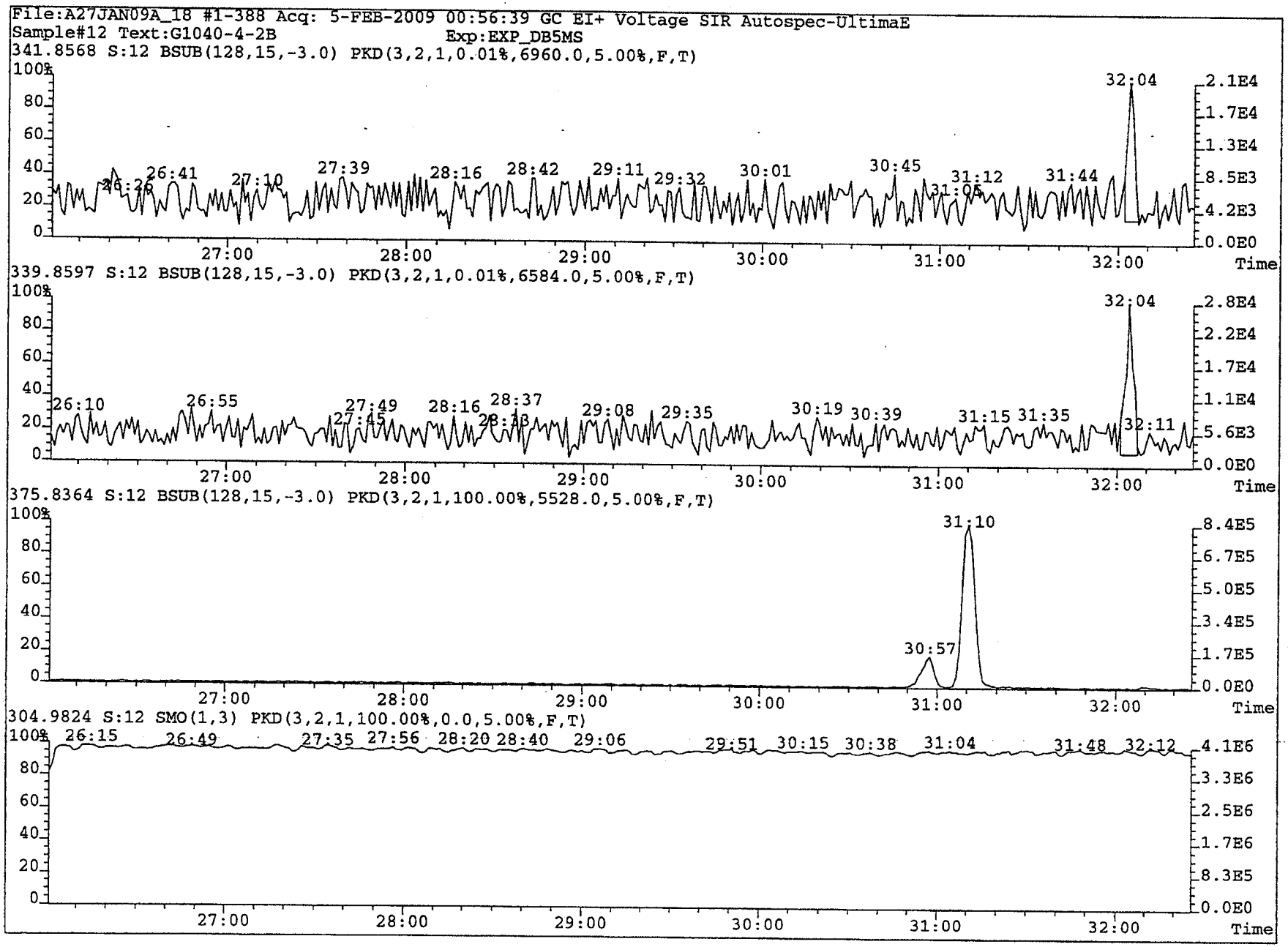

File:A27JAN09A_18 #1-388 Acq: 5-FEB-2009 00:56:39 GC EI+ Voltage SIR Autospec-UltimaE
Sample#12 Text:G1040-4-2B
Exp:EXP_DB5MS
303.9016 S:12 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,8244.0,5.00%,F,T)
305.8987 S:12 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,8320.0,5.00%,F,T)
315.9419 S:12 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6440.0,5.00%,F,T)
317.9389 S:12 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6820.0,5.00%,F,T)
375.8364 S:12 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,5528.0,5.00%,F,T)
304.9824 S:12 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time


File:A27JAN09A_18 #1-199 Acq: 5-FEB-2009 00:56:39 GC EI+ Voltage SIR Autospec-UltimaE
Sample#12 Text:G1040-4-2B Exp:EXP_DB5MS
339.8597 S:12 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,8496.0,5.00%,F,T)
341.8568 S:12 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,8032.0,5.00%,F,T)
351.9000 S:12 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7220.0,5.00%,F,T)
353.8970 S:12 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5428.0,5.00%,F,T)
409.7974 S:12 F:2 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,7272.0,5.00%,F,T)
366.9792 S:12 F:2 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time


File:A27JAN09A_18 #1-256 Acq: 5-FEB-2009 00:56:39 GC EI+ Voltage SIR Autospec-UltimaE
Sample#12 Text:G1040-4-2B Exp:EXP_DB5MS
373.8207 S:12 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5900.0,5.00%,F,T)
375.8178 S:12 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5760.0,5.00%,F,T)
383.8639 S:12 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5260.0,5.00%,F,T)
385.8610 S:12 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7260.0,5.00%,F,T)
445.7555 S:12 F:3 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,7424.0,5.00%,F,T)
380.9760 S:12 F:3 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time


File:A27JAN09A_18 #1-339 Acq: 5-FEB-2009 00:56:39 GC EI+ Voltage SIR Autospec-UltimaE
Sample#12 Text:G1040-4-2B Exp:EXP_DB5MS
407.7818 S:12 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6732.0,5.00%,F,T)
409.7788 S:12 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5428.0,5.00%,F,T)
417.8253 S:12 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,9088.0,5.00%,F,T)
419.8220 S:12 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,8604.0,5.00%,F,T)
479.7165 S:12 F:4 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,6064.0,5.00%,F,T)
430.9728 S:12 F:4 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time


File:A27JAN09A_18 #1-307 Acq: 5-FEB-2009 00:56:39 GC EI+ Voltage SIR Autospec-UltimaE
Sample#12 Text:G1040-4-2B
Exp:EXP_DB5MS
441.7427 S:12 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6596.0,5.00%,F,T)
443.7398 S:12 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6488.0,5.00%,F,T)
469.7780 S:12 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6972.0,5.00%,F,T)
471.7750 S:12 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6728.0,5.00%,F,T)
513.6775 S:12 F:5 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,6376.0,5.00%,F,T)
454.9728 S:12 F:5 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time


File:A27JAN09A_18 #1-388 Acq: 5-FEB-2009 00:56:39 GC EI+ Voltage SIR Autospec-UltimaE
Sample#12 Text:G1040-4-2B Exp:EXP_DB5MS
341.8568 S:12 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6960.0,5.00%,F,T)
339.8597 S:12 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6584.0,5.00%,F,T)
375.8364 S:12 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,5528.0,5.00%,F,T)
304.9824 S:12 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time

Percent Lipids

prepared
for

HART CROWSER, INC.

Project: Port Gamble, 17330-14

ARI JOB NO: OG44

prepared
by

Analytical Resources, Inc.

ANALYTICAL RESOURCES INCORPORATED

LIPIDS ANALYSIS DATA SHEET
Percent Lipids by Method Bligh&Dyer

Data Release Authorized:
Reported: 01/13/09
Date Received: 12/16/08
Page 1 of 1

QC Report No: OG44-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14

Client/ ARI ID	Date Sampled	Matrix	Analysis Date	RL	Result
OYSTER #1A OG44A 09-348	12/15/08	Tissue	01/09/09	0.0008	1.97 %
OYSTER #2A OG44C 09-350	12/15/08	Tissue	01/09/09	0.0008	1.97 %
Method Blank			01/09/09	0.0008	0.0080 %
Method Blank			01/09/09	0.0008	< 0.0008 % U
Method Blank			01/09/09	0.0008	0.0080 %

Results Are On A Wet Weight Basis

RL-Analytical reporting limit
U-Undetected at reported detection limit

Bid # N/A
Ext # ↓

% Lipids – Tissue

Client Name: Hart Crowser, Inc.

ARI Job No(s): 2644

Calculated on LIMs

ARI Sample ID	Client Sample ID	Original Extracted Weight	Original Volume (FEV)	Volume Taken (Split)	Tare Weight (g)	Tare + Sample Weight (g)	% Lipids
2644 MBT		25.##g	5mL	2.5mL	1.1591	1.1596	
MBT Dup		25.##g	↓	↓	1.1649	1.1650	
MBT Trip		25.##g			1.1694	1.1697	
A	checked	25.##g			1.1560	1.4017	
C	↓	25.##g	↓	↓	1.1747	1.4214	
11/9/09 Date/Analyst: →			1/12/09 →			1/13/09	

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Organic Extractions Laboratory
Analyst Notes

ARI Job No.: 0622 Client ID: Hart Crowser, Inc.

Parameter: Tissue Prep Client Project: Port Gamble

SOP Number(s): **No Anomalies:**

List problems, concerns, corrective actions and any other pertinent information

OYSTERS 1/6/09 9.f.
Prep Time ... # of Analysts 4 noon To 13:30.
Shucking hrs 1/4
+ Blending.
ALL spatula's and Knives Washed with Alconox and Acid Bath and Three Times DI H2O. Blender Cleaned between ea. Comp. with Alconox, Acid Bath and Three Times DI H2O. Foil on Trays dull side up for metals.

Analyst Initials: 9.f. 1/6/09 **Date:**

Hart Crowser Tissue Prep.

Oysters…

Oyster #1 A (15 oyster composite) 3
Oyster #1 B (15 oyster composite) Prep & Freeze 3
Oyster #2 A (15 oyster composite) 3
Oyster #2 B (15 oyster composite) Prep & Freeze 2

Oyster #1 A Composite weight 1236.50 g

Oyster #1 B Composite weight 1114.44 g

Oyster #2 A Composite weight 974.87g

Oyster #2 B Composite weight 770.78g

goes with Job 0644

Analytical Resources, Incorporated
Analytical Chemists and Consultants

February 25, 2009

Mr. Roger McGinnis
Hart Crowser, Inc.
1700 Westlake Avenue North Suite 200
Seattle, WA 98109-3056

RE: Project: Port Gamble, 17330-14
ARI Job No.: OG45

Dear Mr. McGinnis:

Please find enclosed the original Chain-of-Custody (COC) records, sample receipt documentation, and the final data package for the samples from the project referenced above.

The samples were analyzed for Total Metals, % Lipids, PCBs and Dioxin Furans, as requested.

Sample receipt and details of these analyses are discussed in the Case Narrative.

An electronic copy of this data package and the supporting data 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.

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

Enclosures

cc: files OG45

KB/kb

Chain of Custody Documentation

prepared for

HART CROWSER, INC.

Project: Port Gamble, 17330-14

ARI JOB NO: OG45

prepared by

Analytical Resources, Inc.

Sample Custody Record

1 OF 2

Samples Shipped to: ART

Hart Crowser, Inc.
1910 Fairview Avenue East
Seattle, Washington 98102-3699
Phone: 206-324-9530 FAX: 206-328-5581

JOB 17330-14 LAB NUMBER

PROJECT NAME PORT GAMBLE

HART CROWSER CONTACT ROGER MCGUNNIS

SAMPLED BY: PORT GAMBLE S'KLALLAM TRIBE NATURAL RESOURCES DEPT.

LAB NO.	SAMPLE ID	DESCRIPTION	DATE	TIME	MATRIX	REQUESTED ANALYSIS: METALS	DIOXIN/FURANS	PCBs	% LIPIDS	NO. OF CONTAINERS	OBSERVATIONS/COMMENTS/ COMPOSITING INSTRUCTIONS
											CFR 12/17/08
	GDSTATION#1 GD1	12.16.08	12-16-08	—	BIOTA	X	X	X	X	3	3 replicates INDIVIDUALS
	GDSTATION#1 GD2	12.16.08		—						3	3 replicates " " HOLD
	GDSTATION#1 GD3	12.16.08		—						3	3 replicates " " HOLD
	GDSTATION#2 GD1	12.16.08		—		X	X	X	X	3	3 replicates " "
	GDSTATION#2 GD2	12.16.08 CFR 12/17/08		—						3	3 replicates " " HOLD
	GDSTATION#2 GD3	12.16.08		—						3	3 replicates " " HOLD
	GDSTATION#3 GD1	12.16.08		—		X	X	X	X	3	3 replicates " "
	GDSTATION#3 GD2	12.16.08		—						3	3 replicates " " HOLD
	GDSTATION#3 GD3	12.16.08		—						3	3 replicates " " HOLD
	GDSTATION#1 GDEXTRA	12.16.08		—							2 geoducks extra volume
	GDSTATION#2 GDEXTRA	12.16.08		—							2 geoducks extra volume
	GDSTATION#3 GDEXTRA	12.16.08		—							4 geoducks extra volume

CFR 12/17/08

RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE	12/16/08	SIGNATURE Warren Woodard	12/16/08
PRINT NAME Eileen Rust	TIME	PRINT NAME Warren Woodard	TIME
COMPANY HC	1830	COMPANY Analytical Resources	18:30
RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE		SIGNATURE	
PRINT NAME	TIME	PRINT NAME	TIME
COMPANY		COMPANY	

SPECIAL SHIPMENT HANDLING OR STORAGE REQUIREMENTS:

SAMPLE ID = SITE + SAMPLE ID
SEE ATTACHED PAGES.

HOLD -B, -C SAMPLES

37 TOTAL NUMBER OF CONTAINERS

SAMPLE RECEIPT INFORMATION
CUSTODY SEALS: ☐YES ☐NO ☐N/A
GOOD CONDITION: ☐YES ☐NO
TEMPERATURE:
SHIPMENT METHOD: ☐HAND ☐COURIER ☐OVERNIGHT

COOLER NO.: STORAGE LOCATION:

See Lab Work Order No. for Other Contract Requirements

TURNAROUND TIME:
☐ 24 HOURS ☐ 1 WEEK
☐ 48 HOURS ☒ STANDARD
☐ 72 HOURS OTHER

White and Yellow Copies to Lab — Pink to Project Manager — Lab to Return White Copy to Hart Crowser — Gold to Sample Custodian

Sample Custody Record

2 of 2

Samples Shipped to: ARI

HART CROWSER

Hart Crowser, Inc.
1910 Fairview Avenue East
Seattle, Washington 98102-3699
Phone: 206-324-9530 FAX: 206-328-5581

JOB 17330-14 LAB NUMBER

PROJECT NAME PORT GAMBLE

HART CROWSER CONTACT ROGER MCGINNIS

SAMPLED BY: PORT GAMBLE S'KLALLAM TRIBE NATURAL RESOURCES DEPT.

LAB NO.	SAMPLE ID	DESCRIPTION	DATE	TIME	MATRIX	REQUESTED ANALYSIS: METALS	DIOXIN/FURANS	PCBs	% LIPIDS	NO. OF CONTAINERS	OBSERVATIONS/COMMENTS/ COMPOSITING INSTRUCTIONS
											CFR 12/17/08
CLAM#1	C.12.15.08		12-15-08	—	BIOTA	X	X	X	X	32	32 replicates INDIVIDUALS
CLAM#2	C.12.15.08			—		X	X	X	X	30	30 " " " "
OYSTER#1	O1.12.15.08			—		X	X	X	X	15	15 " " " "
OYSTER#1	O2.12.15.08			—						15	15 " " " " HOLD
OYSTER#2	O1.12.15.08			—		X	X	X	X	15	15 " " " "
OYSTER#2	O2.12.15.08		↓	—	↓					15	15 " " " " HOLD

RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE	12/16/08	Wayne Woodard	12/16/08
PRINT NAME Ellen Rust	TIME	SIGNATURE Warren Woodard	TIME
COMPANY HC	1830	PRINT NAME Analytical Resources	18:30
		COMPANY	
RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE	TIME	SIGNATURE	TIME
PRINT NAME		PRINT NAME	
COMPANY		COMPANY	

SPECIAL SHIPMENT HANDLING OR STORAGE REQUIREMENTS:

SAMPLE ID = SITE + SAMPLE ID SEE ATTACHED PAGES.

HOLD - B, C SAMPLES

COOLER NO.: STORAGE LOCATION:

See Lab Work Order No. for Other Contract Requirements

12 TOTAL NUMBER OF CONTAINERS

SAMPLE RECEIPT INFORMATION
CUSTODY SEALS: ☐YES ☐NO ☐N/A
GOOD CONDITION ☐YES ☐NO
TEMPERATURE
SHIPMENT METHOD: ☐HAND ☐COURIER ☐OVERNIGHT

TURNAROUND TIME:
☐ 24 HOURS ☐ 1 WEEK
☐ 48 HOURS ☒ STANDARD
☐ 72 HOURS OTHER

White and Yellow Copies to Lab — Pink to Project Manager — Lab to Return White Copy to Hart Crowser — Gold to Sample Custodian

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Hart Crowser Project Name: _____

COC No: _____ Delivered by: Hand

Assigned ARI Job No: _____ Tracking No: _____

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
Record cooler temperature (recommended 2.0-6.0 °C for chemistry	Alive	°C

Cooler Accepted by: JH Date: 12/23/08 Time: 16:56

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?	Wet	
Was sufficient ice used (if appropriate)?	YES	(NO)
Were all bottles sealed in individual plastic bags?	YES	(NO)
Did all bottle arrive in good condition (unbroken)?	(YES)	NO
Were all bottle labels complete and legible?	(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 checklist)	YES	(NO)
Were all VOC vials free of air bubbles? (NA)	YES	NO
Was sufficient amount of sample sent in each bottle?	(YES)	NO

Samples Logged by: JH Date: 1-5-09 Time: 12:34

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

Explain discrepancies or negative responses:

By: Date:

Case Narrative

prepared
for

HART CROWSER, INC.

Project: Port Gamble, 17330-14

ARI JOB NO: OG45

prepared
by

Analytical Resources, Inc.

Case Narrative
Hart Crowser
Port Gamble, 17330-14 (Clam)
ARI Job: OG45
February 26, 2009

Sample Receipt

Analytical Resources Inc. (ARI) accepted eighteen tissue samples in good condition on December 16, 2008. The samples were logged under several different ARI SDGs based on sample preps. Please note that several sample containers were prepped and archived upon receipt as requested on the COC. All samples and preps were frozen to protect holding times. For further detail regarding sample receipt, please refer to the Cooer Receipt Form.

** Select samples were sent to SGS Environmental for Dioxin and Furans analysis. The data has been included in this data package.

PCBs Method 8082:

The samples were extracted on 1/9/09 and analyzed on 1/16/09 within the method recommended holding times for frozen samples.

Initial calibration(s): All compounds of interest were within method acceptance criteria.

Continuing calibration(s): Are in control.

Samples: There were no anomalies associated with these samples.

Surrogates: Are in control.

LCS/LCSD(s): Are in control.

Method Blank: The method blanks were free of contamination.

Total Metals:

All samples were prepared on 1/8/09 and analyzed between 1/14/09 and 1/21/09 within the method recommended holding times for frozen samples.

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

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

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

LCS(s): All LCS percent recoveries were within control limits.

MS(s): The matrix spike in is in control.

% Lipids: The data is included in this data package.

Data Reporting Qualifiers

Effective 12/28/04

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 ≥ 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
NR	Spiked compound recovery is not reported due to chromatographic interference
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.
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
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.

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 ≥40% RPD with no obvious chromatographic interference

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

LCS SOLUTIONS

12/30/08

LABE	SOLN ID	TEST	CONC. UG/ML	SOLVENT	EXP.
1	1549-3	PCB	20	ACETONE	10/10/09
2	1472-3	BCOC PEST	10	ACETONE	07/20/08
3	1517-1	PEST	02/04/20	ACETONE	05/15/09
4	1561-2	LOW PEST	0.2/0.4/2	ACETONE	05/15/09
5	1537-1	EPH	1500	MECL2	08/16/09
6	1559-2	PCP	12.5/125	ACETONE	11/05/09
7	1573-1	ABN	100	ACETONE	08/01/09
8	1566-1	TBT	2.5	MECL2	12/04/09
9	1567-3	PORE TBT	.125/.25	MECL2	12/04/09
10	1554-3	ABN ACID	100/200	MEOH	10/21/09
11	1563-3	TPHD	15000	ACETONE	11/20/09
12	1563-1	ABN BASE	200	ACETONE	06/30/09
13	1573-2	LOW PCB	2	ACETONE	10/10/09
14	1547-1	LOW ABN ACID	10/20	MEOH	04/10/09
15*	1452-1	SIM PNA	15/75	MEOH	04/09/09
16	1502-2	DIOXANE	100	MEOH	02/20/09
17	1516-2	1248 PCB	20	ACETONE	05/07/09
18	1514-4	LOW SIM PNA	1.5/7.5	ACETONE	04/24/09
19	1517-3	AK103	7500	MECL2	12/29/08
20	1572-2	PNA	100	ACETONE	12/26/09
21*	1414-4	SKY/BHT	100	MEOH	04/08/09
22	1570-1	HERB	12.5/12500	MEOH	02/19/09
23	1505-1	LOW ABN BASE	20	MEOH	03/20/09
24	1541-4	LOW ABN	10	ACETONE	08/01/09
25	1481-1	DIPHENYL	100	MEOH	07/20/08
26	1545-2	OP-PEST	25	MEOH	02/14/09
27	1495-1	STEROLS	200	MEOH	12/29/08
28	1494-1	ADD. PEST	4	ACETONE	01/23/09
29	1496-3	DECANES	100	MEOH	02/12/09
30	1497-2	EDB/DBCP	2	ACETONE	02/12/09
31	1510-3	TERPINEOL	100	MEOH	03/21/09

LCS SOLUTIONS

12/30/08

32	1545-3	GUAIACOL	50-200	ACETONE	06/05/09
33	1522-1	RESIN ACID	250	ACETONE	06/11/09
34	1530-2	CONGENERS	1	ACETONE	07/23/09
50	1571-1	FULL RESIN	250	ACETONE	06/10/09
*=REVERIFIED SOLUTION					

SURR SOLUTIONS

12/30/08

LABEL	SOLN ID	TEST	CONC. UG/ML	SOLVENT	EXP.
A	1559-5	ABN	100/150	MEOH	03/13/09
B	1572-1	SIM PNA	15/75	MEOH	08/28/09
C	1559-1	SIM ABN	25/37.5	MEOH	03/13/09
D	1561-3	LOW PCB	0.2	ACETONE	07/31/09
E*	1478-1	HERB	62.5	MEOH	09/21/09
F	1520-3	PCP	12.5	ACETONE	04/18/09
G	1534-1	1,4DIOXANE	100	MEOH	02/20/09
H	1545-1	OP-PEST	25	MEOH	02/14/09
I	1559-4	LOW S. PNA	1.5	MEOH	08/28/09
J	1566-5	TBT-PORE	0.125	MECL2	12/04/09
K	1538-1	MED PCB	20	ACETONE	07/31/09
L	1566-4	TBT	2.5	MECL2	12/04/09
M	1558-2	EPH	1500	MECL2	09/24/09
N	1538-2	PCB	2	ACETONE	07/31/09
O	1567-4	TPH	450	MECL2	09/24/09
P	1560-3	HCID	2250	MECL2	09/24/09
Q	1497-3	EDB	2	ACETONE	02/12/09
R	1521-4	RESIN ACID	250	ACETONE	06/11/09
S	1568-5	PBDE	.25	MEOH	12/11/09
T	*reverified	solution			
U					
V					
W					
X					
Y					
Z					

Data Summary Package

prepared
for

HART CROWSER, INC.

Project: Port Gamble, 17330-14

ARI JOB NO: OG45

prepared
by

Analytical Resources, Inc.

PCBS

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082
Page 1 of 1

Sample ID: CLAM #1A
SAMPLE

Lab Sample ID: OG45A
LIMS ID: 09-357
Matrix: Tissue
Data Release Authorized:
Reported: 01/19/09

QC Report No: OG45-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/15/08
Date Received: 12/16/08

Date Extracted: 01/09/09
Date Analyzed: 01/16/09 20:53
Instrument/Analyst: ECD5/JGR
GPC Cleanup: Yes
Sulfur Cleanup: No
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.0 g-as-rec
Final Extract Volume: 2.0 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: NA

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	8.0	< 8.0 U
53469-21-9	Aroclor 1242	8.0	< 8.0 U
12672-29-6	Aroclor 1248	12	< 12 Y
11097-69-1	Aroclor 1254	8.0	< 8.0 U
11096-82-5	Aroclor 1260	8.0	< 8.0 U
11104-28-2	Aroclor 1221	8.0	< 8.0 U
11141-16-5	Aroclor 1232	8.0	< 8.0 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	57.5%
Tetrachlorometaxylene	61.8%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082
Page 1 of 1

Sample ID: CLAM 2A
SAMPLE

Lab Sample ID: OG45B
LIMS ID: 09-408
Matrix: Tissue
Data Release Authorized:
Reported: 01/19/09

QC Report No: OG45-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/15/08
Date Received: 12/16/08

Date Extracted: 01/09/09
Date Analyzed: 01/16/09 21:11
Instrument/Analyst: ECD5/JGR
GPC Cleanup: Yes
Sulfur Cleanup: No
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.0 g-as-rec
Final Extract Volume: 2.0 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: NA

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	8.0	< 8.0 U
53469-21-9	Aroclor 1242	8.0	< 8.0 U
12672-29-6	Aroclor 1248	8.0	< 8.0 U
11097-69-1	Aroclor 1254	8.0	< 8.0 U
11096-82-5	Aroclor 1260	8.0	< 8.0 U
11104-28-2	Aroclor 1221	8.0	< 8.0 U
11141-16-5	Aroclor 1232	8.0	< 8.0 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	61.2%
Tetrachlorometaxylene	64.2%

ANALYTICAL RESOURCES INCORPORATED

SW8082/PCB TISSUE SURROGATE RECOVERY SUMMARY

Matrix: Tissue

QC Report No: OG45-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14

Client ID	DCBP	TCMX	TOT OUT
MB-010909	71.5%	67.2%	0
LCS-010909	67.5%	65.8%	0
LCSD-010909	69.2%	63.2%	0
CLAM #1A	57.5%	61.8%	0
CLAM 2A	61.2%	64.2%	0

	LCS/MB LIMITS	QC LIMITS
(DCBP) = Decachlorobiphenyl	(36-130)	(33-149)
(TCMX) = Tetrachlorometaxylene	(30-119)	(32-121)

Prep Method: TissM
Log Number Range: 09-357 to 09-408

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082
Page 1 of 1

Sample ID: LCS-010909
LCS/LCSD

Lab Sample ID: LCS-010909
LIMS ID: 09-357
Matrix: Tissue
Data Release Authorized:
Reported: 01/19/09

QC Report No: OG45-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: NA
Date Received: NA

Date Extracted LCS/LCSD: 01/09/09

Date Analyzed LCS: 01/16/09 20:19
LCSD: 01/16/09 20:36
Instrument/Analyst LCS: ECD5/JGR
LCSD: ECD5/JGR
GPC Cleanup: Yes
Sulfur Cleanup: No
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount LCS: 25.0 g-as-rec
LCSD: 25.0 g-as-rec
Final Extract Volume LCS: 2.0 mL
LCSD: 2.0 mL
Dilution Factor LCS: 1.00
LCSD: 1.00
Silica Gel: No

Percent Moisture: NA

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Aroclor 1016	30.2	40.0	75.5%	28.6	40.0	71.5%	5.4%
Aroclor 1260	29.9	40.0	74.8%	30.0	40.0	75.0%	0.3%

PCB Surrogate Recovery

	LCS	LCSD
Decachlorobiphenyl	67.5%	69.2%
Tetrachlorometaxylene	65.8%	63.2%

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

PCB METHOD BLANK SUMMARY

BLANK NO.

OG45MBS1

Lab Name: ANALYTICAL RESOURCES, INC
Client: HART CROWSER, INC.

ARI Job No.: OG45
Project: PORT GAMBLE

Lab Sample ID: OG45MBS1
Lab File ID: 0116B017

Date Extracted: 01/09/09
Matrix: SOLID

Date Analyzed: 01/16/09
Instrument ID: ECD5

Time Analyzed: 2001
GC Columns: ZB5/ZB35

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

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED
01	OG45LCSS1	OG45LCSS1	01/16/09
02	OG45LCSDS1	OG45LCSDS1	01/16/09
03	CLAM #1A	OG45A	01/16/09
04	CLAM 2A	OG45B	01/16/09

ALL RUNS ARE DUAL COLUMN

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082
Page 1 of 1

Sample ID: MB-010909
METHOD BLANK

Lab Sample ID: MB-010909
LIMS ID: 09-357
Matrix: Tissue
Data Release Authorized:
Reported: 01/19/09

QC Report No: OG45-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: NA
Date Received: NA

Date Extracted: 01/09/09
Date Analyzed: 01/16/09 20:01
Instrument/Analyst: ECD5/JGR
GPC Cleanup: Yes
Sulfur Cleanup: No
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.0 g
Final Extract Volume: 2.0 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: NA

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	8.0	< 8.0 U
53469-21-9	Aroclor 1242	8.0	< 8.0 U
12672-29-6	Aroclor 1248	8.0	< 8.0 U
11097-69-1	Aroclor 1254	8.0	< 8.0 U
11096-82-5	Aroclor 1260	8.0	< 8.0 U
11104-28-2	Aroclor 1221	8.0	< 8.0 U
11141-16-5	Aroclor 1232	8.0	< 8.0 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	71.5%
Tetrachlorometaxylene	67.2%

METALS

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: CLAM #1A
SAMPLE

Lab Sample ID: OG45A
LIMS ID: 09-357
Matrix: Tissue
Data Release Authorized:
Reported: 01/22/09

QC Report No: OG45-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/15/08
Date Received: 12/16/08

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-as-rec	Q
3050B	01/08/09	6010B	01/21/09	**7440-38-2**	**Arsenic**	1	**2**	
3050B	01/08/09	6010B	01/21/09	**7440-43-9**	**Cadmium**	0.04	**0.36**	
3050B	01/08/09	6010B	01/21/09	**7440-47-3**	**Chromium**	0.1	**0.3**	
3050B	01/08/09	6010B	01/21/09	**7440-50-8**	**Copper**	0.04	**1.37**	
3050B	01/08/09	6010B	01/21/09	7439-92-1	Lead	0.4	0.4	U
CLP-M	01/08/09	7471A	01/14/09	7439-97-6	Mercury	0.01	0.01	U
3050B	01/08/09	6010B	01/21/09	**7440-22-4**	**Silver**	0.06	**0.12**	
3050B	01/08/09	6010B	01/21/09	**7440-66-6**	**Zinc**	0.2	**10.1**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: CLAM 2A
SAMPLE

Lab Sample ID: OG45B
LIMS ID: 09-408
Matrix: Tissue
Data Release Authorized:
Reported: 01/22/09

QC Report No: OG45-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/15/08
Date Received: 12/16/08

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-as-rec	Q
3050B	01/08/09	6010B	01/21/09	**7440-38-2**	**Arsenic**	1	**2**	
3050B	01/08/09	6010B	01/21/09	**7440-43-9**	**Cadmium**	0.04	**0.24**	
3050B	01/08/09	6010B	01/21/09	**7440-47-3**	**Chromium**	0.1	**0.3**	
3050B	01/08/09	6010B	01/21/09	**7440-50-8**	**Copper**	0.04	**1.02**	
3050B	01/08/09	6010B	01/21/09	7439-92-1	Lead	0.4	0.4	U
CLP-M	01/08/09	7471A	01/14/09	7439-97-6	Mercury	0.01	0.01	U
3050B	01/08/09	6010B	01/21/09	**7440-22-4**	**Silver**	0.06	**0.09**	
3050B	01/08/09	6010B	01/21/09	**7440-66-6**	**Zinc**	0.2	**10.5**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: LAB CONTROL

Lab Sample ID: OG44LCS
LIMS ID: 09-348
Matrix: Tissue
Data Release Authorized:
Reported: 01/22/09

QC Report No: OG44-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: NA
Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike Found	Spike Added	% Recovery	Q
Arsenic	6010B	80	80	100%	
Cadmium	6010B	20.3	20.0	102%	
Chromium	6010B	19.8	20.0	99.0%	
Copper	6010B	19.2	20.0	96.0%	
Lead	6010B	79.4	80.0	99.2%	
Mercury	7471A	0.21	0.20	105%	
Silver	6010B	20.3	20.0	102%	
Zinc	6010B	20.1	20.0	100%	

Reported in mg/kg-wet

N-Control limit not met
NA-Not Applicable, Analyte Not Spiked
Control Limits: 80-120%

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: METHOD BLANK

Lab Sample ID: OG44MB
LIMS ID: 09-348
Matrix: Tissue
Data Release Authorized:
Reported: 01/22/09

QC Report No: OG44-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: NA
Date Received: NA

Percent Total Solids: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-as-rec	Q
3050B	01/08/09	6010B	01/21/09	7440-38-2	Arsenic	1	1	U
3050B	01/08/09	6010B	01/21/09	7440-43-9	Cadmium	0.04	0.04	U
3050B	01/08/09	6010B	01/21/09	7440-47-3	Chromium	0.1	0.1	U
3050B	01/08/09	6010B	01/21/09	7440-50-8	Copper	0.04	0.04	U
3050B	01/08/09	6010B	01/21/09	7439-92-1	Lead	0.4	0.4	U
CLP-M	01/08/09	7471A	01/14/09	7439-97-6	Mercury	0.01	0.01	U
3050B	01/08/09	6010B	01/21/09	7440-22-4	Silver	0.06	0.06	U
3050B	01/08/09	6010B	01/21/09	7440-66-6	Zinc	0.2	0.2	U

U-Analyte undetected at given RL
RL-Reporting Limit

DIOXIN

SGS

Laboratory Results

Ms. Kelly Bottem
Analytical Resources, Inc.
4611 S. 134th Place
Suite 100
Tukwila WA 98168-3240

Phone: 206-695-6211
Fax: 206-695-6201

Dear Ms. Bottem:

Enclosed is a full data package containing the final results for samples received by SGS Environmental Services, Inc. on January 15, 2009 under your project name "Port Gamble". The samples were analyzed by Method 1613 following SGS's Standard Operating Procedures and are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards.

Number of Samples Received:	2
Your Project Reference:	Port Gamble
SGS Project Number:	G1040-5

We appreciate your business and look forward to working with you again. Please contact me at 910-350-1903 if you have questions or need additional technical support.

Sincerely,

Jeannie Milholland

Jeannie Milholland
Project Manager

2-17-2009
Date

DC138.033007.7

SGS

Case Narrative
SGS Project: **G1040-5**
Project Name: **Port Gamble**

For Method: 1613

- The submitted samples were accepted into the lab on January 15th, 2009 and extracted on February 1st, 2009 by method 3540C. The sample extract and associated QC extracts were then processed through clean-up as prescribed in the SGS standard operating procedures and analyzed by HRGC/HRMS for method 1613.
- No analytical issues were encountered.

Craig R. Tronzo 2/17/09

Craig R. Tronzo Date
Data Validation

Paradigm Analytical Laboratories, Inc. | 5500 Business Dr., Wilmington, NC 28405 t (910) 350-1903 f (910) 350-1557 www.us.sgs.com

SGS

Table of Contents

Section 1: Cover Letter/Case Narrative

Contains the Table of Contents, a project narrative, the client and SGS project identifiers, the number and type of samples, the methodology used to process the samples, and a summary table of sample results. A listing of current certifications by state, a table of abbreviations and qualifiers and the Toxic Equivalent Factors (TEF) are also supplied.

Section 2: Project Information

Contains the chain-of-custody(s), internal chain-of-custody(s) if applicable, sample login summary, sample receipt checklist, and any other project/client specific information.

Section 3: Sample Analytical Results

Contains results for client samples. Sample results include two pages of summarized analytical data and the associated raw data. The raw data includes a quantitation report from the instrumentation used that lists, ion areas, ratios, retention times, concentrations, and signal-to-noise ratios. It also has the selected ion current profiles (SICPs) for all homolog groups and any manual integrations.

Section 4: Quality Control Analytical Results

Contains results for each analytical workgroup associated with the submitted samples. A workgroup consists of the Lab Method Blank (LMB) and the Ongoing Precision and Recovery sample (OPR). All sample preparation data, including dry weight determinations, extraction logs, clean-up logs and observation notes are also documented. Any other supporting QC data will be documented here upon client request.

Section 5: Initial Calibration

Contains a table summarizing calibration data such as relative response factors, concentrations, and percent relative standard deviation. This section also contains related daily instrument QC information: GC performance data, mass resolution check, windows defining mix, and SICPs for all homolog groups and any manual integrations as well as the injection prep and instrument run logs.

Section 6: Continuing Calibration Data

Contains all daily instrument quality control information. This includes mass resolution checks, a table summarizing the window defining peaks, SICPs for the first and last eluters for each homolog group, SICPs documenting GC performance, a summary quantitation report showing RRFs for the Ccal and Ical, and SICPs for all homolog groups and any manual integrations, injection prep and instrumentation runlogs.

SGS

List of Qualifiers: Dioxin's

B Analyte was detected in the Lab Method Blank at a level above the Reporting Limit.

EDL "Estimated Detection Limit"

EMPC "Estimated Maximum Possible Concentration"

RL Report Limit

CL Control Limit

U Undetected

ppt Parts-per-trillion (pg/g; ng/L)

V Recovery is below quality control limit. The data has been validated based on a favorable signal-to-noise and detection limit.

Outside quality control limits

* Indicates that the ion-ratio fails high or low; analyte reported as an EMPC

An average uncertainty of 30% can be routinely achieved as concluded from the evaluation of HRGC-HRMS standard operating procedures. The following flags warn the data user of situations where the uncertainty may be greater than stated.

A Amount detected is less than the Lower Method Calibration Limit.

J Amount detected is between the Method Detection Limit and the Lower Calibration Limit.

O The recovery of this analyte in the OPR is above the Method QC Limits and the reported concentration in the sample may be biased high.

E Amount detected is greater than the Upper Calibration Limit.

S The amount of analyte present has saturated the detector. This situation results in an underestimation of the affected analyte(s).

Q Indicates the presence of a quantitative interference. This situation may result in an underestimation of the affected analyte(s).

I Indicates the presence of a qualitative interference that could cause a false positive or an overestimation of the affected analyte(s).

DPE Indicates the presence of a peak in the polychlorinated diphenylether channel that could cause a false positive or an overestimation of the affected analyte(s).

DC250.081908.1

Toxic Equivalency Factors

Analyte	WHO* 1998	WHO* 2005	International-89	MADEP+
2,3,7,8-TCDD	1	1	1	1
1,2,3,7,8-PeCDD	1	1	0.5	0.5
1,2,3,4,7,8-HxCDD	0.1	0.1	0.1	0.1
1,2,3,6,7,8-HxCDD	0.1	0.1	0.1	0.1
1,2,3,7,8,9-HxCDD	0.1	0.1	0.1	0.1
1,2,3,4,6,7,8-HpCDD	0.01	0.01	0.01	0.1
OCDD	0.0001	0.0003	0.001	0.001
2,3,7,8-TCDF	0.1	0.1	0.1	0.1
1,2,3,7,8-PeCDF	0.05	0.03	0.05	0.5
2,3,4,7,8-PeCDF	0.5	0.3	0.5	0.5
1,2,3,4,7,8-HxCDF	0.1	0.1	0.1	0.1
1,2,3,6,7,8-HxCDF	0.1	0.1	0.1	0.1
2,3,4,6,7,8-HxCDF	0.1	0.1	0.1	0.1
1,2,3,7,8,9-HxCDF	0.1	0.1	0.1	0.1
1,2,3,4,6,7,8-HpCDF	0.01	0.01	0.01	0.1
1,2,3,4,7,8,9-HpCDF	0.01	0.01	0.01	0.1
OCDF	0.0001	0.0003	0.001	0.001

* World Health Organization
+ Massachusetts Department of Environmental Protection

SUBCONTRACTOR ANALYSIS REQUEST
CUSTODY TRANSFER 01/07/09

ANALYTICAL RESOURCES INCORPORATED

ARI Project: OG45

G1040-5

Laboratory: SGS ENVIROMENTAL SERVICES INC.
Lab Contact: TRENT TEMPERLY
Lab Address: 5500 BUSINESS DR.
WILMINGTON, NC 28405
Phone: 910-350-1903
Fax: 910-350-1557

ARI Client: Hart Crowser, Inc.
Project ID: PORT GAMBLE
ARI PM: Kelly Bottem
Phone: 206-695-6211
Fax: 206-695-6201

Analytical Protocol: In-house
Special Instructions:

Requested Turn Around: **01/20/09**
Fax Results (Y/N):

Limits of Liability. *Subcontractor is expected to perform all requested services in accordance with appropriate methodology following Standard Operating Procedures that meet standards for the industry. The total liability of ARI, its officers, agents, employees, or sucessors, arising out of or in connection with the requested services, shall not exceed the negotiated amount for said services. The agreement by the Subcontractor to perform services requested by ARI releases 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 Subcontractor.*

ARI ID	Client ID/ Add'l ID	Sampled	Matrix	Bottles	Analyses
09-357-OG45A	CLAM #1A	12/15/08	Tissue	1	Dioxin/Furans 1613(Sub)
Special Instructions: None					
09-408-OG45B	CLAM 2A	12/15/08	Tissue	1	Dioxin/Furans 1613(Sub)
Special Instructions: None					

Carrier UPS	Airbill 1Z 832 695 01 4592 6947		Date 1/14/09
Relinquished by	Company ARI	Date 1/14/09	Time 1600
Received by	Company SGS 3.5 no Seal	Date 1/15/09	Time 10:15

Subcontractor Custody Form - **OG45**
Page 1 of 1

SGS Environmental Services, Inc.

Cust Proj ID: OG45
Client Name: Analytical Resources, Inc. PO:

G1040-5

Due Date: 2009-02-05 17:00:00
Login Date: 2009-01-16 11:29:30

Sample ID		Cust Sample ID	PRI	Date Collected	Date Received	Date Due	Matrix	LOC	Report	Analysis	Status
G1040-5-1	A	CLAM #1A	STD	2008-12-15 00:00:00	2009-01-15	2009-02-05	Tissue	F2	Full	1613	LG::REVW
G1040-5-2	A	CLAM #2A	STD	2008-12-15 00:00:00	2009-01-15	2009-02-05	Tissue	F2	Full	1613	LG::REVW

Sample Receipt Checklist (SRC)

SGS Environmetal Services Inc.

Client: **Analytical Resources, Inc.** Lab Proj. ID: **G1040-5**

Client Proj. ID: **OG45**

1. X Shipped — Notes:
   __ Hand Delivered

2. X Proper, full, and complete documentation — Notes:
   (unique sample identification on durable label with indelible ink, location of collection, date/time of collection, collector's name, preservation type, sample type (method/matrix))
   __ Acceptable documentation (but, incomplete)
   __ Unacceptable documentation

3. __ Custody Tape on Container — Notes:
   X No Custody Tape

4. X Samples Intact* — Notes:
   (are in appropriate container, are not damaged, and do not show signs of contamination)
   __ Samples Broken / Leaking
   __ VOA Vials Checked for Air Bubbles

5. x Chilled on Receipt* Actual Temp.(s) in °C: 3.5
   __ Ambient on Receipt — Notes:
   __ Walk-in on Ice; Coming down to temp.
   __ Received out of temperature protocol

6. X Sufficient Sample Submitted — Notes:
   __ Insufficient Sample Submitted

7. X Samples Preserved Correctly* — Notes:
   (see preservative checklist where applicable)
   __ Improper Preservative(s)
   __ None recommended (N/A)

8. X Received Within Holding Time — Notes:
   __ Not Received Within Holding Time
   __ N/A

9. X No Discrepancies Noted — Notes:
   __ Discrepancies Noted

Comments: No collection times.

* = Rejection of sample is required when not marked; Contact client services immediately for a resolution.

Inspected and Logged in by: _____

DC27.091503.3 Date / Time: Fri-1/16/09 11:31

Method 1613

CLAM #1A

Analytical Resources, Inc.

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	RL (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	1.00			
1,2,3,7,8-PeCDD	ND	5.00			
1,2,3,4,7,8-HxCDD	ND	5.00			
1,2,3,6,7,8-HxCDD	ND	5.00			
1,2,3,7,8,9-HxCDD	ND	5.00			
1,2,3,4,6,7,8-HpCDD	ND	5.00			
OCDD	ND	10.0			
2,3,7,8-TCDF	ND	1.00			
1,2,3,7,8-PeCDF	ND	5.00			
2,3,4,7,8-PeCDF	ND	5.00			
1,2,3,4,7,8-HxCDF	ND	5.00			
1,2,3,6,7,8-HxCDF	ND	5.00			
2,3,4,6,7,8-HxCDF	ND	5.00			
1,2,3,7,8,9-HxCDF	ND	5.00			
1,2,3,4,6,7,8-HpCDF	ND	5.00			
1,2,3,4,7,8,9-HpCDF	ND	5.00			
OCDF	ND	10.0			
Total TCDDs	ND	1.00			
Total PeCDDs	ND	5.00			
Total HxCDDs	ND	5.00			
Total HpCDDs	ND	5.00			
Total TCDFs	ND	1.00			
Total PeCDFs	ND	5.00			
Total HxCDFs	ND	5.00			
Total HpCDFs	ND	5.00			
WHO-2005 TEQ (ND=0)	0.000				
WHO-2005 TEQ (ND=½)	5.70				

Client Information

Project Name:	Port Gamble		
Sample ID:	CLAM #1A		
Laboratory Information			
Project ID:	G1040-5		
Sample ID:	G1040-5-1B		
Collection Date:	15-Dec-08		
Receipt Date:	15-Jan-09	10:15	
Extraction Date:	01-Feb-09		
Analysis Date:	05-Feb-09	1:44	

Sample Information

Matrix:	Tissue	
Weight / Volume:	10.67	grams
Solids / Lipids:	NA	%
Original pH :	NA	
Batch ID:	WG16457	
Filename:	a27jan09a_18-13	
Retchk:	a27jan09a_17-15	
Begin ConCal:	a27jan09a_17-15	
Initial Cal:	m1613-100708a	

Method 1613

CLAM #1A

Analytical Resources, Inc.

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
$^{13}C_{12}$-2,3,7,8-TCDD	2	1.47	73.7	31:28	0.80	
$^{13}C_{12}$-1,2,3,7,8-PeCDD	2	1.52	75.8	34:16	1.57	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	2	1.53	76.7	36:52	1.27	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	2	1.55	77.4	36:58	1.26	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	2	1.39	69.3	40:20	1.06	
$^{13}C_{12}$-OCDD	4	1.61	40.1	44:40	0.89	
$^{13}C_{12}$-2,3,7,8-TCDF	2	1.53	76.6	30:52	0.79	
$^{13}C_{12}$-1,2,3,7,8-PeCDF	2	1.75	87.5	33:28	1.58	
$^{13}C_{12}$-2,3,4,7,8-PeCDF	2	1.55	77.3	34:05	1.58	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	2	1.54	77.2	36:09	0.52	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	2	1.61	80.3	36:16	0.53	
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	2	1.55	77.7	36:45	0.52	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	2	1.50	75.1	37:33	0.52	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	2	1.40	70.2	39:03	0.45	
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	2	1.44	72.1	41:02	0.45	
Cleanup Standard						
$^{37}Cl_4$-2,3,7,8-TCDD	0.4	0.320	80.0	31:28		
Injection Standards						
$^{13}C_{12}$-1,2,3,4-TCDD	2			31:00	0.80	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	2			37:13	1.25	

Client Information

Project Name: Port Gamble

Sample ID: CLAM #1A

Laboratory Information

Project ID: G1040-5
Sample ID: G1040-5-1B
Collection Date: 15-Dec-08
Receipt Date: 15-Jan-09 10:15
Extraction Date: 01-Feb-09
Analysis Date: 05-Feb-09 1:44

Sample Information

Matrix: Tissue
Weight / Volume: 10.67 grams
Solids / Lipids: NA %
Original pH : NA
Batch ID: WG16457

Filename: a27jan09a_18-13
Retchk: a27jan09a_17-15
Begin ConCal: a27jan09a_17-15

Initial Cal: m1613-100708a

Analyzed by: _____ Date: 020509

Reviewed by: _____ Date: 2/5/09

Form Version:[1613_HRMS12]Repor

Filename ; a27jan09a_18 ;*1613*
Sample ; 13
Acquired ; 5-FEB-09 01:44:57
Processed ; 5-FEB-09 07:32:58
Sample ID ; G1040-5-1B
Cal Table ; m1613-100708a
Results Table ; M1613-012709A_18
Comments ;

Ent;	Name;	Resp;	Ion 1;	Ion 2;	RA;?;	RT;	Conc;	EDL;	S/N1;?;	S/N2;?;M;	Signal1;	Noise 1;	Signal2;	Noise 2
1 ;	2,3,7,8-TCDD;	*;	*;	*;	*;n;	NotFnd;	*;	0.2057;	*;n;	*;n;n;	*;5.23e+03;		*;5.49e+03	
2 ;	1,2,3,7,8-PeCDD;	*;	*;	*;	*;n;	NotFnd;	*;	0.2404;	*;n;	*;n;n;	*;6.88e+03;		*;5.56e+03	
3 ;	1,2,3,4,7,8-HxCDD;	*;	*;	*;	*;n;	NotFnd;	*;	0.3252;	*;n;	*;n;n;	*;5.26e+03;		*;6.76e+03	
4 ;	1,2,3,6,7,8-HxCDD;	*;	*;	*;	*;n;	NotFnd;	*;	0.3252;	*;n;	*;n;n;	*;5.26e+03;		*;6.76e+03	
5 ;	1,2,3,7,8,9-HxCDD;	*;	*;	*;	*;n;	NotFnd;	*;	0.3274;	*;n;	*;n;n;	*;5.26e+03;		*;6.76e+03	
6 ;	1,2,3,4,6,7,8-HpCDD;	*;	*;	*;	*;n;	NotFnd;	*;	0.6121;	*;n;	*;n;n;	*;5.39e+03;		*;7.32e+03	
7 ;	OCDD;	*;	*;	*;	*;n;	NotFnd;	*;	1.7143;	*;n;	*;n;n;	*;6.77e+03;		*;4.84e+03	
8 ;	2,3,7,8-TCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.2090;	*;n;	*;n;n;	*;6.88e+03;		*;7.10e+03	
9 ;	1,2,3,7,8-PeCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.1636;	*;n;	*;n;n;	*;7.11e+03;		*;7.54e+03	
10 ;	2,3,4,7,8-PeCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.1748;	*;n;	*;n;n;	*;7.11e+03;		*;7.54e+03	
11 ;	1,2,3,4,7,8-HxCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.2237;	*;n;	*;n;n;	*;6.10e+03;		*;6.42e+03	
12 ;	1,2,3,6,7,8-HxCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.2070;	*;n;	*;n;n;	*;6.10e+03;		*;6.42e+03	
13 ;	2,3,4,6,7,8-HxCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.2182;	*;n;	*;n;n;	*;6.10e+03;		*;6.42e+03	
14 ;	1,2,3,7,8,9-HxCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.3173;	*;n;	*;n;n;	*;6.10e+03;		*;6.42e+03	
15 ;	1,2,3,4,6,7,8-HpCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.3276;	*;n;	*;n;n;	*;6.56e+03;		*;5.84e+03	
16 ;	1,2,3,4,7,8,9-HpCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.4986;	*;n;	*;n;n;	*;6.56e+03;		*;5.84e+03	
17 ;	OCDF;	*;	*;	*;	*;n;	NotFnd;	*;	1.4176;	*;n;	*;n;n;	*;6.38e+03;		*;5.04e+03	
Extraction Standards														
18 ;	13C-2,3,7,8-TCDD;	5.19e+07;	2.30e+07;	2.89e+07;	0.80;y;	31:28;	73.718;	0.1836;	1277;y;	1516;y;n;	6.86e+06;	5.37e+03;	8.64e+06;	5.70e+03
19 ;	13C-1,2,3,7,8-PeCDD;	3.90e+07;	2.38e+07;	1.52e+07;	1.57;y;	34:16;	75.739;	0.3004;	1335;y;	886;y;n;	9.00e+06;	6.74e+03;	5.76e+06;	6.50e+03
20 ;	13C-1,2,3,4,7,8-HxCDD;	3.47e+07;	1.94e+07;	1.53e+07;	1.27;y;	36:52;	76.683;	0.3038;	1031;y;	659;y;n;	5.97e+06;	5.79e+03;	4.77e+06;	7.23e+03
21 ;	13C-1,2,3,6,7,8-HxCDD;	3.80e+07;	2.12e+07;	1.68e+07;	1.26;y;	36:58;	77.364;	0.2796;	1069;y;	688;y;n;	6.19e+06;	5.79e+03;	4.98e+06;	7.23e+03
22 ;	13C-1,2,3,4,6,7,8-HpCDD;	2.57e+07;	1.32e+07;	1.24e+07;	1.06;y;	40:20;	69.287;	0.3675;	430;y;	483;y;n;	3.01e+06;	6.99e+03;	2.86e+06;	5.93e+03
23 ;	13C-OCDD;	2.37e+07;	1.12e+07;	1.25e+07;	0.89;y;	44:40;	80.251;	0.3667;	334;y;	416;y;n;	1.81e+06;	5.42e+03;	2.01e+06;	4.83e+03
24 ;	13C-2,3,7,8-TCDF;	7.99e+07;	3.54e+07;	4.45e+07;	0.79;y;	30:52;	76.565;	0.1288;	1463;y;	1909;y;n;	8.66e+06;	5.92e+03;	1.07e+07;	5.59e+03
25 ;	13C-1,2,3,7,8-PeCDF;	7.38e+07;	4.53e+07;	2.86e+07;	1.58;y;	33:28;	87.515;	0.2798;	4272;y;	644;y;n;	1.67e+07;	3.92e+03;	1.05e+07;	1.63e+04
26 ;	13C-2,3,4,7,8-PeCDF;	6.39e+07;	3.91e+07;	2.48e+07;	1.58;y;	34:05;	77.324;	0.2858;	3791;y;	577;y;n;	1.48e+07;	3.92e+03;	9.40e+06;	1.63e+04
27 ;	13C-1,2,3,4,7,8-HxCDF;	4.51e+07;	1.54e+07;	2.97e+07;	0.52;y;	36:09;	77.194;	0.1994;	994;y;	1584;y;n;	4.96e+06;	4.99e+03;	9.57e+06;	6.04e+03
28 ;	13C-1,2,3,6,7,8-HxCDF;	5.17e+07;	1.78e+07;	3.39e+07;	0.53;y;	36:16;	80.274;	0.1806;	1115;y;	1730;y;n;	5.57e+06;	4.99e+03;	1.05e+07;	6.04e+03
29 ;	13C-2,3,4,6,7,8-HxCDF;	4.71e+07;	1.60e+07;	3.11e+07;	0.52;y;	36:45;	77.650;	0.1921;	1035;y;	1662;y;n;	5.17e+06;	4.99e+03;	1.00e+07;	6.04e+03
30 ;	13C-1,2,3,7,8,9-HxCDF;	4.05e+07;	1.39e+07;	2.67e+07;	0.52;y;	37:33;	75.077;	0.2156;	741;y;	1165;y;n;	3.70e+06;	4.99e+03;	7.04e+06;	6.04e+03
31 ;	13C-1,2,3,4,6,7,8-HpCDF;	3.25e+07;	1.00e+07;	2.25e+07;	0.45;y;	39:03;	70.209;	0.4062;	268;y;	687;y;n;	2.58e+06;	9.61e+03;	5.64e+06;	8.21e+03
32 ;	13C-1,2,3,4,7,8,9-HpCDF;	2.63e+07;	8.17e+06;	1.81e+07;	0.45;y;	41:02;	72.050;	0.5156;	177;y;	460;y;n;	1.70e+06;	9.61e+03;	3.77e+06;	8.21e+03
Injection Standards														
33 ;	13C-1,2,3,4-TCDD;	6.31e+07;	2.80e+07;	3.51e+07;	0.80;y;	31:00;	46.470;	-;	1333;y;	1590;y;n;	7.16e+06;	5.37e+03;	9.06e+06;	5.70e+03
34 ;	13C-1,2,3,7,8,9-HxCDD;	4.70e+07;	2.61e+07;	2.09e+07;	1.25;y;	37:13;	43.580;	-;	1283;y;	823;y;n;	7.43e+06;	5.79e+03;	5.95e+06;	7.23e+03
Cleanup Standard														
35 ;	37Cl-2,3,7,8-TCDD;	1.20e+07;	1.20e+07;	-;	-;-;	31:28;	16.004;	0.1043;	552;y;	-;-;n;	3.70e+06;	6.70e+03;	-;	-

Totals Raw Data

	Conc	Empc	Flags
TCDF	0	0	FALSE
TCDD	0	0	FALSE
PeCDF	0	0	FALSE
PeCDD	0	0	FALSE
HxCDF	0	0	FALSE
HxCDD	0	0	FALSE
HpCDF	0	0	FALSE
HpCDD	0	0	FALSE

Filename:	a27jan09a_18	Name of Homolog Group:	Total Tetra-Furans
Sample:	13	Number of Peaks Found:	0
Acquired:	5-FEB-09 01:44:57	RRF Used For Totals:	1.0368
Processed:	5-FEB-09 07:32:58	Detection Limit:	0.209
Sample ID:	G1040-5-1B	Noise Height Ion1/Ion2:	6876 / 7100
Cal Table:	m1613-100708a	Begin Window:	
Results Table:	M1613-012709A_18	End Window:	

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	*	*	*	*	n	NotFnd	*		*	n	*	n	n

Filename:	a27jan09a_18	Name of Homolog Group:	Total Tetra-Dioxins
Sample:	13	Number of Peaks Found:	0
Acquired:	5-FEB-09 01:44:57	RRF Used For Totals:	1.0087
Processed:	5-FEB-09 07:32:58	Detection Limit:	0.2057
Sample ID:	G1040-5-1B	Noise Height Ion1/Ion2:	5231 / 5490
Cal Table:	m1613-100708a	Begin Window:	
Results Table:	M1613-012709A_18	End Window:	

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	*	*	*	*	n	NotFnd	*		*	n	*	n	n

Filename:	a27jan09a_18	Name of Homolog Group:	Total Penta-Furans Fn1
Sample:	13	Number of Peaks Found:	0
Acquired:	5-FEB-09 01:44:57	RRF Used For Totals:	1.0121
Processed:	5-FEB-09 07:32:58	Detection Limit:	0.1226
Sample ID:	G1040-5-1B	Noise Height Ion1/Ion2:	5036 / 5612
Cal Table:	m1613-100708a	Begin Window:	
Results Table:	M1613-012709A_18	End Window:	

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	*	*	*	*	n	NotFnd	*		*	n	*	n	n

Totals Raw Data

Filename:	a27jan09a_18	Name of Homolog Group:	Total Penta-Furans Fn2
Sample:	13	Number of Peaks Found:	0
Acquired:	5-FEB-09 01:44:57	RRF Used For Totals:	1.0121
Processed:	5-FEB-09 07:32:58	Detection Limit:	0.1687
Sample ID:	G1040-5-1B	Noise Height Ion1/Ion2:	7108 / 7544
Cal Table:	m1613-100708a	Begin Window:	
Results Table:	M1613-012709A_18	End Window:	

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	*	*	*	*	n	NotFnd	*		*	n	*	n	n

Filename:	a27jan09a_18	Name of Homolog Group:	Total Penta-Dioxins
Sample:	13	Number of Peaks Found:	0
Acquired:	5-FEB-09 01:44:57	RRF Used For Totals:	1.0517
Processed:	5-FEB-09 07:32:58	Detection Limit:	0.2404
Sample ID:	G1040-5-1B	Noise Height Ion1/Ion2:	6880 / 5564
Cal Table:	m1613-100708a	Begin Window:	
Results Table:	M1613-012709A_18	End Window:	

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	*	*	*	*	n	NotFnd	*		*	n	*	n	n

Filename:	a27jan09a_18	Name of Homolog Group:	Total Hexa-Furans
Sample:	13	Number of Peaks Found:	0
Acquired:	5-FEB-09 01:44:57	RRF Used For Totals:	1.1305
Processed:	5-FEB-09 07:32:58	Detection Limit:	0.2377
Sample ID:	G1040-5-1B	Noise Height Ion1/Ion2:	6104 / 6424
Cal Table:	m1613-100708a	Begin Window:	
Results Table:	M1613-012709A_18	End Window:	

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	*	*	*	*	n	NotFnd	*		*	n	*	n	n

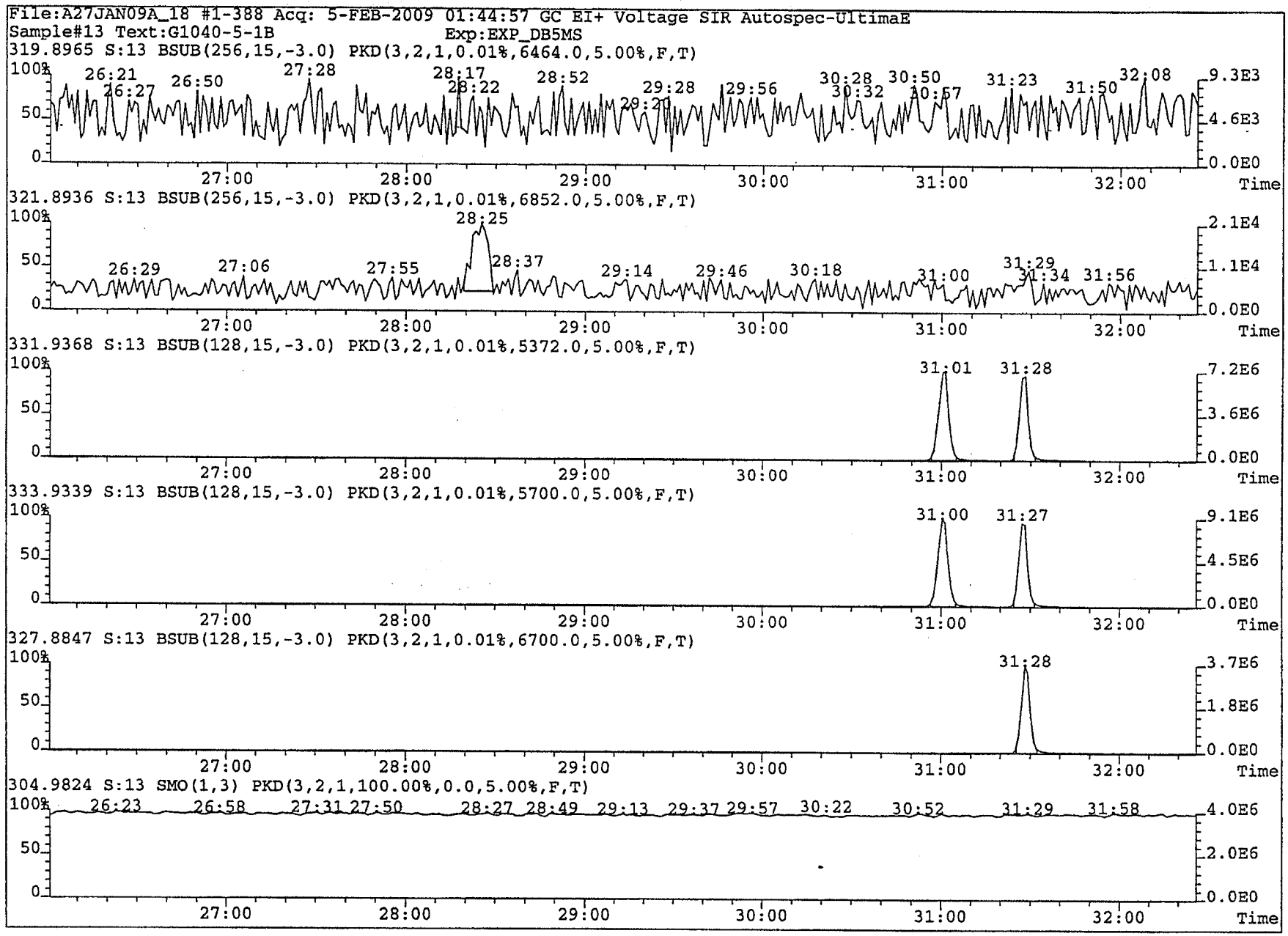
Filename:	a27jan09a_18	Name of Homolog Group:	Total Hexa-Dioxins
Sample:	13	Number of Peaks Found:	0
Acquired:	5-FEB-09 01:44:57	RRF Used For Totals:	1.0077
Processed:	5-FEB-09 07:32:58	Detection Limit:	0.3261
Sample ID:	G1040-5-1B	Noise Height Ion1/Ion2:	5256 / 6760
Cal Table:	m1613-100708a	Begin Window:	
Results Table:	M1613-012709A_18	End Window:	

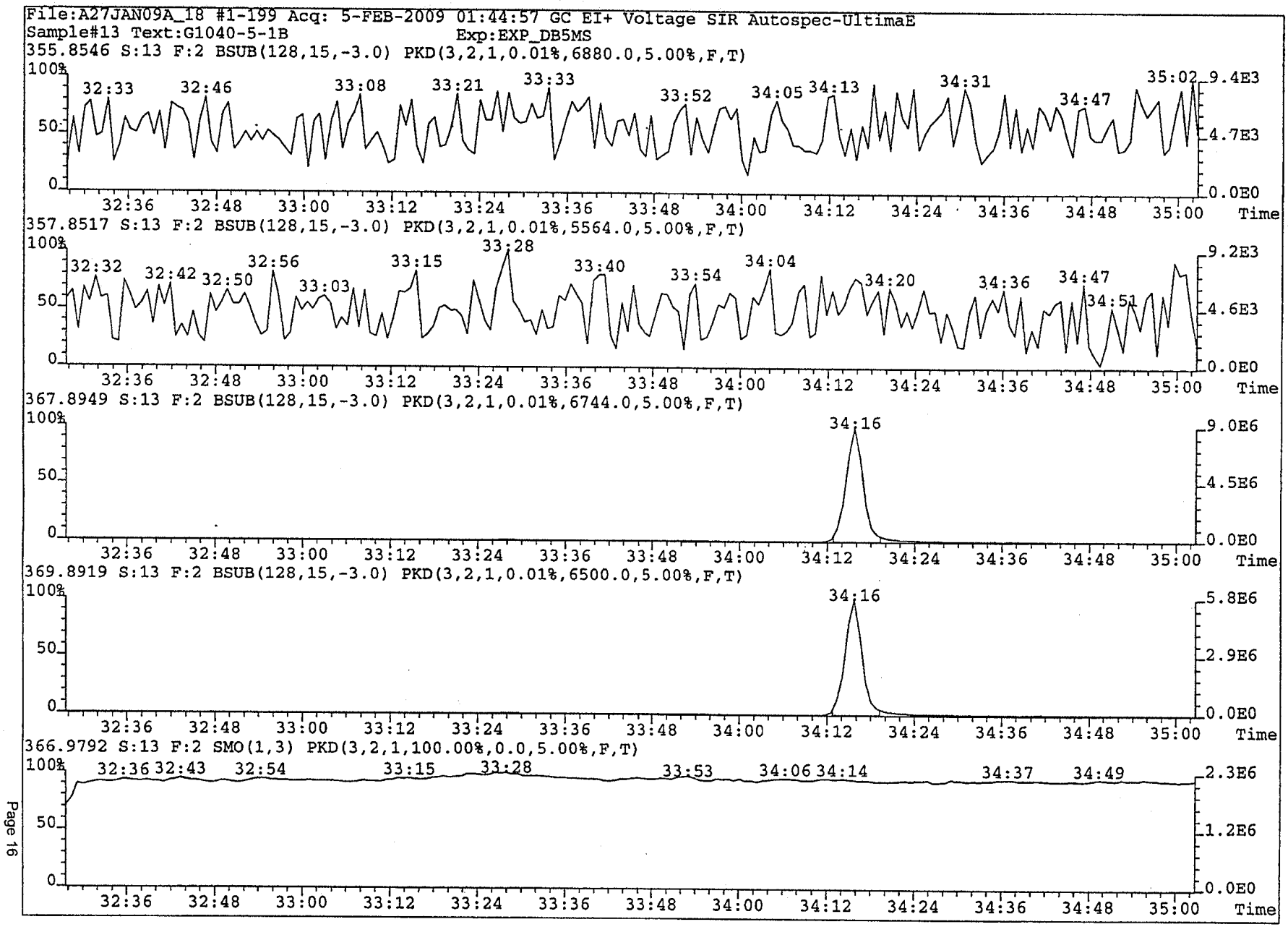
Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?

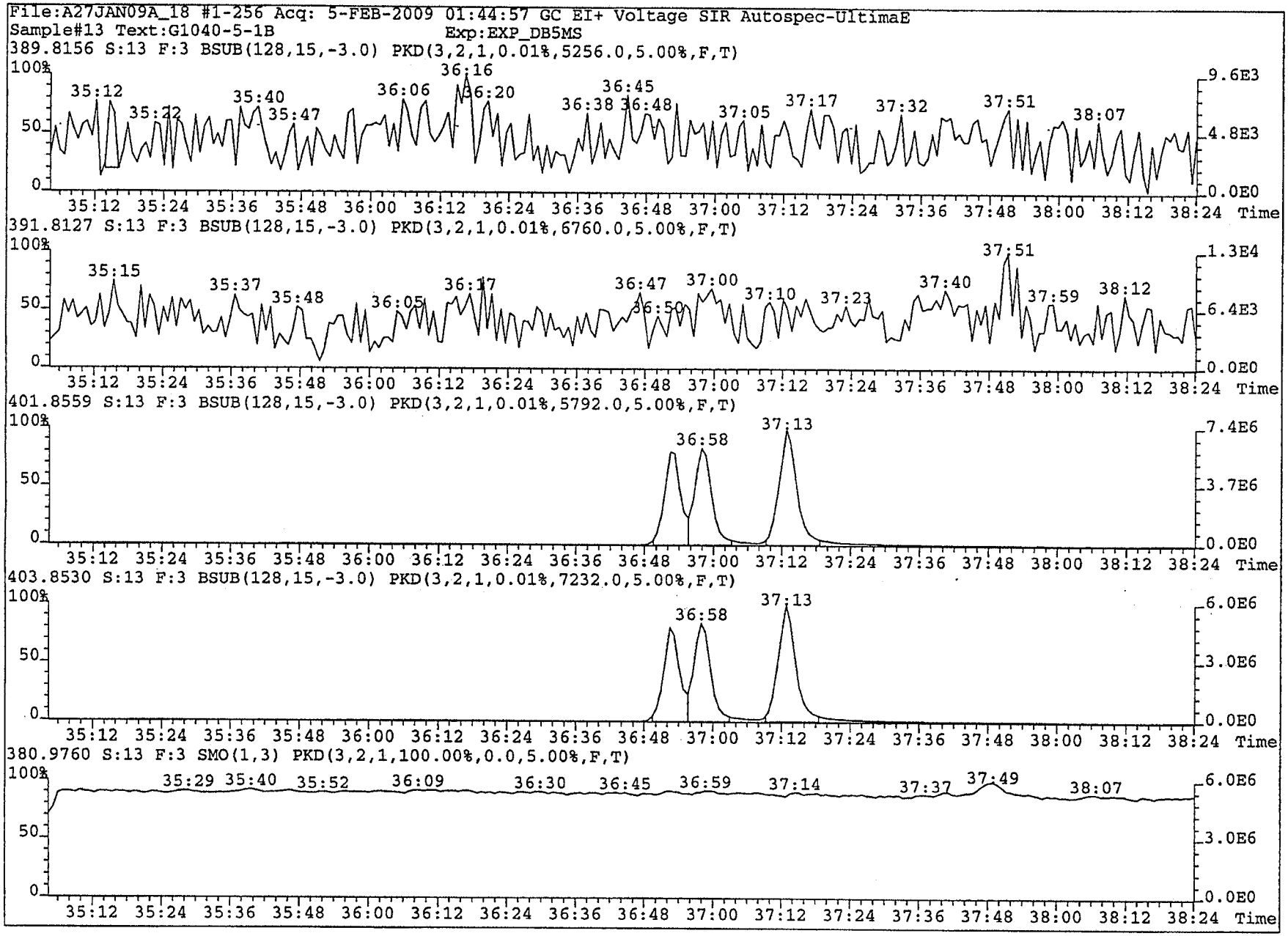
		1	*		*	*	*	n	NotFnd	*		*	n	*	n n

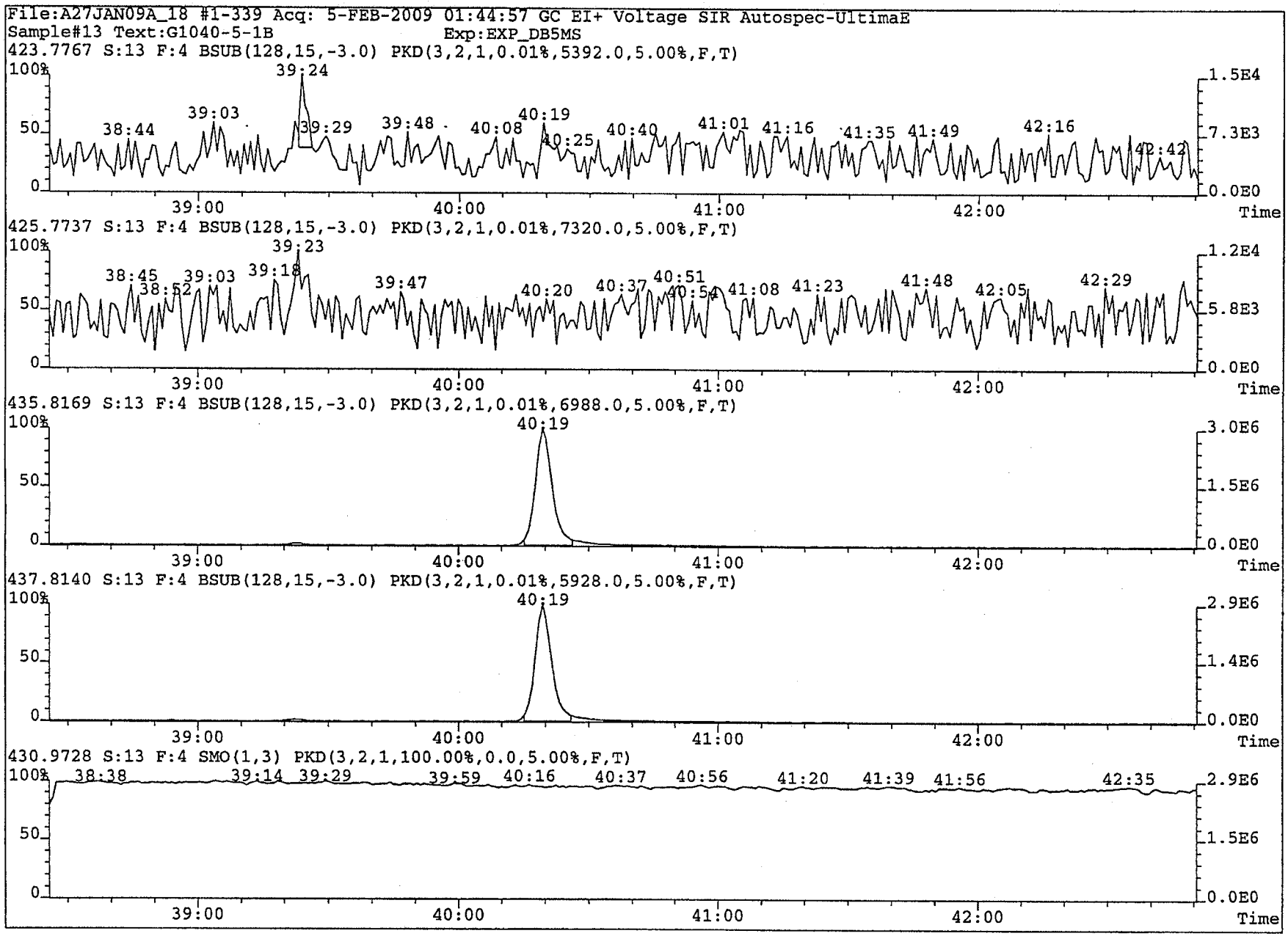
Filename:	a27jan09a_18	Name of Homolog Group:	Total Hepta-Furans												
Sample:	13	Number of Peaks Found:	0												
Acquired:	5-FEB-09 01:44:57	RRF Used For Totals:	1.3693												
Processed:	5-FEB-09 07:32:58	Detection Limit:	0.4036												
Sample ID:	G1040-5-1B	Noise Height Ion1/Ion2:	6560 / 5836												
Cal Table:	m1613-100708a	Begin Window:													
Results Table:	M1613-012709A_18	End Window:													
Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?	
	1	*	*	*	*	n	NotFnd	*		*	n	*	n	n	

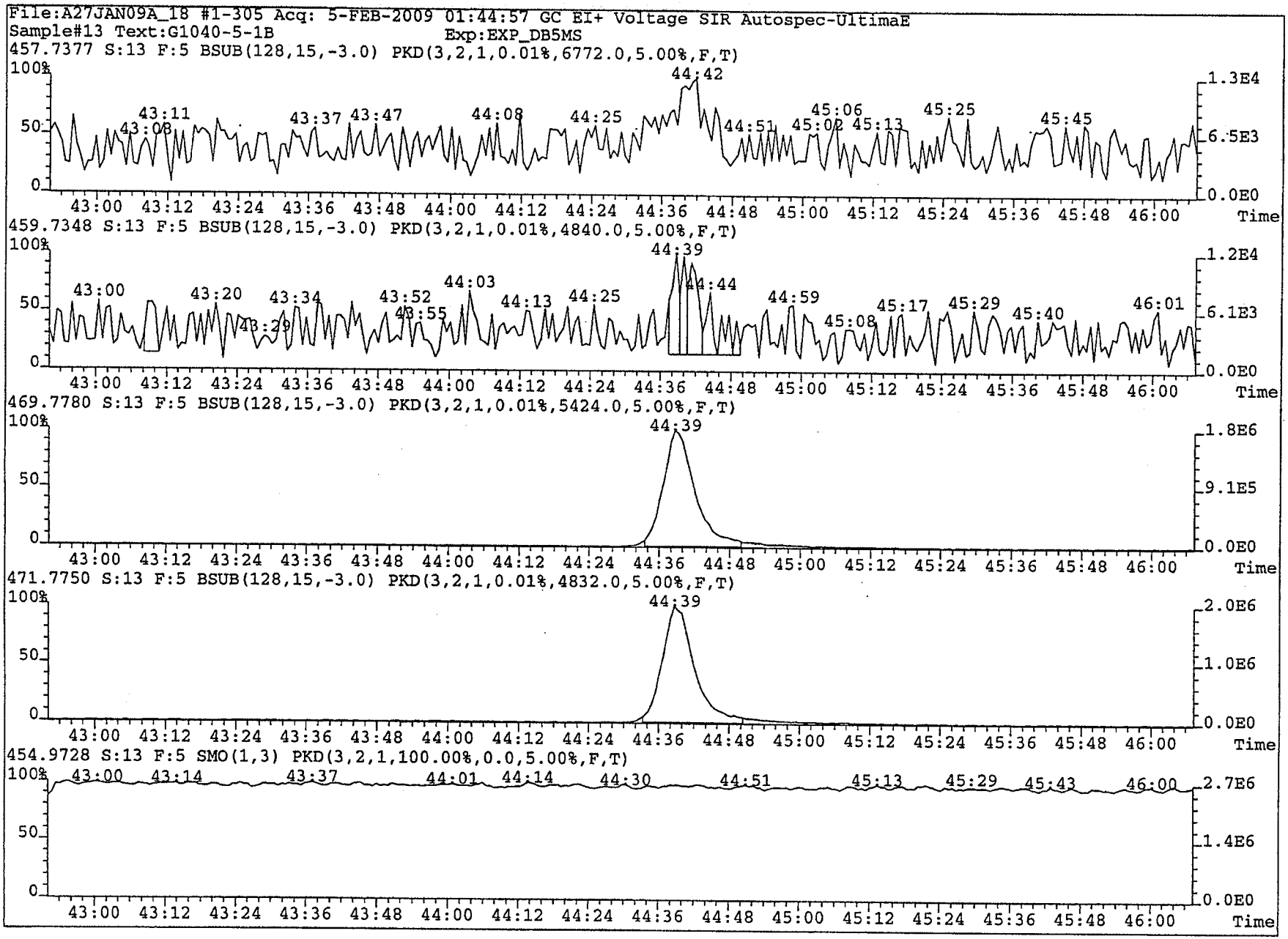
Filename:	a27jan09a_18	Name of Homolog Group:	Total Hepta-Dioxins												
Sample:	13	Number of Peaks Found:	0												
Acquired:	5-FEB-09 01:44:57	RRF Used For Totals:	1.0612												
Processed:	5-FEB-09 07:32:58	Detection Limit:	0.6121												
Sample ID:	G1040-5-1B	Noise Height Ion1/Ion2:	5392 / 7320												
Cal Table:	m1613-100708a	Begin Window:													
Results Table:	M1613-012709A_18	End Window:													
Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?	

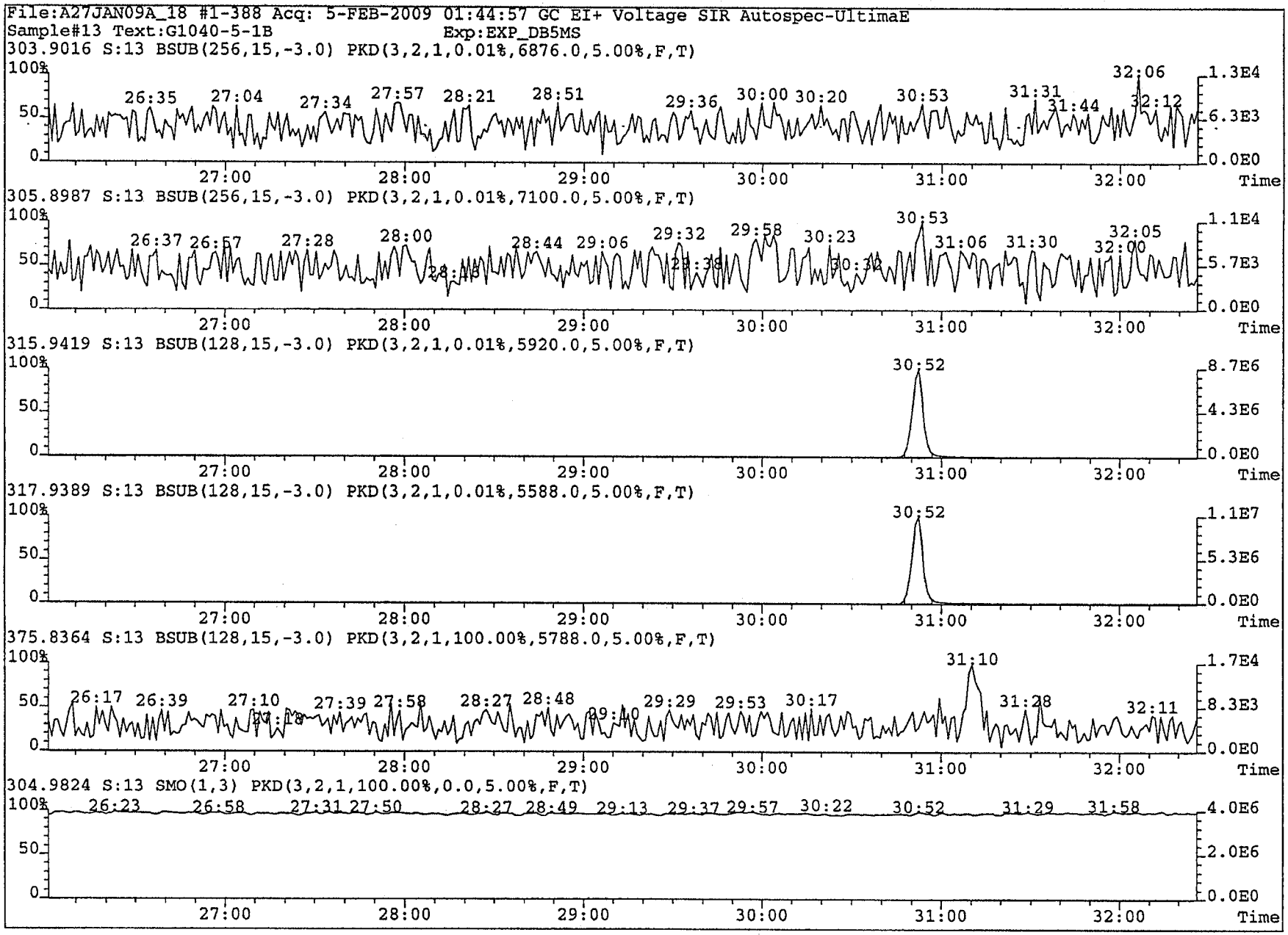

File:A27JAN09A_18 #1-388 Acq: 5-FEB-2009 01:44:57 GC EI+ Voltage SIR Autospec-UltimaE
Sample#13 Text:G1040-5-1B Exp:EXP_DB5MS
319.8965 S:13 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,6464.0,5.00%,F,T)
321.8936 S:13 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,6852.0,5.00%,F,T)
331.9368 S:13 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5372.0,5.00%,F,T)
333.9339 S:13 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5700.0,5.00%,F,T)
327.8847 S:13 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6700.0,5.00%,F,T)
304.9824 S:13 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time

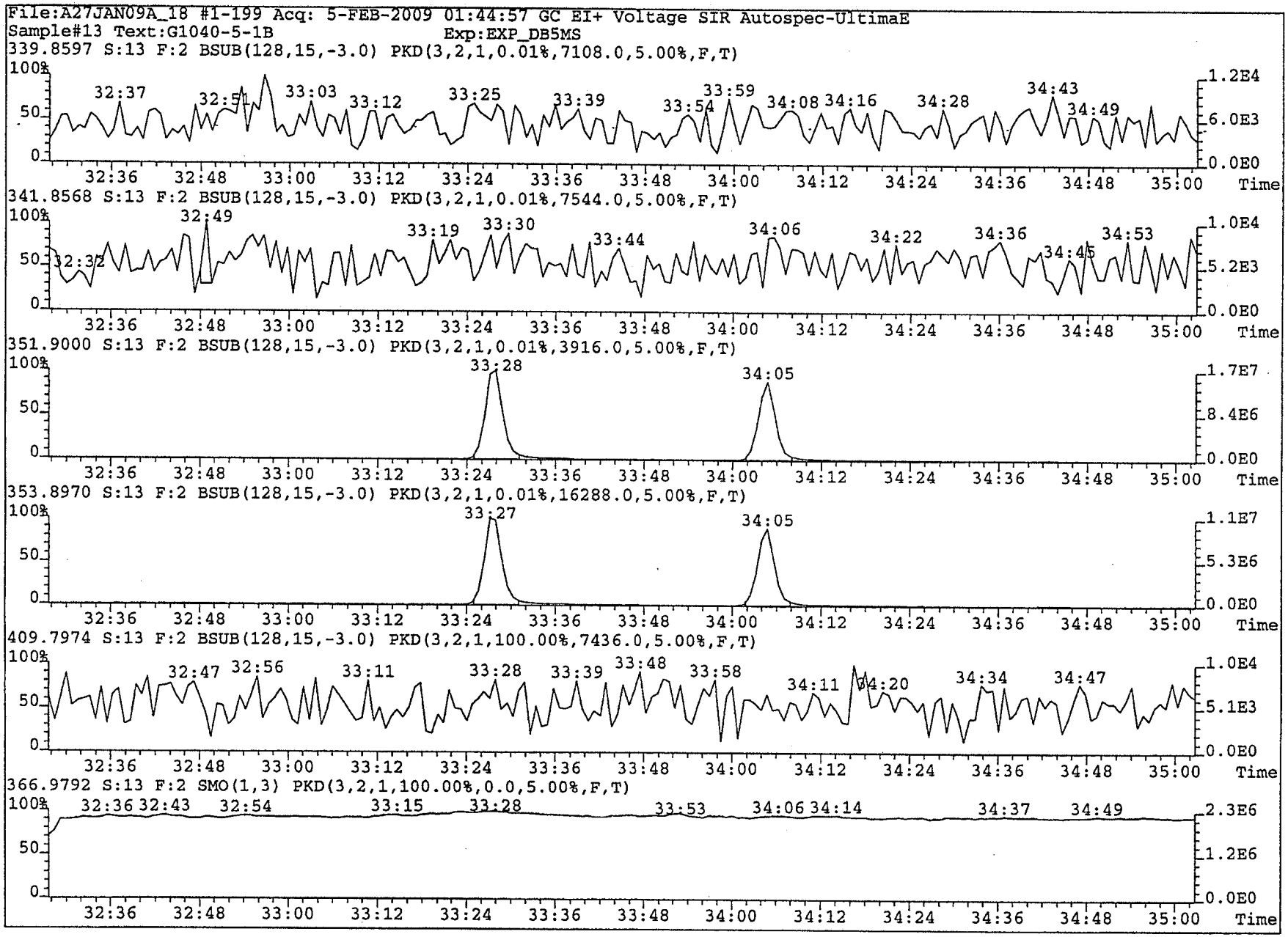

File:A27JAN09A_18 #1-199 Acq: 5-FEB-2009 01:44:57 GC EI+ Voltage SIR Autospec-UltimaE
Sample#13 Text:G1040-5-1B Exp:EXP_DB5MS
355.8546 S:13 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6880.0,5.00%,F,T)
357.8517 S:13 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5564.0,5.00%,F,T)
367.8949 S:13 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6744.0,5.00%,F,T)
369.8919 S:13 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6500.0,5.00%,F,T)
366.9792 S:13 F:2 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time

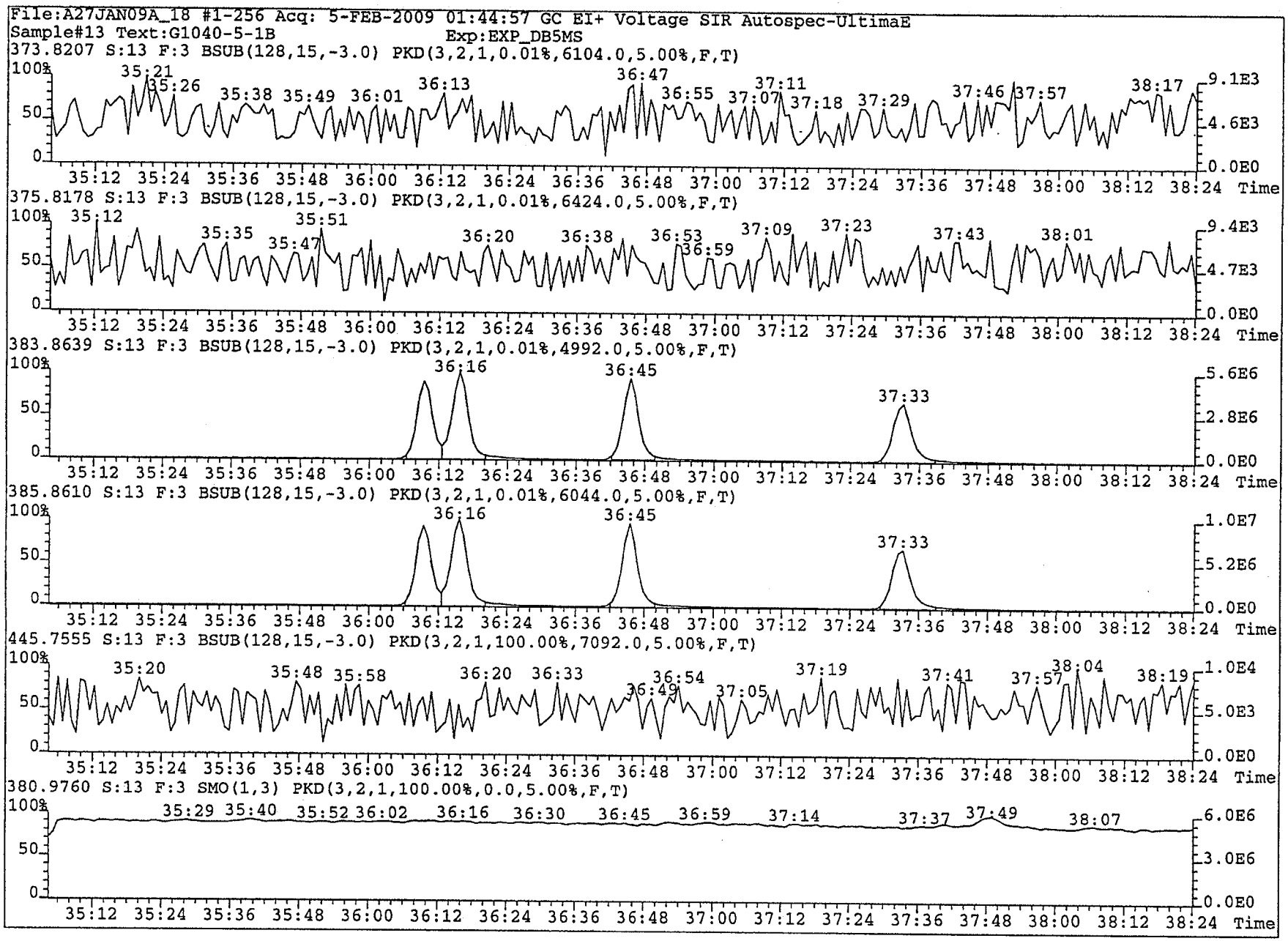

File:A27JAN09A_18 #1-256 Acq: 5-FEB-2009 01:44:57 GC EI+ Voltage SIR Autospec-UltimaE
Sample#13 Text:G1040-5-1B Exp:EXP_DB5MS
389.8156 S:13 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5256.0,5.00%,F,T)
391.8127 S:13 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6760.0,5.00%,F,T)
401.8559 S:13 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5792.0,5.00%,F,T)
403.8530 S:13 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7232.0,5.00%,F,T)
380.9760 S:13 F:3 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time

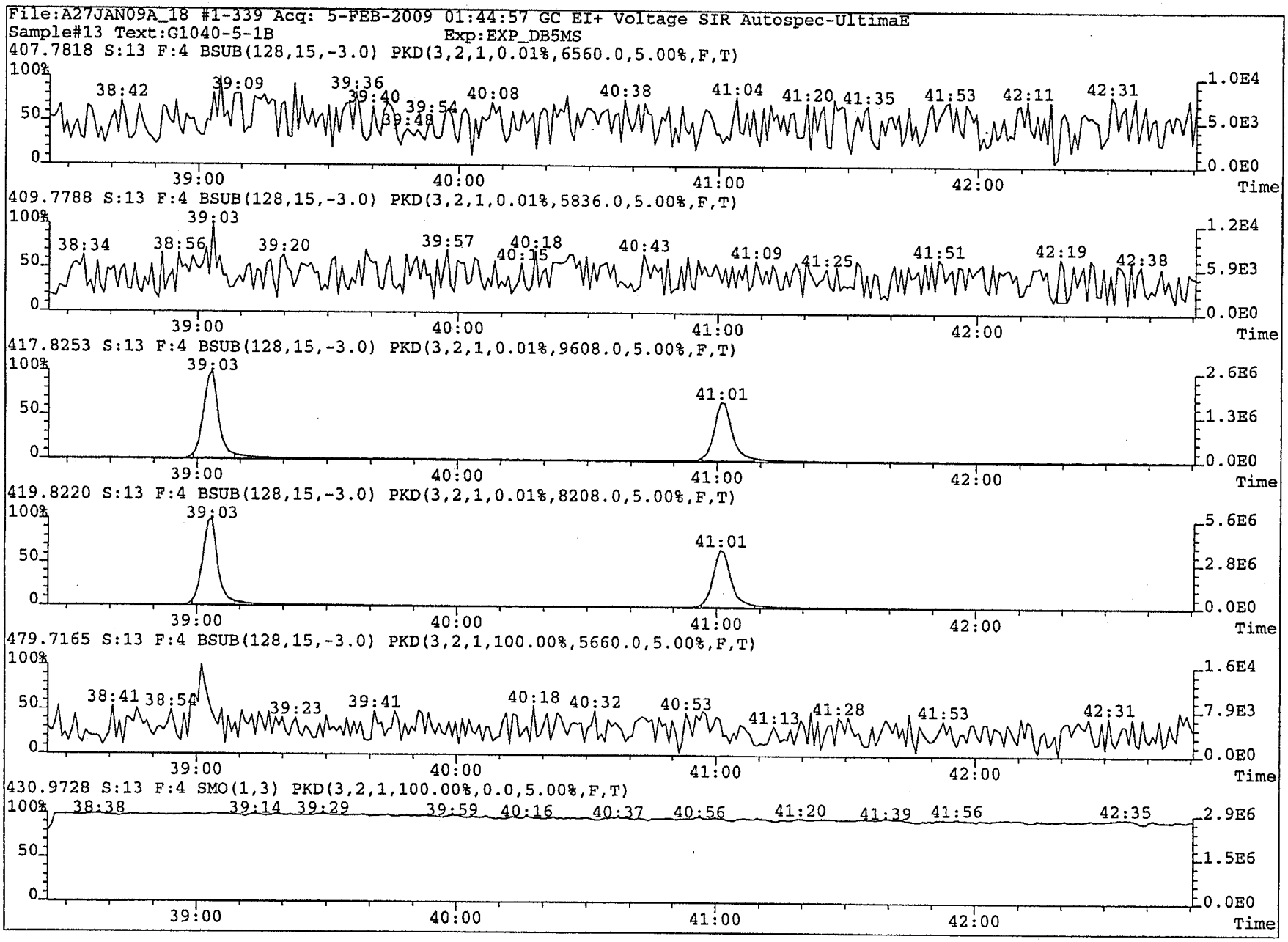

File:A27JAN09A_18 #1-339 Acq: 5-FEB-2009 01:44:57 GC EI+ Voltage SIR Autospec-UltimaE
Sample#13 Text:G1040-5-1B Exp:EXP_DB5MS
423.7767 S:13 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5392.0,5.00%,F,T)
425.7737 S:13 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7320.0,5.00%,F,T)
435.8169 S:13 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6988.0,5.00%,F,T)
437.8140 S:13 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5928.0,5.00%,F,T)
430.9728 S:13 F:4 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time

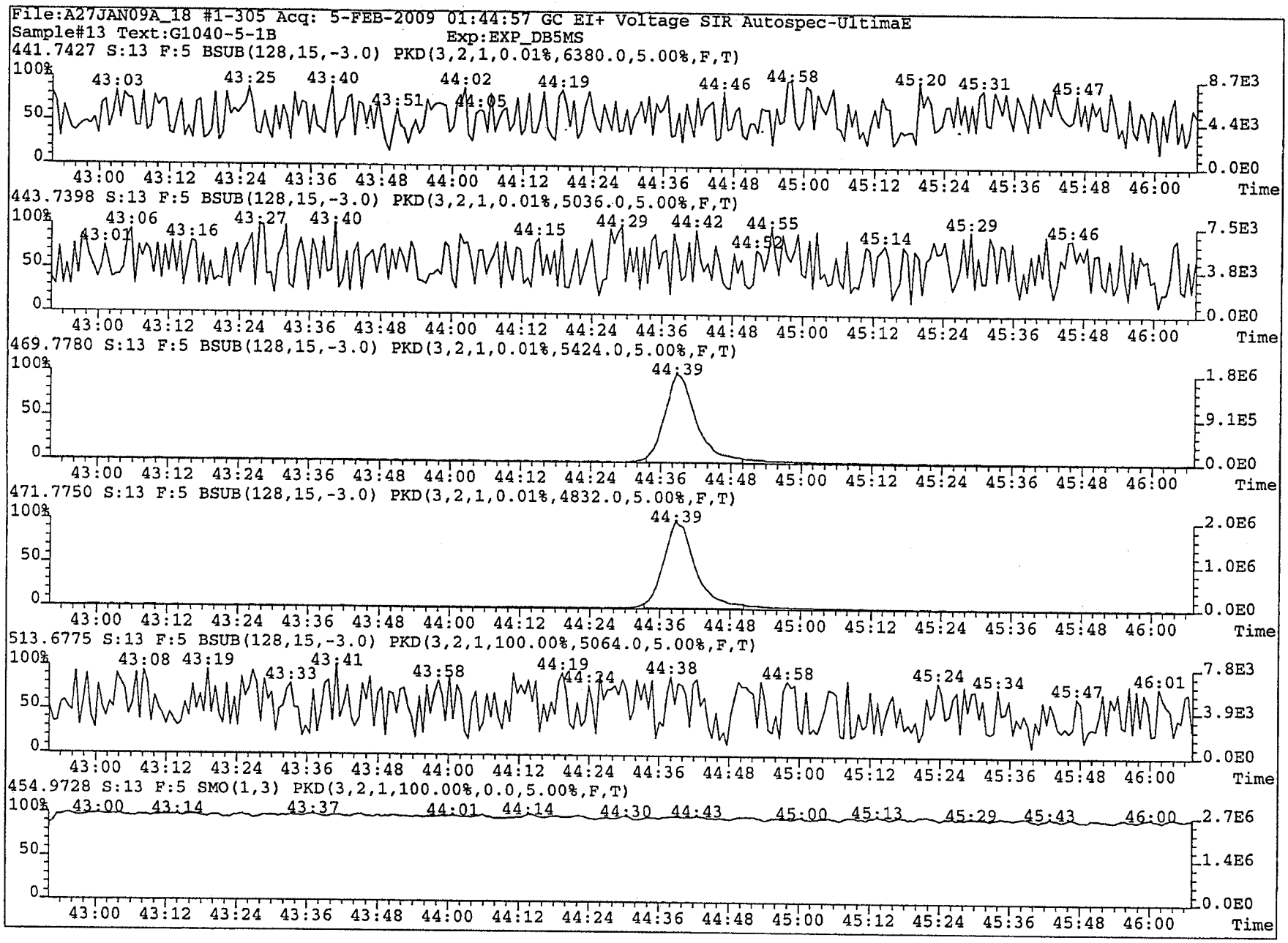

File:A27JAN09A_18 #1-305 Acq: 5-FEB-2009 01:44:57 GC EI+ Voltage SIR Autospec-UltimaE
Sample#13 Text:G1040-5-1B Exp:EXP_DB5MS
457.7377 S:13 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6772.0,5.00%,F,T)
459.7348 S:13 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,4840.0,5.00%,F,T)
469.7780 S:13 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5424.0,5.00%,F,T)
471.7750 S:13 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,4832.0,5.00%,F,T)
454.9728 S:13 F:5 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time

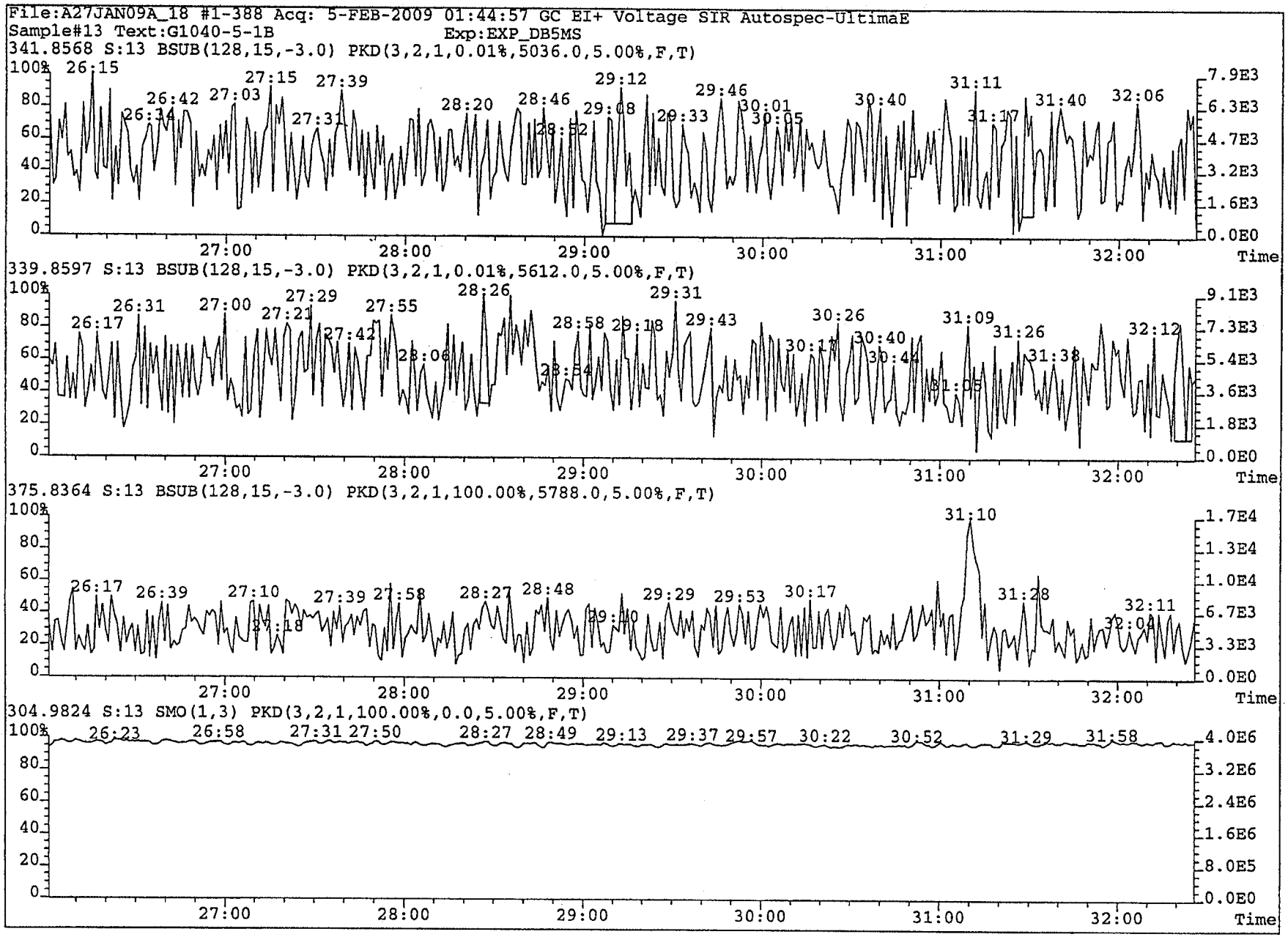

File:A27JAN09A_18 #1-388 Acq: 5-FEB-2009 01:44:57 GC EI+ Voltage SIR Autospec-UltimaE
Sample#13 Text:G1040-5-1B Exp:EXP_DB5MS
303.9016 S:13 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,6876.0,5.00%,F,T)
305.8987 S:13 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,7100.0,5.00%,F,T)
315.9419 S:13 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5920.0,5.00%,F,T)
317.9389 S:13 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5588.0,5.00%,F,T)
375.8364 S:13 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,5788.0,5.00%,F,T)
304.9824 S:13 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time


File:A27JAN09A_18 #1-199 Acq: 5-FEB-2009 01:44:57 GC EI+ Voltage SIR Autospec-UltimaE
Sample#13 Text:G1040-5-1B Exp:EXP_DB5MS
339.8597 S:13 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7108.0,5.00%,F,T)
341.8568 S:13 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7544.0,5.00%,F,T)
351.9000 S:13 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,3916.0,5.00%,F,T)
353.8970 S:13 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,16288.0,5.00%,F,T)
409.7974 S:13 F:2 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,7436.0,5.00%,F,T)
366.9792 S:13 F:2 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time


File:A27JAN09A_18 #1-256 Acq: 5-FEB-2009 01:44:57 GC EI+ Voltage SIR Autospec-UltimaE
Sample#13 Text:G1040-5-1B Exp:EXP_DB5MS
373.8207 S:13 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6104.0,5.00%,F,T)
375.8178 S:13 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6424.0,5.00%,F,T)
383.8639 S:13 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,4992.0,5.00%,F,T)
385.8610 S:13 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6044.0,5.00%,F,T)
445.7555 S:13 F:3 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,7092.0,5.00%,F,T)
380.9760 S:13 F:3 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time


File:A27JAN09A_18 #1-339 Acq: 5-FEB-2009 01:44:57 GC EI+ Voltage SIR Autospec-UltimaE
Sample#13 Text:G1040-5-1B Exp:EXP_DB5MS
407.7818 S:13 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6560.0,5.00%,F,T)
409.7788 S:13 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5836.0,5.00%,F,T)
417.8253 S:13 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,9608.0,5.00%,F,T)
419.8220 S:13 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,8208.0,5.00%,F,T)
479.7165 S:13 F:4 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,5660.0,5.00%,F,T)
430.9728 S:13 F:4 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
100%
50
0
39:00
40:00
41:00
42:00
Time
1.0E4
5.0E3
0.0E0
1.2E4
5.9E3
2.6E6
1.3E6
5.6E6
2.8E6
1.6E4
7.9E3
2.9E6
1.5E6


File:A27JAN09A_18 #1-305 Acq: 5-FEB-2009 01:44:57 GC EI+ Voltage SIR Autospec-UltimaE
Sample#13 Text:G1040-5-1B
Exp:EXP_DB5MS
441.7427 S:13 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6380.0,5.00%,F,T)
443.7398 S:13 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5036.0,5.00%,F,T)
469.7780 S:13 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5424.0,5.00%,F,T)
471.7750 S:13 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,4832.0,5.00%,F,T)
513.6775 S:13 F:5 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,5064.0,5.00%,F,T)
454.9728 S:13 F:5 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time


File:A27JAN09A_18 #1-388 Acq: 5-FEB-2009 01:44:57 GC EI+ Voltage SIR Autospec-UltimaE
Sample#13 Text:G1040-5-1B Exp:EXP_DB5MS
341.8568 S:13 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5036.0,5.00%,F,T)
339.8597 S:13 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5612.0,5.00%,F,T)
375.8364 S:13 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,5788.0,5.00%,F,T)
304.9824 S:13 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time

Method 1613

CLAM #2A

Analytical Resources, Inc.

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	RL (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	1.00			
1,2,3,7,8-PeCDD	ND	5.00			
1,2,3,4,7,8-HxCDD	ND	5.00			
1,2,3,6,7,8-HxCDD	ND	5.00			
1,2,3,7,8,9-HxCDD	ND	5.00			
1,2,3,4,6,7,8-HpCDD	ND	5.00			
OCDD	ND	10.0			
2,3,7,8-TCDF	ND	1.00			
1,2,3,7,8-PeCDF	ND	5.00			
2,3,4,7,8-PeCDF	ND	5.00			
1,2,3,4,7,8-HxCDF	ND	5.00			
1,2,3,6,7,8-HxCDF	ND	5.00			
2,3,4,6,7,8-HxCDF	ND	5.00			
1,2,3,7,8,9-HxCDF	ND	5.00			
1,2,3,4,6,7,8-HpCDF	ND	5.00			
1,2,3,4,7,8,9-HpCDF	ND	5.00			
OCDF	ND	10.0			
Total TCDDs	ND	1.00			
Total PeCDDs	ND	5.00			
Total HxCDDs	ND	5.00			
Total HpCDDs	ND	5.00			
Total TCDFs	ND	1.00			
Total PeCDFs	ND	5.00			
Total HxCDFs	ND	5.00			
Total HpCDFs	ND	5.00			
WHO-2005 TEQ (ND=0)	0.000				
WHO-2005 TEQ (ND=½)	5.70				

Client Information

Project Name:	Port Gamble
Sample ID:	CLAM #2A

Laboratory Information

Project ID:	G1040-5	
Sample ID:	G1040-5-2B	
Collection Date:	15-Dec-08	
Receipt Date:	15-Jan-09	10:15
Extraction Date:	01-Feb-09	
Analysis Date:	09-Feb-09	22:48

Sample Information

Matrix:	Tissue	
Weight / Volume:	10.16	grams
Solids / Lipids:	NA	
Original pH :	NA	
Batch ID:	WG16457	
Filename:	a09feb09a-9	
Retchk:	a09feb09a-1	
Begin ConCal:	a09feb09a-1	
Initial Cal:	m1613-100708a	

Method 1613

CLAM #2A

Analytical Resources, Inc.

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
$^{13}C_{12}$-2,3,7,8-TCDD	2	1.76	87.8	31:27	0.78	
$^{13}C_{12}$-1,2,3,7,8-PeCDD	2	2.24	112	34:16	1.57	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	2	1.74	87.1	36:53	1.37	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	2	1.67	83.3	36:58	1.18	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	2	1.86	92.8	40:19	1.06	
$^{13}C_{12}$-OCDD	4	2.67	66.8	44:39	0.90	
$^{13}C_{12}$-2,3,7,8-TCDF	2	1.58	78.8	30:52	0.79	
$^{13}C_{12}$-1,2,3,7,8-PeCDF	2	2.24	112	33:28	1.61	
$^{13}C_{12}$-2,3,4,7,8-PeCDF	2	2.16	108	34:05	1.59	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	2	1.65	82.4	36:10	0.52	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	2	1.61	80.6	36:16	0.53	
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	2	1.69	84.3	36:45	0.52	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	2	1.74	86.8	37:32	0.53	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	2	1.73	86.7	39:03	0.45	
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	2	1.93	96.3	41:01	0.45	
Cleanup Standard						
$^{37}Cl_4$-2,3,7,8-TCDD	0.4	0.371	92.8	31:28		
Injection Standards						
$^{13}C_{12}$-1,2,3,4-TCDD	2			31:01	0.79	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	2			37:13	1.25	

Client Information

Project Name:	Port Gamble	
Sample ID:	CLAM #2A	

Laboratory Information

Project ID:	G1040-5	
Sample ID:	G1040-5-2B	
Collection Date:	15-Dec-08	
Receipt Date:	15-Jan-09	10:15
Extraction Date:	01-Feb-09	
Analysis Date:	09-Feb-09	22:48

Sample Information

Matrix:	Tissue	
Weight / Volume:	10.16	grams
Solids / Lipids:	NA	%
Original pH :	NA	
Batch ID:	WG16457	
Filename:	a09feb09a-9	
Retchk:	a09feb09a-1	
Begin ConCal:	a09feb09a-1	
Initial Cal:	m1613-100708a	

Analyzed by: JMP
Date: 02/17/09

Reviewed by: YM
Date: 02/17/09

Form Version:[1613_HRMS12]Repor

;*1613*

Filename ; a09feb09a
Sample ; 9
Acquired ; 9-FEB-09 22:48:20
Processed ; 10-FEB-09 07:33:26
Sample ID ; G1040-5-2B
Cal Table ; m1613-100708a
Results Table ; M1613-020909A
Comments ;

Ent;	Name;	Resp;	Ion 1;	Ion 2;	RA;?;	RT;	Conc;	EDL;	S/N1;?;	S/N2;?;M;	Signal1;	Noise 1;	Signal2;	Noise 2
1 ;	2,3,7,8-TCDD;	*;	*;	*;	*;n;	NotFnd;	*;	0.1033;	*;n;	*;n;n;	*;	4.97e+03;	*;	5.72e+03
2 ;	1,2,3,7,8-PeCDD;	*;	*;	*;	*;n;	NotFnd;	*;	0.1851;	*;n;	*;n;n;	*;	1.04e+04;	*;	1.26e+04
3 ;	1,2,3,4,7,8-HxCDD;	*;	*;	*;	*;n;	NotFnd;	*;	0.2110;	*;n;	*;n;n;	*;	9.40e+03;	*;	1.18e+04
4 ;	1,2,3,6,7,8-HxCDD;	*;	*;	*;	*;n;	NotFnd;	*;	0.2177;	*;n;	*;n;n;	*;	9.40e+03;	*;	1.18e+04
5 ;	1,2,3,7,8,9-HxCDD;	*;	*;	*;	*;n;	NotFnd;	*;	0.2159;	*;n;	*;n;n;	*;	9.40e+03;	*;	1.18e+04
6 ;	1,2,3,4,6,7,8-HpCDD;	*;	*;	*;	*;n;	NotFnd;	*;	0.3225;	*;n;	*;n;n;	*;	1.26e+04;	*;	9.10e+03
7 ;	OCDD;	2.02e+05;	8.16e+04;	1.21e+05;	0.68;n;	44:40;	0.409;	0.5129;	3;y;	4;y;n;	2.39e+04;	7.67e+03;	2.98e+04;	7.61e+03
8 ;	2,3,7,8-TCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.1433;	*;n;	*;n;n;	*;	7.95e+03;	*;	7.67e+03
9 ;	1,2,3,7,8-PeCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.1300;	*;n;	*;n;n;	*;	1.27e+04;	*;	1.16e+04
10 ;	2,3,4,7,8-PeCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.1238;	*;n;	*;n;n;	*;	1.27e+04;	*;	1.16e+04
11 ;	1,2,3,4,7,8-HxCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.1363;	*;n;	*;n;n;	*;	1.16e+04;	*;	8.26e+03
12 ;	1,2,3,6,7,8-HxCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.1353;	*;n;	*;n;n;	*;	1.16e+04;	*;	8.26e+03
13 ;	2,3,4,6,7,8-HxCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.1342;	*;n;	*;n;n;	*;	1.16e+04;	*;	8.26e+03
14 ;	1,2,3,7,8,9-HxCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.1773;	*;n;	*;n;n;	*;	1.16e+04;	*;	8.26e+03
15 ;	1,2,3,4,6,7,8-HpCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.2295;	*;n;	*;n;n;	*;	1.52e+04;	*;	9.43e+03
16 ;	1,2,3,4,7,8,9-HpCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.2833;	*;n;	*;n;n;	*;	1.52e+04;	*;	9.43e+03
17 ;	OCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.4226;	*;n;	*;n;n;	*;	6.66e+03;	*;	8.31e+03
Extraction Standards														
18 ;	13C-2,3,7,8-TCDD;	9.88e+07;	4.32e+07;	5.56e+07;	0.78;y;	31:27;	87.768;	0.1285;	2166;y;	2586;y;n;	1.34e+07;	6.20e+03;	1.74e+07;	6.72e+03
19 ;	13C-1,2,3,7,8-PeCDD;	9.21e+07;	5.63e+07;	3.58e+07;	1.57;y;	34:16;	111.923;	0.3106;	2259;y;	1039;y;n;	2.16e+07;	9.56e+03;	1.38e+07;	1.33e+04
20 ;	13C-1,2,3,4,7,8-HxCDD;	9.29e+07;	5.36e+07;	3.92e+07;	1.37;y;	36:53;	87.123;	0.2266;	1131;y;	1438;y;n;	1.61e+07;	1.43e+04;	1.29e+07;	8.96e+03
21 ;	13C-1,2,3,6,7,8-HxCDD;	9.65e+07;	5.21e+07;	4.43e+07;	1.18;y;	36:58;	83.298;	0.2085;	1151;y;	1461;y;n;	1.64e+07;	1.43e+04;	1.31e+07;	8.96e+03
22 ;	13C-1,2,3,4,6,7,8-HpCDD;	8.11e+07;	4.17e+07;	3.93e+07;	1.06;y;	40:19;	92.796;	0.2394;	820;y;	1123;y;n;	9.72e+06;	1.19e+04;	9.27e+06;	8.26e+03
23 ;	13C-OCDD;	9.28e+07;	4.39e+07;	4.89e+07;	0.90;y;	44:39;	133.488;	0.1969;	1429;y;	1163;y;n;	7.99e+06;	5.60e+03;	8.80e+06;	7.57e+03
24 ;	13C-2,3,7,8-TCDF;	1.31e+08;	5.78e+07;	7.35e+07;	0.79;y;	30:52;	78.747;	0.0932;	1980;y;	2568;y;n;	1.38e+07;	6.99e+03;	1.77e+07;	6.90e+03
25 ;	13C-1,2,3,7,8-PeCDF;	1.51e+08;	9.29e+07;	5.78e+07;	1.61;y;	33:28;	111.730;	0.5775;	879;y;	727;y;n;	3.44e+07;	3.91e+04;	2.21e+07;	3.04e+04
26 ;	13C-2,3,4,7,8-PeCDF;	1.43e+08;	8.76e+07;	5.50e+07;	1.59;y;	34:05;	108.034;	0.5899;	895;y;	715;y;n;	3.50e+07;	3.91e+04;	2.18e+07;	3.04e+04
27 ;	13C-1,2,3,4,7,8-HxCDF;	1.13e+08;	3.89e+07;	7.45e+07;	0.52;y;	36:10;	82.423;	0.4806;	248;y;	2268;y;n;	1.31e+07;	5.27e+04;	2.47e+07;	1.09e+04
28 ;	13C-1,2,3,6,7,8-HxCDF;	1.22e+08;	4.24e+07;	7.99e+07;	0.53;y;	36:16;	80.555;	0.4354;	254;y;	2360;y;n;	1.34e+07;	5.27e+04;	2.57e+07;	1.09e+04
29 ;	13C-2,3,4,6,7,8-HxCDF;	1.20e+08;	4.14e+07;	7.90e+07;	0.52;y;	36:45;	84.265;	0.4630;	257;y;	2350;y;n;	1.36e+07;	5.27e+04;	2.55e+07;	1.09e+04
30 ;	13C-1,2,3,7,8,9-HxCDF;	1.10e+08;	3.80e+07;	7.24e+07;	0.53;y;	37:32;	86.772;	0.5198;	199;y;	1851;y;n;	1.05e+07;	5.27e+04;	2.01e+07;	1.09e+04
31 ;	13C-1,2,3,4,6,7,8-HpCDF;	9.45e+07;	2.94e+07;	6.51e+07;	0.45;y;	39:03;	86.649;	0.2166;	840;y;	1152;y;n;	7.28e+06;	8.67e+03;	1.62e+07;	1.40e+04
32 ;	13C-1,2,3,4,7,8,9-HpCDF;	8.27e+07;	2.58e+07;	5.69e+07;	0.45;y;	41:01;	96.282;	0.2749;	694;y;	935;y;n;	6.01e+06;	8.67e+03;	1.31e+07;	1.40e+04
Injection Standards														
33 ;	13C-1,2,3,4-TCDD;	1.01e+08;	4.45e+07;	5.64e+07;	0.79;y;	31:01;	74.290;	-;	1919;y;	2256;y;n;	1.19e+07;	6.20e+03;	1.52e+07;	6.72e+03
34 ;	13C-1,2,3,7,8,9-HxCDD;	1.11e+08;	6.16e+07;	4.93e+07;	1.25;y;	37:13;	102.744;	-;	1255;y;	1576;y;n;	1.79e+07;	1.43e+04;	1.41e+07;	8.96e+03
Cleanup Standard														
35 ;	37Cl-2,3,7,8-TCDD;	2.22e+07;	2.22e+07;	-;	-;-;	31:28;	18.527;	0.0727;	913;y;	-;-;n;	7.11e+06;	7.79e+03;	-;	-

Totals Raw Data

	Conc	Empc	Flags
TCDF	0	0	FALSE
TCDD	0	0	FALSE
PeCDF	0	0	FALSE
PeCDD	0	0	FALSE
HxCDF	0	0	FALSE
HxCDD	0	0	FALSE
HpCDF	0	0	FALSE
HpCDD	0	0	FALSE

Filename:	a09feb09a	Name of Homolog Group:	Total Tetra-Furans		
Sample:	9	Number of Peaks Found:	1	0	
Acquired:	9-FEB-09 22:48:20	RRF Used For Totals:	1.0368		
Processed:	10-FEB-09 07:33:26	Detection Limit:	0.1433		RL=0.500 (pg/µL)
Sample ID:	G1040-5-2B	Noise Height Ion1/Ion2:	7948 / 7672		
Cal Table:	m1613-100708a	Begin Window:		26:14:00	
Results Table:	M1613-020909A	End Window:		33:07:00	

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	2.29E+04	12800	10100	1.27	n	29:32	0.017	S2N	0.9	n	0.7	n	n

Filename:	a09feb09a	Name of Homolog Group:	Total Tetra-Dioxins		
Sample:	9	Number of Peaks Found:	0		
Acquired:	9-FEB-09 22:48:20	RRF Used For Totals:	1.0087		
Processed:	10-FEB-09 07:33:26	Detection Limit:	0.1033		
Sample ID:	G1040-5-2B	Noise Height Ion1/Ion2:	4974 / 5722		
Cal Table:	m1613-100708a	Begin Window:			
Results Table:	M1613-020909A	End Window:			

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	*	*	*	*	n	NotFnd	*		*	n	*	n	n

Filename:	a09feb09a	Name of Homolog Group:	Total Penta-Furans Fp1		
Sample:	9	Number of Peaks Found:	0		
Acquired:	9-FEB-09 22:48:20	RRF Used For Totals:	1.0121		
Processed:	10-FEB-09 07:33:26	Detection Limit:	0.0798		
Sample ID:	G1040-5-2B	Noise Height Ion1/Ion2:	7688 / 7580		
Cal Table:	m1613-100708a	Begin Window:			
Results Table:	M1613-020909A	End Window:			

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	*	*	*	*	n	NotFnd	*		*	n	*	n	n

Totals Raw Data

Page 4 of 9

Filename:	a09feb09a		Name of Homolog Group:	Total Penta-Furans Fn2											
Sample:		9	Number of Peaks Found:	0											
Acquired:	9-FEB-09 22:48:20		RRF Used For Totals:	1.0121											
Processed:	10-FEB-09 07:33:26		Detection Limit:	0.1269											
Sample ID:	G1040-5-2B		Noise Height Ion1/Ion2:	12664/ 11608											
Cal Table:	m1613-100708a		Begin Window:												
Results Table:	M1613-020909A		End Window:												
Name	#		Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
		1	*	*	*	*	n	NotFnd	*		*	n	*	n	n

Page 5 of 9

Filename:	a09feb09a		Name of Homolog Group:	Total Penta-Dioxins											
Sample:		9	Number of Peaks Found:	0											
Acquired:	9-FEB-09 22:48:20		RRF Used For Totals:	1.0517											
Processed:	10-FEB-09 07:33:26		Detection Limit:	0.1851											
Sample ID:	G1040-5-2B		Noise Height Ion1/Ion2:	10372/ 12604											
Cal Table:	m1613-100708a		Begin Window:												
Results Table:	M1613-020909A		End Window:												
Name	#		Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
		1	*	*	*	*	n	NotFnd	*		*	n	*	n	n

Page 6 of 9

Filename:	a09feb09a		Name of Homolog Group:	Total Hexa-Furans											
Sample:		9	Number of Peaks Found:	0											
Acquired:	9-FEB-09 22:48:20		RRF Used For Totals:	1.1305											
Processed:	10-FEB-09 07:33:26		Detection Limit:	0.1449											
Sample ID:	G1040-5-2B		Noise Height Ion1/Ion2:	11608/ 8256											
Cal Table:	m1613-100708a		Begin Window:												
Results Table:	M1613-020909A		End Window:												
Name	#		Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
		1	*	*	*	*	n	NotFnd	*		*	n	*	n	n

Page 7 of 9

Filename:	a09feb09a		Name of Homolog Group:	Total Hexa-Dioxins											
Sample:		9	Number of Peaks Found:	0											
Acquired:	9-FEB-09 22:48:20		RRF Used For Totals:	1.0077											
Processed:	10-FEB-09 07:33:26		Detection Limit:	0.215											
Sample ID:	G1040-5-2B		Noise Height Ion1/Ion2:	9400 / 11752											
Cal Table:	m1613-100708a		Begin Window:												
Results Table:	M1613-020909A		End Window:												
Name	#		Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?

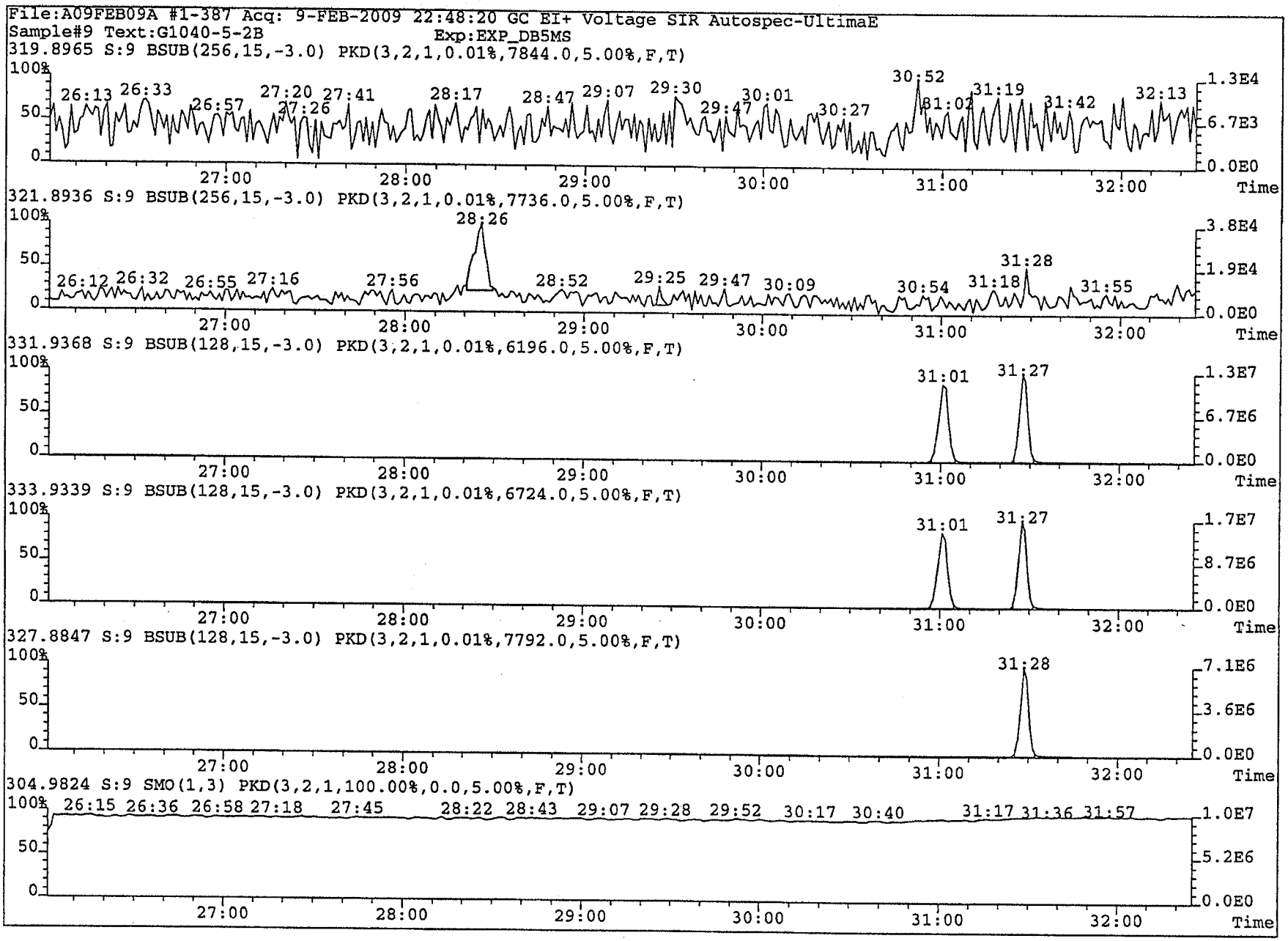
	1	*	*	*	*	n	NotFnd	*		*	n	*	n	n

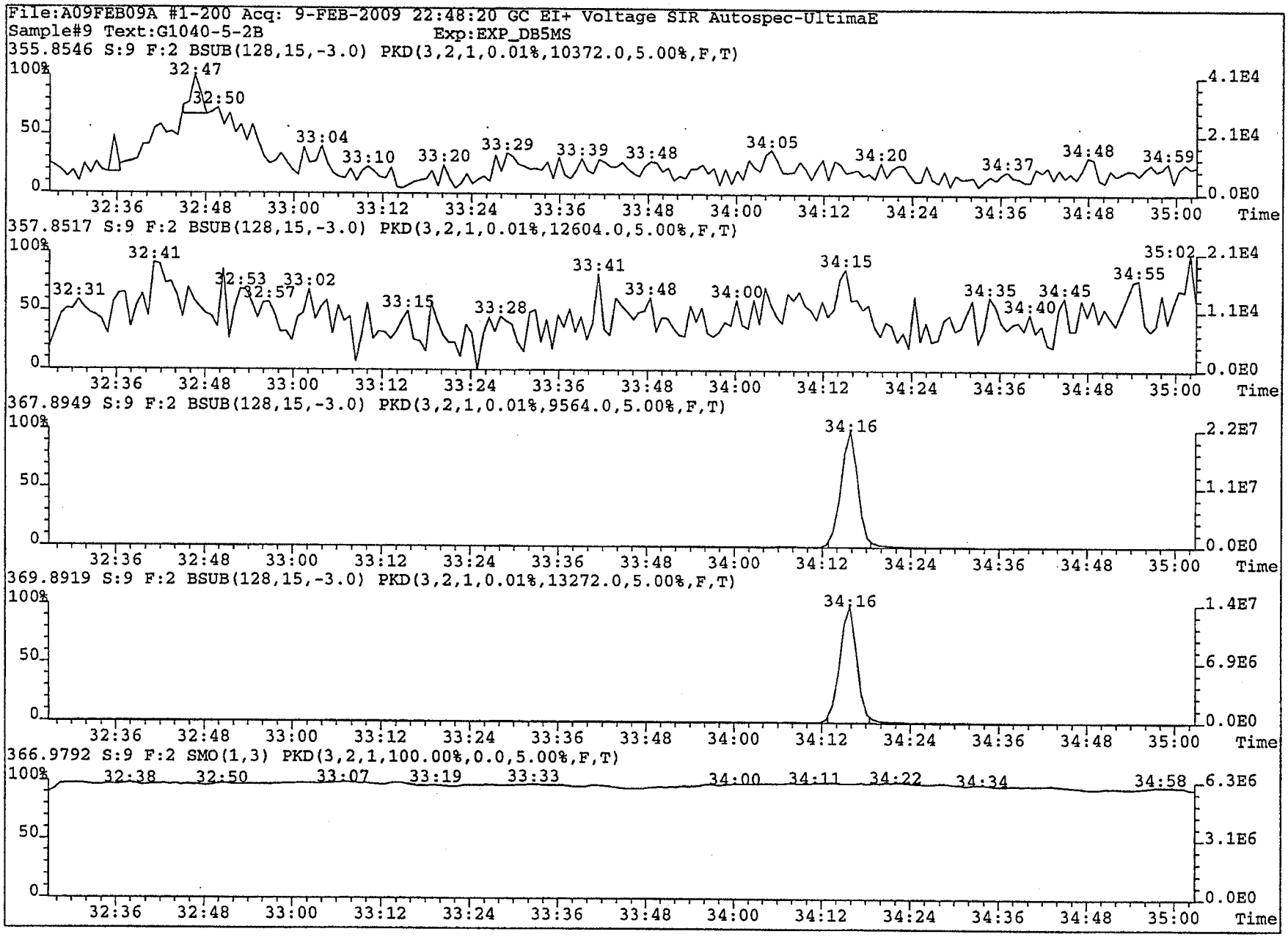
Filename:	a09feb09a	Name of Homolog Group:	Total Hepta-Furans
Sample:	9	Number of Peaks Found:	0
Acquired:	9-FEB-09 22:48:20	RRF Used For Totals:	1.3693
Processed:	10-FEB-09 07:33:26	Detection Limit:	0.2544
Sample ID:	G1040-5-2B	Noise Height Ion1/Ion2:	15236/ 9428
Cal Table:	m1613-100708a	Begin Window:	
Results Table:	M1613-020909A	End Window:	

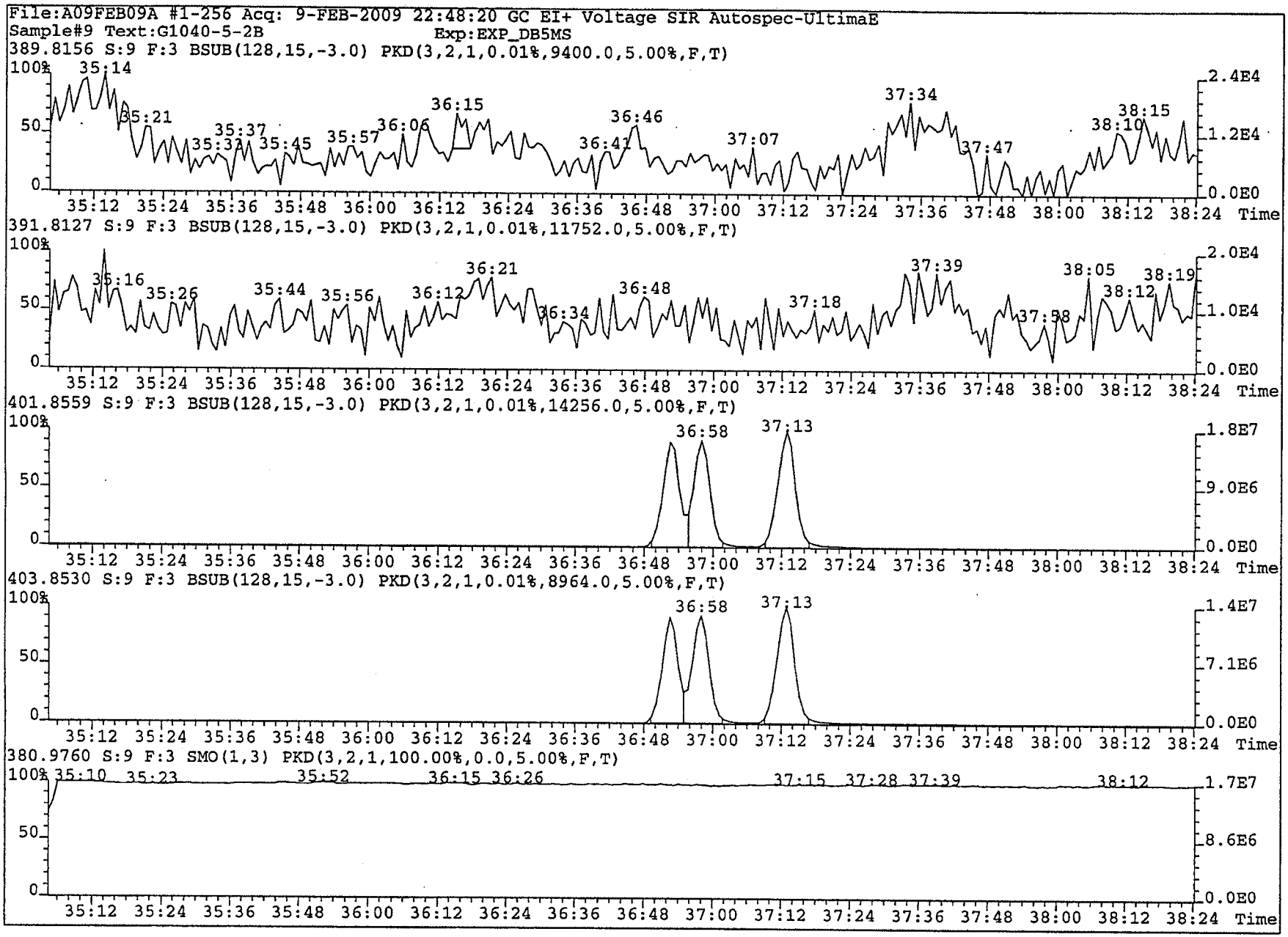
Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	*	*	*	*	n	NotFnd	*		*	n	*	n	n

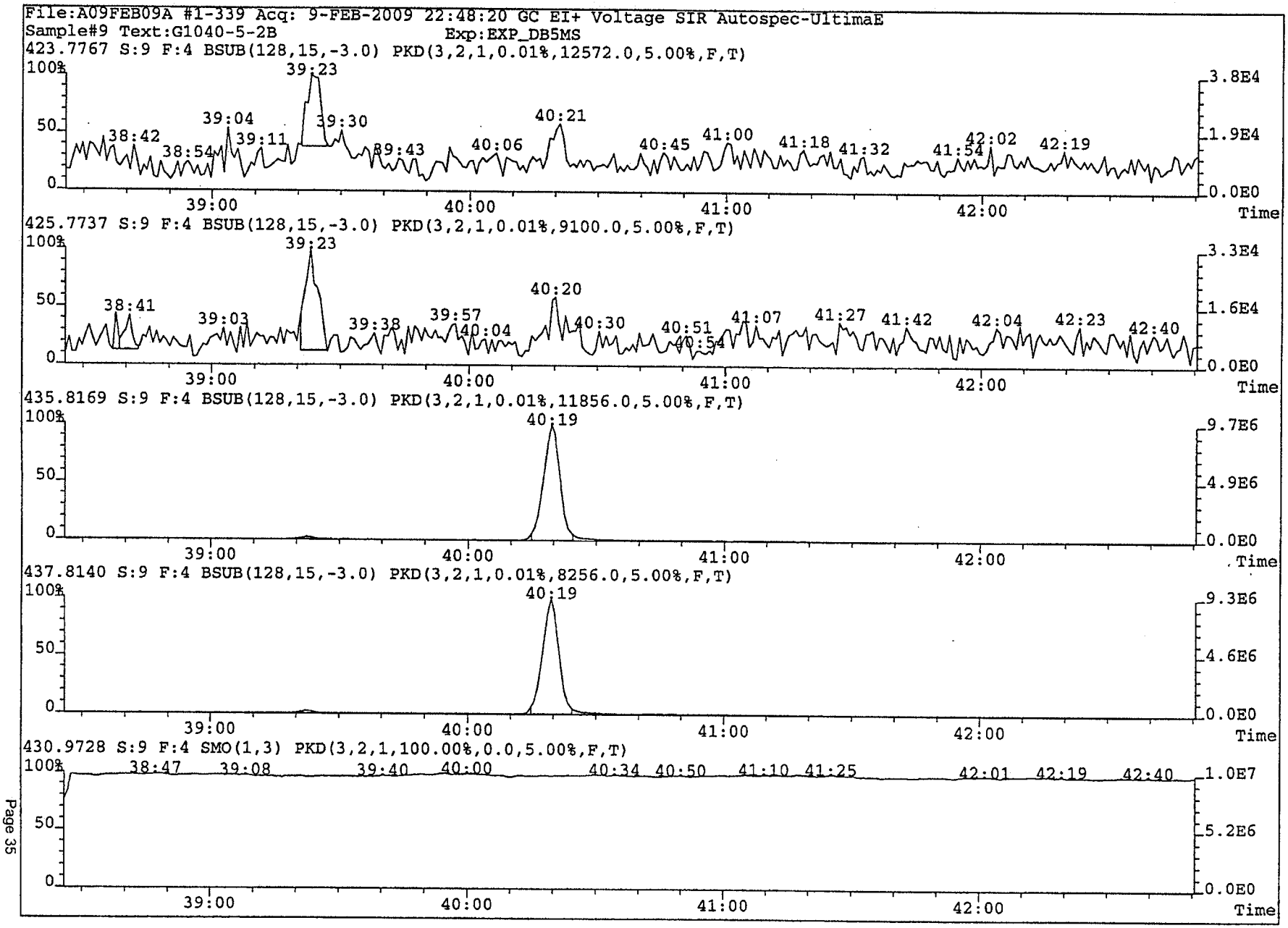
Filename:	a09feb09a	Name of Homolog Group:	Total Hepta-Dioxins	
Sample:	9	Number of Peaks Found:	1	0
Acquired:	9-FEB-09 22:48:20	RRF Used For Totals:	1.0612	
Processed:	10-FEB-09 07:33:26	Detection Limit:	0.3225	RL=2.500 (pg/µL)
Sample ID:	G1040-5-2B	Noise Height Ion1/Ion2:	12572/ 9100	
Cal Table:	m1613-100708a	Begin Window:	39:17:00	
Results Table:	M1613-020909A	End Window:	40:29:00	

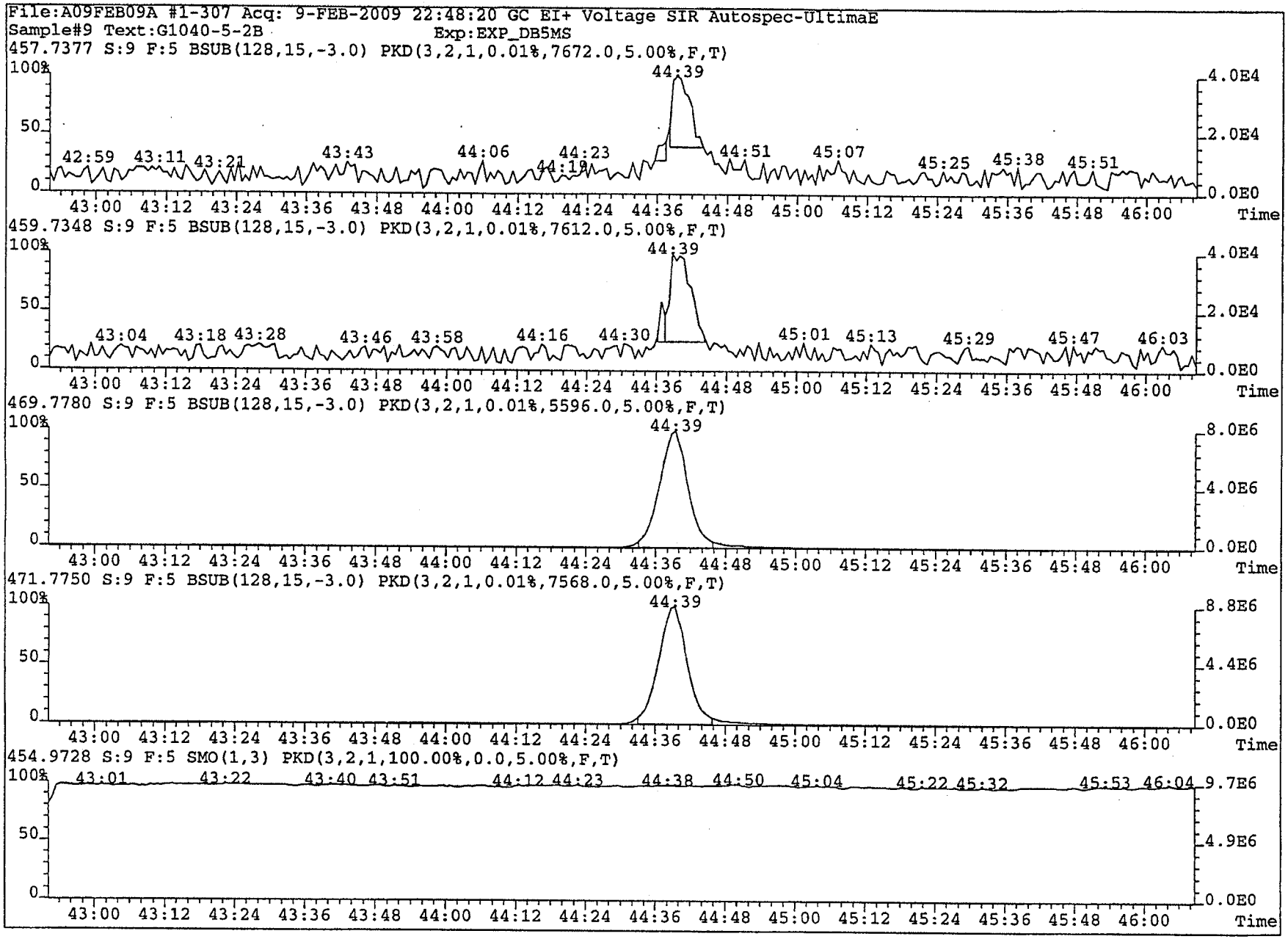
Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	1.83E+05	86000	96900	0.89	y	39:24	0.213	S2N	1.9	n	3.1	y	n

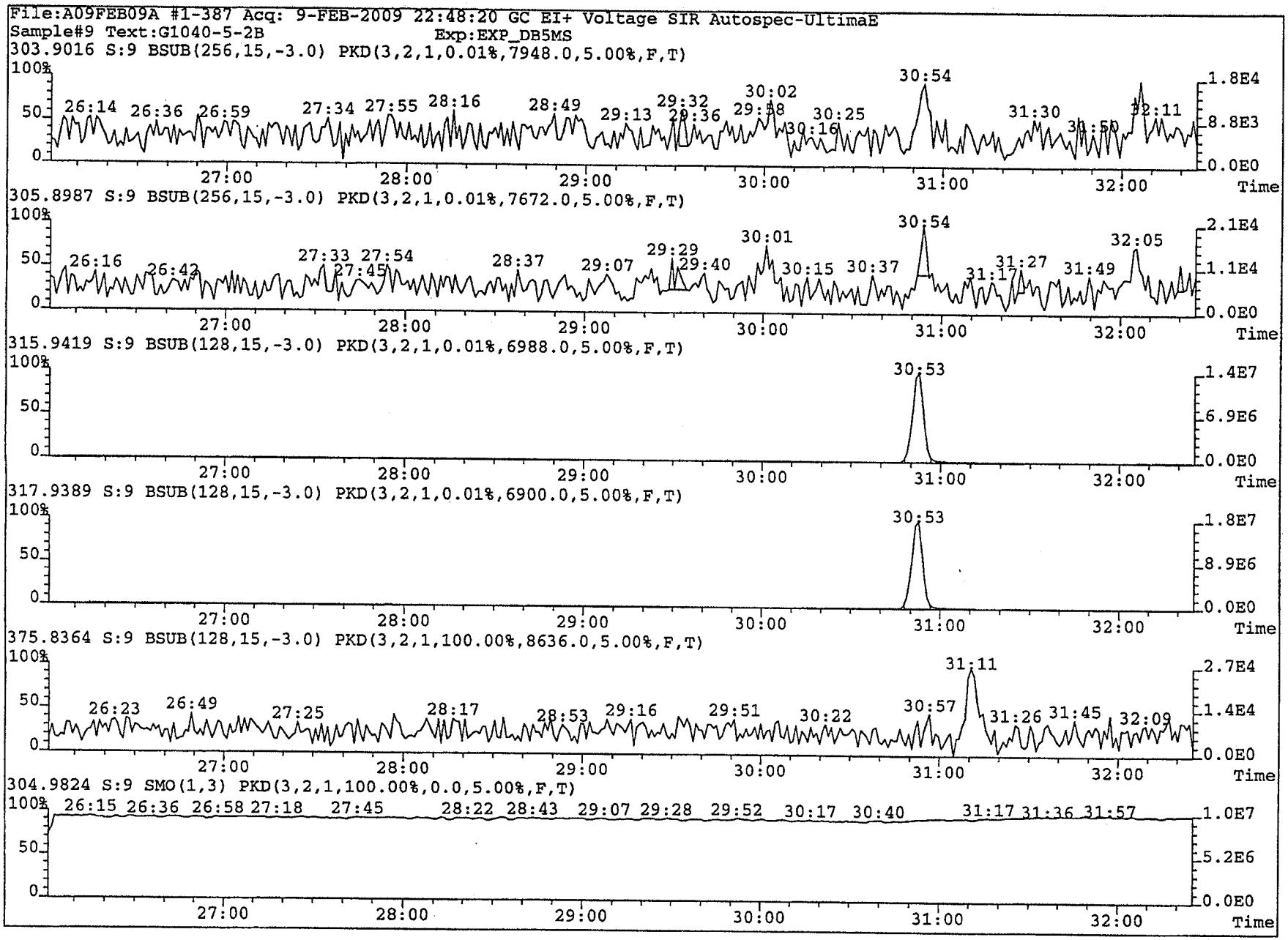

File:A09FEB09A #1-387 Acq: 9-FEB-2009 22:48:20 GC EI+ Voltage SIR Autospec-UltimaE
Sample#9 Text:G1040-5-2B
Exp:EXP_DB5MS
319.8965 S:9 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,7844.0,5.00%,F,T)
321.8936 S:9 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,7736.0,5.00%,F,T)
331.9368 S:9 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6196.0,5.00%,F,T)
333.9339 S:9 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6724.0,5.00%,F,T)
327.8847 S:9 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7792.0,5.00%,F,T)
304.9824 S:9 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time

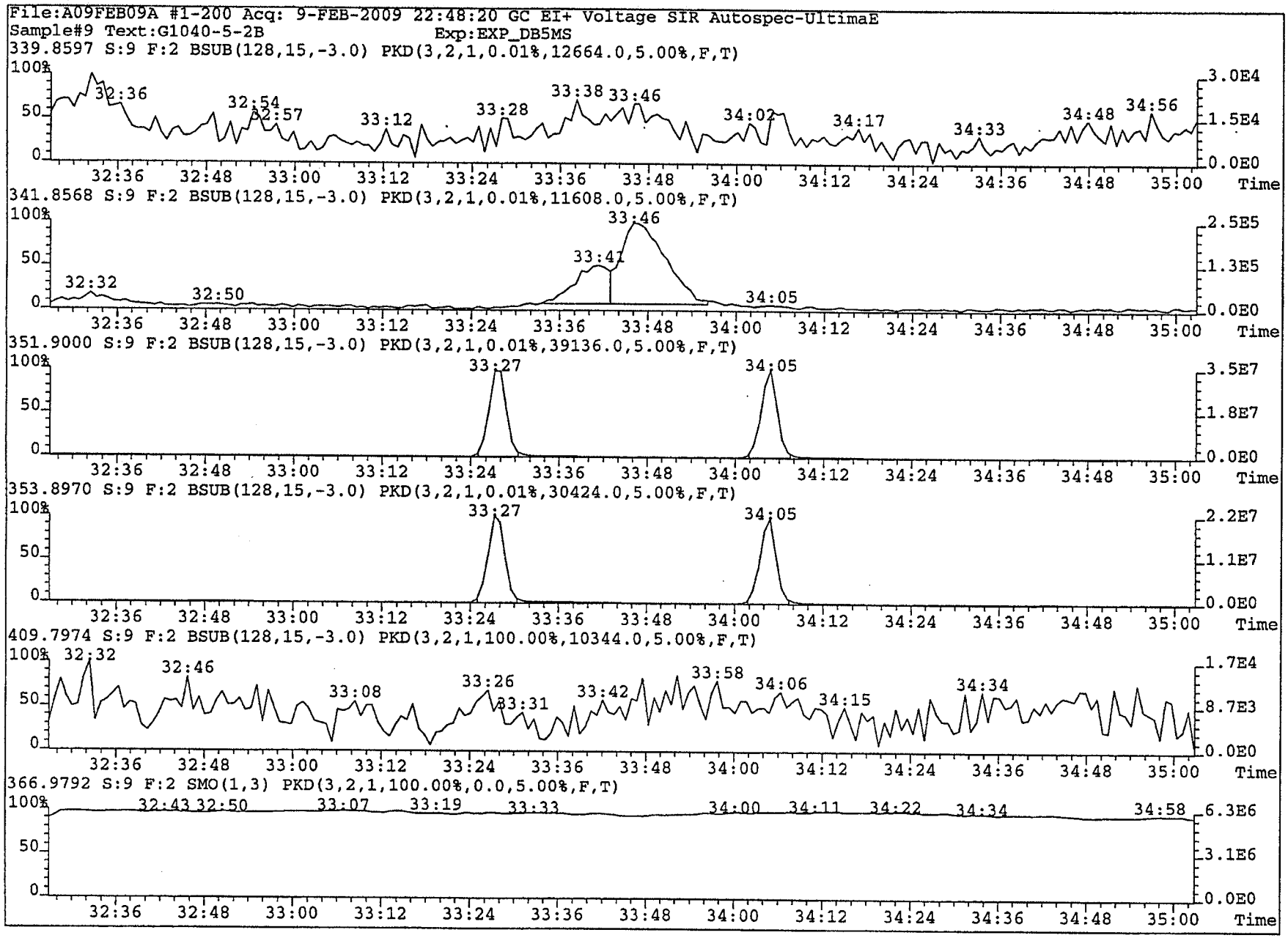

File:A09FEB09A #1-200 Acq: 9-FEB-2009 22:48:20 GC EI+ Voltage SIR Autospec-UltimaE
Sample#9 Text:G1040-5-2B Exp:EXP_DB5MS
355.8546 S:9 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,10372.0,5.00%,F,T)
357.8517 S:9 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,12604.0,5.00%,F,T)
367.8949 S:9 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,9564.0,5.00%,F,T)
369.8919 S:9 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,13272.0,5.00%,F,T)
366.9792 S:9 F:2 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time

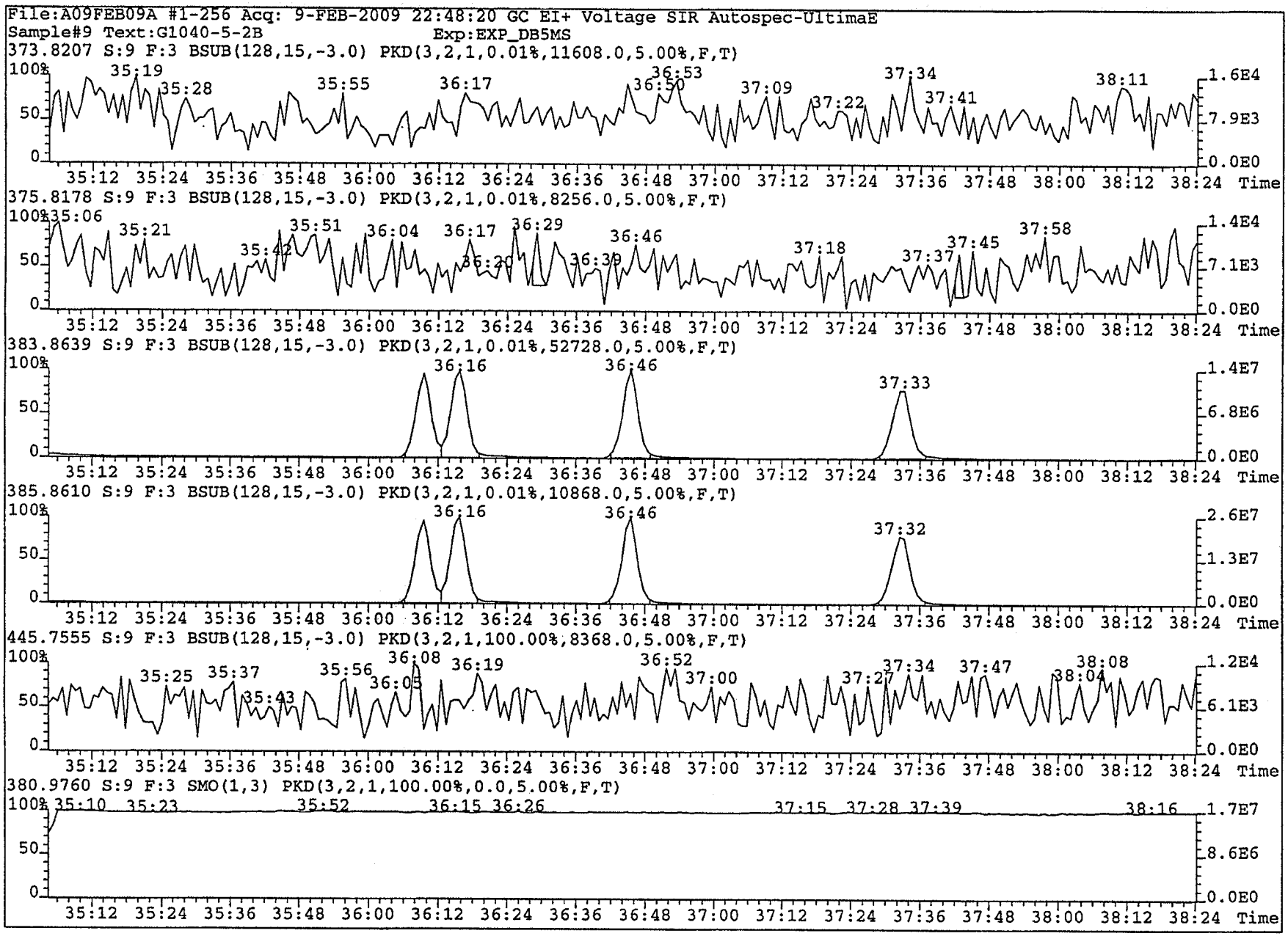

File:A09FEB09A #1-256 Acq: 9-FEB-2009 22:48:20 GC EI+ Voltage SIR Autospec-UltimaE
Sample#9 Text:G1040-5-2B Exp:EXP_DB5MS
389.8156 S:9 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,9400.0,5.00%,F,T)
391.8127 S:9 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,11752.0,5.00%,F,T)
401.8559 S:9 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,14256.0,5.00%,F,T)
403.8530 S:9 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,8964.0,5.00%,F,T)
380.9760 S:9 F:3 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time

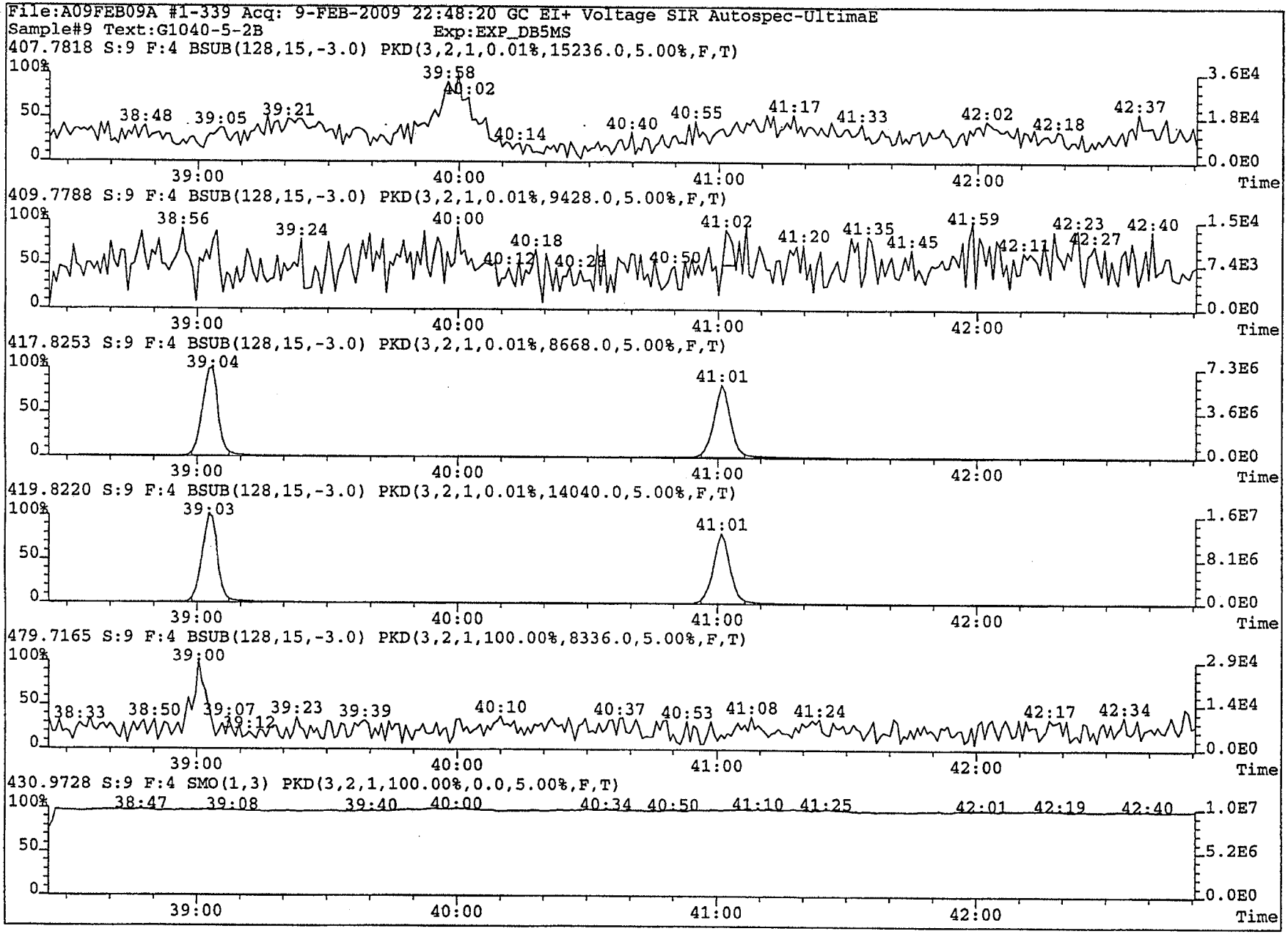

File:A09FEB09A #1-339 Acq: 9-FEB-2009 22:48:20 GC EI+ Voltage SIR Autospec-UltimaE
Sample#9 Text:G1040-5-2B Exp:EXP_DB5MS
423.7767 S:9 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,12572.0,5.00%,F,T)
425.7737 S:9 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,9100.0,5.00%,F,T)
435.8169 S:9 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,11856.0,5.00%,F,T)
437.8140 S:9 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,8256.0,5.00%,F,T)
430.9728 S:9 F:4 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time

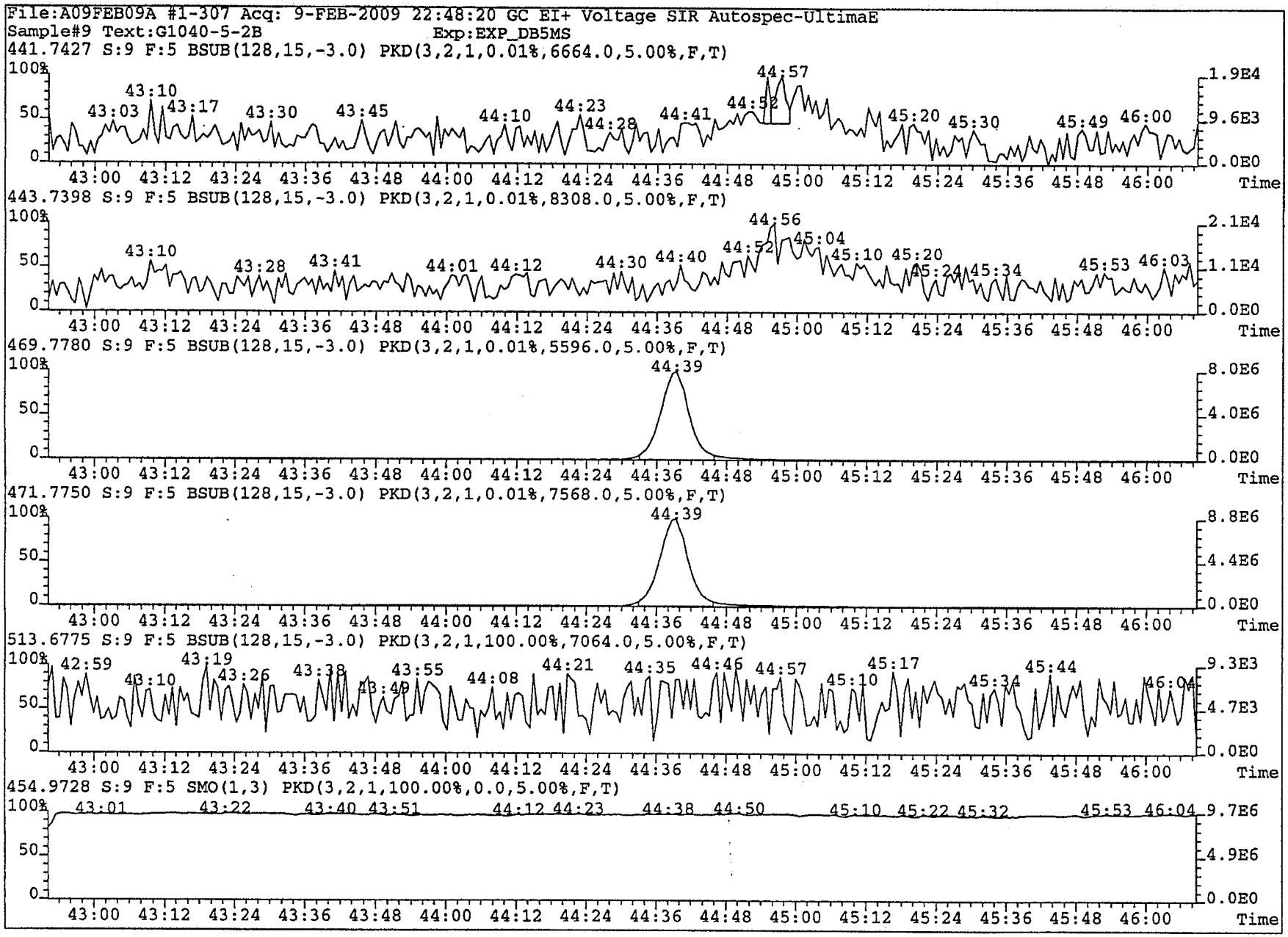

File:A09FEB09A #1-307 Acq: 9-FEB-2009 22:48:20 GC EI+ Voltage SIR Autospec-UltimaE
Sample#9 Text:G1040-5-2B Exp:EXP_DB5MS
457.7377 S:9 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7672.0,5.00%,F,T)
459.7348 S:9 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7612.0,5.00%,F,T)
469.7780 S:9 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5596.0,5.00%,F,T)
471.7750 S:9 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7568.0,5.00%,F,T)
454.9728 S:9 F:5 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
44:39
Time

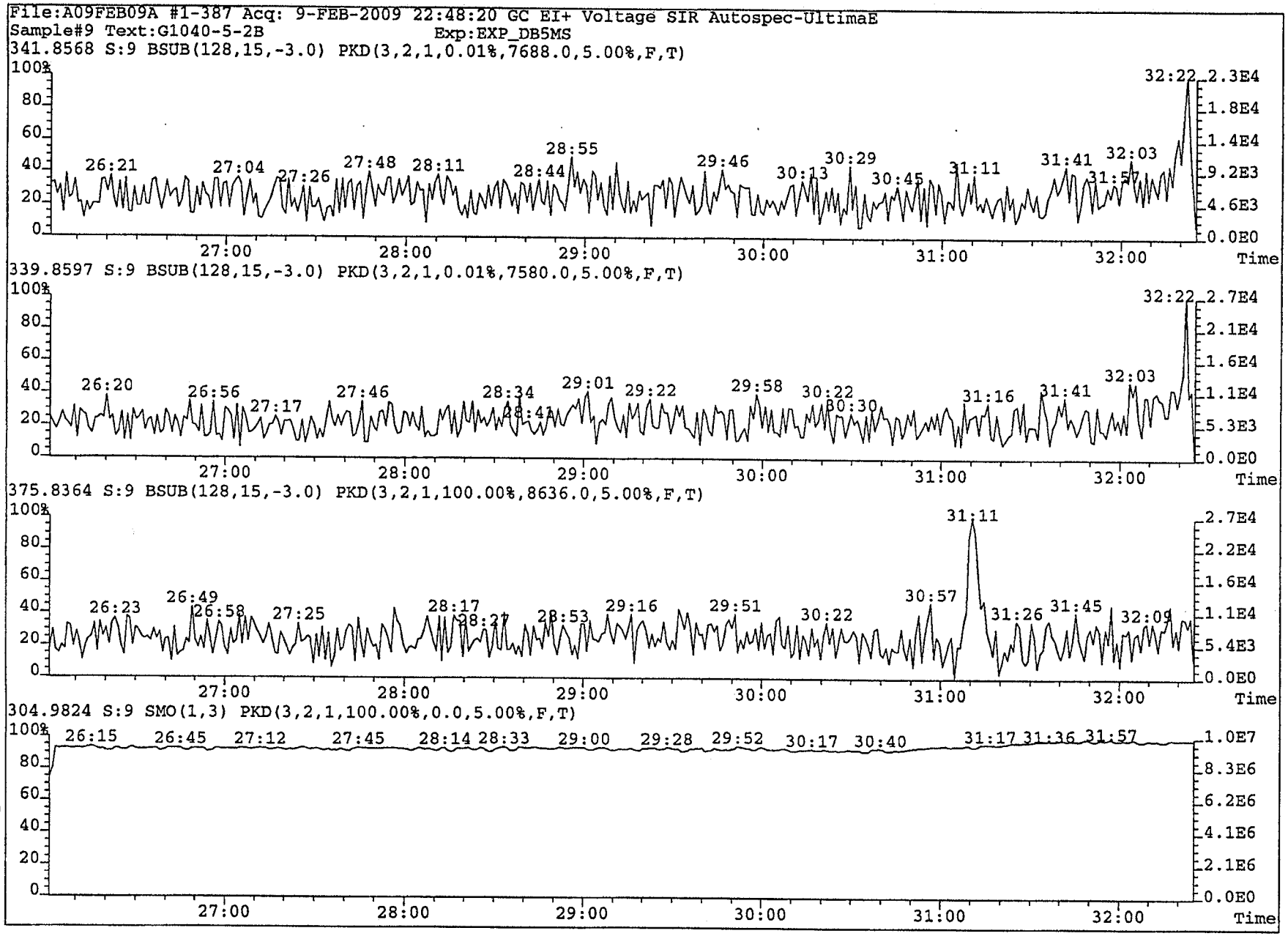

File:A09FEB09A #1-387 Acq: 9-FEB-2009 22:48:20 GC EI+ Voltage SIR Autospec-UltimaE
Sample#9 Text:G1040-5-2B Exp:EXP_DB5MS
303.9016 S:9 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,7948.0,5.00%,F,T)
305.8987 S:9 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,7672.0,5.00%,F,T)
315.9419 S:9 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6988.0,5.00%,F,T)
317.9389 S:9 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6900.0,5.00%,F,T)
375.8364 S:9 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,8636.0,5.00%,F,T)
304.9824 S:9 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time


File:A09FEB09A #1-200 Acq: 9-FEB-2009 22:48:20 GC EI+ Voltage SIR Autospec-UltimaE
Sample#9 Text:G1040-5-2B Exp:EXP_DB5MS
339.8597 S:9 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,12664.0,5.00%,F,T)
341.8568 S:9 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,11608.0,5.00%,F,T)
351.9000 S:9 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,39136.0,5.00%,F,T)
353.8970 S:9 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,30424.0,5.00%,F,T)
409.7974 S:9 F:2 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,10344.0,5.00%,F,T)
366.9792 S:9 F:2 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time


File:A09FEB09A #1-256 Acq: 9-FEB-2009 22:48:20 GC EI+ Voltage SIR Autospec-UltimaE
Sample#9 Text:G1040-5-2B Exp:EXP_DB5MS
373.8207 S:9 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,11608.0,5.00%,F,T)
375.8178 S:9 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,8256.0,5.00%,F,T)
383.8639 S:9 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,52728.0,5.00%,F,T)
385.8610 S:9 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,10868.0,5.00%,F,T)
445.7555 S:9 F:3 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,8368.0,5.00%,F,T)
380.9760 S:9 F:3 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time


File:A09FEB09A #1-339 Acq: 9-FEB-2009 22:48:20 GC EI+ Voltage SIR Autospec-UltimaE
Sample#9 Text:G1040-5-2B Exp:EXP_DB5MS
407.7818 S:9 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,15236.0,5.00%,F,T)
409.7788 S:9 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,9428.0,5.00%,F,T)
417.8253 S:9 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,8668.0,5.00%,F,T)
419.8220 S:9 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,14040.0,5.00%,F,T)
479.7165 S:9 F:4 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,8336.0,5.00%,F,T)
430.9728 S:9 F:4 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time


File:A09FEB09A #1-307 Acq: 9-FEB-2009 22:48:20 GC EI+ Voltage SIR Autospec-UltimaE
Sample#9 Text:G1040-5-2B Exp:EXP_DB5MS
441.7427 S:9 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6664.0,5.00%,F,T)
443.7398 S:9 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,8308.0,5.00%,F,T)
469.7780 S:9 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5596.0,5.00%,F,T)
471.7750 S:9 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7568.0,5.00%,F,T)
513.6775 S:9 F:5 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,7064.0,5.00%,F,T)
454.9728 S:9 F:5 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time


File:A09FEB09A #1-387 Acq: 9-FEB-2009 22:48:20 GC EI+ Voltage SIR Autospec-UltimaE
Sample#9 Text:G1040-5-2B Exp:EXP_DB5MS
341.8568 S:9 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7688.0,5.00%,F,T)
339.8597 S:9 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7580.0,5.00%,F,T)
375.8364 S:9 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,8636.0,5.00%,F,T)
304.9824 S:9 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time

Percent Lipids

prepared
for

HART CROWSER, INC.

Project: Port Gamble, 17330-14

ARI JOB NO: OG45

prepared
by

Analytical Resources, Inc.

ANALYTICAL RESOURCES INCORPORATED

LIPIDS ANALYSIS DATA SHEET
Percent Lipids by Method Bligh&Dyer

Data Release Authorized:
Reported: 01/13/09
Date Received: 12/16/08
Page 1 of 1

QC Report No: OG45-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14

Client/ ARI ID	Date Sampled	Matrix	Analysis Date	RL	Result
CLAM #1A OG45A 09-357	12/15/08	Tissue	01/09/09	0.0008	0.232 %
CLAM 2A OG45B 09-408	12/15/08	Tissue	01/09/09	0.0008	0.487 %
Method Blank			01/09/09	0.0008	< 0.0008 % U
Method Blank			01/09/09	0.0008	< 0.0008 % U
Method Blank			01/09/09	0.0008	< 0.0008 % U

Results Are On A Wet Weight Basis

RL-Analytical reporting limit
U-Undetected at reported detection limit

Percent Lipids-lipid
Data By: Jim Hawk
Created: 1/13/09

Worklist: 142
Analyst: JBH
Comments:

SA (g)	Tare (g)	Final (g)	Aliq Vol (uL)	Ext Vol (mL)	Lipids (%)	Qual	RPD (%)
Blank							
25.00	1.190	1.190	2500.	5.0	< 0.0008 0.0008	U	
Blank							
25.00	1.130	1.130	2500.	5.0	< 0.0008 0.0008	U	
Blank							
25.00	1.183	1.183	2500.	5.0	< 0.0008 0.0008	U	
OG45A							
25.00	1.168	1.197	2500.	5.0	0.232 0.0008		
OG45B							
25.05	1.201	1.262	2500.	5.0	0.487 0.0008		

Bid # N/A
Ext # ↓

% Lipids – Tissue

Client Name: Hart Crowser, Inc.

ARI Job No(s): 0645

Calculated on LIMs

ARI Sample ID	Client Sample ID	Original Extracted Weight	Original Volume (FEV)	Volume Taken (Split)	Tare Weight (g)	Tare + Sample Weight (g)	% Lipids
0645 MBT		25.00 g	5 mL	2.5 mL	1.1902	1.1905	
MBT dup		25.00 g	↓	↓	1.1300	1.1300	
MBT Trip		25.00 g			1.1832	1.1834	
A	Checked	25.00 g			1.1678	1.1972	
B	↓	25.05 g			1.2006	1.2618	
9/9/09 Date/Analyst: →			SP 9/12/09 →			SP 9/13/09	

3071F

Revision 1
8/25/05

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Organic Extractions Laboratory
Analyst Notes

ARI Job No.: QG21 Client ID: Hart Crowser, Inc.

Parameter: Tissue Prep Client Project: Post Gamble

SOP Number(s): **No Anomalies:**

List problems, concerns, corrective actions and any other pertinent information

Chems 1/06/09

Prep Time = 10:00 A.M. –

# of Analysts – 1

hrs – 1 1/4 hr.

ALL Spatulas, Picks, Knives, WARING Blender Washed in Alconox, Rinsed in ACid bath and Three Times DI H2O. Blender Cleaned between ea. Comp. Also ALL Prep Equip. Rinsed with Acetone and DCM Three TIMES. ALL Foil on TRAYS dull side up FOR metals. 12/6/08 g.f.

Analyst Initials:		Date:	

Hart Crowser Tissue Prep.

0645

Clams…..

Clam #1 A (30 clam composite) 3

Clam #1 A composite weight 259.72 g

Clam #2 A (30 clam composite)

Clam #2 A composite weight 346.27 g

Analytical Resources, Incorporated
Analytical Chemists and Consultants

February 25, 2009

Mr. Roger McGinnis
Hart Crowser, Inc.
1700 Westlake Avenue North Suite 200
Seattle, WA 98109-3056

RE: Project: Port Gamble, 17330-14
ARI Job No.: OG53

Dear Mr. McGinnis:

Please find enclosed the original Chain-of-Custody (COC) records, sample receipt documentation, and the final data package for the samples from the project referenced above.

The samples were analyzed for Total Metals, % Lipids, PCBs and Dioxin Furans, as requested.

Sample receipt and details of these analyses are discussed in the Case Narrative.

An electronic copy of this data package and the supporting data 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.

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

Enclosures

cc: files OG53

KB/kb

Chain of Custody
Documentation

prepared
for

HART CROWSER, INC.

Project: Port Gamble, 17330-14

ARI JOB NO: OG53

prepared
by

Analytical Resources, Inc.

Sample Custody Record

Samples Shipped to: ART

HARTCROWSER

Hart Crowser, Inc.
1910 Fairview Avenue East
Seattle, Washington 98102-3699
Phone: 206-324-9530 FAX: 206-328-5581

JOB 17330-14 LAB NUMBER

PROJECT NAME Port Gamble

HART CROWSER CONTACT Roger McGinnis
206 - 612-5232

SAMPLED BY:

LAB NO.	SAMPLE ID	DESCRIPTION	DATE	TIME	MATRIX	SVMS metals	PCBs	% Lipids	dioxins/furans	NO. OF CONTAINERS	OBSERVATIONS/COMMENTS/ COMPOSITING INSTRUCTIONS
	Crab 1-A		12/23/08	10:35	Crab	X	X	X	X		8 crabs

RELINQUISHED BY	DATE	RECEIVED BY	DATE
R. McGinnis	12/23/08	Jami Hayes	12/23/08
SIGNATURE		SIGNATURE	
Roger McGinnis	TIME	Jami Hayes	TIME
PRINT NAME		PRINT NAME	
H.C.	1700	ART	1700
COMPANY		COMPANY	

RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE	TIME	SIGNATURE	TIME
PRINT NAME		PRINT NAME	
COMPANY		COMPANY	

SPECIAL SHIPMENT HANDLING OR STORAGE REQUIREMENTS:

Freeze

Hepatopancreas & meat analyzed separately

TOTAL NUMBER OF CONTAINERS

SAMPLE RECEIPT INFORMATION
CUSTODY SEALS: ☐YES ☐NO ☐N/A
GOOD CONDITION ☐YES ☐NO
TEMPERATURE
SHIPMENT METHOD: ☐HAND ☐COURIER ☐OVERNIGHT

COOLER NO.: STORAGE LOCATION:

See Lab Work Order No. for Other Contract Requirements

TURNAROUND TIME:

☐ 24 HOURS ☐ 1 WEEK
☐ 48 HOURS ☒ STANDARD
☐ 72 HOURS OTHER

White and Yellow Copies to Lab Pink to Project Manager Lab to Return White Copy to Hart Crowser Gold to Sample Custodian

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Hart Crowser | Project Name: _____

COC No: _____ | Delivered by: Hand

Assigned ARI Job No: _____ | Tracking No: _____

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
Record cooler temperature (recommended 2.0-6.0 °C for chemistry	Alive	°C

Cooler Accepted by: JH Date: 12/23/08 Time: 16:56

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?	wet	
Was sufficient ice used (if appropriate)?	YES	(NO)
Were all bottles sealed in individual plastic bags?	YES	(NO)
Did all bottle arrive in good condition (unbroken)?	(YES)	NO
Were all bottle labels complete and legible?	(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 checklist)	YES	(NO)
Were all VOC vials free of air bubbles? (NA)	YES	NO
Was sufficient amount of sample sent in each bottle?	(YES)	NO

Samples Logged by: JH Date: 1-5-09 Time: 12:34

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

Explain discrepancies or negative responses:

By: Date:

Case Narrative

prepared
for

HART CROWSER, INC.

Project: Port Gamble, 17330-14

ARI JOB NO: OG53

prepared
by

Analytical Resources, Inc.

Case Narrative
Hart Crowser
Port Gamble, 17330-14 (Crabs)
ARI Job: OG53
February 26, 2009

Sample Receipt

Analytical Resources Inc. (ARI) accepted one tissue sample in good condition on December 16, 2008. The samples were logged under several different ARI SDGs based on sample preps. Please note that several sample containers were prepped and archived upon receipt as requested on the COC. All samples and preps were frozen to protect holding times. For further detail regarding sample receipt, please refer to the Cooer Receipt Form.

** Select samples were sent to SGS Environmental for Dioxin and Furans analysis. The data has been included in this data package.

PCBs Method 8082:

The samples were extracted on 1/9/09 and analyzed on 1/15/09 within the method recommended holding times for frozen samples.

Initial calibration(s): All compounds of interest were within method acceptance criteria.

Continuing calibration(s): Are in control.

Samples: There were no anomalies associated with these samples.

Surrogates: Are in control.

LCS/LCSD(s): Are in control.

Method Blank: The method blanks were free of contamination.

Total Metals:

All samples were prepared on 1/8/09 and analyzed between 1/14/09 and 1/21/09 within the method recommended holding times for frozen samples.

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

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

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

LCS(s): All LCS percent recoveries were within control limits.

MS(s): The matrix spike in is in control.

% Lipids: The data is included in this data package.

Data Reporting Qualifiers

Effective 12/28/04

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 ≥ 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
NR	Spiked compound recovery is not reported due to chromatographic interference
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.
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
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.

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 ≥40% RPD with no obvious chromatographic interference

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

LCS SOLUTIONS

12/30/08

LABE	SOLN ID	TEST	CONC. UG/ML	SOLVENT	EXP.
1	1549-3	PCB	20	ACETONE	10/10/09
2	1472-3	BCOC PEST	10	ACETONE	07/20/08
3	1517-1	PEST	02/04/20	ACETONE	05/15/09
4	1561-2	LOW PEST	0.2/0.4/2	ACETONE	05/15/09
5	1537-1	EPH	1500	MECL2	08/16/09
6	1559-2	PCP	12.5/125	ACETONE	11/05/09
7	1573-1	ABN	100	ACETONE	08/01/09
8	1566-1	TBT	2.5	MECL2	12/04/09
9	1567-3	PORE TBT	.125/.25	MECL2	12/04/09
10	1554-3	ABN ACID	100/200	MEOH	10/21/09
11	1563-3	TPHD	15000	ACETONE	11/20/09
12	1563-1	ABN BASE	200	ACETONE	06/30/09
13	1573-2	LOW PCB	2	ACETONE	10/10/09
14	1547-1	LOW ABN ACID	10/20	MEOH	04/10/09
15*	1452-1	SIM PNA	15/75	MEOH	04/09/09
16	1502-2	DIOXANE	100	MEOH	02/20/09
17	1516-2	1248 PCB	20	ACETONE	05/07/09
18	1514-4	LOW SIM PNA	1.5/7.5	ACETONE	04/24/09
19	1517-3	AK103	7500	MECL2	12/29/08
20	1572-2	PNA	100	ACETONE	12/26/09
21*	1414-4	SKY/BHT	100	MEOH	04/08/09
22	1570-1	HERB	12.5/12500	MEOH	02/19/09
23	1505-1	LOW ABN BASE	20	MEOH	03/20/09
24	1541-4	LOW ABN	10	ACETONE	08/01/09
25	1481-1	DIPHENYL	100	MEOH	07/20/08
26	1545-2	OP-PEST	25	MEOH	02/14/09
27	1495-1	STEROLS	200	MEOH	12/29/08
28	1494-1	ADD. PEST	4	ACETONE	01/23/09
29	1496-3	DECANES	100	MEOH	02/12/09
30	1497-2	EDB/DBCP	2	ACETONE	02/12/09
31	1510-3	TERPINEOL	100	MEOH	03/21/09

LCS SOLUTIONS

12/30/08

32	1545-3	GUAIACOL	50-200	ACETONE	06/05/09
33	1522-1	RESIN ACID	250	ACETONE	06/11/09
34	1530-2	CONGENERS	1	ACETONE	07/23/09
50	1571-1	FULL RESIN	250	ACETONE	06/10/09
*=REVERIFIED SOLUTION					

SURR SOLUTIONS

12/30/08

LABEL	SOLN ID	TEST	CONC. UG/ML	SOLVENT	EXP.
A	1559-5	ABN	100/150	MEOH	03/13/09
B	1572-1	SIM PNA	15/75	MEOH	08/28/09
C	1559-1	SIM ABN	25/37.5	MEOH	03/13/09
D	1561-3	LOW PCB	0.2	ACETONE	07/31/09
E*	1478-1	HERB	62.5	MEOH	09/21/09
F	1520-3	PCP	12.5	ACETONE	04/18/09
G	1534-1	1,4DIOXANE	100	MEOH	02/20/09
H	1545-1	OP-PEST	25	MEOH	02/14/09
I	1559-4	LOW S. PNA	1.5	MEOH	08/28/09
J	1566-5	TBT-PORE	0.125	MECL2	12/04/09
K	1538-1	MED PCB	20	ACETONE	07/31/09
L	1566-4	TBT	2.5	MECL2	12/04/09
M	1558-2	EPH	1500	MECL2	09/24/09
N	1538-2	PCB	2	ACETONE	07/31/09
O	1567-4	TPH	450	MECL2	09/24/09
P	1560-3	HCID	2250	MECL2	09/24/09
Q	1497-3	EDB	2	ACETONE	02/12/09
R	1521-4	RESIN ACID	250	ACETONE	06/11/09
S	1568-5	PBDE	.25	MEOH	12/11/09
T	*reverified	solution			
U					
V					
W					
X					
Y					
Z					

Data Summary Package

prepared
for

HART CROWSER, INC.

Project: Port Gamble, 17330-14

ARI JOB NO: OG53

prepared
by

Analytical Resources, Inc.

PCBS

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082
Page 1 of 1

Sample ID: CRAB1-A MEAT SAMPLE

Lab Sample ID: OG53A
LIMS ID: 09-396
Matrix: Tissue
Data Release Authorized:
Reported: 01/16/09

QC Report No: OG53-Hart Crowser, Inc.
Project: PORT GAMBLE 17330-14
Date Sampled: 12/23/08
Date Received: 12/23/08

Date Extracted: 01/09/09
Date Analyzed: 01/15/09 16:57
Instrument/Analyst: ECD5/JGR
GPC Cleanup: Yes
Sulfur Cleanup: No
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.0 g-as-rec
Final Extract Volume: 2.0 mL
Dilution Factor: 5.00
Silica Gel: No

Percent Moisture: NA

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	8.0	< 8.0 U
53469-21-9	Aroclor 1242	8.0	< 8.0 U
12672-29-6	Aroclor 1248	8.0	< 8.0 U
11097-69-1	Aroclor 1254	8.0	< 8.0 U
11096-82-5	Aroclor 1260	8.0	< 8.0 U
11104-28-2	Aroclor 1221	8.0	< 8.0 U
11141-16-5	Aroclor 1232	8.0	< 8.0 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	71.4%
Tetrachlorometaxylene	71.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082
Page 1 of 1

Sample ID: CRAB1-A PAN2
SAMPLE

Lab Sample ID: OG53B
LIMS ID: 09-409
Matrix: Tissue
Data Release Authorized:
Reported: 01/16/09

QC Report No: OG53-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/23/08
Date Received: 12/23/08

Date Extracted: 01/09/09
Date Analyzed: 01/15/09 17:14
Instrument/Analyst: ECD5/JGR
GPC Cleanup: Yes
Sulfur Cleanup: No
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.0 g-as-rec
Final Extract Volume: 2.0 mL
Dilution Factor: 5.00
Silica Gel: No

Percent Moisture: NA

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	8.0	< 8.0 U
53469-21-9	Aroclor 1242	8.0	< 8.0 U
12672-29-6	Aroclor 1248	8.0	< 8.0 U
11097-69-1	Aroclor 1254	20	< 20 Y
11096-82-5	**Aroclor 1260**	**8.0**	**15 P**
11104-28-2	Aroclor 1221	8.0	< 8.0 U
11141-16-5	Aroclor 1232	8.0	< 8.0 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	72.6%
Tetrachlorometaxylene	76.8%

ANALYTICAL RESOURCES INCORPORATED

SW8082/PCB TISSUE SURROGATE RECOVERY SUMMARY

Matrix: Tissue

QC Report No: OG53-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14

Client ID	DCBP	TCMX	TOT OUT
MB-010909	67.5%	62.0%	0
LCS-010909	67.5%	61.5%	0
LCSD-010909	53.8%	52.5%	0
CRAB1-A MEAT	71.4%	71.2%	0
CRAB1-A PAN2	72.6%	76.8%	0

	LCS/MB LIMITS	QC LIMITS
(DCBP) = Decachlorobiphenyl	(36-130)	(33-149)
(TCMX) = Tetrachlorometaxylene	(30-119)	(32-121)

Prep Method: TissM
Log Number Range: 09-396 to 09-409

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082
Page 1 of 1

Sample ID: LCS-010909
LCS/LCSD

Lab Sample ID: LCS-010909
LIMS ID: 09-396
Matrix: Tissue
Data Release Authorized:
Reported: 01/16/09

QC Report No: OG53-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: NA
Date Received: NA

Date Extracted LCS/LCSD: 01/09/09
Date Analyzed LCS: 01/15/09 16:23
LCSD: 01/15/09 16:40
Instrument/Analyst LCS: ECD5/JGR
LCSD: ECD5/JGR
GPC Cleanup: Yes
Sulfur Cleanup: No
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount LCS: 25.0 g-as-rec
LCSD: 25.0 g-as-rec
Final Extract Volume LCS: 2.0 mL
LCSD: 2.0 mL
Dilution Factor LCS: 1.00
LCSD: 1.00
Silica Gel: No

Percent Moisture: NA

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Aroclor 1016	29.5	40.0	73.8%	23.0	40.0	57.5%	24.8%
Aroclor 1260	29.4	40.0	73.5%	22.7	40.0	56.8%	25.7%

PCB Surrogate Recovery

	LCS	LCSD
Decachlorobiphenyl	67.5%	53.8%
Tetrachlorometaxylene	61.5%	52.5%

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

PCB METHOD BLANK SUMMARY

BLANK NO.

OG53MBS1

Lab Name: ANALYTICAL RESOURCES, INC
Client: HART CROWSER, INC.

ARI Job No.: OG53
Project: PORT GAMBLE

Lab Sample ID: OG53MBS1
Lab File ID: 0115B034

Date Extracted: 01/09/09
Matrix: SOLID

Date Analyzed: 01/15/09
Instrument ID: ECD5

Time Analyzed: 1605
GC Columns: ZB5/ZB35

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

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED
01	OG53LCSS1	OG53LCSS1	01/15/09
02	OG53LCSDS1	OG53LCSDS1	01/15/09
03	CRAB1-A MEAT	OG53A	01/15/09
04	CRAB1-A PAN2	OG53B	01/15/09

ALL RUNS ARE DUAL COLUMN

FORM IV PCB

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082
Page 1 of 1

Sample ID: MB-010909
METHOD BLANK

Lab Sample ID: MB-010909
LIMS ID: 09-396
Matrix: Tissue
Data Release Authorized:
Reported: 01/16/09

QC Report No: OG53-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: NA
Date Received: NA

Date Extracted: 01/09/09
Date Analyzed: 01/15/09 16:05
Instrument/Analyst: ECD5/JGR
GPC Cleanup: Yes
Sulfur Cleanup: No
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.0 g
Final Extract Volume: 2.0 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: NA

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	8.0	< 8.0 U
53469-21-9	Aroclor 1242	8.0	< 8.0 U
12672-29-6	Aroclor 1248	8.0	< 8.0 U
11097-69-1	Aroclor 1254	8.0	< 8.0 U
11096-82-5	Aroclor 1260	8.0	< 8.0 U
11104-28-2	Aroclor 1221	8.0	< 8.0 U
11141-16-5	Aroclor 1232	8.0	< 8.0 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	67.5%
Tetrachlorometaxylene	62.0%

METALS

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: CRAB1-A MEAT SAMPLE

Lab Sample ID: OG53A
LIMS ID: 09-396
Matrix: Tissue
Data Release Authorized:
Reported: 01/22/09

QC Report No: OG53-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/23/08
Date Received: 12/23/08

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-as-rec	Q
3050B	01/08/09	6010B	01/21/09	**7440-38-2**	**Arsenic**	1	**7**	
3050B	01/08/09	6010B	01/21/09	**7440-43-9**	**Cadmium**	0.04	**0.04**	
3050B	01/08/09	6010B	01/21/09	**7440-47-3**	**Chromium**	0.1	**0.1**	
3050B	01/08/09	6010B	01/21/09	**7440-50-8**	**Copper**	0.04	**8.65**	
3050B	01/08/09	6010B	01/21/09	7439-92-1	Lead	0.4	0.4	U
CLP-M	01/08/09	7471A	01/14/09	**7439-97-6**	**Mercury**	0.009	**0.047**	
3050B	01/08/09	6010B	01/21/09	**7440-22-4**	**Silver**	0.06	**0.19**	
3050B	01/08/09	6010B	01/21/09	**7440-66-6**	**Zinc**	0.2	**50.2**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: CRAB1-A PAN2
SAMPLE

Lab Sample ID: OG53B
LIMS ID: 09-409
Matrix: Tissue
Data Release Authorized:
Reported: 01/22/09

QC Report No: OG53-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/23/08
Date Received: 12/23/08

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-as-rec	Q
3050B	01/08/09	6010B	01/21/09	**7440-38-2**	**Arsenic**	1	**4**	
3050B	01/08/09	6010B	01/21/09	**7440-43-9**	**Cadmium**	0.04	**0.34**	
3050B	01/08/09	6010B	01/21/09	**7440-47-3**	**Chromium**	0.1	**0.1**	
3050B	01/08/09	6010B	01/21/09	**7440-50-8**	**Copper**	0.04	**19.2**	
3050B	01/08/09	6010B	01/21/09	7439-92-1	Lead	0.4	0.4	U
CLP-M	01/08/09	7471A	01/14/09	**7439-97-6**	**Mercury**	0.01	**0.03**	
3050B	01/08/09	6010B	01/21/09	**7440-22-4**	**Silver**	0.06	**0.50**	
3050B	01/08/09	6010B	01/21/09	**7440-66-6**	**Zinc**	0.2	**15.1**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS **Sample ID: LAB CONTROL**

Lab Sample ID: OG44LCS
LIMS ID: 09-348
Matrix: Tissue
Data Release Authorized:
Reported: 01/22/09

QC Report No: OG44-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: NA
Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike Found	Spike Added	% Recovery	Q
Arsenic	6010B	80	80	100%	
Cadmium	6010B	20.3	20.0	102%	
Chromium	6010B	19.8	20.0	99.0%	
Copper	6010B	19.2	20.0	96.0%	
Lead	6010B	79.4	80.0	99.2%	
Mercury	7471A	0.21	0.20	105%	
Silver	6010B	20.3	20.0	102%	
Zinc	6010B	20.1	20.0	100%	

Reported in mg/kg-wet

N-Control limit not met
NA-Not Applicable, Analyte Not Spiked
Control Limits: 80-120%

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: METHOD BLANK

Lab Sample ID: OG44MB
LIMS ID: 09-348
Matrix: Tissue
Data Release Authorized:
Reported: 01/22/09

QC Report No: OG44-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: NA
Date Received: NA

Percent Total Solids: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-as-rec	Q
3050B	01/08/09	6010B	01/21/09	7440-38-2	Arsenic	1	1	U
3050B	01/08/09	6010B	01/21/09	7440-43-9	Cadmium	0.04	0.04	U
3050B	01/08/09	6010B	01/21/09	7440-47-3	Chromium	0.1	0.1	U
3050B	01/08/09	6010B	01/21/09	7440-50-8	Copper	0.04	0.04	U
3050B	01/08/09	6010B	01/21/09	7439-92-1	Lead	0.4	0.4	U
CLP-M	01/08/09	7471A	01/14/09	7439-97-6	Mercury	0.01	0.01	U
3050B	01/08/09	6010B	01/21/09	7440-22-4	Silver	0.06	0.06	U
3050B	01/08/09	6010B	01/21/09	7440-66-6	Zinc	0.2	0.2	U

U-Analyte undetected at given RL
RL-Reporting Limit

DIOXIN

SGS

Laboratory Results

Ms. Kelly Bottem
Analytical Resources, Inc.
4611 S. 134th Place
Suite 100
Tukwila WA 98168-3240

Phone: 206-695-6211
Fax: 206-695-6201

Dear Ms. Bottem:

Enclosed is a full data package containing the final results for samples received by SGS Environmental Services, Inc. on January 15, 2009 under your project name "OG53". The samples were analyzed by Method 1613 following SGS's Standard Operating Procedures and are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards.

Number of Samples Received:	2
Your Project Reference:	OG53
SGS Project Number:	G1040-6

We appreciate your business and look forward to working with you again. Please contact me at 910-350-1903 if you have questions or need additional technical support.

Sincerely,

Jeannie Milholland

Jeannie Milholland
Project Manager

2-17-2009
Date

DC138.033007.7

SGS

Case Narrative
SGS Project: **G1040-6**
Project Name: **OG53**

For Method: 1613

- The submitted samples were accepted into the lab on January 15th, 2009 and extracted on February 1st, 2009 by method 3540C. The sample extract and associated QC extracts were then processed through clean-up as prescribed in the SGS standard operating procedures and analyzed by HRGC/HRMS for method 1613.
- No analytical issues were encountered.

Craig R. Tvonzo 2/17/09

Craig R. Tvonzo Date
Data Validation

Paradigm Analytical Laboratories, Inc. | 5500 Business Dr., Wilmington, NC 28405 t (910) 350-1903 f (910) 350-1557 www.us.sgs.com

SGS

Table of Contents

Section 1: Cover Letter/Case Narrative

Contains the Table of Contents, a project narrative, the client and SGS project identifiers, the number and type of samples, the methodology used to process the samples, and a summary table of sample results. A listing of current certifications by state, a table of abbreviations and qualifiers and the Toxic Equivalent Factors (TEF) are also supplied.

Section 2: Project Information

Contains the chain-of-custody(s), internal chain-of-custody(s) if applicable, sample login summary, sample receipt checklist, and any other project/client specific information.

Section 3: Sample Analytical Results

Contains results for client samples. Sample results include two pages of summarized analytical data and the associated raw data. The raw data includes a quantitation report from the instrumentation used that lists, ion areas, ratios, retention times, concentrations, and signal-to-noise ratios. It also has the selected ion current profiles (SICPs) for all homolog groups and any manual integrations.

Section 4: Quality Control Analytical Results

Contains results for each analytical workgroup associated with the submitted samples. A workgroup consists of the Lab Method Blank (LMB) and the Ongoing Precision and Recovery sample (OPR). All sample preparation data, including dry weight determinations, extraction logs, clean-up logs and observation notes are also documented. Any other supporting QC data will be documented here upon client request.

Section 5: Initial Calibration

Contains a table summarizing calibration data such as relative response factors, concentrations, and percent relative standard deviation. This section also contains related daily instrument QC information: GC performance data, mass resolution check, windows defining mix, and SICPs for all homolog groups and any manual integrations as well as the injection prep and instrument run logs.

Section 6: Continuing Calibration Data

Contains all daily instrument quality control information. This includes mass resolution checks, a table summarizing the window defining peaks, SICPs for the first and last eluters for each homolog group, SICPs documenting GC performance, a summary quantitation report showing RRFs for the Ccal and Ical, and SICPs for all homolog groups and any manual integrations, injection prep and instrumentation runlogs.

List of Qualifiers: Dioxin's

B Analyte was detected in the Lab Method Blank at a level above the Reporting Limit.

EDL "Estimated Detection Limit"

EMPC "Estimated Maximum Possible Concentration"

RL Report Limit

CL Control Limit

U Undetected

ppt Parts-per-trillion (pg/g; ng/L)

V Recovery is below quality control limit. The data has been validated based on a favorable signal-to-noise and detection limit.

Outside quality control limits

* Indicates that the ion-ratio fails high or low; analyte reported as an EMPC

An average uncertainty of 30% can be routinely achieved as concluded from the evaluation of HRGC-HRMS standard operating procedures. The following flags warn the data user of situations where the uncertainty may be greater than stated.

A Amount detected is less than the Lower Method Calibration Limit.

J Amount detected is between the Method Detection Limit and the Lower Calibration Limit.

O The recovery of this analyte in the OPR is above the Method QC Limits and the reported concentration in the sample may be biased high.

E Amount detected is greater than the Upper Calibration Limit.

S The amount of analyte present has saturated the detector. This situation results in an underestimation of the affected analyte(s).

Q Indicates the presence of a quantitative interference. This situation may result in an underestimation of the affected analyte(s).

I Indicates the presence of a qualitative interference that could cause a false positive or an overestimation of the affected analyte(s).

DPE Indicates the presence of a peak in the polychlorinated diphenylether channel that could cause a false positive or an overestimation of the affected analyte(s).

DC250.081908.1

Toxic Equivalency Factors

Analyte	WHO* 1998	WHO* 2005	International-89	MADEP+
2,3,7,8-TCDD	1	1	1	1
1,2,3,7,8-PeCDD	1	1	0.5	0.5
1,2,3,4,7,8-HxCDD	0.1	0.1	0.1	0.1
1,2,3,6,7,8-HxCDD	0.1	0.1	0.1	0.1
1,2,3,7,8,9-HxCDD	0.1	0.1	0.1	0.1
1,2,3,4,6,7,8-HpCDD	0.01	0.01	0.01	0.1
OCDD	0.0001	0.0003	0.001	0.001
2,3,7,8-TCDF	0.1	0.1	0.1	0.1
1,2,3,7,8-PeCDF	0.05	0.03	0.05	0.5
2,3,4,7,8-PeCDF	0.5	0.3	0.5	0.5
1,2,3,4,7,8-HxCDF	0.1	0.1	0.1	0.1
1,2,3,6,7,8-HxCDF	0.1	0.1	0.1	0.1
2,3,4,6,7,8-HxCDF	0.1	0.1	0.1	0.1
1,2,3,7,8,9-HxCDF	0.1	0.1	0.1	0.1
1,2,3,4,6,7,8-HpCDF	0.01	0.01	0.01	0.1
1,2,3,4,7,8,9-HpCDF	0.01	0.01	0.01	0.1
OCDF	0.0001	0.0003	0.001	0.001

* World Health Organization
+ Massachusetts Department of Environmental Protection

SUBCONTRACTOR ANALYSIS REQUEST
CUSTODY TRANSFER 01/07/09

ANALYTICAL RESOURCES INCORPORATED

ARI Project: OG53

G1040-6

Laboratory: SGS ENVIROMENTAL SERVICES INC.
Lab Contact: TRENT TEMPERLY
Lab Address: 5500 BUSINESS DR.
WILMINGTON, NC 28405
Phone: 910-350-1903
Fax: 910-350-1557

ARI Client: Hart Crowser, Inc.
Project ID: PORT GAMBLE
ARI PM: Kelly Bottem
Phone: 206-695-6211
Fax: 206-695-6201

Analytical Protocol: In-house
Special Instructions:

Requested Turn Around: **01/21/09**
Fax Results (Y/N):

Limits of Liability. *Subcontractor is expected to perform all requested services in accordance with appropriate methodology following Standard Operating Procedures that meet standards for the industry. The total liability of ARI, its officers, agents, employees, or sucessors, arising out of or in connection with the requested services, shall not exceed the negotiated amount for said services. The agreement by the Subcontractor to perform services requested by ARI releases 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 Subcontractor.*

ARI ID	Client ID/ Add'l ID	Sampled	Matrix	Bottles	Analyses
09-396-OG53A	CRAB1-A MEAT	12/23/08 10:35	Tissue	1	Dioxin/Furans 1613(Sub)
Special Instructions: None					
09-409-OG53B	CRAB1-A PAN2	12/23/08 10:35	Tissue	1	Dioxin/Furans 1613(Sub)
Special Instructions: None					

Carrier UPS	Airbill 1Z 832 695 01 4592 5947	Date 1/14/09	
Relinquished by	Company ART	Date 1/14/09	Time 1600
Received by	Company SGS 3.5 no seal	Date 1/15/09	Time 10:15

Subcontractor Custody Form - **OG53**
Page 1 of 1

SGS Environmental Services, Inc.

Cust Proj ID: OG53
Client Name: Analytical Resources, Inc. PO:

G1040-6

Due Date: 2009-02-05 17:00:00
Login Date: 2009-01-16 11:39:10

Sample ID		Cust Sample ID	PRI	Date Collected	Date Received	Date Due	Matrix	LOC	Report	Analysis	Status
G1040-6-1	A	CRAB1-A MEAT	STD	2008-12-23 10:35:00	2009-01-15	2009-02-05	Tissue	F2	Full	1613	LG::REVW
G1040-6-2	A	CRAB1-A PAN2	STD	2008-12-23 10:35:00	2009-01-15	2009-02-05	Tissue	F2	Full	1613	LG::REVW

Sample Receipt Checklist (SRC)

SGS Environmetal Services Inc.

Client: **Analytical Resources, Inc.** Lab Proj. ID: **G1040-6**

Client Proj. ID: **OG53**

1. X Shipped
   __ Hand Delivered
   Notes:

2. X Proper, full, and complete documentation
   (unique sample identification on durable label with indelible ink, location of collection, date/time of collection, collector's name, preservation type, sample type (method/matrix))
   __ Acceptable documentation (but, incomplete)
   __ Unacceptable documentation
   Notes:

3. __ Custody Tape on Container
   X No Custody Tape
   Notes:

4. X Samples Intact*
   (are in appropriate container, are not damaged, and do not show signs of contamination)
   __ Samples Broken / Leaking
   __ VOA Vials Checked for Air Bubbles
   Notes:

5. x Chilled on Receipt* Actual Temp.(s) in °C: 3.5
   __ Ambient on Receipt
   __ Walk-in on Ice; Coming down to temp.
   __ Received out of temperature protocol
   Notes:

6. X Sufficient Sample Submitted
   __ Insufficient Sample Submitted
   Notes:

7. X Samples Preserved Correctly*
   (see preservative checklist where applicable)
   __ Improper Preservative(s)
   __ None recommended (N/A)
   Notes:

8. X Received Within Holding Time
   __ Not Received Within Holding Time
   __ N/A
   Notes:

9. X No Discrepancies Noted
   __ Discrepancies Noted
   Notes:

Comments:

* = Rejection of sample is required when not marked; Contact client services immediately for a resolution.

DC27.091503.3

Inspected and Logged in by:

Date / Time: Fri-1/16/09 11:38

Method 1613

CRAB1-A MEAT

Analytical Resources, Inc.

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	RL (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	1.00			
1,2,3,7,8-PeCDD	ND	5.00			
1,2,3,4,7,8-HxCDD	ND	5.00			
1,2,3,6,7,8-HxCDD	ND	5.00			
1,2,3,7,8,9-HxCDD	ND	5.00			
1,2,3,4,6,7,8-HpCDD	ND	5.00			
OCDD	ND	10.0			
2,3,7,8-TCDF	ND	1.00			
1,2,3,7,8-PeCDF	ND	5.00			
2,3,4,7,8-PeCDF	ND	5.00			
1,2,3,4,7,8-HxCDF	ND	5.00			
1,2,3,6,7,8-HxCDF	ND	5.00			
2,3,4,6,7,8-HxCDF	ND	5.00			
1,2,3,7,8,9-HxCDF	ND	5.00			
1,2,3,4,6,7,8-HpCDF	ND	5.00			
1,2,3,4,7,8,9-HpCDF	ND	5.00			
OCDF	ND	10.0			
Total TCDDs	ND	1.00			
Total PeCDDs	ND	5.00			
Total HxCDDs	ND	5.00			
Total HpCDDs	ND	5.00			
Total TCDFs	ND	1.00			
Total PeCDFs	ND	5.00			
Total HxCDFs	ND	5.00			
Total HpCDFs	ND	5.00			
WHO-2005 TEQ (ND=0)	0.000				
WHO-2005 TEQ (ND=½)	5.70				

Client Information

Project Name:	OG53
Sample ID:	CRAB1-A MEAT

Laboratory Information

Project ID:	G1040-6	
Sample ID:	G1040-6-1B	
Collection Date/Time:	23-Dec-08	10:35
Receipt Date:	15-Jan-09	10:15
Extraction Date:	01-Feb-09	
Analysis Date:	09-Feb-09	23:36

Sample Information

Matrix:	Tissue	
Weight / Volume:	10.58	grams
Solids / Lipids:	NA	
Original pH :	NA	
Batch ID:	WG16457	
Filename:	a09feb09a-10	
Retchk:	a09feb09a-1	
Begin ConCal:	a09feb09a-1	
Initial Cal:	m1613-100708a	

Method 1613

CRAB1-A MEAT

Analytical Resources, Inc.

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
$^{13}C_{12}$-2,3,7,8-TCDD	2	1.80	90.1	31:28	0.78	
$^{13}C_{12}$-1,2,3,7,8-PeCDD	2	2.30	115	34:16	1.58	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	2	1.64	82.1	36:53	1.27	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	2	1.66	83.2	36:58	1.26	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	2	1.87	93.6	40:19	1.05	
$^{13}C_{12}$-OCDD	4	2.83	70.7	44:39	0.89	
$^{13}C_{12}$-2,3,7,8-TCDF	2	1.65	82.3	30:52	0.79	
$^{13}C_{12}$-1,2,3,7,8-PeCDF	2	2.33	117	33:27	1.59	
$^{13}C_{12}$-2,3,4,7,8-PeCDF	2	2.24	112	34:05	1.58	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	2	1.68	84.1	36:09	0.54	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	2	1.72	85.8	36:16	0.51	
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	2	1.66	83.2	36:45	0.53	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	2	1.73	86.6	37:33	0.53	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	2	1.70	85.2	39:03	0.45	
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	2	1.86	93.1	41:01	0.45	
Cleanup Standard						
$^{37}Cl_4$-2,3,7,8-TCDD	0.4	0.375	93.8	31:29		
Injection Standards						
$^{13}C_{12}$-1,2,3,4-TCDD	2			31:01	0.79	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	2			37:13	1.25	

Client Information

Project Name: OG53

Sample ID: CRAB1-A MEAT

Laboratory Information

Project ID: G1040-6
Sample ID: G1040-6-1B
Collection Date/Time: 23-Dec-08 10:35
Receipt Date: 15-Jan-09 10:15
Extraction Date: 01-Feb-09
Analysis Date: 09-Feb-09 23:36

Analyzed by: JWP
Date: 021709

Sample Information

Matrix: Tissue
Weight / Volume: 10.58 grams
Solids / Lipids: NA %
Original pH : NA
Batch ID: WG16457

Filename: a09feb09a-10
Retchk: a09feb09a-1
Begin ConCal: a09feb09a-1

Initial Cal: m1613-100708a

Reviewed by: TM
Date: 02/17/09

Form Version:[1613_HRMS12]Repor

Filename ; a09feb09a
Sample ; 10
Acquired ; 9-FEB-09 23:36:37
Processed ; 10-FEB-09 07:33:52
Sample ID ; G1040-6-1B
Cal Table ; m1613-100708a
Results Table ; m1613-020909a
Comments ;

;*1613*
;Inst: HRMS1

Ent;	Name;	Resp;	Ion 1;	Ion 2;	RA;?;	RT;	Conc;	EDL;	S/N1;?;	S/N2;?;M;	Signal1;	Noise 1;	Signal2;	Noise 2
1 ;	2,3,7,8-TCDD;	*;	*;	*;	*;n;	NotFnd;	*;	0.0837;	*;n;	*;y;y;	*;	6.20e+03;	*;	4.51e+03
2 ;	1,2,3,7,8-PeCDD;	*;	*;	*;	*;n;	NotFnd;	*;	0.1462;	*;n;	*;n;n;	*;	8.12e+03;	*;	1.20e+04
3 ;	1,2,3,4,7,8-HxCDD;	*;	*;	*;	*;n;	NotFnd;	*;	0.2021;	*;n;	*;n;n;	*;	1.13e+04;	*;	1.08e+04
4 ;	1,2,3,6,7,8-HxCDD;	*;	*;	*;	*;n;	NotFnd;	*;	0.2136;	*;n;	*;n;n;	*;	1.13e+04;	*;	1.08e+04
5 ;	1,2,3,7,8,9-HxCDD;	*;	*;	*;	*;n;	NotFnd;	*;	0.2094;	*;n;	*;n;n;	*;	1.13e+04;	*;	1.08e+04
6 ;	1,2,3,4,6,7,8-HpCDD;	1.38e+05;	6.85e+04;	6.91e+04;	0.99;y;	40:20;	0.142;	0.2292;	2;n;	2;n;y;	2.06e+04;	9.32e+03;	1.89e+04;	8.00e+03
7 ;	OCDD;	2.25e+05;	1.07e+05;	1.19e+05;	0.90;y;	44:39;	0.388;	0.3519;	4;y;	4;y;y;	2.00e+04;	4.92e+03;	2.50e+04;	6.96e+03
8 ;	2,3,7,8-TCDF;	1.86e+05;	8.10e+04;	1.05e+05;	0.77;y;	30:53;	0.118;	0.1078;	3;n;	4;y;y;	2.01e+04;	7.24e+03;	2.54e+04;	5.76e+03
9 ;	1,2,3,7,8-PeCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.0648;	*;n;	*;n;n;	*;	5.43e+03;	*;	8.53e+03
10 ;	2,3,4,7,8-PeCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.0646;	*;n;	*;n;n;	*;	5.43e+03;	*;	8.53e+03
11 ;	1,2,3,4,7,8-HxCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.1009;	*;n;	*;n;n;	*;	9.13e+03;	*;	7.47e+03
12 ;	1,2,3,6,7,8-HxCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.0943;	*;n;	*;n;n;	*;	9.13e+03;	*;	7.47e+03
13 ;	2,3,4,6,7,8-HxCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.1059;	*;n;	*;n;n;	*;	9.13e+03;	*;	7.47e+03
14 ;	1,2,3,7,8,9-HxCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.1300;	*;n;	*;n;n;	*;	9.13e+03;	*;	7.47e+03
15 ;	1,2,3,4,6,7,8-HpCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.1364;	*;n;	*;n;n;	*;	9.08e+03;	*;	8.16e+03
16 ;	1,2,3,4,7,8,9-HpCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.2014;	*;n;	*;n;n;	*;	9.08e+03;	*;	8.16e+03
17 ;	OCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.3780;	*;n;	*;n;n;	*;	8.22e+03;	*;	6.94e+03
Extraction Standards														
18 ;	13C-2,3,7,8-TCDD;	1.13e+08;	4.95e+07;	6.34e+07;	0.78;y;	31:28;	90.052;	0.1342;	2382;y;	3008;y;n;	1.65e+07;	6.92e+03;	2.17e+07;	7.20e+03
19 ;	13C-1,2,3,7,8-PeCDD;	1.05e+08;	6.46e+07;	4.08e+07;	1.58;y;	34:16;	114.986;	0.2501;	2456;y;	1613;y;n;	2.41e+07;	9.82e+03;	1.52e+07;	9.44e+03
20 ;	13C-1,2,3,4,7,8-HxCDD;	9.73e+07;	5.45e+07;	4.28e+07;	1.27;y;	36:53;	82.072;	0.1653;	1844;y;	1421;y;n;	1.79e+07;	9.70e+03;	1.40e+07;	9.83e+03
21 ;	13C-1,2,3,6,7,8-HxCDD;	1.07e+08;	5.98e+07;	4.73e+07;	1.26;y;	36:58;	83.131;	0.1521;	1789;y;	1418;y;n;	1.74e+07;	9.70e+03;	1.39e+07;	9.83e+03
22 ;	13C-1,2,3,4,6,7,8-HpCDD;	9.10e+07;	4.67e+07;	4.43e+07;	1.05;y;	40:19;	93.623;	0.1912;	1059;y;	1276;y;n;	1.11e+07;	1.04e+04;	1.03e+07;	8.08e+03
23 ;	13C-OCDD;	1.09e+08;	5.16e+07;	5.77e+07;	0.89;y;	44:39;	141.287;	0.1729;	1316;y;	1545;y;n;	9.00e+06;	6.84e+03;	1.00e+07;	6.48e+03
24 ;	90 13C-2,3,7,8-TCDF;	1.53e+08;	6.75e+07;	8.53e+07;	0.79;y;	30:52;	82.265;	0.0948;	1966;y;	2802;y;n;	1.54e+07;	7.83e+03;	1.95e+07;	6.96e+03
25 ;	13C-1,2,3,7,8-PeCDF;	1.75e+08;	1.08e+08;	6.76e+07;	1.59;y;	33:27;	116.627;	0.4912;	1228;y;	864;y;n;	4.00e+07;	3.26e+04;	2.54e+07;	2.93e+04
26 ;	13C-2,3,4,7,8-PeCDF;	1.65e+08;	1.01e+08;	6.38e+07;	1.58;y;	34:05;	112.080;	0.5017;	1181;y;	820;y;n;	3.85e+07;	3.26e+04;	2.41e+07;	2.93e+04
27 ;	13C-1,2,3,4,7,8-HxCDF;	1.29e+08;	4.54e+07;	8.33e+07;	0.54;y;	36:09;	84.046;	0.1269;	1488;y;	2988;y;n;	1.48e+07;	9.92e+03;	2.82e+07;	9.45e+03
28 ;	13C-1,2,3,6,7,8-HxCDF;	1.45e+08;	4.89e+07;	9.61e+07;	0.51;y;	36:16;	85.814;	0.1150;	1625;y;	3202;y;n;	1.61e+07;	9.92e+03;	3.03e+07;	9.45e+03
29 ;	13C-2,3,4,6,7,8-HxCDF;	1.32e+08;	4.56e+07;	8.65e+07;	0.53;y;	36:45;	83.157;	0.1223;	1447;y;	2871;y;n;	1.43e+07;	9.92e+03;	2.71e+07;	9.45e+03
30 ;	13C-1,2,3,7,8,9-HxCDF;	1.23e+08;	4.23e+07;	8.03e+07;	0.53;y;	37:33;	86.616;	0.1373;	1213;y;	2408;y;n;	1.20e+07;	9.92e+03;	2.28e+07;	9.45e+03
31 ;	13C-1,2,3,4,6,7,8-HpCDF;	1.03e+08;	3.22e+07;	7.11e+07;	0.45;y;	39:03;	85.188;	0.1382;	1184;y;	2007;y;n;	8.59e+06;	7.26e+03;	1.90e+07;	9.45e+03
32 ;	13C-1,2,3,4,7,8,9-HpCDF;	8.90e+07;	2.77e+07;	6.13e+07;	0.45;y;	41:01;	93.118;	0.1754;	804;y;	1382;y;n;	5.83e+06;	7.26e+03;	1.31e+07;	9.45e+03
Injection Standards														
33 ;	90 13C-1,2,3,4-TCDD;	1.12e+08;	4.95e+07;	6.29e+07;	0.79;y;	31:01;	82.718;	-;	1794;y;	2209;y;n;	1.24e+07;	6.92e+03;	1.59e+07;	7.20e+03
34 ;	13C-1,2,3,7,8,9-HxCDD;	1.23e+08;	6.85e+07;	5.49e+07;	1.25;y;	37:13;	114.280;	-;	2126;y;	1658;y;n;	2.06e+07;	9.70e+03;	1.63e+07;	9.83e+03
Cleanup Standard														
35 ;	37Cl-2,3,7,8-TCDD;	2.51e+07;	2.51e+07;	-;	-;-;	31:29;	18.762;	0.0525;	1407;y;	-;-;n;	8.29e+06;	5.89e+03;	-;	-

$$\%TCDF\text{-}ES = \frac{6.75e7 + 8.53e7}{4.95e7 + 6.29e7}\left(\frac{2000pg}{2000pg}\right)\left(\frac{100\%}{1.6529}\right) = 82.2\%$$ TM 02/17/09

Totals Raw Data

	Conc	Empc	Flags
TCDF	0	0	FALSE
TCDD	0	0	FALSE
PeCDF	0	0	FALSE
PeCDD	0	0	FALSE
HxCDF	0	0	FALSE
HxCDD	0	0	FALSE
HpCDF	0	0	FALSE
HpCDD	0	0	FALSE

Filename:	a09feb09a	Name of Homolog Group:	Total Tetra-Furans		
Sample:	10	Number of Peaks Found:	5	0	
Acquired:	9-FEB-09 23:36:37	RRF Used For Totals:	1.0368		
Processed:	10-FEB-09 07:33:52	Detection Limit:	0.1078		RL=0.500 (pg/µL)
Sample ID:	G1040-6-1B	Noise Height Ion1/Ion2:	7240 / 5764		
Cal Table:	m1613-100708a	Begin Window:			26:14:00
Results Table:	m1613-020909a	End Window:			33:07:00

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	6.50E+04	22600	42500		0.53 n	28:15	0.041	S2N	1.5	n	1.9	n	y
	2	1.15E+05	42800	71900		0.59 n	30:00	0.072	S2N	1.5	n	2.2	n	y
2,3,7,8-TCDF	3	1.86E+05	81000	105000		0.77 y	30:53	0.118	RL	2.8	n	4.4	y	y
	4	8.45E+04	33600	50900		0.66 y	31:08	0.053	S2N	1.4	n	3	y	y
	5	7.39E+04	30600	43300		0.71 y	32:05	0.047	S2N	2.2	n	2.1	n	y

Filename:	a09feb09a	Name of Homolog Group:	Total Tetra-Dioxins		
Sample:	10	Number of Peaks Found:	1	0	
Acquired:	9-FEB-09 23:36:37	RRF Used For Totals:	1.0087		
Processed:	10-FEB-09 07:33:52	Detection Limit:	0.0837		RL=0.500 (pg/µL)
Sample ID:	G1040-6-1B	Noise Height Ion1/Ion2:	6203 / 4513		
Cal Table:	m1613-100708a	Begin Window:			27:41:00
Results Table:	m1613-020909a	End Window:			32:38:00

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	1.22E+05	51500	70300		0.73 y	31:18	0.107	S2N	2.4	n	4.1	y	y

Filename:	a09feb09a	Name of Homolog Group:	Total Penta-Furans Fn1		
Sample:	10	Number of Peaks Found:	1	0	
Acquired:	9-FEB-09 23:36:37	RRF Used For Totals:	1.0121		
Processed:	10-FEB-09 07:33:52	Detection Limit:	0.0669		
Sample ID:	G1040-6-1B	Noise Height Ion1/Ion2:	7292 / 7144		
Cal Table:	m1613-100708a	Begin Window:			31:45:00
Results Table:	m1613-020909a	End Window:			32:05:00

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	1.12E+05	37600	73900	0.51	n	32:04	0.065	RL	2.9	n	3.9	y	y

Page 4 of 9

Filename:	a09feb09a	Name of Homolog Group:	Total Penta-Furans Fn2
Sample:	10	Number of Peaks Found:	0
Acquired:	9-FEB-09 23:36:37	RRF Used For Totals:	1.0121
Processed:	10-FEB-09 07:33:52	Detection Limit:	0.0647
Sample ID:	G1040-6-1B	Noise Height Ion1/Ion2:	5432 / 8532
Cal Table:	m1613-100708a	Begin Window:	
Results Table:	m1613-020909a	End Window:	

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	*	*	*	*	n	NotFnd	*		*	n	*	n	n

Page 5 of 9

Filename:	a09feb09a	Name of Homolog Group:	Total Penta-Dioxins
Sample:	10	Number of Peaks Found:	0
Acquired:	9-FEB-09 23:36:37	RRF Used For Totals:	1.0517
Processed:	10-FEB-09 07:33:52	Detection Limit:	0.1462
Sample ID:	G1040-6-1B	Noise Height Ion1/Ion2:	8116 / 12048
Cal Table:	m1613-100708a	Begin Window:	
Results Table:	m1613-020909a	End Window:	

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	*	*	*	*	n	NotFnd	*		*	n	*	n	n

Page 6 of 9

Filename:	a09feb09a	Name of Homolog Group:	Total Hexa-Furans	
Sample:	10	Number of Peaks Found:	1	0
Acquired:	9-FEB-09 23:36:37	RRF Used For Totals:	1.1305	
Processed:	10-FEB-09 07:33:52	Detection Limit:	0.1069	RL=2.500 (pg/µL)
Sample ID:	G1040-6-1B	Noise Height Ion1/Ion2:	9128 / 7468	
Cal Table:	m1613-100708a	Begin Window:		35:06:00
Results Table:	m1613-020909a	End Window:		37:40:00

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	8.37E+04	44500	39200	1.14	y	35:20	0.056	S2N	1.9	n	2.5	n	y

Page 7 of 9

Filename:	a09feb09a	Name of Homolog Group:	Total Hexa-Dioxins	
Sample:	10	Number of Peaks Found:	1	0
Acquired:	9-FEB-09 23:36:37	RRF Used For Totals:	1.0077	
Processed:	10-FEB-09 07:33:52	Detection Limit:	0.2086	RL=2.500 (pg/µL)

Totals Raw Data

Sample ID:	G1040-6-1B	Noise Height Ion1/Ion2:	11276/ 10844
Cal Table:	m1613-100708a	Begin Window:	35:36:00
Results Table:	m1613-020909a	End Window:	37:17:00

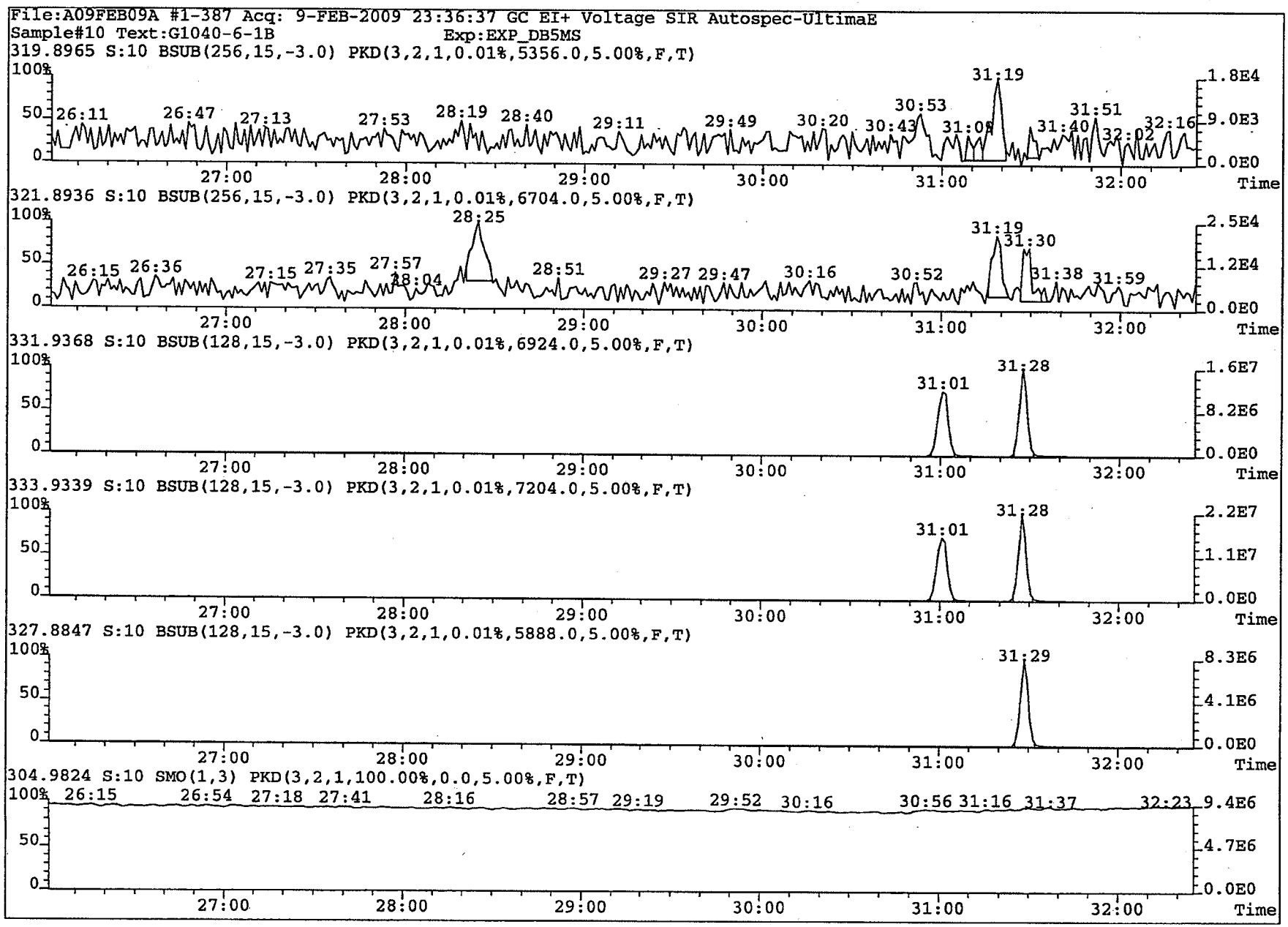
Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	2.34E+05	127000	107000		1.19 y	36:17	0.227	S2N		2.2 n		1.9 n	y

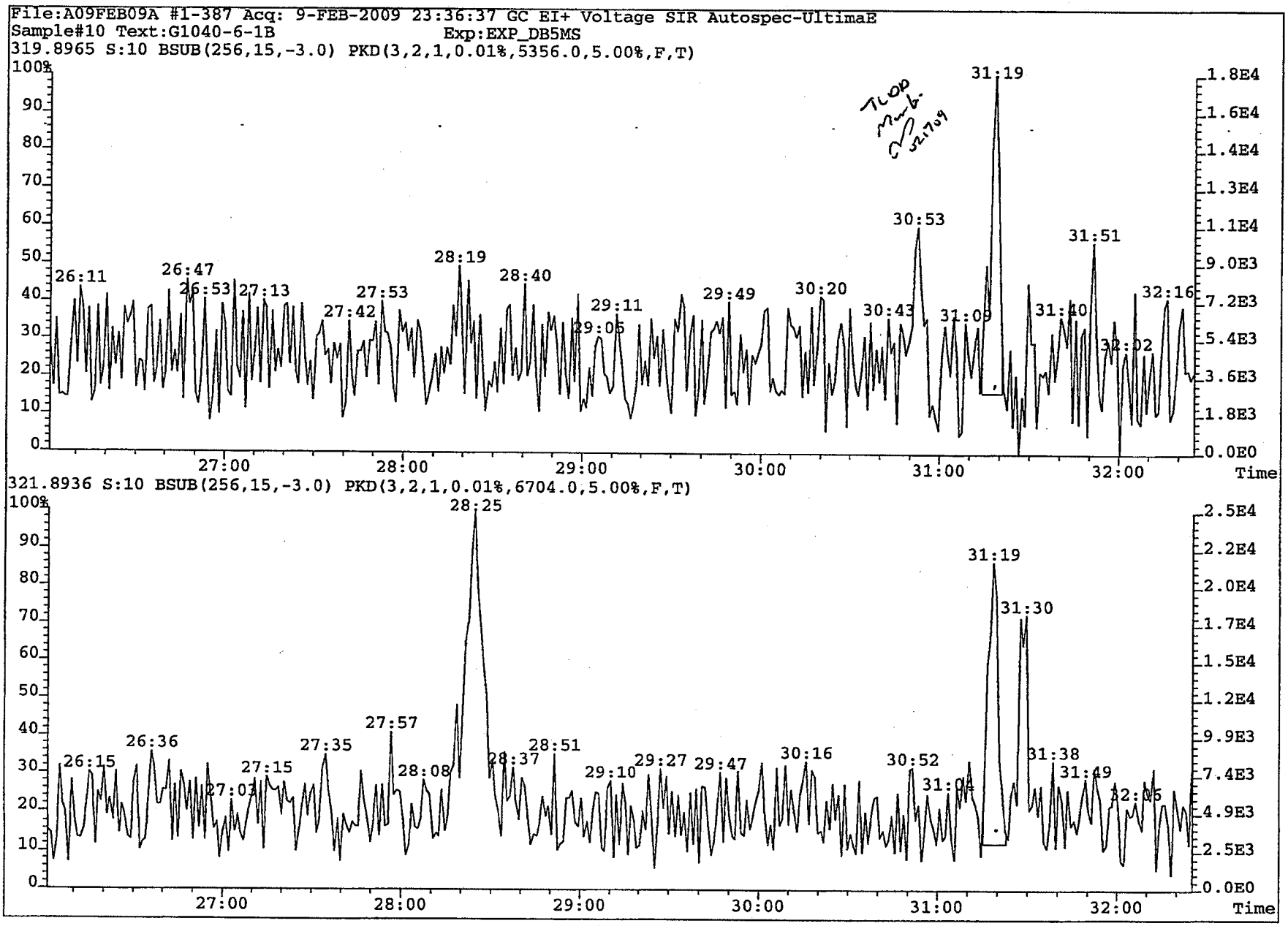
Filename:	a09feb09a	Name of Homolog Group:	Total Hepta-Furans
Sample:	10	Number of Peaks Found:	0
Acquired:	9-FEB-09 23:36:37	RRF Used For Totals:	1.3693
Processed:	10-FEB-09 07:33:52	Detection Limit:	0.1663
Sample ID:	G1040-6-1B	Noise Height Ion1/Ion2:	9076 / 8160
Cal Table:	m1613-100708a	Begin Window:	
Results Table:	m1613-020909a	End Window:	

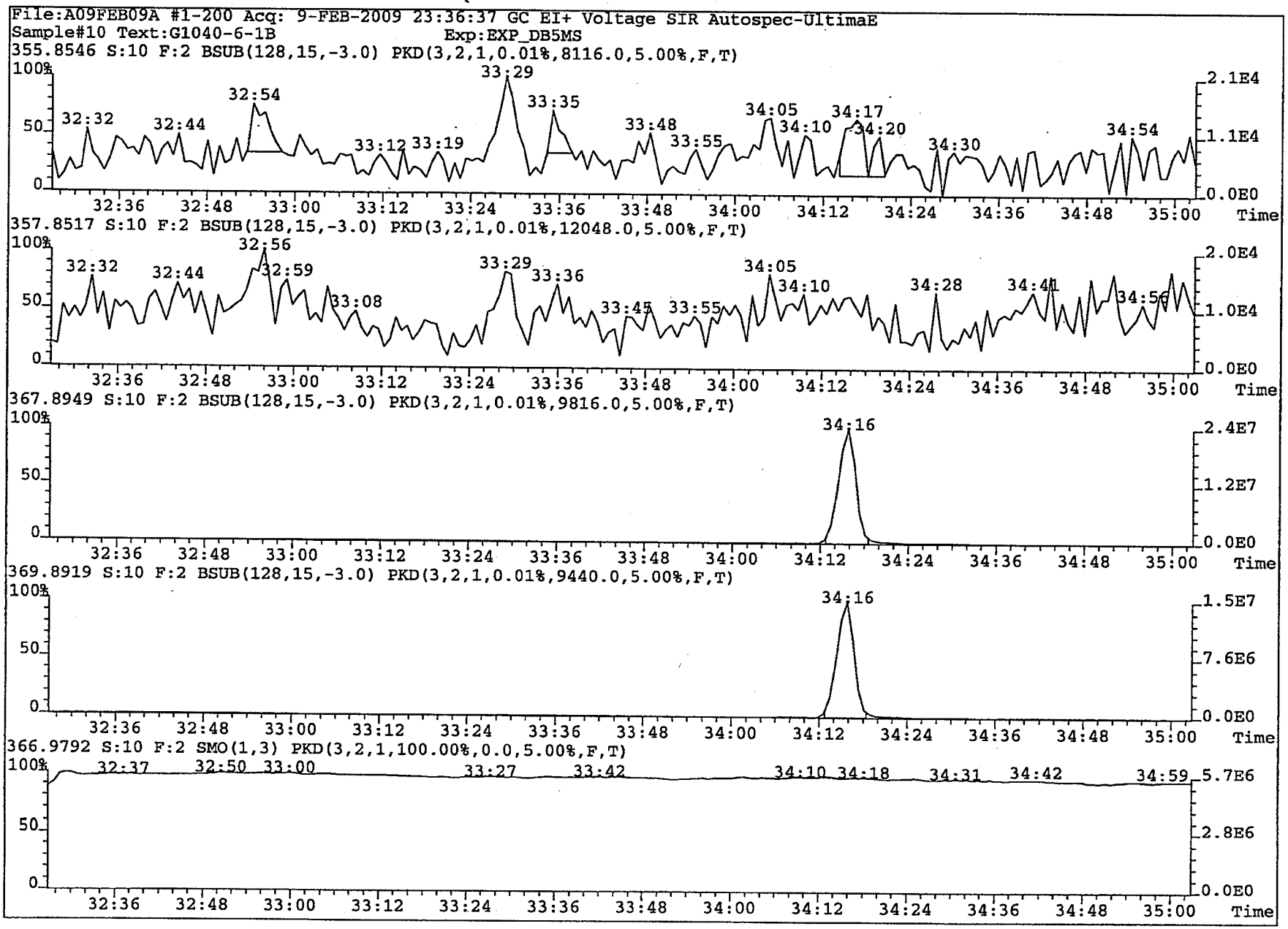
Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	*	*	*	*	n	NotFnd	*		*	n	*	n	n

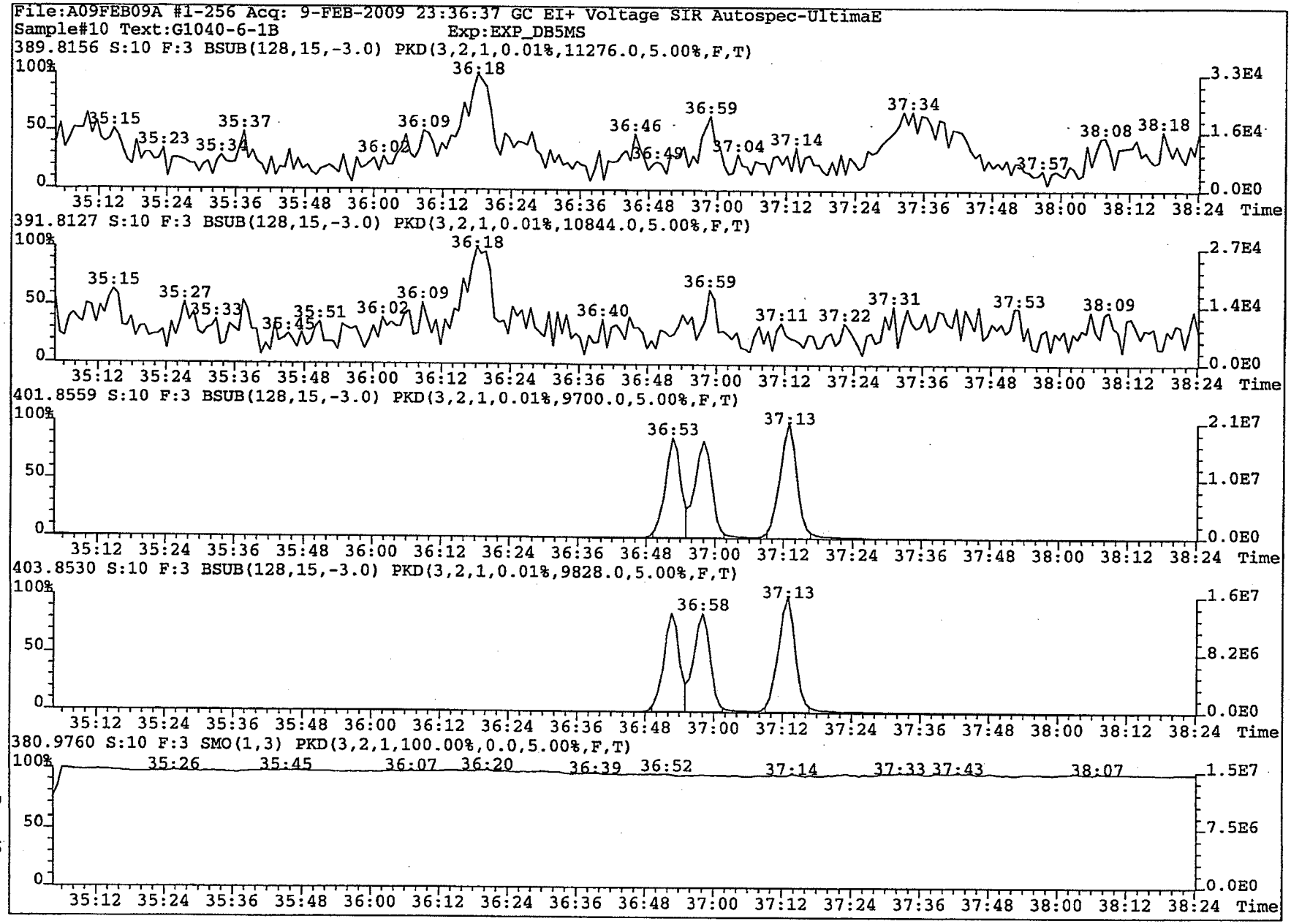
Filename:	a09feb09a	Name of Homolog Group:	Total Hepta-Dioxins	
Sample:	10	Number of Peaks Found:	2	0
Acquired:	9-FEB-09 23:36:37	RRF Used For Totals:	1.0612	
Processed:	10-FEB-09 07:33:52	Detection Limit:	0.2292	RL=2.500 (pg/µL)
Sample ID:	G1040-6-1B	Noise Height Ion1/Ion2:	9316 / 8000	
Cal Table:	m1613-100708a	Begin Window:	39:17:00	
Results Table:	m1613-020909a	End Window:	40:29:00	

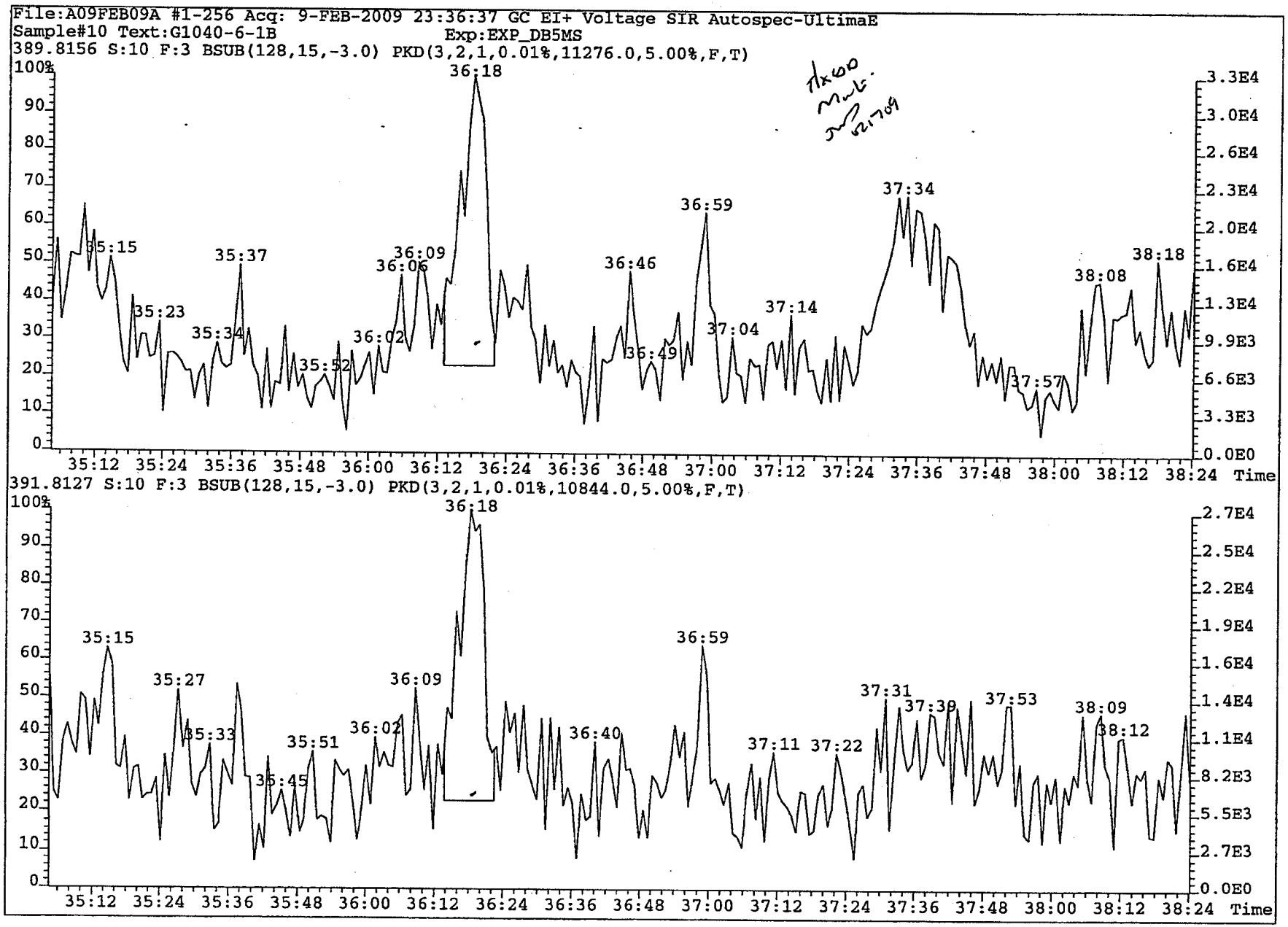
Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	2.44E+05	136000	108000		1.27 n	39:23	0.252	RL		3.4 y		3.8 y	y
1,2,3,4,6,7,8-HpCDI	2	1.38E+05	68500	69100		0.99 y	40:20	0.142	S2N		2.2 n		2.4 n	y

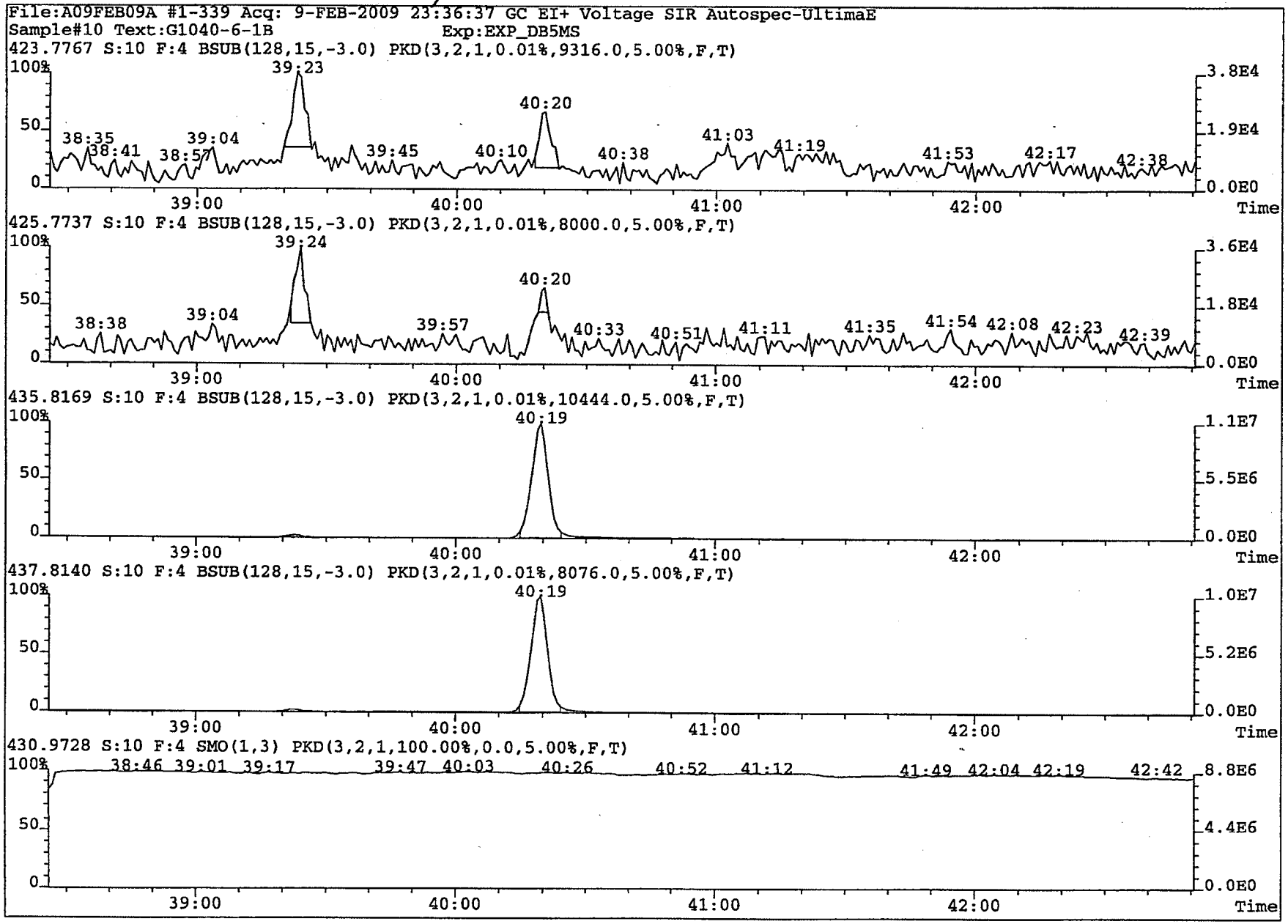

File:A09FEB09A #1-387 Acq: 9-FEB-2009 23:36:37 GC EI+ Voltage SIR Autospec-UltimaE
Sample#10 Text:G1040-6-1B Exp:EXP_DB5MS
319.8965 S:10 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,5356.0,5.00%,F,T)
321.8936 S:10 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,6704.0,5.00%,F,T)
331.9368 S:10 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6924.0,5.00%,F,T)
333.9339 S:10 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7204.0,5.00%,F,T)
327.8847 S:10 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5888.0,5.00%,F,T)
304.9824 S:10 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time

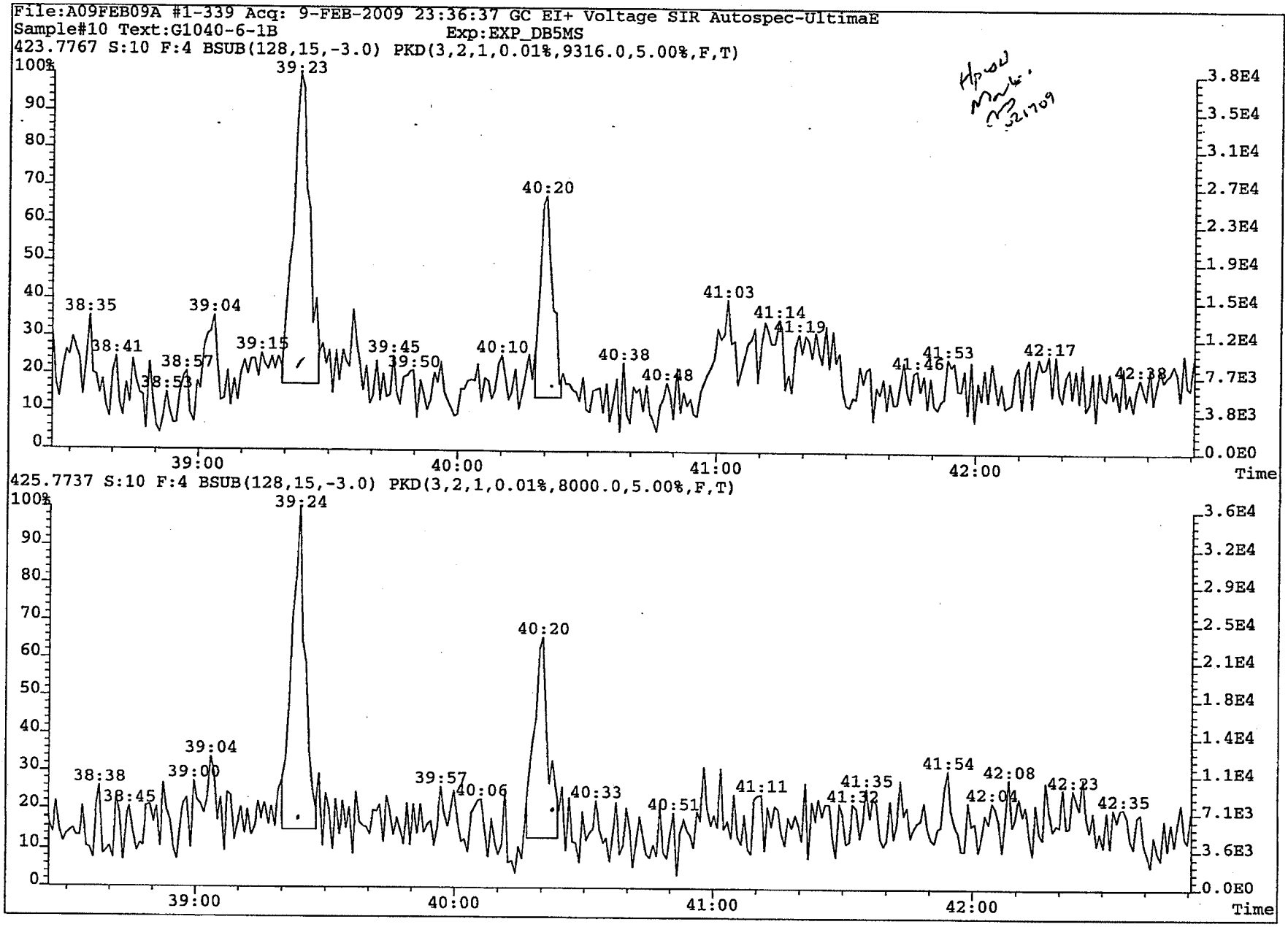

File:A09FEB09A #1-387 Acq: 9-FEB-2009 23:36:37 GC EI+ Voltage SIR Autospec-UltimaE
Sample#10 Text:G1040-6-1B Exp:EXP_DB5MS
319.8965 S:10 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,5356.0,5.00%,F,T)
TCDD
31:19
30:53
31:51
28:19
28:40
26:11
26:47
26:53
27:13
27:53
27:42
29:11
29:06
29:49
30:20
30:43
31:09
31:40
32:02
32:16
Time
321.8936 S:10 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,6704.0,5.00%,F,T)
28:25
31:19
31:30
26:36
27:57
27:35
26:15
27:15
28:08
28:37
28:51
29:10
29:27
29:47
30:16
30:52
31:38
31:49
Time

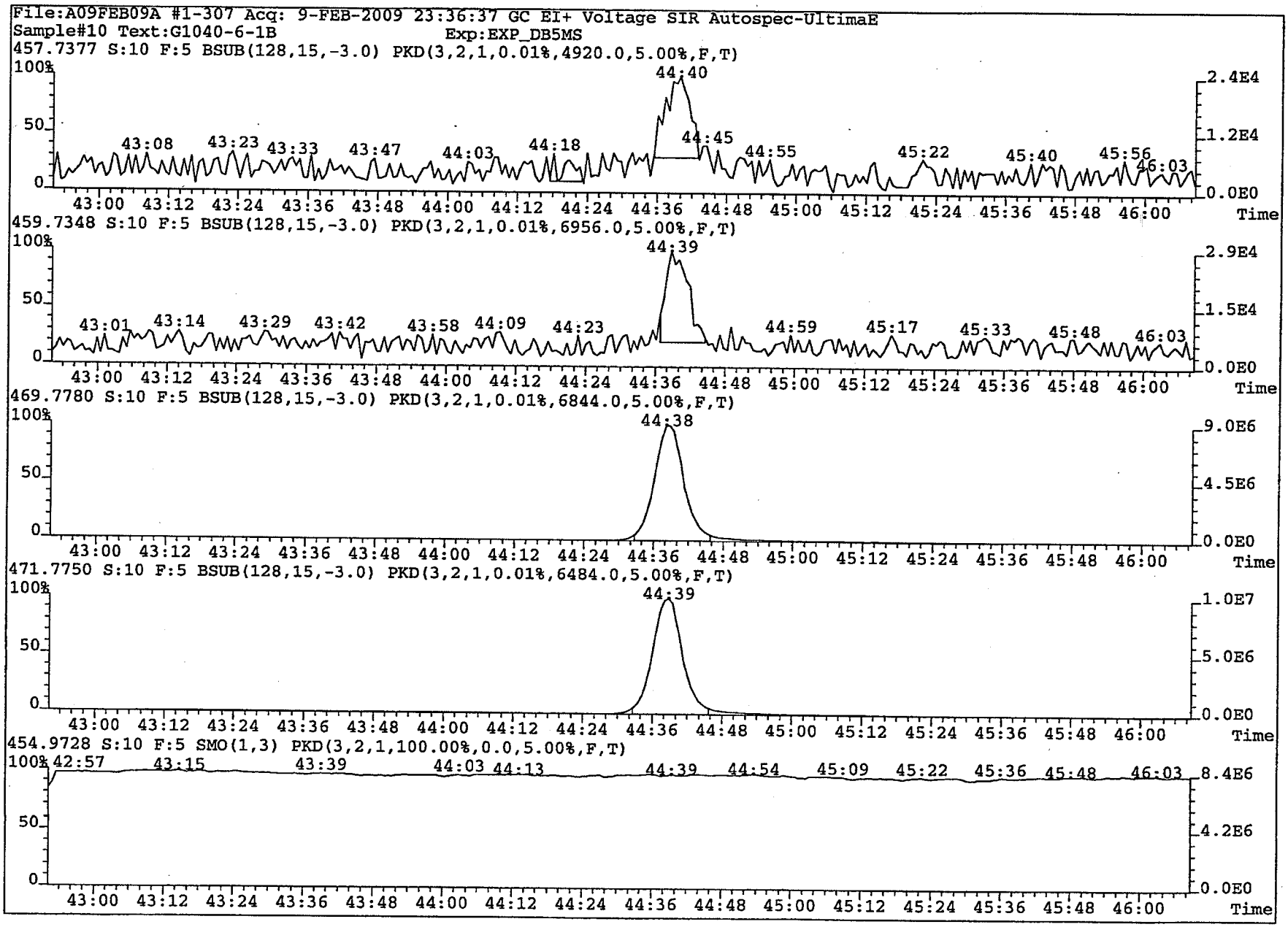

File:A09FEB09A #1-200 Acq: 9-FEB-2009 23:36:37 GC EI+ Voltage SIR Autospec-UltimaE
Sample#10 Text:G1040-6-1B Exp:EXP_DB5MS
355.8546 S:10 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,8116.0,5.00%,F,T)
357.8517 S:10 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,12048.0,5.00%,F,T)
367.8949 S:10 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,9816.0,5.00%,F,T)
369.8919 S:10 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,9440.0,5.00%,F,T)
366.9792 S:10 F:2 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time

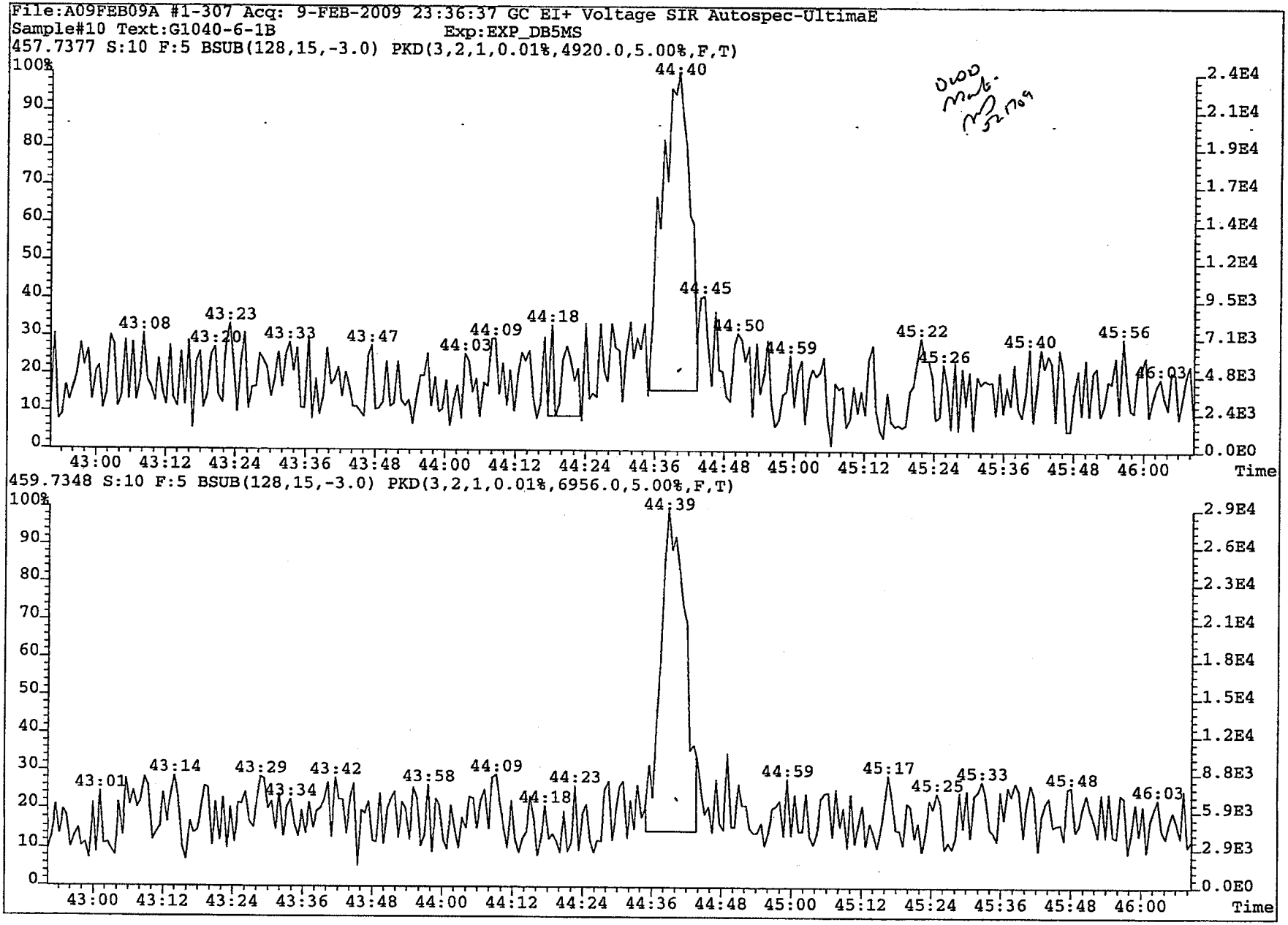

File:A09FEB09A #1-256 Acq: 9-FEB-2009 23:36:37 GC EI+ Voltage SIR Autospec-UltimaE
Sample#10 Text:G1040-6-1B Exp:EXP_DB5MS
389.8156 S:10 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,11276.0,5.00%,F,T)
391.8127 S:10 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,10844.0,5.00%,F,T)
401.8559 S:10 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,9700.0,5.00%,F,T)
403.8530 S:10 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,9828.0,5.00%,F,T)
380.9760 S:10 F:3 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
100%
50
0
35:12 35:24 35:36 35:48 36:00 36:12 36:24 36:36 36:48 37:00 37:12 37:24 37:36 37:48 38:00 38:12 38:24 Time
3.3E4
1.6E4
0.0E0
2.7E4
1.4E4
2.1E7
1.0E7
1.6E7
8.2E6
1.5E7
7.5E6

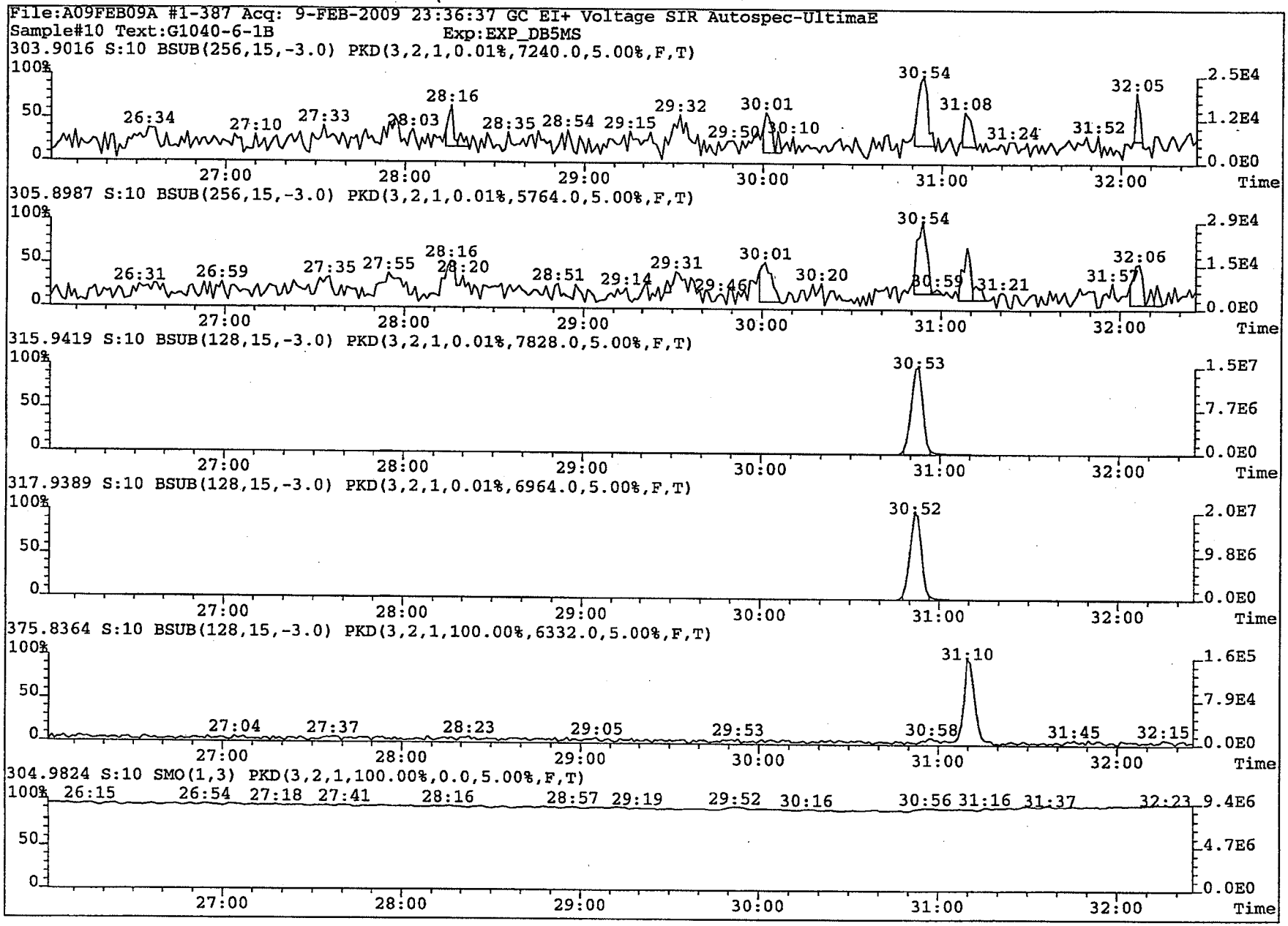

File:A09FEB09A #1-256 Acq: 9-FEB-2009 23:36:37 GC EI+ Voltage SIR Autospec-UltimaE
Sample#10 Text:G1040-6-1B Exp:EXP_DB5MS
389.8156 S:10 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,11276.0,5.00%,F,T)
391.8127 S:10 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,10844.0,5.00%,F,T)
Time

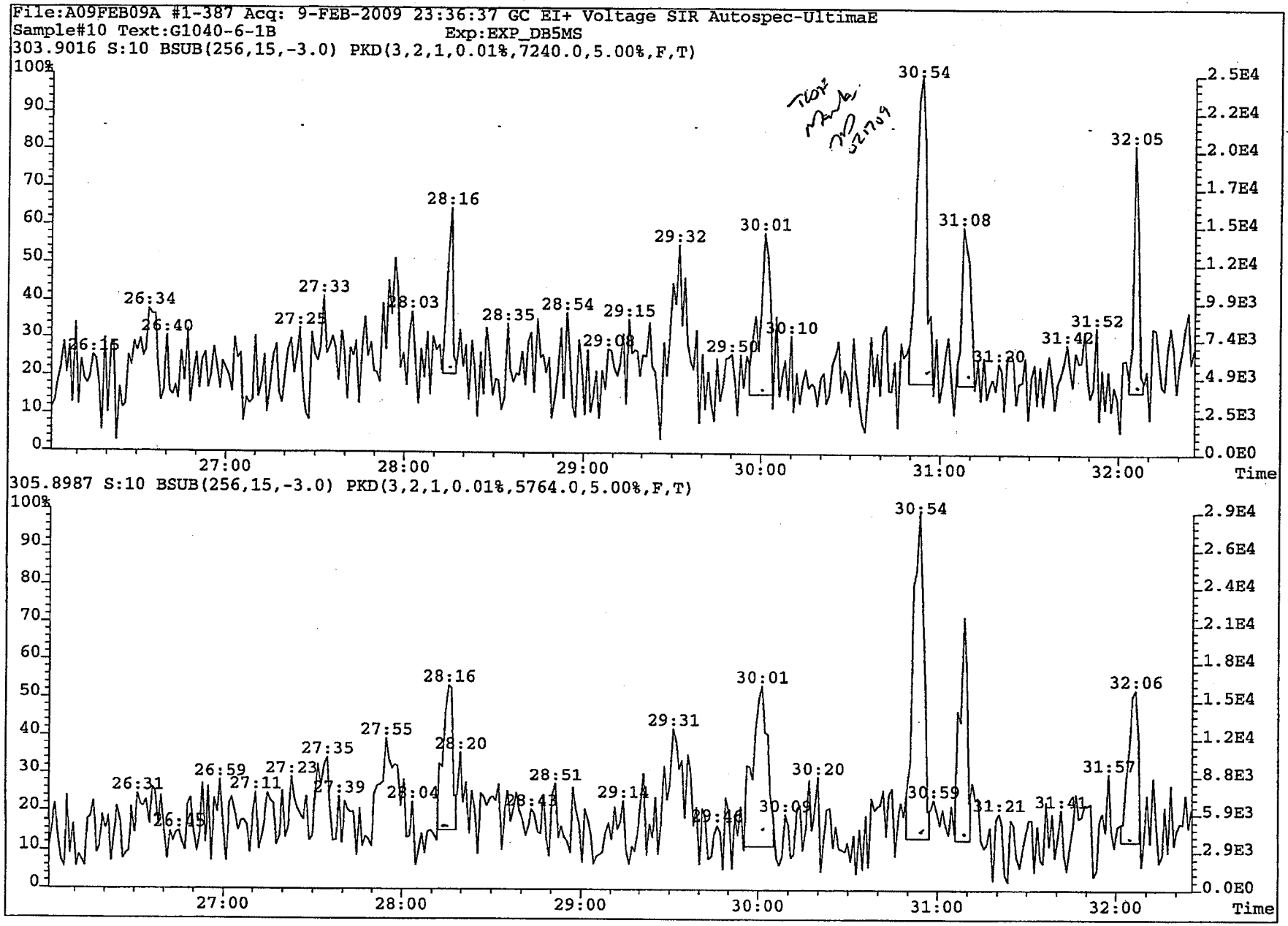

File:A09FEB09A #1-339 Acq: 9-FEB-2009 23:36:37 GC EI+ Voltage SIR Autospec-UltimaE
Sample#10 Text:G1040-6-1B Exp:EXP_DB5MS
423.7767 S:10 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,9316.0,5.00%,F,T)
425.7737 S:10 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,8000.0,5.00%,F,T)
435.8169 S:10 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,10444.0,5.00%,F,T)
437.8140 S:10 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,8076.0,5.00%,F,T)
430.9728 S:10 F:4 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time

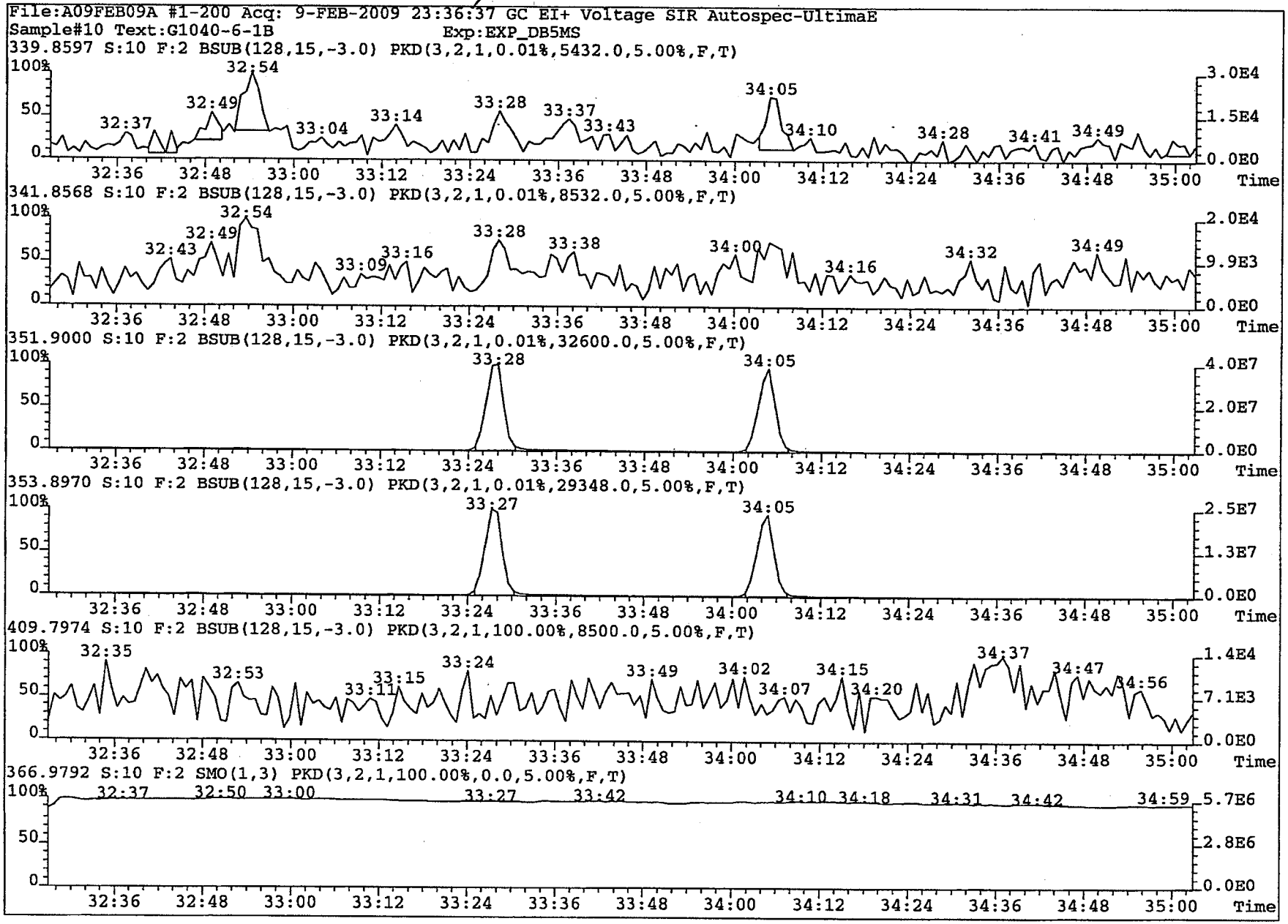

File:A09FEB09A #1-339 Acq: 9-FEB-2009 23:36:37 GC EI+ Voltage SIR Autospec-UltimaE
Sample#10 Text:G1040-6-1B
Exp:EXP_DB5MS
423.7767 S:10 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,9316.0,5.00%,F,T)
100%
39:23
40:20
38:35
39:04
38:41
38:57
38:53
39:15
39:45
39:50
40:10
40:38
40:48
41:03
41:14
41:19
41:46
41:53
42:17
42:38
39:00
40:00
41:00
42:00
Time
3.8E4
3.5E4
3.1E4
2.7E4
2.3E4
1.9E4
1.5E4
1.2E4
7.7E3
3.8E3
0.0E0
425.7737 S:10 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,8000.0,5.00%,F,T)
100%
39:24
40:20
39:04
38:38
39:00
38:45
39:57
40:06
40:33
40:51
41:11
41:32
41:35
41:54
42:04
42:08
42:23
42:35
39:00
40:00
41:00
42:00
Time
3.6E4
3.2E4
2.9E4
2.5E4
2.1E4
1.8E4
1.4E4
1.1E4
7.1E3
3.6E3
0.0E0

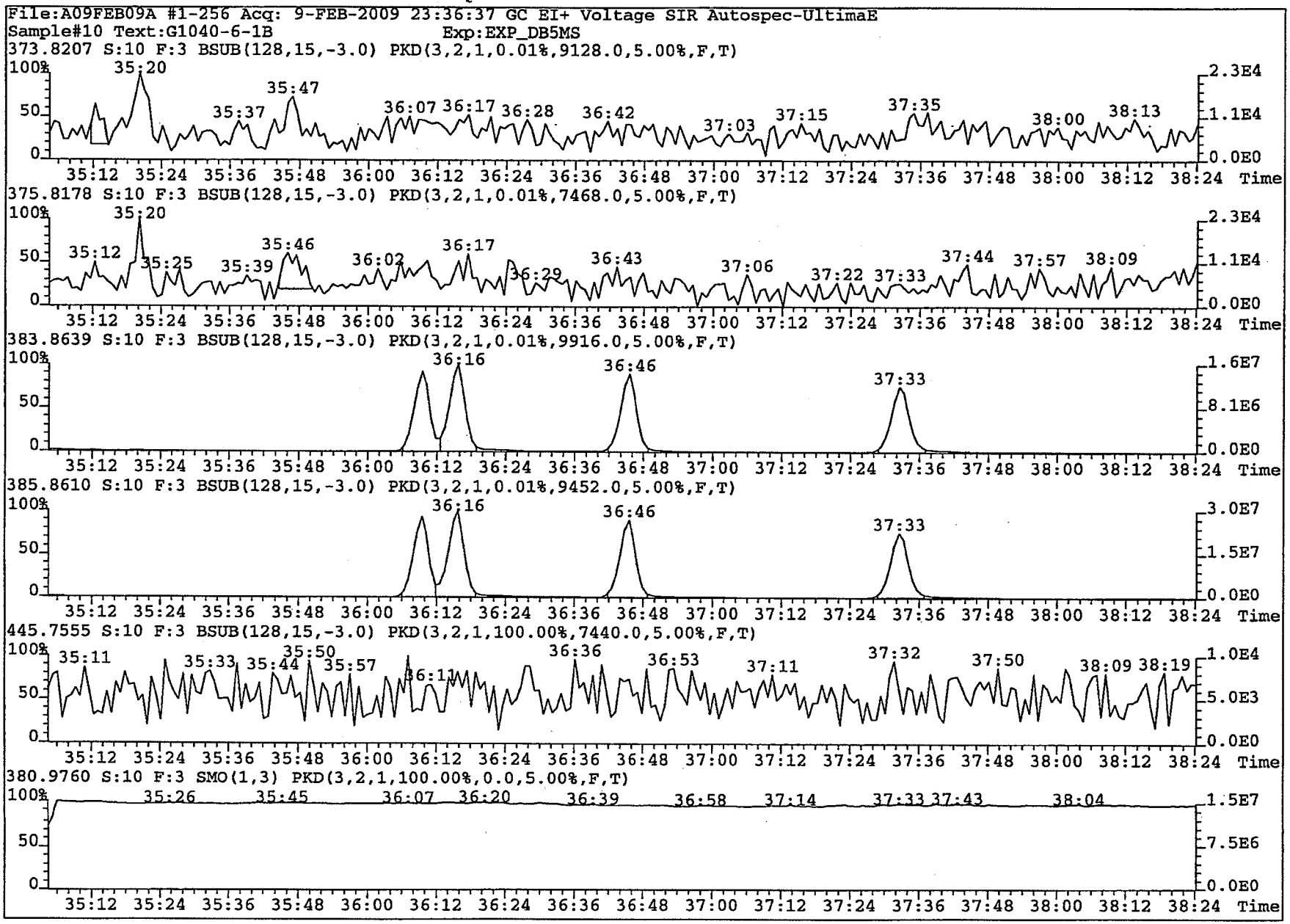

File:A09FEB09A #1-307 Acq: 9-FEB-2009 23:36:37 GC EI+ Voltage SIR Autospec-UltimaE
Sample#10 Text:G1040-6-1B Exp:EXP_DB5MS
457.7377 S:10 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,4920.0,5.00%,F,T)
44:40
43:08 43:23 43:33 43:47 44:03 44:18 44:45 44:55 45:22 45:40 45:56 46:03
2.4E4
1.2E4
0.0E0
459.7348 S:10 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6956.0,5.00%,F,T)
44:39
43:01 43:14 43:29 43:42 43:58 44:09 44:23 44:59 45:17 45:33 45:48 46:03
2.9E4
1.5E4
0.0E0
469.7780 S:10 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6844.0,5.00%,F,T)
44:38
9.0E6
4.5E6
0.0E0
471.7750 S:10 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6484.0,5.00%,F,T)
44:39
1.0E7
5.0E6
0.0E0
454.9728 S:10 F:5 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
42:57 43:15 43:39 44:03 44:13 44:39 44:54 45:09 45:22 45:36 45:48 46:03
8.4E6
4.2E6
0.0E0
100%
50
0
43:00 43:12 43:24 43:36 43:48 44:00 44:12 44:24 44:36 44:48 45:00 45:12 45:24 45:36 45:48 46:00
Time

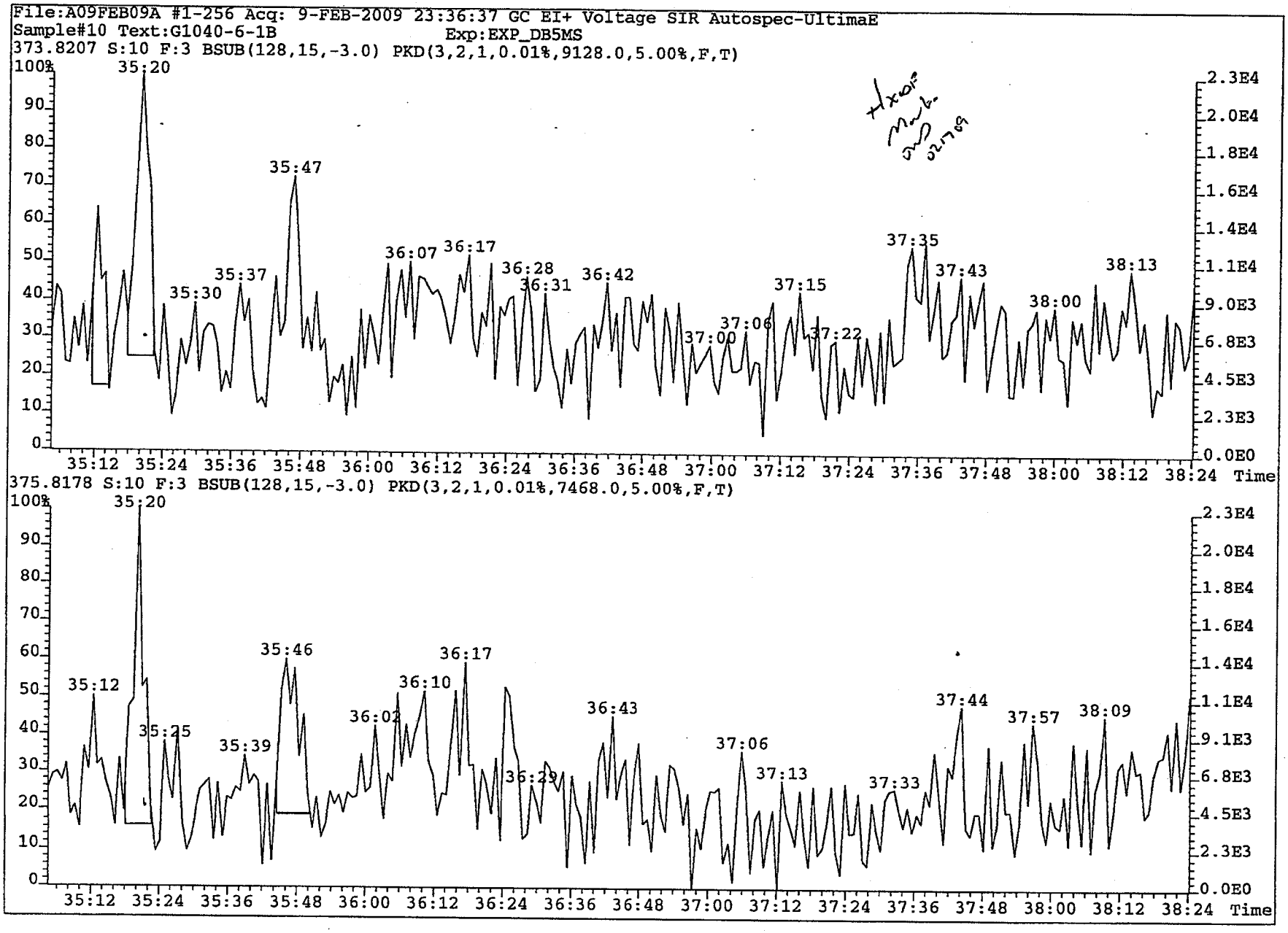

File:A09FEB09A #1-307 Acq: 9-FEB-2009 23:36:37 GC EI+ Voltage SIR Autospec-UltimaE
Sample#10 Text:G1040-6-1B Exp:EXP_DB5MS
457.7377 S:10 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,4920.0,5.00%,F,T)
44:40
44:45
43:08
43:23
43:20
43:33
43:47
44:03
44:09
44:18
44:50
44:59
45:22
45:26
45:40
45:56
46:03
43:00 43:12 43:24 43:36 43:48 44:00 44:12 44:24 44:36 44:48 45:00 45:12 45:24 45:36 45:48 46:00
Time
459.7348 S:10 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6956.0,5.00%,F,T)
44:39
43:01
43:14
43:29
43:34
43:42
43:58
44:09
44:18
44:23
44:59
45:17
45:25
45:33
45:48
46:03
43:00 43:12 43:24 43:36 43:48 44:00 44:12 44:24 44:36 44:48 45:00 45:12 45:24 45:36 45:48 46:00
Time

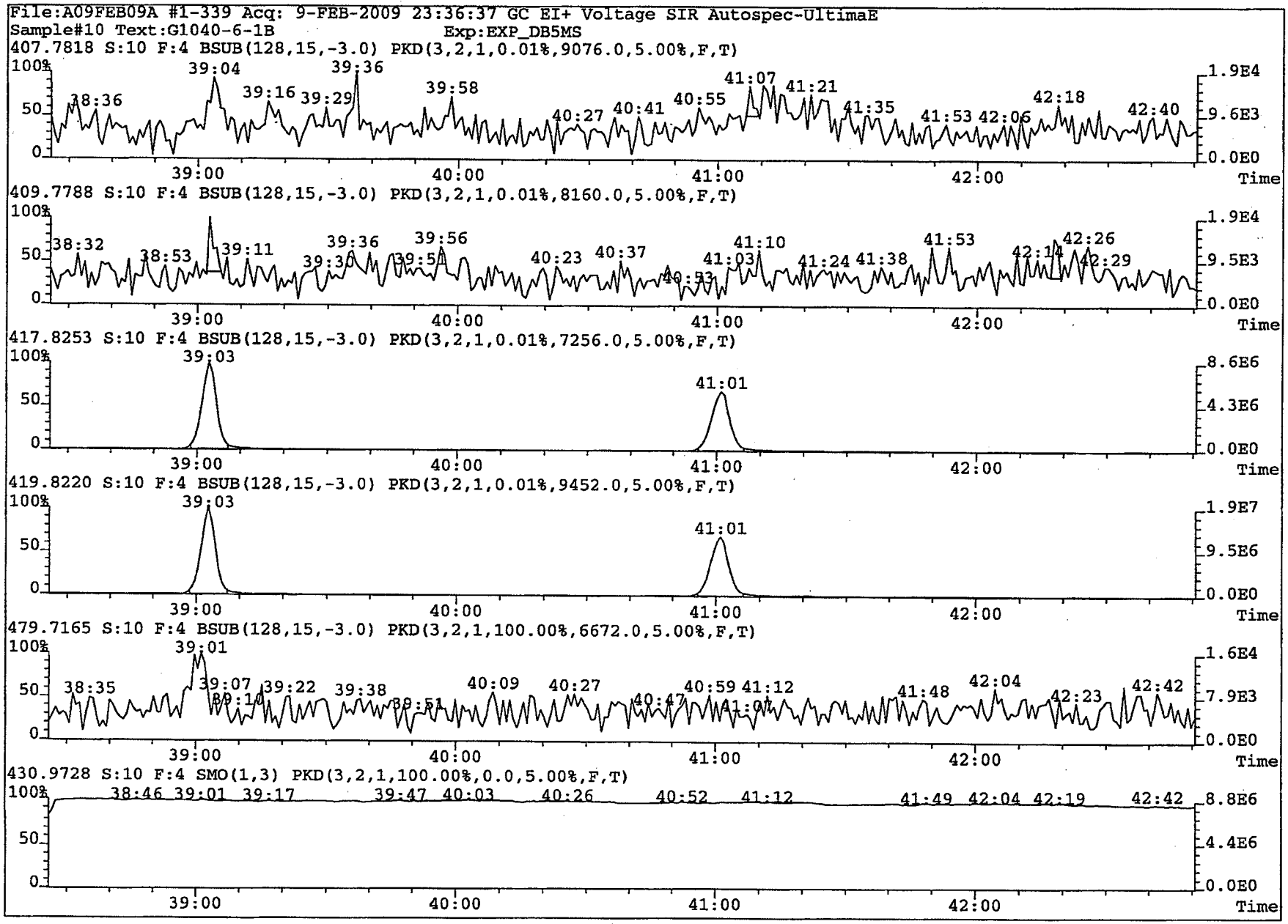

File:A09FEB09A #1-387 Acq: 9-FEB-2009 23:36:37 GC EI+ Voltage SIR Autospec-UltimaE
Sample#10 Text:G1040-6-1B
Exp:EXP_DB5MS
303.9016 S:10 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,7240.0,5.00%,F,T)
305.8987 S:10 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,5764.0,5.00%,F,T)
315.9419 S:10 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7828.0,5.00%,F,T)
317.9389 S:10 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6964.0,5.00%,F,T)
375.8364 S:10 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,6332.0,5.00%,F,T)
304.9824 S:10 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time

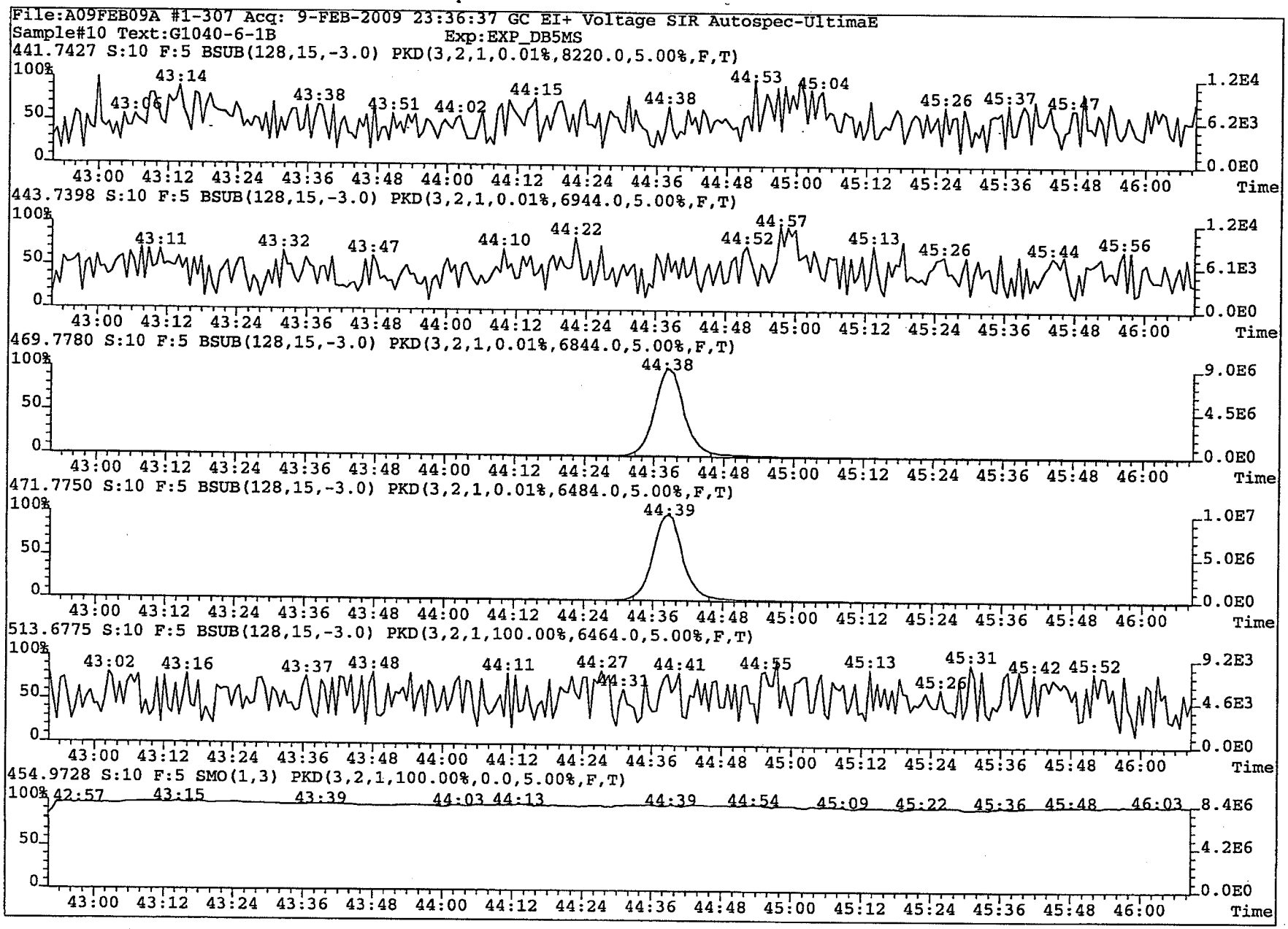

File:A09FEB09A #1-387 Acq: 9-FEB-2009 23:36:37 GC EI+ Voltage SIR Autospec-UltimaE
Sample#10 Text:G1040-6-1B Exp:EXP_DB5MS
303.9016 S:10 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,7240.0,5.00%,F,T)
100%
90
80
70
60
50
40
30
20
10
0
2.5E4
2.2E4
2.0E4
1.7E4
1.5E4
1.2E4
9.9E3
7.4E3
4.9E3
2.5E3
0.0E0
Time
27:00
28:00
29:00
30:00
31:00
32:00
26:15
26:34
26:40
27:25
27:33
28:03
28:16
28:35
28:54
29:08
29:15
29:32
29:50
30:01
30:10
30:54
31:08
31:20
31:42
31:52
32:05
305.8987 S:10 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,5764.0,5.00%,F,T)
100%
90
80
70
60
50
40
30
20
10
0
2.9E4
2.6E4
2.4E4
2.1E4
1.8E4
1.5E4
1.2E4
8.8E3
5.9E3
2.9E3
0.0E0
Time
27:00
28:00
29:00
30:00
31:00
32:00
26:15
26:31
26:59
27:11
27:23
27:35
27:39
27:55
28:04
28:16
28:20
28:43
28:51
29:14
29:31
29:46
30:01
30:09
30:20
30:54
30:59
31:21
31:41
31:57
32:06

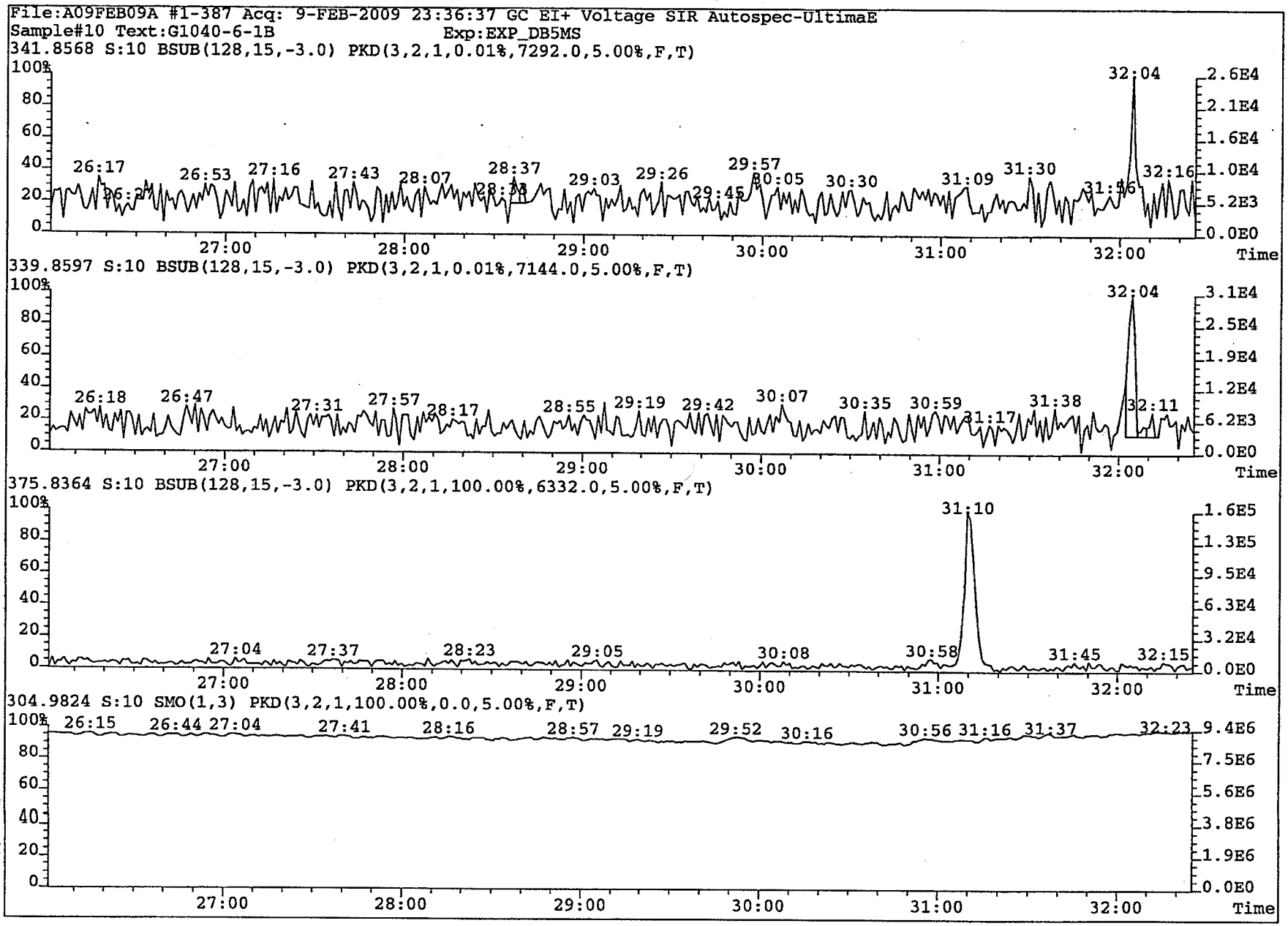

File:A09FEB09A #1-200 Acq: 9-FEB-2009 23:36:37 GC EI+ Voltage SIR Autospec-UltimaE
Sample#10 Text:G1040-6-1B Exp:EXP_DB5MS
339.8597 S:10 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5432.0,5.00%,F,T)
341.8568 S:10 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,8532.0,5.00%,F,T)
351.9000 S:10 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,32600.0,5.00%,F,T)
353.8970 S:10 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,29348.0,5.00%,F,T)
409.7974 S:10 F:2 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,8500.0,5.00%,F,T)
366.9792 S:10 F:2 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
100%
50
0
32:36 32:48 33:00 33:12 33:24 33:36 33:48 34:00 34:12 34:24 34:36 34:48 35:00 Time
3.0E4
1.5E4
0.0E0
2.0E4
9.9E3
4.0E7
2.0E7
2.5E7
1.3E7
1.4E4
7.1E3
5.7E6
2.8E6

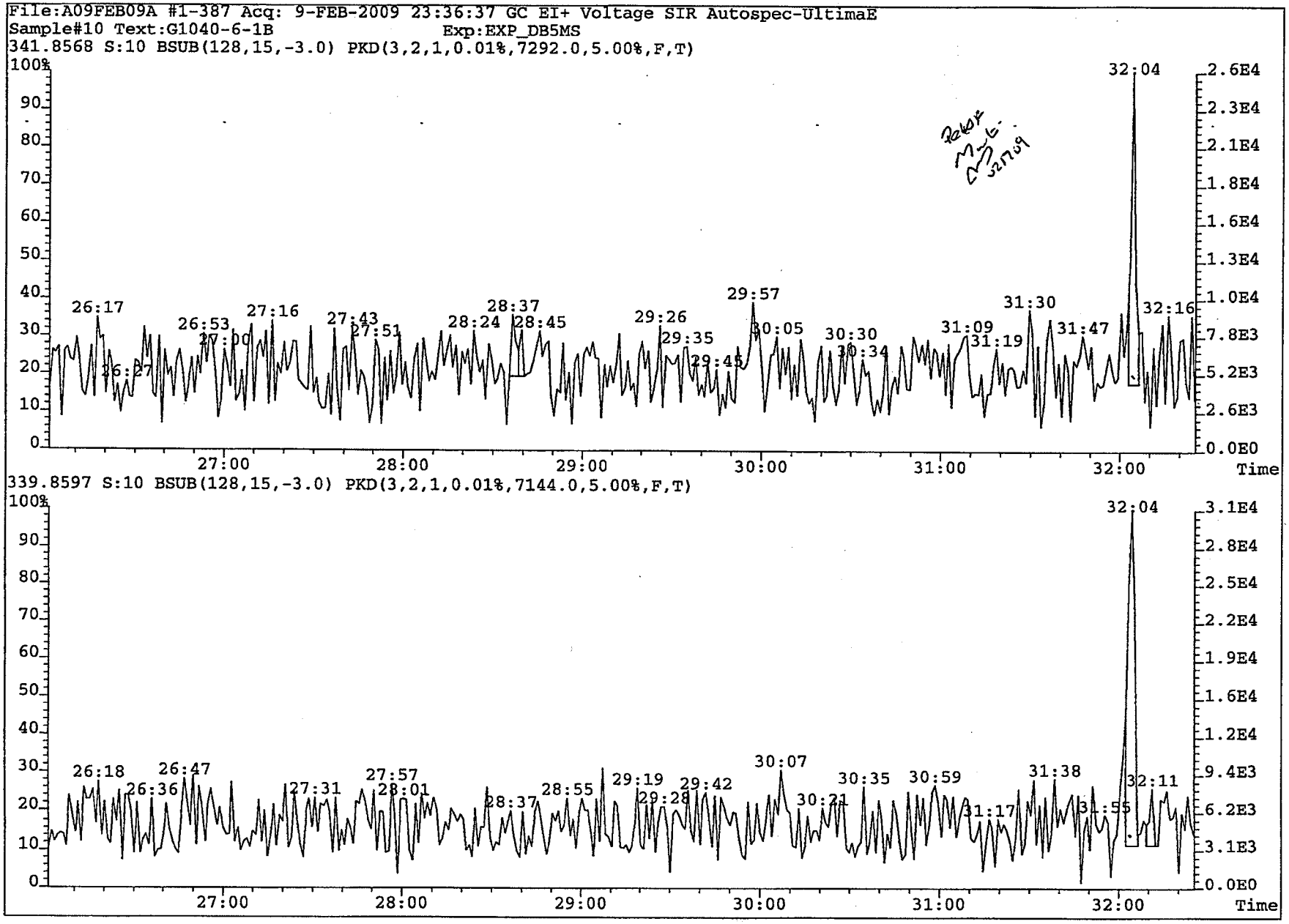

File:A09FEB09A #1-256 Acq: 9-FEB-2009 23:36:37 GC EI+ Voltage SIR Autospec-UltimaE
Sample#10 Text:G1040-6-1B Exp:EXP_DB5MS
373.8207 S:10 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,9128.0,5.00%,F,T)
375.8178 S:10 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7468.0,5.00%,F,T)
383.8639 S:10 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,9916.0,5.00%,F,T)
385.8610 S:10 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,9452.0,5.00%,F,T)
445.7555 S:10 F:3 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,7440.0,5.00%,F,T)
380.9760 S:10 F:3 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time


File:A09FEB09A #1-256 Acq: 9-FEB-2009 23:36:37 GC EI+ Voltage SIR Autospec-UltimaE
Sample#10 Text:G1040-6-1B Exp:EXP_DB5MS
373.8207 S:10 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,9128.0,5.00%,F,T)
375.8178 S:10 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7468.0,5.00%,F,T)
Time


File:A09FEB09A #1-339 Acq: 9-FEB-2009 23:36:37 GC EI+ Voltage SIR Autospec-UltimaE
Sample#10 Text:G1040-6-1B Exp:EXP_DB5MS
407.7818 S:10 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,9076.0,5.00%,F,T)
409.7788 S:10 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,8160.0,5.00%,F,T)
417.8253 S:10 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7256.0,5.00%,F,T)
419.8220 S:10 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,9452.0,5.00%,F,T)
479.7165 S:10 F:4 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,6672.0,5.00%,F,T)
430.9728 S:10 F:4 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time


File:A09FEB09A #1-307 Acq: 9-FEB-2009 23:36:37 GC EI+ Voltage SIR Autospec-UltimaE
Sample#10 Text:G1040-6-1B Exp:EXP_DB5MS
441.7427 S:10 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,8220.0,5.00%,F,T)
443.7398 S:10 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6944.0,5.00%,F,T)
469.7780 S:10 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6844.0,5.00%,F,T)
471.7750 S:10 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6484.0,5.00%,F,T)
513.6775 S:10 F:5 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,6464.0,5.00%,F,T)
454.9728 S:10 F:5 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time


File:A09FEB09A #1-387 Acq: 9-FEB-2009 23:36:37 GC EI+ Voltage SIR Autospec-UltimaE
Sample#10 Text:G1040-6-1B Exp:EXP_DB5MS
341.8568 S:10 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7292.0,5.00%,F,T)
339.8597 S:10 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7144.0,5.00%,F,T)
375.8364 S:10 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,6332.0,5.00%,F,T)
304.9824 S:10 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time


File:A09FEB09A #1-387 Acq: 9-FEB-2009 23:36:37 GC EI+ Voltage SIR Autospec-UltimaE
Sample#10 Text:G1040-6-1B Exp:EXP_DB5MS
341.8568 S:10 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7292.0,5.00%,F,T)
100%
90
80
70
60
50
40
30
20
10
0
26:17
26:27
26:53
27:09
27:16
27:43
27:51
28:24
28:37
28:45
29:26
29:35
29:45
29:57
30:05
30:30
30:34
31:09
31:19
31:30
31:47
32:04
32:16
2.6E4
2.3E4
2.1E4
1.8E4
1.6E4
1.3E4
1.0E4
7.8E3
5.2E3
2.6E3
0.0E0
27:00
28:00
29:00
30:00
31:00
32:00
Time
339.8597 S:10 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7144.0,5.00%,F,T)
100%
90
80
70
60
50
40
30
20
10
0
26:18
26:36
26:47
27:31
27:57
28:01
28:37
28:55
29:19
29:28
29:42
30:07
30:21
30:35
30:59
31:17
31:38
31:55
32:04
32:11
3.1E4
2.8E4
2.5E4
2.2E4
1.9E4
1.6E4
1.2E4
9.4E3
6.2E3
3.1E3
0.0E0
27:00
28:00
29:00
30:00
31:00
32:00
Time

Method 1613

CRAB1-A PAN2

Analytical Resources, Inc.

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	RL (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	1.00			
1,2,3,7,8-PeCDD	ND	5.00			
1,2,3,4,7,8-HxCDD	ND	5.00			
1,2,3,6,7,8-HxCDD	ND	5.00			
1,2,3,7,8,9-HxCDD	ND	5.00			
1,2,3,4,6,7,8-HpCDD	ND	5.00			
OCDD	ND	10.0			
2,3,7,8-TCDF	1.04	1.00	30:53	0.82	
1,2,3,7,8-PeCDF	ND	5.00			
2,3,4,7,8-PeCDF	ND	5.00			
1,2,3,4,7,8-HxCDF	ND	5.00			
1,2,3,6,7,8-HxCDF	ND	5.00			
2,3,4,6,7,8-HxCDF	ND	5.00			
1,2,3,7,8,9-HxCDF	ND	5.00			
1,2,3,4,6,7,8-HpCDF	ND	5.00			
1,2,3,4,7,8,9-HpCDF	ND	5.00			
OCDF	ND	10.0			
Total TCDDs	ND	1.00			
Total PeCDDs	ND	5.00			
Total HxCDDs	ND	5.00			
Total HpCDDs	ND	5.00			
Total TCDFs	1.04	1.00			DPE
Total PeCDFs	ND	5.00			
Total HxCDFs	ND	5.00			
Total HpCDFs	ND	5.00			
WHO-2005 TEQ (ND=0)	0.104				
WHO-2005 TEQ (ND=½)	5.76				

Client Information

Project Name:	OG53
Sample ID:	CRAB1-A PAN2

Laboratory Information

Project ID:	G1040-6	
Sample ID:	G1040-6-2B	
Collection Date/Time:	23-Dec-08	10:35
Receipt Date:	15-Jan-09	10:15
Extraction Date:	01-Feb-09	
Analysis Date:	10-Feb-09	0:24

Sample Information

Matrix:	Tissue	
Weight / Volume:	11.17	grams
Solids / Lipids:	NA	
Original pH :	NA	
Batch ID:	WG16457	
Filename:	a09feb09a-11	
Retchk:	a09feb09a-1	
Begin ConCal:	a09feb09a-1	
Initial Cal:	m1613-100708a	

Method 1613

CRAB1-A PAN2

Analytical Resources, Inc.

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
$^{13}C_{12}$-2,3,7,8-TCDD	2	1.77	88.4	31:28	0.78	
$^{13}C_{12}$-1,2,3,7,8-PeCDD	2	2.14	107	34:16	1.58	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	2	1.72	86.1	36:53	1.26	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	2	1.77	88.4	36:58	1.27	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	2	1.71	85.3	40:19	1.06	
$^{13}C_{12}$-OCDD	4	2.60	64.9	44:39	0.90	
$^{13}C_{12}$-2,3,7,8-TCDF	2	1.72	86.0	30:52	0.79	
$^{13}C_{12}$-1,2,3,7,8-PeCDF	2	2.22	111	33:27	1.58	
$^{13}C_{12}$-2,3,4,7,8-PeCDF	2	2.12	106	34:05	1.57	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	2	1.88	93.9	36:09	0.52	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	2	1.78	88.8	36:16	0.53	
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	2	1.77	88.3	36:45	0.53	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	2	1.70	85.2	37:32	0.53	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	2	1.71	85.7	39:03	0.45	
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	2	1.75	87.6	41:01	0.45	
Cleanup Standard						
$^{37}Cl_4$-2,3,7,8-TCDD	0.4	0.338	84.5	31:29		
Injection Standards						
$^{13}C_{12}$-1,2,3,4-TCDD	2			31:01	0.80	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	2			37:13	1.26	

Client Information

Project Name: OG53

Sample ID: CRAB1-A PAN2

Laboratory Information

Project ID: G1040-6
Sample ID: G1040-6-2B
Collection Date/Time: 23-Dec-08 10:35
Receipt Date: 15-Jan-09 10:15
Extraction Date: 01-Feb-09
Analysis Date: 10-Feb-09 0:24

Analyzed by: _____
Date: 021709

Sample Information

Matrix: Tissue
Weight / Volume: 11.17 grams
Solids / Lipids: NA %
Original pH : NA
Batch ID: WG16457

Filename: a09feb09a-11
Retchk: a09feb09a-1
Begin ConCal: a09feb09a-1

Initial Cal: m1613-100708a

Reviewed by: _____
Date: 02/17/09

Form Version:[1613_HRMS12]Repor

$[TCDF] = \frac{3.92e5 + 4.80e5}{6.40e7 + 8.09e7} \left(\frac{2000\,pg}{11.17g}\right)\left(\frac{1}{1.0368}\right) = 1.04\,pg/g$

TM 02/17/09

Filename ; a09feb09a
Sample ; 11
Acquired ; 10-FEB-09 00:24:54
Processed ; 10-FEB-09 07:34:17
Sample ID ; G1040-6-2B
Cal Table ; m1613-100708a
Results Table ; m1613-020909a
Comments ;

;*1613*-
;Inst: HRMS1

Ent;	Name;	Resp;	Ion 1;	Ion 2;	RA;?;	RT;	Conc;	EDL;	S/N1;?;	S/N2;?;M; Signal1; Noise 1; Signal2; Noise 2
1 ;	2,3,7,8-TCDD;	*;	*;	*;	*;n;	NotFnd;	*;	0.0806;	*;n;	*;n;n; *;4.92e+03; *;4.33e+03
2 ;	1,2,3,7,8-PeCDD;	2.40e+05;	1.76e+05;	6.36e+04;	2.77;n;	34:17;	0.256;	0.1441;	6;y;	4;y;n;4.99e+04;7.79e+03;4.03e+04;9.97e+03
3 ;	1,2,3,4,7,8-HxCDD;	9.40e+04;	5.01e+04;	4.40e+04;	1.14;y;	36:53;	0.117;	0.2019;	2;n;	2;n;n;2.09e+04;8.68e+03;1.71e+04;1.01e+04
4 ;	1,2,3,6,7,8-HxCDD;	5.38e+05;	3.31e+05;	2.07e+05;	1.60;n;	36:59;	0.626;	0.2170;	11;y;	7;y;n;9.97e+04;8.68e+03;7.12e+04;1.01e+04
5 ;	1,2,3,7,8,9-HxCDD;	9.88e+04;	6.22e+04;	3.66e+04;	1.70;n;	37:14;	0.120;	0.2111;	3;n;	2;n;n;2.35e+04;8.68e+03;1.66e+04;1.01e+04
6 ;	1,2,3,4,6,7,8-HpCDD;	6.41e+05;	3.58e+05;	2.83e+05;	1.27;n;	40:20;	0.957;	0.2362;	13;y;	12;y;n;8.45e+04;6.27e+03;7.98e+04;6.78e+03
7 ;	OCDD;	4.31e+05;	1.81e+05;	2.50e+05;	0.73;n;	44:40;	1.059;	0.5538;	5;y;	8;y;n;3.71e+04;7.88e+03;4.94e+04;6.00e+03
8 ;	2,3,7,8-TCDF;	8.72e+05;	3.92e+05;	4.80e+05;	0.82;y;	30:53;	0.580;	0.1391;	11;y;	14;y;y;9.75e+04;8.67e+03;1.15e+05;8.41e+03
9 ;	1,2,3,7,8-PeCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.0885;	*;n;	*;n;n; *;8.08e+03; *;9.21e+03
10 ;	2,3,4,7,8-PeCDF;	3.71e+05;	2.11e+05;	1.60e+05;	1.31;n;	34:05;	0.253;	0.0851;	10;y;	5;y;n;8.07e+04;8.08e+03;4.91e+04;9.21e+03
11 ;	1,2,3,4,7,8-HxCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.1331;	*;n;	*;n;n; *;8.50e+03; *;9.39e+03
12 ;	1,2,3,6,7,8-HxCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.1217;	*;n;	*;n;n; *;8.50e+03; *;9.39e+03
13 ;	2,3,4,6,7,8-HxCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.1293;	*;n;	*;n;n; *;8.50e+03; *;9.39e+03
14 ;	1,2,3,7,8,9-HxCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.1714;	*;n;	*;n;n; *;8.50e+03; *;9.39e+03
15 ;	1,2,3,4,6,7,8-HpCDF;	2.38e+05;	1.29e+05;	1.09e+05;	1.19;y;	39:04;	0.219;	0.1294;	5;y;	5;y;n;3.64e+04;6.66e+03;3.55e+04;7.29e+03
16 ;	1,2,3,4,7,8,9-HpCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.2073;	*;n;	*;n;n; *;6.66e+03; *;7.29e+03
17 ;	OCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.4608;	*;n;	*;n;n; *;6.37e+03; *;7.36e+03
Extraction Standards										
18 ;	13C-2,3,7,8-TCDD;	1.00e+08;	4.41e+07;	5.63e+07;	0.78;y;	31:28;	88.354;	0.1520;	1806;y;	2552;y;n;1.49e+07;8.24e+03;1.93e+07;7.56e+03
19 ;	13C-1,2,3,7,8-PeCDD;	8.91e+07;	5.46e+07;	3.45e+07;	1.58;y;	34:16;	107.202;	0.3343;	1326;y;	1490;y;n;2.16e+07;1.63e+04;1.36e+07;9.12e+03
20 ;	13C-1,2,3,4,7,8-HxCDD;	7.77e+07;	4.34e+07;	3.43e+07;	1.26;y;	36:53;	86.038;	0.2039;	1667;y;	1205;y;n;1.51e+07;9.07e+03;1.19e+07;9.91e+03
21 ;	13C-1,2,3,6,7,8-HxCDD;	8.67e+07;	4.86e+07;	3.81e+07;	1.27;y;	36:58;	88.361;	0.1876;	1615;y;	1164;y;n;1.46e+07;9.07e+03;1.15e+07;9.91e+03
22 ;	13C-1,2,3,4,6,7,8-HpCDD;	6.31e+07;	3.25e+07;	3.06e+07;	1.06;y;	40:19;	85.271;	0.1810;	1338;y;	969;y;n;8.07e+06;6.04e+03;7.54e+06;7.78e+03
23 ;	13C-OCDD;	7.64e+07;	3.62e+07;	4.03e+07;	0.90;y;	44:39;	129.787;	0.2427;	886;y;	1034;y;n;6.63e+06;7.48e+03;7.50e+06;7.26e+03
24 ;	13C-2,3,7,8-TCDF;	1.45e+08;	6.40e+07;	8.09e+07;	0.79;y;	30:52;	86.017;	0.0821;	2495;y;	3118;y;n;1.56e+07;6.25e+03;1.99e+07;6.40e+03
25 ;	13C-1,2,3,7,8-PeCDF;	1.51e+08;	9.25e+07;	5.84e+07;	1.58;y;	33:27;	110.851;	0.2501;	2884;y;	1245;y;n;3.60e+07;1.25e+04;2.32e+07;1.86e+04
26 ;	13C-2,3,4,7,8-PeCDF;	1.41e+08;	8.64e+07;	5.49e+07;	1.57;y;	34:05;	106.011;	0.2555;	2901;y;	1212;y;n;3.63e+07;1.25e+04;2.26e+07;1.86e+04
27 ;	13C-1,2,3,4,7,8-HxCDF;	1.09e+08;	3.75e+07;	7.19e+07;	0.52;y;	36:09;	93.866;	0.1598;	1247;y;	2384;y;n;1.20e+07;9.63e+03;2.29e+07;9.59e+03
28 ;	13C-1,2,3,6,7,8-HxCDF;	1.14e+08;	3.95e+07;	7.47e+07;	0.53;y;	36:16;	88.759;	0.1448;	1410;y;	2643;y;n;1.36e+07;9.63e+03;2.53e+07;9.59e+03
29 ;	13C-2,3,4,6,7,8-HxCDF;	1.07e+08;	3.70e+07;	6.98e+07;	0.53;y;	36:45;	88.275;	0.1540;	1325;y;	2486;y;n;1.28e+07;9.63e+03;2.38e+07;9.59e+03
30 ;	13C-1,2,3,7,8,9-HxCDF;	9.19e+07;	3.16e+07;	6.02e+07;	0.53;y;	37:32;	85.211;	0.1729;	1012;y;	1959;y;n;9.74e+06;9.63e+03;1.88e+07;9.59e+03
31 ;	13C-1,2,3,4,6,7,8-HpCDF;	7.91e+07;	2.45e+07;	5.46e+07;	0.45;y;	39:03;	85.671;	0.1855;	943;y;	1631;y;n;7.33e+06;7.77e+03;1.61e+07;9.90e+03
32 ;	13C-1,2,3,4,7,8,9-HpCDF;	6.37e+07;	1.98e+07;	4.39e+07;	0.45;y;	41:01;	87.583;	0.2355;	597;y;	1027;y;n;4.64e+06;7.77e+03;1.02e+07;9.90e+03
Injection Standards										
33 ;	13C-1,2,3,4-TCDD;	1.02e+08;	4.51e+07;	5.68e+07;	0.80;y;	31:01;	75.008;	-;	1496;y;	2070;y;n;1.23e+07;8.24e+03;1.56e+07;7.56e+03
34 ;	13C-1,2,3,7,8,9-HxCDD;	9.40e+07;	5.23e+07;	4.17e+07;	1.26;y;	37:13;	87.042;	-;	1786;y;	1299;y;n;1.62e+07;9.07e+03;1.29e+07;9.91e+03
Cleanup Standard										
35 ;	37Cl-2,3,7,8-TCDD;	2.05e+07;	2.05e+07;	-;	-;-;	31:29;	16.882;	0.0642;	972;y;	-;-;n;6.91e+06;7.11e+03; -; -

Totals Raw Data

	Conc	Empc	Flags
TCDF	0.58	0.58	FALSE
TCDD	0	0	FALSE
PeCDF	0	0	FALSE
PeCDD	0	0	FALSE
HxCDF	0	0	FALSE
HxCDD	0	0	FALSE
HpCDF	0	0	FALSE
HpCDD	0	0	FALSE

Filename: a09feb09a
Sample: 11
Acquired: 10-FEB-09 00:24:54
Processed: 10-FEB-09 07:34:17
Sample ID: G1040-6-2B
Cal Table: m1613-100708a
Results Table: m1613-020909a

Name of Homolog Group: Total Tetra-Furans
Number of Peaks Found: 9 1
RRF Used For Totals: 1.0368
Detection Limit: 0.1391
Noise Height Ion1/Ion2: 8672 / 8408
Begin Window: 26:14:00
End Window: 33:07:00

RL=0.500 (pg/µL)

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	1.63E+05	110000	52700		2.09	n 26:36	0.109	S2N	2.8	n	1.9	n	n
	2	3.01E+05	122000	179000		0.68	y 27:34	0.201	RL	2.9	n	4	y	n
	3	5.13E+05	222000	291000		0.76	y 27:56	0.342	RL	5.4	y	6.3	y	n
	4	6.71E+05	308000	363000		0.85	y 28:15	0.447	RL	6.6	y	6.8	y	y
	5	6.71E+05	304000	367000		0.83	y 29:31	0.447	RL	6.5	y	8.2	y	y
	6	1.74E+05	54700	119000		0.46	n 30:00	0.116	S2N	1.8	n	3.4	y	n
	7	1.96E+05	78500	118000		0.67	y 30:36	0.131	RL	2.5	n	3	n	n
2,3,7,8-TCDF	8	8.72E+05	392000	480000		0.82	y 30:53	0.58	OK	11.2	y	13.6	y	y
	9	6.90E+05	323000	367000		0.88	y 31:09	0.46	RL	9.7	y	11.1	y	y

Filename: a09feb09a
Sample: 11
Acquired: 10-FEB-09 00:24:54
Processed: 10-FEB-09 07:34:17
Sample ID: G1040-6-2B
Cal Table: m1613-100708a
Results Table: m1613-020909a

Name of Homolog Group: Total Tetra-Dioxins
Number of Peaks Found: 3 0
RRF Used For Totals: 1.0087
Detection Limit: 0.0806
Noise Height Ion1/Ion2: 4924 / 4332
Begin Window: 27:41:00
End Window: 32:38:00

RL=0.500 (pg/µL)

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	9.82E+04	57100	41100		1.39	n 28:21	0.097	RL	2.6	n	5.8	y	n
	2	6.92E+04	20600	48600		0.43	n 28:36	0.068	S2N	1.5	n	3.7	y	n
	3	4.46E+05	179000	267000		0.67	y 31:19	0.44	RL	12.5	y	18.2	y	n

Filename: a09feb09a
Name of Homolog Group: Total Penta-Furans Fn1

Sample:	11	Number of Peaks Found:	2	0											
Acquired:	10-FEB-09 00:24:54	RRF Used For Totals:	1.0121												
Processed:	10-FEB-09 07:34:17	Detection Limit:	0.076												
Sample ID:	G1040-6-2B	Noise Height Ion1/Ion2:	7948 / 7184												
Cal Table:	m1613-100708a	Begin Window:						31:45:00							
Results Table:	m1613-020909a	End Window:						32:05:00							
Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?	
	1	9.35E+05	371000	564000		0.66 y	32:04	0.632	RL	18.7	y	31.1	y	n	
	2	1.93E+04	11000	8320		1.32 n	32:09	0.013	RT	1.1	n	0.5	n	n	

Filename:	a09feb09a	Name of Homolog Group:	Total Penta-Furans Fn2												
Sample:	11	Number of Peaks Found:	6	0											
Acquired:	10-FEB-09 00:24:54	RRF Used For Totals:	1.0121												
Processed:	10-FEB-09 07:34:17	Detection Limit:	0.0868						RL=2.500 (pg/µL)						
Sample ID:	G1040-6-2B	Noise Height Ion1/Ion2:	8080 / 9208												
Cal Table:	m1613-100708a	Begin Window:						31:42:00							
Results Table:	m1613-020909a	End Window:						34:51:00							
Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?	
	1	2.29E+05	132000	97700		1.35 y	32:49	0.155	RL	5.4	y	3.4	y	n	
	2	1.02E+06	595000	422000		1.41 y	32:54	0.687	RL	22.5	y	13.3	y	n	
	3	2.70E+05	176000	93800		1.88 n	33:15	0.183	RL	7.3	y	4.1	y	n	
	4	1.88E+05	130000	58500		2.22 n	33:37	0.127	S2N	4.5	y	2.3	n	n	
	5	1.39E+05	72100	66900		1.08 n	34:01	0.094	RL	4.1	y	3	n	n	
2,3,4,7,8-PeCDF	6	3.71E+05	211000	160000		1.31 n	34:05	0.253	RL	10	y	5.3	y	n	

Filename:	a09feb09a	Name of Homolog Group:	Total Penta-Dioxins												
Sample:	11	Number of Peaks Found:	5	0											
Acquired:	10-FEB-09 00:24:54	RRF Used For Totals:	1.0517												
Processed:	10-FEB-09 07:34:17	Detection Limit:	0.1441						RL=2.500 (pg/µL)						
Sample ID:	G1040-6-2B	Noise Height Ion1/Ion2:	7788 / 9972												
Cal Table:	m1613-100708a	Begin Window:						32:52:00							
Results Table:	m1613-020909a	End Window:						34:37:00							
Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?	
	1	2.37E+05	159000	78200		2.03 n	32:55	0.253	RL	6.4	y	3.2	y	n	
	2	2.62E+05	169000	93100		1.81 n	33:29	0.279	RL	7.9	y	4.4	y	n	
	3	2.62E+05	152000	109000		1.39 y	33:35	0.279	RL	7.6	y	4.2	y	n	
	4	7.35E+04	38300	35100		1.09 n	33:59	0.078	S2N	2.2	n	1.7	n	n	
1,2,3,7,8-PeCDD	5	2.40E+05	176000	63600		2.77 n	34:17	0.256	RL	6.4	y	4	y	n	

Filename:	a09feb09a	Name of Homolog Group:	Total Hexa-Furans

Sample:	11	Number of Peaks Found:	3	0	
Acquired:	10-FEB-09 00:24:54	RRF Used For Totals:	1.1305		
Processed:	10-FEB-09 07:34:17	Detection Limit:	0.1373		RL=2.500 (pg/µL)
Sample ID:	G1040-6-2B	Noise Height Ion1/Ion2:	8504 / 9392		
Cal Table:	m1613-100708a	Begin Window:		35:06:00	
Results Table:	m1613-020909a	End Window:		37:40:00	

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	1.98E+05	102000	96000		1.06 y	35:12	0.166	RL	5.2	y	4	y	n
	2	6.08E+05	332000	276000		1.2 y	35:20	0.509	RL	13.7	y	11.2	y	n
	3	3.56E+05	195000	161000		1.21 y	35:47	0.298	RL	8.4	y	7.5	y	n

Filename:	a09feb09a	Name of Homolog Group:	Total Hexa-Dioxins		
Sample:	11	Number of Peaks Found:	7	0	
Acquired:	10-FEB-09 00:24:54	RRF Used For Totals:	1.0077		
Processed:	10-FEB-09 07:34:17	Detection Limit:	0.2102		RL=2.500 (pg/µL)
Sample ID:	G1040-6-2B	Noise Height Ion1/Ion2:	8676 / 10104		
Cal Table:	m1613-100708a	Begin Window:		35:36:00	
Results Table:	m1613-020909a	End Window:		37:17:00	

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	2.87E+05	152000	136000		1.12 y	35:38	0.347	RL	5.8	y	4.6	y	n
	2	1.11E+05	62500	48800		1.28 y	36:06	0.134	S2N	2.7	n	2.4	n	n
	3	1.10E+06	578000	526000		1.1 y	36:19	1.333	RL	18.8	y	14.5	y	n
1,2,3,4,7,8-HxCDD	4	9.40E+04	50100	44000		1.14 y	36:53	0.117	S2N	2.4	n	1.7	n	n
1,2,3,6,7,8-HxCDD	5	5.38E+05	331000	207000		1.6 n	36:59	0.626	RL	11.5	y	7	y	n
1,2,3,7,8,9-HxCDD	6	9.88E+04	62200	36600		1.7 n	37:14	0.12	S2N	2.7	n	1.6	n	n
	7	1.49E+05	37200	112000		0.33 n	37:51	0.18	RT	1.8	n	3.8	y	n

Filename:	a09feb09a	Name of Homolog Group:	Total Hepta-Furans		
Sample:	11	Number of Peaks Found:	1	0	
Acquired:	10-FEB-09 00:24:54	RRF Used For Totals:	1.3693		
Processed:	10-FEB-09 07:34:17	Detection Limit:	0.1639		RL=2.500 (pg/µL)
Sample ID:	G1040-6-2B	Noise Height Ion1/Ion2:	6660 / 7292		
Cal Table:	m1613-100708a	Begin Window:		38:52:00	
Results Table:	m1613-020909a	End Window:		41:04:00	

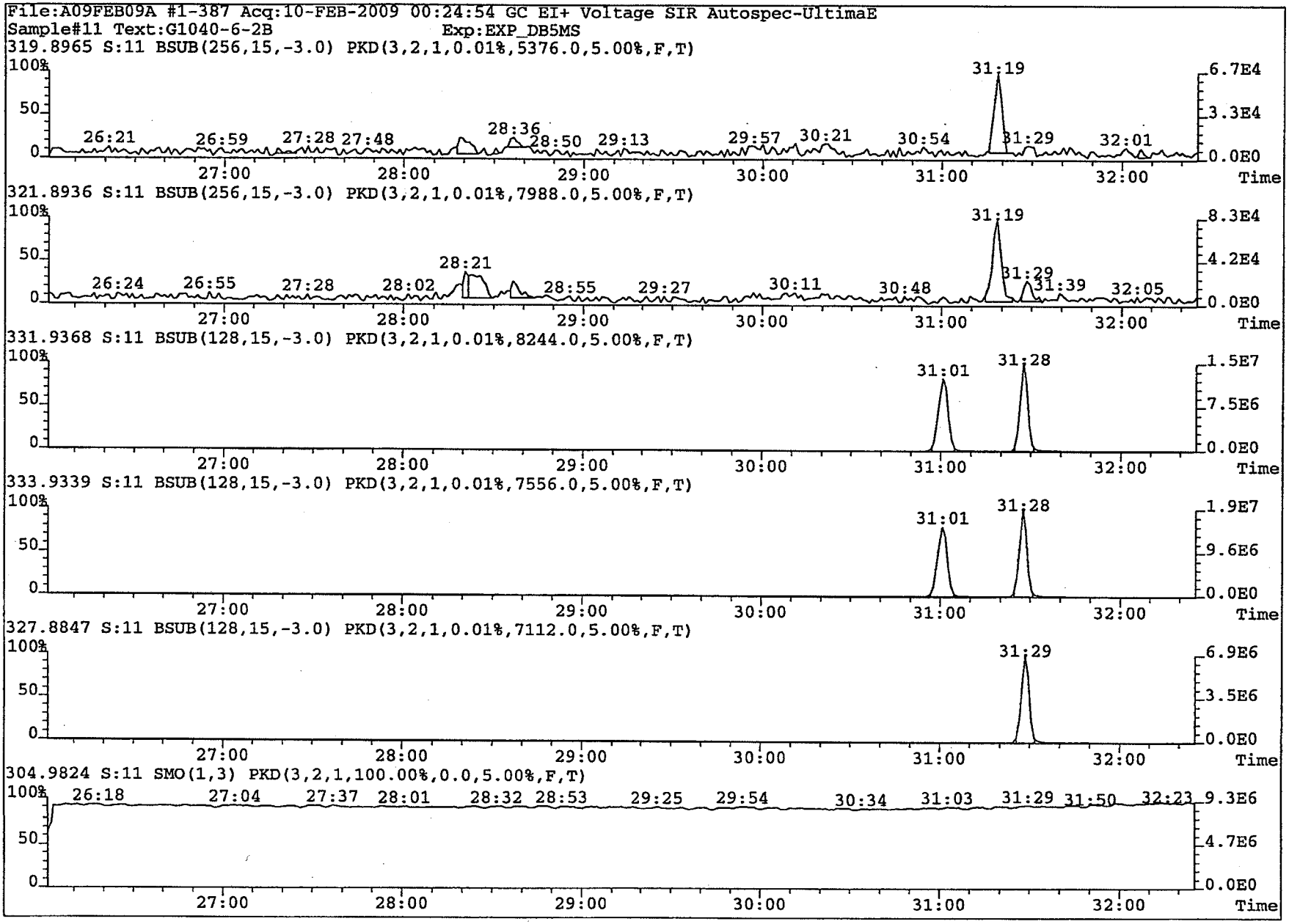
Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
1,2,3,4,6,7,8-HpCDI	1	2.38E+05	129000	109000		1.19 y	39:04	0.219	RL	5.5	y	4.9	y	n

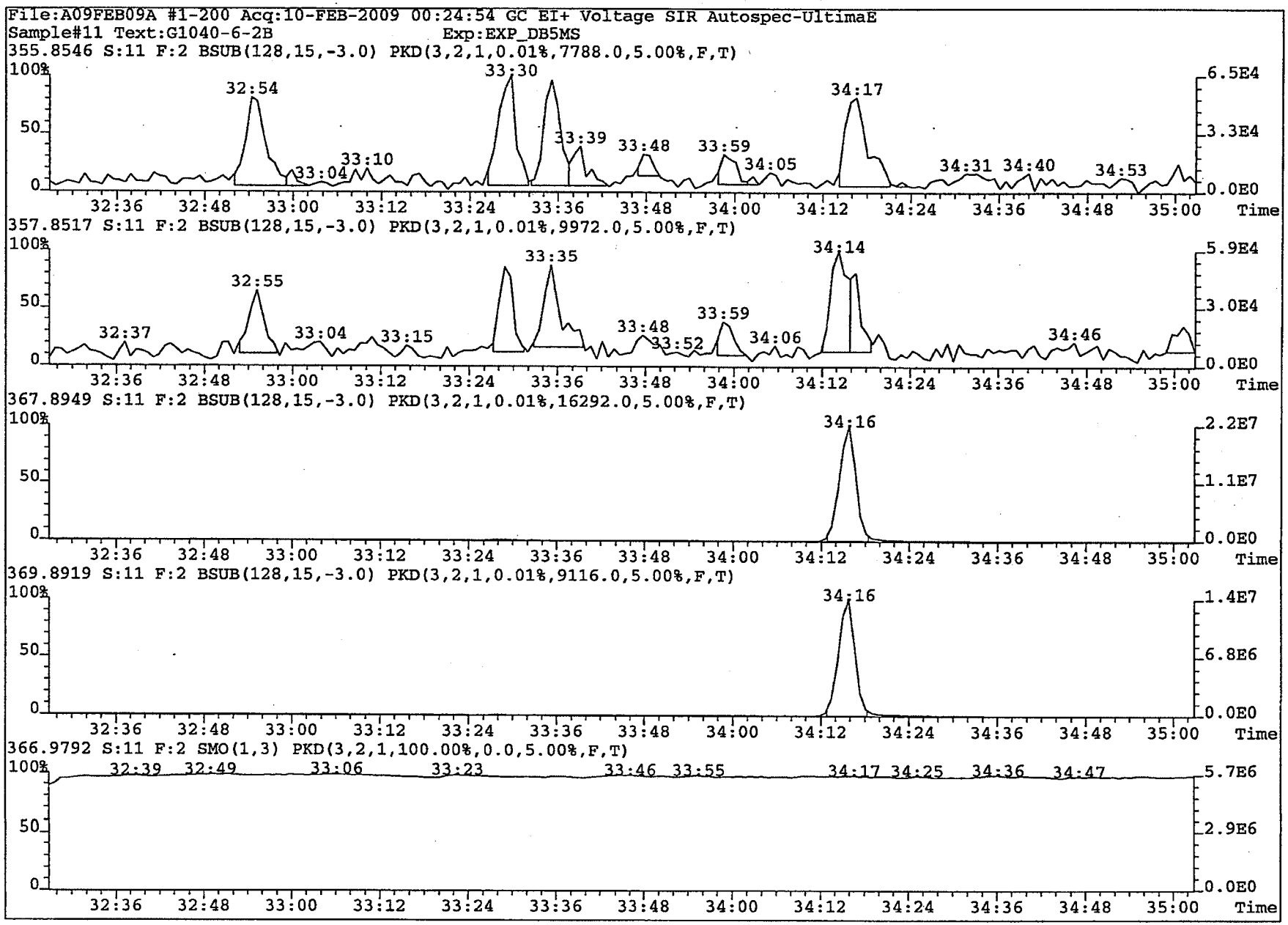
Filename:	a09feb09a	Name of Homolog Group:	Total Hepta-Dioxins		
Sample:	11	Number of Peaks Found:	2	0	
Acquired:	10-FEB-09 00:24:54	RRF Used For Totals:	1.0612		
Processed:	10-FEB-09 07:34:17	Detection Limit:	0.2362		RL=2.500 (pg/µL)

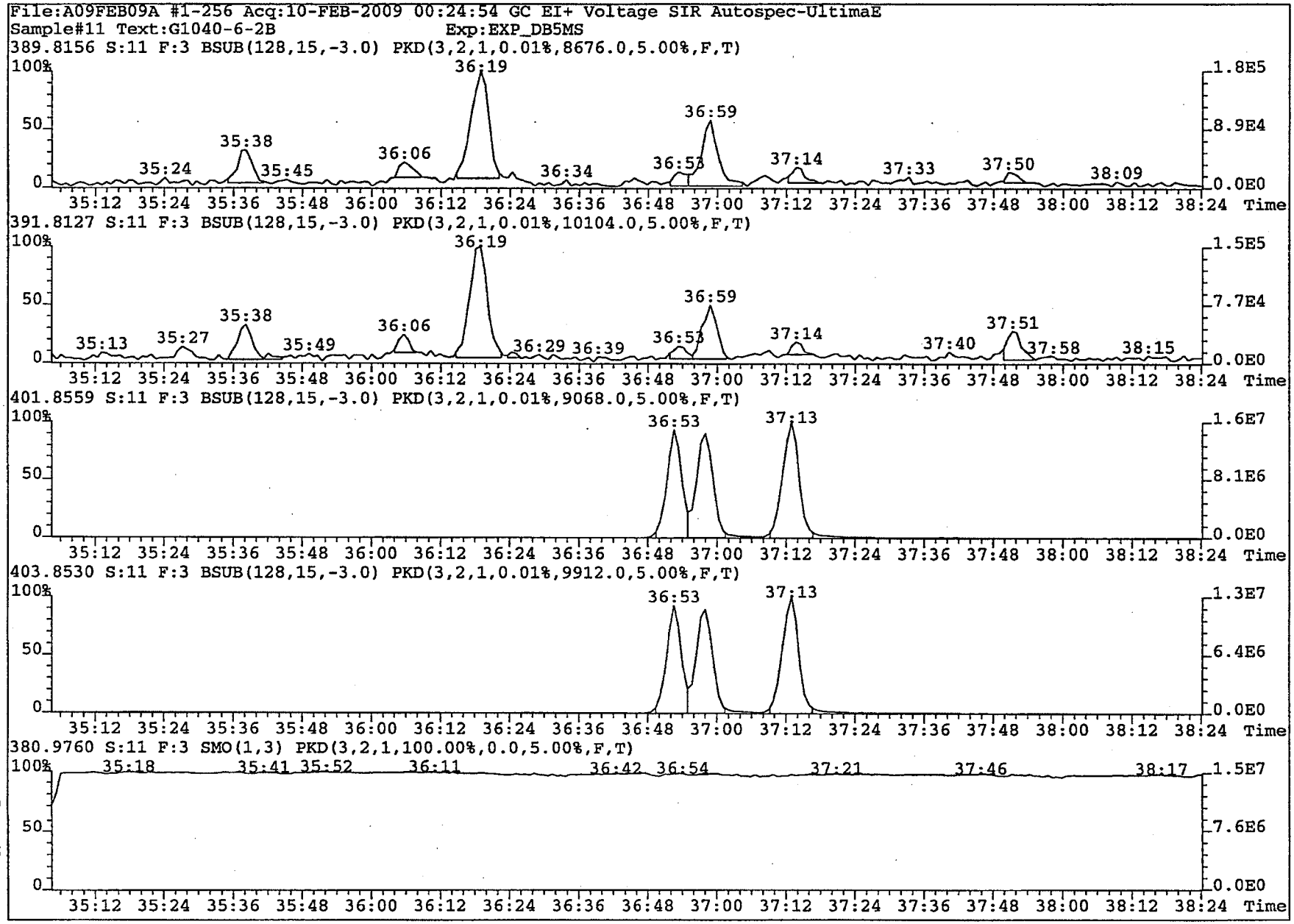
Totals Raw Data

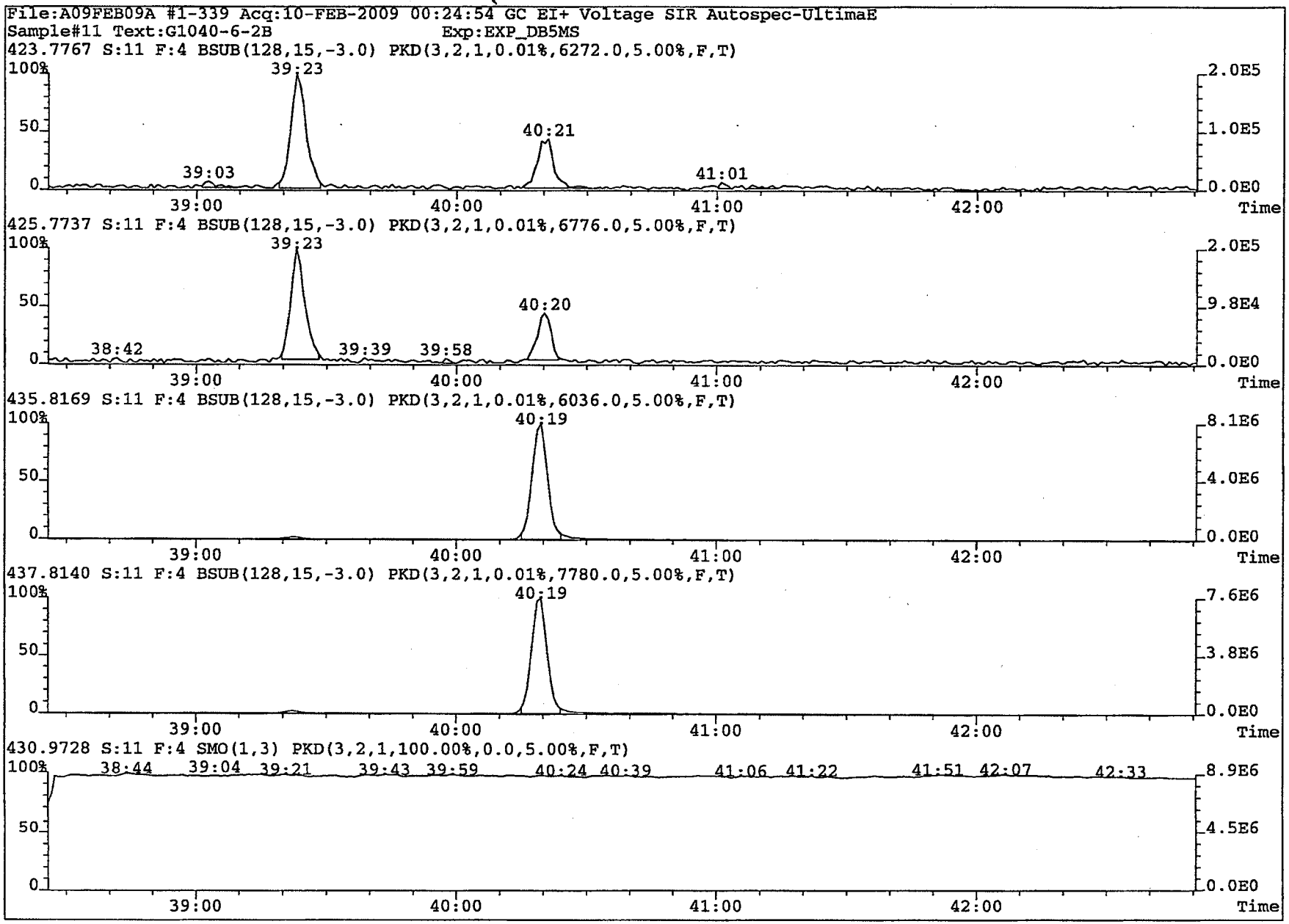
Sample ID:	G1040-6-2B	Noise Height Ion1/Ion2:	6272 / 6776
Cal Table:	m1613-100708a	Begin Window:	39:17:00
Results Table:	m1613-020909a	End Window:	40:29:00

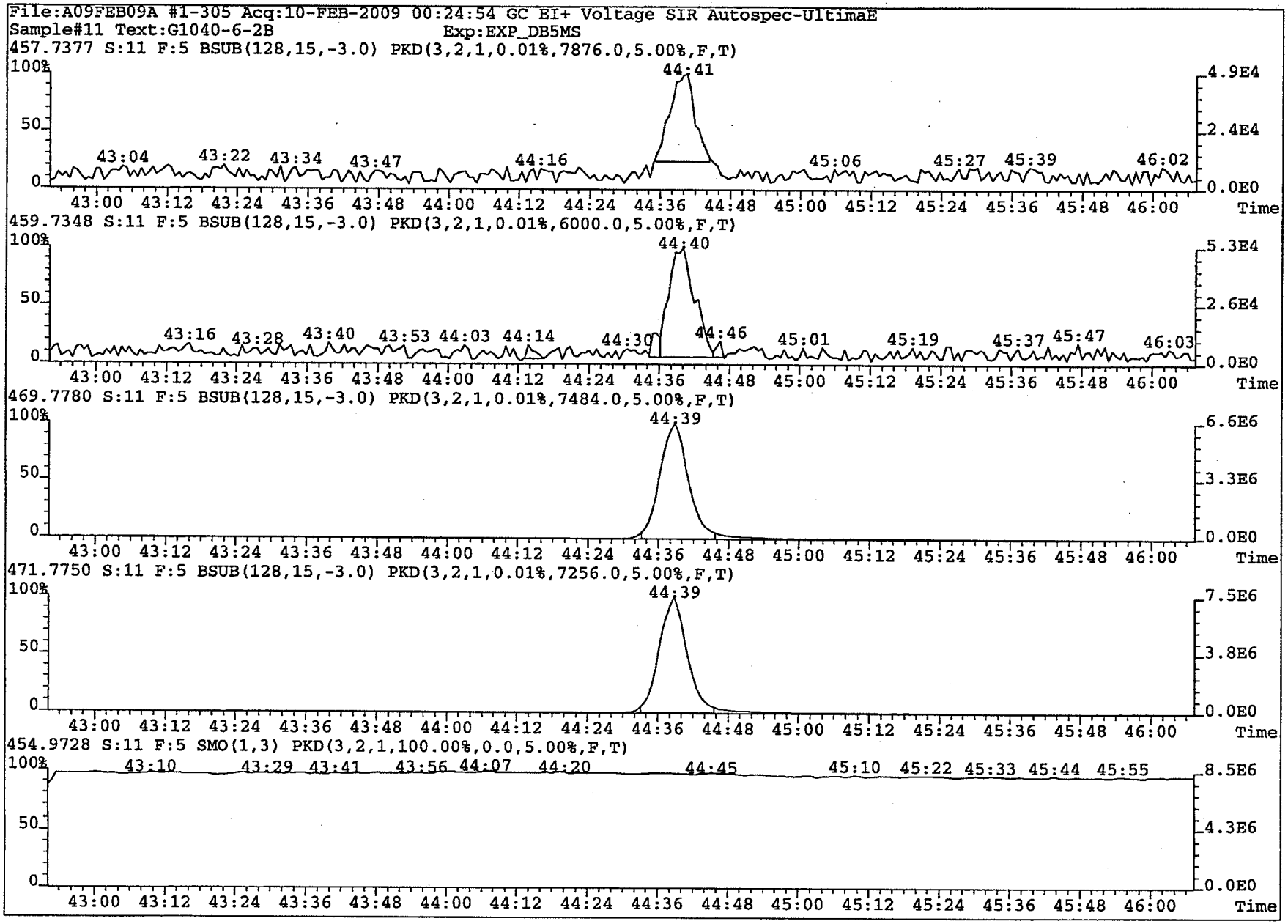
Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	1.49E+06	790000	696000	1.13	y	39:24	2.219	RL	31.2	y	27.6	y	n
1,2,3,4,6,7,8-HpCDI	2	6.41E+05	358000	283000	1.27	n	40:20	0.957	RL	13.5	y	11.8	y	n

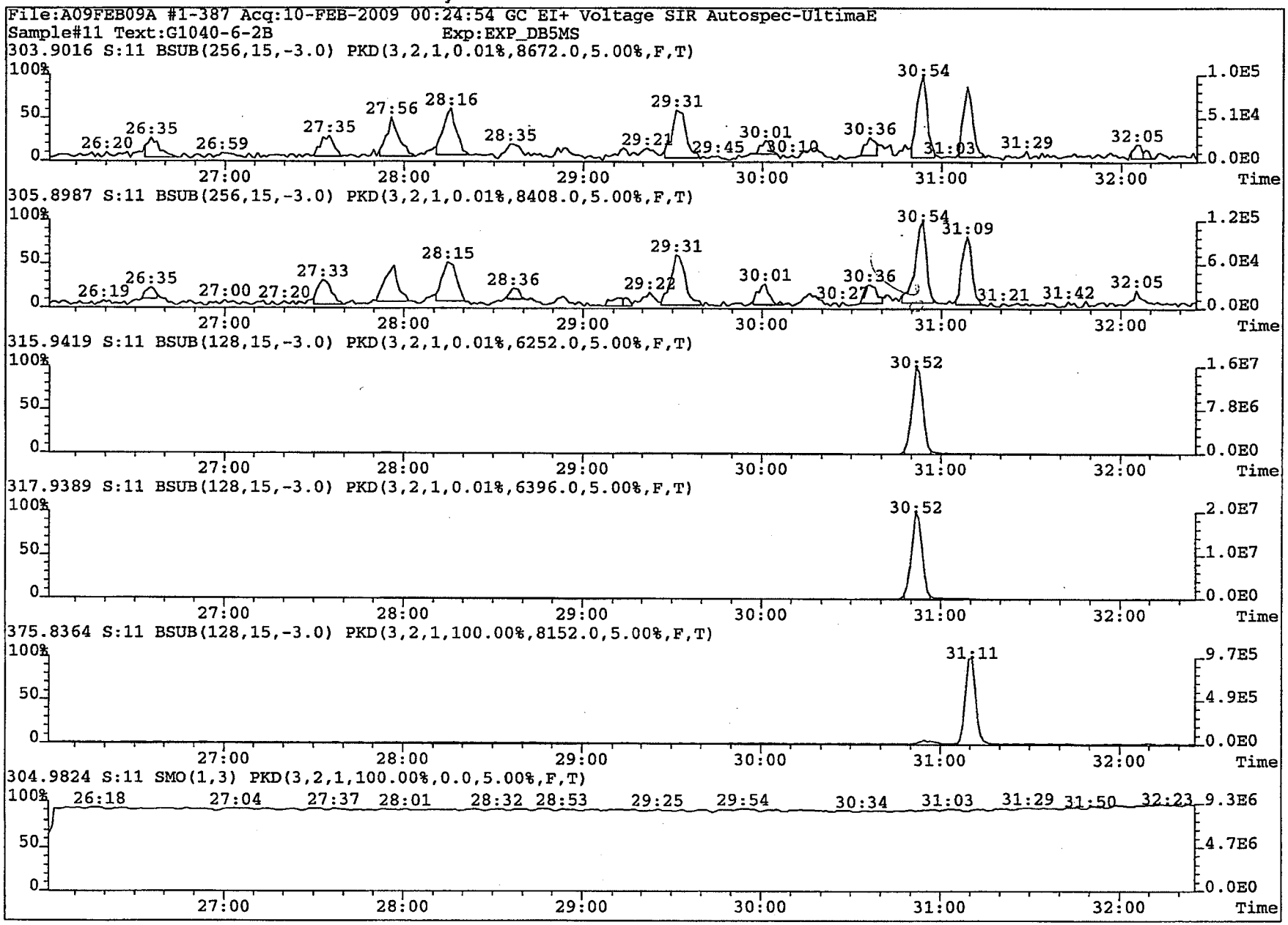

File:A09FEB09A #1-387 Acq:10-FEB-2009 00:24:54 GC EI+ Voltage SIR Autospec-UltimaE
Sample#11 Text:G1040-6-2B Exp:EXP_DB5MS
319.8965 S:11 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,5376.0,5.00%,F,T)
321.8936 S:11 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,7988.0,5.00%,F,T)
331.9368 S:11 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,8244.0,5.00%,F,T)
333.9339 S:11 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7556.0,5.00%,F,T)
327.8847 S:11 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7112.0,5.00%,F,T)
304.9824 S:11 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time

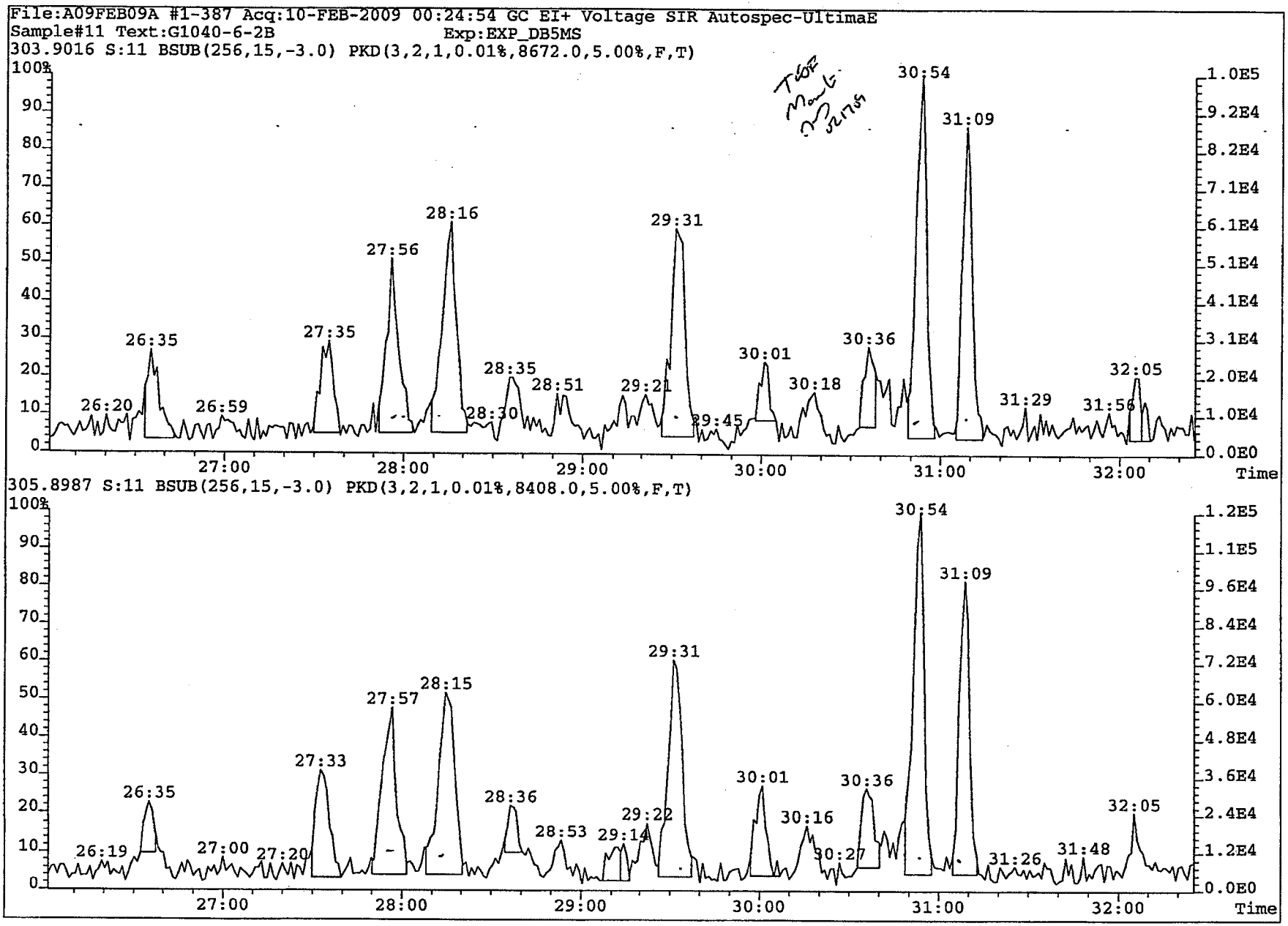

File:A09FEB09A #1-200 Acq:10-FEB-2009 00:24:54 GC EI+ Voltage SIR Autospec-UltimaE
Sample#11 Text:G1040-6-2B Exp:EXP_DB5MS
355.8546 S:11 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7788.0,5.00%,F,T)
32:54 33:30 34:17 33:39 33:48 33:59 33:10 33:04 34:05 34:31 34:40 34:53
6.5E4 3.3E4 0.0E0
357.8517 S:11 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,9972.0,5.00%,F,T)
34:14 33:35 32:55 32:37 33:04 33:15 33:48 33:52 33:59 34:06 34:46
5.9E4 3.0E4 0.0E0
367.8949 S:11 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,16292.0,5.00%,F,T)
34:16
2.2E7 1.1E7 0.0E0
369.8919 S:11 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,9116.0,5.00%,F,T)
34:16
1.4E7 6.8E6 0.0E0
366.9792 S:11 F:2 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
32:39 32:49 33:06 33:23 33:46 33:55 34:17 34:25 34:36 34:47
5.7E6 2.9E6 0.0E0
100% 50 0
32:36 32:48 33:00 33:12 33:24 33:36 33:48 34:00 34:12 34:24 34:36 34:48 35:00 Time

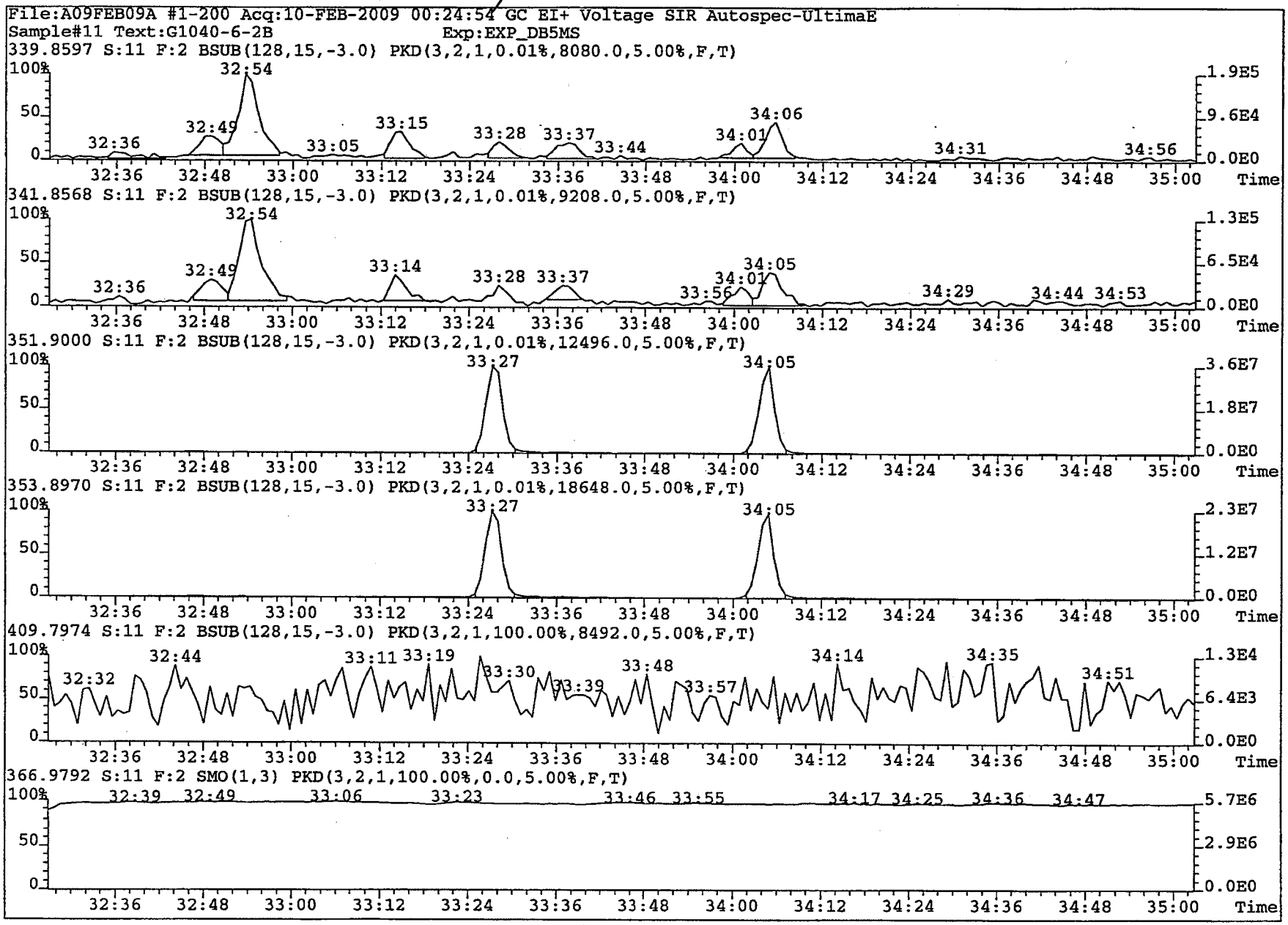

File:A09FEB09A #1-256 Acq:10-FEB-2009 00:24:54 GC EI+ Voltage SIR Autospec-UltimaE
Sample#11 Text:G1040-6-2B Exp:EXP_DB5MS
389.8156 S:11 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,8676.0,5.00%,F,T)
391.8127 S:11 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,10104.0,5.00%,F,T)
401.8559 S:11 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,9068.0,5.00%,F,T)
403.8530 S:11 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,9912.0,5.00%,F,T)
380.9760 S:11 F:3 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
100%
50
0
1.8E5
8.9E4
0.0E0
1.5E5
7.7E4
1.6E7
8.1E6
1.3E7
6.4E6
1.5E7
7.6E6
35:12 35:24 35:36 35:48 36:00 36:12 36:24 36:36 36:48 37:00 37:12 37:24 37:36 37:48 38:00 38:12 38:24 Time

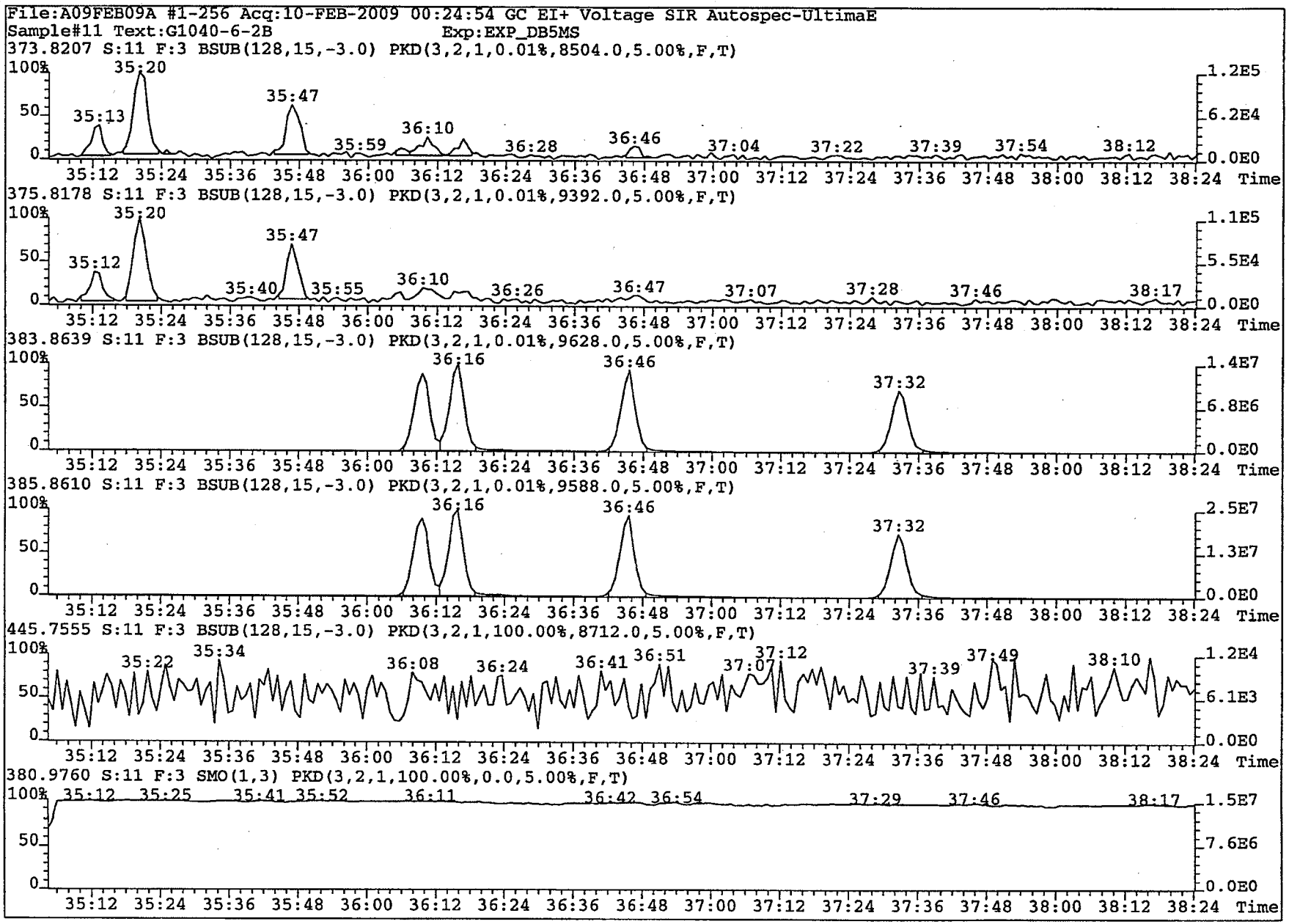

File:A09FEB09A #1-339 Acq:10-FEB-2009 00:24:54 GC EI+ Voltage SIR Autospec-UltimaE
Sample#11 Text:G1040-6-2B Exp:EXP_DB5MS
423.7767 S:11 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6272.0,5.00%,F,T)
39:23
40:21
39:03
41:01
2.0E5
1.0E5
0.0E0
425.7737 S:11 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6776.0,5.00%,F,T)
39:23
40:20
38:42
39:39
39:58
2.0E5
9.8E4
0.0E0
435.8169 S:11 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6036.0,5.00%,F,T)
40:19
8.1E6
4.0E6
0.0E0
437.8140 S:11 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7780.0,5.00%,F,T)
40:19
7.6E6
3.8E6
0.0E0
430.9728 S:11 F:4 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
38:44 39:04 39:21 39:43 39:59 40:24 40:39 41:06 41:22 41:51 42:07 42:33
8.9E6
4.5E6
0.0E0
100%
50
0
39:00
40:00
41:00
42:00
Time

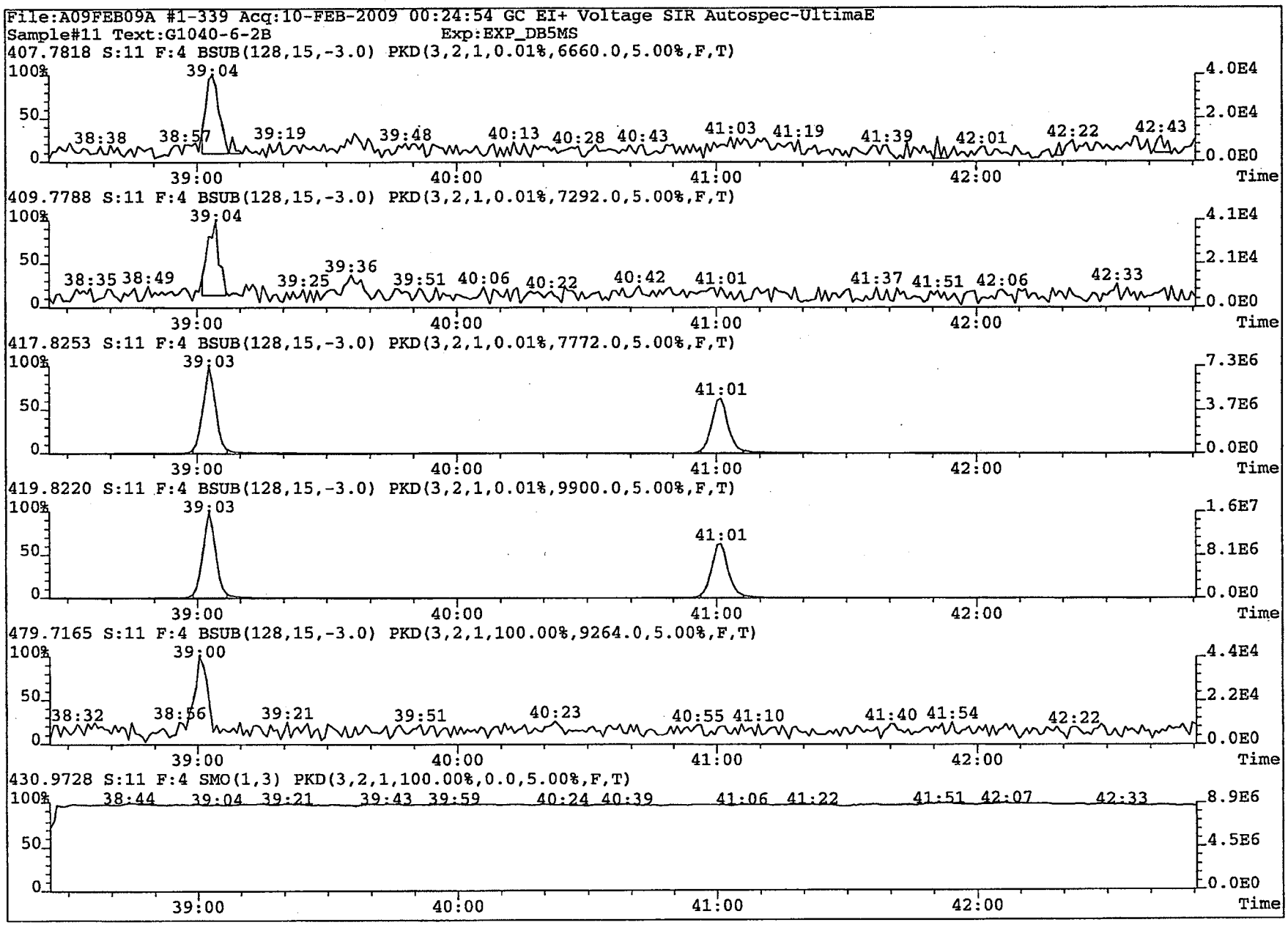

File:A09FEB09A #1-305 Acq:10-FEB-2009 00:24:54 GC EI+ Voltage SIR Autospec-UltimaE
Sample#11 Text:G1040-6-2B Exp:EXP_DB5MS
457.7377 S:11 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7876.0,5.00%,F,T)
44:41
4.9E4
2.4E4
0.0E0
43:04 43:22 43:34 43:47 44:16 45:06 45:27 45:39 46:02
459.7348 S:11 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6000.0,5.00%,F,T)
44:40
5.3E4
2.6E4
0.0E0
43:16 43:28 43:40 43:53 44:03 44:14 44:30 44:46 45:01 45:19 45:37 45:47 46:03
469.7780 S:11 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7484.0,5.00%,F,T)
44:39
6.6E6
3.3E6
0.0E0
471.7750 S:11 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7256.0,5.00%,F,T)
44:39
7.5E6
3.8E6
0.0E0
454.9728 S:11 F:5 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
43:10 43:29 43:41 43:56 44:07 44:20 44:45 45:10 45:22 45:33 45:44 45:55
8.5E6
4.3E6
0.0E0
100%
50
0
43:00 43:12 43:24 43:36 43:48 44:00 44:12 44:24 44:36 44:48 45:00 45:12 45:24 45:36 45:48 46:00
Time

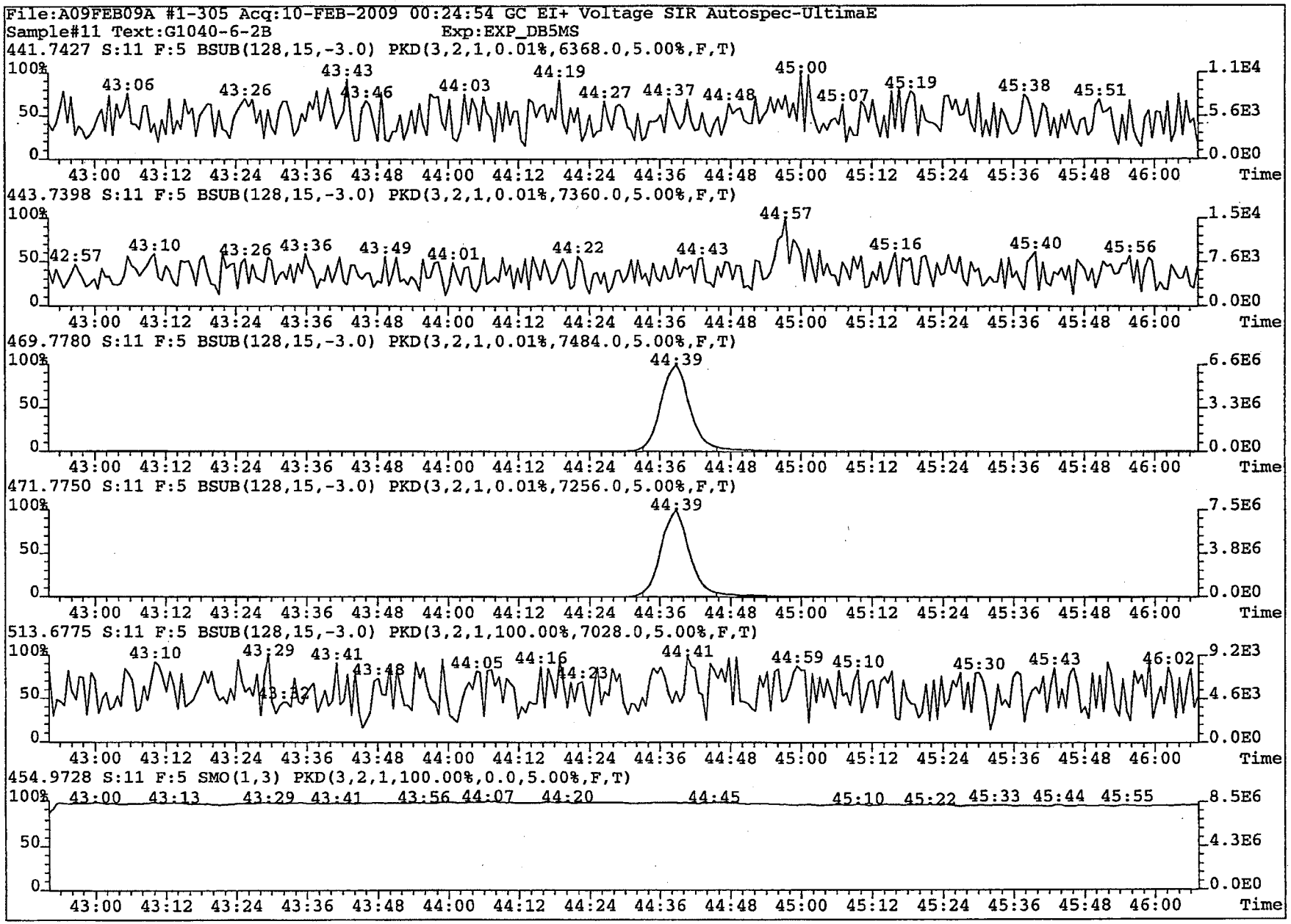

File:A09FEB09A #1-387 Acq:10-FEB-2009 00:24:54 GC EI+ Voltage SIR Autospec-UltimaE
Sample#11 Text:G1040-6-2B Exp:EXP_DB5MS
303.9016 S:11 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,8672.0,5.00%,F,T)
305.8987 S:11 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,8408.0,5.00%,F,T)
315.9419 S:11 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6252.0,5.00%,F,T)
317.9389 S:11 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6396.0,5.00%,F,T)
375.8364 S:11 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,8152.0,5.00%,F,T)
304.9824 S:11 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time

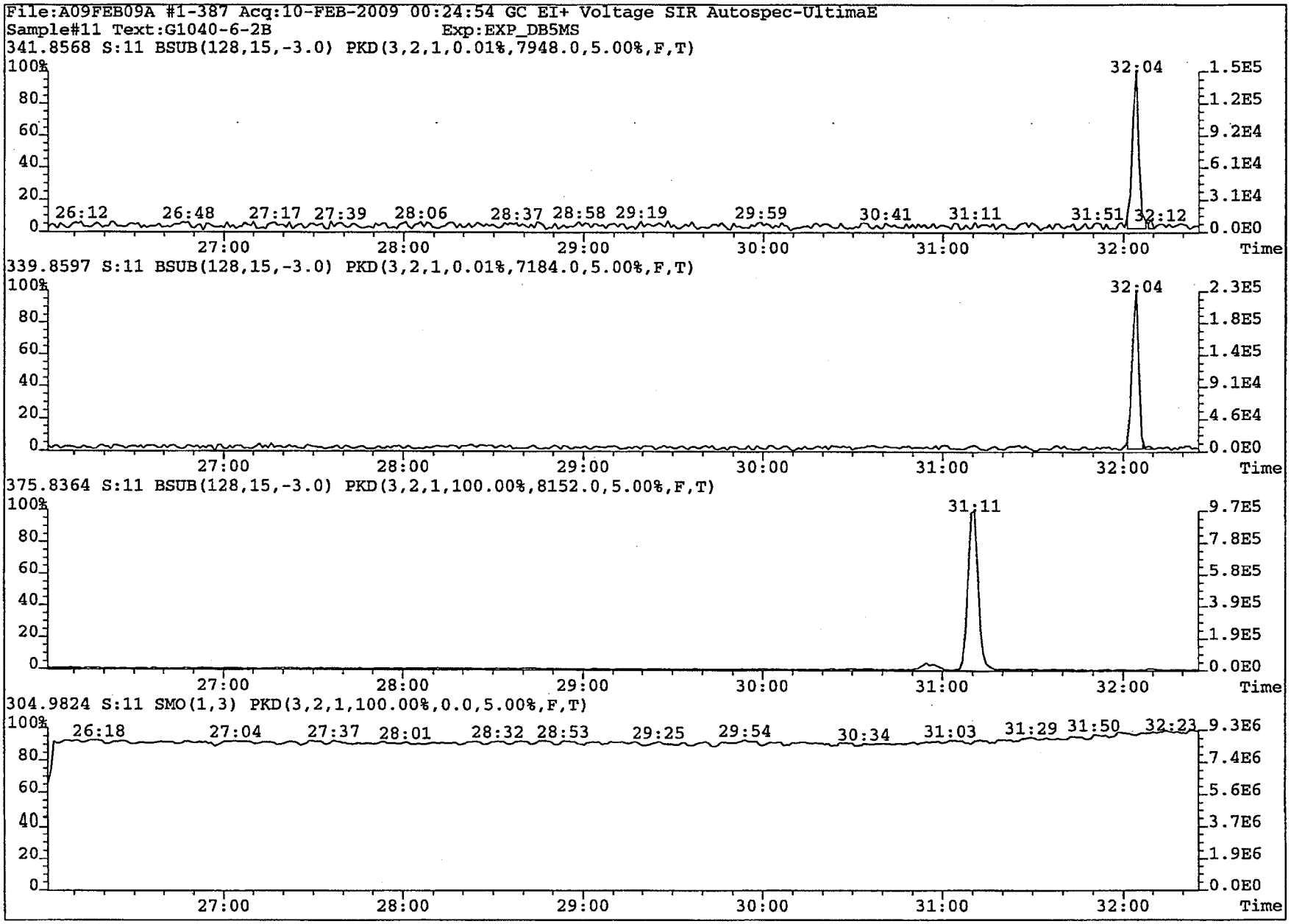

File:A09FEB09A #1-387 Acq:10-FEB-2009 00:24:54 GC EI+ Voltage SIR Autospec-UltimaE
Sample#11 Text:G1040-6-2B Exp:EXP_DB5MS
303.9016 S:11 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,8672.0,5.00%,F,T)
100%
90
80
70
60
50
40
30
20
10
0
1.0E5
9.2E4
8.2E4
7.1E4
6.1E4
5.1E4
4.1E4
3.1E4
2.0E4
1.0E4
0.0E0
26:20
26:35
26:59
27:35
27:56
28:16
28:30
28:35
28:51
29:21
29:31
29:45
30:01
30:18
30:36
30:54
31:09
31:29
31:56
32:05
27:00
28:00
29:00
30:00
31:00
32:00
Time
305.8987 S:11 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,8408.0,5.00%,F,T)
100%
90
80
70
60
50
40
30
20
10
0
1.2E5
1.1E5
9.6E4
8.4E4
7.2E4
6.0E4
4.8E4
3.6E4
2.4E4
1.2E4
0.0E0
26:19
26:35
27:00
27:20
27:33
27:57
28:15
28:36
28:53
29:14
29:22
29:31
30:01
30:16
30:27
30:36
30:54
31:09
31:26
31:48
32:05
27:00
28:00
29:00
30:00
31:00
32:00
Time


File:A09FEB09A #1-200 Acq:10-FEB-2009 00:24:54 GC EI+ Voltage SIR Autospec-UltimaE
Sample#11 Text:G1040-6-2B Exp:EXP_DB5MS
339.8597 S:11 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,8080.0,5.00%,F,T)
341.8568 S:11 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,9208.0,5.00%,F,T)
351.9000 S:11 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,12496.0,5.00%,F,T)
353.8970 S:11 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,18648.0,5.00%,F,T)
409.7974 S:11 F:2 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,8492.0,5.00%,F,T)
366.9792 S:11 F:2 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time


File:A09FEB09A #1-256 Acq:10-FEB-2009 00:24:54 GC EI+ Voltage SIR Autospec-UltimaE
Sample#11 Text:G1040-6-2B Exp:EXP_DB5MS
373.8207 S:11 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,8504.0,5.00%,F,T)
375.8178 S:11 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,9392.0,5.00%,F,T)
383.8639 S:11 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,9628.0,5.00%,F,T)
385.8610 S:11 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,9588.0,5.00%,F,T)
445.7555 S:11 F:3 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,8712.0,5.00%,F,T)
380.9760 S:11 F:3 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time


File:A09FEB09A #1-339 Acq:10-FEB-2009 00:24:54 GC EI+ Voltage SIR Autospec-UltimaE
Sample#11 Text:G1040-6-2B Exp:EXP_DB5MS
407.7818 S:11 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6660.0,5.00%,F,T)
39:04
38:38 38:57 39:19 39:48 40:13 40:28 40:43 41:03 41:19 41:39 42:01 42:22 42:43
4.0E4
2.0E4
0.0E0
409.7788 S:11 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7292.0,5.00%,F,T)
39:04
38:35 38:49 39:25 39:36 39:51 40:06 40:22 40:42 41:01 41:37 41:51 42:06 42:33
4.1E4
2.1E4
0.0E0
417.8253 S:11 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7772.0,5.00%,F,T)
39:03
41:01
7.3E6
3.7E6
0.0E0
419.8220 S:11 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,9900.0,5.00%,F,T)
39:03
41:01
1.6E7
8.1E6
0.0E0
479.7165 S:11 F:4 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,9264.0,5.00%,F,T)
39:00
38:32 38:56 39:21 39:51 40:23 40:55 41:10 41:40 41:54 42:22
4.4E4
2.2E4
0.0E0
430.9728 S:11 F:4 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
38:44 39:04 39:21 39:43 39:59 40:24 40:39 41:06 41:22 41:51 42:07 42:33
8.9E6
4.5E6
0.0E0
100%
50
0
39:00
40:00
41:00
42:00
Time


File:A09FEB09A #1-305 Acq:10-FEB-2009 00:24:54 GC EI+ Voltage SIR Autospec-UltimaE
Sample#11 Text:G1040-6-2B Exp:EXP_DB5MS
441.7427 S:11 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6368.0,5.00%,F,T)
443.7398 S:11 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7360.0,5.00%,F,T)
469.7780 S:11 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7484.0,5.00%,F,T)
471.7750 S:11 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7256.0,5.00%,F,T)
513.6775 S:11 F:5 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,7028.0,5.00%,F,T)
454.9728 S:11 F:5 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time


File:A09FEB09A #1-387 Acq:10-FEB-2009 00:24:54 GC EI+ Voltage SIR Autospec-UltimaE
Sample#11 Text:G1040-6-2B Exp:EXP_DB5MS
341.8568 S:11 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7948.0,5.00%,F,T)
32:04
339.8597 S:11 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7184.0,5.00%,F,T)
32:04
375.8364 S:11 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,8152.0,5.00%,F,T)
31:11
304.9824 S:11 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time

TCDF Confirmation - Method 1613

CRAB1-A PAN2

Analytical Resources, Inc.

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	Adj. RL (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDF	1.22	0.895	19.69	0.80	

Labeled Standard	Spiked Amount (ng)	RT (min.)	Ratio	Qualifier
Extraction Standards				
13C12-2,3,7,8-TCDF	2	19.68	0.77	

Client Information			**Sample Information**		
Project Name:	OG53		Report Basis:	Wet	
			Matrix:	Tissue	
Sample ID:	CRAB1-A PAN2		Weight / Volume:	11.17	g
			Solids / Lipids:	NA	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG16457	
Project ID:	G1040-6		Instrument:		
Sample ID:	G1040-6-2B		Filename:	c17feb09b-8	
Collection Date/Time:	12/23/08	10:35	Retchk:	c17feb09b-2	
Receipt Date:	01/15/09	10:15	Begin ConCal:	c17feb09b-1	
Extraction Date:	02/01/09				
Analysis Date/Time:	02/17/09	13:41	Initial Cal:	mcf-c042108a	

Analyzed by: JWP
Date: 021709

Reviewed by: [signature]
Date: 02/17/09

Quantify Sample Summary Report MassLynx 4.1
Confirms Sample Summary

Dataset: [illegible]

Last Altered: Tuesday, February 17, 2009 15:17:27 Eastern Standard Time
Printed: Tuesday, February 17, 2009 15:18:00 Eastern Standard Time

Name: c17feb09b-8
Date: 17-Feb-2009
Time: 13:41:01
ID: G1040-6-2B
User: HMP
Submitter: mcf-c042108a
Task: HRMS3

	Name	Response	Ion1Area	Ion2Area	RA	RAFail?	RRT	RT	pg/µL	EDL	SN1	SN2	M	Height1	Noise1	Height2	Noise2
1	2378-TCDF	2.954e4	1.313e4	1.641e4	0.80	NO	1.0005	19.69	0.683	0.0617	25.3	33.1	dd	2.066e5	8177	2.804e5	8467
2	ES:13C-2378-TCDF	4.138e6	1.807e6	2.331e6	0.78	NO	1.0477	19.68	103.032	0.0902	2921.4	4034.8	bb	3.383e7	11579	4.184e7	10370
3	JS:13C-1234-TCDD	2.664e6	1.193e6	1.471e6	0.81	NO	0.0000	18.78	229.551	0.1815	3209.2	4392.8	db	2.168e7	6755	2.638e7	6005
4	Hexa Ether	8.597e2	8.597e2	-	-	-	0.0000	16.28	-	-	0.0	-	bd	2.636e4	0	-	-
5	F1 Lock Mass	1.236e5	1.236e5	-	-	-	0.0000	15.33	-	-	0.0	-	bb	4.186e5	0	-	-

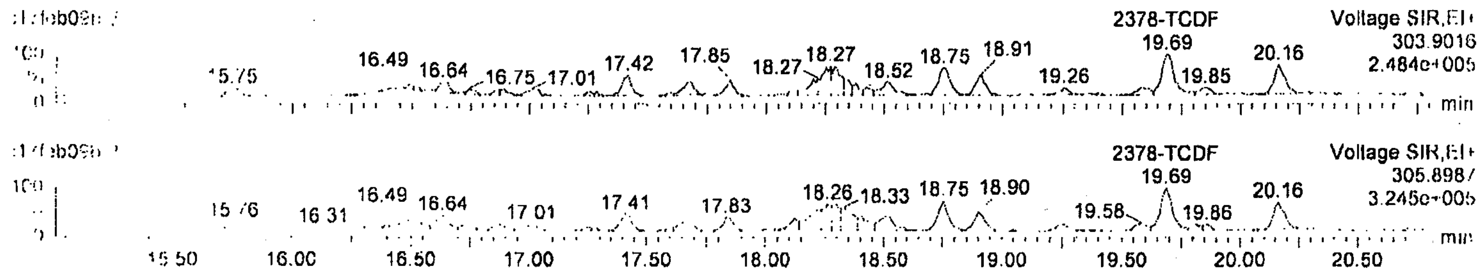
Quantify Sample Report MassLynx 4.1
Confirms Sample Summary

Dataset: Untitled

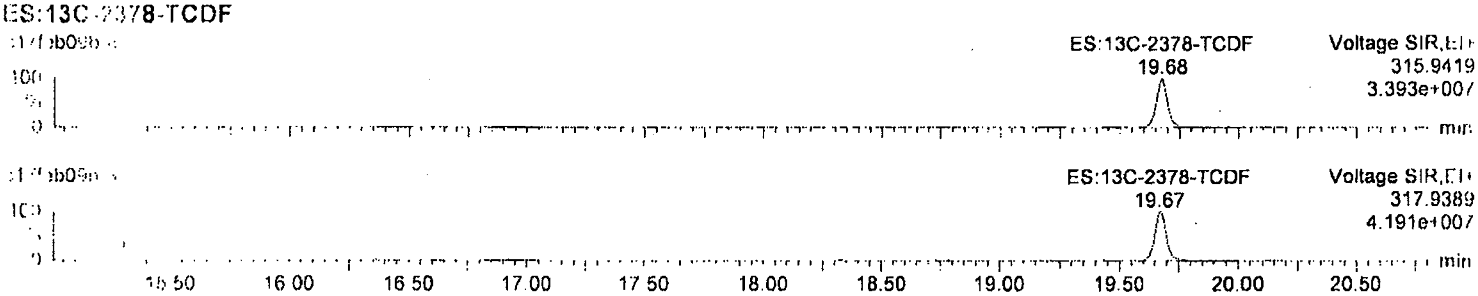
Last Altered: Tuesday, February 17, 2009 15:17:27 Eastern Standard Time
Printed: Tuesday, February 17, 2009 15:18:00 Eastern Standard Time

Name: c17feb09b-8, ID: G1040-6-2B

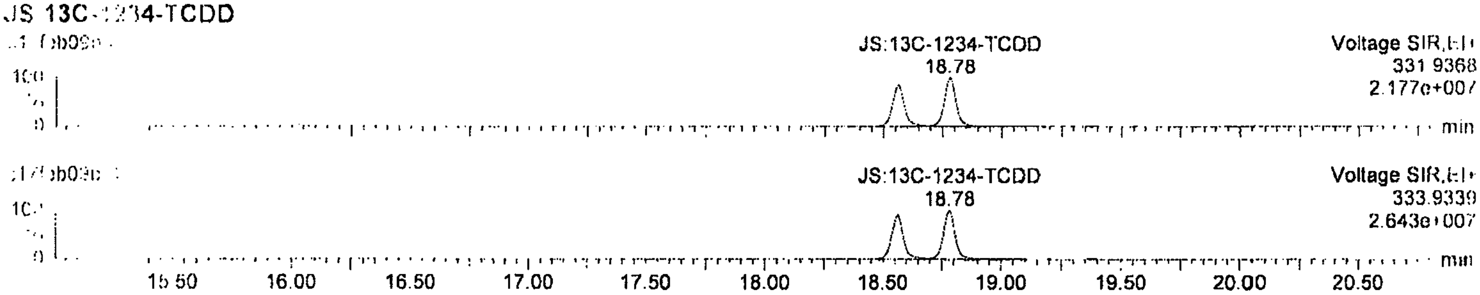
2378-TCDF



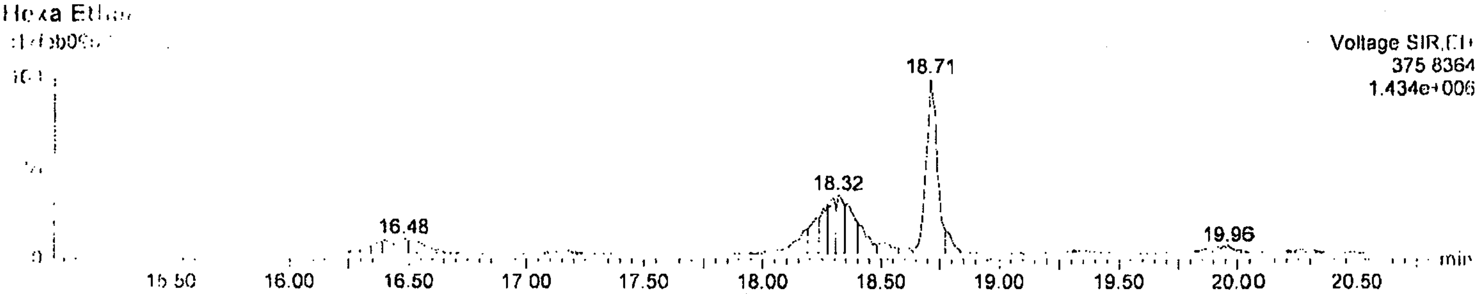
ES:13C-2378-TCDF



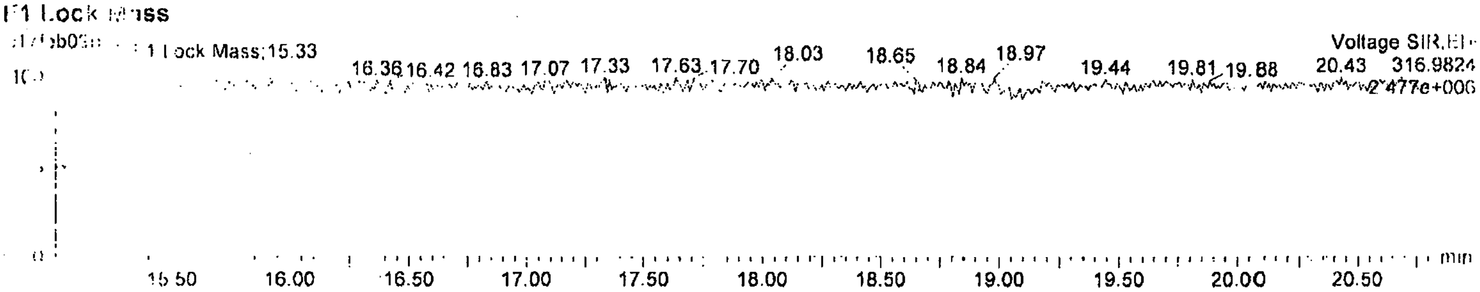
JS 13C-1234-TCDD



Hexa Ether



F1 Lock Mass



Percent Lipids

prepared
for

HART CROWSER, INC.

Project: Port Gamble, 17330-14

ARI JOB NO: OG53

prepared
by

Analytical Resources, Inc.

ANALYTICAL RESOURCES INCORPORATED

LIPIDS ANALYSIS DATA SHEET
Percent Lipids by Method Bligh&Dyer

Data Release Authorized:
Reported: 01/13/09
Date Received: 12/23/08
Page 1 of 1

QC Report No: OG53-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14

Client/ ARI ID	Date Sampled	Matrix	Analysis Date	RL	Result
CRAB1-A MEAT OG53A 09-396	12/23/08	Tissue	01/09/09	0.0008	0.208 %
CRAB1-A PAN2 OG53B 09-409	12/23/08	Tissue	01/09/09	0.0008	3.01 %
Method Blank			01/09/09	0.0008	< 0.0008 % U
Method Blank			01/09/09	0.0008	< 0.0008 % U
Method Blank			01/09/09	0.0008	< 0.0008 % U

Results Are On A Wet Weight Basis

RL-Analytical reporting limit
U-Undetected at reported detection limit

Bid # N/A
Ext # ↓

% Lipids – Tissue

Client Name: Hart Crowser, Inc.

ARI Job No(s): ©G53

Calculated on LIMs

ARI Sample ID	Client Sample ID	Original Extracted Weight	Original Volume (FEV)	Volume Taken (Split)	Tare Weight (g)	Tare + Sample Weight (g)	% Lipids
©G53 MBT		25.~~0~~3g	5mL	2.5mL	1.1751	1.1750	
MBT dup		25.~~0~~3g	↓	↓	1.1686	1.1688	
MBT Trip		25.~~0~~3g			1.1692	1.1690	
A	Checked	25.~~0~~3g			1.1940	1.2195	
B	✓	25.~~0~~1g	↓	↓	1.1789	1.5559	
1/9/09 JH Date/Analyst: →			SP 1/12/09 →			SP 1/13/09	

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Organic Extractions Laboratory
Analyst Notes

ARI Job No.: 0673 Client ID: Hart Crowser, Inc.

Parameter: Tissue Prep Client Project: Port Gamble

SOP Number(s): **No Anomalies:**

List problems, concerns, corrective actions and any other pertinent information

CRAB 1/6/09 SF.

Prep Time — # of Analysts — 3

Getting ALL meat out. hrs — 11:15 to 16:00 = 5.5

ALL Spatula's, Knives, Picks, Waring blender. Washed in Alconox, Acid Bath and Three Times DI H2O Also Rinsed with Acetone and DCM Three Times. Blender cleaned between Composites. Foil on Trays dull side up for metals.

1/6/09

Analyst Initials: 1/6/09 **Date:**

0453

Hart Crowser Tissue Prep.

Crab…

(CRAB1-A) 8 Crab composite

crab 1 weight 656.79g
crab 2 weight 703.21 g
crab 3 weight 877.29 g
crab 4 weight 590.80 g
crab 5 weight 812.60g
crab 6 weight 609.84g
crab 7 weight 812.28g
crab 8 weight 657.79

Composite Meat weight 4056.34g

Composite Hepatopancreas weight 842.91g

Analytical Resources, Incorporated
Analytical Chemists and Consultants

February 25, 2009

Mr. Roger McGinnis
Hart Crowser, Inc.
1700 Westlake Avenue North Suite 200
Seattle, WA 98109-3056

RE: Project: Port Gamble, 17330-14
ARI Job No.: OG88

Dear Mr. McGinnis:

Please find enclosed the original Chain-of-Custody (COC) records, sample receipt documentation, and the final data package for the samples from the project referenced above.

The samples were analyzed for Total Metals, % Lipids, PCBs and Dioxin Furans, as requested.

Sample receipt and details of these analyses are discussed in the Case Narrative.

An electronic copy of this data package and the supporting data 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.

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

Enclosures

cc: files OG88

KB/kb

Chain of Custody
Documentation

prepared
for

HART CROWSER, INC.

Project: Port Gamble, 17330-14

ARI JOB NO: OG88

prepared
by

Analytical Resources, Inc.

Sample Custody Record

0721

1 OF 2

Samples Shipped to: ART

HARTCROWSER

Hart Crowser, Inc.
1910 Fairview Avenue East
Seattle, Washington 98102-3699
Phone: 206-324-9530 FAX: 206-328-5581

JOB 17330-14 LAB NUMBER

PROJECT NAME PORT GAMBLE

HART CROWSER CONTACT ROGER MCGANNIS

SAMPLED BY: PORT GAMBLE S'KLALLAM TRIBE NATURAL RESOURCES DEPT.

LAB NO.	SAMPLE ID	DESCRIPTION	DATE	TIME	MATRIX	REQUESTED ANALYSIS: METALS	DIOXIN/FURANS	PCBs	NO. OF CONTAINERS	OBSERVATIONS/COMMENTS/ COMPOSITING INSTRUCTIONS
	GDSTATION#1	GD1.12.16.08	12-16-08	—	BIOTA					3 replicates
	GDSTATION#1	GD2.12.16.08		—						3 replicates
	GDSTATION#1	GD3.12.16.08		—						3 replicates
	GDSTATION#2	GD1.12.16.08		—						3 replicates
	GDSTATION#2	GD2.12.16.08		—						3 replicates
	GDSTATION#2	GD3.12.16.08		—						3 replicates
	GDSTATION#3	GD1.12.16.08		—						3 replicates
	GDSTATION#3	GD2.12.16.08		—						3 replicates
	GDSTATION#3	GD3.12.16.08		—						3 replicates
	GDSTATION#1	GDEXTRA.12.16.08		—						2 geoducks extra volume
	GDSTATION#2	GDEXTRA.12.16.08		—						2 geoducks extra volume
	GDSTATION#3	GDEXTRA.12.16.08		—						4 geoducks extra volume

RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE Eileen Rust	12/16/08	SIGNATURE Warren Woodard	12/16/08
PRINT NAME	TIME	PRINT NAME	TIME
COMPANY HC	1830	COMPANY Analytical Resources	18:30
RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE		SIGNATURE	
PRINT NAME	TIME	PRINT NAME	TIME
COMPANY		COMPANY	

SPECIAL SHIPMENT HANDLING OR STORAGE REQUIREMENTS:
SAMPLE ID = SITE + SAMPLE ID
SEE ATTACHED PAGES.

TOTAL NUMBER OF CONTAINERS

SAMPLE RECEIPT INFORMATION
CUSTODY SEALS: ☐YES ☐NO ☐N/A
GOOD CONDITION ☐YES ☐NO
TEMPERATURE
SHIPMENT METHOD: ☐HAND ☐COURIER ☐OVERNIGHT

COOLER NO.: STORAGE LOCATION:

See Lab Work Order No. for Other Contract Requirements

TURNAROUND TIME:
☐ 24 HOURS ☐ 1 WEEK
☐ 48 HOURS ☒ STANDARD
☐ 72 HOURS OTHER

White and Yellow Copies to Lab Pink to Project Manager Lab to Return White Copy to Hart Crowser Gold to Sample Custodian

Sample Custody Record

OF2

2 OF 2

Samples Shipped to: ARI

HARTCROWSER

Hart Crowser, Inc.
1910 Fairview Avenue East
Seattle, Washington 98102-3699
Phone: 206-324-9530 FAX: 206-328-5581

JOB 17330-14 LAB NUMBER

PROJECT NAME PORT GAMBLE

HART CROWSER CONTACT ROGER MCGINNIS

SAMPLED BY: PORT GAMBLE S'KLALLAM TRIBE NATURAL DEPT. RESOURCES

LAB NO.	SAMPLE ID	DESCRIPTION	DATE	TIME	MATRIX	METALS	DIOXIN/FURANS	PCBs	NO. OF CONTAINERS	OBSERVATIONS/COMMENTS/ COMPOSITING INSTRUCTIONS
CLAM#1	C.12.15.08		12-15-08	—	BIOTA					3 replicates
CLAM#2	C.12.15.08			—						" "
OYSTER#1	01.12.15.08			—						" "
OYSTER#1	02.12.15.08			—						" "
OYSTER#2	01.12.15.08			—						" "
OYSTER#2	02.12.15.08		↓	—	↓					" "

RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE	12/16/08	Warren Woodland	12/16/08
PRINT NAME Colleen Rust	TIME	PRINT NAME Warren Woodland	TIME
COMPANY HC	1830	COMPANY Analytical Resources	18:30
RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE	TIME	SIGNATURE	TIME
PRINT NAME		PRINT NAME	
COMPANY		COMPANY	

SPECIAL SHIPMENT HANDLING OR STORAGE REQUIREMENTS:

SAMPLE ID = SITE + SAMPLE ID
SEE ATTACHED PAGES.

TOTAL NUMBER OF CONTAINERS

SAMPLE RECEIPT INFORMATION
CUSTODY SEALS: ☐YES ☐NO ☐N/A
GOOD CONDITION ☐YES ☐NO
TEMPERATURE
SHIPMENT METHOD: ☐HAND ☐COURIER ☐OVERNIGHT

COOLER NO.: STORAGE LOCATION:

See Lab Work Order No. for Other Contract Requirements

TURNAROUND TIME:
☐ 24 HOURS ☐ 1 WEEK
☐ 48 HOURS ☒ STANDARD
☐ 72 HOURS OTHER

White and Yellow Copies to Lab Pink to Project Manager Lab to Return White Copy to Hart Crowser Gold to Sample Custodian

Case Narrative

prepared
for

HART CROWSER, INC.

Project: Port Gamble, 17330-14

ARI JOB NO: OG88

prepared
by

Analytical Resources, Inc.

Case Narrative
Hart Crowser
Port Gamble, 17330-14 (Geoducks)
ARI Job: OG88
February 26, 2009

Sample Receipt

Analytical Resources Inc. (ARI) accepted eighteen tissue samples in good condition on December 16, 2008. The samples were logged under several different ARI SDGs based on sample preps. Please note that several sample containers were prepped and archived upon receipt as requested on the COC. All samples and preps were frozen to protect holding times. For further detail regarding sample receipt, please refer to the Cooer Receipt Form.

** Select samples were sent to SGS Environmental for Dioxin and Furans analysis. The data has been included in this data package.

PCBs Method 8082:

The samples were extracted on 1/13/09 and analyzed on 2/2/09 within the method recommended holding times for frozen samples.

Initial calibration(s): All compounds of interest were within method acceptance criteria.

Continuing calibration(s): Are in control.

Samples: There were no anomalies associated with these samples.

Surrogates: Are in control.

LCS/LCSD(s): Are in control.

Method Blank: The method blanks were free of contamination.

Total Metals:

All samples were prepared on 1/13/09 and analyzed between 1/14/09 and 1/21/09 within the method recommended holding times for frozen samples.

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

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

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

LCS(s): All LCS percent recoveries were within control limits.

MS(s): The matrix spike in is in control.

% Lipids: The data is included in this data package.

Data Reporting Qualifiers

Effective 12/28/04

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 ≥ 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
NR	Spiked compound recovery is not reported due to chromatographic interference
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.
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
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.

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 ≥40% RPD with no obvious chromatographic interference

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

LCS SOLUTIONS

12/30/08

LABE	SOLN ID	TEST	CONC. UG/ML	SOLVENT	EXP.
1	1549-3	PCB	20	ACETONE	10/10/09
2	1472-3	BCOC PEST	10	ACETONE	07/20/08
3	1517-1	PEST	02/04/20	ACETONE	05/15/09
4	1561-2	LOW PEST	0.2/0.4/2	ACETONE	05/15/09
5	1537-1	EPH	1500	MECL2	08/16/09
6	1559-2	PCP	12.5/125	ACETONE	11/05/09
7	1573-1	ABN	100	ACETONE	08/01/09
8	1566-1	TBT	2.5	MECL2	12/04/09
9	1567-3	PORE TBT	.125/.25	MECL2	12/04/09
10	1554-3	ABN ACID	100/200	MEOH	10/21/09
11	1563-3	TPHD	15000	ACETONE	11/20/09
12	1563-1	ABN BASE	200	ACETONE	06/30/09
13	1573-2	LOW PCB	2	ACETONE	10/10/09
14	1547-1	LOW ABN ACID	10/20	MEOH	04/10/09
15*	1452-1	SIM PNA	15/75	MEOH	04/09/09
16	1502-2	DIOXANE	100	MEOH	02/20/09
17	1516-2	1248 PCB	20	ACETONE	05/07/09
18	1514-4	LOW SIM PNA	1.5/7.5	ACETONE	04/24/09
19	1517-3	AK103	7500	MECL2	12/29/08
20	1572-2	PNA	100	ACETONE	12/26/09
21*	1414-4	SKY/BHT	100	MEOH	04/08/09
22	1570-1	HERB	12.5/12500	MEOH	02/19/09
23	1505-1	LOW ABN BASE	20	MEOH	03/20/09
24	1541-4	LOW ABN	10	ACETONE	08/01/09
25	1481-1	DIPHENYL	100	MEOH	07/20/08
26	1545-2	OP-PEST	25	MEOH	02/14/09
27	1495-1	STEROLS	200	MEOH	12/29/08
28	1494-1	ADD. PEST	4	ACETONE	01/23/09
29	1496-3	DECANES	100	MEOH	02/12/09
30	1497-2	EDB/DBCP	2	ACETONE	02/12/09
31	1510-3	TERPINEOL	100	MEOH	03/21/09

LCS SOLUTIONS

12/30/08

32	1545-3	GUAIACOL	50-200	ACETONE	06/05/09
33	1522-1	RESIN ACID	250	ACETONE	06/11/09
34	1530-2	CONGENERS	1	ACETONE	07/23/09
50	1571-1	FULL RESIN	250	ACETONE	06/10/09
*=REVERIFIED SOLUTION					

SURR SOLUTIONS

12/30/08

LABEL	SOLN ID	TEST	CONC. UG/ML	SOLVENT	EXP.
A	1559-5	ABN	100/150	MEOH	03/13/09
B	1572-1	SIM PNA	15/75	MEOH	08/28/09
C	1559-1	SIM ABN	25/37.5	MEOH	03/13/09
D	1561-3	LOW PCB	0.2	ACETONE	07/31/09
E*	1478-1	HERB	62.5	MEOH	09/21/09
F	1520-3	PCP	12.5	ACETONE	04/18/09
G	1534-1	1,4DIOXANE	100	MEOH	02/20/09
H	1545-1	OP-PEST	25	MEOH	02/14/09
I	1559-4	LOW S. PNA	1.5	MEOH	08/28/09
J	1566-5	TBT-PORE	0.125	MECL2	12/04/09
K	1538-1	MED PCB	20	ACETONE	07/31/09
L	1566-4	TBT	2.5	MECL2	12/04/09
M	1558-2	EPH	1500	MECL2	09/24/09
N	1538-2	PCB	2	ACETONE	07/31/09
O	1567-4	TPH	450	MECL2	09/24/09
P	1560-3	HCID	2250	MECL2	09/24/09
Q	1497-3	EDB	2	ACETONE	02/12/09
R	1521-4	RESIN ACID	250	ACETONE	06/11/09
S	1568-5	PBDE	.25	MEOH	12/11/09
T	*reverified	solution			
U					
V					
W					
X					
Y					
Z					

Data Summary Package

prepared
for

HART CROWSER, INC.

Project: Port Gamble, 17330-14

ARI JOB NO: OG88

prepared
by

Analytical Resources, Inc.

PCBS

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082
Page 1 of 1

Sample ID: GD STATION #1A SAMPLE

Lab Sample ID: OG88A
LIMS ID: 09-584
Matrix: Tissue
Data Release Authorized:
Reported: 02/03/09

QC Report No: OG88-Hart Crowser, Inc.
Project: PORT GAMBLE 17330-14
Date Sampled: 12/16/08
Date Received: 12/16/08

Date Extracted: 01/13/09
Date Analyzed: 02/02/09 08:33
Instrument/Analyst: ECD6/JGR
GPC Cleanup: Yes
Sulfur Cleanup: No
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 50.7 g-as-rec
Final Extract Volume: 2.0 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: NA

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	4.0	< 4.0 U
53469-21-9	Aroclor 1242	4.0	< 4.0 U
12672-29-6	Aroclor 1248	4.0	< 4.0 U
11097-69-1	Aroclor 1254	4.0	< 4.0 U
11096-82-5	Aroclor 1260	4.0	< 4.0 U
11104-28-2	Aroclor 1221	4.0	< 4.0 U
11141-16-5	Aroclor 1232	4.0	< 4.0 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	66.5%
Tetrachlorometaxylene	64.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082
Page 1 of 1

Sample ID: GD STATION #2A
SAMPLE

Lab Sample ID: OG88B
LIMS ID: 09-585
Matrix: Tissue
Data Release Authorized:
Reported: 02/03/09

QC Report No: OG88-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/16/08
Date Received: 12/16/08

Date Extracted: 01/13/09
Date Analyzed: 02/02/09 09:38
Instrument/Analyst: ECD6/JGR
GPC Cleanup: Yes
Sulfur Cleanup: No
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 50.3 g-as-rec
Final Extract Volume: 2.0 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: NA

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	4.0	< 4.0 U
53469-21-9	Aroclor 1242	4.0	< 4.0 U
12672-29-6	Aroclor 1248	4.0	< 4.0 U
11097-69-1	Aroclor 1254	4.0	< 4.0 U
11096-82-5	Aroclor 1260	4.0	< 4.0 U
11104-28-2	Aroclor 1221	4.0	< 4.0 U
11141-16-5	Aroclor 1232	4.0	< 4.0 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	64.8%
Tetrachlorometaxylene	60.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082
Page 1 of 1

Sample ID: GD STATION #3A
SAMPLE

Lab Sample ID: OG88C
LIMS ID: 09-586
Matrix: Tissue
Data Release Authorized:
Reported: 02/03/09

QC Report No: OG88-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/16/08
Date Received: 12/16/08

Date Extracted: 01/13/09
Date Analyzed: 02/02/09 10:00
Instrument/Analyst: ECD6/JGR
GPC Cleanup: Yes
Sulfur Cleanup: No
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 50.1 g-as-rec
Final Extract Volume: 2.0 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: NA

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	4.0	< 4.0 U
53469-21-9	Aroclor 1242	4.0	< 4.0 U
12672-29-6	Aroclor 1248	4.0	< 4.0 U
11097-69-1	Aroclor 1254	4.0	< 4.0 U
11096-82-5	Aroclor 1260	4.0	< 4.0 U
11104-28-2	Aroclor 1221	4.0	< 4.0 U
11141-16-5	Aroclor 1232	4.0	< 4.0 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	56.5%
Tetrachlorometaxylene	58.8%

ANALYTICAL RESOURCES INCORPORATED

SW8082/PCB TISSUE SURROGATE RECOVERY SUMMARY

Matrix: Tissue

QC Report No: OG88-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14

Client ID	DCBP	TCMX	TOT OUT
MB-011309	84.0%	58.0%	0
LCS-011309	79.8%	57.2%	0
LCSD-011309	81.5%	60.8%	0
GD STATION #1A	66.5%	64.2%	0
GD STATION #1A MS	62.2%	62.0%	0
GD STATION #1A MSD	59.2%	57.5%	0
GD STATION #2A	64.8%	60.0%	0
GD STATION #3A	56.5%	58.8%	0

	LCS/MB LIMITS	QC LIMITS
(DCBP) = Decachlorobiphenyl	(36-130)	(33-149)
(TCMX) = Tetrachlorometaxylene	(30-119)	(32-121)

Prep Method: TissM
Log Number Range: 09-584 to 09-586

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082
Page 1 of 1

Sample ID: GD STATION #1A
MS/MSD

Lab Sample ID: OG88A
LIMS ID: 09-584
Matrix: Tissue
Data Release Authorized:
Reported: 02/03/09

QC Report No: OG88-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/16/08
Date Received: 12/16/08

Date Extracted MS/MSD: 01/13/09

Date Analyzed MS: 02/02/09 08:55
MSD: 02/02/09 09:16
Instrument/Analyst MS: ECD6/JGR
MSD: ECD6/JGR
GPC Cleanup: Yes
Sulfur Cleanup: No
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount MS: 50.6 g-as-rec
MSD: 50.8 g-as-rec
Final Extract Volume MS: 2.0 mL
MSD: 2.0 mL
Dilution Factor MS: 1.00
MSD: 1.00
Silica Gel: No

Percent Moisture: NA

Analyte	Sample	MS	Spike Added-MS	MS Recovery	MSD	Spike Added-MSD	MSD Recovery	RPD
Aroclor 1016	< 4.0 U	11.3	19.8	57.1%	10.4	19.7	52.8%	8.3%
Aroclor 1260	< 4.0 U	13.4	19.8	67.7%	12.4	19.7	62.9%	7.8%

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

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082
Page 1 of 1

Sample ID: GD STATION #1A
MATRIX SPIKE

Lab Sample ID: OG88A
LIMS ID: 09-584
Matrix: Tissue
Data Release Authorized:
Reported: 02/03/09

QC Report No: OG88-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/16/08
Date Received: 12/16/08

Date Extracted: 01/13/09
Date Analyzed: 02/02/09 08:55
Instrument/Analyst: ECD6/JGR
GPC Cleanup: Yes
Sulfur Cleanup: No
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 50.6 g-as-rec
Final Extract Volume: 2.0 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: NA

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	4.0	---
53469-21-9	Aroclor 1242	4.0	< 4.0 U
12672-29-6	Aroclor 1248	4.0	< 4.0 U
11097-69-1	Aroclor 1254	4.0	< 4.0 U
11096-82-5	Aroclor 1260	4.0	---
11104-28-2	Aroclor 1221	4.0	< 4.0 U
11141-16-5	Aroclor 1232	4.0	< 4.0 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	62.2%
Tetrachlorometaxylene	62.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082
Page 1 of 1

Sample ID: GD STATION #1A
MATRIX SPIKE DUP

Lab Sample ID: OG88A
LIMS ID: 09-584
Matrix: Tissue
Data Release Authorized:
Reported: 02/03/09

QC Report No: OG88-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/16/08
Date Received: 12/16/08

Date Extracted: 01/13/09
Date Analyzed: 02/02/09 09:16
Instrument/Analyst: ECD6/JGR
GPC Cleanup: Yes
Sulfur Cleanup: No
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 50.8 g-as-rec
Final Extract Volume: 2.0 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: NA

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	3.9	---
53469-21-9	Aroclor 1242	3.9	< 3.9 U
12672-29-6	Aroclor 1248	3.9	< 3.9 U
11097-69-1	Aroclor 1254	3.9	< 3.9 U
11096-82-5	Aroclor 1260	3.9	---
11104-28-2	Aroclor 1221	3.9	< 3.9 U
11141-16-5	Aroclor 1232	3.9	< 3.9 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	59.2%
Tetrachlorometaxylene	57.5%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082
Page 1 of 1

Sample ID: LCS-011309
LCS/LCSD

Lab Sample ID: LCS-011309
LIMS ID: 09-584
Matrix: Tissue
Data Release Authorized:
Reported: 02/03/09

QC Report No: OG88-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: NA
Date Received: NA

Date Extracted LCS/LCSD: 01/13/09

Date Analyzed LCS: 02/02/09 07:50
LCSD: 02/02/09 08:12
Instrument/Analyst LCS: ECD6/JGR
LCSD: ECD6/JGR
GPC Cleanup: Yes
Sulfur Cleanup: No
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount LCS: 50.0 g-as-rec
LCSD: 50.0 g-as-rec
Final Extract Volume LCS: 2.0 mL
LCSD: 2.0 mL
Dilution Factor LCS: 1.00
LCSD: 1.00
Silica Gel: No

Percent Moisture: NA

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Aroclor 1016	13.7	20.0	68.5%	14.1	20.0	70.5%	2.9%
Aroclor 1260	16.0	20.0	80.0%	17.3	20.0	86.5%	7.8%

PCB Surrogate Recovery

	LCS	LCSD
Decachlorobiphenyl	79.8%	81.5%
Tetrachlorometaxylene	57.2%	60.8%

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

PCB METHOD BLANK SUMMARY

BLANK NO.: OG88MBS1

Lab Name: ANALYTICAL RESOURCES, INC
Client: HART CROWSER, INC.

ARI Job No.: OG88
Project: PORT GAMBLE

Lab Sample ID: OG88MBS1
Lab File ID: 0202A005

Date Extracted: 01/13/09
Matrix: SOLID

Date Analyzed: 02/02/09
Instrument ID: ECD6

Time Analyzed: 0729
GC Columns: ZB5/ZB35

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

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED
01	OG88LCSS1	OG88LCSS1	02/02/09
02	OG88LCSDS1	OG88LCSDS1	02/02/09
03	GD STATION #1A	OG88A	02/02/09
04	GD STATION #1A MS	OG88AMS	02/02/09
05	GD STATION #1A MSD	OG88AMSD	02/02/09
06	GD STATION #2A	OG88B	02/02/09
07	GD STATION #3A	OG88C	02/02/09

ALL RUNS ARE DUAL COLUMN

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082
Page 1 of 1

Sample ID: MB-011309
METHOD BLANK

Lab Sample ID: MB-011309
LIMS ID: 09-584
Matrix: Tissue
Data Release Authorized:
Reported: 02/03/09

QC Report No: OG88-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: NA
Date Received: NA

Date Extracted: 01/13/09
Date Analyzed: 02/02/09 07:29
Instrument/Analyst: ECD6/JGR
GPC Cleanup: Yes
Sulfur Cleanup: No
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 50.0 g
Final Extract Volume: 2.0 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: NA

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	4.0	< 4.0 U
53469-21-9	Aroclor 1242	4.0	< 4.0 U
12672-29-6	Aroclor 1248	4.0	< 4.0 U
11097-69-1	Aroclor 1254	4.0	< 4.0 U
11096-82-5	Aroclor 1260	4.0	< 4.0 U
11104-28-2	Aroclor 1221	4.0	< 4.0 U
11141-16-5	Aroclor 1232	4.0	< 4.0 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	84.0%
Tetrachlorometaxylene	58.0%

METALS

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: GD STATION #1A SAMPLE

Lab Sample ID: OG88A
LIMS ID: 09-584
Matrix: Tissue
Data Release Authorized:
Reported: 01/22/09

QC Report No: OG88-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/16/08
Date Received: 12/16/08

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-as-rec	Q
3050B	01/13/09	6010B	01/21/09	7440-38-2	Arsenic	1	1	
3050B	01/13/09	6010B	01/21/09	7440-43-9	Cadmium	0.04	0.19	
3050B	01/13/09	6010B	01/21/09	7440-47-3	Chromium	0.1	0.1	
3050B	01/13/09	6010B	01/21/09	7440-50-8	Copper	0.04	3.25	
3050B	01/13/09	6010B	01/21/09	7439-92-1	Lead	0.4	0.4	U
CLP-M	01/13/09	7471A	01/14/09	7439-97-6	Mercury	0.01	0.01	
3050B	01/13/09	6010B	01/21/09	7440-22-4	Silver	0.06	0.93	
3050B	01/13/09	6010B	01/21/09	7440-66-6	Zinc	0.2	16.5	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: GD STATION #2A
SAMPLE

Lab Sample ID: OG88B
LIMS ID: 09-585
Matrix: Tissue
Data Release Authorized:
Reported: 01/22/09

QC Report No: OG88-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/16/08
Date Received: 12/16/08

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-as-rec	Q
3050B	01/13/09	6010B	01/21/09	**7440-38-2**	**Arsenic**	1	**2**	
3050B	01/13/09	6010B	01/21/09	**7440-43-9**	**Cadmium**	0.04	**0.19**	
3050B	01/13/09	6010B	01/21/09	**7440-47-3**	**Chromium**	0.1	**0.1**	
3050B	01/13/09	6010B	01/21/09	**7440-50-8**	**Copper**	0.04	**2.85**	
3050B	01/13/09	6010B	01/21/09	7439-92-1	Lead	0.4	0.4	U
CLP-M	01/13/09	7471A	01/14/09	**7439-97-6**	**Mercury**	0.01	**0.01**	
3050B	01/13/09	6010B	01/21/09	**7440-22-4**	**Silver**	0.06	**1.15**	
3050B	01/13/09	6010B	01/21/09	**7440-66-6**	**Zinc**	0.2	**14.5**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: GD STATION #3A SAMPLE

Lab Sample ID: OG88C
LIMS ID: 09-586
Matrix: Tissue
Data Release Authorized:
Reported: 01/22/09

QC Report No: OG88-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/16/08
Date Received: 12/16/08

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-as-rec	Q
3050B	01/13/09	6010B	01/21/09	**7440-38-2**	**Arsenic**	1	**2**	
3050B	01/13/09	6010B	01/21/09	**7440-43-9**	**Cadmium**	0.04	**0.26**	
3050B	01/13/09	6010B	01/21/09	**7440-47-3**	**Chromium**	0.1	**0.2**	
3050B	01/13/09	6010B	01/21/09	**7440-50-8**	**Copper**	0.04	**6.29**	
3050B	01/13/09	6010B	01/21/09	7439-92-1	Lead	0.4	0.4	U
CLP-M	01/13/09	7471A	01/14/09	**7439-97-6**	**Mercury**	0.01	**0.02**	
3050B	01/13/09	6010B	01/21/09	**7440-22-4**	**Silver**	0.06	**1.47**	
3050B	01/13/09	6010B	01/21/09	**7440-66-6**	**Zinc**	0.2	**30.8**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: LAB CONTROL

Lab Sample ID: OG88LCS
LIMS ID: 09-584
Matrix: Tissue
Data Release Authorized:
Reported: 01/22/09

QC Report No: OG88-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: NA
Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike Found	Spike Added	% Recovery	Q
Arsenic	6010B	78	80	97.5%	
Cadmium	6010B	19.7	20.0	98.5%	
Chromium	6010B	19.5	20.0	97.5%	
Copper	6010B	18.8	20.0	94.0%	
Lead	6010B	77.6	80.0	97.0%	
Mercury	7471A	0.21	0.20	105%	
Silver	6010B	20.0	20.0	100%	
Zinc	6010B	19.5	20.0	97.5%	

Reported in mg/kg-wet

N-Control limit not met
NA-Not Applicable, Analyte Not Spiked
Control Limits: 80-120%

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: METHOD BLANK

Lab Sample ID: OG88MB
LIMS ID: 09-584
Matrix: Tissue
Data Release Authorized:
Reported: 01/22/09

QC Report No: OG88-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: NA
Date Received: NA

Percent Total Solids: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-as-rec	Q
3050B	01/13/09	6010B	01/21/09	7440-38-2	Arsenic	1	1	U
3050B	01/13/09	6010B	01/21/09	7440-43-9	Cadmium	0.04	0.04	U
3050B	01/13/09	6010B	01/21/09	7440-47-3	Chromium	0.1	0.1	U
3050B	01/13/09	6010B	01/21/09	7440-50-8	Copper	0.04	0.04	U
3050B	01/13/09	6010B	01/21/09	7439-92-1	Lead	0.4	0.4	U
CLP-M	01/13/09	7471A	01/14/09	7439-97-6	Mercury	0.01	0.01	U
3050B	01/13/09	6010B	01/21/09	7440-22-4	Silver	0.06	0.06	U
3050B	01/13/09	6010B	01/21/09	7440-66-6	Zinc	0.2	0.2	U

U-Analyte undetected at given RL
RL-Reporting Limit

DIOXIN

SGS

Laboratory Results

Ms. Kelly Bottem
Analytical Resources, Inc.
4611 S. 134th Place
Suite 100
Tukwila WA 98168-3240

Phone: 206-695-6211
Fax: 206-695-6201

Dear Ms. Bottem:

Enclosed is a full data package containing the final results for samples received by SGS Environmental Services, Inc. on January 15, 2009 under your project name "OG88". The samples were analyzed by Method 1613 following SGS's Standard Operating Procedures and are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards.

Number of Samples Received:	3
Your Project Reference:	OG88
SGS Project Number:	G1040-7

We appreciate your business and look forward to working with you again. Please contact me at 910-350-1903 if you have questions or need additional technical support.

Sincerely,

Jeannie Milholland

Jeannie Milholland
Project Manager

2-17-2009
Date

DC138.033007.7

SGS

Case Narrative
SGS Project: **G1040-7**
Project Name: **OG88**

For Method: 1613

- The submitted samples were accepted into the lab on January 15th, 2009 and extracted on February 1st, 2009 by method 3540C. The sample extract and associated QC extracts were then processed through clean-up as prescribed in the SGS standard operating procedures and analyzed by HRGC/HRMS for method 1613.
- No analytical issues were encountered.

Craig R. Tronzo 2/17/09
Craig R. Tronzo Date
Data Validation

Paradigm Analytical Laboratories, Inc. | 5500 Business Dr., Wilmington, NC 28405 t (910) 350-1903 f (910) 350-1557 www.us.sgs.com

SGS

Table of Contents

Section 1: Cover Letter/Case Narrative

Contains the Table of Contents, a project narrative, the client and SGS project identifiers, the number and type of samples, the methodology used to process the samples, and a summary table of sample results. A listing of current certifications by state, a table of abbreviations and qualifiers and the Toxic Equivalent Factors (TEF) are also supplied.

Section 2: Project Information

Contains the chain-of-custody(s), internal chain-of-custody(s) if applicable, sample login summary, sample receipt checklist, and any other project/client specific information.

Section 3: Sample Analytical Results

Contains results for client samples. Sample results include two pages of summarized analytical data and the associated raw data. The raw data includes a quantitation report from the instrumentation used that lists, ion areas, ratios, retention times, concentrations, and signal-to-noise ratios. It also has the selected ion current profiles (SICPs) for all homolog groups and any manual integrations.

Section 4: Quality Control Analytical Results

Contains results for each analytical workgroup associated with the submitted samples. A workgroup consists of the Lab Method Blank (LMB) and the Ongoing Precision and Recovery sample (OPR). All sample preparation data, including dry weight determinations, extraction logs, clean-up logs and observation notes are also documented. Any other supporting QC data will be documented here upon client request.

Section 5: Initial Calibration

Contains a table summarizing calibration data such as relative response factors, concentrations, and percent relative standard deviation. This section also contains related daily instrument QC information: GC performance data, mass resolution check, windows defining mix, and SICPs for all homolog groups and any manual integrations as well as the injection prep and instrument run logs.

Section 6: Continuing Calibration Data

Contains all daily instrument quality control information. This includes mass resolution checks, a table summarizing the window defining peaks, SICPs for the first and last eluters for each homolog group, SICPs documenting GC performance, a summary quantitation report showing RRFs for the Ccal and Ical, and SICPs for all homolog groups and any manual integrations, injection prep and instrumentation runlogs.

SGS

List of Qualifiers: Dioxin's

B Analyte was detected in the Lab Method Blank at a level above the Reporting Limit.

EDL "Estimated Detection Limit"

EMPC "Estimated Maximum Possible Concentration"

RL Report Limit

CL Control Limit

U Undetected

ppt Parts-per-trillion (pg/g; ng/L)

V Recovery is below quality control limit. The data has been validated based on a favorable signal-to-noise and detection limit.

Outside quality control limits

* Indicates that the ion-ratio fails high or low; analyte reported as an EMPC

An average uncertainty of 30% can be routinely achieved as concluded from the evaluation of HRGC-HRMS standard operating procedures. The following flags warn the data user of situations where the uncertainty may be greater than stated.

A Amount detected is less than the Lower Method Calibration Limit.

J Amount detected is between the Method Detection Limit and the Lower Calibration Limit.

O The recovery of this analyte in the OPR is above the Method QC Limits and the reported concentration in the sample may be biased high.

E Amount detected is greater than the Upper Calibration Limit.

S The amount of analyte present has saturated the detector. This situation results in an underestimation of the affected analyte(s).

Q Indicates the presence of a quantitative interference. This situation may result in an underestimation of the affected analyte(s).

I Indicates the presence of a qualitative interference that could cause a false positive or an overestimation of the affected analyte(s).

DPE Indicates the presence of a peak in the polychlorinated diphenylether channel that could cause a false positive or an overestimation of the affected analyte(s).

DC250.081908.1

Toxic Equivalency Factors

Analyte	WHO* 1998	WHO* 2005	International-89	MADEP+
2,3,7,8-TCDD	1	1	1	1
1,2,3,7,8-PeCDD	1	1	0.5	0.5
1,2,3,4,7,8-HxCDD	0.1	0.1	0.1	0.1
1,2,3,6,7,8-HxCDD	0.1	0.1	0.1	0.1
1,2,3,7,8,9-HxCDD	0.1	0.1	0.1	0.1
1,2,3,4,6,7,8-HpCDD	0.01	0.01	0.01	0.1
OCDD	0.0001	0.0003	0.001	0.001
2,3,7,8-TCDF	0.1	0.1	0.1	0.1
1,2,3,7,8-PeCDF	0.05	0.03	0.05	0.5
2,3,4,7,8-PeCDF	0.5	0.3	0.5	0.5
1,2,3,4,7,8-HxCDF	0.1	0.1	0.1	0.1
1,2,3,6,7,8-HxCDF	0.1	0.1	0.1	0.1
2,3,4,6,7,8-HxCDF	0.1	0.1	0.1	0.1
1,2,3,7,8,9-HxCDF	0.1	0.1	0.1	0.1
1,2,3,4,6,7,8-HpCDF	0.01	0.01	0.01	0.1
1,2,3,4,7,8,9-HpCDF	0.01	0.01	0.01	0.1
OCDF	0.0001	0.0003	0.001	0.001

* World Health Organization
+ Massachusetts Department of Environmental Protection

SUBCONTRACTOR ANALYSIS REQUEST
CUSTODY TRANSFER 01/08/09

ANALYTICAL RESOURCES INCORPORATED

ARI Project: OG88

G1040-7

Laboratory: SGS ENVIROMENTAL SERVICES INC.
Lab Contact: TRENT TEMPERLY
Lab Address: 5500 BUSINESS DR.
WILMINGTON, NC 28405
Phone: 910-350-1903
Fax: 910-350-1557

ARI Client: Hart Crowser, Inc.
Project ID: PORT GAMBLE
ARI PM: Kelly Bottem
Phone: 206-695-6211
Fax: 206-695-6201

Analytical Protocol: In-house
Special Instructions:

Requested Turn Around:
Fax Results (Y/N): **YES**

Limits of Liability. *Subcontractor is expected to perform all requested services in accordance with appropriate methodology following Standard Operating Procedures that meet standards for the industry. The total liability of ARI, its officers, agents, employees, or sucessors, arising out of or in connection with the requested services, shall not exceed the negotiated amount for said services. The agreement by the Subcontractor to perform services requested by ARI releases 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 Subcontractor.*

ARI ID	Client ID/ Add'l ID	Sampled	Matrix	Bottles	Analyses
09-584-OG88A	GD STATION #1A	12/16/08	Tissue	1	Dioxin/Furans 1613(Sub)
Special Instructions: None					
09-585-OG88B	GD STATION #2A	12/16/08	Tissue	1	Dioxin/Furans 1613(Sub)
Special Instructions: None					
09-586-OG88C	GD STATION #3A	12/16/08	Tissue	1	Dioxin/Furans 1613(Sub)
Special Instructions: None					

Carrier UPS	Airbill 1Z 832 695 01 4592 5947		Date 1/14/09
Relinquished by	Company ARI	Date 1/14/09	Time 1600
Received by	Company SGS 3.5 no seal	Date 1/15/09	Time 10:15

Subcontractor Custody Form - **OG88**
Page 1 of 1

SGS Environmental Services, Inc.

Cust Proj ID: OG88
Client Name: Analytical Resources, Inc. PO:

G1040-7

Due Date: 2009-02-05 17:00:00
Login Date: 2009-01-16 11:43:30

Sample ID		Cust Sample ID	PRI	Date Collected	Date Received	Date Due	Matrix	LOC	Report	Analysis	Status
G1040-7-1	A	GD STATION #1A	STD	2008-12-16 00:00:00	2009-01-15	2009-02-05	Tissue	F2	Full	1613	LG::REVW
G1040-7-2	A	GD STATION #2A	STD	2008-12-16 00:00:00	2009-01-15	2009-02-05	Tissue	F2	Full	1613	LG::REVW
G1040-7-3	A	GD STATION #3A	STD	2008-12-16 00:00:00	2009-01-15	2009-02-05	Tissue	F2	Full	1613	LG::REVW

Sample Receipt Checklist (SRC)

SGS Environmetal Services Inc.

Client: **Analytical Resources, Inc.** Lab Proj. ID: **G1040-07**

Client Proj. ID: **OG88**

1. X Shipped — Notes:
   __ Hand Delivered

2. X Proper, full, and complete documentation — Notes:
   (unique sample identification on durable label with indelible ink, location of collection, date/time of collection, collector's name, preservation type, sample type (method/matrix))
   __ Acceptable documentation (but, incomplete)
   __ Unacceptable documentation

3. __ Custody Tape on Container — Notes:
   X No Custody Tape

4. X Samples Intact* — Notes:
   (are in appropriate container, are not damaged, and do not show signs of contamination)
   __ Samples Broken / Leaking
   __ VOA Vials Checked for Air Bubbles

5. X Chilled on Receipt* Actual Temp.(s) in °C: 3.5
   __ Ambient on Receipt — Notes:
   __ Walk-in on Ice; Coming down to temp.
   __ Received out of temperature protocol

6. X Sufficient Sample Submitted — Notes:
   __ Insufficient Sample Submitted

7. X Samples Preserved Correctly* — Notes:
   (see preservative checklist where applicable)
   __ Improper Preservative(s)
   __ None recommended (N/A)

8. X Received Within Holding Time — Notes:
   __ Not Received Within Holding Time
   __ N/A

9. X No Discrepancies Noted — Notes:
   __ Discrepancies Noted

Comments:

* = Rejection of sample is required when not marked; Contact client services immediately for a resolution.

Inspected and Logged in by:

DC27.091503.3 Date / Time: Fri-1/16/09 11:44

Method 1613

GD STATION #1A

Analytical Resources, Inc.

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	RL (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	1.00			
1,2,3,7,8-PeCDD	ND	5.00			
1,2,3,4,7,8-HxCDD	ND	5.00			
1,2,3,6,7,8-HxCDD	ND	5.00			
1,2,3,7,8,9-HxCDD	ND	5.00			
1,2,3,4,6,7,8-HpCDD	ND	5.00			
OCDD	ND	10.0			
2,3,7,8-TCDF	ND	1.00			
1,2,3,7,8-PeCDF	ND	5.00			
2,3,4,7,8-PeCDF	ND	5.00			
1,2,3,4,7,8-HxCDF	ND	5.00			
1,2,3,6,7,8-HxCDF	ND	5.00			
2,3,4,6,7,8-HxCDF	ND	5.00			
1,2,3,7,8,9-HxCDF	ND	5.00			
1,2,3,4,6,7,8-HpCDF	ND	5.00			
1,2,3,4,7,8,9-HpCDF	ND	5.00			
OCDF	ND	10.0			
Total TCDDs	ND	1.00			
Total PeCDDs	ND	5.00			
Total HxCDDs	ND	5.00			
Total HpCDDs	ND	5.00			
Total TCDFs	ND	1.00			
Total PeCDFs	ND	5.00			
Total HxCDFs	ND	5.00			
Total HpCDFs	ND	5.00			
WHO-2005 TEQ (ND=0)	0.000				
WHO-2005 TEQ (ND=½)	5.70				

Client Information		**Sample Information**	
Project Name:	OG88		
		Matrix:	Tissue
Sample ID:	GD STATION #1A	Weight / Volume:	10.75 grams
		Solids / Lipids:	NA
		Original pH :	NA
Laboratory Information		Batch ID:	WG16457
Project ID:	G1040-7		
Sample ID:	G1040-7-1B	Filename:	a09feb09a-12
Collection Date:	16-Dec-08	Retchk:	a09feb09a-1
Receipt Date:	15-Jan-09 10:15	Begin ConCal:	a09feb09a-1
Extraction Date:	01-Feb-09		
Analysis Date:	10-Feb-09 1:13	Initial Cal:	m1613-100708a

Method 1613

GD STATION #1A

Analytical Resources, Inc.

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
$^{13}C_{12}$-2,3,7,8-TCDD	2	1.63	81.5	31:27	0.78	
$^{13}C_{12}$-1,2,3,7,8-PeCDD	2	2.07	103	34:16	1.58	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	2	1.61	80.4	36:52	1.26	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	2	1.66	82.8	36:58	1.27	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	2	1.66	83.1	40:19	1.06	
$^{13}C_{12}$-OCDD	4	1.68	42.0	44:39	0.90	
$^{13}C_{12}$-2,3,7,8-TCDF	2	1.64	82.1	30:52	0.80	
$^{13}C_{12}$-1,2,3,7,8-PeCDF	2	2.17	108	33:27	1.58	
$^{13}C_{12}$-2,3,4,7,8-PeCDF	2	2.02	101	34:05	1.59	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	2	1.62	81.1	36:09	0.54	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	2	1.64	82.0	36:15	0.51	
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	2	1.61	80.4	36:45	0.53	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	2	1.58	78.9	37:32	0.53	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	2	1.53	76.3	39:03	0.45	
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	2	1.69	84.3	41:01	0.45	
Cleanup Standard						
$^{37}Cl_4$-2,3,7,8-TCDD	0.4	0.347	86.8	31:28		
Injection Standards						
$^{13}C_{12}$-1,2,3,4-TCDD	2			31:01	0.79	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	2			37:13	1.25	

Client Information

Project Name: OG88

Sample ID: GD STATION #1A

Laboratory Information

Project ID: G1040-7
Sample ID: G1040-7-1B
Collection Date: 16-Dec-08
Receipt Date: 15-Jan-09 10:15
Extraction Date: 01-Feb-09
Analysis Date: 10-Feb-09 1:13

Analyzed by: DMP
Date: 02/17/09

Sample Information

Matrix: Tissue
Weight / Volume: 10.75 grams
Solids / Lipids: NA %
Original pH : NA
Batch ID: WG16457

Filename: a09feb09a-12
Retchk: a09feb09a-1
Begin ConCal: a09feb09a-1

Initial Cal: m1613-100708a

Reviewed by: TM
Date: 02/17/09

Form Version:[1613_HRMS12]Repor

;*1613

Filename ; a09feb09a
Sample ; 12
Acquired ; 10-FEB-09 01:13:15
Processed ; 10-FEB-09 07:34:41
Sample ID ; G1040-7-1B
Cal Table ; m1613-100708a
Results Table ; M1613-020909A
Comments ;

Ent;	Name;	Resp;	Ion 1;	Ion 2;	RA;?;	RT;	Conc;	EDL;	S/N1;?;	S/N2;?;M;	Signal1;	Noise 1;	Signal2;	Noise 2
1 ;	2,3,7,8-TCDD;	*;	*;	*;	*;n;	NotFnd;	*;	0.1198;	*;n;	*;n;n;		*;6.01e+03;		*;5.61e+03
2 ;	1,2,3,7,8-PeCDD;	*;	*;	*;	*;n;	NotFnd;	*;	0.1691;	*;n;	*;n;n;		*;8.80e+03;		*;9.43e+03
3 ;	1,2,3,4,7,8-HxCDD;	*;	*;	*;	*;n;	NotFnd;	*;	0.1982;	*;n;	*;n;n;		*;8.22e+03;		*;8.92e+03
4 ;	1,2,3,6,7,8-HxCDD;	*;	*;	*;	*;n;	NotFnd;	*;	0.1953;	*;n;	*;n;n;		*;8.22e+03;		*;8.92e+03
5 ;	1,2,3,7,8,9-HxCDD;	*;	*;	*;	*;n;	NotFnd;	*;	0.1980;	*;n;	*;n;n;		*;8.22e+03;		*;8.92e+03
6 ;	1,2,3,4,6,7,8-HpCDD;	8.71e+04;	3.46e+04;	5.25e+04;	0.66;n;	40:20;	0.126;	0.2798;	1;n;	3;n;n;	1.24e+04;	8.61e+03;	2.17e+04;	7.52e+03
7 ;	OCDD;	3.37e+05;	1.66e+05;	1.71e+05;	0.97;y;	44:40;	1.209;	0.7128;	6;y;	7;y;n;	3.51e+04;	5.78e+03;	3.79e+04;	5.80e+03
8 ;	2,3,7,8-TCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.1415;	*;n;	*;n;n;		*;6.98e+03;		*;8.64e+03
9 ;	1,2,3,7,8-PeCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.0975;	*;n;	*;n;n;		*;8.80e+03;		*;8.48e+03
10 ;	2,3,4,7,8-PeCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.1013;	*;n;	*;n;n;		*;8.80e+03;		*;8.48e+03
11 ;	1,2,3,4,7,8-HxCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.1376;	*;n;	*;n;n;		*;8.99e+03;		*;7.84e+03
12 ;	1,2,3,6,7,8-HxCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.1255;	*;n;	*;n;n;		*;8.99e+03;		*;7.84e+03
13 ;	2,3,4,6,7,8-HxCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.1373;	*;n;	*;n;n;		*;8.99e+03;		*;7.84e+03
14 ;	1,2,3,7,8,9-HxCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.1761;	*;n;	*;n;n;		*;8.99e+03;		*;7.84e+03
15 ;	1,2,3,4,6,7,8-HpCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.1519;	*;n;	*;n;n;		*;6.48e+03;		*;6.73e+03
16 ;	1,2,3,4,7,8,9-HpCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.2050;	*;n;	*;n;n;		*;6.48e+03;		*;6.73e+03
17 ;	OCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.7750;	*;n;	*;n;n;		*;7.66e+03;		*;7.32e+03
Extraction Standards														
18 ;	13C-2,3,7,8-TCDD;	8.76e+07;	3.85e+07;	4.91e+07;	0.78;y;	31:27;	81.455;	0.1414;	1634;y;	2635;y;n;	1.27e+07;	7.78e+03;	1.61e+07;	6.12e+03
19 ;	13C-1,2,3,7,8-PeCDD;	8.13e+07;	4.98e+07;	3.14e+07;	1.58;y;	34:16;	103.412;	0.2284;	2141;y;	1568;y;n;	1.90e+07;	8.88e+03;	1.18e+07;	7.53e+03
20 ;	13C-1,2,3,4,7,8-HxCDD;	7.68e+07;	4.29e+07;	3.39e+07;	1.26;y;	36:52;	80.382;	0.1911;	1483;y;	1251;y;n;	1.41e+07;	9.51e+03;	1.11e+07;	8.84e+03
21 ;	13C-1,2,3,6,7,8-HxCDD;	8.59e+07;	4.81e+07;	3.79e+07;	1.27;y;	36:58;	82.801;	0.1759;	1562;y;	1321;y;n;	1.49e+07;	9.51e+03;	1.17e+07;	8.84e+03
22 ;	13C-1,2,3,4,6,7,8-HpCDD;	6.50e+07;	3.35e+07;	3.16e+07;	1.06;y;	40:19;	83.053;	0.2017;	1082;y;	973;y;n;	8.41e+06;	7.78e+03;	7.89e+06;	8.11e+03
23 ;	13C-OCDD;	5.24e+07;	2.48e+07;	2.76e+07;	0.90;y;	44:39;	84.069;	0.2184;	590;y;	761;y;n;	4.29e+06;	7.26e+03;	4.88e+06;	6.42e+03
24 ;	13C-2,3,7,8-TCDF;	1.31e+08;	5.81e+07;	7.27e+07;	0.80;y;	30:52;	82.083;	0.0947;	2178;y;	2438;y;n;	1.42e+07;	6.50e+03;	1.78e+07;	7.29e+03
25 ;	13C-1,2,3,7,8-PeCDF;	1.40e+08;	8.54e+07;	5.41e+07;	1.58;y;	33:27;	108.362;	0.2936;	1580;y;	1517;y;n;	3.26e+07;	2.06e+04;	2.11e+07;	1.39e+04
26 ;	13C-2,3,4,7,8-PeCDF;	1.27e+08;	7.81e+07;	4.92e+07;	1.59;y;	34:05;	101.009;	0.2999;	1481;y;	1357;y;n;	3.06e+07;	2.06e+04;	1.89e+07;	1.39e+04
27 ;	13C-1,2,3,4,7,8-HxCDF;	1.00e+08;	3.52e+07;	6.48e+07;	0.54;y;	36:09;	81.102;	0.1080;	1352;y;	3969;y;n;	1.09e+07;	8.08e+03;	2.11e+07;	5.31e+03
28 ;	13C-1,2,3,6,7,8-HxCDF;	1.12e+08;	3.78e+07;	7.38e+07;	0.51;y;	36:15;	81.987;	0.0978;	1522;y;	4344;y;n;	1.23e+07;	8.08e+03;	2.31e+07;	5.31e+03
29 ;	13C-2,3,4,6,7,8-HxCDF;	1.03e+08;	3.55e+07;	6.74e+07;	0.53;y;	36:45;	80.356;	0.1040;	1396;y;	3976;y;n;	1.13e+07;	8.08e+03;	2.11e+07;	5.31e+03
30 ;	13C-1,2,3,7,8,9-HxCDF;	9.00e+07;	3.11e+07;	5.90e+07;	0.53;y;	37:32;	78.923;	0.1168;	1105;y;	3235;y;n;	8.93e+06;	8.08e+03;	1.72e+07;	5.31e+03
31 ;	13C-1,2,3,4,6,7,8-HpCDF;	7.45e+07;	2.33e+07;	5.13e+07;	0.45;y;	39:03;	76.257;	0.2537;	643;y;	834;y;n;	5.86e+06;	9.11e+03;	1.32e+07;	1.58e+04
32 ;	13C-1,2,3,4,7,8,9-HpCDF;	6.49e+07;	2.02e+07;	4.47e+07;	0.45;y;	41:01;	84.324;	0.3220;	489;y;	614;y;n;	4.45e+06;	9.11e+03;	9.71e+06;	1.58e+04
Injection Standards														
33 ;	13C-1,2,3,4-TCDD;	9.64e+07;	4.26e+07;	5.37e+07;	0.79;y;	31:01;	70.927;	-;	1514;y;	2393;y;n;	1.18e+07;	7.78e+03;	1.46e+07;	6.12e+03
34 ;	13C-1,2,3,7,8,9-HxCDD;	9.94e+07;	5.52e+07;	4.42e+07;	1.25;y;	37:13;	92.072;	-;	1755;y;	1504;y;n;	1.67e+07;	9.51e+03;	1.33e+07;	8.84e+03
Cleanup Standard														
35 ;	37Cl-2,3,7,8-TCDD;	1.99e+07;	1.99e+07;	-;	-;-;	31:28;	17.344;	0.0739;	882;y;	-;-;n;	6.82e+06;	7.74e+03;	-;	-

Totals Raw Data

	Conc	Empc	Flags
TCDF	0	0	FALSE
TCDD	0	0	FALSE
PeCDF	0	0	FALSE
PeCDD	0	0	FALSE
HxCDF	0	0	FALSE
HxCDD	0	0	FALSE
HpCDF	0	0	FALSE
HpCDD	0	0	FALSE

Filename:	a09feb09a	Name of Homolog Group:	Total Tetra-Furans
Sample:	12	Number of Peaks Found:	0
Acquired:	10-FEB-09 01:13:15	RRF Used For Totals:	1.0368
Processed:	10-FEB-09 07:34:41	Detection Limit:	0.1415
Sample ID:	G1040-7-1B	Noise Height Ion1/Ion2:	6976 / 8640
Cal Table:	m1613-100708a	Begin Window:	
Results Table:	M1613-020909A	End Window:	

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	*	*	*	*	n	NotFnd	*		*	n	*	n	n

Filename:	a09feb09a	Name of Homolog Group:	Total Tetra-Dioxins
Sample:	12	Number of Peaks Found:	0
Acquired:	10-FEB-09 01:13:15	RRF Used For Totals:	1.0087
Processed:	10-FEB-09 07:34:41	Detection Limit:	0.1198
Sample ID:	G1040-7-1B	Noise Height Ion1/Ion2:	6014 / 5605
Cal Table:	m1613-100708a	Begin Window:	
Results Table:	M1613-020909A	End Window:	

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	*	*	*	*	n	NotFnd	*		*	n	*	n	n

Filename:	a09feb09a	Name of Homolog Group:	Total Penta-Furans Fn1
Sample:	12	Number of Peaks Found:	0
Acquired:	10-FEB-09 01:13:15	RRF Used For Totals:	1.0121
Processed:	10-FEB-09 07:34:41	Detection Limit:	0.077
Sample ID:	G1040-7-1B	Noise Height Ion1/Ion2:	7672 / 5728
Cal Table:	m1613-100708a	Begin Window:	
Results Table:	M1613-020909A	End Window:	

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	*	*	*	*	n	NotFnd	*		*	n	*	n	n

Filename:	a09feb09a	Name of Homolog Group:	Total Penta-Furans Fn2
Sample:	12	Number of Peaks Found:	0
Acquired:	10-FEB-09 01:13:15	RRF Used For Totals:	1.0121
Processed:	10-FEB-09 07:34:41	Detection Limit:	0.0993
Sample ID:	G1040-7-1B	Noise Height Ion1/Ion2:	8804 / 8476
Cal Table:	m1613-100708a	Begin Window:	
Results Table:	M1613-020909A	End Window:	

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	*	*	*	*	n	NotFnd	*		*	n	*	n	n

Filename:	a09feb09a	Name of Homolog Group:	Total Penta-Dioxins
Sample:	12	Number of Peaks Found:	0
Acquired:	10-FEB-09 01:13:15	RRF Used For Totals:	1.0517
Processed:	10-FEB-09 07:34:41	Detection Limit:	0.1691
Sample ID:	G1040-7-1B	Noise Height Ion1/Ion2:	8804 / 9432
Cal Table:	m1613-100708a	Begin Window:	
Results Table:	M1613-020909A	End Window:	

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	*	*	*	*	n	NotFnd	*		*	n	*	n	n

Filename:	a09feb09a	Name of Homolog Group:	Total Hexa-Furans
Sample:	12	Number of Peaks Found:	0
Acquired:	10-FEB-09 01:13:15	RRF Used For Totals:	1.1305
Processed:	10-FEB-09 07:34:41	Detection Limit:	0.1426
Sample ID:	G1040-7-1B	Noise Height Ion1/Ion2:	8988 / 7844
Cal Table:	m1613-100708a	Begin Window:	
Results Table:	M1613-020909A	End Window:	

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	*	*	*	*	n	NotFnd	*		*	n	*	n	n

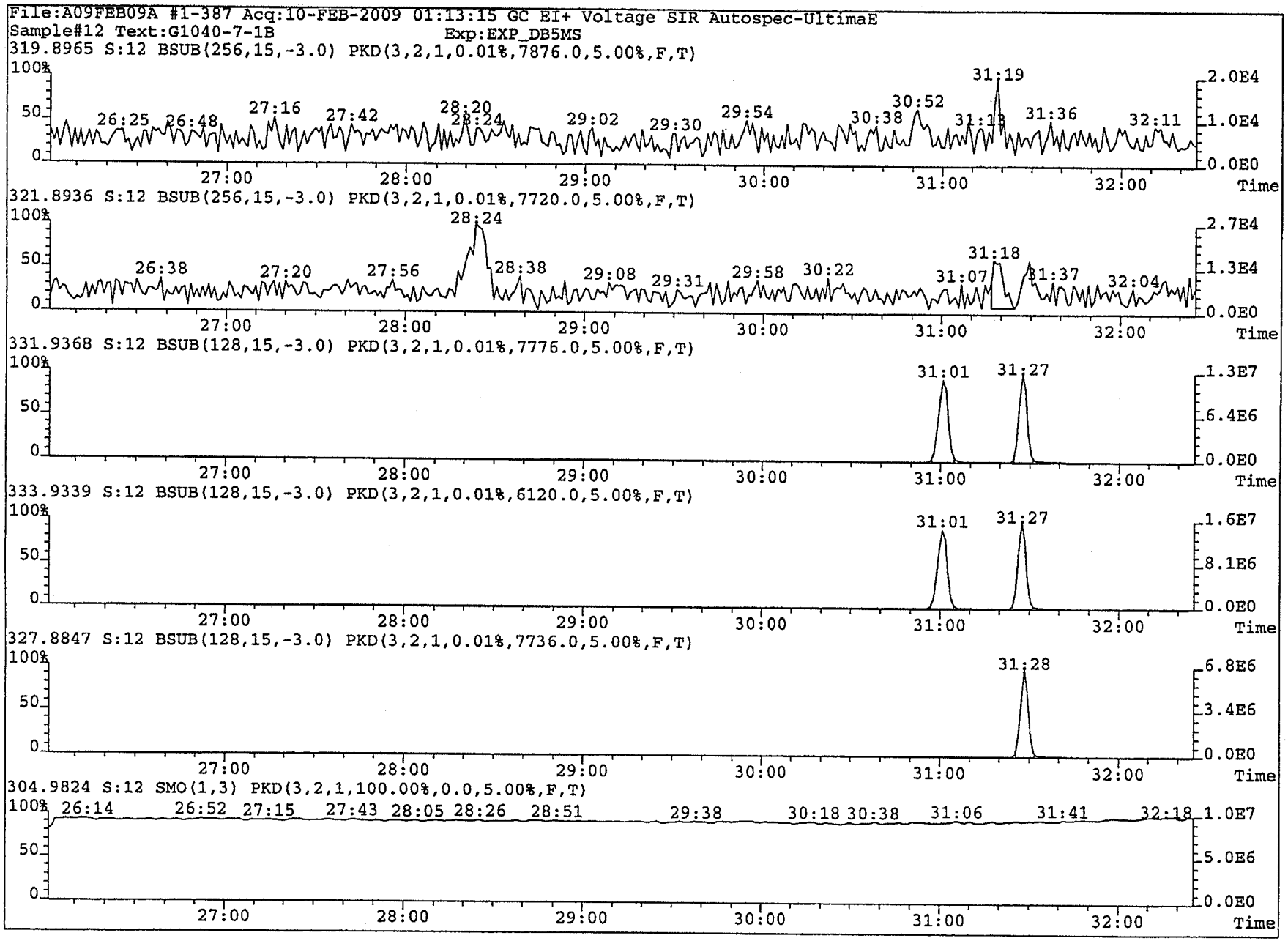
Filename:	a09feb09a	Name of Homolog Group:	Total Hexa-Dioxins
Sample:	12	Number of Peaks Found:	0
Acquired:	10-FEB-09 01:13:15	RRF Used For Totals:	1.0077
Processed:	10-FEB-09 07:34:41	Detection Limit:	0.1972
Sample ID:	G1040-7-1B	Noise Height Ion1/Ion2:	8220 / 8916
Cal Table:	m1613-100708a	Begin Window:	
Results Table:	M1613-020909A	End Window:	

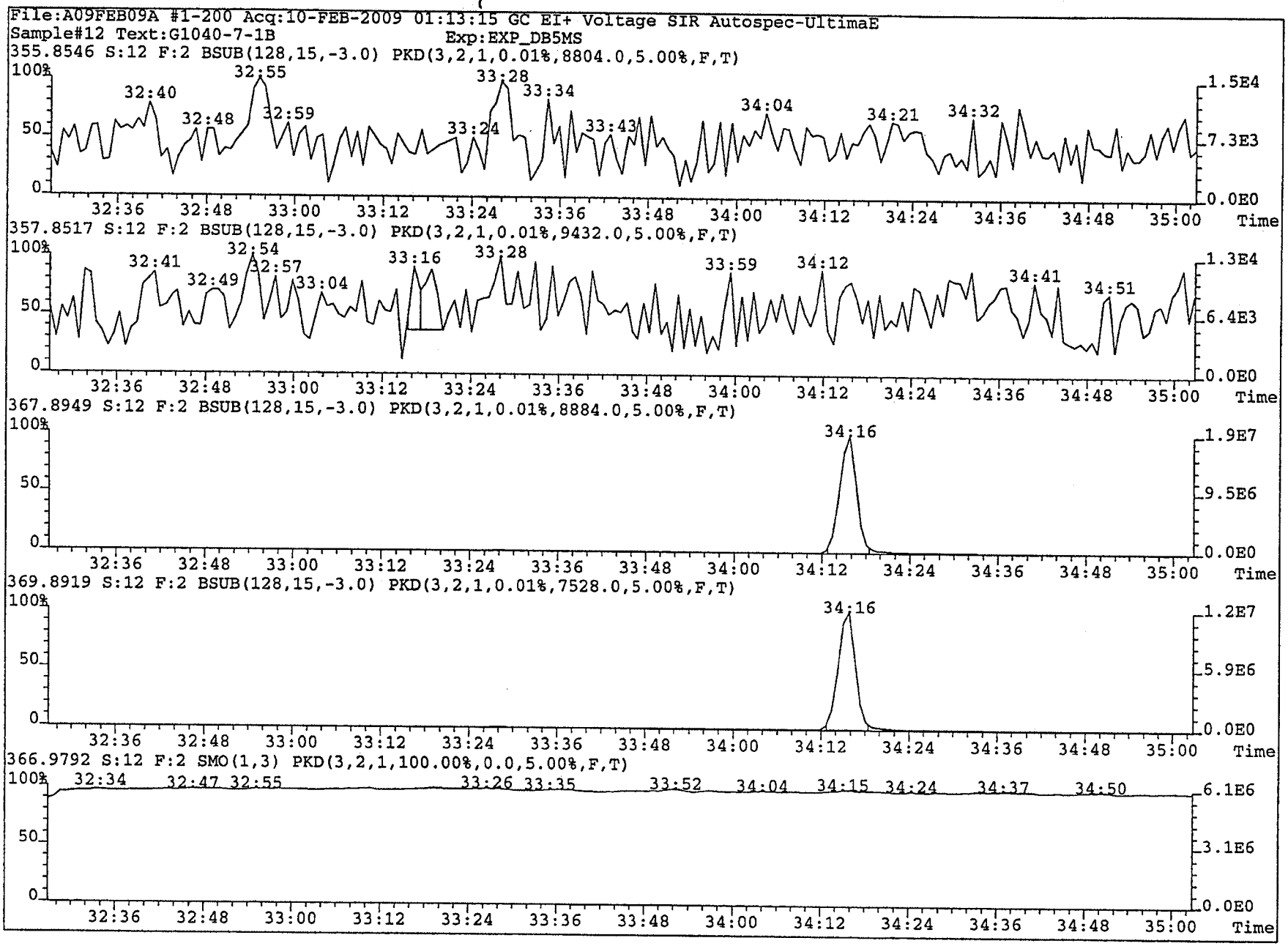
Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?

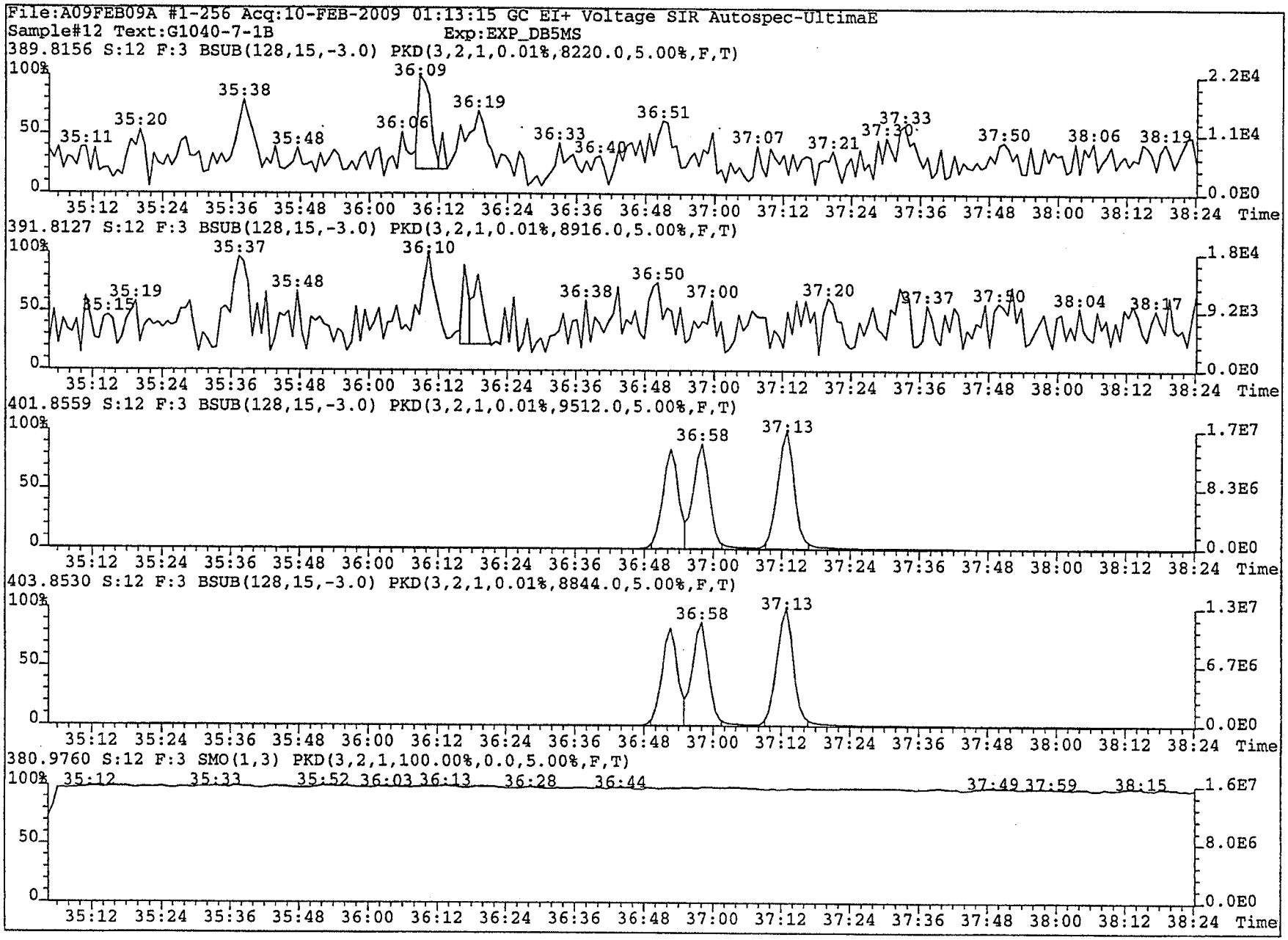
		1	*		*	*	*	n	NotFnd	*		*	n	*	n	n

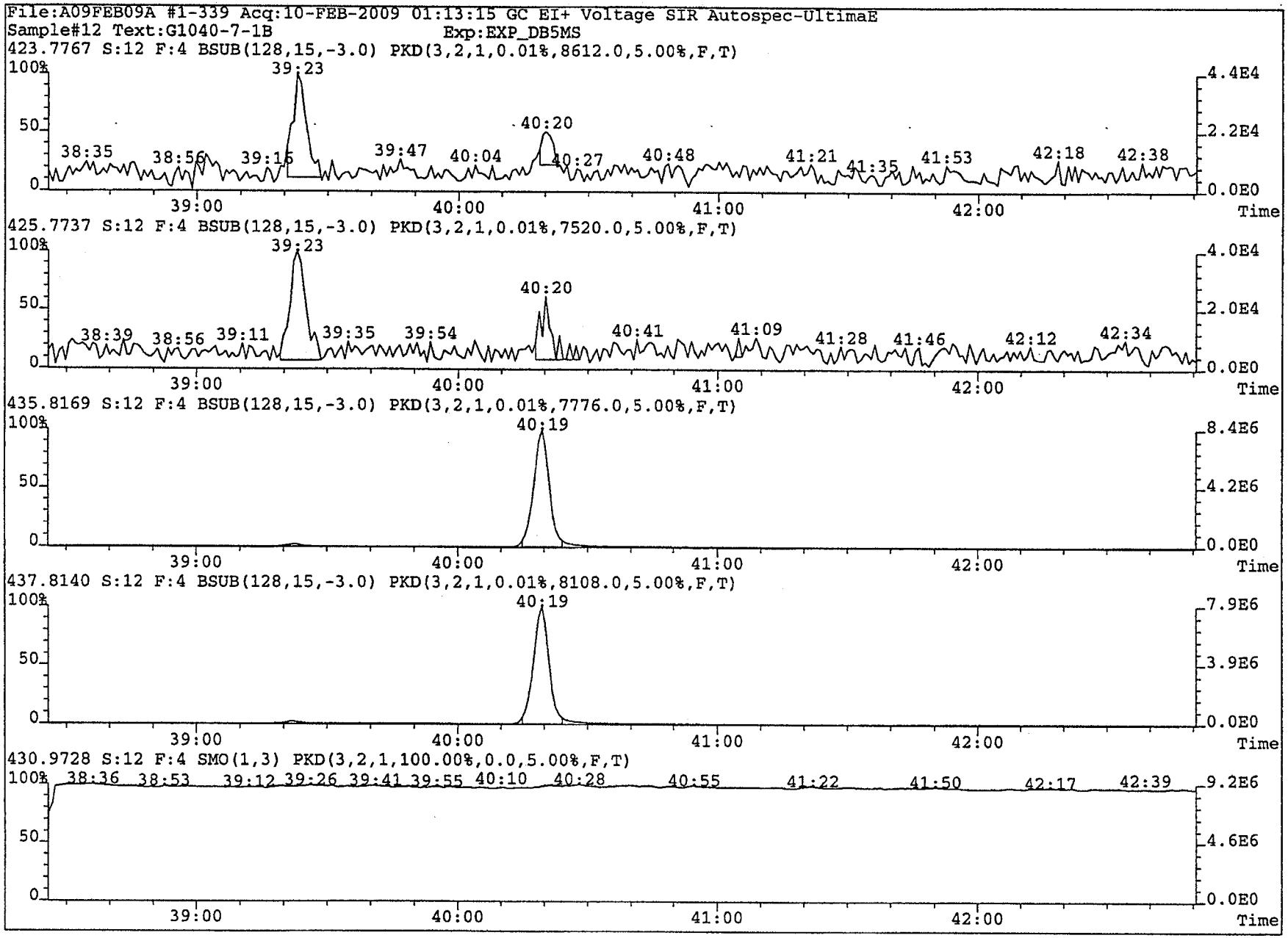
Filename:	a09feb09a		Name of Homolog Group:	Total Hepta-Furans												
Sample:	12		Number of Peaks Found:	0												
Acquired:	10-FEB-09 01:13:15		RRF Used For Totals:	1.3693												
Processed:	10-FEB-09 07:34:41		Detection Limit:	0.1765												
Sample ID:	G1040-7-1B		Noise Height Ion1/Ion2:	6480 / 6732												
Cal Table:	m1613-100708a		Begin Window:													
Results Table:	M1613-020909A		End Window:													
Name	#		Response		Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
		1	*		*	*	*	n	NotFnd	*		*	n	*	n	n

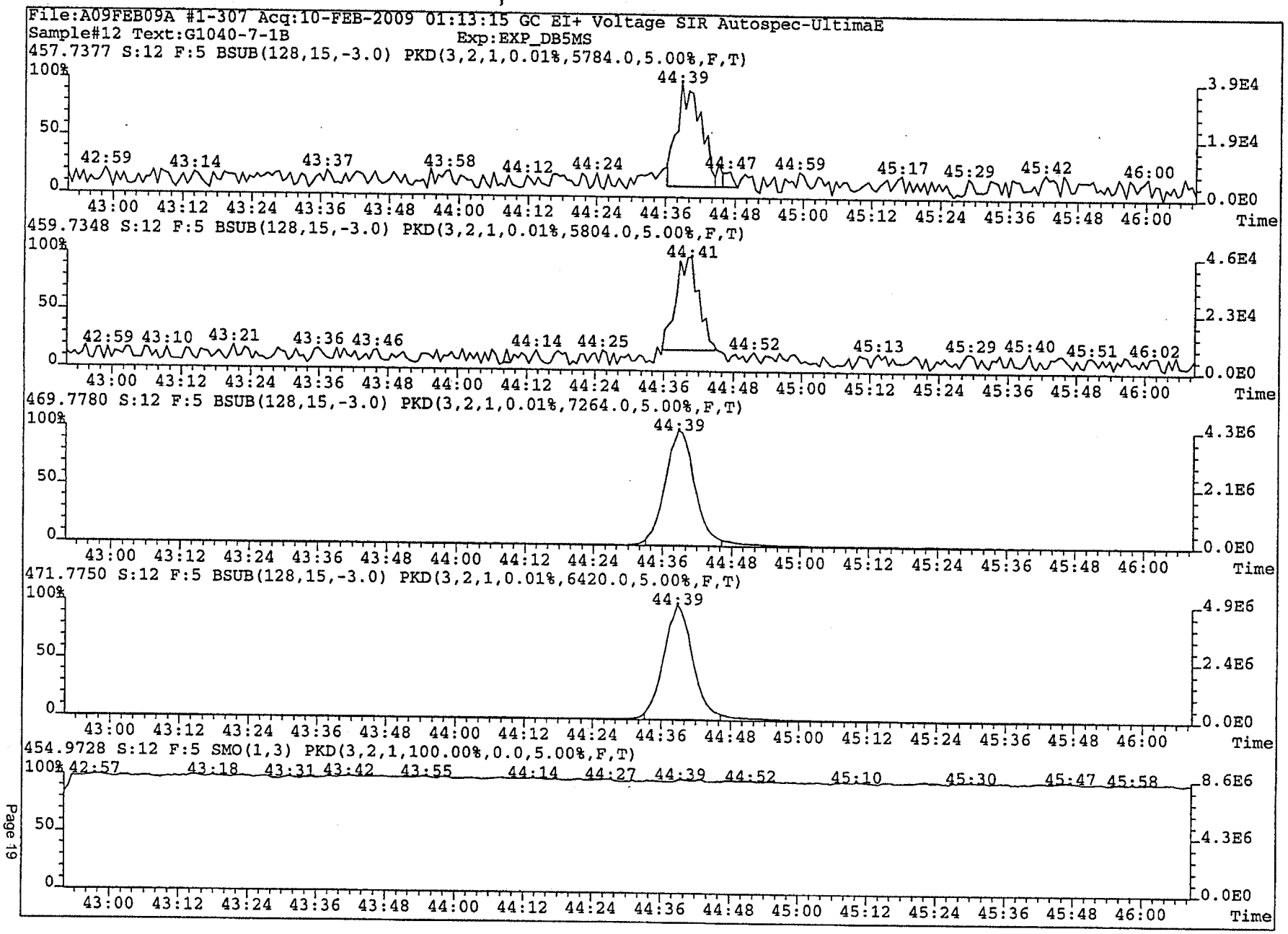
Filename:	a09feb09a		Name of Homolog Group:	Total Hepta-Dioxins												
Sample:	12		Number of Peaks Found:	2	0											
Acquired:	10-FEB-09 01:13:15		RRF Used For Totals:	1.0612												
Processed:	10-FEB-09 07:34:41		Detection Limit:	0.2798						RL=2.500 (pg/µL)						
Sample ID:	G1040-7-1B		Noise Height Ion1/Ion2:	8612 / 7520												
Cal Table:	m1613-100708a		Begin Window:						39:17:00							
Results Table:	M1613-020909A		End Window:						40:29:00							
Name	#		Response		Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
		1		2.97E+05	139000	159000	0.88	n	39:24	0.431	RL		4.5	y	5	y	n
1,2,3,4,6,7,8-HpCDI		2		8.71E+04	34600	52500	0.66	n	40:20	0.126	S2N		1.4	n	2.9	n	n

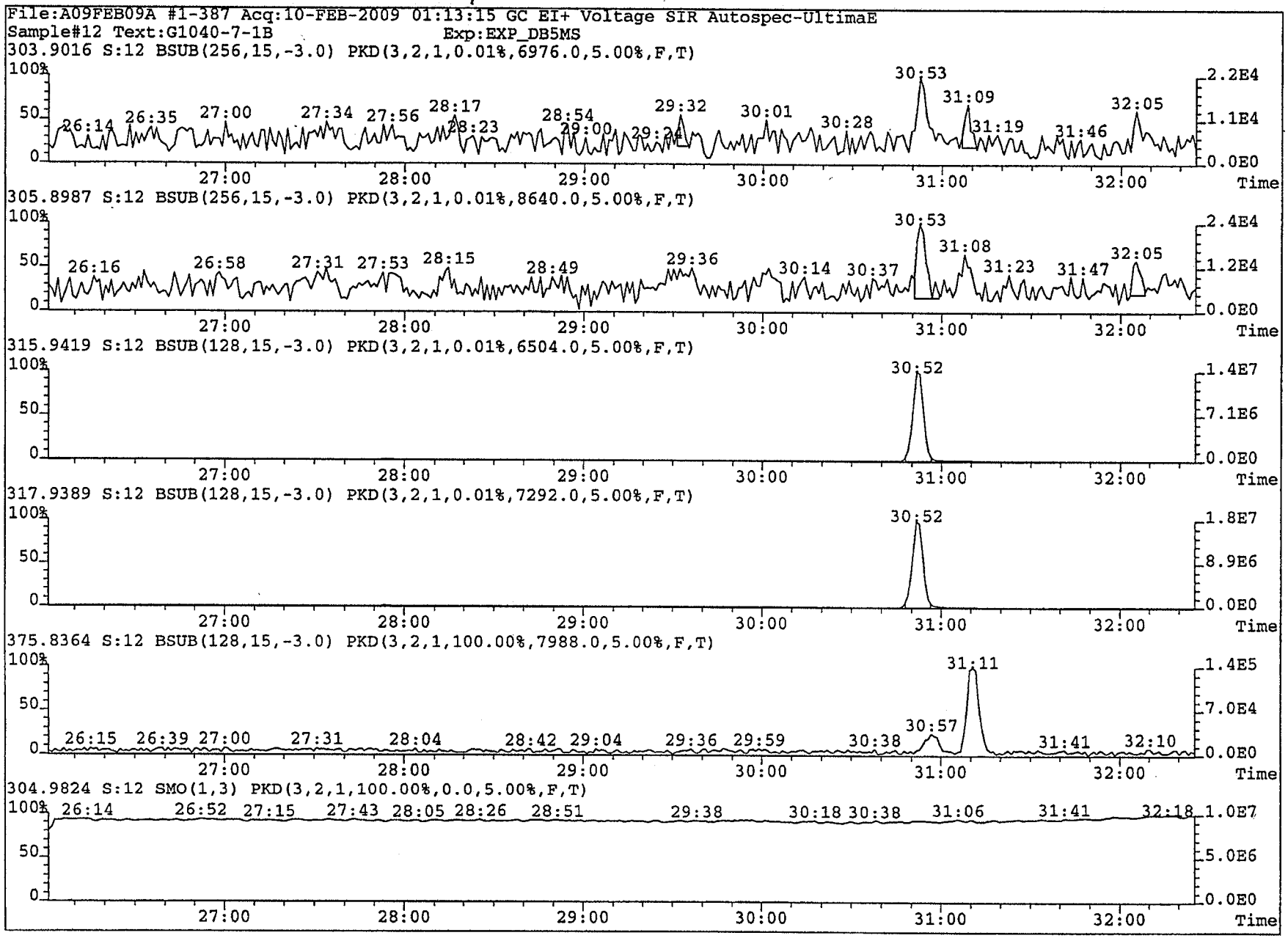

File:A09FEB09A #1-387 Acq:10-FEB-2009 01:13:15 GC EI+ Voltage SIR Autospec-UltimaE
Sample#12 Text:G1040-7-1B Exp:EXP_DB5MS
319.8965 S:12 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,7876.0,5.00%,F,T)
321.8936 S:12 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,7720.0,5.00%,F,T)
331.9368 S:12 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7776.0,5.00%,F,T)
333.9339 S:12 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6120.0,5.00%,F,T)
327.8847 S:12 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7736.0,5.00%,F,T)
304.9824 S:12 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time

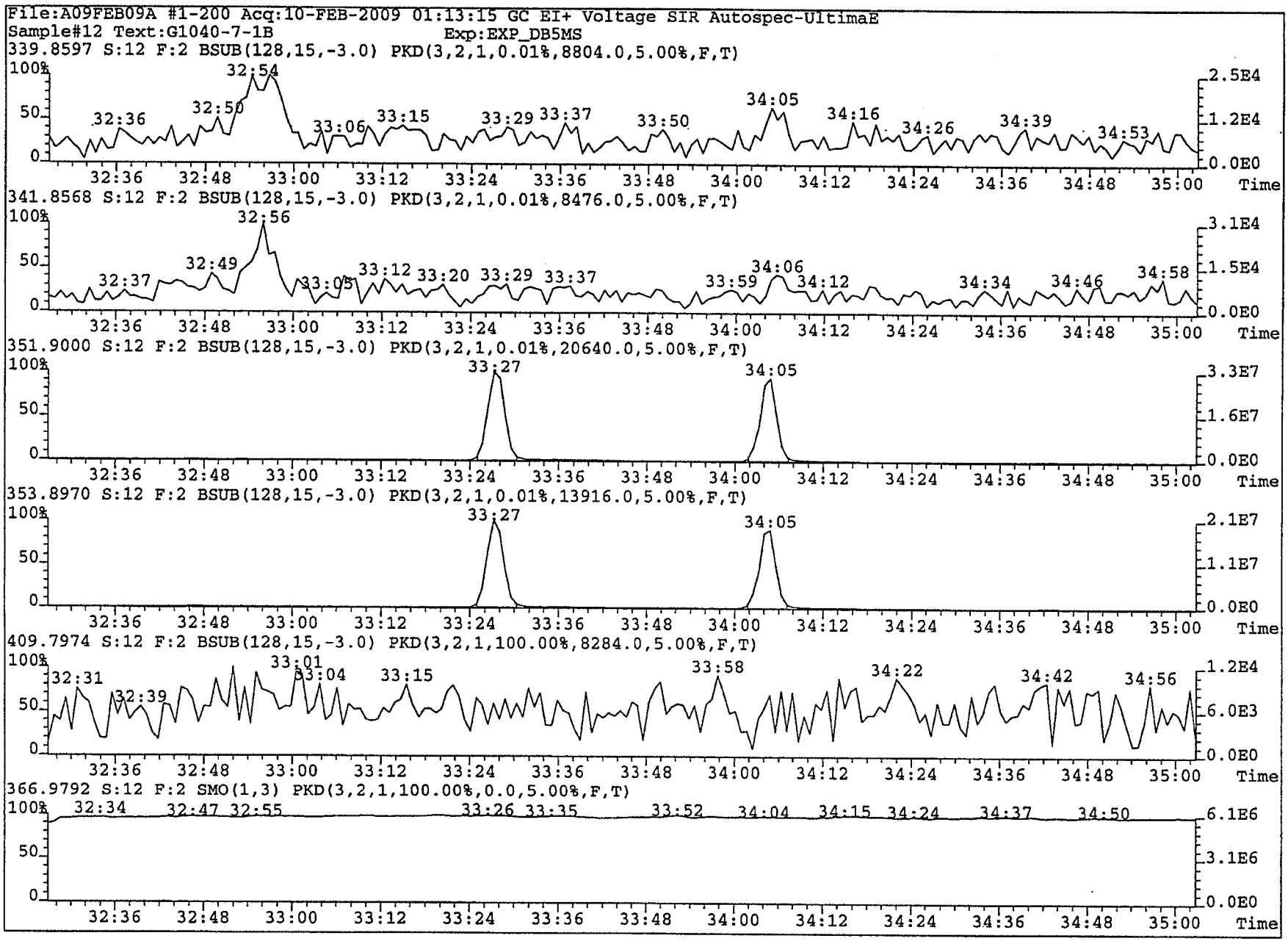

File:A09FEB09A #1-200 Acq:10-FEB-2009 01:13:15 GC EI+ Voltage SIR Autospec-UltimaE
Sample#12 Text:G1040-7-1B Exp:EXP_DB5MS
355.8546 S:12 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,8804.0,5.00%,F,T)
357.8517 S:12 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,9432.0,5.00%,F,T)
367.8949 S:12 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,8884.0,5.00%,F,T)
369.8919 S:12 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7528.0,5.00%,F,T)
366.9792 S:12 F:2 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time

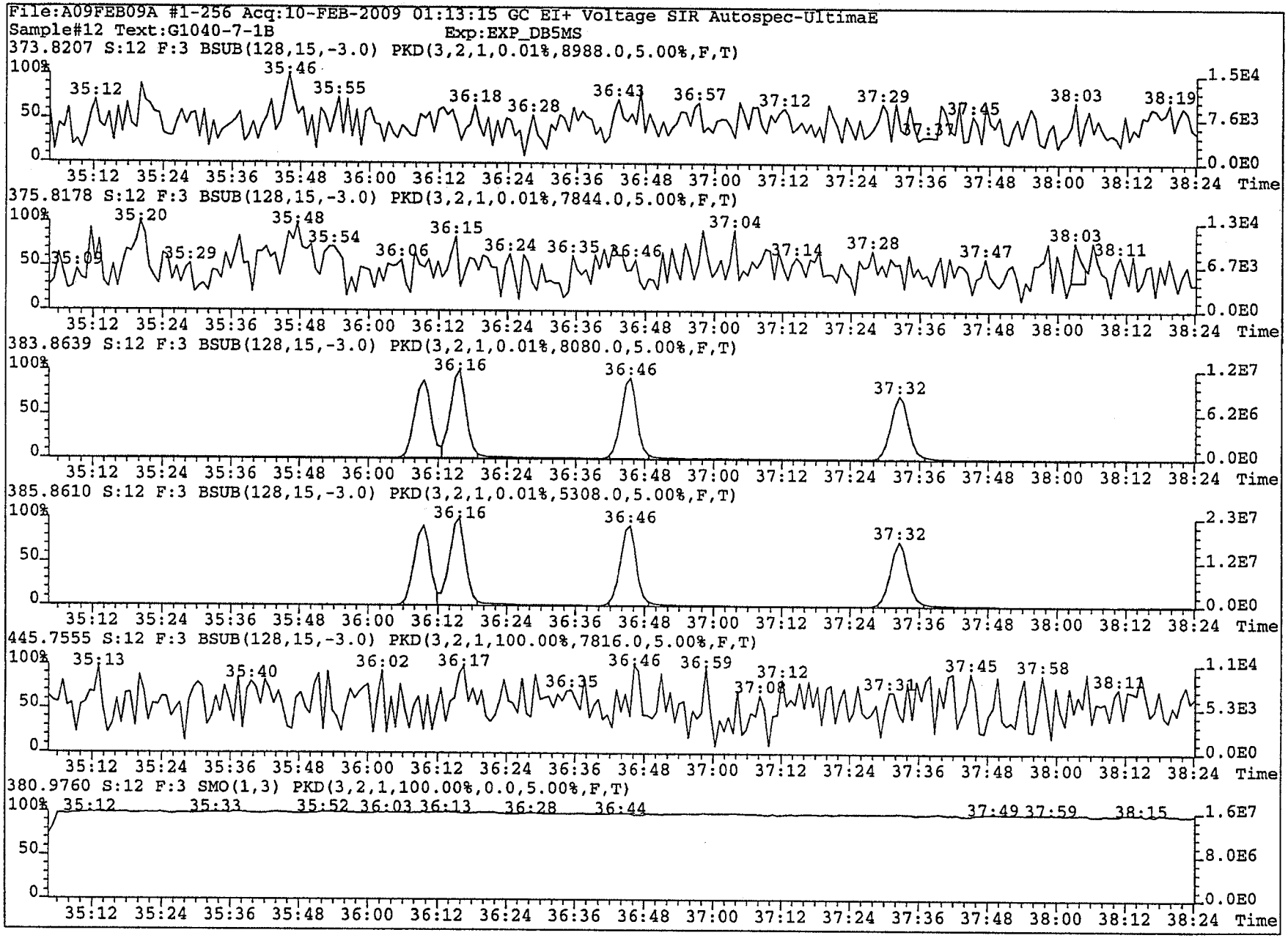

File:A09FEB09A #1-256 Acq:10-FEB-2009 01:13:15 GC EI+ Voltage SIR Autospec-UltimaE
Sample#12 Text:G1040-7-1B Exp:EXP_DB5MS
389.8156 S:12 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,8220.0,5.00%,F,T)
391.8127 S:12 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,8916.0,5.00%,F,T)
401.8559 S:12 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,9512.0,5.00%,F,T)
403.8530 S:12 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,8844.0,5.00%,F,T)
380.9760 S:12 F:3 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time

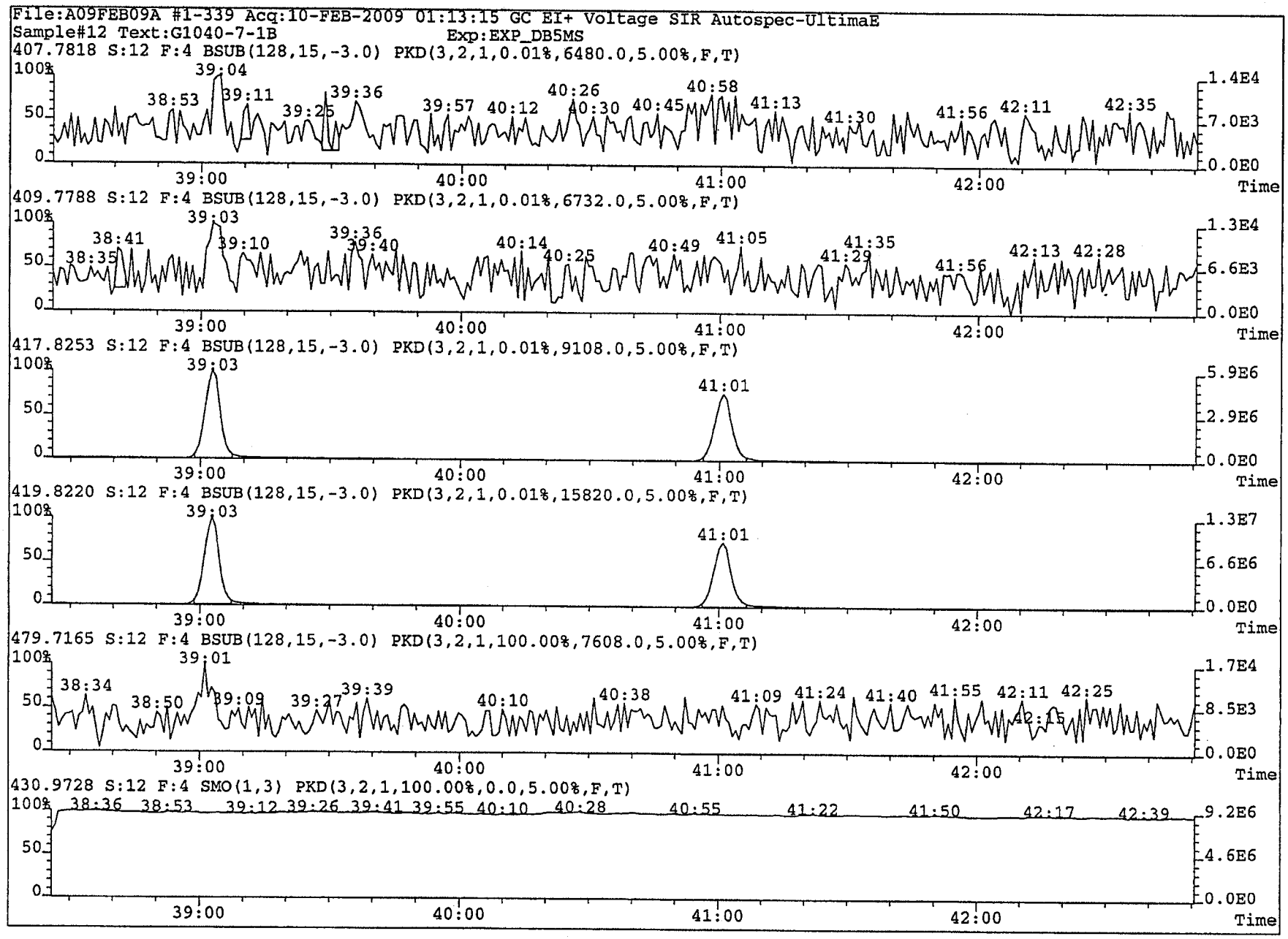

File:A09FEB09A #1-339 Acq:10-FEB-2009 01:13:15 GC EI+ Voltage SIR Autospec-UltimaE
Sample#12 Text:G1040-7-1B Exp:EXP_DB5MS
423.7767 S:12 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,8612.0,5.00%,F,T)
39:23
40:20
38:35 38:56 39:15 39:47 40:04 40:27 40:48 41:21 41:35 41:53 42:18 42:38
4.4E4
2.2E4
0.0E0
425.7737 S:12 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7520.0,5.00%,F,T)
39:23
40:20
38:39 38:56 39:11 39:35 39:54 40:41 41:09 41:28 41:46 42:12 42:34
4.0E4
2.0E4
0.0E0
435.8169 S:12 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7776.0,5.00%,F,T)
40:19
8.4E6
4.2E6
0.0E0
437.8140 S:12 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,8108.0,5.00%,F,T)
40:19
7.9E6
3.9E6
0.0E0
430.9728 S:12 F:4 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
38:36 38:53 39:12 39:26 39:41 39:55 40:10 40:28 40:55 41:22 41:50 42:17 42:39
9.2E6
4.6E6
0.0E0
100%
50
0
39:00
40:00
41:00
42:00
Time

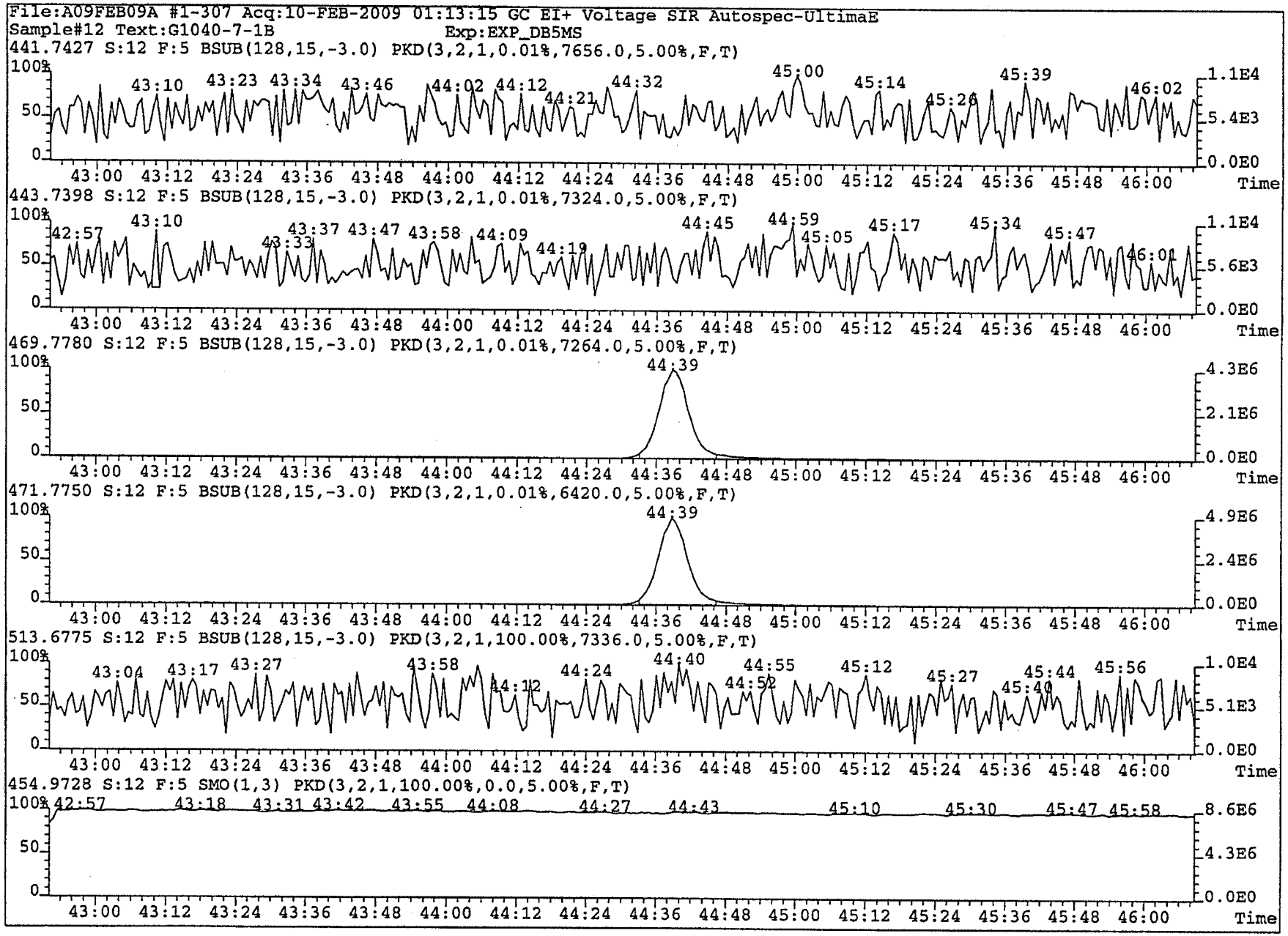

File:A09FEB09A #1-307 Acq:10-FEB-2009 01:13:15 GC EI+ Voltage SIR Autospec-UltimaE
Sample#12 Text:G1040-7-1B Exp:EXP_DB5MS
457.7377 S:12 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5784.0,5.00%,F,T)
459.7348 S:12 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5804.0,5.00%,F,T)
469.7780 S:12 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7264.0,5.00%,F,T)
471.7750 S:12 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6420.0,5.00%,F,T)
454.9728 S:12 F:5 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time

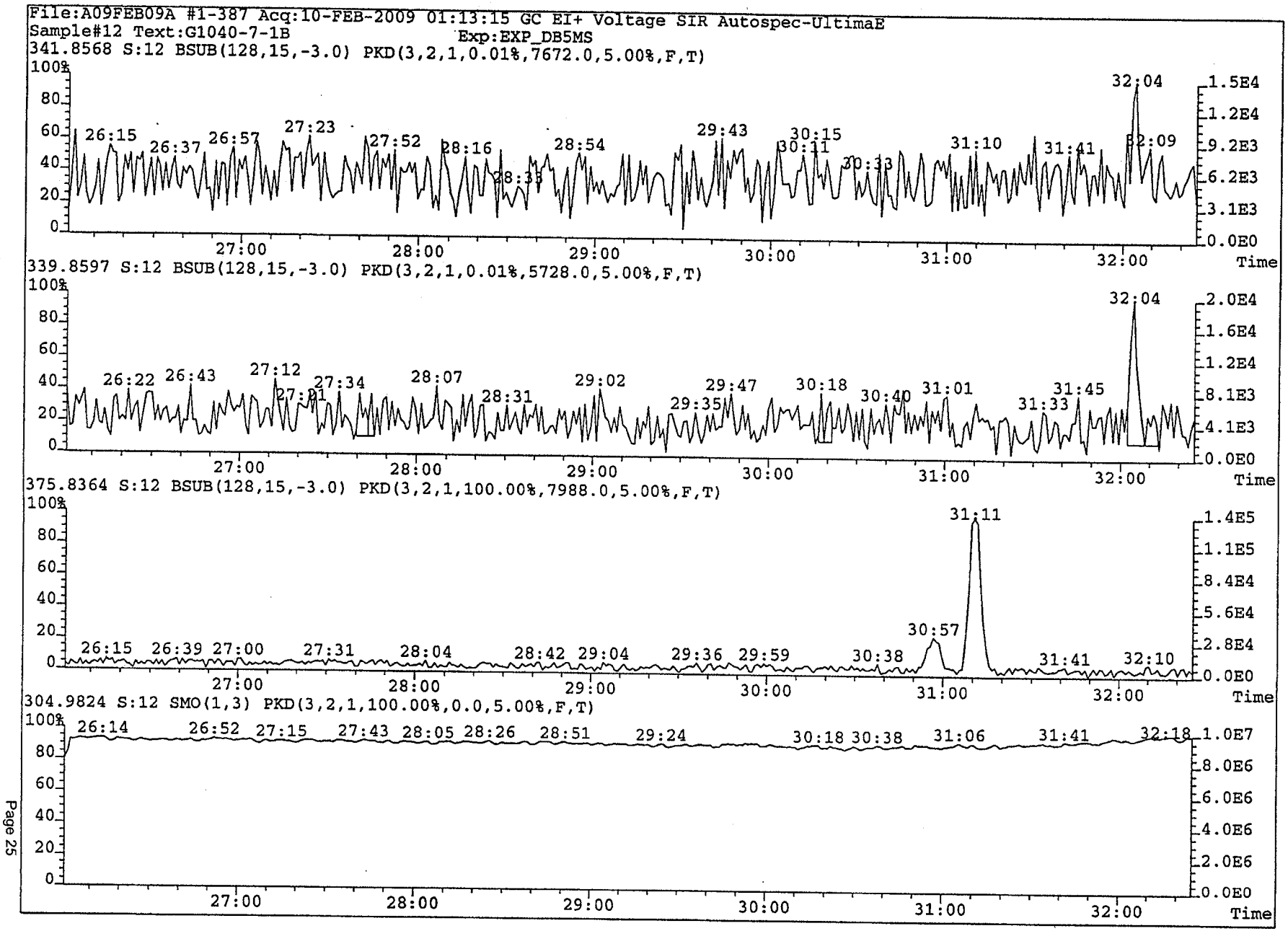

File:A09FEB09A #1-387 Acq:10-FEB-2009 01:13:15 GC EI+ Voltage SIR Autospec-UltimaE
Sample#12 Text:G1040-7-1B Exp:EXP_DB5MS
303.9016 S:12 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,6976.0,5.00%,F,T)
305.8987 S:12 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,8640.0,5.00%,F,T)
315.9419 S:12 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6504.0,5.00%,F,T)
317.9389 S:12 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7292.0,5.00%,F,T)
375.8364 S:12 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,7988.0,5.00%,F,T)
304.9824 S:12 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time


File:A09FEB09A #1-200 Acq:10-FEB-2009 01:13:15 GC EI+ Voltage SIR Autospec-UltimaE
Sample#12 Text:G1040-7-1B Exp:EXP_DB5MS
339.8597 S:12 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,8804.0,5.00%,F,T)
341.8568 S:12 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,8476.0,5.00%,F,T)
351.9000 S:12 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,20640.0,5.00%,F,T)
353.8970 S:12 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,13916.0,5.00%,F,T)
409.7974 S:12 F:2 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,8284.0,5.00%,F,T)
366.9792 S:12 F:2 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time


File:A09FEB09A #1-256 Acq:10-FEB-2009 01:13:15 GC EI+ Voltage SIR Autospec-UltimaE
Sample#12 Text:G1040-7-1B Exp:EXP_DB5MS
373.8207 S:12 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,8988.0,5.00%,F,T)
375.8178 S:12 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7844.0,5.00%,F,T)
383.8639 S:12 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,8080.0,5.00%,F,T)
385.8610 S:12 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5308.0,5.00%,F,T)
445.7555 S:12 F:3 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,7816.0,5.00%,F,T)
380.9760 S:12 F:3 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time


File:A09FEB09A #1-339 Acq:10-FEB-2009 01:13:15 GC EI+ Voltage SIR Autospec-UltimaE
Sample#12 Text:G1040-7-1B Exp:EXP_DB5MS
407.7818 S:12 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6480.0,5.00%,F,T)
409.7788 S:12 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6732.0,5.00%,F,T)
417.8253 S:12 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,9108.0,5.00%,F,T)
419.8220 S:12 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,15820.0,5.00%,F,T)
479.7165 S:12 F:4 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,7608.0,5.00%,F,T)
430.9728 S:12 F:4 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time


File:A09FEB09A #1-307 Acq:10-FEB-2009 01:13:15 GC EI+ Voltage SIR Autospec-UltimaE
Sample#12 Text:G1040-7-1B Exp:EXP_DB5MS
441.7427 S:12 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7656.0,5.00%,F,T)
443.7398 S:12 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7324.0,5.00%,F,T)
469.7780 S:12 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7264.0,5.00%,F,T)
471.7750 S:12 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6420.0,5.00%,F,T)
513.6775 S:12 F:5 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,7336.0,5.00%,F,T)
454.9728 S:12 F:5 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time


File:A09FEB09A #1-387 Acq:10-FEB-2009 01:13:15 GC EI+ Voltage SIR Autospec-UltimaE
Sample#12 Text:G1040-7-1B
Exp:EXP_DB5MS
341.8568 S:12 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7672.0,5.00%,F,T)
339.8597 S:12 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5728.0,5.00%,F,T)
375.8364 S:12 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,7988.0,5.00%,F,T)
304.9824 S:12 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time

Method 1613

GD STATION #2A

Analytical Resources, Inc.

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	RL (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	1.00			
1,2,3,7,8-PeCDD	ND	5.00			
1,2,3,4,7,8-HxCDD	ND	5.00			
1,2,3,6,7,8-HxCDD	ND	5.00			
1,2,3,7,8,9-HxCDD	ND	5.00			
1,2,3,4,6,7,8-HpCDD	ND	5.00			
OCDD	ND	10.0			
2,3,7,8-TCDF	ND	1.00			
1,2,3,7,8-PeCDF	ND	5.00			
2,3,4,7,8-PeCDF	ND	5.00			
1,2,3,4,7,8-HxCDF	ND	5.00			
1,2,3,6,7,8-HxCDF	ND	5.00			
2,3,4,6,7,8-HxCDF	ND	5.00			
1,2,3,7,8,9-HxCDF	ND	5.00			
1,2,3,4,6,7,8-HpCDF	ND	5.00			
1,2,3,4,7,8,9-HpCDF	ND	5.00			
OCDF	ND	10.0			
Total TCDDs	ND	1.00			
Total PeCDDs	ND	5.00			
Total HxCDDs	ND	5.00			
Total HpCDDs	ND	5.00			
Total TCDFs	ND	1.00			
Total PeCDFs	ND	5.00			
Total HxCDFs	ND	5.00			
Total HpCDFs	ND	5.00			
WHO-2005 TEQ (ND=0)	0.000				
WHO-2005 TEQ (ND=½)	5.70				

Client Information

Project Name:	OG88
Sample ID:	GD STATION #2A

Laboratory Information

Project ID:	G1040-7	
Sample ID:	G1040-7-2B	
Collection Date:	16-Dec-08	
Receipt Date:	15-Jan-09	10:15
Extraction Date:	01-Feb-09	
Analysis Date:	10-Feb-09	2:01

Sample Information

Matrix:	Tissue	
Weight / Volume:	11.09	grams
Solids / Lipids:	NA	
Original pH :	NA	
Batch ID:	WG16457	
Filename:	a09feb09a-13	
Retchk:	a09feb09a-1	
Begin ConCal:	a09feb09a-1	
Initial Cal:	m1613-100708a	

Method 1613

GD STATION #2A

Analytical Resources, Inc.

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
$^{13}C_{12}$-2,3,7,8-TCDD	2	1.55	77.3	31:28	0.79	
$^{13}C_{12}$-1,2,3,7,8-PeCDD	2	1.94	96.8	34:16	1.58	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	2	1.58	79.2	36:52	1.26	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	2	1.61	80.6	36:58	1.26	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	2	1.60	80.0	40:19	1.06	
$^{13}C_{12}$-OCDD	4	2.87	71.9	44:39	0.89	
$^{13}C_{12}$-2,3,7,8-TCDF	2	1.53	76.4	30:52	0.80	
$^{13}C_{12}$-1,2,3,7,8-PeCDF	2	2.02	101	33:27	1.59	
$^{13}C_{12}$-2,3,4,7,8-PeCDF	2	1.91	95.6	34:04	1.59	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	2	1.57	78.6	36:09	0.52	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	2	1.61	80.5	36:15	0.53	
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	2	1.63	81.4	36:45	0.52	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	2	1.63	81.5	37:32	0.53	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	2	1.63	81.3	39:03	0.45	
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	2	1.66	83.0	41:01	0.45	
Cleanup Standard						
$^{37}Cl_4$-2,3,7,8-TCDD	0.4	0.335	83.8	31:28		
Injection Standards						
$^{13}C_{12}$-1,2,3,4-TCDD	2			31:01	0.81	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	2			37:13	1.25	

Client Information

Project Name: OG88

Sample ID: GD STATION #2A

Laboratory Information

Project ID: G1040-7
Sample ID: G1040-7-2B
Collection Date: 16-Dec-08
Receipt Date: 15-Jan-09 10:15
Extraction Date: 01-Feb-09
Analysis Date: 10-Feb-09 2:01

Sample Information

Matrix: Tissue
Weight / Volume: 11.09 grams
Solids / Lipids: NA %
Original pH : NA
Batch ID: WG16457

Filename: a09feb09a-13
Retchk: a09feb09a-1
Begin ConCal: a09feb09a-1

Initial Cal: m1613-100708a

Analyzed by: DWP
Date: 02/09

Reviewed by: JM
Date: 02/17/09

Form Version:[1613_HRMS12]Repor

Filename ; a09feb09a
Sample ; 13
Acquired ; 10-FEB-09 02:01:37
Processed ; 10-FEB-09 07:35:07
Sample ID ; G1040-7-2B
Cal Table ; m1613-100708a
Results Table ; M1613-020909A
Comments ;

;*1613*

Ent;	Name;	Resp;	Ion 1;	Ion 2;	RA;?;	RT;	Conc;	EDL;	S/N1;?;	S/N2;?;M;	Signal1;	Noise 1;	Signal2;	Noise 2
1 ;	2,3,7,8-TCDD;	*;	*;	*;	*;n;	NotFnd;	*;	0.0910;	*;n;	*;n;n;	*;	4.97e+03;	*;	4.54e+03
2 ;	1,2,3,7,8-PeCDD;	*;	*;	*;	*;n;	NotFnd;	*;	0.2902;	*;n;	*;n;n;	*;	1.56e+04;	*;	1.66e+04
3 ;	1,2,3,4,7,8-HxCDD;	*;	*;	*;	*;n;	NotFnd;	*;	0.1740;	*;n;	*;n;n;	*;	7.30e+03;	*;	7.67e+03
4 ;	1,2,3,6,7,8-HxCDD;	*;	*;	*;	*;n;	NotFnd;	*;	0.1660;	*;n;	*;n;n;	*;	7.30e+03;	*;	7.67e+03
5 ;	1,2,3,7,8,9-HxCDD;	*;	*;	*;	*;n;	NotFnd;	*;	0.1710;	*;n;	*;n;n;	*;	7.30e+03;	*;	7.67e+03
6 ;	1,2,3,4,6,7,8-HpCDD;	*;	*;	*;	*;n;	NotFnd;	*;	0.2376;	*;n;	*;n;n;	*;	6.78e+03;	*;	6.42e+03
7 ;	OCDD;	3.21e+05;	1.82e+05;	1.39e+05;	1.31;n;	44:40;	0.649;	0.3576;	6;y;	6;y;n;	3.95e+04;	6.16e+03;	3.13e+04;	5.06e+03
8 ;	2,3,7,8-TCDF;	1.22e+05;	4.14e+04;	8.05e+04;	0.51;n;	30:53;	0.088;	0.1259;	2;n;	3;n;n;	1.27e+04;	6.63e+03;	2.01e+04;	7.25e+03
9 ;	1,2,3,7,8-PeCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.1564;	*;n;	*;n;n;	*;	1.37e+04;	*;	1.67e+04
10 ;	2,3,4,7,8-PeCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.1772;	*;n;	*;n;n;	*;	1.37e+04;	*;	1.67e+04
11 ;	1,2,3,4,7,8-HxCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.0959;	*;n;	*;n;n;	*;	6.36e+03;	*;	6.24e+03
12 ;	1,2,3,6,7,8-HxCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.0908;	*;n;	*;n;n;	*;	6.36e+03;	*;	6.24e+03
13 ;	2,3,4,6,7,8-HxCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.0963;	*;n;	*;n;n;	*;	6.36e+03;	*;	6.24e+03
14 ;	1,2,3,7,8,9-HxCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.1181;	*;n;	*;n;n;	*;	6.36e+03;	*;	6.24e+03
15 ;	1,2,3,4,6,7,8-HpCDF;	1.38e+05;	7.89e+04;	5.89e+04;	1.34;n;	39:04;	0.121;	0.1339;	4;y;	3;n;n;	2.51e+04;	6.81e+03;	1.90e+04;	6.96e+03
16 ;	1,2,3,4,7,8,9-HpCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.2058;	*;n;	*;n;n;	*;	6.81e+03;	*;	6.96e+03
17 ;	OCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.3193;	*;n;	*;n;n;	*;	5.28e+03;	*;	6.62e+03
Extraction Standards														
18 ;	13C-2,3,7,8-TCDD;	9.08e+07;	4.02e+07;	5.07e+07;	0.79;y;	31:28;	77.313;	0.1244;	1710;y;	3258;y;n;	1.37e+07;	8.02e+03;	1.74e+07;	5.34e+03
19 ;	13C-1,2,3,7,8-PeCDD;	8.31e+07;	5.09e+07;	3.23e+07;	1.58;y;	34:16;	96.801;	0.3354;	1513;y;	910;y;n;	1.96e+07;	1.29e+04;	1.22e+07;	1.34e+04
20 ;	13C-1,2,3,4,7,8-HxCDD;	7.86e+07;	4.38e+07;	3.47e+07;	1.26;y;	36:52;	79.219;	0.1383;	1949;y;	1761;y;n;	1.40e+07;	7.18e+03;	1.10e+07;	6.27e+03
21 ;	13C-1,2,3,6,7,8-HxCDD;	8.68e+07;	4.83e+07;	3.85e+07;	1.26;y;	36:58;	80.539;	0.1273;	2121;y;	1922;y;n;	1.52e+07;	7.18e+03;	1.20e+07;	6.27e+03
22 ;	13C-1,2,3,4,6,7,8-HpCDD;	6.50e+07;	3.34e+07;	3.16e+07;	1.06;y;	40:19;	79.934;	0.1514;	1331;y;	1271;y;n;	8.17e+06;	6.14e+03;	7.54e+06;	5.93e+03
23 ;	13C-OCDD;	9.30e+07;	4.38e+07;	4.92e+07;	0.89;y;	44:39;	143.699;	0.1857;	1241;y;	1849;y;n;	8.40e+06;	6.77e+03;	9.27e+06;	5.01e+03
24 ;	13C-2,3,7,8-TCDF;	1.33e+08;	5.92e+07;	7.38e+07;	0.80;y;	30:52;	76.418;	0.0822;	2278;y;	2583;y;n;	1.42e+07;	6.22e+03;	1.78e+07;	6.88e+03
25 ;	13C-1,2,3,7,8-PeCDF;	1.42e+08;	8.71e+07;	5.48e+07;	1.59;y;	33:27;	100.823;	0.3126;	1650;y;	1245;y;n;	3.60e+07;	2.18e+04;	2.30e+07;	1.84e+04
26 ;	13C-2,3,4,7,8-PeCDF;	1.32e+08;	8.09e+07;	5.07e+07;	1.59;y;	34:04;	95.571;	0.3194;	1414;y;	1025;y;n;	3.08e+07;	2.18e+04;	1.89e+07;	1.84e+04
27 ;	13C-1,2,3,4,7,8-HxCDF;	1.01e+08;	3.46e+07;	6.61e+07;	0.52;y;	36:09;	78.591;	0.1063;	1707;y;	3456;y;n;	1.18e+07;	6.91e+03;	2.23e+07;	6.44e+03
28 ;	13C-1,2,3,6,7,8-HxCDF;	1.14e+08;	3.94e+07;	7.44e+07;	0.53;y;	36:15;	80.481;	0.0963;	1828;y;	3767;y;n;	1.26e+07;	6.91e+03;	2.43e+07;	6.44e+03
29 ;	13C-2,3,4,6,7,8-HxCDF;	1.08e+08;	3.72e+07;	7.09e+07;	0.52;y;	36:45;	81.359;	0.1025;	1737;y;	3507;y;n;	1.20e+07;	6.91e+03;	2.26e+07;	6.44e+03
30 ;	13C-1,2,3,7,8,9-HxCDF;	9.65e+07;	3.34e+07;	6.31e+07;	0.53;y;	37:32;	81.466;	0.1150;	1455;y;	2957;y;n;	1.01e+07;	6.91e+03;	1.91e+07;	6.44e+03
31 ;	13C-1,2,3,4,6,7,8-HpCDF;	8.25e+07;	2.58e+07;	5.67e+07;	0.45;y;	39:03;	81.310;	0.1860;	846;y;	1506;y;n;	7.07e+06;	8.36e+03;	1.53e+07;	1.01e+04
32 ;	13C-1,2,3,4,7,8,9-HpCDF;	6.63e+07;	2.07e+07;	4.56e+07;	0.45;y;	41:01;	82.926;	0.2361;	554;y;	993;y;n;	4.63e+06;	8.36e+03;	1.01e+07;	1.01e+04
Injection Standards														
33 ;	13C-1,2,3,4-TCDD;	1.05e+08;	4.71e+07;	5.82e+07;	0.81;y;	31:01;	77.516;	-;	1619;y;	2977;y;n;	1.30e+07;	8.02e+03;	1.59e+07;	5.34e+03
34 ;	13C-1,2,3,7,8,9-HxCDD;	1.03e+08;	5.74e+07;	4.58e+07;	1.25;y;	37:13;	95.611;	-;	2329;y;	2170;y;n;	1.67e+07;	7.18e+03;	1.36e+07;	6.27e+03
Cleanup Standard														
35 ;	%37Cl-2,3,7,8-TCDD;	2.10e+07;	2.10e+07;	-;	-;-;	31:28;	16.739;	0.0686;	907;y;	-;-;n;	7.13e+06;	7.86e+03;	-;	-

% TCDD-CS ⇒ $\frac{2.10e7}{4.71e7 + 5.82e7}\left(\frac{2000pg}{400pg}\right)\left(\frac{100\%}{1.1889}\right) = 83.9\%$ TM 02/17/09

Totals Raw Data

	Conc	Empc	Flags
TCDF	0	0	FALSE
TCDD	0	0	FALSE
PeCDF	0	0	FALSE
PeCDD	0	0	FALSE
HxCDF	0	0	FALSE
HxCDD	0	0	FALSE
HpCDF	0	0	FALSE
HpCDD	0	0	FALSE

Filename:	a09feb09a	Name of Homolog Group:	Total Tetra-Furans		
Sample:	13	Number of Peaks Found:	1	0	
Acquired:	10-FEB-09 02:01:37	RRF Used For Totals:	1.0368		
Processed:	10-FEB-09 07:35:07	Detection Limit:	0.1259		RL=0.500 (pg/µL)
Sample ID:	G1040-7-2B	Noise Height Ion1/Ion2:	6632 / 7248		
Cal Table:	m1613-100708a	Begin Window:		26:14:00	
Results Table:	M1613-020909A	End Window:		33:07:00	

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
2,3,7,8-TCDF	1	1.22E+05	41400	80500	0.51	n	30:53	0.088	S2N	1.9	n	2.8	n	n

Filename:	a09feb09a	Name of Homolog Group:	Total Tetra-Dioxins		
Sample:	13	Number of Peaks Found:	0		
Acquired:	10-FEB-09 02:01:37	RRF Used For Totals:	1.0087		
Processed:	10-FEB-09 07:35:07	Detection Limit:	0.091		
Sample ID:	G1040-7-2B	Noise Height Ion1/Ion2:	4973 / 4545		
Cal Table:	m1613-100708a	Begin Window:			
Results Table:	M1613-020909A	End Window:			

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	*	*	*	*	n	NotFnd	*		*	n	*	n	n

Filename:	a09feb09a	Name of Homolog Group:	Total Penta-Furans Fn1		
Sample:	13	Number of Peaks Found:	0		
Acquired:	10-FEB-09 02:01:37	RRF Used For Totals:	1.0121		
Processed:	10-FEB-09 07:35:07	Detection Limit:	0.0779		
Sample ID:	G1040-7-2B	Noise Height Ion1/Ion2:	6712 / 7496		
Cal Table:	m1613-100708a	Begin Window:			
Results Table:	M1613-020909A	End Window:			

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	*	*	*	*	n	NotFnd	*		*	n	*	n	n

Page 4 of 9

Filename:	a09feb09a	Name of Homolog Group:	Total Penta-Furans Fn2
Sample:	13	Number of Peaks Found:	0
Acquired:	10-FEB-09 02:01:37	RRF Used For Totals:	1.0121
Processed:	10-FEB-09 07:35:07	Detection Limit:	0.1666
Sample ID:	G1040-7-2B	Noise Height Ion1/Ion2:	13660/ 16716
Cal Table:	m1613-100708a	Begin Window:	
Results Table:	M1613-020909A	End Window:	

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	*	*	*	*	n	NotFnd	*		*	n	*	n	n

Page 5 of 9

Filename:	a09feb09a	Name of Homolog Group:	Total Penta-Dioxins
Sample:	13	Number of Peaks Found:	0
Acquired:	10-FEB-09 02:01:37	RRF Used For Totals:	1.0517
Processed:	10-FEB-09 07:35:07	Detection Limit:	0.2902
Sample ID:	G1040-7-2B	Noise Height Ion1/Ion2:	15624/ 16632
Cal Table:	m1613-100708a	Begin Window:	
Results Table:	M1613-020909A	End Window:	

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	*	*	*	*	n	NotFnd	*		*	n	*	n	n

Page 6 of 9

Filename:	a09feb09a	Name of Homolog Group:	Total Hexa-Furans
Sample:	13	Number of Peaks Found:	0
Acquired:	10-FEB-09 02:01:37	RRF Used For Totals:	1.1305
Processed:	10-FEB-09 07:35:07	Detection Limit:	0.0996
Sample ID:	G1040-7-2B	Noise Height Ion1/Ion2:	6364 / 6240
Cal Table:	m1613-100708a	Begin Window:	
Results Table:	M1613-020909A	End Window:	

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	*	*	*	*	n	NotFnd	*		*	n	*	n	n

Page 7 of 9

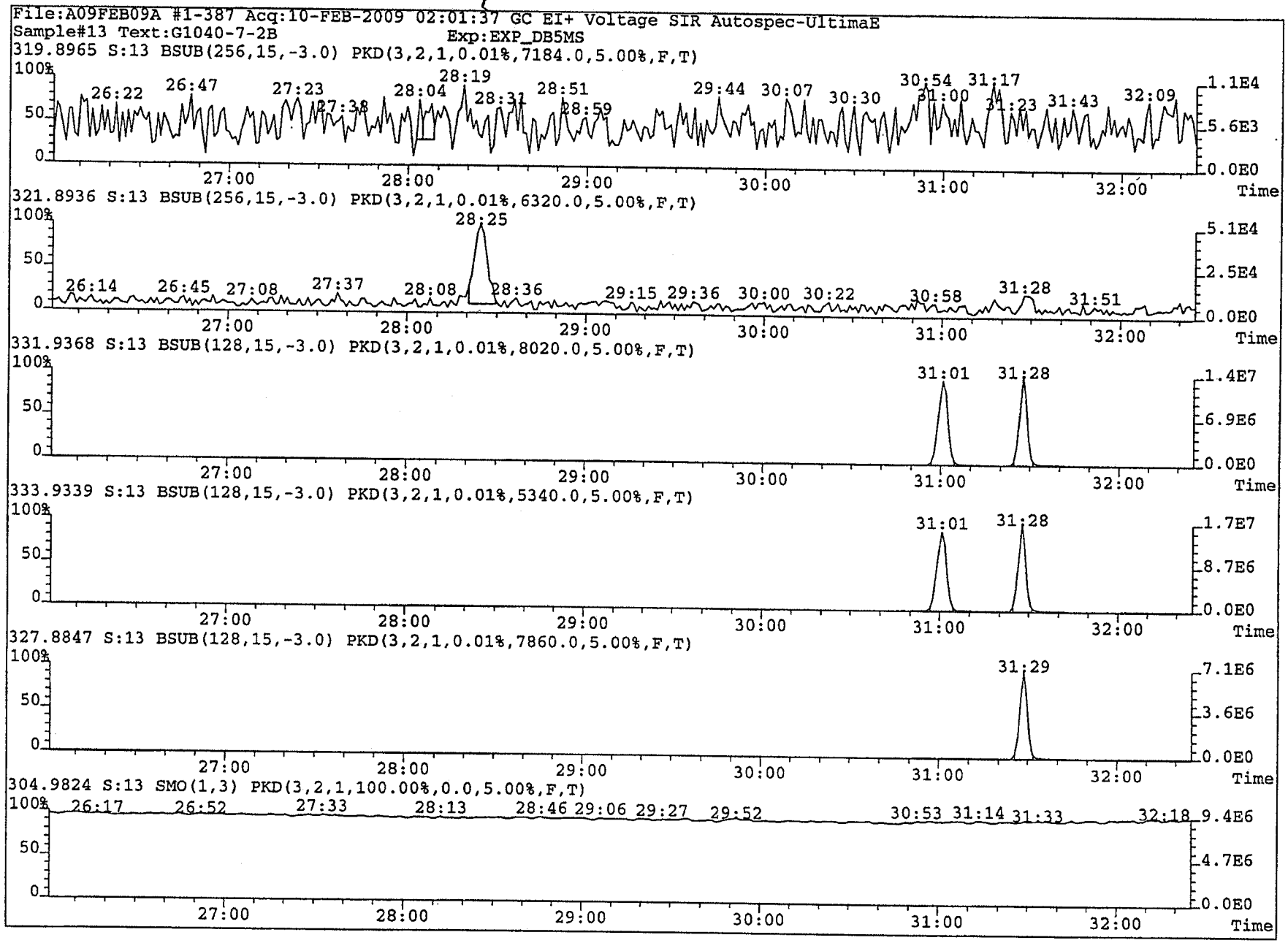
Filename:	a09feb09a	Name of Homolog Group:	Total Hexa-Dioxins
Sample:	13	Number of Peaks Found:	0
Acquired:	10-FEB-09 02:01:37	RRF Used For Totals:	1.0077
Processed:	10-FEB-09 07:35:07	Detection Limit:	0.1703
Sample ID:	G1040-7-2B	Noise Height Ion1/Ion2:	7296 / 7672
Cal Table:	m1613-100708a	Begin Window:	
Results Table:	M1613-020909A	End Window:	

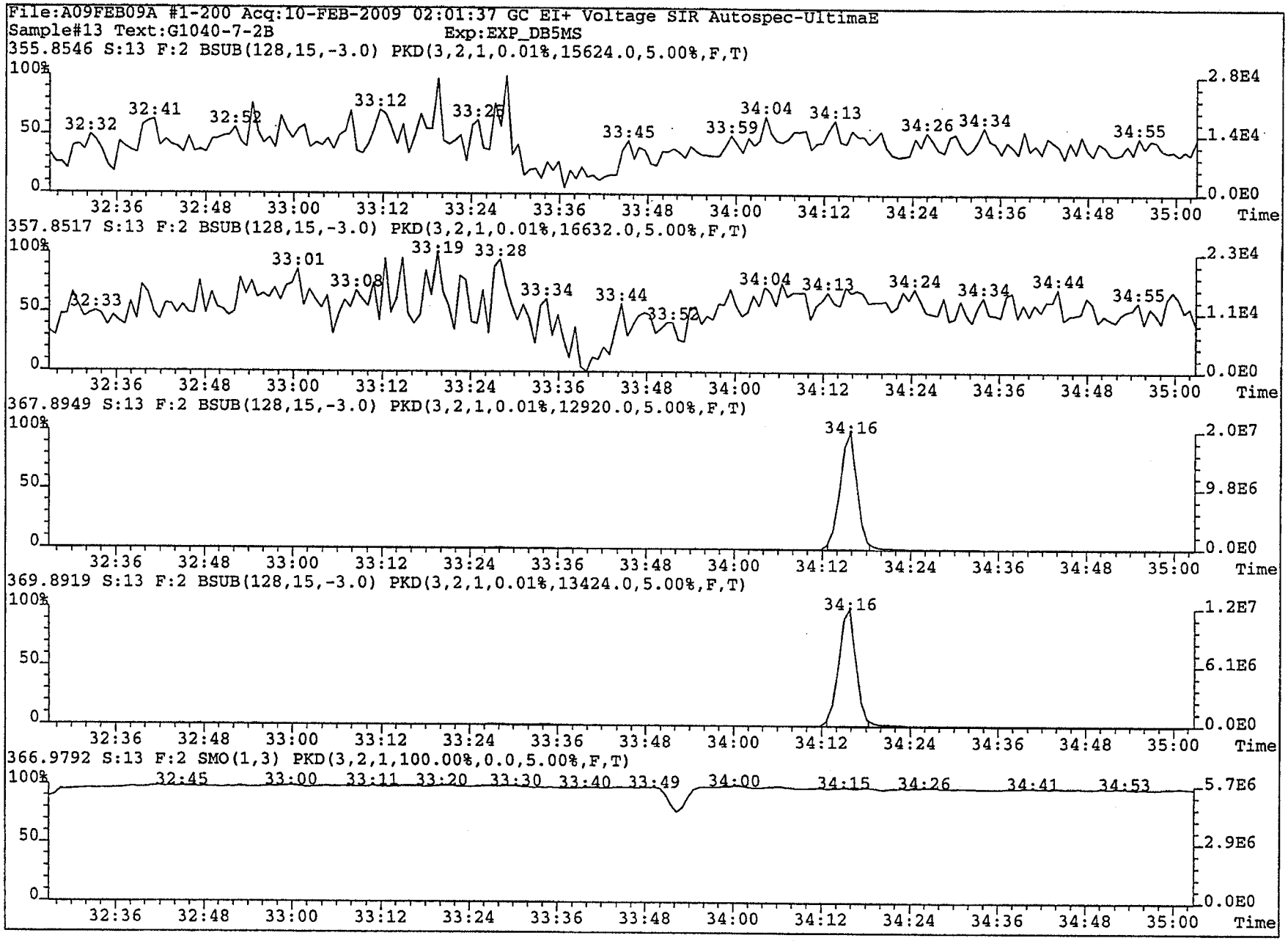
Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?

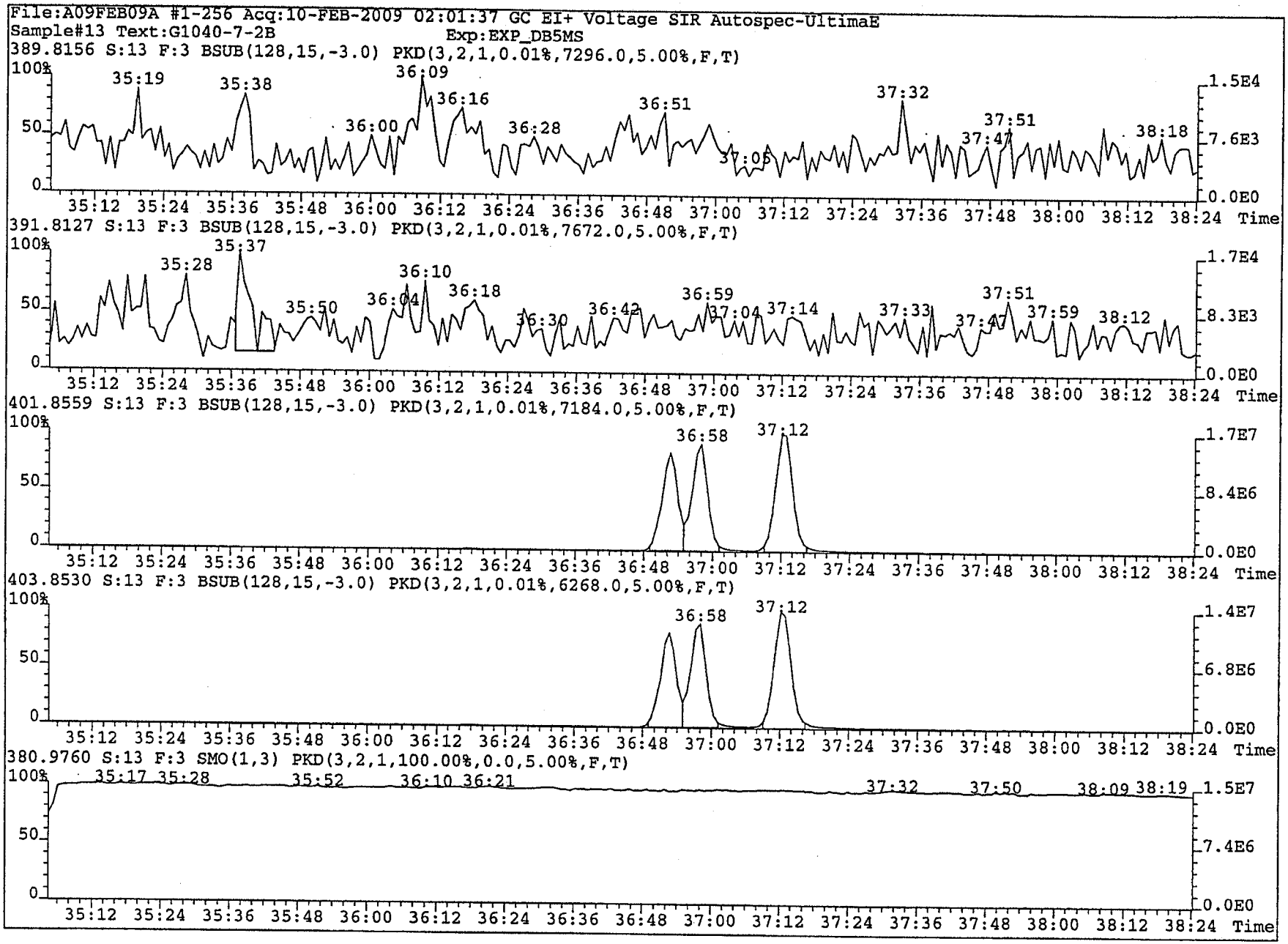
	1	*		*	*	*	n	NotFnd		*		*	n	*	n	n		

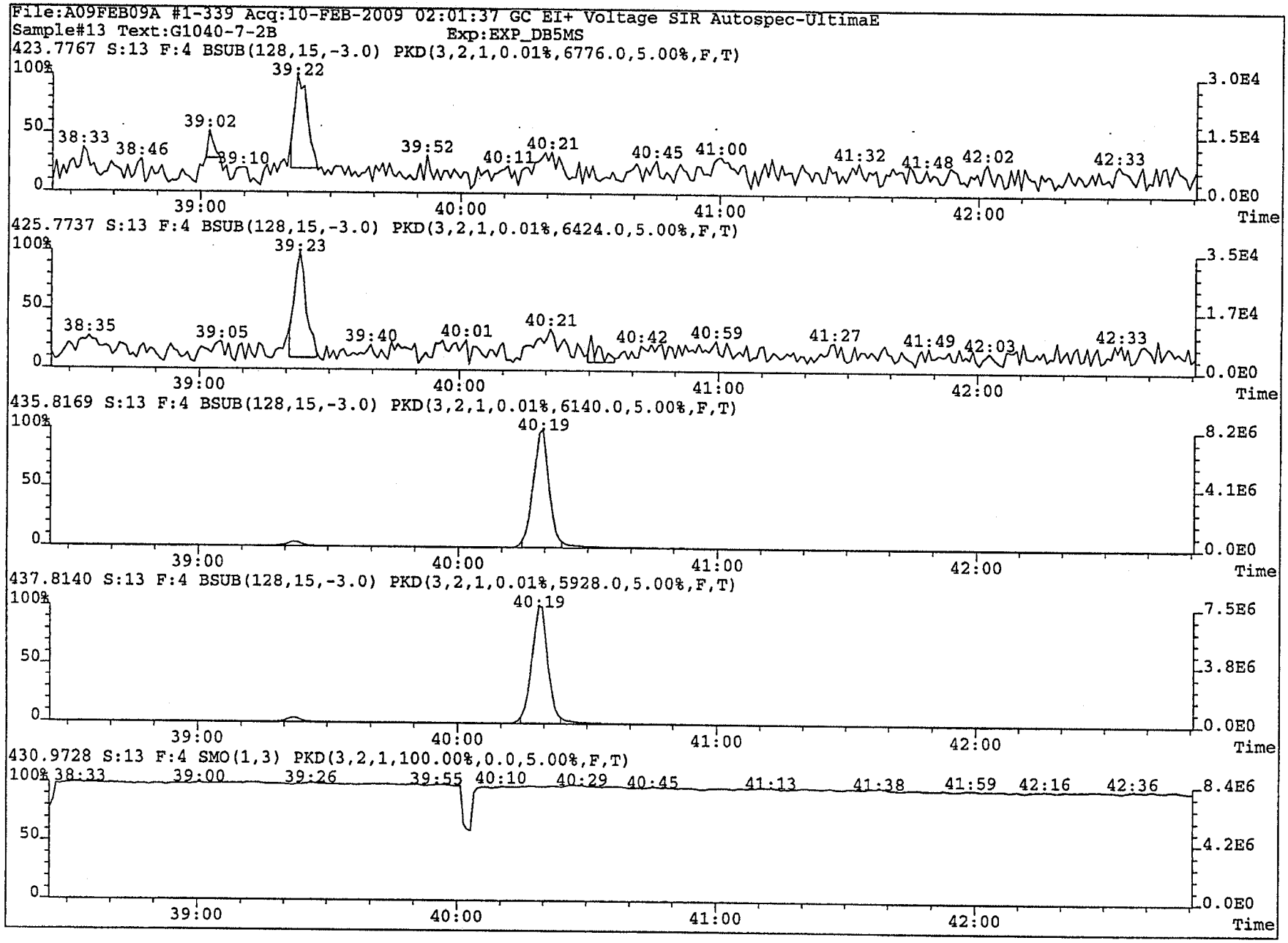
Filename:	a09feb09a		Name of Homolog Group:	Total Hepta-Furans														
Sample:		13	Number of Peaks Found:	1	0													
Acquired:	10-FEB-09 02:01:37		RRF Used For Totals:	1.3693														
Processed:	10-FEB-09 07:35:07		Detection Limit:	0.1658							RL=2.500 (pg/µL)							
Sample ID:	G1040-7-2B		Noise Height Ion1/Ion2:	6812 / 6956														
Cal Table:	m1613-100708a		Begin Window:						38:52:00									
Results Table:	M1613-020909A		End Window:						41:04:00									
Name	#		Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?			
1,2,3,4,6,7,8-HpCDI		1	1.38E+05	78900	58900	1.34	n	39:04	0.121	RL		3.7	y	2.7	n	n		

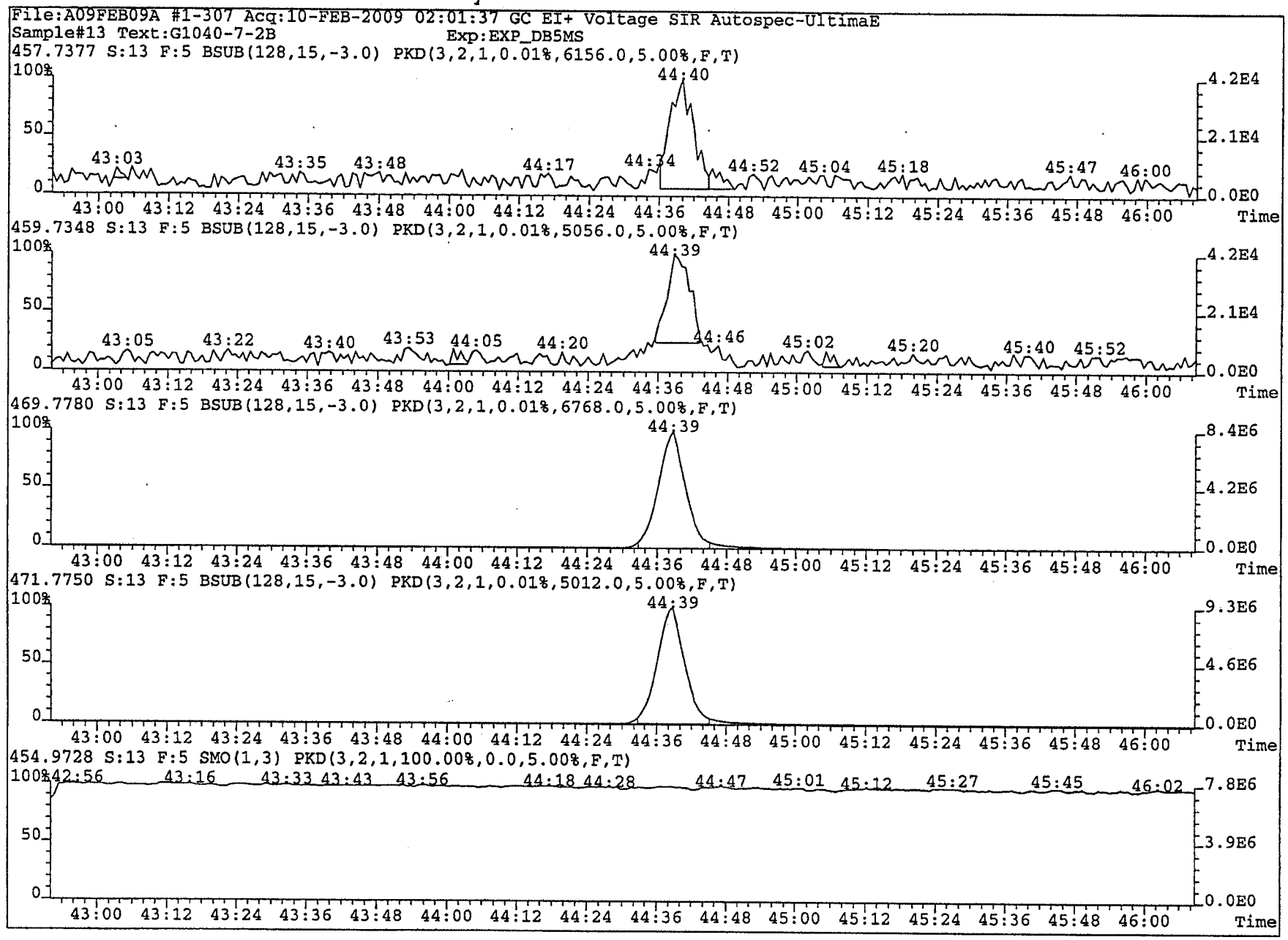
Filename:	a09feb09a		Name of Homolog Group:	Total Hepta-Dioxins														
Sample:		13	Number of Peaks Found:	1	0													
Acquired:	10-FEB-09 02:01:37		RRF Used For Totals:	1.0612														
Processed:	10-FEB-09 07:35:07		Detection Limit:	0.2376							RL=2.500 (pg/µL)							
Sample ID:	G1040-7-2B		Noise Height Ion1/Ion2:	6776 / 6424														
Cal Table:	m1613-100708a		Begin Window:						39:17:00									
Results Table:	M1613-020909A		End Window:						40:29:00									
Name	#		Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?			
		1	1.83E+05	82700	101000	0.82	n	39:23	0.266	RL		3.6	y	4.9	y	n		

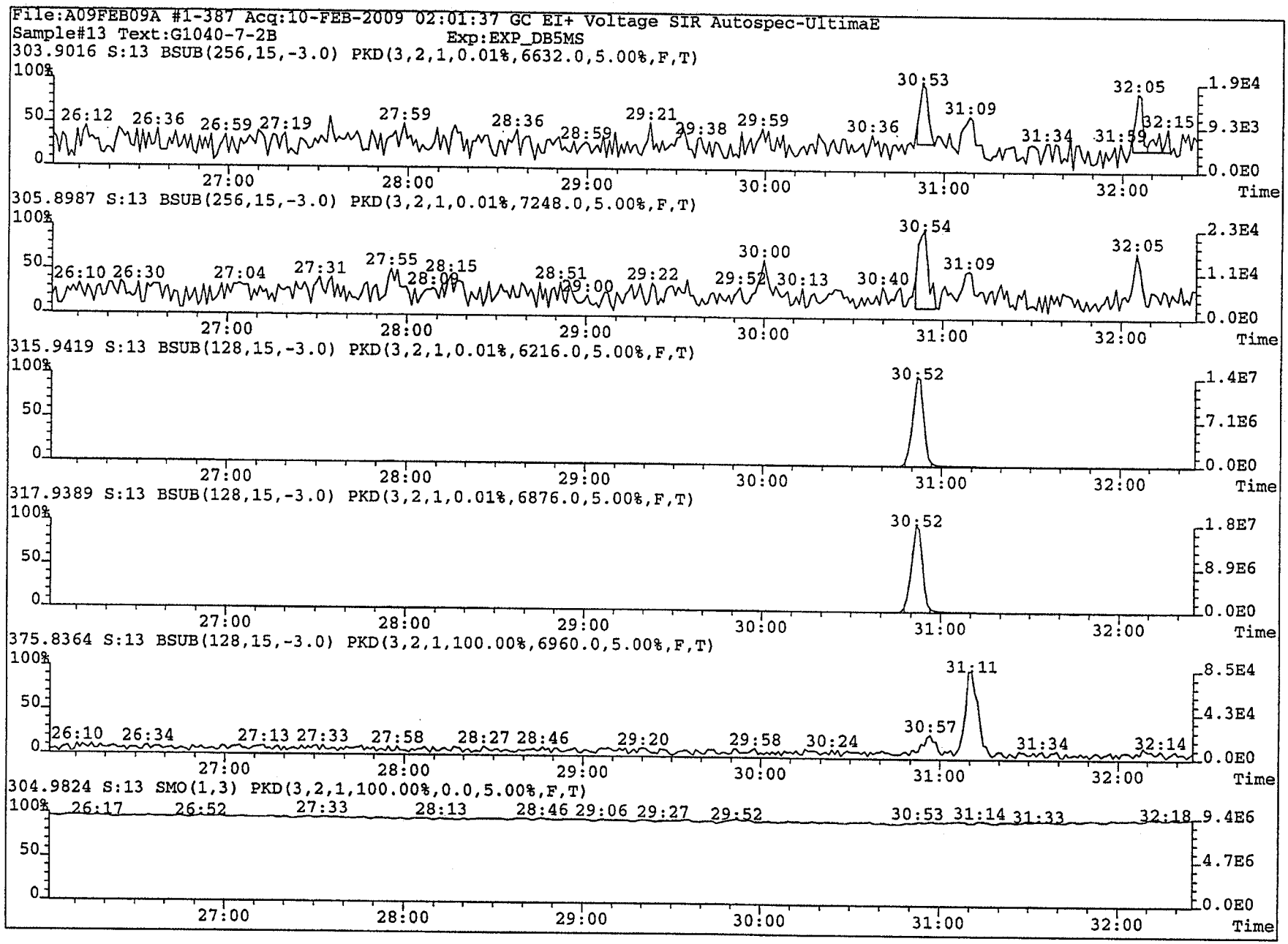

File:A09FEB09A #1-387 Acq:10-FEB-2009 02:01:37 GC EI+ Voltage SIR Autospec-UltimaE
Sample#13 Text:G1040-7-2B
Exp:EXP_DB5MS
319.8965 S:13 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,7184.0,5.00%,F,T)
321.8936 S:13 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,6320.0,5.00%,F,T)
331.9368 S:13 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,8020.0,5.00%,F,T)
333.9339 S:13 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5340.0,5.00%,F,T)
327.8847 S:13 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7860.0,5.00%,F,T)
304.9824 S:13 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time

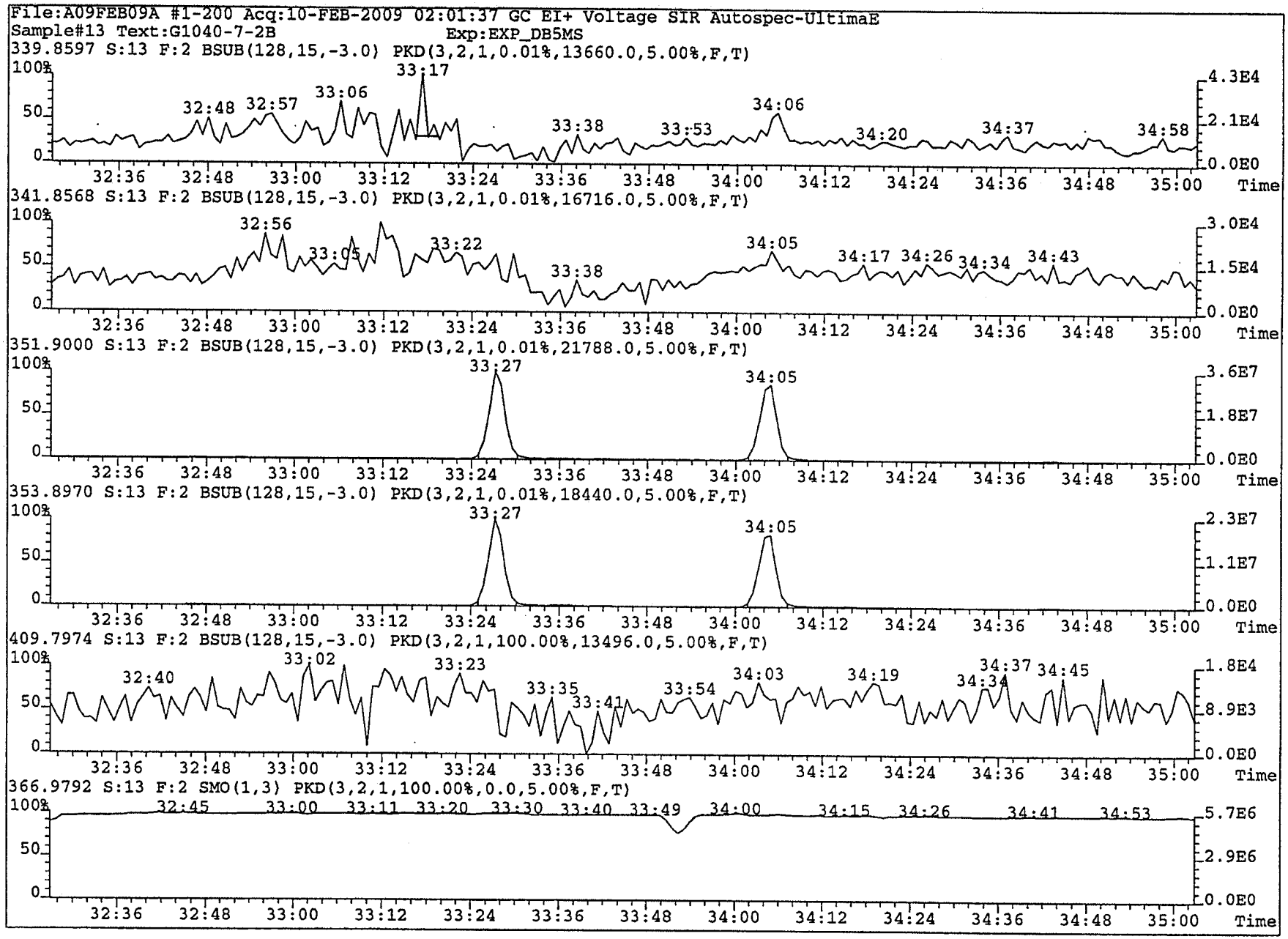

File:A09FEB09A #1-200 Acq:10-FEB-2009 02:01:37 GC EI+ Voltage SIR Autospec-UltimaE
Sample#13 Text:G1040-7-2B Exp:EXP_DB5MS
355.8546 S:13 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,15624.0,5.00%,F,T)
357.8517 S:13 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,16632.0,5.00%,F,T)
367.8949 S:13 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,12920.0,5.00%,F,T)
369.8919 S:13 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,13424.0,5.00%,F,T)
366.9792 S:13 F:2 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time

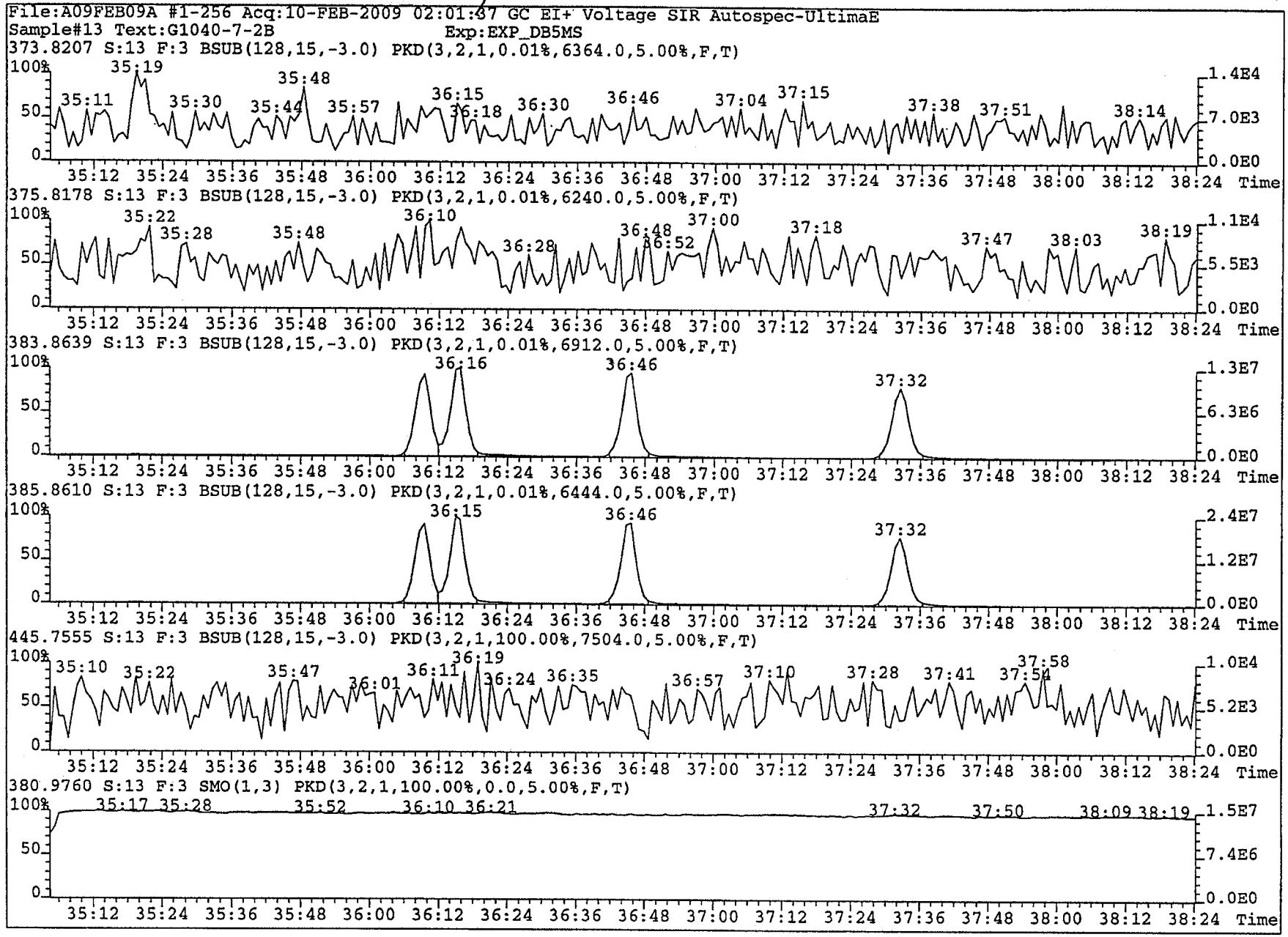

File:A09FEB09A #1-256 Acq:10-FEB-2009 02:01:37 GC EI+ Voltage SIR Autospec-UltimaE
Sample#13 Text:G1040-7-2B
Exp:EXP_DB5MS
389.8156 S:13 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7296.0,5.00%,F,T)
391.8127 S:13 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7672.0,5.00%,F,T)
401.8559 S:13 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7184.0,5.00%,F,T)
403.8530 S:13 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6268.0,5.00%,F,T)
380.9760 S:13 F:3 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time

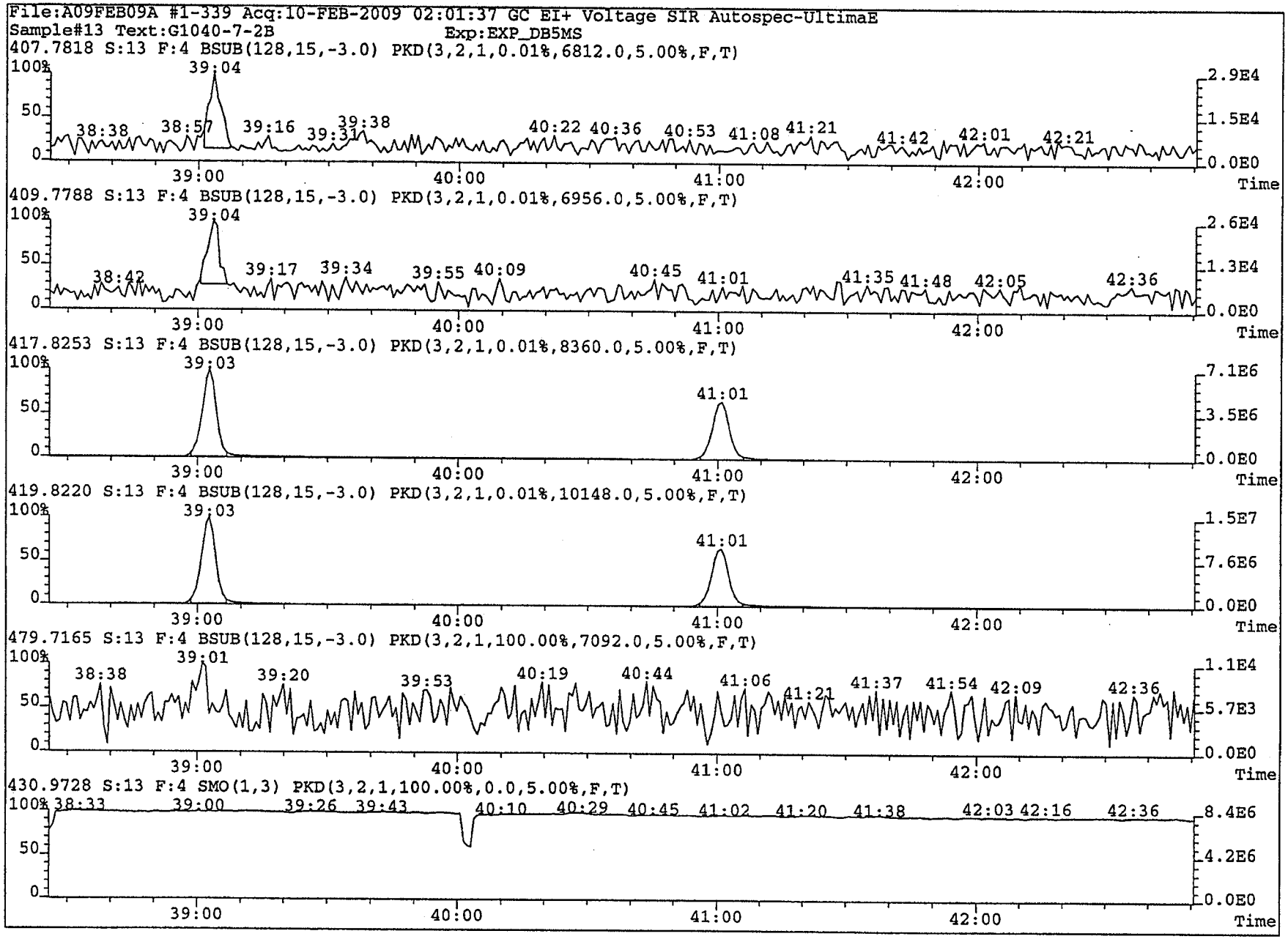

File:A09FEB09A #1-339 Acq:10-FEB-2009 02:01:37 GC EI+ Voltage SIR Autospec-UltimaE
Sample#13 Text:G1040-7-2B Exp:EXP_DB5MS
423.7767 S:13 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6776.0,5.00%,F,T)
425.7737 S:13 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6424.0,5.00%,F,T)
435.8169 S:13 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6140.0,5.00%,F,T)
437.8140 S:13 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5928.0,5.00%,F,T)
430.9728 S:13 F:4 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time

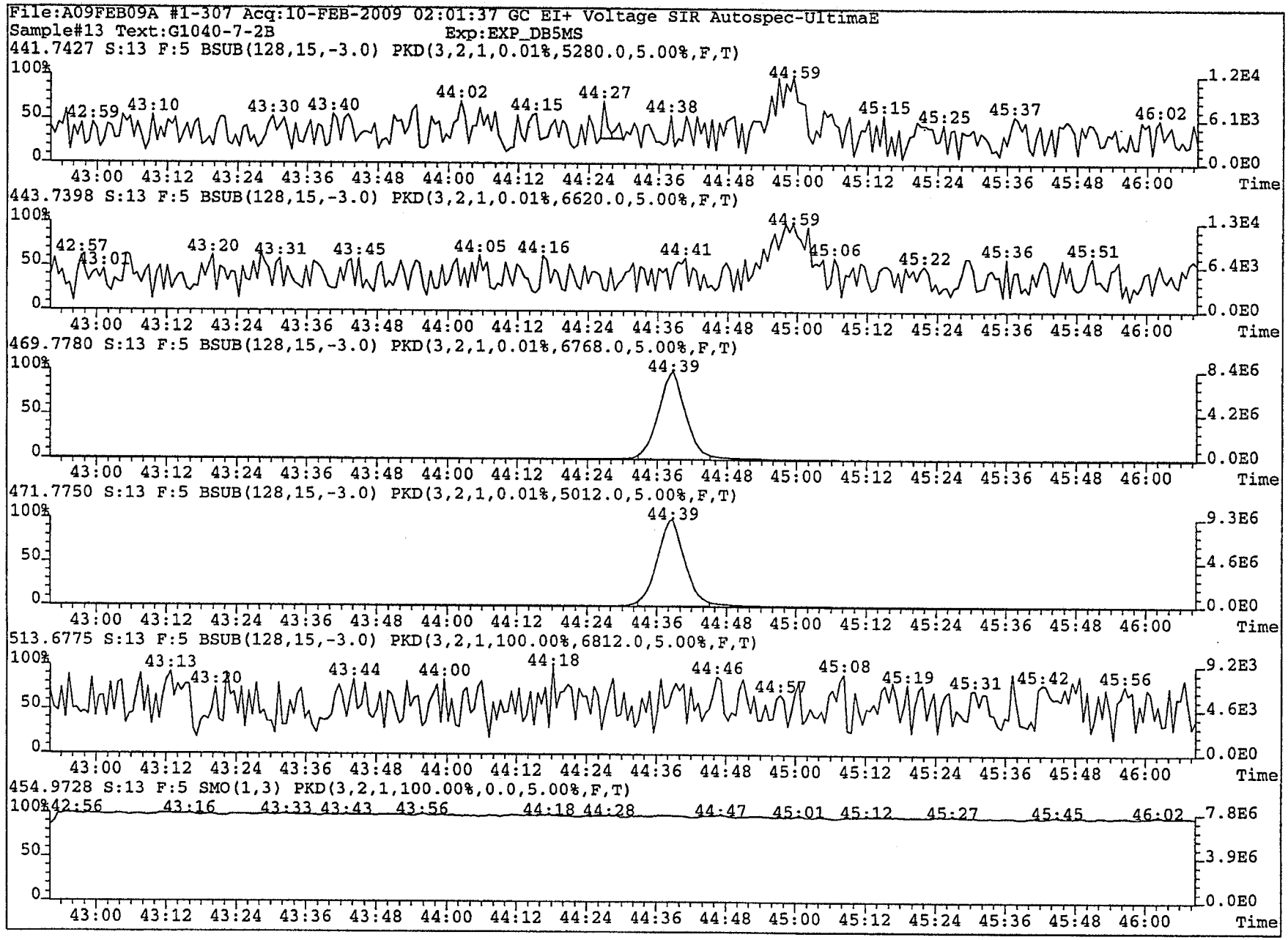

File:A09FEB09A #1-307 Acq:10-FEB-2009 02:01:37 GC EI+ Voltage SIR Autospec-UltimaE
Sample#13 Text:G1040-7-2B Exp:EXP_DB5MS
457.7377 S:13 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6156.0,5.00%,F,T)
459.7348 S:13 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5056.0,5.00%,F,T)
469.7780 S:13 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6768.0,5.00%,F,T)
471.7750 S:13 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5012.0,5.00%,F,T)
454.9728 S:13 F:5 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time

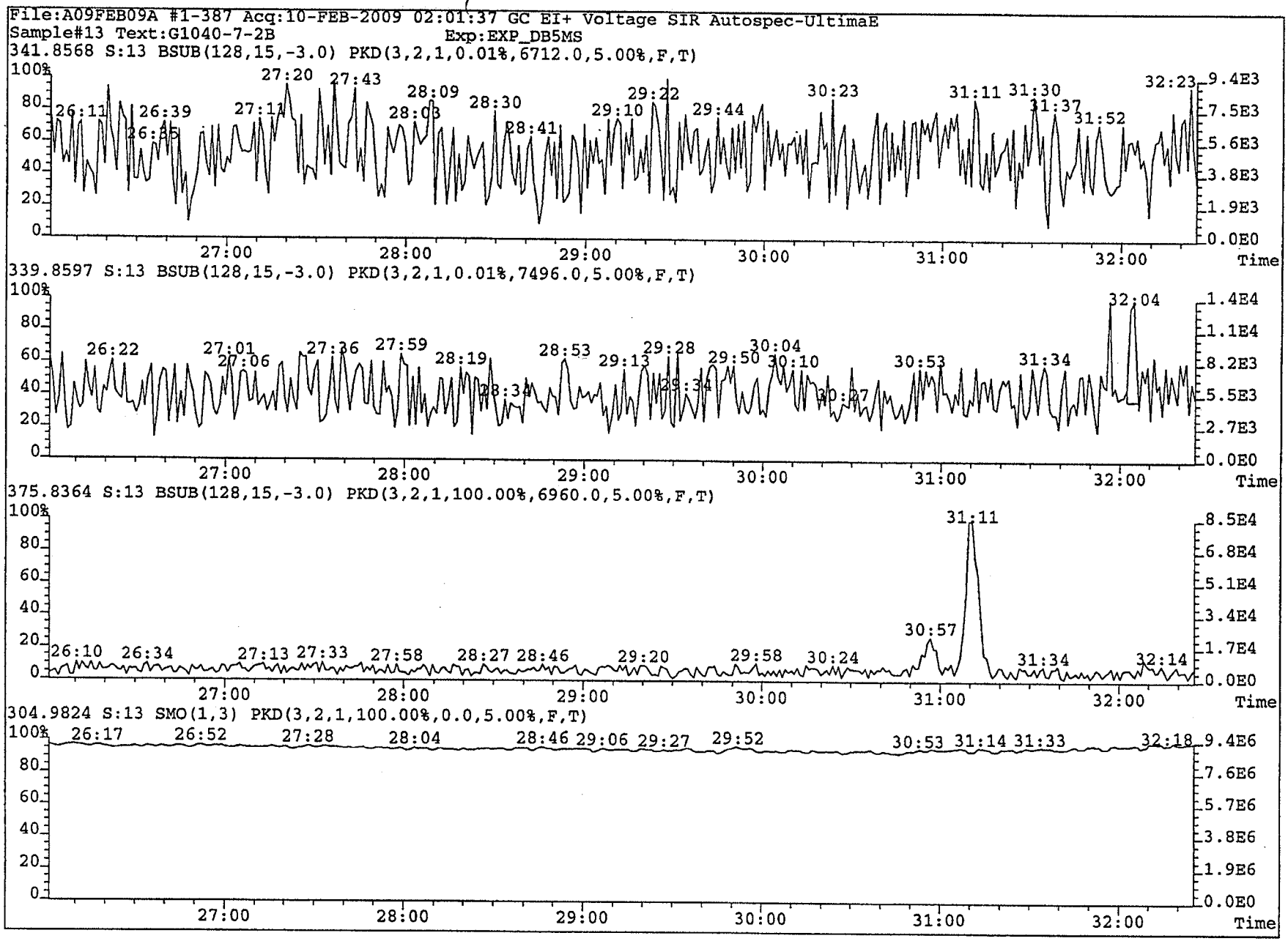

File:A09FEB09A #1-387 Acq:10-FEB-2009 02:01:37 GC EI+ Voltage SIR Autospec-UltimaE
Sample#13 Text:G1040-7-2B Exp:EXP_DB5MS
303.9016 S:13 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,6632.0,5.00%,F,T)
305.8987 S:13 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,7248.0,5.00%,F,T)
315.9419 S:13 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6216.0,5.00%,F,T)
317.9389 S:13 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6876.0,5.00%,F,T)
375.8364 S:13 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,6960.0,5.00%,F,T)
304.9824 S:13 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time


File:A09FEB09A #1-200 Acq:10-FEB-2009 02:01:37 GC EI+ Voltage SIR Autospec-UltimaE
Sample#13 Text:G1040-7-2B Exp:EXP_DB5MS
339.8597 S:13 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,13660.0,5.00%,F,T)
341.8568 S:13 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,16716.0,5.00%,F,T)
351.9000 S:13 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,21788.0,5.00%,F,T)
353.8970 S:13 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,18440.0,5.00%,F,T)
409.7974 S:13 F:2 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,13496.0,5.00%,F,T)
366.9792 S:13 F:2 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time


File:A09FEB09A #1-256 Acq:10-FEB-2009 02:01:37 GC EI+ Voltage SIR Autospec-UltimaE
Sample#13 Text:G1040-7-2B Exp:EXP_DB5MS
373.8207 S:13 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6364.0,5.00%,F,T)
375.8178 S:13 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6240.0,5.00%,F,T)
383.8639 S:13 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6912.0,5.00%,F,T)
385.8610 S:13 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6444.0,5.00%,F,T)
445.7555 S:13 F:3 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,7504.0,5.00%,F,T)
380.9760 S:13 F:3 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time


File:A09FEB09A #1-339 Acq:10-FEB-2009 02:01:37 GC EI+ Voltage SIR Autospec-UltimaE
Sample#13 Text:G1040-7-2B Exp:EXP_DB5MS
407.7818 S:13 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6812.0,5.00%,F,T)
409.7788 S:13 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6956.0,5.00%,F,T)
417.8253 S:13 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,8360.0,5.00%,F,T)
419.8220 S:13 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,10148.0,5.00%,F,T)
479.7165 S:13 F:4 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,7092.0,5.00%,F,T)
430.9728 S:13 F:4 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time


File:A09FEB09A #1-307 Acq:10-FEB-2009 02:01:37 GC EI+ Voltage SIR Autospec-UltimaE
Sample#13 Text:G1040-7-2B Exp:EXP_DB5MS
441.7427 S:13 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5280.0,5.00%,F,T)
443.7398 S:13 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6620.0,5.00%,F,T)
469.7780 S:13 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6768.0,5.00%,F,T)
471.7750 S:13 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5012.0,5.00%,F,T)
513.6775 S:13 F:5 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,6812.0,5.00%,F,T)
454.9728 S:13 F:5 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time


File:A09FEB09A #1-387 Acq:10-FEB-2009 02:01:37 GC EI+ Voltage SIR Autospec-UltimaE
Sample#13 Text:G1040-7-2B Exp:EXP_DB5MS
341.8568 S:13 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6712.0,5.00%,F,T)
339.8597 S:13 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7496.0,5.00%,F,T)
375.8364 S:13 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,6960.0,5.00%,F,T)
304.9824 S:13 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time

Method 1613

GD STATION #3A

Analytical Resources, Inc.

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	RL (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	1.00			
1,2,3,7,8-PeCDD	ND	5.00			
1,2,3,4,7,8-HxCDD	ND	5.00			
1,2,3,6,7,8-HxCDD	ND	5.00			
1,2,3,7,8,9-HxCDD	ND	5.00			
1,2,3,4,6,7,8-HpCDD	ND	5.00			
OCDD	ND	10.0			
2,3,7,8-TCDF	ND	1.00			
1,2,3,7,8-PeCDF	ND	5.00			
2,3,4,7,8-PeCDF	ND	5.00			
1,2,3,4,7,8-HxCDF	ND	5.00			
1,2,3,6,7,8-HxCDF	ND	5.00			
2,3,4,6,7,8-HxCDF	ND	5.00			
1,2,3,7,8,9-HxCDF	ND	5.00			
1,2,3,4,6,7,8-HpCDF	ND	5.00			
1,2,3,4,7,8,9-HpCDF	ND	5.00			
OCDF	ND	10.0			
Total TCDDs	ND	1.00			
Total PeCDDs	ND	5.00			
Total HxCDDs	ND	5.00			
Total HpCDDs	ND	5.00			
Total TCDFs	ND	1.00			
Total PeCDFs	ND	5.00			
Total HxCDFs	ND	5.00			
Total HpCDFs	ND	5.00			
WHO-2005 TEQ (ND=0)	0.000				
WHO-2005 TEQ (ND=½)	5.70				

Client Information

Project Name:	OG88
Sample ID:	GD STATION #3A

Laboratory Information

Project ID:	G1040-7	
Sample ID:	G1040-7-3B	
Collection Date:	16-Dec-08	
Receipt Date:	15-Jan-09	10:15
Extraction Date:	01-Feb-09	
Analysis Date:	10-Feb-09	2:49

Sample Information

Matrix:	Tissue	
Weight / Volume:	11.09	grams
Solids / Lipids:	NA	
Original pH :	NA	
Batch ID:	WG16457	
Filename:	a09feb09a-14	
Retchk:	a09feb09a-1	
Begin ConCal:	a09feb09a-1	
Initial Cal:	m1613-100708a	

Method 1613

GD STATION #3A

Analytical Resources, Inc.

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
$^{13}C_{12}$-2,3,7,8-TCDD	2	1.63	81.7	31:27	0.79	
$^{13}C_{12}$-1,2,3,7,8-PeCDD	2	2.00	99.8	34:16	1.58	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	2	1.62	81.2	36:52	1.28	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	2	1.65	82.3	36:58	1.27	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	2	1.68	84.1	40:19	1.06	
$^{13}C_{12}$-OCDD	4	2.85	71.2	44:39	0.90	
$^{13}C_{12}$-2,3,7,8-TCDF	2	1.66	83.1	30:52	0.79	
$^{13}C_{12}$-1,2,3,7,8-PeCDF	2	2.08	104	33:27	1.60	
$^{13}C_{12}$-2,3,4,7,8-PeCDF	2	2.00	100	34:04	1.58	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	2	1.71	85.3	36:09	0.54	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	2	1.72	86.0	36:15	0.51	
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	2	1.70	84.8	36:45	0.52	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	2	1.65	82.3	37:32	0.53	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	2	1.62	81.2	39:03	0.45	
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	2	1.69	84.7	41:01	0.45	
Cleanup Standard						
$^{37}Cl_4$-2,3,7,8-TCDD	0.4	0.336	84.0	31:28		
Injection Standards						
$^{13}C_{12}$-1,2,3,4-TCDD	2			31:00	0.79	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	2			37:13	1.25	

Client Information

Project Name: OG88

Sample ID: GD STATION #3A

Laboratory Information

Project ID: G1040-7
Sample ID: G1040-7-3B
Collection Date: 16-Dec-08
Receipt Date: 15-Jan-09 10:15
Extraction Date: 01-Feb-09
Analysis Date: 10-Feb-09 2:49

Analyzed by: JWD
Date: 2/17/09

Sample Information

Matrix: Tissue
Weight / Volume: 11.09 grams
Solids / Lipids: NA %
Original pH : NA
Batch ID: WG16457

Filename: a09feb09a-14
Retchk: a09feb09a-1
Begin ConCal: a09feb09a-1

Initial Cal: m1613-100708a

Reviewed by: TM
Date: 02/17/09

Form Version:[1613_HRMS12]Repor

;*1613*

Filename ; a09feb09a
Sample ; 14
Acquired ; 10-FEB-09 02:49:56
Processed ; 10-FEB-09 07:35:32
Sample ID ; G1040-7-3B
Cal Table ; m1613-100708a
Results Table ; M1613-020909A
Comments ;

Ent;	Name;	Resp;	Ion 1;	Ion 2;	RA;?;	RT;	Conc;	EDL;	S/N1;?;	S/N2;?;M;	Signal1;	Noise 1;	Signal2;	Noise 2
1 ;	2,3,7,8-TCDD;	*;	*;	*;	*;n;	NotFnd;	*;	0.1273;	*;n;	*;n;n;	*;	5.88e+03;	*;	4.25e+03
2 ;	1,2,3,7,8-PeCDD;	*;	*;	*;	*;n;	NotFnd;	*;	0.1807;	*;n;	*;n;n;	*;	8.39e+03;	*;	7.10e+03
3 ;	1,2,3,4,7,8-HxCDD;	*;	*;	*;	*;n;	NotFnd;	*;	0.2129;	*;n;	*;n;n;	*;	7.07e+03;	*;	6.74e+03
4 ;	1,2,3,6,7,8-HxCDD;	*;	*;	*;	*;n;	NotFnd;	*;	0.2221;	*;n;	*;n;n;	*;	7.07e+03;	*;	6.74e+03
5 ;	1,2,3,7,8,9-HxCDD;	*;	*;	*;	*;n;	NotFnd;	*;	0.2191;	*;n;	*;n;n;	*;	7.07e+03;	*;	6.74e+03
6 ;	1,2,3,4,6,7,8-HpCDD;	*;	*;	*;	*;n;	NotFnd;	*;	0.3640;	*;n;	*;n;n;	*;	7.97e+03;	*;	6.77e+03
7 ;	OCDD;	3.09e+04;	1.20e+04;	1.88e+04;	0.64;n;	44:39;	0.092;	0.6707;	1;n;	2;n;n;	8.99e+03;	7.13e+03;	1.53e+04;	7.50e+03
8 ;	2,3,7,8-TCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.1581;	*;n;	*;n;n;	*;	7.39e+03;	*;	7.03e+03
9 ;	1,2,3,7,8-PeCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.0948;	*;n;	*;n;n;	*;	7.20e+03;	*;	6.83e+03
10 ;	2,3,4,7,8-PeCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.1057;	*;n;	*;n;n;	*;	7.20e+03;	*;	6.83e+03
11 ;	1,2,3,4,7,8-HxCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.1356;	*;n;	*;n;n;	*;	7.12e+03;	*;	5.89e+03
12 ;	1,2,3,6,7,8-HxCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.1312;	*;n;	*;n;n;	*;	7.12e+03;	*;	5.89e+03
13 ;	2,3,4,6,7,8-HxCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.1390;	*;n;	*;n;n;	*;	7.12e+03;	*;	5.89e+03
14 ;	1,2,3,7,8,9-HxCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.1792;	*;n;	*;n;n;	*;	7.12e+03;	*;	5.89e+03
15 ;	1,2,3,4,6,7,8-HpCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.2098;	*;n;	*;n;n;	*;	6.04e+03;	*;	8.32e+03
16 ;	1,2,3,4,7,8,9-HpCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.3168;	*;n;	*;n;n;	*;	6.04e+03;	*;	8.32e+03
17 ;	OCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.5762;	*;n;	*;n;n;	*;	7.38e+03;	*;	7.55e+03
Extraction Standards														
18 ;	13C-2,3,7,8-TCDD;	7.12e+07;	3.14e+07;	3.98e+07;	0.79;y;	31:27;	81.656;	0.1755;	1412;y;	2067;y;n;	1.04e+07;	7.38e+03;	1.33e+07;	6.41e+03
19 ;	13C-1,2,3,7,8-PeCDD;	6.36e+07;	3.89e+07;	2.47e+07;	1.58;y;	34:16;	99.750;	0.3026;	2265;y;	880;y;n;	1.50e+07;	6.61e+03;	9.48e+06;	1.08e+04
20 ;	13C-1,2,3,4,7,8-HxCDD;	5.49e+07;	3.09e+07;	2.40e+07;	1.28;y;	36:52;	81.179;	0.2434;	1189;y;	1086;y;n;	1.06e+07;	8.94e+03;	8.24e+06;	7.59e+03
21 ;	13C-1,2,3,6,7,8-HxCDD;	6.05e+07;	3.38e+07;	2.66e+07;	1.27;y;	36:58;	82.279;	0.2240;	1181;y;	1087;y;n;	1.06e+07;	8.94e+03;	8.26e+06;	7.59e+03
22 ;	13C-1,2,3,4,6,7,8-HpCDD;	4.66e+07;	2.39e+07;	2.27e+07;	1.06;y;	40:19;	84.108;	0.2751;	855;y;	660;y;n;	5.86e+06;	6.85e+03;	5.59e+06;	8.47e+03
23 ;	13C-OCDD;	6.28e+07;	2.97e+07;	3.31e+07;	0.90;y;	44:39;	142.468;	0.2802;	910;y;	1076;y;n;	5.88e+06;	6.46e+03;	6.41e+06;	5.96e+03
24 ;	13C-2,3,7,8-TCDF;	1.07e+08;	4.74e+07;	5.98e+07;	0.79;y;	30:52;	83.043;	0.1068;	1956;y;	2275;y;n;	1.18e+07;	6.01e+03;	1.46e+07;	6.42e+03
25 ;	13C-1,2,3,7,8-PeCDF;	1.08e+08;	6.67e+07;	4.17e+07;	1.60;y;	33:27;	103.862;	0.3405;	1341;y;	1512;y;n;	2.75e+07;	2.05e+04;	1.74e+07;	1.15e+04
26 ;	13C-2,3,4,7,8-PeCDF;	1.02e+08;	6.27e+07;	3.96e+07;	1.58;y;	34:04;	100.034;	0.3478;	1126;y;	1314;y;n;	2.31e+07;	2.05e+04;	1.51e+07;	1.15e+04
27 ;	13C-1,2,3,4,7,8-HxCDF;	7.45e+07;	2.60e+07;	4.84e+07;	0.54;y;	36:09;	85.292;	0.2034;	903;y;	1974;y;n;	8.62e+06;	9.56e+03;	1.63e+07;	8.28e+03
28 ;	13C-1,2,3,6,7,8-HxCDF;	8.28e+07;	2.80e+07;	5.48e+07;	0.51;y;	36:15;	85.937;	0.1842;	942;y;	2076;y;n;	9.00e+06;	9.56e+03;	1.72e+07;	8.28e+03
29 ;	13C-2,3,4,6,7,8-HxCDF;	7.68e+07;	2.63e+07;	5.05e+07;	0.52;y;	36:45;	84.785;	0.1959;	890;y;	1964;y;n;	8.51e+06;	9.56e+03;	1.63e+07;	8.28e+03
30 ;	13C-1,2,3,7,8,9-HxCDF;	6.64e+07;	2.29e+07;	4.35e+07;	0.53;y;	37:32;	82.254;	0.2199;	719;y;	1553;y;n;	6.87e+06;	9.56e+03;	1.29e+07;	8.28e+03
31 ;	13C-1,2,3,4,6,7,8-HpCDF;	5.62e+07;	1.75e+07;	3.87e+07;	0.45;y;	39:03;	81.190;	0.2576;	617;y;	993;y;n;	4.66e+06;	7.56e+03;	1.03e+07;	1.03e+04
32 ;	13C-1,2,3,4,7,8,9-HpCDF;	4.61e+07;	1.43e+07;	3.18e+07;	0.45;y;	41:01;	84.656;	0.3270;	413;y;	663;y;n;	3.12e+06;	7.56e+03;	6.85e+06;	1.03e+04
Injection Standards														
33 ;	13C-1,2,3,4-TCDD;	7.81e+07;	3.45e+07;	4.37e+07;	0.79;y;	31:00;	57.503;	-;	1267;y;	1836;y;n;	9.35e+06;	7.38e+03;	1.18e+07;	6.41e+03
34 ;	13C-1,2,3,7,8,9-HxCDD;	7.04e+07;	3.92e+07;	3.12e+07;	1.25;y;	37:13;	65.182;	-;	1339;y;	1221;y;n;	1.20e+07;	8.94e+03;	9.27e+06;	7.59e+03
Cleanup Standard														
35 ;	37Cl-2,3,7,8-TCDD;	1.56e+07;	1.56e+07;	-;	-;-;	31:28;	16.810;	0.0725;	808;y;	-;-;n;	4.90e+06;	6.07e+03;	-;	-

Totals Raw Data

	Conc	Empc	Flags
TCDF	0	0	FALSE
TCDD	0	0	FALSE
PeCDF	0	0	FALSE
PeCDD	0	0	FALSE
HxCDF	0	0	FALSE
HxCDD	0	0	FALSE
HpCDF	0	0	FALSE
HpCDD	0	0	FALSE

Filename:	a09feb09a	Name of Homolog Group:	Total Tetra-Furans		
Sample:	14	Number of Peaks Found:	1	0	
Acquired:	10-FEB-09 02:49:56	RRF Used For Totals:	1.0368		
Processed:	10-FEB-09 07:35:32	Detection Limit:	0.1581		RL=0.500 (pg/µL)
Sample ID:	G1040-7-3B	Noise Height Ion1/Ion2:	7388 / 7028		
Cal Table:	m1613-100708a	Begin Window:		26:14:00	
Results Table:	M1613-020909A	End Window:		33:07:00	

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	5.51E+04	23400	31700	0.74	y	32:06	0.05	S2N		1.2 n		1.4 n	n

Filename:	a09feb09a	Name of Homolog Group:	Total Tetra-Dioxins		
Sample:	14	Number of Peaks Found:	0		
Acquired:	10-FEB-09 02:49:56	RRF Used For Totals:	1.0087		
Processed:	10-FEB-09 07:35:32	Detection Limit:	0.1273		
Sample ID:	G1040-7-3B	Noise Height Ion1/Ion2:	5880 / 4252		
Cal Table:	m1613-100708a	Begin Window:			
Results Table:	M1613-020909A	End Window:			

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	*	*	*	*	n	NotFnd	*		*	n	*	n	n

Filename:	a09feb09a	Name of Homolog Group:	Total Penta-Furans Fn1		
Sample:	14	Number of Peaks Found:	0		
Acquired:	10-FEB-09 02:49:56	RRF Used For Totals:	1.0121		
Processed:	10-FEB-09 07:35:32	Detection Limit:	0.1002		
Sample ID:	G1040-7-3B	Noise Height Ion1/Ion2:	7212 / 6824		
Cal Table:	m1613-100708a	Begin Window:			
Results Table:	M1613-020909A	End Window:			

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	*	*	*	*	n	NotFnd	*		*	n	*	n	n

Totals Raw Data

Filename:	a09feb09a	Name of Homolog Group:	Total Penta-Furans Fn2
Sample:	14	Number of Peaks Found:	0
Acquired:	10-FEB-09 02:49:56	RRF Used For Totals:	1.0121
Processed:	10-FEB-09 07:35:32	Detection Limit:	0.1002
Sample ID:	G1040-7-3B	Noise Height Ion1/Ion2:	7200 / 6832
Cal Table:	m1613-100708a	Begin Window:	
Results Table:	M1613-020909A	End Window:	

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	*	*	*	*	n	NotFnd	*		*	n	*	n	n

Filename:	a09feb09a	Name of Homolog Group:	Total Penta-Dioxins
Sample:	14	Number of Peaks Found:	0
Acquired:	10-FEB-09 02:49:56	RRF Used For Totals:	1.0517
Processed:	10-FEB-09 07:35:32	Detection Limit:	0.1807
Sample ID:	G1040-7-3B	Noise Height Ion1/Ion2:	8392 / 7096
Cal Table:	m1613-100708a	Begin Window:	
Results Table:	M1613-020909A	End Window:	

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	*	*	*	*	n	NotFnd	*		*	n	*	n	n

Filename:	a09feb09a	Name of Homolog Group:	Total Hexa-Furans
Sample:	14	Number of Peaks Found:	0
Acquired:	10-FEB-09 02:49:56	RRF Used For Totals:	1.1305
Processed:	10-FEB-09 07:35:32	Detection Limit:	0.1447
Sample ID:	G1040-7-3B	Noise Height Ion1/Ion2:	7116 / 5892
Cal Table:	m1613-100708a	Begin Window:	
Results Table:	M1613-020909A	End Window:	

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	*	*	*	*	n	NotFnd	*		*	n	*	n	n

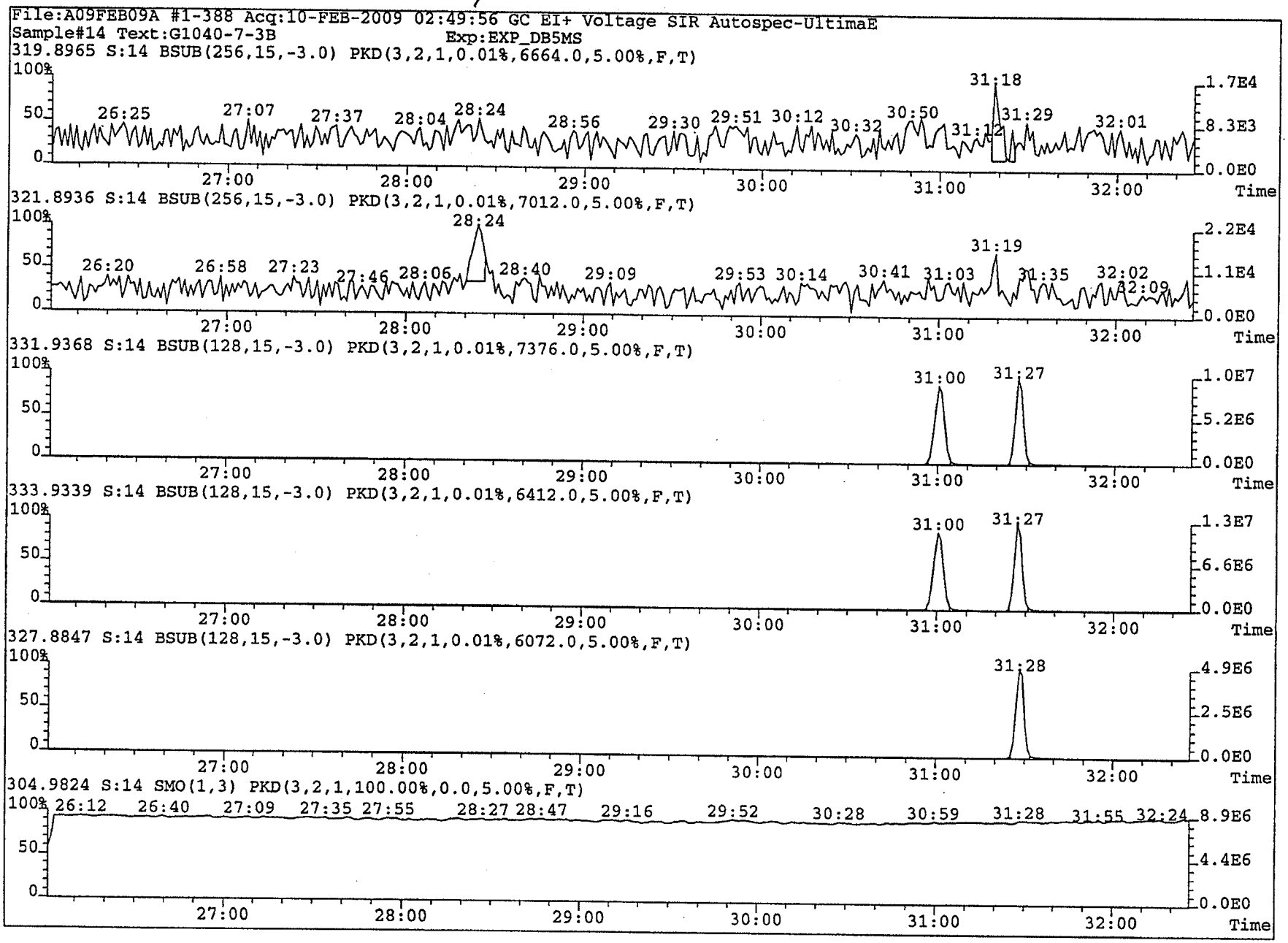
Filename:	a09feb09a	Name of Homolog Group:	Total Hexa-Dioxins
Sample:	14	Number of Peaks Found:	0
Acquired:	10-FEB-09 02:49:56	RRF Used For Totals:	1.0077
Processed:	10-FEB-09 07:35:32	Detection Limit:	0.2182
Sample ID:	G1040-7-3B	Noise Height Ion1/Ion2:	7072 / 6736
Cal Table:	m1613-100708a	Begin Window:	
Results Table:	M1613-020909A	End Window:	

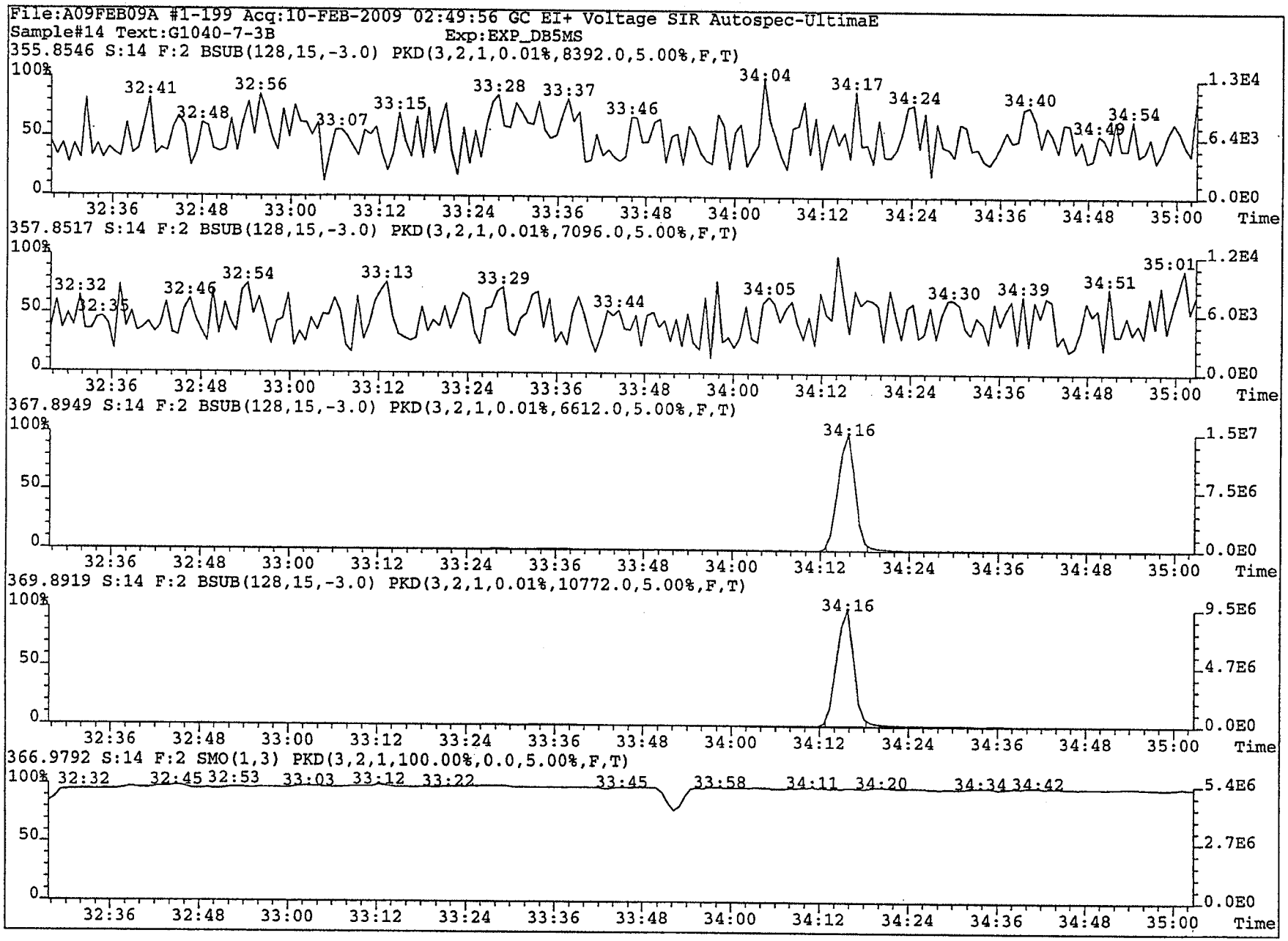
Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?

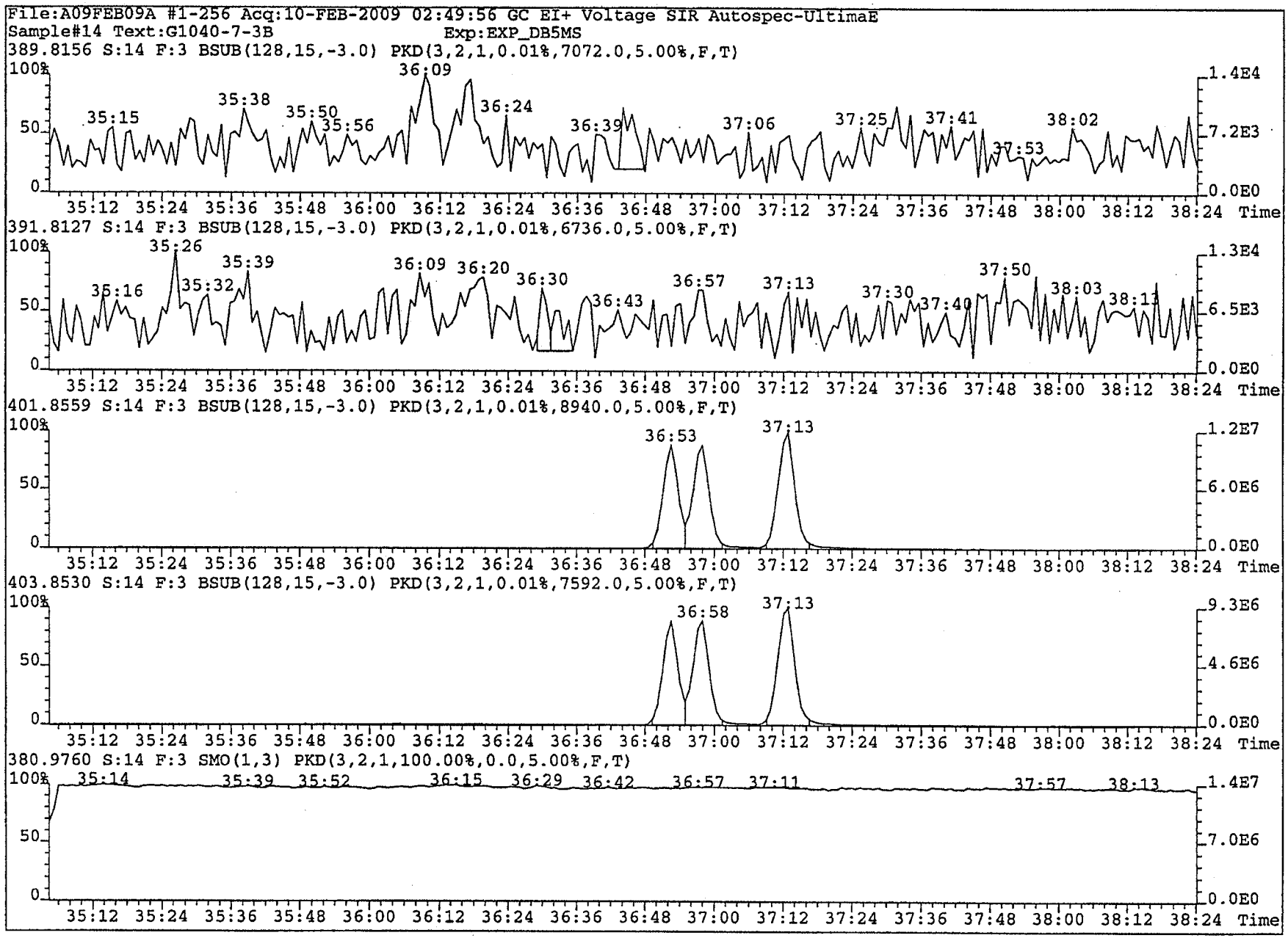
		1	*		*	*	*	n	NotFnd	*		*	n	*	n	n

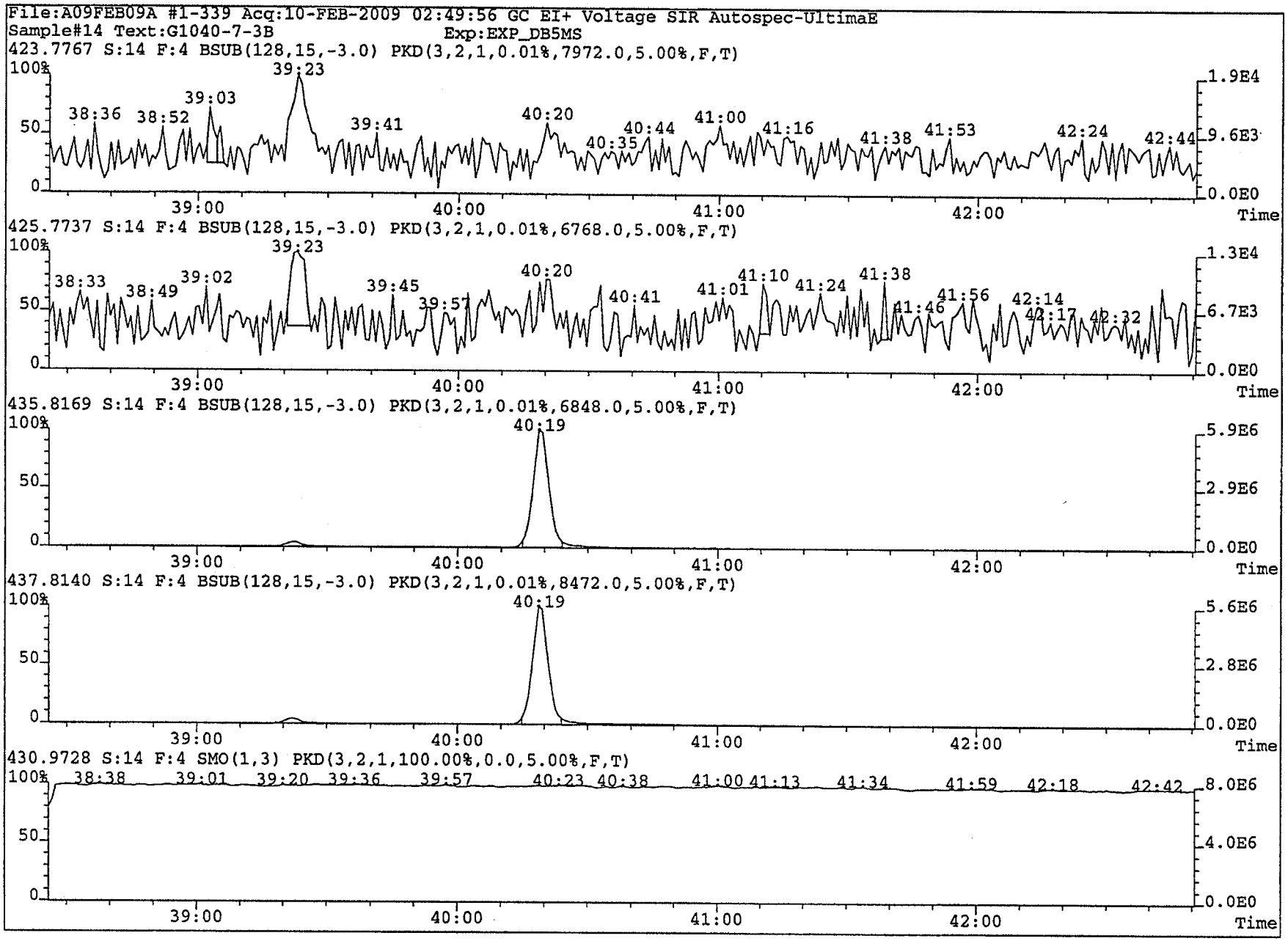
Filename:	a09feb09a		Name of Homolog Group:	Total Hepta-Furans											
Sample:		14	Number of Peaks Found:	0											
Acquired:	10-FEB-09 02:49:56		RRF Used For Totals:	1.3693											
Processed:	10-FEB-09 07:35:32		Detection Limit:	0.2578											
Sample ID:	G1040-7-3B		Noise Height Ion1/Ion2:	6044 / 8324											
Cal Table:	m1613-100708a		Begin Window:												
Results Table:	M1613-020909A		End Window:												
Name	#		Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
		1	*	*	*	*	n	NotFnd	*		*	n	*	n	n

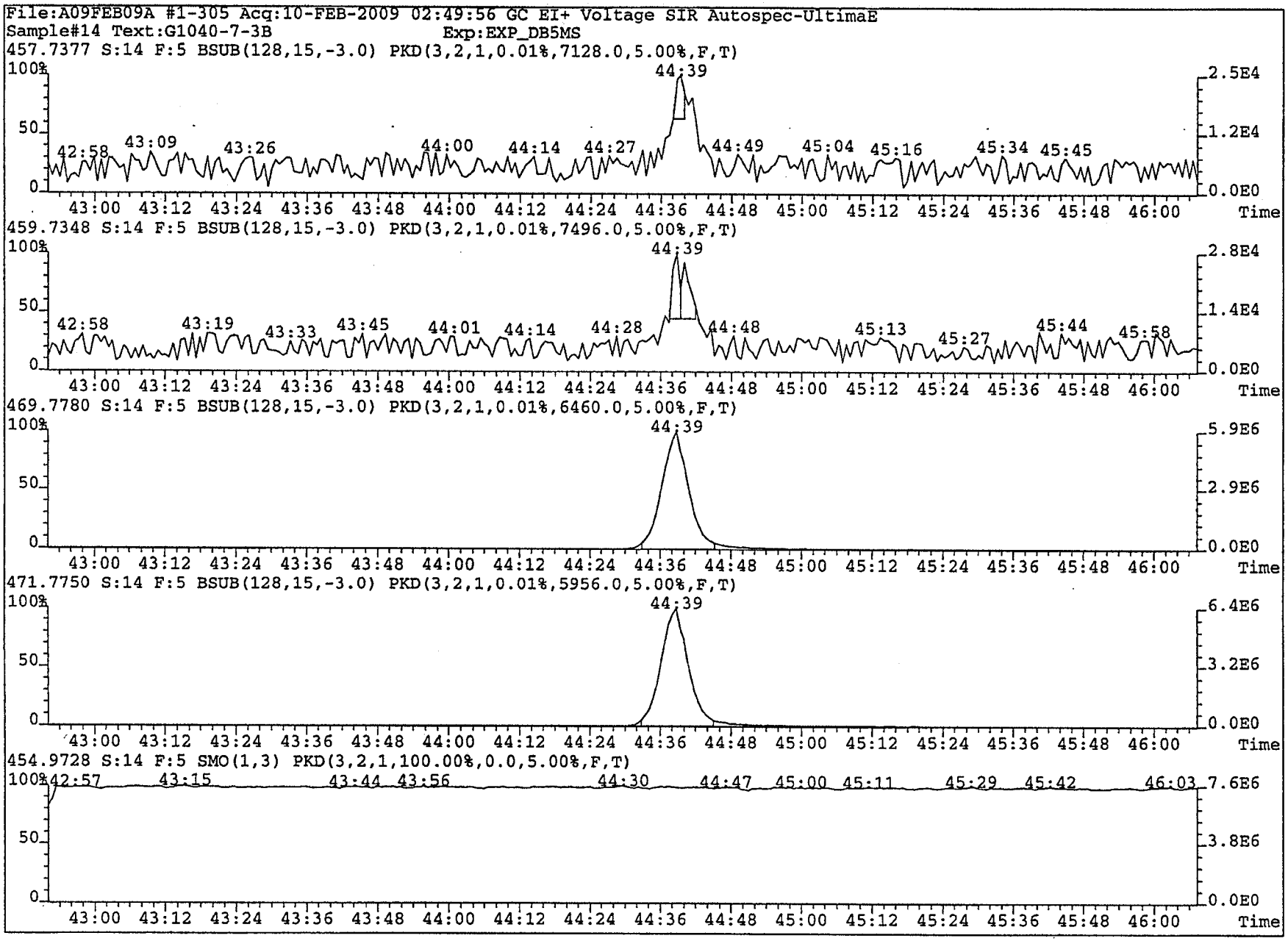
Filename:	a09feb09a		Name of Homolog Group:	Total Hepta-Dioxins											
Sample:		14	Number of Peaks Found:	0											
Acquired:	10-FEB-09 02:49:56		RRF Used For Totals:	1.0612											
Processed:	10-FEB-09 07:35:32		Detection Limit:	0.364											
Sample ID:	G1040-7-3B		Noise Height Ion1/Ion2:	7972 / 6768											
Cal Table:	m1613-100708a		Begin Window:												
Results Table:	M1613-020909A		End Window:												
Name	#		Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?

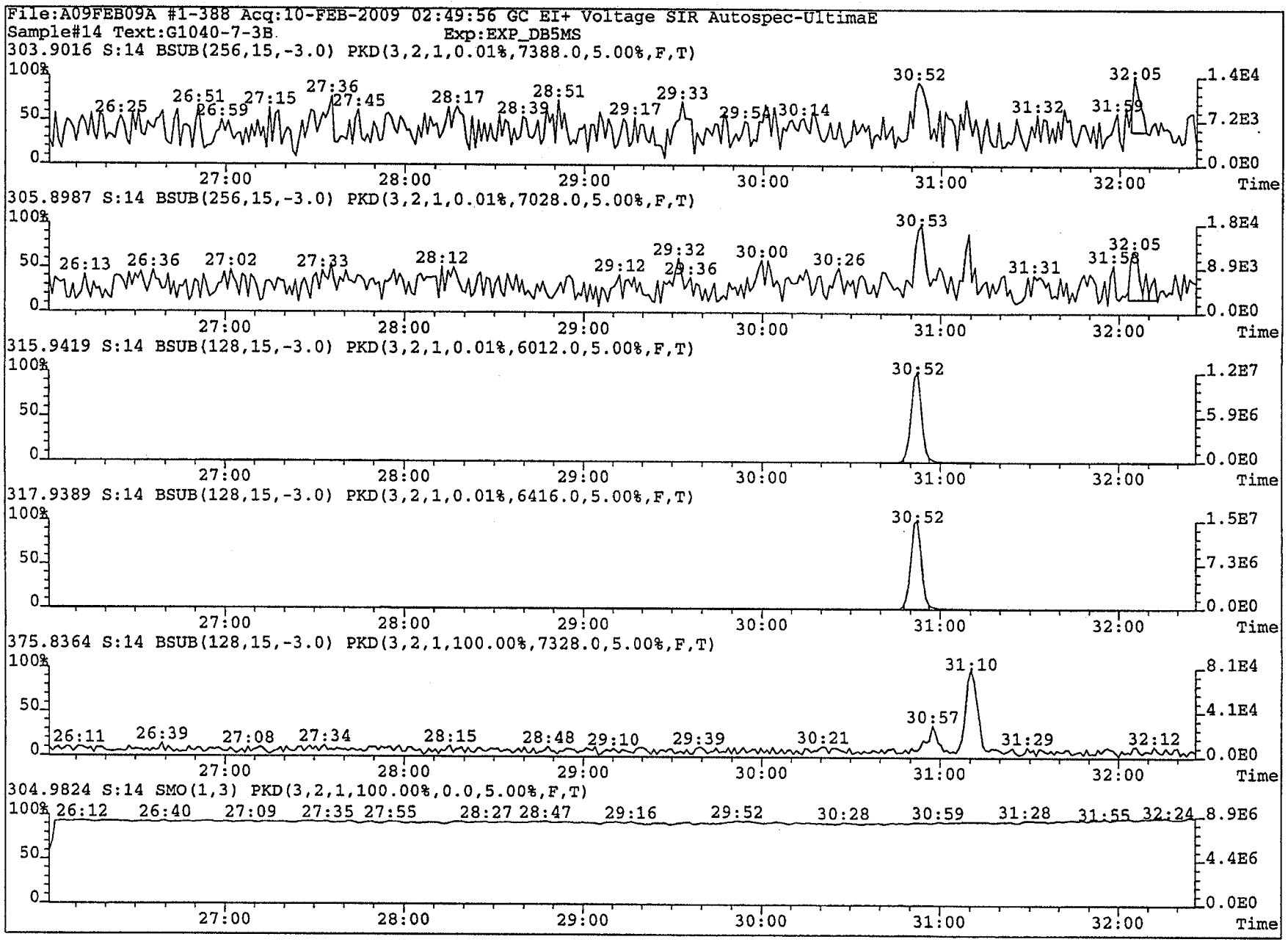

File:A09FEB09A #1-388 Acq:10-FEB-2009 02:49:56 GC EI+ Voltage SIR Autospec-UltimaE
Sample#14 Text:G1040-7-3B
Exp:EXP_DB5MS
319.8965 S:14 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,6664.0,5.00%,F,T)
321.8936 S:14 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,7012.0,5.00%,F,T)
331.9368 S:14 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7376.0,5.00%,F,T)
333.9339 S:14 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6412.0,5.00%,F,T)
327.8847 S:14 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6072.0,5.00%,F,T)
304.9824 S:14 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time

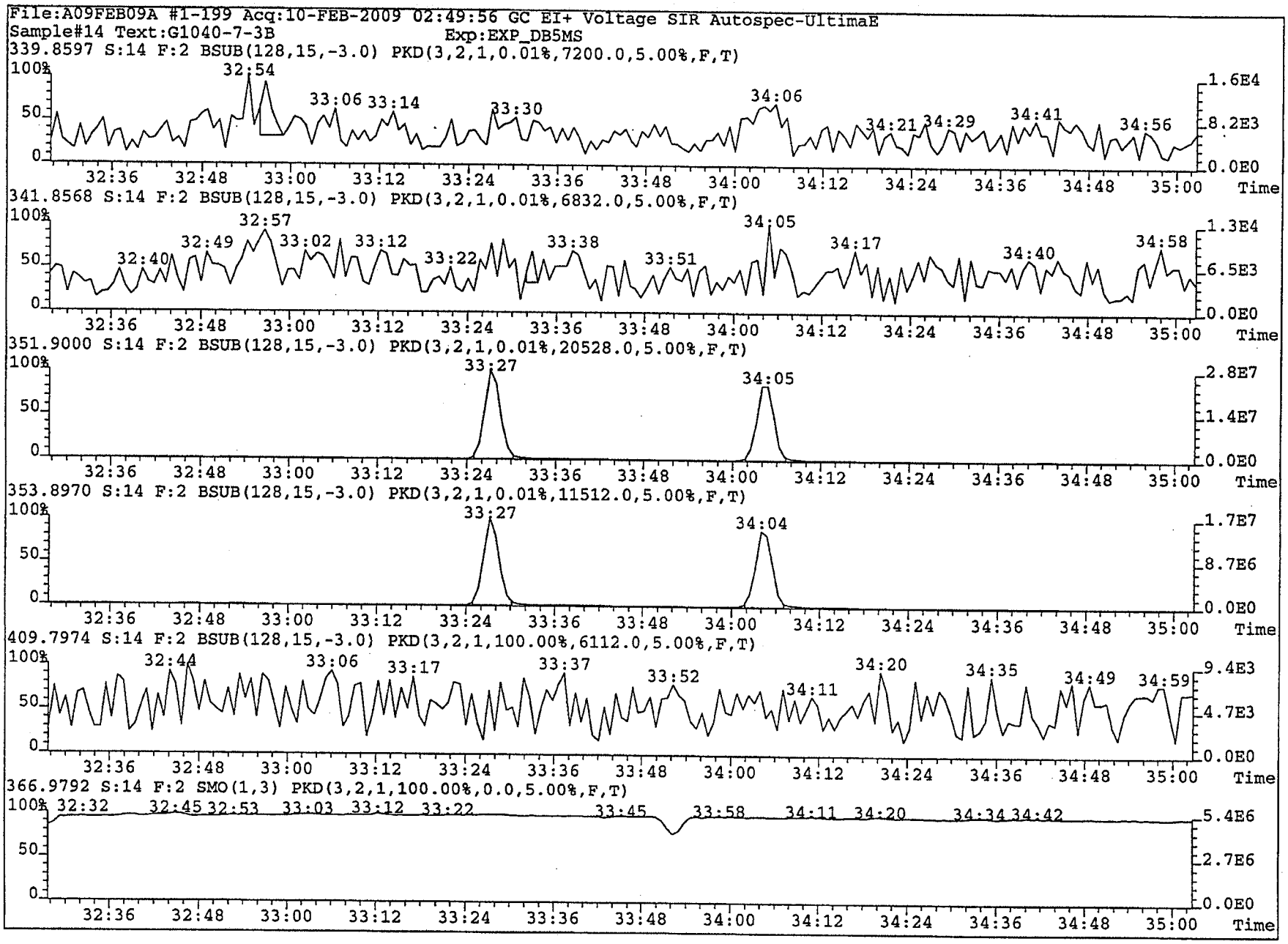

File:A09FEB09A #1-199 Acq:10-FEB-2009 02:49:56 GC EI+ Voltage SIR Autospec-UltimaE
Sample#14 Text:G1040-7-3B Exp:EXP_DB5MS
355.8546 S:14 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,8392.0,5.00%,F,T)
357.8517 S:14 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7096.0,5.00%,F,T)
367.8949 S:14 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6612.0,5.00%,F,T)
369.8919 S:14 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,10772.0,5.00%,F,T)
366.9792 S:14 F:2 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time

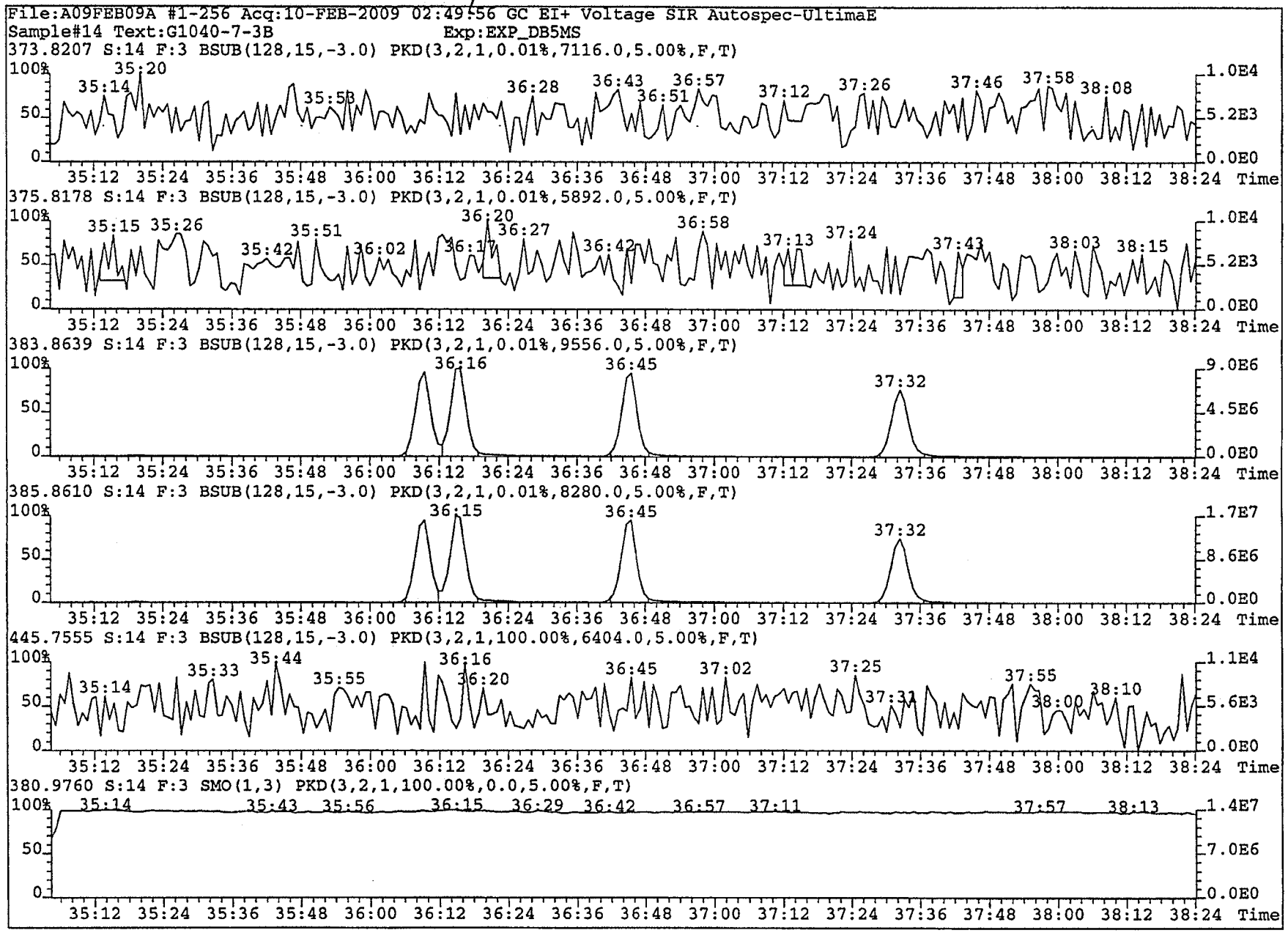

File:A09FEB09A #1-256 Acq:10-FEB-2009 02:49:56 GC EI+ Voltage SIR Autospec-UltimaE
Sample#14 Text:G1040-7-3B Exp:EXP_DB5MS
389.8156 S:14 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7072.0,5.00%,F,T)
391.8127 S:14 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6736.0,5.00%,F,T)
401.8559 S:14 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,8940.0,5.00%,F,T)
403.8530 S:14 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7592.0,5.00%,F,T)
380.9760 S:14 F:3 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time

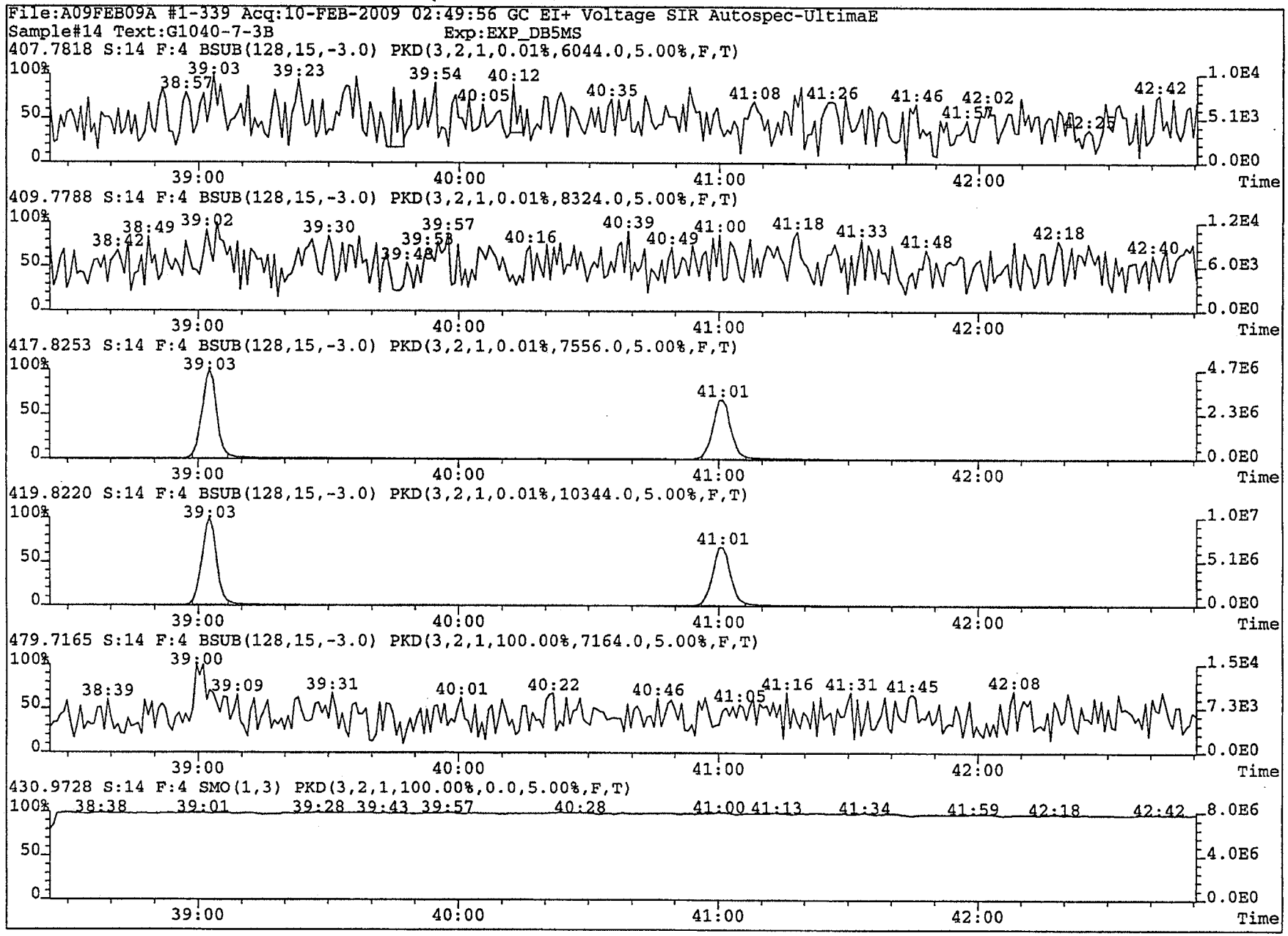

File:A09FEB09A #1-339 Acq:10-FEB-2009 02:49:56 GC EI+ Voltage SIR Autospec-UltimaE
Sample#14 Text:G1040-7-3B Exp:EXP_DB5MS
423.7767 S:14 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7972.0,5.00%,F,T)
425.7737 S:14 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6768.0,5.00%,F,T)
435.8169 S:14 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6848.0,5.00%,F,T)
437.8140 S:14 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,8472.0,5.00%,F,T)
430.9728 S:14 F:4 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
100%
50
0
39:00
40:00
41:00
42:00
Time
1.9E4
9.6E3
0.0E0
1.3E4
6.7E3
5.9E6
2.9E6
5.6E6
2.8E6
8.0E6
4.0E6

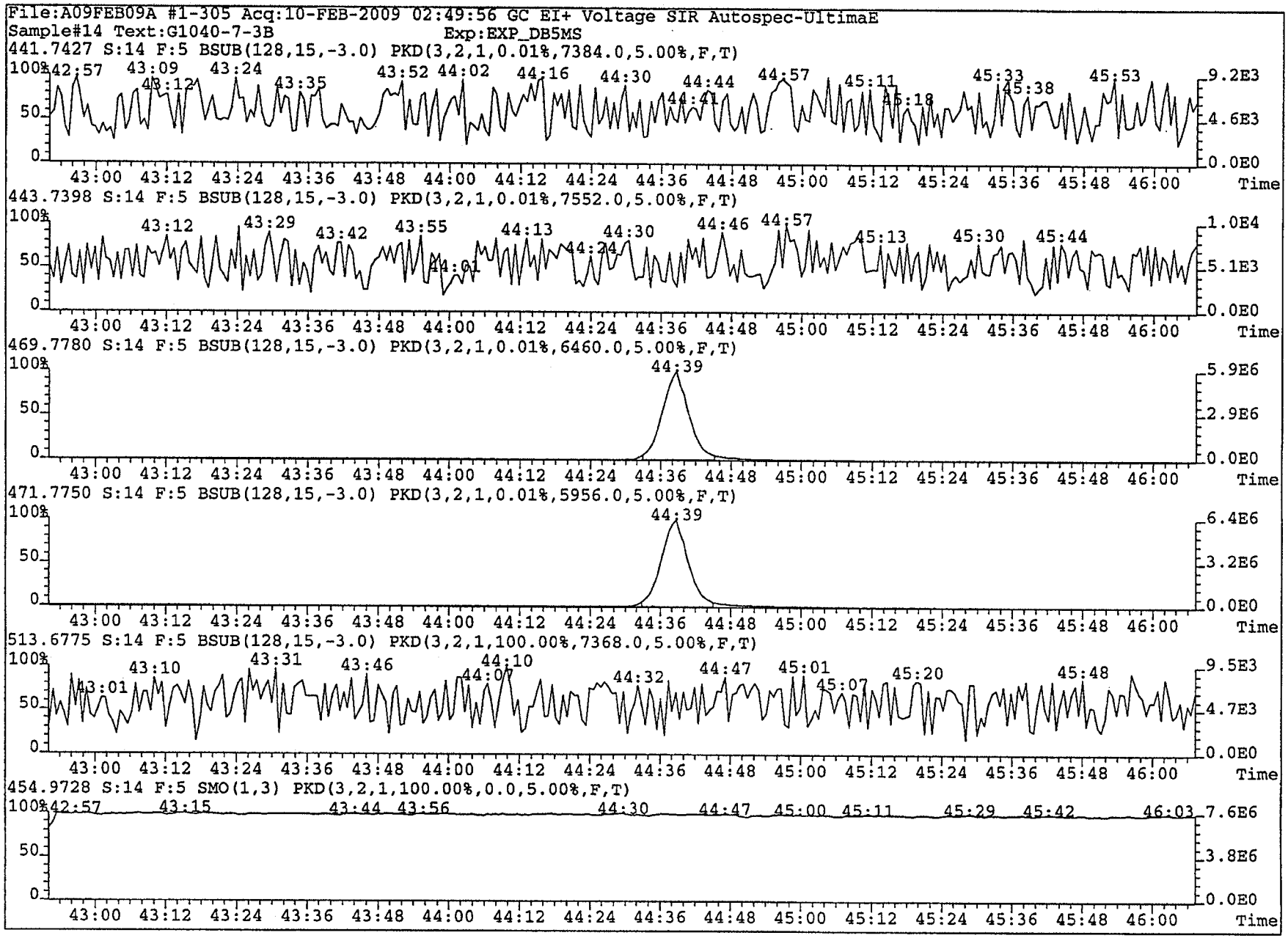

File:A09FEB09A #1-305 Acq:10-FEB-2009 02:49:56 GC EI+ Voltage SIR Autospec-UltimaE
Sample#14 Text:G1040-7-3B Exp:EXP_DB5MS
457.7377 S:14 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7128.0,5.00%,F,T)
459.7348 S:14 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7496.0,5.00%,F,T)
469.7780 S:14 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6460.0,5.00%,F,T)
471.7750 S:14 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5956.0,5.00%,F,T)
454.9728 S:14 F:5 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
100%
50
0
44:39
42:58 43:09 43:26 44:00 44:14 44:27 44:49 45:04 45:16 45:34 45:45
42:58 43:19 43:33 43:45 44:01 44:14 44:28 44:48 45:13 45:27 45:44 45:58
42:57 43:15 43:44 43:56 44:30 44:47 45:00 45:11 45:29 45:42 46:03
2.5E4
1.2E4
0.0E0
2.8E4
1.4E4
5.9E6
2.9E6
6.4E6
3.2E6
7.6E6
3.8E6
43:00 43:12 43:24 43:36 43:48 44:00 44:12 44:24 44:36 44:48 45:00 45:12 45:24 45:36 45:48 46:00
Time

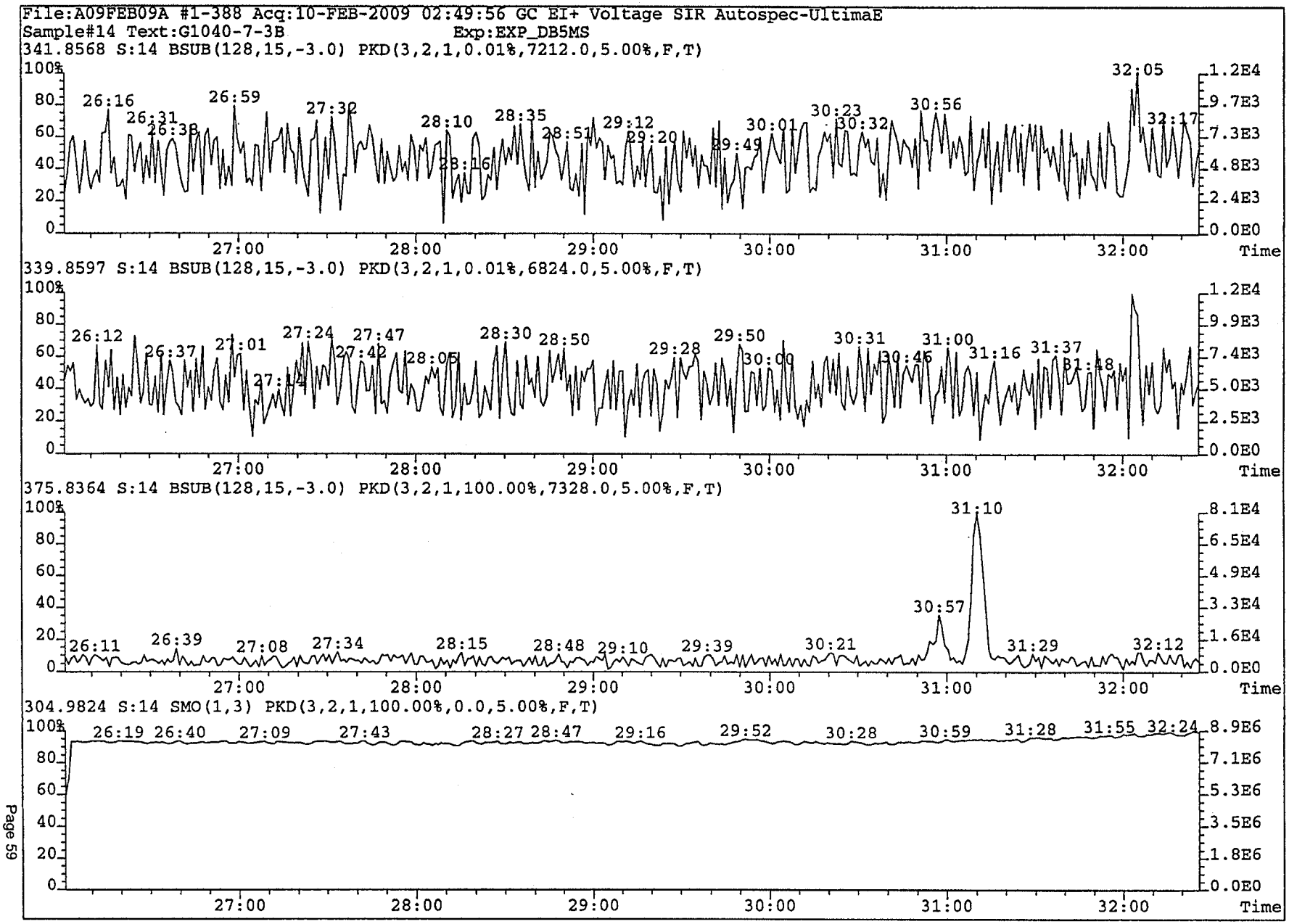

File:A09FEB09A #1-388 Acq:10-FEB-2009 02:49:56 GC EI+ Voltage SIR Autospec-UltimaE
Sample#14 Text:G1040-7-3B Exp:EXP_DB5MS
303.9016 S:14 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,7388.0,5.00%,F,T)
305.8987 S:14 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,7028.0,5.00%,F,T)
315.9419 S:14 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6012.0,5.00%,F,T)
317.9389 S:14 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6416.0,5.00%,F,T)
375.8364 S:14 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,7328.0,5.00%,F,T)
304.9824 S:14 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time


File:A09FEB09A #1-199 Acq:10-FEB-2009 02:49:56 GC EI+ Voltage SIR Autospec-UltimaE
Sample#14 Text:G1040-7-3B Exp:EXP_DB5MS
339.8597 S:14 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7200.0,5.00%,F,T)
341.8568 S:14 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6832.0,5.00%,F,T)
351.9000 S:14 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,20528.0,5.00%,F,T)
353.8970 S:14 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,11512.0,5.00%,F,T)
409.7974 S:14 F:2 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,6112.0,5.00%,F,T)
366.9792 S:14 F:2 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time


File:A09FEB09A #1-256 Acq:10-FEB-2009 02:49:56 GC EI+ Voltage SIR Autospec-UltimaE
Sample#14 Text:G1040-7-3B Exp:EXP_DB5MS
373.8207 S:14 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7116.0,5.00%,F,T)
375.8178 S:14 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5892.0,5.00%,F,T)
383.8639 S:14 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,9556.0,5.00%,F,T)
385.8610 S:14 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,8280.0,5.00%,F,T)
445.7555 S:14 F:3 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,6404.0,5.00%,F,T)
380.9760 S:14 F:3 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time


File:A09FEB09A #1-339 Acq:10-FEB-2009 02:49:56 GC EI+ Voltage SIR Autospec-UltimaE
Sample#14 Text:G1040-7-3B Exp:EXP_DB5MS
407.7818 S:14 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6044.0,5.00%,F,T)
409.7788 S:14 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,8324.0,5.00%,F,T)
417.8253 S:14 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7556.0,5.00%,F,T)
419.8220 S:14 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,10344.0,5.00%,F,T)
479.7165 S:14 F:4 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,7164.0,5.00%,F,T)
430.9728 S:14 F:4 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time


File:A09FEB09A #1-305 Acq:10-FEB-2009 02:49:56 GC EI+ Voltage SIR Autospec-UltimaE
Sample#14 Text:G1040-7-3B Exp:EXP_DB5MS
441.7427 S:14 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7384.0,5.00%,F,T)
443.7398 S:14 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7552.0,5.00%,F,T)
469.7780 S:14 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6460.0,5.00%,F,T)
471.7750 S:14 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5956.0,5.00%,F,T)
513.6775 S:14 F:5 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,7368.0,5.00%,F,T)
454.9728 S:14 F:5 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
100%
50
0
43:00 43:12 43:24 43:36 43:48 44:00 44:12 44:24 44:36 44:48 45:00 45:12 45:24 45:36 45:48 46:00
Time
9.2E3
4.6E3
0.0E0
1.0E4
5.1E3
5.9E6
2.9E6
6.4E6
3.2E6
9.5E3
4.7E3
7.6E6
3.8E6


File:A09FEB09A #1-388 Acq:10-FEB-2009 02:49:56 GC EI+ Voltage SIR Autospec-UltimaE
Sample#14 Text:G1040-7-3B Exp:EXP_DB5MS
341.8568 S:14 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7212.0,5.00%,F,T)
339.8597 S:14 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6824.0,5.00%,F,T)
375.8364 S:14 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,7328.0,5.00%,F,T)
304.9824 S:14 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time

Percent Lipids

prepared
for

HART CROWSER, INC.

Project: Port Gamble, 17330-14

ARI JOB NO: OG88

prepared
by

Analytical Resources, Inc.

ANALYTICAL RESOURCES INCORPORATED

LIPIDS ANALYSIS DATA SHEET
Percent Lipids by Method Bligh&Dyer

Data Release Authorized:
Reported: 01/19/09
Date Received: 12/16/08
Page 1 of 1

QC Report No: OG88-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14

Client/ ARI ID	Date Sampled	Matrix	Analysis Date	RL	Result
GD STATION #1A OG88A 09-584	12/16/08	Tissue	01/15/09	0.0004	0.481 %
GD STATION #2A OG88B 09-585	12/16/08	Tissue	01/15/09	0.0004	0.426 %
GD STATION #3A OG88C 09-586	12/16/08	Tissue	01/15/09	0.0004	0.823 %
Method Blank			01/15/09	0.0004	0.0040 %
Method Blank			01/15/09	0.0004	< 0.0004 % U
Method Blank			01/15/09	0.0004	< 0.0004 % U
GD STATION #1A DUP OG88ADUP 09-584	12/16/08	Tissue	01/15/09	0.0004	0.565 % RPD: 16.1 %
GD STATION #1A TRP OG88ATRP 09-584	12/16/08	Tissue	01/15/09	0.0004	0.417 % RPD: 14.3 %

Results Are On A Wet Weight Basis

RL-Analytical reporting limit
U-Undetected at reported detection limit

Percent Lipids-lipid
Data By: Jim Hawk
Created: 1/17/09

Worklist: 1723
Analyst: SDP
Comments:

SA (g)	Tare (g)	Final (g)	Aliq Vol (uL)	Ext Vol (mL)	Lipids (%)	Qual	RPD (%)
Blank							
50.00	1.181	1.182	2500.	5.0	0.0040 0.0004		
Blank							
50.00	1.152	1.152	2500.	5.0	< 0.0004 0.0004	U	
Blank							
50.00	1.170	1.170	2500.	5.0	< 0.0004 0.0004	U	
OG88A							
50.68	1.172	1.294	2500.	5.0	0.481 0.0004		
Ref: 4 OG88A DUP							
50.62	1.173	1.316	2500.	5.0	0.565 0.0004		16.06
Ref: 4 OG88A DUP							
50.80	1.164	1.270	2500.	5.0	0.417 0.0004		14.25
OG88B							
50.28	1.196	1.303	2500.	5.0	0.426 0.0004		
OG88C							
50.08	1.180	1.386	2500.	5.0	0.823 0.0004		

Bid # N/A
Ext # ↓

% Lipids – Tissue

Client Name: Hart Crowser, Inc.

ARI Job No(s): 0688

Calculated on LIMs

ARI Sample ID	Client Sample ID	Original Extracted Weight	Original Volume (FEV)	Volume Taken (Split)	Tare Weight (g)	Tare + Sample Weight	% Lipids
0688 MBT		50.00 g	5ML	2.500ML	1.1814	1.1818	
MBT dup		50.00 g	↓	↓	1.1516	1.1515	
MBT trip		50.00 g			1.1701	1.1704	
A		50.68g			1.1723	1.2943	
A dup		50.62g			1.1726	1.3163	
A trip		50.80g			1.1636	1.2701	
B		50.28g			1.1960	1.3030	
↓ C		50.08g	↓	↓	1.1797	1.3856	
Date/Analyst:		SE 1/15/09			→	W. 1/16/09	

Hart Crowser Tissue Prep.

Geoducks.....

12 composites (3 Geoducks each composite)

Analyze

(GD STATION #1 A) composite weight 2739.54g
composite skin weight 451.93g

Prep & Freeze

(GD STATION #1 B) composite weight 3419.78g
composite skin weight 504.10g

(GD STATION #1 C) composite weight 2609.14g
composite skin weight 516.22g

(GD STATION #1 EXTRA) composite weight 1007.52g
composite skin weight 98.6g

Analyze

(GD STATION #2 A) composite weight ~~347~~ NTR 11/6/19 3745.93
composite skin weight 514.61g

Prep & Freeze

(GD STATION #2 B) composite weight 3765.44
composite skin weight 226.3

(GD STATION #2 C) composite weight 3,738.46g
composite skin weight 201.84g

(GD STATION #2 EXTRA) composite weight 2,480.74 g
composite skin weight 107.24 g

Analyze

(GD STATION #3 A) composite weight 1,684.22 g
composite skin weight 420.29 g

Prep & Freeze 1,456.05 g

(GD STATION #3 B) composite weight ~~3,738.46~~ g sf. 11/7/09
composite skin weight 435.85 g

(GD STATION #3 C) composite weight 1,770.47 g
composite skin weight 441.73 g

(GD STATION #3 EXTRA) composite weight 1,332.69 g
composite skin weight 138.41 g

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Organic Extractions Laboratory
Analyst Notes

ARI Job No.: 0619 Client ID: Hart Crowser, Inc.

Parameter: Client Project: Port Gamble

SOP Number(s): **No Anomalies:**

List problems, concerns, corrective actions and any other pertinent information

6 Geoducks 1-6/09 J.F.

Prep Time - # of Analysts 4

Start 15:00 TO 18:30 hrs 3.5 hrs/1st day } 3 ANALYSTS.
Start 10:00 a.m - 15:00 = 5 Hrs. and day }

ALL Spatula's, KNIVES and WARING Blender washed in Alconox, Acid Bath and DI H2O Three Times. Blender washed and Rinsed between EA comp. Rinsed with Acetone and Three Times DCM. Also the Magic Bullet Blender. (no DCMs).

EXTRA Cd Station # 1 only had Two Geoducks.
EXTRA Cd Station # 2 only had Two. J.F. 1/6/09
EXTRA Cd Station # 3 has four 1/7/09 Geoducks.

Analyst Initials: **Date:** 1/6/09

Analytical Resources, Incorporated
Analytical Chemists and Consultants

February 26, 2009

Mr. Roger McGinnis
Hart Crowser, Inc.
1700 Westlake Avenue North Suite 200
Seattle, WA 98109-3056

RE: Project: Port Gamble, 17330-14
ARI Job No.: OH01

Dear Mr. McGinnis:

Please find enclosed the original Chain-of-Custody (COC) records, sample receipt documentation, and the final data package for the samples from the project referenced above.

The samples were analyzed for Grain Size, select Conventionals, PCBs, SVOCs, Resin Acids, Total Metals and Dioxin and Furans, as requested.

Sample receipt and details of these analyses are discussed in the Case Narrative.

An electronic copy of this data package and the supporting data 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.

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

Enclosures

cc: files OH01

KB/co

Chain of Custody
Documentation

prepared
for

HART CROWSER, INC.

Project: Port Gamble, 17330-14

ARI JOB NO: OH01

prepared
by

Analytical Resources, Inc.

Sample Custody Record

0093

3 of 5

Samples Shipped to: ARI

HARTCROWSER

Hart Crowser, Inc.
1910 Fairview Avenue East
Seattle, Washington 98102-3699
Phone: 206-324-9530 FAX: 206-328-5581

JOB 17330-14 LAB NUMBER

PROJECT NAME PORT GAMBLE

HART CROWSER CONTACT ROGER McGINNIS

ANNE CONDAS

SAMPLED BY: VP/CV

LAB NO.	SAMPLE ID	DESCRIPTION	DATE	TIME	MATRIX	REQUESTED ANALYSIS: TOTAL SULFIDE	TOC	TVS	AMMONIA	GRAIN SIZE	SMS SVOC*	SMS METALS*	PCBs	MICROTOX	DIOXIN	RESIN ACIDS	GUAIACOL	RETENE	NO. OF CONTAINERS	OBSERVATIONS/COMMENTS/ COMPOSITING INSTRUCTIONS
	PGSS-77A		12/9/08	1603	SED	X	X	X	X							✓			6	*SMS METALS - As, Cd,
	PGSS-78		12/10/08	0754		↓	↓	↓	↓							↓			6	Cr, Cu, Pb, Ag, Zn, Hg
	PGSS-80		↓	0817															6	
	PGSS-82			0851															6	
	PGSS-83			0917															6	
	PGSS-92			1103												↓			6	
	PGSS-6EO-3		↓	1035	↓	↓	↓	↓	↓										6	HOLD

RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE: Carl Ulberg	12/4/08	SIGNATURE: Jami Heugs	12/4/08
PRINT NAME: HC	TIME: 1210	PRINT NAME: ARI	TIME: 1210
COMPANY		COMPANY	
RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE	TIME	SIGNATURE	TIME
PRINT NAME		PRINT NAME	
COMPANY		COMPANY	

SPECIAL SHIPMENT HANDLING OR STORAGE REQUIREMENTS:
FREEZE EXTRA SAMPLE VOLUME
FULL DATA PACKAGE

42 TOTAL NUMBER OF CONTAINERS

SAMPLE RECEIPT INFORMATION
CUSTODY SEALS: ☐YES ☐NO ☐N/A
GOOD CONDITION: ☐YES ☐NO
TEMPERATURE
SHIPMENT METHOD: ☐HAND ☐COURIER ☐OVERNIGHT

COOLER NO.: STORAGE LOCATION:

See Lab Work Order No. _____ for Other Contract Requirements

TURNAROUND TIME:
☐ 24 HOURS ☐ 1 WEEK
☐ 48 HOURS ☐ STANDARD
☐ 72 HOURS OTHER _____

White and Yellow Copies to Lab Pink to Project Manager Lab to Return White Copy to Hart Crowser Gold to Sample Custodian

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Hart Crowser Project Name: _____

COC No: _____ Delivered by: Hand

Assigned ARI Job No: _____ Tracking No: _____

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

Record cooler temperature (recommended 2.0-6.0 °C for chemistry) 0.8, -2.0, 1.2, 1.2, 0.6, 1.6, 1.2 °C, 2.0, 1.2

Cooler Accepted by: JH Date: 12/11/08 Time: 1225

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? Wrap IC

Was sufficient ice used (if appropriate)? (YES) NO

Were all bottles sealed in individual plastic bags? (YES) NO

Did all bottle arrive in good condition (unbroken)? (YES) NO

Were all bottle labels complete and legible? (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 checklist) YES (NO)

Were all VOC vials free of air bubbles? (NA) YES NO

Was sufficient amount of sample sent in each bottle? (YES) NO

Samples Logged by: JH Date: 1/9/09 Time: 1100

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

Explain discrepancies or negative responses:

By: Date:

Case Narrative

prepared
for

HART CROWSER, INC.

Project: Port Gamble, 17330-14

ARI JOB NO: OH01

prepared
by

Analytical Resources, Inc.

Case Narrative
Hart Crowser
Port Gamble, 17330-14
ARI Job: OH01
February 26, 2009

Sample Receipt

Analytical Resources Inc. (ARI) accepted seven sediment samples in good condition on December 11, 2008 under the ARI job number OH01. The cooler temperatures measured by IR thermometer following ARI SOP ranged between -2.0 and 2.0°C and the samples were well iced. Please note that several sample containers were archived up receipt as requested on the COC. All samples were frozen to protect holding times. For further detail regarding sample receipt, please refer to the Cooer Receipt Form. The original analyses are reported under ARI SDG OD93. The Microtox data is reported in its own data package.

Resin Acids and SVOCs by Method 8270D:

The samples were extracted and analyzed within the method recommended holding times.

Initial calibration(s): All compounds of interest were within method acceptance criteria.

Continuing calibration(s): Are in control.

Samples: There were no anomalies associated with these samples.

Surrogates: The surrogate TPH is out of control high for **PGSS-GEO-3.** All other surrogate recoveries were in control and no further corrective action was taken.

LCS/LCSD(s): The LCS and LCSD percent recoveries of Neoabietic Acid, Palustric and Abietic Acid fell outside the advisory control limits for the **LCS-1/27/09** analysis. All samples were undetected for this compound. No further corrective action is required for these outliers as the control limits are advisory.

Method Blank: The method blanks were free of contamination.

MS/MSD(s): Several matrix spike and matrix spike duplicate percent recoveries fell outside the advisory control limits for sample PGSS-GEO-3. No further corrective action is required for these outliers as the control limits are advisory.

PCBs by Method 8082:

The samples were extracted and analyzed within the method recommended holding times.

Initial calibration(s): All compounds of interest were within method acceptance criteria.

Continuing calibration(s): Are in control.

Samples: There were no anomalies associated with these samples.

Case Narrative
Hart Crowser
Port Gamble, 17330-14
ARI Job: OH01
February 26, 2009

Surrogates: Are in control.

LCS/LCSD(s): Are in control.

Method Blank: The method blanks were free of contamination.

Total Metals 6010 and 7000 Series:

The samples were digested and analyzed within the method recommended holding times.

Initial calibration(s): All compounds of interest were within method acceptance criteria.

Continuing calibration(s): Are in control.

Samples: There were no anomalies associated with these samples.

LCS: Is in control.

Method Blank: The method blanks were free of contamination.

Conventional Parameters:

All samples were prepared and analyzed on within the method recommended holding times for frozen samples with the exception of sample PGSS-GEO-3 which was analyzed outside of the method recommended holding time for ammonia and sulfide.

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

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

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

LCS(s): All LCS percent recoveries were within control limits.

SRM(s): All SRM percent recoveries were within control limits.

Grain Size: The grain size analysis and case narrative are included in this data package.

Dioxin/ Furans: Are included in this data package.

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Client: Hart Crowser, Inc.	**ARI Project No.:** OH01
Client Project: Port Gamble	**Client Project No.:** 17330-14

Case Narrative

1. Two samples were submitted for grain size analysis according to Puget Sound Estuary Protocol (PSEP) methodology on January 9, 2009.
2. The samples were run in a single batch and one sample from another job was chosen for triplicate analysis. The triplicate data is reported on the QA summary.
3. Sample PGSS-92 contained shell fragments.
4. The data is provided in summary tables and plots.
5. There were no other noted anomalies in this project.

Approved by: Lucinda Smith Date: 2/23/09
Title: Geotechnical Division Manager

Data Reporting Qualifiers

Effective 12/28/04

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 ≥ 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
NR	Spiked compound recovery is not reported due to chromatographic interference
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.
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
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.

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 ≥40% RPD with no obvious chromatographic interference

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

LCS SOLUTIONS

12/30/08

LABE	SOLN ID	TEST	CONC. UG/ML	SOLVENT	EXP.
1	1549-3	PCB	20	ACETONE	10/10/09
2	1472-3	BCOC PEST	10	ACETONE	07/20/08
3	1517-1	PEST	02/04/20	ACETONE	05/15/09
4	1561-2	LOW PEST	0.2/0.4/2	ACETONE	05/15/09
5	1537-1	EPH	1500	MECL2	08/16/09
6	1559-2	PCP	12.5/125	ACETONE	11/05/09
7	1573-1	ABN	100	ACETONE	08/01/09
8	1566-1	TBT	2.5	MECL2	12/04/09
9	1567-3	PORE TBT	.125/.25	MECL2	12/04/09
10	1554-3	ABN ACID	100/200	MEOH	10/21/09
11	1563-3	TPHD	15000	ACETONE	11/20/09
12	1563-1	ABN BASE	200	ACETONE	06/30/09
13	1573-2	LOW PCB	2	ACETONE	10/10/09
14	1547-1	LOW ABN ACID	10/20	MEOH	04/10/09
15*	1452-1	SIM PNA	15/75	MEOH	04/09/09
16	1502-2	DIOXANE	100	MEOH	02/20/09
17	1516-2	1248 PCB	20	ACETONE	05/07/09
18	1514-4	LOW SIM PNA	1.5/7.5	ACETONE	04/24/09
19	1517-3	AK103	7500	MECL2	12/29/08
20	1572-2	PNA	100	ACETONE	12/26/09
21*	1414-4	SKY/BHT	100	MEOH	04/08/09
22	1570-1	HERB	12.5/12500	MEOH	02/19/09
23	1505-1	LOW ABN BASE	20	MEOH	03/20/09
24	1541-4	LOW ABN	10	ACETONE	08/01/09
25	1481-1	DIPHENYL	100	MEOH	07/20/08
26	1545-2	OP-PEST	25	MEOH	02/14/09
27	1495-1	STEROLS	200	MEOH	12/29/08
28	1494-1	ADD. PEST	4	ACETONE	01/23/09
29	1496-3	DECANES	100	MEOH	02/12/09
30	1497-2	EDB/DBCP	2	ACETONE	02/12/09
31	1510-3	TERPINEOL	100	MEOH	03/21/09

LCS SOLUTIONS

12/30/08

32	1545-3	GUAIACOL	50-200	ACETONE	06/05/09
33	1522-1	RESIN ACID	250	ACETONE	06/11/09
34	1530-2	CONGENERS	1	ACETONE	07/23/09
50	1571-1	FULL RESIN	250	ACETONE	06/10/09
*=REVERIFIED SOLUTION					

SURR SOLUTIONS

12/30/08

LABEL	SOLN ID	TEST	CONC. UG/ML	SOLVENT	EXP.
A	1559-5	ABN	100/150	MEOH	03/13/09
B	1572-1	SIM PNA	15/75	MEOH	08/28/09
C	1559-1	SIM ABN	25/37.5	MEOH	03/13/09
D	1561-3	LOW PCB	0.2	ACETONE	07/31/09
E*	1478-1	HERB	62.5	MEOH	09/21/09
F	1520-3	PCP	12.5	ACETONE	04/18/09
G	1534-1	1,4DIOXANE	100	MEOH	02/20/09
H	1545-1	OP-PEST	25	MEOH	02/14/09
I	1559-4	LOW S. PNA	1.5	MEOH	08/28/09
J	1566-5	TBT-PORE	0.125	MECL2	12/04/09
K	1538-1	MED PCB	20	ACETONE	07/31/09
L	1566-4	TBT	2.5	MECL2	12/04/09
M	1558-2	EPH	1500	MECL2	09/24/09
N	1538-2	PCB	2	ACETONE	07/31/09
O	1567-4	TPH	450	MECL2	09/24/09
P	1560-3	HCID	2250	MECL2	09/24/09
Q	1497-3	EDB	2	ACETONE	02/12/09
R	1521-4	RESIN ACID	250	ACETONE	06/11/09
S	1568-5	PBDE	.25	MEOH	12/11/09
T	*reverified solution				
U					
V					
W					
X					
Y					
Z					

Data Summary Package

prepared
for

HART CROWSER, INC.

Project: Port Gamble, 17330-14

ARI JOB NO: OH01

prepared
by

Analytical Resources, Inc.

SEMIVOLATILES

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270 GC/MS **Sample ID: PGSS-77A**
Page 1 of 2 **SAMPLE**

Lab Sample ID: OH01A
LIMS ID: 09-646
Matrix: Sediment
Data Release Authorized:
Reported: 01/26/09

QC Report No: OH01-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/09/08
Date Received: 12/11/08

Date Extracted: 01/14/09
Date Analyzed: 01/22/09 20:46
Instrument/Analyst: NT4/LJR
GPC Cleanup: Yes

Sample Amount: 25.2 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 28.5%

CAS Number	Analyte	RL	Result
108-95-2	**Phenol**	**20**	**110**
541-73-1	1,3-Dichlorobenzene	20	< 20 U
106-46-7	1,4-Dichlorobenzene	20	< 20 U
100-51-6	Benzyl Alcohol	20	< 20 U
95-50-1	1,2-Dichlorobenzene	20	< 20 U
95-48-7	2-Methylphenol	20	< 20 U
106-44-5	4-Methylphenol	20	< 20 U
105-67-9	2,4-Dimethylphenol	20	< 20 U
65-85-0	Benzoic Acid	200	< 200 U
120-82-1	1,2,4-Trichlorobenzene	20	< 20 U
91-20-3	**Naphthalene**	**20**	**37**
87-68-3	Hexachlorobutadiene	20	< 20 U
91-57-6	2-Methylnaphthalene	20	< 20 U
131-11-3	Dimethylphthalate	20	< 20 U
208-96-8	Acenaphthylene	20	< 20 U
83-32-9	Acenaphthene	20	< 20 U
132-64-9	Dibenzofuran	20	< 20 U
84-66-2	Diethylphthalate	20	< 20 U
86-73-7	Fluorene	20	< 20 U
86-30-6	N-Nitrosodiphenylamine	20	< 20 U
118-74-1	Hexachlorobenzene	20	< 20 U
87-86-5	Pentachlorophenol	99	< 99 U
85-01-8	**Phenanthrene**	**20**	**49**
120-12-7	**Anthracene**	**20**	**18 J**
84-74-2	Di-n-Butylphthalate	20	< 20 U
206-44-0	**Fluoranthene**	**20**	**53**
129-00-0	**Pyrene**	**20**	**54**
85-68-7	Butylbenzylphthalate	20	< 20 U
56-55-3	**Benzo(a)anthracene**	**20**	**29**
117-81-7	bis(2-Ethylhexyl)phthalate	20	< 20 U
218-01-9	**Chrysene**	**20**	**40**
117-84-0	Di-n-Octyl phthalate	20	< 20 U
205-99-2	**Benzo(b)fluoranthene**	**20**	**38**
207-08-9	**Benzo(k)fluoranthene**	**20**	**22**
50-32-8	**Benzo(a)pyrene**	**20**	**22**
193-39-5	**Indeno(1,2,3-cd)pyrene**	**20**	**13 J**
53-70-3	Dibenz(a,h)anthracene	20	< 20 U
191-24-2	**Benzo(g,h,i)perylene**	**20**	**18 J**
90-05-1	Guaiacol	20	< 20 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270 GC/MS **Sample ID: PGSS-77A**
Page 2 of 2 **SAMPLE**

Lab Sample ID: OH01A QC Report No: OH01-Hart Crowser, Inc.
LIMS ID: 09-646 Project: PORT GAMBLE
Matrix: Sediment 17330-14
Date Analyzed: 01/22/09 20:46

CAS Number	Analyte	RL	Result
483-65-8	**Retene**	**20**	**14**
90-12-0	1-Methylnaphthalene	20	< 20 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	64.8%	2-Fluorobiphenyl	65.2%
d14-p-Terphenyl	85.6%	d4-1,2-Dichlorobenzene	54.4%
d5-Phenol	66.4%	2-Fluorophenol	58.9%
2,4,6-Tribromophenol	81.6%	d4-2-Chlorophenol	62.1%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270 GC/MS

Sample ID: PGSS-80
SAMPLE

Lab Sample ID: OH01C
LIMS ID: 09-648
Matrix: Sediment
Data Release Authorized:
Reported: 01/26/09

QC Report No: OH01-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/10/08
Date Received: 12/11/08

Date Extracted: 01/14/09
Date Analyzed: 01/22/09 21:20
Instrument/Analyst: NT4/LJR
GPC Cleanup: Yes

Sample Amount: 25.3 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 19.1%

CAS Number	Analyte	RL	Result
108-95-2	**Phenol**	**20**	**31**
541-73-1	1,3-Dichlorobenzene	20	< 20 U
106-46-7	1,4-Dichlorobenzene	20	< 20 U
100-51-6	Benzyl Alcohol	20	< 20 U
95-50-1	1,2-Dichlorobenzene	20	< 20 U
95-48-7	2-Methylphenol	20	< 20 U
106-44-5	4-Methylphenol	20	< 20 U
105-67-9	2,4-Dimethylphenol	20	< 20 U
65-85-0	Benzoic Acid	200	< 200 U
120-82-1	1,2,4-Trichlorobenzene	20	< 20 U
91-20-3	Naphthalene	20	< 20 U
87-68-3	Hexachlorobutadiene	20	< 20 U
91-57-6	2-Methylnaphthalene	20	< 20 U
131-11-3	Dimethylphthalate	20	< 20 U
208-96-8	Acenaphthylene	20	< 20 U
83-32-9	Acenaphthene	20	< 20 U
132-64-9	Dibenzofuran	20	< 20 U
84-66-2	Diethylphthalate	20	< 20 U
86-73-7	Fluorene	20	< 20 U
86-30-6	N-Nitrosodiphenylamine	20	< 20 U
118-74-1	Hexachlorobenzene	20	< 20 U
87-86-5	Pentachlorophenol	99	< 99 U
85-01-8	Phenanthrene	20	< 20 U
120-12-7	Anthracene	20	< 20 U
84-74-2	Di-n-Butylphthalate	20	< 20 U
206-44-0	Fluoranthene	20	< 20 U
129-00-0	Pyrene	20	< 20 U
85-68-7	Butylbenzylphthalate	20	< 20 U
56-55-3	Benzo(a)anthracene	20	< 20 U
117-81-7	bis(2-Ethylhexyl)phthalate	20	< 20 U
218-01-9	Chrysene	20	< 20 U
117-84-0	Di-n-Octyl phthalate	20	< 20 U
205-99-2	Benzo(b)fluoranthene	20	< 20 U
207-08-9	Benzo(k)fluoranthene	20	< 20 U
50-32-8	Benzo(a)pyrene	20	< 20 U
193-39-5	Indeno(1,2,3-cd)pyrene	20	< 20 U
53-70-3	Dibenz(a,h)anthracene	20	< 20 U
191-24-2	Benzo(g,h,i)perylene	20	< 20 U
90-05-1	Guaiacol	20	< 20 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270 GC/MS **Sample ID: PGSS-80**
Page 2 of 2 **SAMPLE**

Lab Sample ID: OH01C QC Report No: OH01-Hart Crowser, Inc.
LIMS ID: 09-648 Project: PORT GAMBLE
Matrix: Sediment 17330-14
Date Analyzed: 01/22/09 21:20

CAS Number	Analyte	RL	Result
483-65-8	Retene	20	< 20 U
90-12-0	1-Methylnaphthalene	20	< 20 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	68.4%	2-Fluorobiphenyl	63.6%
d14-p-Terphenyl	82.8%	d4-1,2-Dichlorobenzene	56.8%
d5-Phenol	63.5%	2-Fluorophenol	62.9%
2,4,6-Tribromophenol	68.8%	d4-2-Chlorophenol	63.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270 GC/MS **Sample ID: PGSS-GEO-3**
Page 1 of 2 **SAMPLE**

Lab Sample ID: OH01F
LIMS ID: 09-651
Matrix: Sediment
Data Release Authorized:
Reported: 01/26/09

QC Report No: OH01-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/10/08
Date Received: 12/11/08

Date Extracted: 01/14/09
Date Analyzed: 01/22/09 21:54
Instrument/Analyst: NT4/LJR
GPC Cleanup: Yes

Sample Amount: 25.1 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 26.3%

CAS Number	Analyte	RL	Result
108-95-2	Phenol	20	< 20 U
541-73-1	1,3-Dichlorobenzene	20	< 20 U
106-46-7	1,4-Dichlorobenzene	20	< 20 U
100-51-6	Benzyl Alcohol	20	< 20 U
95-50-1	1,2-Dichlorobenzene	20	< 20 U
95-48-7	2-Methylphenol	20	< 20 U
106-44-5	4-Methylphenol	20	< 20 U
105-67-9	2,4-Dimethylphenol	20	< 20 U
65-85-0	Benzoic Acid	200	< 200 U
120-82-1	1,2,4-Trichlorobenzene	20	< 20 U
91-20-3	Naphthalene	20	< 20 U
87-68-3	Hexachlorobutadiene	20	< 20 U
91-57-6	2-Methylnaphthalene	20	< 20 U
131-11-3	Dimethylphthalate	20	< 20 U
208-96-8	Acenaphthylene	20	< 20 U
83-32-9	Acenaphthene	20	< 20 U
132-64-9	Dibenzofuran	20	< 20 U
84-66-2	Diethylphthalate	20	< 20 U
86-73-7	Fluorene	20	< 20 U
86-30-6	N-Nitrosodiphenylamine	20	< 20 U
118-74-1	Hexachlorobenzene	20	< 20 U
87-86-5	Pentachlorophenol	100	< 100 U
85-01-8	**Phenanthrene**	**20**	**26**
120-12-7	Anthracene	20	< 20 U
84-74-2	Di-n-Butylphthalate	20	< 20 U
206-44-0	**Fluoranthene**	**20**	**34**
129-00-0	**Pyrene**	**20**	**42**
85-68-7	Butylbenzylphthalate	20	< 20 U
56-55-3	**Benzo(a)anthracene**	**20**	**12 J**
117-81-7	bis(2-Ethylhexyl)phthalate	20	< 20 U
218-01-9	**Chrysene**	**20**	**15 J**
117-84-0	Di-n-Octyl phthalate	20	< 20 U
205-99-2	**Benzo(b)fluoranthene**	**20**	**11 J**
207-08-9	**Benzo(k)fluoranthene**	**20**	**12 J**
50-32-8	**Benzo(a)pyrene**	**20**	**13 J**
193-39-5	Indeno(1,2,3-cd)pyrene	20	< 20 U
53-70-3	Dibenz(a,h)anthracene	20	< 20 U
191-24-2	Benzo(g,h,i)perylene	20	< 20 U
90-05-1	Guaiacol	20	< 20 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270 GC/MS

Sample ID: PGSS-GEO-3
SAMPLE

Lab Sample ID: OH01F
LIMS ID: 09-651
Matrix: Sediment
Date Analyzed: 01/22/09 21:54

QC Report No: OH01-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14

CAS Number	Analyte	RL	Result
483-65-8	Retene	20	< 20 U
90-12-0	1-Methylnaphthalene	20	< 20 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	71.2%	2-Fluorobiphenyl	70.8%
d14-p-Terphenyl	102%	d4-1,2-Dichlorobenzene	61.2%
d5-Phenol	67.7%	2-Fluorophenol	65.1%
2,4,6-Tribromophenol	84.8%	d4-2-Chlorophenol	67.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270 GC/MS

Sample ID: PGSS-92
SAMPLE

Lab Sample ID: OH01G
LIMS ID: 09-652
Matrix: Sediment
Data Release Authorized:
Reported: 01/26/09

QC Report No: OH01-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/10/08
Date Received: 12/11/08

Date Extracted: 01/14/09
Date Analyzed: 01/22/09 22:28
Instrument/Analyst: NT4/LJR
GPC Cleanup: Yes

Sample Amount: 25.2 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 30.2%

CAS Number	Analyte	RL	Result
108-95-2	**Phenol**	**20**	**42**
541-73-1	1,3-Dichlorobenzene	20	< 20 U
106-46-7	1,4-Dichlorobenzene	20	< 20 U
100-51-6	Benzyl Alcohol	20	< 20 U
95-50-1	1,2-Dichlorobenzene	20	< 20 U
95-48-7	2-Methylphenol	20	< 20 U
106-44-5	4-Methylphenol	20	< 20 U
105-67-9	2,4-Dimethylphenol	20	< 20 U
65-85-0	Benzoic Acid	200	< 200 U
120-82-1	1,2,4-Trichlorobenzene	20	< 20 U
91-20-3	Naphthalene	20	< 20 U
87-68-3	Hexachlorobutadiene	20	< 20 U
91-57-6	2-Methylnaphthalene	20	< 20 U
131-11-3	Dimethylphthalate	20	< 20 U
208-96-8	Acenaphthylene	20	< 20 U
83-32-9	Acenaphthene	20	< 20 U
132-64-9	Dibenzofuran	20	< 20 U
84-66-2	Diethylphthalate	20	< 20 U
86-73-7	Fluorene	20	< 20 U
86-30-6	N-Nitrosodiphenylamine	20	< 20 U
118-74-1	Hexachlorobenzene	20	< 20 U
87-86-5	Pentachlorophenol	99	< 99 U
85-01-8	**Phenanthrene**	**20**	**30**
120-12-7	Anthracene	20	< 20 U
84-74-2	Di-n-Butylphthalate	20	< 20 U
206-44-0	**Fluoranthene**	**20**	**30**
129-00-0	**Pyrene**	**20**	**35**
85-68-7	Butylbenzylphthalate	20	< 20 U
56-55-3	**Benzo(a)anthracene**	**20**	**12 J**
117-81-7	bis(2-Ethylhexyl)phthalate	20	< 20 U
218-01-9	**Chrysene**	**20**	**12 J**
117-84-0	Di-n-Octyl phthalate	20	< 20 U
205-99-2	Benzo(b)fluoranthene	20	< 20 U
207-08-9	Benzo(k)fluoranthene	20	< 20 U
50-32-8	**Benzo(a)pyrene**	**20**	**11 J**
193-39-5	Indeno(1,2,3-cd)pyrene	20	< 20 U
53-70-3	Dibenz(a,h)anthracene	20	< 20 U
191-24-2	Benzo(g,h,i)perylene	20	< 20 U
90-05-1	Guaiacol	20	< 20 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270 GC/MS **Sample ID: PGSS-92**
Page 2 of 2 **SAMPLE**

Lab Sample ID: OH01G
LIMS ID: 09-652
Matrix: Sediment
Date Analyzed: 01/22/09 22:28

QC Report No: OH01-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14

CAS Number	Analyte	RL	Result
483-65-8	Retene	20	< 20 U
90-12-0	1-Methylnaphthalene	20	< 20 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	63.2%	2-Fluorobiphenyl	62.0%
d14-p-Terphenyl	79.2%	d4-1,2-Dichlorobenzene	55.6%
d5-Phenol	58.4%	2-Fluorophenol	57.6%
2,4,6-Tribromophenol	65.3%	d4-2-Chlorophenol	58.9%

ANALYTICAL RESOURCES INCORPORATED

SW8270 SEMIVOLATILES SOIL/SEDIMENT SURROGATE RECOVERY SUMMARY

Matrix: Sediment

QC Report No: OH01-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14

Client ID	NBZ	FBP	TPH	DCB	PHL	2FP	TBP	2CP	TOT OUT
MB-011409	66.8%	63.2%	98.0%	60.4%	65.9%	61.3%	70.7%	61.9%	0
LCS-011409	68.4%	62.0%	88.8%	59.2%	66.9%	60.3%	74.9%	61.9%	0
LCSD-011409	68.8%	62.4%	87.6%	59.6%	66.4%	60.5%	72.5%	61.9%	0
PGSS-77A	64.8%	65.2%	85.6%	54.4%	66.4%	58.9%	81.6%	62.1%	0
PGSS-80	68.4%	63.6%	82.8%	56.8%	63.5%	62.9%	68.8%	63.7%	0
PGSS-GEO-3	71.2%	70.8%	102%*	61.2%	67.7%	65.1%	84.8%	67.2%	1
PGSS-92	63.2%	62.0%	79.2%	55.6%	58.4%	57.6%	65.3%	58.9%	0

	LCS/MB LIMITS	QC LIMITS
(NBZ) = d5-Nitrobenzene	(37-85)	(29-87)
(FBP) = 2-Fluorobiphenyl	(39-82)	(32-88)
(TPH) = d14-p-Terphenyl	(38-105)	(21-97)
(DCB) = d4-1,2-Dichlorobenzene	(33-79)	(25-82)
(PHL) = d5-Phenol	(40-85)	(29-85)
(2FP) = 2-Fluorophenol	(20-93)	(10-114)
(TBP) = 2,4,6-Tribromophenol	(40-96)	(25-103)
(2CP) = d4-2-Chlorophenol	(41-81)	(30-84)

Prep Method: SW3550B
Log Number Range: 09-646 to 09-652

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270 GC/MS
Page 1 of 2

Sample ID: LCS-011409
LCS/LCSD

Lab Sample ID: LCS-011409
LIMS ID: 09-646
Matrix: Sediment
Data Release Authorized:
Reported: 01/26/09

QC Report No: OH01-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/09/08
Date Received: 12/11/08

Date Extracted LCS/LCSD: 01/14/09

Date Analyzed LCS: 01/22/09 17:53
LCSD: 01/22/09 18:28
Instrument/Analyst LCS: NT4/LJR
LCSD: NT4/LJR
GPC Cleanup: YES

Sample Amount LCS: 25.0 g
LCSD: 25.0 g
Final Extract Volume LCS: 0.5 mL
LCSD: 0.5 mL
Dilution Factor LCS: 1.00
LCSD: 1.00
Percent Moisture: NA

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Phenol	313	500	62.6%	336	500	67.2%	7.1%
1,3-Dichlorobenzene	280	500	56.0%	304	500	60.8%	8.2%
1,4-Dichlorobenzene	283	500	56.6%	309	500	61.8%	8.8%
Benzyl Alcohol	420	1000	42.0%	457	1000	45.7%	8.4%
1,2-Dichlorobenzene	293	500	58.6%	320	500	64.0%	8.8%
2-Methylphenol	328	500	65.6%	345	500	69.0%	5.1%
4-Methylphenol	688	1000	68.8%	736	1000	73.6%	6.7%
2,4-Dimethylphenol	255	500	51.0%	288	500	57.6%	12.2%
Benzoic Acid	1010	1500	67.3%	1000	1500	66.7%	1.0%
1,2,4-Trichlorobenzene	300	500	60.0%	318	500	63.6%	5.8%
Naphthalene	310	500	62.0%	335	500	67.0%	7.8%
Hexachlorobutadiene	318	500	63.6%	337	500	67.4%	5.8%
2-Methylnaphthalene	320	500	64.0%	344	500	68.8%	7.2%
Dimethylphthalate	368	500	73.6%	392	500	78.4%	6.3%
Acenaphthylene	327	500	65.4%	345	500	69.0%	5.4%
Acenaphthene	330	500	66.0%	346	500	69.2%	4.7%
Dibenzofuran	343	500	68.6%	357	500	71.4%	4.0%
Diethylphthalate	414	500	82.8%	437	500	87.4%	5.4%
Fluorene	348	500	69.6%	366	500	73.2%	5.0%
N-Nitrosodiphenylamine	353	500	70.6%	373	500	74.6%	5.5%
Hexachlorobenzene	364	500	72.8%	384	500	76.8%	5.3%
Pentachlorophenol	356	500	71.2%	372	500	74.4%	4.4%
Phenanthrene	384	500	76.8%	405	500	81.0%	5.3%
Anthracene	364	500	72.8%	382	500	76.4%	4.8%
Di-n-Butylphthalate	402	500	80.4%	421	500	84.2%	4.6%
Fluoranthene	388	500	77.6%	405	500	81.0%	4.3%
Pyrene	456	500	91.2%	493	500	98.6%	7.8%
Butylbenzylphthalate	443	500	88.6%	473	500	94.6%	6.6%
Benzo(a)anthracene	384	500	76.8%	410	500	82.0%	6.5%
bis(2-Ethylhexyl)phthalate	440	500	88.0%	471	500	94.2%	6.8%
Chrysene	377	500	75.4%	394	500	78.8%	4.4%
Di-n-Octyl phthalate	391	500	78.2%	412	500	82.4%	5.2%
Benzo(b)fluoranthene	445	500	89.0%	482	500	96.4%	8.0%
Benzo(k)fluoranthene	438	500	87.6%	443	500	88.6%	1.1%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270 GC/MS

Sample ID: LCSD-011409
LCS/LCSD

Lab Sample ID: LCS-011409
LIMS ID: 09-646
Matrix: Sediment
Date Analyzed LCS: 01/22/09 17:53
LCSD: 01/22/09 18:28

QC Report No: OH01-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Benzo(a)pyrene	330	500	66.0%	346	500	69.2%	4.7%
Indeno(1,2,3-cd)pyrene	402	500	80.4%	436	500	87.2%	8.1%
Dibenz(a,h)anthracene	393	500	78.6%	424	500	84.8%	7.6%
Benzo(g,h,i)perylene	404	500	80.8%	430	500	86.0%	6.2%
Guaiacol	342	500	68.4%	376	500	75.2%	9.5%
1-Methylnaphthalene	348	500	69.6%	375	500	75.0%	7.5%

Semivolatile Surrogate Recovery

	LCS	LCSD
d5-Nitrobenzene	68.4%	68.8%
2-Fluorobiphenyl	62.0%	62.4%
d14-p-Terphenyl	88.8%	87.6%
d4-1,2-Dichlorobenzene	59.2%	59.6%
d5-Phenol	66.9%	66.4%
2-Fluorophenol	60.3%	60.5%
2,4,6-Tribromophenol	74.9%	72.5%
d4-2-Chlorophenol	61.9%	61.9%

Results reported in µg/kg
RPD calculated using sample concentrations per SW846.

4B
SEMIVOLATILE METHOD BLANK SUMMARY

BLANK NO.

OH01MBS1

Lab Name: ANALYTICAL RESOURCES, INC
Client: HART CROWSER, INC.

ARI Job No: OH02
Project: PORT GAMBLE

Lab File ID: OH01MB
Date Extracted: 01/14/09

Instrument ID: NT4
Date Analyzed: 01/22/09

Matrix: SOLID
Time Analyzed: 1718

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

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01	OH01LCSS1	OH01LCSS1	OH01SB	01/22/09
02	OH01LCSDS1	OH01LCSDS1	OH01SBD	01/22/09
03	PGSS-77A	OH01A	OH01A	01/22/09
04	PGSS-80	OH01C	OH01C	01/22/09
05	PGSS-GEO-3	OH01F	OH01F	01/22/09
06	PGSS-92	OH01G	OH01G	01/22/09
07	PGSS-51	OH02E	OH02E	01/22/09
08	PGSS-64	OH02P	OH02P	01/22/09
09	PGSS-73	OH02V	OH02V	01/23/09
10	PGSS-75	OH02W	OH02W	01/23/09
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				

COMMENTS:

FORM IV SV

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270 GC/MS

Sample ID: MB-011409
METHOD BLANK

Lab Sample ID: MB-011409
LIMS ID: 09-646
Matrix: Sediment
Data Release Authorized:
Reported: 01/26/09

QC Report No: OH01-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: NA
Date Received: NA

Date Extracted: 01/14/09
Date Analyzed: 01/22/09 17:18
Instrument/Analyst: NT4/LJR
GPC Cleanup: Yes

Sample Amount: 25.0 g
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: NA

CAS Number	Analyte	RL	Result
108-95-2	Phenol	20	< 20 U
541-73-1	1,3-Dichlorobenzene	20	< 20 U
106-46-7	1,4-Dichlorobenzene	20	< 20 U
100-51-6	Benzyl Alcohol	20	< 20 U
95-50-1	1,2-Dichlorobenzene	20	< 20 U
95-48-7	2-Methylphenol	20	< 20 U
106-44-5	4-Methylphenol	20	< 20 U
105-67-9	2,4-Dimethylphenol	20	< 20 U
65-85-0	Benzoic Acid	200	< 200 U
120-82-1	1,2,4-Trichlorobenzene	20	< 20 U
91-20-3	Naphthalene	20	< 20 U
87-68-3	Hexachlorobutadiene	20	< 20 U
91-57-6	2-Methylnaphthalene	20	< 20 U
131-11-3	Dimethylphthalate	20	< 20 U
208-96-8	Acenaphthylene	20	< 20 U
83-32-9	Acenaphthene	20	< 20 U
132-64-9	Dibenzofuran	20	< 20 U
84-66-2	Diethylphthalate	20	< 20 U
86-73-7	Fluorene	20	< 20 U
86-30-6	N-Nitrosodiphenylamine	20	< 20 U
118-74-1	Hexachlorobenzene	20	< 20 U
87-86-5	Pentachlorophenol	100	< 100 U
85-01-8	Phenanthrene	20	< 20 U
120-12-7	Anthracene	20	< 20 U
84-74-2	Di-n-Butylphthalate	20	< 20 U
206-44-0	Fluoranthene	20	< 20 U
129-00-0	Pyrene	20	< 20 U
85-68-7	Butylbenzylphthalate	20	< 20 U
56-55-3	Benzo(a)anthracene	20	< 20 U
117-81-7	bis(2-Ethylhexyl)phthalate	20	< 20 U
218-01-9	Chrysene	20	< 20 U
117-84-0	Di-n-Octyl phthalate	20	< 20 U
205-99-2	Benzo(b)fluoranthene	20	< 20 U
207-08-9	Benzo(k)fluoranthene	20	< 20 U
50-32-8	Benzo(a)pyrene	20	< 20 U
193-39-5	Indeno(1,2,3-cd)pyrene	20	< 20 U
53-70-3	Dibenz(a,h)anthracene	20	< 20 U
191-24-2	Benzo(g,h,i)perylene	20	< 20 U
90-05-1	Guaiacol	20	< 20 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270 GC/MS

Sample ID: MB-011409
METHOD BLANK

Lab Sample ID: MB-011409
LIMS ID: 09-646
Matrix: Sediment
Date Analyzed: 01/22/09 17:18

QC Report No: OH01-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14

CAS Number	Analyte	RL	Result
483-65-8	Retene	20	< 20 U
90-12-0	1-Methylnaphthalene	20	< 20 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	66.8%	2-Fluorobiphenyl	63.2%
d14-p-Terphenyl	98.0%	d4-1,2-Dichlorobenzene	60.4%
d5-Phenol	65.9%	2-Fluorophenol	61.3%
2,4,6-Tribromophenol	70.7%	d4-2-Chlorophenol	61.9%

RESIN ACIDS

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: PGSS-GEO-3
SAMPLE

Lab Sample ID: OH01F
LIMS ID: 09-651
Matrix: Sediment
Data Release Authorized: VTS
Reported: 02/27/09

QC Report No: OH01-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/10/08
Date Received: 12/11/08

Date Extracted: 01/14/09
Date Analyzed: 01/27/09 16:39
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 25.7 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: 26.3%

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	97	< 97 U
471-74-9	Sandaracopimaric Acid	97	< 97 U
5835-26-7	Isopimaric Acid	97	< 97 U
1945-53-5	Palustric Acid	97	< 97 U
1740-19-8	Dehydroabietic Acid	97	< 97 U
514-10-3	Abietic Acid	97	< 97 U
471-77-2	Neoabietic Acid	97	< 97 U
5829-48-1	9,10-Dichlorostearic Acid	97	< 97 U
112-80-1	**Oleic Acid**	**97**	**900**
463-40-1	Linolenic Acid	97	< 97 U

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	78.2%

ANALYTICAL RESOURCES INCORPORATED

SW8270 RESIN ACIDS SOIL/SEDIMENT SURROGATE RECOVERY SUMMARY

Matrix: Sediment

QC Report No: OH01-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14

Client ID	MPA	TOT OUT
MB-011409	81.2%	0
LCS-011409	94.6%	0
LCSD-011409	94.4%	0
PGSS-GEO-3	78.2%	0
PGSS-GEO-3 MS	82.2%	0
PGSS-GEO-3 MSD	74.4%	0

	LCS/MB LIMITS	QC LIMITS
(MPA) = O-Methyl Podocarpic Acid	(28-120)	(19-114)

Prep Method: SW3550B
Log Number Range: 09-651 to 09-651

FORM-II SW8270

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: PGSS-GEO-3
MATRIX SPIKE

Lab Sample ID: OH01F
LIMS ID: 09-651
Matrix: Sediment
Data Release Authorized: VTS
Reported: 02/27/09

QC Report No: OH01-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/10/08
Date Received: 12/11/08

Date Extracted MS: 01/14/09

Sample Amount MS: 25.6 g-dry-wt
MSD: 25.6 g-dry-wt
Final Extract Volume MS: 0.5 mL
MSD: 0.5 mL
Dilution Factor MS: 1.00
MSD: 1.00
Moisture: 26.3%

Date Analyzed MS: 01/27/09 16:54
MSD: 01/27/09 17:09
Instrument/Analyst MS: NT6/VTS
MSD: NT6/VTS

Analyte	Sample	MS	Spike Added-MS	MS Recovery	MSD	Spike Added-MSD	MSD Recovery	RPD
Pimaric Acid	< 97.4 U	727	978	74.3%	726	977	74.3%	0.1%
Sandaracopimaric Acid	< 97.4 U	721	978	73.7%	716	977	73.3%	0.7%
Isopimaric Acid	< 97.4 U	396	978	40.5%	393	977	40.2%	0.8%
Palustric Acid	< 97.4 U	< 97.8 U	978	NA	< 97.7 U	977	NA	NA
Dehydroabietic Acid	< 97.4 U	826	978	84.5%	805	977	82.4%	2.6%
Abietic Acid	< 97.4 U	510	978	52.1%	440	977	45.0%	14.7%
Neoabietic Acid	< 97.4 U	< 97.8 U	978	NA	< 97.7 U	977	NA	NA
9,10-Dichlorostearic Acid	< 97.4 U	592	978	60.5%	658	977	67.3%	10.6%
Oleic Acid	905	1830	978	94.6%	1680	977	79.3%	8.5%
Linolenic Acid	< 97.4 U	499	978	51.0%	438	977	44.8%	13.0%

Results reported in µg/kg
NA-No recovery due to high concentration of analyte in original sample and/or calculated negative recovery.
RPD calculated using sample concentrations per SW846.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: PGSS-GEO-3
MATRIX SPIKE

Lab Sample ID: OH01F
LIMS ID: 09-651
Matrix: Sediment
Data Release Authorized: VTS
Reported: 02/27/09

QC Report No: OH01-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/10/08
Date Received: 12/11/08

Date Extracted: 01/14/09
Date Analyzed: 01/27/09 16:54
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 25.6 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: 26.3%

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	98	---
471-74-9	Sandaracopimaric Acid	98	---
5835-26-7	Isopimaric Acid	98	---
1945-53-5	Palustric Acid	98	---
1740-19-8	Dehydroabietic Acid	98	---
514-10-3	Abietic Acid	98	---
471-77-2	Neoabietic Acid	98	---
5829-48-1	9,10-Dichlorostearic Acid	98	---
112-80-1	Oleic Acid	98	---
463-40-1	Linolenic Acid	98	---

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	82.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS

Sample ID: PGSS-GEO-3
MATRIX SPIKE DUP

Lab Sample ID: OH01F
LIMS ID: 09-651
Matrix: Sediment
Data Release Authorized: VTS
Reported: 02/27/09

QC Report No: OH01-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/10/08
Date Received: 12/11/08

Date Extracted: 01/14/09
Date Analyzed: 01/27/09 17:09
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 25.6 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: 26.3%

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	98	---
471-74-9	Sandaracopimaric Acid	98	---
5835-26-7	Isopimaric Acid	98	---
1945-53-5	Palustric Acid	98	---
1740-19-8	Dehydroabietic Acid	98	---
514-10-3	Abietic Acid	98	---
471-77-2	Neoabietic Acid	98	---
5829-48-1	9,10-Dichlorostearic Acid	98	---
112-80-1	Oleic Acid	98	---
463-40-1	Linolenic Acid	98	---

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	74.4%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: LCS-011409
LAB CONTROL SAMPLE

Lab Sample ID: LCS-011409
LIMS ID: 09-651
Matrix: Sediment
Data Release Authorized: VTS
Reported: 02/27/09

QC Report No: OH01-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: NA
Date Received: NA

Date Extracted LCS: 01/14/09

Date Analyzed LCS: 01/27/09 16:09
LCSD: 01/27/09 16:24
Instrument/Analyst LCS: NT6/VTS
LCSD: NT6/VTS

Sample Amount LCS: 25.0 mL
LCSD: 25.0 mL
Final Extract Volume LCS: 0.50 mL
LCSD: 0.50 mL
Dilution Factor LCS: 1.00
LCSD: 1.00

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Pimaric Acid	893	1000	89.3%	921	1000	92.1%	3.1%
Sandaracopimaric Acid	879	1000	87.9%	905	1000	90.5%	2.9%
Isopimaric Acid	582	1000	58.2%	558	1000	55.8%	4.2%
Palustric Acid	< 100 U	1000	NA	< 100 U	1000	NA	NA
Dehydroabietic Acid	912	1000	91.2%	966	1000	96.6%	5.8%
Abietic Acid	3240 E	1000	324%	3780 E	1000	378%	15.4%
Neoabietic Acid	33.6 J	1000	3.4%	17.8 J	1000	1.8%	61.5%
9,10-Dichlorostearic Acid	898	1000	89.8%	925	1000	92.5%	3.0%
Oleic Acid	903	1000	90.3%	949	1000	94.9%	5.0%
Linolenic Acid	831	1000	83.1%	857	1000	85.7%	3.1%

Reported in µg/kg (ppb)

NA-No recovery due to high concentration of analyte in original sample, calculated negative recovery, or undetected spike.
RPD calculated using sample concentrations per SW846.

TBT Surrogate Recovery

	LCS	LCSD
O-Methyl Podocarpic Acid	94.6%	94.4%

4B

SEMIVOLATILE METHOD BLANK SUMMARY

BLANK NO.

OH01MBS1

Lab Name: ANALYTICAL RESOURCES, INC

Client: HART CROWSER, INC.

ARI Job No: OH01

Project: PORT GAMBLE

Lab File ID: OH01MB

Date Extracted: 01/14/09

Instrument ID: NT6

Date Analyzed: 01/27/09

Matrix: SOLID

Time Analyzed: 1554

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

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01	OH01LCSS1	OH01LCSS1	OH01SB	01/27/09
02	OH01LCSDS1	OH01LCSDS1	OH01SBD	01/27/09
03	PGSS-GEO-3	OH01F	OH01F	01/27/09
04	PGSS-GEO-3 MS	OH01FMS	OH01FMS	01/27/09
05	PGSS-GEO-3 MSD	OH01FMSD	OH01FMSD	01/27/09
06				
07				
08				
09				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				

COMMENTS:

FORM IV SV

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Resin Acids by SW8270D GC/MS
Page 1 of 1

Sample ID: MB-011409
METHOD BLANK

Lab Sample ID: MB-011409
LIMS ID: 09-651
Matrix: Sediment
Data Release Authorized: VTS
Reported: 02/27/09

QC Report No: OH01-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: NA
Date Received: NA

Date Extracted: 01/14/09
Date Analyzed: 01/27/09 15:54
Instrument/Analyst: NT6/VTS
GPC Cleanup: No

Sample Amount: 25.0 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
127-27-5	Pimaric Acid	100	< 100 U
471-74-9	Sandaracopimaric Acid	100	< 100 U
5835-26-7	Isopimaric Acid	100	< 100 U
1945-53-5	Palustric Acid	100	< 100 U
1740-19-8	Dehydroabietic Acid	100	< 100 U
514-10-3	Abietic Acid	100	< 100 U
471-77-2	Neoabietic Acid	100	< 100 U
5829-48-1	9,10-Dichlorostearic Acid	100	< 100 U
112-80-1	Oleic Acid	100	< 100 U
463-40-1	Linolenic Acid	100	< 100 U

Reported in µg/kg (ppb)

Resin Acid Surrogate Recovery

O-Methyl Podocarpic Acid	81.2%

PCB

ANALYTICAL RESOURCES INCORPORATED

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

Sample ID: PGSS-77A
SAMPLE

Lab Sample ID: OH01A
LIMS ID: 09-646
Matrix: Sediment
Data Release Authorized:
Reported: 01/20/09

QC Report No: OH01-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/09/08
Date Received: 12/11/08

Date Extracted: 01/14/09
Date Analyzed: 01/19/09 11:12
Instrument/Analyst: ECD5/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.2 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: 28.5%

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

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	71.2%
Tetrachlorometaxylene	72.2%

FORM I

ANALYTICAL RESOURCES INCORPORATED

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

Sample ID: PGSS-80
SAMPLE

Lab Sample ID: OH01C
LIMS ID: 09-648
Matrix: Sediment
Data Release Authorized:
Reported: 01/20/09

QC Report No: OH01-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/10/08
Date Received: 12/11/08

Date Extracted: 01/14/09
Date Analyzed: 01/19/09 12:03
Instrument/Analyst: ECD5/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.6 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: 19.1%

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

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	81.0%
Tetrachlorometaxylene	68.8%

ANALYTICAL RESOURCES INCORPORATED

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

Sample ID: PGSS-GEO-3
SAMPLE

Lab Sample ID: OH01F
LIMS ID: 09-651
Matrix: Sediment
Data Release Authorized: VTS
Reported: 02/27/09

QC Report No: OH01-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/10/08
Date Received: 12/11/08

Date Extracted: 01/14/09
Date Analyzed: 01/19/09 12:20
Instrument/Analyst: ECD5/PK
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.1 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: 26.3%

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

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	82.2%
Tetrachlorometaxylene	92.2%

ANALYTICAL RESOURCES INCORPORATED

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

Sample ID: PGSS-92
SAMPLE

Lab Sample ID: OH01G
LIMS ID: 09-652
Matrix: Sediment
Data Release Authorized:
Reported: 01/20/09

QC Report No: OH01-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/10/08
Date Received: 12/11/08

Date Extracted: 01/14/09
Date Analyzed: 01/19/09 12:37
Instrument/Analyst: ECD5/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.6 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: 30.2%

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

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	69.5%
Tetrachlorometaxylene	72.8%

FORM I

ANALYTICAL RESOURCES INCORPORATED

SW8082/PCB SOIL/SEDIMENT SURROGATE RECOVERY SUMMARY

Matrix: Sediment

QC Report No: OH01-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14

Client ID	DCBP % REC	DCBP LCL-UCL	TCMX % REC	TCMX LCL-UCL	TOT OUT
MB-011409	81.0%	36-130	79.5%	30-119	0
LCS-011409	69.8%	36-130	60.8%	30-119	0
LCSD-011409	58.2%	36-130	54.2%	30-119	0
PGSS-77A	71.2%	33-149	72.2%	32-121	0
PGSS-77A MS	78.2%	33-149	80.2%	32-121	0
PGSS-77A MSD	81.2%	33-149	85.2%	32-121	0
PGSS-80	81.0%	33-149	68.8%	32-121	0
PGSS-GEO-3	82.2%	33-149	92.2%	32-121	0
PGSS-92	69.5%	33-149	72.8%	32-121	0

Low Level PSDDA Control Limits
Prep Method: SW3550B
Log Number Range: 09-646 to 09-652

ANALYTICAL RESOURCES INCORPORATED

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

Sample ID: PGSS-77A
MS/MSD

Lab Sample ID: OH01A
LIMS ID: 09-646
Matrix: Sediment
Data Release Authorized:
Reported: 01/20/09

QC Report No: OH01-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/09/08
Date Received: 12/11/08

Date Extracted MS/MSD: 01/14/09

Sample Amount MS: 25.3 g-dry-wt
MSD: 25.3 g-dry-wt

Date Analyzed MS: 01/19/09 11:29
MSD: 01/19/09 11:46

Final Extract Volume MS: 1.0 mL
MSD: 1.0 mL

Instrument/Analyst MS: ECD5/JGR
MSD: ECD5/JGR

Dilution Factor MS: 1.00
MSD: 1.00

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

Silica Gel: No

Percent Moisture: 28.5%

Analyte	Sample	MS	Spike Added-MS	MS Recovery	MSD	Spike Added-MSD	MSD Recovery	RPD
Aroclor 1016	< 4.0 U	15.0	19.7	76.1%	16.0	19.8	80.8%	6.5%
Aroclor 1260	< 4.0 U	17.3	19.7	87.8%	17.9	19.8	90.4%	3.4%

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

ANALYTICAL RESOURCES INCORPORATED

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

Sample ID: PGSS-77A
MATRIX SPIKE

Lab Sample ID: OH01A
LIMS ID: 09-646
Matrix: Sediment
Data Release Authorized:
Reported: 01/20/09

QC Report No: OH01-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/09/08
Date Received: 12/11/08

Date Extracted: 01/14/09
Date Analyzed: 01/19/09 11:29
Instrument/Analyst: ECD5/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.3 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: 28.5%

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

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	78.2%
Tetrachlorometaxylene	80.2%

ANALYTICAL RESOURCES INCORPORATED

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

Sample ID: PGSS-77A
MATRIX SPIKE DUP

Lab Sample ID: OH01A
LIMS ID: 09-646
Matrix: Sediment
Data Release Authorized:
Reported: 01/20/09

QC Report No: OH01-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/09/08
Date Received: 12/11/08

Date Extracted: 01/14/09
Date Analyzed: 01/19/09 11:46
Instrument/Analyst: ECD5/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.3 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: 28.5%

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

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	81.2%
Tetrachlorometaxylene	85.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA PCB by GC/ECD

Sample ID: LCS-011409
LCS/LCSD

Lab Sample ID: LCS-011409
LIMS ID: 09-646
Matrix: Sediment
Data Release Authorized:
Reported: 01/20/09

QC Report No: OH01-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: NA
Date Received: NA

Date Extracted LCS/LCSD: 01/14/09

Date Analyzed LCS: 01/19/09 10:38
LCSD: 01/19/09 10:55
Instrument/Analyst LCS: ECD5/JGR
LCSD: ECD5/JGR

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

Sample Amount LCS: 25.0 g-dry-wt
LCSD: 25.0 g-dry-wt
Final Extract Volume LCS: 1.0 mL
LCSD: 1.0 mL
Dilution Factor LCS: 1.00
LCSD: 1.00
Silica Gel: No

Percent Moisture: NA

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Aroclor 1016	12.3	20.0	61.5%	12.3	20.0	61.5%	0.0%
Aroclor 1260	16.2	20.0	81.0%	13.8	20.0	69.0%	16.0%

PCB Surrogate Recovery

	LCS	LCSD
Decachlorobiphenyl	69.8%	58.2%
Tetrachlorometaxylene	60.8%	54.2%

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

PCB METHOD BLANK SUMMARY

BLANK NO.

OH01MBS1

Lab Name: ANALYTICAL RESOURCES, INC
Client: HART CROWSER, INC.

ARI Job No.: OH01
Project: PORT GAMBLE

Lab Sample ID: OH01MBS1
Lab File ID: 0119B015

Date Extracted: 01/14/09
Matrix: SOLID

Date Analyzed: 01/19/09
Instrument ID: ECD5

Time Analyzed: 1021
GC Columns: ZB5/ZB35

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

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED
01	OH01LCSS1	OH01LCSS1	01/19/09
02	OH01LCSDS1	OH01LCSDS1	01/19/09
03	PGSS-77A	OH01A	01/19/09
04	PGSS-77A MS	OH01AMS	01/19/09
05	PGSS-77A MSD	OH01AMSD	01/19/09
06	PGSS-80	OH01C	01/19/09
07	PGSS-GEO-3	OH01F	01/19/09
08	PGSS-92	OH01G	01/19/09
09	PGSS-51	OH02E	01/19/09
10	PGSS-64	OH02P	01/19/09
11	PGSS-73	OH02V	01/19/09
12	PGSS-75	OH02W	01/19/09

ALL RUNS ARE DUAL COLUMN

FORM IV PCB

ANALYTICAL RESOURCES INCORPORATED

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

Sample ID: MB-011409
METHOD BLANK

Lab Sample ID: MB-011409
LIMS ID: 09-646
Matrix: Sediment
Data Release Authorized:
Reported: 01/20/09

QC Report No: OH01-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: NA
Date Received: NA

Date Extracted: 01/14/09
Date Analyzed: 01/19/09 10:21
Instrument/Analyst: ECD5/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.0 g
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: NA

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

Reported in µg/kg (ppb)

PCB Surrogate Recovery	
Decachlorobiphenyl	81.0%
Tetrachlorometaxylene	79.5%

METALS

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: PGSS-77A
SAMPLE

Lab Sample ID: OH01A
LIMS ID: 09-646
Matrix: Sediment
Data Release Authorized:
Reported: 01/26/09

QC Report No: OH01-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/09/08
Date Received: 12/11/08

Percent Total Solids: 72.3%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	01/13/09	6010B	01/22/09	7440-38-2	Arsenic	6	6	U
3050B	01/13/09	6010B	01/22/09	**7440-43-9**	**Cadmium**	0.3	**0.5**	
3050B	01/13/09	6010B	01/22/09	**7440-47-3**	**Chromium**	0.6	**22.7**	
3050B	01/13/09	6010B	01/22/09	**7440-50-8**	**Copper**	0.3	**12.8**	
3050B	01/13/09	6010B	01/22/09	**7439-92-1**	**Lead**	3	**4**	
CLP	01/13/09	7471A	01/16/09	7439-97-6	Mercury	0.05	0.05	U
3050B	01/13/09	6010B	01/22/09	7440-22-4	Silver	0.4	0.4	U
3050B	01/13/09	6010B	01/22/09	**7440-66-6**	**Zinc**	1	**39**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: PGSS-80
SAMPLE

Lab Sample ID: OH01C
LIMS ID: 09-648
Matrix: Sediment
Data Release Authorized:
Reported: 01/26/09

QC Report No: OH01-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/10/08
Date Received: 12/11/08

Percent Total Solids: 82.4%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	01/13/09	6010B	01/22/09	7440-38-2	Arsenic	6	6	U
3050B	01/13/09	6010B	01/22/09	7440-43-9	Cadmium	0.2	0.2	U
3050B	01/13/09	6010B	01/22/09	**7440-47-3**	**Chromium**	0.6	**20.1**	
3050B	01/13/09	6010B	01/22/09	**7440-50-8**	**Copper**	0.2	**7.0**	
3050B	01/13/09	6010B	01/22/09	7439-92-1	Lead	2	2	U
CLP	01/13/09	7471A	01/16/09	7439-97-6	Mercury	0.06	0.06	U
3050B	01/13/09	6010B	01/22/09	7440-22-4	Silver	0.3	0.3	U
3050B	01/13/09	6010B	01/22/09	**7440-66-6**	**Zinc**	1	**26**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: PGSS-GEO-3
SAMPLE

Lab Sample ID: OH01F
LIMS ID: 09-651
Matrix: Sediment
Data Release Authorized:
Reported: 01/26/09

QC Report No: OH01-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/10/08
Date Received: 12/11/08

Percent Total Solids: 71.8%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	01/13/09	6010B	01/22/09	7440-38-2	Arsenic	7	7	U
3050B	01/13/09	6010B	01/22/09	7440-43-9	Cadmium	0.3	0.3	U
3050B	01/13/09	6010B	01/22/09	**7440-47-3**	**Chromium**	0.7	**16.8**	
3050B	01/13/09	6010B	01/22/09	**7440-50-8**	**Copper**	0.3	**5.9**	
3050B	01/13/09	6010B	01/22/09	7439-92-1	Lead	3	3	U
CLP	01/13/09	7471A	01/16/09	7439-97-6	Mercury	0.06	0.06	U
3050B	01/13/09	6010B	01/22/09	7440-22-4	Silver	0.4	0.4	U
3050B	01/13/09	6010B	01/22/09	**7440-66-6**	**Zinc**	1	**28**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: PGSS-92
SAMPLE

Lab Sample ID: OH01G
LIMS ID: 09-652
Matrix: Sediment
Data Release Authorized:
Reported: 01/26/09

QC Report No: OH01-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/10/08
Date Received: 12/11/08

Percent Total Solids: 62.9%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	01/13/09	6010B	01/22/09	7440-38-2	Arsenic	8	8	U
3050B	01/13/09	6010B	01/22/09	**7440-43-9**	**Cadmium**	0.3	**0.7**	
3050B	01/13/09	6010B	01/22/09	**7440-47-3**	**Chromium**	0.8	**25.9**	
3050B	01/13/09	6010B	01/22/09	**7440-50-8**	**Copper**	0.3	**22.1**	
3050B	01/13/09	6010B	01/22/09	**7439-92-1**	**Lead**	3	**6**	
CLP	01/13/09	7471A	01/16/09	7439-97-6	Mercury	0.07	0.07	U
3050B	01/13/09	6010B	01/22/09	7440-22-4	Silver	0.5	0.5	U
3050B	01/13/09	6010B	01/22/09	**7440-66-6**	**Zinc**	2	**49**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: PGSS-77A
MATRIX SPIKE

Lab Sample ID: OH01A
LIMS ID: 09-646
Matrix: Sediment
Data Release Authorized:
Reported: 01/26/09

QC Report No: OH01-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/09/08
Date Received: 12/11/08

MATRIX SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Spike	Spike Added	% Recovery	Q
Arsenic	6010B	6 U	262	258	102%	
Cadmium	6010B	0.5	64.7	64.6	99.4%	
Chromium	6010B	22.7	83.1	64.6	93.5%	
Copper	6010B	12.8	77.0	64.6	99.4%	
Lead	6010B	4	254	258	96.9%	
Mercury	7471A	0.05 U	0.58	0.551	105%	
Silver	6010B	0.4 U	67.2	64.6	104%	
Zinc	6010B	39	102	64.6	97.5%	

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%

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: PGSS-77A
DUPLICATE

Lab Sample ID: OH01A
LIMS ID: 09-646
Matrix: Sediment
Data Release Authorized:
Reported: 01/26/09

QC Report No: OH01-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/09/08
Date Received: 12/11/08

MATRIX DUPLICATE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Duplicate	RPD	Control Limit	Q
Arsenic	6010B	6 U	6 U	0.0%	+/- 6	L
Cadmium	6010B	0.5	0.5	0.0%	+/- 0.3	L
Chromium	6010B	22.7	26.4	15.1%	+/- 20%	
Copper	6010B	12.8	13.0	1.6%	+/- 20%	
Lead	6010B	4	4	0.0%	+/- 3	L
Mercury	7471A	0.05 U	0.05 U	0.0%	+/- 0.05	L
Silver	6010B	0.4 U	0.4 U	0.0%	+/- 0.4	L
Zinc	6010B	39	38	2.6%	+/- 20%	

Reported in mg/kg-dry

*-Control Limit Not Met
L-RPD Invalid, Limit = Detection Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS **Sample ID: LAB CONTROL**

Lab Sample ID: OH01LCS
LIMS ID: 09-648
Matrix: Sediment
Data Release Authorized:
Reported: 01/26/09

QC Report No: OH01-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: NA
Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike Found	Spike Added	% Recovery	Q
Arsenic	6010B	202	200	101%	
Cadmium	6010B	50.6	50.0	101%	
Chromium	6010B	48.8	50.0	97.6%	
Copper	6010B	49.5	50.0	99.0%	
Lead	6010B	198	200	99.0%	
Mercury	7471A	1.02	1.00	102%	
Silver	6010B	53.1	50.0	106%	
Zinc	6010B	50	50	100%	

Reported in mg/kg-dry

N-Control limit not met
NA-Not Applicable, Analyte Not Spiked
Control Limits: 80-120%

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS **Sample ID: METHOD BLANK**

Lab Sample ID: OH01MB
LIMS ID: 09-648
Matrix: Sediment
Data Release Authorized:
Reported: 01/26/09

QC Report No: OH01-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: NA
Date Received: NA

Percent Total Solids: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	01/13/09	6010B	01/22/09	7440-38-2	Arsenic	5	5	U
3050B	01/13/09	6010B	01/22/09	7440-43-9	Cadmium	0.2	0.2	U
3050B	01/13/09	6010B	01/22/09	7440-47-3	Chromium	0.5	0.5	U
3050B	01/13/09	6010B	01/22/09	7440-50-8	Copper	0.2	0.2	U
3050B	01/13/09	6010B	01/22/09	7439-92-1	Lead	2	2	U
CLP	01/13/09	7471A	01/16/09	7439-97-6	Mercury	0.05	0.05	U
3050B	01/13/09	6010B	01/22/09	7440-22-4	Silver	0.3	0.3	U
3050B	01/13/09	6010B	01/22/09	7440-66-6	Zinc	1	1	U

U-Analyte undetected at given RL
RL-Reporting Limit

GENERAL CHEMISTRY

SAMPLE RESULTS-CONVENTIONALS
OH01-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 01/22/09

Project: PORT GAMBLE
Event: 17330-14
Date Sampled: 12/10/08
Date Received: 12/11/08

Client ID: PGSS-GEO-3
ARI ID: 09-651 OH01F

Analyte	Date	Method	Units	RL	Sample
Total Solids	01/09/09 010909#1	EPA 160.3	Percent	0.01	70.90
Preserved Total Solids	01/09/09 010909#1	EPA 160.3	Percent	0.01	71.90
Total Volatile Solids	01/09/09 010909#1	EPA 160.4	Percent	0.01	1.74
N-Ammonia	01/14/09 011409#3	EPA 350.1M	mg-N/kg	0.14	10.4
Sulfide	01/13/09 011309#1	EPA 376.2	mg/kg	13.9	114
Total Organic Carbon	01/13/09 011309#1	Plumb,1981	Percent	0.020	1.78

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

MS/MSD RESULTS-CONVENTIONALS
OH01-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 01/22/09

Project: PORT GAMBLE
Event: 17330-14
Date Sampled: 12/10/08
Date Received: 12/11/08

Analyte	Date	Units	Sample	Spike	Spike Added	Recovery
ARI ID: OH01F Client ID: PGSS-GEO-3						
N-Ammonia	01/14/09	mg-N/kg	10.4	135	129	96.7%
Sulfide	01/13/09	mg/kg	114	257	164	87.2%
Total Organic Carbon	01/13/09	Percent	1.78	3.75	1.85	106.3%

REPLICATE RESULTS-CONVENTIONALS
OH01-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 01/22/09

Project: PORT GAMBLE
Event: 17330-14
Date Sampled: 12/10/08
Date Received: 12/11/08

Analyte	Date	Units	Sample	Replicate(s)	RPD/RSD
ARI ID: OH01F Client ID: PGSS-GEO-3					
Total Solids	01/09/09	Percent	70.90	69.50 69.50	1.2%
Preserved Total Solids	01/09/09	Percent	71.90	69.20 68.10	2.8%
Total Volatile Solids	01/09/09	Percent	1.74	1.81 1.76	2.0%
N-Ammonia	01/14/09	mg-N/kg	10.4	9.91 10.0	2.6%
Sulfide	01/13/09	mg/kg	114	103	10.1%
Total Organic Carbon	01/13/09	Percent	1.78	1.46 1.43	12.5%

LAB CONTROL RESULTS-CONVENTIONALS
OH01-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 01/22/09

Project: PORT GAMBLE
Event: 17330-14
Date Sampled: NA
Date Received: NA

Analyte	Date	Units	LCS	Spike Added	Recovery
Sulfide	01/13/09	mg/kg	135	123	110.1%
Total Organic Carbon	01/13/09	Percent	0.535	0.500	107.0%

METHOD BLANK RESULTS-CONVENTIONALS
OH01-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 01/22/09

Project: PORT GAMBLE
Event: 17330-14
Date Sampled: NA
Date Received: NA

Analyte	Date	Units	Blank
Total Solids	01/09/09	Percent	< 0.01 U
Preserved Total Solids	01/09/09	Percent	< 0.01 U
Total Volatile Solids	01/09/09	Percent	< 0.01 U
N-Ammonia	01/14/09	mg-N/kg	< 0.10 U
Sulfide	01/13/09	mg/kg	< 1.00 U
Total Organic Carbon	01/13/09	Percent	< 0.020 U

STANDARD REFERENCE RESULTS-CONVENTIONALS
OH01-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 01/22/09

Project: PORT GAMBLE
Event: 17330-14
Date Sampled: NA
Date Received: NA

Analyte/SRM ID	Date	Units	SRM	True Value	Recovery
N-Ammonia SPEX 28-24AS	01/14/09	mg-N/kg	96.6	100	96.6%
Total Organic Carbon NIST #8704	01/13/09	Percent	3.95	3.35	117.9%

GEOTECH

Hart Crowser, Inc.
Port Gamble 17330-14

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	
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
OK08 E-1	100.0	99.4	99.3	98.4	89.6	66.3	51.6	33.6	20.7	15.0	9.7	6.9	5.0	3.2
	100.0	94.4	93.6	92.7	84.2	61.9	47.8	30.4	20.4	14.5	9.2	6.4	4.7	3.0
	100.0	97.6	97.1	96.3	87.4	64.4	49.9	32.0	20.8	14.4	9.2	6.4	4.7	3.1
PGSS-77A	100.0	100.0	99.9	98.9	92.0	60.5	27.0	18.5	14.6	11.7	9.4	7.5	5.9	3.8
PGSS-92	100.0	83.2	75.9	68.5	60.7	42.9	27.1	18.0	13.9	10.5	8.2	6.2	4.8	3.4

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.

Hart Crowser, Inc.
Port Gamble 17330-14

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
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)
OK08 E-1	0.7	0.9	8.8	23.3	14.7	18.0	12.9	5.7	5.3	2.8	1.9	1.8	3.2	33.6
	6.4	0.8	8.5	22.3	14.1	17.4	10.0	5.9	5.3	2.7	1.7	1.7	3.0	30.4
	2.9	0.8	8.9	23.0	14.5	17.9	11.2	6.4	5.1	2.8	1.7	1.6	3.1	32.0
PGSS-77A	0.1	1.0	6.9	31.5	33.6	8.5	3.9	3.0	2.2	2.0	1.6	2.1	3.8	18.5
PGSS-92	24.1	7.4	7.9	17.8	15.8	9.1	4.1	3.4	2.3	2.0	1.4	1.5	3.4	18.0

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.

DIOXIN

SGS

Laboratory Results

Ms. Kelly Bottem
Analytical Resources, Inc.
4611 S. 134th Place
Suite 100
Tukwila WA 98168-3240

Phone: 206-695-6211
Fax: 206-695-6201

Dear Ms. Bottem:

Enclosed is a full data package containing the final results for samples received by SGS Environmental Services, Inc. on January 15, 2009 under your project name "Port Gamble". The samples were analyzed by Method 1613 following SGS's Standard Operating Procedures and are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards.

Number of Samples Received:	4
Your Project Reference:	Port Gamble
SGS Project Number:	G1040-1

We appreciate your business and look forward to working with you again. Please contact me at 910-350-1903 if you have questions or need additional technical support.

Sincerely,

Jeannie Milholland

Jeannie Milholland
Project Manager

2-17-2009
Date

DC138.033007.7

SGS

Case Narrative
SGS Project: **G1040-1**
Project Name: **Port Gamble**

For Method: 1613

- The submitted samples were accepted into the lab on January 15th, 2009 and extracted on January 19th, 2009 by method 3540C. The sample extract and associated QC extracts were then processed through clean-up as prescribed in the SGS standard operating procedures and analyzed by HRGC/HRMS for method 1613.
- No analytical issues were encountered.

Craig R. Tronzo 2/18/09

Craig R. Tronzo Date
Data Validation

Paradigm Analytical Laboratories, Inc. | 5500 Business Dr., Wilmington, NC 28405 t (910) 350-1903 f (910) 350-1557 www.us.sgs.com

SGS

Table of Contents

Section 1: Cover Letter/Case Narrative

Contains the Table of Contents, a project narrative, the client and SGS project identifiers, the number and type of samples, the methodology used to process the samples, and a summary table of sample results. A listing of current certifications by state, a table of abbreviations and qualifiers and the Toxic Equivalent Factors (TEF) are also supplied.

Section 2: Project Information

Contains the chain-of-custody(s), internal chain-of-custody(s) if applicable, sample login summary, sample receipt checklist, and any other project/client specific information.

Section 3: Sample Analytical Results

Contains results for client samples. Sample results include two pages of summarized analytical data and the associated raw data. The raw data includes a quantitation report from the instrumentation used that lists, ion areas, ratios, retention times, concentrations, and signal-to-noise ratios. It also has the selected ion current profiles (SICPs) for all homolog groups and any manual integrations.

Section 4: Quality Control Analytical Results

Contains results for each analytical workgroup associated with the submitted samples. A workgroup consists of the Lab Method Blank (LMB) and the Ongoing Precision and Recovery sample (OPR). All sample preparation data, including dry weight determinations, extraction logs, clean-up logs and observation notes are also documented. Any other supporting QC data will be documented here upon client request.

Section 5: Initial Calibration

Contains a table summarizing calibration data such as relative response factors, concentrations, and percent relative standard deviation. This section also contains related daily instrument QC information: GC performance data, mass resolution check, windows defining mix, and SICPs for all homolog groups and any manual integrations as well as the injection prep and instrument run logs.

Section 6: Continuing Calibration Data

Contains all daily instrument quality control information. This includes mass resolution checks, a table summarizing the window defining peaks, SICPs for the first and last eluters for each homolog group, SICPs documenting GC performance, a summary quantitation report showing RRFs for the Ccal and Ical, and SICPs for all homolog groups and any manual integrations, injection prep and instrumentation runlogs.

SGS

List of Qualifiers: Dioxin's

B	Analyte was detected in the Lab Method Blank at a level above the Reporting Limit.
EDL	"Estimated Detection Limit"
EMPC	"Estimated Maximum Possible Concentration"
RL	Report Limit
CL	Control Limit
U	Undetected
ppt	Parts-per-trillion (pg/g; ng/L)
V	Recovery is below quality control limit. The data has been validated based on a favorable signal-to-noise and detection limit.
#	Outside quality control limits
*	Indicates that the ion-ratio fails high or low; analyte reported as an EMPC

An average uncertainty of 30% can be routinely achieved as concluded from the evaluation of HRGC-HRMS standard operating procedures. The following flags warn the data user of situations where the uncertainty may be greater than stated.

A	Amount detected is less than the Lower Method Calibration Limit.
J	Amount detected is between the Method Detection Limit and the Lower Calibration Limit.
O	The recovery of this analyte in the OPR is above the Method QC Limits and the reported concentration in the sample may be biased high.
E	Amount detected is greater than the Upper Calibration Limit.
S	The amount of analyte present has saturated the detector. This situation results in an underestimation of the affected analyte(s).
Q	Indicates the presence of a quantitative interference. This situation may result in an underestimation of the affected analyte(s).
I	Indicates the presence of a qualitative interference that could cause a false positive or an overestimation of the affected analyte(s).
DPE	Indicates the presence of a peak in the polychlorinated diphenylether channel that could cause a false positive or an overestimation of the affected analyte(s).

SGS

Toxic Equivalency Factors

Analyte	WHO* 1998	WHO* 2005	International-89	MADEP+
2,3,7,8-TCDD	1	1	1	1
1,2,3,7,8-PeCDD	1	1	0.5	0.5
1,2,3,4,7,8-HxCDD	0.1	0.1	0.1	0.1
1,2,3,6,7,8-HxCDD	0.1	0.1	0.1	0.1
1,2,3,7,8,9-HxCDD	0.1	0.1	0.1	0.1
1,2,3,4,6,7,8-HpCDD	0.01	0.01	0.01	0.1
OCDD	0.0001	0.0003	0.001	0.001
2,3,7,8-TCDF	0.1	0.1	0.1	0.1
1,2,3,7,8-PeCDF	0.05	0.03	0.05	0.5
2,3,4,7,8-PeCDF	0.5	0.3	0.5	0.5
1,2,3,4,7,8-HxCDF	0.1	0.1	0.1	0.1
1,2,3,6,7,8-HxCDF	0.1	0.1	0.1	0.1
2,3,4,6,7,8-HxCDF	0.1	0.1	0.1	0.1
1,2,3,7,8,9-HxCDF	0.1	0.1	0.1	0.1
1,2,3,4,6,7,8-HpCDF	0.01	0.01	0.01	0.1
1,2,3,4,7,8,9-HpCDF	0.01	0.01	0.01	0.1
OCDF	0.0001	0.0003	0.001	0.001

* World Health Organization
+ Massachusetts Department of Environmental Protection

SUBCONTRACTOR ANALYSIS REQUEST
CUSTODY TRANSFER 01/14/09

ANALYTICAL RESOURCES INCORPORATED

ARI Project: OH01

G1040-1

Laboratory: SGS ENVIROMENTAL SERVICES INC.
Lab Contact: TRENT TEMPERLY
Lab Address: 5500 BUSINESS DR.
WILMINGTON, NC 28405
Phone: 910-350-1903
Fax: 910-350-1557

ARI Client: Hart Crowser, Inc.
Project ID: PORT GAMBLE
ARI PM: Kelly Bottem
Phone: 206-695-6211
Fax: 206-695-6201

Analytical Protocol: In-house
Special Instructions:

Requested Turn Around:
Fax Results (Y/N): **Yes**

Limits of Liability. *Subcontractor is expected to perform all requested services in accordance with appropriate methodology following Standard Operating Procedures that meet standards for the industry. The total liability of ARI, its officers, agents, employees, or sucessors, arising out of or in connection with the requested services, shall not exceed the negotiated amount for said services. The agreement by the Subcontractor to perform services requested by ARI releases 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 Subcontractor.*

ARI ID	Client ID/ Add'l ID	Sampled	Matrix	Bottles	Analyses
09-646-OH01A	PGSS-77A	12/09/08 16:03	Sediment	1	Dioxin/Furans 1613(Sub)
Special Instructions: DIOXIN ANALYSIS 1613					
09-648-OH01C	PGSS-80	12/10/08 08:17	Sediment	1	Dioxin/Furans 1613(Sub)
Special Instructions: DIOXIN ANALYSIS 1613					
09-651-OH01F	PGSS-GEO-3	12/10/08 10:35	Sediment	1	Dioxin/Furans 1613(Sub)
Special Instructions: DIOXIN ANALYSIS 1613					
09-652-OH01G	PGSS-92	12/10/08 11:03	Sediment	1	Dioxin/Furans 1613(Sub)
Special Instructions: DIOXIN ANALYSIS1613					

Carrier UPS | Airbill 1Z 832 695 01 4551 6751 | Date 1/14/09

Relinquished by [signature] | Company ARI | Date 1/14/09 | Time 1600

Received by [signature] | Company SGS 2.1 no seal | Date 1/15/09 | Time 10:15

Subcontractor Custody Form - **OH01**
Page 1 of 1

SGS Environmental Services, Inc.

Cust Proj ID: OH01
Client Name: Analytical Resources, Inc. PO:

G1040-1

Due Date: 2009-02-05 17:00:00
Login Date: 2009-01-16 09:29:32

Sample ID		Cust Sample ID	PRI	Date Collected	Date Received	Date Due	Matrix	LOC	Report	Analysis	Status
G1040-1-1	A	PGSS-77A	STD	2008-12-09 16:03:00	2009-01-15	2009-02-05	Sediment	W2	Full	1613	LG::REVW
G1040-1-2	A	PGSS-80	STD	2008-12-10 08:17:00	2009-01-15	2009-02-05	Sediment	W2	Full	1613	LG::REVW
G1040-1-3	A	PGSS-GEO-3	STD	2008-12-10 10:35:00	2009-01-15	2009-02-05	Sediment	W2	Full	1613	LG::REVW
G1040-1-4	A	PGSS-92	STD	2008-12-10 11:03:00	2009-01-15	2009-02-05	Sediment	W2	Full	1613	LG::REVW

Kelly Bottem

Fax Lotti

Sample Receipt Checklist (SRC)

SGS Environmetal Services Inc.

Client: **Analytical Resources, Inc.** Lab Proj. ID: **G1040-1**

Client Proj. ID: **OH01**

1. X Shipped
   __ Hand Delivered
   Notes:

2. X Proper, full, and complete documentation
   (unique sample identification on durable label with indelible ink, location of collection, date/time of collection, collector's name, preservation type, sample type (method/matrix))
   __ Acceptable documentation (but, incomplete)
   __ Unacceptable documentation
   Notes:

3. __ Custody Tape on Container
   X No Custody Tape
   Notes:

4. X Samples Intact*
   (are in appropriate container, are not damaged, and do not show signs of contamination)
   __ Samples Broken / Leaking
   __ VOA Vials Checked for Air Bubbles
   Notes:

5. X Chilled on Receipt* Actual Temp.(s) in °C: 2.1
   __ Ambient on Receipt
   __ Walk-in on Ice; Coming down to temp.
   __ Received out of temperature protocol
   Notes:

6. X Sufficient Sample Submitted
   __ Insufficient Sample Submitted
   Notes:

7. X Samples Preserved Correctly*
   (see preservative checklist where applicable)
   __ Improper Preservative(s)
   __ None recommended (N/A)
   Notes:

8. X Received Within Holding Time
   __ Not Received Within Holding Time
   __ N/A
   Notes:

9. X No Discrepancies Noted
   __ Discrepancies Noted
   Notes:

Comments:

* = Rejection of sample is required when not marked; Contact client services immediately for a resolution.

DC27.091503.3

Inspected and Logged in by:

Date / Time: Fri-1/16/09 09:29

Method 1613

PGSS-77A

Analytical Resources, Inc.

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	RL (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	1.00			
1,2,3,7,8-PeCDD	ND	5.00			
1,2,3,4,7,8-HxCDD	ND	5.00			
1,2,3,6,7,8-HxCDD	ND	5.00			
1,2,3,7,8,9-HxCDD	ND	5.00			
1,2,3,4,6,7,8-HpCDD	20.1	5.00	40:21	1.04	
OCDD	199	10.0	44:40	0.88	
2,3,7,8-TCDF	ND	1.00			
1,2,3,7,8-PeCDF	ND	5.00			
2,3,4,7,8-PeCDF	ND	5.00			
1,2,3,4,7,8-HxCDF	ND	5.00			
1,2,3,6,7,8-HxCDF	ND	5.00			
2,3,4,6,7,8-HxCDF	ND	5.00			
1,2,3,7,8,9-HxCDF	ND	5.00			
1,2,3,4,6,7,8-HpCDF	ND	5.00			
1,2,3,4,7,8,9-HpCDF	ND	5.00			
OCDF	ND	10.0			
Total TCDDs	23.0	1.00			
Total PeCDDs	ND	5.00			
Total HxCDDs	9.89	5.00			
Total HpCDDs	126	5.00			
Total TCDFs	7.05	1.00			DPE
Total PeCDFs	ND	5.00			
Total HxCDFs	ND	5.00			
Total HpCDFs	ND	5.00			
WHO-2005 TEQ (ND=0)	0.261				
WHO-2005 TEQ (ND=½)	5.94				

Client Information

Project Name:	Port Gamble		**Sample Information**		
			Matrix:	Sediment	
Sample ID:	PGSS-77A		Weight / Volume:	16.46	grams
			Solids / Lipids:	66.9	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG16440	
Project ID:	G1040-1				
Sample ID:	G1040-1-1B		Filename:	a27jan09a_5-7	
Collection Date/Time:	09-Dec-08	16:03	Retchk:	a27jan09a_4-15	
Receipt Date:	15-Jan-09	10:15	Begin ConCal:	a27jan09a_4-15	
Extraction Date:	19-Jan-09				
Analysis Date:	29-Jan-09	13:33	Initial Cal:	m1613-100708a	

Method 1613

PGSS-77A

Analytical Resources, Inc.

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
$^{13}C_{12}$-2,3,7,8-TCDD	2	1.49	74.4	31:28	0.78	
$^{13}C_{12}$-1,2,3,7,8-PeCDD	2	1.53	76.6	34:15	1.57	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	2	1.61	80.3	36:53	1.27	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	2	1.60	80.0	36:58	1.26	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	2	1.47	73.6	40:20	1.05	
$^{13}C_{12}$-OCDD	4	2.58	64.4	44:39	0.91	
$^{13}C_{12}$-2,3,7,8-TCDF	2	1.61	80.3	30:52	0.79	
$^{13}C_{12}$-1,2,3,7,8-PeCDF	2	1.71	85.4	33:28	1.58	
$^{13}C_{12}$-2,3,4,7,8-PeCDF	2	1.52	75.8	34:05	1.59	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	2	1.70	85.2	36:09	0.52	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	2	1.73	86.3	36:15	0.53	
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	2	1.66	83.2	36:45	0.53	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	2	1.62	81.0	37:33	0.53	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	2	1.47	73.5	39:03	0.45	
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	2	1.50	74.8	41:01	0.45	
Cleanup Standard						
$^{37}Cl_4$-2,3,7,8-TCDD	0.4	0.330	82.5	31:29		
Injection Standards						
$^{13}C_{12}$-1,2,3,4-TCDD	2			31:01	0.80	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	2			37:13	1.25	

Client Information

Project Name:	Port Gamble
Sample ID:	PGSS-77A

Laboratory Information

Project ID:	G1040-1	
Sample ID:	G1040-1-1B	
Collection Date/Time:	09-Dec-08	16:03
Receipt Date:	15-Jan-09	10:15
Extraction Date:	19-Jan-09	
Analysis Date:	29-Jan-09	13:33

Sample Information

Matrix:	Sediment	
Weight / Volume:	16.46	grams
Solids / Lipids:	66.9	%
Original pH :	NA	
Batch ID:	WG16440	
Filename:	a27jan09a_5-7	
Retchk:	a27jan09a_4-15	
Begin ConCal:	a27jan09a_4-15	
Initial Cal:	m1613-100708a	

Analyzed by: _____ Date: 021709

Reviewed by: _____ Date: 02/17/09

Form Version:[1613_HRMS12]Repor

Filename ; a27jan09a_5
Sample ; 7
Acquired ; 29-JAN-09 13:33:41
Processed ; 30-JAN-09 07:42:35
Sample ID ; G1040-1-1B
Cal Table ; m1613-100708a
Results Table ; m1613-012709a_5
Comments ;

;*1613*
;Inst: HRMS1

[OCDD] = (1.18e7 + 1.33e7) / (2.04e7 + 2.26e7) × (4000pg / ~~2000pg~~) × (1 / 1.0643) = 199pg/g

16.4g x 0.6695

Ent;	Name;	Resp;	Ion 1;	Ion 2;	RA;?;	RT;	Conc;	EDL;	S/N1;?;	S/N2;?;M;	Signal1;	Noise 1;	Signal2;	Noise 2
1 ;	2,3,7,8-TCDD;	*;	*;	*;	*;n;	NotFnd;	*;	0.1689;	*;n;	*;n;n;	*;	6.07e+03;	*;	5.27e+03
2 ;	1,2,3,7,8-PeCDD;	*;	*;	*;	*;n;	NotFnd;	*;	0.2188;	*;n;	*;n;n;	*;	7.51e+03;	*;	7.41e+03
3 ;	1,2,3,4,7,8-HxCDD;	*;	*;	*;	*;n;	NotFnd;	*;	0.3360;	*;n;	*;n;n;	*;	7.31e+03;	*;	8.04e+03
4 ;	1,2,3,6,7,8-HxCDD;	2.00e+05;	1.13e+05;	8.68e+04;	1.30;y;	36:59;	0.453;	0.3427;	6;y;	3;y;n;	4.45e+04;	7.31e+03;	2.62e+04;	8.04e+03
5 ;	1,2,3,7,8,9-HxCDD;	1.10e+05;	7.90e+04;	3.11e+04;	2.54;n;	37:14;	0.257;	0.3417;	3;y;	2;n;n;	2.25e+04;	7.31e+03;	1.22e+04;	8.04e+03
6 ;	1,2,3,4,6,7,8-HpCDD;	3.63e+06;	1.85e+06;	1.78e+06;	1.04;y;	40:21;	11.072;	0.5575;	59;y;	67;y;n;	4.61e+05;	7.79e+03;	4.77e+05;	7.12e+03
7 ;	OCDD;	2.51e+07;	1.18e+07;	1.33e+07;	0.88;y;	44:40;	109.734;	0.9781;	285;y;	415;y;n;	2.21e+06;	7.75e+03;	2.49e+06;	6.00e+03
8 ;	2,3,7,8-TCDF;	5.20e+05;	2.19e+05;	3.02e+05;	0.72;y;	30:53;	0.486;	0.1785;	8;y;	10;y;y;	6.24e+04;	8.12e+03;	7.54e+04;	7.42e+03
9 ;	1,2,3,7,8-PeCDF;	1.38e+05;	8.43e+04;	5.38e+04;	1.57;y;	33:28;	0.158;	0.1387;	4;y;	3;n;n;	3.49e+04;	8.88e+03;	2.29e+04;	8.19e+03
10 ;	2,3,4,7,8-PeCDF;	1.84e+05;	1.27e+05;	5.63e+04;	2.26;n;	34:05;	0.229;	0.1667;	5;y;	3;y;n;	4.28e+04;	8.88e+03;	2.51e+04;	8.19e+03
11 ;	1,2,3,4,7,8-HxCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.2252;	*;n;	*;n;n;	*;	8.54e+03;	*;	7.25e+03
12 ;	1,2,3,6,7,8-HxCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.1996;	*;n;	*;n;n;	*;	8.54e+03;	*;	7.25e+03
13 ;	2,3,4,6,7,8-HxCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.2175;	*;n;	*;n;n;	*;	8.54e+03;	*;	7.25e+03
14 ;	1,2,3,7,8,9-HxCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.3044;	*;n;	*;n;n;	*;	8.54e+03;	*;	7.25e+03
15 ;	1,2,3,4,6,7,8-HpCDF;	7.09e+05;	3.32e+05;	3.77e+05;	0.88;n;	39:04;	1.340;	0.2765;	16;y;	14;y;n;	1.03e+05;	6.57e+03;	9.81e+04;	6.77e+03
16 ;	1,2,3,4,7,8,9-HpCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.4045;	*;n;	*;n;n;	*;	6.57e+03;	*;	6.77e+03
17 ;	OCDF;	9.18e+05;	4.67e+05;	4.51e+05;	1.03;n;	44:59;	3.375;	0.8868;	12;y;	14;y;n;	8.82e+04;	7.62e+03;	9.78e+04;	7.20e+03
Extraction Standards														
18 ;	13C-2,3,7,8-TCDD;	6.45e+07;	2.83e+07;	3.63e+07;	0.78;y;	31:28;	74.357;	0.2065;	1079;y;	1545;y;n;	8.76e+06;	8.12e+03;	1.12e+07;	7.25e+03
19 ;	13C-1,2,3,7,8-PeCDD;	4.86e+07;	2.97e+07;	1.89e+07;	1.57;y;	34:15;	76.615;	0.2729;	1527;y;	1070;y;n;	1.18e+07;	7.72e+03;	7.62e+06;	7.12e+03
20 ;	13C-1,2,3,4,7,8-HxCDD;	4.11e+07;	2.30e+07;	1.81e+07;	1.27;y;	36:53;	80.274;	0.2734;	984;y;	927;y;n;	7.49e+06;	7.60e+03;	5.82e+06;	6.28e+03
21 ;	13C-1,2,3,6,7,8-HxCDD;	4.45e+07;	2.48e+07;	1.96e+07;	1.26;y;	36:58;	79.965;	0.2516;	999;y;	950;y;n;	7.60e+06;	7.60e+03;	5.96e+06;	6.28e+03
22 ;	13C-1,2,3,4,6,7,8-HpCDD;	3.09e+07;	1.58e+07;	1.50e+07;	1.05;y;	40:20;	73.588;	0.3251;	529;y;	594;y;n;	3.88e+06;	7.33e+03;	3.68e+06;	6.20e+03
23 ;	13C-OCDD;	4.30e+07;	2.04e+07;	2.26e+07;	0.91;y;	44:39;	128.804;	0.4238;	543;y;	586;y;n;	3.73e+06;	6.87e+03;	4.19e+06;	7.16e+03
24 ;	13C-2,3,7,8-TCDF;	1.03e+08;	4.57e+07;	5.75e+07;	0.79;y;	30:52;	80.252;	0.1225;	1720;y;	1998;y;n;	1.11e+07;	6.48e+03;	1.40e+07;	7.03e+03
25 ;	13C-1,2,3,7,8-PeCDF;	8.88e+07;	5.44e+07;	3.44e+07;	1.58;y;	33:28;	85.418;	0.2368;	3020;y;	1068;y;n;	2.31e+07;	7.64e+03;	1.44e+07;	1.35e+04
26 ;	13C-2,3,4,7,8-PeCDF;	7.71e+07;	4.74e+07;	2.97e+07;	1.59;y;	34:05;	75.765;	0.2419;	2360;y;	856;y;n;	1.80e+07;	7.64e+03;	1.15e+07;	1.35e+04
27 ;	13C-1,2,3,4,7,8-HxCDF;	5.63e+07;	1.93e+07;	3.70e+07;	0.52;y;	36:09;	85.201;	0.2045;	888;y;	1881;y;n;	6.29e+06;	7.08e+03;	1.19e+07;	6.32e+03
28 ;	13C-1,2,3,6,7,8-HxCDF;	6.30e+07;	2.18e+07;	4.12e+07;	0.53;y;	36:15;	86.320;	0.1853;	1020;y;	2184;y;n;	7.22e+06;	7.08e+03;	1.38e+07;	6.32e+03
29 ;	13C-2,3,4,6,7,8-HxCDF;	5.71e+07;	1.97e+07;	3.74e+07;	0.53;y;	36:45;	83.199;	0.1970;	928;y;	2013;y;n;	6.57e+06;	7.08e+03;	1.27e+07;	6.32e+03
30 ;	13C-1,2,3,7,8,9-HxCDF;	4.95e+07;	1.71e+07;	3.23e+07;	0.53;y;	37:33;	80.961;	0.2212;	690;y;	1466;y;n;	4.88e+06;	7.08e+03;	9.27e+06;	6.32e+03
31 ;	13C-1,2,3,4,6,7,8-HpCDF;	3.85e+07;	1.19e+07;	2.66e+07;	0.45;y;	39:03;	73.523;	0.3286;	395;y;	825;y;n;	3.26e+06;	8.26e+03;	7.27e+06;	8.81e+03
32 ;	13C-1,2,3,4,7,8,9-HpCDF;	3.08e+07;	9.51e+06;	2.13e+07;	0.45;y;	41:01;	74.769;	0.4172;	273;y;	566;y;n;	2.26e+06;	8.26e+03;	4.98e+06;	8.81e+03
Injection Standards														
33 ;	13C-1,2,3,4-TCDD;	7.78e+07;	3.45e+07;	4.33e+07;	0.80;y;	31:01;	57.275;	-;	1090;y;	1542;y;n;	8.84e+06;	8.12e+03;	1.12e+07;	7.25e+03
34 ;	13C-1,2,3,7,8,9-HxCDD;	5.32e+07;	2.96e+07;	2.37e+07;	1.25;y;	37:13;	49.327;	-;	1148;y;	1132;y;n;	8.73e+06;	7.60e+03;	7.10e+06;	6.28e+03
Cleanup Standard														
35 ;	37Cl-2,3,7,8-TCDD;	1.53e+07;	1.53e+07;	-;	-;-;	31:29;	16.515;	0.0763;	803;y;	-;-;n;	4.86e+06;	6.05e+03;	-;	-

Totals Raw Data

	Conc	Empc	Flags
TCDF	3.883	3.883	FALSE
TCDD	12.67	12.67	FALSE
PeCDF	0	0	FALSE
PeCDD	0	0	FALSE
HxCDF	0	0	FALSE
HxCDD	5.449	5.449	FALSE
HpCDF	0	0	FALSE
HpCDD	69.347	69.347	FALSE

Filename: a27jan09a_5
Sample: 7
Acquired: 29-JAN-09 13:33:41
Processed: 30-JAN-09 07:42:35
Sample ID: G1040-1-1B
Cal Table: m1613-100708a
Results Table: m1613-012709a_5

Name of Homolog Group: Total Tetra-Furans
Number of Peaks Found: 18 5
RRF Used For Totals: 1.0368
Detection Limit: 0.1785
Noise Height Ion1/Ion2: 8116 / 7416
Begin Window: 26:14:00
End Window: 33:07:00

RL=0.500 (pg/µL)

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	3.68E+05	156000	212000		0.74 y	26:37	0.344	RL	3.8	y	5.2	y	n
	2	1.91E+04	8910	10200		0.88 y	26:43	0.018	S2N	0.5	n	0.7	n	n
	3	1.98E+05	107000	91000		1.17 n	27:02	0.185	RL	3	n	3.6	y	n
	4	3.34E+05	135000	199000		0.68 y	27:33	0.312	RL	3.6	y	5.4	y	n
	5	1.21E+06	523000	690000		0.76 y	27:55	1.133	OK	9.7	y	15.3	y	y
	6	8.03E+05	341000	462000		0.74 y	28:14	0.751	OK	6	y	8.4	y	n
	7	3.16E+05	139000	177000		0.79 y	28:37	0.295	RL	3.8	y	4.4	y	n
	8	3.49E+05	131000	218000		0.6 n	28:53	0.326	RL	4	y	5.9	y	n
	9	9.27E+04	21200	71500		0.3 n	29:13	0.087	S2N	1.1	n	2.5	n	n
	10	1.37E+05	61900	75300		0.82 y	29:22	0.128	S2N	2.1	n	2.5	n	n
	11	9.12E+05	384000	528000		0.73 y	29:33	0.852	OK	7.5	y	11.2	y	y
	12	5.84E+05	239000	344000		0.7 y	30:00	0.545	OK	5.2	y	7.9	y	y
	13	1.53E+05	10500	142000		0.07 n	30:15	0.143	S2N	0.9	n	4.1	y	n
	14	1.21E+05	58400	62700		0.93 n	30:30	0.113	S2N	2.1	n	2.2	n	n
	15	1.75E+05	51000	124000		0.41 n	30:41	0.164	S2N	2.4	n	4	y	n
2,3,7,8-TCDF	16	5.20E+05	219000	302000		0.72 y	30:53	0.486	RL	7.7	y	10.2	y	y
	17	6.44E+05	296000	348000		0.85 y	31:08	0.602	OK	10.5	y	13.8	y	n
	18	1.20E+05	77200	42400		1.82 n	32:06	0.112	RL	4.3	y	3	n	n

Filename: a27jan09a_5
Sample: 7
Acquired: 29-JAN-09 13:33:41
Processed: 30-JAN-09 07:42:35
Sample ID: G1040-1-1B
Cal Table: m1613-100708a
Results Table: m1613-012709a_5

Name of Homolog Group: Total Tetra-Dioxins
Number of Peaks Found: 6 5
RRF Used For Totals: 1.0087
Detection Limit: 0.1689
Noise Height Ion1/Ion2: 6066 / 5268
Begin Window: 27:41:00
End Window: 32:38:00

RL=0.500 (pg/µL)

Totals Raw Data

Name	#		Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
		1	3.68E+06	1560000	2110000		0.74	y 28:19	5.649	OK	53.1	y	81.5	y	n
		2	3.18E+06	1370000	1800000		0.76	y 28:37	4.877	OK	43	y	63.7	y	y
		3	2.36E+05	108000	128000		0.84	y 29:57	0.362	RL	3.9	y	5.8	y	y
		4	3.26E+05	144000	182000		0.79	y 30:10	0.501	OK	4.7	y	6.7	y	y
		5	5.65E+05	250000	315000		0.79	y 31:02	0.868	OK	13.5	y	18.4	y	y
		6	5.04E+05	224000	281000		0.8	y 31:18	0.775	OK	8	y	12.6	y	y

Filename: a27jan09a_5
Sample: 7
Acquired: 29-JAN-09 13:33:41
Processed: 30-JAN-09 07:42:35
Sample ID: G1040-1-1B
Cal Table: m1613-100708a
Results Table: m1613-012709a_5

Name of Homolog Group: Total Penta-Furans Fn1
Number of Peaks Found: 1 0
RRF Used For Totals: 1.0121
Detection Limit: 0.1307
Noise Height Ion1/Ion2: 6916 / 7776
Begin Window: 31:46:00
End Window: 32:06:00

Name	#		Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
		1	5.53E+05	207000	346000		0.6	y 32:05	0.659	RL	14.5	y	21.5	y	n

Filename: a27jan09a_5
Sample: 7
Acquired: 29-JAN-09 13:33:41
Processed: 30-JAN-09 07:42:35
Sample ID: G1040-1-1B
Cal Table: m1613-100708a
Results Table: m1613-012709a_5

Name of Homolog Group: Total Penta-Furans Fn2
Number of Peaks Found: 7 0
RRF Used For Totals: 1.0121
Detection Limit: 0.1518
Noise Height Ion1/Ion2: 8880 / 8188
Begin Window: 31:43:00
End Window: 10:52

RL=2.500 (pg/µL)

Name	#		Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
		1	2.15E+05	127000	87800		1.44	y 32:49	0.256	RL	5.8	y	3.3	y	n
		2	4.64E+05	284000	179000		1.59	y 32:54	0.552	RL	8.7	y	6.2	y	n
		3	1.92E+05	138000	53200		2.6	n 33:14	0.228	RL	4.5	y	2.8	n	n
1,2,3,7,8-PeCDF		4	1.38E+05	84300	53800		1.57	y 33:28	0.158	RL	3.9	y	2.8	n	n
		5	1.66E+05	107000	59800		1.78	y 33:37	0.198	S2N	4	y	2.2	n	n
		6	7.73E+04	58600	18700		3.13	n 34:01	0.092	S2N	2.6	n	1.7	n	n
2,3,4,7,8-PeCDF		7	1.84E+05	127000	56300		2.26	n 34:05	0.229	RL	4.8	y	3.1	y	n

Filename: a27jan09a_5
Sample: 7
Acquired: 29-JAN-09 13:33:41
Processed: 30-JAN-09 07:42:35
Sample ID: G1040-1-1B
Cal Table: m1613-100708a

Name of Homolog Group: Total Penta-Dioxins
Number of Peaks Found: 4 0
RRF Used For Totals: 1.0517
Detection Limit: 0.2188
Noise Height Ion1/Ion2: 7508 / 7412
Begin Window: 32:51:00

RL=2.500 (pg/µL)

Results Table: m1613-012709a_5 End Window: 34:36:00

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	6.82E+05	427000	255000		1.67 y	32:56	1.333	RL	19 y		10.7 y		n
	2	8.72E+05	546000	326000		1.68 y	33:29	1.705	RL	30.9 y		19.6 y		n
	3	8.13E+05	511000	301000		1.7 y	33:38	1.589	RL	23.3 y		14.8 y		n
	4	4.06E+05	247000	159000		1.55 y	33:59	0.794	RL	12.4 y		7.9 y		n

Filename: a27jan09a_5 Name of Homolog Group: Total Hexa-Furans
Sample: 7 Number of Peaks Found: 3 0
Acquired: 29-JAN-09 13:33:41 RRF Used For Totals: 1.1305
Processed: 30-JAN-09 07:42:35 Detection Limit: 0.2331
Sample ID: G1040-1-1B Noise Height Ion1/Ion2: 8544 / 7252
Cal Table: m1613-100708a Begin Window: 35:05:00
Results Table: m1613-012709a_5 End Window: 37:39:00

RL=2.500 (pg/µL)

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	1.54E+05	74900	78900		0.95 n	35:13	0.241	RL	3.8 y		3.8 y		n
	2	4.36E+05	250000	186000		1.35 y	35:20	0.683	RL	11.2 y		9.7 y		n
	3	5.23E+05	284000	238000		1.19 y	35:47	0.819	RL	12.6 y		11.2 y		n

Filename: a27jan09a_5 Name of Homolog Group: Total Hexa-Dioxins
Sample: 7 Number of Peaks Found: 6 2
Acquired: 29-JAN-09 13:33:41 RRF Used For Totals: 1.0077
Processed: 30-JAN-09 07:42:35 Detection Limit: 0.3404
Sample ID: G1040-1-1B Noise Height Ion1/Ion2: 7312 / 8036
Cal Table: m1613-100708a Begin Window: 35:36:00
Results Table: m1613-012709a_5 End Window: 37:17:00

RL=2.500 (pg/µL)

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	1.27E+06	702000	565000		1.24 y	35:38	2.94	OK	34.2 y		24.6 y		n
	2	1.03E+06	557000	474000		1.18 y	36:06	2.392	RL	28.8 y		20.6 y		n
	3	1.08E+06	605000	476000		1.27 y	36:19	2.509	OK	22.6 y		17 y		n
	4	2.71E+05	146000	125000		1.16 y	36:25	0.628	RL	8.2 y		5.2 y		n
1,2,3,6,7,8-HxCDD	5	2.00E+05	113000	86800		1.3 y	36:59	0.453	RL	6.1 y		3.3 y		n
1,2,3,7,8,9-HxCDD	6	1.10E+05	79000	31100		2.54 n	37:14	0.257	S2N	3.1 y		1.5 n		n

Filename: a27jan09a_5 Name of Homolog Group: Total Hepta-Furans
Sample: 7 Number of Peaks Found: 2 0
Acquired: 29-JAN-09 13:33:41 RRF Used For Totals: 1.3693
Processed: 30-JAN-09 07:42:35 Detection Limit: 0.3331
Sample ID: G1040-1-1B Noise Height Ion1/Ion2: 6568 / 6772
Cal Table: m1613-100708a Begin Window: 38:52:00
Results Table: m1613-012709a_5 End Window: 41:04:00

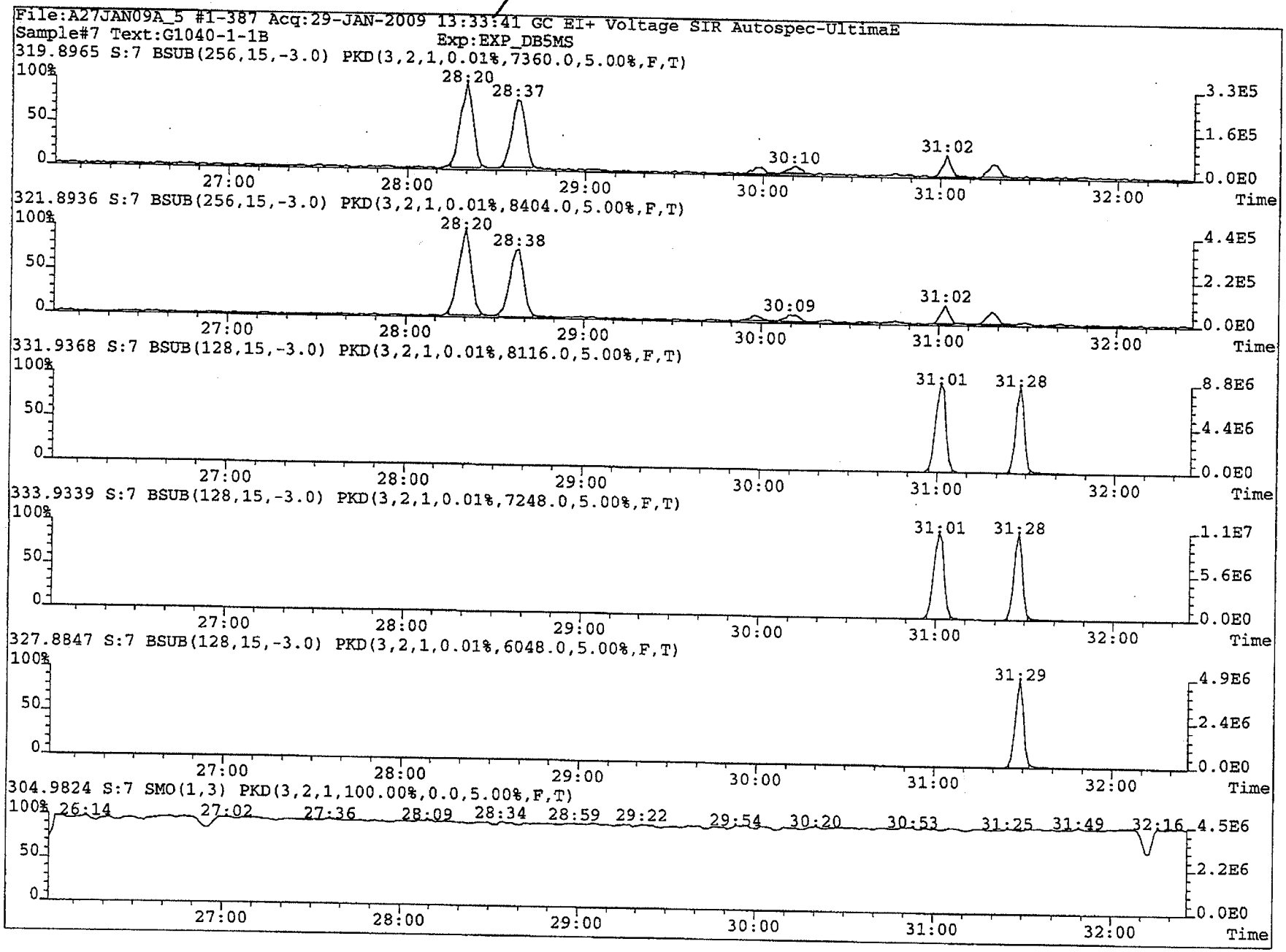
RL=2.500 (pg/µL)

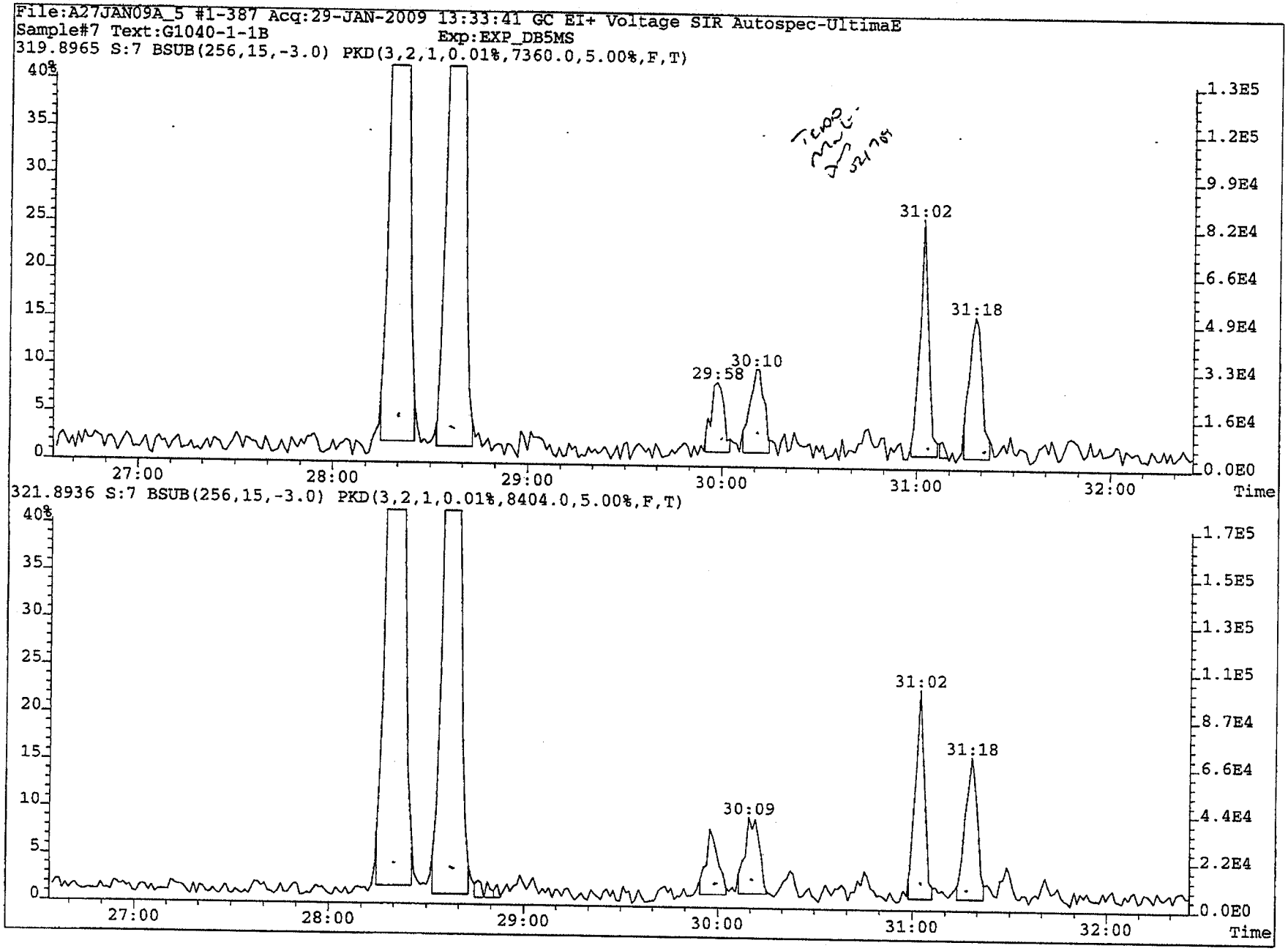
Totals Raw Data

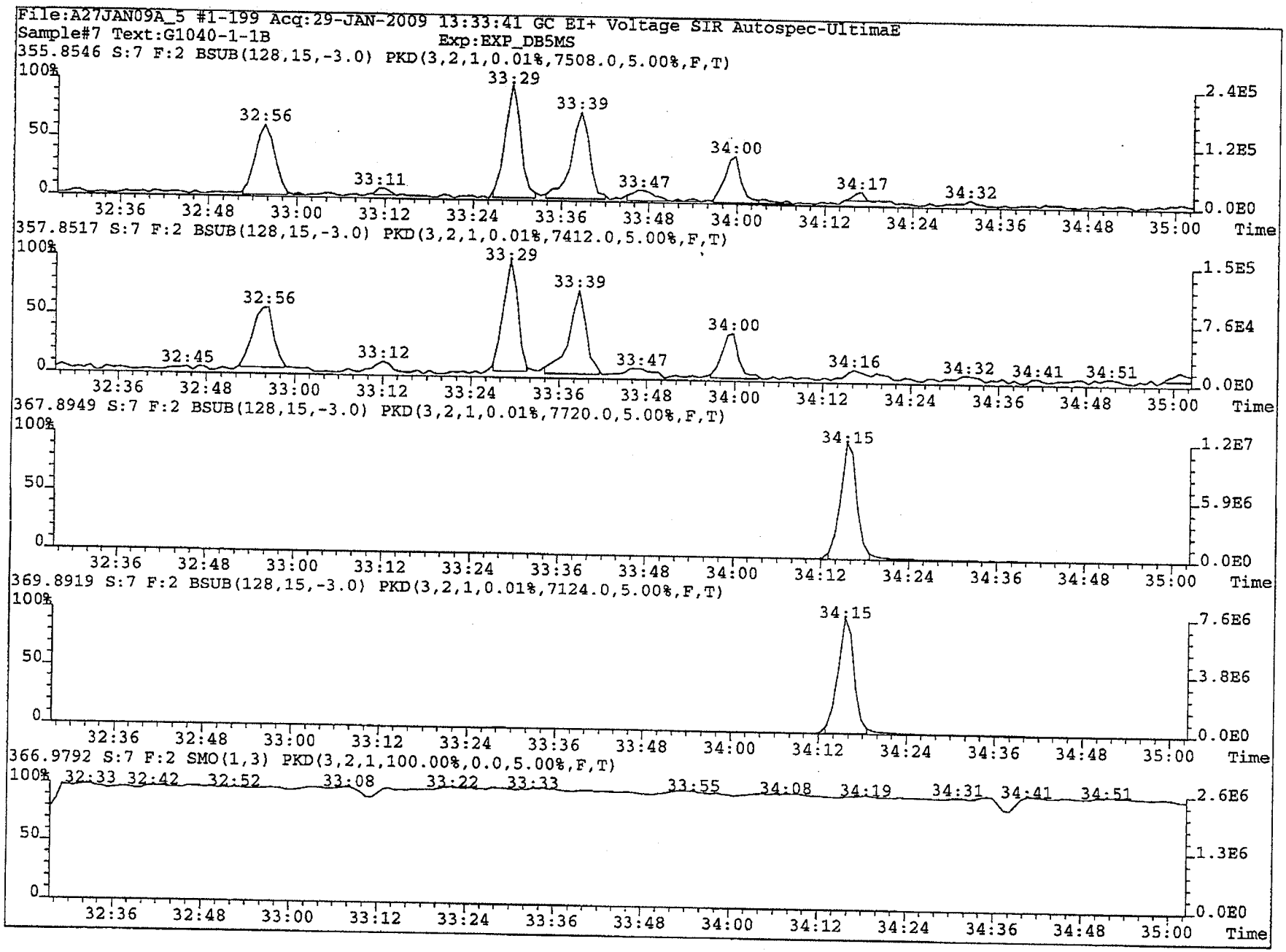
Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
1,2,3,4,6,7,8-HpCDI	1	7.09E+05	332000	377000	0.88	n	39:04	1.34	RL	15.6	y	14.5	y	n
	2	1.17E+06	588000	582000	1.01	y	39:36	2.464	RL	26	y	24.2	y	n

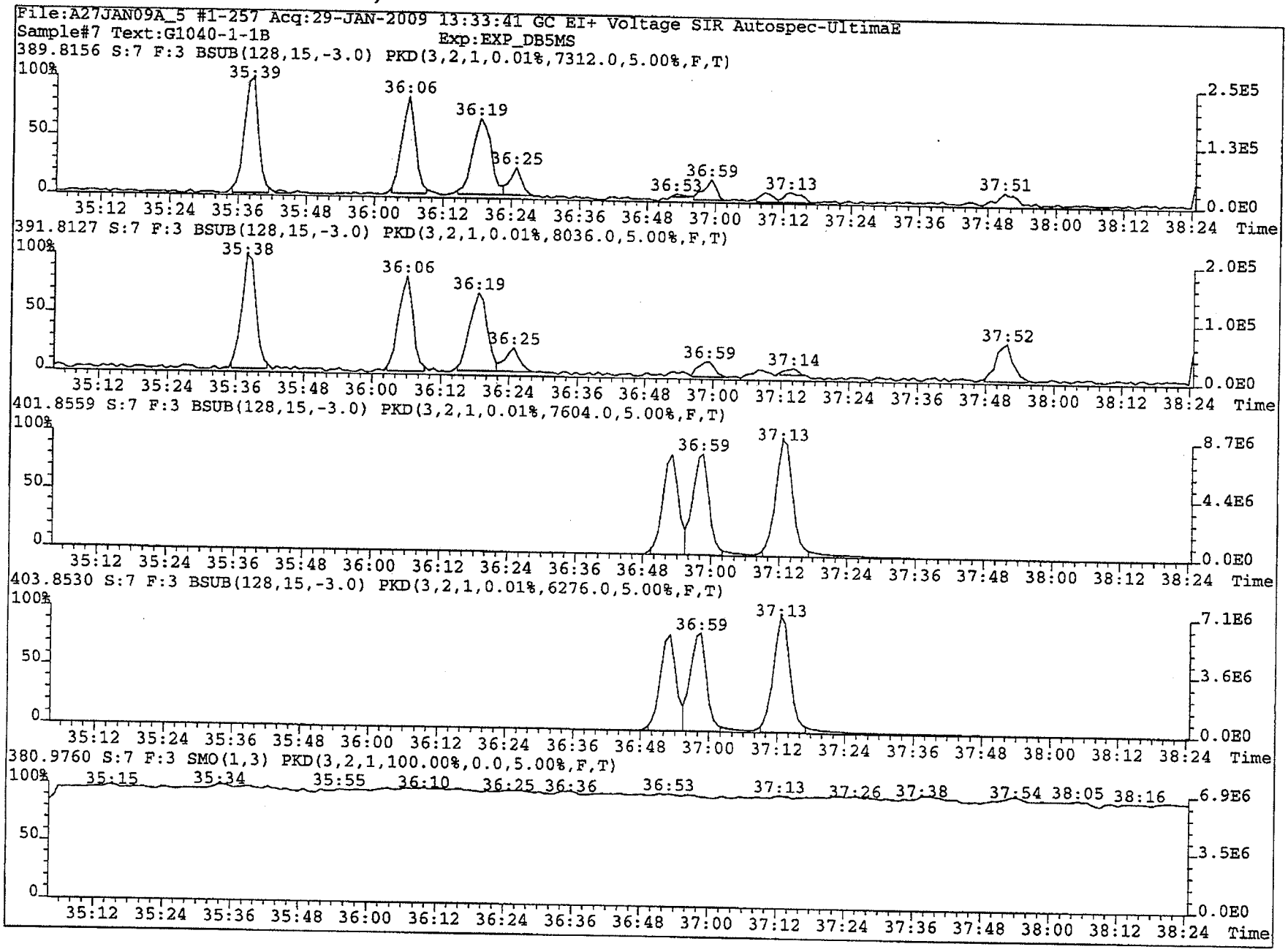
Filename:	a27jan09a_5	Name of Homolog Group:	Total Hepta-Dioxins		
Sample:	7	Number of Peaks Found:	2	2	
Acquired:	29-JAN-09 13:33:41	RRF Used For Totals:	1.0612		
Processed:	30-JAN-09 07:42:35	Detection Limit:	0.5575		RL=2.500 (pg/µL)
Sample ID:	G1040-1-1B	Noise Height Ion1/Ion2:	7792 / 7124		
Cal Table:	m1613-100708a	Begin Window:			39:18:00
Results Table:	m1613-012709a_5	End Window:			40:30:00

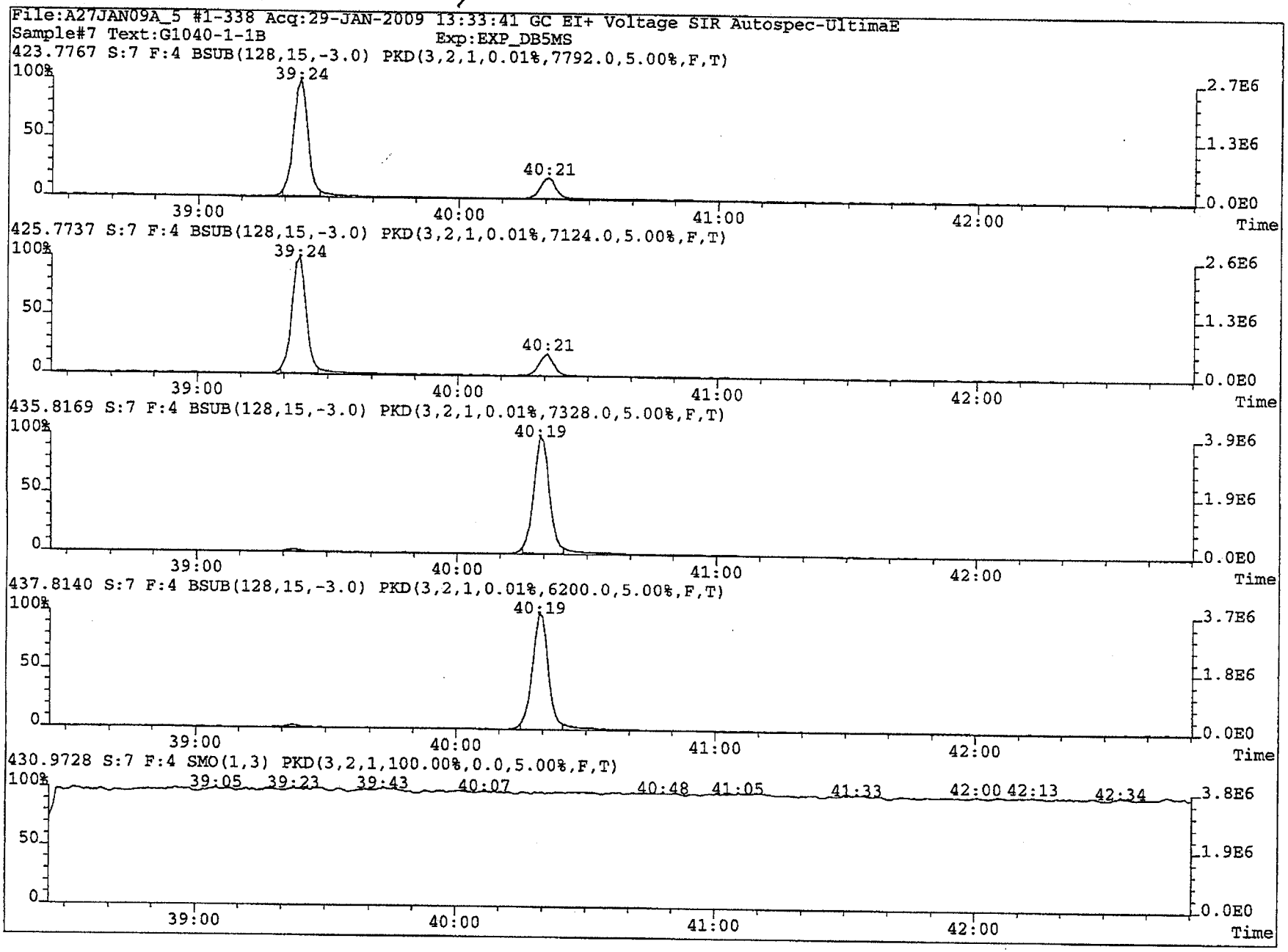
Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
1,2,3,4,6,7,8-HpCDI	1	1.91E+07	9750000	9340000	1.04	y	39:24	58.275	OK	342.4	y	359.5	y	n
	2	3.63E+06	1850000	1780000	1.04	y	40:21	11.072	OK	59.2	y	67	y	n

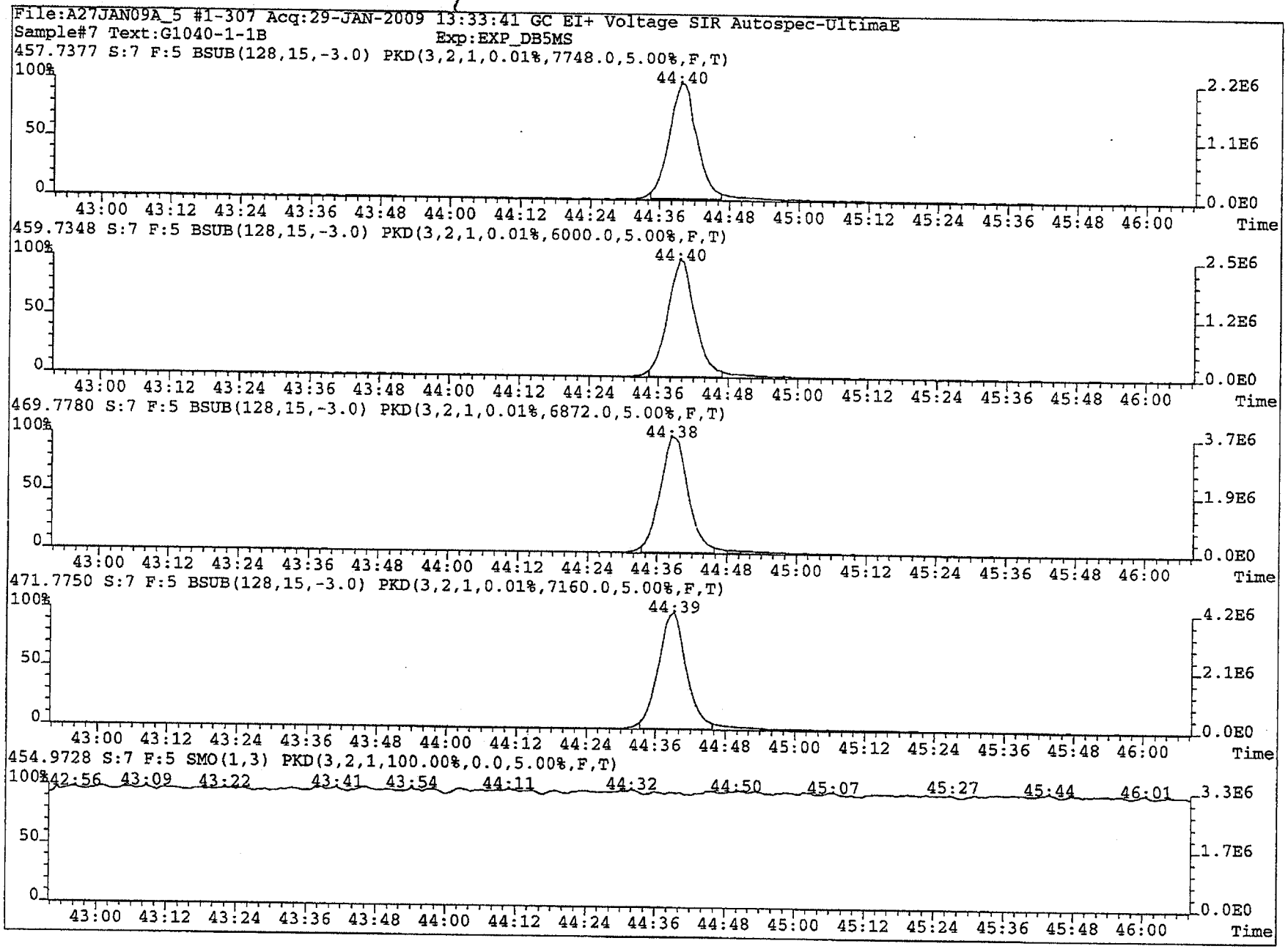

File:A27JAN09A_5 #1-387 Acq:29-JAN-2009 13:33:41 GC EI+ Voltage SIR Autospec-UltimaE
Sample#7 Text:G1040-1-1B
Exp:EXP_DB5MS
319.8965 S:7 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,7360.0,5.00%,F,T)
28:20
28:37
30:10
31:02
3.3E5
1.6E5
0.0E0
321.8936 S:7 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,8404.0,5.00%,F,T)
28:20
28:38
30:09
31:02
4.4E5
2.2E5
0.0E0
331.9368 S:7 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,8116.0,5.00%,F,T)
31:01
31:28
8.8E6
4.4E6
0.0E0
333.9339 S:7 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7248.0,5.00%,F,T)
31:01
31:28
1.1E7
5.6E6
0.0E0
327.8847 S:7 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6048.0,5.00%,F,T)
31:29
4.9E6
2.4E6
0.0E0
304.9824 S:7 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
26:14
27:02
27:36
28:09
28:34
28:59
29:22
29:54
30:20
30:53
31:25
31:49
32:16
4.5E6
2.2E6
0.0E0
100%
50
0
27:00
28:00
29:00
30:00
31:00
32:00
Time

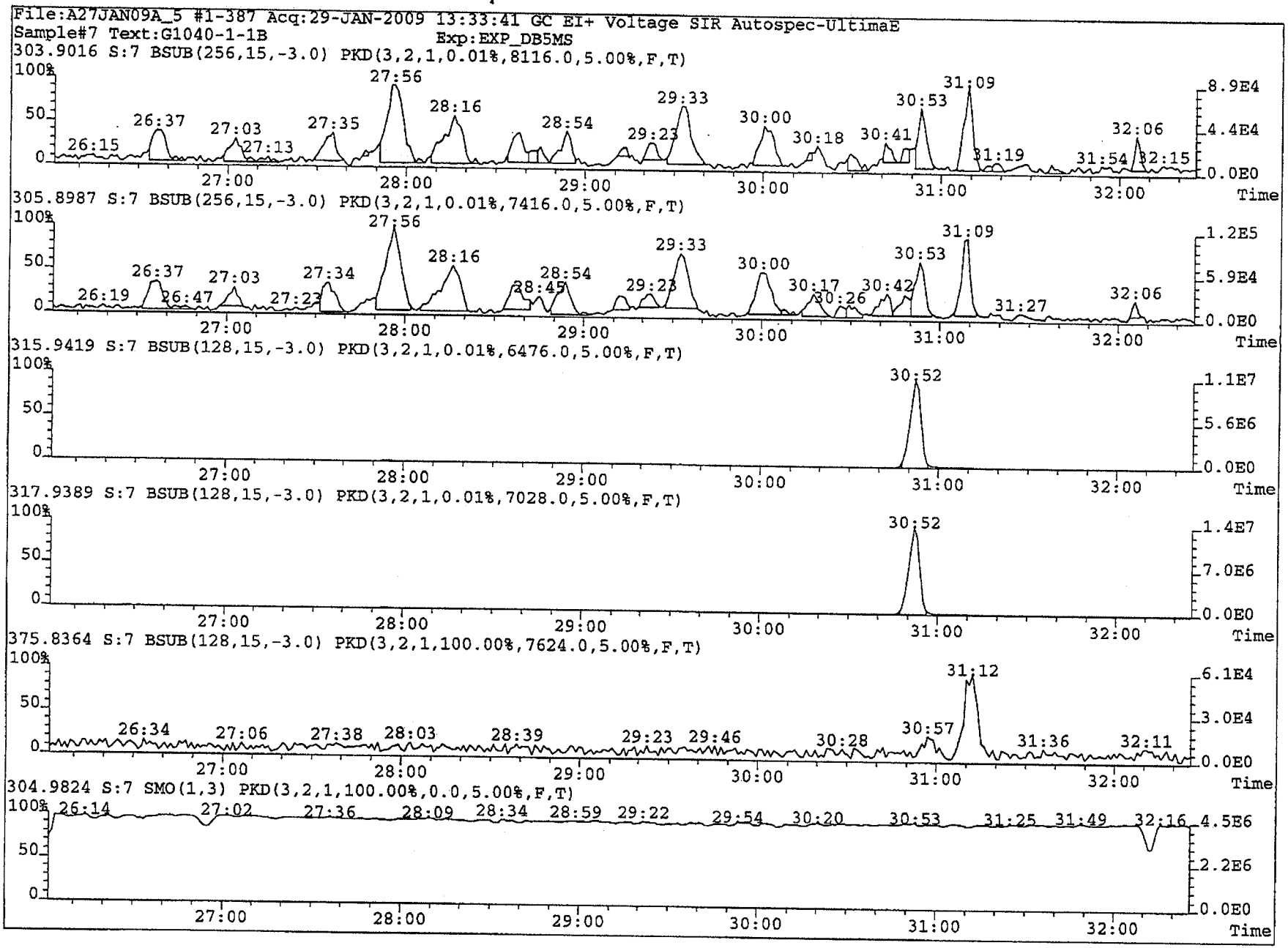

File:A27JAN09A_5 #1-387 Acq:29-JAN-2009 13:33:41 GC EI+ Voltage SIR Autospec-UltimaE
Sample#7 Text:G1040-1-1B
Exp:EXP_DB5MS
319.8965 S:7 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,7360.0,5.00%,F,T)
29:58
30:10
31:02
31:18
321.8936 S:7 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,8404.0,5.00%,F,T)
30:09
31:02
31:18
Time

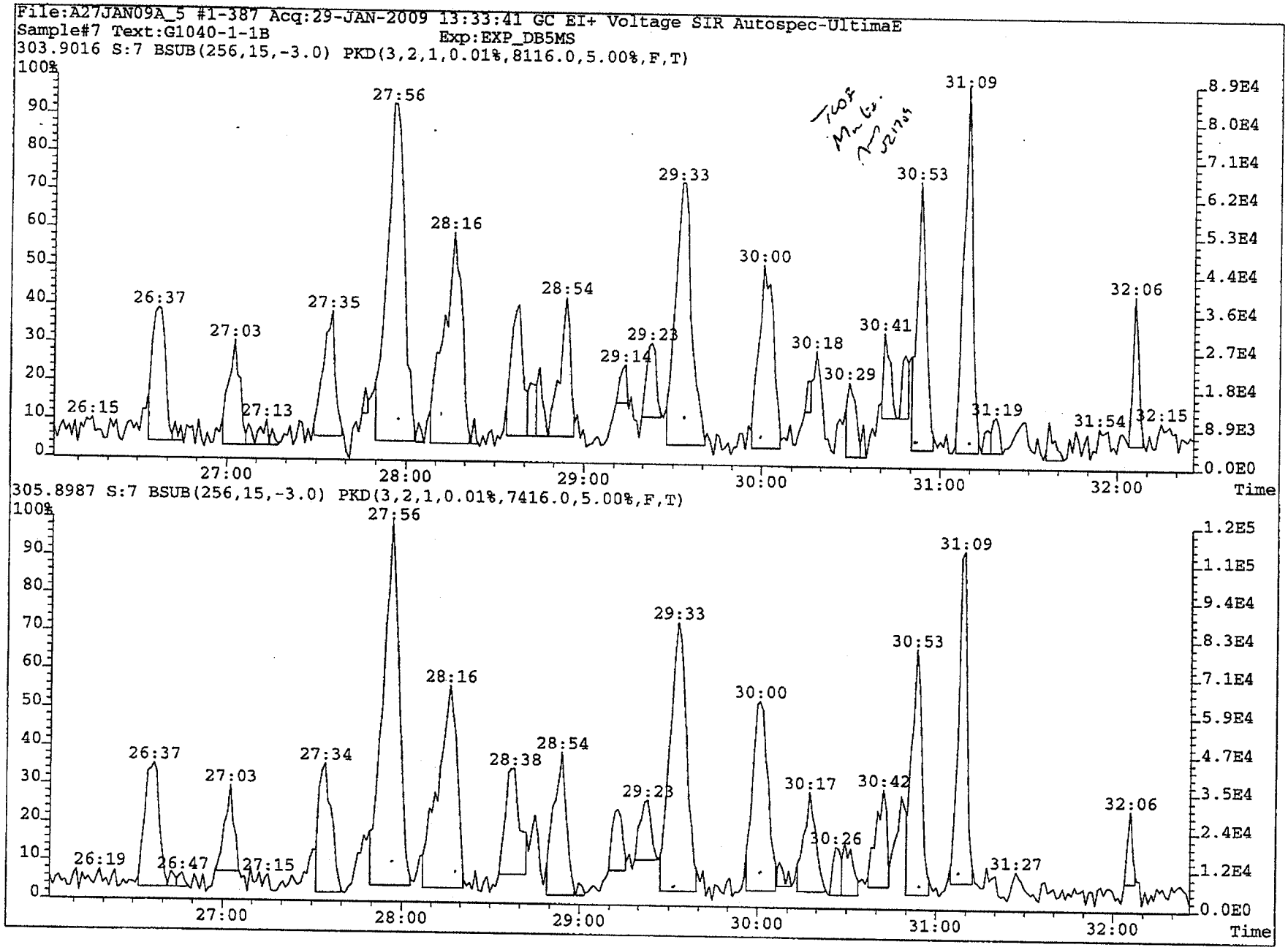

File:A27JAN09A_5 #1-199 Acq:29-JAN-2009 13:33:41 GC EI+ Voltage SIR Autospec-UltimaE
Sample#7 Text:G1040-1-1B
Exp:EXP_DB5MS
355.8546 S:7 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7508.0,5.00%,F,T)
32:56
33:11
33:29
33:39
33:47
34:00
34:17
34:32
2.4E5
1.2E5
0.0E0
357.8517 S:7 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7412.0,5.00%,F,T)
32:45
32:56
33:12
33:29
33:39
33:47
34:00
34:16
34:32
34:41
34:51
1.5E5
7.6E4
0.0E0
367.8949 S:7 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7720.0,5.00%,F,T)
34:15
1.2E7
5.9E6
0.0E0
369.8919 S:7 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7124.0,5.00%,F,T)
34:15
7.6E6
3.8E6
0.0E0
366.9792 S:7 F:2 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
32:33
32:42
32:52
33:08
33:22
33:33
33:55
34:08
34:19
34:31
34:41
34:51
2.6E6
1.3E6
0.0E0
100%
50
0
32:36
32:48
33:00
33:12
33:24
33:36
33:48
34:00
34:12
34:24
34:36
34:48
35:00
Time

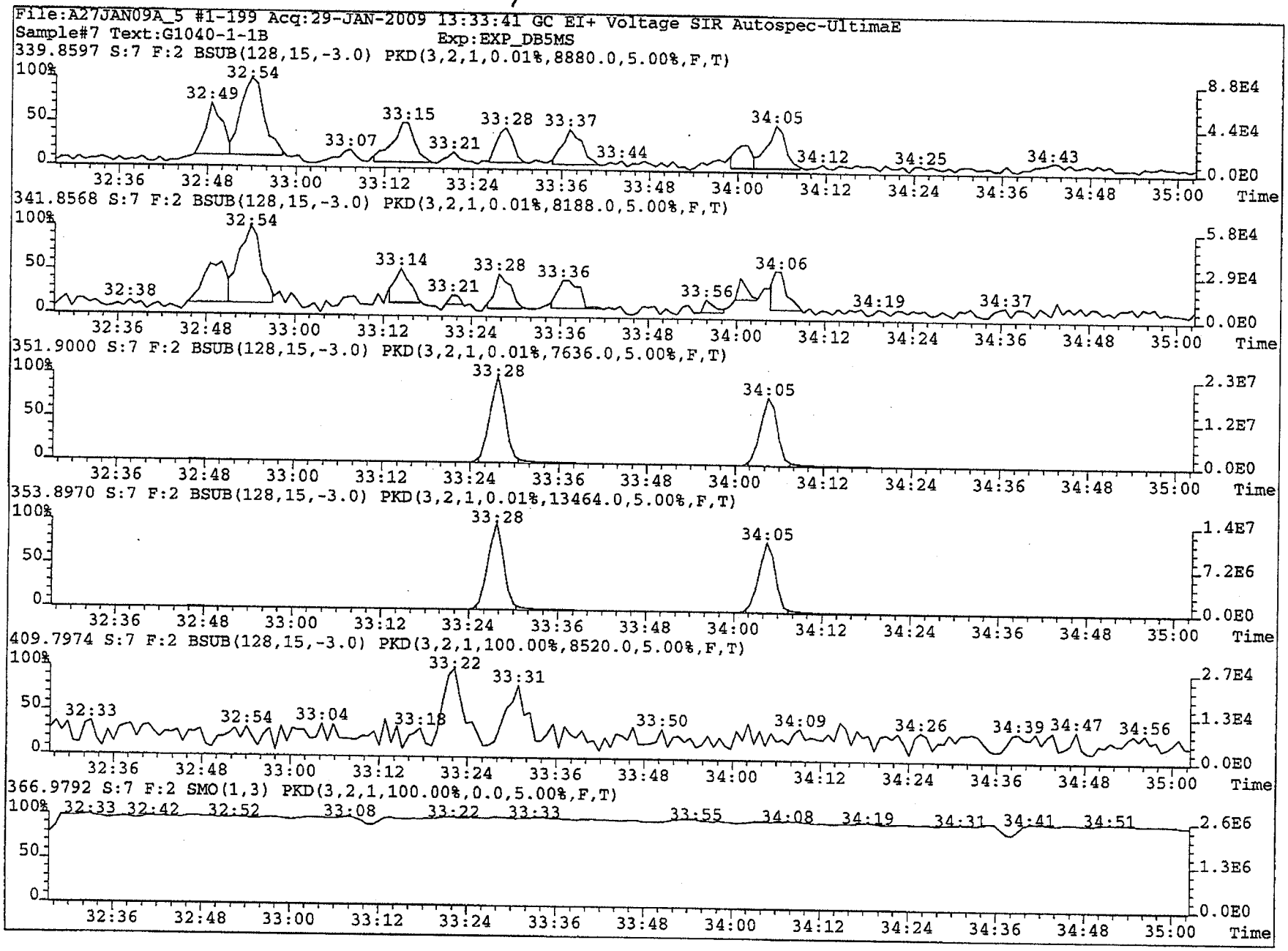

File:A27JAN09A_5 #1-257 Acq:29-JAN-2009 13:33:41 GC EI+ Voltage SIR Autospec-UltimaE
Sample#7 Text:G1040-1-1B
Exp:EXP_DB5MS
389.8156 S:7 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7312.0,5.00%,F,T)
35:39
36:06
36:19
36:25
36:53
36:59
37:13
37:51
2.5E5
1.3E5
0.0E0
391.8127 S:7 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,8036.0,5.00%,F,T)
35:38
36:06
36:19
36:25
36:59
37:14
37:52
2.0E5
1.0E5
0.0E0
401.8559 S:7 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7604.0,5.00%,F,T)
36:59
37:13
8.7E6
4.4E6
0.0E0
403.8530 S:7 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6276.0,5.00%,F,T)
36:59
37:13
7.1E6
3.6E6
0.0E0
380.9760 S:7 F:3 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
35:15
35:34
35:55
36:10
36:25
36:36
36:53
37:13
37:26
37:38
37:54
38:05
38:16
6.9E6
3.5E6
0.0E0
100%
50
0
35:12 35:24 35:36 35:48 36:00 36:12 36:24 36:36 36:48 37:00 37:12 37:24 37:36 37:48 38:00 38:12 38:24 Time

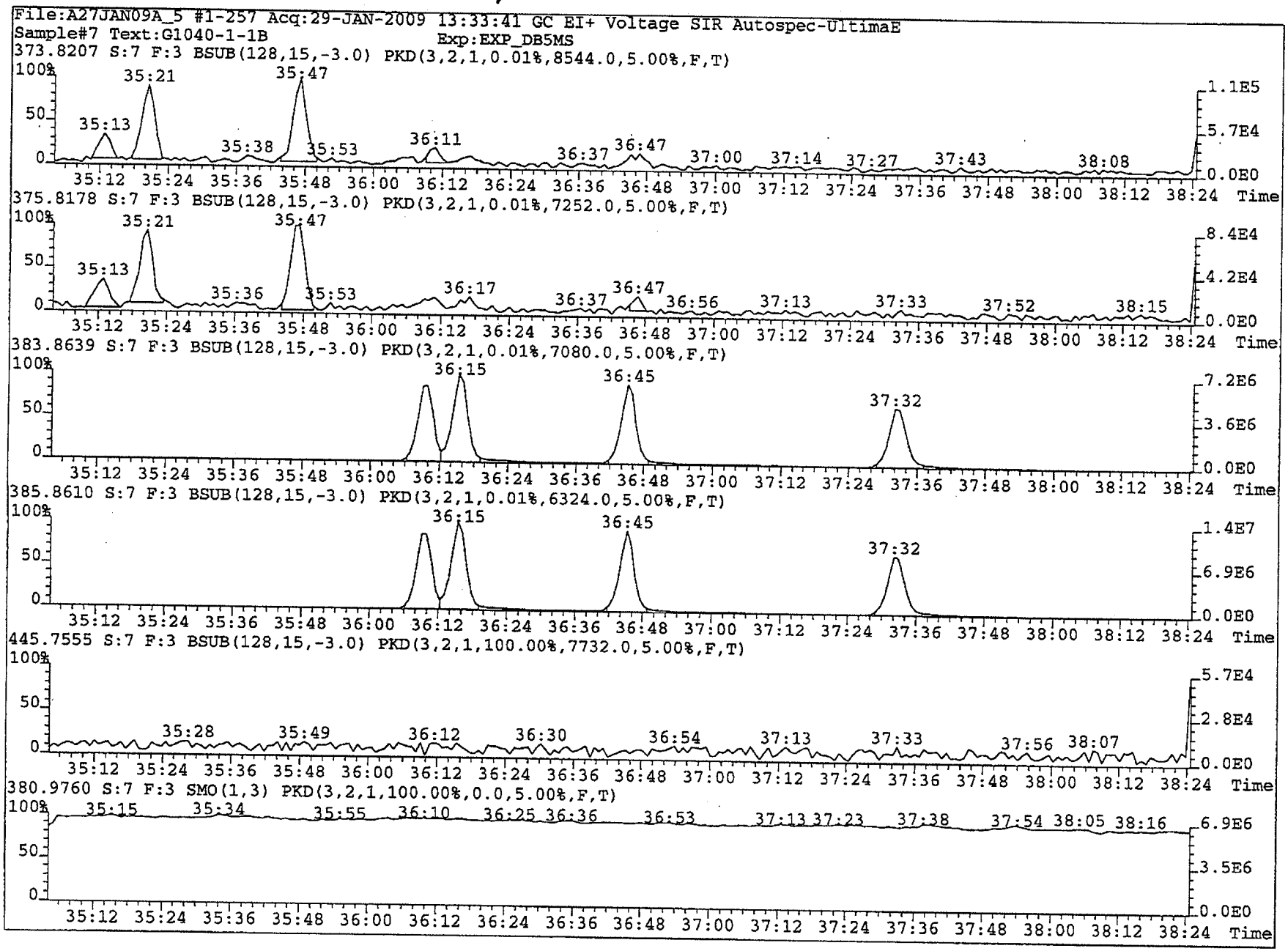

File:A27JAN09A_5 #1-338 Acq:29-JAN-2009 13:33:41 GC EI+ Voltage SIR Autospec-UltimaE
Sample#7 Text:G1040-1-1B Exp:EXP_DB5MS
423.7767 S:7 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7792.0,5.00%,F,T)
39:24
40:21
2.7E6
1.3E6
0.0E0
425.7737 S:7 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7124.0,5.00%,F,T)
39:24
40:21
2.6E6
1.3E6
0.0E0
435.8169 S:7 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7328.0,5.00%,F,T)
40:19
3.9E6
1.9E6
0.0E0
437.8140 S:7 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6200.0,5.00%,F,T)
40:19
3.7E6
1.8E6
0.0E0
430.9728 S:7 F:4 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
39:05 39:23 39:43 40:07 40:48 41:05 41:33 42:00 42:13 42:34
3.8E6
1.9E6
0.0E0
100%
50
0
39:00
40:00
41:00
42:00
Time

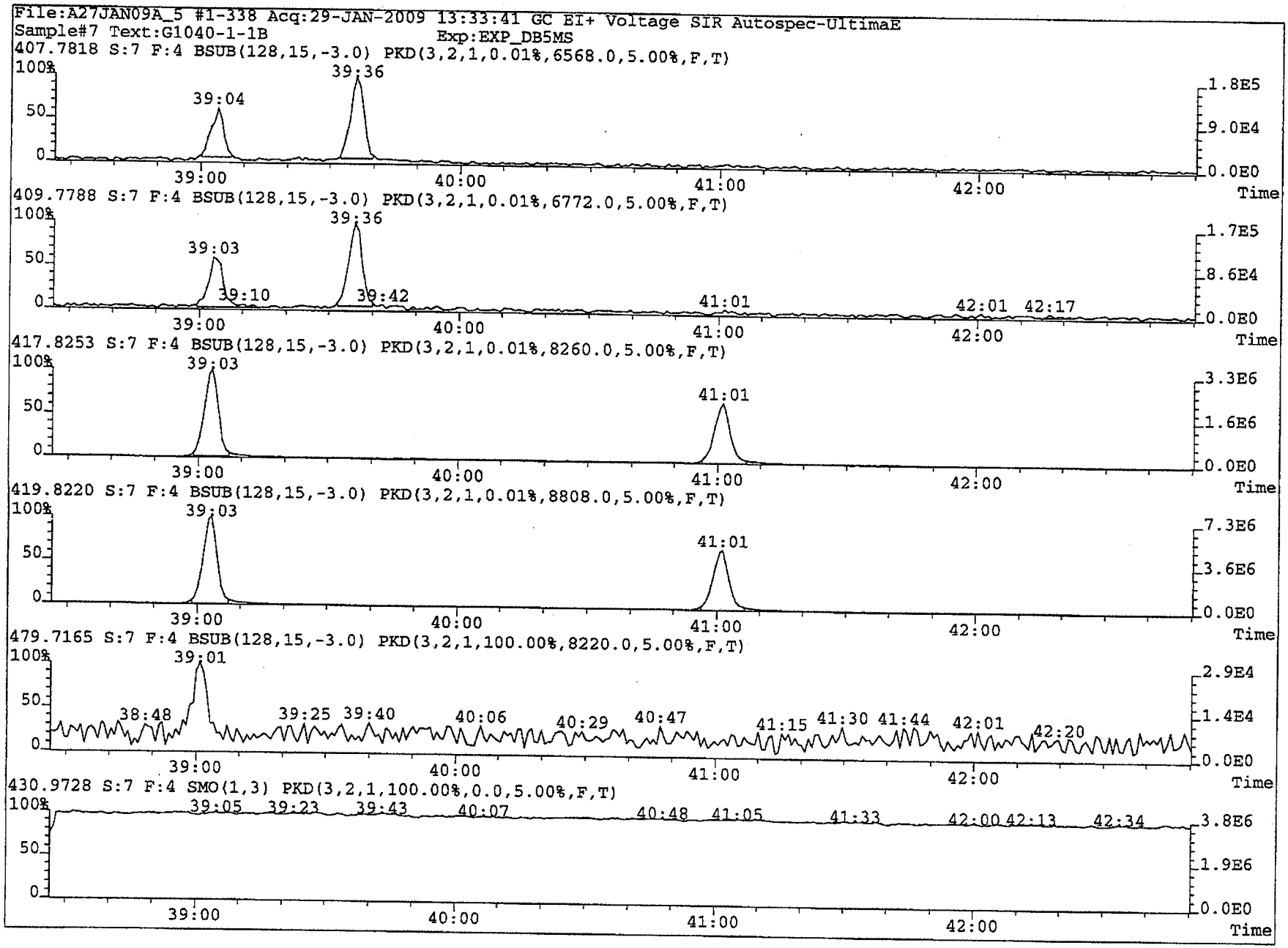

File:A27JAN09A_5 #1-307 Acq:29-JAN-2009 13:33:41 GC EI+ Voltage SIR Autospec-UltimaE
Sample#7 Text:G1040-1-1B Exp:EXP_DB5MS
457.7377 S:7 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7748.0,5.00%,F,T)
44:40
459.7348 S:7 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6000.0,5.00%,F,T)
44:40
469.7780 S:7 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6872.0,5.00%,F,T)
44:38
471.7750 S:7 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7160.0,5.00%,F,T)
44:39
454.9728 S:7 F:5 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
42:56 43:09 43:22 43:41 43:54 44:11 44:32 44:50 45:07 45:27 45:44 46:01
100%
50
0
43:00 43:12 43:24 43:36 43:48 44:00 44:12 44:24 44:36 44:48 45:00 45:12 45:24 45:36 45:48 46:00
Time
2.2E6
1.1E6
0.0E0
2.5E6
1.2E6
3.7E6
1.9E6
4.2E6
2.1E6
3.3E6
1.7E6

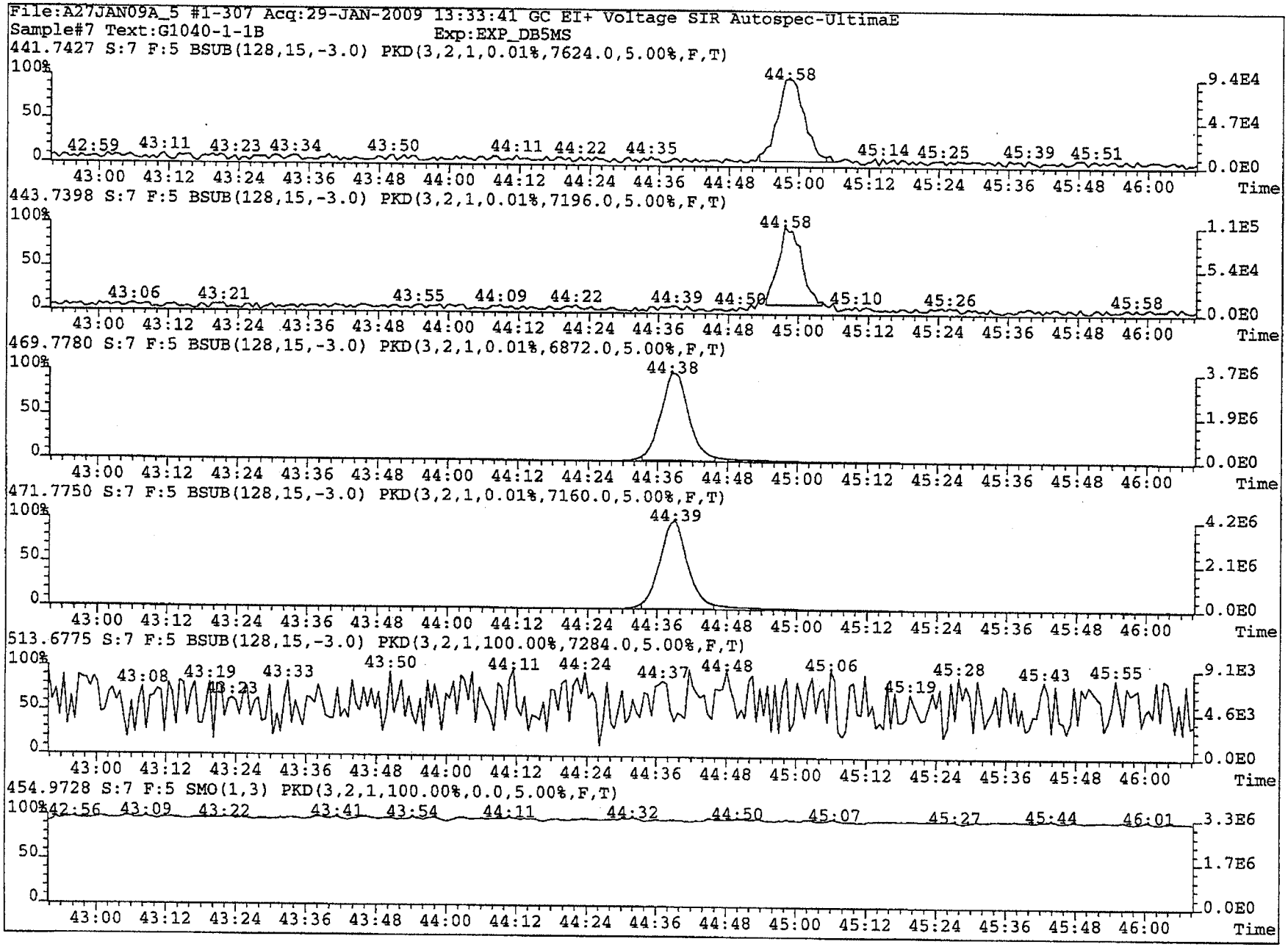

File:A27JAN09A_5 #1-387 Acq:29-JAN-2009 13:33:41 GC EI+ Voltage SIR Autospec-UltimaE
Sample#7 Text:G1040-1-1B Exp:EXP_DB5MS
303.9016 S:7 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,8116.0,5.00%,F,T)
305.8987 S:7 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,7416.0,5.00%,F,T)
315.9419 S:7 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6476.0,5.00%,F,T)
317.9389 S:7 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7028.0,5.00%,F,T)
375.8364 S:7 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,7624.0,5.00%,F,T)
304.9824 S:7 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time

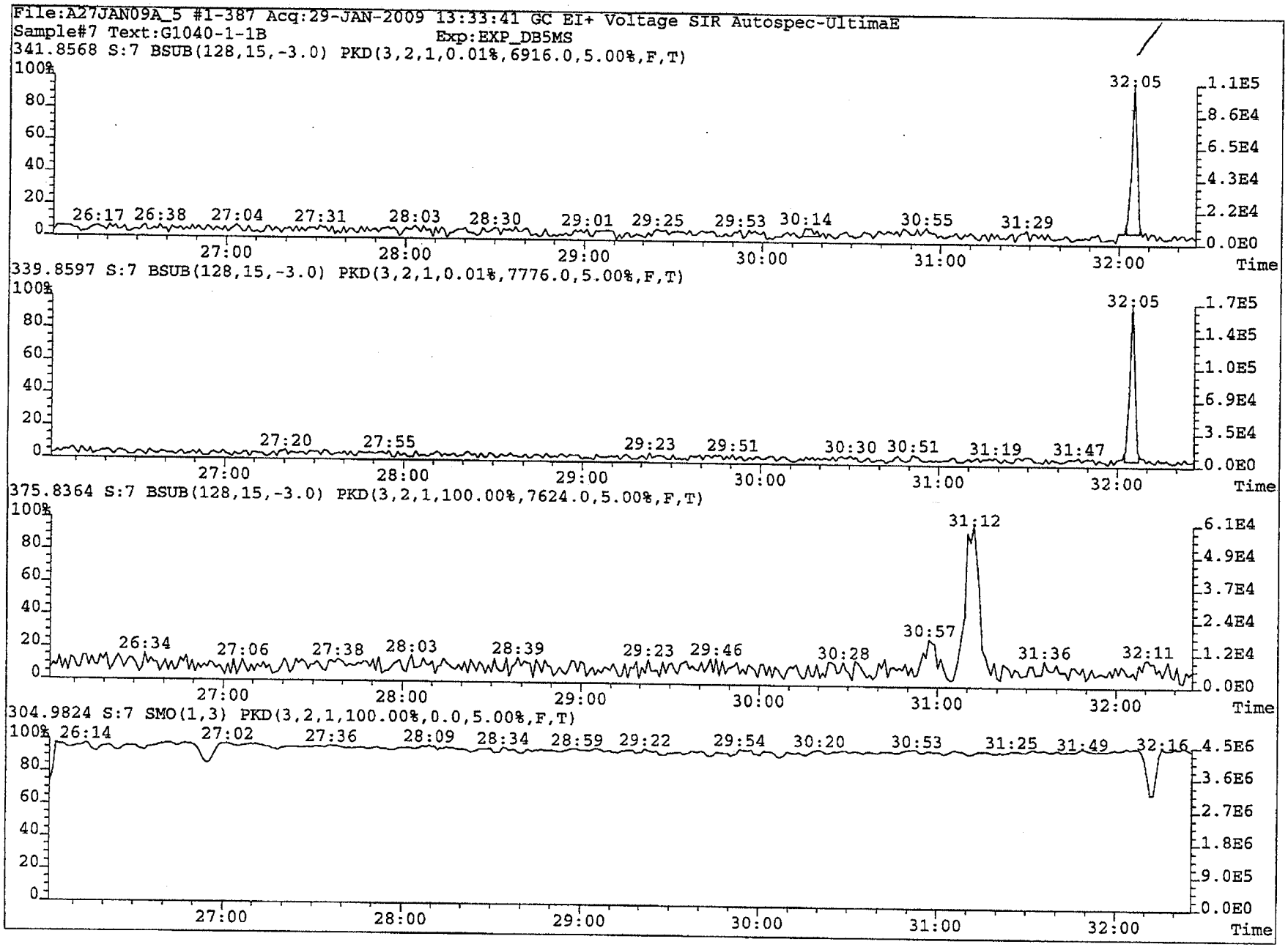

File:A27JAN09A_5 #1-387 Acq:29-JAN-2009 13:33:41 GC EI+ Voltage SIR Autospec-UltimaE
Sample#7 Text:G1040-1-1B
Exp:EXP_DB5MS
303.9016 S:7 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,8116.0,5.00%,F,T)
100%
90
80
70
60
50
40
30
20
10
0
26:15
26:37
27:03
27:13
27:35
27:56
28:16
28:54
29:14
29:23
29:33
30:00
30:18
30:29
30:41
30:53
31:09
31:19
31:54
32:06
32:15
8.9E4
8.0E4
7.1E4
6.2E4
5.3E4
4.4E4
3.6E4
2.7E4
1.8E4
8.9E3
0.0E0
27:00
28:00
29:00
30:00
31:00
32:00
Time
305.8987 S:7 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,7416.0,5.00%,F,T)
100%
90
80
70
60
50
40
30
20
10
0
26:19
26:37
26:47
27:03
27:15
27:34
27:56
28:16
28:38
28:54
29:23
29:33
30:00
30:17
30:26
30:42
30:53
31:09
31:27
32:06
1.2E5
1.1E5
9.4E4
8.3E4
7.1E4
5.9E4
4.7E4
3.5E4
2.4E4
1.2E4
0.0E0
27:00
28:00
29:00
30:00
31:00
32:00
Time


File:A27JAN09A_5 #1-199 Acq:29-JAN-2009 13:33:41 GC EI+ Voltage SIR Autospec-UltimaE
Sample#7 Text:G1040-1-1B Exp:EXP_DB5MS
339.8597 S:7 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,8880.0,5.00%,F,T)
341.8568 S:7 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,8188.0,5.00%,F,T)
351.9000 S:7 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7636.0,5.00%,F,T)
353.8970 S:7 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,13464.0,5.00%,F,T)
409.7974 S:7 F:2 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,8520.0,5.00%,F,T)
366.9792 S:7 F:2 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time


File:A27JAN09A_5 #1-257 Acq:29-JAN-2009 13:33:41 GC EI+ Voltage SIR Autospec-UltimaE
Sample#7 Text:G1040-1-1B Exp:EXP_DB5MS
373.8207 S:7 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,8544.0,5.00%,F,T)
375.8178 S:7 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7252.0,5.00%,F,T)
383.8639 S:7 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7080.0,5.00%,F,T)
385.8610 S:7 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6324.0,5.00%,F,T)
445.7555 S:7 F:3 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,7732.0,5.00%,F,T)
380.9760 S:7 F:3 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time


File:A27JAN09A_5 #1-338 Acq:29-JAN-2009 13:33:41 GC EI+ Voltage SIR Autospec-UltimaE
Sample#7 Text:G1040-1-1B Exp:EXP_DB5MS
407.7818 S:7 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6568.0,5.00%,F,T)
39:04
39:36
1.8E5
9.0E4
0.0E0
409.7788 S:7 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6772.0,5.00%,F,T)
39:03
39:10
39:36
39:42
41:01
42:01
42:17
1.7E5
8.6E4
0.0E0
417.8253 S:7 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,8260.0,5.00%,F,T)
39:03
41:01
3.3E6
1.6E6
0.0E0
419.8220 S:7 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,8808.0,5.00%,F,T)
39:03
41:01
7.3E6
3.6E6
0.0E0
479.7165 S:7 F:4 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,8220.0,5.00%,F,T)
39:01
38:48
39:25
39:40
40:06
40:29
40:47
41:15
41:30
41:44
42:01
42:20
2.9E4
1.4E4
0.0E0
430.9728 S:7 F:4 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
39:05
39:23
39:43
40:07
40:48
41:05
41:33
42:00
42:13
42:34
3.8E6
1.9E6
0.0E0
100%
50
0
39:00
40:00
41:00
42:00
Time


File:A27JAN09A_5 #1-307 Acq:29-JAN-2009 13:33:41 GC EI+ Voltage SIR Autospec-UltimaE
Sample#7 Text:G1040-1-1B Exp:EXP_DB5MS
441.7427 S:7 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7624.0,5.00%,F,T)
443.7398 S:7 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7196.0,5.00%,F,T)
469.7780 S:7 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6872.0,5.00%,F,T)
471.7750 S:7 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7160.0,5.00%,F,T)
513.6775 S:7 F:5 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,7284.0,5.00%,F,T)
454.9728 S:7 F:5 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time


File:A27JAN09A_5 #1-387 Acq:29-JAN-2009 13:33:41 GC EI+ Voltage SIR Autospec-UltimaE
Sample#7 Text:G1040-1-1B Exp:EXP_DB5MS
341.8568 S:7 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6916.0,5.00%,F,T)
32:05
26:17 26:38 27:04 27:31 28:03 28:30 29:01 29:25 29:53 30:14 30:55 31:29
1.1E5 8.6E4 6.5E4 4.3E4 2.2E4 0.0E0
339.8597 S:7 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7776.0,5.00%,F,T)
32:05
27:20 27:55 29:23 29:51 30:30 30:51 31:19 31:47
1.7E5 1.4E5 1.0E5 6.9E4 3.5E4 0.0E0
375.8364 S:7 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,7624.0,5.00%,F,T)
31:12
26:34 27:06 27:38 28:03 28:39 29:23 29:46 30:28 30:57 31:36 32:11
6.1E4 4.9E4 3.7E4 2.4E4 1.2E4 0.0E0
304.9824 S:7 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
26:14 27:02 27:36 28:09 28:34 28:59 29:22 29:54 30:20 30:53 31:25 31:49 32:16
4.5E6 3.6E6 2.7E6 1.8E6 9.0E5 0.0E0
27:00 28:00 29:00 30:00 31:00 32:00 Time

Method 1613

PGSS-80

Analytical Resources, Inc.

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	RL (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	1.00			
1,2,3,7,8-PeCDD	ND	5.00			
1,2,3,4,7,8-HxCDD	ND	5.00			
1,2,3,6,7,8-HxCDD	ND	5.00			
1,2,3,7,8,9-HxCDD	ND	5.00			
1,2,3,4,6,7,8-HpCDD	ND	5.00			
OCDD	10.5	10.0	44:40	0.90	
2,3,7,8-TCDF	ND	1.00			
1,2,3,7,8-PeCDF	ND	5.00			
2,3,4,7,8-PeCDF	ND	5.00			
1,2,3,4,7,8-HxCDF	ND	5.00			
1,2,3,6,7,8-HxCDF	ND	5.00			
2,3,4,6,7,8-HxCDF	ND	5.00			
1,2,3,7,8,9-HxCDF	ND	5.00			
1,2,3,4,6,7,8-HpCDF	ND	5.00			
1,2,3,4,7,8,9-HpCDF	ND	5.00			
OCDF	ND	10.0			
Total TCDDs	ND	1.00			
Total PeCDDs	ND	5.00			
Total HxCDDs	ND	5.00			
Total HpCDDs	4.49	5.00			
Total TCDFs	ND	1.00			
Total PeCDFs	ND	5.00			
Total HxCDFs	ND	5.00			
Total HpCDFs	ND	5.00			
WHO-2005 TEQ (ND=0)	0.00315				
WHO-2005 TEQ (ND=½)	5.70				

Client Information

Project Name:	Port Gamble	
Sample ID:	PGSS-80	
Laboratory Information		
Project ID:	G1040-1	
Sample ID:	G1040-1-2B	
Collection Date/Time:	10-Dec-08	08:17
Receipt Date:	15-Jan-09	10:15
Extraction Date:	19-Jan-09	
Analysis Date:	29-Jan-09	14:22

Sample Information

Matrix:	Sediment	
Weight / Volume:	14.12	grams
Solids / Lipids:	80.6	%
Original pH :	NA	
Batch ID:	WG16440	
Filename:	a27jan09a_5-8	
Retchk:	a27jan09a_4-15	
Begin ConCal:	a27jan09a_4-15	
Initial Cal:	m1613-100708a	

Method 1613

PGSS-80

Analytical Resources, Inc.

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
$^{13}C_{12}$-2,3,7,8-TCDD	2	1.60	79.9	31:28	0.79	
$^{13}C_{12}$-1,2,3,7,8-PeCDD	2	1.55	77.5	34:15	1.58	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	2	1.70	84.9	36:53	1.27	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	2	1.75	87.6	36:58	1.27	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	2	1.56	78.0	40:20	1.06	
$^{13}C_{12}$-OCDD	4	2.66	66.5	44:39	0.89	
$^{13}C_{12}$-2,3,7,8-TCDF	2	1.62	81.1	30:52	0.79	
$^{13}C_{12}$-1,2,3,7,8-PeCDF	2	1.82	91.0	33:28	1.57	
$^{13}C_{12}$-2,3,4,7,8-PeCDF	2	1.61	80.6	34:04	1.57	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	2	1.74	86.8	36:10	0.52	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	2	1.82	90.9	36:15	0.53	
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	2	1.79	89.4	36:45	0.52	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	2	1.68	83.9	37:33	0.52	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	2	1.59	79.6	39:03	0.44	
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	2	1.57	78.4	41:01	0.45	
Cleanup Standard						
$^{37}Cl_4$-2,3,7,8-TCDD	0.4	0.347	86.8	31:29		
Injection Standards						
$^{13}C_{12}$-1,2,3,4-TCDD	2			31:01	0.78	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	2			37:13	1.27	

Client Information

Project Name: Port Gamble

Sample ID: PGSS-80

Laboratory Information

Project ID: G1040-1
Sample ID: G1040-1-2B
Collection Date/Time: 10-Dec-08 08:17
Receipt Date: 15-Jan-09 10:15
Extraction Date: 19-Jan-09
Analysis Date: 29-Jan-09 14:22

Analyzed by: _____
Date: 02/7/09

Sample Information

Matrix: Sediment
Weight / Volume: 14.12 grams
Solids / Lipids: 80.6 %
Original pH : NA
Batch ID: WG16440

Filename: a27jan09a_5-8
Retchk: a27jan09a_4-15
Begin ConCal: a27jan09a_4-15

Initial Cal: m1613-100708a

Reviewed by: _____
Date: 02/17/09

Form Version:[1613_HRMS12]Repor

[OCDD] = 5.38e5 + 5.98e5 / (1.69e7 + 1.89e7) × (40009 / (14.12g × 0.806)) × (1 / 1.0643) = 10.5 pg/g

Filename ; a27jan09a_5
Sample ; 8
Acquired ; 29-JAN-09 14:22:05
Processed ; 30-JAN-09 07:42:58
Sample ID ; G1040-1-2B
Cal Table ; m1613-100708a
Results Table ; m1613-012709a_5
Comments ;

;*1613*
;Inst: HRMS1

Ent;	Name;	Resp;	Ion 1;	Ion 2;	RA;?;	RT;	Conc;	EDL;	S/N1;?;	S/N2;?;M;	Signal1;	Noise 1;	Signal2;	Noise 2
1 ;	2,3,7,8-TCDD;	*;	*;	*;	*;n;	NotFnd;	*;	0.1929;	*;n;	*;n;n;	*;	5.74e+03;	*;	6.64e+03
2 ;	1,2,3,7,8-PeCDD;	*;	*;	*;	*;n;	NotFnd;	*;	0.2609;	*;n;	*;n;n;	*;	6.81e+03;	*;	6.71e+03
3 ;	1,2,3,4,7,8-HxCDD;	*;	*;	*;	*;n;	NotFnd;	*;	0.3867;	*;n;	*;n;n;	*;	7.96e+03;	*;	7.13e+03
4 ;	1,2,3,6,7,8-HxCDD;	*;	*;	*;	*;n;	NotFnd;	*;	0.3893;	*;n;	*;n;n;	*;	7.96e+03;	*;	7.13e+03
5 ;	1,2,3,7,8,9-HxCDD;	*;	*;	*;	*;n;	NotFnd;	*;	0.3906;	*;n;	*;n;n;	*;	7.96e+03;	*;	7.13e+03
6 ;	1,2,3,4,6,7,8-HpCDD;	2.34e+05;	1.26e+05;	1.08e+05;	1.18;y;	40:20;	0.837;	0.5819;	5;y;	4;y;n;	3.05e+04;	6.36e+03;	3.15e+04;	7.16e+03
7 ;	OCDD;	1.14e+06;	5.38e+05;	5.98e+05;	0.90;y;	44:40;	5.972;	1.0018;	16;y;	22;y;y;	1.00e+05;	6.34e+03;	1.11e+05;	5.00e+03
8 ;	2,3,7,8-TCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.2079;	*;n;	*;n;n;	*;	8.02e+03;	*;	6.78e+03
9 ;	1,2,3,7,8-PeCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.1404;	*;n;	*;n;n;	*;	7.48e+03;	*;	7.00e+03
10 ;	2,3,4,7,8-PeCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.1624;	*;n;	*;n;n;	*;	7.48e+03;	*;	7.00e+03
11 ;	1,2,3,4,7,8-HxCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.2337;	*;n;	*;n;n;	*;	6.50e+03;	*;	7.20e+03
12 ;	1,2,3,6,7,8-HxCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.2148;	*;n;	*;n;n;	*;	6.50e+03;	*;	7.20e+03
13 ;	2,3,4,6,7,8-HxCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.2226;	*;n;	*;n;n;	*;	6.50e+03;	*;	7.20e+03
14 ;	1,2,3,7,8,9-HxCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.3077;	*;n;	*;n;n;	*;	6.50e+03;	*;	7.20e+03
15 ;	1,2,3,4,6,7,8-HpCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.3233;	*;n;	*;n;n;	*;	6.55e+03;	*;	6.91e+03
16 ;	1,2,3,4,7,8,9-HpCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.4801;	*;n;	*;n;n;	*;	6.55e+03;	*;	6.91e+03
17 ;	OCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.9547;	*;n;	*;n;n;	*;	5.70e+03;	*;	7.14e+03
Extraction Standards														
18 ;	13C-2,3,7,8-TCDD;	5.70e+07;	2.52e+07;	3.18e+07;	0.79;y;	31:28;	79.909;	0.2150;	1352;y;	1409;y;n;	8.40e+06;	6.22e+03;	1.07e+07;	7.58e+03
19 ;	13C-1,2,3,7,8-PeCDD;	4.04e+07;	2.47e+07;	1.57e+07;	1.58;y;	34:15;	77.459;	0.2617;	1434;y;	959;y;n;	8.93e+06;	6.23e+03;	5.81e+06;	6.06e+03
20 ;	13C-1,2,3,4,7,8-HxCDD;	3.50e+07;	1.96e+07;	1.54e+07;	1.27;y;	36:53;	84.917;	0.3112;	991;y;	838;y;n;	6.35e+06;	6.41e+03;	5.00e+06;	5.97e+03
21 ;	13C-1,2,3,6,7,8-HxCDD;	3.92e+07;	2.19e+07;	1.73e+07;	1.27;y;	36:58;	87.530;	0.2864;	1030;y;	860;y;n;	6.60e+06;	6.41e+03;	5.14e+06;	5.97e+03
22 ;	13C-1,2,3,4,6,7,8-HpCDD;	2.63e+07;	1.36e+07;	1.28e+07;	1.06;y;	40:20;	77.999;	0.4196;	560;y;	417;y;n;	3.36e+06;	5.99e+03;	3.21e+06;	7.69e+03
23 ;	13C-OCDD;	3.58e+07;	1.69e+07;	1.89e+07;	0.89;y;	44:39;	133.032;	0.5093;	471;y;	493;y;n;	3.01e+06;	6.39e+03;	3.37e+06;	6.83e+03
24 ;	13C-2,3,7,8-TCDF;	8.57e+07;	3.79e+07;	4.78e+07;	0.79;y;	30:52;	81.064;	0.1490;	1201;y;	1746;y;n;	9.09e+06;	7.57e+03;	1.15e+07;	6.60e+03
25 ;	13C-1,2,3,7,8-PeCDF;	7.77e+07;	4.74e+07;	3.03e+07;	1.57;y;	33:28;	90.980;	0.2637;	2632;y;	940;y;n;	1.90e+07;	7.23e+03;	1.23e+07;	1.30e+04
26 ;	13C-2,3,4,7,8-PeCDF;	6.74e+07;	4.12e+07;	2.62e+07;	1.57;y;	34:04;	80.576;	0.2694;	2168;y;	772;y;n;	1.57e+07;	7.23e+03;	1.01e+07;	1.30e+04
27 ;	13C-1,2,3,4,7,8-HxCDF;	4.62e+07;	1.57e+07;	3.04e+07;	0.52;y;	36:10;	86.752;	0.2398;	738;y;	1901;y;n;	5.21e+06;	7.06e+03;	9.99e+06;	5.26e+03
28 ;	13C-1,2,3,6,7,8-HxCDF;	5.34e+07;	1.84e+07;	3.49e+07;	0.53;y;	36:15;	90.846;	0.2172;	824;y;	2116;y;n;	5.82e+06;	7.06e+03;	1.11e+07;	5.26e+03
29 ;	13C-2,3,4,6,7,8-HxCDF;	4.94e+07;	1.69e+07;	3.24e+07;	0.52;y;	36:45;	89.378;	0.2310;	796;y;	2027;y;n;	5.62e+06;	7.06e+03;	1.07e+07;	5.26e+03
30 ;	13C-1,2,3,7,8,9-HxCDF;	4.13e+07;	1.42e+07;	2.71e+07;	0.52;y;	37:33;	83.892;	0.2593;	593;y;	1510;y;n;	4.19e+06;	7.06e+03;	7.94e+06;	5.26e+03
31 ;	13C-1,2,3,4,6,7,8-HpCDF;	3.35e+07;	1.03e+07;	2.32e+07;	0.44;y;	39:03;	79.541;	0.4663;	331;y;	596;y;n;	2.82e+06;	8.54e+03;	6.22e+06;	1.04e+04
32 ;	13C-1,2,3,4,7,8,9-HpCDF;	2.60e+07;	8.06e+06;	1.79e+07;	0.45;y;	41:01;	78.327;	0.5918;	225;y;	408;y;n;	1.92e+06;	8.54e+03;	4.25e+06;	1.04e+04
Injection Standards														
33 ;	13C-1,2,3,4-TCDD;	6.39e+07;	2.81e+07;	3.58e+07;	0.78;y;	31:01;	47.052;	-;	1223;y;	1274;y;n;	7.60e+06;	6.22e+03;	9.66e+06;	7.58e+03
34 ;	13C-1,2,3,7,8,9-HxCDD;	4.29e+07;	2.40e+07;	1.89e+07;	1.27;y;	37:13;	39.718;	-;	1075;y;	923;y;n;	6.89e+06;	6.41e+03;	5.51e+06;	5.97e+03
Cleanup Standard														
35 ;	37Cl-2,3,7,8-TCDD;	1.32e+07;	1.32e+07;	-;	-;-;	31:29;	17.369;	0.1060;	587;y;	-;-;n;	4.26e+06;	7.26e+03;	-;	-

Totals Raw Data

	Conc	Empc	Flags
TCDF	0	0	FALSE
TCDD	0	0	FALSE
PeCDF	0	0	FALSE
PeCDD	0	0	FALSE
HxCDF	0	0	FALSE
HxCDD	0	0	FALSE
HpCDF	0	0	FALSE
HpCDD	2.557	2.557	FALSE

Filename: a27jan09a_5
Sample: 8
Acquired: 29-JAN-09 14:22:05
Processed: 30-JAN-09 07:42:58
Sample ID: G1040-1-2B
Cal Table: m1613-100708a
Results Table: m1613-012709a_5

Name of Homolog Group: Total Tetra-Furans
Number of Peaks Found: 1 0
RRF Used For Totals: 1.0368
Detection Limit: 0.2079
Noise Height Ion1/Ion2: 8020 / 6784
Begin Window: 26:14:00
End Window: 33:07:00

RL=0.500 (pg/µL)

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	1.51E+05	95800	55400	1.73	n	32:06	0.17	RL	3.8	y	3.1	y	n

Filename: a27jan09a_5
Sample: 8
Acquired: 29-JAN-09 14:22:05
Processed: 30-JAN-09 07:42:58
Sample ID: G1040-1-2B
Cal Table: m1613-100708a
Results Table: m1613-012709a_5

Name of Homolog Group: Total Tetra-Dioxins
Number of Peaks Found: 0
RRF Used For Totals: 1.0087
Detection Limit: 0.1929
Noise Height Ion1/Ion2: 5738 / 6641
Begin Window:
End Window:

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	*	*	*	*	n	NotFnd	*		*	n	*	n	n

Filename: a27jan09a_5
Sample: 8
Acquired: 29-JAN-09 14:22:05
Processed: 30-JAN-09 07:42:58
Sample ID: G1040-1-2B
Cal Table: m1613-100708a
Results Table: m1613-012709a_5

Name of Homolog Group: Total Penta-Furans Fn1
Number of Peaks Found: 0
RRF Used For Totals: 1.0121
Detection Limit: 0.1332
Noise Height Ion1/Ion2: 5660 / 7136
Begin Window:
End Window:

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	*	*	*	*	n	NotFnd	*		*	n	*	n	n

Filename:	a27jan09a_5	Name of Homolog Group:	Total Penta-Furans Fn2
Sample:	8	Number of Peaks Found:	0
Acquired:	29-JAN-09 14:22:05	RRF Used For Totals:	1.0121
Processed:	30-JAN-09 07:42:58	Detection Limit:	0.1507
Sample ID:	G1040-1-2B	Noise Height Ion1/Ion2:	7480 / 6996
Cal Table:	m1613-100708a	Begin Window:	
Results Table:	m1613-012709a_5	End Window:	

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	*	*	*	*	n	NotFnd	*		*	n	*	n	n

Filename:	a27jan09a_5	Name of Homolog Group:	Total Penta-Dioxins
Sample:	8	Number of Peaks Found:	0
Acquired:	29-JAN-09 14:22:05	RRF Used For Totals:	1.0517
Processed:	30-JAN-09 07:42:58	Detection Limit:	0.2609
Sample ID:	G1040-1-2B	Noise Height Ion1/Ion2:	6808 / 6708
Cal Table:	m1613-100708a	Begin Window:	
Results Table:	m1613-012709a_5	End Window:	

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	*	*	*	*	n	NotFnd	*		*	n	*	n	n

Filename:	a27jan09a_5	Name of Homolog Group:	Total Hexa-Furans
Sample:	8	Number of Peaks Found:	0
Acquired:	29-JAN-09 14:22:05	RRF Used For Totals:	1.1305
Processed:	30-JAN-09 07:42:58	Detection Limit:	0.2412
Sample ID:	G1040-1-2B	Noise Height Ion1/Ion2:	6504 / 7196
Cal Table:	m1613-100708a	Begin Window:	
Results Table:	m1613-012709a_5	End Window:	

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	*	*	*	*	n	NotFnd	*		*	n	*	n	n

Filename:	a27jan09a_5	Name of Homolog Group:	Total Hexa-Dioxins
Sample:	8	Number of Peaks Found:	1 0
Acquired:	29-JAN-09 14:22:05	RRF Used For Totals:	1.0077
Processed:	30-JAN-09 07:42:58	Detection Limit:	0.389 RL=2.500 (pg/µL)
Sample ID:	G1040-1-2B	Noise Height Ion1/Ion2:	7964 / 7132
Cal Table:	m1613-100708a	Begin Window:	35:36:00
Results Table:	m1613-012709a_5	End Window:	37:17:00

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?

	1	7.16E+04	49300	22300	2.21 n	36:19		0.192	S2N	2.1 n		1.8 n	n	

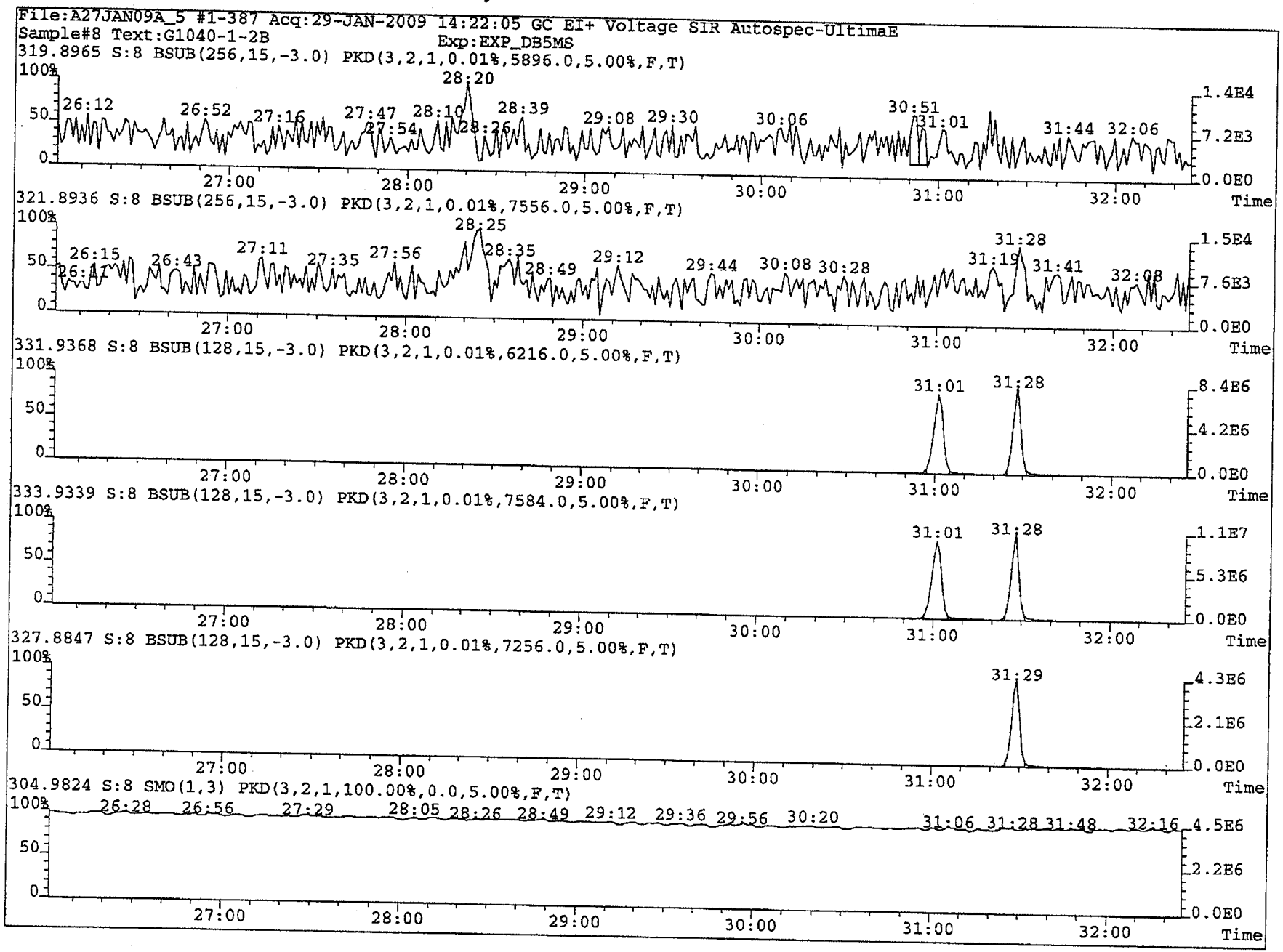
Filename:	a27jan09a_5	Name of Homolog Group:	Total Hepta-Furans
Sample:	8	Number of Peaks Found:	0
Acquired:	29-JAN-09 14:22:05	RRF Used For Totals:	1.3693
Processed:	30-JAN-09 07:42:58	Detection Limit:	0.3914
Sample ID:	G1040-1-2B	Noise Height Ion1/Ion2:	6548 / 6908
Cal Table:	m1613-100708a	Begin Window:	
Results Table:	m1613-012709a_5	End Window:	

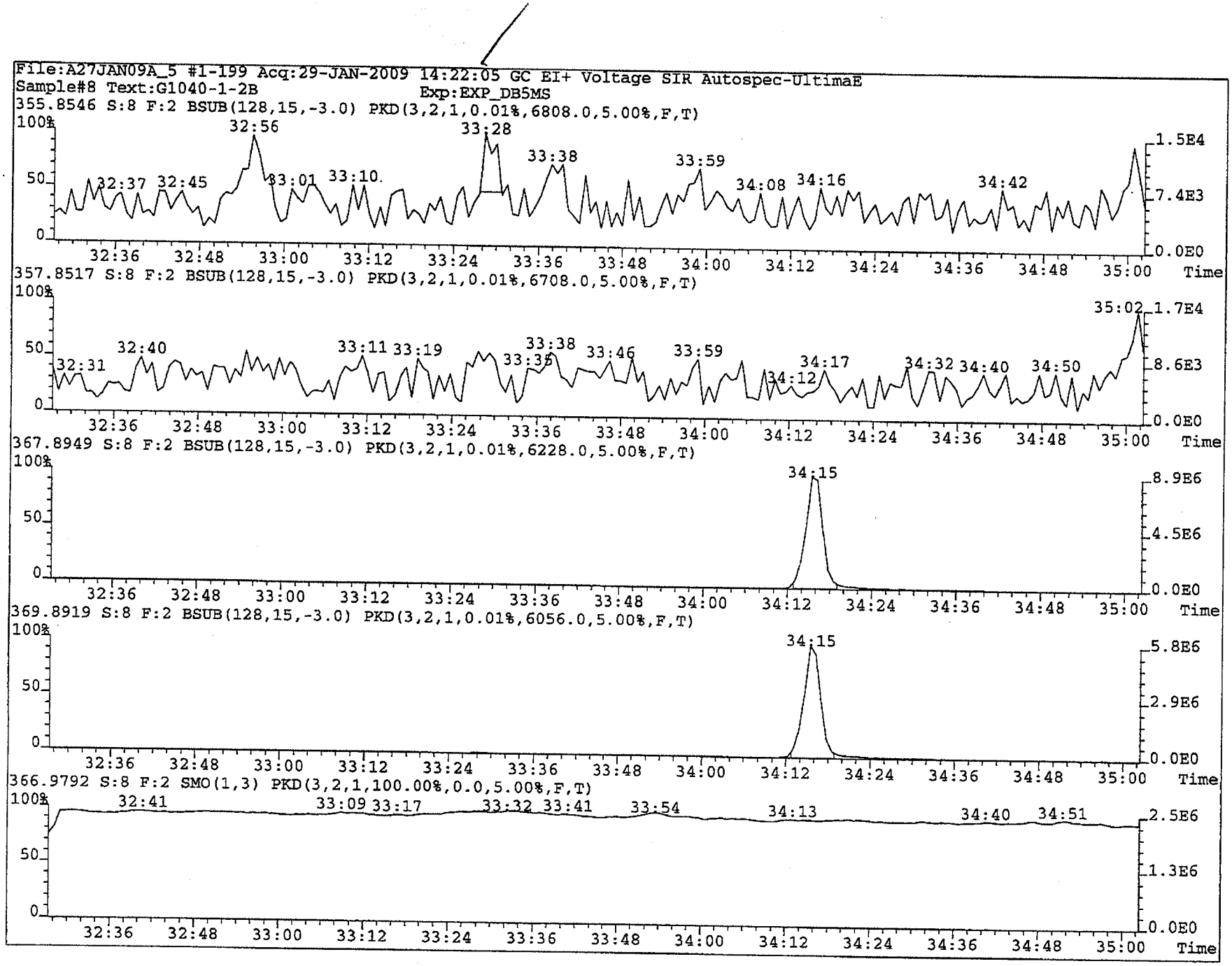
Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	*	*	*	*	n	NotFnd	*		*	n	*	n	n

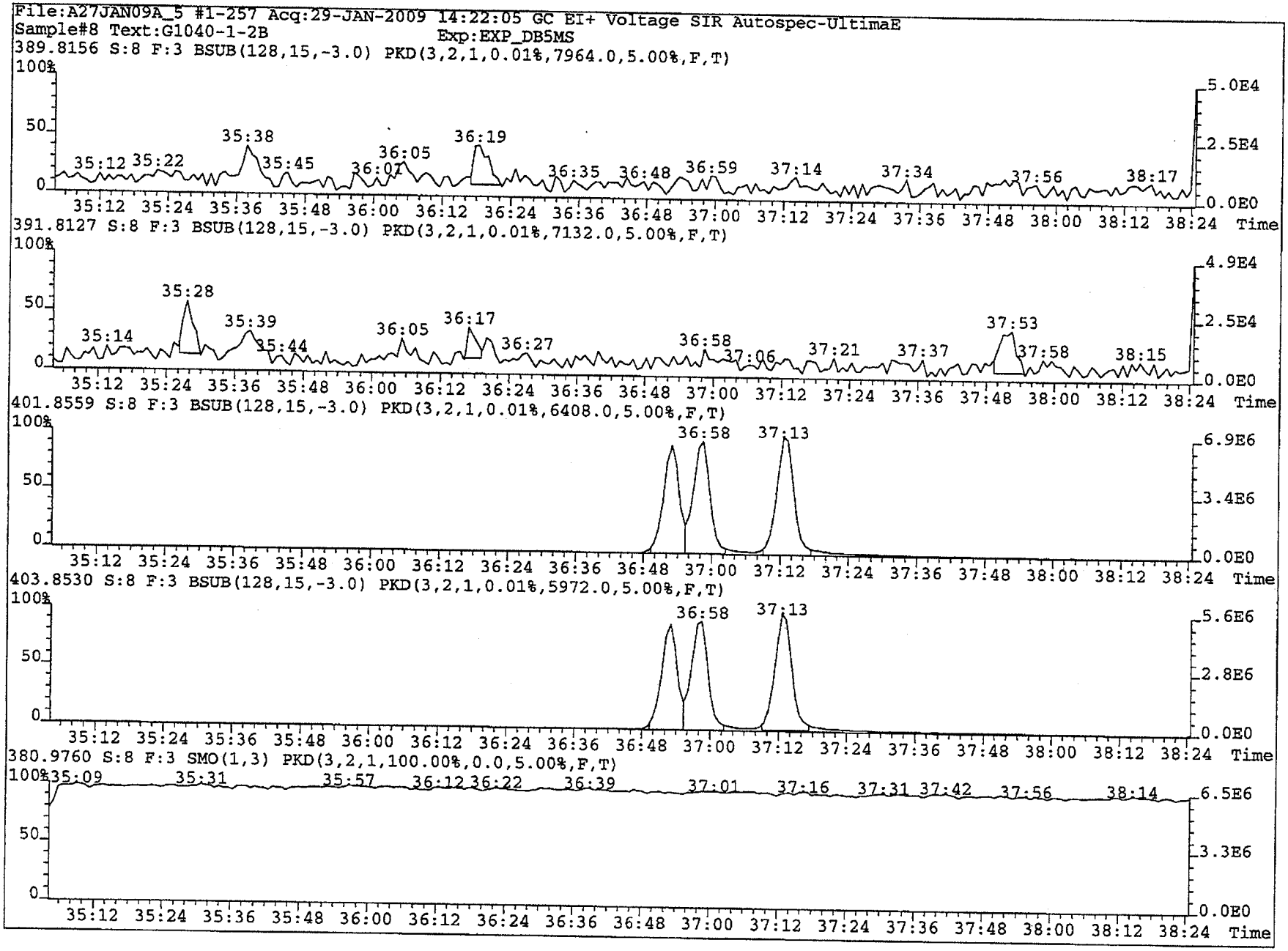
Filename:	a27jan09a_5	Name of Homolog Group:	Total Hepta-Dioxins
Sample:	8	Number of Peaks Found:	2 1
Acquired:	29-JAN-09 14:22:05	RRF Used For Totals:	1.0612
Processed:	30-JAN-09 07:42:58	Detection Limit:	0.5819
Sample ID:	G1040-1-2B	Noise Height Ion1/Ion2:	6356 / 7156
Cal Table:	m1613-100708a	Begin Window:	39:18:00
Results Table:	m1613-012709a_5	End Window:	40:30:00

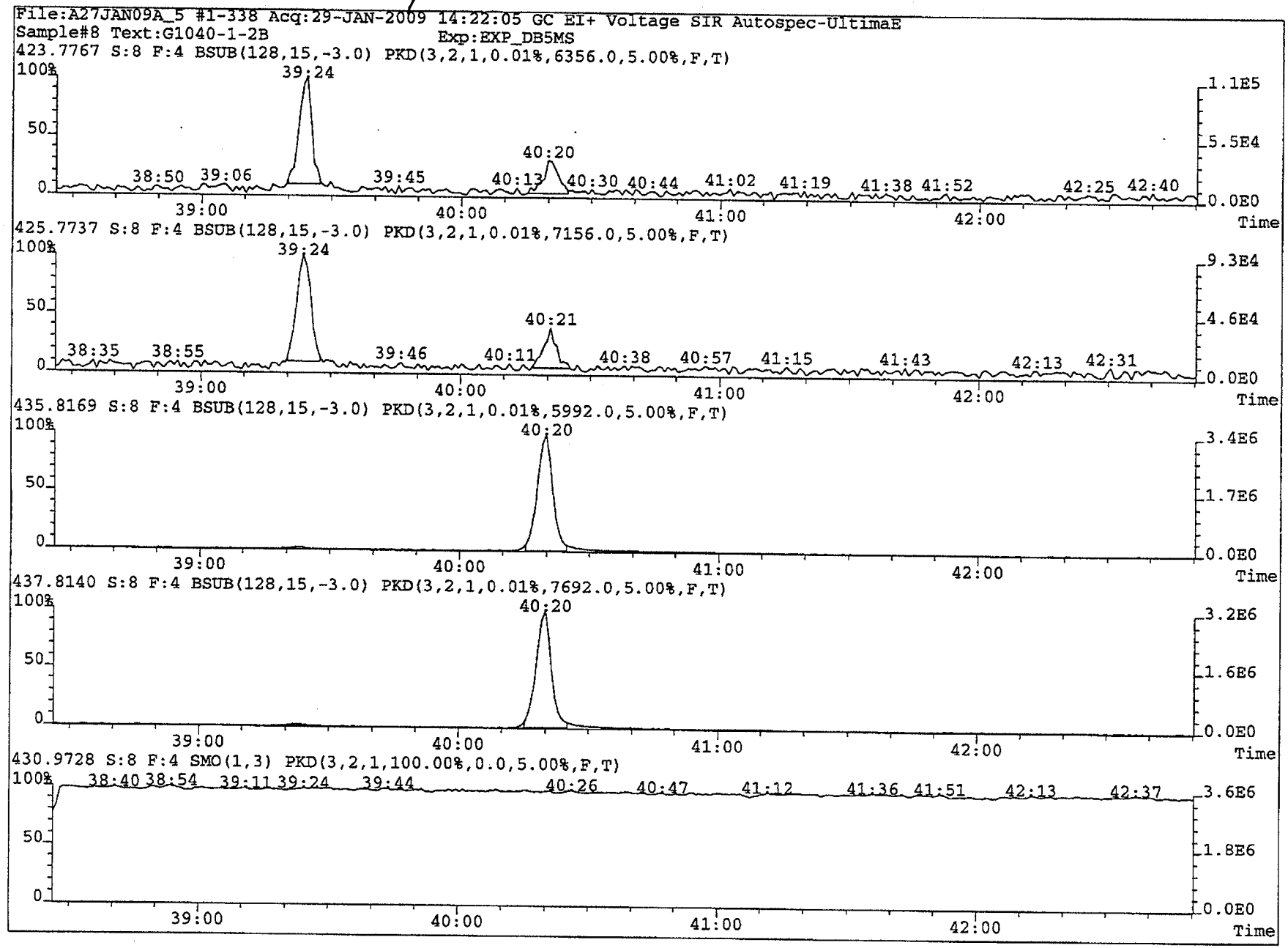
RL=2.500 (pg/µL)

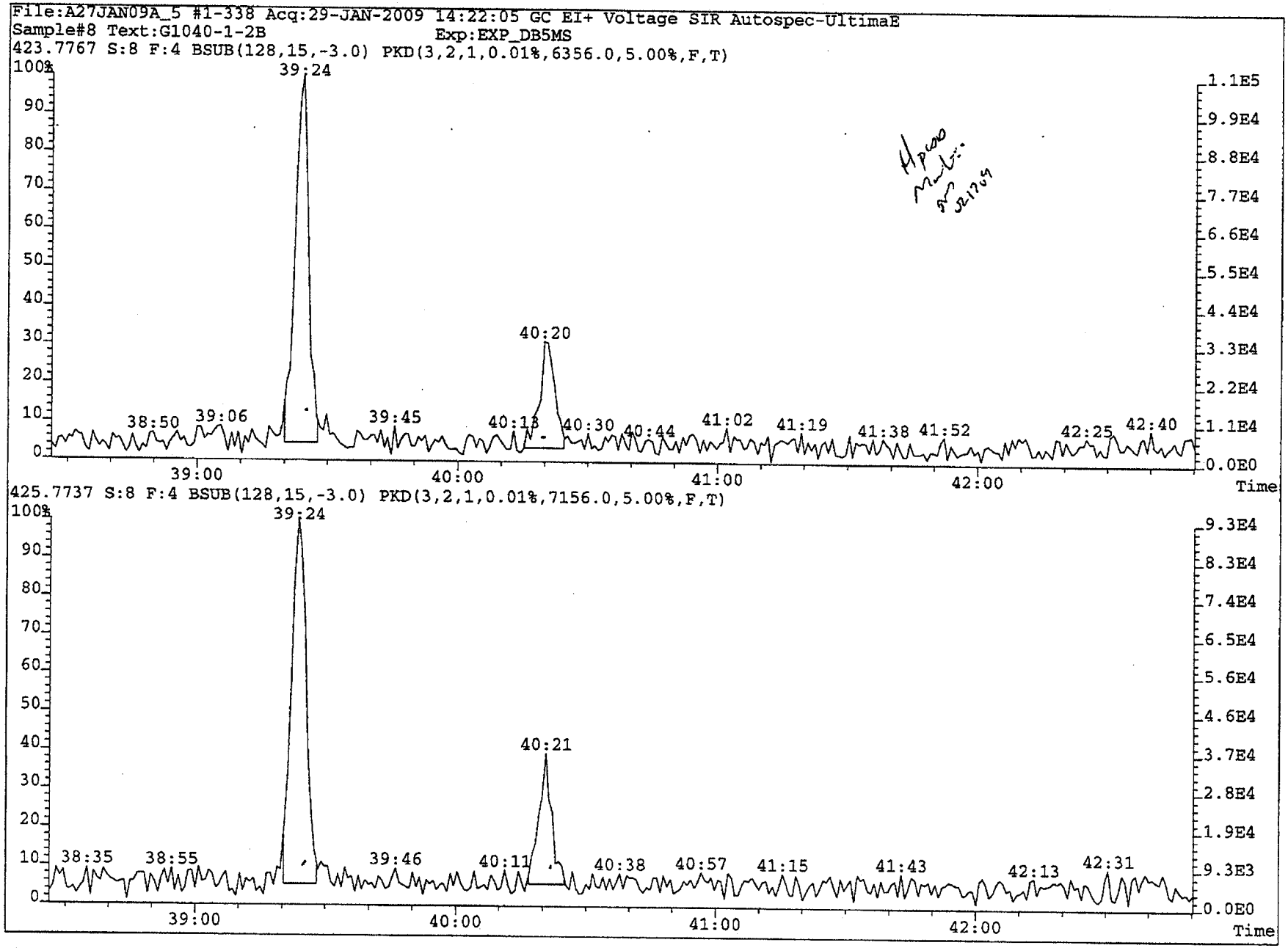
Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	7.15E+05	373000	341000		1.09 y	39:24	2.557	OK	16.6 y		12.3 y	y	
1,2,3,4,6,7,8-HpCDI	2	2.34E+05	126000	108000		1.18 y	40:20	0.837	RL	4.8 y		4.4 y	n	

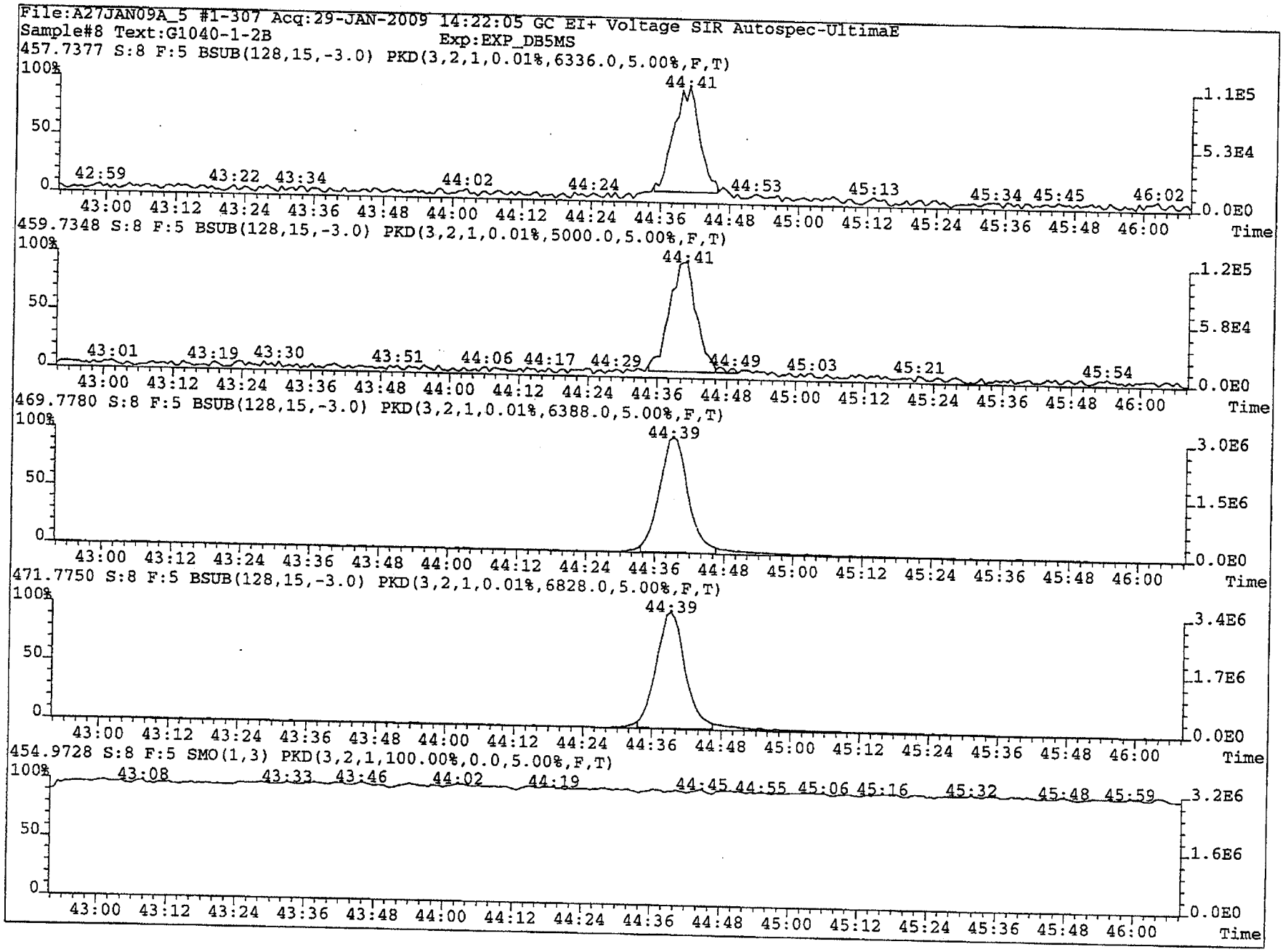

File:A27JAN09A_5 #1-387 Acq:29-JAN-2009 14:22:05 GC EI+ Voltage SIR Autospec-UltimaE
Sample#8 Text:G1040-1-2B
Exp:EXP_DB5MS
319.8965 S:8 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,5896.0,5.00%,F,T)
321.8936 S:8 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,7556.0,5.00%,F,T)
331.9368 S:8 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6216.0,5.00%,F,T)
333.9339 S:8 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7584.0,5.00%,F,T)
327.8847 S:8 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7256.0,5.00%,F,T)
304.9824 S:8 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time

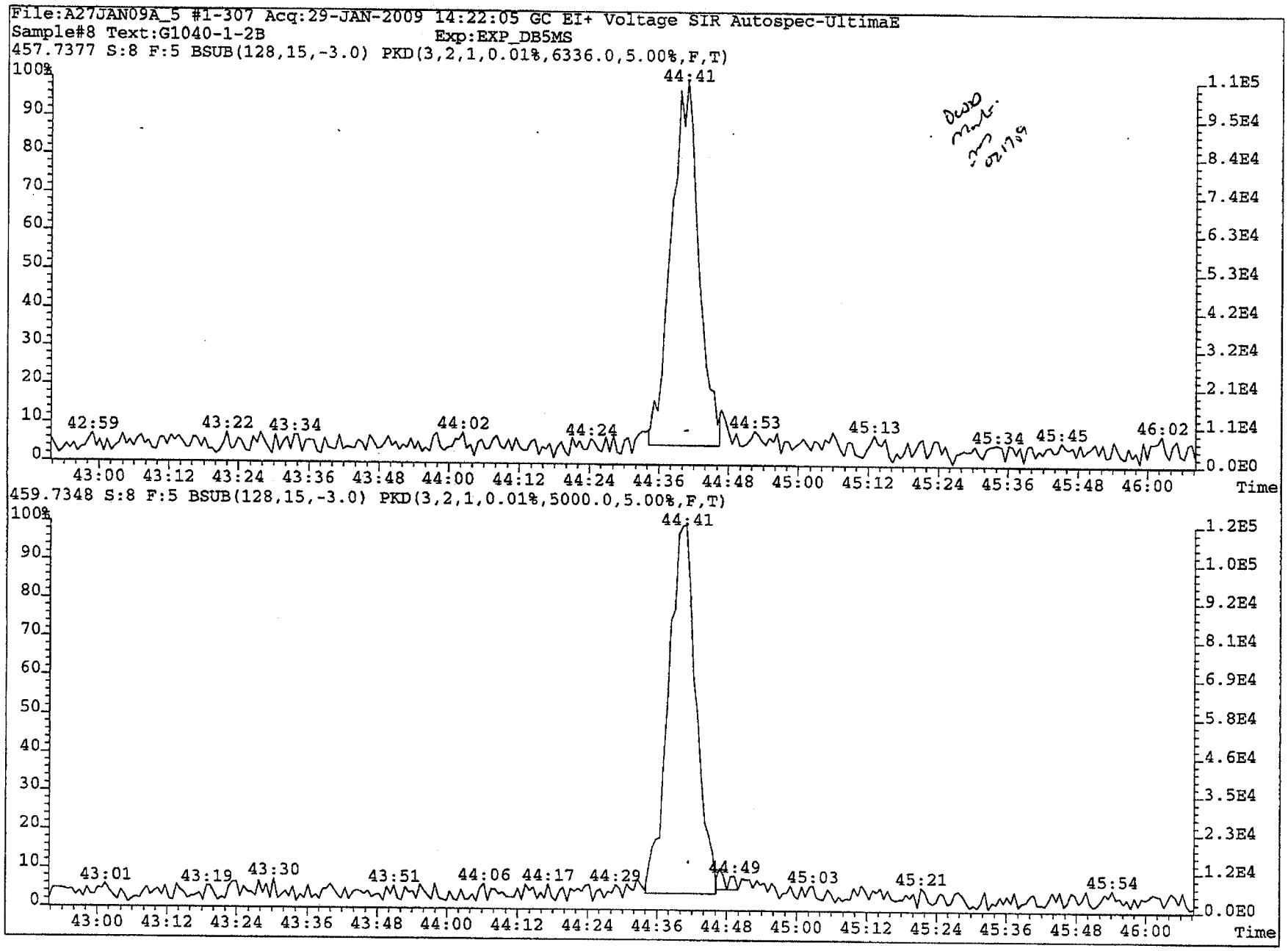

File:A27JAN09A_5 #1-199 Acq:29-JAN-2009 14:22:05 GC EI+ Voltage SIR Autospec-UltimaE
Sample#8 Text:G1040-1-2B
Exp:EXP_DB5MS
355.8546 S:8 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6808.0,5.00%,F,T)
357.8517 S:8 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6708.0,5.00%,F,T)
367.8949 S:8 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6228.0,5.00%,F,T)
369.8919 S:8 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6056.0,5.00%,F,T)
366.9792 S:8 F:2 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time

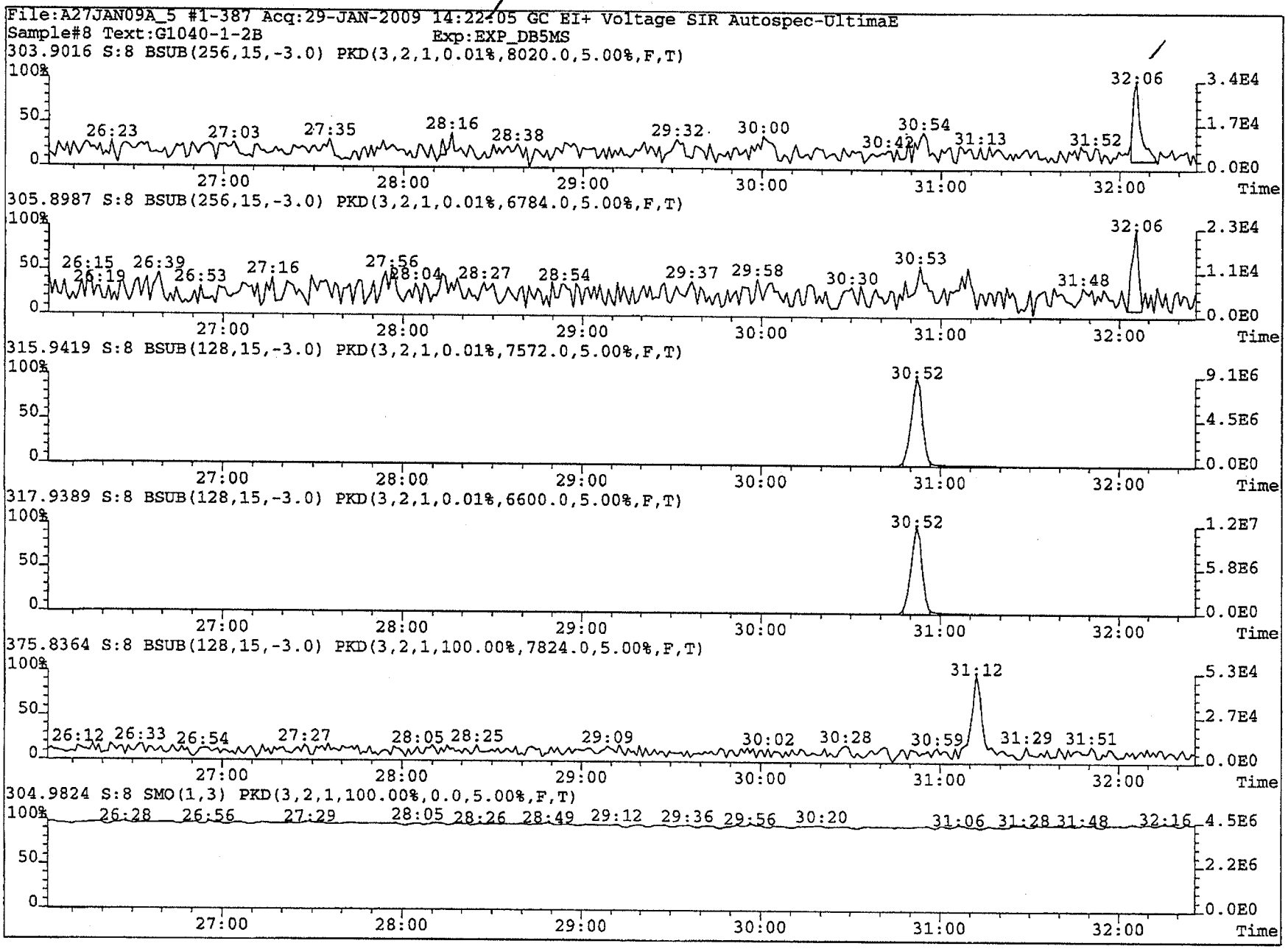

File:A27JAN09A_5 #1-257 Acq:29-JAN-2009 14:22:05 GC EI+ Voltage SIR Autospec-UltimaE
Sample#8 Text:G1040-1-2B Exp:EXP_DB5MS
389.8156 S:8 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7964.0,5.00%,F,T)
391.8127 S:8 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7132.0,5.00%,F,T)
401.8559 S:8 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6408.0,5.00%,F,T)
403.8530 S:8 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5972.0,5.00%,F,T)
380.9760 S:8 F:3 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time

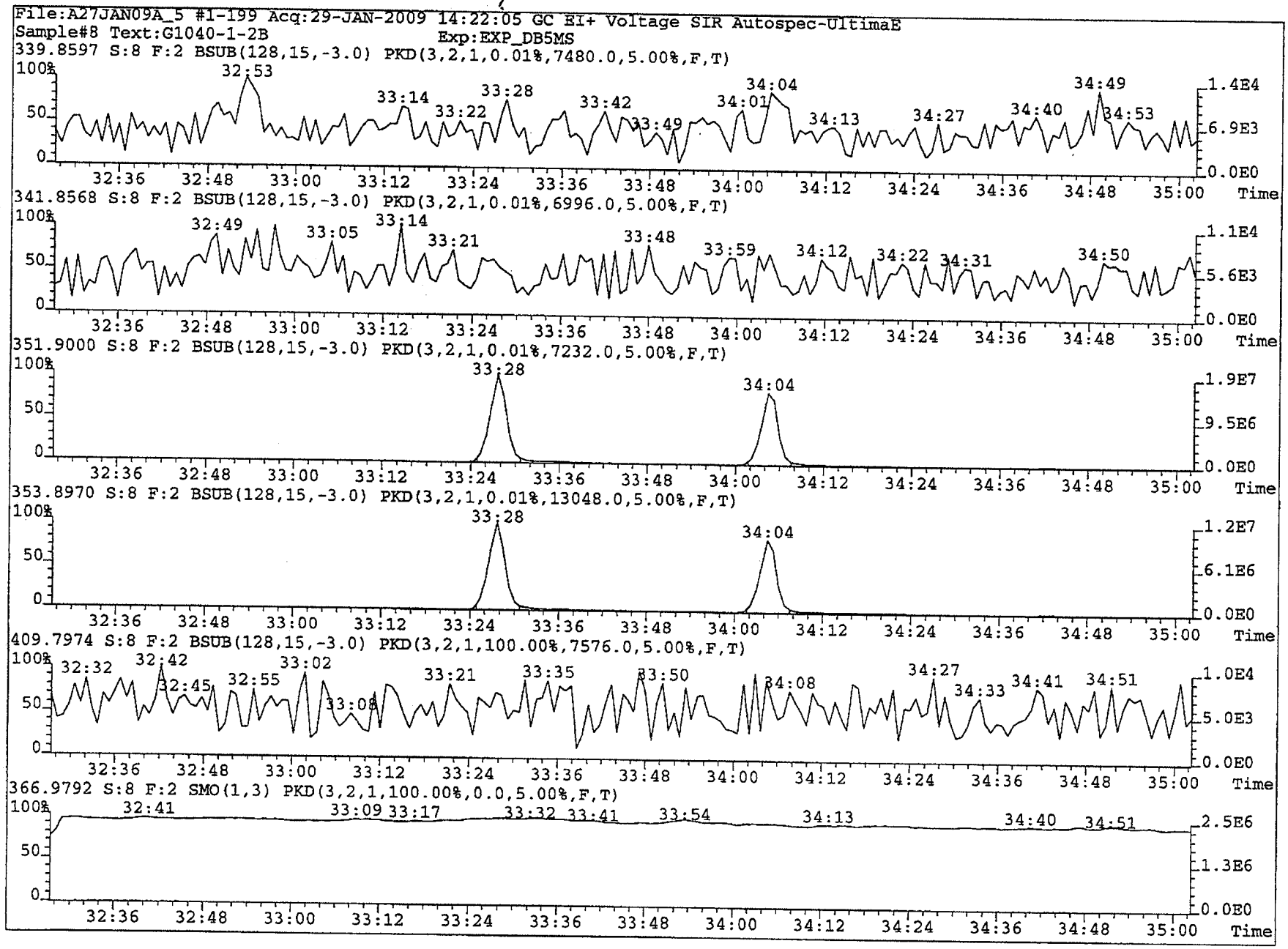

File:A27JAN09A_5 #1-338 Acq:29-JAN-2009 14:22:05 GC EI+ Voltage SIR Autospec-UltimaE
Sample#8 Text:G1040-1-2B
Exp:EXP_DB5MS
423.7767 S:8 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6356.0,5.00%,F,T)
425.7737 S:8 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7156.0,5.00%,F,T)
435.8169 S:8 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5992.0,5.00%,F,T)
437.8140 S:8 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7692.0,5.00%,F,T)
430.9728 S:8 F:4 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time

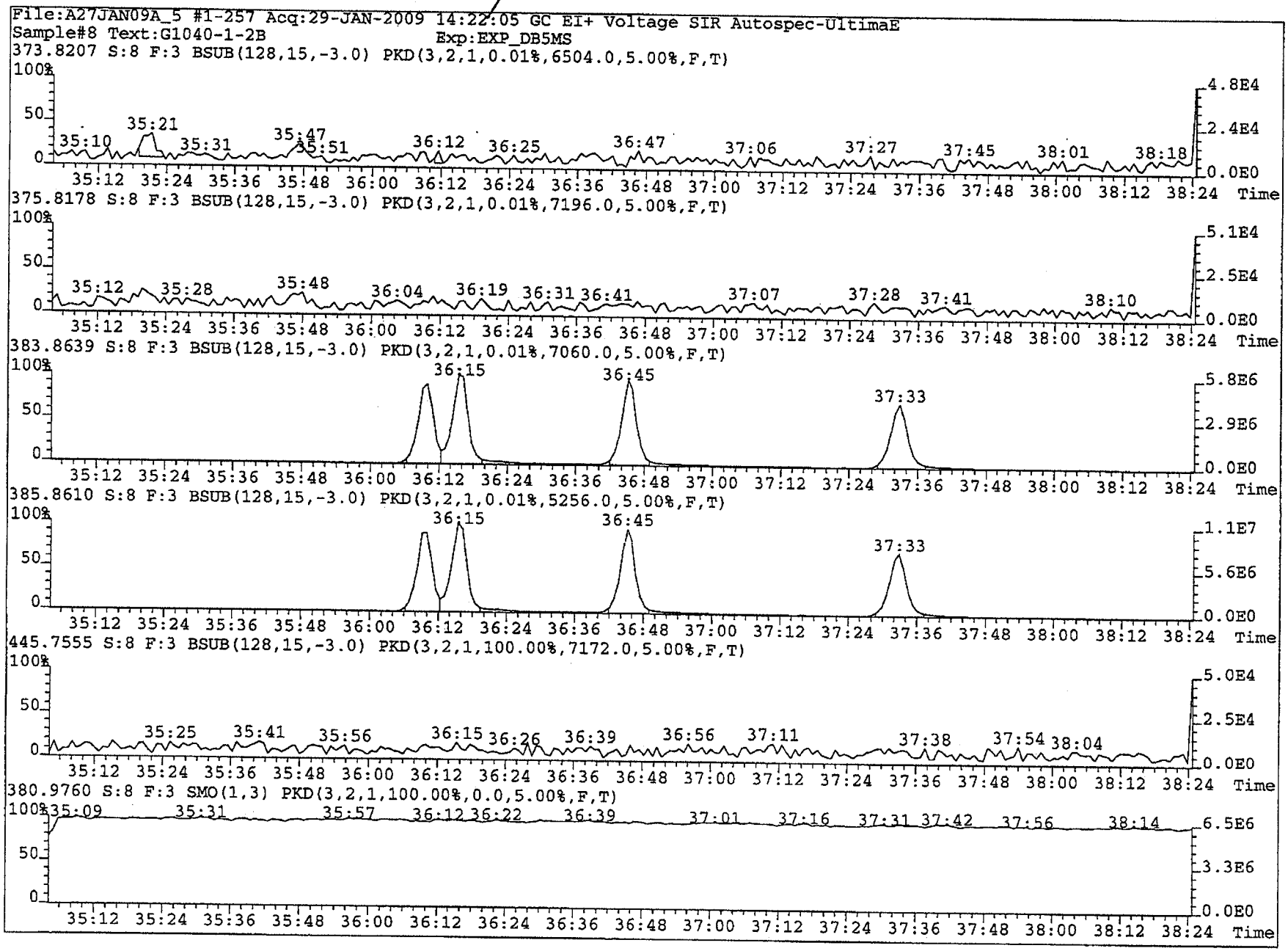

File:A27JAN09A_5 #1-338 Acq:29-JAN-2009 14:22:05 GC EI+ Voltage SIR Autospec-UltimaE
Sample#8 Text:G1040-1-2B Exp:EXP_DB5MS
423.7767 S:8 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6356.0,5.00%,F,T)
39:24
40:20
38:50 39:06 39:45 40:13 40:30 40:44 41:02 41:19 41:38 41:52 42:25 42:40
39:00 40:00 41:00 42:00
Time
425.7737 S:8 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7156.0,5.00%,F,T)
39:24
40:21
38:35 38:55 39:46 40:11 40:38 40:57 41:15 41:43 42:13 42:31
39:00 40:00 41:00 42:00
Time

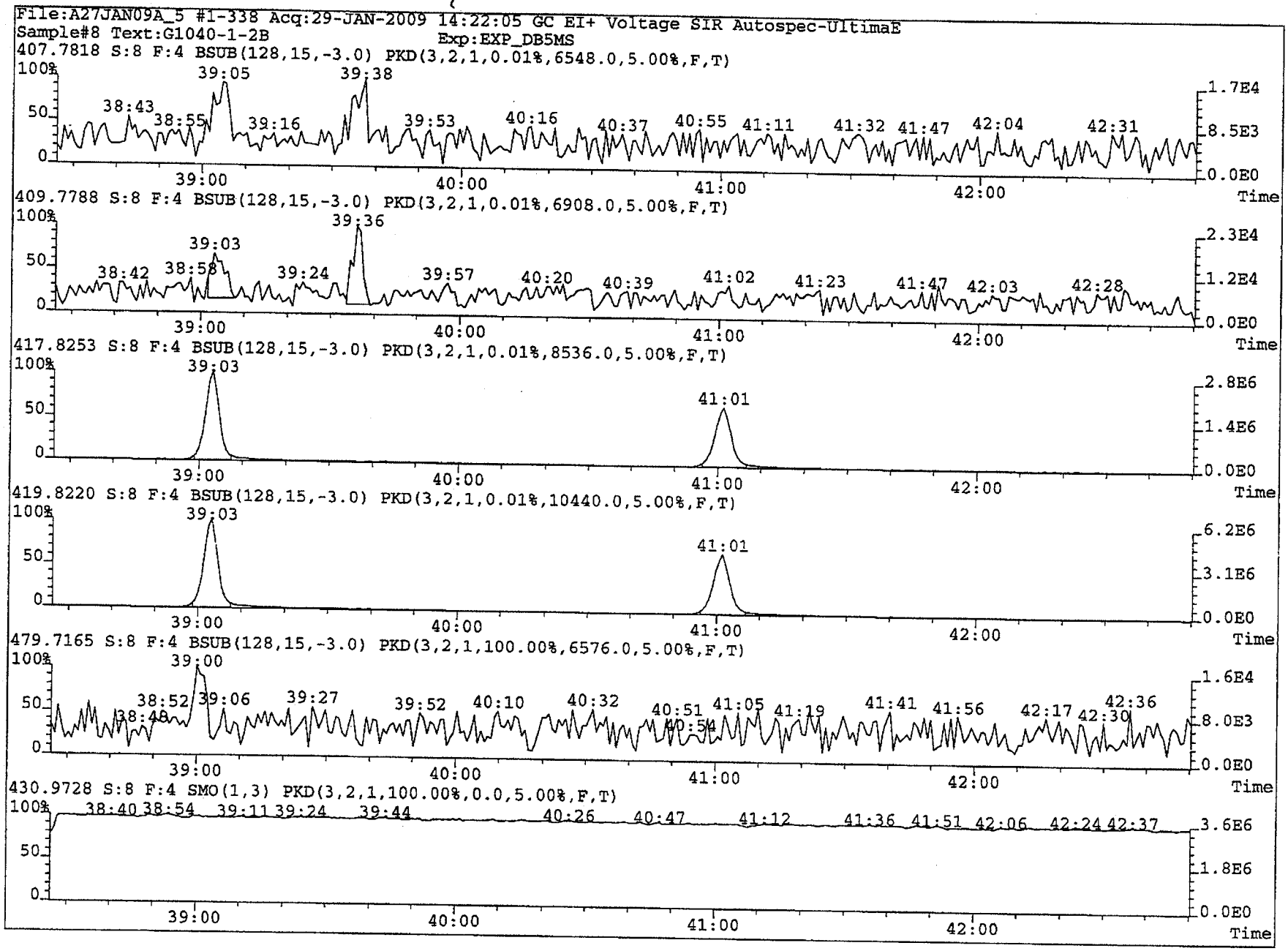

File:A27JAN09A_5 #1-307 Acq:29-JAN-2009 14:22:05 GC EI+ Voltage SIR Autospec-UltimaE
Sample#8 Text:G1040-1-2B Exp:EXP_DB5MS
457.7377 S:8 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6336.0,5.00%,F,T)
459.7348 S:8 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5000.0,5.00%,F,T)
469.7780 S:8 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6388.0,5.00%,F,T)
471.7750 S:8 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6828.0,5.00%,F,T)
454.9728 S:8 F:5 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time

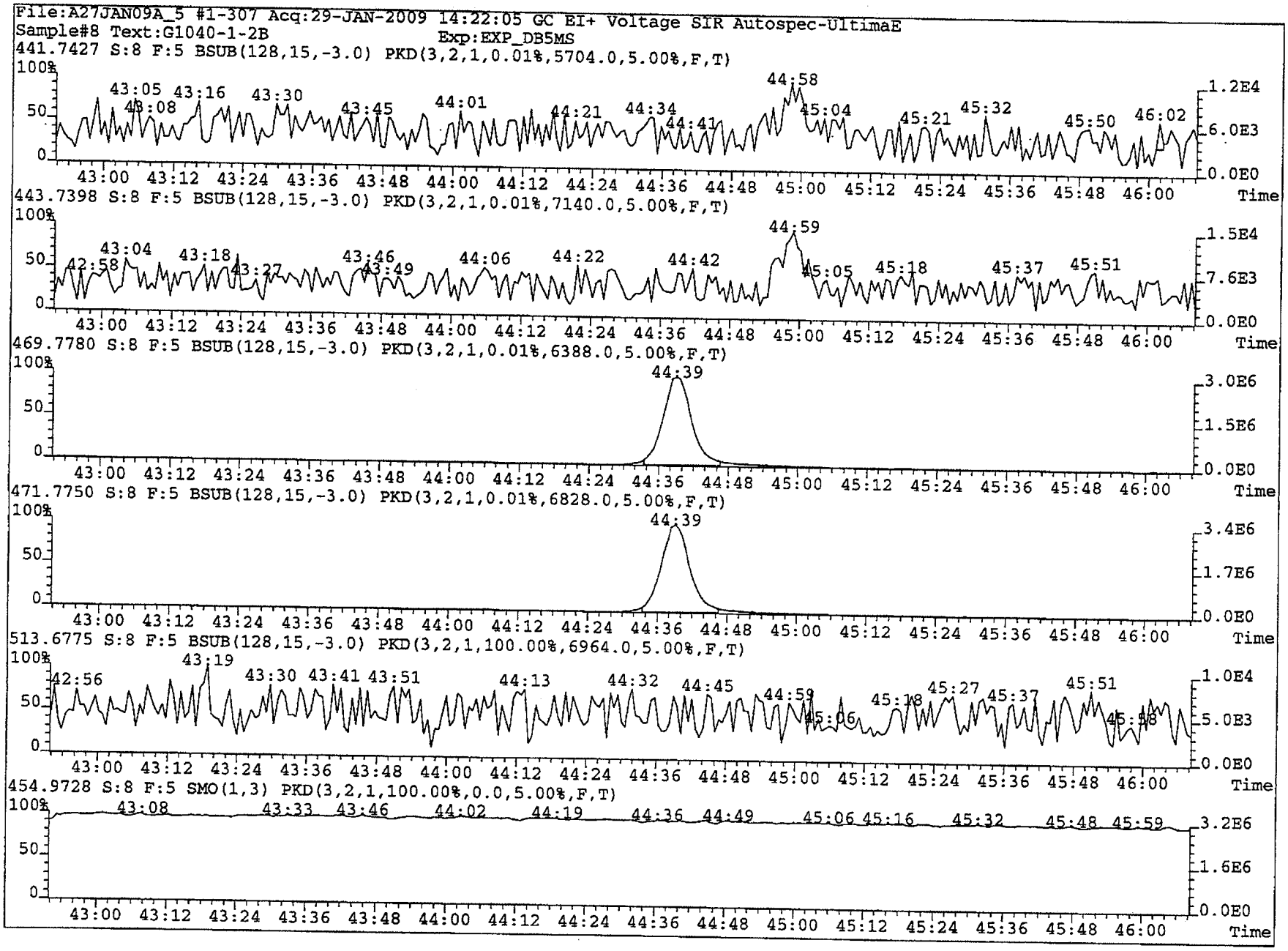

File:A27JAN09A_5 #1-307 Acq:29-JAN-2009 14:22:05 GC EI+ Voltage SIR Autospec-UltimaE
Sample#8 Text:G1040-1-2B Exp:EXP_DB5MS
457.7377 S:8 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6336.0,5.00%,F,T)
44:41
42:59
43:22
43:34
44:02
44:24
44:53
45:13
45:34
45:45
46:02
Time
459.7348 S:8 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5000.0,5.00%,F,T)
44:41
43:01
43:19
43:30
43:51
44:06
44:17
44:29
44:49
45:03
45:21
45:54
Time

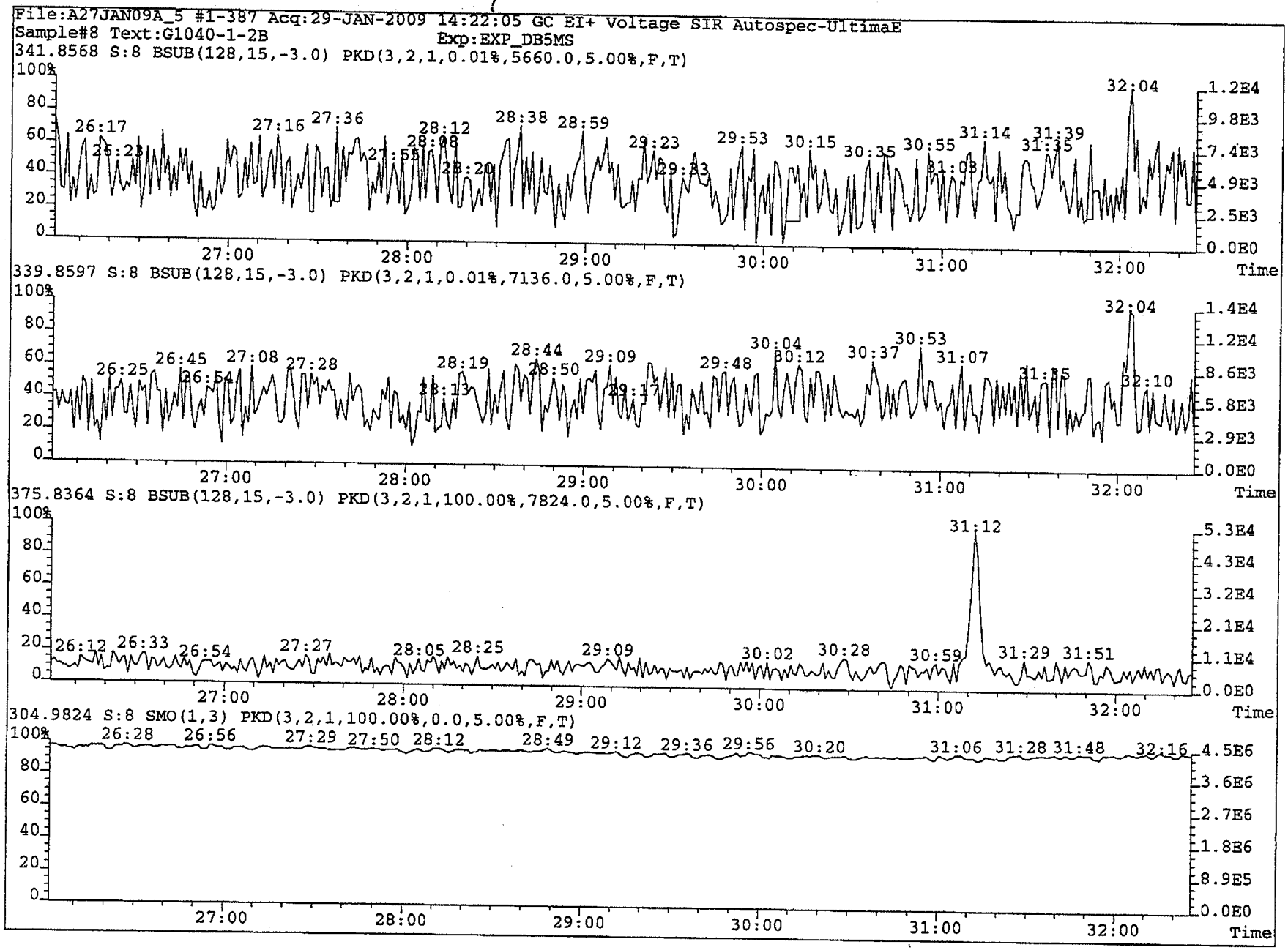

File:A27JAN09A_5 #1-387 Acq:29-JAN-2009 14:22:05 GC EI+ Voltage SIR Autospec-UltimaE
Sample#8 Text:G1040-1-2B Exp:EXP_DB5MS
303.9016 S:8 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,8020.0,5.00%,F,T)
305.8987 S:8 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,6784.0,5.00%,F,T)
315.9419 S:8 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7572.0,5.00%,F,T)
317.9389 S:8 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6600.0,5.00%,F,T)
375.8364 S:8 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,7824.0,5.00%,F,T)
304.9824 S:8 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time


File:A27JAN09A_5 #1-199 Acq:29-JAN-2009 14:22:05 GC EI+ Voltage SIR Autospec-UltimaE
Sample#8 Text:G1040-1-2B Exp:EXP_DB5MS
339.8597 S:8 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7480.0,5.00%,F,T)
341.8568 S:8 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6996.0,5.00%,F,T)
351.9000 S:8 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7232.0,5.00%,F,T)
353.8970 S:8 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,13048.0,5.00%,F,T)
409.7974 S:8 F:2 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,7576.0,5.00%,F,T)
366.9792 S:8 F:2 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time


File:A27JAN09A_5 #1-257 Acq:29-JAN-2009 14:22:05 GC EI+ Voltage SIR Autospec-UltimaE
Sample#8 Text:G1040-1-2B Exp:EXP_DB5MS
373.8207 S:8 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6504.0,5.00%,F,T)
375.8178 S:8 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7196.0,5.00%,F,T)
383.8639 S:8 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7060.0,5.00%,F,T)
385.8610 S:8 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5256.0,5.00%,F,T)
445.7555 S:8 F:3 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,7172.0,5.00%,F,T)
380.9760 S:8 F:3 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time


File:A27JAN09A_5 #1-338 Acq:29-JAN-2009 14:22:05 GC EI+ Voltage SIR Autospec-UltimaE
Sample#8 Text:G1040-1-2B
Exp:EXP_DB5MS
407.7818 S:8 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6548.0,5.00%,F,T)
409.7788 S:8 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6908.0,5.00%,F,T)
417.8253 S:8 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,8536.0,5.00%,F,T)
419.8220 S:8 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,10440.0,5.00%,F,T)
479.7165 S:8 F:4 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,6576.0,5.00%,F,T)
430.9728 S:8 F:4 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time


File:A27JAN09A_5 #1-307 Acq:29-JAN-2009 14:22:05 GC EI+ Voltage SIR Autospec-UltimaE
Sample#8 Text:G1040-1-2B Exp:EXP_DB5MS
441.7427 S:8 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5704.0,5.00%,F,T)
443.7398 S:8 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7140.0,5.00%,F,T)
469.7780 S:8 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6388.0,5.00%,F,T)
471.7750 S:8 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6828.0,5.00%,F,T)
513.6775 S:8 F:5 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,6964.0,5.00%,F,T)
454.9728 S:8 F:5 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time


File:A27JAN09A_5 #1-387 Acq:29-JAN-2009 14:22:05 GC EI+ Voltage SIR Autospec-UltimaE
Sample#8 Text:G1040-1-2B
Exp:EXP_DB5MS
341.8568 S:8 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5660.0,5.00%,F,T)
339.8597 S:8 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7136.0,5.00%,F,T)
375.8364 S:8 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,7824.0,5.00%,F,T)
304.9824 S:8 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time

Method 1613

PGSS-GEO-3

Analytical Resources, Inc.

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	RL (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	1.00			
1,2,3,7,8-PeCDD	ND	5.00			
1,2,3,4,7,8-HxCDD	ND	5.00			
1,2,3,6,7,8-HxCDD	ND	5.00			
1,2,3,7,8,9-HxCDD	ND	5.00			
1,2,3,4,6,7,8-HpCDD	5.90	5.00	40:20	1.01	
OCDD	43.6	10.0	44:40	0.86	
2,3,7,8-TCDF	ND	1.00			
1,2,3,7,8-PeCDF	ND	5.00			
2,3,4,7,8-PeCDF	ND	5.00			
1,2,3,4,7,8-HxCDF	ND	5.00			
1,2,3,6,7,8-HxCDF	ND	5.00			
2,3,4,6,7,8-HxCDF	ND	5.00			
1,2,3,7,8,9-HxCDF	ND	5.00			
1,2,3,4,6,7,8-HpCDF	ND	5.00			
1,2,3,4,7,8,9-HpCDF	ND	5.00			
OCDF	ND	10.0			
Total TCDDs	3.63	1.00			
Total PeCDDs	ND	5.00			
Total HxCDDs	ND	5.00			
Total HpCDDs	21.3	5.00			
Total TCDFs	3.28	1.00			DPE
Total PeCDFs	ND	5.00			
Total HxCDFs	ND	5.00			
Total HpCDFs	ND	5.00			
WHO-2005 TEQ (ND=0)	0.0721				
WHO-2005 TEQ (ND=½)	5.75				

Client Information

Project Name:	Port Gamble				
			Matrix:	Sediment	
Sample ID:	PGSS-GEO-3		Weight / Volume:	15.41	grams
			Solids / Lipids:	72.9	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG16440	
Project ID:	G1040-1				
Sample ID:	G1040-1-3B		Filename:	a27jan09a_5-9	
Collection Date/Time:	10-Dec-08	10:35	Retchk:	a27jan09a_4-15	
Receipt Date:	15-Jan-09	10:15	Begin ConCal:	a27jan09a_4-15	
Extraction Date:	19-Jan-09				
Analysis Date:	29-Jan-09	15:10	Initial Cal:	m1613-100708a	

Sample Information

Method 1613

PGSS-GEO-3

Analytical Resources, Inc.

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
$^{13}C_{12}$-2,3,7,8-TCDD	2	1.66	83.1	31:28	0.79	
$^{13}C_{12}$-1,2,3,7,8-PeCDD	2	1.64	81.8	34:15	1.59	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	2	1.69	84.6	36:53	1.26	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	2	1.68	84.2	36:58	1.26	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	2	1.57	78.3	40:19	1.06	
$^{13}C_{12}$-OCDD	4	2.59	64.7	44:39	0.89	
$^{13}C_{12}$-2,3,7,8-TCDF	2	1.70	85.0	30:52	0.79	
$^{13}C_{12}$-1,2,3,7,8-PeCDF	2	1.83	91.4	33:28	1.57	
$^{13}C_{12}$-2,3,4,7,8-PeCDF	2	1.68	84.2	34:04	1.59	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	2	1.76	88.0	36:09	0.52	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	2	1.76	88.1	36:15	0.53	
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	2	1.75	87.3	36:45	0.53	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	2	1.69	84.5	37:32	0.53	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	2	1.58	78.9	39:03	0.45	
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	2	1.53	76.6	41:01	0.45	
Cleanup Standard						
$^{37}Cl_4$-2,3,7,8-TCDD	0.4	0.368	92.0	31:29		
Injection Standards						
$^{13}C_{12}$-1,2,3,4-TCDD	2			31:01	0.79	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	2			37:13	1.26	

Client Information

Project Name: Port Gamble

Sample ID: PGSS-GEO-3

Laboratory Information

Project ID: G1040-1
Sample ID: G1040-1-3B
Collection Date/Time: 10-Dec-08 10:35
Receipt Date: 15-Jan-09 10:15
Extraction Date: 19-Jan-09
Analysis Date: 29-Jan-09 15:10

Analyzed by: JMP
Date: 021709

Sample Information

Matrix: Sediment
Weight / Volume: 15.41 grams
Solids / Lipids: 72.9 %
Original pH : NA
Batch ID: WG16440

Filename: a27jan09a_5-9
Retchk: a27jan09a_4-15
Begin ConCal: a27jan09a_4-15

Initial Cal: m1613-100708a

Reviewed by: JM
Date: 02/17/09

Form Version:[1613_HRMS12]Repor

[OCDD] = 2.90e6 + 3.36e6 / 2.27e7 + 2.54e7 × (40000pg / 15.41g × 0.7886) × (1 / 1.0643) = 43.6 pg/g TM 02/17/09

Filename ; a27jan09a_5
Sample ; 9
Acquired ; 29-JAN-09 15:10:24
Processed ; 30-JAN-09 07:43:21
Sample ID ; G1040-1-3B
Cal Table ; m1613-100708a
Results Table ; m1613-012709a_5
Comments ;

;*1613*
;Inst: HRMS1

Ent;	Name;	Resp;	Ion 1;	Ion 2;	RA;?;	RT;	Conc;	EDL;	S/N1;?;	S/N2;?;M; Signal1; Noise 1; Signal2; Noise 2
1 ;	2,3,7,8-TCDD;	*;	*;	*;	*;n;	NotFnd;	*;	0.1262;	*;n;	*;n;n; *;4.94e+03; *;5.43e+03
2 ;	1,2,3,7,8-PeCDD;	6.27e+04;	3.71e+04;	2.56e+04;	1.45;y;	34:17;	0.106;	0.2055;	2;n;	2;n;n;1.31e+04;7.62e+03;1.31e+04;7.74e+03
3 ;	1,2,3,4,7,8-HxCDD;	1.79e+05;	1.10e+05;	6.84e+04;	1.62;n;	~~36:59;~~	0.360;	0.2844;	4;y;	3;y;n;3.01e+04;7.51e+03;2.30e+04;7.25e+03
4 ;	1,2,3,6,7,8-HxCDD;	1.79e+05;	1.10e+05;	6.84e+04;	1.62;n;	36:59;	0.347;	0.2677;	4;y;	3;y;n;3.01e+04;7.51e+03;2.30e+04;7.25e+03
5 ;	1,2,3,7,8,9-HxCDD;	*;	*;	*;	*;n;	NotFnd;	*;	0.2778;	*;n;	*;n;n; *;7.51e+03; *;7.25e+03
6 ;	1,2,3,4,6,7,8-HpCDD;	1.28e+06;	6.44e+05;	6.40e+05;	1.01;y;	40:20;	3.312;	0.4033;	26;y;	23;y;n;1.67e+05;6.36e+03;1.50e+05;6.56e+03
7 ;	OCDD;	6.26e+06;	2.90e+06;	3.36e+06;	0.86;y;	44:40;	24.472;	0.8165;	85;y;	92;y;n;5.46e+05;6.43e+03;6.16e+05;6.67e+03
8 ;	2,3,7,8-TCDF;	4.26e+05;	1.78e+05;	2.48e+05;	0.72;y;	30:52;	0.348;	0.1595;	6;y;	6;y;y;4.09e+04;6.86e+03;5.78e+04;9.07e+03
9 ;	1,2,3,7,8-PeCDF;	1.20e+05;	7.70e+04;	4.35e+04;	1.77;y;	33:28;	0.119;	0.0994;	5;y;	3;y;n;3.44e+04;7.49e+03;1.86e+04;6.14e+03
10 ;	2,3,4,7,8-PeCDF;	1.66e+05;	9.87e+04;	6.76e+04;	1.46;y;	34:05;	0.173;	0.1076;	5;y;	4;y;n;3.55e+04;7.49e+03;2.26e+04;6.14e+03
11 ;	1,2,3,4,7,8-HxCDF;	5.17e+04;	3.27e+04;	1.90e+04;	1.72;n;	36:10;	0.069;	0.1573;	2;n;	2;n;n;1.25e+04;7.24e+03;1.13e+04;6.24e+03
12 ;	1,2,3,6,7,8-HxCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.1549;	*;n;	*;n;n; *;7.24e+03; *;6.24e+03
13 ;	2,3,4,6,7,8-HxCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.1571;	*;n;	*;n;n; *;7.24e+03; *;6.24e+03
14 ;	1,2,3,7,8,9-HxCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.2272;	*;n;	*;n;n; *;7.24e+03; *;6.24e+03
15 ;	1,2,3,4,6,7,8-HpCDF;	4.60e+05;	2.34e+05;	2.25e+05;	1.04;y;	39:03;	0.728;	0.1946;	14;y;	9;y;n;6.28e+04;4.59e+03;5.77e+04;6.75e+03
16 ;	1,2,3,4,7,8,9-HpCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.3047;	*;n;	*;n;n; *;4.59e+03; *;6.75e+03
17 ;	OCDF;	3.64e+05;	1.88e+05;	1.76e+05;	1.07;n;	44:58;	1.198;	0.7168;	6;y;	6;y;n;4.46e+04;6.90e+03;3.87e+04;6.77e+03
Extraction Standards										
18 ;	13C-2,3,7,8-TCDD;	7.79e+07;	3.44e+07;	4.35e+07;	0.79;y;	31:28;	83.064;	0.1597;	1639;y;	2000;y;n;1.08e+07;6.60e+03;1.36e+07;6.81e+03
19 ;	13C-1,2,3,7,8-PeCDD;	5.61e+07;	3.44e+07;	2.16e+07;	1.59;y;	34:15;	81.796;	0.2408;	1706;y;	1158;y;n;1.30e+07;7.63e+03;8.28e+06;7.15e+03
20 ;	13C-1,2,3,4,7,8-HxCDD;	4.81e+07;	2.69e+07;	2.12e+07;	1.26;y;	36:53;	84.529;	0.2341;	1437;y;	909;y;n;8.50e+06;5.92e+03;6.61e+06;7.27e+03
21 ;	13C-1,2,3,6,7,8-HxCDD;	5.20e+07;	2.90e+07;	2.30e+07;	1.26;y;	36:58;	84.130;	0.2155;	1567;y;	1018;y;n;9.27e+06;5.92e+03;7.40e+06;7.27e+03
22 ;	13C-1,2,3,4,6,7,8-HpCDD;	3.65e+07;	1.88e+07;	1.77e+07;	1.06;y;	40:19;	78.251;	0.2580;	821;y;	705;y;n;4.65e+06;5.66e+03;4.41e+06;6.25e+03
23 ;	13C-OCDD;	4.81e+07;	2.27e+07;	2.54e+07;	0.89;y;	44:39;	129.455;	0.3573;	604;y;	788;y;n;4.25e+06;7.04e+03;4.80e+06;6.09e+03
24 ;	13C-2,3,7,8-TCDF;	1.18e+08;	5.23e+07;	6.58e+07;	0.79;y;	30:52;	84.944;	0.1068;	1756;y;	2689;y;n;1.29e+07;7.33e+03;1.60e+07;5.95e+03
25 ;	13C-1,2,3,7,8-PeCDF;	1.03e+08;	6.26e+07;	4.00e+07;	1.57;y;	33:28;	91.337;	0.3834;	1164;y;	975;y;n;2.56e+07;2.20e+04;1.61e+07;1.66e+04
26 ;	13C-2,3,4,7,8-PeCDF;	9.26e+07;	5.69e+07;	3.57e+07;	1.59;y;	34:04;	84.191;	0.3916;	1027;y;	850;y;n;2.26e+07;2.20e+04;1.41e+07;1.66e+04
27 ;	13C-1,2,3,4,7,8-HxCDF;	6.46e+07;	2.22e+07;	4.24e+07;	0.52;y;	36:09;	87.927;	0.1746;	1145;y;	2431;y;n;7.63e+06;6.66e+03;1.47e+07;6.04e+03
28 ;	13C-1,2,3,6,7,8-HxCDF;	7.14e+07;	2.48e+07;	4.67e+07;	0.53;y;	36:15;	88.065;	0.1581;	1192;y;	2523;y;n;7.94e+06;6.66e+03;1.52e+07;6.04e+03
29 ;	13C-2,3,4,6,7,8-HxCDF;	6.66e+07;	2.30e+07;	4.36e+07;	0.53;y;	36:45;	87.324;	0.1682;	1187;y;	2451;y;n;7.90e+06;6.66e+03;1.48e+07;6.04e+03
30 ;	13C-1,2,3,7,8,9-HxCDF;	5.74e+07;	1.99e+07;	3.76e+07;	0.53;y;	37:32;	84.501;	0.1888;	834;y;	1766;y;n;5.55e+06;6.66e+03;1.07e+07;6.04e+03
31 ;	13C-1,2,3,4,6,7,8-HpCDF;	4.59e+07;	1.42e+07;	3.17e+07;	0.45;y;	39:03;	78.831;	0.2106;	718;y;	1320;y;n;3.94e+06;5.48e+03;8.78e+06;6.65e+03
32 ;	13C-1,2,3,4,7,8,9-HpCDF;	3.51e+07;	1.09e+07;	2.42e+07;	0.45;y;	41:01;	76.605;	0.2673;	461;y;	857;y;n;2.53e+06;5.48e+03;5.70e+06;6.65e+03
Injection Standards										
33 ;	13C-1,2,3,4-TCDD;	8.41e+07;	3.70e+07;	4.71e+07;	0.79;y;	31:01;	61.887;	-;	1507;y;	1856;y;n;9.94e+06;6.60e+03;1.26e+07;6.81e+03
34 ;	13C-1,2,3,7,8,9-HxCDD;	5.92e+07;	3.30e+07;	2.62e+07;	1.26;y;	37:13;	54.863;	-;	1657;y;	1070;y;n;9.80e+06;5.92e+03;7.78e+06;7.27e+03
Cleanup Standard										
35 ;	37Cl-2,3,7,8-TCDD;	1.84e+07;	1.84e+07;	-;	-;-;	31:29;	18.414;	0.0697;	938;y;	-;-;n;5.85e+06;6.24e+03; -; -

Totals Raw Data

	Conc	Empc	Flags
TCDF	1.84	1.84	FALSE
TCDD	2.038	2.038	FALSE
PeCDF	0	0	FALSE
PeCDD	0	0	FALSE
HxCDF	0	0	FALSE
HxCDD	0	0	FALSE
HpCDF	0	0	FALSE
HpCDD	11.93	11.93	FALSE

Filename: a27jan09a_5
Sample: 9
Acquired: 29-JAN-09 15:10:24
Processed: 30-JAN-09 07:43:21
Sample ID: G1040-1-3B
Cal Table: m1613-100708a
Results Table: m1613-012709a_5

Name of Homolog Group: Total Tetra-Furans
Number of Peaks Found: 7 3
RRF Used For Totals: 1.0368
Detection Limit: 0.1595
Noise Height Ion1/Ion2: 6864 / 9068
Begin Window: 26:14:00
End Window: 33:07:00

RL=0.500 (pg/µL)

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	8.96E+05	390000	506000		0.77 y	27:55	0.732	OK	9.4	y	8.7	y	y
	2	6.63E+05	290000	373000		0.78 y	28:14	0.541	OK	5.8	y	5.8	y	y
	3	6.95E+05	288000	407000		0.71 y	29:33	0.567	OK	6.7	y	7.4	y	y
	4	4.74E+05	202000	271000		0.75 y	30:00	0.387	RL	6.5	y	5.6	y	y
2,3,7,8-TCDF	5	4.26E+05	178000	248000		0.72 y	30:52	0.348	RL	6	y	6.4	y	y
	6	5.25E+05	238000	287000		0.83 y	31:08	0.429	RL	10	y	8.3	y	y
	7	3.24E+05	199000	125000		1.6 n	32:05	0.264	RL	12.7	y	5.4	y	y

Filename: a27jan09a_5
Sample: 9
Acquired: 29-JAN-09 15:10:24
Processed: 30-JAN-09 07:43:21
Sample ID: G1040-1-3B
Cal Table: m1613-100708a
Results Table: m1613-012709a_5

Name of Homolog Group: Total Tetra-Dioxins
Number of Peaks Found: 6 2
RRF Used For Totals: 1.0087
Detection Limit: 0.1262
Noise Height Ion1/Ion2: 4937 / 5433
Begin Window: 27:41:00
End Window: 32:38:00

RL=0.500 (pg/µL)

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	9.09E+05	398000	511000		0.78 y	28:19	1.156	OK	14.9	y	18.7	y	n
	2	6.93E+05	309000	384000		0.81 y	28:37	0.882	OK	12.9	y	14.7	y	n
	3	1.14E+05	53100	60400		0.88 y	30:09	0.144	RL	3	y	3.3	y	n
	4	2.53E+05	105000	148000		0.71 y	31:02	0.322	RL	6.5	y	8.6	y	n
	5	2.19E+05	93800	125000		0.75 y	31:18	0.279	RL	6.2	y	5.5	y	n
	6	4.69E+04	14300	32600		0.44 n	31:40	0.06	S2N	1.3	n	1.7	n	n

Totals Raw Data

Filename: a27jan09a_5
Sample: 9
Acquired: 29-JAN-09 15:10:24
Processed: 30-JAN-09 07:43:21
Sample ID: G1040-1-3B
Cal Table: m1613-100708a
Results Table: m1613-012709a_5

Name of Homolog Group: Total Penta-Furans Fn1
Number of Peaks Found: 1 0
RRF Used For Totals: 1.0121
Detection Limit: 0.0914
Noise Height Ion1/Ion2: 6608 / 5464
Begin Window: 31:46:00
End Window: 32:06:00

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	4.24E+05	179000	245000		0.73 y	32:04	0.429	RL	11.4 y		19.8 y		n

Filename: a27jan09a_5
Sample: 9
Acquired: 29-JAN-09 15:10:24
Processed: 30-JAN-09 07:43:21
Sample ID: G1040-1-3B
Cal Table: m1613-100708a
Results Table: m1613-012709a_5

Name of Homolog Group: Total Penta-Furans Fn2
Number of Peaks Found: 7 0
RRF Used For Totals: 1.0121
Detection Limit: 0.1033
Noise Height Ion1/Ion2: 7492 / 6144
Begin Window: 31:43:00
End Window: 34:52:00

RL=2.500 (pg/µL)

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	2.33E+05	138000	94700		1.46 y	32:49	0.236	RL	7 y		5.4 y	y	
	2	5.21E+05	308000	213000		1.44 y	32:54	0.528	RL	11.6 y		9.7 y	y	
	3	1.42E+05	88400	53300		1.66 y	33:14	0.143	RL	3.7 y		3.6 y	n	
1,2,3,7,8-PeCDF	4	1.20E+05	77000	43500		1.77 y	33:28	0.119	RL	4.6 y		3 y	n	
	5	1.29E+05	77200	51900		1.49 y	33:37	0.131	RL	3.5 y		3.1 y	n	
	6	7.96E+04	55300	24300		2.28 n	34:01	0.081	S2N	3.3 y		1.6 n	n	
2,3,4,7,8-PeCDF	7	1.66E+05	98700	67600		1.46 y	34:05	0.173	RL	4.7 y		3.7 y	n	

Filename: a27jan09a_5
Sample: 9
Acquired: 29-JAN-09 15:10:24
Processed: 30-JAN-09 07:43:21
Sample ID: G1040-1-3B
Cal Table: m1613-100708a
Results Table: m1613-012709a_5

Name of Homolog Group: Total Penta-Dioxins
Number of Peaks Found: 6 0
RRF Used For Totals: 1.0517
Detection Limit: 0.2055
Noise Height Ion1/Ion2: 7624 / 7736
Begin Window: 32:51:00
End Window: 34:36:00

RL=2.500 (pg/µL)

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	4.05E+05	250000	154000		1.62 y	32:55	0.686	RL	10.4 y		6.6 y	n	
	2	3.81E+05	235000	147000		1.6 y	33:29	0.647	RL	12.2 y		8.2 y	n	
	3	9.23E+04	51700	40600		1.27 n	33:35	0.156	S2N	2.7 n		2 n	n	
	4	2.96E+05	177000	119000		1.49 y	33:38	0.502	RL	9.3 y		5.7 y	n	
	5	1.99E+05	120000	79500		1.5 y	33:59	0.337	RL	7.4 y		4.7 y	n	
1,2,3,7,8-PeCDD	6	6.27E+04	37100	25600		1.45 y	34:17	0.106	S2N	1.7 n		1.7 n	n	

Totals Raw Data

Filename:	a27jan09a_5	Name of Homolog Group:	Total Hexa-Furans
Sample:	9	Number of Peaks Found:	3 0
Acquired:	29-JAN-09 15:10:24	RRF Used For Totals:	1.1305
Processed:	30-JAN-09 07:43:21	Detection Limit:	0.1717
Sample ID:	G1040-1-3B	Noise Height Ion1/Ion2:	7244 / 6244
Cal Table:	m1613-100708a	Begin Window:	35:05:00
Results Table:	m1613-012709a_5	End Window:	37:39:00

RL=2.500 (pg/µL)

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	3.69E+05	217000	152000	1.43	n	35:21	0.502	RL	10.1	y	8.9	y	n
	2	2.05E+05	114000	91000	1.25	y	35:47	0.279	RL	6	y	5.7	y	n
1,2,3,4,7,8-HxCDF	3	5.17E+04	32700	19000	1.72	n	36:10	0.069	S2N	1.7	n	1.8	n	n

Page 7 of 9

Filename:	a27jan09a_5	Name of Homolog Group:	Total Hexa-Dioxins
Sample:	9	Number of Peaks Found:	5 0
Acquired:	29-JAN-09 15:10:24	RRF Used For Totals:	1.0077
Processed:	30-JAN-09 07:43:21	Detection Limit:	0.2767
Sample ID:	G1040-1-3B	Noise Height Ion1/Ion2:	7512 / 7252
Cal Table:	m1613-100708a	Begin Window:	35:36:00
Results Table:	m1613-012709a_5	End Window:	37:17:00

RL=2.500 (pg/µL)

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	5.14E+05	300000	214000	1.4	y	35:38	1.018	RL	14.3	y	10.9	y	n
	2	4.33E+05	237000	196000	1.21	y	36:06	0.859	RL	9.7	y	10	y	n
	3	8.85E+05	485000	400000	1.21	y	36:19	1.754	RL	16.9	y	14.3	y	n
	4	4.99E+04	27100	22800	1.19	y	36:25	0.099	S2N	1.8	n	1.7	n	n
1,2,3,6,7,8-HxCDD	5	1.79E+05	110000	68400	1.62	n	36:59	0.347	RL	4	y	3.2	y	n

Page 8 of 9

Filename:	a27jan09a_5	Name of Homolog Group:	Total Hepta-Furans
Sample:	9	Number of Peaks Found:	3 0
Acquired:	29-JAN-09 15:10:24	RRF Used For Totals:	1.3693
Processed:	30-JAN-09 07:43:21	Detection Limit:	0.2421
Sample ID:	G1040-1-3B	Noise Height Ion1/Ion2:	4592 / 6752
Cal Table:	m1613-100708a	Begin Window:	38:52:00
Results Table:	m1613-012709a_5	End Window:	41:04:00

RL=2.500 (pg/µL)

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
1,2,3,4,6,7,8-HpCDI	1	4.60E+05	234000	225000	1.04	y	39:03	0.728	RL	13.7	y	8.5	y	n
	2	1.51E+04	6770	8340	0.81	n	39:09	0.027	S2N	1.2	n	0.9	n	n
	3	4.83E+05	244000	240000	1.02	y	39:36	0.871	RL	17.2	y	10.1	y	n

Page 9 of 9

Filename:	a27jan09a_5	Name of Homolog Group:	Total Hepta-Dioxins
Sample:	9	Number of Peaks Found:	2 2

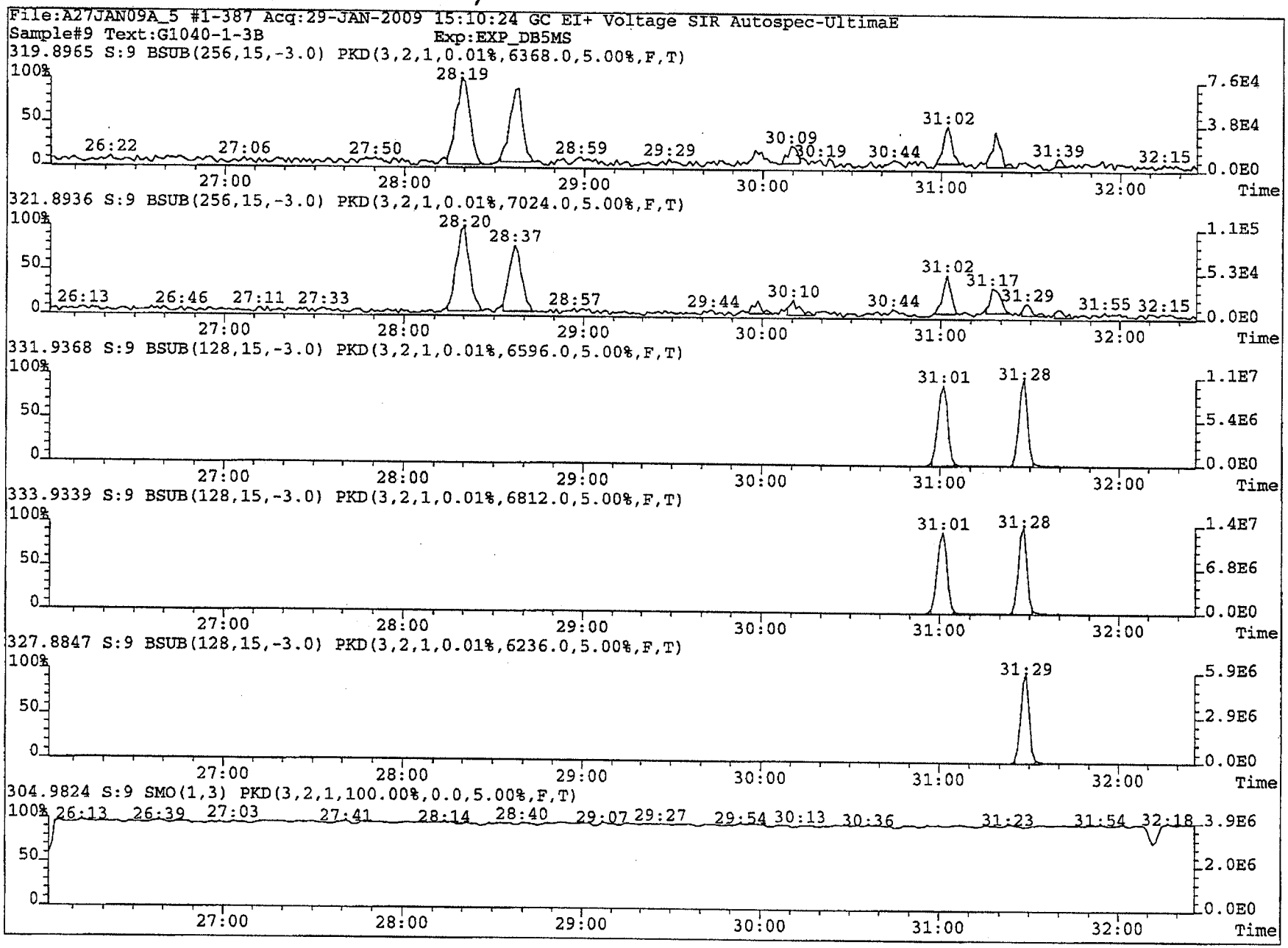
Totals Raw Data

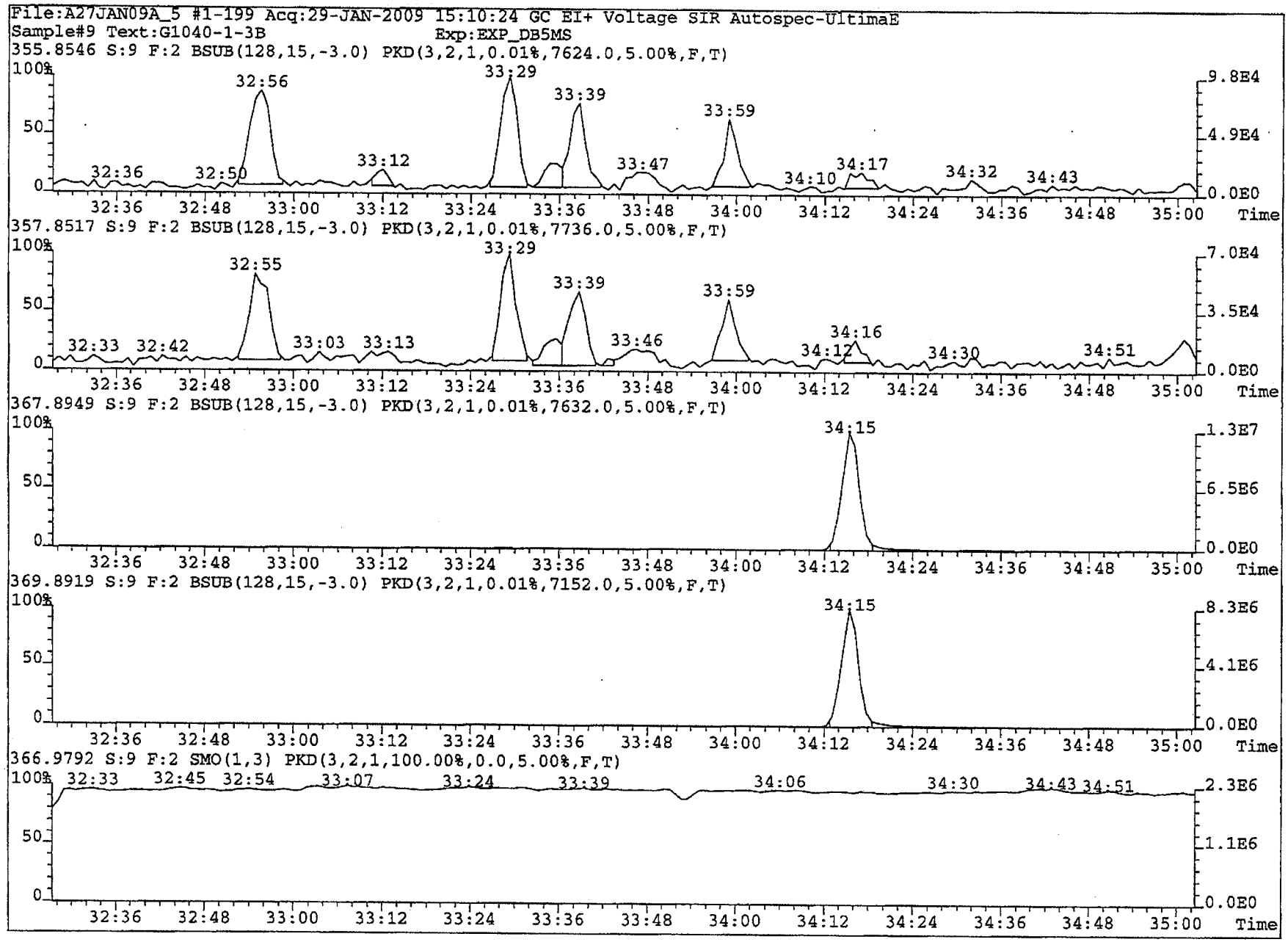
Acquired:	29-JAN-09 15:10:24	RRF Used For Totals:	1.0612
Processed:	30-JAN-09 07:43:21	Detection Limit:	0.4033
Sample ID:	G1040-1-3B	Noise Height Ion1/Ion2:	6360 / 6560
Cal Table:	m1613-100708a	Begin Window:	
Results Table:	m1613-012709a_5	End Window:	

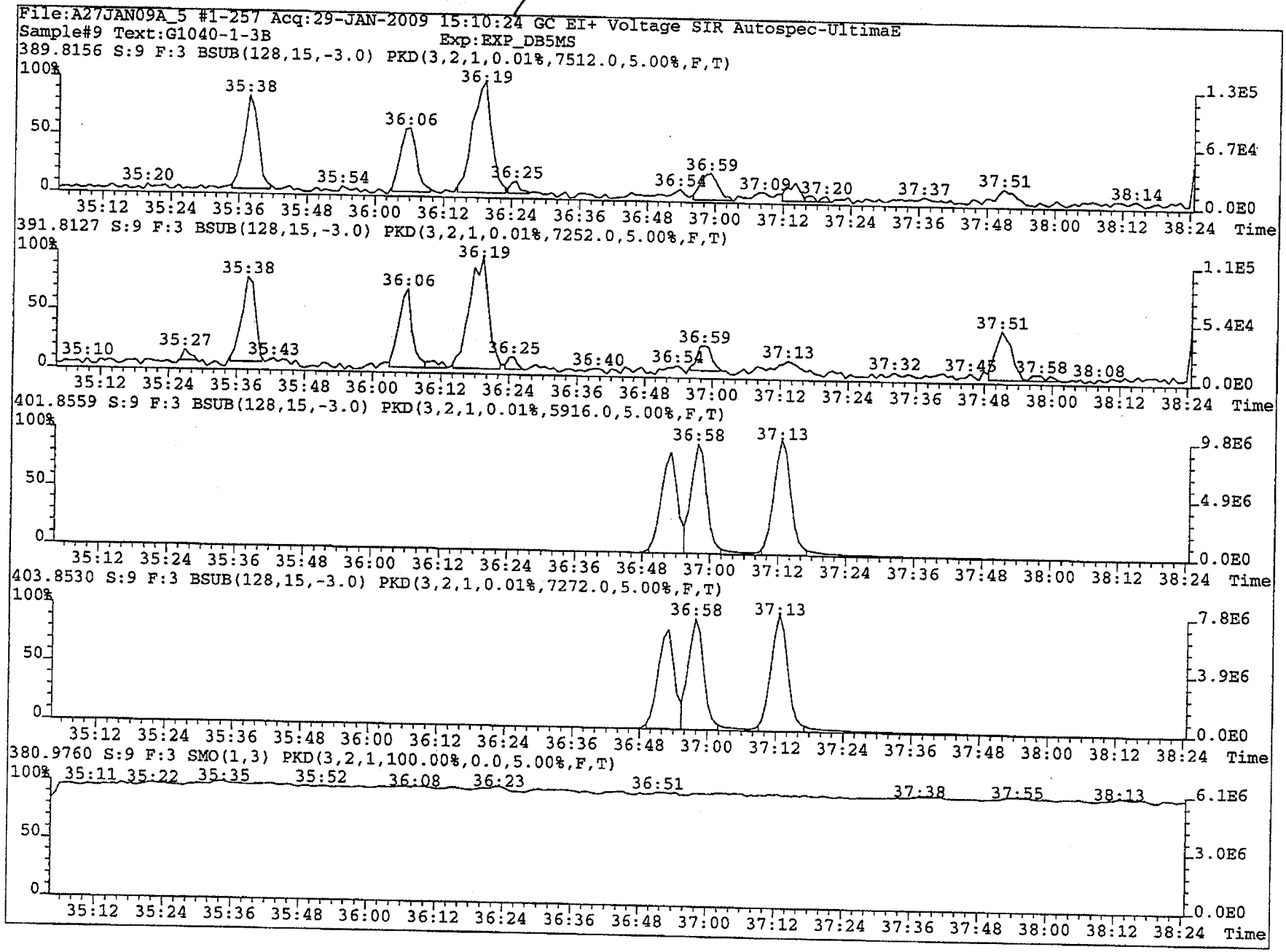
RL=2.500 (pg/µL)

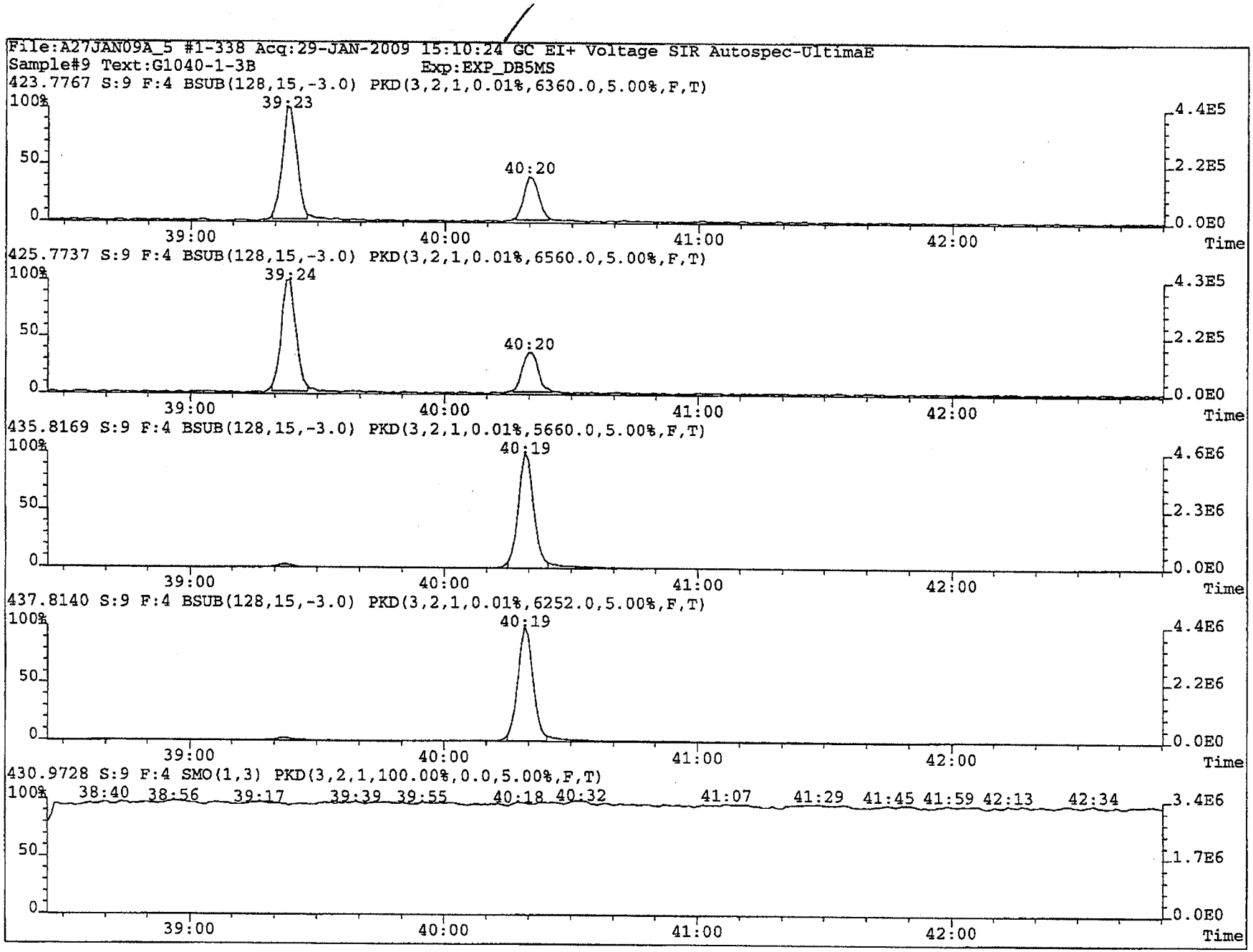
39:17:00
40:29:00

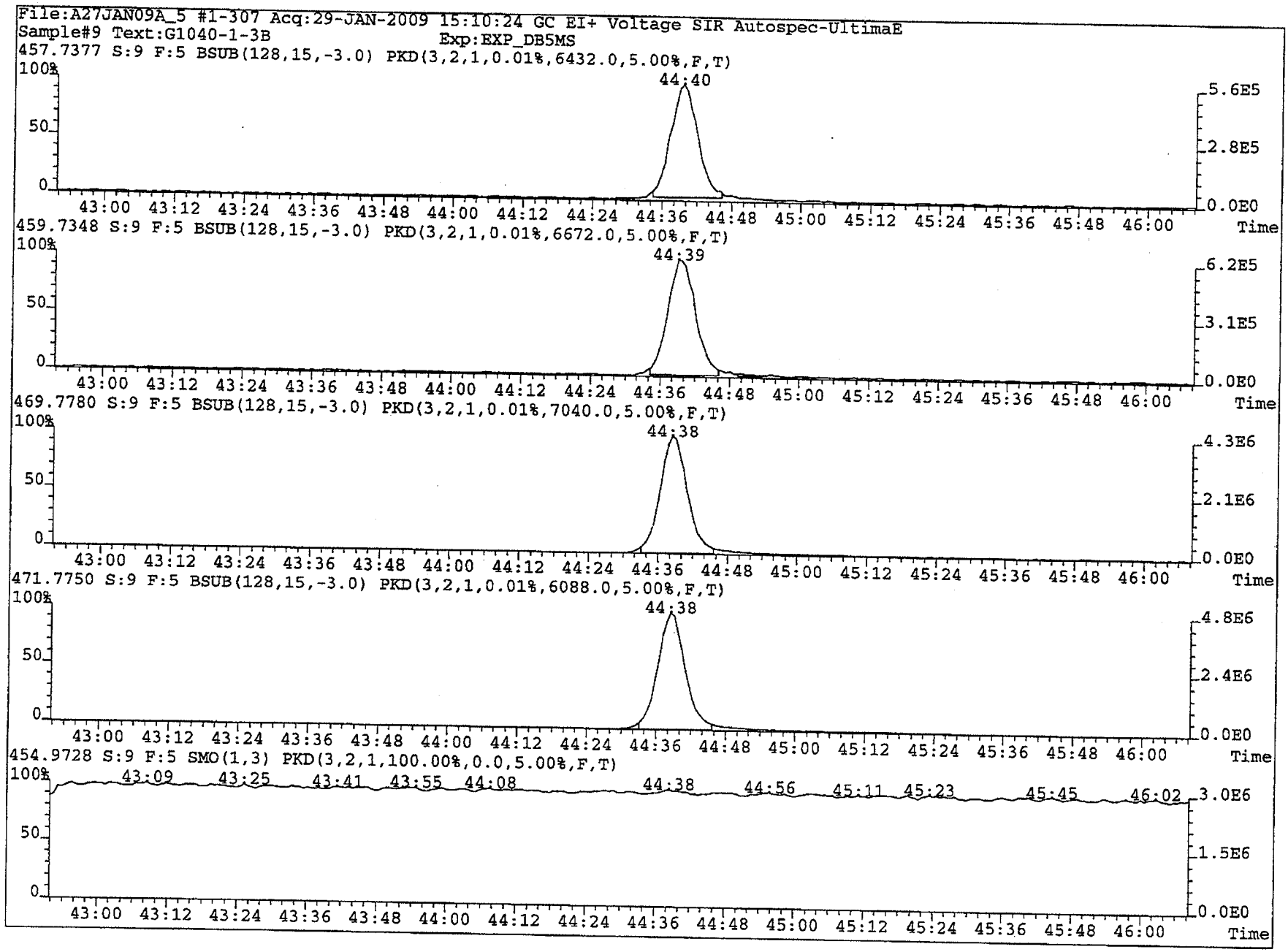
Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	3.34E+06	1690000	1650000		1.02 y	39:23	8.618	OK	68.6	y	64.7	y	n
1,2,3,4,6,7,8-HpCDI	2	1.28E+06	644000	640000		1.01 y	40:20	3.312	OK	26.3	y	22.9	y	n

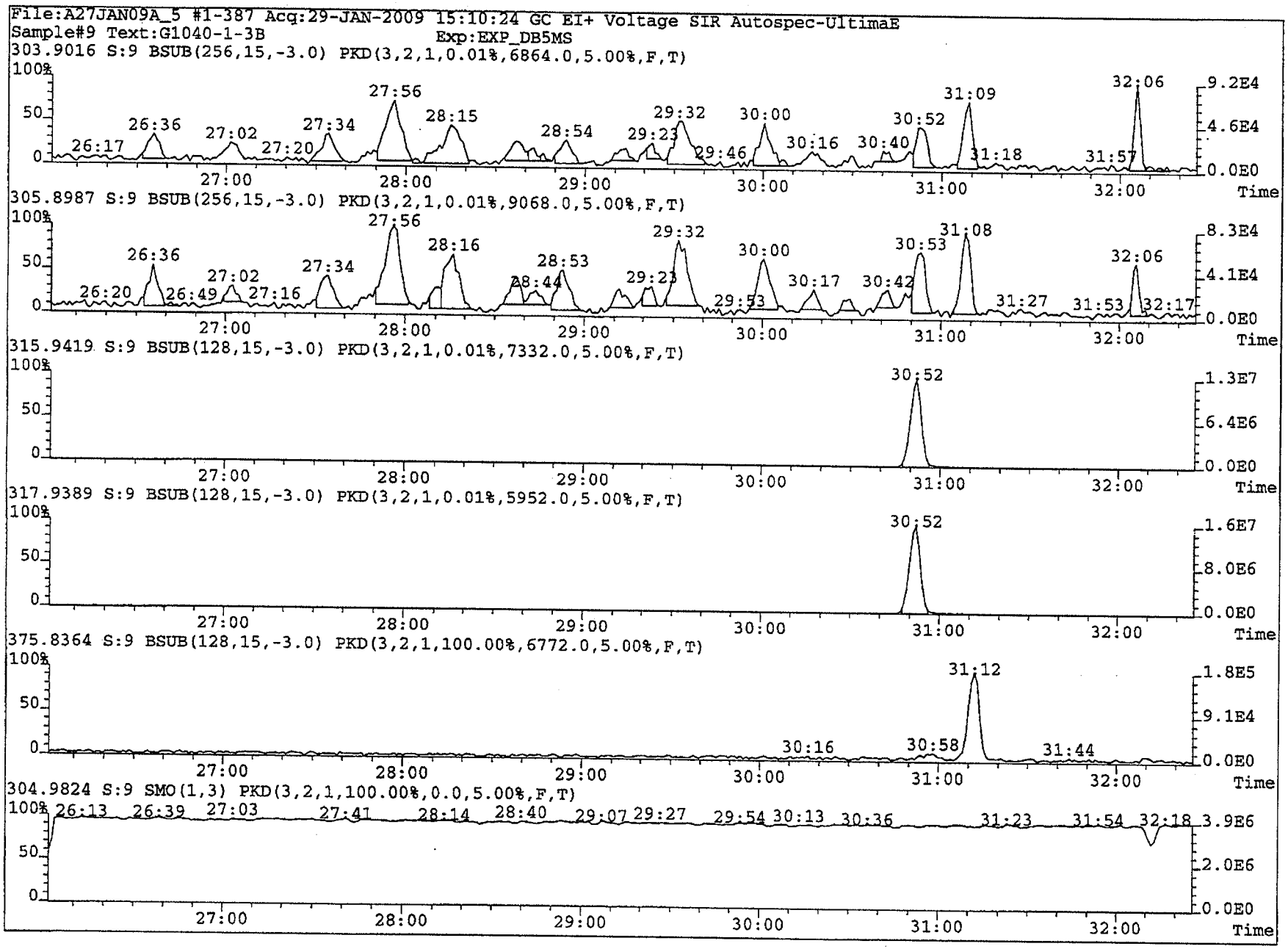

File:A27JAN09A_5 #1-387 Acq:29-JAN-2009 15:10:24 GC EI+ Voltage SIR Autospec-UltimaE
Sample#9 Text:G1040-1-3B
Exp:EXP_DB5MS
319.8965 S:9 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,6368.0,5.00%,F,T)
321.8936 S:9 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,7024.0,5.00%,F,T)
331.9368 S:9 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6596.0,5.00%,F,T)
333.9339 S:9 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6812.0,5.00%,F,T)
327.8847 S:9 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6236.0,5.00%,F,T)
304.9824 S:9 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time

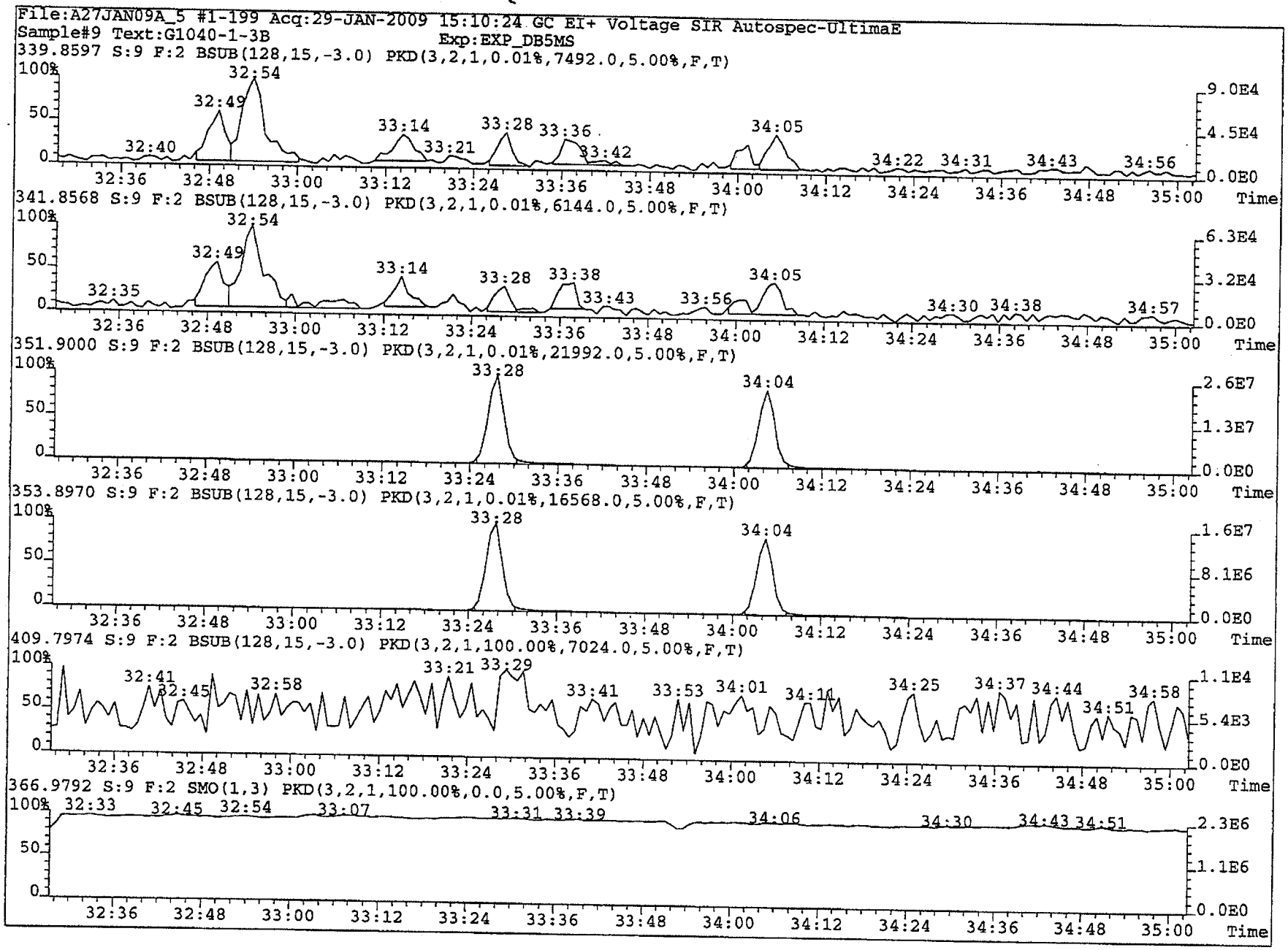

File:A27JAN09A_5 #1-199 Acq:29-JAN-2009 15:10:24 GC EI+ Voltage SIR Autospec-UltimaE
Sample#9 Text:G1040-1-3B Exp:EXP_DB5MS
355.8546 S:9 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7624.0,5.00%,F,T)
32:56 33:29 33:39 33:59 32:36 32:50 33:12 33:47 34:10 34:17 34:32 34:43
9.8E4 4.9E4 0.0E0
357.8517 S:9 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7736.0,5.00%,F,T)
32:55 33:29 33:39 33:59 32:33 32:42 33:03 33:13 33:46 34:12 34:16 34:30 34:51
7.0E4 3.5E4 0.0E0
367.8949 S:9 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7632.0,5.00%,F,T)
34:15
1.3E7 6.5E6 0.0E0
369.8919 S:9 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7152.0,5.00%,F,T)
34:15
8.3E6 4.1E6 0.0E0
366.9792 S:9 F:2 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
32:33 32:45 32:54 33:07 33:24 33:39 34:06 34:30 34:43 34:51
2.3E6 1.1E6 0.0E0
100% 50 0
32:36 32:48 33:00 33:12 33:24 33:36 33:48 34:00 34:12 34:24 34:36 34:48 35:00 Time

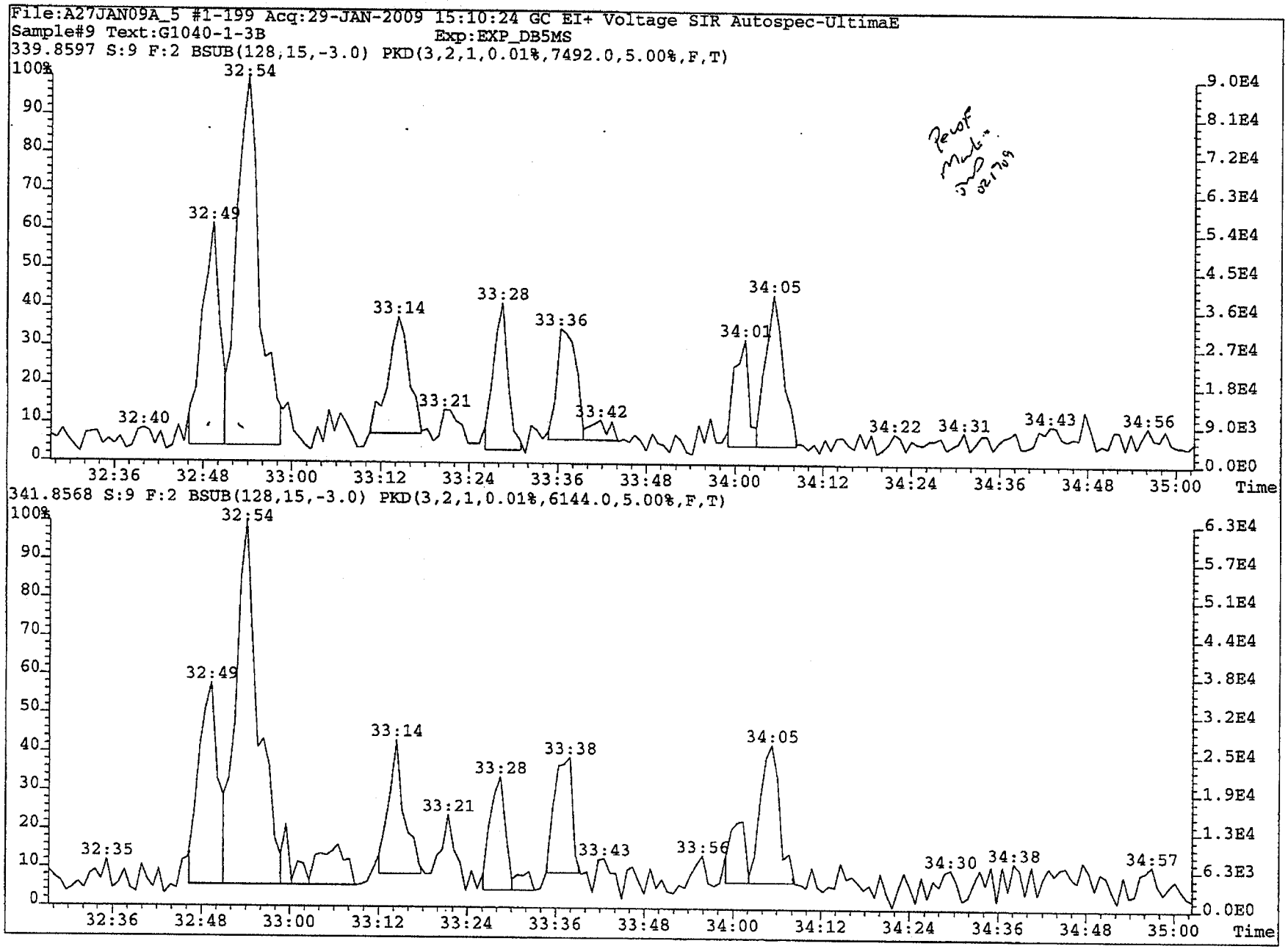

File:A27JAN09A_5 #1-257 Acq:29-JAN-2009 15:10:24 GC EI+ Voltage SIR Autospec-UltimaE
Sample#9 Text:G1040-1-3B
Exp:EXP_DB5MS
389.8156 S:9 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7512.0,5.00%,F,T)
391.8127 S:9 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7252.0,5.00%,F,T)
401.8559 S:9 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5916.0,5.00%,F,T)
403.8530 S:9 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7272.0,5.00%,F,T)
380.9760 S:9 F:3 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time

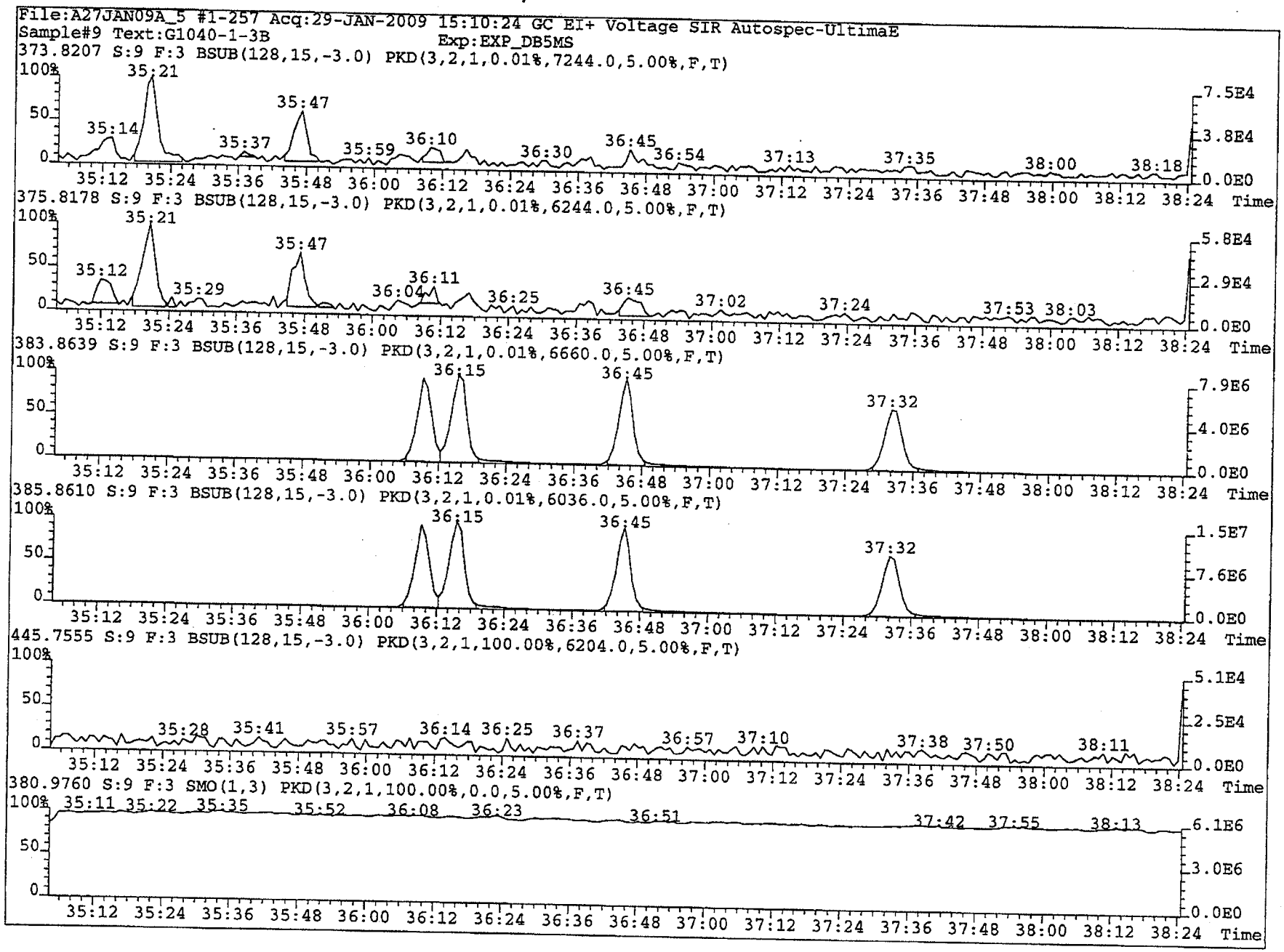

File:A27JAN09A_5 #1-338 Acq:29-JAN-2009 15:10:24 GC EI+ Voltage SIR Autospec-UltimaE
Sample#9 Text:G1040-1-3B Exp:EXP_DB5MS
423.7767 S:9 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6360.0,5.00%,F,T)
39:23
40:20
4.4E5
2.2E5
0.0E0
425.7737 S:9 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6560.0,5.00%,F,T)
39:24
40:20
4.3E5
2.2E5
0.0E0
435.8169 S:9 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5660.0,5.00%,F,T)
40:19
4.6E6
2.3E6
0.0E0
437.8140 S:9 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6252.0,5.00%,F,T)
40:19
4.4E6
2.2E6
0.0E0
430.9728 S:9 F:4 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
38:40 38:56 39:17 39:39 39:55 40:18 40:32 41:07 41:29 41:45 41:59 42:13 42:34
3.4E6
1.7E6
0.0E0
100%
50
0
39:00
40:00
41:00
42:00
Time

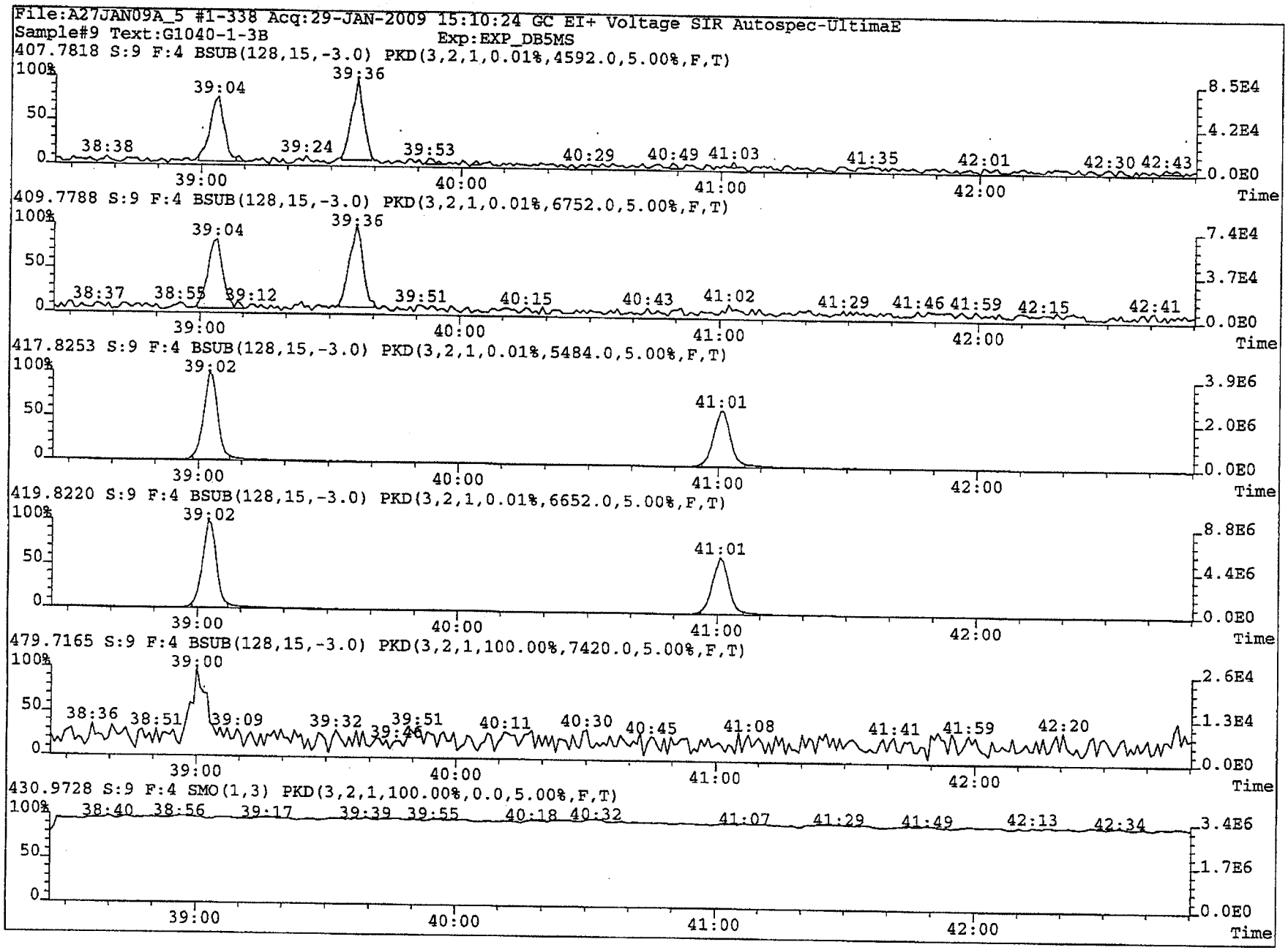

File:A27JAN09A_5 #1-307 Acq:29-JAN-2009 15:10:24 GC EI+ Voltage SIR Autospec-UltimaE
Sample#9 Text:G1040-1-3B Exp:EXP_DB5MS
457.7377 S:9 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6432.0,5.00%,F,T)
44:40
5.6E5
2.8E5
0.0E0
459.7348 S:9 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6672.0,5.00%,F,T)
44:39
6.2E5
3.1E5
0.0E0
469.7780 S:9 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7040.0,5.00%,F,T)
44:38
4.3E6
2.1E6
0.0E0
471.7750 S:9 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6088.0,5.00%,F,T)
44:38
4.8E6
2.4E6
0.0E0
454.9728 S:9 F:5 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
43:09 43:25 43:41 43:55 44:08 44:38 44:56 45:11 45:23 45:45 46:02
3.0E6
1.5E6
0.0E0
100%
50
0
43:00 43:12 43:24 43:36 43:48 44:00 44:12 44:24 44:36 44:48 45:00 45:12 45:24 45:36 45:48 46:00
Time

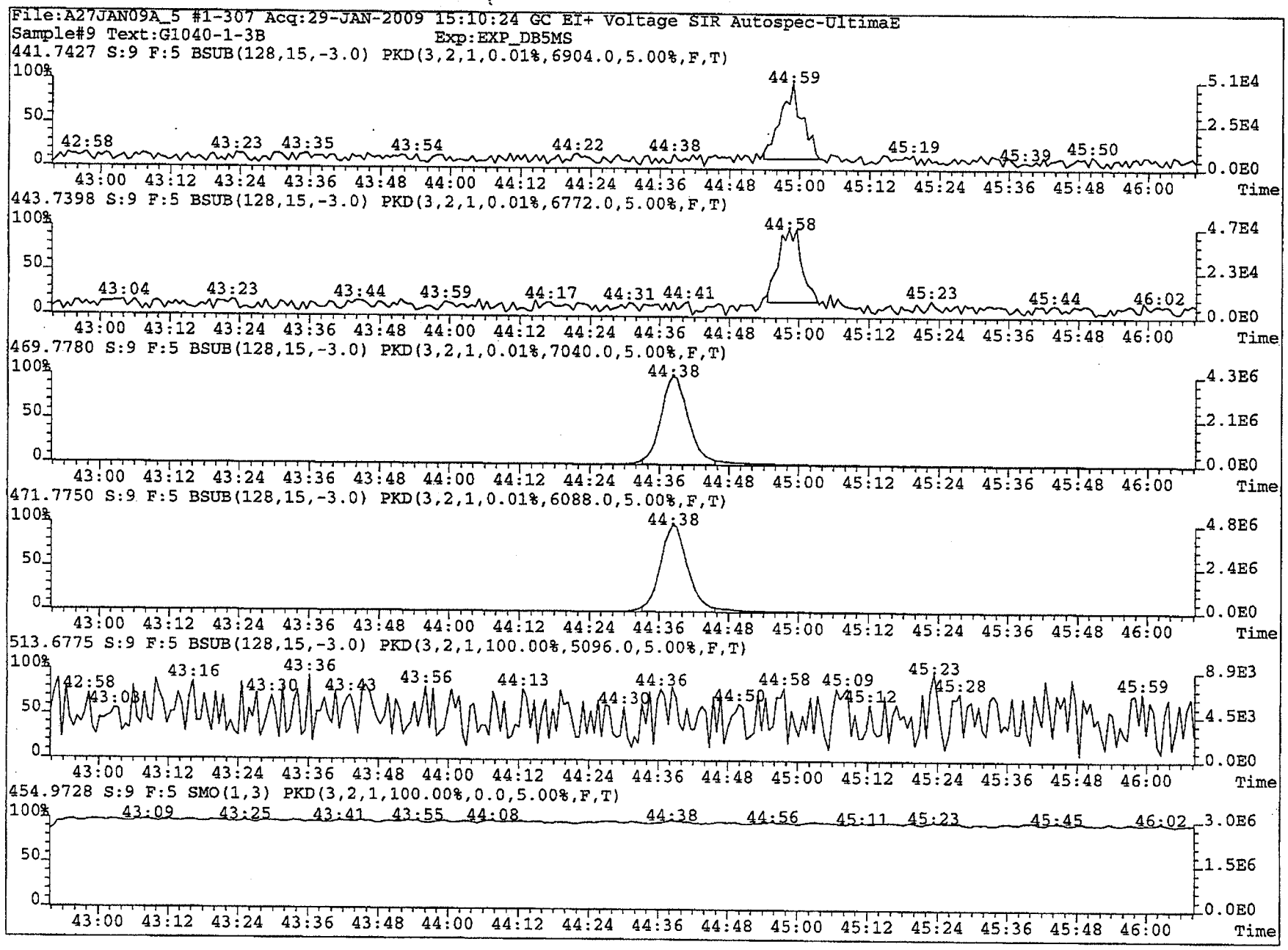

File:A27JAN09A_5 #1-387 Acq:29-JAN-2009 15:10:24 GC EI+ Voltage SIR Autospec-UltimaE
Sample#9 Text:G1040-1-3B Exp:EXP_DB5MS
303.9016 S:9 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,6864.0,5.00%,F,T)
305.8987 S:9 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,9068.0,5.00%,F,T)
315.9419 S:9 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7332.0,5.00%,F,T)
317.9389 S:9 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5952.0,5.00%,F,T)
375.8364 S:9 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,6772.0,5.00%,F,T)
304.9824 S:9 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time

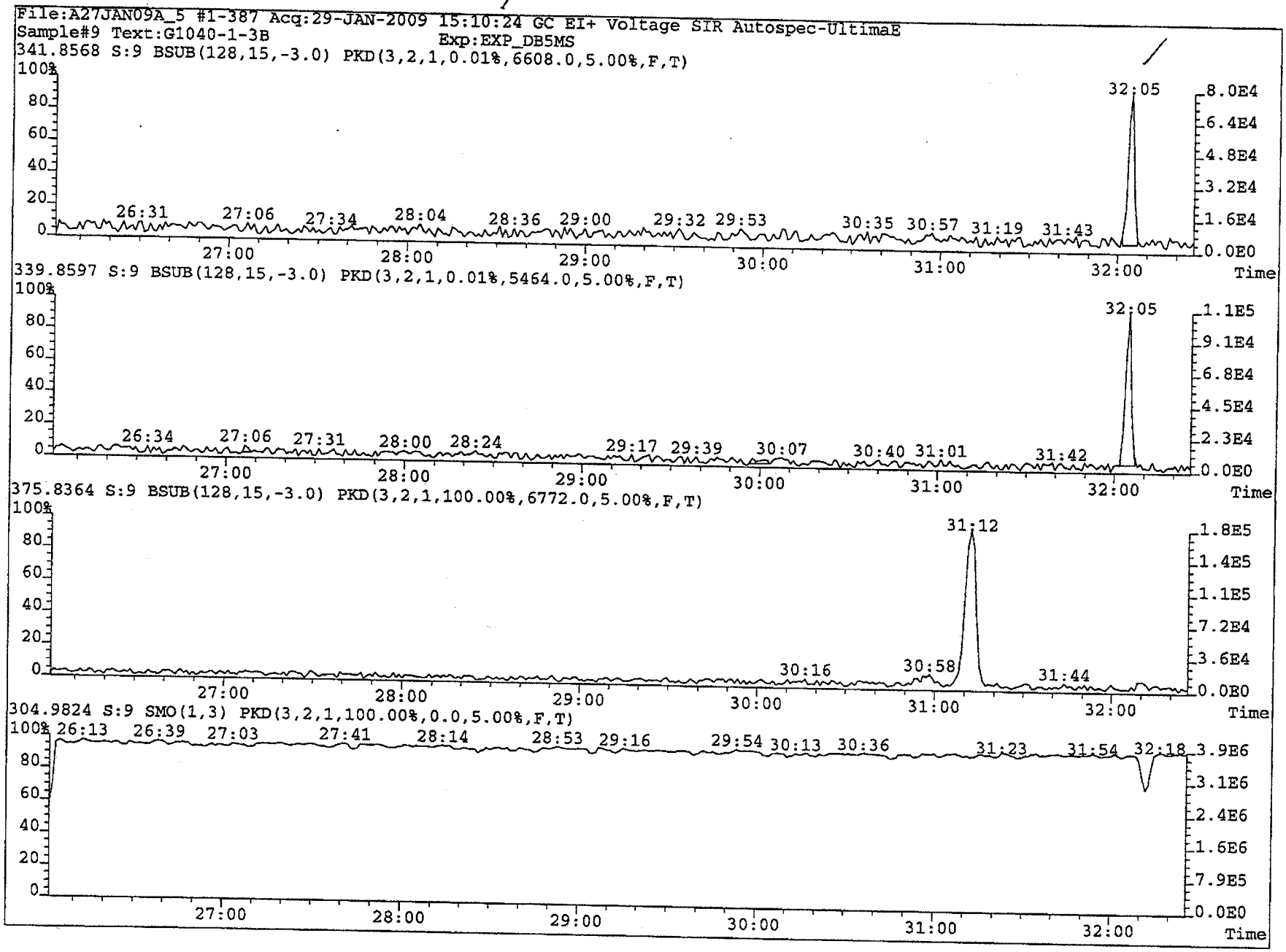

File:A27JAN09A_5 #1-199 Acq:29-JAN-2009 15:10:24 GC EI+ Voltage SIR Autospec-UltimaE
Sample#9 Text:G1040-1-3B Exp:EXP_DB5MS
339.8597 S:9 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7492.0,5.00%,F,T)
341.8568 S:9 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6144.0,5.00%,F,T)
351.9000 S:9 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,21992.0,5.00%,F,T)
353.8970 S:9 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,16568.0,5.00%,F,T)
409.7974 S:9 F:2 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,7024.0,5.00%,F,T)
366.9792 S:9 F:2 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time


File:A27JAN09A_5 #1-199 Acq:29-JAN-2009 15:10:24 GC EI+ Voltage SIR Autospec-UltimaE
Sample#9 Text:G1040-1-3B Exp:EXP_DB5MS
339.8597 S:9 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7492.0,5.00%,F,T)
32:54
32:49
33:14
33:28
33:36
34:05
34:01
32:40
33:21
33:42
34:22
34:31
34:43
34:56
Time
341.8568 S:9 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6144.0,5.00%,F,T)
32:54
32:49
33:14
33:38
33:28
34:05
33:21
32:35
33:43
33:56
34:30
34:38
34:57
Time


File:A27JAN09A_5 #1-257 Acq:29-JAN-2009 15:10:24 GC EI+ Voltage SIR Autospec-UltimaE
Sample#9 Text:G1040-1-3B
Exp:EXP_DB5MS
373.8207 S:9 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7244.0,5.00%,F,T)
375.8178 S:9 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6244.0,5.00%,F,T)
383.8639 S:9 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6660.0,5.00%,F,T)
385.8610 S:9 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6036.0,5.00%,F,T)
445.7555 S:9 F:3 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,6204.0,5.00%,F,T)
380.9760 S:9 F:3 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time


File:A27JAN09A_5 #1-338 Acq:29-JAN-2009 15:10:24 GC EI+ Voltage SIR Autospec-UltimaE
Sample#9 Text:G1040-1-3B
Exp:EXP_DB5MS
407.7818 S:9 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,4592.0,5.00%,F,T)
409.7788 S:9 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6752.0,5.00%,F,T)
417.8253 S:9 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5484.0,5.00%,F,T)
419.8220 S:9 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6652.0,5.00%,F,T)
479.7165 S:9 F:4 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,7420.0,5.00%,F,T)
430.9728 S:9 F:4 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time


File:A27JAN09A_5 #1-307 Acq:29-JAN-2009 15:10:24 GC EI+ Voltage SIR Autospec-UltimaE
Sample#9 Text:G1040-1-3B Exp:EXP_DB5MS
441.7427 S:9 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6904.0,5.00%,F,T)
443.7398 S:9 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6772.0,5.00%,F,T)
469.7780 S:9 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7040.0,5.00%,F,T)
471.7750 S:9 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6088.0,5.00%,F,T)
513.6775 S:9 F:5 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,5096.0,5.00%,F,T)
454.9728 S:9 F:5 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time


File:A27JAN09A_5 #1-387 Acq:29-JAN-2009 15:10:24 GC EI+ Voltage SIR Autospec-UltimaE
Sample#9 Text:G1040-1-3B
Exp:EXP_DB5MS
341.8568 S:9 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6608.0,5.00%,F,T)
339.8597 S:9 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5464.0,5.00%,F,T)
375.8364 S:9 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,6772.0,5.00%,F,T)
304.9824 S:9 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time

Method 1613

PGSS-92

Analytical Resources, Inc.

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	RL (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	1.00			
1,2,3,7,8-PeCDD	ND	5.00			
1,2,3,4,7,8-HxCDD	ND	5.00			
1,2,3,6,7,8-HxCDD	ND	5.00			
1,2,3,7,8,9-HxCDD	ND	5.00			
1,2,3,4,6,7,8-HpCDD	89.8	5.00	40:20	1.03	
OCDD	922	10.0	44:40	0.89	
2,3,7,8-TCDF	ND	1.00			
1,2,3,7,8-PeCDF	ND	5.00			
2,3,4,7,8-PeCDF	ND	5.00			
1,2,3,4,7,8-HxCDF	ND	5.00			
1,2,3,6,7,8-HxCDF	ND	5.00			
2,3,4,6,7,8-HxCDF	ND	5.00			
1,2,3,7,8,9-HxCDF	ND	5.00			
1,2,3,4,6,7,8-HpCDF	7.91	5.00	39:03	0.98	
1,2,3,4,7,8,9-HpCDF	ND	5.00			
OCDF	26.0	10.0	44:58	0.87	
Total TCDDs	9.38	1.00			
Total PeCDDs	ND	5.00			Q
Total HxCDDs	46.4	5.00			
Total HpCDDs	563	5.00			
Total TCDFs	7.73	1.00			Q DPE
Total PeCDFs	ND	5.00			Q
Total HxCDFs	5.16	5.00			
Total HpCDFs	25.4	5.00			
WHO-2005 TEQ (ND=0)	1.26				
WHO-2005 TEQ (ND=½)	6.91				

Client Information

Project Name:	Port Gamble				
			Matrix:	Sediment	
Sample ID:	PGSS-92		Weight / Volume:	18.61	grams
			Solids / Lipids:	58.3	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG16440	
Project ID:	G1040-1				
Sample ID:	G1040-1-4B		Filename:	a27jan09a_5-10	
Collection Date/Time:	10-Dec-08	11:03	Retchk:	a27jan09a_4-15	
Receipt Date:	15-Jan-09	10:15	Begin ConCal:	a27jan09a_4-15	
Extraction Date:	19-Jan-09				
Analysis Date:	29-Jan-09	15:58	Initial Cal:	m1613-100708a	

Sample Information

Method 1613

PGSS-92

Analytical Resources, Inc.

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
$^{13}C_{12}$-2,3,7,8-TCDD	2	1.69	84.5	31:28	0.78	
$^{13}C_{12}$-1,2,3,7,8-PeCDD	2	1.68	83.9	34:15	1.58	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	2	1.63	81.6	36:53	1.26	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	2	1.60	79.9	36:58	1.26	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	2	1.49	74.6	40:19	1.06	
$^{13}C_{12}$-OCDD	4	2.52	63.0	44:39	0.90	
$^{13}C_{12}$-2,3,7,8-TCDF	2	1.68	83.8	30:52	0.79	
$^{13}C_{12}$-1,2,3,7,8-PeCDF	2	1.84	91.9	33:28	1.57	
$^{13}C_{12}$-2,3,4,7,8-PeCDF	2	1.70	84.9	34:04	1.57	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	2	1.67	83.3	36:09	0.52	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	2	1.65	82.3	36:15	0.53	
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	2	1.67	83.5	36:45	0.53	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	2	1.64	82.0	37:33	0.53	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	2	1.48	74.2	39:02	0.45	
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	2	1.46	72.9	41:01	0.46	
Cleanup Standard						
$^{37}Cl_4$-2,3,7,8-TCDD	0.4	0.366	91.5	31:29		
Injection Standards						
$^{13}C_{12}$-1,2,3,4-TCDD	2			31:01	0.79	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	2			37:13	1.26	

Client Information

Project Name:	Port Gamble	
Sample ID:	PGSS-92	

Laboratory Information

Project ID:	G1040-1	
Sample ID:	G1040-1-4B	
Collection Date/Time:	10-Dec-08	11:03
Receipt Date:	15-Jan-09	10:15
Extraction Date:	19-Jan-09	
Analysis Date:	29-Jan-09	15:58

Analyzed by: JWD

Date: 02/17/09

Sample Information

Matrix:	Sediment	
Weight / Volume:	18.61	grams
Solids / Lipids:	58.3	%
Original pH :	NA	
Batch ID:	WG16440	
Filename:	a27jan09a_5-10	
Retchk:	a27jan09a_4-15	
Begin ConCal:	a27jan09a_4-15	
Initial Cal:	m1613-100708a	

Reviewed by: MM

Date: 02/17/09

Form Version:[1613_HRMS12]Repor

$[HpCDD] = \frac{9.08e6 + 8.78e6}{1.78e7 + 1.68e7} \left(\frac{2000pg}{18.61g \times 0.5826}\right)\left(\frac{1}{1.0612}\right) =$

89.719% cm 02/17/09

Filename ; a27jan09a_5
Sample ; 10
Acquired ; 29-JAN-09 15:58:43
Processed ; 30-JAN-09 07:43:45
Sample ID ; G1040-1-4B
Cal Table ; m1613-100708a
Results Table ; m1613-012709a_5
Comments ;

;*1613*
;Inst: HRMS1

Ent;	Name;	Resp;	Ion 1;	Ion 2;	RA;?;	RT;	Conc;	EDL;	S/N1;?;	S/N2;?;M; Signal1; Noise 1; Signal2; Noise 2
1 ;	2,3,7,8-TCDD;	*;	*;	*;	*;n;	NotFnd;	*;	0.1810;	*;n;	*;n;n; *;6.68e+03; *;6.11e+03
2 ;	1,2,3,7,8-PeCDD;	1.74e+05;	1.01e+05;	7.30e+04;	1.38;y;	34:16;	0.301;	0.2222;	5;y;	3;y;n;3.44e+04;7.36e+03;2.85e+04;8.31e+03
3 ;	1,2,3,4,7,8-HxCDD;	1.66e+05;	1.00e+05;	6.57e+04;	1.52;n;	36:53;	0.348;	0.3870;	3;y;	2;n;n;3.22e+04;1.07e+04;2.18e+04;8.89e+03
4 ;	1,2,3,6,7,8-HxCDD;	6.47e+05;	3.76e+05;	2.71e+05;	1.39;y;	36:58;	1.330;	0.4084;	11;y;	9;y;n;1.13e+05;1.07e+04;8.25e+04;8.89e+03
5 ;	1,2,3,7,8,9-HxCDD;	2.54e+05;	1.40e+05;	1.14e+05;	1.23;y;	37:14;	0.531;	0.4006;	4;y;	4;y;n;4.46e+04;1.07e+04;3.56e+04;8.89e+03
6 ;	1,2,3,4,6,7,8-HpCDD;	1.79e+07;	9.08e+06;	8.78e+06;	1.03;y;	40:20;	48.659;	0.8527;	199;y;	155;y;n;2.18e+06;1.09e+04;2.11e+06;1.36e+04
7 ;	OCDD;	1.24e+08;	5.83e+07;	6.53e+07;	0.89;y;	44:40;	499.706;	0.7344;	1838;y;	2378;y;n;1.11e+07;6.02e+03;1.24e+07;5.23e+03
8 ;	2,3,7,8-TCDF;	5.29e+05;	2.30e+05;	3.00e+05;	0.77;y;	30:53;	0.460;	0.2214;	5;y;	7;y;y;5.43e+04;1.01e+04;6.56e+04;9.90e+03
9 ;	1,2,3,7,8-PeCDF;	2.18e+05;	1.26e+05;	9.19e+04;	1.37;y;	33:28;	0.224;	0.1108;	6;y;	5;y;n;5.37e+04;8.72e+03;3.98e+04;7.76e+03
10 ;	2,3,4,7,8-PeCDF;	2.48e+05;	1.75e+05;	7.36e+04;	2.37;n;	34:05;	0.269;	0.1323;	6;y;	4;y;n;5.64e+04;8.72e+03;2.77e+04;7.76e+03
11 ;	1,2,3,4,7,8-HxCDF;	1.47e+05;	9.48e+04;	5.19e+04;	1.83;n;	36:10;	0.209;	0.2463;	4;y;	2;n;n;3.37e+04;8.71e+03;2.03e+04;1.02e+04
12 ;	1,2,3,6,7,8-HxCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.2252;	*;n;	*;n;n; *;8.71e+03; *;1.02e+04
13 ;	2,3,4,6,7,8-HxCDF;	2.09e+05;	1.11e+05;	9.75e+04;	1.14;y;	36:46;	0.291;	0.2401;	5;y;	3;n;n;4.09e+04;8.71e+03;3.01e+04;1.02e+04
14 ;	1,2,3,7,8,9-HxCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.3217;	*;n;	*;n;n; *;8.71e+03; *;1.02e+04
15 ;	1,2,3,4,6,7,8-HpCDF;	2.53e+06;	1.25e+06;	1.28e+06;	0.98;y;	39:03;	4.290;	0.2918;	44;y;	46;y;n;3.54e+05;8.05e+03;3.60e+05;7.86e+03
16 ;	1,2,3,4,7,8,9-HpCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.4541;	*;n;	*;n;n; *;8.05e+03; *;7.86e+03
17 ;	OCDF;	4.14e+06;	1.92e+06;	2.22e+06;	0.87;y;	44:58;	14.086;	0.6663;	59;y;	63;y;n;3.44e+05;5.86e+03;3.98e+05;6.28e+03
Extraction Standards										
18 ;	13C-2,3,7,8-TCDD;	7.56e+07;	3.31e+07;	4.25e+07;	0.78;y;	31:28;	84.470;	0.1706;	1469;y;	1648;y;n;9.15e+06;6.23e+03;1.19e+07;7.21e+03
19 ;	13C-1,2,3,7,8-PeCDD;	5.49e+07;	3.36e+07;	2.13e+07;	1.58;y;	34:15;	83.891;	0.2195;	2110;y;	1147;y;n;1.23e+07;5.81e+03;7.84e+06;6.83e+03
20 ;	13C-1,2,3,4,7,8-HxCDD;	4.62e+07;	2.57e+07;	2.04e+07;	1.26;y;	36:53;	81.595;	0.2503;	1295;y;	900;y;n;8.31e+06;6.42e+03;6.46e+06;7.18e+03
21 ;	13C-1,2,3,6,7,8-HxCDD;	4.91e+07;	2.74e+07;	2.17e+07;	1.26;y;	36:58;	79.841;	0.2304;	1264;y;	894;y;n;8.11e+06;6.42e+03;6.42e+06;7.18e+03
22 ;	13C-1,2,3,4,6,7,8-HpCDD;	3.46e+07;	1.78e+07;	1.68e+07;	1.06;y;	40:19;	74.571;	0.3228;	672;y;	487;y;n;4.16e+06;6.19e+03;3.99e+06;8.18e+03
23 ;	13C-OCDD;	4.65e+07;	2.20e+07;	2.45e+07;	0.90;y;	44:39;	126.003;	0.3531;	726;y;	660;y;n;4.11e+06;5.66e+03;4.52e+06;6.85e+03
24 ;	13C-2,3,7,8-TCDF;	1.11e+08;	4.92e+07;	6.19e+07;	0.79;y;	30:52;	83.781;	0.1019;	1892;y;	2507;y;n;1.14e+07;6.04e+03;1.47e+07;5.86e+03
25 ;	13C-1,2,3,7,8-PeCDF;	9.84e+07;	6.02e+07;	3.83e+07;	1.57;y;	33:28;	91.839;	0.3031;	1572;y;	1589;y;n;2.76e+07;1.75e+04;1.76e+07;1.11e+04
26 ;	13C-2,3,4,7,8-PeCDF;	8.90e+07;	5.45e+07;	3.46e+07;	1.57;y;	34:04;	84.843;	0.3097;	1256;y;	1264;y;n;2.20e+07;1.75e+04;1.40e+07;1.11e+04
27 ;	13C-1,2,3,4,7,8-HxCDF;	6.08e+07;	2.08e+07;	4.01e+07;	0.52;y;	36:09;	83.300;	0.1758;	1243;y;	1913;y;n;6.90e+06;5.55e+03;1.30e+07;6.78e+03
28 ;	13C-1,2,3,6,7,8-HxCDF;	6.63e+07;	2.30e+07;	4.33e+07;	0.53;y;	36:15;	82.233;	0.1593;	1393;y;	2146;y;n;7.73e+06;5.55e+03;1.46e+07;6.78e+03
29 ;	13C-2,3,4,6,7,8-HxCDF;	6.33e+07;	2.19e+07;	4.15e+07;	0.53;y;	36:45;	83.519;	0.1694;	1298;y;	2016;y;n;7.20e+06;5.55e+03;1.37e+07;6.78e+03
30 ;	13C-1,2,3,7,8,9-HxCDF;	5.53e+07;	1.91e+07;	3.63e+07;	0.53;y;	37:33;	81.953;	0.1902;	992;y;	1555;y;n;5.51e+06;5.55e+03;1.05e+07;6.78e+03
31 ;	13C-1,2,3,4,6,7,8-HpCDF;	4.29e+07;	1.33e+07;	2.96e+07;	0.45;y;	39:02;	74.177;	0.2799;	479;y;	1044;y;n;3.71e+06;7.74e+03;8.16e+06;7.81e+03
32 ;	13C-1,2,3,4,7,8,9-HpCDF;	3.32e+07;	1.04e+07;	2.28e+07;	0.46;y;	41:01;	72.847;	0.3553;	309;y;	685;y;n;2.39e+06;7.74e+03;5.35e+06;7.81e+03
Injection Standards										
33 ;	13C-1,2,3,4-TCDD;	8.02e+07;	3.55e+07;	4.48e+07;	0.79;y;	31:01;	59.055;	-;	1508;y;	1634;y;n;9.40e+06;6.23e+03;1.18e+07;7.21e+03
34 ;	13C-1,2,3,7,8,9-HxCDD;	5.89e+07;	3.28e+07;	2.61e+07;	1.26;y;	37:13;	54.529;	-;	1465;y;	1051;y;n;9.40e+06;6.42e+03;7.55e+06;7.18e+03
Cleanup Standard										
35 ;	37Cl-2,3,7,8-TCDD;	1.74e+07;	1.74e+07;	-;	-;-;	31:29;	18.286;	0.0658;	952;y;	-;-;n;5.26e+06;5.52e+03; -; -

Totals Raw Data

	Conc	Empc	Flags
TCDF	4.188	4.188	FALSE
TCDD	5.087	5.618	TRUE
PeCDF	0	0	FALSE
PeCDD	0	0	FALSE
HxCDF	2.799	2.799	FALSE
HxCDD	25.141	25.141	FALSE
HpCDF	13.792	13.792	FALSE
HpCDD	305.461	305.461	FALSE

Filename: a27jan09a_5 Name of Homolog Group: Total Tetra-Furans
Sample: 10 Number of Peaks Found: 15 5
Acquired: 29-JAN-09 15:58:43 RRF Used For Totals: 1.0368
Processed: 30-JAN-09 07:43:45 Detection Limit: 0.2214 RL=0.500 (pg/µL)
Sample ID: G1040-1-4B Noise Height Ion1/Ion2: 10052/ 9904
Cal Table: m1613-100708a Begin Window: 26:14:00
Results Table: m1613-012709a_5 End Window: 33:07:00

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	4.19E+05	190000	229000	0.83	y	26:38	0.364	RL	4	y	5.1	y	n
	2	2.33E+05	95900	137000	0.7	y	27:02	0.202	RL	3.2	y	3.8	y	n
	3	4.14E+05	184000	229000	0.8	y	27:34	0.359	RL	3.8	y	4.3	y	n
	4	1.42E+06	630000	788000	0.8	y	27:55	1.231	OK	10.3	y	11.8	y	y
	5	9.36E+05	422000	514000	0.82	y	28:15	0.812	OK	6.3	y	8	y	y
	6	3.44E+05	123000	221000	0.56	n	28:38	0.298	RL	2.6	n	4.7	y	n
	7	3.77E+05	149000	228000	0.65	n	28:53	0.327	RL	3	n	4.8	y	n
	8	1.78E+05	88500	89900	0.98	n	29:22	0.155	RL	2.6	n	2.5	n	n
	9	1.10E+06	482000	617000	0.78	y	29:33	0.954	OK	7.6	y	9.9	y	y
	10	6.54E+05	277000	377000	0.74	y	30:00	0.568	OK	5.3	y	7.3	y	y
	11	2.57E+05	121000	136000	0.88	y	30:17	0.223	S2N	2.4	n	2.6	n	n
	12	8.76E+04	41900	45700	0.92	n	30:29	0.076	S2N	1.2	n	1.7	n	n
2,3,7,8-TCDF	13	5.29E+05	230000	300000	0.77	y	30:53	0.46	RL	5.4	y	6.6	y	y
	14	7.18E+05	315000	403000	0.78	y	31:08	0.623	OK	8.5	y	10.7	y	n
	15	1.70E+05	101000	69100	1.46	n	32:06	0.147	RL	4.4	y	3	n	n

Filename: a27jan09a_5 Name of Homolog Group: Total Tetra-Dioxins
Sample: 10 Number of Peaks Found: 6 3
Acquired: 29-JAN-09 15:58:43 RRF Used For Totals: 1.0087
Processed: 30-JAN-09 07:43:45 Detection Limit: 0.181 RL=0.500 (pg/µL)
Sample ID: G1040-1-4B Noise Height Ion1/Ion2: 6680 / 6112
Cal Table: m1613-100708a Begin Window: 27:41:00
Results Table: m1613-012709a_5 End Window: 32:38:00

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	2.20E+06	972000	1230000	0.79	y	28:20	2.89	OK	27.1	y	36.1	y	n
	2	1.68E+06	717000	958000	0.75	y	28:37	2.197	OK	20.4	y	30.4	y	n

	3	3.06E+05	135000	171000	0.79 y	29:58	0.401	RL	3.6 y	5 y	y
	4	3.53E+05	173000	180000	0.96 n	30:10	0.464	RL	5.4 y	6.3 y	y
	5	3.72E+05	149000	223000	0.67 y	31:02	0.488	RL	5.7 y	9.1 y	y
	6	4.05E+05	197000	208000	0.95 n	31:18	0.531	EMPC	6.7 y	7.8 y	y

Filename:	a27jan09a_5	Name of Homolog Group:	Total Penta-Furans Fn1											
Sample:	10	Number of Peaks Found:	1	0										
Acquired:	29-JAN-09 15:58:43	RRF Used For Totals:	1.0121											
Processed:	30-JAN-09 07:43:45	Detection Limit:	0.1022											
Sample ID:	G1040-1-4B	Noise Height Ion1/Ion2:	7388 / 6520											
Cal Table:	m1613-100708a	Begin Window:					31:46:00							
Results Table:	m1613-012709a_5	End Window:					32:06:00							
Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	1.25E+06	499000	755000		0.66 y	32:05	1.322	RL		28.8 y		51.5 y	n

Filename:	a27jan09a_5	Name of Homolog Group:	Total Penta-Furans Fn2											
Sample:	10	Number of Peaks Found:	6	0										
Acquired:	29-JAN-09 15:58:43	RRF Used For Totals:	1.0121											
Processed:	30-JAN-09 07:43:45	Detection Limit:	0.1212					RL=2.500 (pg/µL)						
Sample ID:	G1040-1-4B	Noise Height Ion1/Ion2:	8724 / 7760											
Cal Table:	m1613-100708a	Begin Window:					31:43:00							
Results Table:	m1613-012709a_5	End Window:					34:52:00							
Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	3.40E+05	209000	130000		1.6 y	32:49	0.358	RL		5.5 y		4.3 y	y
	2	6.81E+05	409000	272000		1.5 y	32:55	0.718	RL		11.3 y		8.5 y	y
	3	2.53E+05	166000	87100		1.9 n	33:14	0.266	RL		7.2 y		5.4 y	n
1,2,3,7,8-PeCDF	4	2.18E+05	126000	91900		1.37 y	33:28	0.224	RL		6.2 y		5.1 y	n
	5	1.96E+05	114000	82400		1.38 y	33:37	0.207	RL		4.8 y		3.7 y	n
2,3,4,7,8-PeCDF	6	2.48E+05	175000	73600		2.37 n	34:05	0.269	RL		6.5 y		3.6 y	n

Filename:	a27jan09a_5	Name of Homolog Group:	Total Penta-Dioxins											
Sample:	10	Number of Peaks Found:	9	0										
Acquired:	29-JAN-09 15:58:43	RRF Used For Totals:	1.0517											
Processed:	30-JAN-09 07:43:45	Detection Limit:	0.2222					RL=2.500 (pg/µL)						
Sample ID:	G1040-1-4B	Noise Height Ion1/Ion2:	7356 / 8312											
Cal Table:	m1613-100708a	Begin Window:					32:51:00							
Results Table:	m1613-012709a_5	End Window:					34:36:00							
Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	8.37E+05	516000	321000		1.61 y	32:56	1.45	RL		22 y		11.8 y	n
	2	1.23E+05	65100	57500		1.13 n	33:12	0.212	RL		4.5 y		2.8 n	n

	3	9.62E+05	575000	388000	1.48 y	33:29	1.667	RL	35.9 y	21.5 y	n
	4	1.46E+05	94200	52200	1.81 n	33:35	0.253	RL	5.6 y	3.6 y	n
	5	8.47E+05	505000	341000	1.48 y	33:38	1.466	RL	27.2 y	15 y	n
	6	1.75E+05	104000	71100	1.46 y	33:46	0.303	RL	4.9 y	3.2 y	n
	7	3.69E+05	221000	148000	1.49 y	33:59	0.64	RL	12.4 y	6.8 y	n
1,2,3,7,8-PeCDD	8	1.74E+05	101000	73000	1.38 y	34:16	0.301	RL	4.7 y	3.4 y	n
	9	4.64E+04	19500	26900	0.72 n	35:01	0.08	RT	1.5 n	1.6 n	n

Filename:	a27jan09a_5	Name of Homolog Group:	Total Hexa-Furans		
Sample:	10	Number of Peaks Found:	6	1	
Acquired:	29-JAN-09 15:58:43	RRF Used For Totals:	1.1305		
Processed:	30-JAN-09 07:43:45	Detection Limit:	0.2556		RL=2.500 (pg/µL)
Sample ID:	G1040-1-4B	Noise Height Ion1/Ion2:	8708 / 10216		
Cal Table:	m1613-100708a	Begin Window:		35:05:00	
Results Table:	m1613-012709a_5	End Window:		37:39:00	

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	4.48E+05	249000	199000		1.25 y	35:13	0.645	RL	11 y		8.2 y		n
	2	1.45E+06	839000	609000		1.38 y	35:20	2.083	RL	37.3 y		22.9 y		n
	3	6.42E+04	39000	25200		1.54 n	35:38	0.092	S2N	1.5 n		0.9 n		n
	4	1.94E+06	1070000	873000		1.23 y	35:47	2.799	OK	45.4 y		30.6 y		n
1,2,3,4,7,8-HxCDF	5	1.47E+05	94800	51900		1.83 n	36:10	0.209	S2N	3.9 y		2 n		n
2,3,4,6,7,8-HxCDF	6	2.09E+05	111000	97500		1.14 y	36:46	0.291	RL	4.7 y		2.9 n		n

Filename:	a27jan09a_5	Name of Homolog Group:	Total Hexa-Dioxins		
Sample:	10	Number of Peaks Found:	9	4	
Acquired:	29-JAN-09 15:58:43	RRF Used For Totals:	1.0077		
Processed:	30-JAN-09 07:43:45	Detection Limit:	0.3991		RL=2.500 (pg/µL)
Sample ID:	G1040-1-4B	Noise Height Ion1/Ion2:	10728/ 8892		
Cal Table:	m1613-100708a	Begin Window:		35:36:00	
Results Table:	m1613-012709a_5	End Window:		37:17:00	

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	5.21E+06	2830000	2380000		1.19 y	35:38	10.849	OK	92.2 y		93.1 y		n
	2	2.16E+06	1210000	947000		1.28 y	36:06	4.498	OK	40.3 y		36.2 y		n
	3	3.35E+06	1860000	1490000		1.25 y	36:19	6.971	OK	49.2 y		46.4 y		n
	4	1.35E+06	746000	609000		1.22 y	36:24	2.823	OK	23.6 y		22.1 y		n
1,2,3,4,7,8-HxCDD	5	1.66E+05	100000	65700		1.52 n	36:53	0.348	S2N	3 y		2.4 n		n
1,2,3,6,7,8-HxCDD	6	6.47E+05	376000	271000		1.39 y	36:58	1.33	RL	10.5 y		9.3 y		n
	7	2.96E+05	166000	129000		1.29 y	37:09	0.616	RL	4.1 y		5 y		n
1,2,3,7,8,9-HxCDD	8	2.54E+05	140000	114000		1.23 y	37:14	0.531	RL	4.2 y		4 y		n
	9	3.82E+05	114000	267000		0.43 n	37:51	0.795	RT	3.7 y		9.7 y		n

Totals Raw Data

Filename: a27jan09a_5
Sample: 10
Acquired: 29-JAN-09 15:58:43
Processed: 30-JAN-09 07:43:45
Sample ID: G1040-1-4B
Cal Table: m1613-100708a
Results Table: m1613-012709a_5

Name of Homolog Group: Total Hepta-Furans
Number of Peaks Found: 2 2
RRF Used For Totals: 1.3693
Detection Limit: 0.3622
Noise Height Ion1/Ion2: 8048 / 7860
Begin Window: 38:52:00
End Window: 41:03:00

RL=2.500 (pg/µL)

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
1,2,3,4,6,7,8-HpCDI	1	2.53E+06	1250000	1280000	0.98	y	39:03	4.29	OK	44	y	45.8	y	n
	2	4.95E+06	2510000	2440000	1.03	y	39:36	9.502	OK	84.3	y	81.1	y	n

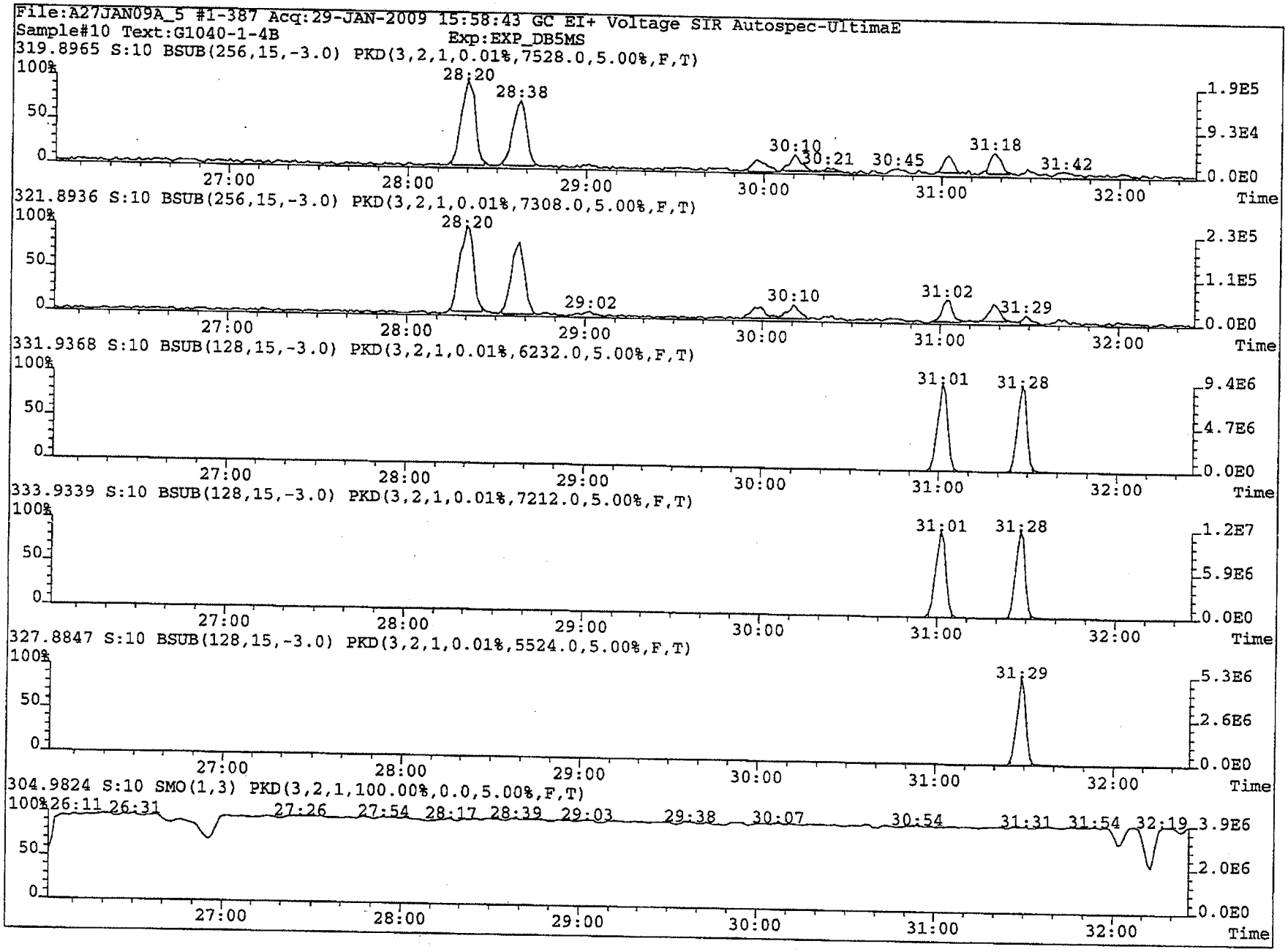
Page 9 of 9

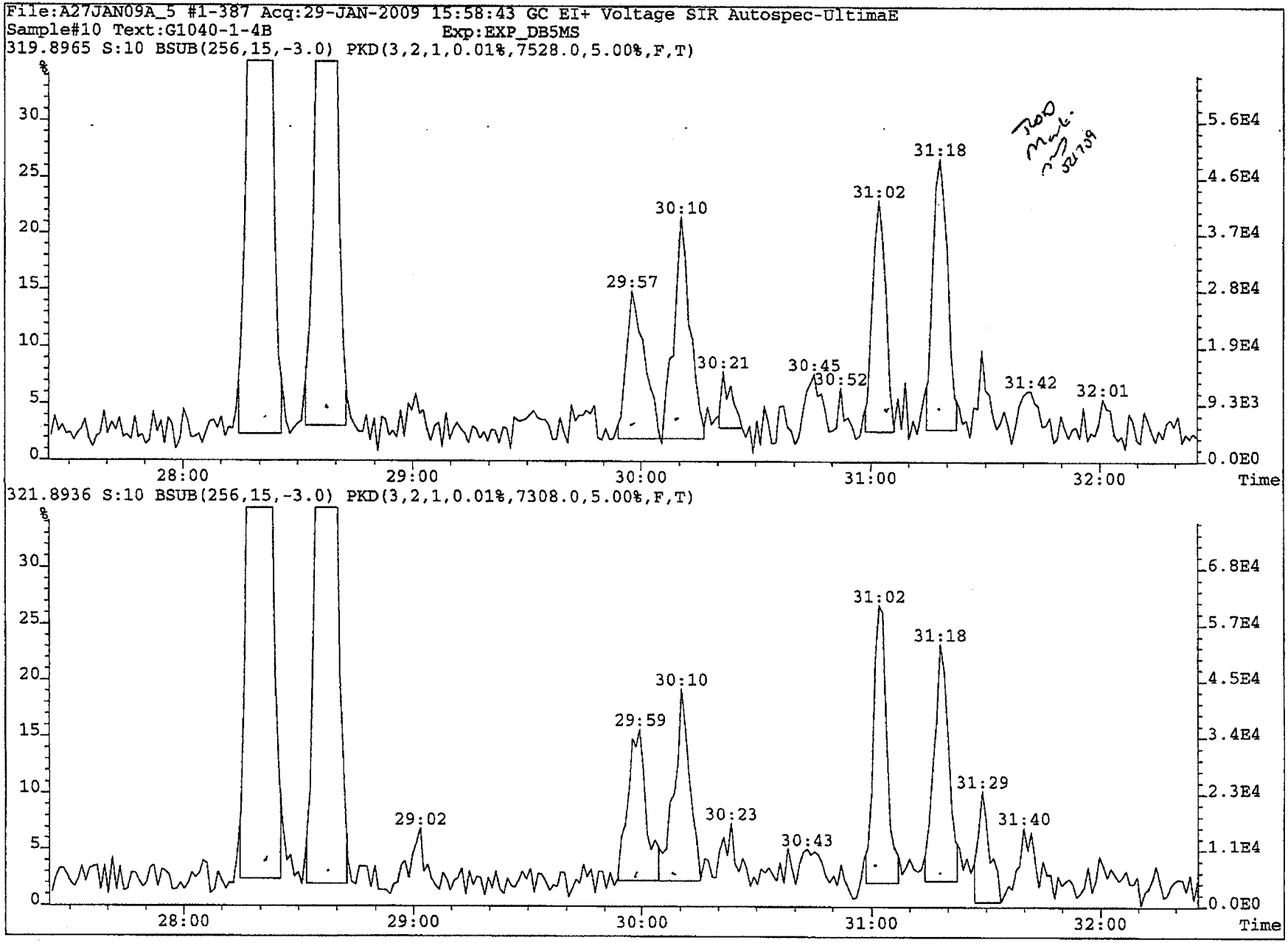
Filename: a27jan09a_5
Sample: 10
Acquired: 29-JAN-09 15:58:43
Processed: 30-JAN-09 07:43:45
Sample ID: G1040-1-4B
Cal Table: m1613-100708a
Results Table: m1613-012709a_5

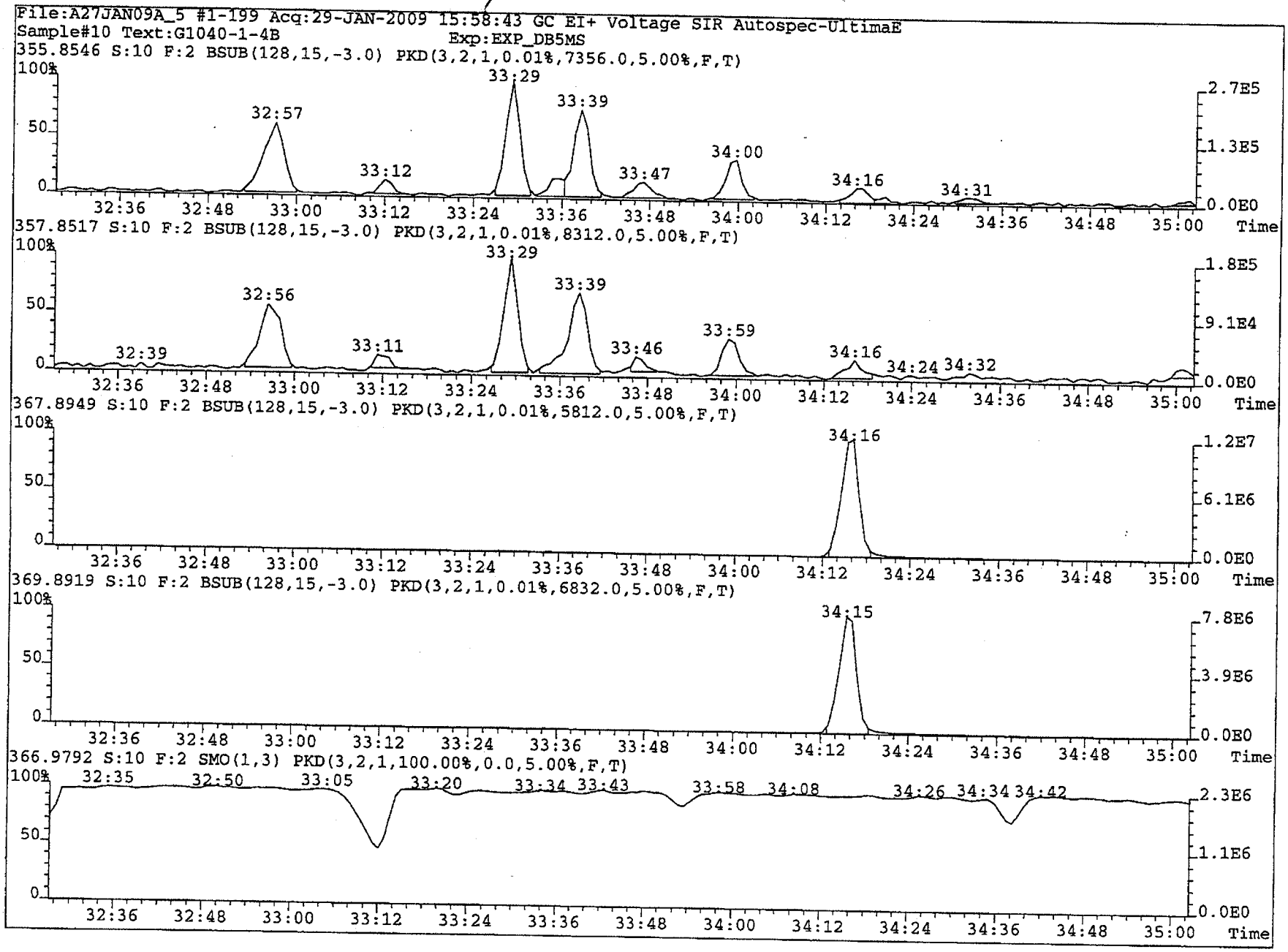
Name of Homolog Group: Total Hepta-Dioxins
Number of Peaks Found: 2 2
RRF Used For Totals: 1.0612
Detection Limit: 0.8527
Noise Height Ion1/Ion2: 10936/ 13648
Begin Window: 39:17:00
End Window: 40:29:00

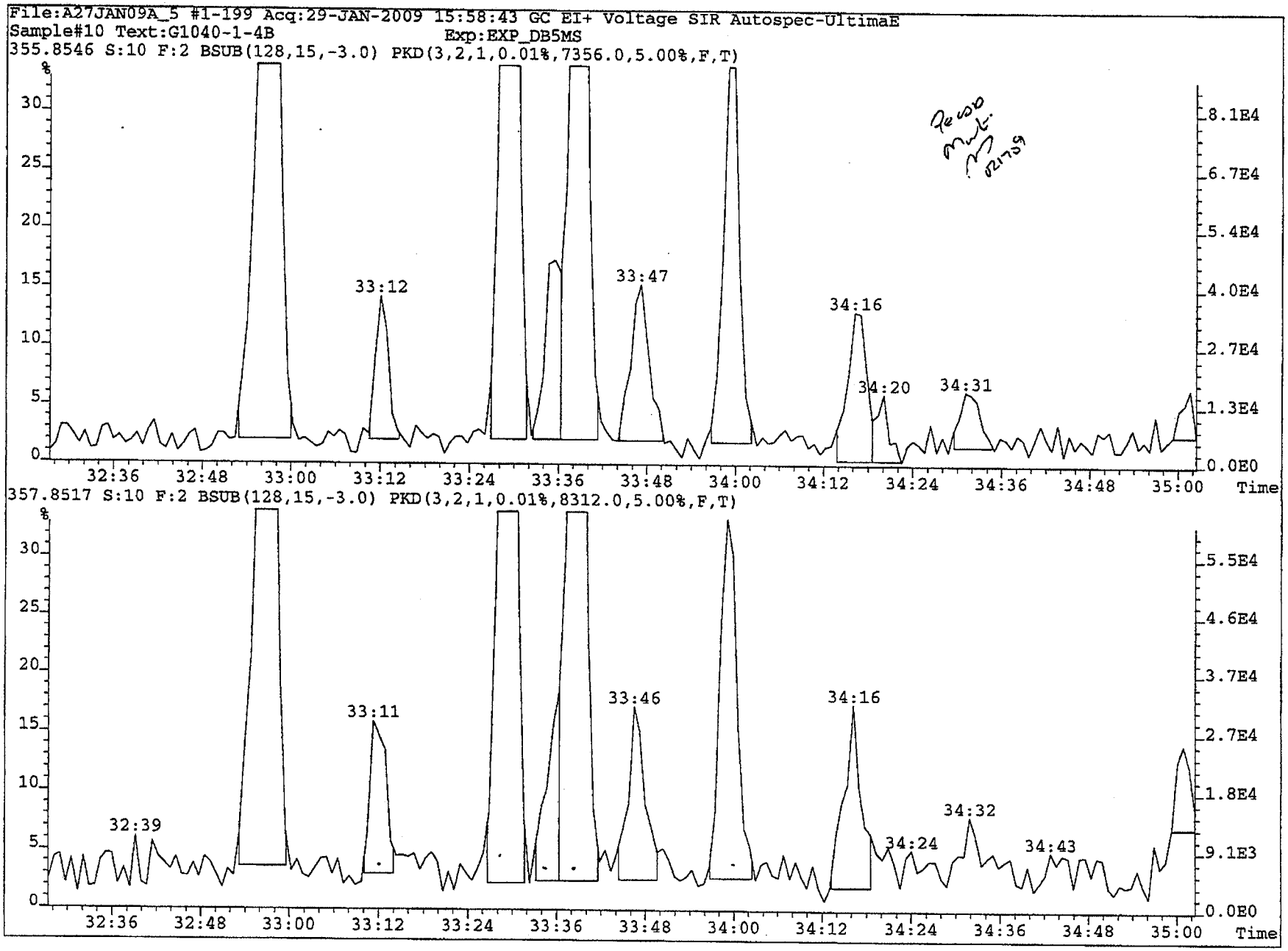
RL=2.500 (pg/µL)

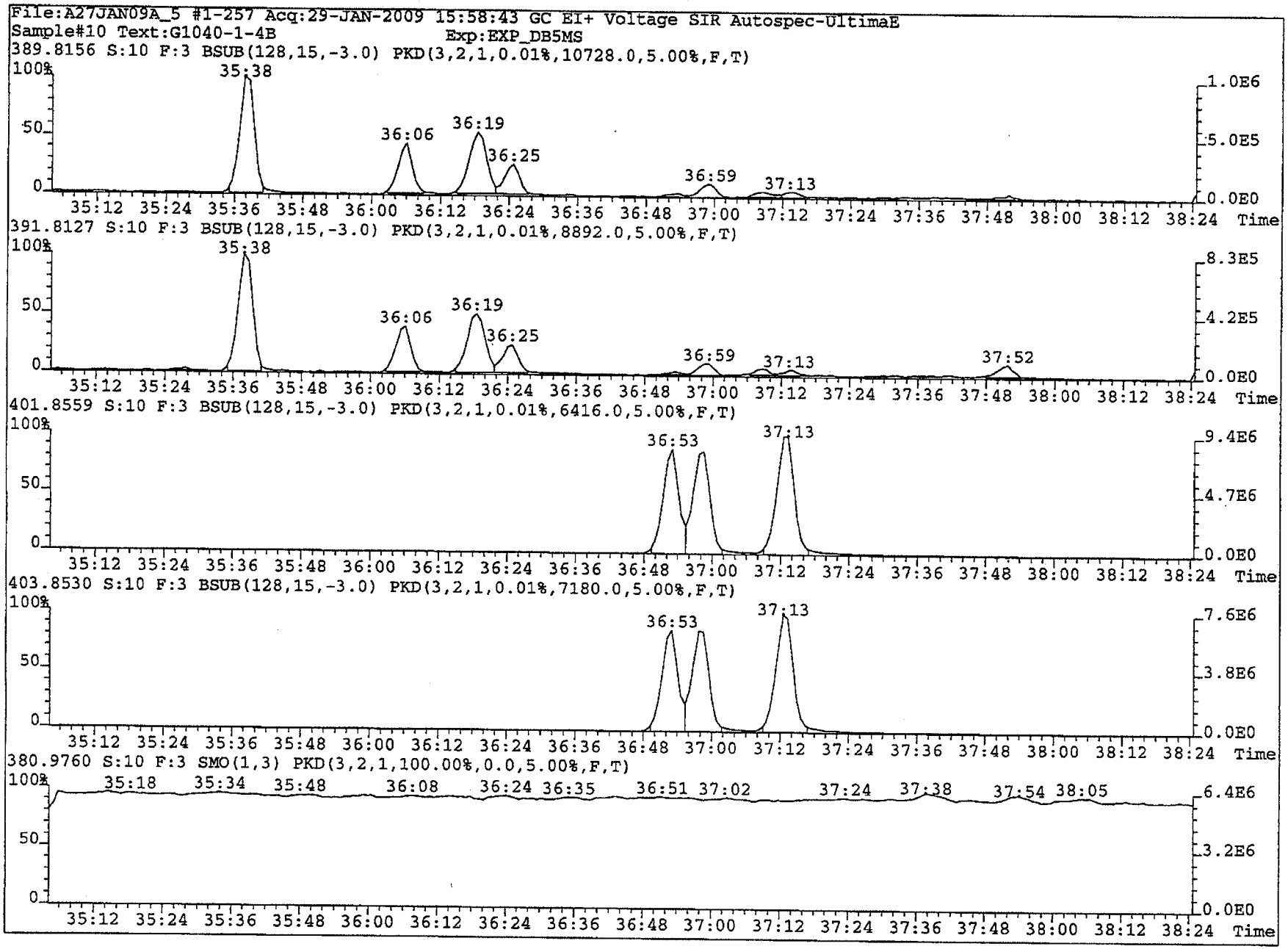
Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	9.42E+07	47900000	46300000	1.03	y	39:23	256.802	OK	1175.8	y	907.2	y	n
1,2,3,4,6,7,8-HpCDI	2	1.79E+07	9080000	8780000	1.03	y	40:20	48.659	OK	199.1	y	154.7	y	n

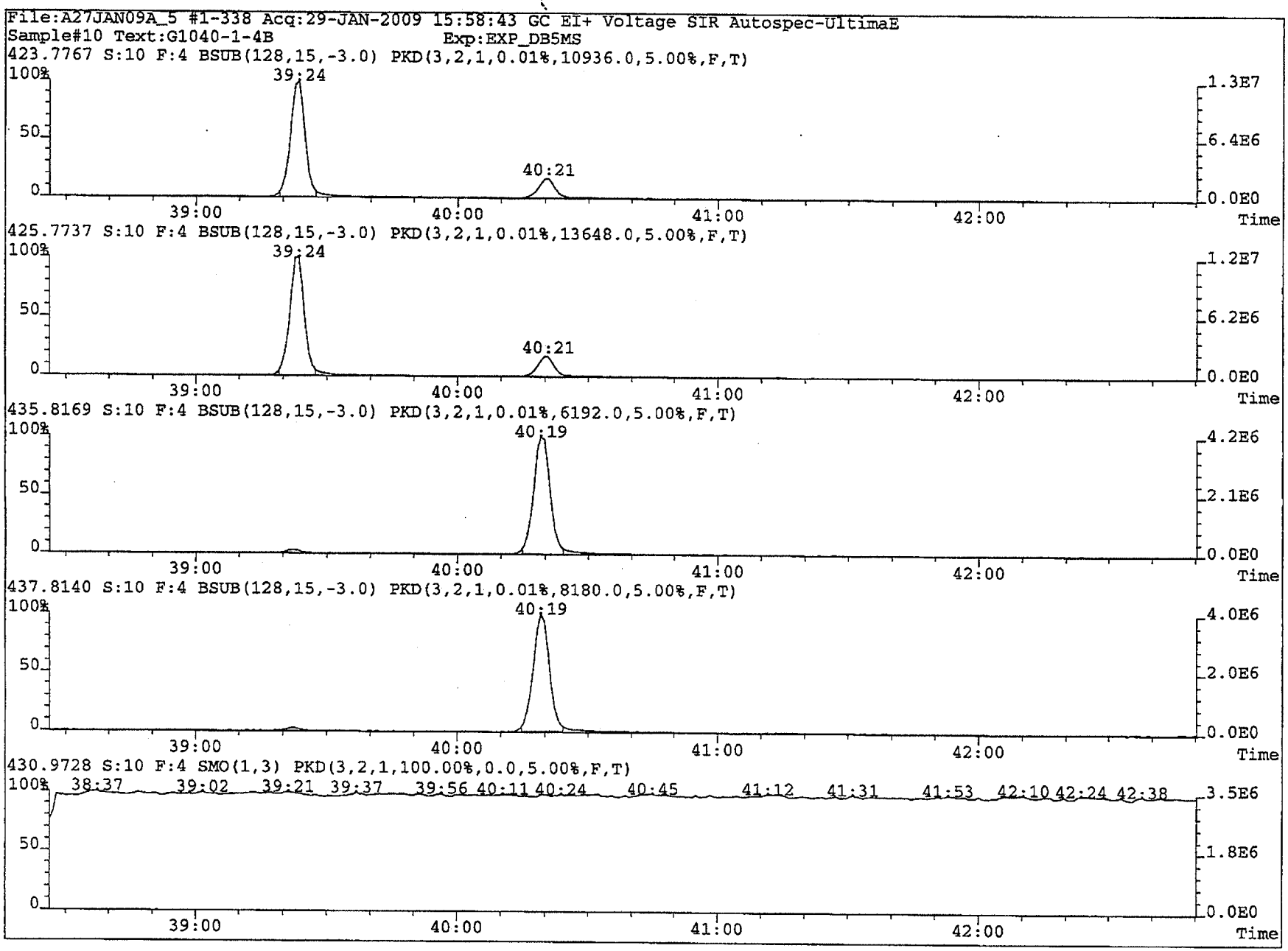

File:A27JAN09A_5 #1-387 Acq:29-JAN-2009 15:58:43 GC EI+ Voltage SIR Autospec-UltimaE
Sample#10 Text:G1040-1-4B
Exp:EXP_DB5MS
319.8965 S:10 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,7528.0,5.00%,F,T)
28:20
28:38
30:10
30:21
30:45
31:18
31:42
1.9E5
9.3E4
0.0E0
321.8936 S:10 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,7308.0,5.00%,F,T)
28:20
29:02
30:10
31:02
31:29
2.3E5
1.1E5
0.0E0
331.9368 S:10 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6232.0,5.00%,F,T)
31:01
31:28
9.4E6
4.7E6
0.0E0
333.9339 S:10 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7212.0,5.00%,F,T)
31:01
31:28
1.2E7
5.9E6
0.0E0
327.8847 S:10 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5524.0,5.00%,F,T)
31:29
5.3E6
2.6E6
0.0E0
304.9824 S:10 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
26:11
26:31
27:26
27:54
28:17
28:39
29:03
29:38
30:07
30:54
31:31
31:54
32:19
3.9E6
2.0E6
0.0E0
100%
50
0
27:00
28:00
29:00
30:00
31:00
32:00
Time

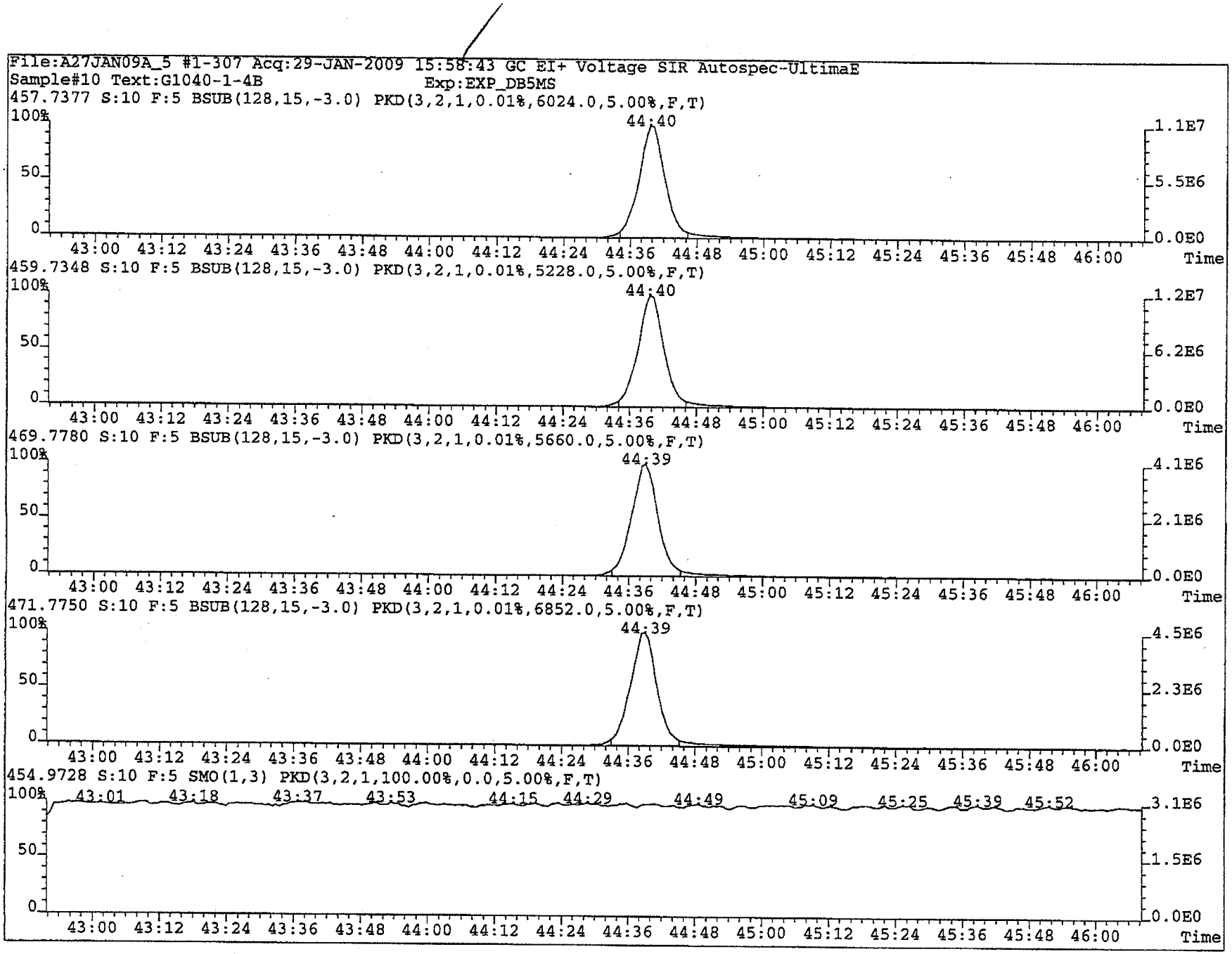

File:A27JAN09A_5 #1-387 Acq:29-JAN-2009 15:58:43 GC EI+ Voltage SIR Autospec-UltimaE
Sample#10 Text:G1040-1-4B Exp:EXP_DB5MS
319.8965 S:10 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,7528.0,5.00%,F,T)
29:57
30:10
30:21
30:45
30:52
31:02
31:18
31:42
32:01
5.6E4
4.6E4
3.7E4
2.8E4
1.9E4
9.3E3
0.0E0
28:00
29:00
30:00
31:00
32:00
Time
321.8936 S:10 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,7308.0,5.00%,F,T)
29:02
29:59
30:10
30:23
30:43
31:02
31:18
31:29
31:40
6.8E4
5.7E4
4.5E4
3.4E4
2.3E4
1.1E4
0.0E0
28:00
29:00
30:00
31:00
32:00
Time

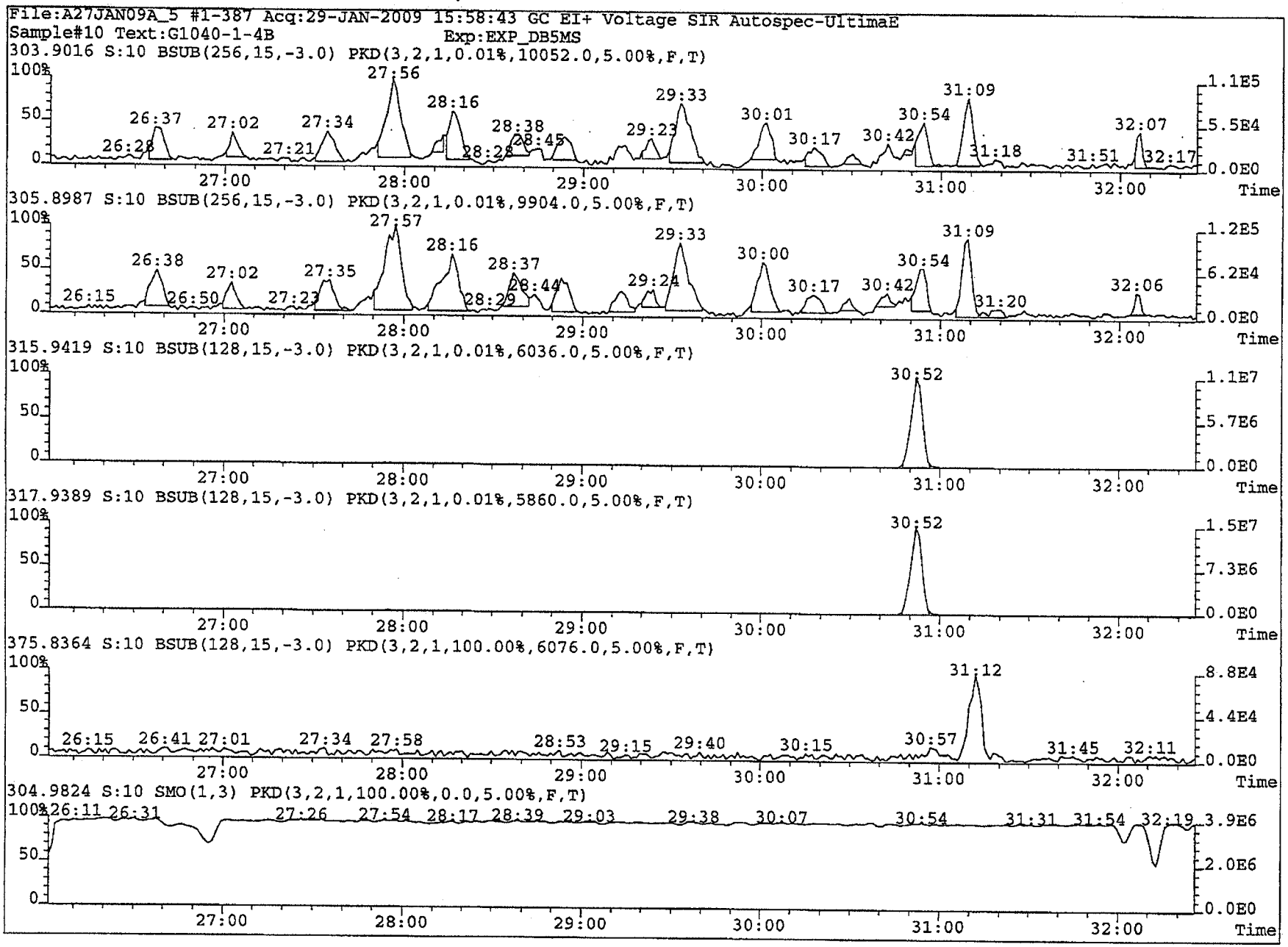

File:A27JAN09A_5 #1-199 Acq:29-JAN-2009 15:58:43 GC EI+ Voltage SIR Autospec-UltimaE
Sample#10 Text:G1040-1-4B
Exp:EXP_DB5MS
355.8546 S:10 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7356.0,5.00%,F,T)
32:57
33:12
33:29
33:39
33:47
34:00
34:16
34:31
2.7E5
1.3E5
0.0E0
357.8517 S:10 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,8312.0,5.00%,F,T)
32:39
32:56
33:11
33:29
33:39
33:46
33:59
34:16
34:24
34:32
1.8E5
9.1E4
0.0E0
367.8949 S:10 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5812.0,5.00%,F,T)
34:16
1.2E7
6.1E6
0.0E0
369.8919 S:10 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6832.0,5.00%,F,T)
34:15
7.8E6
3.9E6
0.0E0
366.9792 S:10 F:2 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
32:35
32:50
33:05
33:20
33:34
33:43
33:58
34:08
34:26
34:34
34:42
2.3E6
1.1E6
0.0E0
100%
50
0
32:36
32:48
33:00
33:12
33:24
33:36
33:48
34:00
34:12
34:24
34:36
34:48
35:00
Time

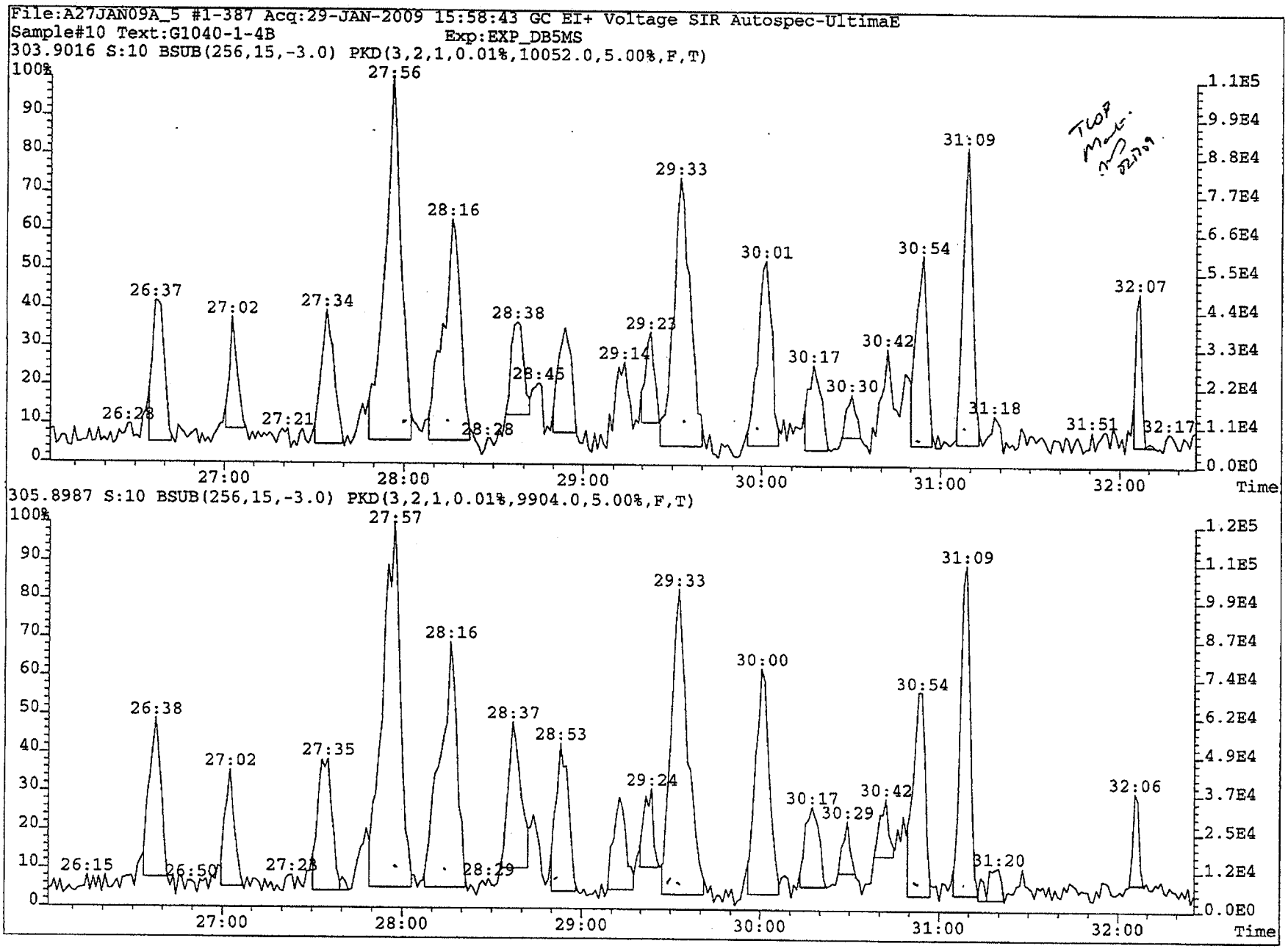

File:A27JAN09A_5 #1-199 Acq:29-JAN-2009 15:58:43 GC EI+ Voltage SIR Autospec-UltimaE
Sample#10 Text:G1040-1-4B
Exp:EXP_DB5MS
355.8546 S:10 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7356.0,5.00%,F,T)
33:12
33:47
34:16
34:20
34:31
8.1E4
6.7E4
5.4E4
4.0E4
2.7E4
1.3E4
0.0E0
32:36 32:48 33:00 33:12 33:24 33:36 33:48 34:00 34:12 34:24 34:36 34:48 35:00 Time
357.8517 S:10 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,8312.0,5.00%,F,T)
32:39
33:11
33:46
34:16
34:24
34:32
34:43
5.5E4
4.6E4
3.7E4
2.7E4
1.8E4
9.1E3
0.0E0
32:36 32:48 33:00 33:12 33:24 33:36 33:48 34:00 34:12 34:24 34:36 34:48 35:00 Time

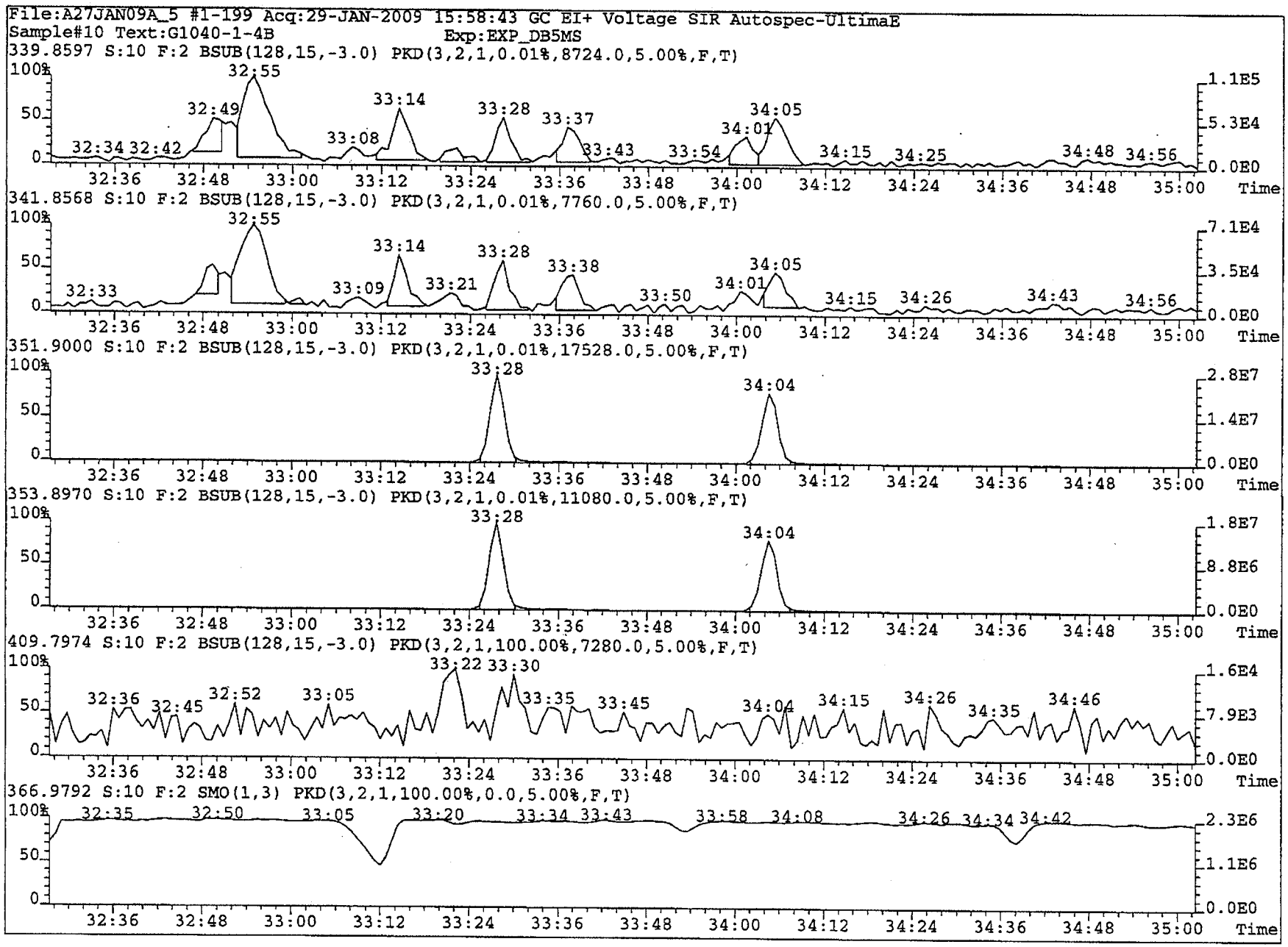

File:A27JAN09A_5 #1-257 Acq:29-JAN-2009 15:58:43 GC EI+ Voltage SIR Autospec-UltimaE
Sample#10 Text:G1040-1-4B Exp:EXP_DB5MS
389.8156 S:10 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,10728.0,5.00%,F,T)
391.8127 S:10 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,8892.0,5.00%,F,T)
401.8559 S:10 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6416.0,5.00%,F,T)
403.8530 S:10 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7180.0,5.00%,F,T)
380.9760 S:10 F:3 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
35:38
36:06
36:19
36:25
36:59
37:13
37:52
36:53
35:18
35:34
35:48
36:08
36:24
36:35
36:51
37:02
37:24
37:38
37:54
38:05
Time

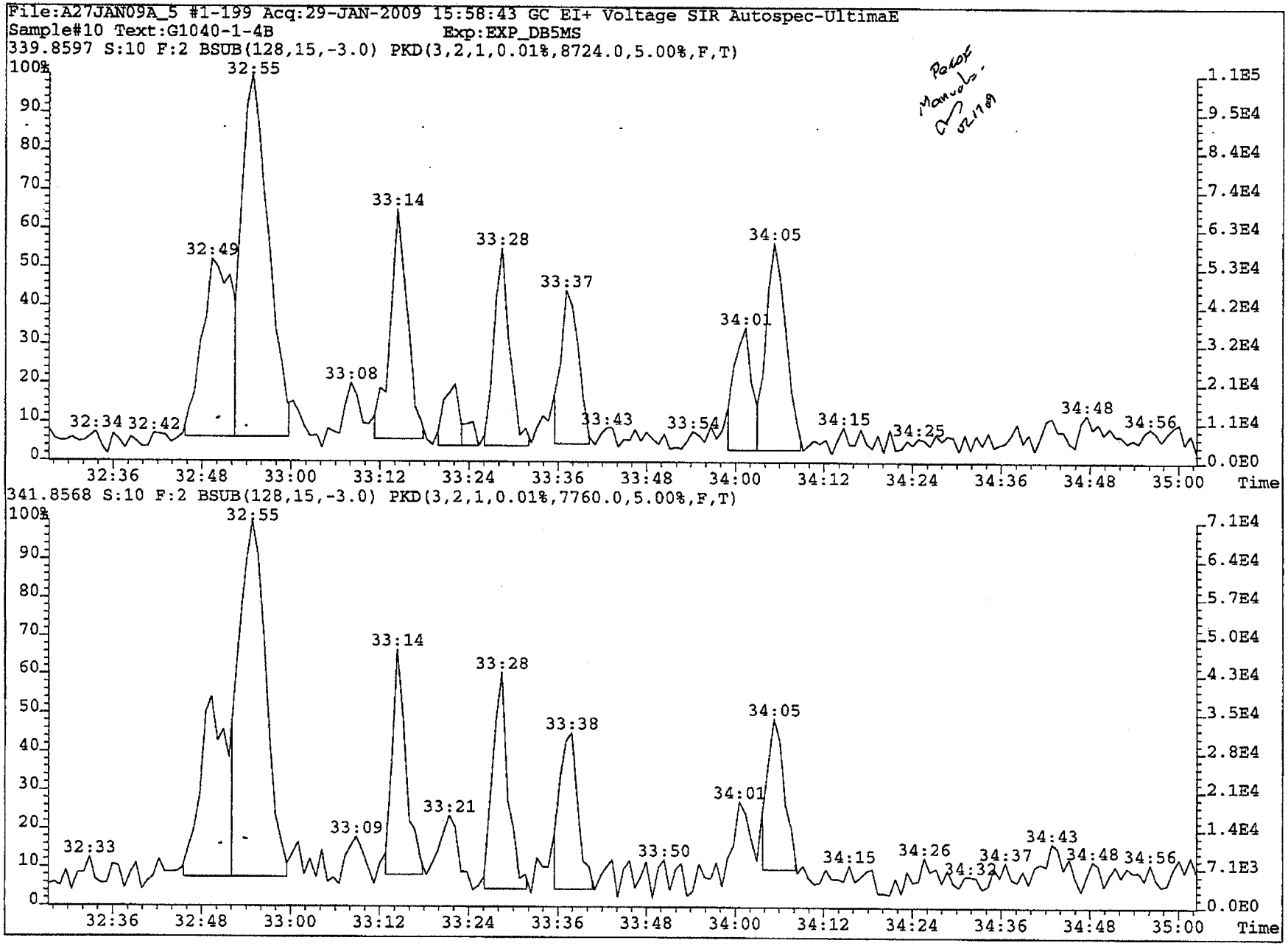

File:A27JAN09A_5 #1-338 Acq:29-JAN-2009 15:58:43 GC EI+ Voltage SIR Autospec-UltimaE
Sample#10 Text:G1040-1-4B
Exp:EXP_DB5MS
423.7767 S:10 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,10936.0,5.00%,F,T)
39:24
40:21
1.3E7
6.4E6
0.0E0
425.7737 S:10 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,13648.0,5.00%,F,T)
39:24
40:21
1.2E7
6.2E6
0.0E0
435.8169 S:10 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6192.0,5.00%,F,T)
40:19
4.2E6
2.1E6
0.0E0
437.8140 S:10 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,8180.0,5.00%,F,T)
40:19
4.0E6
2.0E6
0.0E0
430.9728 S:10 F:4 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
38:37 39:02 39:21 39:37 39:56 40:11 40:24 40:45 41:12 41:31 41:53 42:10 42:24 42:38
3.5E6
1.8E6
0.0E0
100%
50
0
39:00
40:00
41:00
42:00
Time

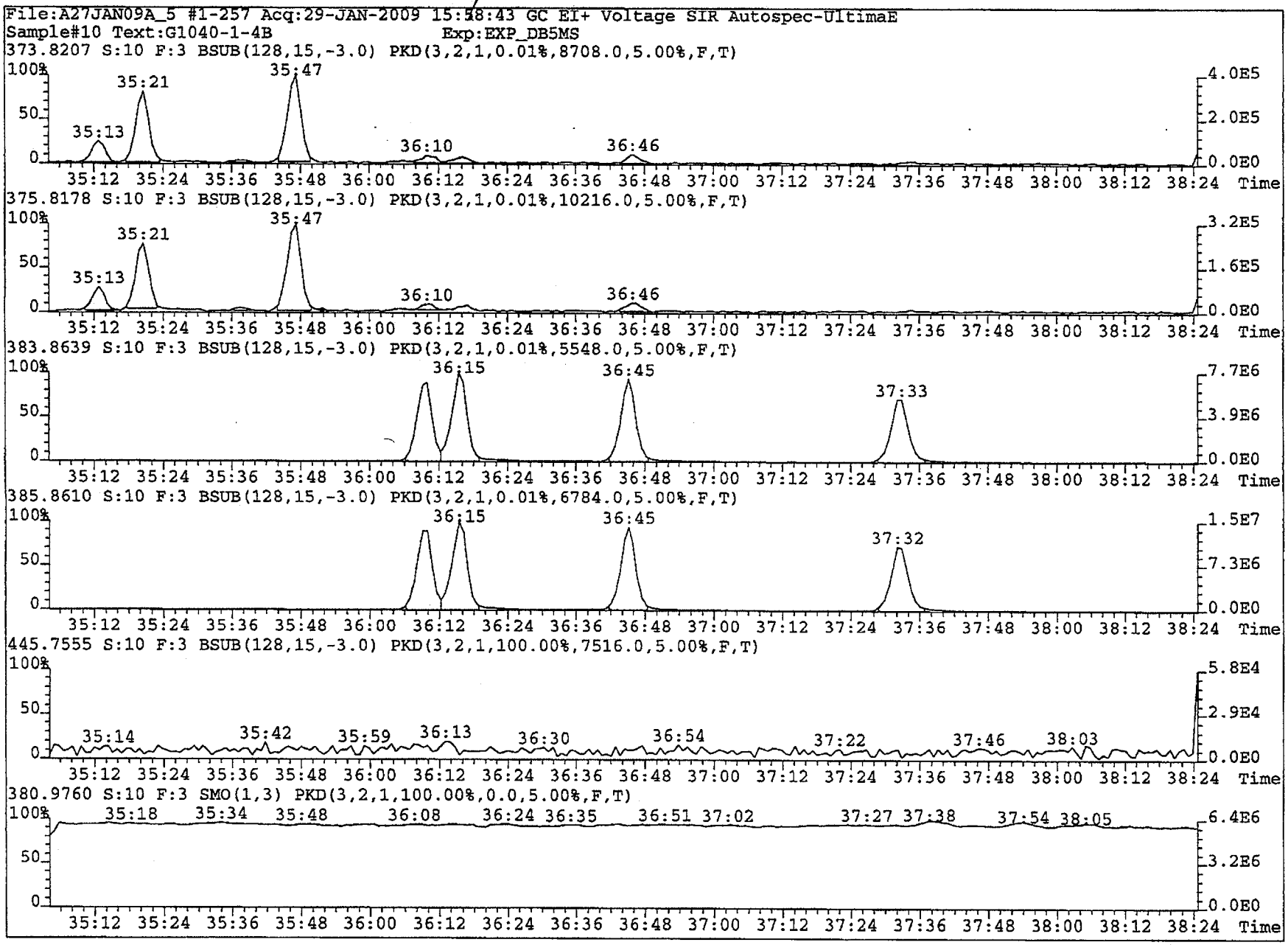

File:A27JAN09A_5 #1-307 Acq:29-JAN-2009 15:58:43 GC EI+ Voltage SIR Autospec-UltimaE
Sample#10 Text:G1040-1-4B Exp:EXP_DB5MS
457.7377 S:10 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6024.0,5.00%,F,T)
44:40
459.7348 S:10 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5228.0,5.00%,F,T)
44:40
469.7780 S:10 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5660.0,5.00%,F,T)
44:39
471.7750 S:10 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6852.0,5.00%,F,T)
44:39
454.9728 S:10 F:5 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
43:01 43:18 43:37 43:53 44:15 44:29 44:49 45:09 45:25 45:39 45:52
100%
50
0
43:00 43:12 43:24 43:36 43:48 44:00 44:12 44:24 44:36 44:48 45:00 45:12 45:24 45:36 45:48 46:00
Time
1.1E7
5.5E6
0.0E0
1.2E7
6.2E6
4.1E6
2.1E6
4.5E6
2.3E6
3.1E6
1.5E6

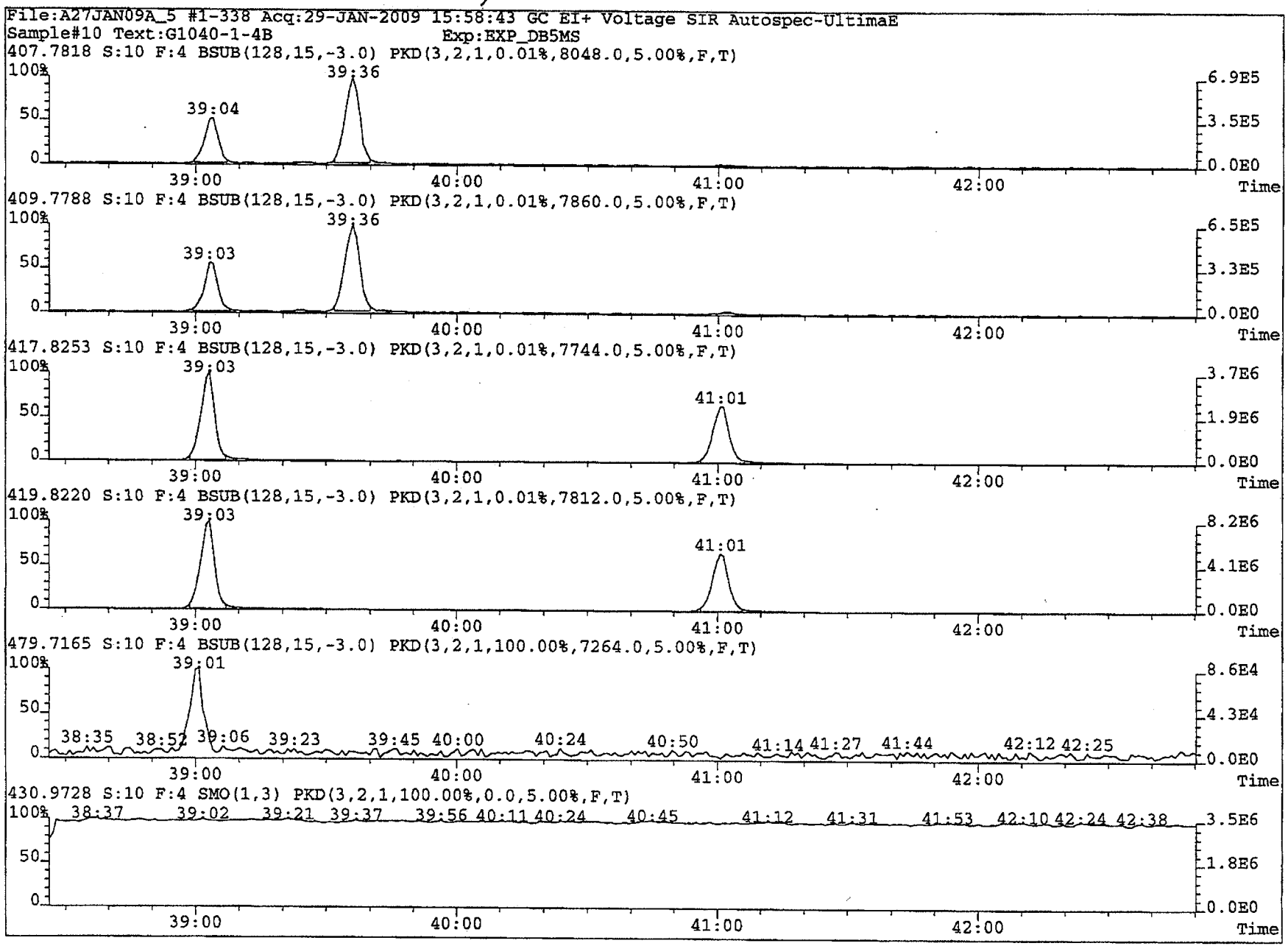

File:A27JAN09A_5 #1-387 Acq:29-JAN-2009 15:58:43 GC EI+ Voltage SIR Autospec-UltimaE
Sample#10 Text:G1040-1-4B Exp:EXP_DB5MS
303.9016 S:10 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,10052.0,5.00%,F,T)
305.8987 S:10 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,9904.0,5.00%,F,T)
315.9419 S:10 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6036.0,5.00%,F,T)
317.9389 S:10 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5860.0,5.00%,F,T)
375.8364 S:10 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,6076.0,5.00%,F,T)
304.9824 S:10 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time

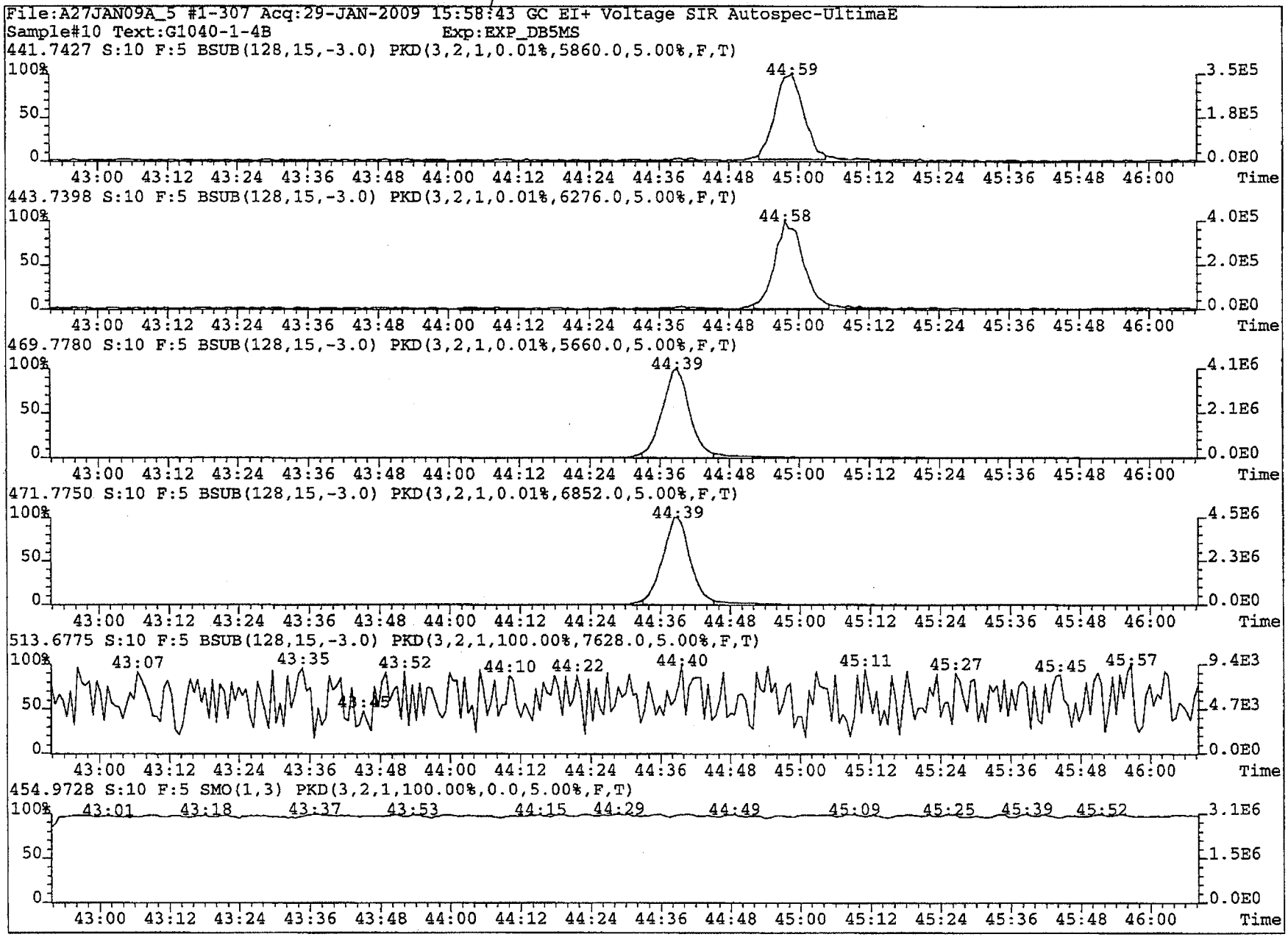

File:A27JAN09A_5 #1-387 Acq:29-JAN-2009 15:58:43 GC EI+ Voltage SIR Autospec-UltimaE
Sample#10 Text:G1040-1-4B Exp:EXP_DB5MS
303.9016 S:10 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,10052.0,5.00%,F,T)
27:56
26:37
27:02
27:34
28:16
28:38
28:45
29:14
29:23
29:33
30:01
30:17
30:30
30:42
30:54
31:09
31:18
31:51
32:07
32:17
26:28
27:21
28:28
Time
305.8987 S:10 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,9904.0,5.00%,F,T)
27:57
26:38
27:02
27:35
28:16
28:37
28:53
29:24
29:33
30:00
30:17
30:29
30:42
30:54
31:09
31:20
32:06
26:15
26:50
27:23
28:29
Time

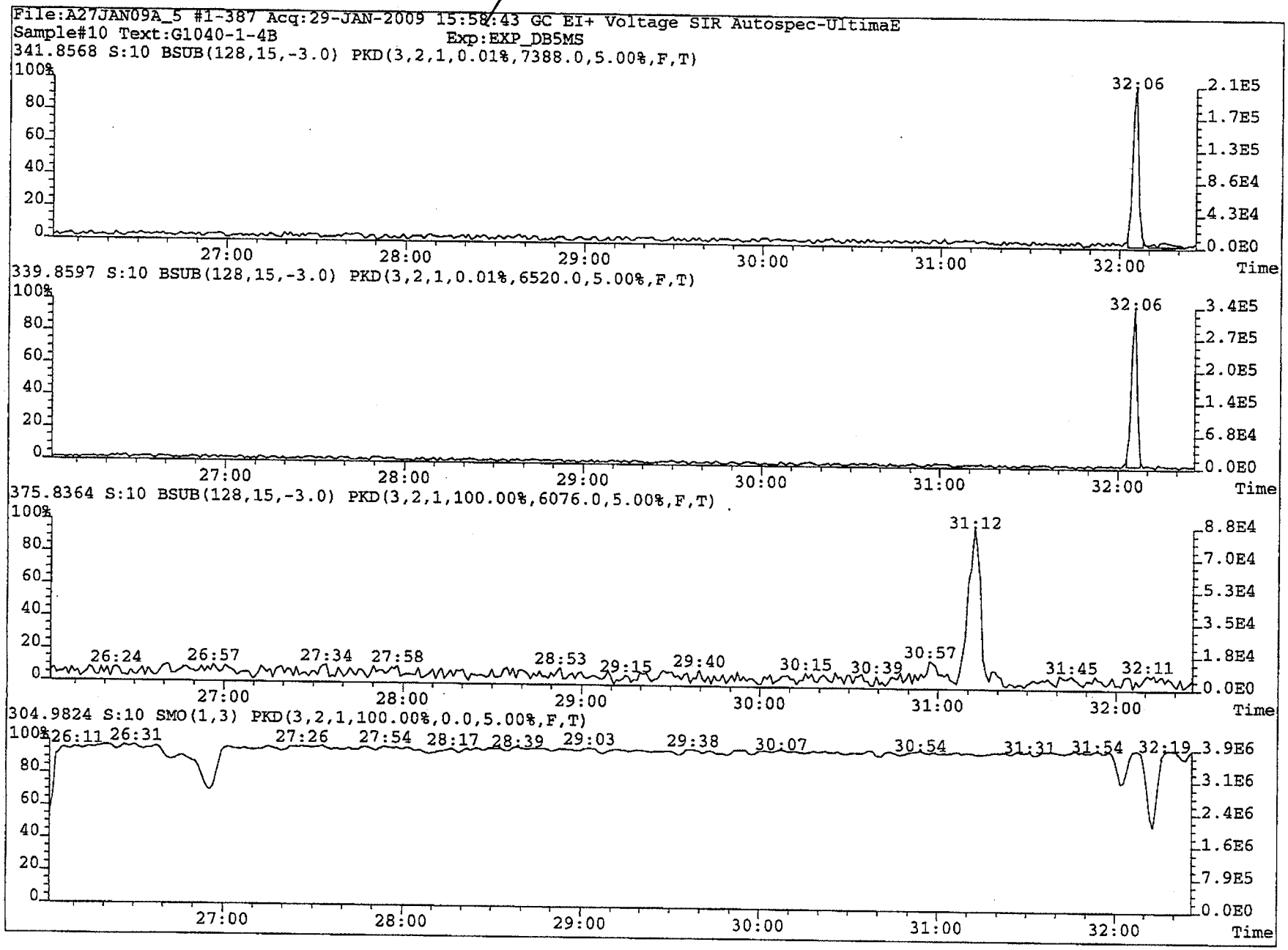

File:A27JAN09A_5 #1-199 Acq:29-JAN-2009 15:58:43 GC EI+ Voltage SIR Autospec-UltimaE
Sample#10 Text:G1040-1-4B Exp:EXP_DB5MS
339.8597 S:10 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,8724.0,5.00%,F,T)
341.8568 S:10 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7760.0,5.00%,F,T)
351.9000 S:10 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,17528.0,5.00%,F,T)
353.8970 S:10 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,11080.0,5.00%,F,T)
409.7974 S:10 F:2 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,7280.0,5.00%,F,T)
366.9792 S:10 F:2 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time


File:A27JAN09A_5 #1-199 Acq:29-JAN-2009 15:58:43 GC EI+ Voltage SIR Autospec-UltimaE
Sample#10 Text:G1040-1-4B Exp:EXP_DB5MS
339.8597 S:10 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,8724.0,5.00%,F,T)
32:55
32:49
33:14
33:28
33:37
34:05
34:01
33:08
32:34
32:42
33:43
33:54
34:15
34:25
34:48
34:56
Time
341.8568 S:10 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7760.0,5.00%,F,T)
32:55
33:14
33:28
33:38
34:05
34:01
33:21
33:09
32:33
33:50
34:15
34:26
34:37
34:43
34:48
34:56
34:32
Time


File:A27JAN09A_5 #1-257 Acq:29-JAN-2009 15:58:43 GC EI+ Voltage SIR Autospec-UltimaE
Sample#10 Text:G1040-1-4B Exp:EXP_DB5MS
373.8207 S:10 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,8708.0,5.00%,F,T)
35:13 35:21 35:47 36:10 36:46
375.8178 S:10 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,10216.0,5.00%,F,T)
35:13 35:21 35:47 36:10 36:46
383.8639 S:10 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5548.0,5.00%,F,T)
36:15 36:45 37:33
385.8610 S:10 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6784.0,5.00%,F,T)
36:15 36:45 37:32
445.7555 S:10 F:3 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,7516.0,5.00%,F,T)
35:14 35:42 35:59 36:13 36:30 36:54 37:22 37:46 38:03
380.9760 S:10 F:3 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
35:18 35:34 35:48 36:08 36:24 36:35 36:51 37:02 37:27 37:38 37:54 38:05
35:12 35:24 35:36 35:48 36:00 36:12 36:24 36:36 36:48 37:00 37:12 37:24 37:36 37:48 38:00 38:12 38:24 Time


File:A27JAN09A_5 #1-338 Acq:29-JAN-2009 15:58:43 GC EI+ Voltage SIR Autospec-UltimaE
Sample#10 Text:G1040-1-4B Exp:EXP_DB5MS
407.7818 S:10 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,8048.0,5.00%,F,T)
39:04
39:36
6.9E5
3.5E5
0.0E0
409.7788 S:10 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7860.0,5.00%,F,T)
39:03
39:36
6.5E5
3.3E5
0.0E0
417.8253 S:10 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7744.0,5.00%,F,T)
39:03
41:01
3.7E6
1.9E6
0.0E0
419.8220 S:10 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7812.0,5.00%,F,T)
39:03
41:01
8.2E6
4.1E6
0.0E0
479.7165 S:10 F:4 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,7264.0,5.00%,F,T)
39:01
38:35 38:52 39:06 39:23 39:45 40:00 40:24 40:50 41:14 41:27 41:44 42:12 42:25
8.6E4
4.3E4
0.0E0
430.9728 S:10 F:4 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
38:37 39:02 39:21 39:37 39:56 40:11 40:24 40:45 41:12 41:31 41:53 42:10 42:24 42:38
3.5E6
1.8E6
0.0E0
100%
50
0
39:00
40:00
41:00
42:00
Time


File:A27JAN09A_5 #1-307 Acq:29-JAN-2009 15:58:43 GC EI+ Voltage SIR Autospec-UltimaE
Sample#10 Text:G1040-1-4B Exp:EXP_DB5MS
441.7427 S:10 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5860.0,5.00%,F,T)
44:59
3.5E5
1.8E5
0.0E0
443.7398 S:10 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6276.0,5.00%,F,T)
44:58
4.0E5
2.0E5
0.0E0
469.7780 S:10 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5660.0,5.00%,F,T)
44:39
4.1E6
2.1E6
0.0E0
471.7750 S:10 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6852.0,5.00%,F,T)
44:39
4.5E6
2.3E6
0.0E0
513.6775 S:10 F:5 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,7628.0,5.00%,F,T)
43:07
43:35
43:52
44:10
44:22
44:40
45:11
45:27
45:45
45:57
9.4E3
4.7E3
0.0E0
454.9728 S:10 F:5 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
43:01
43:18
43:37
43:53
44:15
44:29
44:49
45:09
45:25
45:39
45:52
3.1E6
1.5E6
0.0E0
100%
50
0
43:00 43:12 43:24 43:36 43:48 44:00 44:12 44:24 44:36 44:48 45:00 45:12 45:24 45:36 45:48 46:00
Time


File:A27JAN09A_5 #1-387 Acq:29-JAN-2009 15:58:43 GC EI+ Voltage SIR Autospec-UltimaE
Sample#10 Text:G1040-1-4B Exp:EXP_DB5MS
341.8568 S:10 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7388.0,5.00%,F,T)
32:06
339.8597 S:10 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6520.0,5.00%,F,T)
32:06
375.8364 S:10 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,6076.0,5.00%,F,T)
31:12
26:24 26:57 27:34 27:58 28:53 29:15 29:40 30:15 30:39 30:57 31:45 32:11
304.9824 S:10 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
26:11 26:31 27:26 27:54 28:17 28:39 29:03 29:38 30:07 30:54 31:31 31:54 32:19
27:00 28:00 29:00 30:00 31:00 32:00
Time

TOTAL SOLIDS

Extractions Total Solids-extts
Data By: Nguyen C. Trinh
Created: 1/10/09

Worklist: 9351
Analyst: NTC
Comments:

	ARI ID CLIENT ID	Tare Wt (g)	Wet Wt (g)	Dry Wt (g)	% Solids	pH
1.	OH01A 09-646 PGSS-77A	1.16	12.10	8.98	71.5	NR
2.	OH01C 09-648 PGSS-80	1.16	12.96	10.71	80.9	NR
3.	OH01F 09-651 PGSS-GEO-3	1.16	13.90	10.55	73.7	NR
4.	OH01G 09-652 PGSS-92	1.18	12.28	8.93	69.8	NR

Solids Data Entry Report Checked by: MH Date: 01/15/09
Date: 01/15/09 Data Analyst: KM

Solids Determination performed on 01/13/09 by MH

JOB	SAMPLE	CLIENTID	TAREWEIGHT	SAMPDISH	DRYWEIGHT	SOLIDS
OH01	A	PGSS-77A	0.993	10.190	7.641	72.28
OH01	C	PGSS-80	0.945	10.474	8.797	82.40
OH01	F	PGSS-GEO-3	0.963	10.620	7.902	71.85
OH01	G	PGSS-92	1.030	10.351	6.895	62.92

Analytical Resources, Incorporated
Analytical Chemists and Consultants

February 26, 2009

Mr. Roger McGinnis
Hart Crowser, Inc.
1700 Westlake Avenue North Suite 200
Seattle, WA 98109-3056

RE: Project: Port Gamble, 17330-14
ARI Job No.: OH02

Dear Mr. McGinnis:

Please find enclosed the original Chain-of-Custody (COC) records, sample receipt documentation, and the final data package for the samples from the project referenced above.

The samples were analyzed for Grain Size, select Conventionals, PCBs, SVOCs, Total Metals and Dioxin and Furans, as requested.

Sample receipt and details of these analyses are discussed in the Case Narrative.

An electronic copy of this data package and the supporting data 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.

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

Enclosures

cc: files OH02

KB/co

Chain of Custody
Documentation

prepared
for

HART CROWSER, INC.

Project: Port Gamble, 17330-14

ARI JOB NO: OH02

prepared
by

Analytical Resources, Inc.

Sample Custody Record

OD97

Samples Shipped to: ARI

1 of 3

HARTCROWSER

Hart Crowser, Inc.
1910 Fairview Avenue East
Seattle, Washington 98102-3699
Phone: 206-324-9530 FAX: 206-328-5581

JOB 17330.14 LAB NUMBER

PROJECT NAME PORT GAMBLE

HART CROWSER CONTACT ROGER MC GINNIS
ANNE CONRAD

SAMPLED BY: VP, CU

LAB NO.	SAMPLE ID	DESCRIPTION	DATE	TIME	MATRIX	TOTAL SULFIDE	TOC	TVS	AMMONIA	GRAIN SIZE	SMS SVOC	SMS METALS*	PCBs	MICROTOX	DIOXIN	RESIN ACIDS	GUAIACOL	RETENE	NO. OF CONTAINERS	OBSERVATIONS/COMMENTS/ COMPOSITING INSTRUCTIONS
	PGSS-45		12/8/08	1145	SED	X	X	X	X							X			6	*SMS METALS – As, Cd, Cr, Cu, Pb, Ag, Zn, Hg
	PGSS-46			1215	X														6	
	PGSS-47			1325	X														6	
	PGSS-47A			1400	X														6	HOLD
	PGSS-51			1425	X	X	X	X	X							X			6	
	PGSS-53			1508	X														6	
	PGSS-54			1534	X														6	
	PGSS-55			1600	X														6	
	PGSS-56			1626	X														6	
	PGSS-58		12/9/08	0727	X														6	
	PGSS-61			0757	X														6	
	PGSS-62			0821															6	

RELINQUISHED BY	DATE	RECEIVED BY	DATE
CH	12/11/08	Jami Hayes	12/11/08
SIGNATURE	TIME	SIGNATURE	TIME
Carl Ulberg	1210	Jami Hayes	1210
PRINT NAME		PRINT NAME	
HC		ARI	
COMPANY		COMPANY	

RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE	TIME	SIGNATURE	TIME
PRINT NAME		PRINT NAME	
COMPANY		COMPANY	

SPECIAL SHIPMENT HANDLING OR STORAGE REQUIREMENTS:
FREEZE EXTRA SAMPLE VOLUME
FULL DATA PACKAGE

12 TOTAL NUMBER OF CONTAINERS

SAMPLE RECEIPT INFORMATION
CUSTODY SEALS: ☐YES ☐NO ☐N/A
GOOD CONDITION: ☐YES ☐NO
TEMPERATURE
SHIPMENT METHOD: ☐HAND ☐COURIER ☐OVERNIGHT

COOLER NO.: STORAGE LOCATION:

See Lab Work Order No. _____
for Other Contract Requirements

TURNAROUND TIME:
☐ 24 HOURS ☐ 1 WEEK
☐ 48 HOURS ☐ STANDARD
☐ 72 HOURS OTHER _____

White and Yellow Copies to Lab Pink to Project Manager Lab to Return White Copy to Hart Crowser Gold to Sample Custodian

Sample Custody Record

0092

Samples Shipped to: ARI

2 of 3

HARTCROWSER

Hart Crowser, Inc.
1910 Fairview Avenue East
Seattle, Washington 98102-3699
Phone: 206-324-9530 FAX: 206-328-5581

JOB 17330-14 LAB NUMBER

PROJECT NAME PORT GAMBLE

HART CROWSER CONTACT ROGER McGINNIS

ANNE CONRAD

SAMPLED BY: VP, CV

LAB NO.	SAMPLE ID	DESCRIPTION	DATE	TIME	MATRIX	TOTAL SULFIDE	TOC	TVS	AMMONIA	GRAIN SIZE	SMS SVOCs	SMS METALS	PCBs	MICROTOX	DIOXIN	RESIN ACIDS	GUAIACOL	RETENE	NO. OF CONTAINERS	OBSERVATIONS/COMMENTS/ COMPOSITING INSTRUCTIONS
	PGSS-62A		12/9/08	1009	SED	X	X	X	X							X			6	*SMS METALS - As, Cd, Cr, Cu, Pb, Ag, Zn, Hg
	PGSS-62B			0846															6	
	PGSS-63			0913															6	
	PGSS-64			1035															6	
	PGSS-67			1101															6	
	PGSS-68			1212															6	
	PGSS-69			1236															6	
	PGSS-70			1301															6	
	PGSS-71			1332															6	
	PGSS-73			1428															6	
	PGSS-75			1458															6	
	PGSS-77			1530															6	

RELINQUISHED BY	DATE	RECEIVED BY	DATE
Carl Ulberg	12/11/08	Jami Hayes	12/11/08
SIGNATURE	TIME	SIGNATURE	TIME
Carl Ulberg	1210	Jami Hayes	1210
PRINT NAME		PRINT NAME	
HC		ARI	
COMPANY		COMPANY	
RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE	TIME	SIGNATURE	TIME
PRINT NAME		PRINT NAME	
COMPANY		COMPANY	

SPECIAL SHIPMENT HANDLING OR STORAGE REQUIREMENTS:

FREEZE EXTRA SAMPLE VOLUME

FULL DATA PACKAGE

72 TOTAL NUMBER OF CONTAINERS

SAMPLE RECEIPT INFORMATION:
CUSTODY SEALS: ☐YES ☐NO ☐N/A
GOOD CONDITION: ☐YES ☐NO
TEMPERATURE:
SHIPMENT METHOD: ☐HAND ☐COURIER ☐OVERNIGHT

COOLER NO.: STORAGE LOCATION:

See Lab Work Order No. _____
for Other Contract Requirements

TURNAROUND TIME:
☐ 24 HOURS ☐ 1 WEEK
☐ 48 HOURS ☐ STANDARD
☐ 72 HOURS OTHER _____

White and Yellow Copies to Lab Pink to Project Manager Lab to Return White Copy to Hart Crowser Gold to Sample Custodian

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Hart Crowser | Project Name: _____

COC No: _____ | Delivered by: Hand

Assigned ARI Job No: OD92 | Tracking No: _____

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

Record cooler temperature (recommended 2.0-6.0 °C for chemistry) 0.8, -2.0, 1.2, 1.2, 0.6, 1.6, 1.2 °C, 2.0, 1.2

Cooler Accepted by: JH Date: 12/11/08 Time: 1225

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?		ice	
Was sufficient ice used (if appropriate)?		(YES)	NO
Were all bottles sealed in individual plastic bags?		(YES)	NO
Did all bottle arrive in good condition (unbroken)?		(YES)	NO
Were all bottle labels complete and legible?		(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 checklist)		YES	(NO)
Were all VOC vials free of air bubbles?	(NA)	YES	NO
Was sufficient amount of sample sent in each bottle?		(YES)	NO

Samples Logged by: JH Date: 12/12/08 Time: 14:17

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

Explain discrepancies or negative responses:

By: Date:

Case Narrative

prepared
for

HART CROWSER, INC.

Project: Port Gamble, 17330-14

ARI JOB NO: OH02

prepared
by

Analytical Resources, Inc.

Case Narrative
Hart Crowser
Port Gamble, 17330-14
ARI Job: OH02
February 26, 2009

Sample Receipt

Analytical Resources Inc. (ARI) accepted twenty one sediment samples in good condition on December 8, 2008 under the ARI job number OH02. The cooler temperatures measured by IR thermometer following ARI SOP ranged between -2.0 and 2.0°C and the samples were well iced. Please note that several sample containers were archived up receipt as requested on the COC. All samples were frozen to protect holding times. For further detail regarding sample receipt, please refer to the Cooer Receipt Form. The original analyses are reported under ARI SDG OD92. The Microtox data is reported in its own data package.

SVOCs by Method 8270D:

The samples were extracted and analyzed within the method recommended holding times.

Initial calibration(s): All compounds of interest were within method acceptance criteria.

Continuing calibration(s): Are in control.

Samples: There were no anomalies associated with these samples.

Surrogates: Are in control.

LCS/LCSD(s): Are in control.

Method Blank: The method blanks were free of contamination.

PCBs by Method 8082:

The samples were extracted and analyzed within the method recommended holding times.

Initial calibration(s): All compounds of interest were within method acceptance criteria.

Continuing calibration(s): Are in control.

Samples: There were no anomalies associated with these samples.

Surrogates: Are in control.

LCS/LCSD(s): Are in control.

Method Blank: The method blanks were free of contamination.

Case Narrative
Hart Crowser
Port Gamble, 17330-14
ARI Job: OH02
February 26, 2009

Total Metals 6010 and 7000 Series:

The samples were digested and analyzed within the method recommended holding times.

Initial calibration(s): All compounds of interest were within method acceptance criteria.

Continuing calibration(s): Are in control.

Samples: There were no anomalies associated with these samples.

LCS: Is in control.

Method Blank: The method blanks were free of contamination.

Grain Size: The grain size analysis and case narrative are included in this data package.

Dioxin/ Furans: Are included in this data package.

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Client: Hart Crowser, Inc. **ARI Project No.:** OH02

Client Project: 1733014 PORT GAMBLE

Case Narrative

1. Thirteen samples were submitted for grain size analysis according to Puget Sound Estuary Protocol (PSEP) methodology on January 9, 2009.
2. The samples were run in a single batch and one sample from another job was chosen for triplicate analysis. The triplicate data is reported on the QA summary.
3. One sample did not contain the required 5 grams of fines for the pipette portion of the analysis. The analytical balance has a capacity of about 200 grams (by 0.0001 grams) and a sample that would yield 5 grams of fines could not be split and stay within the capacity of the balance.
4. Three samples contained woody or other organic matter, which may have broken down during the sieving process, affecting grain size analysis.
5. Three samples contained some shells.
6. The data is provided in summary tables and plots.
7. There were no other noted anomalies in this project.

Approved by: Elizabeth Goble Date: 2/11/09
Title: Lead Technician

Data Reporting Qualifiers

Effective 12/28/04

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 ≥ 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
NR	Spiked compound recovery is not reported due to chromatographic interference
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.
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
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.

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 ≥40% RPD with no obvious chromatographic interference

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

LCS SOLUTIONS

12/30/08

LABE	SOLN ID	TEST	CONC. UG/ML	SOLVENT	EXP.
1	1549-3	PCB	20	ACETONE	10/10/09
2	1472-3	BCOC PEST	10	ACETONE	07/20/08
3	1517-1	PEST	02/04/20	ACETONE	05/15/09
4	1561-2	LOW PEST	0.2/0.4/2	ACETONE	05/15/09
5	1537-1	EPH	1500	MECL2	08/16/09
6	1559-2	PCP	12.5/125	ACETONE	11/05/09
7	1573-1	ABN	100	ACETONE	08/01/09
8	1566-1	TBT	2.5	MECL2	12/04/09
9	1567-3	PORE TBT	.125/.25	MECL2	12/04/09
10	1554-3	ABN ACID	100/200	MEOH	10/21/09
11	1563-3	TPHD	15000	ACETONE	11/20/09
12	1563-1	ABN BASE	200	ACETONE	06/30/09
13	1573-2	LOW PCB	2	ACETONE	10/10/09
14	1547-1	LOW ABN ACID	10/20	MEOH	04/10/09
15*	1452-1	SIM PNA	15/75	MEOH	04/09/09
16	1502-2	DIOXANE	100	MEOH	02/20/09
17	1516-2	1248 PCB	20	ACETONE	05/07/09
18	1514-4	LOW SIM PNA	1.5/7.5	ACETONE	04/24/09
19	1517-3	AK103	7500	MECL2	12/29/08
20	1572-2	PNA	100	ACETONE	12/26/09
21*	1414-4	SKY/BHT	100	MEOH	04/08/09
22	1570-1	HERB	12.5/12500	MEOH	02/19/09
23	1505-1	LOW ABN BASE	20	MEOH	03/20/09
24	1541-4	LOW ABN	10	ACETONE	08/01/09
25	1481-1	DIPHENYL	100	MEOH	07/20/08
26	1545-2	OP-PEST	25	MEOH	02/14/09
27	1495-1	STEROLS	200	MEOH	12/29/08
28	1494-1	ADD. PEST	4	ACETONE	01/23/09
29	1496-3	DECANES	100	MEOH	02/12/09
30	1497-2	EDB/DBCP	2	ACETONE	02/12/09
31	1510-3	TERPINEOL	100	MEOH	03/21/09

LCS SOLUTIONS

12/30/08

32	1545-3	GUAIACOL	50-200	ACETONE	06/05/09
33	1522-1	RESIN ACID	250	ACETONE	06/11/09
34	1530-2	CONGENERS	1	ACETONE	07/23/09
50	1571-1	FULL RESIN	250	ACETONE	06/10/09
*=REVERIFIED SOLUTION					

SURR SOLUTIONS

12/30/08

LABEL	SOLN ID	TEST	CONC. UG/ML	SOLVENT	EXP.
A	1559-5	ABN	100/150	MEOH	03/13/09
B	1572-1	SIM PNA	15/75	MEOH	08/28/09
C	1559-1	SIM ABN	25/37.5	MEOH	03/13/09
D	1561-3	LOW PCB	0.2	ACETONE	07/31/09
E*	1478-1	HERB	62.5	MEOH	09/21/09
F	1520-3	PCP	12.5	ACETONE	04/18/09
G	1534-1	1,4DIOXANE	100	MEOH	02/20/09
H	1545-1	OP-PEST	25	MEOH	02/14/09
I	1559-4	LOW S. PNA	1.5	MEOH	08/28/09
J	1566-5	TBT-PORE	0.125	MECL2	12/04/09
K	1538-1	MED PCB	20	ACETONE	07/31/09
L	1566-4	TBT	2.5	MECL2	12/04/09
M	1558-2	EPH	1500	MECL2	09/24/09
N	1538-2	PCB	2	ACETONE	07/31/09
O	1567-4	TPH	450	MECL2	09/24/09
P	1560-3	HCID	2250	MECL2	09/24/09
Q	1497-3	EDB	2	ACETONE	02/12/09
R	1521-4	RESIN ACID	250	ACETONE	06/11/09
S	1568-5	PBDE	.25	MEOH	12/11/09
T	*reverified	solution			
U					
V					
W					
X					
Y					
Z					

Data Summary Package

prepared
for

HART CROWSER, INC.

Project: Port Gamble, 17330-14

ARI JOB NO: OH02

prepared
by

Analytical Resources, Inc.

SEMIVOLATILES

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270 GC/MS **Sample ID: PGSS-51**
Page 1 of 2 **SAMPLE**

Lab Sample ID: OH02E
LIMS ID: 09-657
Matrix: Sediment
Data Release Authorized:
Reported: 01/26/09

QC Report No: OH02-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/08/08
Date Received: 01/09/09

Date Extracted: 01/14/09
Date Analyzed: 01/22/09 23:02
Instrument/Analyst: NT4/LJR
GPC Cleanup: Yes

Sample Amount: 25.2 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 55.3%

CAS Number	Analyte	RL	Result
108-95-2	**Phenol**	**20**	**280**
541-73-1	1,3-Dichlorobenzene	20	< 20 U
106-46-7	1,4-Dichlorobenzene	20	< 20 U
100-51-6	Benzyl Alcohol	20	< 20 U
95-50-1	1,2-Dichlorobenzene	20	< 20 U
95-48-7	2-Methylphenol	20	< 20 U
106-44-5	**4-Methylphenol**	**20**	**18 J**
105-67-9	2,4-Dimethylphenol	20	< 20 U
65-85-0	Benzoic Acid	200	< 200 U
120-82-1	1,2,4-Trichlorobenzene	20	< 20 U
91-20-3	**Naphthalene**	**20**	**14 J**
87-68-3	Hexachlorobutadiene	20	< 20 U
91-57-6	2-Methylnaphthalene	20	< 20 U
131-11-3	Dimethylphthalate	20	< 20 U
208-96-8	Acenaphthylene	20	< 20 U
83-32-9	Acenaphthene	20	< 20 U
132-64-9	Dibenzofuran	20	< 20 U
84-66-2	Diethylphthalate	20	< 20 U
86-73-7	Fluorene	20	< 20 U
86-30-6	N-Nitrosodiphenylamine	20	< 20 U
118-74-1	Hexachlorobenzene	20	< 20 U
87-86-5	Pentachlorophenol	99	< 99 U
85-01-8	**Phenanthrene**	**20**	**32**
120-12-7	**Anthracene**	**20**	**12 J**
84-74-2	Di-n-Butylphthalate	20	< 20 U
206-44-0	**Fluoranthene**	**20**	**47**
129-00-0	**Pyrene**	**20**	**48**
85-68-7	Butylbenzylphthalate	20	< 20 U
56-55-3	**Benzo(a)anthracene**	**20**	**25**
117-81-7	bis(2-Ethylhexyl)phthalate	20	< 20 U
218-01-9	**Chrysene**	**20**	**40**
117-84-0	Di-n-Octyl phthalate	20	< 20 U
205-99-2	**Benzo(b)fluoranthene**	**20**	**26**
207-08-9	**Benzo(k)fluoranthene**	**20**	**24**
50-32-8	**Benzo(a)pyrene**	**20**	**17 J**
193-39-5	**Indeno(1,2,3-cd)pyrene**	**20**	**9.9 J**
53-70-3	Dibenz(a,h)anthracene	20	< 20 U
191-24-2	**Benzo(g,h,i)perylene**	**20**	**12 J**
90-05-1	Guaiacol	20	< 20 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270 GC/MS **Sample ID: PGSS-51**
 SAMPLE

Lab Sample ID: OH02E QC Report No: OH02-Hart Crowser, Inc.
LIMS ID: 09-657 Project: PORT GAMBLE
Matrix: Sediment 1733014
Date Analyzed: 01/22/09 23:02

CAS Number	Analyte	RL	Result
483-65-8	Retene	20	< 20 U
90-12-0	1-Methylnaphthalene	20	< 20 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	63.6%	2-Fluorobiphenyl	64.0%
d14-p-Terphenyl	83.2%	d4-1,2-Dichlorobenzene	48.0%
d5-Phenol	62.7%	2-Fluorophenol	57.3%
2,4,6-Tribromophenol	79.5%	d4-2-Chlorophenol	59.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270 GC/MS **Sample ID: PGSS-64**
Page 1 of 2 **SAMPLE**

Lab Sample ID: OH02P
LIMS ID: 09-668
Matrix: Sediment
Data Release Authorized:
Reported: 01/26/09

QC Report No: OH02-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/09/08
Date Received: 01/09/09

Date Extracted: 01/14/09
Date Analyzed: 01/22/09 23:37
Instrument/Analyst: NT4/LJR
GPC Cleanup: Yes

Sample Amount: 25.7 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 30.9%

CAS Number	Analyte	RL	Result
108-95-2	**Phenol**	**20**	**42**
541-73-1	1,3-Dichlorobenzene	20	< 20 U
106-46-7	1,4-Dichlorobenzene	20	< 20 U
100-51-6	Benzyl Alcohol	20	< 20 U
95-50-1	1,2-Dichlorobenzene	20	< 20 U
95-48-7	2-Methylphenol	20	< 20 U
106-44-5	4-Methylphenol	20	< 20 U
105-67-9	2,4-Dimethylphenol	20	< 20 U
65-85-0	Benzoic Acid	200	< 200 U
120-82-1	1,2,4-Trichlorobenzene	20	< 20 U
91-20-3	**Naphthalene**	**20**	**18 J**
87-68-3	Hexachlorobutadiene	20	< 20 U
91-57-6	2-Methylnaphthalene	20	< 20 U
131-11-3	Dimethylphthalate	20	< 20 U
208-96-8	Acenaphthylene	20	< 20 U
83-32-9	Acenaphthene	20	< 20 U
132-64-9	Dibenzofuran	20	< 20 U
84-66-2	Diethylphthalate	20	< 20 U
86-73-7	Fluorene	20	< 20 U
86-30-6	N-Nitrosodiphenylamine	20	< 20 U
118-74-1	Hexachlorobenzene	20	< 20 U
87-86-5	Pentachlorophenol	97	< 97 U
85-01-8	**Phenanthrene**	**20**	**13 J**
120-12-7	Anthracene	20	< 20 U
84-74-2	Di-n-Butylphthalate	20	< 20 U
206-44-0	**Fluoranthene**	**20**	**19 J**
129-00-0	**Pyrene**	**20**	**18 J**
85-68-7	Butylbenzylphthalate	20	< 20 U
56-55-3	**Benzo(a)anthracene**	**20**	**9.9 J**
117-81-7	bis(2-Ethylhexyl)phthalate	20	< 20 U
218-01-9	**Chrysene**	**20**	**16 J**
117-84-0	Di-n-Octyl phthalate	20	< 20 U
205-99-2	**Benzo(b)fluoranthene**	**20**	**12 J**
207-08-9	**Benzo(k)fluoranthene**	**20**	**11 J**
50-32-8	**Benzo(a)pyrene**	**20**	**10 J**
193-39-5	Indeno(1,2,3-cd)pyrene	20	< 20 U
53-70-3	Dibenz(a,h)anthracene	20	< 20 U
191-24-2	Benzo(g,h,i)perylene	20	< 20 U
90-05-1	Guaiacol	20	< 20 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270 GC/MS

Sample ID: PGSS-64
SAMPLE

Lab Sample ID: OH02P
LIMS ID: 09-668
Matrix: Sediment
Date Analyzed: 01/22/09 23:37

QC Report No: OH02-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014

CAS Number	Analyte	RL	Result
483-65-8	Retene	20	< 20 U
90-12-0	1-Methylnaphthalene	20	< 20 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	58.0%	2-Fluorobiphenyl	58.0%
d14-p-Terphenyl	74.8%	d4-1,2-Dichlorobenzene	50.4%
d5-Phenol	54.4%	2-Fluorophenol	52.5%
2,4,6-Tribromophenol	69.3%	d4-2-Chlorophenol	53.6%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270 GC/MS
Page 1 of 2

Sample ID: PGSS-73
SAMPLE

Lab Sample ID: OH02V
LIMS ID: 09-674
Matrix: Sediment
Data Release Authorized:
Reported: 01/26/09

QC Report No: OH02-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/09/08
Date Received: 01/09/09

Date Extracted: 01/14/09
Date Analyzed: 01/23/09 00:11
Instrument/Analyst: NT4/LJR
GPC Cleanup: Yes

Sample Amount: 25.3 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 21.0%

CAS Number	Analyte	RL	Result
108-95-2	Phenol	20	< 20 U
541-73-1	1,3-Dichlorobenzene	20	< 20 U
106-46-7	1,4-Dichlorobenzene	20	< 20 U
100-51-6	Benzyl Alcohol	20	< 20 U
95-50-1	1,2-Dichlorobenzene	20	< 20 U
95-48-7	2-Methylphenol	20	< 20 U
106-44-5	4-Methylphenol	20	< 20 U
105-67-9	2,4-Dimethylphenol	20	< 20 U
65-85-0	Benzoic Acid	200	< 200 U
120-82-1	1,2,4-Trichlorobenzene	20	< 20 U
91-20-3	Naphthalene	20	< 20 U
87-68-3	Hexachlorobutadiene	20	< 20 U
91-57-6	2-Methylnaphthalene	20	< 20 U
131-11-3	Dimethylphthalate	20	< 20 U
208-96-8	Acenaphthylene	20	< 20 U
83-32-9	Acenaphthene	20	< 20 U
132-64-9	Dibenzofuran	20	< 20 U
84-66-2	Diethylphthalate	20	< 20 U
86-73-7	Fluorene	20	< 20 U
86-30-6	N-Nitrosodiphenylamine	20	< 20 U
118-74-1	Hexachlorobenzene	20	< 20 U
87-86-5	Pentachlorophenol	99	< 99 U
85-01-8	Phenanthrene	20	< 20 U
120-12-7	Anthracene	20	< 20 U
84-74-2	Di-n-Butylphthalate	20	< 20 U
206-44-0	Fluoranthene	20	< 20 U
129-00-0	Pyrene	20	< 20 U
85-68-7	Butylbenzylphthalate	20	< 20 U
56-55-3	Benzo(a)anthracene	20	< 20 U
117-81-7	bis(2-Ethylhexyl)phthalate	20	< 20 U
218-01-9	Chrysene	20	< 20 U
117-84-0	Di-n-Octyl phthalate	20	< 20 U
205-99-2	Benzo(b)fluoranthene	20	< 20 U
207-08-9	Benzo(k)fluoranthene	20	< 20 U
50-32-8	Benzo(a)pyrene	20	< 20 U
193-39-5	Indeno(1,2,3-cd)pyrene	20	< 20 U
53-70-3	Dibenz(a,h)anthracene	20	< 20 U
191-24-2	Benzo(g,h,i)perylene	20	< 20 U
90-05-1	Guaiacol	20	< 20 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270 GC/MS **Sample ID: PGSS-73**
 SAMPLE

Lab Sample ID: OH02V QC Report No: OH02-Hart Crowser, Inc.
LIMS ID: 09-674 Project: PORT GAMBLE
Matrix: Sediment 1733014
Date Analyzed: 01/23/09 00:11

CAS Number	Analyte	RL	Result
483-65-8	**Retene**	**20**	**110**
90-12-0	1-Methylnaphthalene	20	< 20 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	64.8%	2-Fluorobiphenyl	62.8%
d14-p-Terphenyl	75.6%	d4-1,2-Dichlorobenzene	57.6%
d5-Phenol	58.4%	2-Fluorophenol	58.1%
2,4,6-Tribromophenol	68.3%	d4-2-Chlorophenol	59.5%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270 GC/MS
Page 1 of 2

Sample ID: PGSS-75
SAMPLE

Lab Sample ID: OH02W
LIMS ID: 09-675
Matrix: Sediment
Data Release Authorized:
Reported: 01/26/09

QC Report No: OH02-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/09/08
Date Received: 01/09/09

Date Extracted: 01/14/09
Date Analyzed: 01/23/09 00:45
Instrument/Analyst: NT4/LJR
GPC Cleanup: Yes

Sample Amount: 25.2 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 18.9%

CAS Number	Analyte	RL	Result
108-95-2	**Phenol**	**20**	**25**
541-73-1	1,3-Dichlorobenzene	20	< 20 U
106-46-7	1,4-Dichlorobenzene	20	< 20 U
100-51-6	Benzyl Alcohol	20	< 20 U
95-50-1	1,2-Dichlorobenzene	20	< 20 U
95-48-7	2-Methylphenol	20	< 20 U
106-44-5	4-Methylphenol	20	< 20 U
105-67-9	2,4-Dimethylphenol	20	< 20 U
65-85-0	**Benzoic Acid**	**200**	**120 J**
120-82-1	1,2,4-Trichlorobenzene	20	< 20 U
91-20-3	Naphthalene	20	< 20 U
87-68-3	Hexachlorobutadiene	20	< 20 U
91-57-6	2-Methylnaphthalene	20	< 20 U
131-11-3	Dimethylphthalate	20	< 20 U
208-96-8	Acenaphthylene	20	< 20 U
83-32-9	Acenaphthene	20	< 20 U
132-64-9	Dibenzofuran	20	< 20 U
84-66-2	Diethylphthalate	20	< 20 U
86-73-7	Fluorene	20	< 20 U
86-30-6	N-Nitrosodiphenylamine	20	< 20 U
118-74-1	Hexachlorobenzene	20	< 20 U
87-86-5	Pentachlorophenol	99	< 99 U
85-01-8	Phenanthrene	20	< 20 U
120-12-7	Anthracene	20	< 20 U
84-74-2	Di-n-Butylphthalate	20	< 20 U
206-44-0	Fluoranthene	20	< 20 U
129-00-0	Pyrene	20	< 20 U
85-68-7	Butylbenzylphthalate	20	< 20 U
56-55-3	Benzo(a)anthracene	20	< 20 U
117-81-7	bis(2-Ethylhexyl)phthalate	20	< 20 U
218-01-9	Chrysene	20	< 20 U
117-84-0	Di-n-Octyl phthalate	20	< 20 U
205-99-2	Benzo(b)fluoranthene	20	< 20 U
207-08-9	Benzo(k)fluoranthene	20	< 20 U
50-32-8	Benzo(a)pyrene	20	< 20 U
193-39-5	Indeno(1,2,3-cd)pyrene	20	< 20 U
53-70-3	Dibenz(a,h)anthracene	20	< 20 U
191-24-2	Benzo(g,h,i)perylene	20	< 20 U
90-05-1	Guaiacol	20	< 20 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270 GC/MS

Sample ID: PGSS-75
SAMPLE

Lab Sample ID: OH02W
LIMS ID: 09-675
Matrix: Sediment
Date Analyzed: 01/23/09 00:45

QC Report No: OH02-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014

CAS Number	Analyte	RL	Result
483-65-8	Retene	20	< 20 U
90-12-0	1-Methylnaphthalene	20	< 20 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	68.8%	2-Fluorobiphenyl	66.0%
d14-p-Terphenyl	79.6%	d4-1,2-Dichlorobenzene	58.4%
d5-Phenol	61.9%	2-Fluorophenol	60.5%
2,4,6-Tribromophenol	73.9%	d4-2-Chlorophenol	62.4%

ANALYTICAL RESOURCES INCORPORATED

SW8270 SEMIVOLATILES SOIL/SEDIMENT SURROGATE RECOVERY SUMMARY

Matrix: Sediment

QC Report No: OH02-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014

Client ID	NBZ	FBP	TPH	DCB	PHL	2FP	TBP	2CP	TOT OUT
MB-011409	66.8%	63.2%	98.0%	60.4%	65.9%	61.3%	70.7%	61.9%	0
LCS-011409	68.4%	62.0%	88.8%	59.2%	66.9%	60.3%	74.9%	61.9%	0
LCSD-011409	68.8%	62.4%	87.6%	59.6%	66.4%	60.5%	72.5%	61.9%	0
PGSS-51	63.6%	64.0%	83.2%	48.0%	62.7%	57.3%	79.5%	59.7%	0
PGSS-64	58.0%	58.0%	74.8%	50.4%	54.4%	52.5%	69.3%	53.6%	0
PGSS-73	64.8%	62.8%	75.6%	57.6%	58.4%	58.1%	68.3%	59.5%	0
PGSS-75	68.8%	66.0%	79.6%	58.4%	61.9%	60.5%	73.9%	62.4%	0

	LCS/MB LIMITS	QC LIMITS
(NBZ) = d5-Nitrobenzene	(37-85)	(29-87)
(FBP) = 2-Fluorobiphenyl	(39-82)	(32-88)
(TPH) = d14-p-Terphenyl	(38-105)	(21-97)
(DCB) = d4-1,2-Dichlorobenzene	(33-79)	(25-82)
(PHL) = d5-Phenol	(40-85)	(29-85)
(2FP) = 2-Fluorophenol	(20-93)	(10-114)
(TBP) = 2,4,6-Tribromophenol	(40-96)	(25-103)
(2CP) = d4-2-Chlorophenol	(41-81)	(30-84)

Prep Method: SW3550B
Log Number Range: 09-657 to 09-675

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270 GC/MS

Sample ID: LCS-011409
LCS/LCSD

Lab Sample ID: LCS-011409
LIMS ID: 09-657
Matrix: Sediment
Data Release Authorized:
Reported: 01/26/09

QC Report No: OH02-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/08/08
Date Received: 01/09/09

Date Extracted LCS/LCSD: 01/14/09

Date Analyzed LCS: 01/22/09 17:53
LCSD: 01/22/09 18:28
Instrument/Analyst LCS: NT4/LJR
LCSD: NT4/LJR
GPC Cleanup: YES

Sample Amount LCS: 25.0 g
LCSD: 25.0 g
Final Extract Volume LCS: 0.5 mL
LCSD: 0.5 mL
Dilution Factor LCS: 1.00
LCSD: 1.00
Percent Moisture: NA

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Phenol	313	500	62.6%	336	500	67.2%	7.1%
1,3-Dichlorobenzene	280	500	56.0%	304	500	60.8%	8.2%
1,4-Dichlorobenzene	283	500	56.6%	309	500	61.8%	8.8%
Benzyl Alcohol	420	1000	42.0%	457	1000	45.7%	8.4%
1,2-Dichlorobenzene	293	500	58.6%	320	500	64.0%	8.8%
2-Methylphenol	328	500	65.6%	345	500	69.0%	5.1%
4-Methylphenol	688	1000	68.8%	736	1000	73.6%	6.7%
2,4-Dimethylphenol	255	500	51.0%	288	500	57.6%	12.2%
Benzoic Acid	1010	1500	67.3%	1000	1500	66.7%	1.0%
1,2,4-Trichlorobenzene	300	500	60.0%	318	500	63.6%	5.8%
Naphthalene	310	500	62.0%	335	500	67.0%	7.8%
Hexachlorobutadiene	318	500	63.6%	337	500	67.4%	5.8%
2-Methylnaphthalene	320	500	64.0%	344	500	68.8%	7.2%
Dimethylphthalate	368	500	73.6%	392	500	78.4%	6.3%
Acenaphthylene	327	500	65.4%	345	500	69.0%	5.4%
Acenaphthene	330	500	66.0%	346	500	69.2%	4.7%
Dibenzofuran	343	500	68.6%	357	500	71.4%	4.0%
Diethylphthalate	414	500	82.8%	437	500	87.4%	5.4%
Fluorene	348	500	69.6%	366	500	73.2%	5.0%
N-Nitrosodiphenylamine	353	500	70.6%	373	500	74.6%	5.5%
Hexachlorobenzene	364	500	72.8%	384	500	76.8%	5.3%
Pentachlorophenol	356	500	71.2%	372	500	74.4%	4.4%
Phenanthrene	384	500	76.8%	405	500	81.0%	5.3%
Anthracene	364	500	72.8%	382	500	76.4%	4.8%
Di-n-Butylphthalate	402	500	80.4%	421	500	84.2%	4.6%
Fluoranthene	388	500	77.6%	405	500	81.0%	4.3%
Pyrene	456	500	91.2%	493	500	98.6%	7.8%
Butylbenzylphthalate	443	500	88.6%	473	500	94.6%	6.6%
Benzo(a)anthracene	384	500	76.8%	410	500	82.0%	6.5%
bis(2-Ethylhexyl)phthalate	440	500	88.0%	471	500	94.2%	6.8%
Chrysene	377	500	75.4%	394	500	78.8%	4.4%
Di-n-Octyl phthalate	391	500	78.2%	412	500	82.4%	5.2%
Benzo(b)fluoranthene	445	500	89.0%	482	500	96.4%	8.0%
Benzo(k)fluoranthene	438	500	87.6%	443	500	88.6%	1.1%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270 GC/MS
Page 2 of 2

Sample ID: LCSD-011409
LCS/LCSD

Lab Sample ID: LCS-011409
LIMS ID: 09-657
Matrix: Sediment
Date Analyzed LCS: 01/22/09 17:53
LCSD: 01/22/09 18:28

QC Report No: OH02-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Benzo(a)pyrene	330	500	66.0%	346	500	69.2%	4.7%
Indeno(1,2,3-cd)pyrene	402	500	80.4%	436	500	87.2%	8.1%
Dibenz(a,h)anthracene	393	500	78.6%	424	500	84.8%	7.6%
Benzo(g,h,i)perylene	404	500	80.8%	430	500	86.0%	6.2%
Guaiacol	342	500	68.4%	376	500	75.2%	9.5%
1-Methylnaphthalene	348	500	69.6%	375	500	75.0%	7.5%

Semivolatile Surrogate Recovery

	LCS	LCSD
d5-Nitrobenzene	68.4%	68.8%
2-Fluorobiphenyl	62.0%	62.4%
d14-p-Terphenyl	88.8%	87.6%
d4-1,2-Dichlorobenzene	59.2%	59.6%
d5-Phenol	66.9%	66.4%
2-Fluorophenol	60.3%	60.5%
2,4,6-Tribromophenol	74.9%	72.5%
d4-2-Chlorophenol	61.9%	61.9%

Results reported in µg/kg
RPD calculated using sample concentrations per SW846.

4B

SEMIVOLATILE METHOD BLANK SUMMARY

BLANK NO.

OH01MBS1

Lab Name: ANALYTICAL RESOURCES, INC — Client: HART CROWSER, INC.

ARI Job No: OH02 — Project: PORT GAMBLE

Lab File ID: OH01MB — Date Extracted: 01/14/09

Instrument ID: NT4 — Date Analyzed: 01/22/09

Matrix: SOLID — Time Analyzed: 1718

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

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01	OH01LCSS1	OH01LCSS1	OH01SB	01/22/09
02	OH01LCSDS1	OH01LCSDS1	OH01SBD	01/22/09
03	PGSS-77A	OH01A	OH01A	01/22/09
04	PGSS-80	OH01C	OH01C	01/22/09
05	PGSS-GEO-3	OH01F	OH01F	01/22/09
06	PGSS-92	OH01G	OH01G	01/22/09
07	PGSS-51	OH02E	OH02E	01/22/09
08	PGSS-64	OH02P	OH02P	01/22/09
09	PGSS-73	OH02V	OH02V	01/23/09
10	PGSS-75	OH02W	OH02W	01/23/09
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				

COMMENTS:

FORM IV SV

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270 GC/MS
Page 1 of 2

Sample ID: MB-011409
METHOD BLANK

Lab Sample ID: MB-011409
LIMS ID: 09-657
Matrix: Sediment
Data Release Authorized:
Reported: 01/26/09

QC Report No: OH02-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: NA
Date Received: NA

Date Extracted: 01/14/09
Date Analyzed: 01/22/09 17:18
Instrument/Analyst: NT4/LJR
GPC Cleanup: Yes

Sample Amount: 25.0 g
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: NA

CAS Number	Analyte	RL	Result
108-95-2	Phenol	20	< 20 U
541-73-1	1,3-Dichlorobenzene	20	< 20 U
106-46-7	1,4-Dichlorobenzene	20	< 20 U
100-51-6	Benzyl Alcohol	20	< 20 U
95-50-1	1,2-Dichlorobenzene	20	< 20 U
95-48-7	2-Methylphenol	20	< 20 U
106-44-5	4-Methylphenol	20	< 20 U
105-67-9	2,4-Dimethylphenol	20	< 20 U
65-85-0	Benzoic Acid	200	< 200 U
120-82-1	1,2,4-Trichlorobenzene	20	< 20 U
91-20-3	Naphthalene	20	< 20 U
87-68-3	Hexachlorobutadiene	20	< 20 U
91-57-6	2-Methylnaphthalene	20	< 20 U
131-11-3	Dimethylphthalate	20	< 20 U
208-96-8	Acenaphthylene	20	< 20 U
83-32-9	Acenaphthene	20	< 20 U
132-64-9	Dibenzofuran	20	< 20 U
84-66-2	Diethylphthalate	20	< 20 U
86-73-7	Fluorene	20	< 20 U
86-30-6	N-Nitrosodiphenylamine	20	< 20 U
118-74-1	Hexachlorobenzene	20	< 20 U
87-86-5	Pentachlorophenol	100	< 100 U
85-01-8	Phenanthrene	20	< 20 U
120-12-7	Anthracene	20	< 20 U
84-74-2	Di-n-Butylphthalate	20	< 20 U
206-44-0	Fluoranthene	20	< 20 U
129-00-0	Pyrene	20	< 20 U
85-68-7	Butylbenzylphthalate	20	< 20 U
56-55-3	Benzo(a)anthracene	20	< 20 U
117-81-7	bis(2-Ethylhexyl)phthalate	20	< 20 U
218-01-9	Chrysene	20	< 20 U
117-84-0	Di-n-Octyl phthalate	20	< 20 U
205-99-2	Benzo(b)fluoranthene	20	< 20 U
207-08-9	Benzo(k)fluoranthene	20	< 20 U
50-32-8	Benzo(a)pyrene	20	< 20 U
193-39-5	Indeno(1,2,3-cd)pyrene	20	< 20 U
53-70-3	Dibenz(a,h)anthracene	20	< 20 U
191-24-2	Benzo(g,h,i)perylene	20	< 20 U
90-05-1	Guaiacol	20	< 20 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270 GC/MS

Sample ID: MB-011409
METHOD BLANK

Lab Sample ID: MB-011409
LIMS ID: 09-657
Matrix: Sediment
Date Analyzed: 01/22/09 17:18

QC Report No: OH02-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014

CAS Number	Analyte	RL	Result
483-65-8	Retene	20	< 20 U
90-12-0	1-Methylnaphthalene	20	< 20 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	66.8%	2-Fluorobiphenyl	63.2%
d14-p-Terphenyl	98.0%	d4-1,2-Dichlorobenzene	60.4%
d5-Phenol	65.9%	2-Fluorophenol	61.3%
2,4,6-Tribromophenol	70.7%	d4-2-Chlorophenol	61.9%

PCB

ANALYTICAL RESOURCES INCORPORATED

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

Sample ID: PGSS-45
SAMPLE

Lab Sample ID: OH02A
LIMS ID: 09-653
Matrix: Sediment
Data Release Authorized:
Reported: 01/20/09

QC Report No: OH02-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/08/08
Date Received: 01/09/09

Date Extracted: 01/14/09
Date Analyzed: 01/19/09 14:20
Instrument/Analyst: ECD5/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.2 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: 60.9%

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

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	76.8%
Tetrachlorometaxylene	78.8%

ANALYTICAL RESOURCES INCORPORATED

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

Sample ID: PGSS-47
SAMPLE

Lab Sample ID: OH02C
LIMS ID: 09-655
Matrix: Sediment
Data Release Authorized:
Reported: 01/20/09

QC Report No: OH02-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/08/08
Date Received: 01/09/09

Date Extracted: 01/14/09
Date Analyzed: 01/19/09 14:37
Instrument/Analyst: ECD5/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.9 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: 30.8%

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	3.8	< 3.8 U
53469-21-9	Aroclor 1242	3.8	< 3.8 U
12672-29-6	Aroclor 1248	3.8	< 3.8 U
11097-69-1	Aroclor 1254	3.8	< 3.8 U
11096-82-5	Aroclor 1260	3.8	< 3.8 U
11104-28-2	Aroclor 1221	3.8	< 3.8 U
11141-16-5	Aroclor 1232	3.8	< 3.8 U
37324-23-5	Aroclor 1262	3.8	< 3.8 U
11100-14-4	Aroclor 1268	3.8	< 3.8 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	74.5%
Tetrachlorometaxylene	76.8%

ANALYTICAL RESOURCES INCORPORATED

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

Sample ID: PGSS-51
SAMPLE

Lab Sample ID: OH02E
LIMS ID: 09-657
Matrix: Sediment
Data Release Authorized:
Reported: 01/20/09

QC Report No: OH02-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/08/08
Date Received: 01/09/09

Date Extracted: 01/14/09
Date Analyzed: 01/19/09 14:54
Instrument/Analyst: ECD5/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.3 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: 55.3%

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

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	84.8%
Tetrachlorometaxylene	76.0%

ANALYTICAL RESOURCES INCORPORATED

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

Sample ID: PGSS-53
SAMPLE

Lab Sample ID: OH02F
LIMS ID: 09-658
Matrix: Sediment
Data Release Authorized:
Reported: 01/20/09

QC Report No: OH02-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/08/08
Date Received: 01/09/09

Date Extracted: 01/14/09
Date Analyzed: 01/19/09 15:11
Instrument/Analyst: ECD5/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.7 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: 55.6%

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

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	81.2%
Tetrachlorometaxylene	75.5%

ANALYTICAL RESOURCES INCORPORATED

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

Sample ID: PGSS-54
SAMPLE

Lab Sample ID: OH02G
LIMS ID: 09-659
Matrix: Sediment
Data Release Authorized:
Reported: 01/20/09

QC Report No: OH02-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/08/08
Date Received: 01/09/09

Date Extracted: 01/14/09
Date Analyzed: 01/19/09 15:28
Instrument/Analyst: ECD5/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.6 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: 48.1%

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

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	73.0%
Tetrachlorometaxylene	70.2%

ANALYTICAL RESOURCES INCORPORATED

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

Sample ID: PGSS-56
SAMPLE

Lab Sample ID: OH02I
LIMS ID: 09-661
Matrix: Sediment
Data Release Authorized:
Reported: 01/20/09

QC Report No: OH02-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/08/08
Date Received: 01/09/09

Date Extracted: 01/14/09
Date Analyzed: 01/19/09 15:45
Instrument/Analyst: ECD5/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.7 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: 24.0%

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

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	81.0%
Tetrachlorometaxylene	75.8%

ANALYTICAL RESOURCES INCORPORATED

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

Sample ID: PGSS-58
SAMPLE

Lab Sample ID: OH02J
LIMS ID: 09-662
Matrix: Sediment
Data Release Authorized:
Reported: 01/20/09

QC Report No: OH02-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/08/08
Date Received: 01/09/09

Date Extracted: 01/14/09
Date Analyzed: 01/19/09 16:02
Instrument/Analyst: ECD5/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.5 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: 62.3%

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	3.9	< 3.9 U
53469-21-9	Aroclor 1242	3.9	< 3.9 U
12672-29-6	Aroclor 1248	3.9	< 3.9 U
11097-69-1	Aroclor 1254	3.9	< 3.9 U
11096-82-5	Aroclor 1260	3.9	< 3.9 U
11104-28-2	Aroclor 1221	5.9	< 5.9 Y
11141-16-5	Aroclor 1232	3.9	< 3.9 U
37324-23-5	Aroclor 1262	3.9	< 3.9 U
11100-14-4	Aroclor 1268	3.9	< 3.9 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	65.5%
Tetrachlorometaxylene	66.2%

ANALYTICAL RESOURCES INCORPORATED

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

Sample ID: PGSS-62
SAMPLE

Lab Sample ID: OH02L
LIMS ID: 09-664
Matrix: Sediment
Data Release Authorized:
Reported: 01/20/09

QC Report No: OH02-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/08/08
Date Received: 01/09/09

Date Extracted: 01/14/09
Date Analyzed: 01/19/09 16:19
Instrument/Analyst: ECD5/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.7 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: 19.0%

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

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	73.5%
Tetrachlorometaxylene	70.0%

ANALYTICAL RESOURCES INCORPORATED

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

Sample ID: PGSS-63
SAMPLE

Lab Sample ID: OH02N
LIMS ID: 09-666
Matrix: Sediment
Data Release Authorized:
Reported: 01/20/09

QC Report No: OH02-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/09/08
Date Received: 01/09/09

Date Extracted: 01/14/09
Date Analyzed: 01/19/09 16:37
Instrument/Analyst: ECD5/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.8 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: 29.4%

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	3.9	< 3.9 U
53469-21-9	Aroclor 1242	3.9	< 3.9 U
12672-29-6	Aroclor 1248	3.9	< 3.9 U
11097-69-1	**Aroclor 1254**	**3.9**	**5.7**
11096-82-5	Aroclor 1260	3.9	< 3.9 U
11104-28-2	Aroclor 1221	3.9	< 3.9 U
11141-16-5	Aroclor 1232	3.9	< 3.9 U
37324-23-5	Aroclor 1262	3.9	< 3.9 U
11100-14-4	Aroclor 1268	3.9	< 3.9 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	74.8%
Tetrachlorometaxylene	73.8%

ANALYTICAL RESOURCES INCORPORATED

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

Sample ID: PGSS-64
SAMPLE

Lab Sample ID: OH02P
LIMS ID: 09-668
Matrix: Sediment
Data Release Authorized:
Reported: 01/20/09

QC Report No: OH02-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/09/08
Date Received: 01/09/09

Date Extracted: 01/14/09
Date Analyzed: 01/19/09 16:54
Instrument/Analyst: ECD5/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.9 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: 30.9%

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

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	83.5%
Tetrachlorometaxylene	82.0%

ANALYTICAL RESOURCES INCORPORATED

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

Sample ID: PGSS-67
SAMPLE

Lab Sample ID: OH02Q
LIMS ID: 09-669
Matrix: Sediment
Data Release Authorized:
Reported: 01/20/09

QC Report No: OH02-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/09/08
Date Received: 01/09/09

Date Extracted: 01/14/09
Date Analyzed: 01/19/09 17:11
Instrument/Analyst: ECD5/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.9 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: 27.2%

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

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	75.8%
Tetrachlorometaxylene	75.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA PCB by GC/ECD

Sample ID: PGSS-73
SAMPLE

Lab Sample ID: OH02V
LIMS ID: 09-674
Matrix: Sediment
Data Release Authorized:
Reported: 01/20/09

QC Report No: OH02-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/09/08
Date Received: 01/09/09

Date Extracted: 01/14/09
Date Analyzed: 01/19/09 17:28
Instrument/Analyst: ECD5/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.6 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: 21.0%

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

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	71.0%
Tetrachlorometaxylene	68.2%

ANALYTICAL RESOURCES INCORPORATED

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

Sample ID: PGSS-75
SAMPLE

Lab Sample ID: OH02W
LIMS ID: 09-675
Matrix: Sediment
Data Release Authorized:
Reported: 01/20/09

QC Report No: OH02-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/09/08
Date Received: 01/09/09

Date Extracted: 01/14/09
Date Analyzed: 01/19/09 17:45
Instrument/Analyst: ECD5/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.6 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: 18.9%

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

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	76.5%
Tetrachlorometaxylene	81.0%

ANALYTICAL RESOURCES INCORPORATED

SW8082/PCB SOIL/SEDIMENT SURROGATE RECOVERY SUMMARY

Matrix: Sediment

QC Report No: OH02-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014

Client ID	DCBP % REC	DCBP LCL-UCL	TCMX % REC	TCMX LCL-UCL	TOT OUT
MB-011409	81.0%	36-130	79.5%	30-119	0
LCS-011409	69.8%	36-130	60.8%	30-119	0
LCSD-011409	58.2%	36-130	54.2%	30-119	0
PGSS-45	76.8%	33-149	78.8%	32-121	0
PGSS-47	74.5%	33-149	76.8%	32-121	0
PGSS-51	84.8%	33-149	76.0%	32-121	0
PGSS-53	81.2%	33-149	75.5%	32-121	0
PGSS-54	73.0%	33-149	70.2%	32-121	0
PGSS-56	81.0%	33-149	75.8%	32-121	0
PGSS-58	65.5%	33-149	66.2%	32-121	0
PGSS-62	73.5%	33-149	70.0%	32-121	0
PGSS-63	74.8%	33-149	73.8%	32-121	0
PGSS-64	83.5%	33-149	82.0%	32-121	0
PGSS-67	75.8%	33-149	75.0%	32-121	0
PGSS-73	71.0%	33-149	68.2%	32-121	0
PGSS-75	76.5%	33-149	81.0%	32-121	0

Low Level PSDDA Control Limits
Prep Method: SW3550B
Log Number Range: 09-653 to 09-675

ANALYTICAL RESOURCES INCORPORATED

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

Sample ID: LCS-011409
LCS/LCSD

Lab Sample ID: LCS-011409
LIMS ID: 09-653
Matrix: Sediment
Data Release Authorized:
Reported: 01/20/09

QC Report No: OH02-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: NA
Date Received: NA

Date Extracted LCS/LCSD: 01/14/09

Date Analyzed LCS: 01/19/09 10:38
LCSD: 01/19/09 10:55
Instrument/Analyst LCS: ECD5/JGR
LCSD: ECD5/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount LCS: 25.0 g-dry-wt
LCSD: 25.0 g-dry-wt
Final Extract Volume LCS: 1.0 mL
LCSD: 1.0 mL
Dilution Factor LCS: 1.00
LCSD: 1.00
Silica Gel: No

Percent Moisture: NA

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Aroclor 1016	12.3	20.0	61.5%	12.3	20.0	61.5%	0.0%
Aroclor 1260	16.2	20.0	81.0%	13.8	20.0	69.0%	16.0%

PCB Surrogate Recovery

	LCS	LCSD
Decachlorobiphenyl	69.8%	58.2%
Tetrachlorometaxylene	60.8%	54.2%

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

PCB METHOD BLANK SUMMARY

BLANK NO.

OH01MBS1

Lab Name: ANALYTICAL RESOURCES, INC
Client: HART CROWSER, INC.

ARI Job No.: OH01
Project: PORT GAMBLE

Lab Sample ID: OH01MBS1
Lab File ID: 0119B015

Date Extracted: 01/14/09
Matrix: SOLID

Date Analyzed: 01/19/09
Instrument ID: ECD5

Time Analyzed: 1021
GC Columns: ZB5/ZB35

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

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED
01	OH01LCSS1	OH01LCSS1	01/19/09
02	OH01LCSDS1	OH01LCSDS1	01/19/09
03	PGSS-77A	OH01A	01/19/09
04	PGSS-77A MS	OH01AMS	01/19/09
05	PGSS-77A MSD	OH01AMSD	01/19/09
06	PGSS-80	OH01C	01/19/09
07	PGSS-GEO-3	OH01F	01/19/09
08	PGSS-92	OH01G	01/19/09
09	PGSS-51	OH02E	01/19/09
10	PGSS-64	OH02P	01/19/09
11	PGSS-73	OH02V	01/19/09
12	PGSS-75	OH02W	01/19/09

ALL RUNS ARE DUAL COLUMN

ANALYTICAL RESOURCES INCORPORATED

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

Sample ID: MB-011409
METHOD BLANK

Lab Sample ID: MB-011409
LIMS ID: 09-653
Matrix: Sediment
Data Release Authorized:
Reported: 01/20/09

QC Report No: OH02-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: NA
Date Received: NA

Date Extracted: 01/14/09
Date Analyzed: 01/19/09 10:21
Instrument/Analyst: ECD5/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.0 g
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: NA

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

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	81.0%
Tetrachlorometaxylene	79.5%

METALS

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: PGSS-51
SAMPLE

Lab Sample ID: OH02E
LIMS ID: 09-657
Matrix: Sediment
Data Release Authorized:
Reported: 01/27/09

QC Report No: OH02-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/08/08
Date Received: 01/09/09

Percent Total Solids: 43.7%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	01/14/09	6010B	01/23/09	7440-38-2	Arsenic	10	10	U
3050B	01/14/09	6010B	01/23/09	**7440-43-9**	**Cadmium**	0.4	**1.2**	
3050B	01/14/09	6010B	01/23/09	**7440-47-3**	**Chromium**	1	**34**	
3050B	01/14/09	6010B	01/23/09	**7440-50-8**	**Copper**	0.4	**25.5**	
3050B	01/14/09	6010B	01/23/09	**7439-92-1**	**Lead**	4	**8**	
CLP	01/14/09	7471A	01/16/09	7439-97-6	Mercury	0.1	0.1	U
3050B	01/14/09	6010B	01/23/09	7440-22-4	Silver	0.6	0.6	U
3050B	01/14/09	6010B	01/23/09	**7440-66-6**	**Zinc**	2	**61**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: PGSS-64
SAMPLE

Lab Sample ID: OH02P
LIMS ID: 09-668
Matrix: Sediment
Data Release Authorized:
Reported: 01/27/09

QC Report No: OH02-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/09/08
Date Received: 01/09/09

Percent Total Solids: 69.4%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	01/14/09	6010B	01/22/09	7440-38-2	Arsenic	7	7	U
3050B	01/14/09	6010B	01/22/09	**7440-43-9**	**Cadmium**	0.3	**0.6**	
3050B	01/14/09	6010B	01/22/09	**7440-47-3**	**Chromium**	0.7	**22.5**	
3050B	01/14/09	6010B	01/22/09	**7440-50-8**	**Copper**	0.3	**12.6**	
3050B	01/14/09	6010B	01/22/09	**7439-92-1**	**Lead**	3	**4**	
CLP	01/14/09	7471A	01/16/09	7439-97-6	Mercury	0.05	0.05	U
3050B	01/14/09	6010B	01/22/09	7440-22-4	Silver	0.4	0.4	U
3050B	01/14/09	6010B	01/22/09	**7440-66-6**	**Zinc**	1	**37**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: PGSS-73
SAMPLE

Lab Sample ID: OH02V
LIMS ID: 09-674
Matrix: Sediment
Data Release Authorized:
Reported: 01/27/09

QC Report No: OH02-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/09/08
Date Received: 01/09/09

Percent Total Solids: 80.5%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	01/14/09	6010B	01/22/09	7440-38-2	Arsenic	6	6	U
3050B	01/14/09	6010B	01/22/09	**7440-43-9**	**Cadmium**	0.2	**0.3**	
3050B	01/14/09	6010B	01/22/09	**7440-47-3**	**Chromium**	0.6	**16.2**	
3050B	01/14/09	6010B	01/22/09	**7440-50-8**	**Copper**	0.2	**6.8**	
3050B	01/14/09	6010B	01/22/09	7439-92-1	Lead	2	2	U
CLP	01/14/09	7471A	01/16/09	7439-97-6	Mercury	0.05	0.05	U
3050B	01/14/09	6010B	01/22/09	7440-22-4	Silver	0.4	0.4	U
3050B	01/14/09	6010B	01/22/09	**7440-66-6**	**Zinc**	1	**28**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: PGSS-75
SAMPLE

Lab Sample ID: OH02W
LIMS ID: 09-675
Matrix: Sediment
Data Release Authorized:
Reported: 01/27/09

QC Report No: OH02-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/09/08
Date Received: 01/09/09

Percent Total Solids: 80.8%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	01/14/09	6010B	01/22/09	7440-38-2	Arsenic	6	6	U
3050B	01/14/09	6010B	01/22/09	7440-43-9	Cadmium	0.2	0.2	U
3050B	01/14/09	6010B	01/22/09	**7440-47-3**	**Chromium**	0.6	**11.2**	
3050B	01/14/09	6010B	01/22/09	**7440-50-8**	**Copper**	0.2	**3.4**	
3050B	01/14/09	6010B	01/22/09	7439-92-1	Lead	2	2	U
CLP	01/14/09	7471A	01/16/09	7439-97-6	Mercury	0.05	0.05	U
3050B	01/14/09	6010B	01/22/09	7440-22-4	Silver	0.4	0.4	U
3050B	01/14/09	6010B	01/22/09	**7440-66-6**	**Zinc**	1	**17**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: LAB CONTROL

Lab Sample ID: OH02LCS
LIMS ID: 09-657
Matrix: Sediment
Data Release Authorized:
Reported: 01/27/09

QC Report No: OH02-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: NA
Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike Found	Spike Added	% Recovery	Q
Arsenic	6010B	207	200	104%	
Cadmium	6010B	51.3	50.0	103%	
Chromium	6010B	50.1	50.0	100%	
Copper	6010B	49.5	50.0	99.0%	
Lead	6010B	204	200	102%	
Silver	6010B	53.4	50.0	107%	
Zinc	6010B	51	50	102%	

Reported in mg/kg-dry

N-Control limit not met
NA-Not Applicable, Analyte Not Spiked
Control Limits: 80-120%

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS **Sample ID: METHOD BLANK**

Lab Sample ID: OH02MB
LIMS ID: 09-657
Matrix: Sediment
Data Release Authorized:
Reported: 01/27/09

QC Report No: OH02-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: NA
Date Received: NA

Percent Total Solids: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	01/14/09	6010B	01/22/09	7440-38-2	Arsenic	5	5	U
3050B	01/14/09	6010B	01/22/09	7440-43-9	Cadmium	0.2	0.2	U
3050B	01/14/09	6010B	01/22/09	7440-47-3	Chromium	0.5	0.5	U
3050B	01/14/09	6010B	01/22/09	7440-50-8	Copper	0.2	0.2	U
3050B	01/14/09	6010B	01/22/09	7439-92-1	Lead	2	2	U
3050B	01/14/09	6010B	01/22/09	7440-22-4	Silver	0.3	0.3	U
3050B	01/14/09	6010B	01/22/09	7440-66-6	Zinc	1	1	U

U-Analyte undetected at given RL
RL-Reporting Limit

DIOXIN

SGS

Laboratory Results

Ms. Kelly Bottem
Analytical Resources, Inc.
4611 S. 134th Place
Suite 100
Tukwila WA 98168-3240

Phone: 206-695-6211
Fax: 206-695-6201

Dear Ms. Bottem:

Enclosed is a full data package containing the final results for samples received by SGS Environmental Services, Inc. on January 15, 2009 under your project name "Port Gamble". The samples were analyzed by Method 1613 following SGS's Standard Operating Procedures and are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards.

Number of Samples Received:	4
Your Project Reference:	Port Gamble
SGS Project Number:	G1040-2

We appreciate your business and look forward to working with you again. Please contact me at 910-350-1903 if you have questions or need additional technical support.

Sincerely,

Jeannie Milholland

Jeannie Milholland
Project Manager

2-17-2009
Date

DC138.033007.7

SGS

Case Narrative
SGS Project: **G1040-2**
Project Name: **Port Gamble**

For Method: 1613

- The submitted samples were accepted into the lab on January 15th, 2009 and extracted on January 19th, 2009 by method 3540C. The sample extract and associated QC extracts were then processed through clean-up as prescribed in the SGS standard operating procedures and analyzed by HRGC/HRMS for method 1613.
- No analytical issues were encountered.

Craig Tronzo 2/18/09

Craig R. Tronzo Date
Data Validation

Paradigm Analytical Laboratories, Inc. | 5500 Business Dr., Wilmington, NC 28405 t (910) 350-1903 f (910) 350-1557 www.us.sgs.com

SGS

Table of Contents

Section 1: Cover Letter/Case Narrative

Contains the Table of Contents, a project narrative, the client and SGS project identifiers, the number and type of samples, the methodology used to process the samples, and a summary table of sample results. A listing of current certifications by state, a table of abbreviations and qualifiers and the Toxic Equivalent Factors (TEF) are also supplied.

Section 2: Project Information

Contains the chain-of-custody(s), internal chain-of-custody(s) if applicable, sample login summary, sample receipt checklist, and any other project/client specific information.

Section 3: Sample Analytical Results

Contains results for client samples. Sample results include two pages of summarized analytical data and the associated raw data. The raw data includes a quantitation report from the instrumentation used that lists, ion areas, ratios, retention times, concentrations, and signal-to-noise ratios. It also has the selected ion current profiles (SICPs) for all homolog groups and any manual integrations.

Section 4: Quality Control Analytical Results

Contains results for each analytical workgroup associated with the submitted samples. A workgroup consists of the Lab Method Blank (LMB) and the Ongoing Precision and Recovery sample (OPR). All sample preparation data, including dry weight determinations, extraction logs, clean-up logs and observation notes are also documented. Any other supporting QC data will be documented here upon client request.

Section 5: Initial Calibration

Contains a table summarizing calibration data such as relative response factors, concentrations, and percent relative standard deviation. This section also contains related daily instrument QC information: GC performance data, mass resolution check, windows defining mix, and SICPs for all homolog groups and any manual integrations as well as the injection prep and instrument run logs.

Section 6: Continuing Calibration Data

Contains all daily instrument quality control information. This includes mass resolution checks, a table summarizing the window defining peaks, SICPs for the first and last eluters for each homolog group, SICPs documenting GC performance, a summary quantitation report showing RRFs for the Ccal and Ical, and SICPs for all homolog groups and any manual integrations, injection prep and instrumentation runlogs.

SGS

List of Qualifiers: Dioxin's

B	Analyte was detected in the Lab Method Blank at a level above the Reporting Limit.
EDL	"Estimated Detection Limit"
EMPC	"Estimated Maximum Possible Concentration"
RL	Report Limit
CL	Control Limit
U	Undetected
ppt	Parts-per-trillion (pg/g; ng/L)
V	Recovery is below quality control limit. The data has been validated based on a favorable signal-to-noise and detection limit.
#	Outside quality control limits
*	Indicates that the ion-ratio fails high or low; analyte reported as an EMPC

An average uncertainty of 30% can be routinely achieved as concluded from the evaluation of HRGC-HRMS standard operating procedures. The following flags warn the data user of situations where the uncertainty may be greater than stated.

A	Amount detected is less than the Lower Method Calibration Limit.
J	Amount detected is between the Method Detection Limit and the Lower Calibration Limit.
O	The recovery of this analyte in the OPR is above the Method QC Limits and the reported concentration in the sample may be biased high.
E	Amount detected is greater than the Upper Calibration Limit.
S	The amount of analyte present has saturated the detector. This situation results in an underestimation of the affected analyte(s).
Q	Indicates the presence of a quantitative interference. This situation may result in an underestimation of the affected analyte(s).
I	Indicates the presence of a qualitative interference that could cause a false positive or an overestimation of the affected analyte(s).
DPE	Indicates the presence of a peak in the polychlorinated diphenylether channel that could cause a false positive or an overestimation of the affected analyte(s).

DC250.081908.1

SGS

Toxic Equivalency Factors

Analyte	WHO* 1998	WHO* 2005	International-89	MADEP+
2,3,7,8-TCDD	1	1	1	1
1,2,3,7,8-PeCDD	1	1	0.5	0.5
1,2,3,4,7,8-HxCDD	0.1	0.1	0.1	0.1
1,2,3,6,7,8-HxCDD	0.1	0.1	0.1	0.1
1,2,3,7,8,9-HxCDD	0.1	0.1	0.1	0.1
1,2,3,4,6,7,8-HpCDD	0.01	0.01	0.01	0.1
OCDD	0.0001	0.0003	0.001	0.001
2,3,7,8-TCDF	0.1	0.1	0.1	0.1
1,2,3,7,8-PeCDF	0.05	0.03	0.05	0.5
2,3,4,7,8-PeCDF	0.5	0.3	0.5	0.5
1,2,3,4,7,8-HxCDF	0.1	0.1	0.1	0.1
1,2,3,6,7,8-HxCDF	0.1	0.1	0.1	0.1
2,3,4,6,7,8-HxCDF	0.1	0.1	0.1	0.1
1,2,3,7,8,9-HxCDF	0.1	0.1	0.1	0.1
1,2,3,4,6,7,8-HpCDF	0.01	0.01	0.01	0.1
1,2,3,4,7,8,9-HpCDF	0.01	0.01	0.01	0.1
OCDF	0.0001	0.0003	0.001	0.001

* World Health Organization
+ Massachusetts Department of Environmental Protection

SUBCONTRACTOR ANALYSIS REQUEST
CUSTODY TRANSFER 01/09/09

ANALYTICAL RESOURCES INCORPORATED

ARI Project: OH02

G1040-2

Laboratory: SGS ENVIROMENTAL SERVICES INC.
Lab Contact: TRENT TEMPERLY
Lab Address: 5500 BUSINESS DR.
WILMINGTON, NC 28405
Phone: 910-350-1903
Fax: 910-350-1557

ARI Client: Hart Crowser, Inc.
Project ID: PORT GAMBLE
ARI PM: Kelly Bottem
Phone: 206-695-6211
Fax: 206-695-6201

Analytical Protocol: PSDDA
Special Instructions:

Requested Turn Around: **01/23/09**
Fax Results (Y/N): **Yes**

Limits of Liability. *Subcontractor is expected to perform all requested services in accordance with appropriate methodology following Standard Operating Procedures that meet standards for the industry. The total liability of ARI, its officers, agents, employees, or sucessors, arising out of or in connection with the requested services, shall not exceed the negotiated amount for said services. The agreement by the Subcontractor to perform services requested by ARI releases 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 Subcontractor.*

ARI ID	Client ID/ Add'l ID	Sampled	Matrix	Bottles	Analyses
09-657-OH02E	PGSS-51	12/08/08 14:25	Sediment	1	Dioxin/Furans 1613(Sub)
Special Instructions: None					
09-668-OH02P	PGSS-64	12/09/08 10:35	Sediment	1	Dioxin/Furans 1613(Sub)
Special Instructions: None					
09-674-OH02V	PGSS-73	12/09/08 14:28	Sediment	1	Dioxin/Furans 1613(Sub)
Special Instructions: None					
09-675-OH02W	PGSS-75	12/09/08 14:58	Sediment	1	Dioxin/Furans 1613(Sub)
Special Instructions: None					

Carrier UPS	Airbill 1Z 832 695 01 4551 0751		Date 1/14/09
Relinquished by	Company ARI	Date 1/14/09	Time 1600
Received by	Company SGS 2.1 no seal	Date 1/15/09	Time 10:15

Subcontractor Custody Form - **OH02**
Page 1 of 1

SGS Environmental Services, Inc.

Cust Proj ID: OH02
Client Name: Analytical Resources, Inc. PO:

G1040-2

Due Date: 2009-02-05 17:00:00
Login Date: 2009-01-16 09:34:54

Sample ID		Cust Sample ID	PRI	Date Collected	Date Received	Date Due	Matrix	LOC	Report	Analysis	Status
G1040-2-1	A	PGSS-51	STD	2008-12-08 14:25:00	2009-01-15	2009-02-05	Sediment	W2	Full	1613	LG::REVW
G1040-2-2	A	PGSS-64	STD	2008-12-09 10:35:00	2009-01-15	2009-02-05	Sediment	W2	Full	1613	LG::REVW
G1040-2-3	A	PGSS-73	STD	2008-12-09 14:28:00	2009-01-15	2009-02-05	Sediment	W2	Full	1613	LG::REVW
G1040-2-4	A	PGSS-75	STD	2008-12-09 14:58:00	2009-01-15	2009-02-05	Sediment	W2	Full	1613	LG::REVW

Sample Receipt Checklist (SRC)

SGS Environmetal Services Inc.

Client: **Analytical Resources, Inc.** Lab Proj. ID: **G1040-2**

Client Proj. ID: **OH02**

1. X Shipped
   __ Hand Delivered
   Notes:

2. X Proper, full, and complete documentation
   (unique sample identification on durable label with indelible ink, location of collection, date/time of collection, collector's name, preservation type, sample type (method/matrix))
   __ Acceptable documentation (but, incomplete)
   __ Unacceptable documentation
   Notes:

3. __ Custody Tape on Container
   X No Custody Tape
   Notes:

4. X Samples Intact*
   (are in appropriate container, are not damaged, and do not show signs of contamination)
   __ Samples Broken / Leaking
   __ VOA Vials Checked for Air Bubbles
   Notes:

5. X Chilled on Receipt* Actual Temp.(s) in °C: 2.1
   __ Ambient on Receipt
   __ Walk-in on Ice; Coming down to temp.
   __ Received out of temperature protocol
   Notes:

6. X Sufficient Sample Submitted
   __ Insufficient Sample Submitted
   Notes:

7. X Samples Preserved Correctly*
   (see preservative checklist where applicable)
   __ Improper Preservative(s)
   __ None recommended (N/A)
   Notes:

8. X Received Within Holding Time
   __ Not Received Within Holding Time
   __ N/A
   Notes:

9. X No Discrepancies Noted
   __ Discrepancies Noted
   Notes:

Comments:

* = Rejection of sample is required when not marked; Contact client services immediately for a resolution.

DC27.091503.3

Inspected and Logged in by:

Date / Time: Fri-1/16/09 09:34

Method 1613

PGSS-51

Analytical Resources, Inc.

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	RL (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	1.00			
1,2,3,7,8-PeCDD	ND	5.00			
1,2,3,4,7,8-HxCDD	ND	5.00			
1,2,3,6,7,8-HxCDD	ND	5.00			
1,2,3,7,8,9-HxCDD	ND	5.00			
1,2,3,4,6,7,8-HpCDD	48.3	5.00	40:20	1.07	
OCDD	449	10.0	44:40	0.89	
2,3,7,8-TCDF	1.86	1.00	30:53	0.80	
1,2,3,7,8-PeCDF	ND	5.00			
2,3,4,7,8-PeCDF	ND	5.00			
1,2,3,4,7,8-HxCDF	ND	5.00			
1,2,3,6,7,8-HxCDF	ND	5.00			
2,3,4,6,7,8-HxCDF	ND	5.00			
1,2,3,7,8,9-HxCDF	ND	5.00			
1,2,3,4,6,7,8-HpCDF	5.52	5.00	39:03	1.00	
1,2,3,4,7,8,9-HpCDF	ND	5.00			
OCDF	13.8	10.0	44:59	0.88	
Total TCDDs	23.3	1.00			
Total PeCDDs	ND	5.00			Q
Total HxCDDs	32.1	5.00			
Total HpCDDs	286	5.00			
Total TCDFs	25.2	1.00			Q DPE
Total PeCDFs	ND	5.00			Q
Total HxCDFs	ND	5.00			
Total HpCDFs	15.4	5.00			
WHO-2005 TEQ (ND=0)	0.863				
WHO-2005 TEQ (ND=½)	6.46				

Client Information

Project Name:	Port Gamble		**Sample Information**		
			Matrix:	Sediment	
Sample ID:	PGSS-51		Weight / Volume:	24.77	grams
			Solids / Lipids:	41.9	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG16440	
Project ID:	G1040-2				
Sample ID:	G1040-2-1B		Filename:	a27jan09a_6-10	
Collection Date/Time:	08-Dec-08	14:25	Retchk:	a27jan09a_5-14	
Receipt Date:	15-Jan-09	10:15	Begin ConCal:	a27jan09a_5-14	
Extraction Date:	19-Jan-09				
Analysis Date:	30-Jan-09	3:20	Initial Cal:	m1613-100708a	

Method 1613

PGSS-51

Analytical Resources, Inc.

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
$^{13}C_{12}$-2,3,7,8-TCDD	2	1.61	80.4	31:27	0.78	
$^{13}C_{12}$-1,2,3,7,8-PeCDD	2	1.54	76.9	34:16	1.56	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	2	1.58	79.2	36:53	1.38	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	2	1.55	77.3	36:58	1.17	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	2	1.36	68.1	40:19	1.07	
$^{13}C_{12}$-OCDD	4	2.29	57.3	44:39	0.89	
$^{13}C_{12}$-2,3,7,8-TCDF	2	1.63	81.6	30:52	0.80	
$^{13}C_{12}$-1,2,3,7,8-PeCDF	2	1.63	81.5	33:27	1.57	
$^{13}C_{12}$-2,3,4,7,8-PeCDF	2	1.53	76.7	34:04	1.57	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	2	1.68	84.1	36:09	0.52	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	2	1.61	80.5	36:16	0.53	
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	2	1.61	80.5	36:45	0.52	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	2	1.59	79.7	37:32	0.52	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	2	1.40	70.0	39:03	0.45	
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	2	1.43	71.5	41:01	0.45	
Cleanup Standard						
$^{37}Cl_4$-2,3,7,8-TCDD	0.4	0.353	88.3	31:28		
Injection Standards						
$^{13}C_{12}$-1,2,3,4-TCDD	2			31:01	0.80	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	2			37:13	1.26	

Client Information

Project Name:	Port Gamble
Sample ID:	PGSS-51

Laboratory Information

Project ID:	G1040-2	
Sample ID:	G1040-2-1B	
Collection Date/Time:	08-Dec-08	14:25
Receipt Date:	15-Jan-09	10:15
Extraction Date:	19-Jan-09	
Analysis Date:	30-Jan-09	3:20

Sample Information

Matrix:	Sediment	
Weight / Volume:	24.77	grams
Solids / Lipids:	41.9	%
Original pH :	NA	
Batch ID:	WG16440	
Filename:	a27jan09a_6-10	
Retchk:	a27jan09a_5-14	
Begin ConCal:	a27jan09a_5-14	
Initial Cal:	m1613-100708a	

Analyzed by: _____ Date: 021709

Reviewed by: TM Date: 02/17/09

Form Version:[1613_HRMS12]Repor

;*1613*
;Inst: HRMS1

Filename ; a27jan09a_6
Sample ; 10
Acquired ; 30-JAN-09 03:20:36
Processed ; 30-JAN-09 08:16:38
Sample ID ; G1040-2-1B
Cal Table ; m1613-100708a
Results Table ; m1613-012709a_6
Comments ;

[OCDD] = (2.60e7 + 2.92e7) / (2.10e7 + 2.35e7) (4000pg / (24.77g x 0.4193)) (1 / 1.063) = 449pg/g
02/17/09

Ent;	Name;	Resp;	Ion 1;	Ion 2;	RA;?;	RT;	Conc;	EDL;	S/N1;?;	S/N2;?;M; Signal1; Noise 1; Signal2; Noise 2
1 ;	2,3,7,8-TCDD;	1.85e+05;	7.24e+04;	1.13e+05;	0.64;n;	31:28;	0.217;	0.1326;	4;y;	6;y;n;1.96e+04;5.56e+03;2.84e+04;4.55e+03
2 ;	1,2,3,7,8-PeCDD;	2.11e+05;	1.46e+05;	6.49e+04;	2.25;n;	34:17;	0.338;	0.2136;	4;y;	4;y;n;4.00e+04;9.36e+03;2.79e+04;6.94e+03
3 ;	1,2,3,4,7,8-HxCDD;	9.72e+04;	5.84e+04;	3.88e+04;	1.50;n;	36:53;	0.200;	0.3778;	3;n;	2;n;n;2.80e+04;9.47e+03;1.62e+04;8.46e+03
4 ;	1,2,3,6,7,8-HxCDD;	5.36e+05;	3.21e+05;	2.15e+05;	1.49;n;	36:59;	1.081;	0.3609;	11;y;	8;y;n;1.04e+05;9.47e+03;6.74e+04;8.46e+03
5 ;	1,2,3,7,8,9-HxCDD;	2.90e+05;	1.91e+05;	9.84e+04;	1.94;n;	37:14;	0.595;	0.3719;	6;y;	4;y;n;5.74e+04;9.47e+03;3.26e+04;8.46e+03
6 ;	1,2,3,4,6,7,8-HpCDD;	8.84e+06;	4.56e+06;	4.28e+06;	1.07;y;	40:20;	25.094;	0.6896;	115;y;	102;y;n;1.05e+06;9.20e+03;9.87e+05;9.71e+03
7 ;	OCDD;	5.52e+07;	2.60e+07;	2.92e+07;	0.89;y;	44:40;	233.267;	1.0104;	693;y;	757;y;n;4.90e+06;7.07e+03;5.39e+06;7.12e+03
8 ;	2,3,7,8-TCDF;	1.28e+06;	5.70e+05;	7.09e+05;	0.80;y;	30:53;	0.967;	0.1335;	23;y;	20;y;y;1.18e+05;5.22e+03;1.57e+05;7.78e+03
9 ;	1,2,3,7,8-PeCDF;	3.37e+05;	1.89e+05;	1.48e+05;	1.28;n;	33:28;	0.332;	0.1261;	9;y;	9;y;n;7.97e+04;9.28e+03;6.34e+04;7.42e+03
10 ;	2,3,4,7,8-PeCDF;	4.93e+05;	3.03e+05;	1.90e+05;	1.59;y;	34:05;	0.501;	0.1397;	11;y;	8;y;n;1.03e+05;9.28e+03;6.11e+04;7.42e+03
11 ;	1,2,3,4,7,8-HxCDF;	1.91e+05;	8.31e+04;	1.08e+05;	0.77;n;	36:10;	0.255;	0.2846;	3;y;	4;y;n;3.47e+04;1.11e+04;3.74e+04;1.04e+04
12 ;	1,2,3,6,7,8-HxCDF;	1.47e+05;	6.70e+04;	7.96e+04;	0.84;n;	36:16;	0.190;	0.2576;	2;n;	2;n;n;2.62e+04;1.11e+04;2.17e+04;1.04e+04
13 ;	2,3,4,6,7,8-HxCDF;	1.93e+05;	1.22e+05;	7.07e+04;	1.72;n;	36:46;	0.265;	0.3071;	4;y;	2;n;n;4.42e+04;1.11e+04;2.35e+04;1.04e+04
14 ;	1,2,3,7,8,9-HxCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.3837;	*;n;	*;n;n; *;1.11e+04; *;1.04e+04
15 ;	1,2,3,4,6,7,8-HpCDF;	1.68e+06;	8.41e+05;	8.38e+05;	1.00;y;	39:03;	2.866;	0.3295;	25;y;	29;y;n;2.31e+05;9.13e+03;2.28e+05;7.81e+03
16 ;	1,2,3,4,7,8,9-HpCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.4849;	*;n;	*;n;n; *;9.13e+03; *;7.81e+03
17 ;	OCDF;	2.02e+06;	9.42e+05;	1.08e+06;	0.88;y;	44:59;	7.172;	0.8233;	28;y;	30;y;n;1.92e+05;6.88e+03;2.04e+05;6.86e+03
Extraction Standards										
18 ;	13C-2,3,7,8-TCDD;	8.48e+07;	3.73e+07;	4.76e+07;	0.78;y;	31:27;	80.339;	0.1515;	1452;y;	2061;y;n;9.94e+06;6.84e+03;1.27e+07;6.18e+03
19 ;	13C-1,2,3,7,8-PeCDD;	5.93e+07;	3.62e+07;	2.32e+07;	1.56;y;	34:16;	76.874;	0.2234;	1956;y;	1172;y;n;1.33e+07;6.78e+03;8.51e+06;7.26e+03
20 ;	13C-1,2,3,4,7,8-HxCDD;	4.71e+07;	2.73e+07;	1.98e+07;	1.38;y;	36:53;	79.188;	0.2591;	1007;y;	796;y;n;7.65e+06;7.59e+03;6.09e+06;7.65e+03
21 ;	13C-1,2,3,6,7,8-HxCDD;	5.00e+07;	2.70e+07;	2.30e+07;	1.17;y;	36:58;	77.321;	0.2384;	1099;y;	880;y;n;8.35e+06;7.59e+03;6.73e+06;7.65e+03
22 ;	13C-1,2,3,4,6,7,8-HpCDD;	3.32e+07;	1.71e+07;	1.61e+07;	1.07;y;	40:19;	68.067;	0.3009;	505;y;	568;y;n;3.94e+06;7.79e+03;3.82e+06;6.72e+03
23 ;	13C-OCDD;	4.45e+07;	2.10e+07;	2.35e+07;	0.89;y;	44:39;	114.640;	0.3001;	541;y;	908;y;n;3.74e+06;6.92e+03;4.17e+06;4.60e+03
24 ;	13C-2,3,7,8-TCDF;	1.28e+08;	5.66e+07;	7.10e+07;	0.80;y;	30:52;	81.541;	0.1080;	1701;y;	2452;y;n;1.26e+07;7.42e+03;1.55e+07;6.34e+03
25 ;	13C-1,2,3,7,8-PeCDF;	1.03e+08;	6.29e+07;	4.02e+07;	1.57;y;	33:27;	81.506;	0.2331;	3301;y;	957;y;n;2.42e+07;7.32e+03;1.60e+07;1.67e+04
26 ;	13C-2,3,4,7,8-PeCDF;	9.49e+07;	5.79e+07;	3.70e+07;	1.57;y;	34:04;	76.666;	0.2381;	2895;y;	805;y;n;2.12e+07;7.32e+03;1.34e+07;1.67e+04
27 ;	13C-1,2,3,4,7,8-HxCDF;	6.46e+07;	2.22e+07;	4.25e+07;	0.52;y;	36:09;	84.114;	0.2251;	853;y;	1397;y;n;6.72e+06;7.88e+03;1.29e+07;9.22e+03
28 ;	13C-1,2,3,6,7,8-HxCDF;	6.83e+07;	2.36e+07;	4.47e+07;	0.53;y;	36:16;	80.479;	0.2039;	971;y;	1567;y;n;7.65e+06;7.88e+03;1.44e+07;9.22e+03
29 ;	13C-2,3,4,6,7,8-HxCDF;	6.42e+07;	2.21e+07;	4.21e+07;	0.52;y;	36:45;	80.449;	0.2168;	816;y;	1306;y;n;6.43e+06;7.88e+03;1.20e+07;9.22e+03
30 ;	13C-1,2,3,7,8,9-HxCDF;	5.66e+07;	1.94e+07;	3.72e+07;	0.52;y;	37:32;	79.631;	0.2434;	666;y;	1085;y;n;5.25e+06;7.88e+03;1.00e+07;9.22e+03
31 ;	13C-1,2,3,4,6,7,8-HpCDF;	4.26e+07;	1.32e+07;	2.94e+07;	0.45;y;	39:03;	69.978;	0.2776;	489;y;	806;y;n;3.46e+06;7.08e+03;7.76e+06;9.62e+03
32 ;	13C-1,2,3,4,7,8,9-HpCDF;	3.43e+07;	1.07e+07;	2.36e+07;	0.45;y;	41:01;	71.439;	0.3524;	338;y;	552;y;n;2.39e+06;7.08e+03;5.32e+06;9.62e+03
Injection Standards										
33 ;	13C-1,2,3,4-TCDD;	9.47e+07;	4.20e+07;	5.27e+07;	0.80;y;	31:01;	69.668;	-;	1496;y;	2086;y;n;1.02e+07;6.84e+03;1.29e+07;6.18e+03
34 ;	13C-1,2,3,7,8,9-HxCDD;	6.19e+07;	3.45e+07;	2.74e+07;	1.26;y;	37:13;	57.359;	-;	1348;y;	1063;y;n;1.02e+07;7.59e+03;8.13e+06;7.65e+03
Cleanup Standard										
35 ;	37Cl-2,3,7,8-TCDD;	1.99e+07;	1.99e+07;	-;	-;-;	31:28;	17.671;	0.0781;	768;y;	-;-;n;5.50e+06;7.16e+03; -; -

Totals Raw Data

	Conc	Empc	Flags
TCDF	13.074	13.074	FALSE
TCDD	12.077	12.077	FALSE
PeCDF	0	0	FALSE
PeCDD	0	0	FALSE
HxCDF	0	0	FALSE
HxCDD	16.659	16.659	FALSE
HpCDF	7.99	7.99	FALSE
HpCDD	148.337	148.337	FALSE

Filename: a27jan09a_6 Name of Homolog Group: Total Tetra-Furans
Sample: 10 Number of Peaks Found: 21 12
Acquired: 30-JAN-09 03:20:36 RRF Used For Totals: 1.0368
Processed: 30-JAN-09 08:16:38 Detection Limit: 0.1335 RL=0.500 (pg/µL)
Sample ID: G1040-2-1B Noise Height Ion1/Ion2: 5224 / 7776
Cal Table: m1613-100708a Begin Window: 26:14:00
Results Table: m1613-012709a_6 End Window: 33:07:00

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	8.97E+05	395000	502000		0.79 y	26:35	0.678	OK	13.8	y	13.2	y	n
	2	6.08E+05	280000	329000		0.85 y	27:02	0.46	RL	11.4	y	9.2	y	n
	3	9.13E+05	405000	507000		0.8 y	27:33	0.69	OK	14.6	y	13.5	y	n
	4	3.12E+06	1400000	1720000		0.81 y	27:55	2.359	OK	37.9	y	30.7	y	n
	5	2.10E+06	934000	1170000		0.8 y	28:14	1.589	OK	24.1	y	19.1	y	n
	6	9.69E+05	423000	547000		0.77 y	28:36	0.733	OK	13.8	y	11.9	y	y
	7	3.95E+05	165000	230000		0.72 y	28:43	0.299	RL	7	y	7.4	y	y
	8	9.91E+05	414000	577000		0.72 y	28:52	0.749	OK	15.4	y	12.7	y	y
	9	6.29E+05	298000	331000		0.9 n	29:11	0.476	RL	10.5	y	7.4	y	n
	10	7.90E+05	357000	433000		0.83 y	29:21	0.597	OK	11.4	y	9.9	y	n
	11	2.38E+06	1050000	1340000		0.78 y	29:32	1.8	OK	27.3	y	23.7	y	n
	12	1.43E+06	639000	790000		0.81 y	30:00	1.08	OK	21.8	y	16.8	y	n
	13	6.69E+05	310000	359000		0.86 y	30:17	0.506	OK	10.2	y	8.9	y	n
	14	3.58E+05	167000	191000		0.88 y	30:28	0.271	RL	5.6	y	4.4	y	n
	15	6.12E+05	276000	337000		0.82 y	30:41	0.463	RL	9.5	y	8.4	y	y
	16	3.50E+05	159000	192000		0.83 y	30:47	0.265	RL	9.2	y	6.9	y	y
2,3,7,8-TCDF	17	1.28E+06	570000	709000		0.8 y	30:53	0.967	OK	22.5	y	20.2	y	y
	18	1.75E+06	749000	1000000		0.75 y	31:08	1.326	OK	37.1	y	33.8	y	n
	19	1.51E+05	70400	80400		0.88 y	31:17	0.114	RL	3.1	y	2.7	n	n
	20	3.84E+05	236000	148000		1.6 n	32:06	0.29	RL	19.5	y	9.4	y	n
	21	1.77E+04	5060	12600		0.4 n	32:11	0.013	S2N	0.8	n	0.8	n	n

Filename: a27jan09a_6 Name of Homolog Group: Total Tetra-Dioxins
Sample: 10 Number of Peaks Found: 11 6
Acquired: 30-JAN-09 03:20:36 RRF Used For Totals: 1.0087
Processed: 30-JAN-09 08:16:38 Detection Limit: 0.1326 RL=0.500 (pg/µL)

Totals Raw Data

Sample ID: G1040-2-1B
Cal Table: m1613-100708a
Results Table: m1613-012709a_6
Noise Height Ion1/Ion2: 5555 / 4551
Begin Window: 27:40:00
End Window: 32:37:00

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	4.13E+06	1770000	2350000		0.75 y	28:19	4.823	OK	58.6	y	90.4	y	n
	2	3.23E+06	1420000	1810000		0.78 y	28:36	3.776	OK	47.1	y	71.3	y	n
	3	1.29E+05	65400	63600		1.03 n	29:00	0.151	RL	2.9	n	3.5	y	n
	4	5.75E+05	256000	319000		0.8 y	29:57	0.673	OK	8.1	y	13	y	y
	5	6.08E+05	281000	328000		0.86 y	30:10	0.711	OK	9.4	y	12.9	y	y
	6	1.18E+05	60300	57800		1.04 n	30:22	0.138	RL	3.2	y	4	y	n
	7	1.17E+05	41900	75300		0.56 n	30:44	0.137	S2N	2.2	n	4.1	y	n
	8	8.74E+05	378000	496000		0.76 y	31:02	1.022	OK	17	y	25	y	y
	9	9.18E+05	398000	520000		0.76 y	31:18	1.072	OK	14.5	y	25.5	y	n
2,3,7,8-TCDD	10	1.85E+05	72400	113000		0.64 n	31:28	0.217	RL	3.5	y	6.2	y	n
	11	1.06E+05	38100	67900		0.56 n	31:40	0.124	RL	2.7	n	4.9	y	n

Filename: a27jan09a_6
Sample: 10
Acquired: 30-JAN-09 03:20:36
Processed: 30-JAN-09 08:16:38
Sample ID: G1040-2-1B
Cal Table: m1613-100708a
Results Table: m1613-012709a_6
Name of Homolog Group: Total Penta-Furans Fn1
Number of Peaks Found: 1 0
RRF Used For Totals: 1.0121
Detection Limit: 0.1026
Noise Height Ion1/Ion2: 7164 / 5760
Begin Window: 31:45:00
End Window: 32:05:00

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	1.42E+06	546000	877000		0.62 y	32:05	1.42	RL	34.2	y	65.4	y	n

Filename: a27jan09a_6
Sample: 10
Acquired: 30-JAN-09 03:20:36
Processed: 30-JAN-09 08:16:38
Sample ID: G1040-2-1B
Cal Table: m1613-100708a
Results Table: m1613-012709a_6
Name of Homolog Group: Total Penta-Furans Fn2
Number of Peaks Found: 9 0
RRF Used For Totals: 1.0121
Detection Limit: 0.1327
RL=2.500 (pg/µL)
Noise Height Ion1/Ion2: 9284 / 7424
Begin Window: 31:42:00
End Window: 34:51:00

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	6.65E+05	421000	244000		1.72 y	32:49	0.664	RL	13.9	y	9.8	y	n
	2	1.31E+06	797000	513000		1.55 y	32:54	1.308	RL	23.4	y	18	y	n
	3	9.61E+04	71600	24500		2.92 n	33:08	0.096	S2N	2.6	n	1.4	n	n
	4	5.24E+05	321000	202000		1.59 y	33:14	0.523	RL	11	y	9.2	y	n
	5	1.20E+05	63300	56800		1.12 n	33:22	0.12	RL	2.5	n	3	y	n
1,2,3,7,8-PeCDF	6	3.37E+05	189000	148000		1.28 n	33:28	0.332	RL	8.6	y	8.5	y	n
	7	3.93E+05	254000	140000		1.82 n	33:37	0.392	RL	8.5	y	6.6	y	n
	8	3.20E+05	221000	98900		2.23 n	34:01	0.319	RL	8.4	y	5.3	y	n
2,3,4,7,8-PeCDF	9	4.93E+05	303000	190000		1.59 y	34:05	0.501	RL	11.1	y	8.2	y	n

Filename: a27jan09a_6
Sample: 10
Acquired: 30-JAN-09 03:20:36
Processed: 30-JAN-09 08:16:38
Sample ID: G1040-2-1B
Cal Table: m1613-100708a
Results Table: m1613-012709a_6

Name of Homolog Group: Total Penta-Dioxins
Number of Peaks Found: 9 0
RRF Used For Totals: 1.0517
Detection Limit: 0.2136
Noise Height Ion1/Ion2: 9364 / 6944
Begin Window: 32:52:00
End Window: 34:37:00

RL=2.500 (pg/µL)

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	1.37E+06	816000	552000		1.48 y	32:56	2.192	RL	28.8	y	24	y	n
	2	1.40E+05	75500	64300		1.17 n	33:12	0.224	RL	3.9	y	3.4	y	n
	3	1.44E+06	893000	544000		1.64 y	33:29	2.301	RL	38.4	y	30.4	y	n
	4	1.33E+06	833000	501000		1.66 y	33:38	2.138	RL	27.3	y	21.8	y	n
	5	2.90E+05	179000	111000		1.61 y	33:47	0.465	RL	5.6	y	4.9	y	n
1,2,3,7,8-PeCDD	6	6.66E+05	384000	282000		1.36 y	33:59	1.068	RL	17	y	14.2	y	n
	7	2.11E+05	146000	64900		2.25 n	34:17	0.338	RL	4.3	y	4	y	n
	8	7.41E+04	32700	41400		0.79 n	34:32	0.119	S2N	2	n	2.2	n	n
	9	7.79E+04	11000	66900		0.16 n	35:01	0.125	RT	0.9	n	4	y	n

Filename: a27jan09a_6
Sample: 10
Acquired: 30-JAN-09 03:20:36
Processed: 30-JAN-09 08:16:38
Sample ID: G1040-2-1B
Cal Table: m1613-100708a
Results Table: m1613-012709a_6

Name of Homolog Group: Total Hexa-Furans
Number of Peaks Found: 6 0
RRF Used For Totals: 1.1305
Detection Limit: 0.3046
Noise Height Ion1/Ion2: 11052/ 10420
Begin Window: 35:06:00
End Window: 37:40:00

RL=2.500 (pg/µL)

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	3.38E+05	192000	147000		1.31 y	35:13	0.472	RL	6.3	y	6.1	y	n
	2	1.21E+06	694000	518000		1.34 y	35:20	1.691	RL	20.8	y	18.3	y	n
	3	1.12E+06	664000	460000		1.44 n	35:47	1.568	RL	19.4	y	15.9	y	n
1,2,3,4,7,8-HxCDF	4	1.91E+05	83100	108000		0.77 n	36:10	0.255	RL	3.1	y	3.6	y	n
1,2,3,6,7,8-HxCDF	5	1.47E+05	67000	79600		0.84 n	36:16	0.19	S2N	2.4	n	2.1	n	n
2,3,4,6,7,8-HxCDF	6	1.93E+05	122000	70700		1.72 n	36:46	0.265	S2N	4	y	2.3	n	n

Filename: a27jan09a_6
Sample: 10
Acquired: 30-JAN-09 03:20:36
Processed: 30-JAN-09 08:16:38
Sample ID: G1040-2-1B
Cal Table: m1613-100708a
Results Table: m1613-012709a_6

Name of Homolog Group: Total Hexa-Dioxins
Number of Peaks Found: 9 3
RRF Used For Totals: 1.0077
Detection Limit: 0.3704
Noise Height Ion1/Ion2: 9472 / 8456
Begin Window: 35:36:00
End Window: 37:17:00

RL=2.500 (pg/µL)

Totals Raw Data

Name	#	Response		Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
		1	3.06E+06	1720000	1350000		1.28	y 35:38	6.262	OK	58.2	y	51.4	y	n
		2	2.14E+06	1170000	965000		1.22	y 36:06	4.371	OK	40.7	y	37.2	y	n
		3	2.95E+06	1650000	1300000		1.27	y 36:19	6.026	OK	44.5	y	38.6	y	n
1,2,3,4,7,8-HxCDD		4	7.61E+05	410000	351000		1.17	y 36:24	1.556	RL	13.3	y	12.3	y	n
1,2,3,6,7,8-HxCDD		5	9.72E+04	58400	38800		1.5	n 36:53	0.2	S2N	3	n	1.9	n	n
		6	5.36E+05	321000	215000		1.49	n 36:59	1.081	RL	10.9	y	8	y	n
		7	1.63E+05	96500	66700		1.45	n 37:09	0.334	RL	3.2	y	3.5	y	n
1,2,3,7,8,9-HxCDD		8	2.90E+05	191000	98400		1.94	n 37:14	0.595	RL	6.1	y	3.9	y	n
		9	6.12E+05	159000	453000		0.35	n 37:51	1.251	RT	4.3	y	14.5	y	n

Filename: a27jan09a_6
Sample: 10
Acquired: 30-JAN-09 03:20:36
Processed: 30-JAN-09 08:16:38
Sample ID: G1040-2-1B
Cal Table: m1613-100708a
Results Table: m1613-012709a_6

Name of Homolog Group: Total Hepta-Furans
Number of Peaks Found: 2 2
RRF Used For Totals: 1.3693
Detection Limit: 0.3984
Noise Height Ion1/Ion2: 9132 / 7812
Begin Window: 38:52:00
End Window: 41:04:00

RL=2.500 (pg/µL)

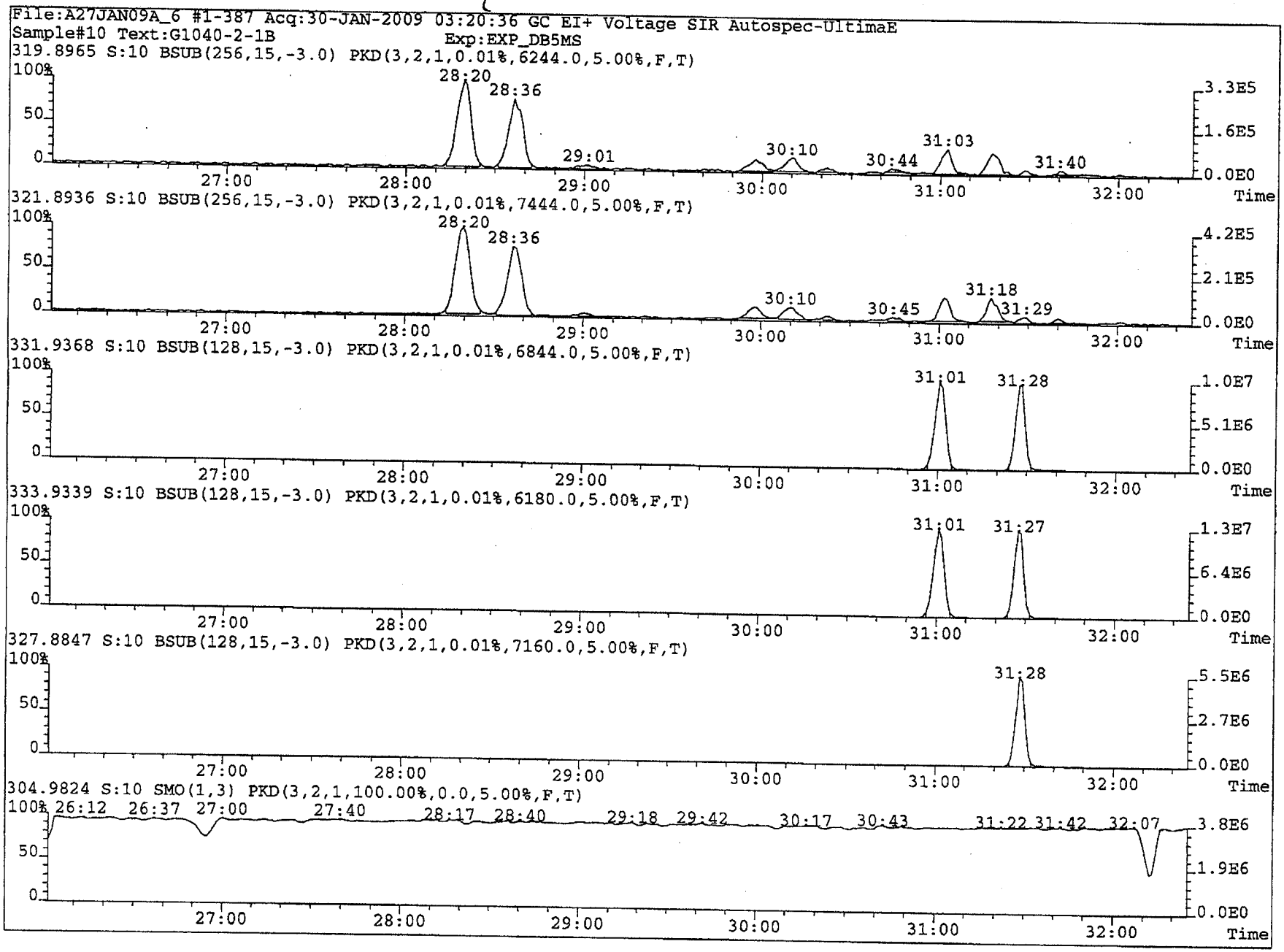
Name	#	Response		Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
1,2,3,4,6,7,8-HpCDI		1	1.68E+06	841000	838000		1	y 39:03	2.866	OK	25.3	y	29.2	y	n
		2	2.70E+06	1390000	1310000		1.06	y 39:36	5.124	OK	37.4	y	43	y	n

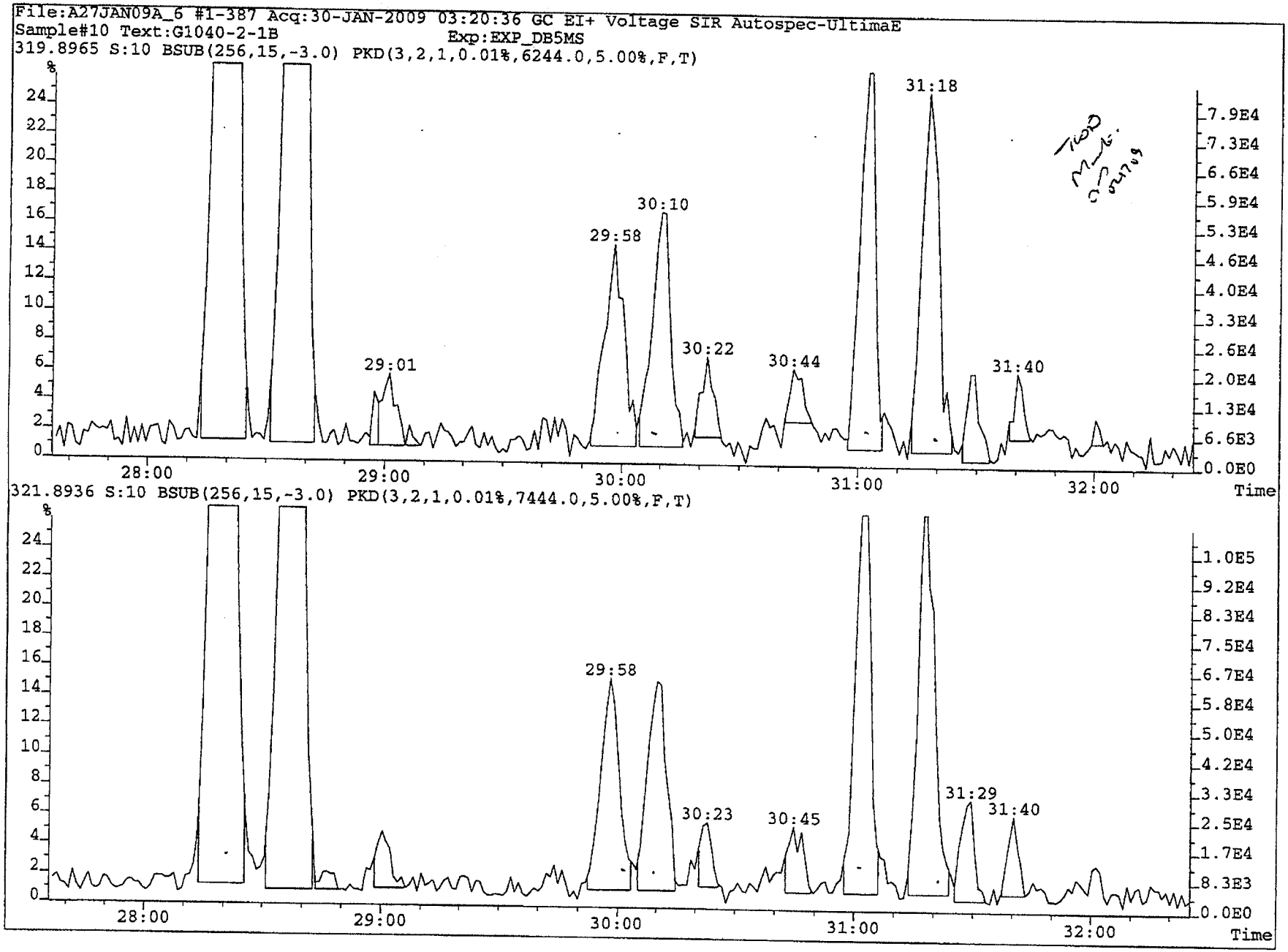
Filename: a27jan09a_6
Sample: 10
Acquired: 30-JAN-09 03:20:36
Processed: 30-JAN-09 08:16:38
Sample ID: G1040-2-1B
Cal Table: m1613-100708a
Results Table: m1613-012709a_6

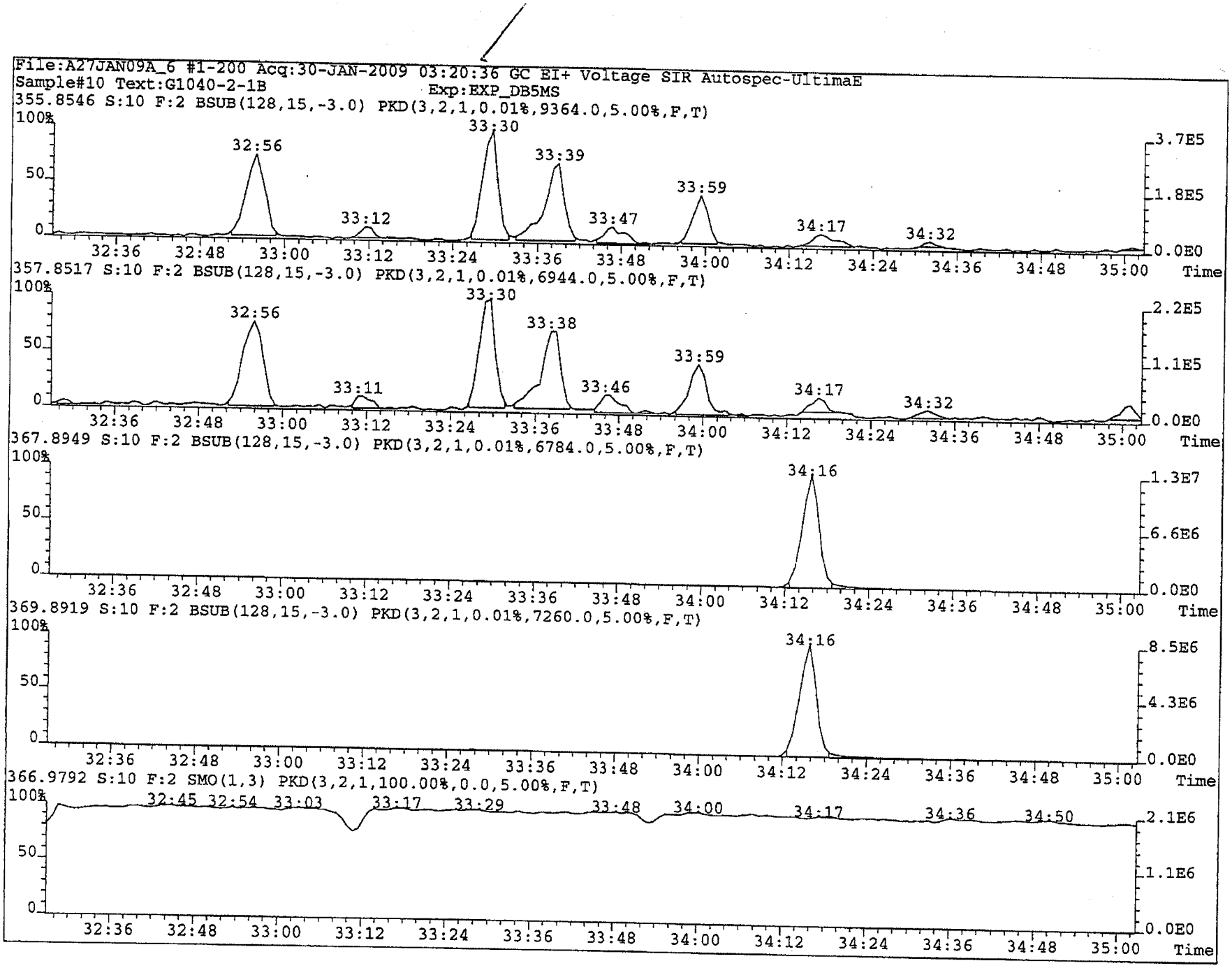
Name of Homolog Group: Total Hepta-Dioxins
Number of Peaks Found: 2 2
RRF Used For Totals: 1.0612
Detection Limit: 0.6896
Noise Height Ion1/Ion2: 9204 / 9712
Begin Window: 39:17:00
End Window: 40:29:00

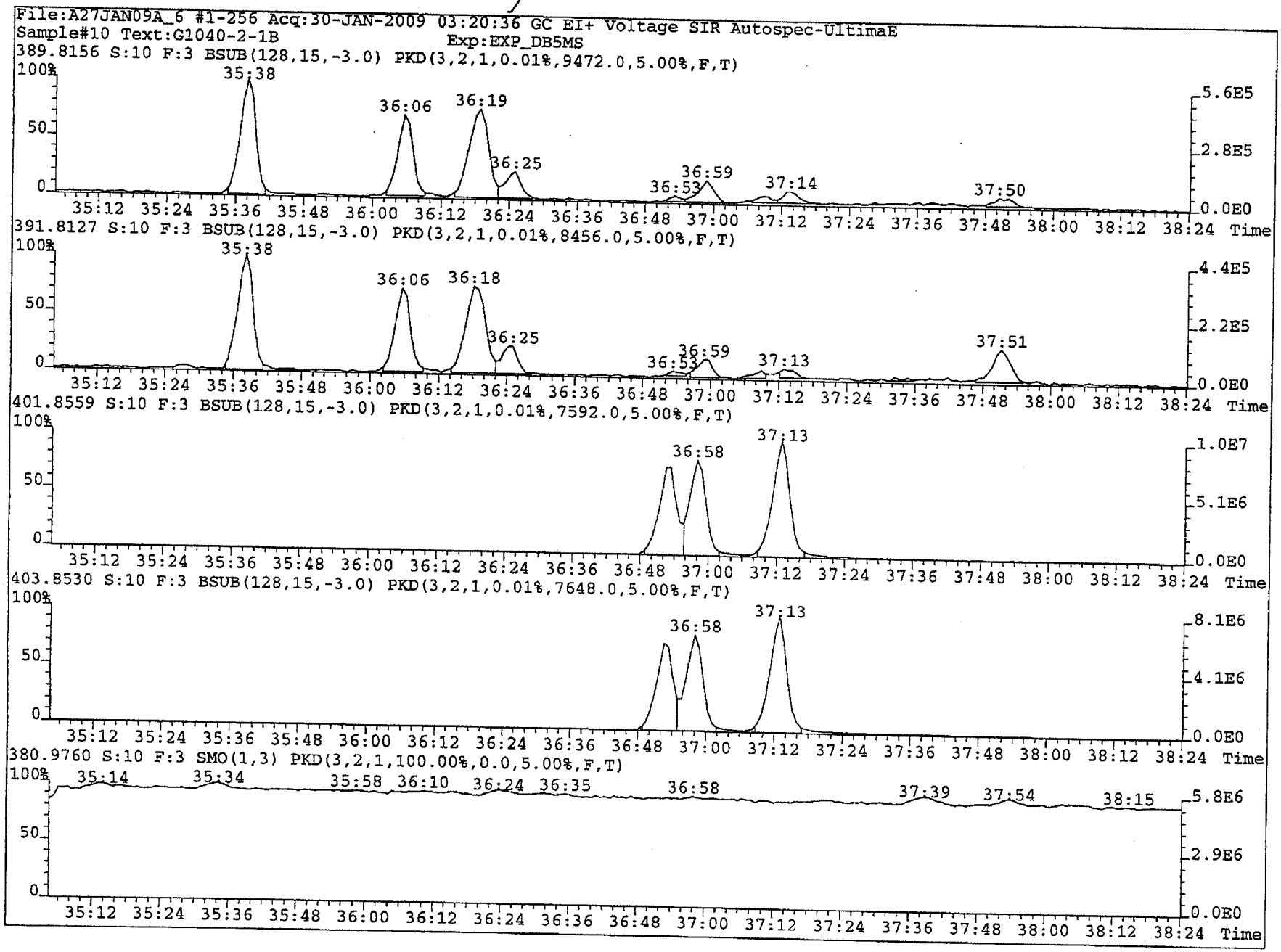
RL=2.500 (pg/µL)

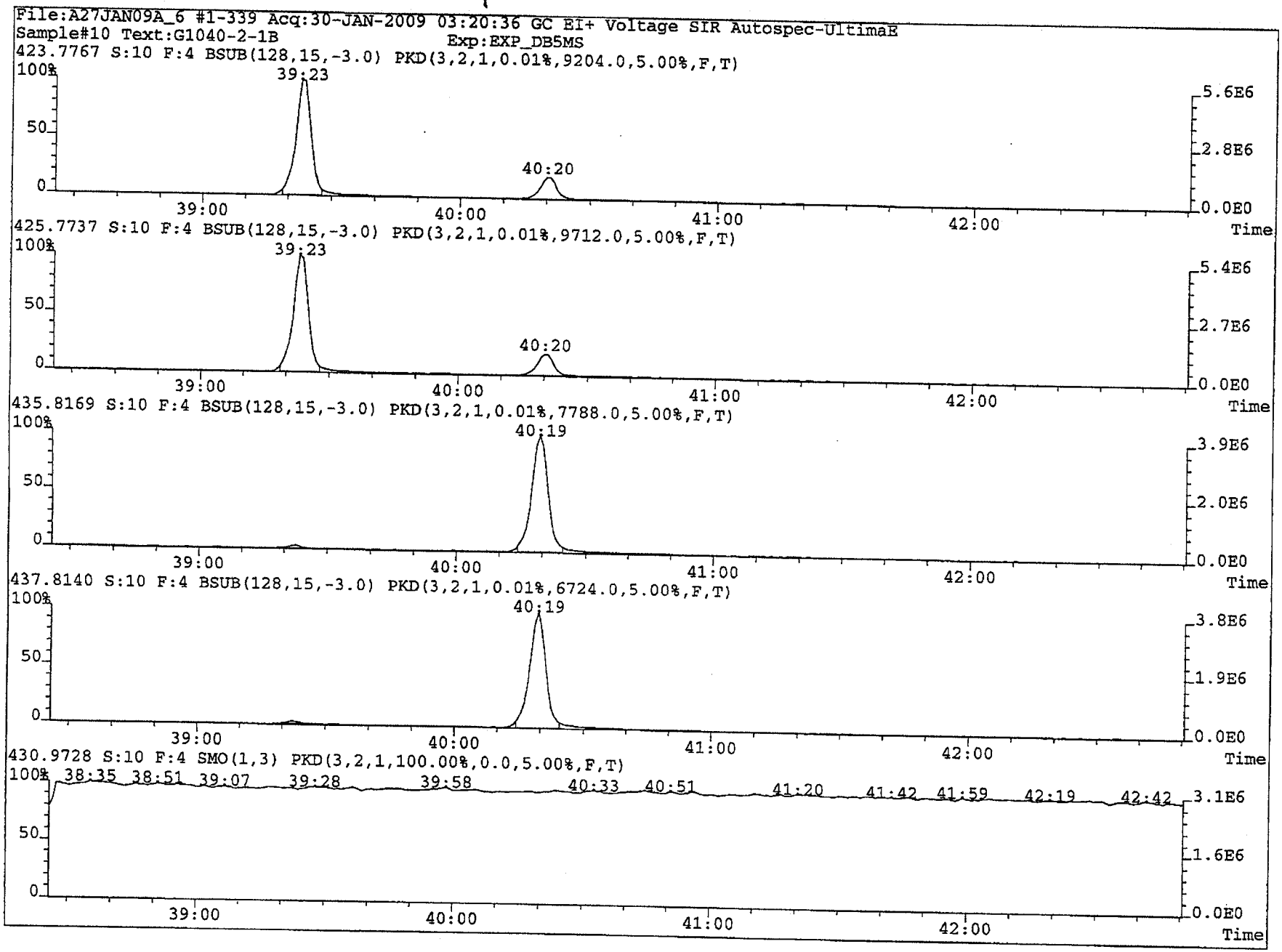
Name	#	Response		Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
		1	4.34E+07	22100000	21300000		1.04	y 39:23	123.243	OK	609.2	y	554.7	y	n
1,2,3,4,6,7,8-HpCDI		2	8.84E+06	4560000	4280000		1.07	y 40:20	25.094	OK	114.5	y	101.6	y	n

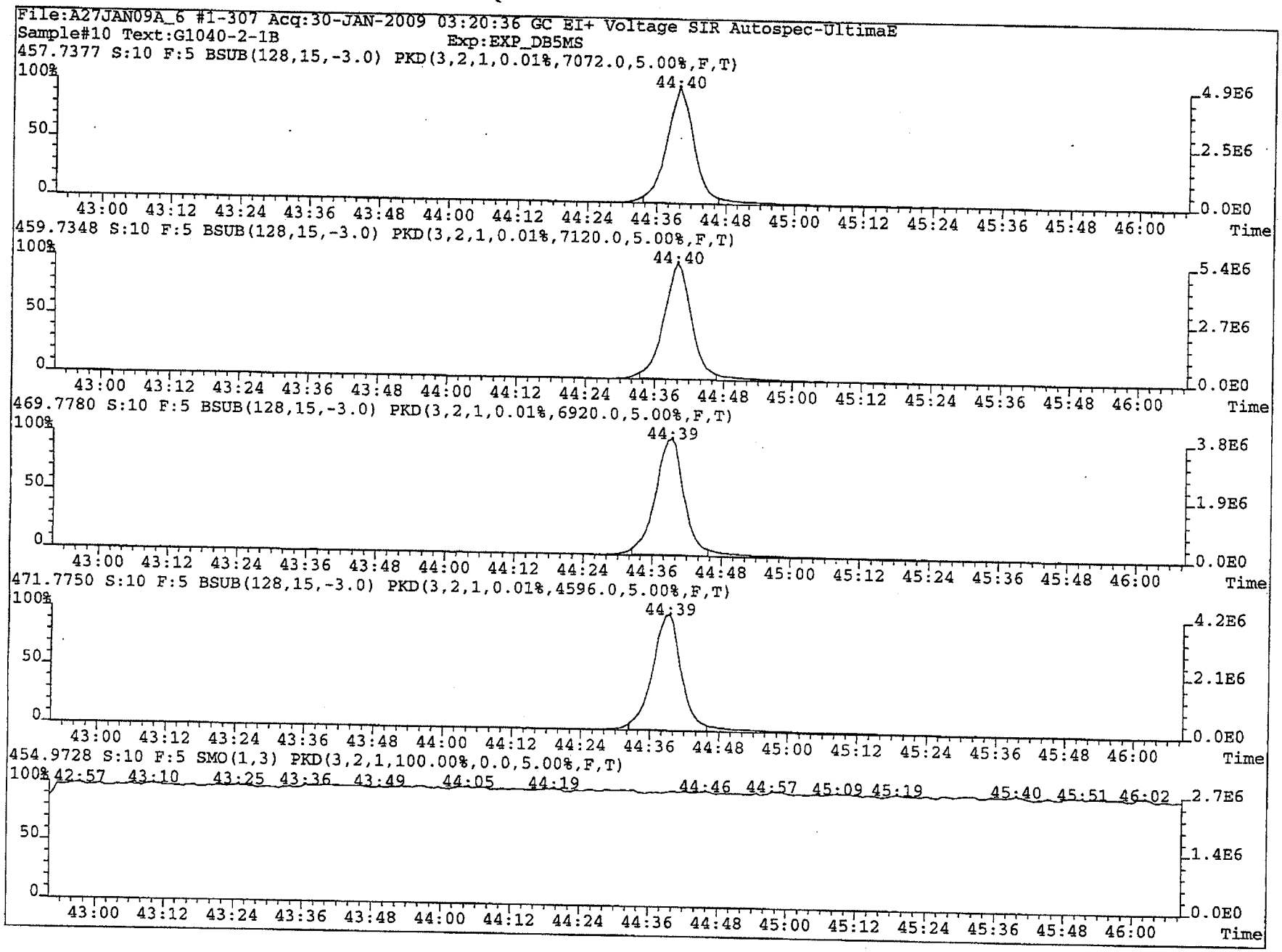

File:A27JAN09A_6 #1-387 Acq:30-JAN-2009 03:20:36 GC EI+ Voltage SIR Autospec-UltimaE
Sample#10 Text:G1040-2-1B
Exp:EXP_DB5MS
319.8965 S:10 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,6244.0,5.00%,F,T)
28:20
28:36
29:01
30:10
30:44
31:03
31:40
3.3E5
1.6E5
0.0E0
321.8936 S:10 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,7444.0,5.00%,F,T)
28:20
28:36
30:10
30:45
31:18
31:29
4.2E5
2.1E5
0.0E0
331.9368 S:10 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6844.0,5.00%,F,T)
31:01
31:28
1.0E7
5.1E6
0.0E0
333.9339 S:10 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6180.0,5.00%,F,T)
31:01
31:27
1.3E7
6.4E6
0.0E0
327.8847 S:10 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7160.0,5.00%,F,T)
31:28
5.5E6
2.7E6
0.0E0
304.9824 S:10 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
26:12
26:37
27:00
27:40
28:17
28:40
29:18
29:42
30:17
30:43
31:22
31:42
32:07
3.8E6
1.9E6
0.0E0
100%
50
0
27:00
28:00
29:00
30:00
31:00
32:00
Time

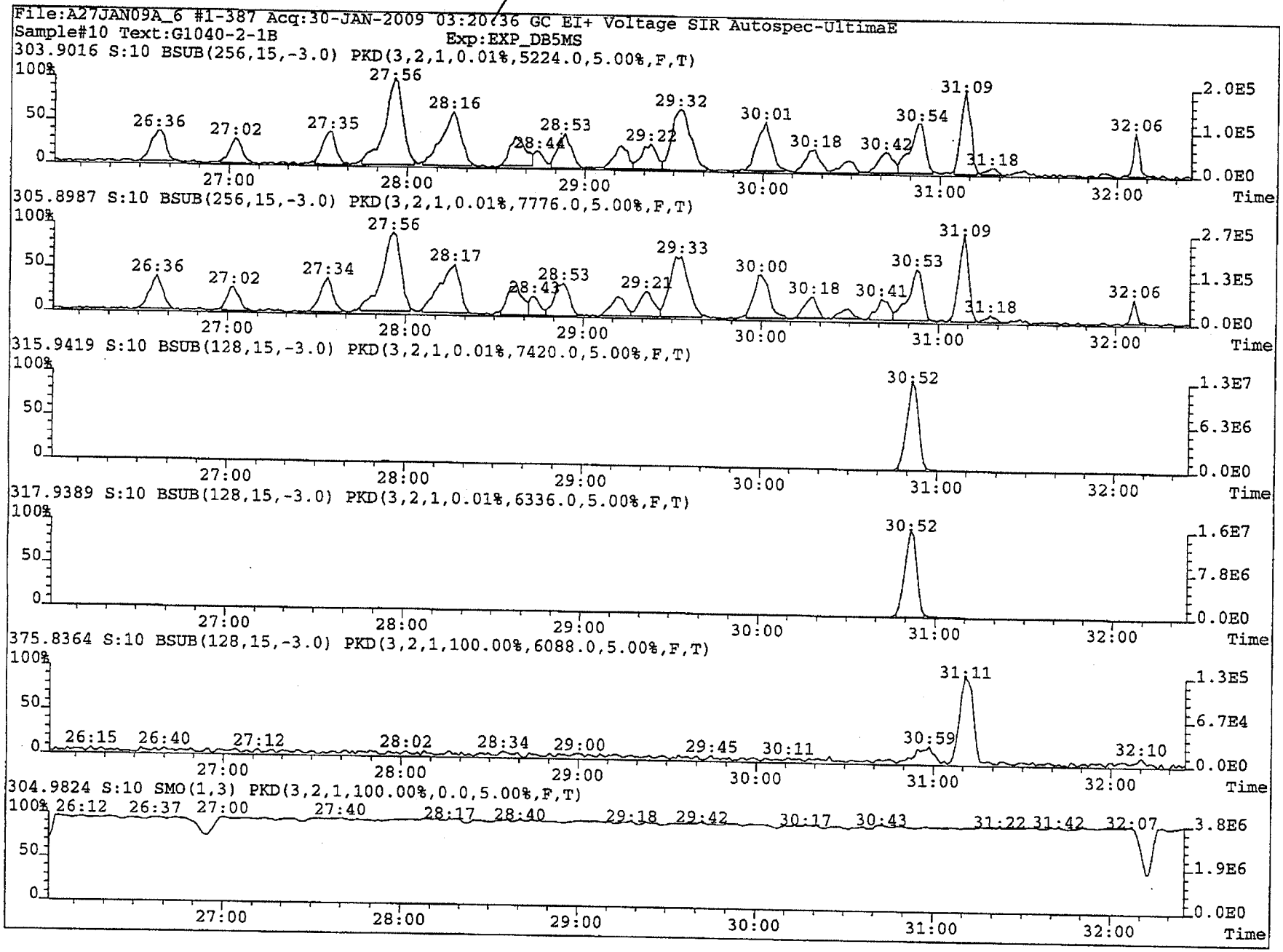

File:A27JAN09A_6 #1-387 Acq:30-JAN-2009 03:20:36 GC EI+ Voltage SIR Autospec-UltimaE
Sample#10 Text:G1040-2-1B
Exp:EXP_DB5MS
319.8965 S:10 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,6244.0,5.00%,F,T)
%
29:01
29:58
30:10
30:22
30:44
31:18
31:40
7.9E4
7.3E4
6.6E4
5.9E4
5.3E4
4.6E4
4.0E4
3.3E4
2.6E4
2.0E4
1.3E4
6.6E3
0.0E0
28:00
29:00
30:00
31:00
32:00
Time
321.8936 S:10 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,7444.0,5.00%,F,T)
%
29:58
30:23
30:45
31:29
31:40
1.0E5
9.2E4
8.3E4
7.5E4
6.7E4
5.8E4
5.0E4
4.2E4
3.3E4
2.5E4
1.7E4
8.3E3
0.0E0
28:00
29:00
30:00
31:00
32:00
Time

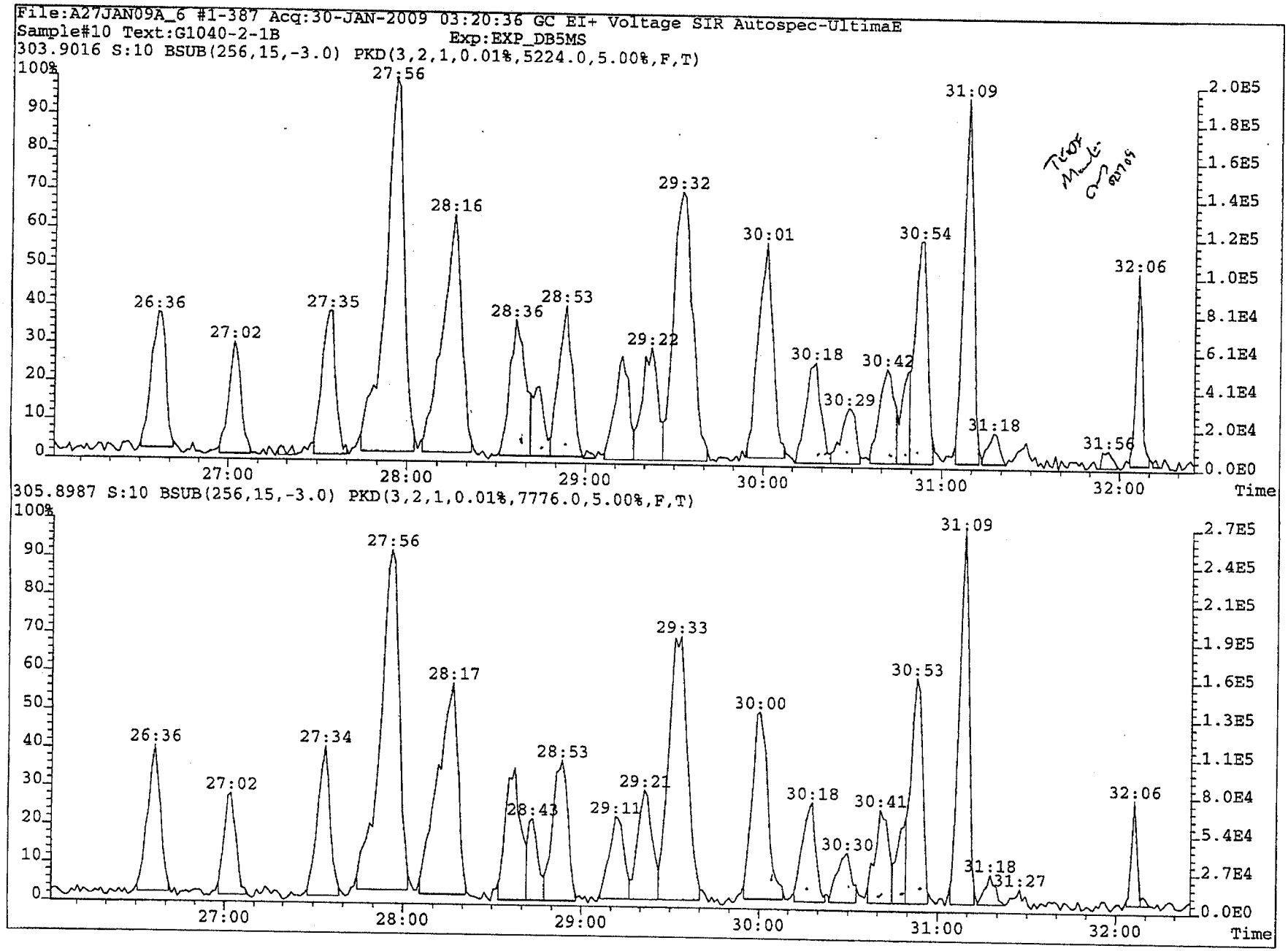

File:A27JAN09A_6 #1-200 Acq:30-JAN-2009 03:20:36 GC EI+ Voltage SIR Autospec-UltimaE
Sample#10 Text:G1040-2-1B
Exp:EXP_DB5MS
355.8546 S:10 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,9364.0,5.00%,F,T)
32:56
33:12
33:30
33:39
33:47
33:59
34:17
34:32
3.7E5
1.8E5
0.0E0
357.8517 S:10 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6944.0,5.00%,F,T)
32:56
33:11
33:30
33:38
33:46
33:59
34:17
34:32
2.2E5
1.1E5
0.0E0
367.8949 S:10 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6784.0,5.00%,F,T)
34:16
1.3E7
6.6E6
0.0E0
369.8919 S:10 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7260.0,5.00%,F,T)
34:16
8.5E6
4.3E6
0.0E0
366.9792 S:10 F:2 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
32:45 32:54 33:03 33:17 33:29 33:48 34:00 34:17 34:36 34:50
2.1E6
1.1E6
0.0E0
100%
50
0
32:36 32:48 33:00 33:12 33:24 33:36 33:48 34:00 34:12 34:24 34:36 34:48 35:00
Time

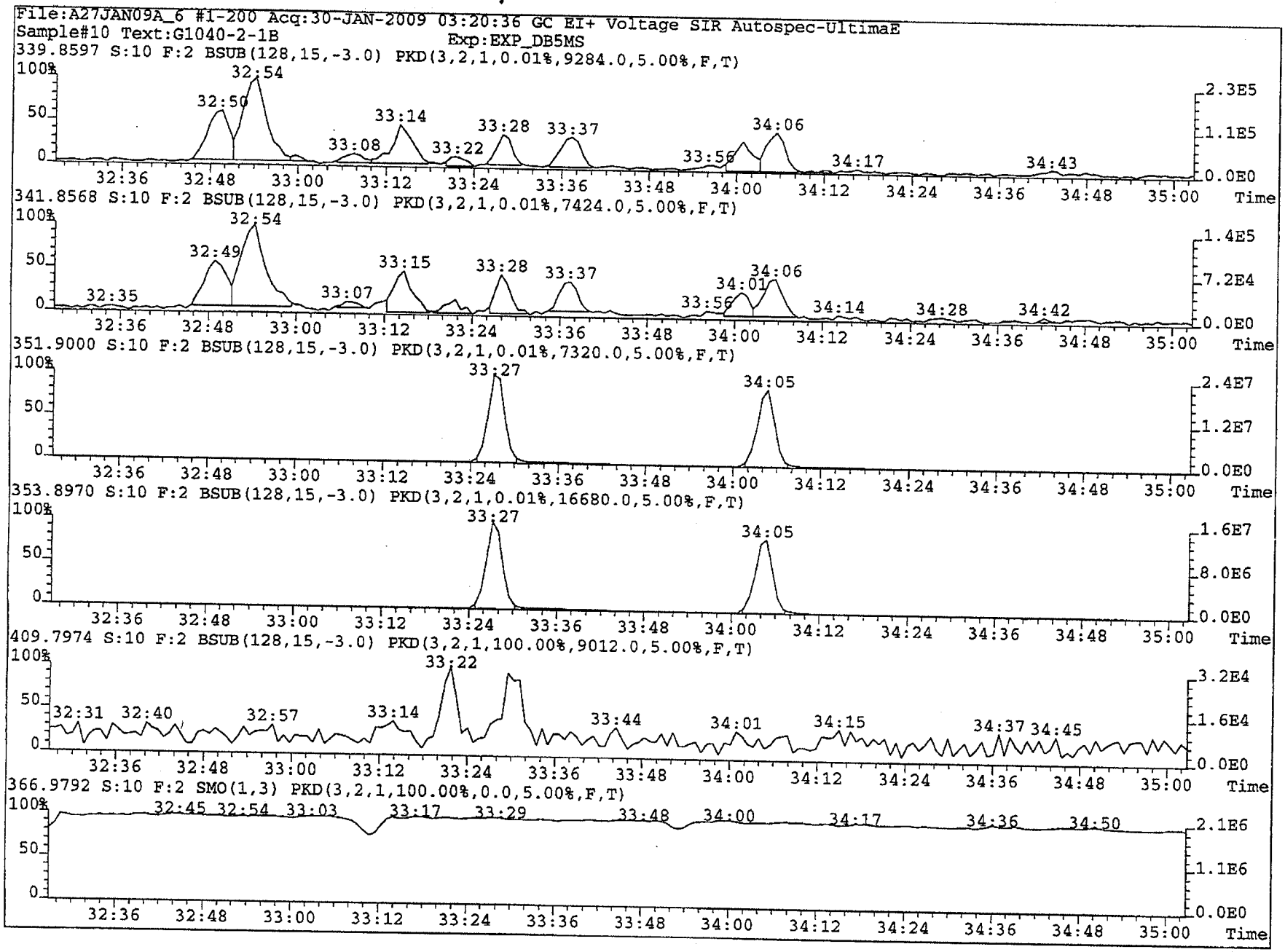

File:A27JAN09A_6 #1-256 Acq:30-JAN-2009 03:20:36 GC EI+ Voltage SIR Autospec-UltimaE
Sample#10 Text:G1040-2-1B
Exp:EXP_DB5MS
389.8156 S:10 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,9472.0,5.00%,F,T)
35:38
36:06
36:19
36:25
36:53
36:59
37:14
37:50
5.6E5
2.8E5
0.0E0
391.8127 S:10 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,8456.0,5.00%,F,T)
35:38
36:06
36:18
36:25
36:53
36:59
37:13
37:51
4.4E5
2.2E5
0.0E0
401.8559 S:10 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7592.0,5.00%,F,T)
36:58
37:13
1.0E7
5.1E6
0.0E0
403.8530 S:10 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7648.0,5.00%,F,T)
36:58
37:13
8.1E6
4.1E6
0.0E0
380.9760 S:10 F:3 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
35:14
35:34
35:58
36:10
36:24
36:35
36:58
37:39
37:54
38:15
5.8E6
2.9E6
0.0E0
35:12 35:24 35:36 35:48 36:00 36:12 36:24 36:36 36:48 37:00 37:12 37:24 37:36 37:48 38:00 38:12 38:24 Time

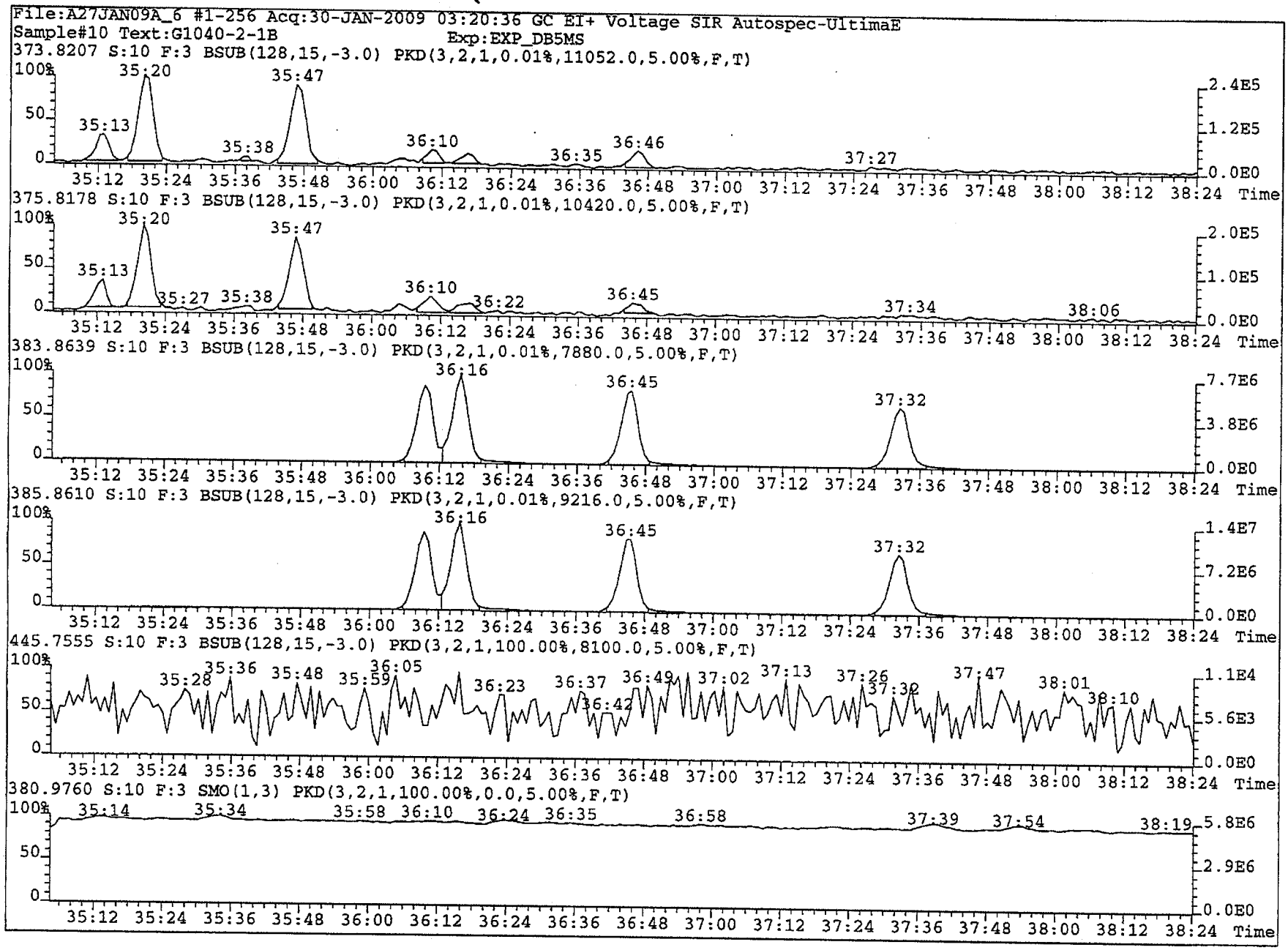

File:A27JAN09A_6 #1-339 Acq:30-JAN-2009 03:20:36 GC EI+ Voltage SIR Autospec-UltimaE
Sample#10 Text:G1040-2-1B
Exp:EXP_DB5MS
423.7767 S:10 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,9204.0,5.00%,F,T)
39:23
40:20
425.7737 S:10 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,9712.0,5.00%,F,T)
39:23
40:20
435.8169 S:10 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7788.0,5.00%,F,T)
40:19
437.8140 S:10 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6724.0,5.00%,F,T)
40:19
430.9728 S:10 F:4 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
38:35 38:51 39:07 39:28 39:58 40:33 40:51 41:20 41:42 41:59 42:19 42:42
100%
50
0
39:00
40:00
41:00
42:00
Time
5.6E6
2.8E6
0.0E0
5.4E6
2.7E6
3.9E6
2.0E6
3.8E6
1.9E6
3.1E6
1.6E6

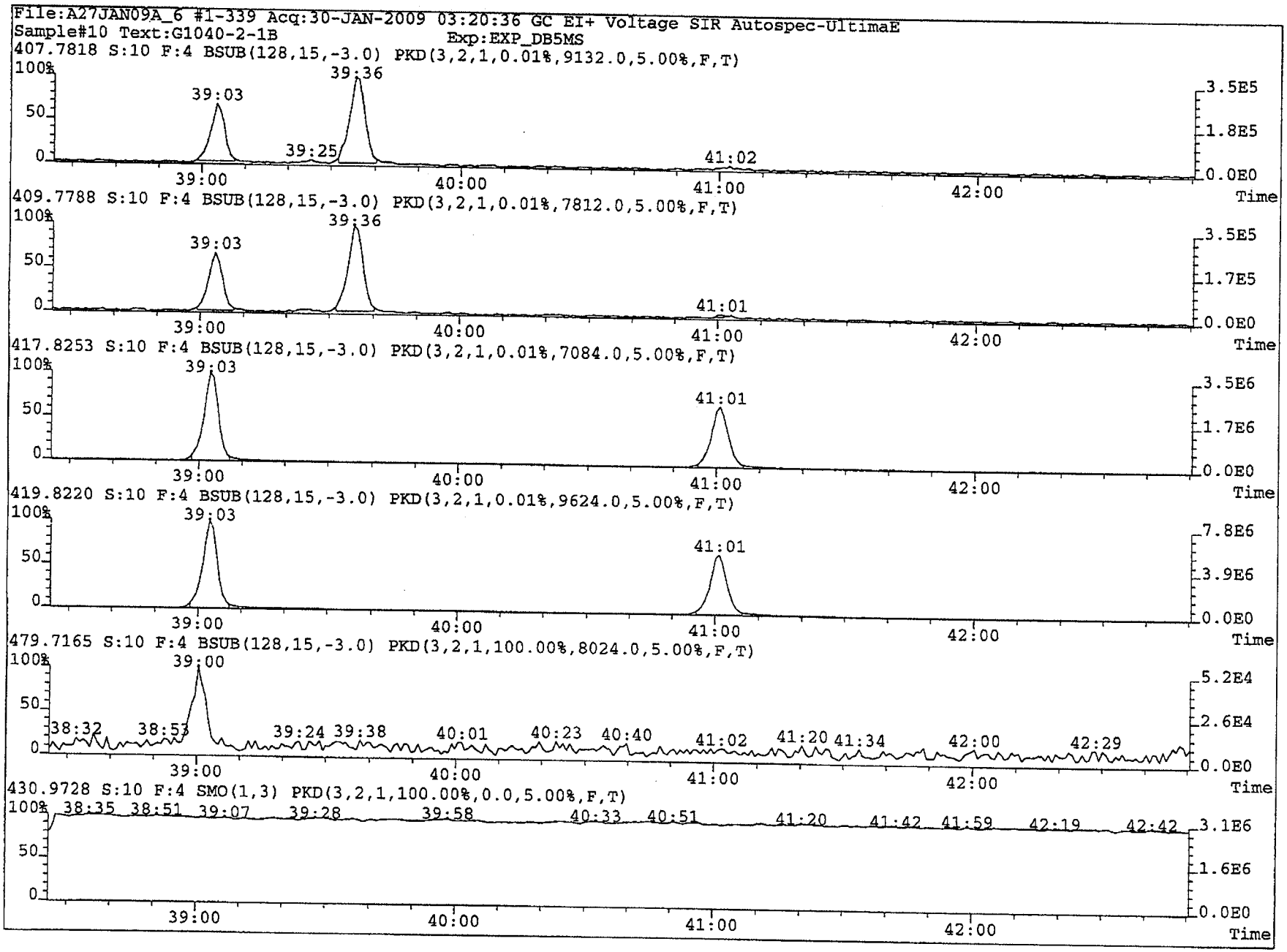

File:A27JAN09A_6 #1-307 Acq:30-JAN-2009 03:20:36 GC EI+ Voltage SIR Autospec-UltimaE
Sample#10 Text:G1040-2-1B
Exp:EXP_DB5MS
457.7377 S:10 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7072.0,5.00%,F,T)
44:40
4.9E6
2.5E6
0.0E0
459.7348 S:10 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7120.0,5.00%,F,T)
44:40
5.4E6
2.7E6
0.0E0
469.7780 S:10 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6920.0,5.00%,F,T)
44:39
3.8E6
1.9E6
0.0E0
471.7750 S:10 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,4596.0,5.00%,F,T)
44:39
4.2E6
2.1E6
0.0E0
454.9728 S:10 F:5 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
42:57 43:10 43:25 43:36 43:49 44:05 44:19 44:46 44:57 45:09 45:19 45:40 45:51 46:02
2.7E6
1.4E6
0.0E0
100%
50
0
43:00 43:12 43:24 43:36 43:48 44:00 44:12 44:24 44:36 44:48 45:00 45:12 45:24 45:36 45:48 46:00
Time

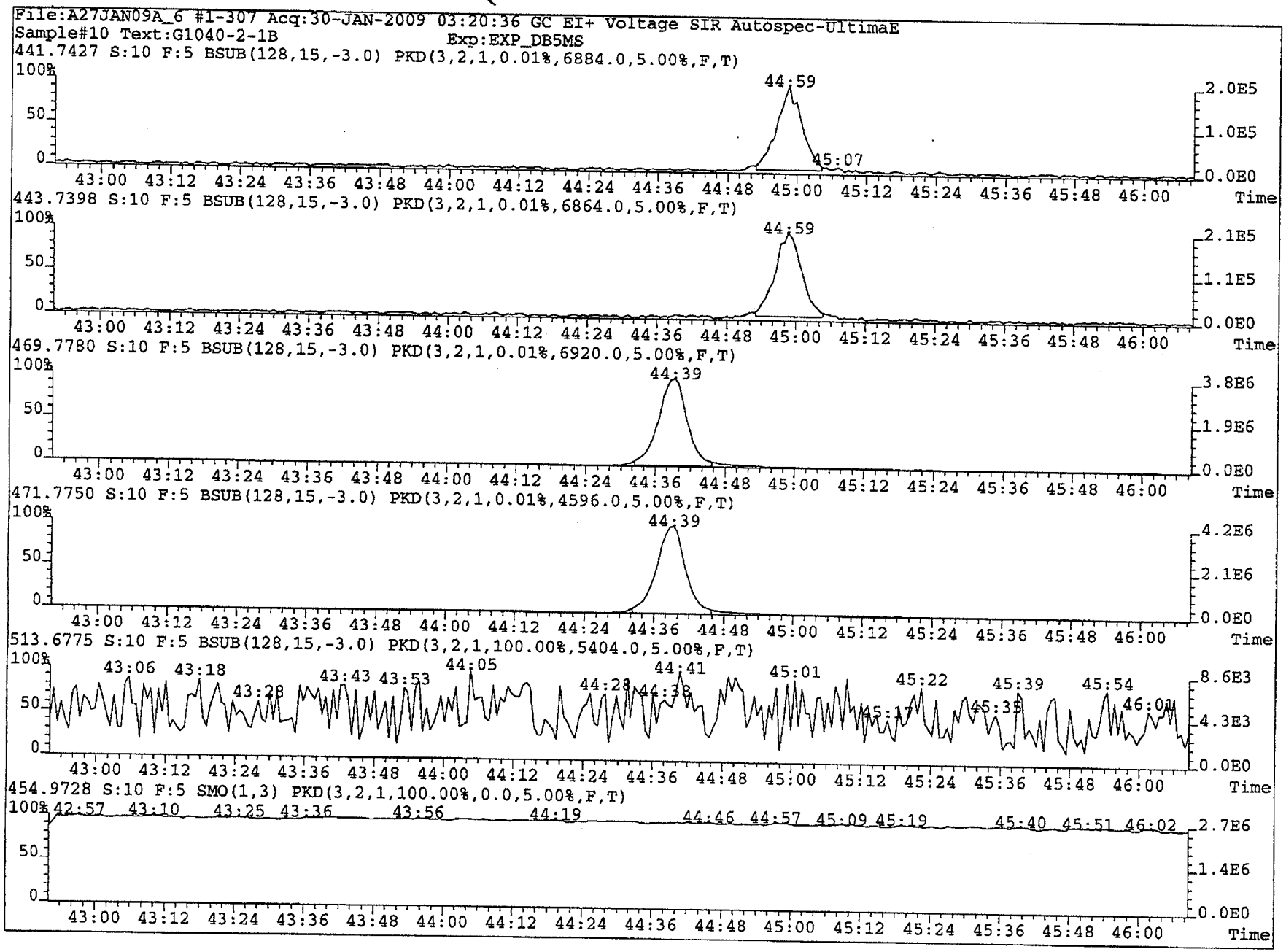

File:A27JAN09A_6 #1-387 Acq:30-JAN-2009 03:20:36 GC EI+ Voltage SIR Autospec-UltimaE
Sample#10 Text:G1040-2-1B
Exp:EXP_DB5MS
303.9016 S:10 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,5224.0,5.00%,F,T)
305.8987 S:10 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,7776.0,5.00%,F,T)
315.9419 S:10 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7420.0,5.00%,F,T)
317.9389 S:10 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6336.0,5.00%,F,T)
375.8364 S:10 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,6088.0,5.00%,F,T)
304.9824 S:10 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time

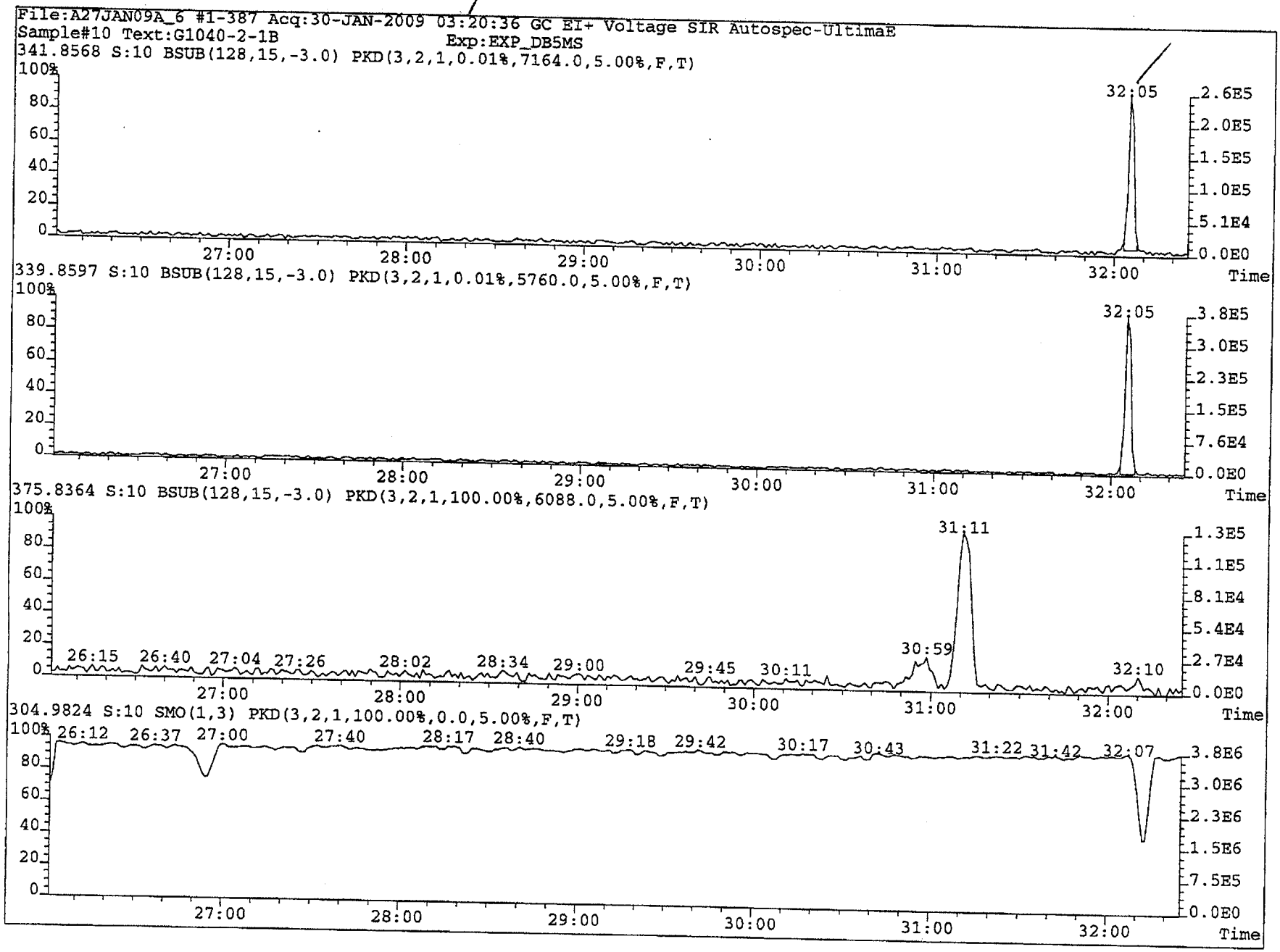

File:A27JAN09A_6 #1-387 Acq:30-JAN-2009 03:20:36 GC EI+ Voltage SIR Autospec-UltimaE
Sample#10 Text:G1040-2-1B
Exp:EXP_DB5MS
303.9016 S:10 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,5224.0,5.00%,F,T)
26:36
27:02
27:35
27:56
28:16
28:36
28:53
29:22
29:32
30:01
30:18
30:29
30:42
30:54
31:09
31:18
31:56
32:06
305.8987 S:10 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,7776.0,5.00%,F,T)
26:36
27:02
27:34
27:56
28:17
28:43
28:53
29:11
29:21
29:33
30:00
30:18
30:30
30:41
30:53
31:09
31:18
31:27
32:06
Time


File:A27JAN09A_6 #1-200 Acq:30-JAN-2009 03:20:36 GC EI+ Voltage SIR Autospec-UltimaE
Sample#10 Text:G1040-2-1B
Exp:EXP_DB5MS
339.8597 S:10 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,9284.0,5.00%,F,T)
341.8568 S:10 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7424.0,5.00%,F,T)
351.9000 S:10 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7320.0,5.00%,F,T)
353.8970 S:10 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,16680.0,5.00%,F,T)
409.7974 S:10 F:2 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,9012.0,5.00%,F,T)
366.9792 S:10 F:2 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time


File:A27JAN09A_6 #1-256 Acq:30-JAN-2009 03:20:36 GC EI+ Voltage SIR Autospec-UltimaE
Sample#10 Text:G1040-2-1B Exp:EXP_DB5MS
373.8207 S:10 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,11052.0,5.00%,F,T)
375.8178 S:10 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,10420.0,5.00%,F,T)
383.8639 S:10 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7880.0,5.00%,F,T)
385.8610 S:10 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,9216.0,5.00%,F,T)
445.7555 S:10 F:3 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,8100.0,5.00%,F,T)
380.9760 S:10 F:3 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time


File:A27JAN09A_6 #1-339 Acq:30-JAN-2009 03:20:36 GC EI+ Voltage SIR Autospec-UltimaE
Sample#10 Text:G1040-2-1B Exp:EXP_DB5MS
407.7818 S:10 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,9132.0,5.00%,F,T)
39:03
39:36
39:25
41:02
3.5E5
1.8E5
0.0E0
409.7788 S:10 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7812.0,5.00%,F,T)
39:03
39:36
41:01
3.5E5
1.7E5
0.0E0
417.8253 S:10 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7084.0,5.00%,F,T)
39:03
41:01
3.5E6
1.7E6
0.0E0
419.8220 S:10 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,9624.0,5.00%,F,T)
39:03
41:01
7.8E6
3.9E6
0.0E0
479.7165 S:10 F:4 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,8024.0,5.00%,F,T)
39:00
38:32 38:53 39:24 39:38 40:01 40:23 40:40 41:02 41:20 41:34 42:00 42:29
5.2E4
2.6E4
0.0E0
430.9728 S:10 F:4 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
38:35 38:51 39:07 39:28 39:58 40:33 40:51 41:20 41:42 41:59 42:19 42:42
3.1E6
1.6E6
0.0E0
100%
50
0
39:00
40:00
41:00
42:00
Time


File:A27JAN09A_6 #1-307 Acq:30-JAN-2009 03:20:36 GC EI+ Voltage SIR Autospec-UltimaE
Sample#10 Text:G1040-2-1B
Exp:EXP_DB5MS
441.7427 S:10 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6884.0,5.00%,F,T)
443.7398 S:10 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6864.0,5.00%,F,T)
469.7780 S:10 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6920.0,5.00%,F,T)
471.7750 S:10 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,4596.0,5.00%,F,T)
513.6775 S:10 F:5 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,5404.0,5.00%,F,T)
454.9728 S:10 F:5 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time


File:A27JAN09A_6 #1-387 Acq:30-JAN-2009 03:20:36 GC EI+ Voltage SIR Autospec-UltimaE
Sample#10 Text:G1040-2-1B
Exp:EXP_DB5MS
341.8568 S:10 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7164.0,5.00%,F,T)
32:05
339.8597 S:10 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5760.0,5.00%,F,T)
32:05
375.8364 S:10 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,6088.0,5.00%,F,T)
31:11
30:59
26:15 26:40 27:04 27:26 28:02 28:34 29:00 29:45 30:11
32:10
304.9824 S:10 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
26:12 26:37 27:00 27:40 28:17 28:40 29:18 29:42 30:17 30:43 31:22 31:42 32:07
27:00 28:00 29:00 30:00 31:00 32:00
Time

TCDF Confirmation - Method 1613
PGSS-51
Analytical Resources, Inc.

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	Adj. RL (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDF	2.13	0.964	19.71	0.83	

Labeled Standard	Spiked Amount (ng)	RT (min.)	Ratio	Qualifier
Extraction Standards				
13C12-2,3,7,8-TCDF	2	19.70	0.78	

Client Information			**Sample Information**		
Project Name:	Port Gamble		Report Basis:	Dry	
			Matrix:	Sediment	
Sample ID:	PGSS-51		Weight / Volume:	24.77	g
			Solids / Lipids:	41.9	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG16440	
Project ID:	G1040-2		Instrument:		
Sample ID:	G1040-2-1B		Filename:	c09feb09a-12	
Collection Date/Time:	12/08/08	14:25	Retchk:	c09feb09a-2	
Receipt Date:	01/15/09	10:15	Begin ConCal:	c09feb09a-1	
Extraction Date:	01/19/09				
Analysis Date/Time:	02/09/09	12:12	Initial Cal:	mcf-c042108a	

Analyzed by: JWP
Date: 021709

Reviewed by: TM
Date: 02/17/09

Quantify Sample Summary Report MassLynx 4.1
Confirms Sample Summary

Dataset: Untitled

Last Altered: Monday, February 09, 2009 15:31:45 Eastern Standard Time
Printed: Monday, February 09, 2009 15:33:58 Eastern Standard Time

Method: C:\MassLynx\DEFAULT.PRO\MethDB\confirms.mdb 20 Jan 2009 09:14:04
Calibration: C:\MassLynx\DEFAULT.PRO\CurveDB\mcf-c042108a.cdb 22 Apr 2008 07:57:25

Name: c09feb09a-12
Date: 09-Feb-2009
Time: 12:12:28
ID: G1040-2-1B
User: HMP
Submitter: mcf-c042108a
Task: HRMS3

	Name	Response	Ion1Area	Ion2Area	RA	RAFail?	RRT	RT	pg/µL	EDL	SN1	SN2	M	Height1	Noise1	Height2	Noise2
1	2378-TCDF	4.337e4	1.970e4	2.367e4	0.83	NO	1.0009	19.71	1.104	0.1510	19.1	19.1	dd	3.402e5	17769	4.294e5	22513
2	ES:13C-2378-TCDF	3.757e6	1.648e6	2.109e6	0.78	NO	1.0471	19.70	99.600	0.1553	1572.0	2289.1	bb	3.358e7	21362	4.181e7	18263
3	JS:13C-1234-TCDD	2.502e6	1.120e6	1.382e6	0.81	NO	0.0000	18.81	215.586	0.2850	1736.3	2936.4	bb	2.273e7	13091	2.725e7	9278
4	Hexa Ether	1.016e5	1.016e5	-	-	-	0.0000	16.54	-	-	0.0	-	bs	1.471e6	0	-	-
5	F1 Lock Mass	4.443e4	4.443e4	-	-	-	0.0000	15.40	-	-	0.0	-	bb	4.346e5	0	-	-

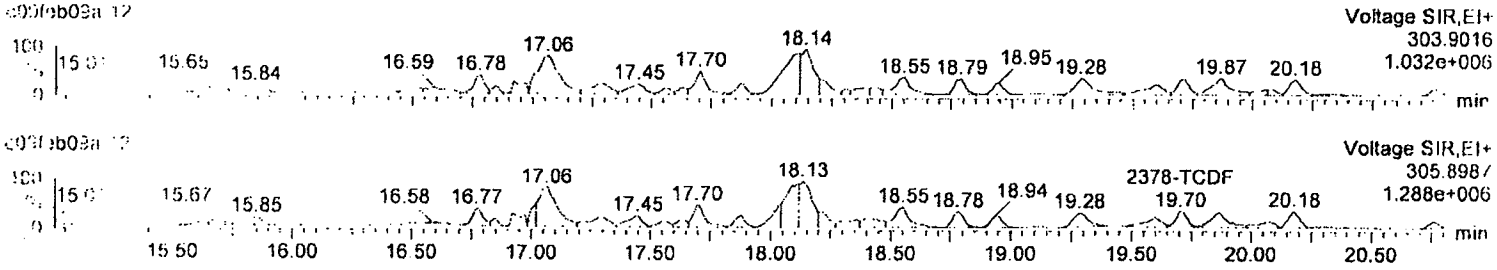
Quantify Sample Report **MassLynx 4.1**
Confirms Sample Summary

Dataset Untitled

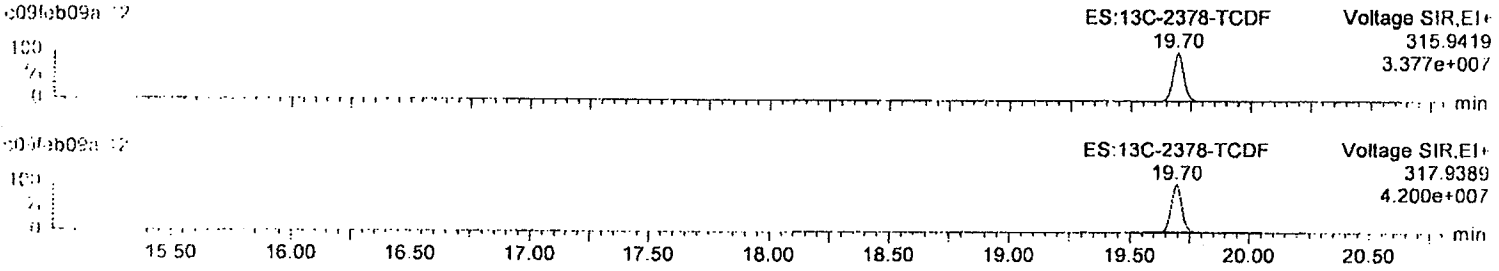
Last Altered Monday, February 09, 2009 15:15:11 Eastern Standard Time
Printed Monday, February 09, 2009 15:18:44 Eastern Standard Time

Name: c09feb09a-12, ID: G1040-2-1B

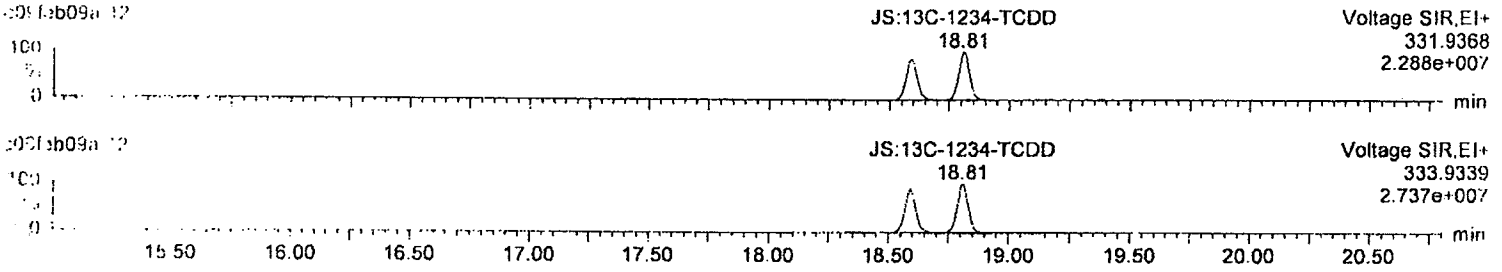
2378-TCDF



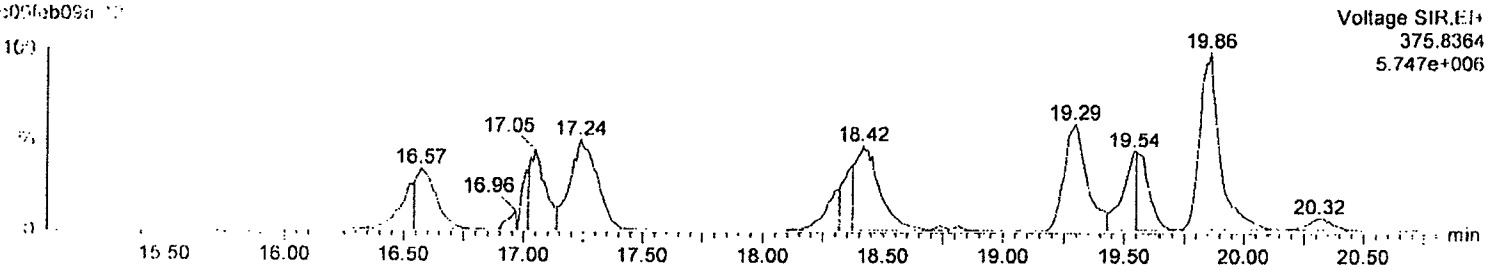
ES:13C-2378-TCDF



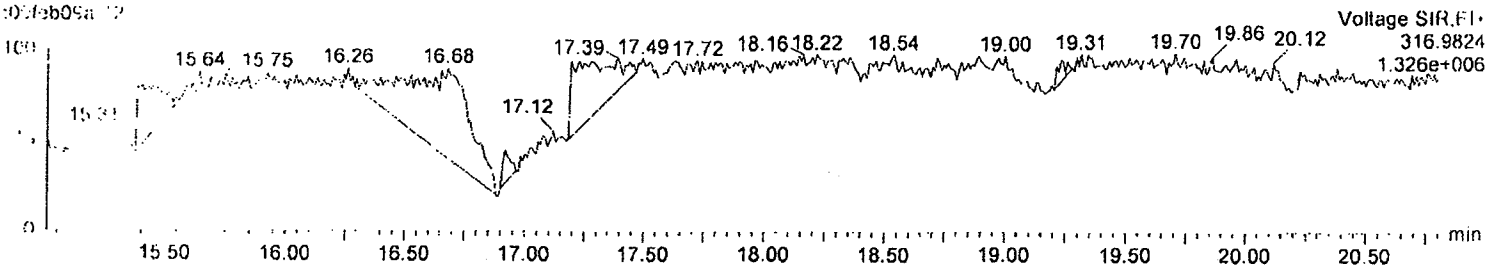
JS:13C-1234-TCDD

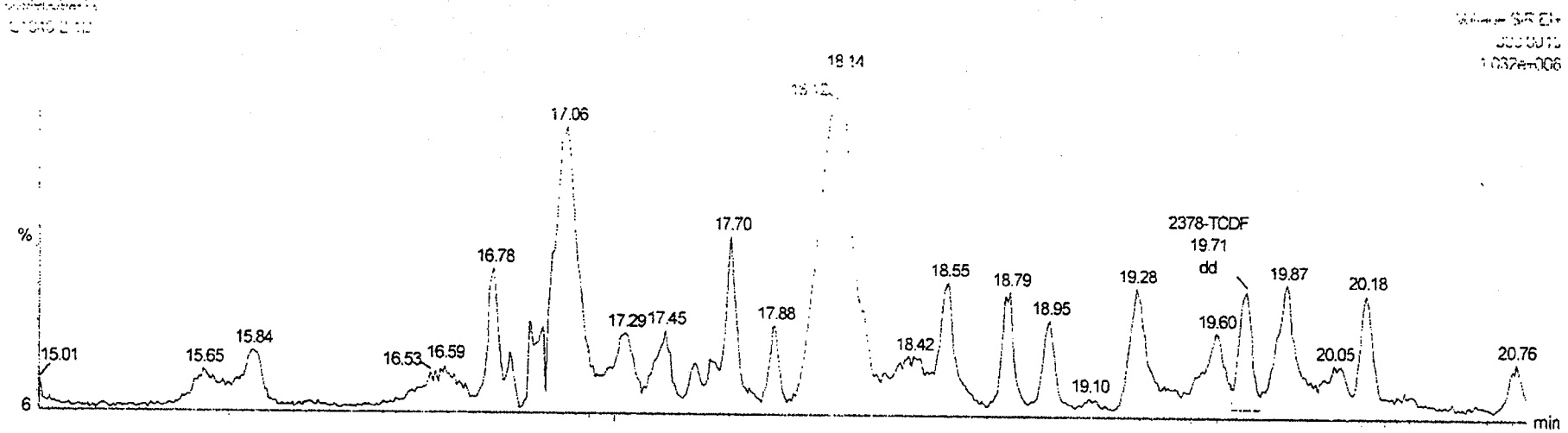


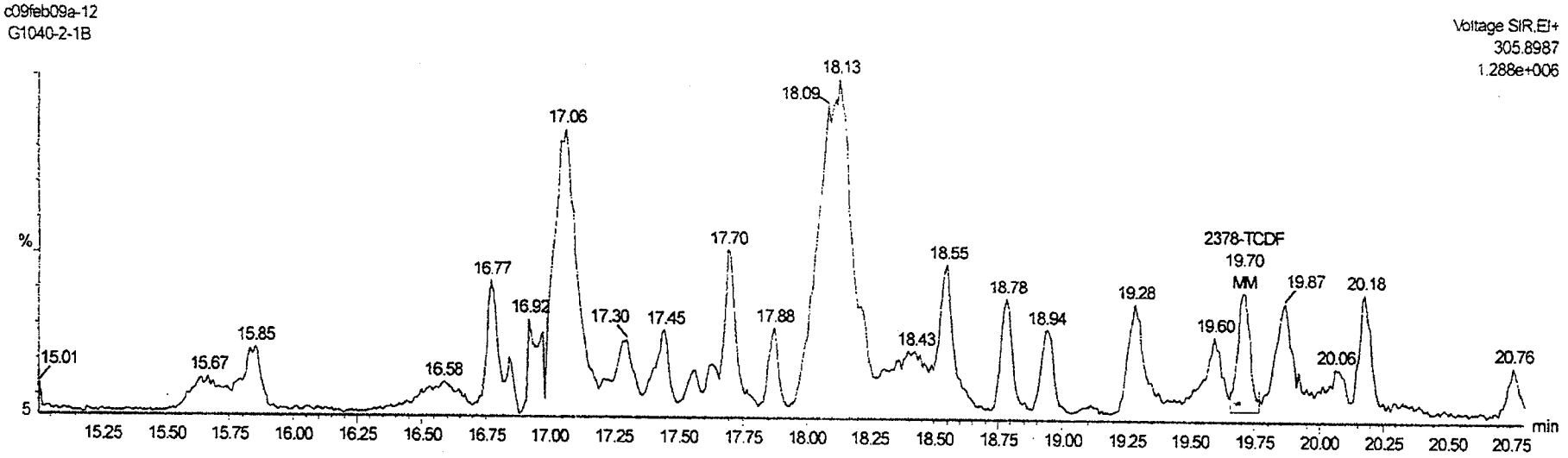
Hexa Ether



F1 Lock Mass




18.14
17.06
17.70
16.78
2378-TCDF
19.71
dd
18.55
18.79
19.28
19.87
20.18
18.95
17.29
17.45
17.88
15.84
15.65
16.53
16.59
18.42
19.60
20.05
15.01
20.76
19.10
%
6
min


c09feb09a-12
G1040-2-1B
Voltage SIR.EI+
305.8987
1.288e+006
18.13
18.09
17.06
17.70
16.77
2378-TCDF
19.70
MM
18.55
18.78
19.87
20.18
19.28
16.92
17.30
17.45
17.88
18.94
15.85
18.43
19.60
20.06
15.01
15.67
16.58
20.76
%
5
15.25 15.50 15.75 16.00 16.25 16.50 16.75 17.00 17.25 17.50 17.75 18.00 18.25 18.50 18.75 19.00 19.25 19.50 19.75 20.00 20.25 20.50 20.75
min

Method 1613

PGSS-64

Analytical Resources, Inc.

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	RL (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	1.00			
1,2,3,7,8-PeCDD	ND	5.00			
1,2,3,4,7,8-HxCDD	ND	5.00			
1,2,3,6,7,8-HxCDD	ND	5.00			
1,2,3,7,8,9-HxCDD	ND	5.00			
1,2,3,4,6,7,8-HpCDD	16.4	5.00	40:20	1.00	
OCDD	135	10.0	44:40	0.89	
2,3,7,8-TCDF	1.05	1.00	30:53	0.85	
1,2,3,7,8-PeCDF	ND	5.00			
2,3,4,7,8-PeCDF	ND	5.00			
1,2,3,4,7,8-HxCDF	ND	5.00			
1,2,3,6,7,8-HxCDF	ND	5.00			
2,3,4,6,7,8-HxCDF	ND	5.00			
1,2,3,7,8,9-HxCDF	ND	5.00			
1,2,3,4,6,7,8-HpCDF	ND	5.00			
1,2,3,4,7,8,9-HpCDF	ND	5.00			
OCDF	ND	10.0			
Total TCDDs	6.55	1.00			
Total PeCDDs	ND	5.00			Q
Total HxCDDs	4.94	5.00			
Total HpCDDs	80.0	5.00			
Total TCDFs	10.2	1.00			DPE
Total PeCDFs	ND	5.00			
Total HxCDFs	ND	5.00			
Total HpCDFs	ND	5.00			
WHO-2005 TEQ (ND=0)	0.310				
WHO-2005 TEQ (ND=½)	5.94				

Client Information

Project Name:	Port Gamble		
Sample ID:	PGSS-64		

Laboratory Information

Project ID:	G1040-2	
Sample ID:	G1040-2-2B	
Collection Date/Time:	09-Dec-08	10:35
Receipt Date:	15-Jan-09	10:15
Extraction Date:	19-Jan-09	
Analysis Date:	30-Jan-09	4:08

Sample Information

Matrix:	Sediment	
Weight / Volume:	17.34	grams
Solids / Lipids:	63.6	%
Original pH :	NA	
Batch ID:	WG16440	
Filename:	a27jan09a_6-11	
Retchk:	a27jan09a_5-14	
Begin ConCal:	a27jan09a_5-14	
Initial Cal:	m1613-100708a	

Method 1613

PGSS-64

Analytical Resources, Inc.

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
$^{13}C_{12}$-2,3,7,8-TCDD	2	1.69	84.3	31:27	0.79	
$^{13}C_{12}$-1,2,3,7,8-PeCDD	2	1.73	86.6	34:16	1.58	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	2	1.73	86.3	36:53	1.27	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	2	1.67	83.3	36:58	1.26	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	2	1.51	75.3	40:19	1.05	
$^{13}C_{12}$-OCDD	4	2.35	58.7	44:39	0.90	
$^{13}C_{12}$-2,3,7,8-TCDF	2	1.70	85.1	30:52	0.80	
$^{13}C_{12}$-1,2,3,7,8-PeCDF	2	1.80	89.9	33:28	1.56	
$^{13}C_{12}$-2,3,4,7,8-PeCDF	2	1.71	85.3	34:05	1.58	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	2	1.76	88.1	36:09	0.52	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	2	1.78	89.1	36:16	0.53	
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	2	1.73	86.6	36:45	0.53	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	2	1.70	85.2	37:32	0.52	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	2	1.54	76.8	39:03	0.45	
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	2	1.50	75.1	41:01	0.45	
Cleanup Standard						
$^{37}Cl_4$-2,3,7,8-TCDD	0.4	0.371	92.8	31:28		
Injection Standards						
$^{13}C_{12}$-1,2,3,4-TCDD	2			31:01	0.79	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	2			37:13	1.25	

Client Information

Project Name:	Port Gamble
Sample ID:	PGSS-64

Laboratory Information

Project ID:	G1040-2	
Sample ID:	G1040-2-2B	
Collection Date/Time:	09-Dec-08	10:35
Receipt Date:	15-Jan-09	10:15
Extraction Date:	19-Jan-09	
Analysis Date:	30-Jan-09	4:08

Analyzed by: DVP

Date: 02/17/09

Sample Information

Matrix:	Sediment	
Weight / Volume:	17.34	grams
Solids / Lipids:	63.6	%
Original pH :	NA	
Batch ID:	WG16440	
Filename:	a27jan09a_6-11	
Retchk:	a27jan09a_5-14	
Begin ConCal:	a27jan09a_5-14	
Initial Cal:	m1613-100708a	

Reviewed by: TM

Date: 02/17/09

Form Version:[1613_HRMS12]Repor

$[OCDD] = \frac{8.08e6 + 9.08e6}{2.05e7 + 2.27e7} \left(\frac{40000\,pg}{17.34g \times 0.6361}\right)\left(\frac{1}{1.0643}\right) = 135\,pg/g$ TM 02/17/09

Filename ; a27jan09a_6
Sample ; 11
Acquired ; 30-JAN-09 04:08:59
Processed ; 30-JAN-09 08:16:40
Sample ID ; G1040-2-2B
Cal Table ; m1613-100708a
Results Table ; m1613-012709a_6
Comments ;

;*1613*
;Inst: HRMS1

Ent	Name	Resp	Ion 1	Ion 2	RA;?	RT	Conc	EDL	S/N1;?	S/N2;?;M; Signal1; Noise 1; Signal2; Noise 2
1	2,3,7,8-TCDD	*	*	*	*;n	NotFnd	*	0.1443	*	*;y;y; *;5.57e+03; *;6.04e+03
2	1,2,3,7,8-PeCDD	1.52e+05	7.90e+04	7.28e+04	1.08;n	34:17	0.249	0.1820	3;y	4;y;n;3.01e+04;8.70e+03;2.42e+04;6.34e+03
3	1,2,3,4,7,8-HxCDD	2.71e+05	1.45e+05	1.26e+05	1.15;y	~~36:59~~ ND	0.538	0.3058	5;y	5;y;n;4.66e+04;8.86e+03;3.86e+04;7.28e+03
4	1,2,3,6,7,8-HxCDD	2.71e+05	1.45e+05	1.26e+05	1.15;y	36:59	0.534	0.2918	5;y	5;y;n;4.66e+04;8.86e+03;3.86e+04;7.28e+03
5	1,2,3,7,8,9-HxCDD	1.40e+05	5.32e+04	8.69e+04	0.61;n	37:14	0.279	0.3009	2;n	4;y;n;2.02e+04;8.86e+03;2.57e+04;7.28e+03
6	1,2,3,4,6,7,8-HpCDD	3.35e+06	1.67e+06	1.67e+06	1.00;y	40:20	9.030	0.4825	54;y	60;y;n;4.22e+05;7.88e+03;3.93e+05;6.60e+03
7	OCDD	1.72e+07	8.08e+06	9.08e+06	0.89;y	44:40	74.499	0.8630	274;y	240;y;n;1.46e+06;5.32e+03;1.60e+06;6.68e+03
8	2,3,7,8-TCDF	6.93e+05	3.18e+05	3.75e+05	0.85;y	30:53	0.579	0.1851	8;y	10;y;y;6.80e+04;8.58e+03;8.54e+04;8.88e+03
9	1,2,3,7,8-PeCDF	2.30e+05	1.42e+05	8.78e+04	1.62;y	33:28	0.236	0.1228	9;y	4;y;n;6.07e+04;6.95e+03;3.23e+04;8.96e+03
10	2,3,4,7,8-PeCDF	2.82e+05	1.76e+05	1.05e+05	1.68;y	34:06	0.296	0.1262	10;y	5;y;n;6.71e+04;6.95e+03;4.37e+04;8.96e+03
11	1,2,3,4,7,8-HxCDF	*	*	*	*;n	NotFnd	*	0.2015	*;n	*;n;n; *;8.66e+03; *;7.84e+03
12	1,2,3,6,7,8-HxCDF	1.08e+05	5.81e+04	4.97e+04	1.17;y	36:17	0.133	0.1829	3;n	2;n;n;2.24e+04;8.66e+03;1.71e+04;7.84e+03
13	2,3,4,6,7,8-HxCDF	*	*	*	*;n	NotFnd	*	0.1960	*;n	*;n;n; *;8.66e+03; *;7.84e+03
14	1,2,3,7,8,9-HxCDF	*	*	*	*;n	NotFnd	*	0.2628	*;n	*;n;n; *;8.66e+03; *;7.84e+03
15	1,2,3,4,6,7,8-HpCDF	8.21e+05	3.95e+05	4.26e+05	0.93;y	39:03	1.343	0.2464	15;y	17;y;n;1.11e+05;7.20e+03;1.17e+05;6.70e+03
16	1,2,3,4,7,8,9-HpCDF	*	*	*	*;n	NotFnd	*	0.3568	*;n	*;n;n; *;7.20e+03; *;6.70e+03
17	OCDF	7.42e+05	3.75e+05	3.67e+05	1.02;y	44:58	2.709	0.7574	14;y	11;y;n;7.37e+04;5.18e+03;7.86e+04;7.34e+03
	Extraction Standards									
18	13C-2,3,7,8-TCDD	7.72e+07	3.41e+07	4.31e+07	0.79;y	31:27	84.247	0.1627	1885;y	1850;y;n;1.05e+07;5.54e+03;1.35e+07;7.29e+03
19	13C-1,2,3,7,8-PeCDD	5.80e+07	3.55e+07	2.25e+07	1.58;y	34:16	86.615	0.2240	2071;y	1534;y;n;1.43e+07;6.90e+03;9.23e+06;6.02e+03
20	13C-1,2,3,4,7,8-HxCDD	4.88e+07	2.73e+07	2.15e+07	1.27;y	36:53	86.317	0.2500	1121;y	959;y;n;8.59e+06;7.66e+03;6.77e+06;7.06e+03
21	13C-1,2,3,6,7,8-HxCDD	5.12e+07	2.86e+07	2.26e+07	1.26;y	36:58	83.268	0.2301	1204;y	1061;y;n;9.22e+06;7.66e+03;7.49e+06;7.06e+03
22	13C-1,2,3,4,6,7,8-HpCDD	3.49e+07	1.79e+07	1.70e+07	1.05;y	40:19	75.295	0.2782	552;y	742;y;n;4.32e+06;7.83e+03;4.15e+06;5.60e+03
23	13C-OCDD	4.33e+07	2.05e+07	2.27e+07	0.90;y	44:39	117.288	0.3277	520;y	756;y;n;3.70e+06;7.12e+03;4.13e+06;5.47e+03
24	13C-2,3,7,8-TCDF	1.15e+08	5.12e+07	6.43e+07	0.80;y	30:52	85.065	0.1115	1952;y	2221;y;n;1.22e+07;6.23e+03;1.51e+07;6.81e+03
25	13C-1,2,3,7,8-PeCDF	9.86e+07	6.01e+07	3.85e+07	1.56;y	33:28	89.863	0.4120	1034;y	984;y;n;2.43e+07;2.35e+04;1.52e+07;1.54e+04
26	13C-2,3,4,7,8-PeCDF	9.16e+07	5.61e+07	3.55e+07	1.58;y	34:05	85.254	0.4209	950;y	916;y;n;2.23e+07;2.35e+04;1.41e+07;1.54e+04
27	13C-1,2,3,4,7,8-HxCDF	6.44e+07	2.21e+07	4.23e+07	0.52;y	36:09	88.121	0.2007	957;y	1831;y;n;7.37e+06;7.70e+03;1.38e+07;7.56e+03
28	13C-1,2,3,6,7,8-HxCDF	7.18e+07	2.48e+07	4.70e+07	0.53;y	36:16	89.092	0.1819	1075;y	2071;y;n;8.28e+06;7.70e+03;1.56e+07;7.56e+03
29	13C-2,3,4,6,7,8-HxCDF	6.56e+07	2.27e+07	4.29e+07	0.53;y	36:45	86.541	0.1934	1003;y	1926;y;n;7.73e+06;7.70e+03;1.46e+07;7.56e+03
30	13C-1,2,3,7,8,9-HxCDF	5.75e+07	1.98e+07	3.77e+07	0.52;y	37:32	85.150	0.2171	757;y	1500;y;n;5.83e+06;7.70e+03;1.13e+07;7.56e+03
31	13C-1,2,3,4,6,7,8-HpCDF	4.44e+07	1.38e+07	3.07e+07	0.45;y	39:03	76.795	0.2895	430;y	990;y;n;3.79e+06;8.82e+03;8.54e+06;8.62e+03
32	13C-1,2,3,4,7,8,9-HpCDF	3.42e+07	1.07e+07	2.36e+07	0.45;y	41:01	75.054	0.3675	307;y	678;y;n;2.71e+06;8.82e+03;5.84e+06;8.62e+03
	Injection Standards									
33	13C-1,2,3,4-TCDD	8.21e+07	3.62e+07	4.59e+07	0.79;y	31:01	60.454	-;	1687;y	1627;y;n;9.36e+06;5.54e+03;1.19e+07;7.29e+03
34	13C-1,2,3,7,8,9-HxCDD	5.89e+07	3.26e+07	2.62e+07	1.25;y	37:13	54.521	-;	1333;y	1158;y;n;1.02e+07;7.66e+03;8.17e+06;7.06e+03
	Cleanup Standard									
35	37Cl-2,3,7,8-TCDD	1.81e+07	1.81e+07	-;	-;-	31:28	18.568	0.0901	739;y	-;-;n;5.60e+06;7.58e+03; -; -

Totals Raw Data

	Conc	Empc	Flags
TCDF	5.623	5.623	FALSE
TCDD	3.613	3.613	FALSE
PeCDF	0	0	FALSE
PeCDD	0	0	FALSE
HxCDF	0	0	FALSE
HxCDD	2.725	2.725	FALSE
HpCDF	0	0	FALSE
HpCDD	44.143	44.143	FALSE

Filename: a27jan09a_6 | Name of Homolog Group: Total Tetra-Furans
Sample: 11 | Number of Peaks Found: 19 6
Acquired: 30-JAN-09 04:08:59 | RRF Used For Totals: 1.0368
Processed: 30-JAN-09 08:16:40 | Detection Limit: 0.1851 | RL=0.500 (pg/µL)
Sample ID: G1040-2-2B | Noise Height Ion1/Ion2: 8584 / 8876
Cal Table: m1613-100708a | Begin Window: 26:14:00
Results Table: m1613-012709a_6 | End Window: 33:07:00

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	4.70E+05	208000	262000		0.79 y	26:35	0.392	RL	5	y	5.7	y	n
	2	2.76E+05	122000	154000		0.79 y	27:01	0.23	RL	3.2	y	3.8	y	n
	3	3.62E+05	160000	202000		0.8 y	27:34	0.303	RL	4.1	y	4.8	y	n
	4	1.66E+06	733000	924000		0.79 y	27:55	1.384	OK	13.5	y	15.4	y	y
	5	1.10E+06	505000	598000		0.84 y	28:15	0.921	OK	8.6	y	9.9	y	y
	6	4.39E+05	204000	235000		0.87 y	28:36	0.367	RL	5.1	y	5.5	y	y
	7	2.51E+05	107000	144000		0.74 y	28:43	0.21	RL	3	y	3.2	y	y
	8	4.98E+05	213000	285000		0.75 y	28:53	0.416	RL	4.6	y	7.4	y	y
	9	3.46E+05	154000	192000		0.8 y	29:12	0.289	RL	3.5	y	4.7	y	y
	10	4.45E+05	191000	254000		0.75 y	29:21	0.372	RL	4.6	y	5.4	y	y
	11	1.36E+06	586000	770000		0.76 y	29:32	1.132	OK	10.6	y	13.3	y	y
	12	8.79E+05	387000	492000		0.79 y	30:00	0.734	OK	8.6	y	9.7	y	y
	13	3.98E+05	185000	212000		0.87 y	30:17	0.332	RL	4.2	y	4.7	y	y
	14	2.13E+05	95000	118000		0.8 y	30:29	0.178	RL	2.6	n	3.2	y	y
	15	3.48E+05	150000	198000		0.76 y	30:41	0.291	RL	3.4	y	4.7	y	y
	16	2.16E+05	96900	119000		0.81 y	30:48	0.18	RL	3.5	y	3.6	y	y
2,3,7,8-TCDF	17	6.93E+05	318000	375000		0.85 y	30:53	0.579	OK	7.9	y	9.6	y	y
	18	1.05E+06	437000	609000		0.72 y	31:09	0.873	OK	14.8	y	19.6	y	n
	19	1.88E+05	98900	89400		1.11 n	32:05	0.157	RL	4.9	y	3.6	y	n

Filename: a27jan09a_6 | Name of Homolog Group: Total Tetra-Dioxins
Sample: 11 | Number of Peaks Found: 6 3
Acquired: 30-JAN-09 04:08:59 | RRF Used For Totals: 1.0087
Processed: 30-JAN-09 08:16:40 | Detection Limit: 0.1443 | RL=0.500 (pg/µL)
Sample ID: G1040-2-2B | Noise Height Ion1/Ion2: 5568 / 6038
Cal Table: m1613-100708a | Begin Window: 27:40:00

Results Table:	m1613-012709a_6	End Window:					32:37:00						
Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	? Mod?
	1	1.40E+06	610000	787000		0.78 y	28:20	1.794	OK	21.3	y	26.1	y n
	2	1.00E+06	419000	582000		0.72 y	28:36	1.286	OK	14.4	y	16.9	y n
	3	2.99E+05	140000	159000		0.88 y	29:58	0.384	RL	6.7	y	4.6	y y
	4	2.76E+05	119000	157000		0.76 y	30:10	0.355	RL	4.7	y	5	y y
	5	2.53E+05	119000	134000		0.88 y	31:02	0.325	RL	6	y	6	y n
	6	4.15E+05	191000	224000		0.85 y	31:19	0.533	OK	6.6	y	8.3	y y

Filename:	a27jan09a_6	Name of Homolog Group:	Total Penta-Furans Fn1	
Sample:	11	Number of Peaks Found:	1	0
Acquired:	30-JAN-09 04:08:59	RRF Used For Totals:	1.0121	
Processed:	30-JAN-09 08:16:40	Detection Limit:	0.1071	
Sample ID:	G1040-2-2B	Noise Height Ion1/Ion2:	6984 / 6720	
Cal Table:	m1613-100708a	Begin Window:		31:46:00
Results Table:	m1613-012709a_6	End Window:		32:06:00

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	? Mod?
	1	7.35E+05	270000	465000		0.58 y	32:04	0.763	RL	15.5	y	26.6	y n

Filename:	a27jan09a_6	Name of Homolog Group:	Total Penta-Furans Fn2	
Sample:	11	Number of Peaks Found:	8	0
Acquired:	30-JAN-09 04:08:59	RRF Used For Totals:	1.0121	
Processed:	30-JAN-09 08:16:40	Detection Limit:	0.1244	RL=2.500 (pg/µL)
Sample ID:	G1040-2-2B	Noise Height Ion1/Ion2:	6952 / 8960	
Cal Table:	m1613-100708a	Begin Window:		7:43
Results Table:	m1613-012709a_6	End Window:		34:52:00

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	? Mod?
	1	4.13E+05	271000	142000		1.91 n	32:49	0.429	RL	13.2	y	5.6	y n
	2	7.74E+05	495000	278000		1.78 y	32:54	0.804	RL	19.3	y	9.8	y n
	3	4.33E+04	23900	19400		1.23 n	33:07	0.045	S2N	2.1	n	1.2	n n
	4	2.94E+05	178000	116000		1.54 y	33:15	0.305	RL	8.2	y	4.6	y n
1,2,3,7,8-PeCDF	5	2.30E+05	142000	87800		1.62 y	33:28	0.236	RL	8.7	y	3.6	y n
	6	3.02E+05	181000	121000		1.49 y	33:37	0.313	RL	7.4	y	4.3	y n
	7	2.03E+05	122000	80100		1.53 y	34:01	0.21	RL	6.8	y	2.9	n n
2,3,4,7,8-PeCDF	8	2.82E+05	176000	105000		1.68 y	34:06	0.296	RL	9.6	y	4.9	y n

Filename:	a27jan09a_6	Name of Homolog Group:	Total Penta-Dioxins	
Sample:	11	Number of Peaks Found:	11	0
Acquired:	30-JAN-09 04:08:59	RRF Used For Totals:	1.0517	
Processed:	30-JAN-09 08:16:40	Detection Limit:	0.182	RL=2.500 (pg/µL)
Sample ID:	G1040-2-2B	Noise Height Ion1/Ion2:	8704 / 6340	

Cal Table: m1613-100708a
Results Table: m1613-012709a_6
Begin Window: 32:52:00
End Window: 34:37:00

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	6.46E+05	388000	258000		1.5 y	32:56	1.058	RL	16.5 y		13.2 y		n
	2	6.80E+04	46500	21600		2.16 n	33:12	0.111	S2N	2.5 n		2.3 n		n
	3	6.25E+05	363000	262000		1.39 y	33:29	1.024	RL	18.1 y		16.3 y		n
	4	1.37E+05	86600	50100		1.73 y	33:35	0.224	RL	4 y		4.3 y		n
	5	4.94E+05	279000	215000		1.3 n	33:39	0.809	RL	13.6 y		12.5 y		n
	6	1.25E+05	77600	47700		1.63 y	33:47	0.205	RL	3 y		2.5 n		n
	7	2.57E+05	155000	102000		1.52 y	33:59	0.421	RL	6.3 y		6.4 y		n
	8	2.32E+04	16800	6460		2.6 n	34:04	0.038	G	1.1 n		0.7 n		n
1,2,3,7,8-PeCDD	9	1.52E+05	79000	72800		1.08 n	34:17	0.249	RL	3.5 y		3.8 y		n
	10	6.56E+04	32000	33500		0.96 n	34:20	0.107	S2N	1.6 n		2.1 n		n
	11	6.91E+04	31500	37600		0.84 n	34:32	0.113	S2N	1.8 n		2 n		n

Filename: a27jan09a_6
Sample: 11
Acquired: 30-JAN-09 04:08:59
Processed: 30-JAN-09 08:16:40
Sample ID: G1040-2-2B
Cal Table: m1613-100708a
Results Table: m1613-012709a_6

Name of Homolog Group: Total Hexa-Furans
Number of Peaks Found: 6 0
RRF Used For Totals: 1.1305
Detection Limit: 0.2082
Noise Height Ion1/Ion2: 8660 / 7844
RL=2.500 (pg/µL)
Begin Window: 35:06:00
End Window: 37:40:00

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	2.07E+05	137000	70500		1.94 n	35:13	0.283	RL	5.6 y		3.7 y		n
	2	6.89E+05	412000	277000		1.48 n	35:20	0.94	RL	17.1 y		13.6 y		n
	3	5.53E+05	313000	240000		1.3 y	35:47	0.754	RL	12.9 y		10.9 y		n
1,2,3,6,7,8-HxCDF	4	1.08E+05	58100	49700		1.17 y	36:17	0.133	S2N	2.6 n		2.2 n		n
	5	9.59E+03	4600	4990		0.92 n	36:21	0.013	S2N	0.4 n		0.8 n		n
	6	1.23E+04	7340	4990		1.47 n	36:23	0.017	S2N	0.8 n		0.8 n		n

Filename: a27jan09a_6
Sample: 11
Acquired: 30-JAN-09 04:08:59
Processed: 30-JAN-09 08:16:40
Sample ID: G1040-2-2B
Cal Table: m1613-100708a
Results Table: m1613-012709a_6

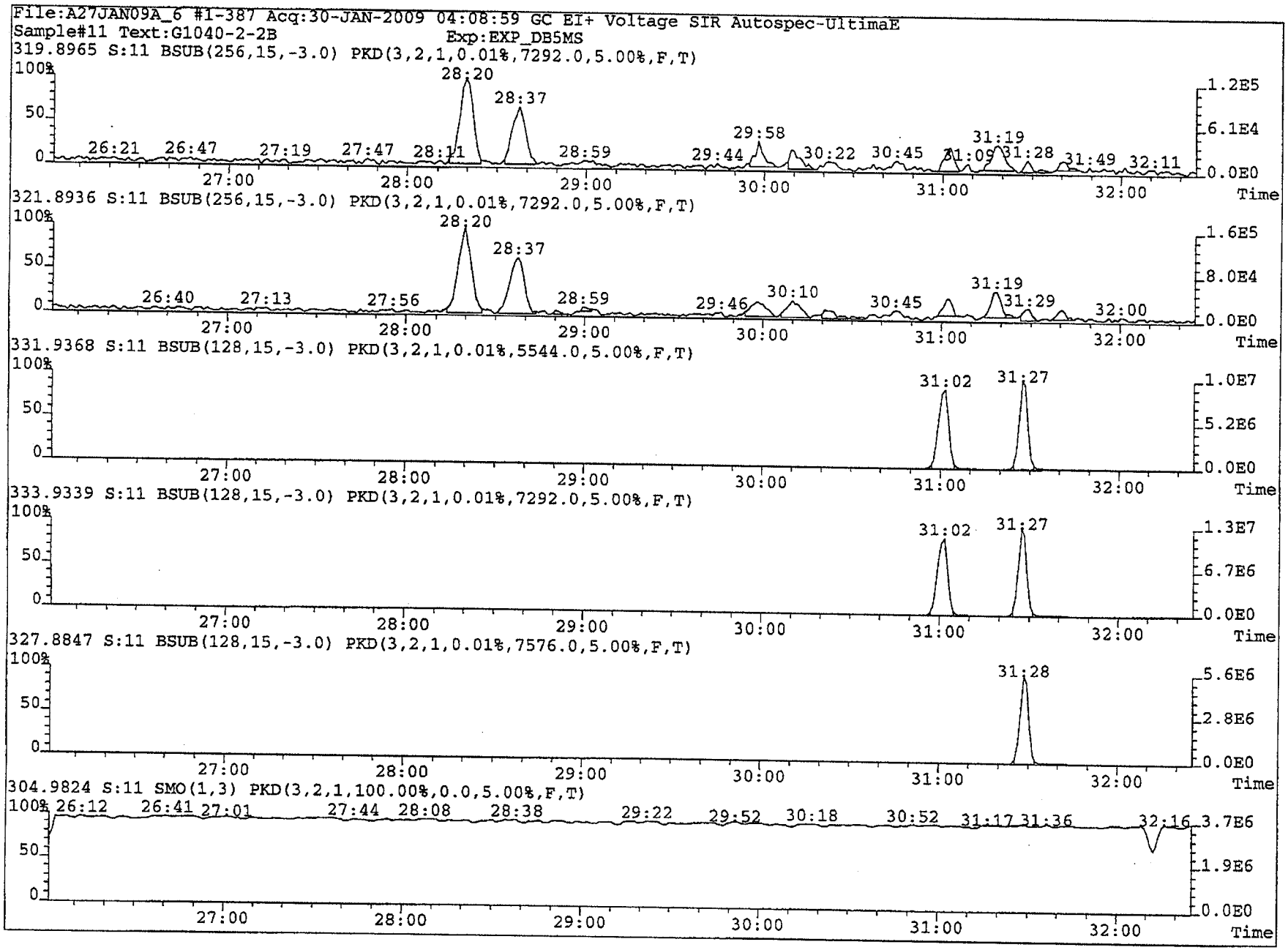
Name of Homolog Group: Total Hexa-Dioxins
Number of Peaks Found: 9 1
RRF Used For Totals: 1.0077
Detection Limit: 0.2997
Noise Height Ion1/Ion2: 8864 / 7284
RL=2.500 (pg/µL)
Begin Window: 35:36:00
End Window: 37:17:00

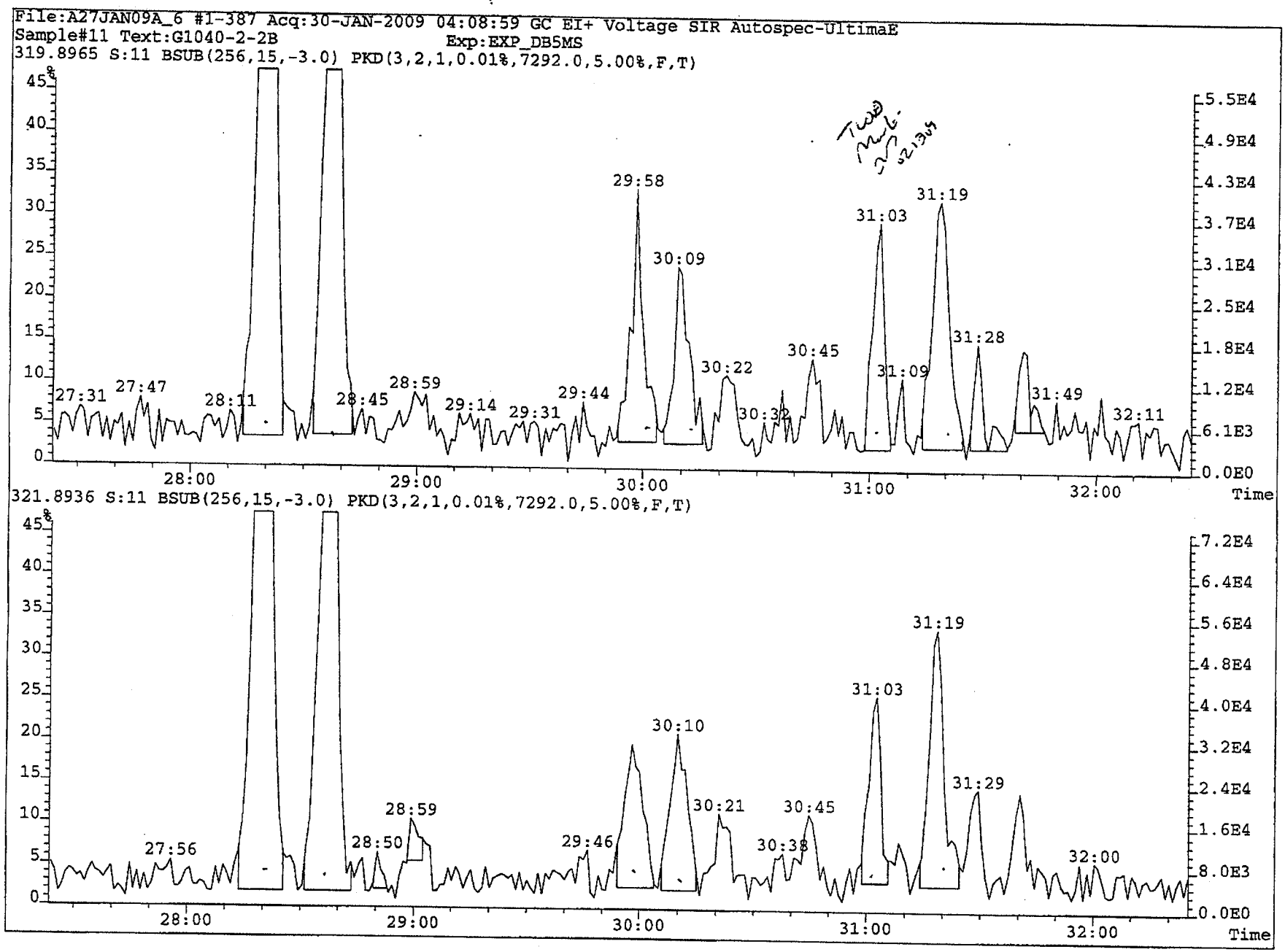
Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	1.18E+06	650000	526000		1.23 y	35:38	2.333	RL	24.9 y		27 y		n
	2	1.83E+04	7910	10400		0.76 n	35:44	0.036	S2N	0.5 n		0.9 n		n
	3	9.38E+05	536000	402000		1.33 y	36:06	1.862	RL	19.1 y		17.9 y		n
	4	1.37E+06	769000	604000		1.27 y	36:19	2.725	OK	24.5 y		23.2 y		n
	5	2.26E+05	122000	104000		1.18 y	36:24	0.449	RL	5.6 y		5.6 y		n

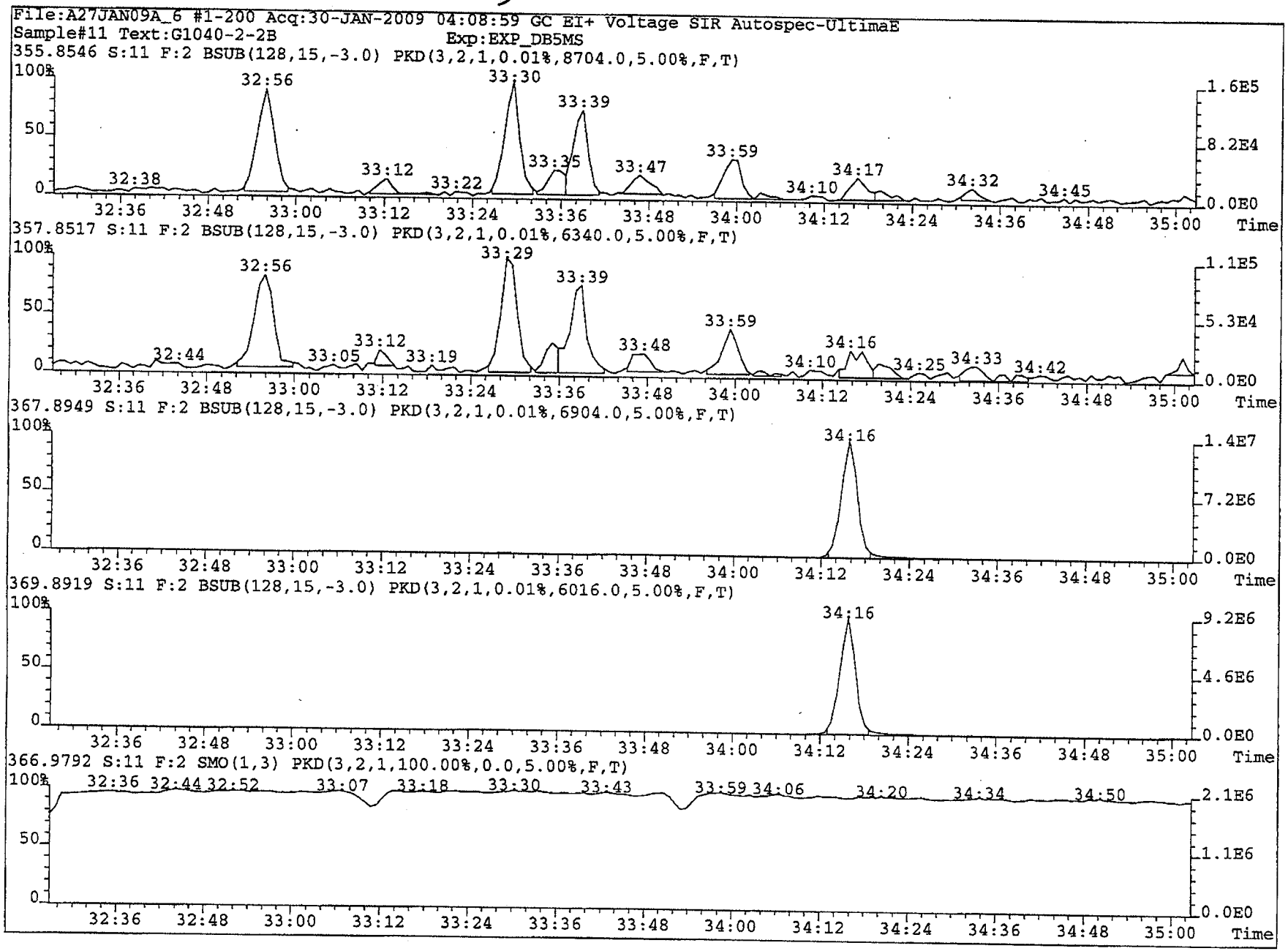
1,2,3,6,7,8-HxCDD	6	2.71E+05	145000	126000	1.15 y	36:59	0.534	RL	5.3 y	5.3 y	n
	7	5.18E+04	7760	44100	0.18 n	37:09	0.103	S2N	0.7 n	1.7 n	n
1,2,3,7,8,9-HxCDD	8	1.40E+05	53200	86900	0.61 n	37:14	0.279	S2N	2.3 n	3.5 y	n
	9	2.49E+05	49600	200000	0.25 n	37:51	0.495	RT	2.5 n	8.9 y	n

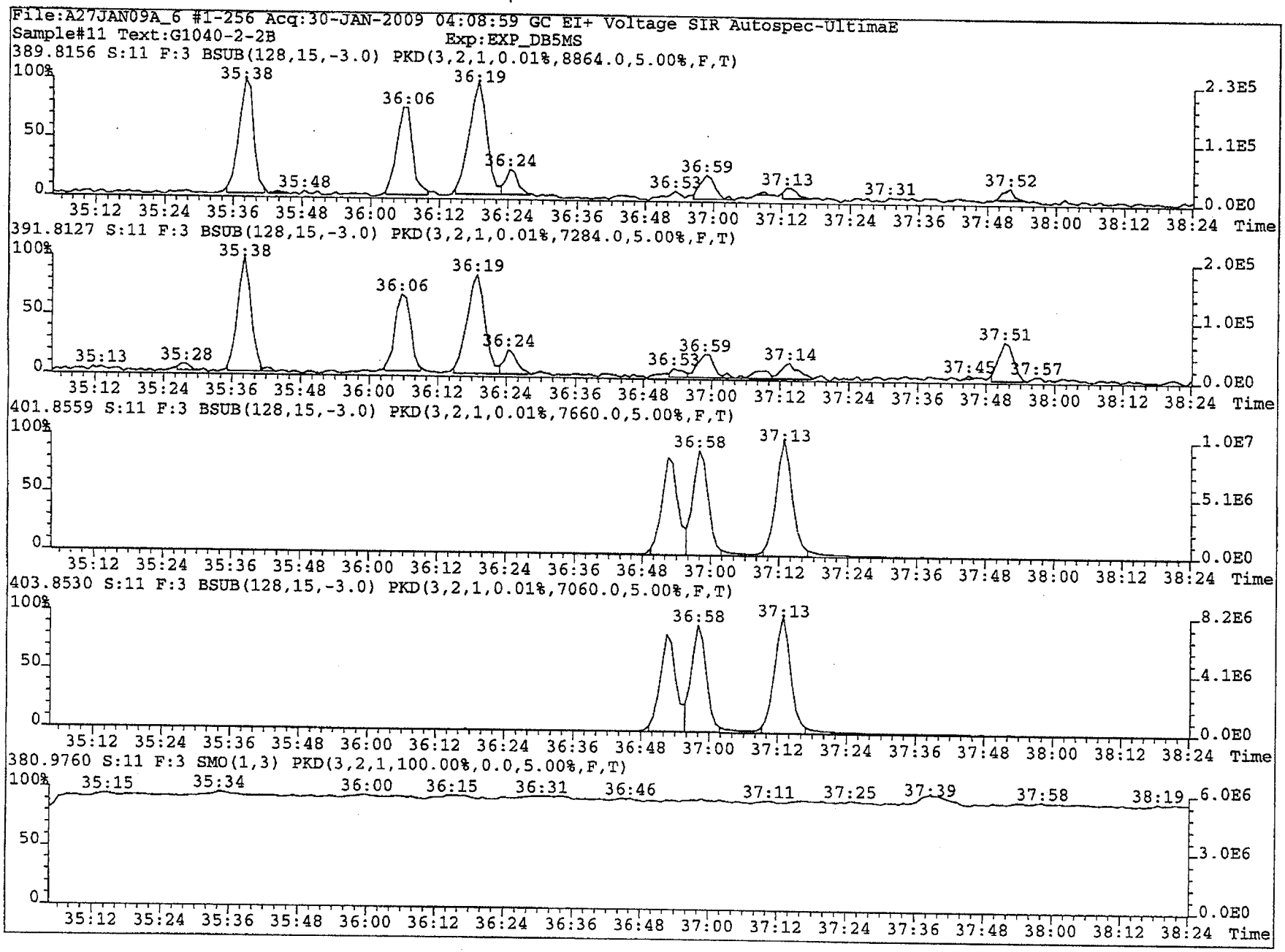
Filename:	a27jan09a_6	Name of Homolog Group:	Total Hepta-Furans								
Sample:	11	Number of Peaks Found:	2	0							
Acquired:	30-JAN-09 04:08:59	RRF Used For Totals:	1.3693								
Processed:	30-JAN-09 08:16:40	Detection Limit:	0.2941				RL=2.500 (pg/µL)				
Sample ID:	G1040-2-2B	Noise Height Ion1/Ion2:	7200 / 6696								
Cal Table:	m1613-100708a	Begin Window:				38:52:00					
Results Table:	m1613-012709a_6	End Window:				41:04:00					
Name	#	Response	Ion 1	Ion 2	RA ?	RT	Conc	Status	S/N1 ?	S/N2 ?	Mod?
1,2,3,4,6,7,8-HpCDI	1	8.21E+05	395000	426000	0.93 y	39:03	1.343	RL	15.5 y	17.5 y	n
	2	1.25E+06	653000	596000	1.1 y	39:36	2.319	RL	24.3 y	25.7 y	n

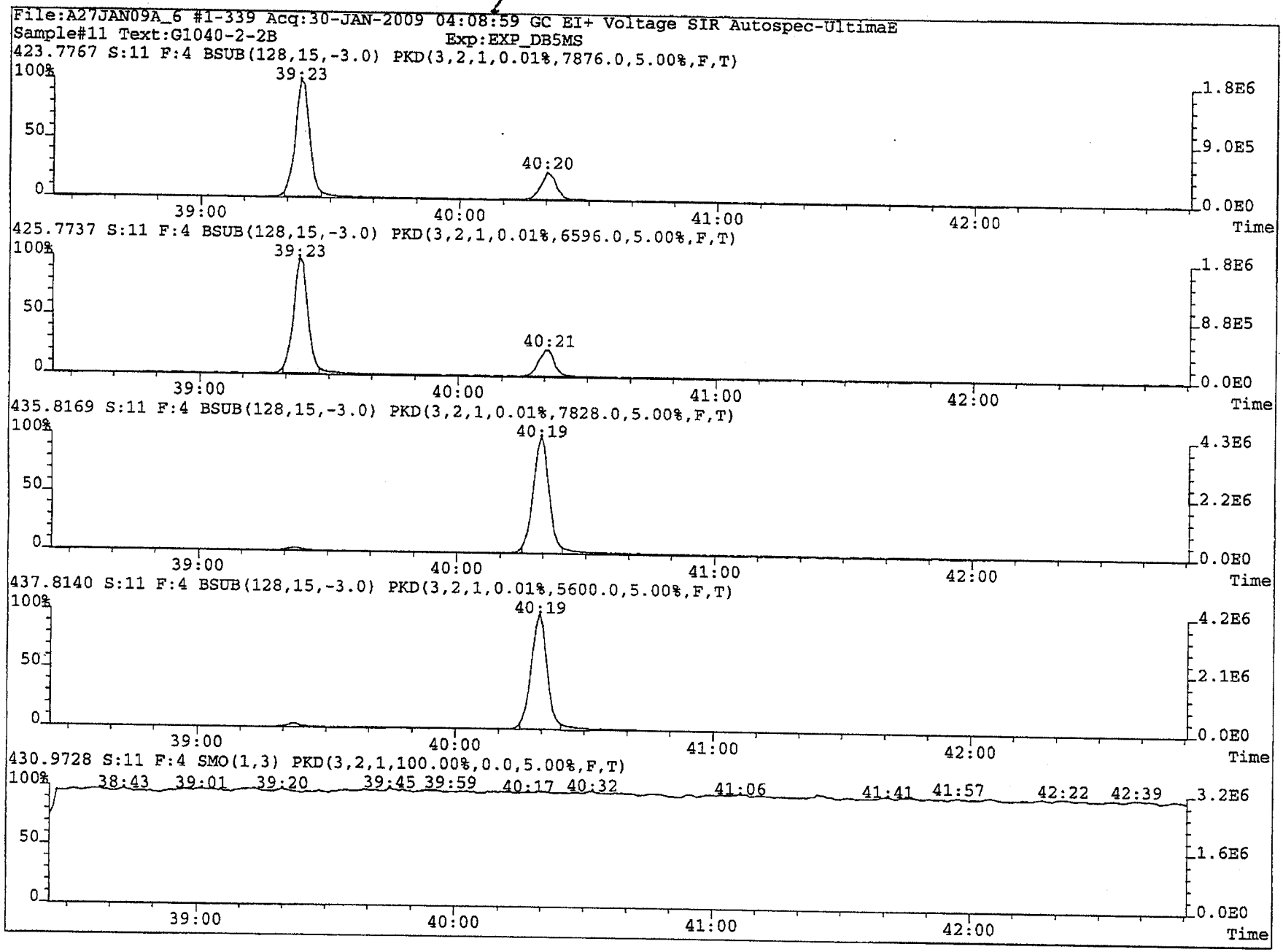
Filename:	a27jan09a_6	Name of Homolog Group:	Total Hepta-Dioxins								
Sample:	11	Number of Peaks Found:	2	2							
Acquired:	30-JAN-09 04:08:59	RRF Used For Totals:	1.0612								
Processed:	30-JAN-09 08:16:40	Detection Limit:	0.4825				RL=2.500 (pg/µL)				
Sample ID:	G1040-2-2B	Noise Height Ion1/Ion2:	7876 / 6596								
Cal Table:	m1613-100708a	Begin Window:				39:17:00					
Results Table:	m1613-012709a_6	End Window:				40:29:00					
Name	#	Response	Ion 1	Ion 2	RA ?	RT	Conc	Status	S/N1 ?	S/N2 ?	Mod?
	1	1.30E+07	6650000	6360000	1.04 y	39:23	35.113	OK	227.8 y	264 y	n
1,2,3,4,6,7,8-HpCDI	2	3.35E+06	1670000	1670000	1 y	40:20	9.03	OK	53.6 y	59.5 y	n

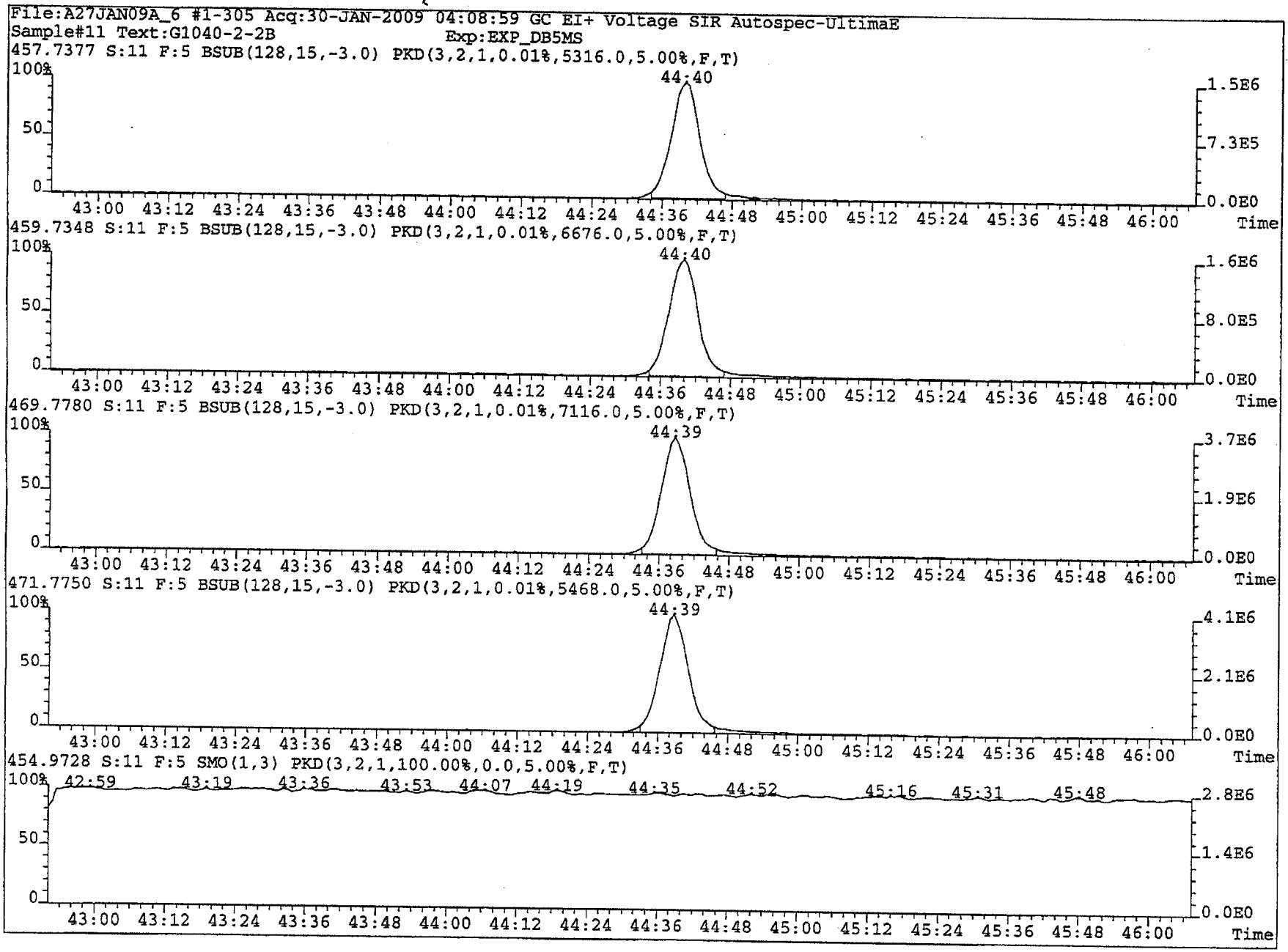

File:A27JAN09A_6 #1-387 Acq:30-JAN-2009 04:08:59 GC EI+ Voltage SIR Autospec-UltimaE
Sample#11 Text:G1040-2-2B
Exp:EXP_DB5MS
319.8965 S:11 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,7292.0,5.00%,F,T)
321.8936 S:11 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,7292.0,5.00%,F,T)
331.9368 S:11 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5544.0,5.00%,F,T)
333.9339 S:11 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7292.0,5.00%,F,T)
327.8847 S:11 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7576.0,5.00%,F,T)
304.9824 S:11 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time

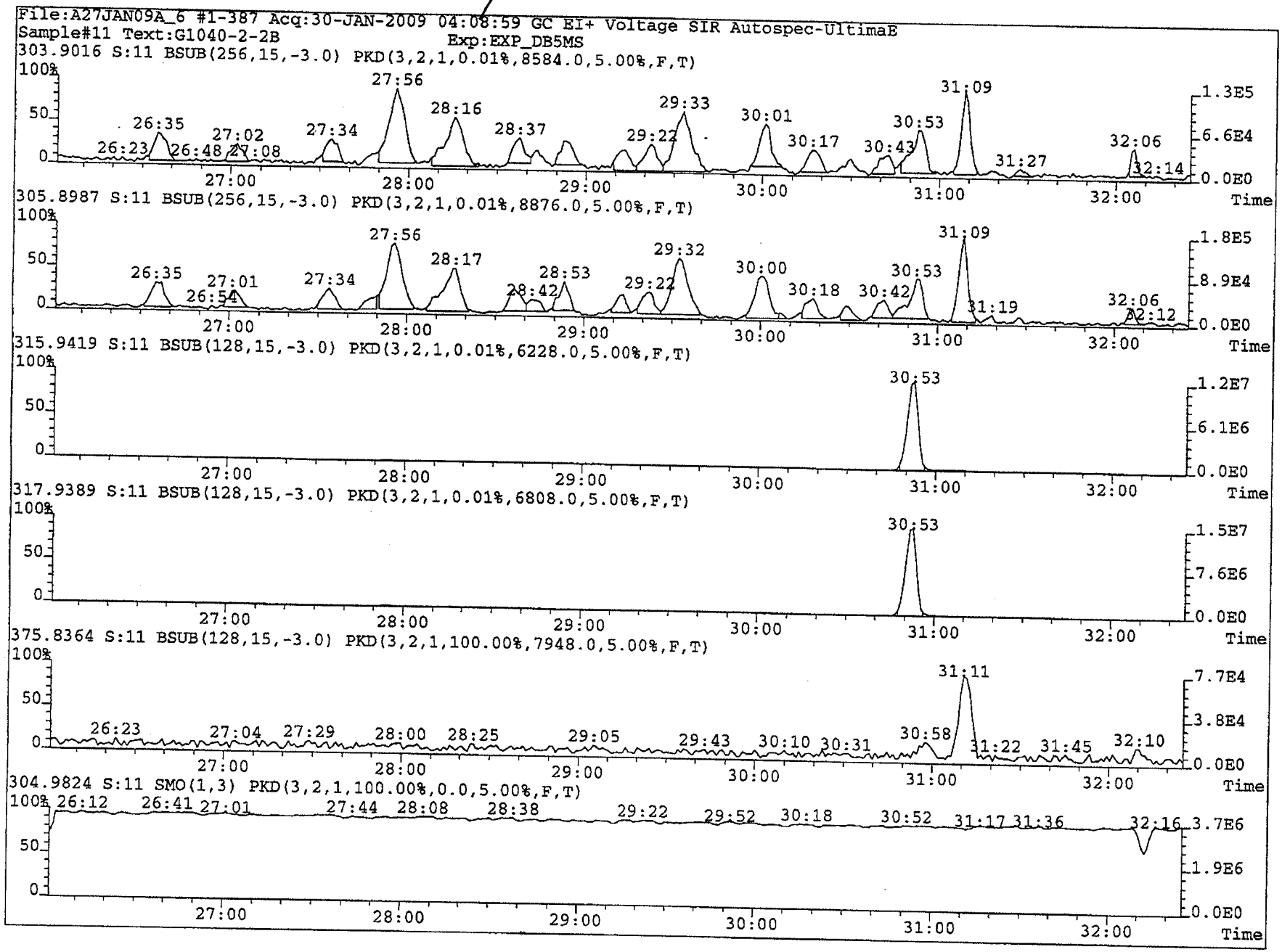

File:A27JAN09A_6 #1-387 Acq:30-JAN-2009 04:08:59 GC EI+ Voltage SIR Autospec-UltimaE
Sample#11 Text:G1040-2-2B
Exp:EXP_DB5MS
319.8965 S:11 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,7292.0,5.00%,F,T)
%
45
40
35
30
25
20
15
10
5
0
5.5E4
4.9E4
4.3E4
3.7E4
3.1E4
2.5E4
1.8E4
1.2E4
6.1E3
0.0E0
27:31
27:47
28:11
28:45
28:59
29:14
29:31
29:44
29:58
30:09
30:22
30:32
30:45
31:03
31:09
31:19
31:28
31:49
32:11
28:00
29:00
30:00
31:00
32:00
Time
321.8936 S:11 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,7292.0,5.00%,F,T)
%
45
40
35
30
25
20
15
10
5
0
7.2E4
6.4E4
5.6E4
4.8E4
4.0E4
3.2E4
2.4E4
1.6E4
8.0E3
0.0E0
27:56
28:50
28:59
29:46
30:10
30:21
30:38
30:45
31:03
31:19
31:29
32:00
28:00
29:00
30:00
31:00
32:00
Time

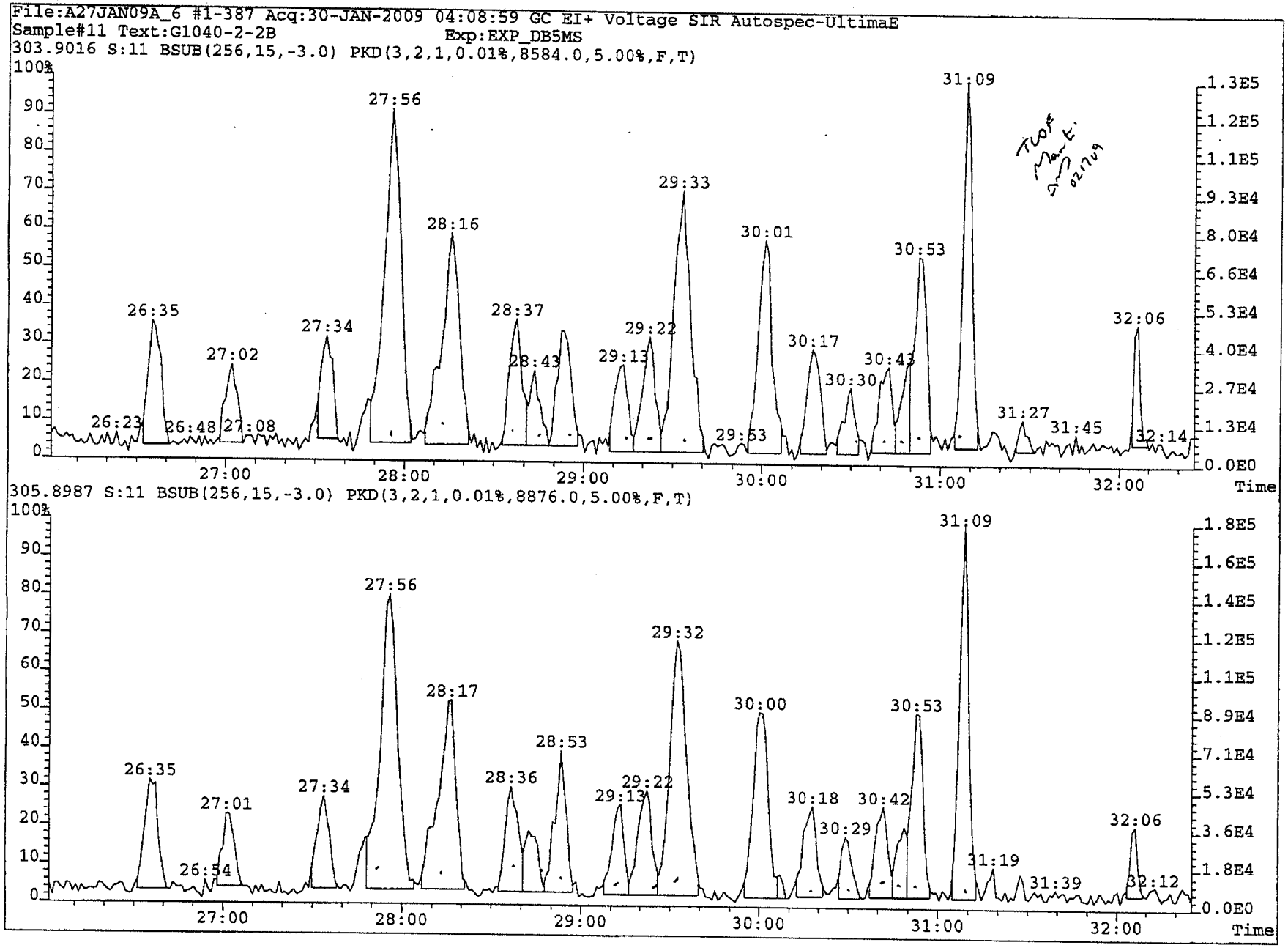

File:A27JAN09A_6 #1-200 Acq:30-JAN-2009 04:08:59 GC EI+ Voltage SIR Autospec-UltimaE
Sample#11 Text:G1040-2-2B
Exp:EXP_DB5MS
355.8546 S:11 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,8704.0,5.00%,F,T)
357.8517 S:11 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6340.0,5.00%,F,T)
367.8949 S:11 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6904.0,5.00%,F,T)
369.8919 S:11 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6016.0,5.00%,F,T)
366.9792 S:11 F:2 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time

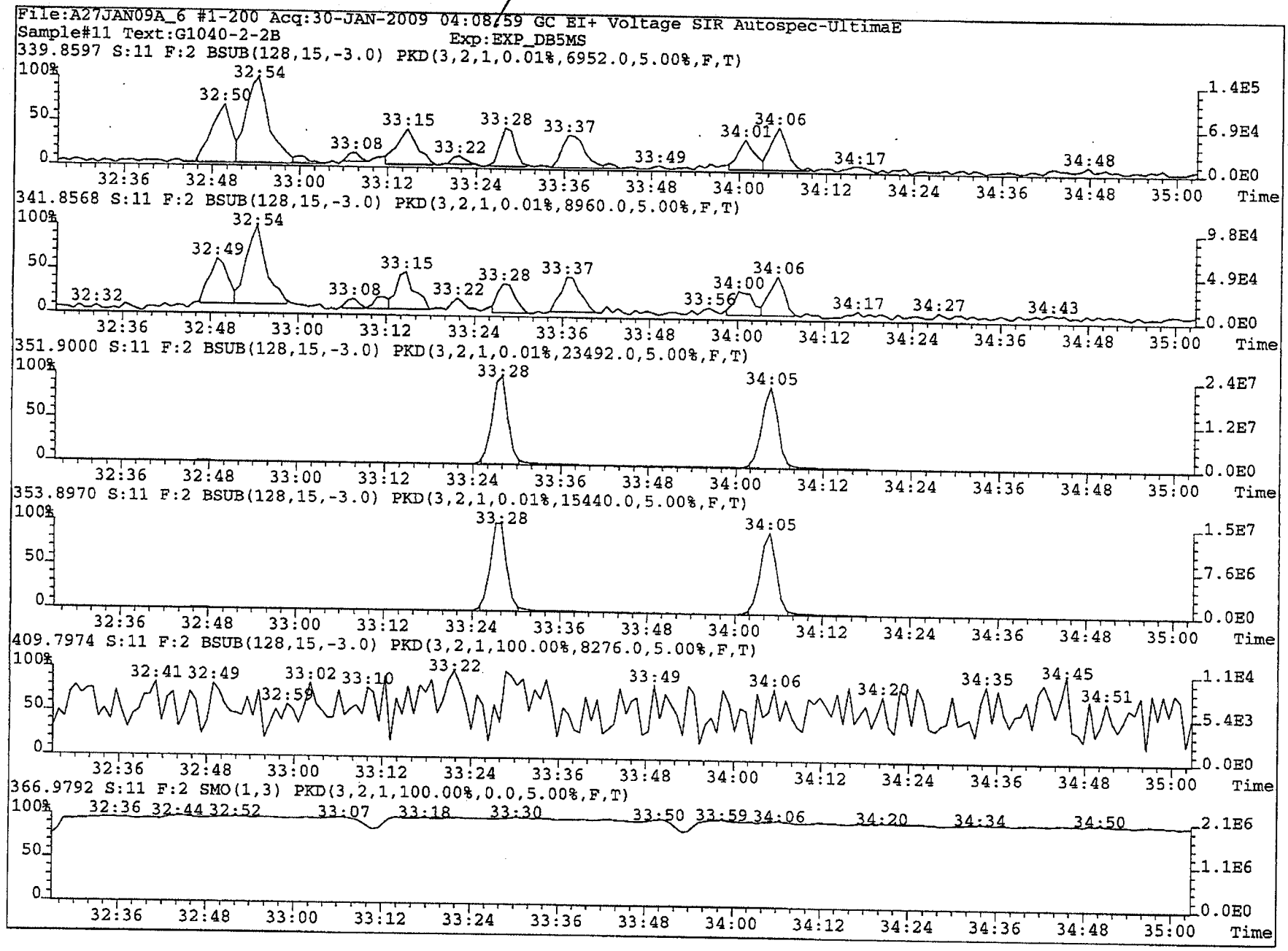

File:A27JAN09A_6 #1-256 Acq:30-JAN-2009 04:08:59 GC EI+ Voltage SIR Autospec-UltimaE
Sample#11 Text:G1040-2-2B Exp:EXP_DB5MS
389.8156 S:11 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,8864.0,5.00%,F,T)
391.8127 S:11 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7284.0,5.00%,F,T)
401.8559 S:11 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7660.0,5.00%,F,T)
403.8530 S:11 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7060.0,5.00%,F,T)
380.9760 S:11 F:3 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time

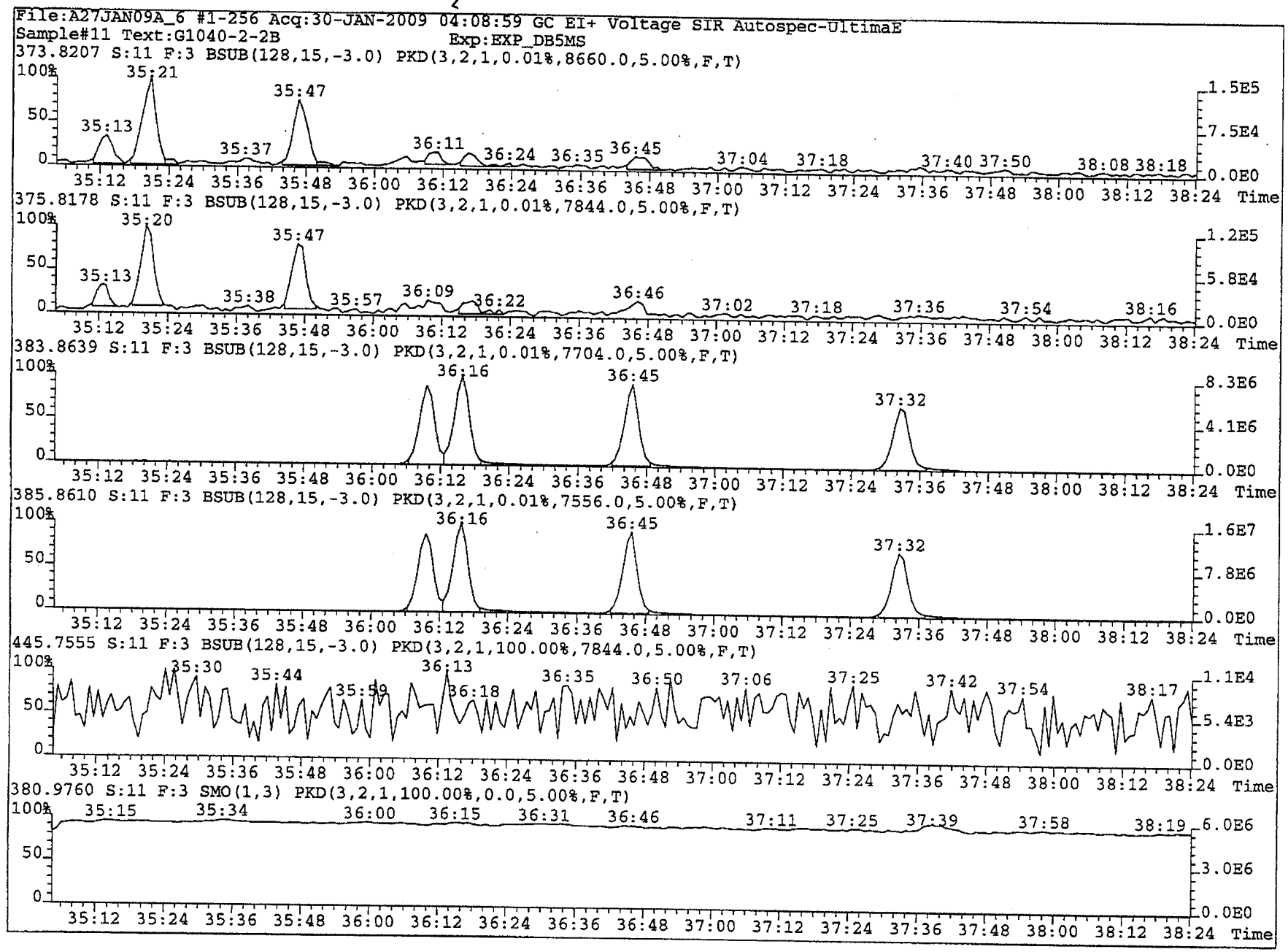

File:A27JAN09A_6 #1-339 Acq:30-JAN-2009 04:08:59 GC EI+ Voltage SIR Autospec-UltimaE
Sample#11 Text:G1040-2-2B
Exp:EXP_DB5MS
423.7767 S:11 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7876.0,5.00%,F,T)
39:23
40:20
1.8E6
9.0E5
0.0E0
425.7737 S:11 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6596.0,5.00%,F,T)
39:23
40:21
1.8E6
8.8E5
0.0E0
435.8169 S:11 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7828.0,5.00%,F,T)
40:19
4.3E6
2.2E6
0.0E0
437.8140 S:11 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5600.0,5.00%,F,T)
40:19
4.2E6
2.1E6
0.0E0
430.9728 S:11 F:4 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
38:43 39:01 39:20 39:45 39:59 40:17 40:32 41:06 41:41 41:57 42:22 42:39
3.2E6
1.6E6
0.0E0
100%
50
0
39:00
40:00
41:00
42:00
Time

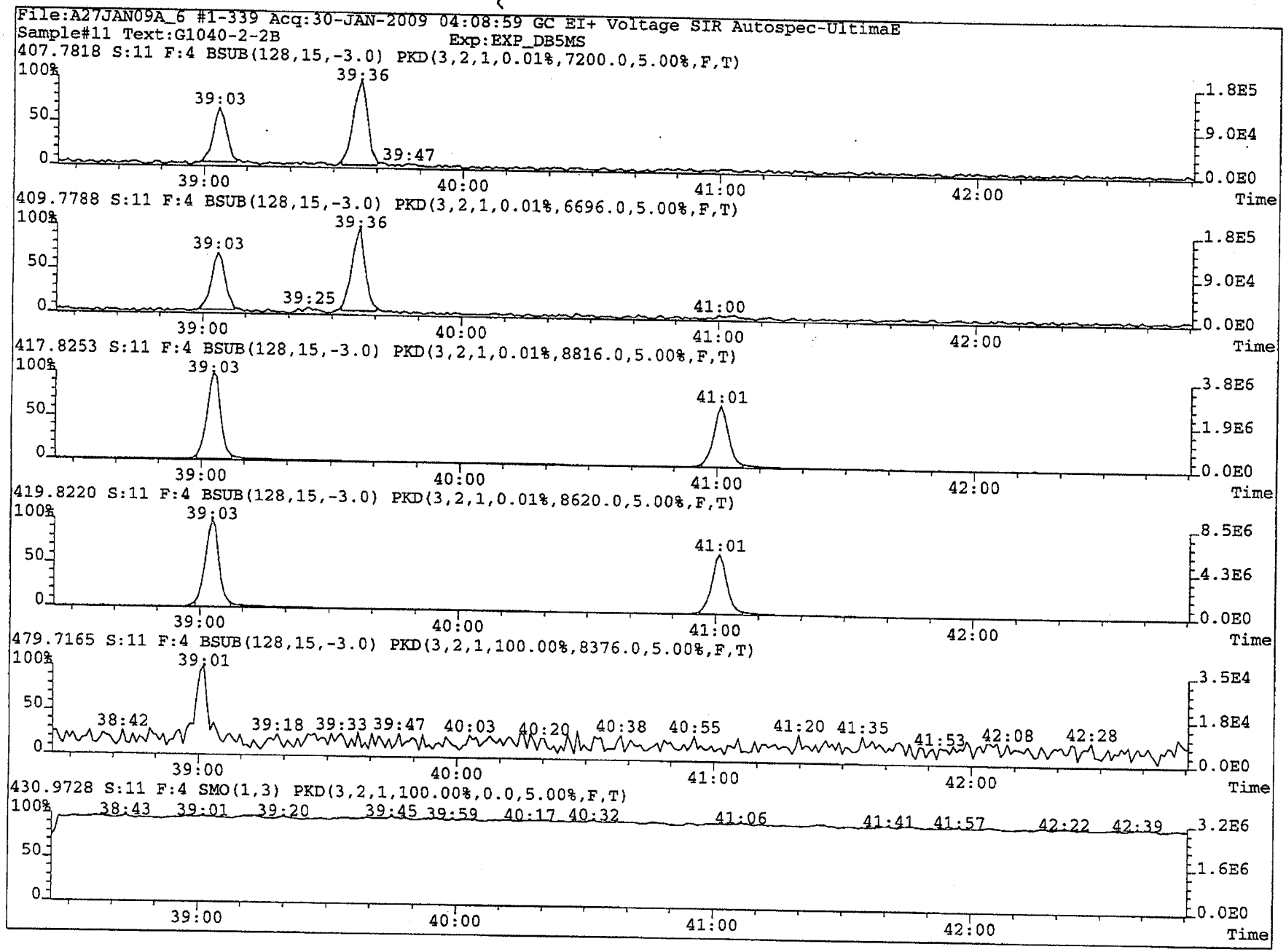

File:A27JAN09A_6 #1-305 Acq:30-JAN-2009 04:08:59 GC EI+ Voltage SIR Autospec-UltimaE
Sample#11 Text:G1040-2-2B Exp:EXP_DB5MS
457.7377 S:11 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5316.0,5.00%,F,T)
44:40
459.7348 S:11 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6676.0,5.00%,F,T)
44:40
469.7780 S:11 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7116.0,5.00%,F,T)
44:39
471.7750 S:11 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5468.0,5.00%,F,T)
44:39
454.9728 S:11 F:5 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
42:59 43:19 43:36 43:53 44:07 44:19 44:35 44:52 45:16 45:31 45:48
100%
50
0
43:00 43:12 43:24 43:36 43:48 44:00 44:12 44:24 44:36 44:48 45:00 45:12 45:24 45:36 45:48 46:00
Time
1.5E6
7.3E5
0.0E0
1.6E6
8.0E5
3.7E6
1.9E6
4.1E6
2.1E6
2.8E6
1.4E6

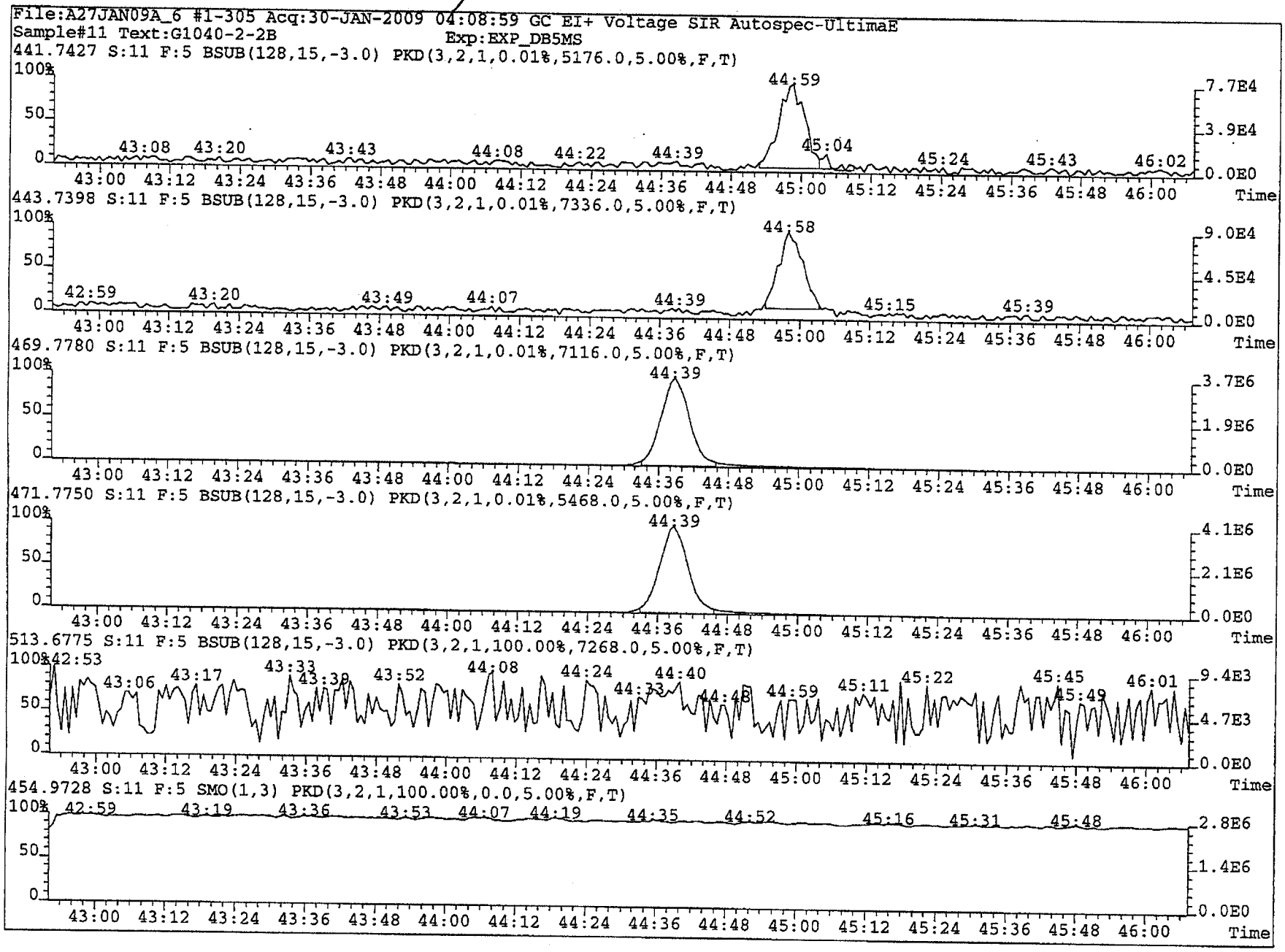

File:A27JAN09A_6 #1-387 Acq:30-JAN-2009 04:08:59 GC EI+ Voltage SIR Autospec-UltimaE
Sample#11 Text:G1040-2-2B
Exp:EXP_DB5MS
303.9016 S:11 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,8584.0,5.00%,F,T)
305.8987 S:11 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,8876.0,5.00%,F,T)
315.9419 S:11 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6228.0,5.00%,F,T)
317.9389 S:11 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6808.0,5.00%,F,T)
375.8364 S:11 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,7948.0,5.00%,F,T)
304.9824 S:11 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time

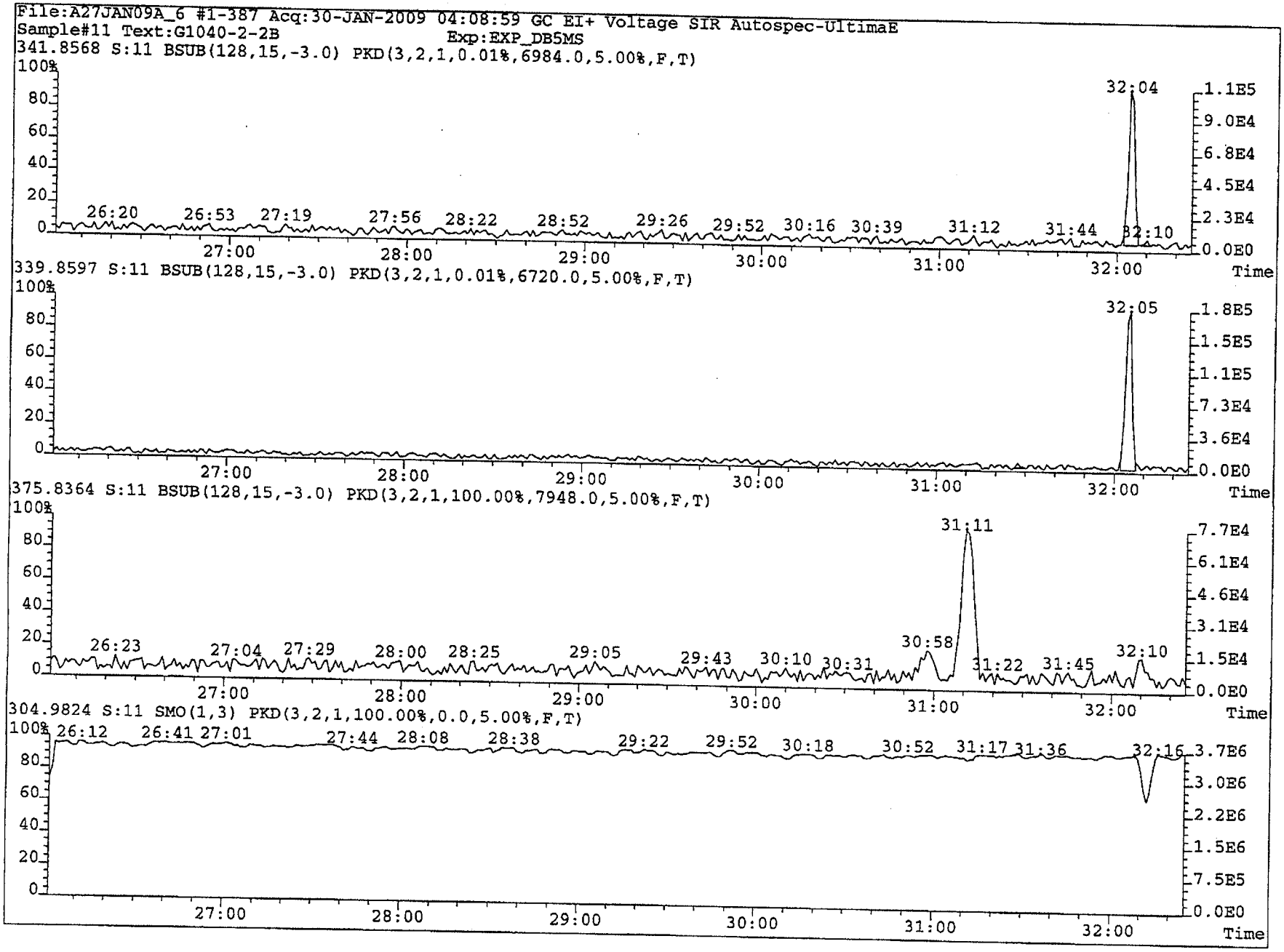

File:A27JAN09A_6 #1-387 Acq:30-JAN-2009 04:08:59 GC EI+ Voltage SIR Autospec-UltimaE
Sample#11 Text:G1040-2-2B
Exp:EXP_DB5MS
303.9016 S:11 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,8584.0,5.00%,F,T)
100%
90
80
70
60
50
40
30
20
10
0
1.3E5
1.2E5
1.1E5
9.3E4
8.0E4
6.6E4
5.3E4
4.0E4
2.7E4
1.3E4
0.0E0
Time
27:00
28:00
29:00
30:00
31:00
32:00
26:23
26:35
26:48
27:02
27:08
27:34
27:56
28:16
28:37
28:43
29:13
29:22
29:33
29:53
30:01
30:17
30:30
30:43
30:53
31:09
31:27
31:45
32:06
32:14
305.8987 S:11 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,8876.0,5.00%,F,T)
100%
90
80
70
60
50
40
30
20
10
0
1.8E5
1.6E5
1.4E5
1.2E5
1.1E5
8.9E4
7.1E4
5.3E4
3.6E4
1.8E4
0.0E0
Time
27:00
28:00
29:00
30:00
31:00
32:00
26:35
26:54
27:01
27:34
27:56
28:17
28:36
28:53
29:13
29:22
29:32
30:00
30:18
30:29
30:42
30:53
31:09
31:19
31:39
32:06
32:12


File:A27JAN09A_6 #1-200 Acq:30-JAN-2009 04:08:59 GC EI+ Voltage SIR Autospec-UltimaE
Sample#11 Text:G1040-2-2B
Exp:EXP_DB5MS
339.8597 S:11 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6952.0,5.00%,F,T)
341.8568 S:11 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,8960.0,5.00%,F,T)
351.9000 S:11 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,23492.0,5.00%,F,T)
353.8970 S:11 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,15440.0,5.00%,F,T)
409.7974 S:11 F:2 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,8276.0,5.00%,F,T)
366.9792 S:11 F:2 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time


File:A27JAN09A_6 #1-256 Acq:30-JAN-2009 04:08:59 GC EI+ Voltage SIR Autospec-UltimaE
Sample#11 Text:G1040-2-2B Exp:EXP_DB5MS
373.8207 S:11 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,8660.0,5.00%,F,T)
375.8178 S:11 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7844.0,5.00%,F,T)
383.8639 S:11 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7704.0,5.00%,F,T)
385.8610 S:11 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7556.0,5.00%,F,T)
445.7555 S:11 F:3 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,7844.0,5.00%,F,T)
380.9760 S:11 F:3 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time


File:A27JAN09A_6 #1-339 Acq:30-JAN-2009 04:08:59 GC EI+ Voltage SIR Autospec-UltimaE
Sample#11 Text:G1040-2-2B
Exp:EXP_DB5MS
407.7818 S:11 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7200.0,5.00%,F,T)
39:03
39:36
39:47
1.8E5
9.0E4
0.0E0
409.7788 S:11 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6696.0,5.00%,F,T)
39:03
39:36
39:25
41:00
1.8E5
9.0E4
0.0E0
417.8253 S:11 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,8816.0,5.00%,F,T)
39:03
41:01
3.8E6
1.9E6
0.0E0
419.8220 S:11 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,8620.0,5.00%,F,T)
39:03
41:01
8.5E6
4.3E6
0.0E0
479.7165 S:11 F:4 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,8376.0,5.00%,F,T)
39:01
38:42
39:18 39:33 39:47 40:03 40:20 40:38 40:55 41:20 41:35 41:53 42:08 42:28
3.5E4
1.8E4
0.0E0
430.9728 S:11 F:4 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
38:43 39:01 39:20 39:45 39:59 40:17 40:32 41:06 41:41 41:57 42:22 42:39
3.2E6
1.6E6
0.0E0
100%
50
0
39:00
40:00
41:00
42:00
Time


File:A27JAN09A_6 #1-305 Acq:30-JAN-2009 04:08:59 GC EI+ Voltage SIR Autospec-UltimaE
Sample#11 Text:G1040-2-2B Exp:EXP_DB5MS
441.7427 S:11 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5176.0,5.00%,F,T)
443.7398 S:11 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7336.0,5.00%,F,T)
469.7780 S:11 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7116.0,5.00%,F,T)
471.7750 S:11 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5468.0,5.00%,F,T)
513.6775 S:11 F:5 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,7268.0,5.00%,F,T)
454.9728 S:11 F:5 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time


File:A27JAN09A_6 #1-387 Acq:30-JAN-2009 04:08:59 GC EI+ Voltage SIR Autospec-UltimaE
Sample#11 Text:G1040-2-2B
Exp:EXP_DB5MS
341.8568 S:11 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6984.0,5.00%,F,T)
339.8597 S:11 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6720.0,5.00%,F,T)
375.8364 S:11 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,7948.0,5.00%,F,T)
304.9824 S:11 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time

TCDF Confirmation - Method 1613
PGSS-64
Analytical Resources, Inc.

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	Adj. RL (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDF	1.08	0.907	19.71	0.70	

Labeled Standard	Spiked Amount (ng)	RT (min.)	Ratio	Qualifier
Extraction Standards				
13C12-2,3,7,8-TCDF	2	19.69	0.78	

Client Information			**Sample Information**		
Project Name:	Port Gamble		Report Basis:	Dry	
			Matrix:	Sediment	
Sample ID:	PGSS-64		Weight / Volume:	17.34	g
			Solids / Lipids:	63.6	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG16440	
Project ID:	G1040-2		Instrument:		
Sample ID:	G1040-2-2B		Filename:	c09feb09a-13	
Collection Date/Time:	12/09/08	10:35	Retchk:	c09feb09a-2	
Receipt Date:	01/15/09	10:15	Begin ConCal:	c09feb09a-1	
Extraction Date:	01/19/09				
Analysis Date/Time:	02/09/09	12:35	Initial Cal:	mcf-c042108a	

Analyzed by: _____
Date: 02/17/09

Reviewed by: _____
Date: 02/17/09

Quantify Sample Summary Report MassLynx 4.1
Confirms Sample Summary

Dataset: Unnamed

Last Altered: Monday, February 09, 2009 15:15:11 Eastern Standard Time
Printed: Monday, February 09, 2009 15:18:44 Eastern Standard Time

Name: c09feb09a-13
Date: 09-Feb-2009
Time: 12:35:01
ID: G1040-2-2B
User: HMP
Submitter: mcf-c042108a
Task: HRMS3

	Name	Response	Ion1Area	Ion2Area	RA	RAFail?	RRT	RT	pg/µL	EDL	SN1	SN2	M	Height1	Noise1	Height2	Noise2
1	2378-TCDF	5.724e3	2.362e3	3.363e3	0.70	NO	1.0014	19.71	0.594	0.4331	3.5	5.2	bb	4.792e4	13563	6.533e4	12622
2	ES:13C-2378-TCDF	9.223e5	4.034e5	5.190e5	0.78	NO	1.0471	19.69	104.982	0.4824	473.3	865.1	bb	7.588e6	16033	9.671e6	11179
3	JS:13C-1234-TCDD	5.827e5	2.600e5	3.226e5	0.81	NO	0.0000	18.80	50.210	0.1827	629.1	1060.3	db	5.009e6	7962	5.993e6	5652
4	Hexa Ether	6.379e3	6.379e3	-	-	-	0.0000	16.56	-	-	0.0	-	bd	4.629e4	0	-	-
5	F1 Lock Mass	1.359e5	1.359e5	-	-	-	0.0000	15.29	-	-	0.0	-	bb	4.707e5	0	-	-

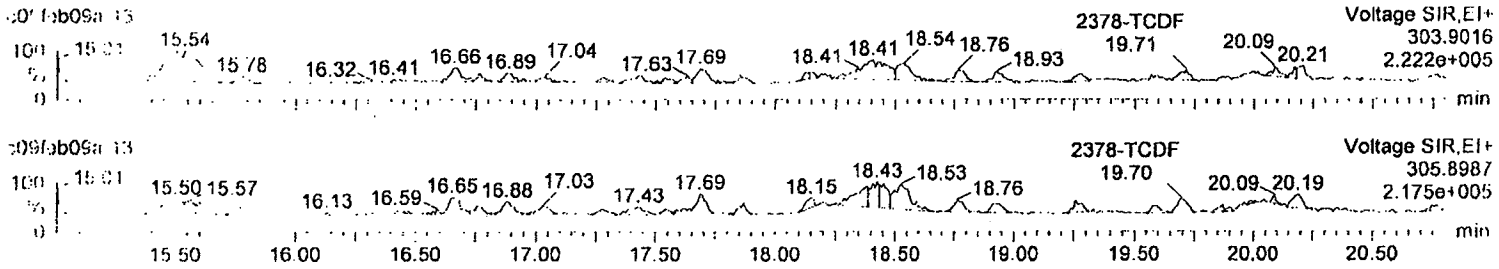
Quantify Sample Report **MassLynx 4.1**
Confirms Sample Summary

Dataset: Untitled

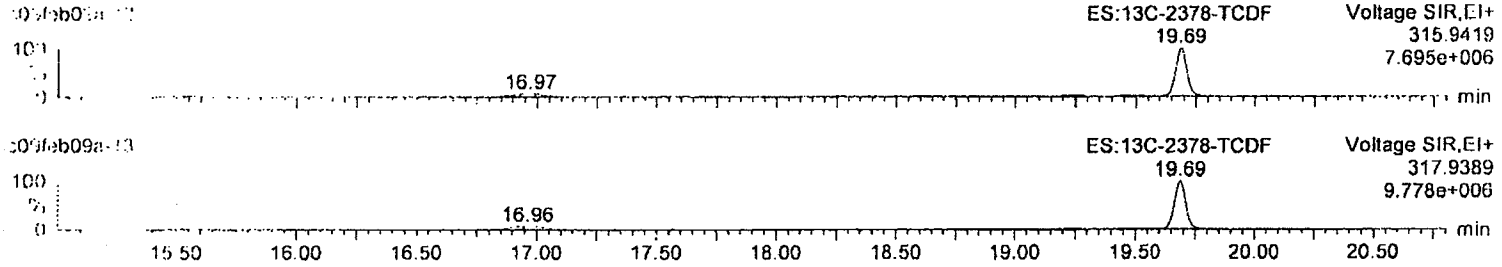
Last Altered: Monday, February 09, 2009 15:15:11 Eastern Standard Time
Printed: Monday, February 09, 2009 15:18:44 Eastern Standard Time

Name: c09feb09a-13, ID: **G1040-2-2B**

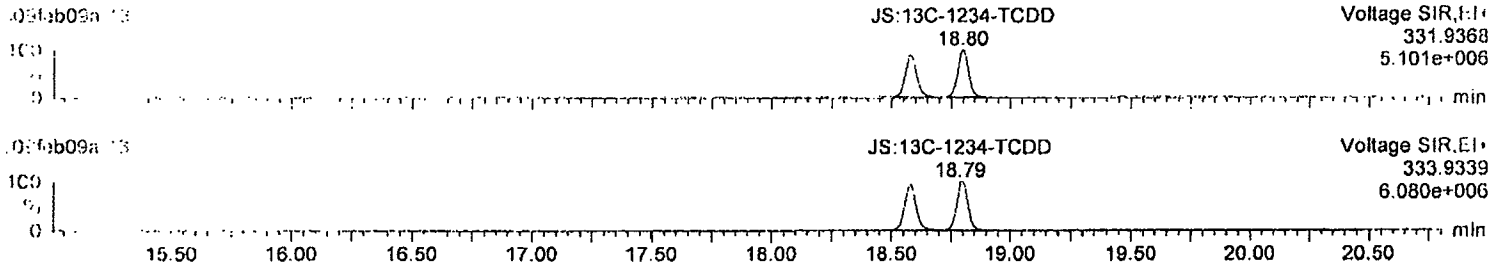
2378-TCDF



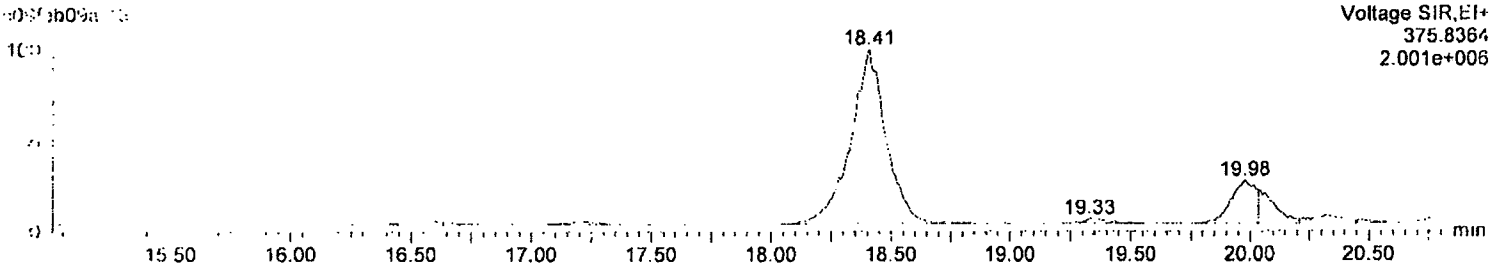
ES:13C-2378-TCDF



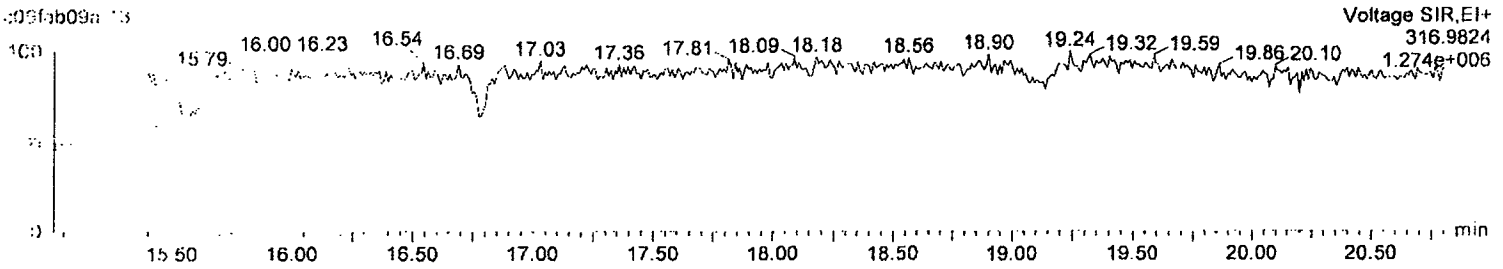
JS:13C-1234-TCDD



Hexa Ether



F1 Lock Mass



Method 1613

PGSS-73

Analytical Resources, Inc.

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	RL (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	1.00			
1,2,3,7,8-PeCDD	ND	5.00			
1,2,3,4,7,8-HxCDD	ND	5.00			
1,2,3,6,7,8-HxCDD	ND	5.00			
1,2,3,7,8,9-HxCDD	ND	5.00			
1,2,3,4,6,7,8-HpCDD	5.85	5.00	40:21	1.17	
OCDD	48.5	10.0	44:40	0.93	
2,3,7,8-TCDF	ND	1.00			
1,2,3,7,8-PeCDF	ND	5.00			
2,3,4,7,8-PeCDF	ND	5.00			
1,2,3,4,7,8-HxCDF	ND	5.00			
1,2,3,6,7,8-HxCDF	ND	5.00			
2,3,4,6,7,8-HxCDF	ND	5.00			
1,2,3,7,8,9-HxCDF	ND	5.00			
1,2,3,4,6,7,8-HpCDF	ND	5.00			
1,2,3,4,7,8,9-HpCDF	ND	5.00			
OCDF	ND	10.0			
Total TCDDs	3.50	1.00			
Total PeCDDs	ND	5.00			
Total HxCDDs	ND	5.00			
Total HpCDDs	27.2	5.00			
Total TCDFs	ND	1.00			
Total PeCDFs	ND	5.00			
Total HxCDFs	ND	5.00			
Total HpCDFs	ND	5.00			
WHO-2005 TEQ (ND=0)	0.0731				
WHO-2005 TEQ (ND=½)	5.75				

Client Information

Project Name:	Port Gamble		**Sample Information**		
			Matrix:	Sediment	
Sample ID:	PGSS-73		Weight / Volume:	15.16	grams
			Solids / Lipids:	75.4	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG16440	
Project ID:	G1040-2				
Sample ID:	G1040-2-3B		Filename:	a27jan09a_6-12	
Collection Date/Time:	09-Dec-08	14:28	Retchk:	a27jan09a_5-14	
Receipt Date:	15-Jan-09	10:15	Begin ConCal:	a27jan09a_5-14	
Extraction Date:	19-Jan-09				
Analysis Date:	30-Jan-09	4:57	Initial Cal:	m1613-100708a	

Method 1613

PGSS-73

Analytical Resources, Inc.

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
$^{13}C_{12}$-2,3,7,8-TCDD	2	1.61	80.3	31:28	0.79	
$^{13}C_{12}$-1,2,3,7,8-PeCDD	2	1.64	81.9	34:16	1.58	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	2	1.63	81.5	36:53	1.27	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	2	1.64	81.9	36:58	1.25	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	2	1.46	73.0	40:19	1.05	
$^{13}C_{12}$-OCDD	4	2.36	59.0	44:39	0.89	
$^{13}C_{12}$-2,3,7,8-TCDF	2	1.63	81.7	30:52	0.79	
$^{13}C_{12}$-1,2,3,7,8-PeCDF	2	1.78	88.9	33:28	1.58	
$^{13}C_{12}$-2,3,4,7,8-PeCDF	2	1.61	80.6	34:05	1.58	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	2	1.69	84.6	36:09	0.52	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	2	1.74	86.9	36:16	0.52	
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	2	1.64	82.0	36:46	0.53	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	2	1.59	79.4	37:33	0.53	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	2	1.49	74.6	39:03	0.45	
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	2	1.40	70.0	41:01	0.45	
Cleanup Standard						
$^{37}Cl_4$-2,3,7,8-TCDD	0.4	0.347	86.8	31:28		
Injection Standards						
$^{13}C_{12}$-1,2,3,4-TCDD	2			31:01	0.79	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	2			37:13	1.25	

Client Information

Project Name: Port Gamble

Sample ID: PGSS-73

Laboratory Information

Project ID: G1040-2
Sample ID: G1040-2-3B
Collection Date/Time: 09-Dec-08 14:28
Receipt Date: 15-Jan-09 10:15
Extraction Date: 19-Jan-09
Analysis Date: 30-Jan-09 4:57

Analyzed by: _____
Date: 02/01

Sample Information

Matrix: Sediment
Weight / Volume: 15.16 grams
Solids / Lipids: 75.4 %
Original pH : NA
Batch ID: WG16440

Filename: a27jan09a_6-12
Retchk: a27jan09a_5-14
Begin ConCal: a27jan09a_5-14

Initial Cal: m1613-100708a

Reviewed by: _____
Date: 02/17/09

Form Version:[1613_HRMS12]Repor

$[OCDD] = \frac{2.7\text{le}6 + 2.92\text{e}6}{1.80\text{e}7 + 2.01\text{e}7} \left(\frac{40000\text{pg}}{15.16\text{g} \times 0.754}\right)\left(\frac{1}{1.0643}\right) = 48.6\text{pg/g}$ OCDD 02/17/09

Filename ; a27jan09a_6
Sample ; 12
Acquired ; 30-JAN-09 04:57:19
Processed ; 30-JAN-09 08:16:41
Sample ID ; G1040-2-3B
Cal Table ; m1613-100708a
Results Table ; m1613-012709a_6
Comments ;

;*1613*
;Inst: HRMS1

Ent;	Name;	Resp;	Ion 1;	Ion 2;	RA;?;	RT;	Conc;	EDL;	S/N1;?;	S/N2;?;M; Signal1; Noise 1; Signal2; Noise 2
1 ;	2,3,7,8-TCDD;	*;	*;	*;	*;n;	NotFnd;	*;	0.1338;	*;n;	*;n;n; *;4.77e+03; *;4.69e+03
2 ;	1,2,3,7,8-PeCDD;	*;	*;	*;	*;n;	NotFnd;	*;	0.2313;	*;n;	*;n;n; *;8.84e+03; *;7.67e+03
3 ;	1,2,3,4,7,8-HxCDD;	8.93e+04;	5.98e+04;	2.95e+04;	2.03;n;	36:59;	0.215;	0.3417;	3;n;	2;n;n;2.38e+04;8.35e+03;1.27e+04;7.52e+03
4 ;	1,2,3,6,7,8-HxCDD;	8.93e+04;	5.98e+04;	2.95e+04;	2.03;n;	36:59;	0.204;	0.3276;	3;n;	2;n;n;2.38e+04;8.35e+03;1.27e+04;7.52e+03
5 ;	1,2,3,7,8,9-HxCDD;	*;	*;	*;	*;n;	NotFnd;	*;	0.3367;	*;n;	*;n;n; *;8.35e+03; *;7.52e+03
6 ;	1,2,3,4,6,7,8-HpCDD;	1.05e+06;	5.66e+05;	4.86e+05;	1.17;y;	40:21;	3.343;	0.5720;	21;y;	17;y;n;1.53e+05;7.40e+03;1.37e+05;7.86e+03
7 ;	OCDD;	5.63e+06;	2.71e+06;	2.92e+06;	0.93;y;	44:40;	27.694;	1.0242;	81;y;	83;y;n;5.46e+05;6.70e+03;5.81e+05;6.97e+03
8 ;	2,3,7,8-TCDF;	1.91e+05;	8.41e+04;	1.06e+05;	0.79;y;	30:54;	0.187;	0.1716;	3;y;	4;y;n;2.35e+04;7.36e+03;2.89e+04;7.16e+03
9 ;	1,2,3,7,8-PeCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.1499;	*;n;	*;n;n; *;7.98e+03; *;1.06e+04
10 ;	2,3,4,7,8-PeCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.1603;	*;n;	*;n;n; *;7.98e+03; *;1.06e+04
11 ;	1,2,3,4,7,8-HxCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.1898;	*;n;	*;n;n; *;7.60e+03; *;7.11e+03
12 ;	1,2,3,6,7,8-HxCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.1766;	*;n;	*;n;n; *;7.60e+03; *;7.11e+03
13 ;	2,3,4,6,7,8-HxCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.1981;	*;n;	*;n;n; *;7.60e+03; *;7.11e+03
14 ;	1,2,3,7,8,9-HxCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.2641;	*;n;	*;n;n; *;7.60e+03; *;7.11e+03
15 ;	1,2,3,4,6,7,8-HpCDF;	3.11e+05;	1.55e+05;	1.56e+05;	0.99;y;	39:04;	0.596;	0.2970;	6;y;	6;y;n;4.81e+04;7.43e+03;4.70e+04;7.34e+03
16 ;	1,2,3,4,7,8,9-HpCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.4581;	*;n;	*;n;n; *;7.43e+03; *;7.34e+03
17 ;	OCDF;	2.44e+05;	1.05e+05;	1.38e+05;	0.76;y;	44:59;	1.009;	0.8839;	4;y;	5;y;n;2.63e+04;7.06e+03;3.42e+04;6.96e+03
Extraction Standards										
18 ;	13C-2,3,7,8-TCDD;	6.51e+07;	2.87e+07;	3.65e+07;	0.79;y;	31:28;	80.310;	0.1649;	1557;y;	1598;y;n;9.34e+06;6.00e+03;1.17e+07;7.31e+03
19 ;	13C-1,2,3,7,8-PeCDD;	4.85e+07;	2.97e+07;	1.88e+07;	1.58;y;	34:16;	81.847;	0.2280;	1783;y;	1221;y;n;1.24e+07;6.95e+03;7.94e+06;6.50e+03
20 ;	13C-1,2,3,4,7,8-HxCDD;	4.04e+07;	2.26e+07;	1.78e+07;	1.27;y;	36:53;	81.429;	0.2400;	1064;y;	992;y;n;7.61e+06;7.15e+03;5.92e+06;5.96e+03
21 ;	13C-1,2,3,6,7,8-HxCDD;	4.41e+07;	2.45e+07;	1.96e+07;	1.25;y;	36:58;	81.892;	0.2209;	1128;y;	1103;y;n;8.06e+06;7.15e+03;6.58e+06;5.96e+03
22 ;	13C-1,2,3,4,6,7,8-HpCDD;	2.97e+07;	1.52e+07;	1.44e+07;	1.05;y;	40:19;	72.956;	0.2829;	612;y;	579;y;n;3.91e+06;6.40e+03;3.63e+06;6.28e+03
23 ;	13C-OCDD;	3.82e+07;	1.80e+07;	2.01e+07;	0.89;y;	44:39;	118.014;	0.3738;	517;y;	616;y;n;3.55e+06;6.87e+03;3.97e+06;6.45e+03
24 ;	13C-2,3,7,8-TCDF;	9.82e+07;	4.34e+07;	5.48e+07;	0.79;y;	30:52;	81.668;	0.1077;	1550;y;	2315;y;n;1.09e+07;7.02e+03;1.36e+07;5.86e+03
25 ;	13C-1,2,3,7,8-PeCDF;	8.64e+07;	5.29e+07;	3.35e+07;	1.58;y;	33:28;	88.900;	0.2536;	3112;y;	853;y;n;2.32e+07;7.45e+03;1.45e+07;1.71e+04
26 ;	13C-2,3,4,7,8-PeCDF;	7.66e+07;	4.70e+07;	2.97e+07;	1.58;y;	34:05;	80.535;	0.2591;	2748;y;	765;y;n;2.05e+07;7.45e+03;1.30e+07;1.71e+04
27 ;	13C-1,2,3,4,7,8-HxCDF;	5.41e+07;	1.86e+07;	3.55e+07;	0.52;y;	36:09;	84.535;	0.1960;	1083;y;	1777;y;n;6.88e+06;6.35e+03;1.33e+07;7.47e+03
28 ;	13C-1,2,3,6,7,8-HxCDF;	6.14e+07;	2.11e+07;	4.03e+07;	0.52;y;	36:16;	86.913;	0.1775;	1196;y;	1942;y;n;7.60e+06;6.35e+03;1.45e+07;7.47e+03
29 ;	13C-2,3,4,6,7,8-HxCDF;	5.45e+07;	1.88e+07;	3.56e+07;	0.53;y;	36:46;	81.933;	0.1888;	1075;y;	1714;y;n;6.83e+06;6.35e+03;1.28e+07;7.47e+03
30 ;	13C-1,2,3,7,8,9-HxCDF;	4.70e+07;	1.63e+07;	3.07e+07;	0.53;y;	37:33;	79.353;	0.2119;	825;y;	1334;y;n;5.24e+06;6.35e+03;9.97e+06;7.47e+03
31 ;	13C-1,2,3,4,6,7,8-HpCDF;	3.79e+07;	1.17e+07;	2.61e+07;	0.45;y;	39:03;	74.622;	0.2332;	431;y;	1428;y;n;3.33e+06;7.73e+03;7.57e+06;5.30e+03
32 ;	13C-1,2,3,4,7,8,9-HpCDF;	2.80e+07;	8.72e+06;	1.93e+07;	0.45;y;	41:01;	70.019;	0.2959;	286;y;	924;y;n;2.21e+06;7.73e+03;4.90e+06;5.30e+03
Injection Standards										
33 ;	13C-1,2,3,4-TCDD;	7.27e+07;	3.21e+07;	4.06e+07;	0.79;y;	31:01;	53.531;	-;	1595;y;	1661;y;n;9.57e+06;6.00e+03;1.21e+07;7.31e+03
34 ;	13C-1,2,3,7,8,9-HxCDD;	5.16e+07;	2.87e+07;	2.30e+07;	1.25;y;	37:13;	47.804;	-;	1325;y;	1271;y;n;9.47e+06;7.15e+03;7.58e+06;5.96e+03
Cleanup Standard										
35 ;	37Cl-2,3,7,8-TCDD;	1.50e+07;	1.50e+07;	-;	-;-;	31:28;	17.333;	0.0751;	748;y;	-;-;n;4.83e+06;6.46e+03; -; -

Totals Raw Data

	Conc	Empc	Flags
TCDF	0	0	FALSE
TCDD	2.001	2.001	FALSE
PeCDF	0	0	FALSE
PeCDD	0	0	FALSE
HxCDF	0	0	FALSE
HxCDD	0	0	FALSE
HpCDF	0	0	FALSE
HpCDD	15.569	15.569	FALSE

Filename: a27jan09a_6
Sample: 12
Acquired: 30-JAN-09 04:57:19
Processed: 30-JAN-09 08:16:41
Sample ID: G1040-2-3B
Cal Table: m1613-100708a
Results Table: m1613-012709a_6

Name of Homolog Group: Total Tetra-Furans
Number of Peaks Found: 8 0
RRF Used For Totals: 1.0368
Detection Limit: 0.1716
Noise Height Ion1/Ion2: 7356 / 7156
Begin Window: 26:14:00
End Window: 33:07:00

RL=0.500 (pg/µL)

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	1.01E+05	22100	79300	0.28	n	27:35	0.1	S2N	1.1	n	2.7	n	n
	2	3.23E+05	141000	181000	0.78	y	27:56	0.317	RL	3.4	y	4.6	y	n
	3	1.58E+05	68600	89500	0.77	y	28:17	0.155	S2N	2.1	n	2.1	n	n
	4	2.71E+05	108000	163000	0.66	y	29:33	0.267	RL	2.9	n	4.2	y	n
	5	2.18E+05	82200	136000	0.61	n	30:02	0.214	RL	2.7	n	3.5	y	n
2,3,7,8-TCDF	6	1.91E+05	84100	106000	0.79	y	30:54	0.187	RL	3.2	y	4	y	n
	7	2.28E+05	91300	137000	0.67	y	31:09	0.224	RL	3.7	y	5.7	y	n
	8	1.06E+05	58800	47100	1.25	n	32:06	0.104	RL	3.1	y	2.9	n	n

Filename: a27jan09a_6
Sample: 12
Acquired: 30-JAN-09 04:57:19
Processed: 30-JAN-09 08:16:41
Sample ID: G1040-2-3B
Cal Table: m1613-100708a
Results Table: m1613-012709a_6

Name of Homolog Group: Total Tetra-Dioxins
Number of Peaks Found: 2 2
RRF Used For Totals: 1.0087
Detection Limit: 0.1338
Noise Height Ion1/Ion2: 4773 / 4692
Begin Window: 27:41:00
End Window: 32:38:00

RL=0.500 (pg/µL)

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	6.92E+05	299000	392000	0.76	y	28:20	1.053	OK	14.6	y	16.4	y	y
	2	6.23E+05	266000	357000	0.74	y	28:37	0.948	OK	11.6	y	14.9	y	y

Filename: a27jan09a_6
Sample: 12
Acquired: 30-JAN-09 04:57:19

Name of Homolog Group: Total Penta-Furans Fn1
Number of Peaks Found: 1 0
RRF Used For Totals: 1.0121

Processed:	30-JAN-09 08:16:41	Detection Limit:	0.1093												
Sample ID:	G1040-2-3B	Noise Height Ion1/Ion2:	7632 / 5504												
Cal Table:	m1613-100708a	Begin Window:						31:46:00							
Results Table:	m1613-012709a_6	End Window:						32:06:00							
Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?	
	1	2.14E+05	70500	143000		0.49 n	32:04	0.259	RL		4 y		11.3 y	n	

Filename:	a27jan09a_6	Name of Homolog Group:	Total Penta-Furans Fn2												
Sample:	12	Number of Peaks Found:	1	0											
Acquired:	30-JAN-09 04:57:19	RRF Used For Totals:	1.0121												
Processed:	30-JAN-09 08:16:41	Detection Limit:	0.1547						RL=2.500 (pg/µL)						
Sample ID:	G1040-2-3B	Noise Height Ion1/Ion2:	7976 / 10620												
Cal Table:	m1613-100708a	Begin Window:						31:43:00							
Results Table:	m1613-012709a_6	End Window:						34:52:00							
Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?	
	1	1.59E+05	125000	33700		3.71 n	32:54	0.192	S2N		5.2 y		1.9 n	n	

Filename:	a27jan09a_6	Name of Homolog Group:	Total Penta-Dioxins												
Sample:	12	Number of Peaks Found:	4	0											
Acquired:	30-JAN-09 04:57:19	RRF Used For Totals:	1.0517												
Processed:	30-JAN-09 08:16:41	Detection Limit:	0.2313						RL=2.500 (pg/µL)						
Sample ID:	G1040-2-3B	Noise Height Ion1/Ion2:	8844 / 7672												
Cal Table:	m1613-100708a	Begin Window:						32:52:00							
Results Table:	m1613-012709a_6	End Window:						34:37:00							
Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?	
	1	2.48E+05	146000	102000		1.44 y	32:56	0.485	RL		5.7 y		5.4 y	n	
	2	3.17E+05	187000	130000		1.44 y	33:29	0.622	RL		10 y		7.8 y	n	
	3	2.42E+05	144000	97800		1.47 y	33:39	0.474	RL		8.4 y		5.9 y	n	
	4	9.65E+04	56800	39700		1.43 y	33:59	0.189	S2N		3 y		2.1 n	n	

Filename:	a27jan09a_6	Name of Homolog Group:	Total Hexa-Furans												
Sample:	12	Number of Peaks Found:	2	0											
Acquired:	30-JAN-09 04:57:19	RRF Used For Totals:	1.1305												
Processed:	30-JAN-09 08:16:41	Detection Limit:	0.2039						RL=2.500 (pg/µL)						
Sample ID:	G1040-2-3B	Noise Height Ion1/Ion2:	7604 / 7108												
Cal Table:	m1613-100708a	Begin Window:						35:06:00							
Results Table:	m1613-012709a_6	End Window:						37:40:00							
Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?	
	1	2.40E+05	139000	101000		1.38 y	35:21	0.391	RL		7.4 y		5.3 y	n	
	2	1.93E+05	126000	67400		1.87 n	35:47	0.315	RL		5.4 y		3.9 y	n	

Filename:	a27jan09a_6	Name of Homolog Group:	Total Hexa-Dioxins		
Sample:	12	Number of Peaks Found:	6	0	
Acquired:	30-JAN-09 04:57:19	RRF Used For Totals:	1.0077		
Processed:	30-JAN-09 08:16:41	Detection Limit:	0.3354		RL=2.500 (pg/µL)
Sample ID:	G1040-2-3B	Noise Height Ion1/Ion2:	8352 / 7520		
Cal Table:	m1613-100708a	Begin Window:			35:36:00
Results Table:	m1613-012709a_6	End Window:			37:17:00

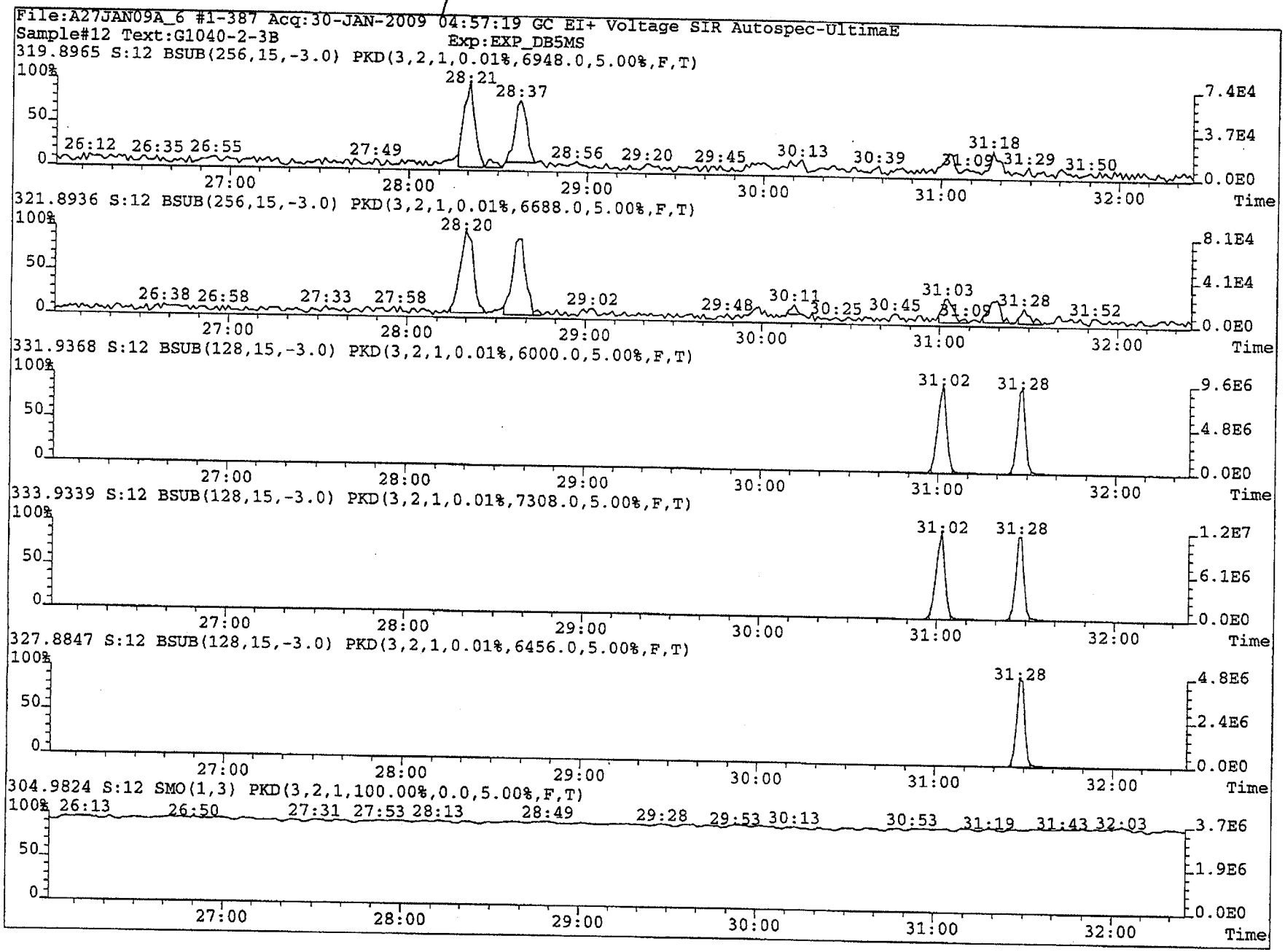
Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	3.79E+05	207000	172000		1.21 y	35:38	0.889	RL	9.7	y	8.1	y	n
	2	3.80E+05	192000	188000		1.02 n	36:06	0.892	RL	9.2	y	8.7	y	n
	3	4.64E+05	258000	206000		1.25 y	36:19	1.09	RL	8.4	y	9.1	y	n
1,2,3,6,7,8-HxCDD	4	8.93E+04	59800	29500		2.03 n	36:59	0.204	S2N	2.9	n	1.7	n	n
	5	1.19E+05	13500	106000		0.13 n	37:51	0.28	RT	1	n	3.8	y	n
	6	1.18E+05	12500	106000		0.12 n	37:53	0.278	RT	0.9	n	3.8	y	n

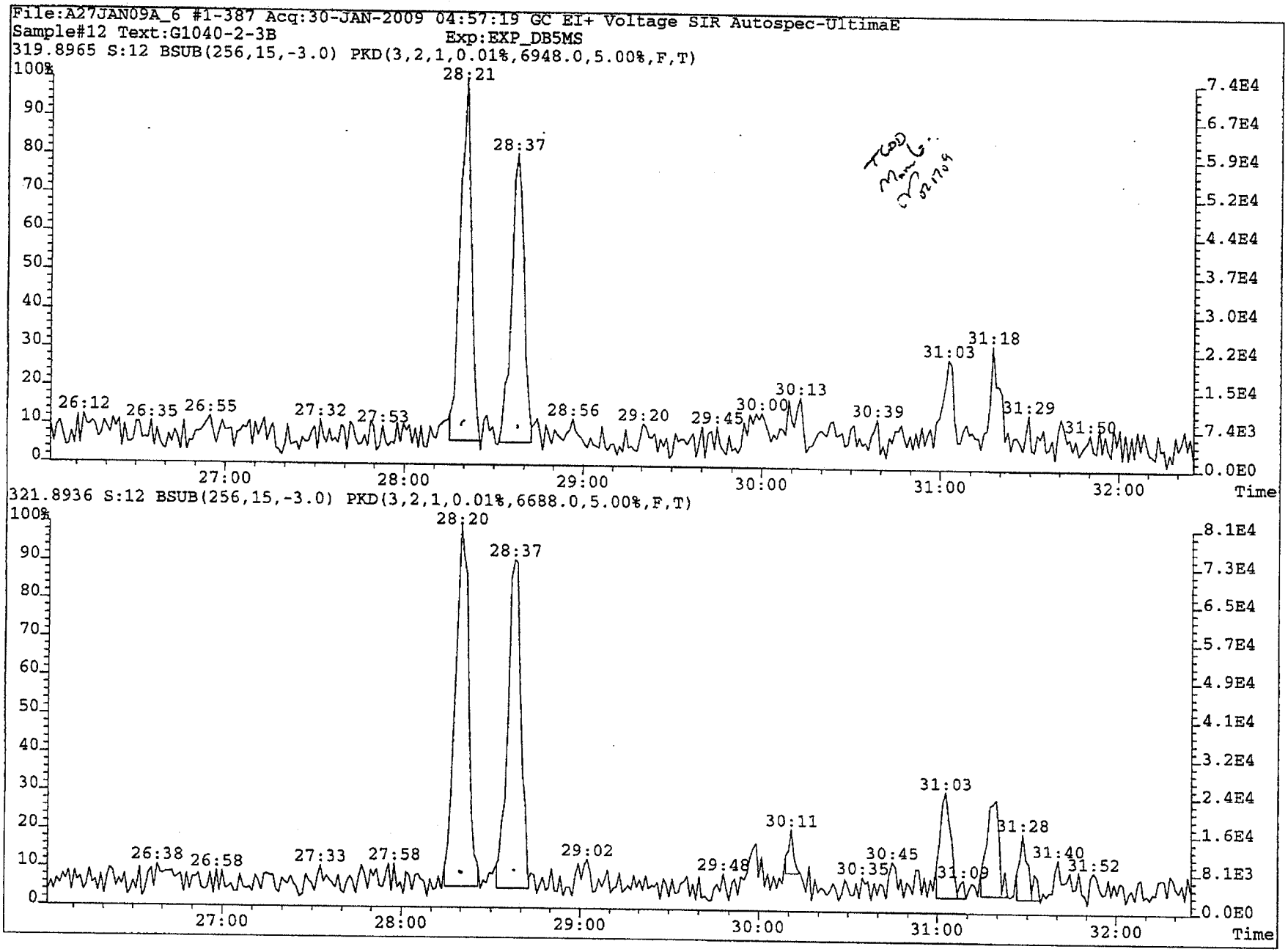
Filename:	a27jan09a_6	Name of Homolog Group:	Total Hepta-Furans		
Sample:	12	Number of Peaks Found:	2	0	
Acquired:	30-JAN-09 04:57:19	RRF Used For Totals:	1.3693		
Processed:	30-JAN-09 08:16:41	Detection Limit:	0.3651		RL=2.500 (pg/µL)
Sample ID:	G1040-2-3B	Noise Height Ion1/Ion2:	7428 / 7344		
Cal Table:	m1613-100708a	Begin Window:			38:52:00
Results Table:	m1613-012709a_6	End Window:			41:04:00

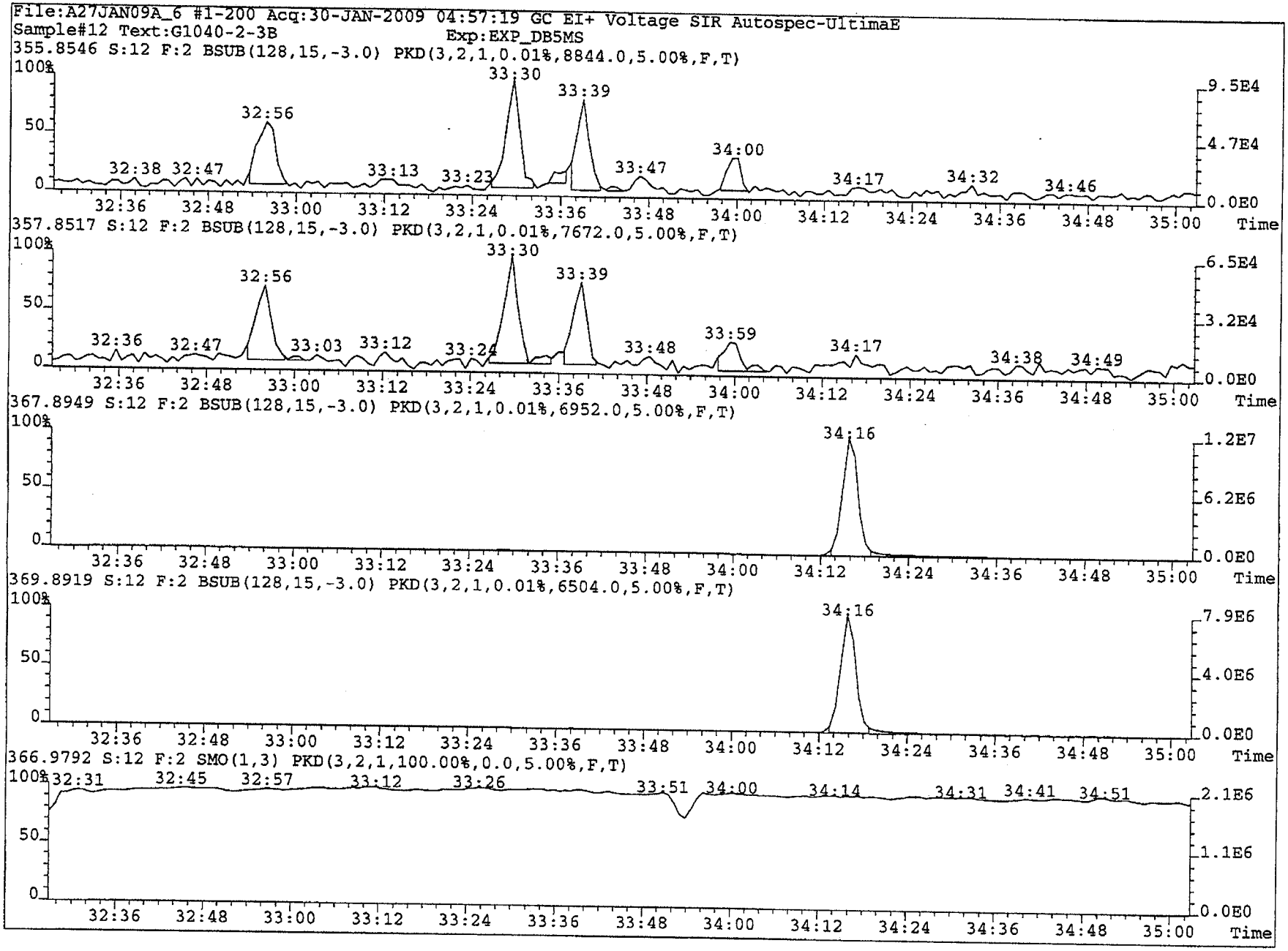
Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
1,2,3,4,6,7,8-HpCDI	1	3.11E+05	155000	156000		0.99 y	39:04	0.596	RL	6.5	y	6.4	y	n
	2	4.01E+05	198000	202000		0.98 y	39:36	0.889	RL	7.4	y	7.3	y	n

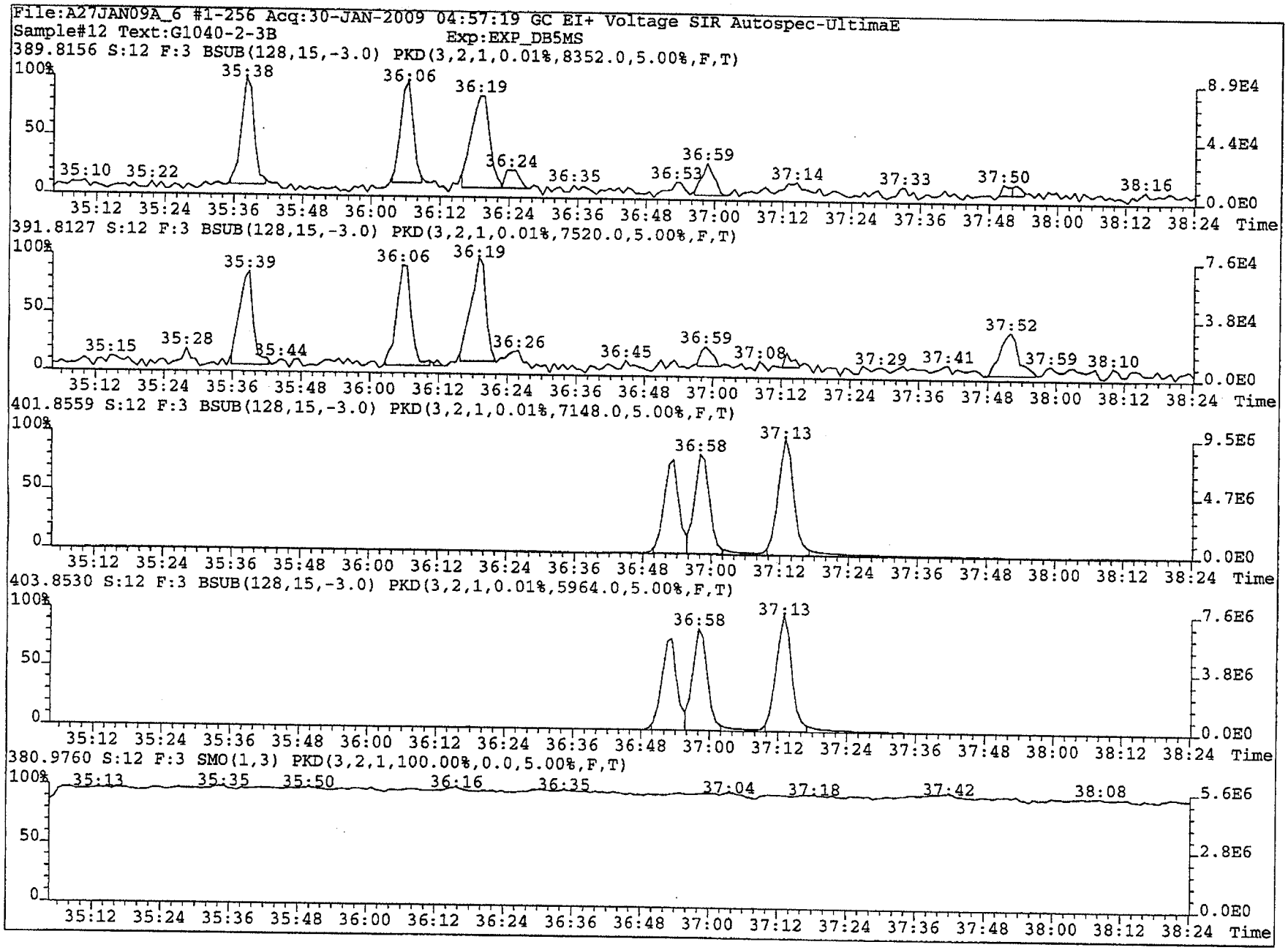
Filename:	a27jan09a_6	Name of Homolog Group:	Total Hepta-Dioxins		
Sample:	12	Number of Peaks Found:	2	2	
Acquired:	30-JAN-09 04:57:19	RRF Used For Totals:	1.0612		
Processed:	30-JAN-09 08:16:41	Detection Limit:	0.572		RL=2.500 (pg/µL)
Sample ID:	G1040-2-3B	Noise Height Ion1/Ion2:	7400 / 7860		
Cal Table:	m1613-100708a	Begin Window:			39:17:00
Results Table:	m1613-012709a_6	End Window:			40:29:00

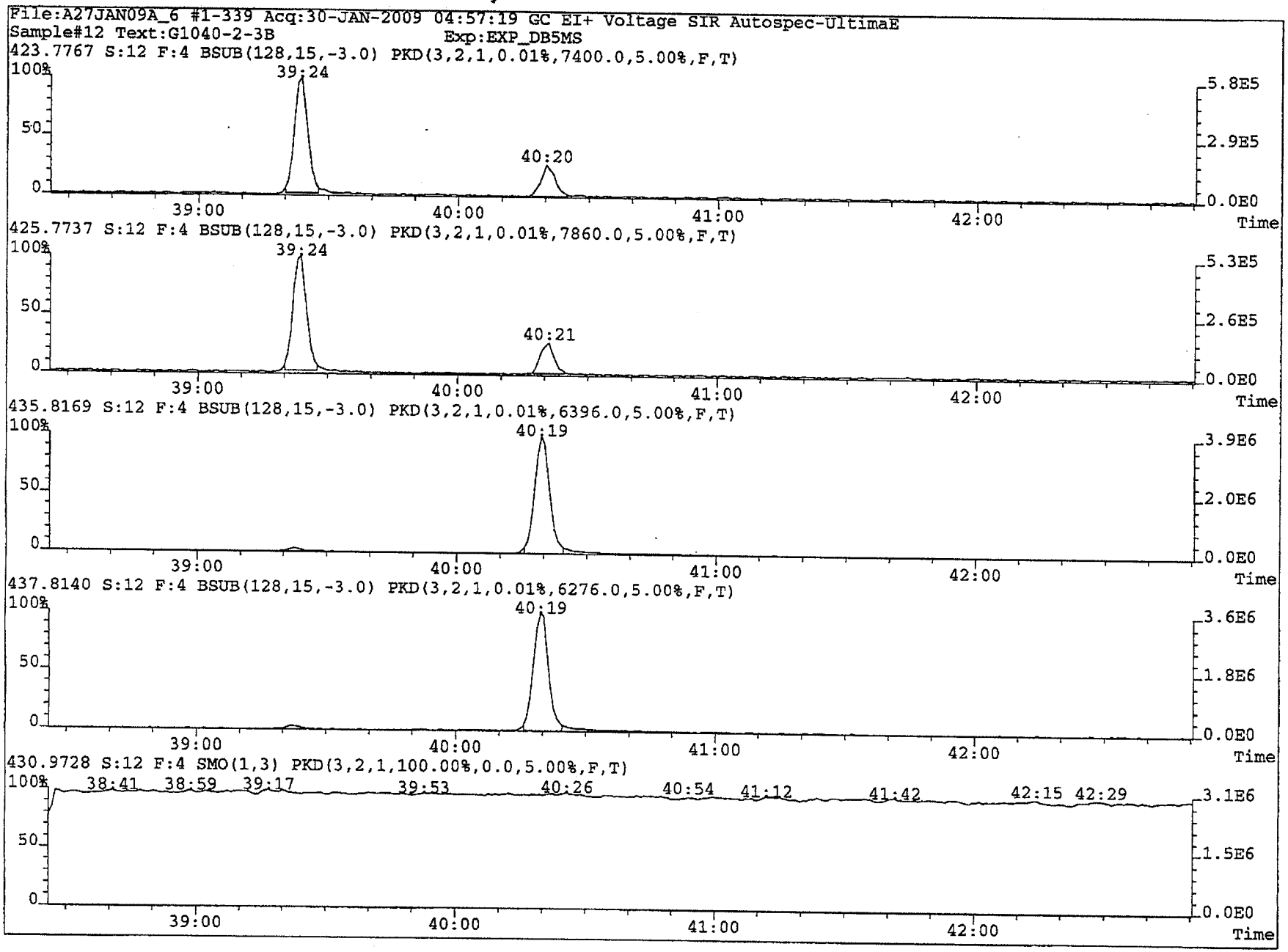
Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	3.85E+06	2010000	1840000		1.1 y	39:24	12.226	OK	77.8	y	65.9	y	n
1,2,3,4,6,7,8-HpCDI	2	1.05E+06	566000	486000		1.17 y	40:21	3.343	OK	20.7	y	17.4	y	n

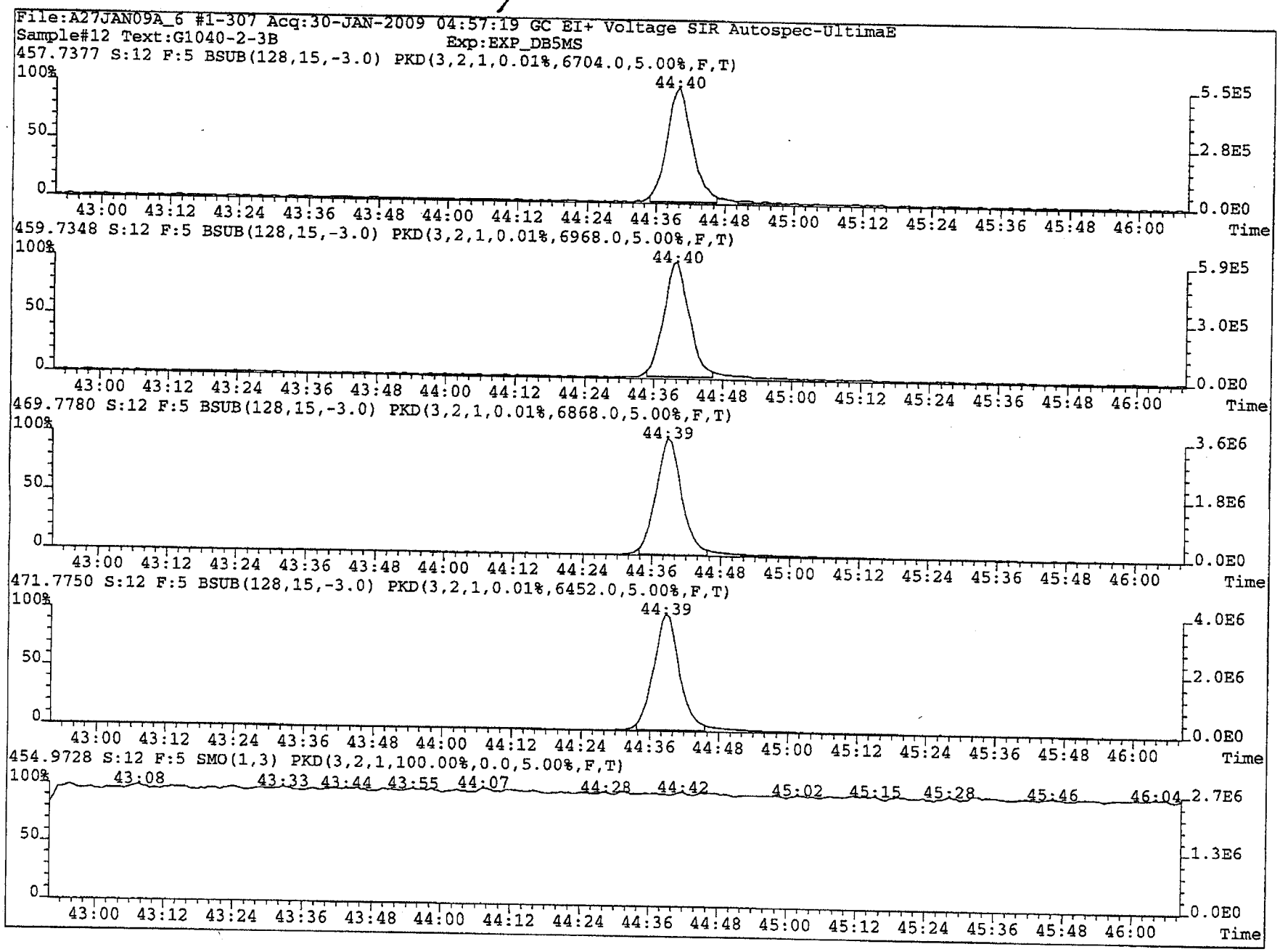

File:A27JAN09A_6 #1-387 Acq:30-JAN-2009 04:57:19 GC EI+ Voltage SIR Autospec-UltimaE
Sample#12 Text:G1040-2-3B
Exp:EXP_DB5MS
319.8965 S:12 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,6948.0,5.00%,F,T)
28:21
28:37
26:12 26:35 26:55 27:49 28:56 29:20 29:45 30:13 30:39 31:09 31:18 31:29 31:50
7.4E4
3.7E4
0.0E0
321.8936 S:12 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,6688.0,5.00%,F,T)
28:20
26:38 26:58 27:33 27:58 29:02 29:48 30:11 30:25 30:45 31:03 31:09 31:28 31:52
8.1E4
4.1E4
0.0E0
331.9368 S:12 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6000.0,5.00%,F,T)
31:02
31:28
9.6E6
4.8E6
0.0E0
333.9339 S:12 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7308.0,5.00%,F,T)
31:02
31:28
1.2E7
6.1E6
0.0E0
327.8847 S:12 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6456.0,5.00%,F,T)
31:28
4.8E6
2.4E6
0.0E0
304.9824 S:12 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
26:13 26:50 27:31 27:53 28:13 28:49 29:28 29:53 30:13 30:53 31:19 31:43 32:03
3.7E6
1.9E6
0.0E0
100%
50
0
27:00
28:00
29:00
30:00
31:00
32:00
Time

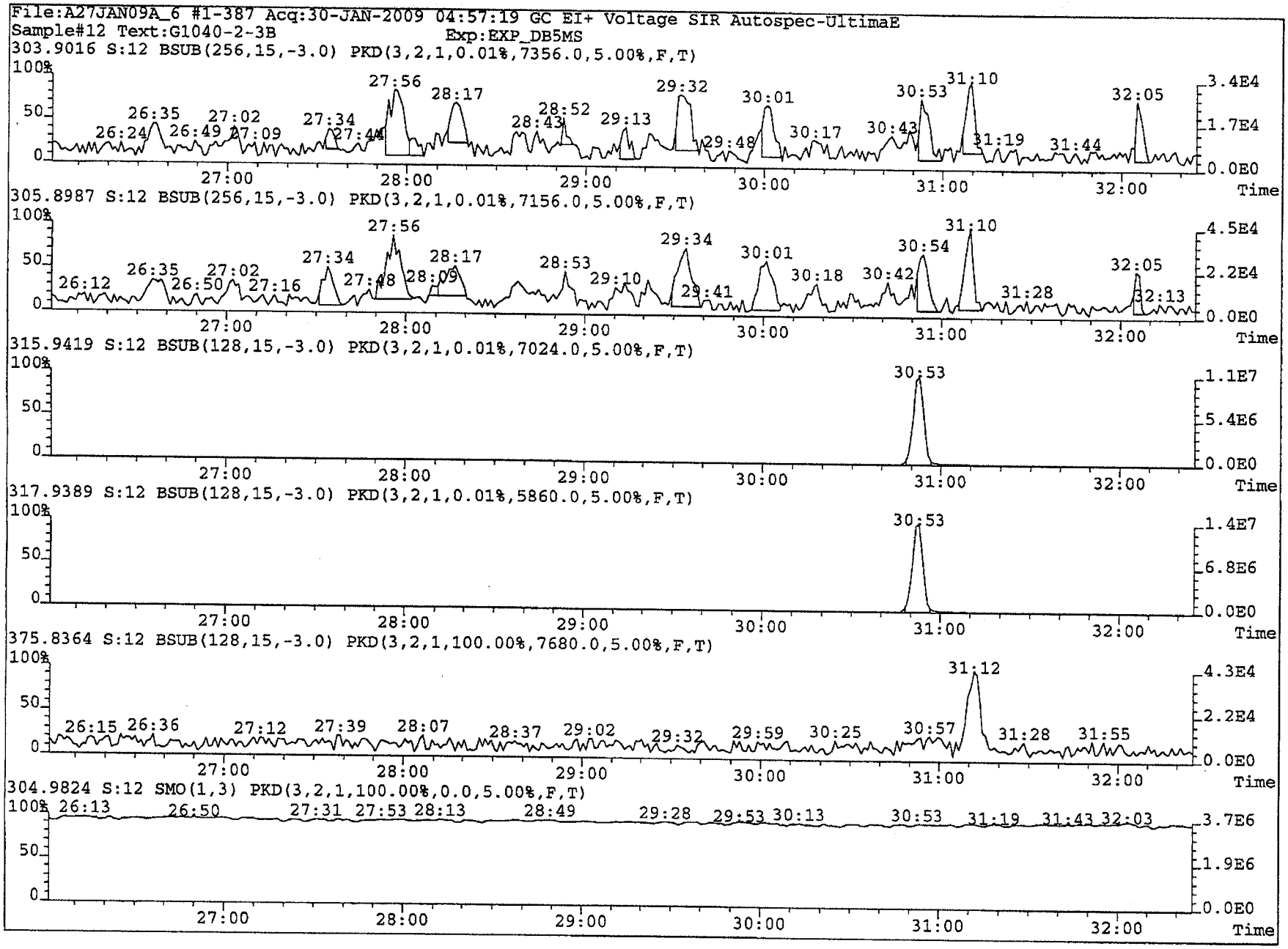

File:A27JAN09A_6 #1-387 Acq:30-JAN-2009 04:57:19 GC EI+ Voltage SIR Autospec-UltimaE
Sample#12 Text:G1040-2-3B
Exp:EXP_DB5MS
319.8965 S:12 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,6948.0,5.00%,F,T)
28:21
28:37
26:12
26:35
26:55
27:32
27:53
28:56
29:20
29:45
30:00
30:13
30:39
31:03
31:18
31:29
31:59
7.4E4
6.7E4
5.9E4
5.2E4
4.4E4
3.7E4
3.0E4
2.2E4
1.5E4
7.4E3
0.0E0
Time
321.8936 S:12 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,6688.0,5.00%,F,T)
28:20
28:37
26:38
26:58
27:33
27:58
29:02
29:48
30:11
30:35
30:45
31:03
31:09
31:28
31:40
31:52
8.1E4
7.3E4
6.5E4
5.7E4
4.9E4
4.1E4
3.2E4
2.4E4
1.6E4
8.1E3
0.0E0
Time

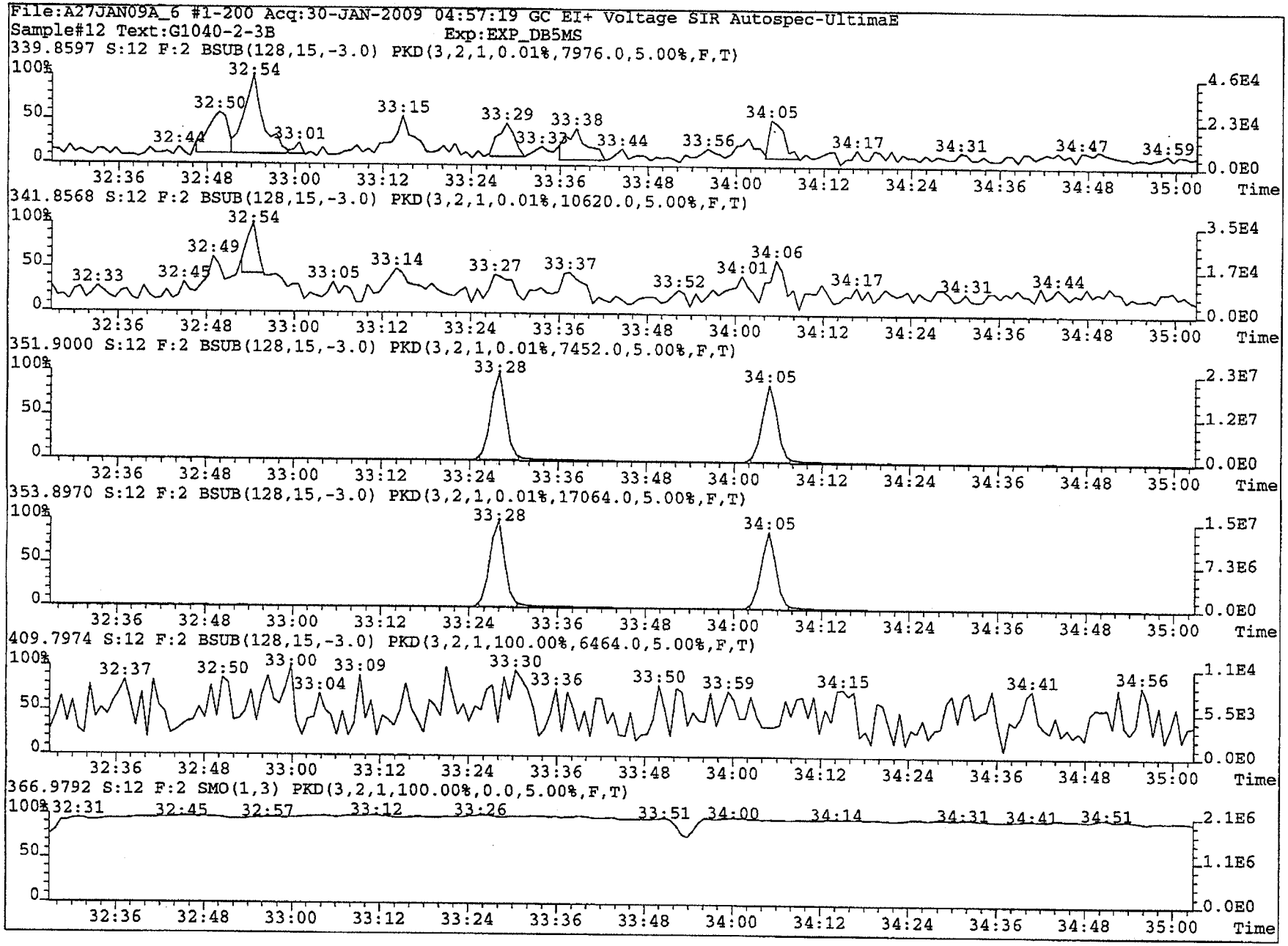

File:A27JAN09A_6 #1-200 Acq:30-JAN-2009 04:57:19 GC EI+ Voltage SIR Autospec-UltimaE
Sample#12 Text:G1040-2-3B
Exp:EXP_DB5MS
355.8546 S:12 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,8844.0,5.00%,F,T)
357.8517 S:12 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7672.0,5.00%,F,T)
367.8949 S:12 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6952.0,5.00%,F,T)
369.8919 S:12 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6504.0,5.00%,F,T)
366.9792 S:12 F:2 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time

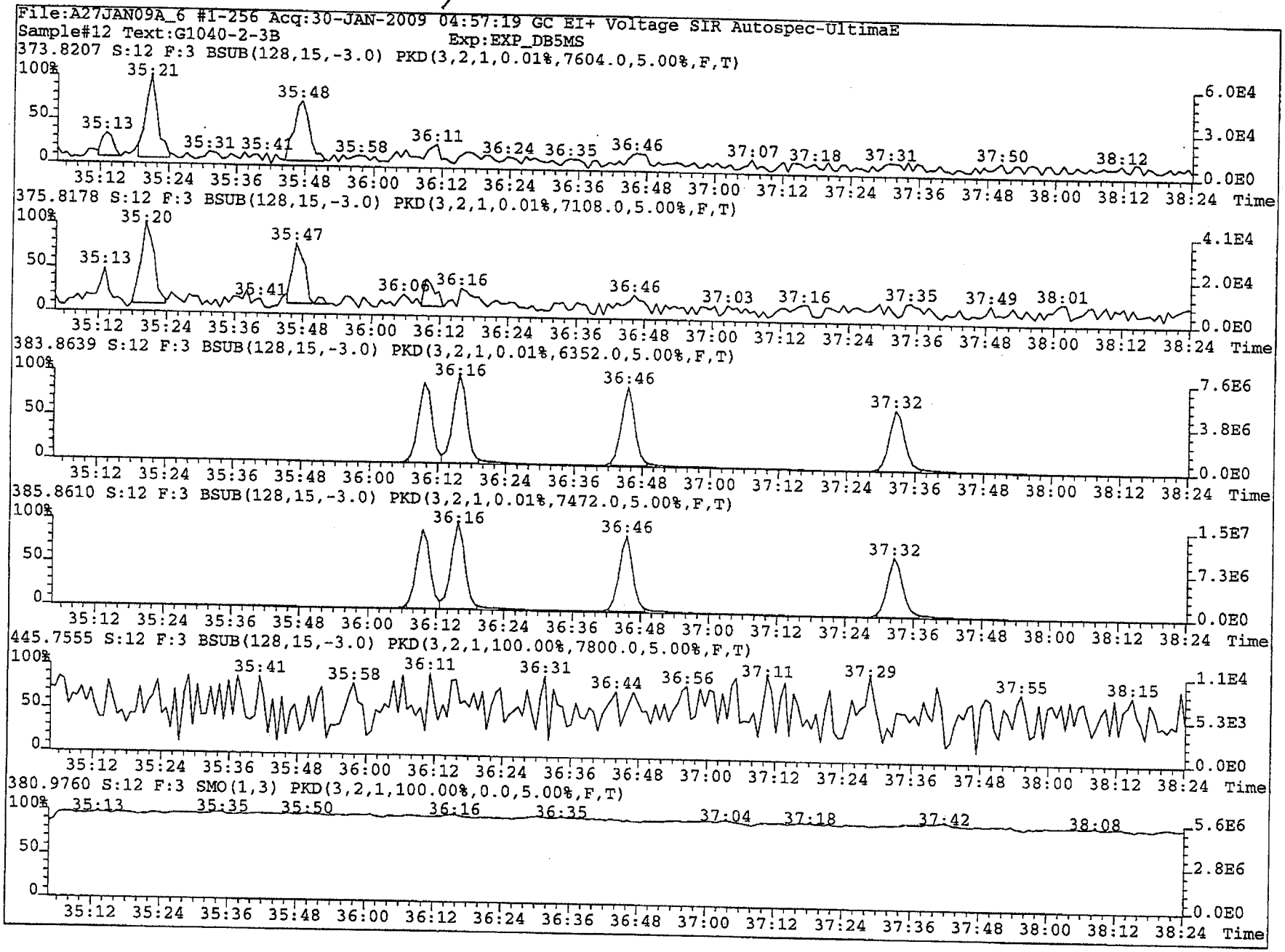

File:A27JAN09A_6 #1-256 Acq:30-JAN-2009 04:57:19 GC EI+ Voltage SIR Autospec-UltimaE
Sample#12 Text:G1040-2-3B
Exp:EXP_DB5MS
389.8156 S:12 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,8352.0,5.00%,F,T)
391.8127 S:12 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7520.0,5.00%,F,T)
401.8559 S:12 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7148.0,5.00%,F,T)
403.8530 S:12 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5964.0,5.00%,F,T)
380.9760 S:12 F:3 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time

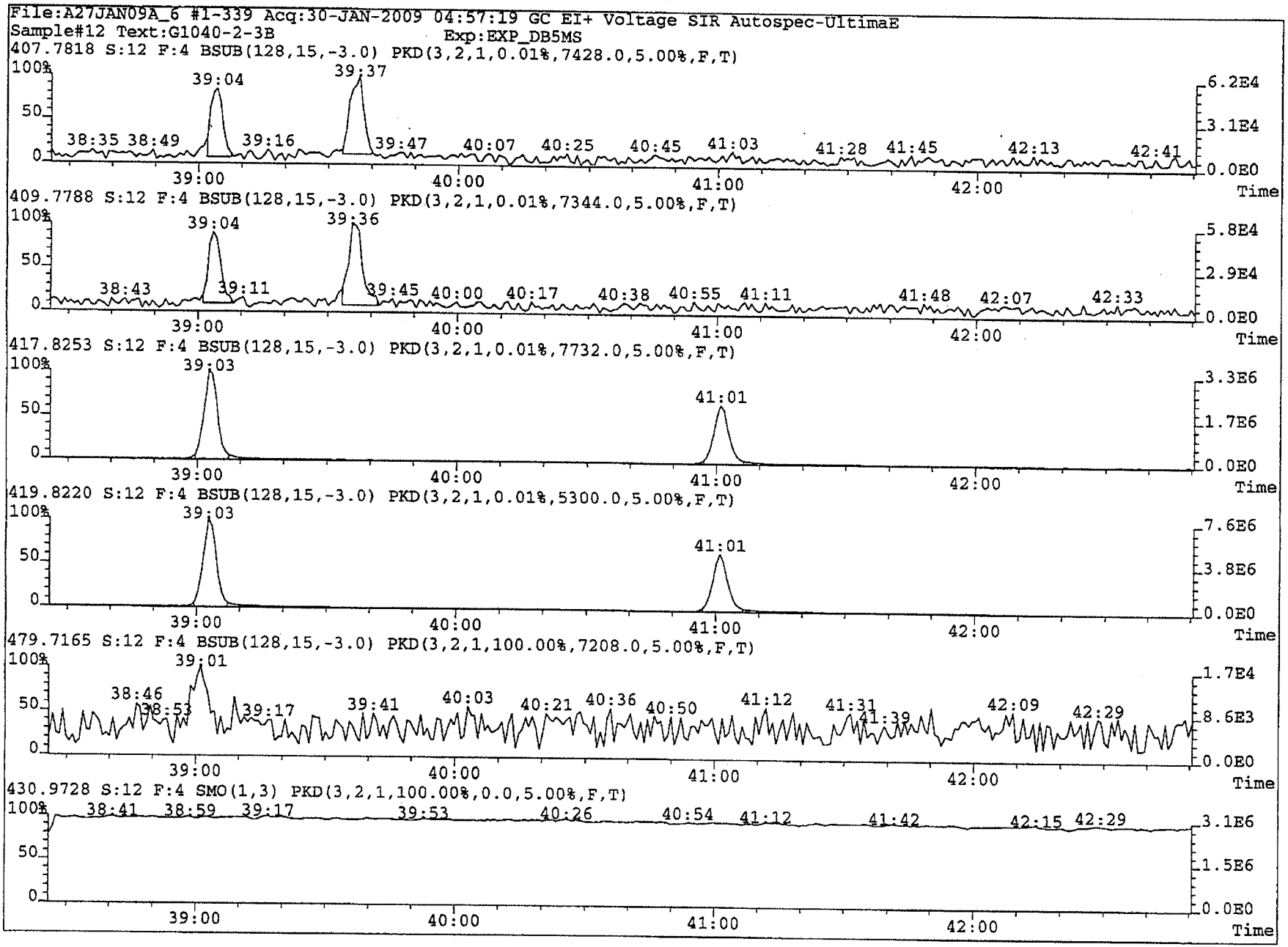

File:A27JAN09A_6 #1-339 Acq:30-JAN-2009 04:57:19 GC EI+ Voltage SIR Autospec-UltimaE
Sample#12 Text:G1040-2-3B Exp:EXP_DB5MS
423.7767 S:12 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7400.0,5.00%,F,T)
39:24
40:20
5.8E5
2.9E5
0.0E0
425.7737 S:12 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7860.0,5.00%,F,T)
39:24
40:21
5.3E5
2.6E5
0.0E0
435.8169 S:12 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6396.0,5.00%,F,T)
40:19
3.9E6
2.0E6
0.0E0
437.8140 S:12 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6276.0,5.00%,F,T)
40:19
3.6E6
1.8E6
0.0E0
430.9728 S:12 F:4 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
38:41 38:59 39:17 39:53 40:26 40:54 41:12 41:42 42:15 42:29
3.1E6
1.5E6
0.0E0
100%
50
0
39:00
40:00
41:00
42:00
Time

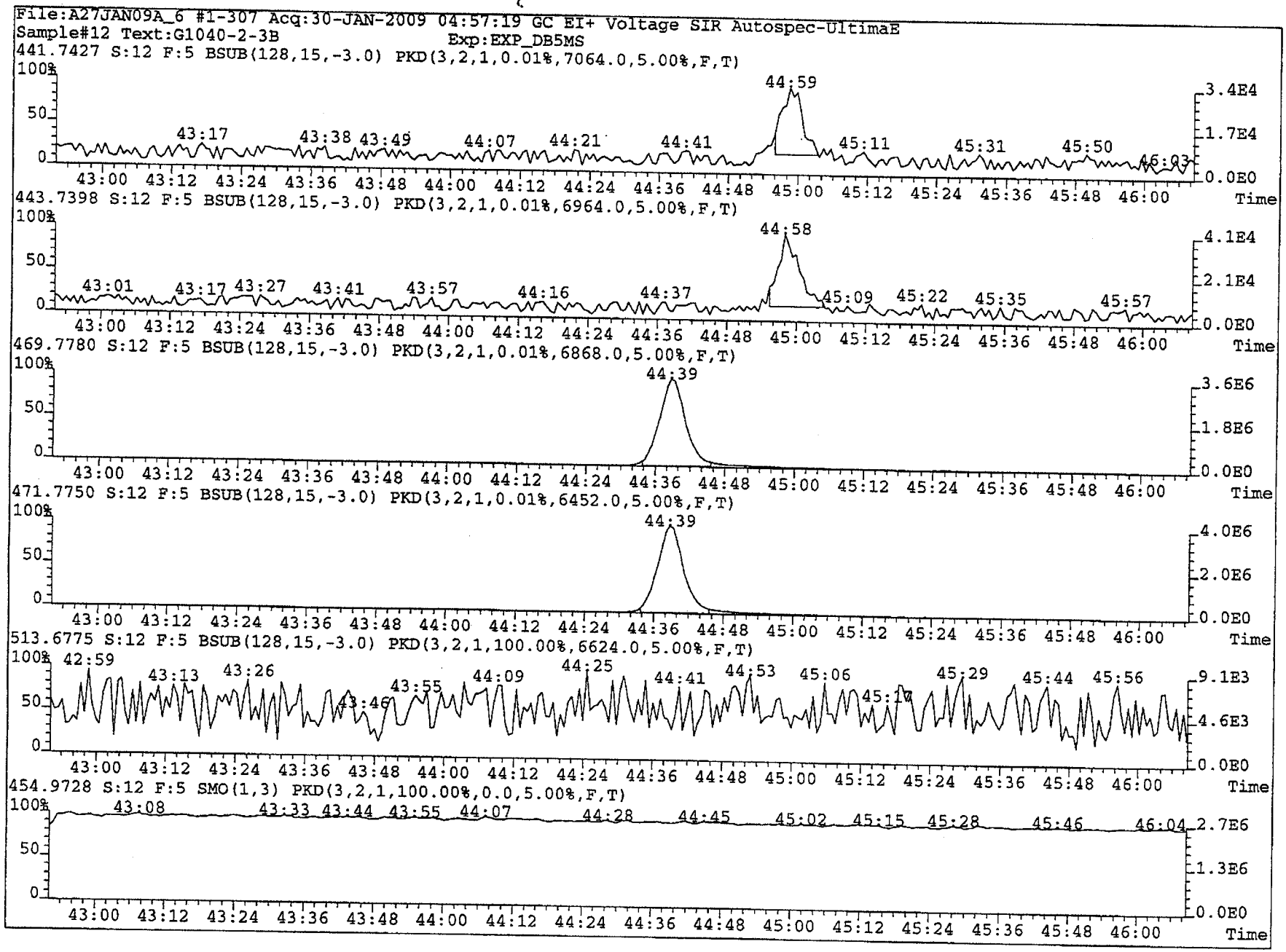

File:A27JAN09A_6 #1-307 Acq:30-JAN-2009 04:57:19 GC EI+ Voltage SIR Autospec-UltimaE
Sample#12 Text:G1040-2-3B
Exp:EXP_DB5MS
457.7377 S:12 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6704.0,5.00%,F,T)
44:40
5.5E5
2.8E5
0.0E0
459.7348 S:12 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6968.0,5.00%,F,T)
44:40
5.9E5
3.0E5
0.0E0
469.7780 S:12 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6868.0,5.00%,F,T)
44:39
3.6E6
1.8E6
0.0E0
471.7750 S:12 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6452.0,5.00%,F,T)
44:39
4.0E6
2.0E6
0.0E0
454.9728 S:12 F:5 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
43:08
43:33 43:44 43:55 44:07
44:28 44:42
45:02 45:15 45:28 45:46 46:04
2.7E6
1.3E6
0.0E0
100%
50
0
43:00 43:12 43:24 43:36 43:48 44:00 44:12 44:24 44:36 44:48 45:00 45:12 45:24 45:36 45:48 46:00
Time

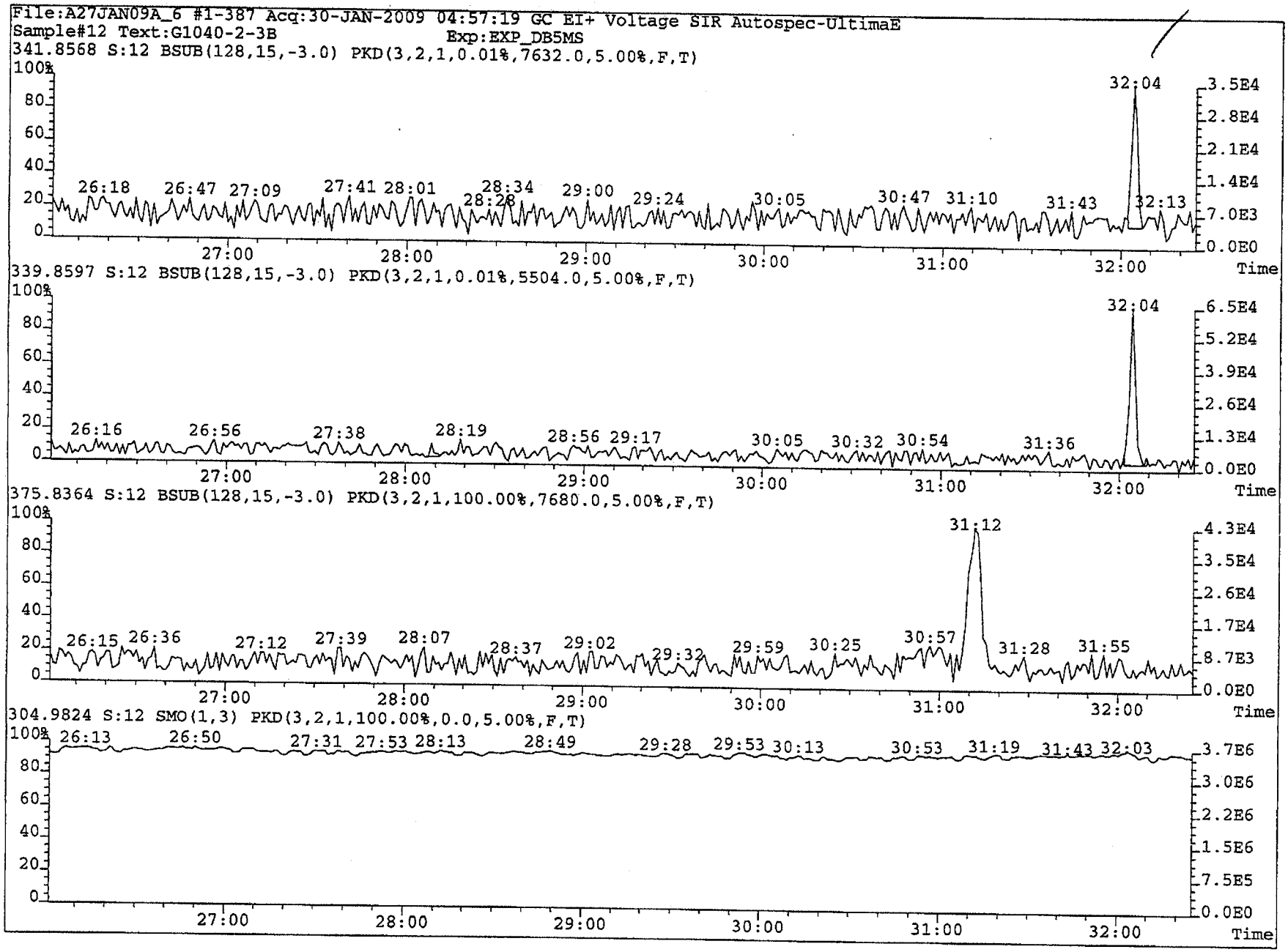

File:A27JAN09A_6 #1-387 Acq:30-JAN-2009 04:57:19 GC EI+ Voltage SIR Autospec-UltimaE
Sample#12 Text:G1040-2-3B
Exp:EXP_DB5MS
303.9016 S:12 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,7356.0,5.00%,F,T)
305.8987 S:12 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,7156.0,5.00%,F,T)
315.9419 S:12 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7024.0,5.00%,F,T)
317.9389 S:12 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5860.0,5.00%,F,T)
375.8364 S:12 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,7680.0,5.00%,F,T)
304.9824 S:12 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time


File:A27JAN09A_6 #1-200 Acq:30-JAN-2009 04:57:19 GC EI+ Voltage SIR Autospec-UltimaE
Sample#12 Text:G1040-2-3B Exp:EXP_DB5MS
339.8597 S:12 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7976.0,5.00%,F,T)
341.8568 S:12 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,10620.0,5.00%,F,T)
351.9000 S:12 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7452.0,5.00%,F,T)
353.8970 S:12 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,17064.0,5.00%,F,T)
409.7974 S:12 F:2 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,6464.0,5.00%,F,T)
366.9792 S:12 F:2 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time


File:A27JAN09A_6 #1-256 Acq:30-JAN-2009 04:57:19 GC EI+ Voltage SIR Autospec-UltimaE
Sample#12 Text:G1040-2-3B
Exp:EXP_DB5MS
373.8207 S:12 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7604.0,5.00%,F,T)
375.8178 S:12 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7108.0,5.00%,F,T)
383.8639 S:12 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6352.0,5.00%,F,T)
385.8610 S:12 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7472.0,5.00%,F,T)
445.7555 S:12 F:3 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,7800.0,5.00%,F,T)
380.9760 S:12 F:3 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time


File:A27JAN09A_6 #1-339 Acq:30-JAN-2009 04:57:19 GC EI+ Voltage SIR Autospec-UltimaE
Sample#12 Text:G1040-2-3B Exp:EXP_DB5MS
407.7818 S:12 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7428.0,5.00%,F,T)
409.7788 S:12 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7344.0,5.00%,F,T)
417.8253 S:12 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7732.0,5.00%,F,T)
419.8220 S:12 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5300.0,5.00%,F,T)
479.7165 S:12 F:4 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,7208.0,5.00%,F,T)
430.9728 S:12 F:4 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time


File:A27JAN09A_6 #1-307 Acq:30-JAN-2009 04:57:19 GC EI+ Voltage SIR Autospec-UltimaE
Sample#12 Text:G1040-2-3B
Exp:EXP_DB5MS
441.7427 S:12 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7064.0,5.00%,F,T)
443.7398 S:12 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6964.0,5.00%,F,T)
469.7780 S:12 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6868.0,5.00%,F,T)
471.7750 S:12 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6452.0,5.00%,F,T)
513.6775 S:12 F:5 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,6624.0,5.00%,F,T)
454.9728 S:12 F:5 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time


File:A27JAN09A_6 #1-387 Acq:30-JAN-2009 04:57:19 GC EI+ Voltage SIR Autospec-UltimaE
Sample#12 Text:G1040-2-3B Exp:EXP_DB5MS
341.8568 S:12 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7632.0,5.00%,F,T)
339.8597 S:12 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5504.0,5.00%,F,T)
375.8364 S:12 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,7680.0,5.00%,F,T)
304.9824 S:12 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time

Method 1613

PGSS-75

Analytical Resources, Inc.

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	RL (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	1.00			
1,2,3,7,8-PeCDD	ND	5.00			
1,2,3,4,7,8-HxCDD	ND	5.00			
1,2,3,6,7,8-HxCDD	ND	5.00			
1,2,3,7,8,9-HxCDD	ND	5.00			
1,2,3,4,6,7,8-HpCDD	ND	5.00			
OCDD	22.8	10.0	44:40	0.92	
2,3,7,8-TCDF	ND	1.00			
1,2,3,7,8-PeCDF	ND	5.00			
2,3,4,7,8-PeCDF	ND	5.00			
1,2,3,4,7,8-HxCDF	ND	5.00			
1,2,3,6,7,8-HxCDF	ND	5.00			
2,3,4,6,7,8-HxCDF	ND	5.00			
1,2,3,7,8,9-HxCDF	ND	5.00			
1,2,3,4,6,7,8-HpCDF	ND	5.00			
1,2,3,4,7,8,9-HpCDF	ND	5.00			
OCDF	13.0	10.0	44:58	0.93	
Total TCDDs	ND	1.00			
Total PeCDDs	ND	5.00			
Total HxCDDs	ND	5.00			
Total HpCDDs	9.93	5.00			
Total TCDFs	ND	1.00			
Total PeCDFs	ND	5.00			
Total HxCDFs	ND	5.00			
Total HpCDFs	18.8	5.00			
WHO-2005 TEQ (ND=0)	0.0107				
WHO-2005 TEQ (ND=½)	5.71				

Client Information

Project Name:	Port Gamble				
			Matrix:	Sediment	
Sample ID:	PGSS-75		Weight / Volume:	14.69	grams
			Solids / Lipids:	77.8	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG16440	
Project ID:	G1040-2				
Sample ID:	G1040-2-4B		Filename:	a27jan09a_12-6	
Collection Date/Time:	09-Dec-08	14:58	Retchk:	a27jan09a_11-15	
Receipt Date:	15-Jan-09	10:15	Begin ConCal:	a27jan09a_11-15	
Extraction Date:	19-Jan-09				
Analysis Date:	01-Feb-09	22:06	Initial Cal:	m1613-100708a	

Method 1613

PGSS-75

Analytical Resources, Inc.

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
$^{13}C_{12}$-2,3,7,8-TCDD	2	1.61	80.3	31:27	0.79	
$^{13}C_{12}$-1,2,3,7,8-PeCDD	2	1.52	75.9	34:15	1.59	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	2	1.66	82.9	36:52	1.26	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	2	1.61	80.7	36:57	1.27	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	2	1.36	68.2	40:19	1.05	
$^{13}C_{12}$-OCDD	4	2.33	58.2	44:39	0.91	
$^{13}C_{12}$-2,3,7,8-TCDF	2	1.64	82.1	30:51	0.80	
$^{13}C_{12}$-1,2,3,7,8-PeCDF	2	1.63	81.7	33:27	1.59	
$^{13}C_{12}$-2,3,4,7,8-PeCDF	2	1.53	76.5	34:04	1.59	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	2	1.71	85.4	36:09	0.52	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	2	1.73	86.3	36:15	0.53	
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	2	1.66	83.0	36:45	0.52	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	2	1.61	80.6	37:32	0.52	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	2	1.39	69.6	39:03	0.45	
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	2	1.36	67.9	41:01	0.45	
Cleanup Standard						
$^{37}Cl_4$-2,3,7,8-TCDD	0.4	0.338	84.5	31:28		
Injection Standards						
$^{13}C_{12}$-1,2,3,4-TCDD	2			31:00	0.79	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	2			37:12	1.25	

Client Information

Project Name: Port Gamble

Sample ID: PGSS-75

Laboratory Information

Project ID:	G1040-2	
Sample ID:	G1040-2-4B	
Collection Date/Time:	09-Dec-08	14:58
Receipt Date:	15-Jan-09	10:15
Extraction Date:	19-Jan-09	
Analysis Date:	01-Feb-09	22:06

Analyzed by: _____

Date: 02/17/09

Sample Information

Matrix:	Sediment	
Weight / Volume:	14.69	grams
Solids / Lipids:	77.8	%
Original pH :	NA	
Batch ID:	WG16440	
Filename:	a27jan09a_12-6	
Retchk:	a27jan09a_11-15	
Begin ConCal:	a27jan09a_11-15	
Initial Cal:	m1613-100708a	

Reviewed by: _____

Date: 02/17/09

Form Version:[1613_]IRMS12|Repor

[OCDF] = 1.06e6 + 1.15e6 / 2.24e7 + 2.47e7 × (4000pg / 14.69g × 0.778) × (1 / 1.2654) = 13.0pg/g TM 02/17/09

Filename ; a27jan09a_12
Sample ; 6
Acquired ; 1-FEB-09 22:06:09
Processed ; 2-FEB-09 09:53:14
Sample ID ; G1040-2-4B
Cal Table ; m1613-100708a
Results Table ; m1613-012709a_12
Comments ;

;*1613*
;Inst: HRMS1

Ent;	Name;	Resp;	Ion 1;	Ion 2;	RA;?;	RT;	Conc;	EDL;	S/N1;?;	S/N2;?;M;	Signal1;	Noise 1;	Signal2;	Noise 2
1 ;	2,3,7,8-TCDD;	*;	*;	*;	*;n;	NotFnd;	*;	0.0976;	*;n;	*;n;y;	*;3.81e+03;		*;5.21e+03	
2 ;	1,2,3,7,8-PeCDD;	*;	*;	*;	*;n;	NotFnd;	*;	0.1764;	*;n;	*;n;n;	*;8.14e+03;		*;6.20e+03	
3 ;	1,2,3,4,7,8-HxCDD;	*;	*;	*;	*;n;	NotFnd;	*;	0.2226;	*;n;	*;n;n;	*;6.96e+03;		*;5.42e+03	
4 ;	1,2,3,6,7,8-HxCDD;	*;	*;	*;	*;n;	NotFnd;	*;	0.2211;	*;n;	*;n;n;	*;6.96e+03;		*;5.42e+03	
5 ;	1,2,3,7,8,9-HxCDD;	*;	*;	*;	*;n;	NotFnd;	*;	0.2234;	*;n;	*;n;n;	*;6.96e+03;		*;5.42e+03	
6 ;	1,2,3,4,6,7,8-HpCDD;	6.36e+05;	3.36e+05;	3.00e+05;	1.12;y;	40:20;	1.730;	0.4241;	14;y;	12;y;n;8.57e+04;	6.31e+03;	7.41e+04;	6.08e+03	
7 ;	OCDD;	3.26e+06;	1.56e+06;	1.70e+06;	0.92;y;	44:40;	13.008;	0.8014;	51;y;	52;y;n;2.89e+05;	5.70e+03;	3.28e+05;	6.29e+03	
8 ;	2,3,7,8-TCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.1273;	*;n;	*;n;n;	*;6.32e+03;		*;8.00e+03	
9 ;	1,2,3,7,8-PeCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.1172;	*;n;	*;n;n;	*;8.70e+03;		*;7.83e+03	
10 ;	2,3,4,7,8-PeCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.1210;	*;n;	*;n;n;	*;8.70e+03;		*;7.83e+03	
11 ;	1,2,3,4,7,8-HxCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.1667;	*;n;	*;n;n;	*;7.01e+03;		*;6.66e+03	
12 ;	1,2,3,6,7,8-HxCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.1509;	*;n;	*;n;n;	*;7.01e+03;		*;6.66e+03	
13 ;	2,3,4,6,7,8-HxCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.1623;	*;n;	*;n;n;	*;7.01e+03;		*;6.66e+03	
14 ;	1,2,3,7,8,9-HxCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.2227;	*;n;	*;n;n;	*;7.01e+03;		*;6.66e+03	
15 ;	1,2,3,4,6,7,8-HpCDF;	1.57e+06;	7.99e+05;	7.66e+05;	1.04;y;	39:03;	2.580;	0.2361;	35;y;	28;y;n;2.03e+05;	5.72e+03;	1.91e+05;	6.82e+03	
16 ;	1,2,3,4,7,8,9-HpCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.3604;	*;n;	*;n;n;	*;5.72e+03;		*;6.82e+03	
17 ;	OCDF;	2.21e+06;	1.06e+06;	1.15e+06;	0.93;y;	44:58;	7.427;	0.6608;	34;y;	38;y;n;1.97e+05;	5.78e+03;	2.26e+05;	5.98e+03	
Extraction Standards														
18 ;	13C-2,3,7,8-TCDD;	9.50e+07;	4.18e+07;	5.32e+07;	0.79;y;	31:27;	80.299;	0.1335;	1681;y;	2503;y;n;1.21e+07;	7.17e+03;	1.54e+07;	6.16e+03	
19 ;	13C-1,2,3,7,8-PeCDD;	6.56e+07;	4.03e+07;	2.53e+07;	1.59;y;	34:15;	75.829;	0.2402;	1336;y;	1291;y;n;1.41e+07;	1.05e+04;	9.06e+06;	7.02e+03	
20 ;	13C-1,2,3,4,7,8-HxCDD;	5.14e+07;	2.87e+07;	2.27e+07;	1.26;y;	36:52;	82.893;	0.2089;	1359;y;	1168;y;n;9.12e+06;	6.71e+03;	7.07e+06;	6.06e+03	
21 ;	13C-1,2,3,6,7,8-HxCDD;	5.43e+07;	3.04e+07;	2.40e+07;	1.27;y;	36:57;	80.670;	0.1923;	1395;y;	1247;y;n;9.36e+06;	6.71e+03;	7.55e+06;	6.06e+03	
22 ;	13C-1,2,3,4,6,7,8-HpCDD;	3.47e+07;	1.78e+07;	1.69e+07;	1.05;y;	40:19;	68.200;	0.2127;	768;y;	783;y;n;4.23e+06;	5.51e+03;	4.03e+06;	5.14e+03	
23 ;	13C-OCDD;	4.71e+07;	2.24e+07;	2.47e+07;	0.91;y;	44:39;	116.438;	0.2834;	752;y;	742;y;n;4.04e+06;	5.37e+03;	4.40e+06;	5.92e+03	
24 ;	13C-2,3,7,8-TCDF;	1.44e+08;	6.38e+07;	8.00e+07;	0.80;y;	30:51;	82.045;	0.0748;	2784;y;	3071;y;n;1.45e+07;	5.19e+03;	1.81e+07;	5.88e+03	
25 ;	13C-1,2,3,7,8-PeCDF;	1.16e+08;	7.10e+07;	4.47e+07;	1.59;y;	33:27;	81.693;	0.2478;	8291;y;	623;y;n;2.64e+07;	3.18e+03;	1.65e+07;	2.65e+04	
26 ;	13C-2,3,4,7,8-PeCDF;	1.06e+08;	6.52e+07;	4.09e+07;	1.59;y;	34:04;	76.514;	0.2531;	7604;y;	577;y;n;2.42e+07;	3.18e+03;	1.53e+07;	2.65e+04	
27 ;	13C-1,2,3,4,7,8-HxCDF;	6.84e+07;	2.35e+07;	4.49e+07;	0.52;y;	36:09;	85.399;	0.1567;	1083;y;	2489;y;n;7.27e+06;	6.72e+03;	1.41e+07;	5.65e+03	
28 ;	13C-1,2,3,6,7,8-HxCDF;	7.62e+07;	2.64e+07;	4.99e+07;	0.53;y;	36:15;	86.303;	0.1420;	1237;y;	2783;y;n;8.31e+06;	6.72e+03;	1.57e+07;	5.65e+03	
29 ;	13C-2,3,4,6,7,8-HxCDF;	6.89e+07;	2.37e+07;	4.52e+07;	0.52;y;	36:45;	82.983;	0.1510;	1142;y;	2591;y;n;7.67e+06;	6.72e+03;	1.46e+07;	5.65e+03	
30 ;	13C-1,2,3,7,8,9-HxCDF;	5.96e+07;	2.05e+07;	3.91e+07;	0.52;y;	37:32;	80.586;	0.1695;	852;y;	1954;y;n;5.72e+06;	6.72e+03;	1.10e+07;	5.65e+03	
31 ;	13C-1,2,3,4,6,7,8-HpCDF;	4.41e+07;	1.36e+07;	3.05e+07;	0.45;y;	39:03;	69.559;	0.2817;	568;y;	707;y;n;3.58e+06;	6.30e+03;	8.00e+06;	1.13e+04	
32 ;	13C-1,2,3,4,7,8,9-HpCDF;	3.39e+07;	1.05e+07;	2.34e+07;	0.45;y;	41:01;	67.867;	0.3576;	378;y;	467;y;n;2.38e+06;	6.30e+03;	5.28e+06;	1.13e+04	
Injection Standards														
33 ;	13C-1,2,3,4-TCDD;	1.06e+08;	4.68e+07;	5.93e+07;	0.79;y;	31:00;	78.058;	-;	1643;y;	2449;y;n;1.18e+07;	7.17e+03;	1.51e+07;	6.16e+03	
34 ;	13C-1,2,3,7,8,9-HxCDD;	6.45e+07;	3.59e+07;	2.86e+07;	1.25;y;	37:12;	59.751;	-;	1571;y;	1407;y;n;1.05e+07;	6.71e+03;	8.52e+06;	6.06e+03	
Cleanup Standard														
35 ;	37Cl-2,3,7,8-TCDD;	2.13e+07;	2.13e+07;	-;	-;-;	31:28;	16.909;	0.0583;	1010;y;	-;-;n;6.27e+06;	6.21e+03;	-;	-	

Totals Raw Data

	Conc	Empc	Flags
TCDF	0	0	FALSE
TCDD	0	0	FALSE
PeCDF	0	0	FALSE
PeCDD	0	0	FALSE
HxCDF	0	0	FALSE
HxCDD	0	0	FALSE
HpCDF	10.728	10.728	FALSE
HpCDD	5.673	5.673	FALSE

Filename: a27jan09a_12
Sample: 6
Acquired: 1-FEB-09 22:06:09
Processed: 2-FEB-09 09:53:14
Sample ID: G1040-2-4B
Cal Table: m1613-100708a
Results Table: m1613-012709a_12

Name of Homolog Group: Total Tetra-Furans
Number of Peaks Found: 1 0
RRF Used For Totals: 1.0368
Detection Limit: 0.1273
Noise Height Ion1/Ion2: 6316 / 8000
Begin Window: 26:13:00
End Window: 33:06:00

RL=0.500 (pg/µL)

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	1.10E+05	61500	48600		1.27 n	31:08	0.074	S2N		2 n		1.9 n	n

Filename: a27jan09a_12
Sample: 6
Acquired: 1-FEB-09 22:06:09
Processed: 2-FEB-09 09:53:14
Sample ID: G1040-2-4B
Cal Table: m1613-100708a
Results Table: m1613-012709a_12

Name of Homolog Group: Total Tetra-Dioxins
Number of Peaks Found: 2 0
RRF Used For Totals: 1.0087
Detection Limit: 0.0976
Noise Height Ion1/Ion2: 3812 / 5210
Begin Window: 27:40:00
End Window: 32:37:00

RL=0.500 (pg/µL)

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	2.14E+05	92300	122000		0.76 y	28:19	0.224	RL		4.4 y		4.4 y	y
	2	1.28E+05	61700	65900		0.94 n	28:37	0.133	RL		3.4 y		2.8 n	y

Filename: a27jan09a_12
Sample: 6
Acquired: 1-FEB-09 22:06:09
Processed: 2-FEB-09 09:53:14
Sample ID: G1040-2-4B
Cal Table: m1613-100708a
Results Table: m1613-012709a_12

Name of Homolog Group: Total Penta-Furans Fn1
Number of Peaks Found: 1 0
RRF Used For Totals: 1.0121
Detection Limit: 0.0907
Noise Height Ion1/Ion2: 6132 / 6468
Begin Window: 31:45:00
End Window: 32:05:00

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	1.27E+05	37900	89200		0.42 n	32:04	0.113	S2N		2.4 n		4.5 y	n

Page 4 of 9

Filename:	a27jan09a_12	Name of Homolog Group:	Total Penta-Furans Fn2
Sample:	6	Number of Peaks Found:	0
Acquired:	1-FEB-09 22:06:09	RRF Used For Totals:	1.0121
Processed:	2-FEB-09 09:53:14	Detection Limit:	0.119
Sample ID:	G1040-2-4B	Noise Height Ion1/Ion2:	8696 / 7832
Cal Table:	m1613-100708a	Begin Window:	
Results Table:	m1613-012709a_12	End Window:	

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	*	*	*	*	n	NotFnd	*		*	n	*	n	n

Page 5 of 9

Filename:	a27jan09a_12	Name of Homolog Group:	Total Penta-Dioxins
Sample:	6	Number of Peaks Found:	2 0
Acquired:	1-FEB-09 22:06:09	RRF Used For Totals:	1.0517
Processed:	2-FEB-09 09:53:14	Detection Limit:	0.1764
Sample ID:	G1040-2-4B	Noise Height Ion1/Ion2:	8140 / 6200
Cal Table:	m1613-100708a	Begin Window:	32:51:00
Results Table:	m1613-012709a_12	End Window:	34:36:00

RL=2.500 (pg/µL)

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	9.45E+04	60900	33600	1.81	n	32:55	0.137	S2N	2.4	n	1.9	n	n
	2	1.11E+05	63000	48300	1.31	n	33:29	0.161	RL	3.3	y	2.9	n	n

Page 6 of 9

Filename:	a27jan09a_12	Name of Homolog Group:	Total Hexa-Furans
Sample:	6	Number of Peaks Found:	3 0
Acquired:	1-FEB-09 22:06:09	RRF Used For Totals:	1.1305
Processed:	2-FEB-09 09:53:14	Detection Limit:	0.1732
Sample ID:	G1040-2-4B	Noise Height Ion1/Ion2:	7012 / 6660
Cal Table:	m1613-100708a	Begin Window:	35:05:00
Results Table:	m1613-012709a_12	End Window:	37:39:00

RL=2.500 (pg/µL)

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	7.38E+04	50700	23100	2.2	n	35:13	0.096	S2N	2.6	n	2.1	n	n
	2	4.09E+05	254000	155000	1.63	n	35:20	0.529	RL	12.1	y	8.9	y	n
	3	8.44E+05	484000	360000	1.35	y	35:47	1.093	RL	22.9	y	18.4	y	n

Page 7 of 9

Filename:	a27jan09a_12	Name of Homolog Group:	Total Hexa-Dioxins
Sample:	6	Number of Peaks Found:	3 0
Acquired:	1-FEB-09 22:06:09	RRF Used For Totals:	1.0077
Processed:	2-FEB-09 09:53:14	Detection Limit:	0.2226

RL=2.500 (pg/µL)

Sample ID: G1040-2-4B
Cal Table: m1613-100708a
Results Table: m1613-012709a_12
Noise Height Ion1/Ion2: 6956 / 5416
Begin Window: 35:35:00
End Window: 37:16:00

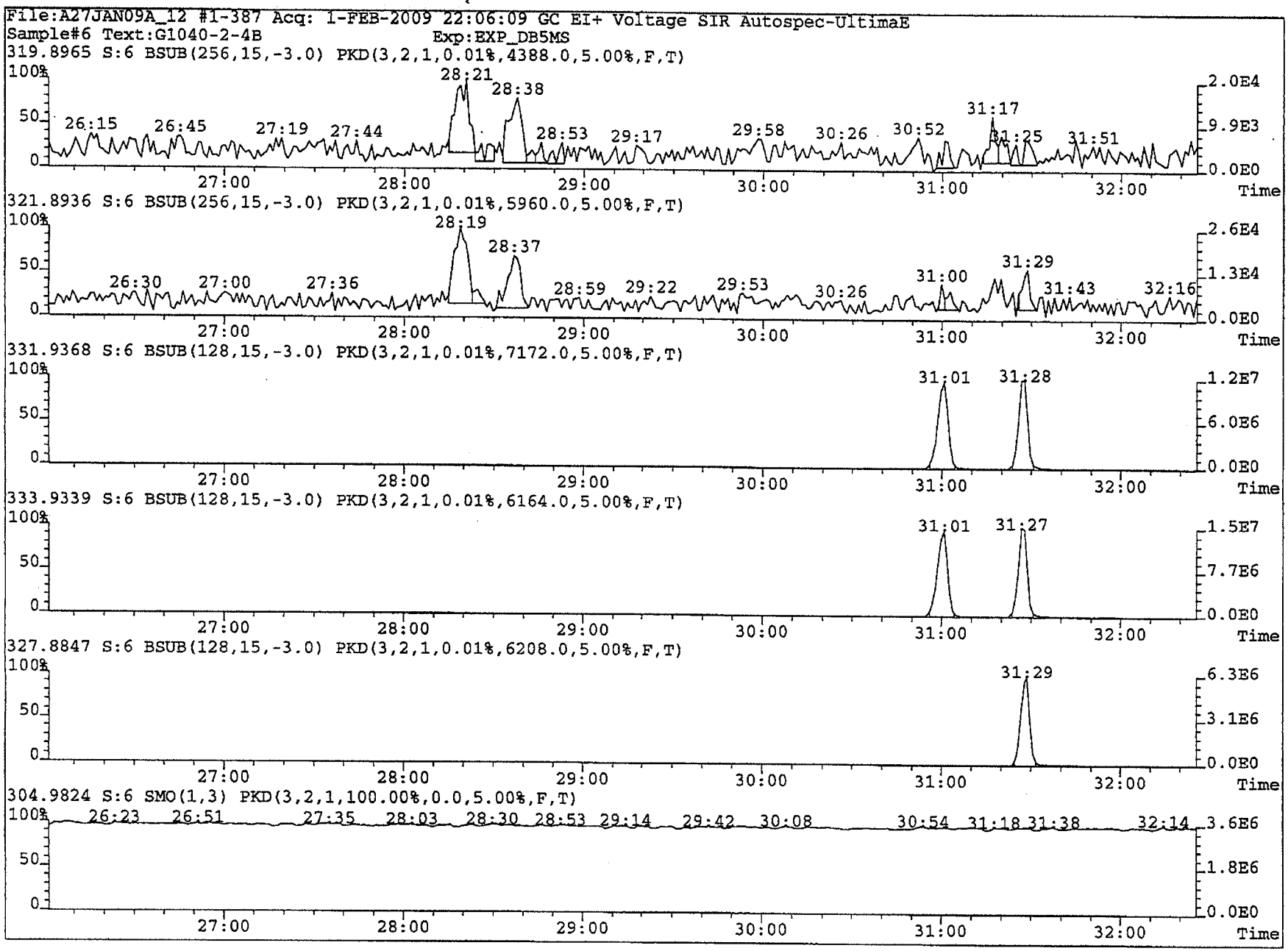
Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	2.52E+05	147000	105000		1.4 y	35:38	0.473	RL	7.5 y		6.4 y		n
	2	1.58E+05	111000	46900		2.36 n	36:06	0.296	RL	4.3 y		3.8 y		n
	3	2.41E+05	147000	94000		1.56 n	36:18	0.452	RL	5.6 y		5.7 y		n

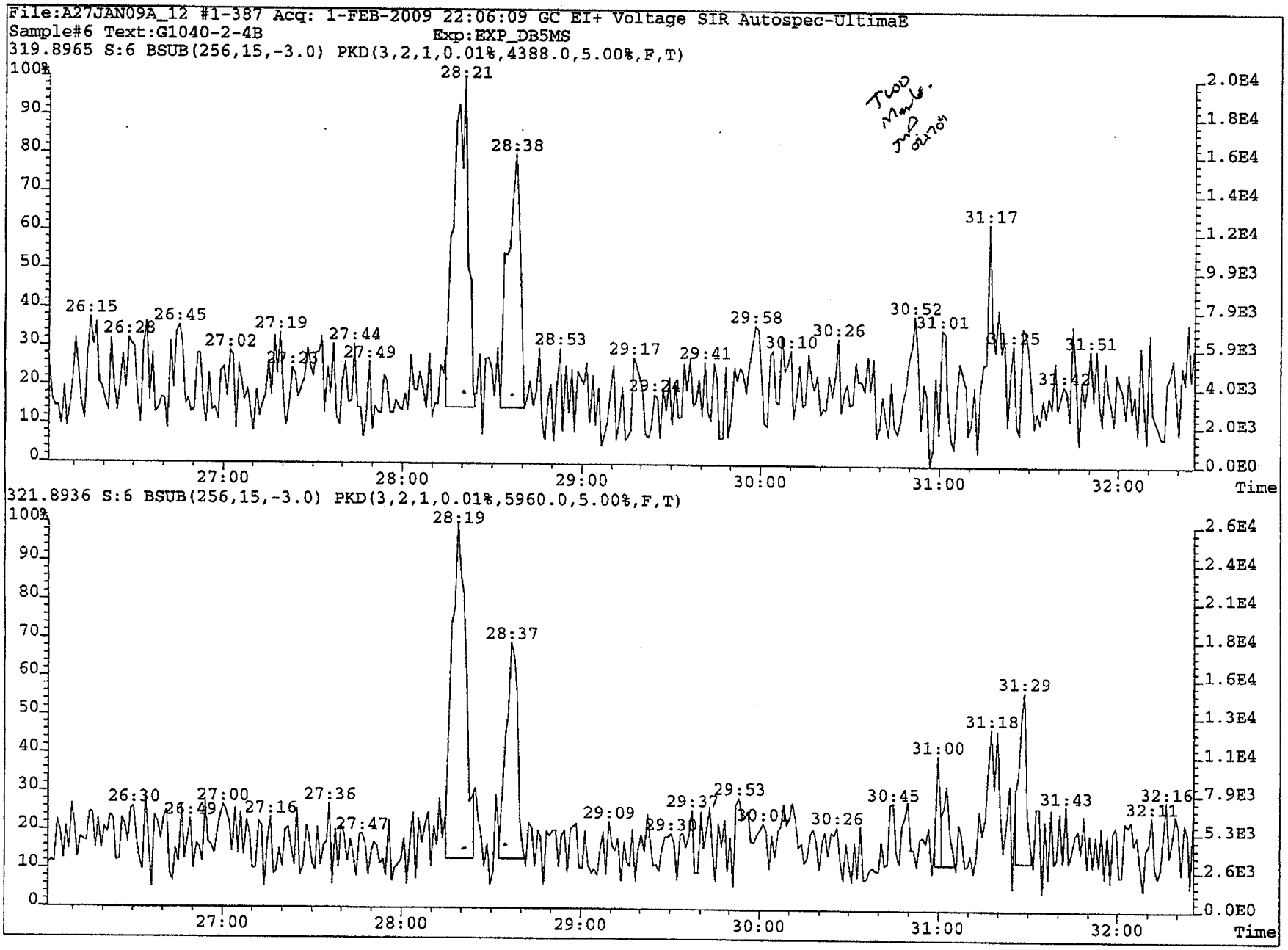
Filename: a27jan09a_12
Sample: 6
Acquired: 1-FEB-09 22:06:09
Processed: 2-FEB-09 09:53:14
Sample ID: G1040-2-4B
Cal Table: m1613-100708a
Results Table: m1613-012709a_12
Name of Homolog Group: Total Hepta-Furans
Number of Peaks Found: 2 2
RRF Used For Totals: 1.3693
Detection Limit: 0.2898
RL=2.500 (pg/µL)
Noise Height Ion1/Ion2: 5720 / 6820
Begin Window: 38:52:00
End Window: 41:04:00

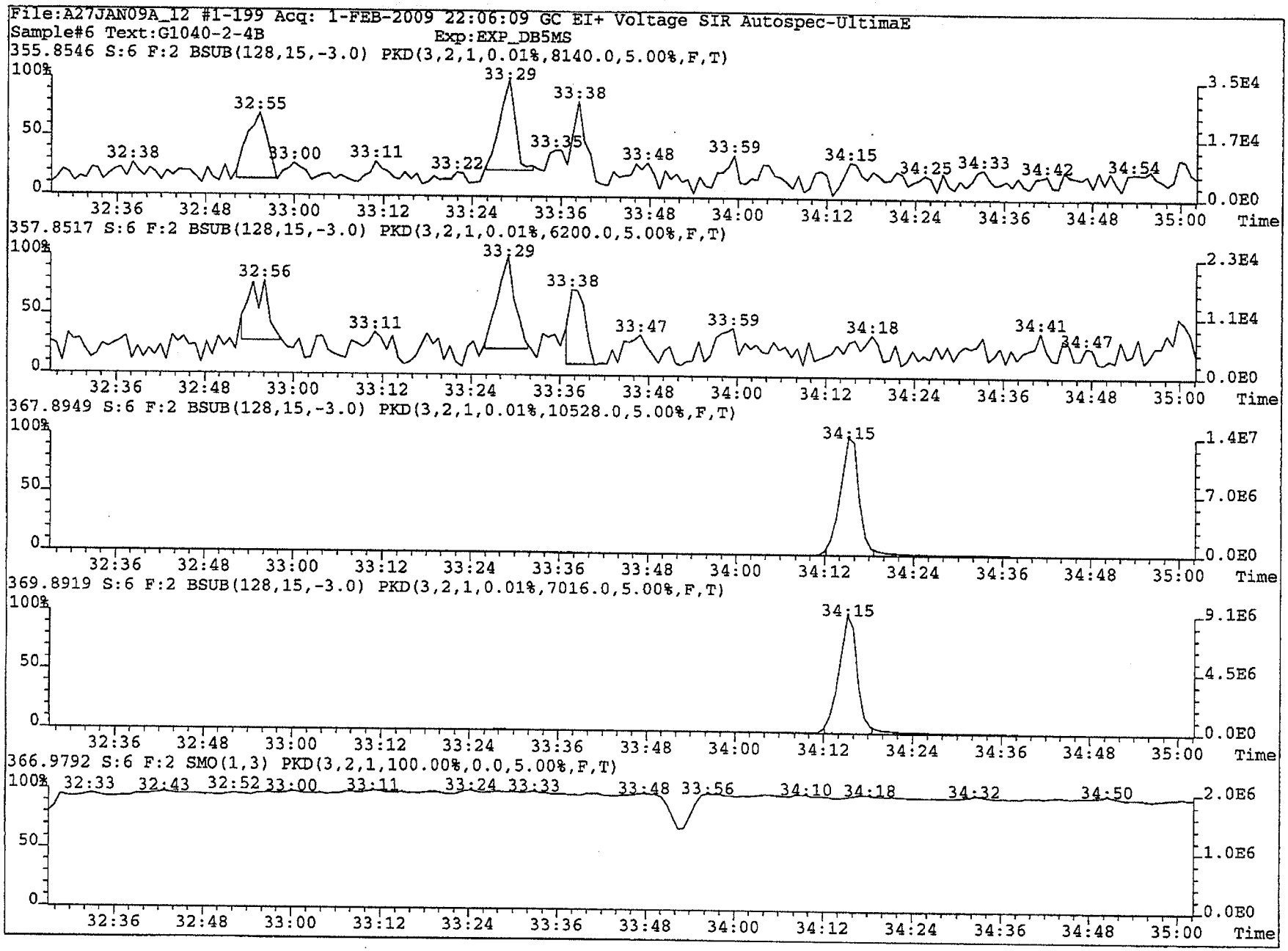
Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
1,2,3,4,6,7,8-HpCDI	1	1.57E+06	799000	766000		1.04 y	39:03	2.58	OK	35.4 y		28 y		n
	2	4.35E+06	2250000	2100000		1.07 y	39:36	8.148	OK	105.5 y		83.1 y		n

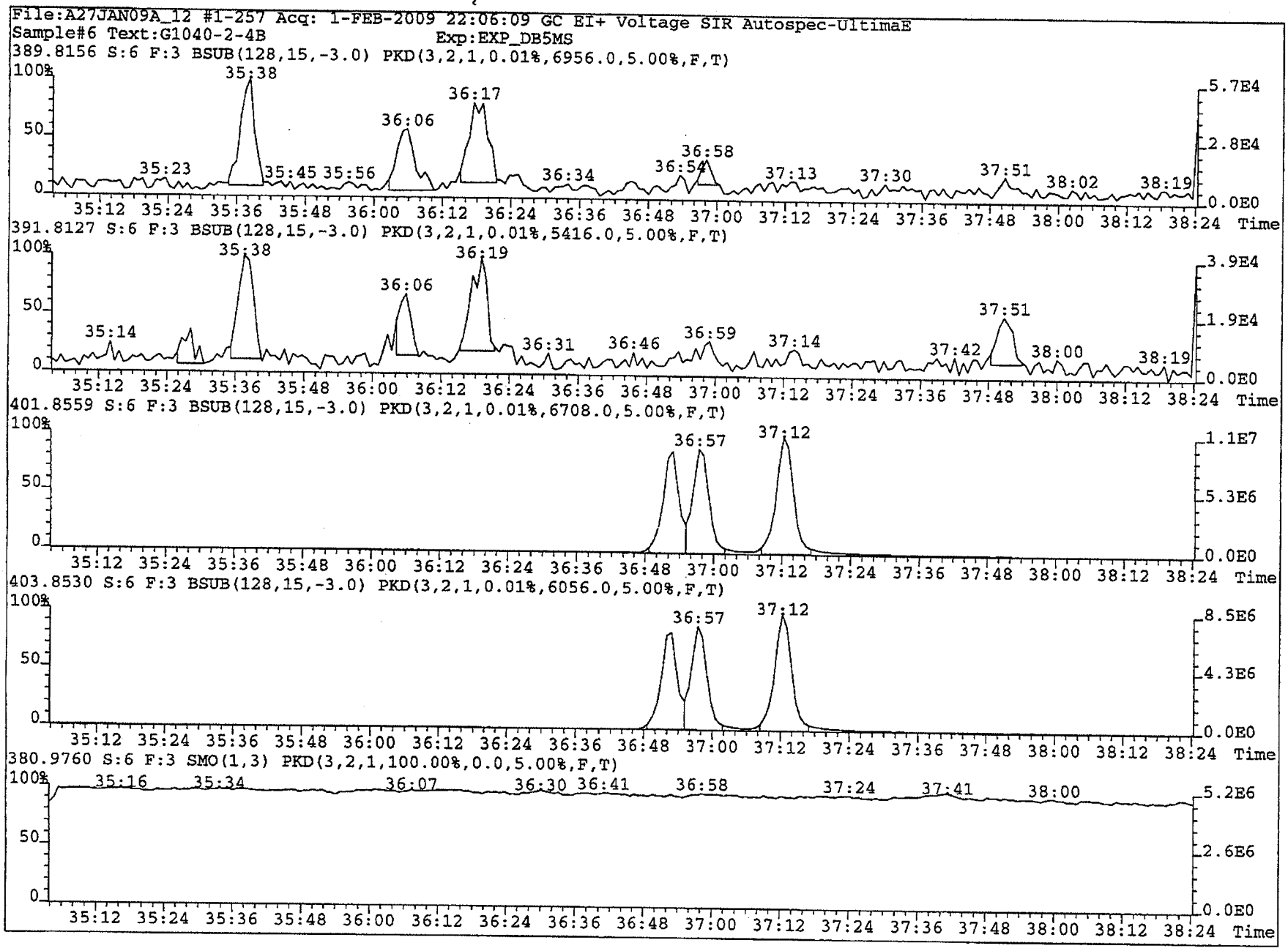
Filename: a27jan09a_12
Sample: 6
Acquired: 1-FEB-09 22:06:09
Processed: 2-FEB-09 09:53:14
Sample ID: G1040-2-4B
Cal Table: m1613-100708a
Results Table: m1613-012709a_12
Name of Homolog Group: Total Hepta-Dioxins
Number of Peaks Found: 2 1
RRF Used For Totals: 1.0612
Detection Limit: 0.4241
RL=2.500 (pg/µL)
Noise Height Ion1/Ion2: 6312 / 6076
Begin Window: 39:17:00
End Window: 40:29:00

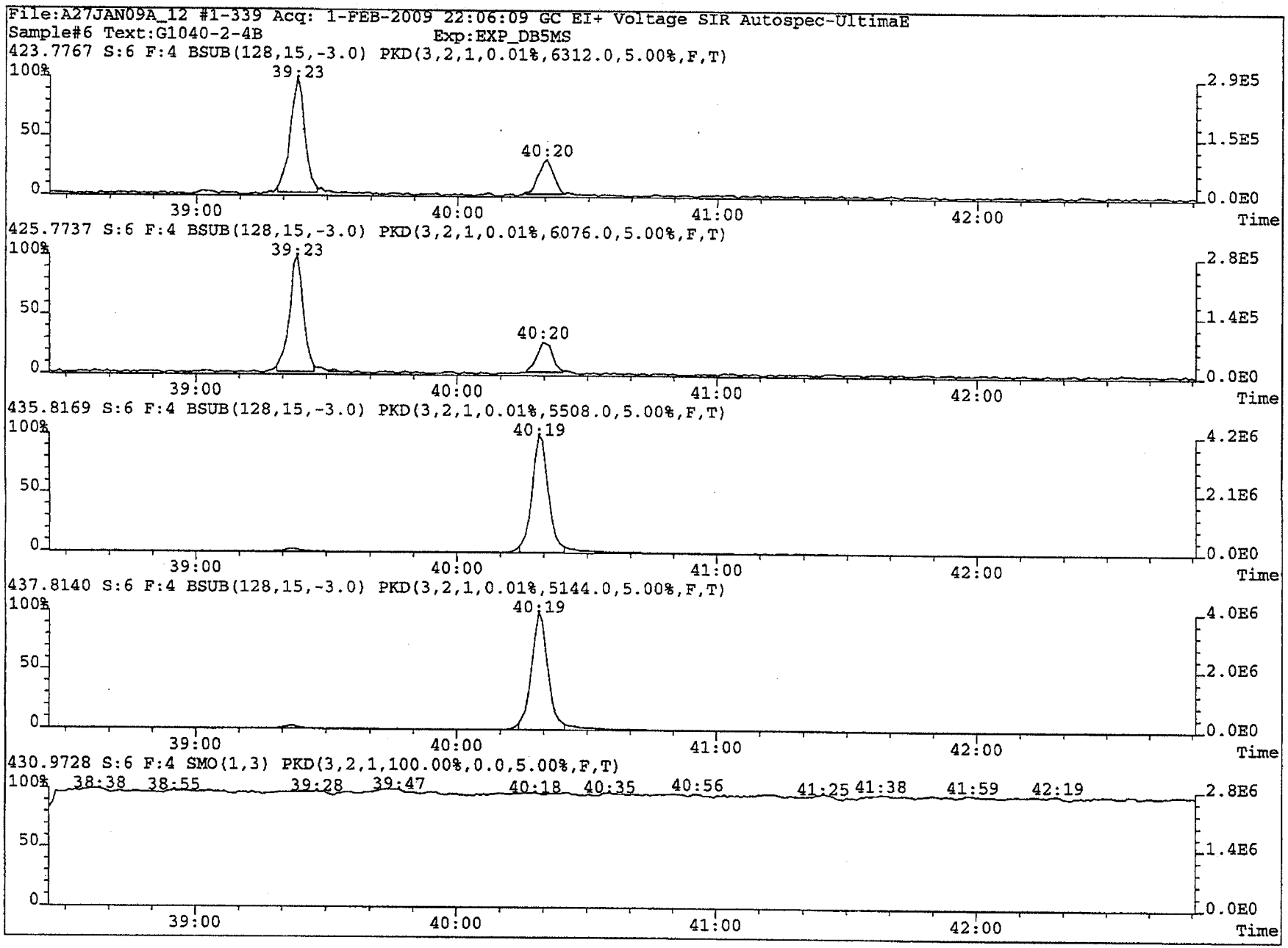
Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	2.09E+06	1080000	1010000		1.07 y	39:23	5.673	OK	45.2 y		46 y		n
1,2,3,4,6,7,8-HpCDI	2	6.36E+05	336000	300000		1.12 y	40:20	1.73	RL	13.6 y		12.2 y		n

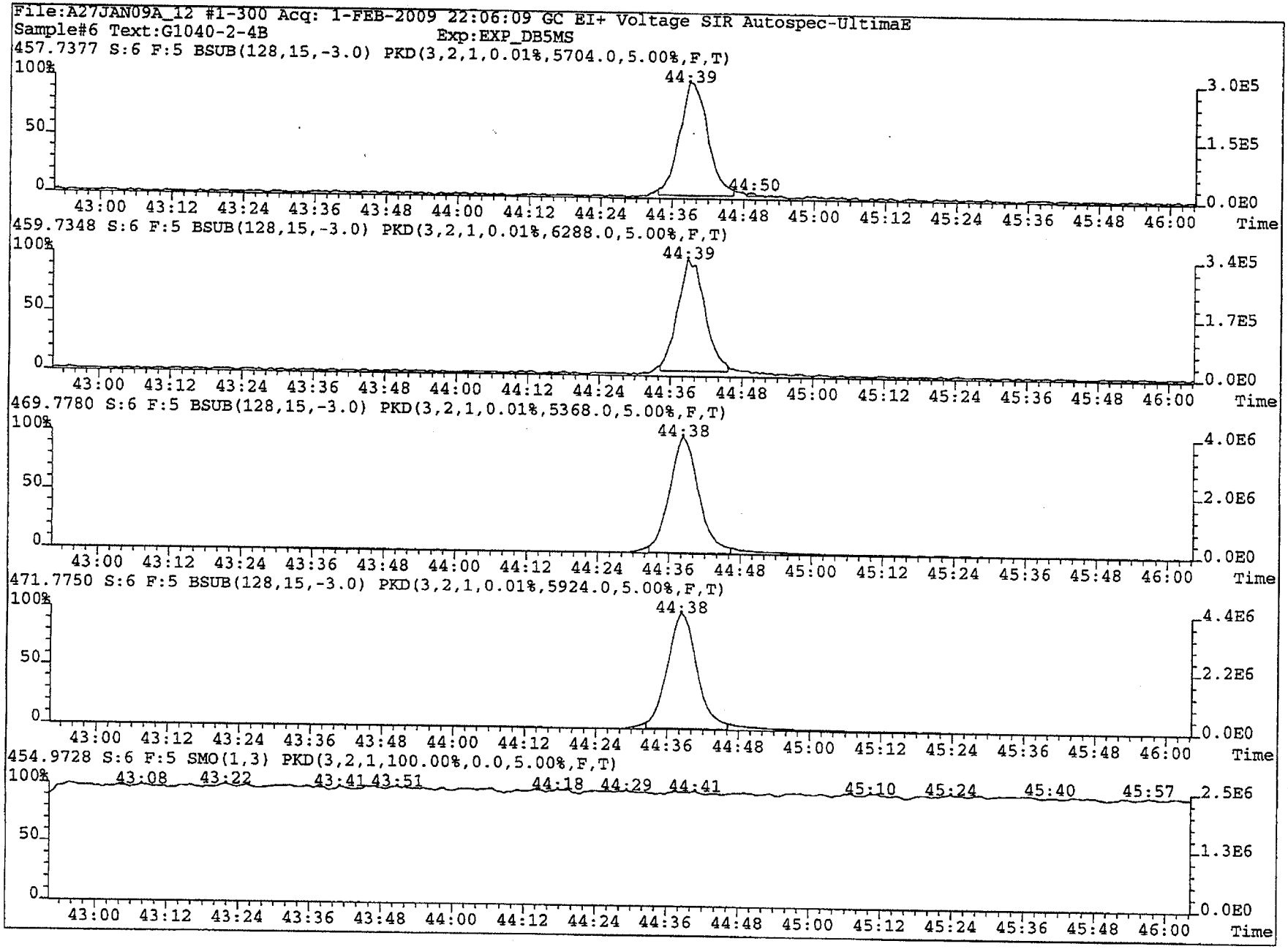

File:A27JAN09A_12 #1-387 Acq: 1-FEB-2009 22:06:09 GC EI+ Voltage SIR Autospec-UltimaE
Sample#6 Text:G1040-2-4B Exp:EXP_DB5MS
319.8965 S:6 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,4388.0,5.00%,F,T)
28:21
28:38
31:17
321.8936 S:6 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,5960.0,5.00%,F,T)
28:19
28:37
31:29
331.9368 S:6 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7172.0,5.00%,F,T)
31:01
31:28
333.9339 S:6 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6164.0,5.00%,F,T)
31:01
31:27
327.8847 S:6 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6208.0,5.00%,F,T)
31:29
304.9824 S:6 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time

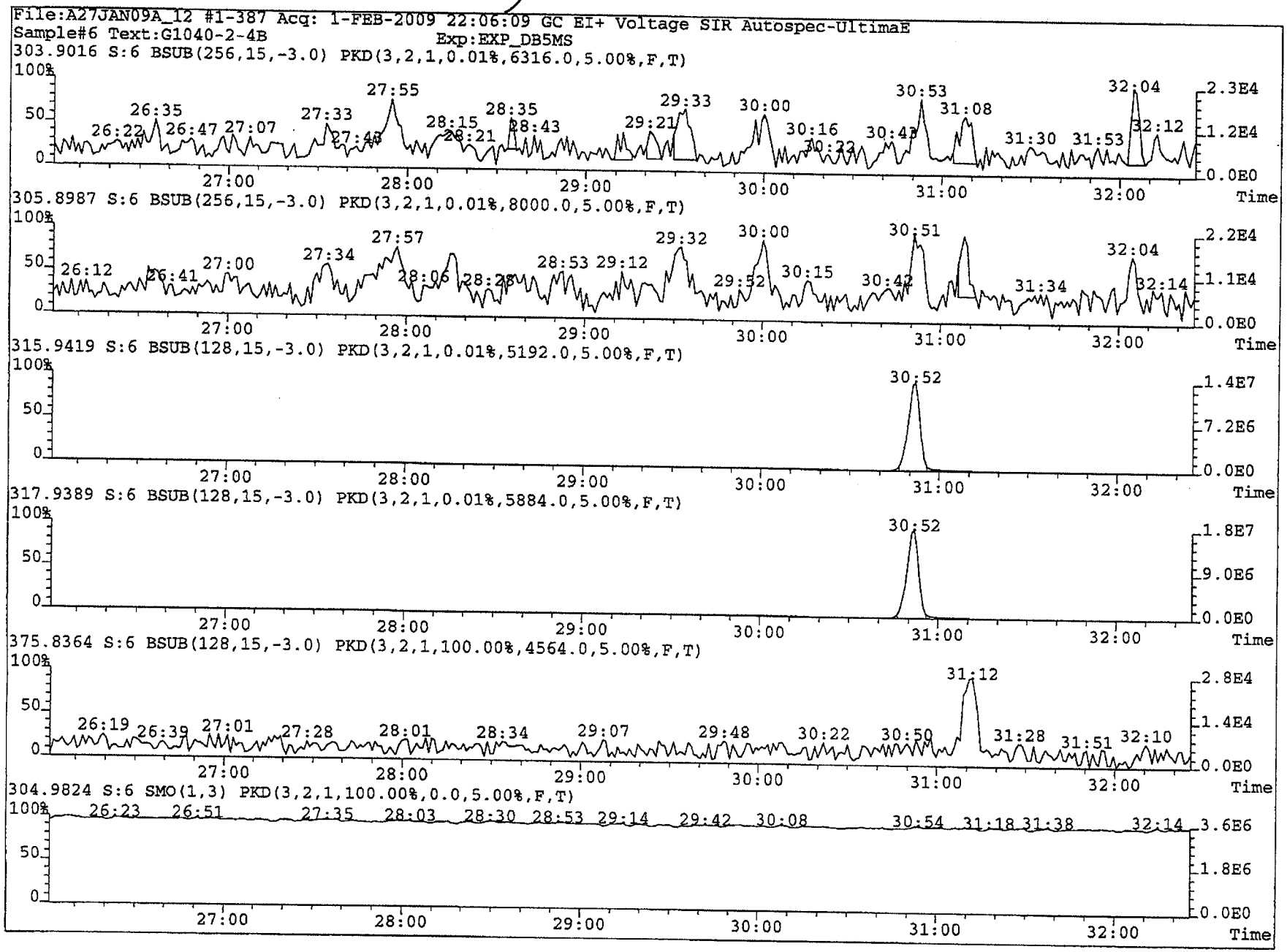

File:A27JAN09A_12 #1-387 Acq: 1-FEB-2009 22:06:09 GC EI+ Voltage SIR Autospec-UltimaE
Sample#6 Text:G1040-2-4B Exp:EXP_DB5MS
319.8965 S:6 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,4388.0,5.00%,F,T)
28:21
28:38
31:17
26:15
26:28
26:45
27:02
27:19
27:44
27:49
28:53
29:17
29:24
29:41
29:58
30:10
30:26
30:52
31:01
31:25
31:42
31:51
Time
321.8936 S:6 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,5960.0,5.00%,F,T)
28:19
28:37
31:29
31:18
31:00
26:30
26:49
27:00
27:16
27:36
27:47
29:09
29:30
29:37
29:53
30:01
30:26
30:45
31:43
32:11
32:16
Time

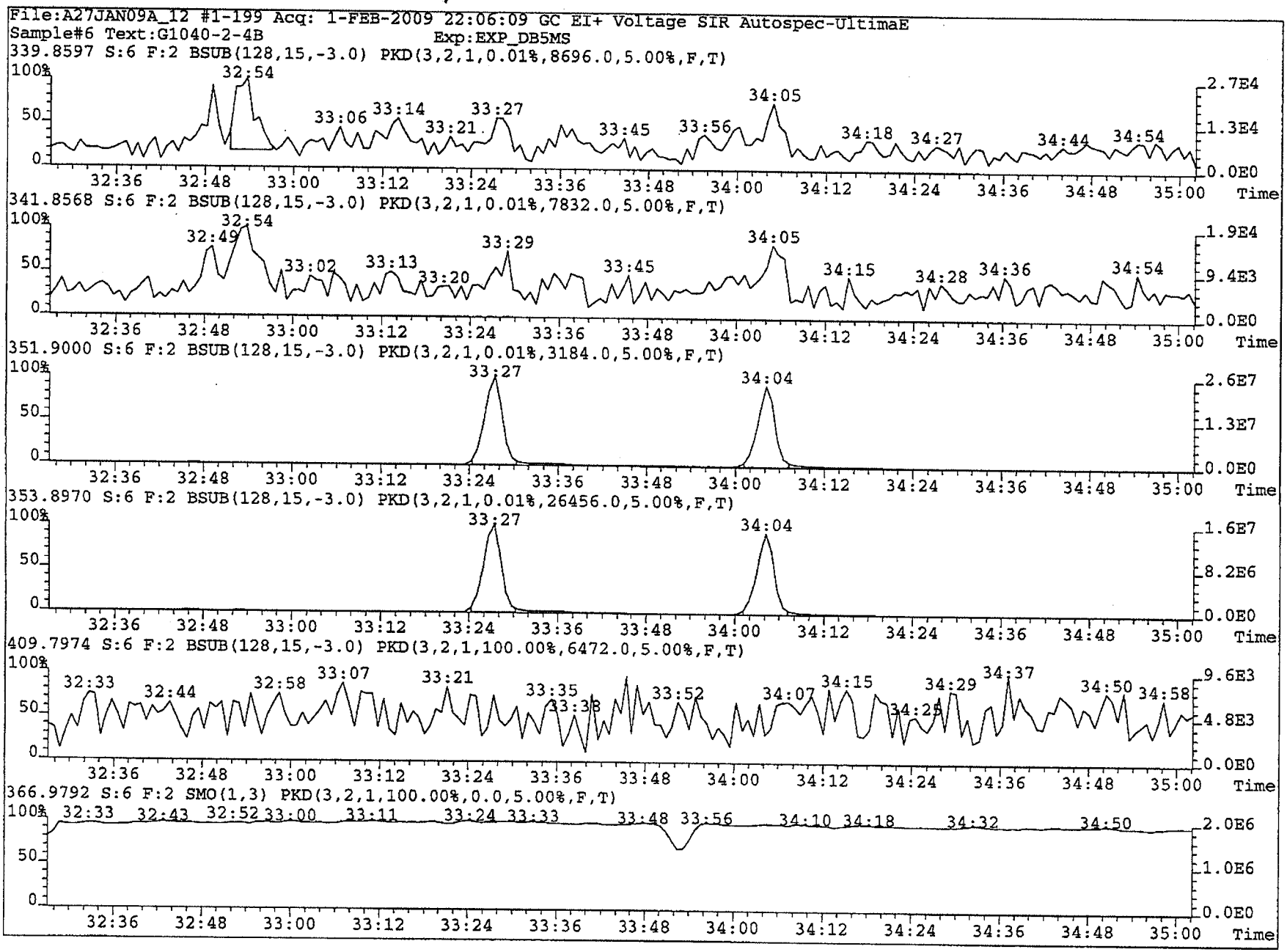

File:A27JAN09A_12 #1-199 Acq: 1-FEB-2009 22:06:09 GC EI+ Voltage SIR Autospec-UltimaE
Sample#6 Text:G1040-2-4B Exp:EXP_DB5MS
355.8546 S:6 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,8140.0,5.00%,F,T)
357.8517 S:6 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6200.0,5.00%,F,T)
367.8949 S:6 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,10528.0,5.00%,F,T)
369.8919 S:6 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7016.0,5.00%,F,T)
366.9792 S:6 F:2 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time

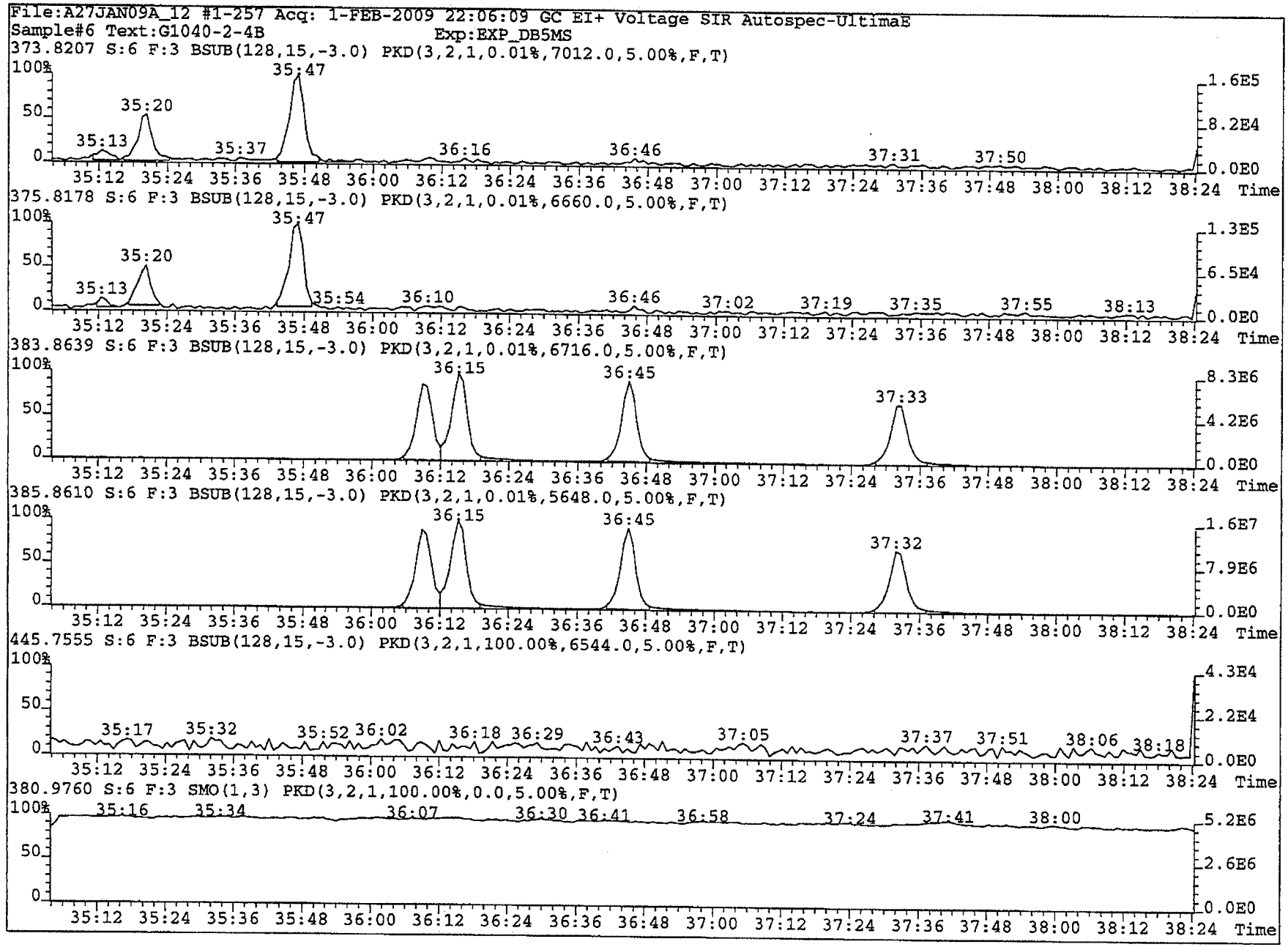

File:A27JAN09A_12 #1-257 Acq: 1-FEB-2009 22:06:09 GC EI+ Voltage SIR Autospec-UltimaE
Sample#6 Text:G1040-2-4B Exp:EXP_DB5MS
389.8156 S:6 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6956.0,5.00%,F,T)
391.8127 S:6 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5416.0,5.00%,F,T)
401.8559 S:6 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6708.0,5.00%,F,T)
403.8530 S:6 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6056.0,5.00%,F,T)
380.9760 S:6 F:3 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time

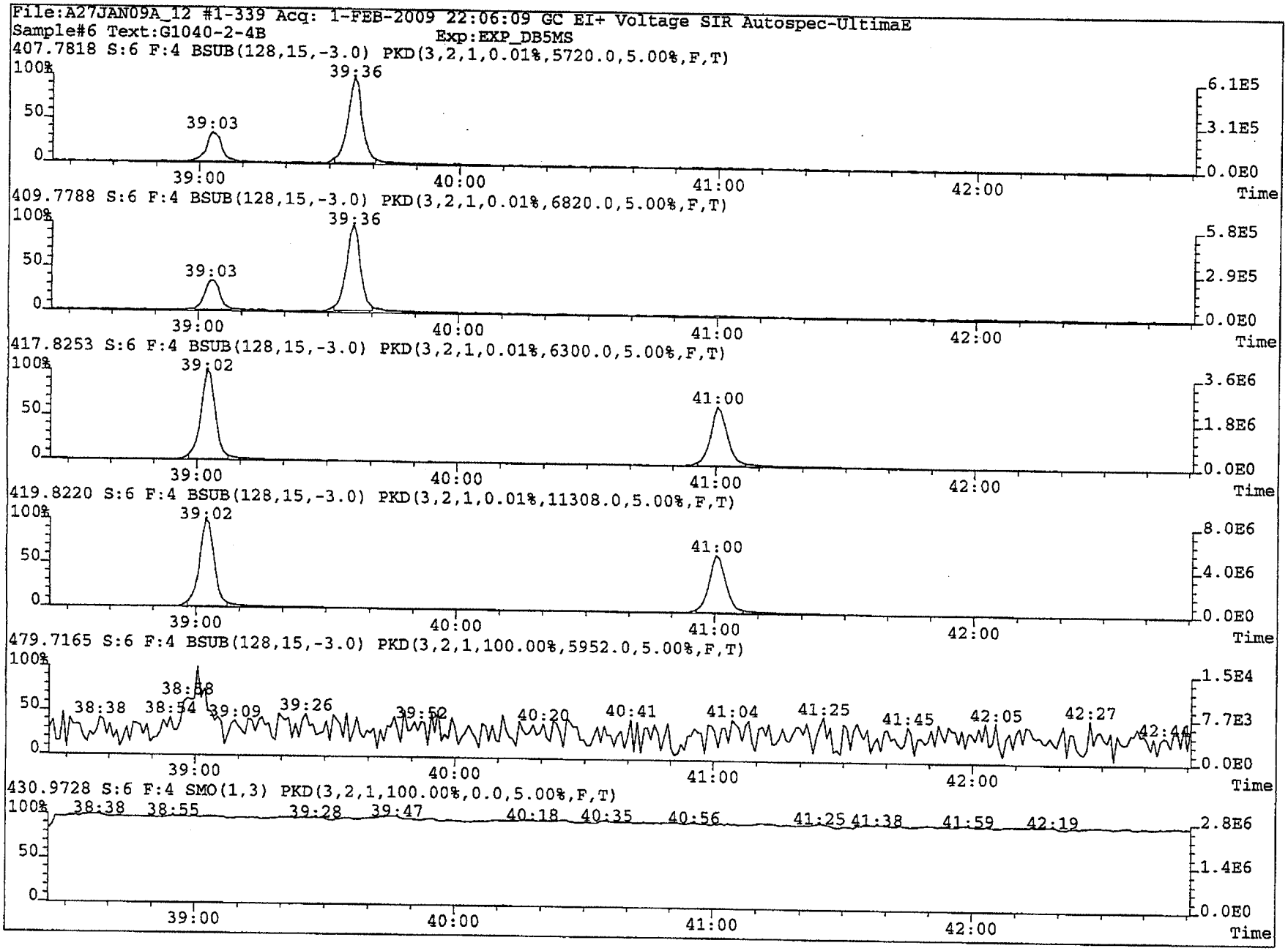

File:A27JAN09A_12 #1-339 Acq: 1-FEB-2009 22:06:09 GC EI+ Voltage SIR Autospec-UltimaE
Sample#6 Text:G1040-2-4B Exp:EXP_DB5MS
423.7767 S:6 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6312.0,5.00%,F,T)
39:23
40:20
2.9E5
1.5E5
0.0E0
425.7737 S:6 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6076.0,5.00%,F,T)
39:23
40:20
2.8E5
1.4E5
0.0E0
435.8169 S:6 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5508.0,5.00%,F,T)
40:19
4.2E6
2.1E6
0.0E0
437.8140 S:6 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5144.0,5.00%,F,T)
40:19
4.0E6
2.0E6
0.0E0
430.9728 S:6 F:4 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
38:38 38:55 39:28 39:47 40:18 40:35 40:56 41:25 41:38 41:59 42:19
2.8E6
1.4E6
0.0E0
100%
50
0
39:00
40:00
41:00
42:00
Time

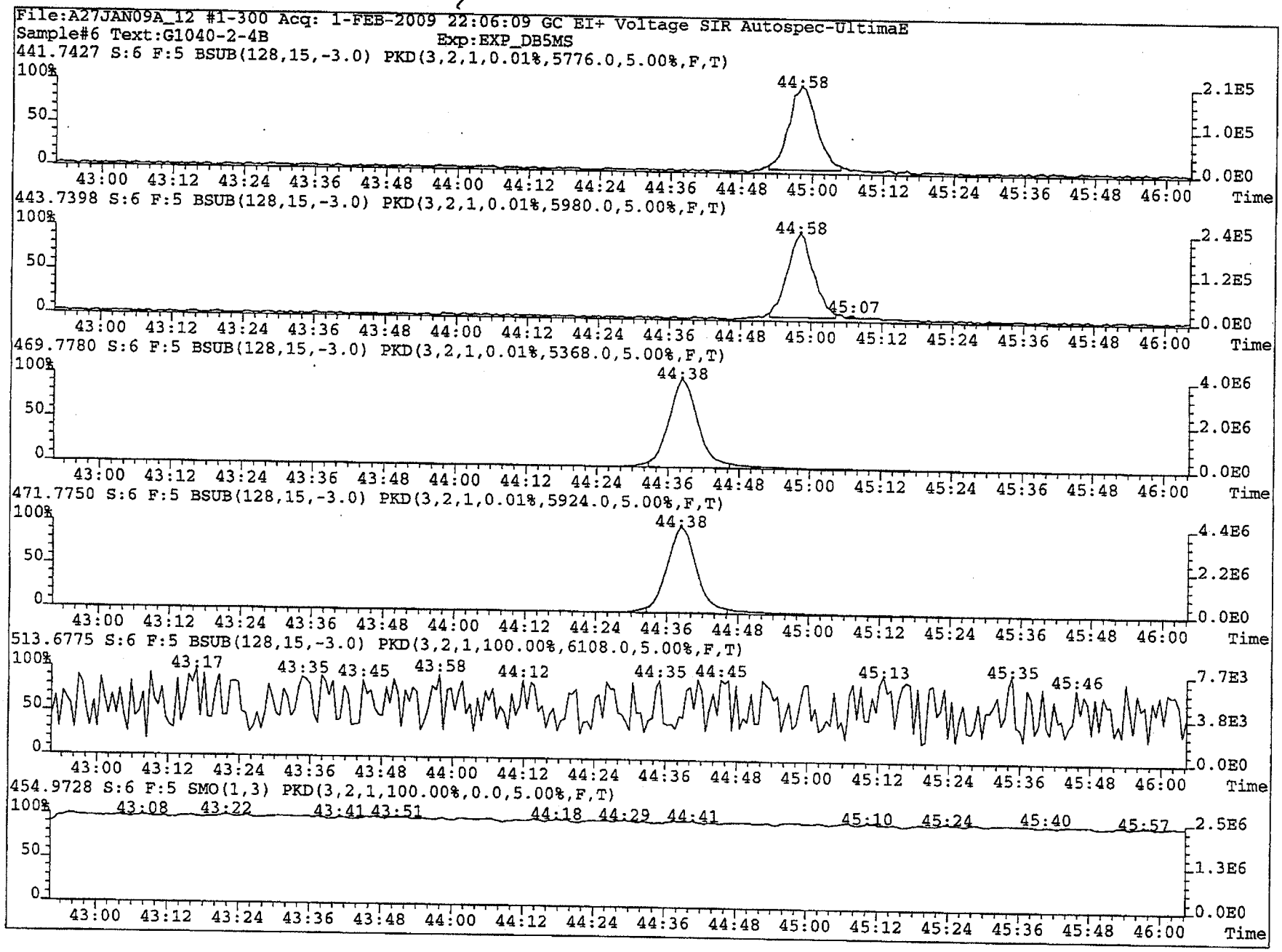

File:A27JAN09A_12 #1-300 Acq: 1-FEB-2009 22:06:09 GC EI+ Voltage SIR Autospec-UltimaE
Sample#6 Text:G1040-2-4B Exp:EXP_DB5MS
457.7377 S:6 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5704.0,5.00%,F,T)
44:39
44:50
459.7348 S:6 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6288.0,5.00%,F,T)
44:39
469.7780 S:6 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5368.0,5.00%,F,T)
44:38
471.7750 S:6 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5924.0,5.00%,F,T)
44:38
454.9728 S:6 F:5 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
43:08 43:22 43:41 43:51 44:18 44:29 44:41 45:10 45:24 45:40 45:57
Time

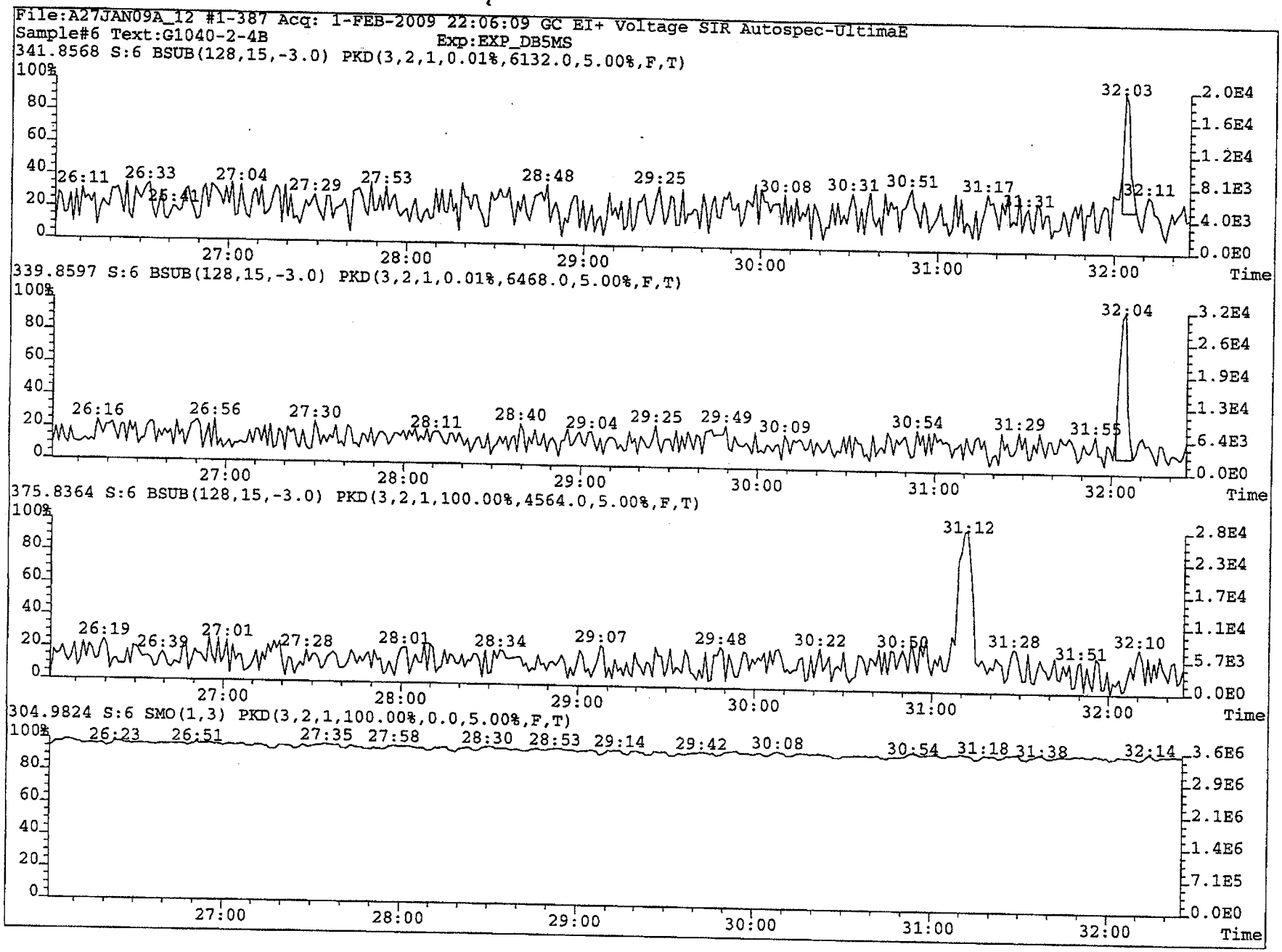

File:A27JAN09A_12 #1-387 Acq: 1-FEB-2009 22:06:09 GC EI+ Voltage SIR Autospec-UltimaE
Sample#6 Text:G1040-2-4B
Exp:EXP_DB5MS
303.9016 S:6 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,6316.0,5.00%,F,T)
305.8987 S:6 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,8000.0,5.00%,F,T)
315.9419 S:6 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5192.0,5.00%,F,T)
317.9389 S:6 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5884.0,5.00%,F,T)
375.8364 S:6 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,4564.0,5.00%,F,T)
304.9824 S:6 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time


File:A27JAN09A_12 #1-199 Acq: 1-FEB-2009 22:06:09 GC EI+ Voltage SIR Autospec-UltimaE
Sample#6 Text:G1040-2-4B Exp:EXP_DB5MS
339.8597 S:6 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,8696.0,5.00%,F,T)
341.8568 S:6 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7832.0,5.00%,F,T)
351.9000 S:6 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,3184.0,5.00%,F,T)
353.8970 S:6 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,26456.0,5.00%,F,T)
409.7974 S:6 F:2 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,6472.0,5.00%,F,T)
366.9792 S:6 F:2 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time


File:A27JAN09A_12 #1-257 Acq: 1-FEB-2009 22:06:09 GC EI+ Voltage SIR Autospec-UltimaE
Sample#6 Text:G1040-2-4B Exp:EXP_DB5MS
373.8207 S:6 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7012.0,5.00%,F,T)
35:47
35:20
35:13
35:37
36:16
36:46
37:31
37:50
1.6E5
8.2E4
0.0E0
375.8178 S:6 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6660.0,5.00%,F,T)
35:47
35:20
35:13
35:54
36:10
36:46
37:02
37:19
37:35
37:55
38:13
1.3E5
6.5E4
0.0E0
383.8639 S:6 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6716.0,5.00%,F,T)
36:15
36:45
37:33
8.3E6
4.2E6
0.0E0
385.8610 S:6 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5648.0,5.00%,F,T)
36:15
36:45
37:32
1.6E7
7.9E6
0.0E0
445.7555 S:6 F:3 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,6544.0,5.00%,F,T)
35:17
35:32
35:52
36:02
36:18
36:29
36:43
37:05
37:37
37:51
38:06
38:18
4.3E4
2.2E4
0.0E0
380.9760 S:6 F:3 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
35:16
35:34
36:07
36:30
36:41
36:58
37:24
37:41
38:00
5.2E6
2.6E6
0.0E0
100%
50
0
35:12 35:24 35:36 35:48 36:00 36:12 36:24 36:36 36:48 37:00 37:12 37:24 37:36 37:48 38:00 38:12 38:24 Time


File:A27JAN09A_12 #1-339 Acq: 1-FEB-2009 22:06:09 GC EI+ Voltage SIR Autospec-UltimaE
Sample#6 Text:G1040-2-4B
Exp:EXP_DB5MS
407.7818 S:6 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5720.0,5.00%,F,T)
39:36
39:03
6.1E5
3.1E5
0.0E0
409.7788 S:6 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6820.0,5.00%,F,T)
39:36
39:03
5.8E5
2.9E5
0.0E0
417.8253 S:6 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6300.0,5.00%,F,T)
39:02
41:00
3.6E6
1.8E6
0.0E0
419.8220 S:6 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,11308.0,5.00%,F,T)
39:02
41:00
8.0E6
4.0E6
0.0E0
479.7165 S:6 F:4 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,5952.0,5.00%,F,T)
38:38
38:54
39:09
39:26
39:52
40:20
40:41
41:04
41:25
41:45
42:05
42:27
42:46
1.5E4
7.7E3
0.0E0
430.9728 S:6 F:4 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
38:38
38:55
39:28
39:47
40:18
40:35
40:56
41:25
41:38
41:59
42:19
2.8E6
1.4E6
0.0E0
39:00
40:00
41:00
42:00
Time


File:A27JAN09A_12 #1-300 Acq: 1-FEB-2009 22:06:09 GC EI+ Voltage SIR Autospec-UltimaE
Sample#6 Text:G1040-2-4B
Exp:EXP_DB5MS
441.7427 S:6 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5776.0,5.00%,F,T)
44:58
443.7398 S:6 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5980.0,5.00%,F,T)
44:58
45:07
469.7780 S:6 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5368.0,5.00%,F,T)
44:38
471.7750 S:6 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5924.0,5.00%,F,T)
44:38
513.6775 S:6 F:5 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,6108.0,5.00%,F,T)
43:17
43:35
43:45
43:58
44:12
44:35
44:45
45:13
45:35
45:46
454.9728 S:6 F:5 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
43:08
43:22
43:41
43:51
44:18
44:29
44:41
45:10
45:24
45:40
45:57
Time


File:A27JAN09A_12 #1-387 Acq: 1-FEB-2009 22:06:09 GC EI+ Voltage SIR Autospec-UltimaE
Sample#6 Text:G1040-2-4B
Exp:EXP_DB5MS
341.8568 S:6 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6132.0,5.00%,F,T)
339.8597 S:6 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6468.0,5.00%,F,T)
375.8364 S:6 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,4564.0,5.00%,F,T)
304.9824 S:6 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time

GEOTECH

Hart Crowser, Inc.
1733014 PORT GAMBLE

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	
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
CR23MOD	100.0	100.0	100.0	99.8	99.2	97.8	90.6	51.6	28.1	15.4	11.1	9.4	7.7	6.3
	100.0	100.0	99.9	99.8	99.2	97.5	89.5	50.8	26.6	15.1	10.8	9.4	7.5	6.2
	100.0	100.0	100.0	99.8	99.2	97.7	90.0	51.5	27.4	14.8	10.8	9.1	7.5	6.1
PGSS-45	100.0	100.0	100.0	99.6	98.7	98.0	97.1	92.8	78.3	59.2	42.0	30.9	22.2	16.3
PGSS-47	100.0	100.0	99.6	98.6	93.9	69.8	33.8	21.0	17.3	13.5	10.6	8.7	6.6	4.7
PGSS-51	100.0	100.0	99.9	98.5	96.4	94.3	85.9	67.0	57.4	46.4	35.9	27.6	20.1	13.8
PGSS-53	100.0	98.5	99.6	98.5	96.5	93.3	80.8	59.2	50.5	41.6	31.8	24.2	17.2	11.8
PGSS-54	100.0	100.0	99.9	98.9	97.7	95.0	82.7	61.6	50.3	39.8	30.8	24.1	17.2	12.1
PGSS-56	100.0	100.0	100.0	99.9	96.8	70.5	23.7	12.8	11.2	9.2	7.7	6.5	4.9	3.5
PGSS-58	100.0	100.0	100.0	99.5	98.6	97.4	90.2	79.1	67.5	52.5	41.8	32.4	23.4	15.9
PGSS-62	100.0	100.0	99.9	99.7	94.8	61.2	15.8	6.3	5.4	4.6	3.9	3.3	2.5	1.8
PGSS-63	100.0	100.0	99.2	96.2	87.7	62.2	33.1	21.7	18.4	14.8	12.0	9.9	7.6	5.8
PGSS-64	100.0	100.0	100.0	99.9	98.3	78.0	29.6	23.4	20.6	17.1	13.8	11.3	8.7	6.2
PGSS-67	100.0	100.0	100.0	99.8	98.8	88.1	28.2	15.0	14.3	12.4	10.6	8.8	6.8	5.0
PGSS-73	100.0	100.0	100.0	99.8	95.1	46.2	8.5	5.8	5.5	4.9	4.3	3.6	2.7	1.9
PGSS-75	100.0	98.7	98.6	98.4	92.4	53.8	9.4	3.0	NA	NA	NA	NA	NA	NA

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.

OH02

Hart Crowser, Inc.
1733014 PORT GAMBLE

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
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)
CR23MOD	0.0	0.2	0.6	1.4	7.2	39.1	23.5	12.7	4.3	1.6	1.8	1.3	6.3	51.6
	0.1	0.2	0.6	1.7	8.0	38.7	24.2	11.5	4.3	1.5	1.8	1.4	6.2	50.8
	0.0	0.2	0.6	1.5	7.7	38.5	24.1	12.7	3.9	1.8	1.6	1.4	6.1	51.5
PGSS-45	0.0	0.4	0.9	0.7	0.8	4.4	14.5	19.1	17.2	11.1	8.7	5.9	16.3	92.8
PGSS-47	0.4	0.9	4.7	24.1	36.1	12.8	3.7	3.8	2.9	2.0	2.1	1.9	4.7	21.0
PGSS-51	0.1	1.4	2.1	2.1	8.4	19.0	9.6	11.0	10.5	8.3	7.5	6.2	13.8	67.0
PGSS-53	0.4	1.1	2.0	3.2	12.5	21.6	8.7	8.9	9.8	7.6	7.0	5.4	11.8	59.2
PGSS-54	0.1	1.0	1.1	2.8	12.3	21.1	11.3	10.5	9.0	6.7	6.9	5.1	12.1	61.6
PGSS-56	0.0	0.1	3.1	26.3	46.8	10.9	1.6	2.0	1.5	1.2	1.6	1.4	3.5	12.8
PGSS-58	0.0	0.5	0.8	1.2	7.2	11.1	11.6	15.0	10.7	9.4	9.0	7.5	15.9	79.1
PGSS-62	0.1	0.2	4.9	33.6	45.4	9.5	0.9	0.8	0.7	0.6	0.7	0.8	1.8	6.3
PGSS-63	0.8	3.0	8.5	25.6	29.1	11.4	3.3	3.6	2.8	2.2	2.2	1.9	5.8	21.7
PGSS-64	0.0	0.1	1.6	20.3	48.4	6.2	2.8	3.5	3.4	2.5	2.6	2.5	6.2	23.4
PGSS-67	0.0	0.1	1.1	10.7	59.8	13.3	0.6	1.9	1.8	1.7	2.1	1.8	5.0	15.0
PGSS-73	0.0	0.2	4.7	48.9	37.7	2.7	0.2	0.6	0.6	0.7	0.9	0.8	1.9	5.8
PGSS-75	1.4	0.3	6.0	38.6	44.4	6.3	NA	NA	NA	NA	NA	NA	NA	3.0

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.

OH02

QA SUMMARY

Client:	Hart Crowser, Inc.	Project No.:	1733014 PORT GAMBLE
ARI Trip. Sample ID:	OJ67-B	Batch No.:	OH02-1
Client Trip. Sample ID:	CR23MOD	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
CR23MOD	100.0	100.0	100.0	99.8	99.2	97.8	90.6	51.6	28.1	15.4	11.1	9.4	7.7	6.3
	100.0	100.0	99.9	99.8	99.2	97.5	89.5	50.8	26.6	15.1	10.8	9.4	7.5	6.2
	100.0	100.0	100.0	99.8	99.2	97.7	90.0	51.5	27.4	14.8	10.8	9.1	7.5	6.1
AVE	NA	100.00	99.97	99.79	99.20	97.70	90.07	51.30	27.39	15.09	10.91	9.28	7.56	6.21
STDEV	NA	0.00	0.05	0.03	0.02	0.16	0.55	0.39	0.73	0.31	0.13	0.20	0.08	0.13
%RSD	NA	0.00	0.05	0.03	0.02	0.16	0.61	0.76	2.68	2.07	1.18	2.15	1.09	2.10

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)
CR23MOD	1/9/2009	2/5/2009	2/10/2009	100.8		13.1
	1/9/2009	2/5/2009	2/10/2009	99.2		12.5
	1/9/2009	2/5/2009	2/10/2009	98.0		12.8
PGSS-45	12/8/2008	2/5/2009	2/9/2009	96.3		13.9
PGSS-47	12/8/2008	2/5/2009	2/9/2009	98.4		10.3
PGSS-51	12/8/2008	2/5/2009	2/9/2009	95.8		11.6
PGSS-53	12/8/2008	2/5/2009	2/9/2009	96.4		12.1
PGSS-54	12/8/2008	2/5/2009	2/9/2009	96.5		12.8
PGSS-56	12/8/2008	2/5/2009	2/9/2009	99.0		8.0
PGSS-58	12/8/2008	2/5/2009	2/9/2009	95.0		12.3
PGSS-62	12/8/2008	2/5/2009	2/9/2009	99.7		7.7
PGSS-63	12/9/2008	2/5/2009	2/9/2009	98.3		7.1
PGSS-64	12/9/2008	2/5/2009	2/9/2009	97.8		7.5
PGSS-67	12/9/2008	2/5/2009	2/9/2009	98.3		5.5
PGSS-73	12/9/2008	2/5/2009	2/9/2009	99.5		5.8
PGSS-75	12/9/2008	2/5/2009	2/9/2009	99.7		3.7

* ARI Internal QA limits = 95-105%

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.

TOTAL SOLIDS

Extractions Total Solids-extts
Data By: Woo suk Chang
Created: 1/ 9/09

Worklist: 9099
Analyst: NTC
Comments:

	ARI ID CLIENT ID	Tare Wt (g)	Wet Wt (g)	Dry Wt (g)	% Solids	pH
1.	OH02A 09-653 PGSS-45	1.16	12.32	5.52	39.1	NR
2.	OH02C 09-655 PGSS-47	1.18	12.44	8.97	69.2	NR
3.	OH02E 09-657 PGSS-51	1.18	12.40	6.20	44.7	NR
4.	OH02F 09-658 PGSS-53	1.18	12.78	6.33	44.4	NR
5.	OH02G 09-659 PGSS-54	1.18	12.14	6.87	51.9	NR
6.	OH02I 09-661 PGSS-56	1.18	12.20	9.55	76.0	NR
7.	OH02J 09-662 PGSS-58	1.16	11.46	5.04	37.7	NR
8.	OH02L 09-664 PGSS-62	1.16	13.12	10.85	81.0	NR
9.	OH02N 09-666 PGSS-63	1.18	12.48	9.16	70.6	NR
10.	OH02P 09-668 PGSS-64	1.16	13.06	9.38	69.1	NR
11.	OH02Q 09-669 PGSS-67	1.18	12.96	9.75	72.8	NR
12.	OH02V 09-674 PGSS-73	1.16	11.58	9.39	79.0	NR
13.	OH02W 09-675 PGSS-75	1.18	12.14	10.07	81.1	NR

Solids Data Entry Report Checked by: MH Date: 01/16/09
Date: 01/16/09 Data Analyst: KM

Solids Determination performed on 01/14/09 by MH

JOB	SAMPLE	CLIENTID	TAREWEIGHT	SAMPDISH	DRYWEIGHT	SOLIDS
OH02	A	PGSS-45	0.999	10.367	4.732	39.85
OH02	C	PGSS-47	0.965	10.208	7.349	69.07
OH02	E	PGSS-51	0.988	10.247	5.033	43.69
OH02	F	PGSS-53	1.008	10.411	5.344	46.11
OH02	G	PGSS-54	0.929	10.253	5.686	51.02
OH02	I	PGSS-56	1.004	10.247	7.880	74.39
OH02	J	PGSS-58	0.980	10.271	4.795	41.06
OH02	L	PGSS-62	0.985	10.354	8.567	80.93
OH02	N	PGSS-63	1.005	10.568	7.776	70.80
OH02	P	PGSS-64	0.992	10.500	7.588	69.37
OH02	Q	PGSS-67	0.946	10.104	7.491	71.47
OH02	V	PGSS-73	0.987	10.433	8.589	80.48
OH02	W	PGSS-75	0.980	10.103	8.351	80.80

Analytical Resources, Incorporated
Analytical Chemists and Consultants

January 26, 2009

Mr. Roger McGinnis
Hart Crowser, Inc.
1700 Westlake Avenue North Suite 200
Seattle, WA 98109-3056

RE: Project: Port Gamble, 17330-14
ARI Job No.: OH08 & OH45

Dear Mr. McGinnis:

Please find enclosed the original Chain-of-Custody (COC) records, sample receipt documentation, and the final data package for the samples from the project referenced above.

The samples were analyzed for various conventional parameters and Grain Size, as requested.

Sample receipt and details of these analyses are discussed in the Case Narrative.

An electronic copy of this data package and the supporting data 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.

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

Enclosures

cc: files OH08, OH45

KB/co

Chain of Custody
Documentation

prepared
for

HART CROWSER, INC.

Project: PORT GAMBLE, 174330-14

ARI JOB NO: OH08 & OH45

prepared
by

Analytical Resources, Inc.

Sample Custody Record

OD97

Samples Shipped to: ARI

HARTCROWSER

1910 Fairview Avenue East
Seattle, Washington 98102-3699
Phone: 206-324-9530 FAX: 206-328-5581

JOB 17333014 LAB NUMBER

PROJECT NAME PORT GAMBLE

HART CROWSER CONTACT ROGER MC GINNIS
ANNE CONRAD

SAMPLED BY: VP, CU

LAB NO.	SAMPLE ID	DESCRIPTION	DATE	TIME	MATRIX	TOTAL SULFIDE	TOC	TVS	AMMONIA	GRAIN SIZE	SMS SVOC	SMS METALS*	PCBs	MICROTOX	DIOXIN	RESIN ACIDS	GUAIACOL	RETENE	NO. OF CONTAINERS	OBSERVATIONS/COMMENTS/ COMPOSITING INSTRUCTIONS
	PGSS-45		12/8/08	1145	SED	X	X	X	X							X			6	*SMS METALS – As, Cd, Cr, Cu, Pb, Ag, Zn, Hg
	PGSS-46			1215	X														6	
	PGSS-47			1325	X														6	
	PGSS-47A			1400	X														6	HOLD
	PGSS-51			1425	X	X	X	X	X							X			6	
	PGSS-53			1508	X														6	
	PGSS-54			1534	X														6	
	PGSS-55			1600	X														6	
	PGSS-56			1626	X														6	
	PGSS-58		12/9/08	0727	X														6	
	PGSS-61			0757	X														6	
	PGSS-62			0821															6	

RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE: CH	12/11/08	SIGNATURE: Jami Hayes	12/11/08
PRINT NAME: Carl Ulberg	TIME	PRINT NAME: Jami Hayes	TIME
COMPANY: HC	1210	COMPANY: ARI	1210
RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE		SIGNATURE	
PRINT NAME	TIME	PRINT NAME	TIME
COMPANY		COMPANY	

SPECIAL SHIPMENT HANDLING OR STORAGE REQUIREMENTS:
FREEZE EXTRA SAMPLE VOLUME
FULL DATA PACKAGE

COOLER NO.: STORAGE LOCATION:

See Lab Work Order No. _____ for Other Contract Requirements

12 TOTAL NUMBER OF CONTAINERS

SAMPLE RECEIPT INFORMATION
CUSTODY SEALS: ☐ YES ☐ NO ☐ N/A
GOOD CONDITION: ☐ YES ☐ NO
TEMPERATURE: _____
SHIPMENT METHOD: ☐ HAND ☐ COURIER ☐ OVERNIGHT

TURNAROUND TIME:
☐ 24 HOURS ☐ 1 WEEK
☐ 48 HOURS ☐ STANDARD
☐ 72 HOURS OTHER _____

White and Yellow Copies to Lab Pink to Project Manager Lab to Return White Copy to Hart Crowser Gold to Sample Custodian

Sample Custody Record

0012

Samples Shipped to: ARI

HARTCROWSER
1910 Fairview Avenue East
Seattle, Washington 98102-3699
Phone: 206-324-9530 FAX: 206-328-5581

JOB 17330-14 LAB NUMBER

PROJECT NAME PORT GAMBLE

HART CROWSER CONTACT ROGER MCGINNIS
ANNE CONRAD

SAMPLED BY: VP, CV

LAB NO.	SAMPLE ID	DESCRIPTION	DATE	TIME	MATRIX	TOTAL SULFIDE	TOC	TVS	AMMONIA	GRAIN SIZE	SMS SVOCS	SMS METALS	PCBs	MICROTOX	DIOXIN	RESIN ACIDS	GUAIACOL	RETENE	NO. OF CONTAINERS	OBSERVATIONS/COMMENTS/ COMPOSITING INSTRUCTIONS
	PGSS-62A		12/9/08	1009	SED	X	X	X	X							X			6	*SMS METALS - As, Cd,
	PGSS-62B			0846															6	Cr, Cu, Pb, Ag, Zn, Hg
	PGSS-63			0913															6	
	PGSS-64			1035															6	
	PGSS-67			1101															6	
	PGSS-68			1212															6	
	PGSS-69			1236															6	
	PGSS-70			1301															6	
	PGSS-71			1332															6	
	PGSS-73			1428															6	
	PGSS-75			1458															6	
	PGSS-77			1530															6	

RELINQUISHED BY	DATE	RECEIVED BY	DATE
Carl Ulberg (SIGNATURE)	12/11/08	Jami Hayes (SIGNATURE)	12/11/08
Carl Ulberg (PRINT NAME)	TIME	Jami Hayes (PRINT NAME)	TIME
HC (COMPANY)	1210	ARI (COMPANY)	1210
RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE	TIME	SIGNATURE	TIME
PRINT NAME		PRINT NAME	
COMPANY		COMPANY	

SPECIAL SHIPMENT HANDLING OR STORAGE REQUIREMENTS:
FREEZE EXTRA SAMPLE VOLUME
FULL DATA PACKAGE

72 TOTAL NUMBER OF CONTAINERS

SAMPLE RECEIPT INFORMATION
CUSTODY SEALS: ☐ YES ☐ NO ☐ N/A
GOOD CONDITION: ☐ YES ☐ NO
TEMPERATURE
SHIPMENT METHOD: ☐ HAND ☐ COURIER ☐ OVERNIGHT

COOLER NO.: STORAGE LOCATION:

See Lab Work Order No. _____ for Other Contract Requirements

TURNAROUND TIME:
☐ 24 HOURS ☐ 1 WEEK
☐ 48 HOURS ☐ STANDARD
☐ 72 HOURS OTHER _____

White and Yellow Copies to Lab Pink to Project Manager Lab to Return White Copy to Hart Crowser Gold to Sample Custodian

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Hart Crowser Project Name: _____

COC No: _____ Delivered by: Hand

Assigned ARI Job No: OD92 Tracking No: _____

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

Record cooler temperature (recommended 2.0-6.0 °C for chemistry) 0.8, -2.0, 1.2, 1.2, 0.6, 1.6, 1.2 °C, 2.0, 1.2

Cooler Accepted by: JH Date: 12/11/08 Time: 1225

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? Ice

Was sufficient ice used (if appropriate)? (YES) NO

Were all bottles sealed in individual plastic bags? (YES) NO

Did all bottle arrive in good condition (unbroken)? (YES) NO

Were all bottle labels complete and legible? (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 checklist) YES (NO)

Were all VOC vials free of air bubbles? (NA) YES NO

Was sufficient amount of sample sent in each bottle? (YES) NO

Samples Logged by: JH Date: 12/12/08 Time: 14:17

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

Explain discrepancies or negative responses:

By: Date:

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:	Turn-around Requested: STD
ARI Client Company: Hart Crowser	Phone: 206-826-4514
Client Contact: Roger McGinnis	
Client Project Name: Port Gamble	
Client Project #: ~~173~~ 174330-14	Samplers: C. Emry

Page: 1	of 1		
Date: 1/12/09	Ice Present? Y		
No. of Coolers: 1	Cooler Temps: 4.6		

Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested: Conventionals								Notes/Comments
CR 20 W	1/9/09	1320	Sed	2	X								
CR 23 Mud	1/9/09	1420	Sed	3	X								
MSMP 43	1/9/09	1200	Sed	3	X								

Comments/Special Instructions	Relinquished by	Received by	Relinquished by	Received by
CR 20 W does not have a preserved sulfide container	(Signature) Roger McGinnis	(Signature) [signature]	(Signature)	(Signature)
	Printed Name: Roger McGinnis	Printed Name: A Volgardsen	Printed Name:	Printed Name:
	Company: Hart Crowser	Company: ARI	Company:	Company:
	Date & Time: 1/12/09 12:45	Date & Time: 1/12/09 1245	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.

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Hart Crawser
Project Name: Port Gamble
COC No:
Delivered by: Hand
Assigned ARI Job No: 0445
Tracking No:

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
Record cooler temperature (recommended 2.0-6.0 °C for chemistry	4.6 °C	

Cooler Accepted by: AV Date: 12/12/09 Time: 1245

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?	U	
Was sufficient ice used (if appropriate)?	(YES)	NO
Were all bottles sealed in individual plastic bags?	YES	(NO)
Did all bottle arrive in good condition (unbroken)?	(YES)	NO
Were all bottle labels complete and legible?	(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 checklist)	YES	(NO)
Were all VOC vials free of air bubbles? (NA)	YES	NO
Was sufficient amount of sample sent in each bottle?	(YES)	NO

Samples Logged by: MM Date: 1/12/09 Time: 1335

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

Explain discrepancies or negative responses:

4oz sample jar reading CR20W; sampling time: 1330; Sulfides found in cooler not indicated on COC

By: MM Date: 1-12-09

Case Narrative

prepared
for

HART CROWSER, INC.

Project: PORT GAMBLE, 174330-14

ARI JOB NO: OH08 & OH45

prepared
by

Analytical Resources, Inc.

Case Narrative
Hart Crowser
Port Gamble, 17330-14
ARI Job: OH08 & OH45
January 26, 2009

Sample Receipt

Analytical Resources Inc. (ARI) accepted twenty-four sediment samples in good condition on December 11, 2008 and three sediment samples on 1/12/09 under the ARI job numbers OH08 and OH45. The cooler temperatures measured by IR thermometer following ARI SOP ranged between --2.0 and 4.6°C and the samples were well iced. Please note that several sample containers were archived up receipt as requested on the COC. All samples were frozen to protect holding times. For further detail regarding sample receipt, please refer to the Cooer Receipt Form. Sample received on 12/11/08 were previously reported under ARI SDG OD92.

Conventional Parameters:

All samples were prepared and analyzed on within the method recommended holding times for frozen samples.

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

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

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

LCS(s): All LCS percent recoveries were within control limits.

SRM(s): All SRM percent recoveries were within control limits.

Replicate(s): The replicate RPD for sulfide was outside the control limit for sample **PGSS-71**. All other quality control parameters were met for sulfide for this sample.

MS(s): The matrix spike in is in control.

Grain Size: The grain size analysis and case narrative are included in this data package.

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Client: Hart Crowser, Inc.	Project No.: OH08
Client Project: 1733014 Port Gamble	

Case Narrative

1. Thirteen samples were submitted for grain size analysis according to PSEP methodology.
2. The samples were run in a single batch, and sample PGSS-45 was chosen for triplicate analysis. The triplicate data is reported on the QA summary.
3. Samples PGSS-53 and PGSS-73 contained woody or other organic matter, which may have broken down during the sieving process, affecting grain size analysis.
4. Samples PGSS-47, PGSS-51, and PGSS-56, contained shells and/or fragments of shells.
5. The data is provided in summary tables and plots.
6. There were no other noted anomalies in this project.

Approved by: _____ Date: Jan 22, 2009
Lead Technician

4611 South 134th Place, Suite 100 • Tukwila WA 98168 • **206-695-6200** • **206-695-6201** fax

Data Reporting Qualifiers

Effective 12/28/04

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 ≥ 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
NR	Spiked compound recovery is not reported due to chromatographic interference
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.
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
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.

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 ≥40% RPD with no obvious chromatographic interference

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

Data Summary Package

prepared
for

HART CROWSER, INC.

Project: PORT GAMBLE, 174330-14

ARI JOB NO: OH08 & OH45

prepared
by

Analytical Resources, Inc.

GENERAL CHEMISTRY

SAMPLE RESULTS-CONVENTIONALS
OH45-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 01/22/09

Project: PORT GAMBLE
Event: 174330-14
Date Sampled: 01/09/09
Date Received: 01/12/09

Client ID: CR20W
ARI ID: 09-1188 OH45A

Analyte	Date	Method	Units	RL	Sample
Total Solids	01/12/09 011209#1	EPA 160.3	Percent	0.01	63.20
Preserved Total Solids	01/12/09 011209#1	EPA 160.3	Percent	0.01	65.10
Total Volatile Solids	01/12/09 011209#1	EPA 160.4	Percent	0.01	2.52
N-Ammonia	01/14/09 011409#1	EPA 350.1M	mg-N/kg	0.15	6.83
Sulfide	01/15/09 011509#1	EPA 376.2	mg/kg	2.89	32.5
Total Organic Carbon	01/13/09 011309#1	Plumb,1981	Percent	0.020	0.679

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
OH45-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 01/22/09

Project: PORT GAMBLE
Event: 174330-14
Date Sampled: 01/09/09
Date Received: 01/12/09

Client ID: CR23MOD
ARI ID: 09-1189 OH45B

Analyte	Date	Method	Units	RL	Sample
Total Solids	01/12/09 011209#1	EPA 160.3	Percent	0.01	66.20
Preserved Total Solids	01/12/09 011209#1	EPA 160.3	Percent	0.01	59.00
Total Volatile Solids	01/12/09 011209#1	EPA 160.4	Percent	0.01	2.12
N-Ammonia	01/14/09 011409#2	EPA 350.1M	mg-N/kg	0.15	4.90
Sulfide	01/15/09 011509#1	EPA 376.2	mg/kg	8.42	111
Total Organic Carbon	01/13/09 011309#1	Plumb,1981	Percent	0.020	0.628

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N. KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
OH45-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 01/22/09

Project: PORT GAMBLE
Event: 174330-14
Date Sampled: 01/09/09
Date Received: 01/12/09

Client ID: MSMP43
ARI ID: 09-1190 OH45C

Analyte	Date	Method	Units	RL	Sample
Total Solids	01/12/09 011209#1	EPA 160.3	Percent	0.01	74.10
Preserved Total Solids	01/12/09 011209#1	EPA 160.3	Percent	0.01	72.90
Total Volatile Solids	01/12/09 011209#1	EPA 160.4	Percent	0.01	0.92
N-Ammonia	01/14/09 011409#2	EPA 350.1M	mg-N/kg	0.13	3.02
Sulfide	01/15/09 011509#1	EPA 376.2	mg/kg	1.35	< 1.35 U
Total Organic Carbon	01/13/09 011309#1	Plumb,1981	Percent	0.020	0.534

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

MS/MSD RESULTS-CONVENTIONALS
OH45-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 01/22/09

Project: PORT GAMBLE
Event: 174330-14
Date Sampled: 01/09/09
Date Received: 01/12/09

Analyte	Date	Units	Sample	Spike	Spike Added	Recovery
ARI ID: OH45A Client ID: CR20W						
N-Ammonia	01/14/09	mg-N/kg	6.83	137	151	86.4%
Sulfide	01/15/09	mg/kg	32.5	363	342	96.6%
Total Organic Carbon	01/13/09	Percent	0.679	1.26	0.601	96.7%

REPLICATE RESULTS-CONVENTIONALS
OH45-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 01/22/09

Project: PORT GAMBLE
Event: 174330-14
Date Sampled: 01/09/09
Date Received: 01/12/09

Analyte	Date	Units	Sample	Replicate(s)	RPD/RSD
ARI ID: OH45A Client ID: CR20W					
Total Solids	01/12/09	Percent	63.20	63.10 62.60	0.5%
Preserved Total Solids	01/12/09	Percent	65.10	65.20 65.20	0.1%
Total Volatile Solids	01/12/09	Percent	2.52	2.45 2.56	2.2%
N-Ammonia	01/14/09	mg-N/kg	6.83	6.69 7.07	2.8%
Sulfide	01/15/09	mg/kg	32.5	32.6	0.3%
Total Organic Carbon	01/13/09	Percent	0.679	0.675 0.666	1.0%

LAB CONTROL RESULTS-CONVENTIONALS
OH45-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 01/22/09

Project: PORT GAMBLE
Event: 174330-14
Date Sampled: NA
Date Received: NA

Analyte	Date	Units	LCS	Spike Added	Recovery
Sulfide	01/15/09	mg/kg	98.2	116	84.5%
Total Organic Carbon	01/13/09	Percent	0.535	0.500	107.0%

METHOD BLANK RESULTS-CONVENTIONALS
OH45-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 01/22/09

Project: PORT GAMBLE
Event: 174330-14
Date Sampled: NA
Date Received: NA

Analyte	Date	Units	Blank
Total Solids	01/12/09	Percent	< 0.01 U
Preserved Total Solids	01/12/09	Percent	< 0.01 U
Total Volatile Solids	01/12/09	Percent	< 0.01 U
N-Ammonia	01/14/09 01/14/09	mg-N/kg	< 0.10 U < 0.10 U
Sulfide	01/15/09	mg/kg	< 1.00 U
Total Organic Carbon	01/13/09	Percent	< 0.020 U

STANDARD REFERENCE RESULTS-CONVENTIONALS
OH45-Hart Crowser, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 01/22/09

Project: PORT GAMBLE
Event: 174330-14
Date Sampled: NA
Date Received: NA

Analyte/SRM ID	Date	Units	SRM	True Value	Recovery
N-Ammonia	01/14/09	mg-N/kg	88.9	100	88.9%
SPEX 28-24AS	01/14/09		96.6	100	96.6%
Total Organic Carbon NIST #8704	01/13/09	Percent	3.95	3.35	117.9%

GEOTECH

Hart Crowser, Inc.
1733014 Port Gamble

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	
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
PGSS-45	100.0	100.0	99.6	96.7	94.4	92.9	91.2	85.8	74.0	52.4	37.6	27.0	19.8	13.7
PGSS-45	100.0	100.0	99.6	97.1	95.7	93.6	91.6	86.3	73.8	54.1	38.0	27.2	20.1	13.6
PGSS-45	100.0	99.7	99.5	97.0	94.9	92.6	90.7	85.4	72.8	53.6	38.3	27.6	20.2	13.9
PGSS-47	100.0	100.0	99.8	98.7	94.1	70.4	35.2	22.0	16.8	13.2	10.3	8.3	6.6	4.5
PGSS-51	100.0	100.0	99.7	98.4	96.5	93.2	84.2	65.3	55.3	46.7	34.3	26.5	19.5	12.7
PGSS-53	100.0	100.0	99.8	98.9	97.2	93.8	81.0	58.9	48.8	39.7	30.9	23.9	17.7	12.2
PGSS-54	100.0	100.0	99.8	98.8	97.8	94.5	82.0	60.8	48.2	37.9	29.2	23.1	16.9	11.7
PGSS-56	100.0	100.0	100.0	99.9	96.6	70.5	23.3	12.6	10.4	8.5	7.1	5.8	4.6	3.1
PGSS-58	100.0	100.0	99.4	96.0	92.1	89.1	81.9	70.5	60.6	47.8	36.8	28.1	20.5	13.6
PGSS-62	100.0	100.0	100.0	99.8	94.9	61.3	16.3	6.7	4.9	4.4	3.8	3.2	2.5	1.7
PGSS-63	100.0	100.0	99.0	96.1	87.5	62.2	33.6	21.8	16.3	13.5	11.0	8.9	7.0	5.1
PGSS-64	100.0	100.0	100.0	99.7	97.7	77.1	29.7	23.2	19.0	16.0	12.7	10.0	7.9	5.5
PGSS-67	100.0	100.0	100.0	99.8	98.8	88.6	27.2	15.3	13.2	11.7	9.7	7.7	6.0	3.9
PGSS-73	100.0	99.8	99.8	99.7	95.0	45.9	8.7	6.1	5.3	4.9	4.3	3.6	2.7	1.8
PGSS-75	100.0	100.0	100.0	99.7	93.6	54.4	10.1	3.9	2.7	2.4	2.2	1.9	1.5	1.2

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.

OH08

Hart Crowser, Inc.
1733014 Port Gamble

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
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)
PGSS-45	0.4	2.9	2.3	1.5	1.7	5.4	11.7	21.7	14.8	10.6	7.2	6.1	13.7	85.8
PGSS-45	0.4	2.4	1.4	2.2	2.0	5.3	12.5	19.8	16.1	10.8	7.1	6.5	13.6	86.3
PGSS-45	0.5	2.5	2.1	2.3	1.9	5.3	12.7	19.1	15.3	10.7	7.4	6.3	13.9	85.4
PGSS-47	0.2	1.1	4.6	23.7	35.1	13.2	5.3	3.5	3.0	1.9	1.7	2.1	4.5	22.0
PGSS-51	0.3	1.3	1.8	3.3	9.0	18.9	10.0	8.6	12.4	7.8	7.0	6.7	12.7	65.3
PGSS-53	0.2	0.9	1.7	3.4	12.7	22.1	10.1	9.2	8.7	7.0	6.2	5.5	12.2	58.9
PGSS-54	0.2	0.9	1.1	3.3	12.5	21.3	12.5	10.4	8.6	6.2	6.2	5.2	11.7	60.8
PGSS-56	0.0	0.1	3.2	26.1	47.2	10.7	2.3	1.8	1.4	1.4	1.2	1.5	3.1	12.6
PGSS-58	0.6	3.4	3.9	3.1	7.2	11.4	9.9	12.8	11.0	8.7	7.6	6.9	13.6	70.5
PGSS-62	0.0	0.2	4.8	33.6	45.0	9.6	1.8	0.6	0.6	0.6	0.7	0.7	1.7	6.7
PGSS-63	1.0	2.9	8.5	25.3	28.6	11.8	5.5	2.8	2.5	2.1	2.0	1.9	5.1	21.8
PGSS-64	0.0	0.3	2.0	20.6	47.4	6.5	4.2	3.0	3.3	2.7	2.1	2.4	5.5	23.2
PGSS-67	0.0	0.1	1.0	10.3	61.3	11.9	2.1	1.5	2.0	2.0	1.7	2.1	3.9	15.3
PGSS-73	0.2	0.1	4.7	49.1	37.1	2.6	0.8	0.5	0.6	0.7	0.8	0.9	1.8	6.1
PGSS-75	0.0	0.3	6.1	39.2	44.3	6.2	1.3	0.2	0.3	0.3	0.3	0.3	1.2	3.9

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.

OH08

QA SUMMARY

Client:	Hart Crowser, Inc.	Project No.:	1733014 Port Gamble
ARI Trip. Sample ID:	OH08A	Batch No.:	OH08-1
Client Trip. Sample ID:	PGSS-45	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
PGSS-45	100.0	100.0	99.6	96.7	94.4	92.9	91.2	85.8	74.0	52.4	37.6	27.0	19.8	13.7
PGSS-45	100.0	100.0	99.6	97.1	95.7	93.6	91.6	86.3	73.8	54.1	38.0	27.2	20.1	13.6
PGSS-45	100.0	99.7	99.5	97.0	94.9	92.6	90.7	85.4	72.8	53.6	38.3	27.6	20.2	13.9
AVE	NA	99.89	99.54	96.94	95.01	93.02	91.15	85.84	73.54	53.36	37.94	27.27	20.03	13.72
STDEV	NA	0.20	0.06	0.22	0.65	0.48	0.45	0.45	0.69	0.89	0.38	0.33	0.22	0.18
%RSD	NA	0.20	0.06	0.22	0.68	0.52	0.49	0.52	0.94	1.67	0.99	1.22	1.09	1.31

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)
PGSS-45	12/11/2008	1/12/2009	1/21/2009	99.2		12.2
PGSS-45	12/11/2008	1/12/2009	1/21/2009	99.2		12.5
PGSS-45	12/11/2008	1/12/2009	1/21/2009	100.1		12.4
PGSS-47	12/11/2008	1/12/2009	1/21/2009	99.6		6.7
PGSS-51	12/11/2008	1/12/2009	1/21/2009	99.3		11.5
PGSS-53	12/11/2008	1/12/2009	1/21/2009	99.8		10.6
PGSS-54	12/11/2008	1/12/2009	1/21/2009	98.8		10.8
PGSS-56	12/11/2008	1/12/2009	1/21/2009	100.0		11.3
PGSS-58	12/11/2008	1/12/2009	1/21/2009	101.6		9.2
PGSS-62	12/11/2008	1/12/2009	1/21/2009	100.4		5.6
PGSS-63	12/11/2008	1/12/2009	1/21/2009	100.1		6.6
PGSS-64	12/11/2008	1/12/2009	1/21/2009	99.7		6.4
PGSS-67	12/11/2008	1/12/2009	1/21/2009	99.8		12.9
PGSS-73	12/11/2008	1/12/2009	1/21/2009	100.0		7.1
PGSS-75	12/11/2008	1/12/2009	1/21/2009	100.8		4.6

* ARI Internal QA limits = 95-105%

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.

Analytical Resources, Incorporated
Analytical Chemists and Consultants

February 26, 2009

Mr. Roger McGinnis
Hart Crowser, Inc.
1700 Westlake Avenue North Suite 200
Seattle, WA 98109-3056

RE: Project: Port Gamble, 17330-14
ARI Job No.: OH13

Dear Mr. McGinnis:

Please find enclosed the original Chain-of-Custody (COC) records, sample receipt documentation, and the final data package for the samples from the project referenced above.

The samples were analyzed for Grain Size, select Conventionals, PCBs, SVOCs, Total Metals and Dioxin and Furans, as requested.

Sample receipt and details of these analyses are discussed in the Case Narrative.

An electronic copy of this data package and the supporting data 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.

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

Enclosures

cc: files OH13

KB/co

Chain of Custody Documentation

prepared for

HART CROWSER, INC.

Project: Port Gamble, 17330-14

ARI JOB NO: OH13

prepared by

Analytical Resources, Inc.

Sample Custody Record

1 of 2

Samples Shipped to: ARI

HARTCROWSER

Hart Crowser, Inc.
1910 Fairview Avenue East
Seattle, Washington 98102-3699
Phone: 206-324-9530 FAX: 206-328-5581

JOB 17330-14 LAB NUMBER

PROJECT NAME PORT GAMBLE

HART CROWSER CONTACT Roger McGinnis

SAMPLED BY: CFR, CWU

LAB NO.	SAMPLE ID	DESCRIPTION	DATE	TIME	MATRIX	SMS Metals*	SVOCs**	PCBs	Ammonia	Total Volatile Solids	TOC	Total Sulfides	Dioxins/Furans	Grain Size	Microtox	Bioassay	NO. OF CONTAINERS	OBSERVATIONS/COMMENTS/ COMPOSITING INSTRUCTIONS
PGSS-8		SEDIMENT	12/4/08	955	SEDIMENT				X	X	X	X						LOW VOLUME
PGSS-14A			12/4/08	1040														LOW VOLUME
PGSS-15				1112														LOW VOLUME
PGSS-16				1145														LOW VOLUME
PGSS-18				1255														LOW VOLUME
PGSS-20				1320														LOW VOLUME
PGSS-22				1348														LOW VOLUME
PGSS-21B				1415														
PGSS-21A				1520														
PGSS-29				1550														
PGSS-29A				1620														
PGSS-30			12/5/08	807														

RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE	12/8/08	SIGNATURE	12/8/08
PRINT NAME Eileen Rust	TIME	PRINT NAME A. Volgardsen	TIME
COMPANY HC	1400	COMPANY ARI	1400
RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE		SIGNATURE	
PRINT NAME	TIME	PRINT NAME	TIME
COMPANY		COMPANY	

SPECIAL SHIPMENT HANDLING OR STORAGE REQUIREMENTS:

LOW VOLUME, LAB NEEDS TO MODIFY SAMPLE VOLUMES FOR PGSS-8, 14A, 15, 16, 18, 20, 22.

* ARSENIC, CADMIUM, CHROMIUM, COPPER, LEAD, MERCURY, NICKEL, SILVER, ZINC.

TOTAL NUMBER OF CONTAINERS

SAMPLE RECEIPT INFORMATION
CUSTODY SEALS: ☐ YES ☐ NO ☐ N/A
GOOD CONDITION: ☐ YES ☐ NO
TEMPERATURE
SHIPMENT METHOD: ☐ HAND ☐ COURIER ☐ OVERNIGHT

COOLER NO.: STORAGE LOCATION: 4275 4295

See Lab Work Order No. _____ for Other Contract Requirements

TURNAROUND TIME:
☐ 24 HOURS ☐ 1 WEEK
☐ 48 HOURS ☒ STANDARD
☐ 72 HOURS OTHER _____

White and Yellow Copies to Lab Pink to Project Manager Lab to Return White Copy to Hart Crowser Gold to Sample Custodian

Sample Custody Record

2 of 2

Samples Shipped to: ARI

HARTCROWSER
Hart Crowser, Inc.
1910 Fairview Avenue East
Seattle, Washington 98102-3699
Phone: 206-324-9530 FAX: 206-328-5581

JOB 17330-14 LAB NUMBER

PROJECT NAME PORT GAMBLE

HART CROWSER CONTACT ROGER McGINNIS

SAMPLED BY: CFR/CWJ

LAB NO.	SAMPLE ID	DESCRIPTION	DATE	TIME	MATRIX	SMS Metals #	SVOCs **	PCBs	Ammonia	TVS	TOC	Total Sulfides	Dioxin/Furans	Grain Size	Microtox	Bioassay	NO. OF CONTAINERS	OBSERVATIONS/COMMENTS/ COMPOSITING INSTRUCTIONS
PGSS-	31	SEDIMENT	12/5/08	850	SEDIMENT				X	X	X	X						
PGSS-	33			920					↓	↓	↓	↓						
PGSS-	35			1020														
PGSS-	38			1045														
PGSS-	38A			1120														
PGSS-	39			1245														
PGSS-	40			1310														
PGSS-	42			1345														
PGSS-	44			1410					↓	↓	↓	↓						

RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE	12/8/08	SIGNATURE	12/8/08
PRINT NAME Eileen Rust	TIME	PRINT NAME A. Volgardsen	TIME
COMPANY HC	1400	COMPANY ARI	1400
RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE	TIME	SIGNATURE	TIME
PRINT NAME		PRINT NAME	
COMPANY		COMPANY	

SPECIAL SHIPMENT HANDLING OR STORAGE REQUIREMENTS:

** SVOCs will include SMS SVOCs, Glycol, Retene, + Resin Acids.

TOTAL NUMBER OF CONTAINERS

SAMPLE RECEIPT INFORMATION:
CUSTODY SEALS ☐ YES ☐ NO ☐ N/A
GOOD CONDITION ☐ YES ☐ NO
TEMPERATURE
SHIPMENT METHOD ☐ HAND ☐ COURIER ☐ OVERNIGHT

COOLER NO.: STORAGE LOCATION:

See Lab Work Order No. _____ for Other Contract Requirements

TURNAROUND TIME:
☐ 24 HOURS ☐ 1 WEEK
☐ 48 HOURS ☒ STANDARD
☐ 72 HOURS OTHER _____

White and Yellow Copies to Lab Pink to Project Manager Lab to Return White Copy to Hart Crowser Gold to Sample Custodian

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: HC Project Name: Port Gamble

COC No: NA Delivered by: Hand

Assigned ARI Job No: ODI5 Tracking No: NA

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

Record cooler temperature (recommended 2.0-6.0 °C for chemistry 0.2, 1.2, 2.0, 2.6 / 5.2, 5.4, 1.2, 2.4, 1.0 7.6, 1.6, °C

Cooler Accepted by: JH Date: 12/8/08 Time: 14:00

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?		Ice	
Was sufficient ice used (if appropriate)?		(YES)	NO
Were all bottles sealed in individual plastic bags?		(YES)	(NO)
Did all bottle arrive in good condition (unbroken)?		(YES)	NO
Were all bottle labels complete and legible?		(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 checklist)		YES	(NO)
Were all VOC vials free of air bubbles?	(NA)	YES	NO
Was sufficient amount of sample sent in each bottle?		(YES)	NO

Samples Logged by: JM Date: 12/8/08 Time: 1600

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

Explain discrepancies or negative responses:

By: Date:

Case Narrative

prepared
for

HART CROWSER, INC.

Project: Port Gamble, 17330-14

ARI JOB NO: OH13

prepared
by

Analytical Resources, Inc.

Case Narrative
Hart Crowser
Port Gamble, 17330-14
ARI Job: OH13
February 26, 2009

Sample Receipt

Analytical Resources Inc. (ARI) accepted twenty one sediment samples in good condition on December 8, 2008 under the ARI job number OH13. The cooler temperatures measured by IR thermometer following ARI SOP ranged between 0.2 and 7.6°C and the samples were well iced. Please note that several sample containers were archived up receipt as requested on the COC. All samples were frozen to protect holding times. For further detail regarding sample receipt, please refer to the Cooer Receipt Form. The original analyses are reported under ARI SDG OD15. The Microtox data is reported in its own data package.

SVOCs by Method 8270D:

The samples were extracted and analyzed within the method recommended holding times.

Initial calibration(s): All compounds of interest were within method acceptance criteria.

Continuing calibration(s): Are in control.

Samples: There were no anomalies associated with these samples.

Surrogates: Are in control.

LCS/LCSD(s): Are in control.

Method Blank: The method blanks were free of contamination.

PCBs by Method 8082:

The samples were extracted and analyzed within the method recommended holding times.

Initial calibration(s): All compounds of interest were within method acceptance criteria.

Continuing calibration(s): Are in control.

Samples: There were no anomalies associated with these samples.

Surrogates: Are in control.

LCS/LCSD(s): Are in control.

Method Blank: The method blanks were free of contamination.

Case Narrative
Hart Crowser
Port Gamble, 17330-14
ARI Job: OH13
February 26, 2009

Total Metals 6010 and 7000 Series:

The samples were digested and analyzed within the method recommended holding times.

Initial calibration(s): All compounds of interest were within method acceptance criteria.

Continuing calibration(s): Are in control.

Samples: There were no anomalies associated with these samples.

LCS: Is in control.

Method Blank: The method blanks were free of contamination.

Grain Size: The grain size analysis and case narrative are included in this data package.

Dioxin/ Furans: Are included in this data package.

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Client: Hart Crowser, Inc.	**ARI Project No.:** OH13
Client Project: Port Gamble	**Client Project No.:** 17330-14

Case Narrative

1. Seventeen samples were submitted for grain size analysis according to Puget Sound Estuary Protocol (PSEP) methodology on January 9, 2009.
2. The samples were run in a single batch and one sample from another job 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.

Approved by: _____ Date: 2/23/09
Title: Geotechnical Division Manager

Data Reporting Qualifiers

Effective 12/28/04

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 ≥ 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
NR	Spiked compound recovery is not reported due to chromatographic interference
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.
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
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.

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 ≥40% RPD with no obvious chromatographic interference

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

LCS SOLUTIONS

12/30/08

LABE	SOLN ID	TEST	CONC. UG/ML	SOLVENT	EXP.
1	1549-3	PCB	20	ACETONE	10/10/09
2	1472-3	BCOC PEST	10	ACETONE	07/20/08
3	1517-1	PEST	02/04/20	ACETONE	05/15/09
4	1561-2	LOW PEST	0.2/0.4/2	ACETONE	05/15/09
5	1537-1	EPH	1500	MECL2	08/16/09
6	1559-2	PCP	12.5/125	ACETONE	11/05/09
7	1573-1	ABN	100	ACETONE	08/01/09
8	1566-1	TBT	2.5	MECL2	12/04/09
9	1567-3	PORE TBT	.125/.25	MECL2	12/04/09
10	1554-3	ABN ACID	100/200	MEOH	10/21/09
11	1563-3	TPHD	15000	ACETONE	11/20/09
12	1563-1	ABN BASE	200	ACETONE	06/30/09
13	1573-2	LOW PCB	2	ACETONE	10/10/09
14	1547-1	LOW ABN ACID	10/20	MEOH	04/10/09
15*	1452-1	SIM PNA	15/75	MEOH	04/09/09
16	1502-2	DIOXANE	100	MEOH	02/20/09
17	1516-2	1248 PCB	20	ACETONE	05/07/09
18	1514-4	LOW SIM PNA	1.5/7.5	ACETONE	04/24/09
19	1517-3	AK103	7500	MECL2	12/29/08
20	1572-2	PNA	100	ACETONE	12/26/09
21*	1414-4	SKY/BHT	100	MEOH	04/08/09
22	1570-1	HERB	12.5/12500	MEOH	02/19/09
23	1505-1	LOW ABN BASE	20	MEOH	03/20/09
24	1541-4	LOW ABN	10	ACETONE	08/01/09
25	1481-1	DIPHENYL	100	MEOH	07/20/08
26	1545-2	OP-PEST	25	MEOH	02/14/09
27	1495-1	STEROLS	200	MEOH	12/29/08
28	1494-1	ADD. PEST	4	ACETONE	01/23/09
29	1496-3	DECANES	100	MEOH	02/12/09
30	1497-2	EDB/DBCP	2	ACETONE	02/12/09
31	1510-3	TERPINEOL	100	MEOH	03/21/09

LCS SOLUTIONS

12/30/08

32	1545-3	GUAIACOL	50-200	ACETONE	06/05/09
33	1522-1	RESIN ACID	250	ACETONE	06/11/09
34	1530-2	CONGENERS	1	ACETONE	07/23/09
50	1571-1	FULL RESIN	250	ACETONE	06/10/09
*=REVERIFIED SOLUTION					

SURR SOLUTIONS

12/30/08

LABEL	SOLN ID	TEST	CONC. UG/ML	SOLVENT	EXP.
A	1559-5	ABN	100/150	MEOH	03/13/09
B	1572-1	SIM PNA	15/75	MEOH	08/28/09
C	1559-1	SIM ABN	25/37.5	MEOH	03/13/09
D	1561-3	LOW PCB	0.2	ACETONE	07/31/09
E*	1478-1	HERB	62.5	MEOH	09/21/09
F	1520-3	PCP	12.5	ACETONE	04/18/09
G	1534-1	1,4DIOXANE	100	MEOH	02/20/09
H	1545-1	OP-PEST	25	MEOH	02/14/09
I	1559-4	LOW S. PNA	1.5	MEOH	08/28/09
J	1566-5	TBT-PORE	0.125	MECL2	12/04/09
K	1538-1	MED PCB	20	ACETONE	07/31/09
L	1566-4	TBT	2.5	MECL2	12/04/09
M	1558-2	EPH	1500	MECL2	09/24/09
N	1538-2	PCB	2	ACETONE	07/31/09
O	1567-4	TPH	450	MECL2	09/24/09
P	1560-3	HCID	2250	MECL2	09/24/09
Q	1497-3	EDB	2	ACETONE	02/12/09
R	1521-4	RESIN ACID	250	ACETONE	06/11/09
S	1568-5	PBDE	.25	MEOH	12/11/09
T	*reverified	solution			
U					
V					
W					
X					
Y					
Z					

Data Summary Package

prepared
for

HART CROWSER, INC.

Project: Port Gamble, 17330-14

ARI JOB NO: OH13

prepared
by

Analytical Resources, Inc.

SEMIVOLATILES

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270 GC/MS **Sample ID: PGSS-8**
Page 1 of 2 **SAMPLE**

Lab Sample ID: OH13A
LIMS ID: 09-729
Matrix: Sediment
Data Release Authorized:
Reported: 01/29/09

QC Report No: OH13-Hart Crowser, Inc.
Project: Port Gamble
17330-14
Date Sampled: 12/04/08
Date Received: 12/08/08

Date Extracted: 01/15/09
Date Analyzed: 01/28/09 19:13
Instrument/Analyst: NT4/LJR
GPC Cleanup: Yes

Sample Amount: 25.1 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 66.6%

CAS Number	Analyte	RL	Result
108-95-2	**Phenol**	**20**	**720**
541-73-1	1,3-Dichlorobenzene	20	< 20 U
106-46-7	1,4-Dichlorobenzene	20	< 20 U
100-51-6	Benzyl Alcohol	20	< 20 U
95-50-1	1,2-Dichlorobenzene	20	< 20 U
95-48-7	2-Methylphenol	20	< 20 U
106-44-5	**4-Methylphenol**	**20**	**47**
105-67-9	2,4-Dimethylphenol	20	< 20 U
65-85-0	Benzoic Acid	200	< 200 U
120-82-1	1,2,4-Trichlorobenzene	20	< 20 U
91-20-3	**Naphthalene**	**20**	**15 J**
87-68-3	Hexachlorobutadiene	20	< 20 U
91-57-6	2-Methylnaphthalene	20	< 20 U
131-11-3	Dimethylphthalate	20	< 20 U
208-96-8	Acenaphthylene	20	< 20 U
83-32-9	Acenaphthene	20	< 20 U
132-64-9	Dibenzofuran	20	< 20 U
84-66-2	Diethylphthalate	20	< 20 U
86-73-7	Fluorene	20	< 20 U
86-30-6	N-Nitrosodiphenylamine	20	< 20 U
118-74-1	Hexachlorobenzene	20	< 20 U
87-86-5	Pentachlorophenol	100	< 100 U
85-01-8	**Phenanthrene**	**20**	**23**
120-12-7	**Anthracene**	**20**	**12 J**
84-74-2	Di-n-Butylphthalate	20	< 20 U
206-44-0	**Fluoranthene**	**20**	**45**
129-00-0	**Pyrene**	**20**	**40**
85-68-7	Butylbenzylphthalate	20	< 20 U
56-55-3	**Benzo(a)anthracene**	**20**	**23**
117-81-7	bis(2-Ethylhexyl)phthalate	20	< 20 U
218-01-9	**Chrysene**	**20**	**41**
117-84-0	Di-n-Octyl phthalate	20	< 20 U
205-99-2	**Benzo(b)fluoranthene**	**20**	**32**
207-08-9	**Benzo(k)fluoranthene**	**20**	**17 J**
50-32-8	**Benzo(a)pyrene**	**20**	**20**
193-39-5	**Indeno(1,2,3-cd)pyrene**	**20**	**11 J**
53-70-3	Dibenz(a,h)anthracene	20	< 20 U
191-24-2	**Benzo(g,h,i)perylene**	**20**	**14 J**
90-05-1	Guaiacol	20	< 20 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270 GC/MS **Sample ID: PGSS-8**
 SAMPLE

Lab Sample ID: OH13A QC Report No: OH13-Hart Crowser, Inc.
LIMS ID: 09-729 Project: Port Gamble
Matrix: Sediment 17330-14
Date Analyzed: 01/28/09 19:13

CAS Number	Analyte	RL	Result
483-65-8	Retene	20	< 20 U
90-12-0	1-Methylnaphthalene	20	< 20 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	54.4%	2-Fluorobiphenyl	61.2%
d14-p-Terphenyl	61.6%	d4-1,2-Dichlorobenzene	37.4%
d5-Phenol	56.8%	2-Fluorophenol	49.3%
2,4,6-Tribromophenol	66.1%	d4-2-Chlorophenol	50.9%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270 GC/MS **Sample ID: PGSS-22**
Page 1 of 2 **SAMPLE**

Lab Sample ID: OH13G
LIMS ID: 09-735
Matrix: Sediment
Data Release Authorized:
Reported: 01/29/09

QC Report No: OH13-Hart Crowser, Inc.
Project: Port Gamble
17330-14
Date Sampled: 12/04/08
Date Received: 12/08/08

Date Extracted: 01/15/09
Date Analyzed: 01/28/09 19:48
Instrument/Analyst: NT4/LJR
GPC Cleanup: Yes

Sample Amount: 25.4 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 68.4%

CAS Number	Analyte	RL	Result
108-95-2	**Phenol**	**20**	**610**
541-73-1	1,3-Dichlorobenzene	20	< 20 U
106-46-7	1,4-Dichlorobenzene	20	< 20 U
100-51-6	Benzyl Alcohol	20	< 20 U
95-50-1	1,2-Dichlorobenzene	20	< 20 U
95-48-7	2-Methylphenol	20	< 20 U
106-44-5	4-Methylphenol	20	< 20 U
105-67-9	2,4-Dimethylphenol	20	< 20 U
65-85-0	Benzoic Acid	200	< 200 U
120-82-1	1,2,4-Trichlorobenzene	20	< 20 U
91-20-3	Naphthalene	20	< 20 U
87-68-3	Hexachlorobutadiene	20	< 20 U
91-57-6	2-Methylnaphthalene	20	< 20 U
131-11-3	Dimethylphthalate	20	< 20 U
208-96-8	Acenaphthylene	20	< 20 U
83-32-9	Acenaphthene	20	< 20 U
132-64-9	Dibenzofuran	20	< 20 U
84-66-2	Diethylphthalate	20	< 20 U
86-73-7	Fluorene	20	< 20 U
86-30-6	N-Nitrosodiphenylamine	20	< 20 U
118-74-1	Hexachlorobenzene	20	< 20 U
87-86-5	Pentachlorophenol	98	< 98 U
85-01-8	Phenanthrene	20	< 20 U
120-12-7	Anthracene	20	< 20 U
84-74-2	Di-n-Butylphthalate	20	< 20 U
206-44-0	**Fluoranthene**	**20**	**16 J**
129-00-0	**Pyrene**	**20**	**18 J**
85-68-7	Butylbenzylphthalate	20	< 20 U
56-55-3	**Benzo(a)anthracene**	**20**	**10 J**
117-81-7	bis(2-Ethylhexyl)phthalate	20	< 20 U
218-01-9	**Chrysene**	**20**	**16 J**
117-84-0	Di-n-Octyl phthalate	20	< 20 U
205-99-2	**Benzo(b)fluoranthene**	**20**	**13 J**
207-08-9	**Benzo(k)fluoranthene**	**20**	**13 J**
50-32-8	**Benzo(a)pyrene**	**20**	**10 J**
193-39-5	Indeno(1,2,3-cd)pyrene	20	< 20 U
53-70-3	Dibenz(a,h)anthracene	20	< 20 U
191-24-2	Benzo(g,h,i)perylene	20	< 20 U
90-05-1	Guaiacol	20	< 20 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270 GC/MS **Sample ID: PGSS-22**
Page 2 of 2 SAMPLE

Lab Sample ID: OH13G QC Report No: OH13-Hart Crowser, Inc.
LIMS ID: 09-735 Project: Port Gamble
Matrix: Sediment 17330-14
Date Analyzed: 01/28/09 19:48

CAS Number	Analyte	RL	Result
483-65-8	Retene	20	< 20 U
90-12-0	1-Methylnaphthalene	20	< 20 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	50.4%	2-Fluorobiphenyl	51.2%
d14-p-Terphenyl	56.4%	d4-1,2-Dichlorobenzene	40.4%
d5-Phenol	54.1%	2-Fluorophenol	46.7%
2,4,6-Tribromophenol	59.2%	d4-2-Chlorophenol	49.9%

ANALYTICAL RESOURCES INCORPORATED

SW8270 SEMIVOLATILES SOIL/SEDIMENT SURROGATE RECOVERY SUMMARY

Matrix: Sediment

QC Report No: OH13-Hart Crowser, Inc.
Project: Port Gamble
17330-14

Client ID	NBZ	FBP	TPH	DCB	PHL	2FP	TBP	2CP	TOT OUT
MB-011509	53.2%	52.4%	67.6%	49.6%	52.5%	50.7%	49.3%	50.7%	0
LCS-011509	56.8%	54.0%	63.2%	51.2%	56.5%	53.1%	57.1%	53.6%	0
LCSD-011509	52.8%	53.6%	67.6%	48.4%	52.8%	49.3%	53.6%	50.4%	0
PGSS-8	54.4%	61.2%	61.6%	37.4%	56.8%	49.3%	66.1%	50.9%	0
PGSS-22	50.4%	51.2%	56.4%	40.4%	54.1%	46.7%	59.2%	49.9%	0

	LCS/MB LIMITS	QC LIMITS
(NBZ) = d5-Nitrobenzene	(37-85)	(29-87)
(FBP) = 2-Fluorobiphenyl	(39-82)	(32-88)
(TPH) = d14-p-Terphenyl	(38-105)	(21-97)
(DCB) = d4-1,2-Dichlorobenzene	(33-79)	(25-82)
(PHL) = d5-Phenol	(40-85)	(29-85)
(2FP) = 2-Fluorophenol	(20-93)	(10-114)
(TBP) = 2,4,6-Tribromophenol	(40-96)	(25-103)
(2CP) = d4-2-Chlorophenol	(41-81)	(30-84)

Prep Method: SW3550B
Log Number Range: 09-729 to 09-735

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270 GC/MS **Sample ID: LCS-011509**
Page 1 of 2 **LCS/LCSD**

Lab Sample ID: LCS-011509 QC Report No: OH13-Hart Crowser, Inc.
LIMS ID: 09-729 Project: Port Gamble
Matrix: Sediment 17330-14
Data Release Authorized: Date Sampled: 12/04/08
Reported: 01/29/09 Date Received: 12/08/08

Date Extracted LCS/LCSD: 01/15/09 Sample Amount LCS: 25.0 g
LCSD: 25.0 g
Date Analyzed LCS: 01/28/09 14:38 Final Extract Volume LCS: 0.5 mL
LCSD: 01/28/09 15:12 LCSD: 0.5 mL
Instrument/Analyst LCS: NT4/LJR Dilution Factor LCS: 1.00
LCSD: NT4/LJR LCSD: 1.00
GPC Cleanup: YES Percent Moisture: NA

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Phenol	269	500	53.8%	271	500	54.2%	0.7%
1,3-Dichlorobenzene	239	500	47.8%	245	500	49.0%	2.5%
1,4-Dichlorobenzene	249	500	49.8%	246	500	49.2%	1.2%
Benzyl Alcohol	266	1000	26.6%	231	1000	23.1%	14.1%
1,2-Dichlorobenzene	255	500	51.0%	257	500	51.4%	0.8%
2-Methylphenol	265	500	53.0%	266	500	53.2%	0.4%
4-Methylphenol	554	1000	55.4%	554	1000	55.4%	0.0%
2,4-Dimethylphenol	222	500	44.4%	205	500	41.0%	8.0%
Benzoic Acid	868	1500	57.9%	837	1500	55.8%	3.6%
1,2,4-Trichlorobenzene	259	500	51.8%	253	500	50.6%	2.3%
Naphthalene	270	500	54.0%	269	500	53.8%	0.4%
Hexachlorobutadiene	265	500	53.0%	266	500	53.2%	0.4%
2-Methylnaphthalene	278	500	55.6%	276	500	55.2%	0.7%
Dimethylphthalate	305	500	61.0%	315	500	63.0%	3.2%
Acenaphthylene	277	500	55.4%	288	500	57.6%	3.9%
Acenaphthene	281	500	56.2%	294	500	58.8%	4.5%
Dibenzofuran	290	500	58.0%	301	500	60.2%	3.7%
Diethylphthalate	335	500	67.0%	345	500	69.0%	2.9%
Fluorene	302	500	60.4%	316	500	63.2%	4.5%
N-Nitrosodiphenylamine	295	500	59.0%	316	500	63.2%	6.9%
Hexachlorobenzene	293	500	58.6%	322	500	64.4%	9.4%
Pentachlorophenol	266	500	53.2%	259	500	51.8%	2.7%
Phenanthrene	317	500	63.4%	338	500	67.6%	6.4%
Anthracene	294	500	58.8%	302	500	60.4%	2.7%
Di-n-Butylphthalate	336	500	67.2%	333	500	66.6%	0.9%
Fluoranthene	322	500	64.4%	320	500	64.0%	0.6%
Pyrene	322	500	64.4%	376	500	75.2%	15.5%
Butylbenzylphthalate	343	500	68.6%	368	500	73.6%	7.0%
Benzo(a)anthracene	309	500	61.8%	329	500	65.8%	6.3%
bis(2-Ethylhexyl)phthalate	329	500	65.8%	340	500	68.0%	3.3%
Chrysene	319	500	63.8%	342	500	68.4%	7.0%
Di-n-Octyl phthalate	320	500	64.0%	337	500	67.4%	5.2%
Benzo(b)fluoranthene	350	500	70.0%	365	500	73.0%	4.2%
Benzo(k)fluoranthene	344	500	68.8%	348	500	69.6%	1.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270 GC/MS **Sample ID: LCSD-011509**
 LCS/LCSD

Lab Sample ID: LCS-011509 QC Report No: OH13-Hart Crowser, Inc.
LIMS ID: 09-729 Project: Port Gamble
Matrix: Sediment 17330-14
Date Analyzed LCS: 01/28/09 14:38
LCSD: 01/28/09 15:12

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Benzo(a)pyrene	260	500	52.0%	268	500	53.6%	3.0%
Indeno(1,2,3-cd)pyrene	342	500	68.4%	411	500	82.2%	18.3%
Dibenz(a,h)anthracene	339	500	67.8%	409	500	81.8%	18.7%
Benzo(g,h,i)perylene	322	500	64.4%	398	500	79.6%	21.1%
Guaiacol	288	500	57.6%	286	500	57.2%	0.7%
1-Methylnaphthalene	297	500	59.4%	296	500	59.2%	0.3%

Semivolatile Surrogate Recovery

	LCS	LCSD
d5-Nitrobenzene	56.8%	52.8%
2-Fluorobiphenyl	54.0%	53.6%
d14-p-Terphenyl	63.2%	67.6%
d4-1,2-Dichlorobenzene	51.2%	48.4%
d5-Phenol	56.5%	52.8%
2-Fluorophenol	53.1%	49.3%
2,4,6-Tribromophenol	57.1%	53.6%
d4-2-Chlorophenol	53.6%	50.4%

Results reported in µg/kg
RPD calculated using sample concentrations per SW846.

4B
SEMIVOLATILE METHOD BLANK SUMMARY

BLANK NO.

OH13MBS1

Lab Name: ANALYTICAL RESOURCES, INC
Client: HART CROWSER, INC.

ARI Job No: OH13
Project: PORT GAMBLE

Lab File ID: OH13MB
Date Extracted: 01/15/09

Instrument ID: NT4
Date Analyzed: 01/27/09

Matrix: SOLID
Time Analyzed: 1525

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

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01	OH13LCSS1	OH13LCSS1	OH13SB	01/28/09
02	OH13LCSDS1	OH13LCSDS1	OH13SBD	01/28/09
03	PGSS-8	OH13A	OH13A	01/28/09
04	PGSS-22	OH13G	OH13G	01/28/09
05				
06				
07				
08				
09				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				

COMMENTS:

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270 GC/MS

Sample ID: MB-011509
METHOD BLANK

Lab Sample ID: MB-011509
LIMS ID: 09-729
Matrix: Sediment
Data Release Authorized:
Reported: 01/29/09

QC Report No: OH13-Hart Crowser, Inc.
Project: Port Gamble
17330-14
Date Sampled: NA
Date Received: NA

Date Extracted: 01/15/09
Date Analyzed: 01/27/09 15:25
Instrument/Analyst: NT4/LJR
GPC Cleanup: Yes

Sample Amount: 25.0 g
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: NA

CAS Number	Analyte	RL	Result
108-95-2	Phenol	20	< 20 U
541-73-1	1,3-Dichlorobenzene	20	< 20 U
106-46-7	1,4-Dichlorobenzene	20	< 20 U
100-51-6	Benzyl Alcohol	20	< 20 U
95-50-1	1,2-Dichlorobenzene	20	< 20 U
95-48-7	2-Methylphenol	20	< 20 U
106-44-5	4-Methylphenol	20	< 20 U
105-67-9	2,4-Dimethylphenol	20	< 20 U
65-85-0	Benzoic Acid	200	< 200 U
120-82-1	1,2,4-Trichlorobenzene	20	< 20 U
91-20-3	Naphthalene	20	< 20 U
87-68-3	Hexachlorobutadiene	20	< 20 U
91-57-6	2-Methylnaphthalene	20	< 20 U
131-11-3	Dimethylphthalate	20	< 20 U
208-96-8	Acenaphthylene	20	< 20 U
83-32-9	Acenaphthene	20	< 20 U
132-64-9	Dibenzofuran	20	< 20 U
84-66-2	Diethylphthalate	20	< 20 U
86-73-7	Fluorene	20	< 20 U
86-30-6	N-Nitrosodiphenylamine	20	< 20 U
118-74-1	Hexachlorobenzene	20	< 20 U
87-86-5	Pentachlorophenol	100	< 100 U
85-01-8	Phenanthrene	20	< 20 U
120-12-7	Anthracene	20	< 20 U
84-74-2	Di-n-Butylphthalate	20	< 20 U
206-44-0	Fluoranthene	20	< 20 U
129-00-0	Pyrene	20	< 20 U
85-68-7	Butylbenzylphthalate	20	< 20 U
56-55-3	Benzo(a)anthracene	20	< 20 U
117-81-7	bis(2-Ethylhexyl)phthalate	20	< 20 U
218-01-9	Chrysene	20	< 20 U
117-84-0	Di-n-Octyl phthalate	20	< 20 U
205-99-2	Benzo(b)fluoranthene	20	< 20 U
207-08-9	Benzo(k)fluoranthene	20	< 20 U
50-32-8	Benzo(a)pyrene	20	< 20 U
193-39-5	Indeno(1,2,3-cd)pyrene	20	< 20 U
53-70-3	Dibenz(a,h)anthracene	20	< 20 U
191-24-2	Benzo(g,h,i)perylene	20	< 20 U
90-05-1	Guaiacol	20	< 20 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270 GC/MS **Sample ID: MB-011509**
 METHOD BLANK

Lab Sample ID: MB-011509 QC Report No: OH13-Hart Crowser, Inc.
LIMS ID: 09-729 Project: Port Gamble
Matrix: Sediment 17330-14
Date Analyzed: 01/27/09 15:25

CAS Number	Analyte	RL	Result
483-65-8	Retene	20	< 20 U
90-12-0	1-Methylnaphthalene	20	< 20 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	53.2%	2-Fluorobiphenyl	52.4%
d14-p-Terphenyl	67.6%	d4-1,2-Dichlorobenzene	49.6%
d5-Phenol	52.5%	2-Fluorophenol	50.7%
2,4,6-Tribromophenol	49.3%	d4-2-Chlorophenol	50.7%

PCB

ANALYTICAL RESOURCES INCORPORATED

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

Sample ID: PGSS-8
SAMPLE

Lab Sample ID: OH13A
LIMS ID: 09-729
Matrix: Sediment
Data Release Authorized:
Reported: 01/21/09

QC Report No: OH13-Hart Crowser, Inc.
Project: Port Gamble
17330-14
Date Sampled: 12/04/08
Date Received: 12/08/08

Date Extracted: 01/15/09
Date Analyzed: 01/20/09 11:49
Instrument/Analyst: ECD5/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.1 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: 66.6%

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	4.0	< 4.0 U
53469-21-9	Aroclor 1242	4.0	< 4.0 U
12672-29-6	Aroclor 1248	4.0	< 4.0 U
11097-69-1	Aroclor 1254	4.0	< 4.0 U
11096-82-5	Aroclor 1260	4.0	< 4.0 U
11104-28-2	Aroclor 1221	4.0	< 4.0 U
11141-16-5	Aroclor 1232	8.0	< 8.0 Y
37324-23-5	Aroclor 1262	4.0	< 4.0 U
11100-14-4	Aroclor 1268	4.0	< 4.0 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	68.5%
Tetrachlorometaxylene	74.5%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA PCB by GC/ECD

Sample ID: PGSS-22
SAMPLE

Lab Sample ID: OH13G
LIMS ID: 09-735
Matrix: Sediment
Data Release Authorized:
Reported: 01/21/09

QC Report No: OH13-Hart Crowser, Inc.
Project: Port Gamble
17330-14
Date Sampled: 12/04/08
Date Received: 12/08/08

Date Extracted: 01/15/09
Date Analyzed: 01/20/09 13:15
Instrument/Analyst: ECD5/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.6 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: 68.4%

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

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	74.8%
Tetrachlorometaxylene	68.8%

ANALYTICAL RESOURCES INCORPORATED

SW8082/PCB SOIL/SEDIMENT SURROGATE RECOVERY SUMMARY

Matrix: Sediment

QC Report No: OH13-Hart Crowser, Inc.
Project: Port Gamble
17330-14

Client ID	DCBP % REC	DCBP LCL-UCL	TCMX % REC	TCMX LCL-UCL	TOT OUT
PGSS-8	68.5%	33-149	74.5%	32-121	0
MB-011509	79.0%	36-130	72.0%	30-119	0
LCS-011509	78.0%	36-130	73.0%	30-119	0
LCSD-011509	77.2%	36-130	73.2%	30-119	0
PGSS-22	74.8%	33-149	68.8%	32-121	0

Low Level PSDDA Control Limits
Prep Method: SW3550B
Log Number Range: 09-729 to 09-735

ANALYTICAL RESOURCES INCORPORATED

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

Sample ID: LCS-011509
LCS/LCSD

Lab Sample ID: LCS-011509
LIMS ID: 09-735
Matrix: Sediment
Data Release Authorized:
Reported: 02/24/09

QC Report No: OH13-Hart Crowser, Inc.
Project: Port Gamble
17330-14
Date Sampled: NA
Date Received: NA

Date Extracted LCS/LCSD: 01/15/09

Date Analyzed LCS: 01/20/09 11:15
LCSD: 01/20/09 11:32
Instrument/Analyst LCS: ECD5/JGR
LCSD: ECD5/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount LCS: 25.0 g-dry-wt
LCSD: 25.0 g-dry-wt
Final Extract Volume LCS: 1.0 mL
LCSD: 1.0 mL
Dilution Factor LCS: 1.00
LCSD: 1.00
Silica Gel: No

Percent Moisture: NA

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Aroclor 1016	15.7	20.0	78.5%	14.9	20.0	74.5%	5.2%
Aroclor 1260	17.5	20.0	87.5%	16.7	20.0	83.5%	4.7%

PCB Surrogate Recovery

	LCS	LCSD
Decachlorobiphenyl	78.0%	77.2%
Tetrachlorometaxylene	73.0%	73.2%

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

ANALYTICAL RESOURCES INCORPORATED

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

Sample ID: MB-011509
METHOD BLANK

Lab Sample ID: MB-011509
LIMS ID: 09-735
Matrix: Sediment
Data Release Authorized:
Reported: 02/24/09

QC Report No: OH13-Hart Crowser, Inc.
Project: Port Gamble
17330-14
Date Sampled: NA
Date Received: NA

Date Extracted: 01/15/09
Date Analyzed: 01/20/09 10:58
Instrument/Analyst: ECD5/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.0 g
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: NA

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

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	79.0%
Tetrachlorometaxylene	72.0%

METALS

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: PGSS-8
SAMPLE

Lab Sample ID: OH13A
LIMS ID: 09-729
Matrix: Sediment
Data Release Authorized:
Reported: 01/26/09

QC Report No: OH13-Hart Crowser, Inc.
Project: Port Gamble
17330-14
Date Sampled: 12/04/08
Date Received: 12/08/08

Percent Total Solids: 34.5%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	01/15/09	6010B	01/22/09	7440-38-2	Arsenic	10	10	U
3050B	01/15/09	6010B	01/22/09	**7440-43-9**	**Cadmium**	0.6	**2.2**	
3050B	01/15/09	6010B	01/22/09	**7440-47-3**	**Chromium**	1	**42**	
3050B	01/15/09	6010B	01/22/09	**7440-50-8**	**Copper**	0.6	**32.2**	
3050B	01/15/09	6010B	01/22/09	**7439-92-1**	**Lead**	6	**10**	
CLP	01/15/09	7471A	01/16/09	7439-97-6	Mercury	0.1	0.1	U
3050B	01/15/09	6010B	01/22/09	7440-22-4	Silver	0.8	0.8	U
3050B	01/15/09	6010B	01/22/09	**7440-66-6**	**Zinc**	3	**78**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: PGSS-22
SAMPLE

Lab Sample ID: OH13G
LIMS ID: 09-735
Matrix: Sediment
Data Release Authorized:
Reported: 01/26/09

QC Report No: OH13-Hart Crowser, Inc.
Project: Port Gamble
17330-14
Date Sampled: 12/04/08
Date Received: 12/08/08

Percent Total Solids: 34.1%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	01/15/09	6010B	01/22/09	7440-38-2	Arsenic	10	10	U
3050B	01/15/09	6010B	01/22/09	**7440-43-9**	**Cadmium**	0.5	**1.9**	
3050B	01/15/09	6010B	01/22/09	**7440-47-3**	**Chromium**	1	**42**	
3050B	01/15/09	6010B	01/22/09	**7440-50-8**	**Copper**	0.5	**31.9**	
3050B	01/15/09	6010B	01/22/09	**7439-92-1**	**Lead**	5	**9**	
CLP	01/15/09	7471A	01/16/09	7439-97-6	Mercury	0.1	0.1	U
3050B	01/15/09	6010B	01/22/09	7440-22-4	Silver	0.8	0.8	U
3050B	01/15/09	6010B	01/22/09	**7440-66-6**	**Zinc**	3	**72**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: PGSS-8
MATRIX SPIKE

Lab Sample ID: OH13A
LIMS ID: 09-729
Matrix: Sediment
Data Release Authorized:
Reported: 01/26/09

QC Report No: OH13-Hart Crowser, Inc.
Project: Port Gamble
17330-14
Date Sampled: 12/04/08
Date Received: 12/08/08

MATRIX SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Spike	Spike Added	% Recovery	Q
Arsenic	6010B	10 U	510	548	93.1%	
Cadmium	6010B	2.2	126	137	90.4%	
Chromium	6010B	42	159	137	85.4%	
Copper	6010B	32.2	152	137	87.4%	
Lead	6010B	10	481	548	85.9%	
Mercury	7471A	0.1 U	1.2	1.06	113%	
Silver	6010B	0.8 U	131	137	95.6%	
Zinc	6010B	78	199	137	88.3%	

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%

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: PGSS-8
DUPLICATE

Lab Sample ID: OH13A
LIMS ID: 09-729
Matrix: Sediment
Data Release Authorized:
Reported: 01/26/09

QC Report No: OH13-Hart Crowser, Inc.
Project: Port Gamble
17330-14
Date Sampled: 12/04/08
Date Received: 12/08/08

MATRIX DUPLICATE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Duplicate	RPD	Control Limit	Q
Arsenic	6010B	10 U	10 U	0.0%	+/- 10	L
Cadmium	6010B	2.2	2.2	0.0%	+/- 0.6	L
Chromium	6010B	42	40	4.9%	+/- 20%	
Copper	6010B	32.2	30.3	6.1%	+/- 20%	
Lead	6010B	10	9	10.5%	+/- 6	L
Mercury	7471A	0.1 U	0.1 U	0.0%	+/- 0.1	L
Silver	6010B	0.8 U	0.8 U	0.0%	+/- 0.8	L
Zinc	6010B	78	76	2.6%	+/- 20%	

Reported in mg/kg-dry

*-Control Limit Not Met
L-RPD Invalid, Limit = Detection Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS **Sample ID: LAB CONTROL**

Lab Sample ID: OH13LCS
LIMS ID: 09-735
Matrix: Sediment
Data Release Authorized:
Reported: 01/26/09

QC Report No: OH13-Hart Crowser, Inc.
Project: Port Gamble
17330-14
Date Sampled: NA
Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike Found	Spike Added	% Recovery	Q
Arsenic	6010B	203	200	102%	
Cadmium	6010B	50.6	50.0	101%	
Chromium	6010B	48.8	50.0	97.6%	
Copper	6010B	48.5	50.0	97.0%	
Lead	6010B	198	200	99.0%	
Silver	6010B	52.4	50.0	105%	
Zinc	6010B	50	50	100%	

Reported in mg/kg-dry

N-Control limit not met
NA-Not Applicable, Analyte Not Spiked
Control Limits: 80-120%

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS **Sample ID: METHOD BLANK**

Lab Sample ID: OH13MB
LIMS ID: 09-735
Matrix: Sediment
Data Release Authorized:
Reported: 01/26/09

QC Report No: OH13-Hart Crowser, Inc.
Project: Port Gamble
17330-14
Date Sampled: NA
Date Received: NA

Percent Total Solids: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	01/15/09	6010B	01/22/09	7440-38-2	Arsenic	5	5	U
3050B	01/15/09	6010B	01/22/09	7440-43-9	Cadmium	0.2	0.2	U
3050B	01/15/09	6010B	01/22/09	7440-47-3	Chromium	0.5	0.5	U
3050B	01/15/09	6010B	01/22/09	7440-50-8	Copper	0.2	0.2	U
3050B	01/15/09	6010B	01/22/09	7439-92-1	Lead	2	2	U
3050B	01/15/09	6010B	01/22/09	7440-22-4	Silver	0.3	0.3	U
3050B	01/15/09	6010B	01/22/09	7440-66-6	Zinc	1	1	U

U-Analyte undetected at given RL
RL-Reporting Limit

GEOTECH

Hart Crowser
17330-14 Port Gamble

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	
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
OK70 A-1	100.0	100.0	100.0	99.8	98.8	92.8	81.7	68.7	56.1	42.2	28.1	18.9	13.2	8.8
	100.0	100.0	100.0	99.8	98.7	92.6	81.4	68.5	56.6	42.0	28.0	18.9	13.3	9.0
	100.0	100.0	100.0	99.8	98.7	92.7	81.6	68.7	55.6	41.4	28.0	19.1	13.2	9.0
PGSS-8	100.0	100.0	99.8	98.5	97.2	95.9	93.0	87.9	77.3	56.5	39.7	27.8	20.3	13.5
PGSS-15	100.0	100.0	100.0	99.3	98.4	97.4	96.0	92.7	83.2	63.7	46.4	33.4	24.2	15.7
PGSS-16	100.0	100.0	100.0	99.4	98.2	97.4	96.7	94.4	86.8	69.8	52.0	36.2	24.0	14.8
PGSS-18	100.0	100.0	100.0	99.7	98.7	97.8	97.1	94.8	87.1	66.1	47.2	33.9	24.1	15.5
PGSS-20	100.0	100.0	100.0	99.7	99.2	98.6	97.9	93.6	78.3	52.9	34.7	23.4	17.0	11.4
PGSS-22	100.0	100.0	99.9	99.4	98.7	97.9	96.6	92.2	81.6	64.2	47.5	34.1	23.7	15.8
PGSS-21B	100.0	99.6	98.7	96.8	94.0	85.6	66.4	50.2	38.3	28.8	21.3	15.6	11.4	7.9
PGSS-29A	100.0	99.5	98.5	96.5	94.0	89.7	82.0	69.9	56.2	42.2	31.2	22.9	16.8	11.6
PGSS-30	100.0	100.0	99.9	98.8	97.4	95.9	93.8	87.6	75.4	61.8	47.1	33.7	24.4	16.0
PGSS-31	100.0	100.0	99.9	99.1	97.9	96.7	95.0	88.6	75.6	60.7	45.8	33.4	23.5	15.3
PGSS-33	100.0	100.0	100.0	99.3	98.2	97.1	95.1	87.0	72.5	57.2	42.0	30.7	22.2	14.6
PGSS-35	100.0	100.0	100.0	99.7	98.7	97.6	96.3	91.0	81.3	66.9	49.5	33.6	23.0	15.2
PGSS-38A	100.0	100.0	99.9	99.2	97.3	87.6	67.4	52.4	41.3	31.4	22.4	13.2	8.8	5.8
PGSS-39	100.0	100.0	99.9	99.1	98.0	96.9	95.2	88.7	75.6	60.6	46.8	33.6	23.9	15.3
PGSS-40	100.0	100.0	100.0	99.1	98.2	97.0	94.0	84.1	70.0	54.9	42.4	30.8	21.5	14.3
PGSS-42	100.0	100.0	100.0	99.1	97.8	96.3	91.6	77.4	61.3	51.4	40.0	29.7	21.0	13.3
PGSS-44	100.0	100.0	100.0	99.2	98.0	96.7	94.1	85.4	74.0	61.1	46.6	33.2	23.5	15.2

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.

OH13

Hart Crowser
17330-14 Port Gamble

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
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)
OK70 A-1	0.0	0.2	1.1	6.0	11.1	13.0	12.6	13.9	14.0	9.2	5.7	4.5	8.8	68.7
	0.0	0.2	1.1	6.0	11.2	12.9	12.0	14.5	14.0	9.1	5.6	4.3	9.0	68.5
	0.0	0.2	1.1	6.0	11.2	12.9	13.1	14.1	13.5	8.9	5.9	4.3	9.0	68.7
PGSS-8	0.2	1.3	1.2	1.3	2.9	5.1	10.6	20.9	16.8	11.8	7.5	6.8	13.5	87.9
PGSS-15	0.0	0.7	0.8	1.0	1.5	3.3	9.5	19.5	17.4	12.9	9.2	8.6	15.7	92.7
PGSS-16	0.0	0.6	1.1	0.8	0.7	2.3	7.6	17.0	17.9	15.8	12.2	9.2	14.8	94.4
PGSS-18	0.0	0.3	1.1	0.9	0.7	2.3	7.7	21.1	18.9	13.3	9.8	8.6	15.5	94.8
PGSS-20	0.0	0.3	0.5	0.6	0.7	4.3	15.4	25.4	18.2	11.2	6.5	5.5	11.4	93.6
PGSS-22	0.1	0.5	0.7	0.8	1.3	4.4	10.6	17.4	16.7	13.4	10.4	7.9	15.8	92.2
PGSS-21B	1.3	2.0	2.8	8.4	19.1	16.2	11.9	9.6	7.5	5.7	4.2	3.6	7.9	50.2
PGSS-29A	1.5	2.0	2.5	4.3	7.7	12.1	13.7	14.0	11.0	8.3	6.2	5.2	11.6	69.9
PGSS-30	0.1	1.1	1.4	1.5	2.1	6.2	12.2	13.6	14.8	13.3	9.3	8.4	16.0	87.6
PGSS-31	0.1	0.9	1.1	1.2	1.7	6.4	13.1	14.9	14.9	12.3	9.9	8.2	15.3	88.6
PGSS-33	0.0	0.7	1.1	1.1	2.0	8.1	14.5	15.4	15.2	11.2	8.5	7.7	14.6	87.0
PGSS-35	0.0	0.3	1.0	1.1	1.3	5.3	9.7	14.4	17.4	15.9	10.6	7.8	15.2	91.0
PGSS-38A	0.1	0.6	1.9	9.8	20.2	15.0	11.0	9.9	9.0	9.2	4.4	3.0	5.8	52.4
PGSS-39	0.1	0.8	1.1	1.1	1.7	6.5	13.2	15.0	13.7	13.2	9.8	8.6	15.3	88.7
PGSS-40	0.0	0.9	0.9	1.2	3.1	9.9	14.1	15.1	12.4	11.6	9.3	7.2	14.3	84.1
PGSS-42	0.0	0.9	1.2	1.5	4.7	14.2	16.1	9.9	11.4	10.3	8.7	7.7	13.3	77.4
PGSS-44	0.0	0.7	1.3	1.3	2.6	8.7	11.4	12.9	14.4	13.5	9.7	8.3	15.2	85.4

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.

QA SUMMARY

Client:	Hart Crowser	Project No.:	17330-14 Port Gamble
ARI Trip. Sample ID:	OK70 A	Batch No.:	OH13-1
		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
OK70 A-1	100.0	100.0	100.0	99.8	98.8	92.8	81.7	68.7	56.1	42.2	28.1	18.9	13.2	8.8
	100.0	100.0	100.0	99.8	98.7	92.6	81.4	68.5	56.6	42.0	28.0	18.9	13.3	9.0
	100.0	100.0	100.0	99.8	98.7	92.7	81.6	68.7	55.6	41.4	28.0	19.1	13.2	9.0
AVE	NA	100.00	100.00	99.79	98.71	92.71	81.56	68.65	56.07	41.88	28.03	18.99	13.26	8.90
STDEV	NA	0.00	0.00	0.03	0.04	0.06	0.12	0.10	0.49	0.39	0.10	0.10	0.03	0.11
%RSD	NA	0.00	0.00	0.03	0.04	0.07	0.15	0.15	0.87	0.94	0.35	0.54	0.21	1.25

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)
OK70 A-1	1/30/2009	2/11/2009	2/20/2009	101.4		17.7
	1/30/2009	2/11/2009	2/20/2009	100.2		17.5
	1/30/2009	2/11/2009	2/20/2009	100.1		17.8
PGSS-8	12/4/2008	2/11/2009	2/20/2009	98.4		12.4
PGSS-15	12/4/2008	2/11/2009	2/20/2009	97.9		11.2
PGSS-16	12/4/2008	2/11/2009	2/20/2009	97.9		9.7
PGSS-18	12/4/2008	2/11/2009	2/20/2009	99.0		12.2
PGSS-20	12/4/2008	2/11/2009	2/20/2009	100.4		14.8
PGSS-22	12/4/2008	2/11/2009	2/20/2009	99.9		10.5
PGSS-21B	12/4/2008	2/11/2009	2/20/2009	104.8		14.2
PGSS-29A	12/4/2008	2/11/2009	2/20/2009	99.1		12.8
PGSS-30	12/5/2008	2/11/2009	2/20/2009	98.9		10.5
PGSS-31	12/5/2008	2/11/2009	2/20/2009	99.0		11.4
PGSS-33	12/5/2008	2/11/2009	2/20/2009	98.8		11.4
PGSS-35	12/5/2008	2/11/2009	2/20/2009	98.6		10.8
PGSS-38A	12/5/2008	2/11/2009	2/20/2009	99.0		23.1
PGSS-39	12/5/2008	2/11/2009	2/20/2009	97.8		11.4
PGSS-40	12/5/2008	2/11/2009	2/20/2009	99.7		12.6
PGSS-42	12/5/2008	2/11/2009	2/20/2009	100.4		12.6
PGSS-44	12/5/2008	2/11/2009	2/20/2009	99.5		12.0

* ARI Internal QA limits = 95-105%

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.

DIOXIN

SGS

Laboratory Results

Ms. Kelly Bottem
Analytical Resources, Inc.
4611 S. 134th Place
Suite 100
Tukwila WA 98168-3240

Phone: 206-695-6211
Fax: 206-695-6201

Dear Ms. Bottem:

Enclosed is a full data package containing the final results for samples received by SGS Environmental Services, Inc. on January 15, 2009 under your project name "Port Gamble". The samples were analyzed by Method 1613 following SGS's Standard Operating Procedures and are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards.

Number of Samples Received:	2
Your Project Reference:	Port Gamble
SGS Project Number:	G1040-3

We appreciate your business and look forward to working with you again. Please contact me at 910-350-1903 if you have questions or need additional technical support.

Sincerely,

Jeannie Milholland

Jeannie Milholland
Project Manager

2-17-2009
Date

DC138.033007.7

SGS

Case Narrative
SGS Project: **G1040-3**
Project Name: **Port Gamble**

For Method: 1613

- The submitted samples were accepted into the lab on January 15th, 2009 and extracted on January 19th, 2009 by method 3540C. The sample extracts and associated QC extracts were then processed through clean-up as prescribed in the SGS standard operating procedures and analyzed by HRGC/HRMS for method 1613.
- No analytical issues were encountered.

Craig R. Tronzo 2/23/09

Craig R. Tronzo
Data Validation

Date

SGS

Table of Contents

Section 1: Cover Letter/Case Narrative

Contains the Table of Contents, a project narrative, the client and SGS project identifiers, the number and type of samples, the methodology used to process the samples, and a summary table of sample results. A listing of current certifications by state, a table of abbreviations and qualifiers and the Toxic Equivalent Factors (TEF) are also supplied.

Section 2: Project Information

Contains the chain-of-custody(s), internal chain-of-custody(s) if applicable, sample login summary, sample receipt checklist, and any other project/client specific information.

Section 3: Sample Analytical Results

Contains results for client samples. Sample results include two pages of summarized analytical data and the associated raw data. The raw data includes a quantitation report from the instrumentation used that lists, ion areas, ratios, retention times, concentrations, and signal-to-noise ratios. It also has the selected ion current profiles (SICPs) for all homolog groups and any manual integrations.

Section 4: Quality Control Analytical Results

Contains results for each analytical workgroup associated with the submitted samples. A workgroup consists of the Lab Method Blank (LMB) and the Ongoing Precision and Recovery sample (OPR). All sample preparation data, including dry weight determinations, extraction logs, clean-up logs and observation notes are also documented. Any other supporting QC data will be documented here upon client request.

Section 5: Initial Calibration

Contains a table summarizing calibration data such as relative response factors, concentrations, and percent relative standard deviation. This section also contains related daily instrument QC information: GC performance data, mass resolution check, windows defining mix, and SICPs for all homolog groups and any manual integrations as well as the injection prep and instrument run logs.

Section 6: Continuing Calibration Data

Contains all daily instrument quality control information. This includes mass resolution checks, a table summarizing the window defining peaks, SICPs for the first and last eluters for each homolog group, SICPs documenting GC performance, a summary quantitation report showing RRFs for the Ccal and Ical, and SICPs for all homolog groups and any manual integrations, injection prep and instrumentation runlogs.

SGS

List of Qualifiers: Dioxin's

B	Analyte was detected in the Lab Method Blank at a level above the Reporting Limit.
EDL	"Estimated Detection Limit"
EMPC	"Estimated Maximum Possible Concentration"
RL	Report Limit
CL	Control Limit
U	Undetected
ppt	Parts-per-trillion (pg/g; ng/L)
V	Recovery is below quality control limit. The data has been validated based on a favorable signal-to-noise and detection limit.
#	Outside quality control limits
*	Indicates that the ion-ratio fails high or low; analyte reported as an EMPC

An average uncertainty of 30% can be routinely achieved as concluded from the evaluation of HRGC-HRMS standard operating procedures. The following flags warn the data user of situations where the uncertainty may be greater than stated.

A	Amount detected is less than the Lower Method Calibration Limit.
J	Amount detected is between the Method Detection Limit and the Lower Calibration Limit.
O	The recovery of this analyte in the OPR is above the Method QC Limits and the reported concentration in the sample may be biased high.
E	Amount detected is greater than the Upper Calibration Limit.
S	The amount of analyte present has saturated the detector. This situation results in an underestimation of the affected analyte(s).
Q	Indicates the presence of a quantitative interference. This situation may result in an underestimation of the affected analyte(s).
I	Indicates the presence of a qualitative interference that could cause a false positive or an overestimation of the affected analyte(s).
DPE	Indicates the presence of a peak in the polychlorinated diphenylether channel that could cause a false positive or an overestimation of the affected analyte(s).

DC250.081908.1

SGS

Toxic Equivalency Factors

Analyte	WHO* 1998	WHO* 2005	International-89	MADEP+
2,3,7,8-TCDD	1	1	1	1
1,2,3,7,8-PeCDD	1	1	0.5	0.5
1,2,3,4,7,8-HxCDD	0.1	0.1	0.1	0.1
1,2,3,6,7,8-HxCDD	0.1	0.1	0.1	0.1
1,2,3,7,8,9-HxCDD	0.1	0.1	0.1	0.1
1,2,3,4,6,7,8-HpCDD	0.01	0.01	0.01	0.1
OCDD	0.0001	0.0003	0.001	0.001
2,3,7,8-TCDF	0.1	0.1	0.1	0.1
1,2,3,7,8-PeCDF	0.05	0.03	0.05	0.5
2,3,4,7,8-PeCDF	0.5	0.3	0.5	0.5
1,2,3,4,7,8-HxCDF	0.1	0.1	0.1	0.1
1,2,3,6,7,8-HxCDF	0.1	0.1	0.1	0.1
2,3,4,6,7,8-HxCDF	0.1	0.1	0.1	0.1
1,2,3,7,8,9-HxCDF	0.1	0.1	0.1	0.1
1,2,3,4,6,7,8-HpCDF	0.01	0.01	0.01	0.1
1,2,3,4,7,8,9-HpCDF	0.01	0.01	0.01	0.1
OCDF	0.0001	0.0003	0.001	0.001

* World Health Organization
+ Massachusetts Department of Environmental Protection

SUBCONTRACTOR ANALYSIS REQUEST
CUSTODY TRANSFER 01/14/09

ANALYTICAL RESOURCES INCORPORATED

ARI Project: OH13

G1040-3

Laboratory: SGS ENVIROMENTAL SERVICES INC.
Lab Contact: TRENT TEMPERLY
Lab Address: 5500 BUSINESS DR.
WILMINGTON, NC 28405
Phone: 910-350-1903
Fax: 910-350-1557

ARI Client: Hart Crowser, Inc.
Project ID: Port Gamble
ARI PM: Kelly Bottem
Phone: 206-695-6211
Fax: 206-695-6201

Analytical Protocol: PSDDA
Special Instructions:

Requested Turn Around: **01/23/09**
Fax Results (Y/N): **Yes**

Limits of Liability. *Subcontractor is expected to perform all requested services in accordance with appropriate methodology following Standard Operating Procedures that meet standards for the industry. The total liability of ARI, its officers, agents, employees, or sucessors, arising out of or in connection with the requested services, shall not exceed the negotiated amount for said services. The agreement by the Subcontractor to perform services requested by ARI releases 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 Subcontractor.*

ARI ID	Client ID/ Add'l ID	Sampled	Matrix	Bottles	Analyses
09-729-OH13A	PGSS-8	12/04/08 09:55	Sediment	1	Dioxin/Furans 1613(Sub)
Special Instructions: None					
09-735-OH13G	PGSS-22	12/04/08 13:48	Sediment	1	Dioxin/Furans 1613(Sub)
Special Instructions: None					

Carrier UPS	Airbill 1Z 832 695 01 4551 0761		Date 1/14/09
Relinquished by	Company ARI	Date 1/14/09	Time 5w 1/14/09 1600
Received by	Company SGS 2.1 no seal	Date 1/15/09	Time 10:15

Subcontractor Custody Form - **OH13**
Page 1 of 1

SGS Environmental Services, Inc.

Cust Proj ID: OH13
Client Name: Analytical Resources, Inc. PO:

G1040-3

Due Date: 2009-02-05 17:00:00
Login Date: 2009-01-16 09:39:35

Sample ID		Cust Sample ID	PRI	Date Collected	Date Received	Date Due	Matrix	LOC	Report	Analysis	Status
G1040-3-1	A	PGSS-8	STD	2008-12-04 09:55:00	2009-01-15	2009-02-05	Sediment	W2	Full	1613	LG::REVW
G1040-3-2	A	PGSS-22	STD	2008-12-04 13:48:00	2009-01-15	2009-02-05	Sediment	W2	Full	1613	LG::REVW

Sample Receipt Checklist (SRC)

SGS Environmetal Services Inc.

Client: **Analytical Resources, Inc.** Lab Proj. ID: **G1040-3**

Client Proj. ID: **OH13**

1. X Shipped
   __ Hand Delivered
   Notes:

2. X Proper, full, and complete documentation
   (unique sample identification on durable label with indelible ink, location of collection, date/time of collection, collector's name, preservation type, sample type (method/matrix))
   __ Acceptable documentation (but, incomplete)
   __ Unacceptable documentation
   Notes:

3. __ Custody Tape on Container
   X No Custody Tape
   Notes:

4. X Samples Intact*
   (are in appropriate container, are not damaged, and do not show signs of contamination)
   __ Samples Broken / Leaking
   __ VOA Vials Checked for Air Bubbles
   Notes:

5. X Chilled on Receipt* Actual Temp.(s) in °C: 2.1
   __ Ambient on Receipt
   __ Walk-in on Ice; Coming down to temp.
   __ Received out of temperature protocol
   Notes:

6. X Sufficient Sample Submitted
   __ Insufficient Sample Submitted
   Notes:

7. X Samples Preserved Correctly*
   (see preservative checklist where applicable)
   __ Improper Preservative(s)
   __ None recommended (N/A)
   Notes:

8. X Received Within Holding Time
   __ Not Received Within Holding Time
   __ N/A
   Notes:

9. X No Discrepancies Noted
   __ Discrepancies Noted
   Notes:

Comments:

* = Rejection of sample is required when not marked; Contact client services immediately for a resolution.

Inspected and Logged in by:

DC27.091503.3

Date / Time: Fri-1/16/09 09:38

Method 1613

PGSS-22

Analytical Resources, Inc.

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	RL (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	1.00			
1,2,3,7,8-PeCDD	ND	5.00			
1,2,3,4,7,8-HxCDD	ND	5.00			
1,2,3,6,7,8-HxCDD	ND	5.00			
1,2,3,7,8,9-HxCDD	ND	5.00			
1,2,3,4,6,7,8-HpCDD	23.8	5.00	40:20	1.00	
OCDD	223	10.0	44:40	0.90	
2,3,7,8-TCDF	1.20	1.00	30:53	0.73	
1,2,3,7,8-PeCDF	ND	5.00			
2,3,4,7,8-PeCDF	ND	5.00			
1,2,3,4,7,8-HxCDF	ND	5.00			
1,2,3,6,7,8-HxCDF	ND	5.00			
2,3,4,6,7,8-HxCDF	ND	5.00			
1,2,3,7,8,9-HxCDF	ND	5.00			
1,2,3,4,6,7,8-HpCDF	ND	5.00			
1,2,3,4,7,8,9-HpCDF	ND	5.00			
OCDF	ND	10.0			
Total TCDDs	22.5	1.00			
Total PeCDDs	ND	5.00			Q
Total HxCDDs	14.7	5.00			
Total HpCDDs	134	5.00			
Total TCDFs	9.90	1.00			DPE
Total PeCDFs	ND	5.00			
Total HxCDFs	ND	5.00			
Total HpCDFs	ND	5.00			
WHO-2005 TEQ (ND=0)	0.425				
WHO-2005 TEQ (ND=½)	6.05				

Client Information

Project Name:	Port Gamble		**Sample Information**		
			Matrix:	Sediment	
Sample ID:	PGSS-22		Weight / Volume:	24.42	grams
			Solids / Lipids:	31.5	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG16440	
Project ID:	G1040-3				
Sample ID:	G1040-3-2B		Filename:	a27jan09a_12-8	
Collection Date/Time:	04-Dec-08	13:48	Retchk:	a27jan09a_11-15	
Receipt Date:	15-Jan-09	10:15	Begin ConCal:	a27jan09a_11-15	
Extraction Date:	19-Jan-09				
Analysis Date:	01-Feb-09	23:42	Initial Cal:	m1613-100708a	

Method 1613

PGSS-22

Analytical Resources, Inc.

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
$^{13}C_{12}$-2,3,7,8-TCDD	2	1.66	83.2	31:27	0.78	
$^{13}C_{12}$-1,2,3,7,8-PeCDD	2	1.72	85.9	34:15	1.57	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	2	1.65	82.3	36:52	1.27	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	2	1.62	80.8	36:57	1.27	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	2	1.47	73.7	40:19	1.07	
$^{13}C_{12}$-OCDD	4	2.54	63.5	44:38	0.90	
$^{13}C_{12}$-2,3,7,8-TCDF	2	1.70	84.9	30:52	0.79	
$^{13}C_{12}$-1,2,3,7,8-PeCDF	2	1.93	96.6	33:27	1.58	
$^{13}C_{12}$-2,3,4,7,8-PeCDF	2	1.74	87.0	34:04	1.57	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	2	1.69	84.4	36:09	0.52	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	2	1.71	85.6	36:15	0.53	
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	2	1.66	83.2	36:45	0.53	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	2	1.66	83.0	37:32	0.53	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	2	1.45	72.5	39:03	0.45	
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	2	1.42	71.2	41:00	0.45	
Cleanup Standard						
$^{37}Cl_4$-2,3,7,8-TCDD	0.4	0.369	92.3	31:28		
Injection Standards						
$^{13}C_{12}$-1,2,3,4-TCDD	2			31:00	0.79	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	2			37:12	1.26	

Client Information

Project Name:	Port Gamble
Sample ID:	PGSS-22

Laboratory Information

Project ID:	G1040-3	
Sample ID:	G1040-3-2B	
Collection Date/Time:	04-Dec-08	13:48
Receipt Date:	15-Jan-09	10:15
Extraction Date:	19-Jan-09	
Analysis Date:	01-Feb-09	23:42

Analyzed by: _____

Date: 02/17/09

Sample Information

Matrix:	Sediment	
Weight / Volume:	24.42	grams
Solids / Lipids:	31.5	%
Original pH :	NA	
Batch ID:	WG16440	
Filename:	a27jan09a_12-8	
Retchk:	a27jan09a_11-15	
Begin ConCal:	a27jan09a_11-15	
Initial Cal:	m1613-100708a	

Reviewed by: _____

Date: 4/18/09

Form Version:[1613_HRMS12]Repor

Filename ; a27jan09a_12
Sample ; 8
Acquired ; 1-FEB-09 23:42:51
Processed ; 2-FEB-09 09:53:59
Sample ID ; G1040-3-2B
Cal Table ; m1613-100708a
Results Table ; m1613-012709a_12
Comments ;

;*1613*
;Inst: HRMS1

$$\frac{(.373)(6622)}{(3.84)(1.2612)(24.42)(.315)} = 23.799$$

Ent;	Name;	Resp;	Ion 1;	Ion 2;	RA;?;	RT;	Conc;	EDL;	S/N1;?;	S/N2;?;M; Signal1; Noise 1; Signal2; Noise 2
1 ;	2,3,7,8-TCDD;	*;	*;	*;	*;n;	NotFnd;	*;	0.1301;	*;n;	*;n;n; *;5.32e+03; *;5.99e+03
2 ;	1,2,3,7,8-PeCDD;	1.19e+05;	8.92e+04;	2.94e+04;	3.03;n;	34:16;	0.179;	0.2133;	4;y;	2;n;n;3.78e+04;1.07e+04;1.57e+04;7.71e+03
3 ;	1,2,3,4,7,8-HxCDD;	7.49e+04;	5.35e+04;	2.14e+04;	2.50;n;	36:53;	0.139;	0.2715;	2;n;	1;n;n;1.89e+04;7.87e+03;9.08e+03;7.55e+03
4 ;	1,2,3,6,7,8-HxCDD;	2.63e+05;	1.60e+05;	1.03e+05;	1.55;n;	36:58;	0.476;	0.2677;	6;y;	5;y;n;4.83e+04;7.87e+03;3.70e+04;7.55e+03
5 ;	1,2,3,7,8,9-HxCDD;	1.29e+05;	8.33e+04;	4.57e+04;	1.82;n;	37:14;	0.238;	0.2714;	3;y;	3;n;n;2.74e+04;7.87e+03;1.95e+04;7.55e+03
6 ;	1,2,3,4,6,7,8-HpCDD;	3.73e+06;	1.86e+06;	1.87e+06;	1.00;y;	40:20;	9.154;	0.5316;	53;y;	56;y;n;4.69e+05;8.92e+03;4.79e+05;8.55e+03
7 ;	OCDD;	2.40e+07;	1.14e+07;	1.26e+07;	0.90;y;	44:40;	85.580;	0.7757;	317;y;	365;y;n;2.12e+06;6.71e+03;2.32e+06;6.36e+03
8 ;	2,3,7,8-TCDF;	6.05e+05;	2.56e+05;	3.49e+05;	0.73;y;	30:53;	0.463;	0.1844;	6;y;	9;y;y;6.23e+04;9.95e+03;8.84e+04;9.88e+03
9 ;	1,2,3,7,8-PeCDF;	1.90e+05;	9.78e+04;	9.21e+04;	1.06;n;	33:28;	0.166;	0.1067;	5;y;	4;y;n;4.43e+04;9.52e+03;3.19e+04;7.70e+03
10 ;	2,3,4,7,8-PeCDF;	2.40e+05;	1.65e+05;	7.52e+04;	2.20;n;	34:05;	0.227;	0.1221;	6;y;	4;y;n;5.90e+04;9.52e+03;3.03e+04;7.70e+03
11 ;	1,2,3,4,7,8-HxCDF;	1.22e+05;	8.33e+04;	3.89e+04;	2.14;n;	36:10;	0.153;	0.1782;	4;y;	2;n;n;2.83e+04;6.74e+03;1.67e+04;9.67e+03
12 ;	1,2,3,6,7,8-HxCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.1589;	*;n;	*;n;n; *;6.74e+03; *;9.67e+03
13 ;	2,3,4,6,7,8-HxCDF;	1.03e+05;	6.58e+04;	3.69e+04;	1.78;n;	36:46;	0.128;	0.1826;	3;y;	2;n;n;2.04e+04;6.74e+03;2.01e+04;9.67e+03
14 ;	1,2,3,7,8,9-HxCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.2437;	*;n;	*;n;n; *;6.74e+03; *;9.67e+03
15 ;	1,2,3,4,6,7,8-HpCDF;	7.69e+05;	3.81e+05;	3.88e+05;	0.98;y;	39:03;	1.185;	0.2278;	16;y;	17;y;n;1.04e+05;6.39e+03;1.16e+05;6.98e+03
16 ;	1,2,3,4,7,8,9-HpCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.3589;	*;n;	*;n;n; *;6.39e+03; *;6.98e+03
17 ;	OCDF;	8.91e+05;	3.96e+05;	4.95e+05;	0.80;y;	44:58;	2.674;	0.6343;	11;y;	17;y;n;7.90e+04;6.96e+03;9.79e+04;5.74e+03
Extraction Standards										
18 ;	13C-2,3,7,8-TCDD;	8.34e+07;	3.65e+07;	4.69e+07;	0.78;y;	31:27;	83.196;	0.1745;	1443;y;	1918;y;n;1.13e+07;7.82e+03;1.46e+07;7.60e+03
19 ;	13C-1,2,3,7,8-PeCDD;	6.29e+07;	3.84e+07;	2.45e+07;	1.57;y;	34:15;	85.875;	0.2784;	1553;y;	1146;y;n;1.48e+07;9.56e+03;9.66e+06;8.43e+03
20 ;	13C-1,2,3,4,7,8-HxCDD;	5.23e+07;	2.92e+07;	2.31e+07;	1.27;y;	36:52;	82.249;	0.2585;	1229;y;	852;y;n;9.28e+06;7.55e+03;7.25e+06;8.51e+03
21 ;	13C-1,2,3,6,7,8-HxCDD;	5.58e+07;	3.13e+07;	2.46e+07;	1.27;y;	36:57;	80.766;	0.2379;	1287;y;	905;y;n;9.72e+06;7.55e+03;7.70e+06;8.51e+03
22 ;	13C-1,2,3,4,6,7,8-HpCDD;	3.84e+07;	1.98e+07;	1.86e+07;	1.07;y;	40:19;	73.658;	0.2447;	816;y;	682;y;n;4.74e+06;5.80e+03;4.55e+06;6.66e+03
23 ;	13C-OCDD;	5.26e+07;	2.49e+07;	2.78e+07;	0.90;y;	44:38;	126.880;	0.2758;	761;y;	949;y;n;4.52e+06;5.94e+03;4.97e+06;5.24e+03
24 ;	13C-2,3,7,8-TCDF;	1.26e+08;	5.57e+07;	7.03e+07;	0.79;y;	30:52;	84.825;	0.1063;	2122;y;	2332;y;n;1.38e+07;6.49e+03;1.73e+07;7.44e+03
25 ;	13C-1,2,3,7,8-PeCDF;	1.16e+08;	7.09e+07;	4.50e+07;	1.58;y;	33:27;	96.593;	0.3264;	1234;y;	1875;y;n;3.02e+07;2.44e+04;1.89e+07;1.01e+04
26 ;	13C-2,3,4,7,8-PeCDF;	1.02e+08;	6.24e+07;	3.98e+07;	1.57;y;	34:04;	86.930;	0.3334;	1017;y;	1575;y;n;2.49e+07;2.44e+04;1.59e+07;1.01e+04
27 ;	13C-1,2,3,4,7,8-HxCDF;	6.93e+07;	2.38e+07;	4.55e+07;	0.52;y;	36:09;	84.400;	0.1622;	1251;y;	2429;y;n;8.15e+06;6.52e+03;1.58e+07;6.50e+03
28 ;	13C-1,2,3,6,7,8-HxCDF;	7.76e+07;	2.69e+07;	5.07e+07;	0.53;y;	36:15;	85.582;	0.1470;	1457;y;	2750;y;n;9.50e+06;6.52e+03;1.79e+07;6.50e+03
29 ;	13C-2,3,4,6,7,8-HxCDF;	7.09e+07;	2.45e+07;	4.64e+07;	0.53;y;	36:45;	83.202;	0.1563;	1266;y;	2389;y;n;8.25e+06;6.52e+03;1.55e+07;6.50e+03
30 ;	13C-1,2,3,7,8,9-HxCDF;	6.30e+07;	2.17e+07;	4.13e+07;	0.53;y;	37:32;	82.949;	0.1755;	963;y;	1863;y;n;6.28e+06;6.52e+03;1.21e+07;6.50e+03
31 ;	13C-1,2,3,4,6,7,8-HpCDF;	4.72e+07;	1.46e+07;	3.26e+07;	0.45;y;	39:03;	72.492;	0.2447;	572;y;	1025;y;n;3.95e+06;6.92e+03;8.86e+06;8.64e+03
32 ;	13C-1,2,3,4,7,8,9-HpCDF;	3.65e+07;	1.13e+07;	2.53e+07;	0.45;y;	41:00;	71.223;	0.3106;	367;y;	655;y;n;2.54e+06;6.92e+03;5.66e+06;8.64e+03
Injection Standards										
33 ;	13C-1,2,3,4-TCDD;	8.99e+07;	3.97e+07;	5.01e+07;	0.79;y;	31:00;	66.137;	-;	1350;y;	1738;y;n;1.06e+07;7.82e+03;1.32e+07;7.60e+03
34 ;	13C-1,2,3,7,8,9-HxCDD;	6.62e+07;	3.69e+07;	2.93e+07;	1.26;y;	37:12;	61.317;	-;	1440;y;	1003;y;n;1.09e+07;7.55e+03;8.54e+06;8.51e+03
Cleanup Standard										
35 ;	37Cl-2,3,7,8-TCDD;	1.97e+07;	1.97e+07;	-;	-;-;	31:28;	18.445;	0.0717;	891;y;	-;-;n;6.02e+06;6.76e+03; -; -

Totals Raw Data

	Conc	Empc	Flags
TCDF	3.807	3.807	FALSE
TCDD	8.66	8.66	FALSE
PeCDF	0	0	FALSE
PeCDD	0	0	FALSE
HxCDF	0	0	FALSE
HxCDD	5.654	5.654	FALSE
HpCDF	0	0	FALSE
HpCDD	51.588	51.588	FALSE

Filename:	a27jan09a_12	Name of Homolog Group:	Total Tetra-Furans		
Sample:	8	Number of Peaks Found:	16	5	
Acquired:	1-FEB-09 23:42:51	RRF Used For Totals:	1.0368		
Processed:	2-FEB-09 09:53:59	Detection Limit:	0.1844		RL=0.500 (pg/µL)
Sample ID:	G1040-3-2B	Noise Height Ion1/Ion2:	9952 / 9880		
Cal Table:	m1613-100708a	Begin Window:			26:14:00
Results Table:	m1613-012709a_12	End Window:			33:07:00

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	4.10E+05	182000	229000	0.8	y	26:34	0.314	RL	3.3	y	5.2	y	n
	2	3.83E+05	176000	207000	0.85	y	27:33	0.293	RL	4.1	y	4.3	y	n
	3	1.41E+06	628000	781000	0.8	y	27:54	1.078	OK	9.9	y	12.2	y	y
	4	9.26E+05	413000	513000	0.81	y	28:14	0.709	OK	5.4	y	7.5	y	y
	5	1.78E+05	45900	132000	0.35	n	28:36	0.136	S2N	1.9	n	3.2	y	n
	6	3.17E+05	155000	162000	0.96	n	28:53	0.243	RL	3.1	y	3.7	y	n
	7	1.63E+05	73400	89800	0.82	y	29:11	0.125	S2N	1.8	n	2.5	n	n
	8	2.58E+05	117000	141000	0.83	y	29:21	0.197	RL	3.1	y	2.8	n	n
	9	1.12E+06	486000	631000	0.77	y	29:32	0.855	OK	7.9	y	10.9	y	y
	10	6.96E+05	316000	380000	0.83	y	29:59	0.533	OK	5.5	y	7.7	y	y
	11	2.05E+05	109000	96300	1.13	n	30:16	0.157	RL	2.7	n	2.9	n	n
	12	1.97E+05	71400	125000	0.57	n	30:40	0.151	S2N	1.8	n	2.9	n	n
	13	1.34E+05	56300	77900	0.72	y	30:48	0.103	S2N	2.2	n	2.5	n	n
2,3,7,8-TCDF	14	6.05E+05	256000	349000	0.73	y	30:53	0.463	RL	6.3	y	8.9	y	y
	15	8.25E+05	355000	470000	0.75	y	31:08	0.632	OK	9.9	y	13.7	y	n
	16	1.87E+05	112000	74600	1.5	n	32:05	0.143	RL	4.9	y	3.4	y	n

Filename:	a27jan09a_12	Name of Homolog Group:	Total Tetra-Dioxins		
Sample:	8	Number of Peaks Found:	6	4	
Acquired:	1-FEB-09 23:42:51	RRF Used For Totals:	1.0087		
Processed:	2-FEB-09 09:53:59	Detection Limit:	0.1301		RL=0.500 (pg/µL)
Sample ID:	G1040-3-2B	Noise Height Ion1/Ion2:	5320 / 5986		
Cal Table:	m1613-100708a	Begin Window:			27:40:00
Results Table:	m1613-012709a_12	End Window:			32:37:00

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	2.96E+06	1300000	1660000	0.78	y	28:19	3.514	OK	50.6	y	54.2	y	n

	2	2.78E+06	1220000	1550000	0.79	y	28:36	3.301	OK	44	y	47.6 y n
	3	3.67E+05	158000	209000	0.76	y	29:57	0.437	RL	5.6	y	7.1 y y
	4	3.36E+05	131000	205000	0.64	n	30:09	0.4	RL	5.5	y	6.5 y y
	5	8.65E+05	383000	482000	0.79	y	31:01	1.029	OK	19.7	y	20.1 y y
	6	6.86E+05	300000	387000	0.77	y	31:17	0.816	OK	11.7	y	14.9 y y

Filename:	a27jan09a_12		Name of Homolog Group:	Total Penta-Furans Fn1										
Sample:		8	Number of Peaks Found:	2	0									
Acquired:	1-FEB-09 23:42:51		RRF Used For Totals:	1.0121										
Processed:	2-FEB-09 09:53:59		Detection Limit:	0.084										
Sample ID:	G1040-3-2B		Noise Height Ion1/Ion2:	7360 / 5332										
Cal Table:	m1613-100708a		Begin Window:				31:45:00							
Results Table:	m1613-012709a_12		End Window:				32:05:00							
Name	#		Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	? Mod?
		1	6.21E+05	241000	380000		0.64 y	32:04	0.562	RL	13	y	29.9 y	n
		2	2.95E+04	21600	7970		2.7 n	32:09	0.027	RT	0.8	n	1 n	n

Filename:	a27jan09a_12		Name of Homolog Group:	Total Penta-Furans Fn2										
Sample:		8	Number of Peaks Found:	8	0									
Acquired:	1-FEB-09 23:42:51		RRF Used For Totals:	1.0121										
Processed:	2-FEB-09 09:53:59		Detection Limit:	0.1139						RL=2.500 (pg/µL)				
Sample ID:	G1040-3-2B		Noise Height Ion1/Ion2:	9524 / 7700										
Cal Table:	m1613-100708a		Begin Window:				31:42:00							
Results Table:	m1613-012709a_12		End Window:				34:51:00							
Name	#		Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	? Mod?
		1	2.75E+05	167000	108000		1.56 y	32:48	0.249	RL	6.4	y	5.1 y	n
		2	5.87E+05	356000	231000		1.54 y	32:54	0.532	RL	11.7	y	8.5 y	n
		3	2.39E+05	140000	99800		1.4 y	33:14	0.217	RL	4.7	y	4.2 y	n
		4	6.16E+04	34200	27400		1.25 n	33:21	0.056	S2N	1.4	n	1.7 n	n
1,2,3,7,8-PeCDF		5	1.90E+05	97800	92100		1.06 n	33:28	0.166	RL	4.6	y	4.1 y	n
		6	2.69E+05	144000	126000		1.14 n	33:37	0.244	RL	4.2	y	3.9 y	n
		7	1.65E+05	108000	56700		1.91 n	34:00	0.149	RL	4.4	y	3.7 y	n
2,3,4,7,8-PeCDF		8	2.40E+05	165000	75200		2.2 n	34:05	0.227	RL	6.2	y	3.9 y	n

Filename:	a27jan09a_12		Name of Homolog Group:	Total Penta-Dioxins										
Sample:		8	Number of Peaks Found:	7	0									
Acquired:	1-FEB-09 23:42:51		RRF Used For Totals:	1.0517										
Processed:	2-FEB-09 09:53:59		Detection Limit:	0.2133						RL=2.500 (pg/µL)				
Sample ID:	G1040-3-2B		Noise Height Ion1/Ion2:	10652/ 7712										
Cal Table:	m1613-100708a		Begin Window:				32:51:00							

Results Table: m1613-012709a_12 End Window: 34:36:00

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	1.25E+06	761000	487000		1.56 y	32:55	1.885	RL	24.4	y	21	y	n
	2	6.57E+04	35600	30000		1.19 n	33:11	0.099	S2N	2	n	1.7	n	n
	3	1.10E+06	673000	427000		1.58 y	33:29	1.661	RL	27.7	y	26.9	y	n
	4	1.04E+06	638000	402000		1.59 y	33:38	1.572	RL	20.8	y	21.4	y	n
	5	1.05E+05	62700	42100		1.49 y	33:46	0.158	S2N	2.3	n	2	n	n
	6	5.44E+05	343000	201000		1.71 y	33:59	0.821	RL	12.7	y	11.4	y	n
1,2,3,7,8-PeCDD	7	1.19E+05	89200	29400		3.03 n	34:16	0.179	S2N	3.5	y	2	n	n

Filename: a27jan09a_12 Name of Homolog Group: Total Hexa-Furans
Sample: 8 Number of Peaks Found: 6 0
Acquired: 1-FEB-09 23:42:51 RRF Used For Totals: 1.1305
Processed: 2-FEB-09 09:53:59 Detection Limit: 0.1883 RL=2.500 (pg/µL)
Sample ID: G1040-3-2B Noise Height Ion1/Ion2: 6736 / 9668
Cal Table: m1613-100708a Begin Window: 35:05:00
Results Table: m1613-012709a_12 End Window: 37:39:00

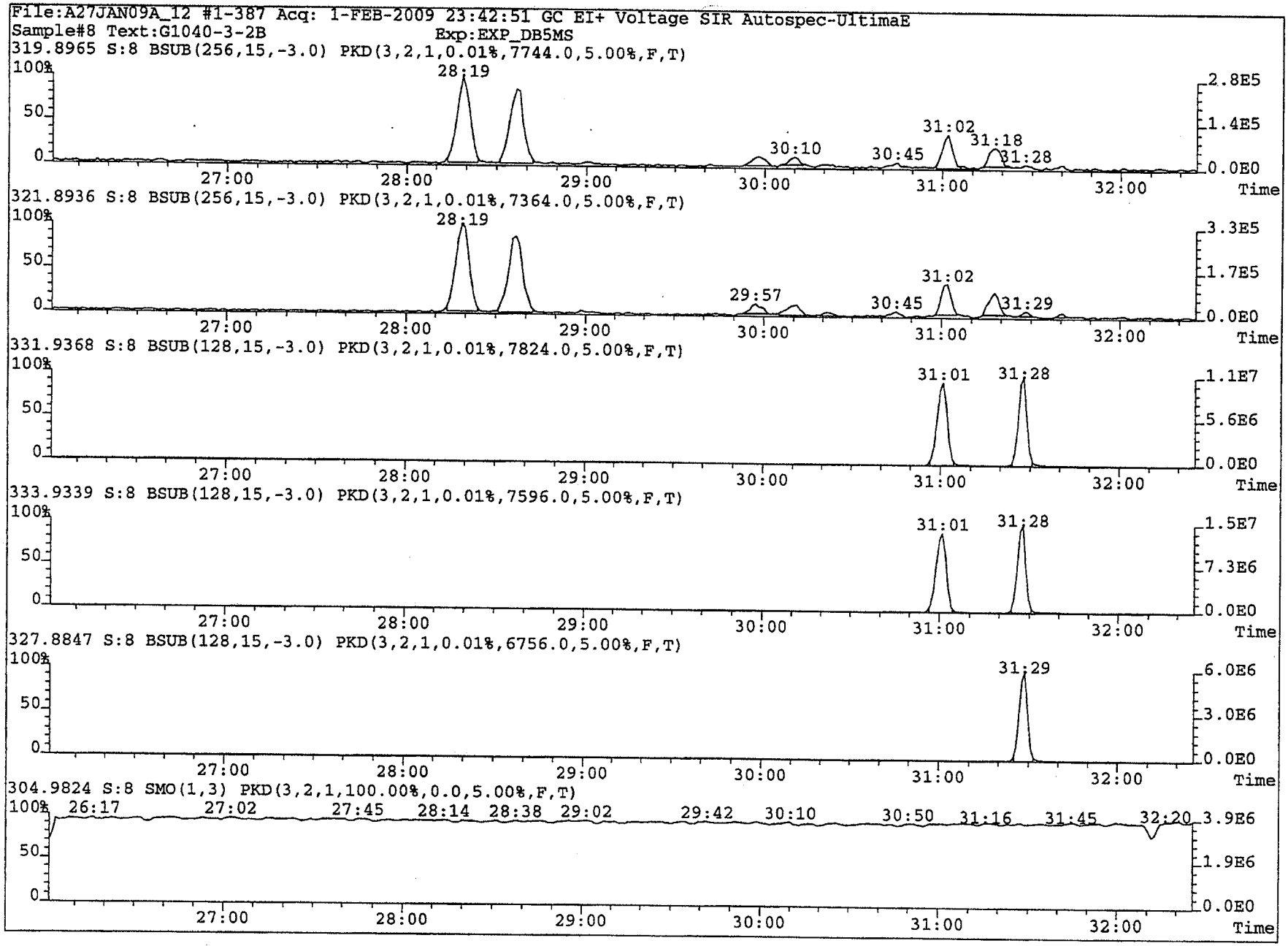
Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	1.63E+05	92800	70700		1.31 y	35:12	0.206	RL	5.4	y	3.2	y	n
	2	5.67E+05	339000	228000		1.48 n	35:20	0.715	RL	17	y	8.6	y	n
	3	5.15E+05	297000	217000		1.37 y	35:46	0.649	RL	15.1	y	8.4	y	n
1,2,3,4,7,8-HxCDF	4	1.22E+05	83300	38900		2.14 n	36:10	0.153	S2N	4.2	y	1.7	n	n
2,3,4,6,7,8-HxCDF	5	1.03E+05	65800	36900		1.78 n	36:46	0.128	S2N	3	y	2.1	n	n
	6	1.56E+04	7420	8150		0.91 n	36:50	0.02	S2N	0.6	n	0.6	n	n

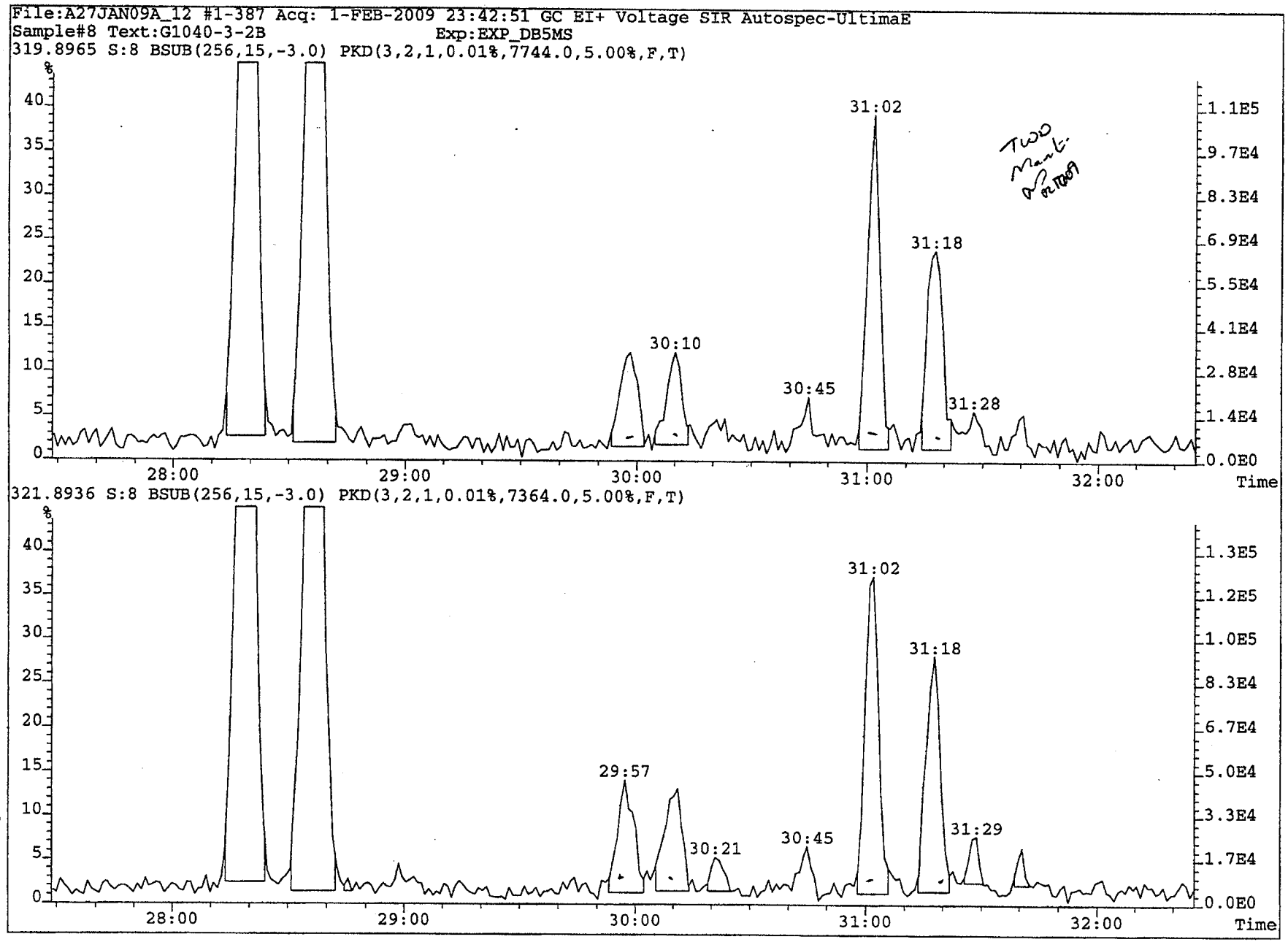
Filename: a27jan09a_12 Name of Homolog Group: Total Hexa-Dioxins
Sample: 8 Number of Peaks Found: 9 2
Acquired: 1-FEB-09 23:42:51 RRF Used For Totals: 1.0077
Processed: 2-FEB-09 09:53:59 Detection Limit: 0.2704 RL=2.500 (pg/µL)
Sample ID: G1040-3-2B Noise Height Ion1/Ion2: 7868 / 7548
Cal Table: m1613-100708a Begin Window: 35:35:00
Results Table: m1613-012709a_12 End Window: 37:16:00

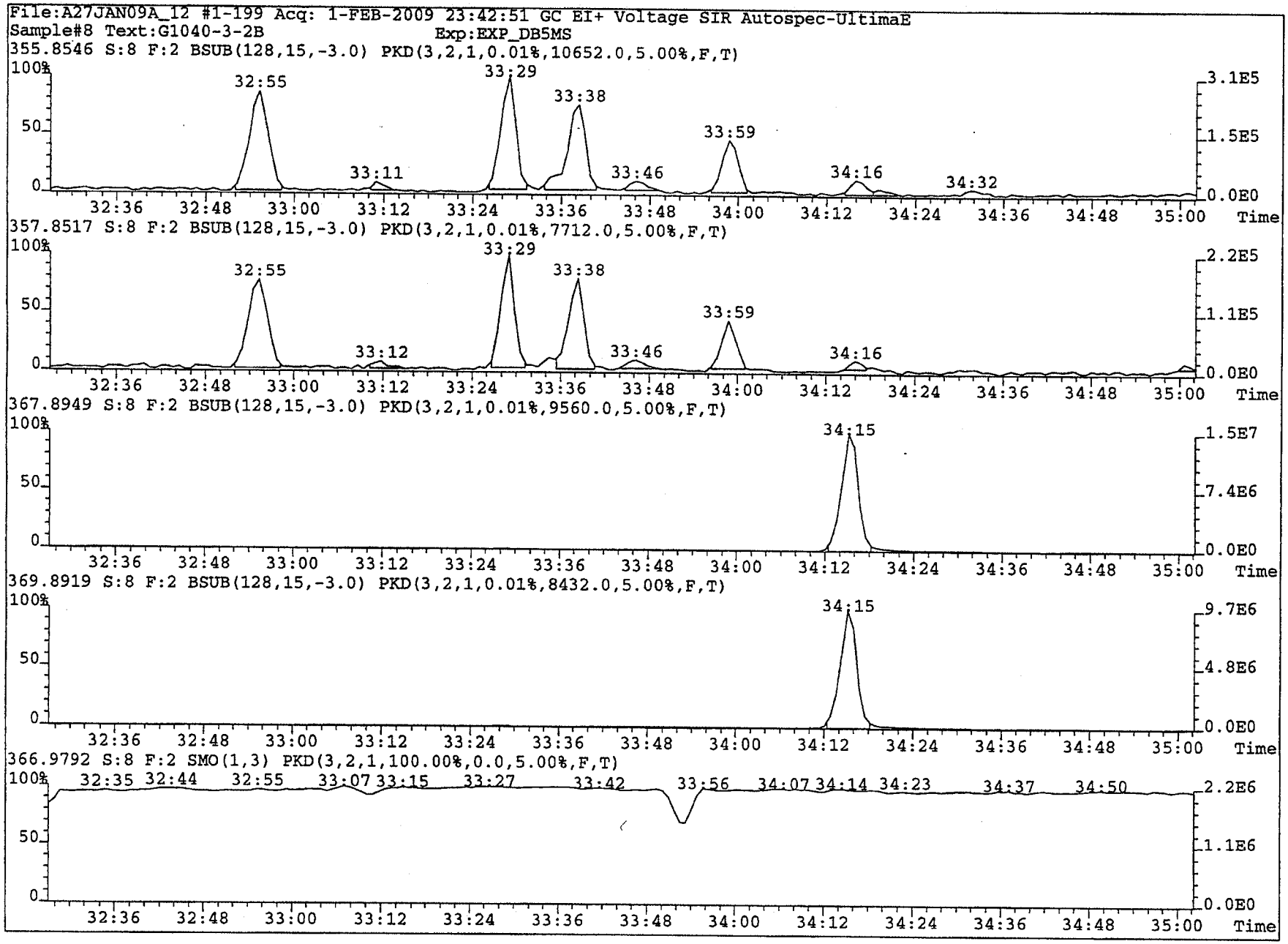
Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	1.28E+06	711000	566000		1.26 y	35:38	2.344	RL	29.1	y	23.7	y	n
	2	1.69E+06	950000	743000		1.28 y	36:05	3.107	OK	41.4	y	32.9	y	n
	3	1.39E+06	747000	641000		1.17 y	36:18	2.547	OK	26.7	y	23.5	y	n
	4	2.62E+05	140000	122000		1.14 y	36:24	0.48	RL	6.2	y	5.1	y	n
1,2,3,4,7,8-HxCDD	5	7.49E+04	53500	21400		2.5 n	36:53	0.139	S2N	2.4	n	1.2	n	n
1,2,3,6,7,8-HxCDD	6	2.63E+05	160000	103000		1.55 n	36:58	0.476	RL	6.1	y	4.9	y	n
	7	5.36E+04	25800	27800		0.93 n	37:08	0.098	S2N	1.1	n	2	n	n
1,2,3,7,8,9-HxCDD	8	1.29E+05	83300	45700		1.82 n	37:14	0.238	RL	3.5	y	2.6	n	n
	9	3.60E+05	102000	258000		0.4 n	37:51	0.661	RT	4.7	y	10.9	y	n

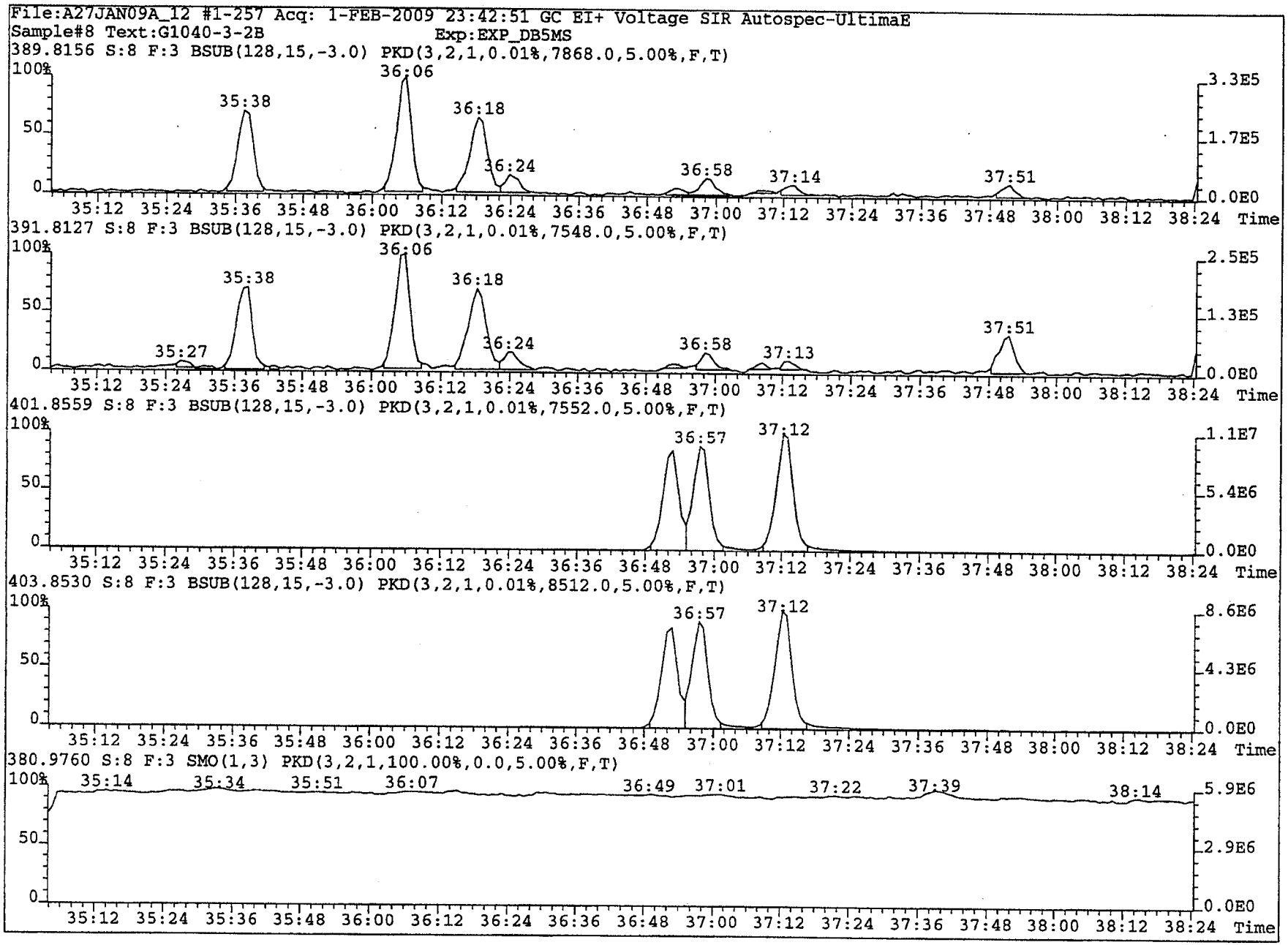
Filename:	a27jan09a_12		Name of Homolog Group:	Total Hepta-Furans											
Sample:		8	Number of Peaks Found:	3	0										
Acquired:	1-FEB-09 23:42:51		RRF Used For Totals:	1.3693											
Processed:	2-FEB-09 09:53:59		Detection Limit:	0.2847							RL=2.500 (pg/µL)				
Sample ID:	G1040-3-2B		Noise Height Ion1/Ion2:	6388 / 6984											
Cal Table:	m1613-100708a		Begin Window:							38:52:00					
Results Table:	m1613-012709a_12		End Window:							41:04:00					
Name	#		Response		Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	? Mod?
1,2,3,4,6,7,8-HpCDI		1		7.69E+05	381000	388000		0.98 y	39:03	1.185	RL	16.3	y	16.7	y n
		2		1.20E+06	621000	583000		1.07 y	39:36	2.102	RL	23.9	y	23.1	y n
		3		1.99E+04	11800	8150		1.45 n	39:41	0.035	S2N	1.1	n	0.8	n n

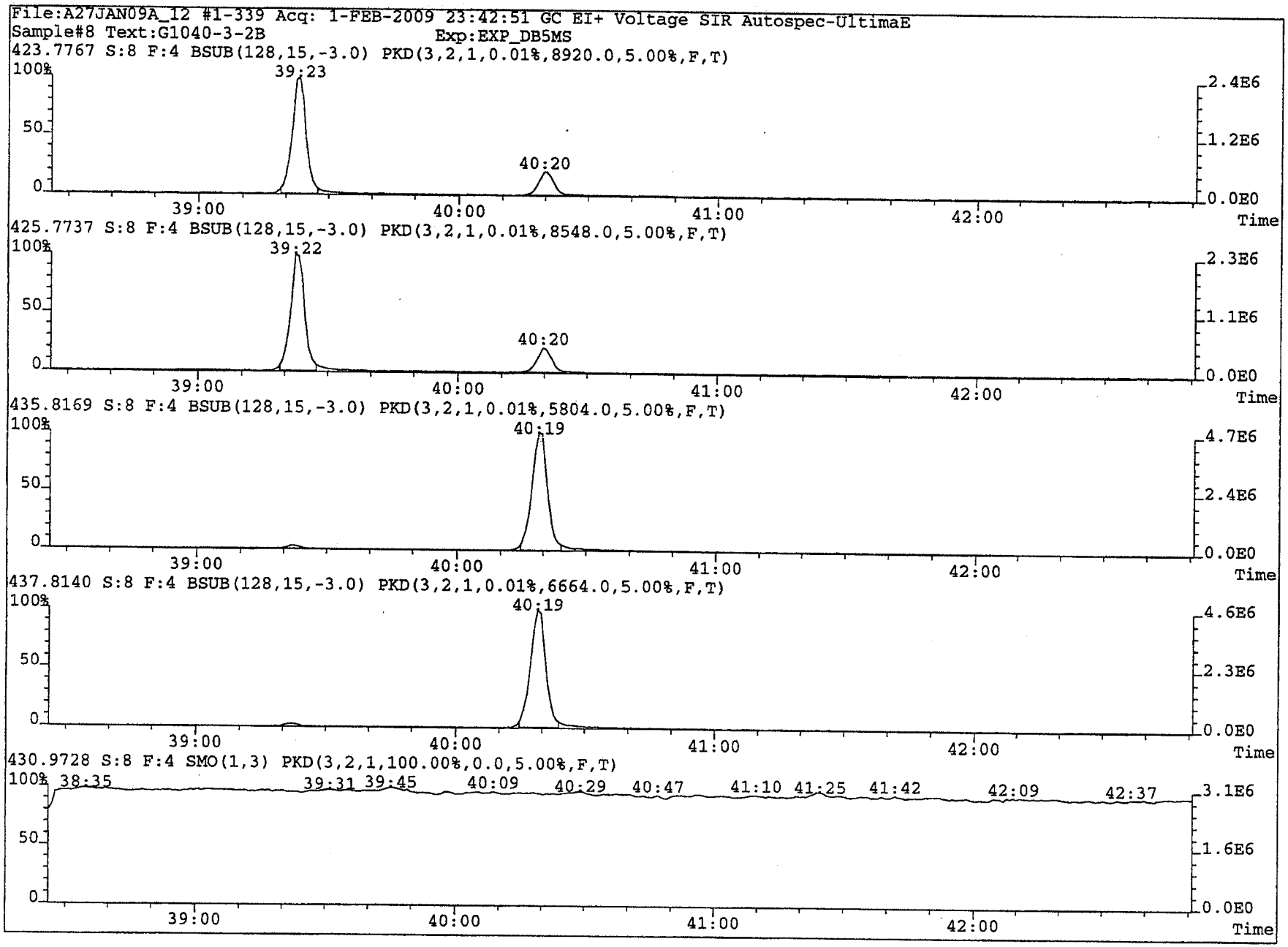
Filename:	a27jan09a_12		Name of Homolog Group:	Total Hepta-Dioxins											
Sample:		8	Number of Peaks Found:	2	2										
Acquired:	1-FEB-09 23:42:51		RRF Used For Totals:	1.0612											
Processed:	2-FEB-09 09:53:59		Detection Limit:	0.5316							RL=2.500 (pg/µL)				
Sample ID:	G1040-3-2B		Noise Height Ion1/Ion2:	8920 / 8548											
Cal Table:	m1613-100708a		Begin Window:							39:17:00					
Results Table:	m1613-012709a_12		End Window:							40:29:00					
Name	#		Response		Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	? Mod?
		1		1.73E+07	8870000	8420000		1.05 y	39:23	42.434	OK	268.4	y	265.5	y n
1,2,3,4,6,7,8-HpCDI		2		3.73E+06	1860000	1870000		1 y	40:20	9.154	OK	52.6	y	56.1	y n

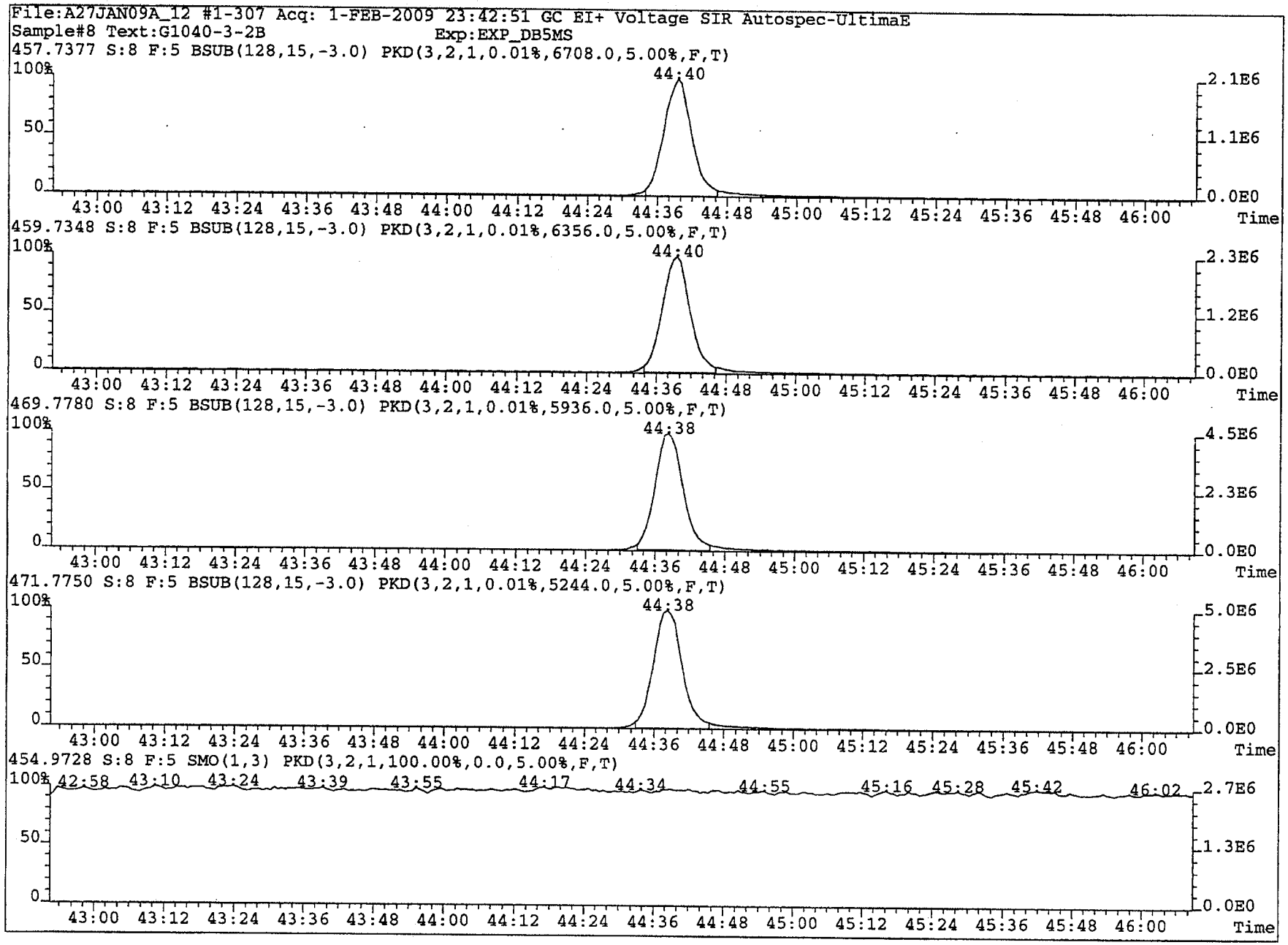

File:A27JAN09A_12 #1-387 Acq: 1-FEB-2009 23:42:51 GC EI+ Voltage SIR Autospec-UltimaE
Sample#8 Text:G1040-3-2B Exp:EXP_DB5MS
319.8965 S:8 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,7744.0,5.00%,F,T)
28:19
30:10
30:45
31:02
31:18
31:28
2.8E5
1.4E5
0.0E0
321.8936 S:8 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,7364.0,5.00%,F,T)
28:19
29:57
30:45
31:02
31:29
3.3E5
1.7E5
0.0E0
331.9368 S:8 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7824.0,5.00%,F,T)
31:01
31:28
1.1E7
5.6E6
0.0E0
333.9339 S:8 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7596.0,5.00%,F,T)
31:01
31:28
1.5E7
7.3E6
0.0E0
327.8847 S:8 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6756.0,5.00%,F,T)
31:29
6.0E6
3.0E6
0.0E0
304.9824 S:8 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
26:17
27:02
27:45
28:14
28:38
29:02
29:42
30:10
30:50
31:16
31:45
32:20
3.9E6
1.9E6
0.0E0
100%
50
0
27:00
28:00
29:00
30:00
31:00
32:00
Time

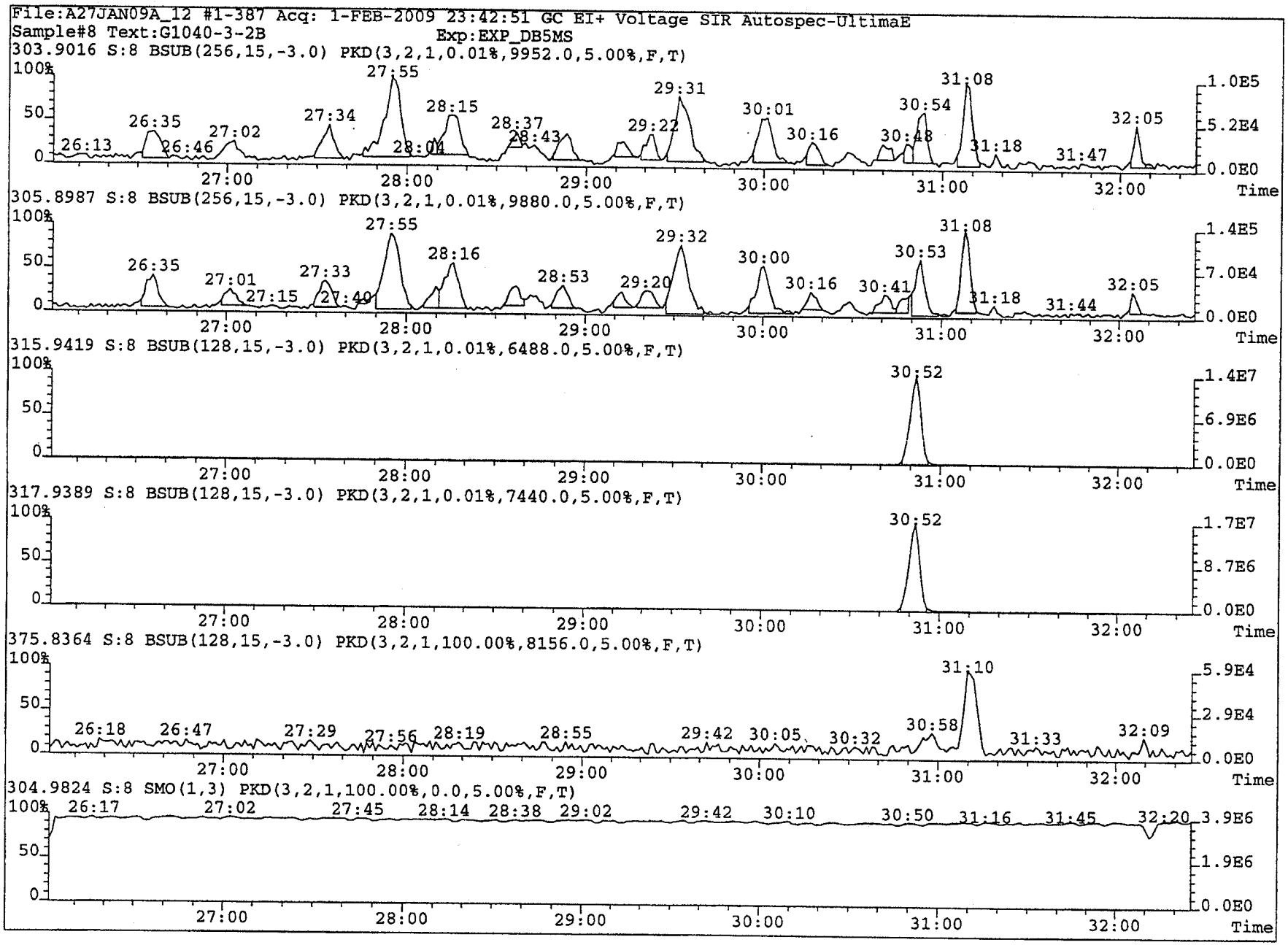

File:A27JAN09A_12 #1-387 Acq: 1-FEB-2009 23:42:51 GC EI+ Voltage SIR Autospec-UltimaE
Sample#8 Text:G1040-3-2B Exp:EXP_DB5MS
319.8965 S:8 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,7744.0,5.00%,F,T)
31:02
31:18
30:10
30:45
31:28
Two Main Peaks
28:00
29:00
30:00
31:00
32:00
Time
321.8936 S:8 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,7364.0,5.00%,F,T)
31:02
31:18
29:57
30:21
30:45
31:29
28:00
29:00
30:00
31:00
32:00
Time

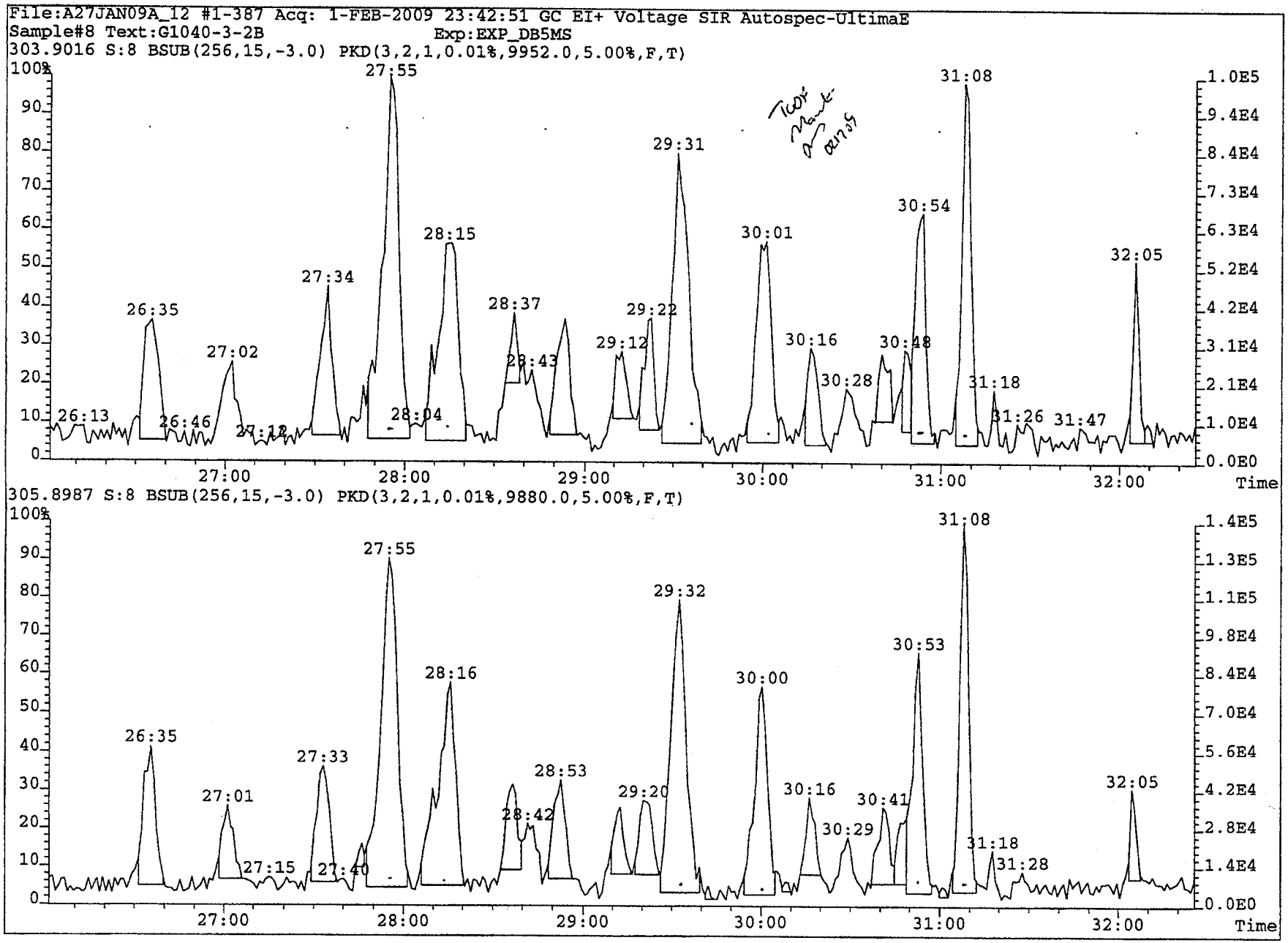

File:A27JAN09A_12 #1-199 Acq: 1-FEB-2009 23:42:51 GC EI+ Voltage SIR Autospec-UltimaE
Sample#8 Text:G1040-3-2B Exp:EXP_DB5MS
355.8546 S:8 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,10652.0,5.00%,F,T)
32:55
33:11
33:29
33:38
33:46
33:59
34:16
34:32
3.1E5
1.5E5
0.0E0
357.8517 S:8 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7712.0,5.00%,F,T)
32:55
33:12
33:29
33:38
33:46
33:59
34:16
2.2E5
1.1E5
0.0E0
367.8949 S:8 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,9560.0,5.00%,F,T)
34:15
1.5E7
7.4E6
0.0E0
369.8919 S:8 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,8432.0,5.00%,F,T)
34:15
9.7E6
4.8E6
0.0E0
366.9792 S:8 F:2 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
32:35 32:44 32:55 33:07 33:15 33:27 33:42 33:56 34:07 34:14 34:23 34:37 34:50
2.2E6
1.1E6
0.0E0
100%
50
0
32:36 32:48 33:00 33:12 33:24 33:36 33:48 34:00 34:12 34:24 34:36 34:48 35:00
Time

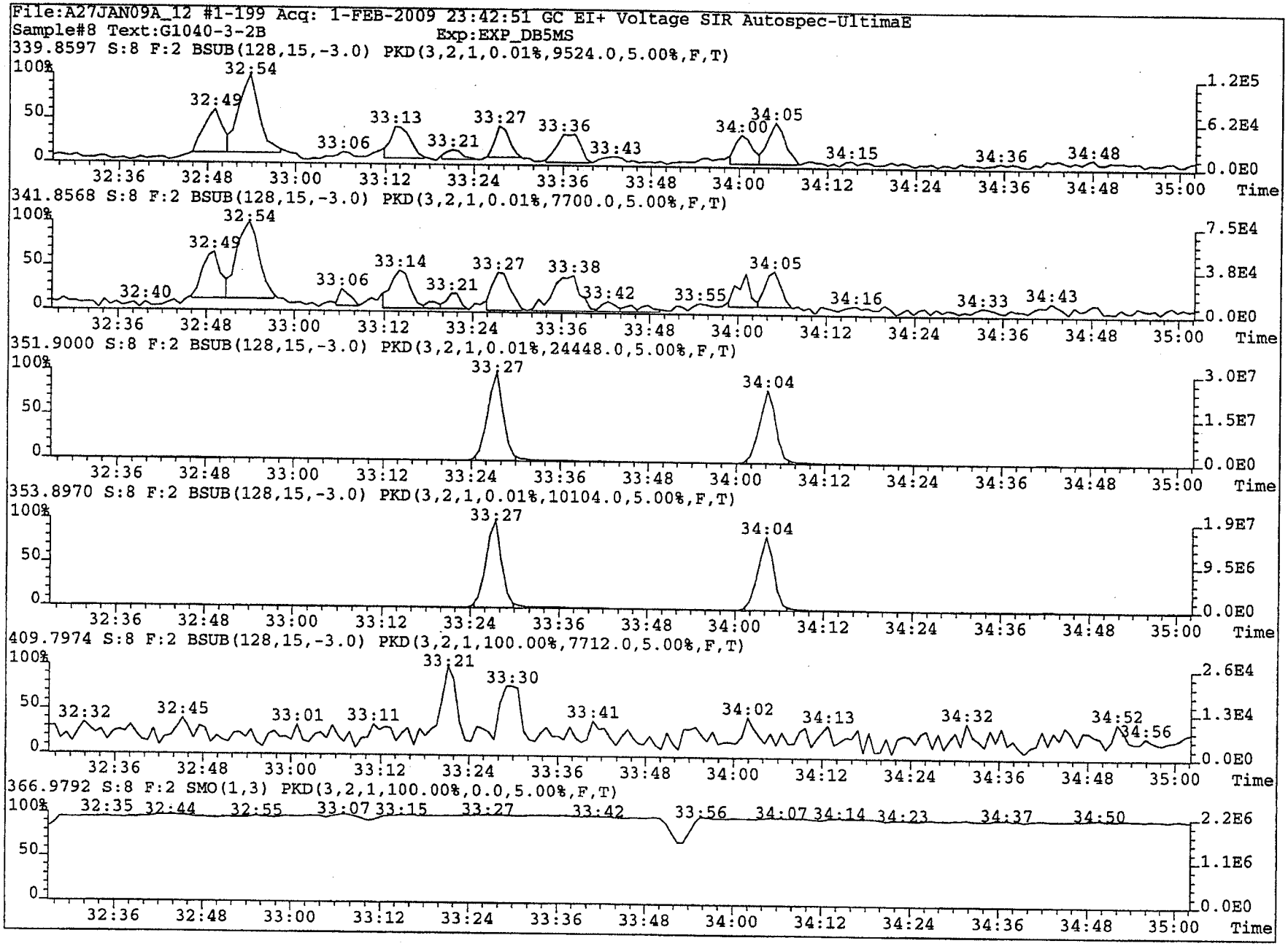

File:A27JAN09A_12 #1-257 Acq: 1-FEB-2009 23:42:51 GC EI+ Voltage SIR Autospec-UltimaE
Sample#8 Text:G1040-3-2B
Exp:EXP_DB5MS
389.8156 S:8 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7868.0,5.00%,F,T)
35:38
36:06
36:18
36:24
36:58
37:14
37:51
391.8127 S:8 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7548.0,5.00%,F,T)
35:27
35:38
36:06
36:18
36:24
36:58
37:13
37:51
401.8559 S:8 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7552.0,5.00%,F,T)
36:57
37:12
403.8530 S:8 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,8512.0,5.00%,F,T)
36:57
37:12
380.9760 S:8 F:3 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
35:14
35:34
35:51
36:07
36:49
37:01
37:22
37:39
38:14
Time

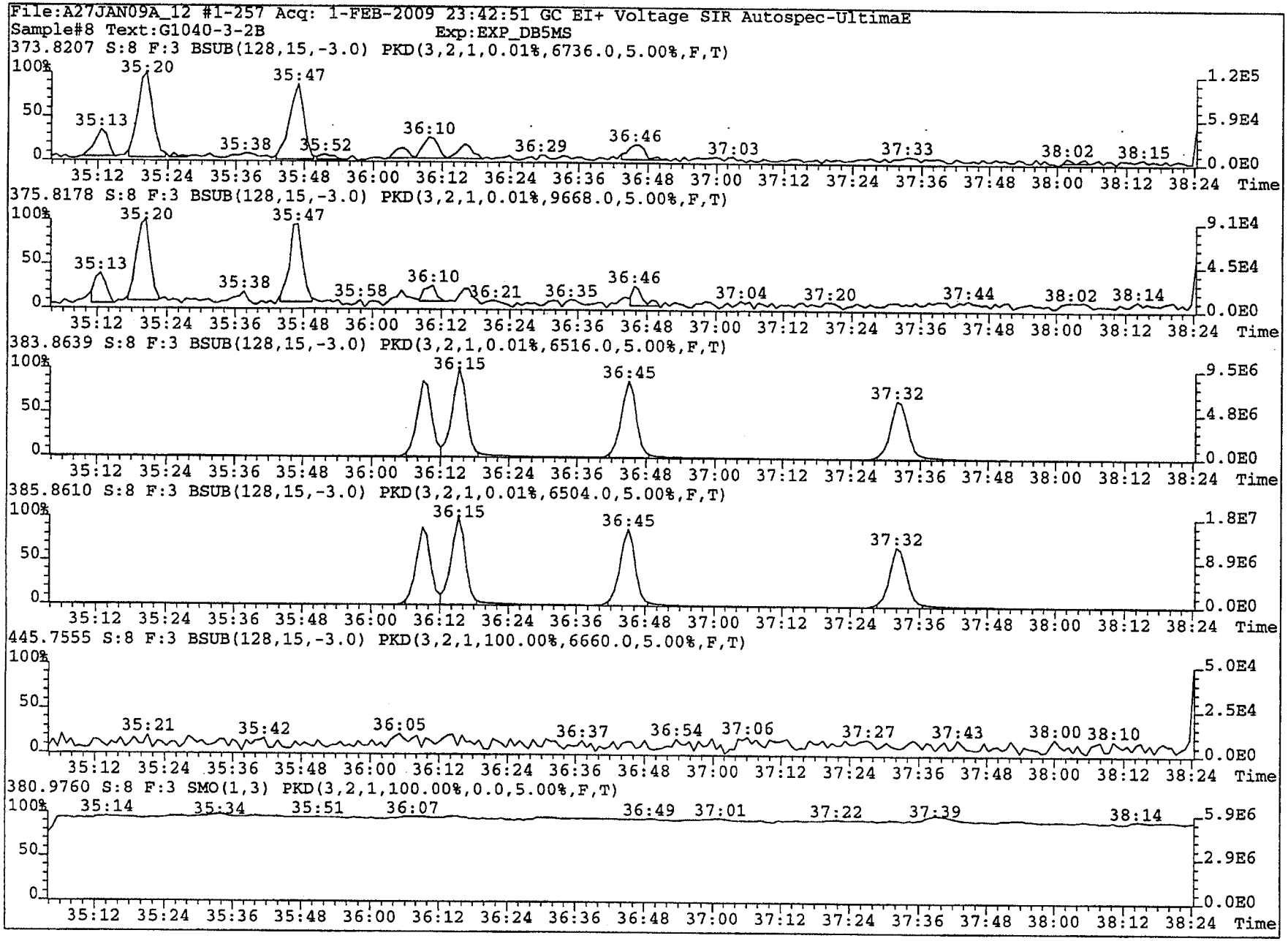

File:A27JAN09A_12 #1-339 Acq: 1-FEB-2009 23:42:51 GC EI+ Voltage SIR Autospec-UltimaE
Sample#8 Text:G1040-3-2B Exp:EXP_DB5MS
423.7767 S:8 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,8920.0,5.00%,F,T)
39:23
40:20
425.7737 S:8 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,8548.0,5.00%,F,T)
39:22
40:20
435.8169 S:8 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5804.0,5.00%,F,T)
40:19
437.8140 S:8 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6664.0,5.00%,F,T)
40:19
430.9728 S:8 F:4 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
38:35 39:31 39:45 40:09 40:29 40:47 41:10 41:25 41:42 42:09 42:37
100%
50
0
39:00
40:00
41:00
42:00
Time
2.4E6
1.2E6
0.0E0
2.3E6
1.1E6
4.7E6
2.4E6
4.6E6
2.3E6
3.1E6
1.6E6

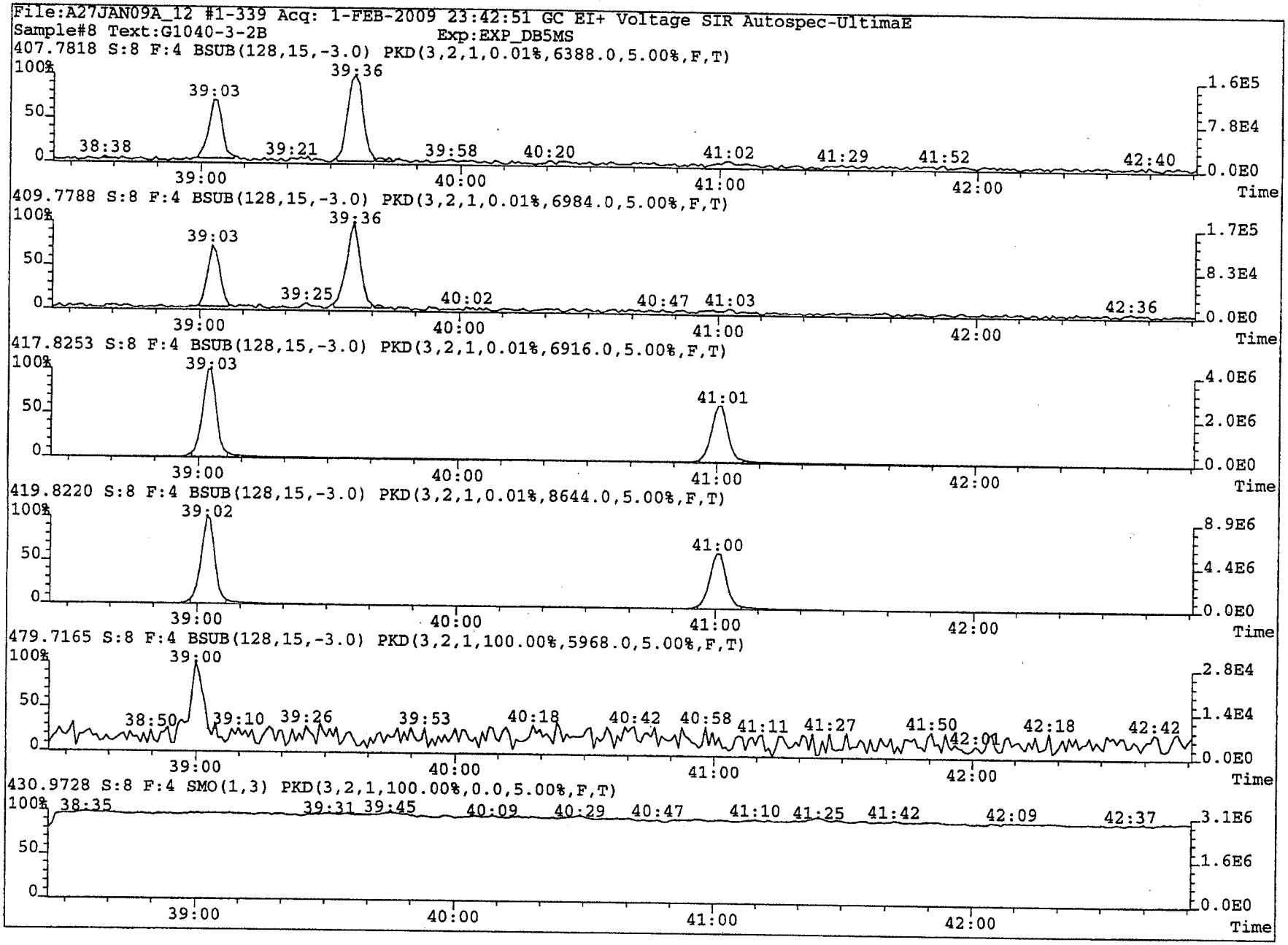

File:A27JAN09A_12 #1-307 Acq: 1-FEB-2009 23:42:51 GC EI+ Voltage SIR Autospec-UltimaE
Sample#8 Text:G1040-3-2B Exp:EXP_DB5MS
457.7377 S:8 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6708.0,5.00%,F,T)
44:40
2.1E6
1.1E6
0.0E0
459.7348 S:8 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6356.0,5.00%,F,T)
44:40
2.3E6
1.2E6
0.0E0
469.7780 S:8 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5936.0,5.00%,F,T)
44:38
4.5E6
2.3E6
0.0E0
471.7750 S:8 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5244.0,5.00%,F,T)
44:38
5.0E6
2.5E6
0.0E0
454.9728 S:8 F:5 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
42:58 43:10 43:24 43:39 43:55 44:17 44:34 44:55 45:16 45:28 45:42 46:02
2.7E6
1.3E6
0.0E0
100%
50
0
43:00 43:12 43:24 43:36 43:48 44:00 44:12 44:24 44:36 44:48 45:00 45:12 45:24 45:36 45:48 46:00
Time

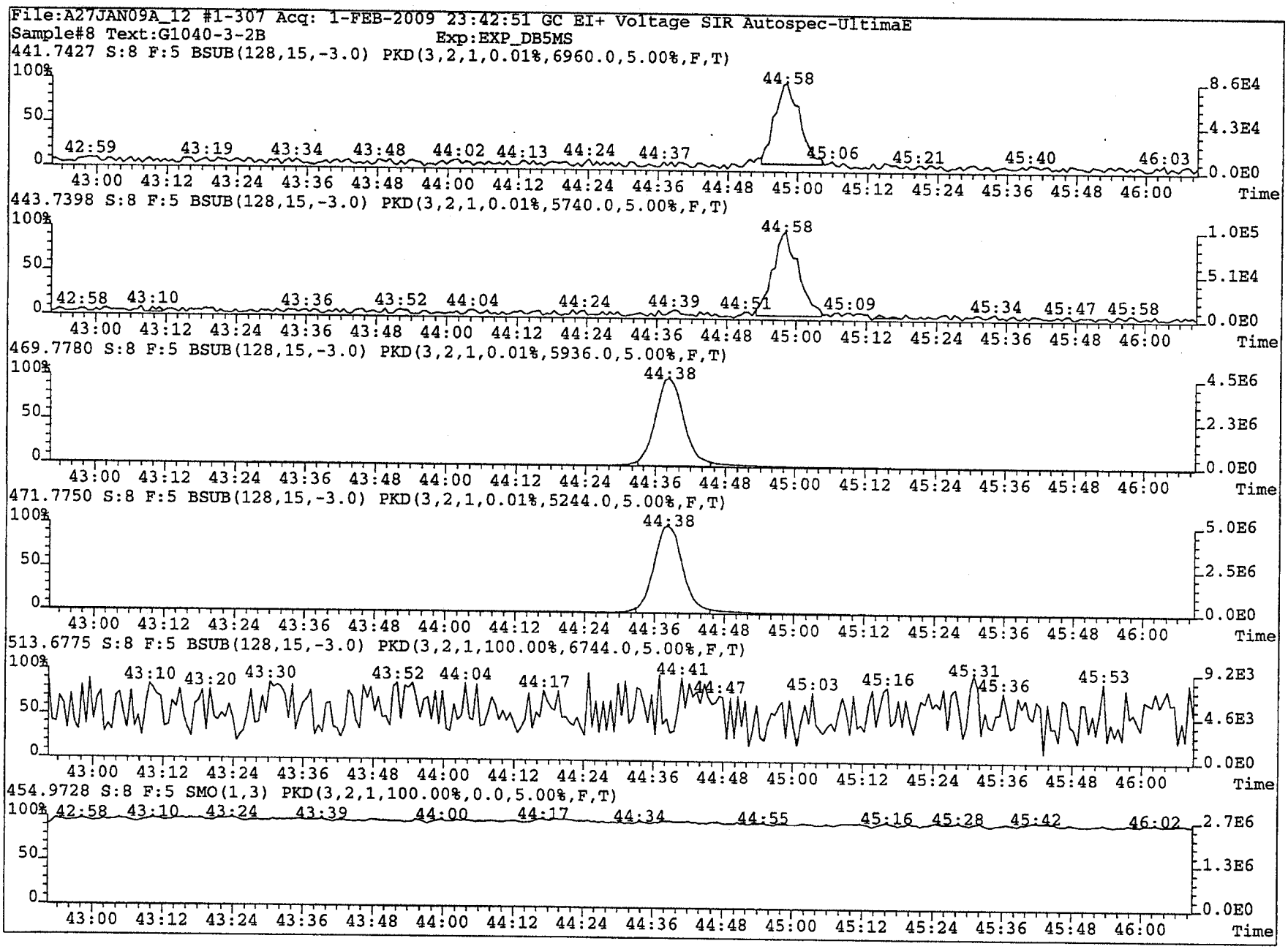

File:A27JAN09A_12 #1-387 Acq: 1-FEB-2009 23:42:51 GC EI+ Voltage SIR Autospec-UltimaE
Sample#8 Text:G1040-3-2B
Exp:EXP_DB5MS
303.9016 S:8 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,9952.0,5.00%,F,T)
305.8987 S:8 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,9880.0,5.00%,F,T)
315.9419 S:8 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6488.0,5.00%,F,T)
317.9389 S:8 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7440.0,5.00%,F,T)
375.8364 S:8 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,8156.0,5.00%,F,T)
304.9824 S:8 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time

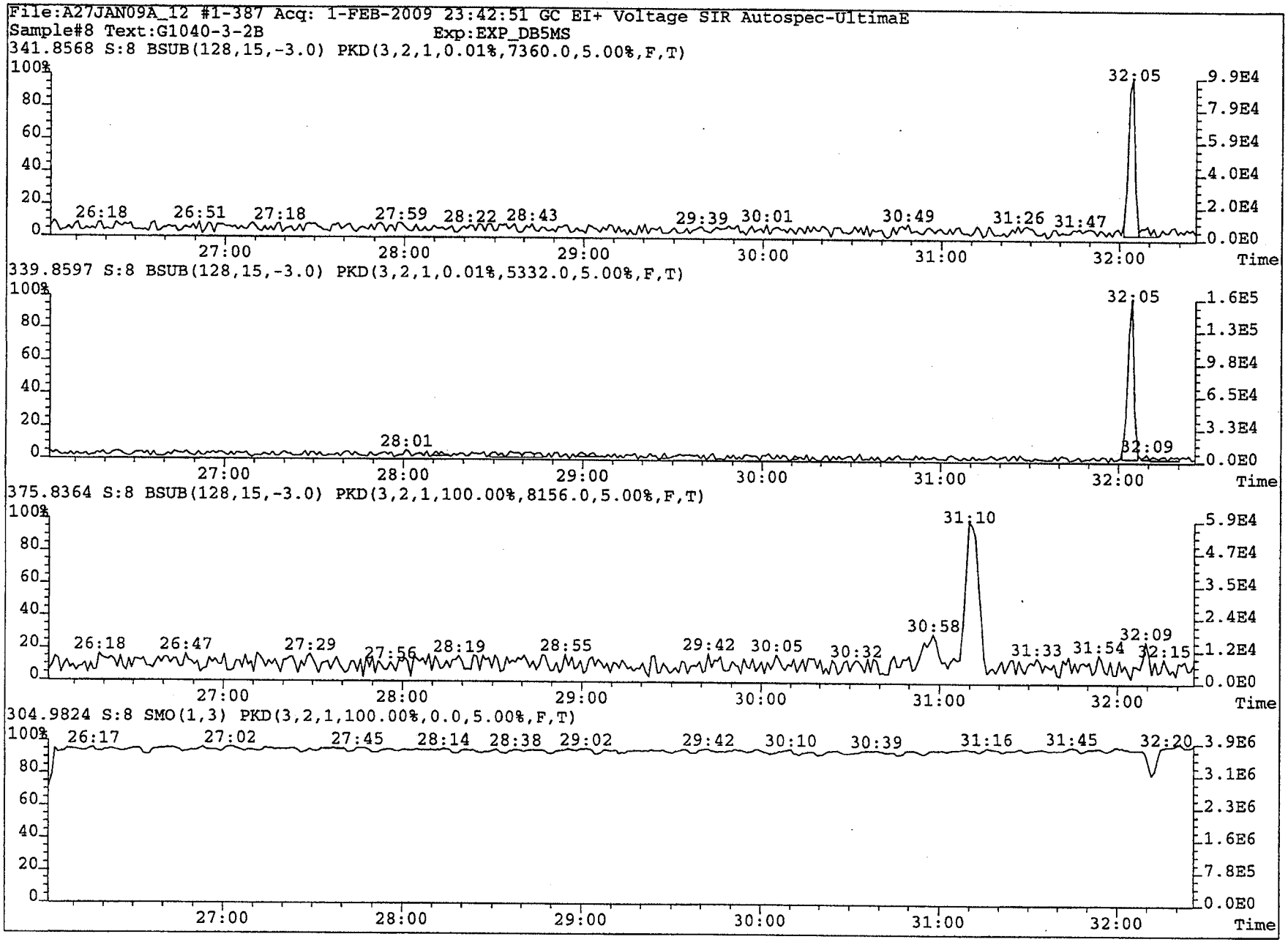

File:A27JAN09A_12 #1-387 Acq: 1-FEB-2009 23:42:51 GC EI+ Voltage SIR Autospec-UltimaE
Sample#8 Text:G1040-3-2B Exp:EXP_DB5MS
303.9016 S:8 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,9952.0,5.00%,F,T)
26:13
26:35
26:46
27:02
27:12
27:34
27:55
28:04
28:15
28:37
28:43
29:12
29:22
29:31
30:01
30:16
30:28
30:48
30:54
31:08
31:18
31:26
31:47
32:05
305.8987 S:8 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,9880.0,5.00%,F,T)
26:35
27:01
27:15
27:33
27:40
27:55
28:16
28:42
28:53
29:20
29:32
30:00
30:16
30:29
30:41
30:53
31:08
31:18
31:28
32:05
27:00
28:00
29:00
30:00
31:00
32:00
Time


File:A27JAN09A_12 #1-199 Acq: 1-FEB-2009 23:42:51 GC EI+ Voltage SIR Autospec-UltimaE
Sample#8 Text:G1040-3-2B Exp:EXP_DB5MS
339.8597 S:8 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,9524.0,5.00%,F,T)
341.8568 S:8 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7700.0,5.00%,F,T)
351.9000 S:8 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,24448.0,5.00%,F,T)
353.8970 S:8 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,10104.0,5.00%,F,T)
409.7974 S:8 F:2 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,7712.0,5.00%,F,T)
366.9792 S:8 F:2 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time


File:A27JAN09A_12 #1-257 Acq: 1-FEB-2009 23:42:51 GC EI+ Voltage SIR Autospec-UltimaE
Sample#8 Text:G1040-3-2B Exp:EXP_DB5MS
373.8207 S:8 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6736.0,5.00%,F,T)
35:13 35:20 35:38 35:47 35:52 36:10 36:29 36:46 37:03 37:33 38:02 38:15
1.2E5 5.9E4 0.0E0
375.8178 S:8 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,9668.0,5.00%,F,T)
35:13 35:20 35:38 35:47 35:58 36:10 36:21 36:35 36:46 37:04 37:20 37:44 38:02 38:14
9.1E4 4.5E4 0.0E0
383.8639 S:8 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6516.0,5.00%,F,T)
36:15 36:45 37:32
9.5E6 4.8E6 0.0E0
385.8610 S:8 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6504.0,5.00%,F,T)
36:15 36:45 37:32
1.8E7 8.9E6 0.0E0
445.7555 S:8 F:3 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,6660.0,5.00%,F,T)
35:21 35:42 36:05 36:37 36:54 37:06 37:27 37:43 38:00 38:10
5.0E4 2.5E4 0.0E0
380.9760 S:8 F:3 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
35:14 35:34 35:51 36:07 36:49 37:01 37:22 37:39 38:14
5.9E6 2.9E6 0.0E0
100% 50 0
35:12 35:24 35:36 35:48 36:00 36:12 36:24 36:36 36:48 37:00 37:12 37:24 37:36 37:48 38:00 38:12 38:24 Time


File:A27JAN09A_12 #1-339 Acq: 1-FEB-2009 23:42:51 GC EI+ Voltage SIR Autospec-UltimaE
Sample#8 Text:G1040-3-2B Exp:EXP_DB5MS
407.7818 S:8 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6388.0,5.00%,F,T)
39:03
39:36
38:38
39:21
39:58
40:20
41:02
41:29
41:52
42:40
1.6E5
7.8E4
0.0E0
409.7788 S:8 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6984.0,5.00%,F,T)
39:03
39:36
39:25
40:02
40:47
41:03
42:36
1.7E5
8.3E4
0.0E0
417.8253 S:8 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6916.0,5.00%,F,T)
39:03
41:01
4.0E6
2.0E6
0.0E0
419.8220 S:8 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,8644.0,5.00%,F,T)
39:02
41:00
8.9E6
4.4E6
0.0E0
479.7165 S:8 F:4 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,5968.0,5.00%,F,T)
39:00
38:50
39:10
39:26
39:53
40:18
40:42
40:58
41:11
41:27
41:50
42:18
42:42
2.8E4
1.4E4
0.0E0
430.9728 S:8 F:4 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
38:35
39:31
39:45
40:09
40:29
40:47
41:10
41:25
41:42
42:09
42:37
3.1E6
1.6E6
0.0E0
100%
50
0
39:00
40:00
41:00
42:00
Time


File:A27JAN09A_12 #1-307 Acq: 1-FEB-2009 23:42:51 GC EI+ Voltage SIR Autospec-UltimaE
Sample#8 Text:G1040-3-2B Exp:EXP_DB5MS
441.7427 S:8 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6960.0,5.00%,F,T)
443.7398 S:8 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5740.0,5.00%,F,T)
469.7780 S:8 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5936.0,5.00%,F,T)
471.7750 S:8 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5244.0,5.00%,F,T)
513.6775 S:8 F:5 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,6744.0,5.00%,F,T)
454.9728 S:8 F:5 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time


File:A27JAN09A_12 #1-387 Acq: 1-FEB-2009 23:42:51 GC EI+ Voltage SIR Autospec-UltimaE
Sample#8 Text:G1040-3-2B Exp:EXP_DB5MS
341.8568 S:8 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7360.0,5.00%,F,T)
339.8597 S:8 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5332.0,5.00%,F,T)
375.8364 S:8 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,8156.0,5.00%,F,T)
304.9824 S:8 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time

TCDF Confirmation - Method 1613
PGSS-22
Analytical Resources, Inc.

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	Adj. RL (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDF	1.47	1.30	21.18	0.88	

Labeled Standard	Spiked Amount (ng)	RT (min.)	Ratio	Qualifier
Extraction Standards				
13C12-2,3,7,8-TCDF	2	21.18	0.76	

Client Information			**Sample Information**		
Project Name:	Port Gamble		Report Basis:	Dry	
			Matrix:	Sediment	
Sample ID:	PGSS-22		Weight / Volume:	24.42	g
			Solids / Lipids:	31.5	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG16440	
Project ID:	G1040-3		Instrument:		
Sample ID:	G1040-3-2B		Filename:	c20feb09b-8	
Collection Date/Time:	12/04/08	13:48	Retchk:	c20feb09b-5	
Receipt Date:	01/15/09	10:15	Begin ConCal:	c20feb09b-2	
Extraction Date:	01/19/09				
Analysis Date/Time:	02/20/09	14:22	Initial Cal:	mcf-c042108a	

Analyzed by: _____
Date: _____

Reviewed by: _____
Date: 2/23/09

Quantify Sample Summary Report MassLynx 4.1
Confirms Sample Summary

Dataset: [illegible]

Last Altered: Friday, February 20, 2009 16:34:13 Eastern Standard Time
Printed: Friday, February 20, 2009 16:35:43 Eastern Standard Time

Name: c20feb09b-8
Date: 20-Feb-2009
Time: 14:22:25
ID: G1040-3-2B
User: HMP
Submitter: mcf-c042108a
Task: HRMS3

	Name	Response	Ion1Area	Ion2Area	RA	RAFail?	RRT	RT	pg/µL	EDL	SN1	SN2	M	Height1	Noise1	Height2	Noise2
1	2378-TCDF	5.277e3	2.469e3	2.809e3	0.88	NO	1.0000	21.18	0.565	0.2258	7.8	7.4	MM	4.622e4	5894	4.696e4	6354
2	ES:13C-2378-TCDF	8.927e5	3.864e5	5.063e5	0.76	NO	1.0446	21.18	86.573	0.5057	391.0	661.3	bb	6.737e6	17227	8.604e6	13011
3	JS:13C-1234-TCDD	6.839e5	3.065e5	3.774e5	0.81	NO	0.0000	20.27	58.931	0.2163	690.7	971.4	db	5.332e6	7720	6.638e6	6834
4	Hexa Ether	9.887e1	9.887e1	-	-	-	0.0000	15.31	-	-	0.0	-	bb	6.581e3	0	-	-
5	F1 Lock Mass	1.567e4	1.567e4	-	-	-	0.0000	15.06	-	-	0.0	-	bb	3.016e5	0	-	-

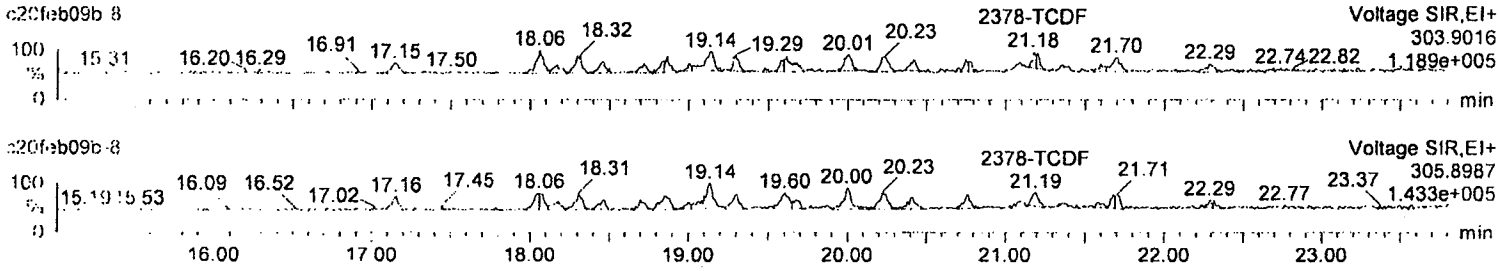
Quantify Sample Report **MassLynx 4.1**
Confirms Sample Summary

Dataset: Untitled

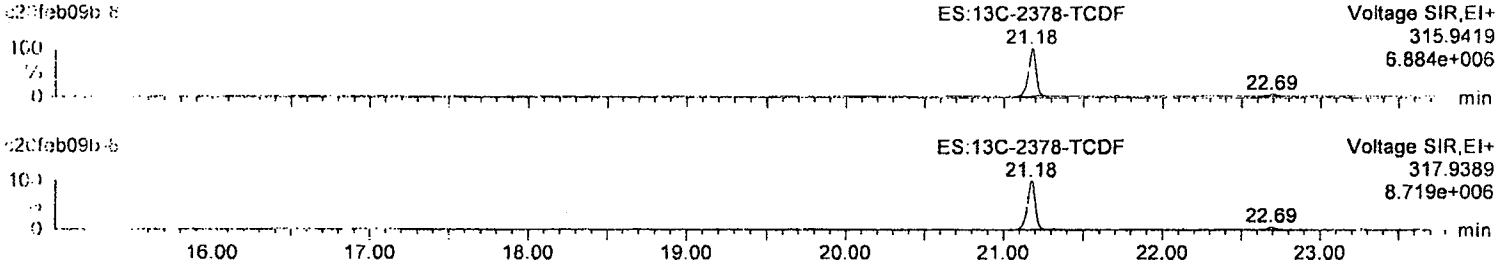
Last Altered: Friday, February 20, 2009 16:25:52 Eastern Standard Time
Printed: Friday, February 20, 2009 16:26:14 Eastern Standard Time

Name: c20feb09b-8, ID: **G1040-3-2B**

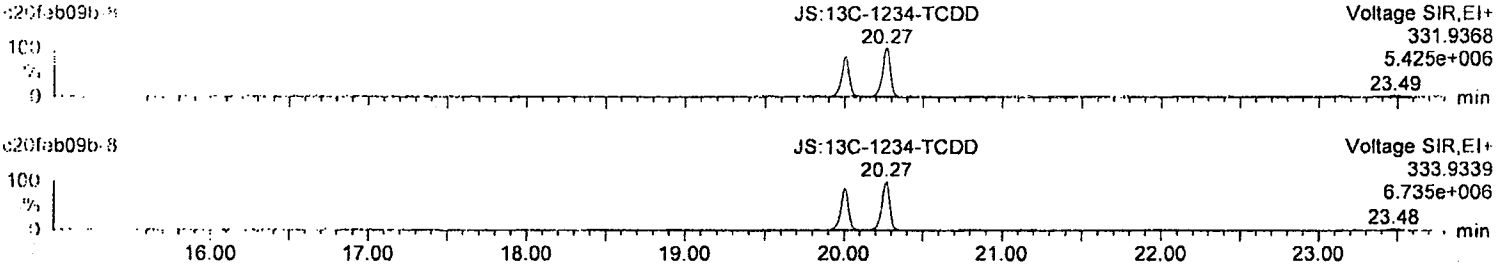
2378-TCDF



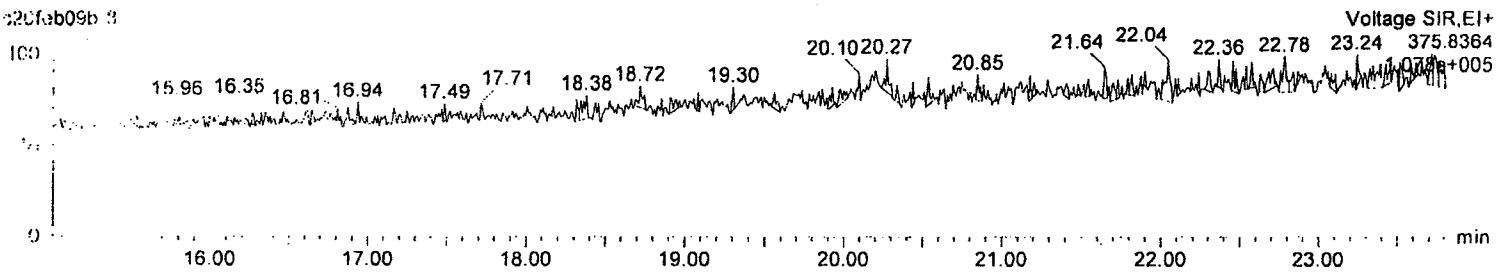
ES:13C-2378-TCDF



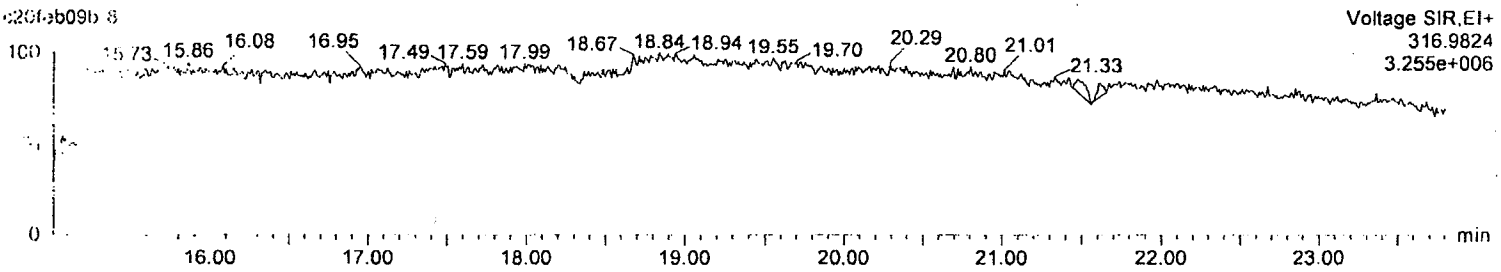
JS 13C-1234-TCDD

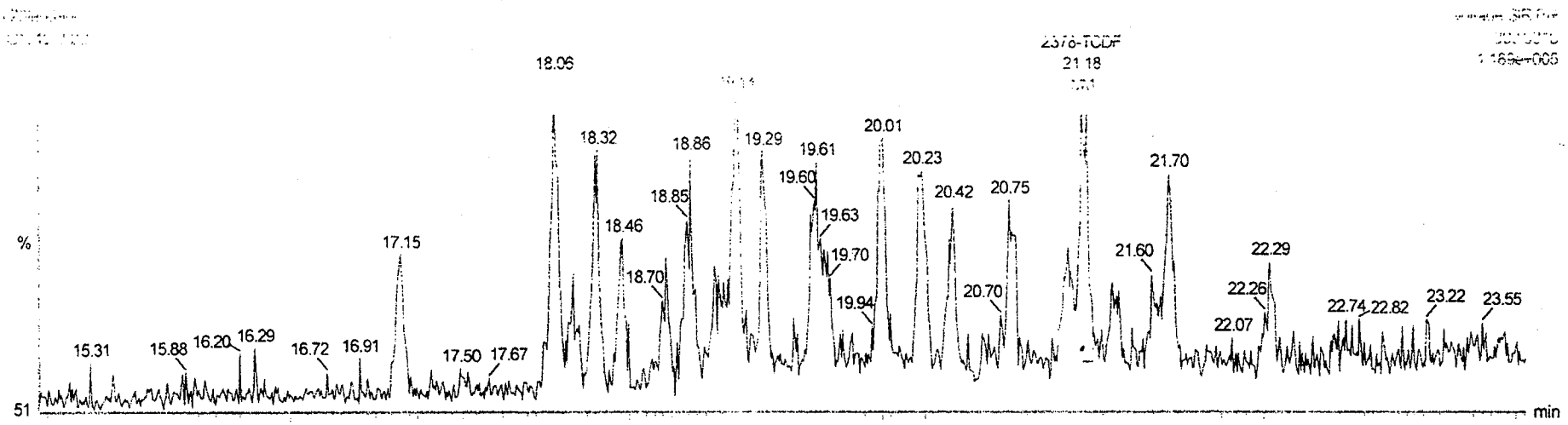


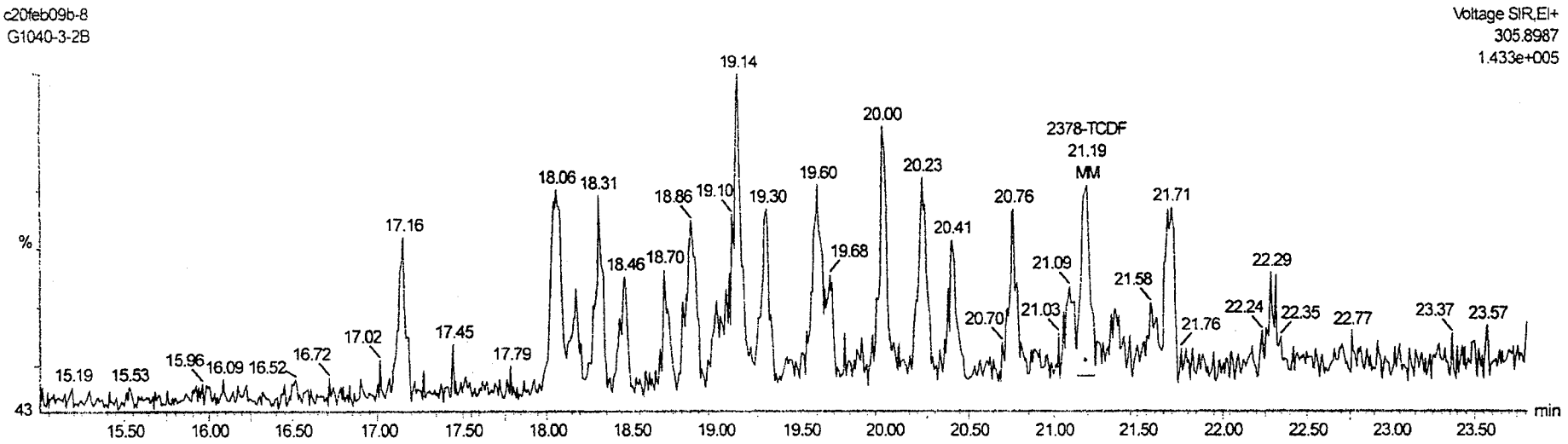
Hexa Ether



F1 Lock Mass







TCDF
Mn 6.
02209

Method 1613

PGSS-8

Analytical Resources, Inc.

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	RL (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	1.00			
1,2,3,7,8-PeCDD	ND	5.00			
1,2,3,4,7,8-HxCDD	ND	5.00			
1,2,3,6,7,8-HxCDD	ND	5.00			
1,2,3,7,8,9-HxCDD	ND	5.00			
1,2,3,4,6,7,8-HpCDD	9.50	5.00	40:20	1.01	
OCDD	70.6	10.0	44:40	0.89	
2,3,7,8-TCDF	ND	1.00			
1,2,3,7,8-PeCDF	ND	5.00			
2,3,4,7,8-PeCDF	ND	5.00			
1,2,3,4,7,8-HxCDF	ND	5.00			
1,2,3,6,7,8-HxCDF	ND	5.00			
2,3,4,6,7,8-HxCDF	ND	5.00			
1,2,3,7,8,9-HxCDF	ND	5.00			
1,2,3,4,6,7,8-HpCDF	ND	5.00			
1,2,3,4,7,8,9-HpCDF	ND	5.00			
OCDF	ND	10.0			
Total TCDDs	5.02	1.00			
Total PeCDDs	ND	5.00			Q
Total HxCDDs	ND	5.00			
Total HpCDDs	34.1	5.00			
Total TCDFs	ND	1.00			
Total PeCDFs	ND	5.00			
Total HxCDFs	ND	5.00			
Total HpCDFs	ND	5.00			
WHO-2005 TEQ (ND=0)	0.116				
WHO-2005 TEQ (ND=½)	5.79				

Client Information

Project Name:	Port Gamble		**Sample Information**		
			Matrix:	Sediment	
Sample ID:	PGSS-8		Weight / Volume:	24.56	grams
			Solids / Lipids:	33.5	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG16440	
Project ID:	G1040-3				
Sample ID:	G1040-3-1B		Filename:	a27jan09a_12-7	
Collection Date/Time:	04-Dec-08	09:55	Retchk:	a27jan09a_11-15	
Receipt Date:	15-Jan-09	10:15	Begin ConCal:	a27jan09a_11-15	
Extraction Date:	19-Jan-09				
Analysis Date:	01-Feb-09	22:54	Initial Cal:	m1613-100708a	

Method 1613

PGSS-8

Analytical Resources, Inc.

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
$^{13}C_{12}$-2,3,7,8-TCDD	2	1.63	81.7	31:27	0.79	
$^{13}C_{12}$-1,2,3,7,8-PeCDD	2	1.64	82.0	34:15	1.57	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	2	1.67	83.7	36:52	1.27	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	2	1.69	84.5	36:57	1.26	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	2	1.49	74.6	40:19	1.06	
$^{13}C_{12}$-OCDD	4	2.48	62.1	44:39	0.90	
$^{13}C_{12}$-2,3,7,8-TCDF	2	1.66	82.8	30:52	0.79	
$^{13}C_{12}$-1,2,3,7,8-PeCDF	2	1.78	88.9	33:27	1.58	
$^{13}C_{12}$-2,3,4,7,8-PeCDF	2	1.67	83.4	34:04	1.57	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	2	1.71	85.6	36:09	0.52	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	2	1.77	88.6	36:15	0.53	
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	2	1.71	85.6	36:45	0.52	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	2	1.66	83.2	37:32	0.53	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	2	1.50	74.8	39:03	0.45	
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	2	1.47	73.6	41:01	0.45	
Cleanup Standard						
$^{37}Cl_4$-2,3,7,8-TCDD	0.4	0.357	89.3	31:28		
Injection Standards						
$^{13}C_{12}$-1,2,3,4-TCDD	2			31:01	0.79	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	2			37:12	1.24	

Client Information

Project Name:	Port Gamble
Sample ID:	PGSS-8

Laboratory Information

Project ID:	G1040-3	
Sample ID:	G1040-3-1B	
Collection Date/Time:	04-Dec-08	09:55
Receipt Date:	15-Jan-09	10:15
Extraction Date:	19-Jan-09	
Analysis Date:	01-Feb-09	22:54

Sample Information

Matrix:	Sediment	
Weight / Volume:	24.56	grams
Solids / Lipids:	33.5	%
Original pH :	NA	
Batch ID:	WG16440	
Filename:	a27jan09a_12-7	
Retchk:	a27jan09a_11-15	
Begin ConCal:	a27jan09a_11-15	
Initial Cal:	m1613-100708a	

Analyzed by: _____ Reviewed by: _____

Date: 02/7/09 Date: 2/18/09

Form Version:[1613_HRMS12]Report

;*1613*
;Inst: HRMS1

Filename ; a27jan09a_12
Sample ; 7
Acquired ; 1-FEB-09 22:54:30
Processed ; 2-FEB-09 09:53:34
Sample ID ; G1040-3-1B
Cal Table ; m1613-100708a
Results Table ; m1613-012709a_12
Comments ;

(.134)(2000) / (3.24)(1.0612)(64.2)(.335) = 9.474

Ent;	Name;	Resp;	Ion 1;	Ion 2;	RA;?;	RT;	Conc;	EDL;	S/N1;?;	S/N2;?;M; Signal1; Noise 1; Signal2; Noise 2
1 ;	2,3,7,8-TCDD;	1.89e+05;	6.87e+04;	1.20e+05;	0.57;n;	31:28;	0.250;	0.1269;	5;y;	7;y;y;2.16e+04;4.66e+03;4.41e+04;6.17e+03
2 ;	1,2,3,7,8-PeCDD;	3.72e+05;	2.36e+05;	1.36e+05;	1.73;y;	34:17;	0.642;	0.2166;	8;y;	7;y;n;7.83e+04;9.39e+03;5.17e+04;7.18e+03
3 ;	1,2,3,4,7,8-HxCDD;	*;	*;	*;	*;n;	NotFnd;	*;	0.2719;	*;n;	*;n;n; *;5.80e+03; *;7.84e+03
4 ;	1,2,3,6,7,8-HxCDD;	2.01e+05;	1.24e+05;	7.71e+04;	1.60;n;	36:58;	0.417;	0.2677;	8;y;	4;y;n;4.72e+04;5.80e+03;3.19e+04;7.84e+03
5 ;	1,2,3,7,8,9-HxCDD;	1.03e+05;	6.82e+04;	3.51e+04;	1.94;n;	37:13;	0.222;	0.2716;	5;y;	2;n;n;2.66e+04;5.80e+03;1.53e+04;7.84e+03
6 ;	1,2,3,4,6,7,8-HpCDD;	1.34e+06;	6.75e+05;	6.69e+05;	1.01;y;	40:20;	3.914;	0.5298;	24;y;	25;y;n;1.85e+05;7.76e+03;1.86e+05;7.41e+03
7 ;	OCDD;	6.64e+06;	3.13e+06;	3.51e+06;	0.89;y;	44:40;	29.082;	0.7611;	105;y;	114;y;n;5.93e+05;5.66e+03;6.46e+05;5.67e+03
8 ;	2,3,7,8-TCDF;	2.40e+05;	1.13e+05;	1.27e+05;	0.88;y;	30:52;	0.206;	0.1695;	5;y;	3;y;y;3.31e+04;6.78e+03;3.56e+04;1.02e+04
9 ;	1,2,3,7,8-PeCDF;	8.23e+04;	4.96e+04;	3.28e+04;	1.51;y;	33:28;	0.085;	0.1164;	2;n;	2;n;n;2.17e+04;8.84e+03;1.51e+04;7.14e+03
10 ;	2,3,4,7,8-PeCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.1214;	*;n;	*;n;n; *;8.84e+03; *;7.14e+03
11 ;	1,2,3,4,7,8-HxCDF;	6.30e+04;	3.18e+04;	3.11e+04;	1.02;n;	36:10;	0.093;	0.1869;	2;n;	2;n;n;1.28e+04;8.37e+03;1.11e+04;6.08e+03
12 ;	1,2,3,6,7,8-HxCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.1719;	*;n;	*;n;n; *;8.37e+03; *;6.08e+03
13 ;	2,3,4,6,7,8-HxCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.1832;	*;n;	*;n;n; *;8.37e+03; *;6.08e+03
14 ;	1,2,3,7,8,9-HxCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.2508;	*;n;	*;n;n; *;8.37e+03; *;6.08e+03
15 ;	1,2,3,4,6,7,8-HpCDF;	4.93e+05;	2.73e+05;	2.20e+05;	1.24;n;	39:04;	0.884;	0.2903;	11;y;	9;y;n;7.36e+04;6.83e+03;6.79e+04;7.96e+03
16 ;	1,2,3,4,7,8,9-HpCDF;	*;	*;	*;	*;n;	NotFnd;	*;	0.4358;	*;n;	*;n;n; *;6.83e+03; *;7.96e+03
17 ;	OCDF;	4.67e+05;	2.76e+05;	1.91e+05;	1.45;n;	44:58;	1.722;	0.7711;	8;y;	6;y;n;5.57e+04;6.74e+03;4.35e+04;6.90e+03
Extraction Standards										
18 ;	13C-2,3,7,8-TCDD;	7.50e+07;	3.30e+07;	4.20e+07;	0.79;y;	31:27;	81.662;	0.1585;	1530;y;	2408;y;n;1.13e+07;7.39e+03;1.40e+07;5.83e+03
19 ;	13C-1,2,3,7,8-PeCDD;	5.51e+07;	3.37e+07;	2.14e+07;	1.57;y;	34:15;	81.956;	0.2959;	1346;y;	1040;y;n;1.32e+07;9.84e+03;8.54e+06;8.21e+03
20 ;	13C-1,2,3,4,7,8-HxCDD;	4.43e+07;	2.48e+07;	1.96e+07;	1.27;y;	36:52;	83.657;	0.2998;	970;y;	793;y;n;8.31e+06;8.57e+03;6.32e+06;7.98e+03
21 ;	13C-1,2,3,6,7,8-HxCDD;	4.86e+07;	2.71e+07;	2.16e+07;	1.26;y;	36:57;	84.480;	0.2759;	991;y;	866;y;n;8.49e+06;8.57e+03;6.91e+06;7.98e+03
22 ;	13C-1,2,3,4,6,7,8-HpCDD;	3.24e+07;	1.67e+07;	1.57e+07;	1.06;y;	40:19;	74.539;	0.3503;	576;y;	456;y;n;4.17e+06;7.25e+03;3.92e+06;8.60e+03
23 ;	13C-OCDD;	4.29e+07;	2.03e+07;	2.26e+07;	0.90;y;	44:39;	124.198;	0.3525;	706;y;	625;y;n;4.00e+06;5.67e+03;4.38e+06;7.02e+03
24 ;	13C-2,3,7,8-TCDF;	1.13e+08;	4.99e+07;	6.28e+07;	0.79;y;	30:52;	82.735;	0.1130;	1834;y;	2311;y;n;1.29e+07;7.05e+03;1.60e+07;6.91e+03
25 ;	13C-1,2,3,7,8-PeCDF;	9.78e+07;	6.00e+07;	3.79e+07;	1.58;y;	33:27;	88.880;	0.4909;	870;y;	824;y;n;2.57e+07;2.95e+04;1.61e+07;1.95e+04
26 ;	13C-2,3,4,7,8-PeCDF;	8.99e+07;	5.49e+07;	3.49e+07;	1.57;y;	34:04;	83.410;	0.5014;	790;y;	756;y;n;2.33e+07;2.95e+04;1.48e+07;1.95e+04
27 ;	13C-1,2,3,4,7,8-HxCDF;	5.86e+07;	2.01e+07;	3.85e+07;	0.52;y;	36:09;	85.615;	0.1752;	968;y;	2467;y;n;7.01e+06;7.24e+03;1.29e+07;5.25e+03
28 ;	13C-1,2,3,6,7,8-HxCDF;	6.68e+07;	2.30e+07;	4.38e+07;	0.53;y;	36:15;	88.528;	0.1587;	1060;y;	2786;y;n;7.67e+06;7.24e+03;1.46e+07;5.25e+03
29 ;	13C-2,3,4,6,7,8-HxCDF;	6.08e+07;	2.08e+07;	3.99e+07;	0.52;y;	36:45;	85.569;	0.1688;	986;y;	2622;y;n;7.14e+06;7.24e+03;1.38e+07;5.25e+03
30 ;	13C-1,2,3,7,8,9-HxCDF;	5.26e+07;	1.81e+07;	3.45e+07;	0.53;y;	37:32;	83.137;	0.1895;	734;y;	1995;y;n;5.31e+06;7.24e+03;1.05e+07;5.25e+03
31 ;	13C-1,2,3,4,6,7,8-HpCDF;	4.05e+07;	1.26e+07;	2.79e+07;	0.45;y;	39:03;	74.760;	0.2707;	422;y;	1077;y;n;3.45e+06;8.17e+03;7.67e+06;7.12e+03
32 ;	13C-1,2,3,4,7,8,9-HpCDF;	3.14e+07;	9.73e+06;	2.17e+07;	0.45;y;	41:01;	73.531;	0.3437;	280;y;	736;y;n;2.28e+06;8.17e+03;5.24e+06;7.12e+03
Injection Standards										
33 ;	13C-1,2,3,4-TCDD;	8.24e+07;	3.64e+07;	4.60e+07;	0.79;y;	31:01;	60.631;	-;	1339;y;	2152;y;n;9.89e+06;7.39e+03;1.25e+07;5.83e+03
34 ;	13C-1,2,3,7,8,9-HxCDD;	5.51e+07;	3.05e+07;	2.46e+07;	1.24;y;	37:12;	51.062;	-;	1108;y;	969;y;n;9.49e+06;8.57e+03;7.73e+06;7.98e+03
Cleanup Standard										
35 ;	37Cl-2,3,7,8-TCDD;	1.75e+07;	1.75e+07;	-;	-;-;	31:28;	17.869;	0.0794;	840;y;	-;-;n;5.93e+06;7.06e+03; -; -

Totals Raw Data

	Conc	Empc	Flags
TCDF	0	0	FALSE
TCDD	2.07	2.07	FALSE
PeCDF	0	0	FALSE
PeCDD	0	0	FALSE
HxCDF	0	0	FALSE
HxCDD	0	0	FALSE
HpCDF	0	0	FALSE
HpCDD	14.066	14.066	FALSE

Filename:	a27jan09a_12	Name of Homolog Group:	Total Tetra-Furans		
Sample:	7	Number of Peaks Found:	6	0	
Acquired:	1-FEB-09 22:54:30	RRF Used For Totals:	1.0368		
Processed:	2-FEB-09 09:53:34	Detection Limit:	0.1695		RL=0.500 (pg/µL)
Sample ID:	G1040-3-1B	Noise Height Ion1/Ion2:	6780 / 10168		
Cal Table:	m1613-100708a	Begin Window:		26:14:00	
Results Table:	m1613-012709a_12	End Window:		33:07:00	

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	5.03E+05	234000	269000		0.87 y	27:55	0.431	RL	4.9	y	3.7	y	y
	2	3.29E+05	151000	179000		0.84 y	28:14	0.282	RL	3.1	y	3	n	y
	3	3.90E+05	180000	210000		0.86 y	29:32	0.334	RL	3.9	y	3.4	y	y
	4	2.73E+05	126000	144000		0.89 n	29:59	0.233	RL	3.4	y	2.7	n	y
2,3,7,8-TCDF	5	2.40E+05	113000	127000		0.88 y	30:52	0.206	RL	4.9	y	3.5	y	y
	6	3.10E+05	134000	176000		0.76 y	31:08	0.266	RL	5.9	y	4.5	y	y

Filename:	a27jan09a_12	Name of Homolog Group:	Total Tetra-Dioxins		
Sample:	7	Number of Peaks Found:	4	3	
Acquired:	1-FEB-09 22:54:30	RRF Used For Totals:	1.0087		
Processed:	2-FEB-09 09:53:34	Detection Limit:	0.1269		RL=0.500 (pg/µL)
Sample ID:	G1040-3-1B	Noise Height Ion1/Ion2:	4658 / 6174		
Cal Table:	m1613-100708a	Begin Window:		27:40:00	
Results Table:	m1613-012709a_12	End Window:		32:37:00	

Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1	6.74E+05	298000	376000		0.79 y	28:19	0.891	OK	13.2	y	12.2	y	y
	2	5.06E+05	221000	285000		0.78 y	28:37	0.668	OK	9.6	y	9.1	y	y
	3	3.87E+05	171000	216000		0.79 y	30:09	0.511	OK	8.7	y	7.2	y	y
2,3,7,8-TCDD	4	1.89E+05	68700	120000		0.57 n	31:28	0.25	RL	4.6	y	7.1	y	y

Filename:	a27jan09a_12	Name of Homolog Group:	Total Penta-Furans Fn1		
Sample:	7	Number of Peaks Found:	1	0	
Acquired:	1-FEB-09 22:54:30	RRF Used For Totals:	1.0121		

Processed:	2-FEB-09 09:53:34	Detection Limit:	0.0966												
Sample ID:	G1040-3-1B	Noise Height Ion1/Ion2:	6016 / 6992												
Cal Table:	m1613-100708a	Begin Window:						31:45:00							
Results Table:	m1613-012709a_12	End Window:						32:05:00							
Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?	
	1	3.26E+05	131000	196000		0.67 y	32:03	0.344	RL		9 y		12.3 y	n	

Filename:	a27jan09a_12	Name of Homolog Group:	Total Penta-Furans Fn2												
Sample:	7	Number of Peaks Found:	4	0											
Acquired:	1-FEB-09 22:54:30	RRF Used For Totals:	1.0121												
Processed:	2-FEB-09 09:53:34	Detection Limit:	0.1188						RL=2.500 (pg/µL)						
Sample ID:	G1040-3-1B	Noise Height Ion1/Ion2:	8844 / 7144												
Cal Table:	m1613-100708a	Begin Window:						31:42:00							
Results Table:	m1613-012709a_12	End Window:						34:51:00							
Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?	
	1	9.99E+04	52500	47400		1.11 n	32:49	0.105	RL		2.5 n		2.7 n	n	
	2	2.27E+05	142000	85800		1.65 y	32:53	0.239	RL		4.8 y		4.2 y	n	
	3	8.78E+04	57100	30600		1.87 n	33:14	0.092	S2N		2.7 n		1.8 n	n	
1,2,3,7,8-PeCDF	4	8.23E+04	49600	32800		1.51 y	33:28	0.085	S2N		2.5 n		2.1 n	n	

Filename:	a27jan09a_12	Name of Homolog Group:	Total Penta-Dioxins												
Sample:	7	Number of Peaks Found:	9	0											
Acquired:	1-FEB-09 22:54:30	RRF Used For Totals:	1.0517												
Processed:	2-FEB-09 09:53:34	Detection Limit:	0.2166						RL=2.500 (pg/µL)						
Sample ID:	G1040-3-1B	Noise Height Ion1/Ion2:	9388 / 7176												
Cal Table:	m1613-100708a	Begin Window:						32:51:00							
Results Table:	m1613-012709a_12	End Window:						34:36:00							
Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?	
	1	7.72E+05	464000	308000		1.51 y	32:55	1.333	RL		16.9 y		13.7 y	n	
	2	1.54E+05	90100	64200		1.4 y	33:12	0.266	RL		4.5 y		3.7 y	n	
	3	4.11E+05	251000	159000		1.58 y	33:29	0.71	RL		11.2 y		10.3 y	n	
	4	6.48E+05	391000	257000		1.52 y	33:35	1.118	RL		17 y		15.7 y	n	
	5	3.20E+05	197000	123000		1.6 y	33:38	0.552	RL		10.1 y		7 y	n	
	6	3.15E+05	182000	133000		1.37 y	33:47	0.544	RL		6.3 y		4.9 y	n	
	7	7.07E+04	49800	21000		2.38 n	33:59	0.122	S2N		2.5 n		1.8 n	n	
1,2,3,7,8-PeCDD	8	3.72E+05	236000	136000		1.73 y	34:17	0.642	RL		8.3 y		7.2 y	n	
	9	1.29E+04	5220	7720		0.68 n	34:23	0.022	S2N		0.4 n		0.7 n	n	

Filename:	a27jan09a_12	Name of Homolog Group:	Total Hexa-Furans	
Sample:	7	Number of Peaks Found:	3	0

Acquired:	1-FEB-09 22:54:30	RRF Used For Totals:	1.1305												
Processed:	2-FEB-09 09:53:34	Detection Limit:	0.1955						RL=2.500 (pg/µL)						
Sample ID:	G1040-3-1B	Noise Height Ion1/Ion2:	8368 / 6076												
Cal Table:	m1613-100708a	Begin Window:						35:05:00							
Results Table:	m1613-012709a_12	End Window:						37:39:00							
Name	#	Response		Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1		3.72E+05	203000	169000		1.2 y	35:20	0.551	RL	8.7 y		9.7 y		n
	2		2.85E+05	161000	124000		1.3 y	35:47	0.423	RL	6.6 y		7.7 y		n
1,2,3,4,7,8-HxCDF	3		6.30E+04	31800	31100		1.02 n	36:10	0.093	S2N	1.5 n		1.8 n		n

□

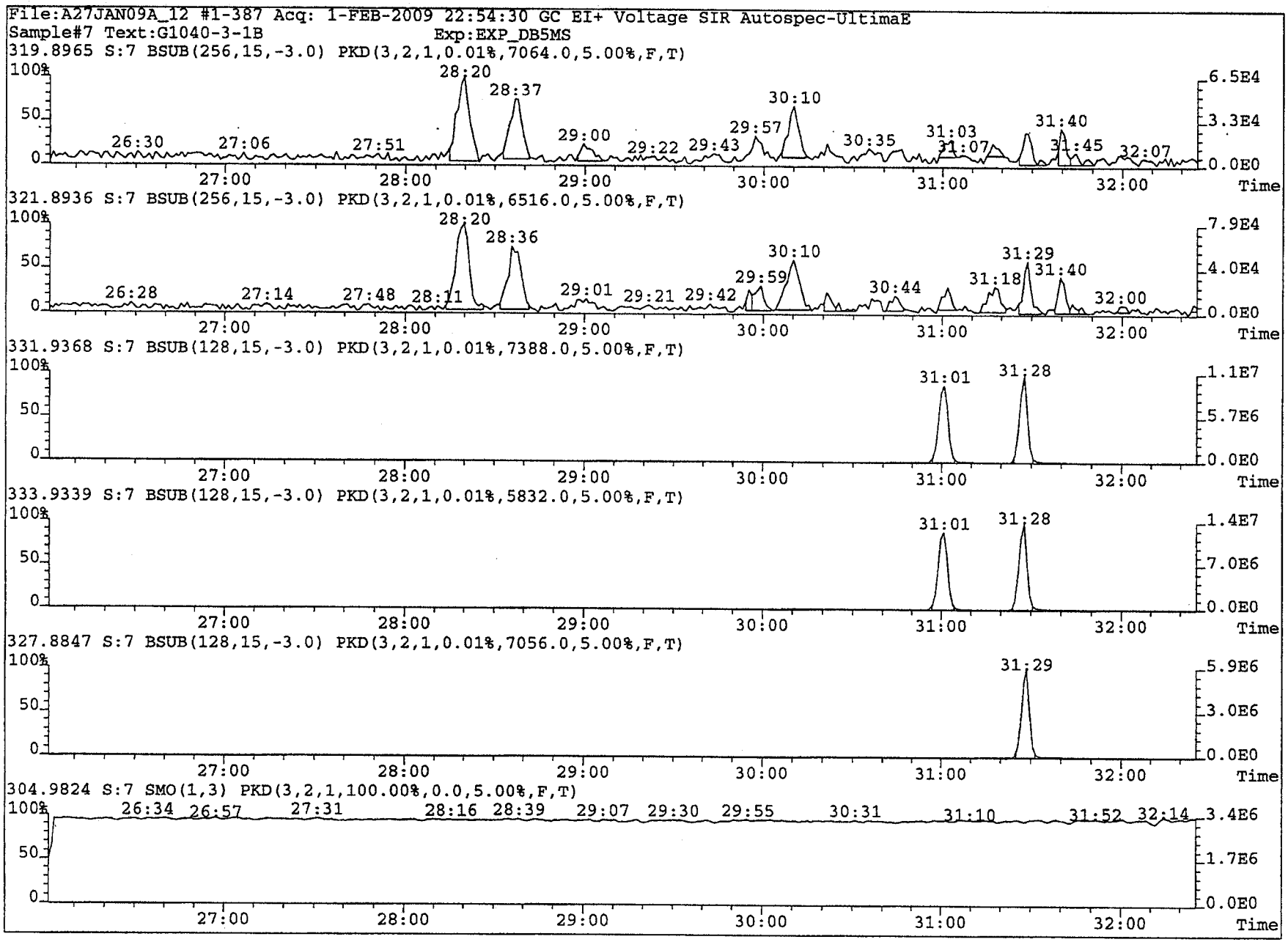
Filename:	a27jan09a_12	Name of Homolog Group:	Total Hexa-Dioxins												
Sample:	7	Number of Peaks Found:	8	0											
Acquired:	1-FEB-09 22:54:30	RRF Used For Totals:	1.0077												
Processed:	2-FEB-09 09:53:34	Detection Limit:	0.2705						RL=2.500 (pg/µL)						
Sample ID:	G1040-3-1B	Noise Height Ion1/Ion2:	5800 / 7844												
Cal Table:	m1613-100708a	Begin Window:						35:35:00							
Results Table:	m1613-012709a_12	End Window:						37:16:00							
Name	#	Response		Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
	1		8.23E+05	455000	368000		1.24 y	35:38	1.757	RL	27.9 y		16.5 y		n
	2		4.13E+05	230000	183000		1.26 y	36:05	0.883	RL	14.1 y		8.3 y		n
	3		1.13E+06	627000	500000		1.25 y	36:18	2.408	RL	29.2 y		16.9 y		y
	4		2.63E+04	18300	8040		2.28 n	36:24	0.056	S2N	1.4 n		1.1 n		n
1,2,3,6,7,8-HxCDD	5		2.01E+05	124000	77100		1.6 n	36:58	0.417	RL	8.1 y		4.1 y		n
1,2,3,7,8,9-HxCDD	6		1.03E+05	68200	35100		1.94 n	37:13	0.222	S2N	4.6 y		2 n		n
	7		5.30E+04	10500	42500		0.25 n	37:51	0.113	RT	2 n		2.5 n		n
	8		4.89E+04	6450	42500		0.15 n	37:52	0.104	RT	0.7 n		2.5 n		n

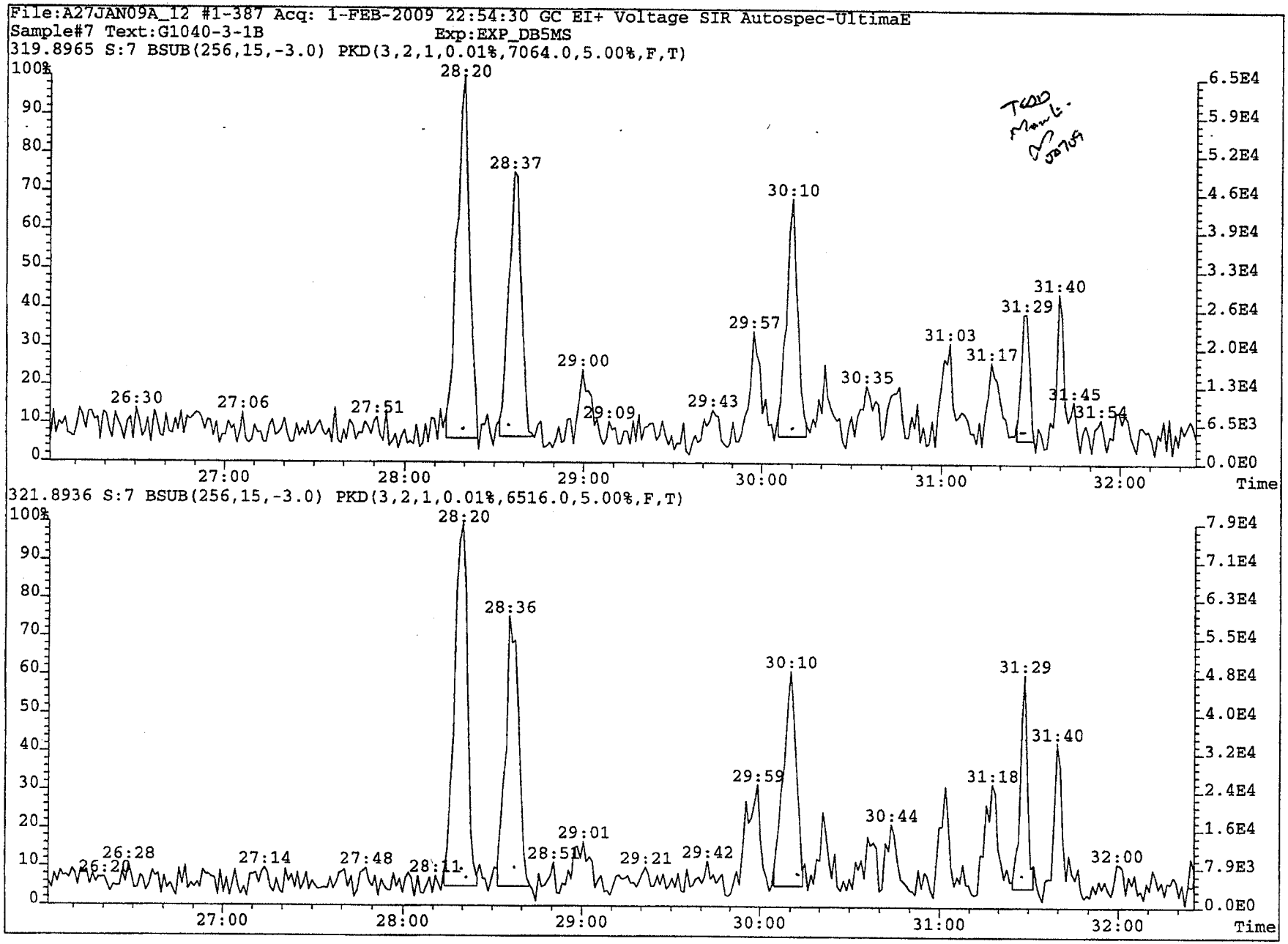
Filename:	a27jan09a_12	Name of Homolog Group:	Total Hepta-Furans												
Sample:	7	Number of Peaks Found:	2	0											
Acquired:	1-FEB-09 22:54:30	RRF Used For Totals:	1.3693												
Processed:	2-FEB-09 09:53:34	Detection Limit:	0.3535						RL=2.500 (pg/µL)						
Sample ID:	G1040-3-1B	Noise Height Ion1/Ion2:	6828 / 7964												
Cal Table:	m1613-100708a	Begin Window:						38:52:00							
Results Table:	m1613-012709a_12	End Window:						41:04:00							
Name	#	Response		Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?
1,2,3,4,6,7,8-HpCDI	1		4.93E+05	273000	220000		1.24 n	39:04	0.884	RL	10.8 y		8.5 y		n
	2		6.90E+05	343000	347000		0.99 y	39:36	1.401	RL	15.5 y		12.1 y		n

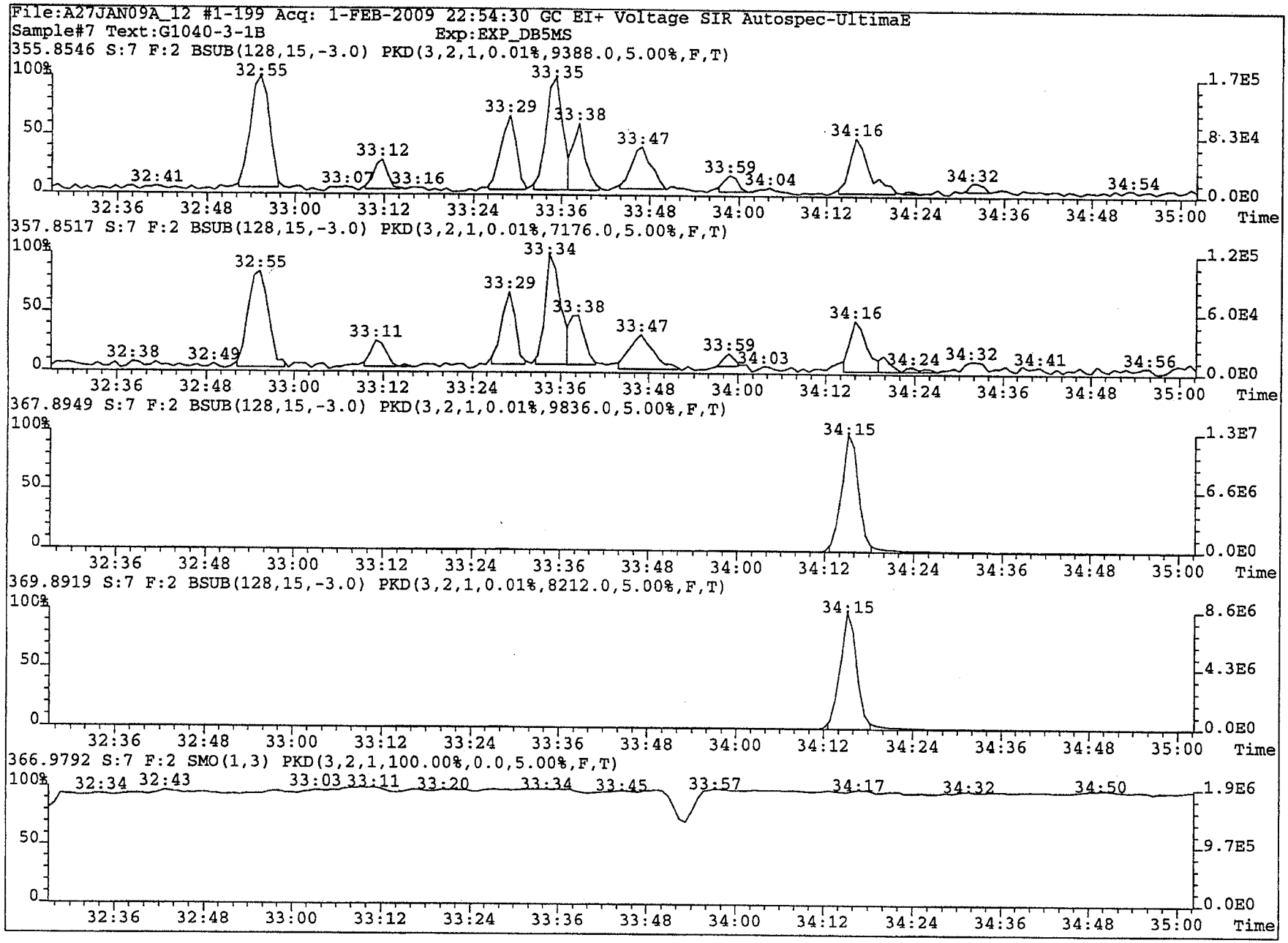
Filename:	a27jan09a_12	Name of Homolog Group:	Total Hepta-Dioxins		
Sample:	7	Number of Peaks Found:	2	2	
Acquired:	1-FEB-09 22:54:30	RRF Used For Totals:	1.0612		

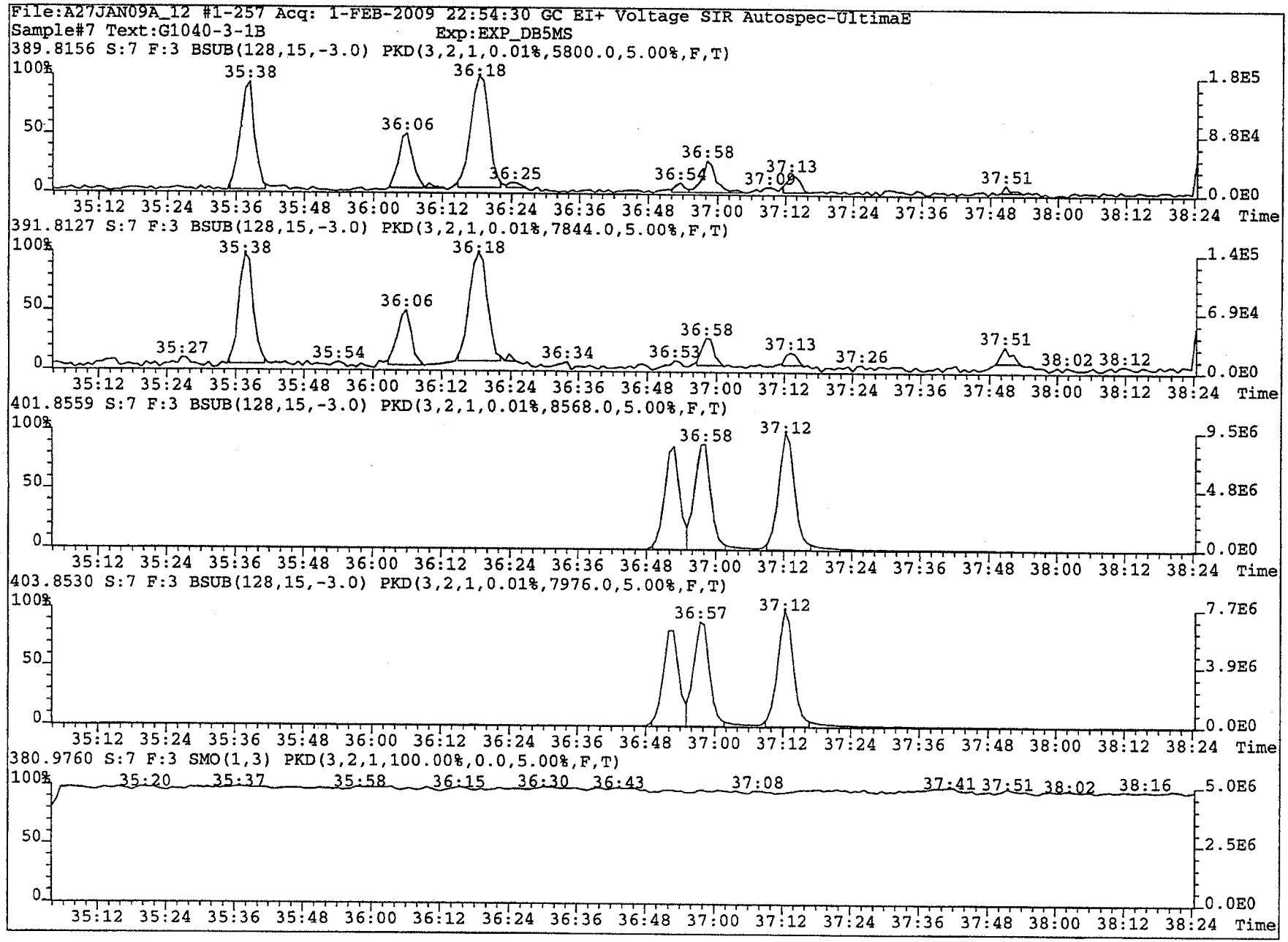
Totals Raw Data

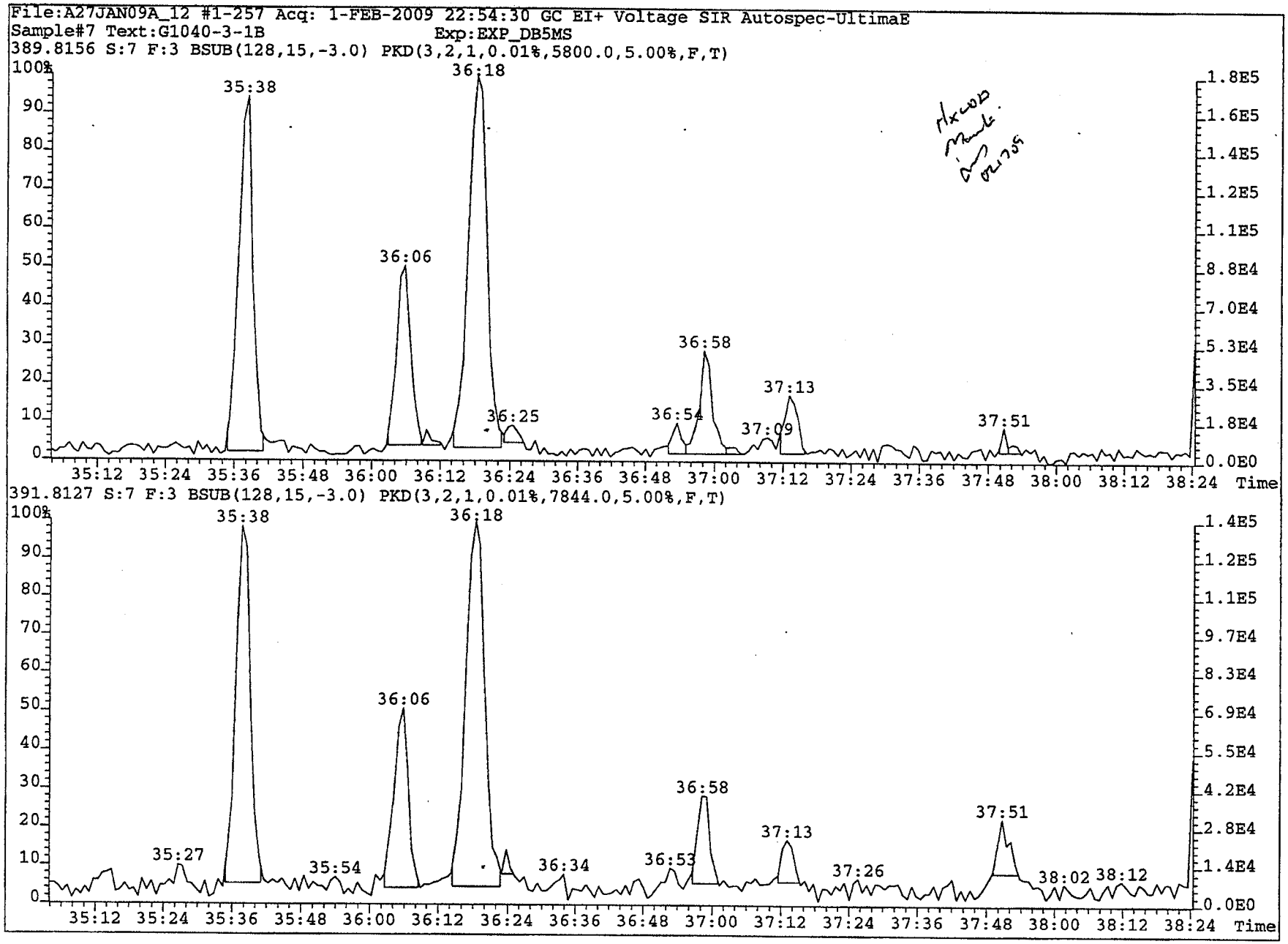
Processed:	2-FEB-09 09:53:34	Detection Limit:	0.5298						RL=2.500 (pg/µL)						
Sample ID:	G1040-3-1B	Noise Height Ion1/Ion2:	7764 / 7408												
Cal Table:	m1613-100708a	Begin Window:						39:17:00							
Results Table:	m1613-012709a_12	End Window:						40:29:00							
Name	#	Response	Ion 1	Ion 2	RA	?	RT	Conc	Status	S/N1	?	S/N2	?	Mod?	
	1	3.49E+06	1810000	1680000		1.08 y	39:23	10.152	OK	61.6	y	60.3	y	n	
1,2,3,4,6,7,8-HpCDI	2	1.34E+06	675000	669000		1.01 y	40:20	3.914	OK	23.8	y	25.1	y	n	

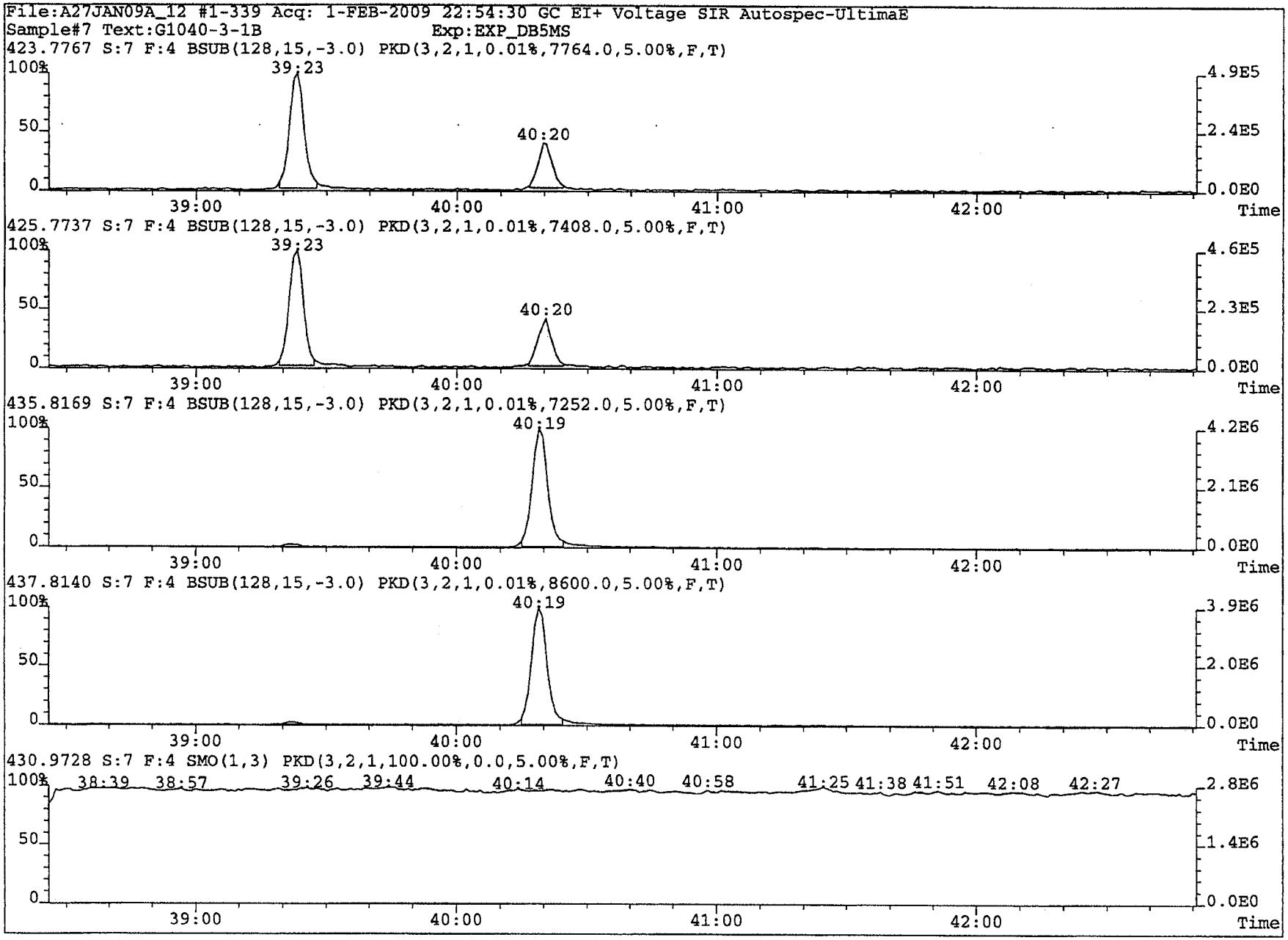

File:A27JAN09A_12 #1-387 Acq: 1-FEB-2009 22:54:30 GC EI+ Voltage SIR Autospec-UltimaE
Sample#7 Text:G1040-3-1B Exp:EXP_DB5MS
319.8965 S:7 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,7064.0,5.00%,F,T)
321.8936 S:7 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,6516.0,5.00%,F,T)
331.9368 S:7 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7388.0,5.00%,F,T)
333.9339 S:7 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5832.0,5.00%,F,T)
327.8847 S:7 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7056.0,5.00%,F,T)
304.9824 S:7 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time

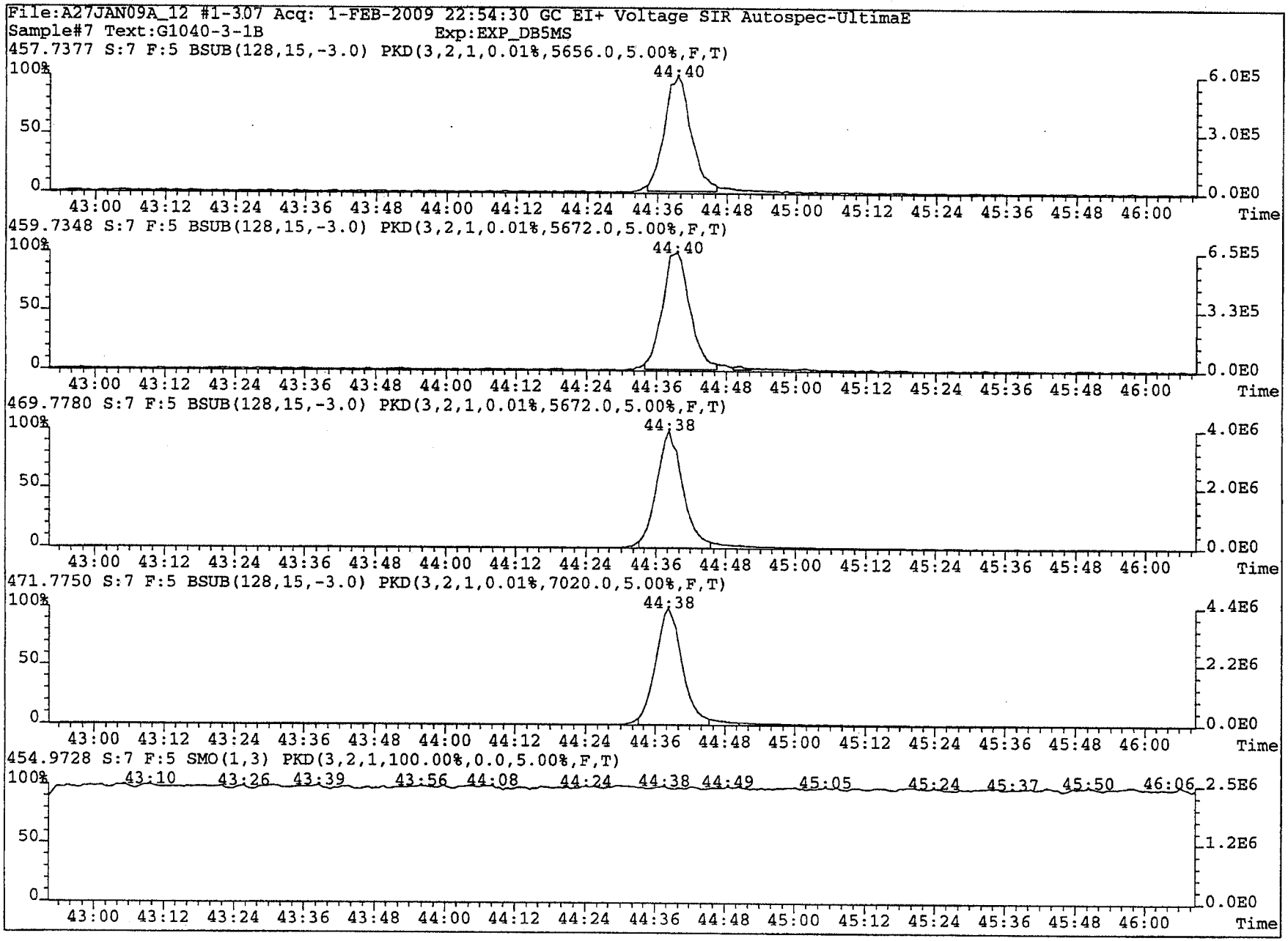

File:A27JAN09A_12 #1-387 Acq: 1-FEB-2009 22:54:30 GC EI+ Voltage SIR Autospec-UltimaE
Sample#7 Text:G1040-3-1B Exp:EXP_DB5MS
319.8965 S:7 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,7064.0,5.00%,F,T)
28:20
28:37
30:10
29:57
29:00
31:40
31:29
31:03
31:17
30:35
26:30
27:06
27:51
29:09
29:43
31:45
31:54
Time
321.8936 S:7 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,6516.0,5.00%,F,T)
28:20
28:36
30:10
31:29
31:40
29:59
31:18
30:44
29:01
26:28
26:20
27:14
27:48
28:11
28:51
29:21
29:42
32:00
Time

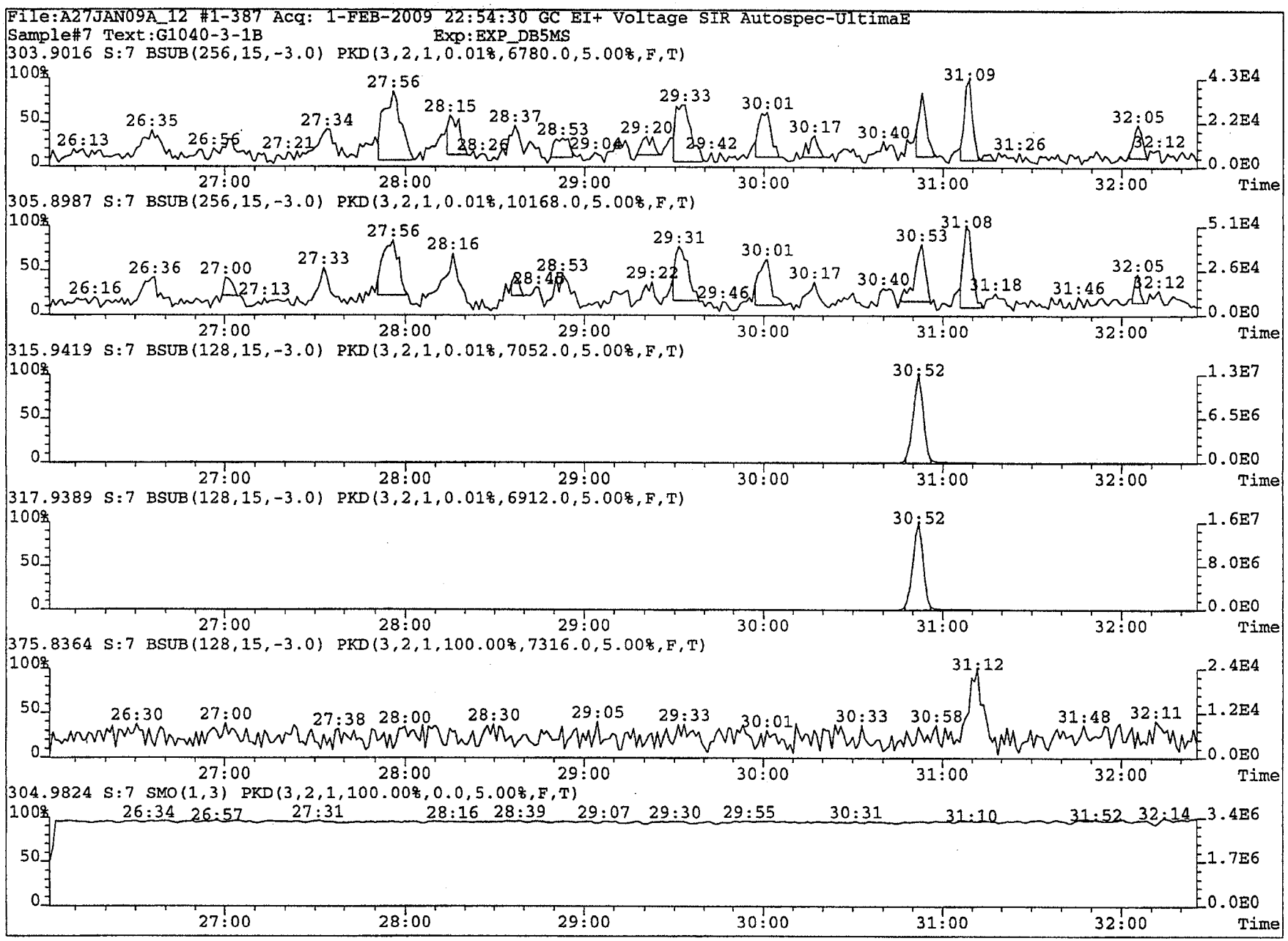

File:A27JAN09A_12 #1-199 Acq: 1-FEB-2009 22:54:30 GC EI+ Voltage SIR Autospec-UltimaE
Sample#7 Text:G1040-3-1B Exp:EXP_DB5MS
355.8546 S:7 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,9388.0,5.00%,F,T)
32:55 33:35 33:29 33:38 33:47 34:16 33:12 32:41 33:07 33:16 33:59 34:04 34:32 34:54
1.7E5 8.3E4 0.0E0
357.8517 S:7 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7176.0,5.00%,F,T)
33:34 32:55 33:29 33:38 33:47 34:16 33:11 32:38 32:49 33:59 34:03 34:24 34:32 34:41 34:56
1.2E5 6.0E4 0.0E0
367.8949 S:7 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,9836.0,5.00%,F,T)
34:15
1.3E7 6.6E6 0.0E0
369.8919 S:7 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,8212.0,5.00%,F,T)
34:15
8.6E6 4.3E6 0.0E0
366.9792 S:7 F:2 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
32:34 32:43 33:03 33:11 33:20 33:34 33:45 33:57 34:17 34:32 34:50
1.9E6 9.7E5 0.0E0
100% 50 0
32:36 32:48 33:00 33:12 33:24 33:36 33:48 34:00 34:12 34:24 34:36 34:48 35:00 Time

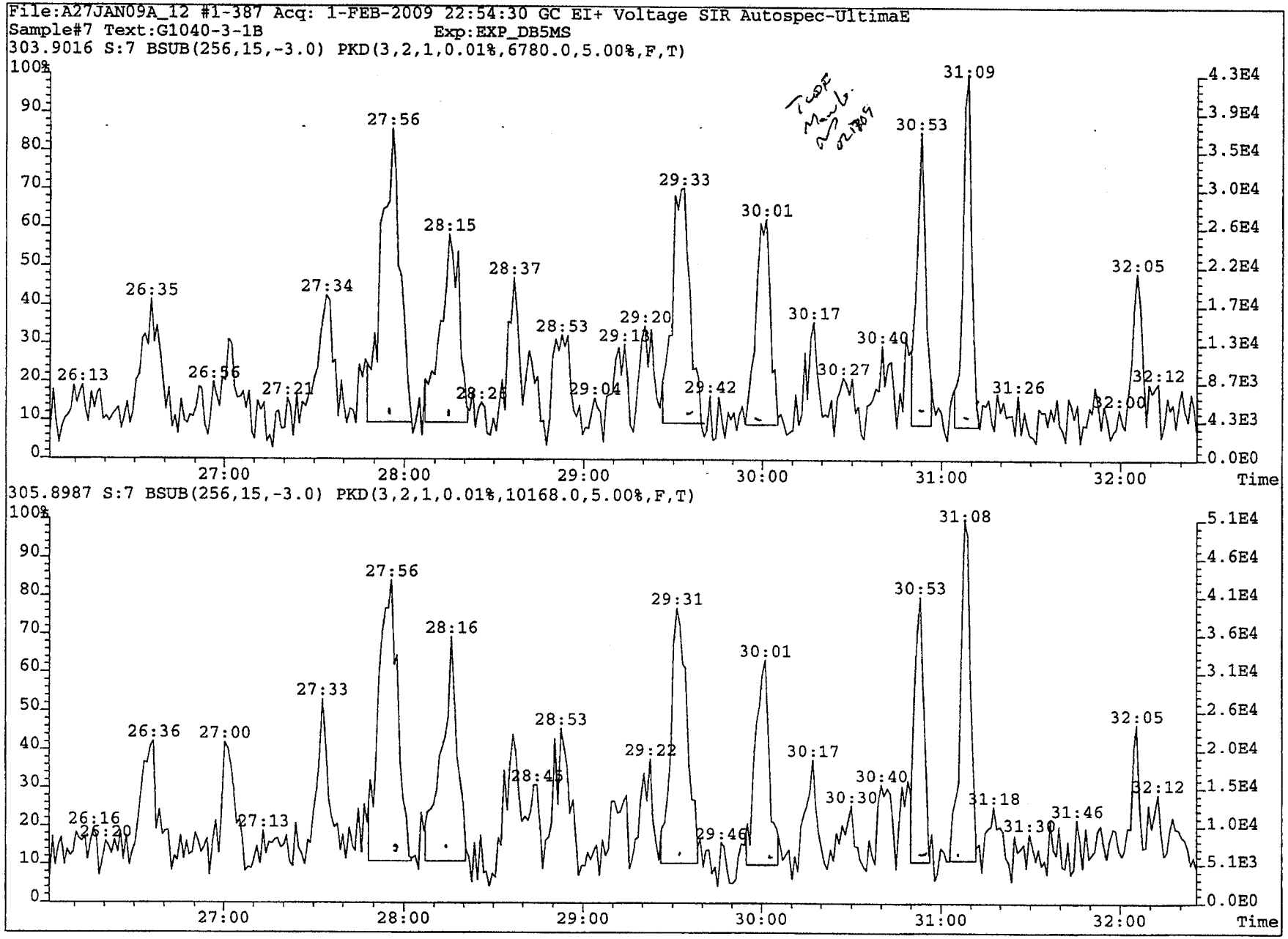

File:A27JAN09A_12 #1-257 Acq: 1-FEB-2009 22:54:30 GC EI+ Voltage SIR Autospec-UltimaE
Sample#7 Text:G1040-3-1B
Exp:EXP_DB5MS
389.8156 S:7 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5800.0,5.00%,F,T)
391.8127 S:7 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7844.0,5.00%,F,T)
401.8559 S:7 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,8568.0,5.00%,F,T)
403.8530 S:7 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7976.0,5.00%,F,T)
380.9760 S:7 F:3 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time

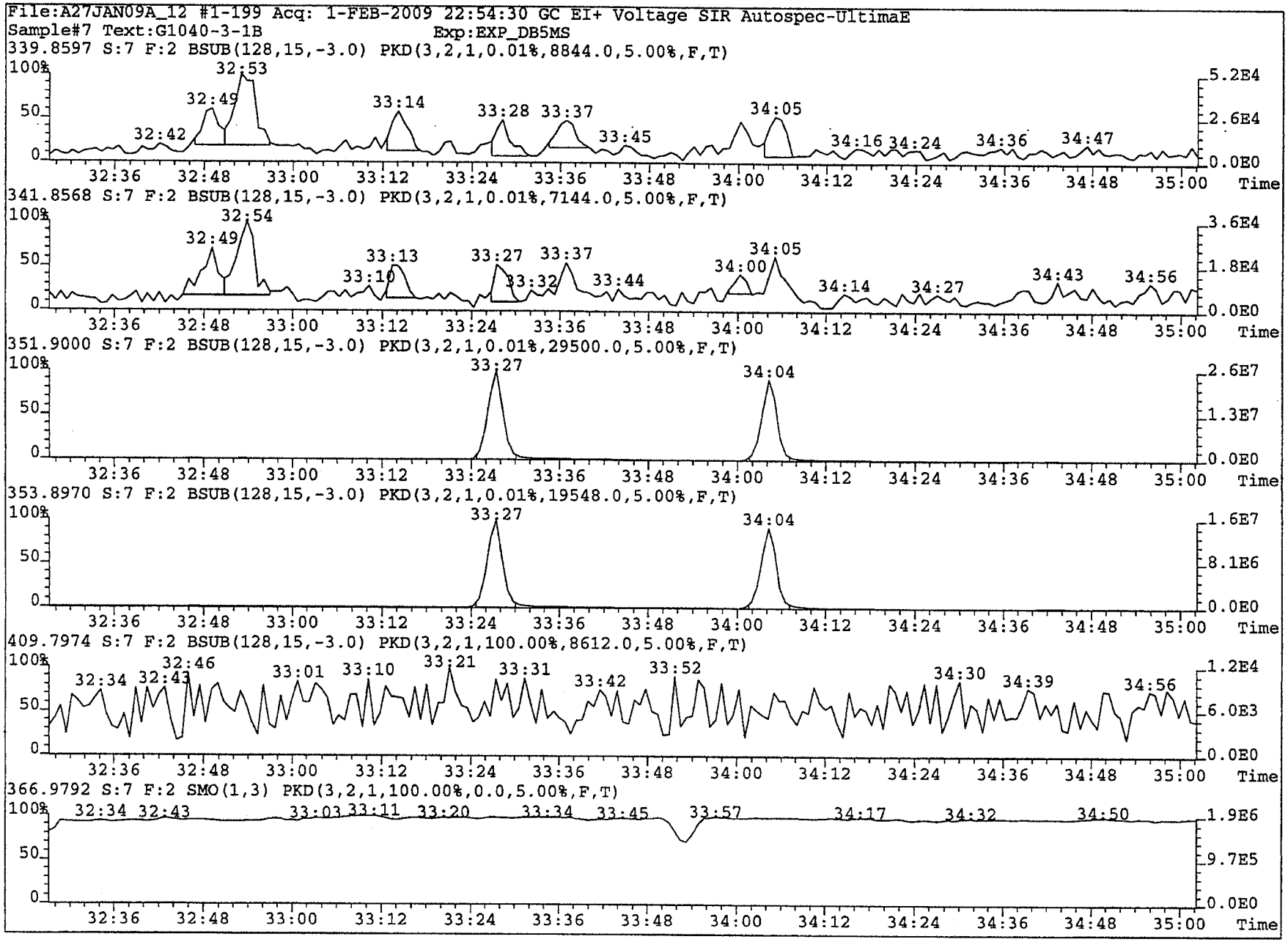

File:A27JAN09A_12 #1-257 Acq: 1-FEB-2009 22:54:30 GC EI+ Voltage SIR Autospec-UltimaE
Sample#7 Text:G1040-3-1B Exp:EXP_DB5MS
389.8156 S:7 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5800.0,5.00%,F,T)
35:38
36:18
36:06
36:58
37:13
36:25
36:54
37:09
37:51
391.8127 S:7 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7844.0,5.00%,F,T)
35:38
36:18
36:06
36:58
37:51
37:13
35:27
35:54
36:34
36:53
37:26
38:02
38:12
Time

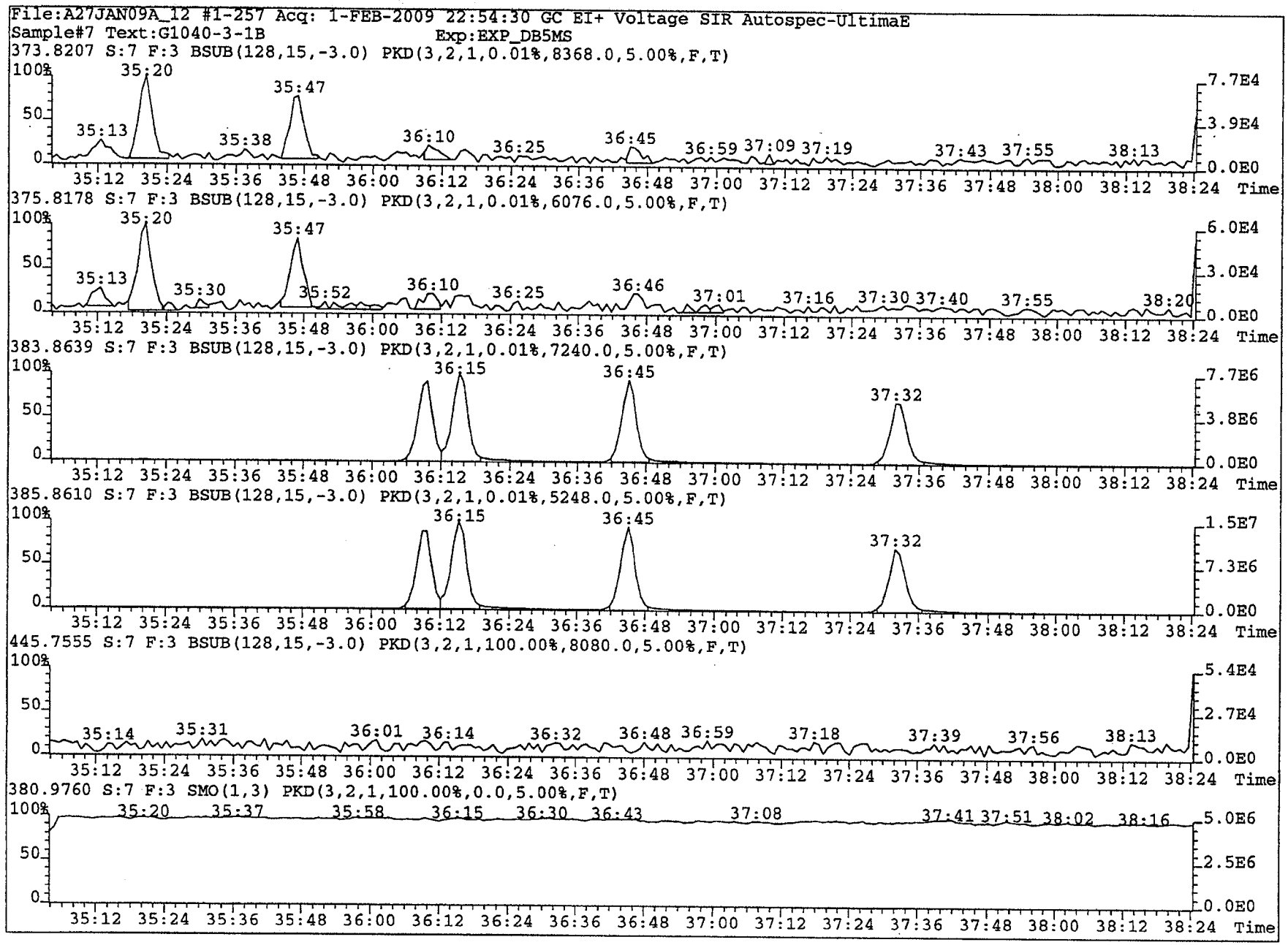

File:A27JAN09A_12 #1-339 Acq: 1-FEB-2009 22:54:30 GC EI+ Voltage SIR Autospec-UltimaE
Sample#7 Text:G1040-3-1B Exp:EXP_DB5MS
423.7767 S:7 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7764.0,5.00%,F,T)
39:23
40:20
4.9E5
2.4E5
0.0E0
425.7737 S:7 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7408.0,5.00%,F,T)
39:23
40:20
4.6E5
2.3E5
0.0E0
435.8169 S:7 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7252.0,5.00%,F,T)
40:19
4.2E6
2.1E6
0.0E0
437.8140 S:7 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,8600.0,5.00%,F,T)
40:19
3.9E6
2.0E6
0.0E0
430.9728 S:7 F:4 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
38:39 38:57 39:26 39:44 40:14 40:40 40:58 41:25 41:38 41:51 42:08 42:27
2.8E6
1.4E6
0.0E0
100%
50
0
39:00
40:00
41:00
42:00
Time

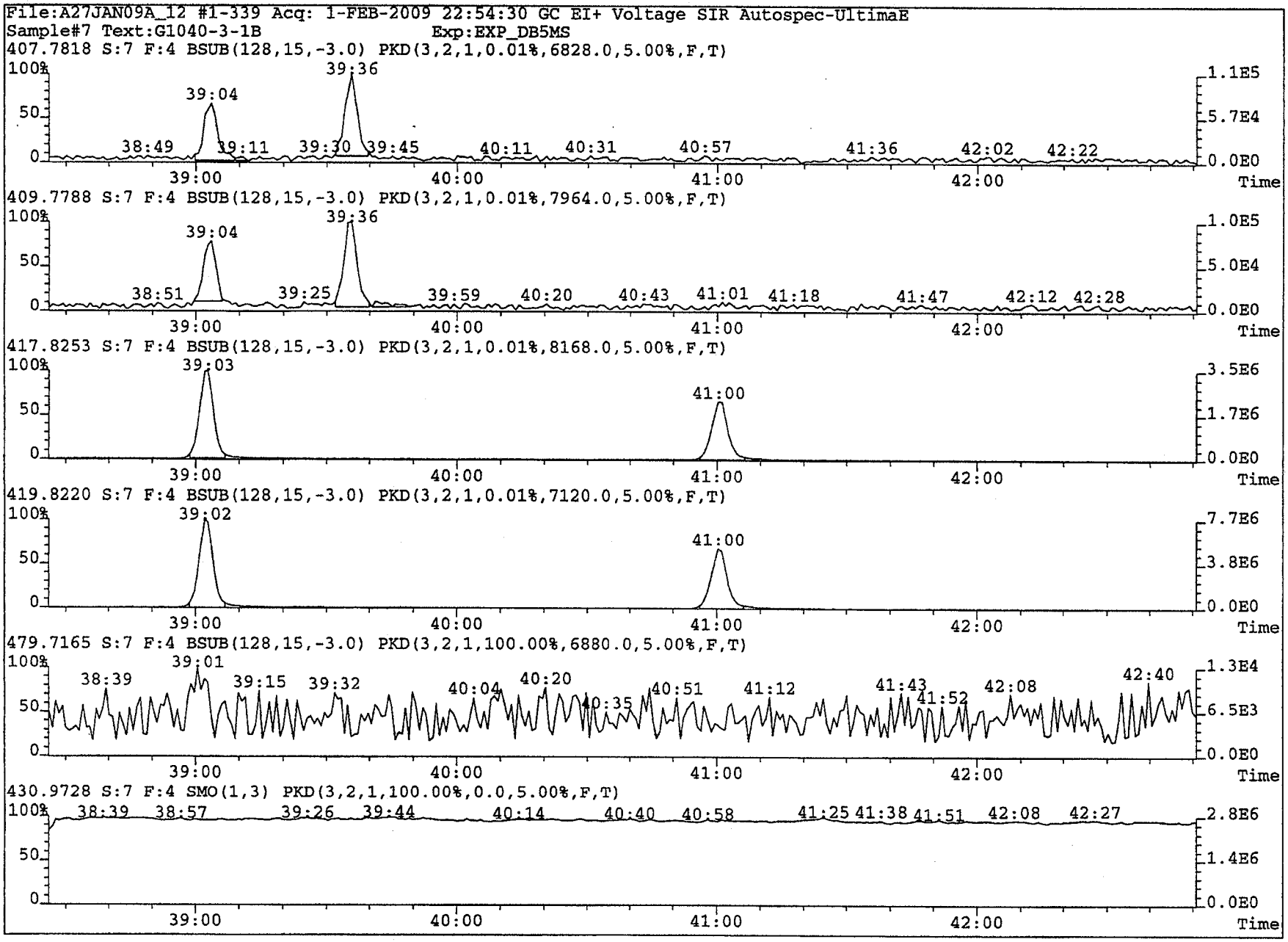

File:A27JAN09A_12 #1-307 Acq: 1-FEB-2009 22:54:30 GC EI+ Voltage SIR Autospec-UltimaE
Sample#7 Text:G1040-3-1B Exp:EXP_DB5MS
457.7377 S:7 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5656.0,5.00%,F,T)
44:40
6.0E5
3.0E5
0.0E0
459.7348 S:7 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5672.0,5.00%,F,T)
44:40
6.5E5
3.3E5
0.0E0
469.7780 S:7 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5672.0,5.00%,F,T)
44:38
4.0E6
2.0E6
0.0E0
471.7750 S:7 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7020.0,5.00%,F,T)
44:38
4.4E6
2.2E6
0.0E0
454.9728 S:7 F:5 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
43:10 43:26 43:39 43:56 44:08 44:24 44:38 44:49 45:05 45:24 45:37 45:50 46:06
2.5E6
1.2E6
0.0E0
100%
50
0
43:00 43:12 43:24 43:36 43:48 44:00 44:12 44:24 44:36 44:48 45:00 45:12 45:24 45:36 45:48 46:00
Time

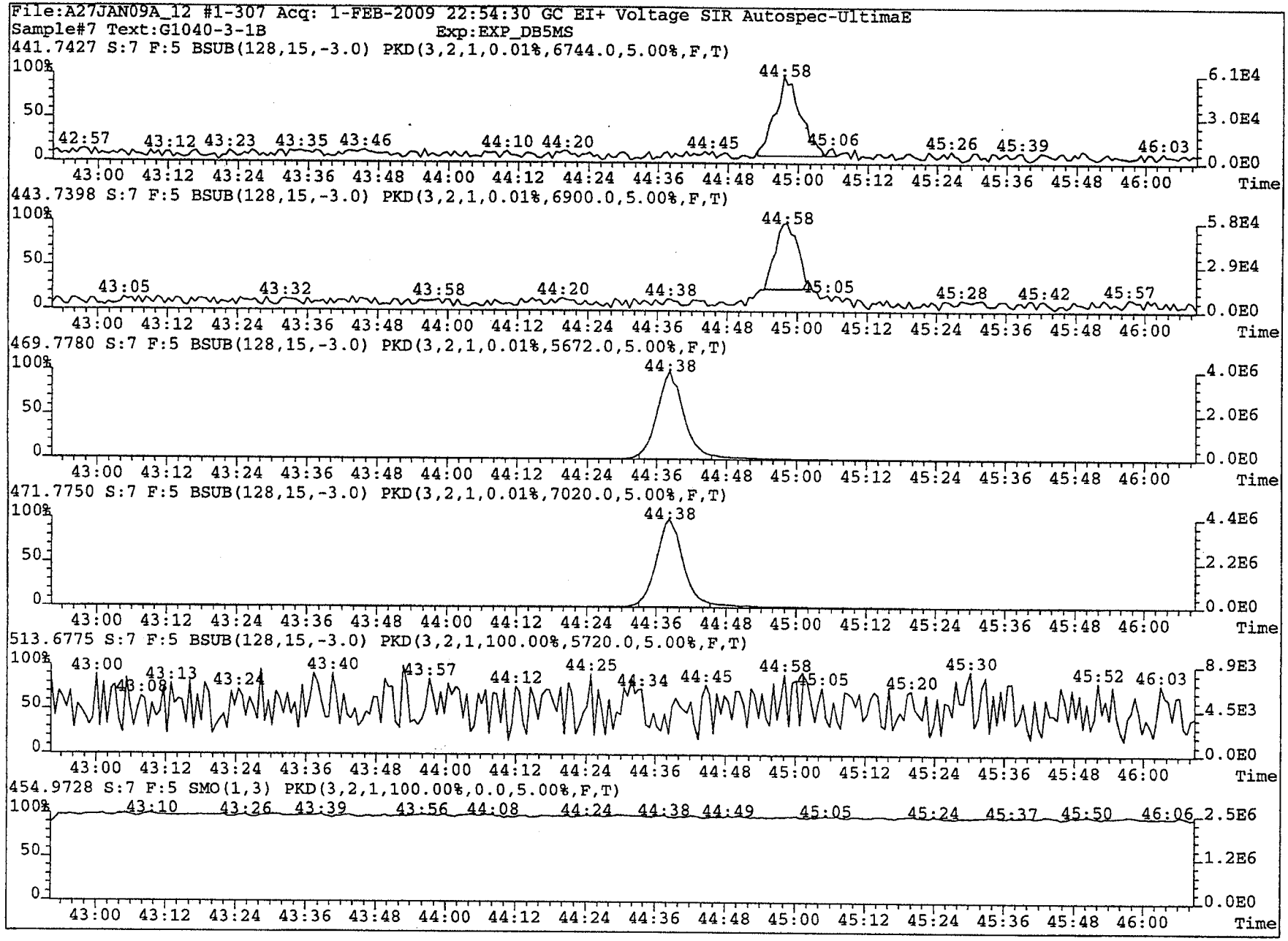

File:A27JAN09A_12 #1-387 Acq: 1-FEB-2009 22:54:30 GC EI+ Voltage SIR Autospec-UltimaE
Sample#7 Text:G1040-3-1B Exp:EXP_DB5MS
303.9016 S:7 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,6780.0,5.00%,F,T)
305.8987 S:7 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,10168.0,5.00%,F,T)
315.9419 S:7 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7052.0,5.00%,F,T)
317.9389 S:7 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6912.0,5.00%,F,T)
375.8364 S:7 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,7316.0,5.00%,F,T)
304.9824 S:7 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time

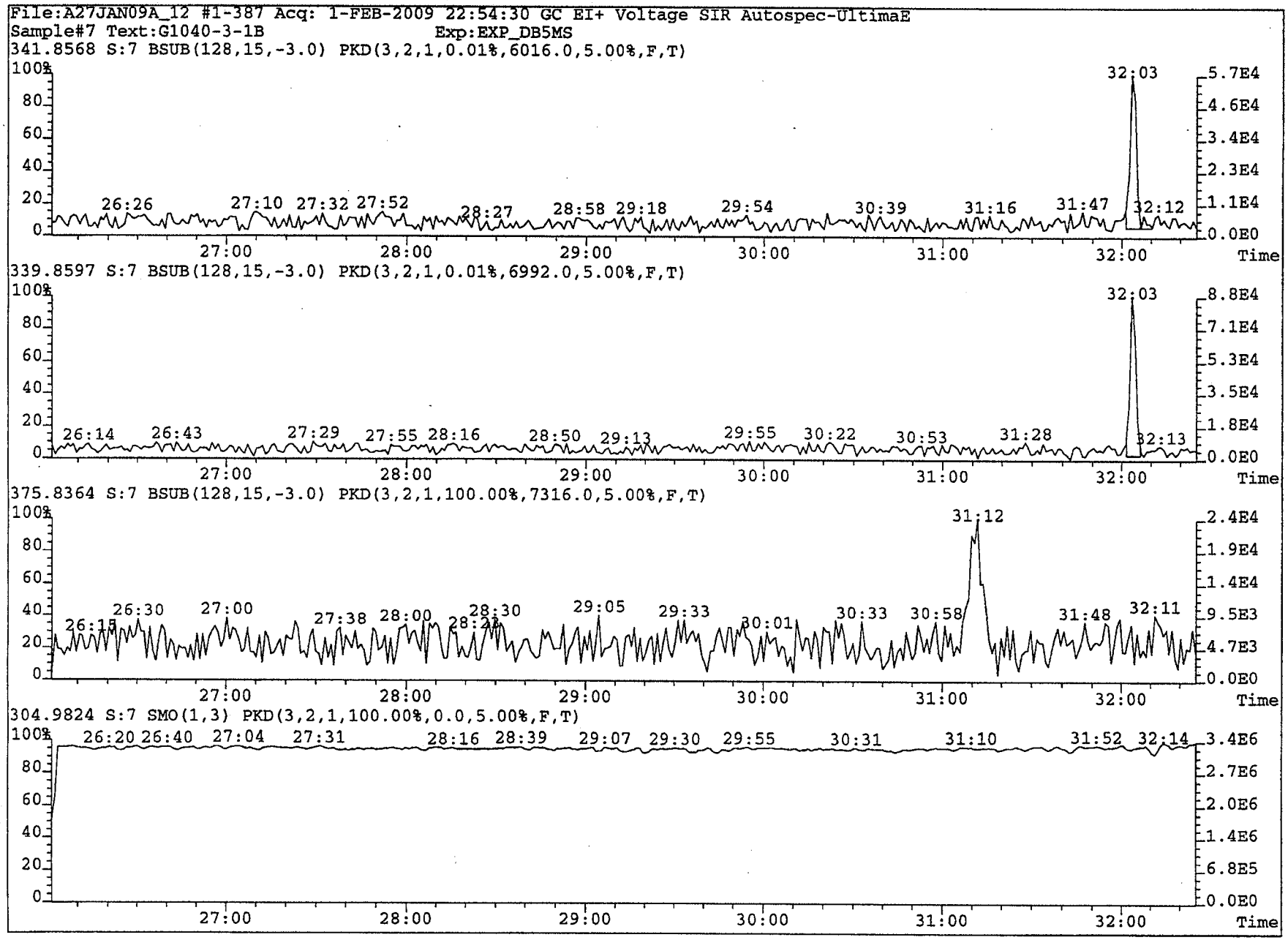

File:A27JAN09A_12 #1-387 Acq: 1-FEB-2009 22:54:30 GC EI+ Voltage SIR Autospec-UltimaE
Sample#7 Text:G1040-3-1B Exp:EXP_DB5MS
303.9016 S:7 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,6780.0,5.00%,F,T)
100%
90
80
70
60
50
40
30
20
10
0
4.3E4
3.9E4
3.5E4
3.0E4
2.6E4
2.2E4
1.7E4
1.3E4
8.7E3
4.3E3
0.0E0
26:13
26:35
26:56
27:21
27:34
27:56
28:15
28:26
28:37
28:53
29:04
29:18
29:20
29:33
29:42
30:01
30:17
30:27
30:40
30:53
31:09
31:26
32:00
32:05
32:12
27:00
28:00
29:00
30:00
31:00
32:00
Time
305.8987 S:7 BSUB(256,15,-3.0) PKD(3,2,1,0.01%,10168.0,5.00%,F,T)
100%
90
80
70
60
50
40
30
20
10
0
5.1E4
4.6E4
4.1E4
3.6E4
3.1E4
2.6E4
2.0E4
1.5E4
1.0E4
5.1E3
0.0E0
26:16
26:20
26:36
27:00
27:13
27:33
27:56
28:16
28:45
28:53
29:22
29:31
29:46
30:01
30:17
30:30
30:40
30:53
31:08
31:18
31:30
31:46
32:05
32:12
27:00
28:00
29:00
30:00
31:00
32:00
Time


File:A27JAN09A_12 #1-199 Acq: 1-FEB-2009 22:54:30 GC EI+ Voltage SIR Autospec-UltimaE
Sample#7 Text:G1040-3-1B Exp:EXP_DB5MS
339.8597 S:7 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,8844.0,5.00%,F,T)
341.8568 S:7 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7144.0,5.00%,F,T)
351.9000 S:7 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,29500.0,5.00%,F,T)
353.8970 S:7 F:2 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,19548.0,5.00%,F,T)
409.7974 S:7 F:2 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,8612.0,5.00%,F,T)
366.9792 S:7 F:2 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time


File:A27JAN09A_12 #1-257 Acq: 1-FEB-2009 22:54:30 GC EI+ Voltage SIR Autospec-UltimaE
Sample#7 Text:G1040-3-1B Exp:EXP_DB5MS
373.8207 S:7 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,8368.0,5.00%,F,T)
375.8178 S:7 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6076.0,5.00%,F,T)
383.8639 S:7 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7240.0,5.00%,F,T)
385.8610 S:7 F:3 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5248.0,5.00%,F,T)
445.7555 S:7 F:3 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,8080.0,5.00%,F,T)
380.9760 S:7 F:3 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time


File:A27JAN09A_12 #1-339 Acq: 1-FEB-2009 22:54:30 GC EI+ Voltage SIR Autospec-UltimaE
Sample#7 Text:G1040-3-1B Exp:EXP_DB5MS
407.7818 S:7 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6828.0,5.00%,F,T)
409.7788 S:7 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7964.0,5.00%,F,T)
417.8253 S:7 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,8168.0,5.00%,F,T)
419.8220 S:7 F:4 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7120.0,5.00%,F,T)
479.7165 S:7 F:4 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,6880.0,5.00%,F,T)
430.9728 S:7 F:4 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time


File:A27JAN09A_12 #1-307 Acq: 1-FEB-2009 22:54:30 GC EI+ Voltage SIR Autospec-UltimaE
Sample#7 Text:G1040-3-1B Exp:EXP_DB5MS
441.7427 S:7 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6744.0,5.00%,F,T)
443.7398 S:7 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6900.0,5.00%,F,T)
469.7780 S:7 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,5672.0,5.00%,F,T)
471.7750 S:7 F:5 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,7020.0,5.00%,F,T)
513.6775 S:7 F:5 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,5720.0,5.00%,F,T)
454.9728 S:7 F:5 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time


File:A27JAN09A_12 #1-387 Acq: 1-FEB-2009 22:54:30 GC EI+ Voltage SIR Autospec-UltimaE
Sample#7 Text:G1040-3-1B Exp:EXP_DB5MS
341.8568 S:7 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6016.0,5.00%,F,T)
339.8597 S:7 BSUB(128,15,-3.0) PKD(3,2,1,0.01%,6992.0,5.00%,F,T)
375.8364 S:7 BSUB(128,15,-3.0) PKD(3,2,1,100.00%,7316.0,5.00%,F,T)
304.9824 S:7 SMO(1,3) PKD(3,2,1,100.00%,0.0,5.00%,F,T)
Time

TOTAL SOLIDS

Extractions Total Solids-extts
Data By: Tae K. You
Created: 1/12/09

Worklist: 9719
Analyst: RVR
Comments:

	ARI ID CLIENT ID	Tare Wt (g)	Wet Wt (g)	Dry Wt (g)	% Solids	pH
1.	OH13A 09-729 PGSS-8	1.16	11.80	4.71	33.4	NR
2.	OH13C 09-731 PGSS-15	1.14	11.66	4.44	31.4	NR
3.	OH13D 09-732 PGSS-16	1.18	11.36	4.04	28.1	NR
4.	OH13E 09-733 PGSS-18	1.16	11.86	4.91	35.0	NR
5.	OH13F 09-734 PGSS-20	1.16	11.38	5.25	40.0	NR
6.	OH13G 09-735 PGSS-22	1.14	11.90	4.54	31.6	NR
7.	OH13H 09-736 PGSS-21B	1.16	13.06	6.29	43.1	NR
8.	OH13K 09-739 PGSS-29A	1.20	12.12	5.24	37.0	NR
9.	OH13L 09-740 PGSS-30	1.18	12.56	5.06	34.1	NR
10.	OH13M 09-741 PGSS-31	1.16	11.32	4.73	35.1	NR
11.	OH13N 09-742 PGSS-33	1.17	12.60	5.75	40.1	NR
12.	OH13O 09-743 PGSS-35	1.17	14.10	5.36	32.4	NR
13.	OH13Q 09-749 PGSS-38A	1.18	12.52	6.61	47.9	NR
14.	OH13R 09-745 PGSS-39	1.17	12.41	5.43	37.9	NR
15.	OH13S 09-746 PGSS-40	1.16	12.84	5.63	38.3	NR

Extractions Total Solids-extts
Data By: Tae K. You
Created: 1/12/09

Worklist: 9719
Analyst: RVR
Comments:

	ARI ID CLIENT ID	Tare Wt (g)	Wet Wt (g)	Dry Wt (g)	% Solids	pH
16.	OH13T 09-747 PGSS-42	1.18	11.72	5.14	37.6	NR
17.	OH13U 09-748 PGSS-44	1.14	11.46	4.59	33.4	NR

Solids Data Entry Report Checked by: MH Date: 01/16/09
Date: 01/16/09 Data Analyst: KM

Solids Determination performed on 01/15/09 by MH

JOB	SAMPLE	CLIENTID	TAREWEIGHT	SAMPDISH	DRYWEIGHT	SOLIDS
OH13	A	PGSS-8	0.974	10.449	4.245	34.52
OH13	C	PGSS-15	0.966	10.620	4.360	35.16
OH13	D	PGSS-16	0.966	10.257	3.833	30.86
OH13	E	PGSS-18	0.972	10.607	4.533	36.96
OH13	F	PGSS-20	0.961	10.450	4.996	42.52
OH13	G	PGSS-22	0.964	10.076	4.068	34.06
OH13	H	PGSS-21B	0.977	10.102	5.111	45.30
OH13	K	PGSS-29A	1.000	10.167	4.382	36.89
OH13	L	PGSS-30	0.974	10.561	4.236	34.03
OH13	M	PGSS-31	0.923	10.355	4.544	38.39
OH13	N	PGSS-33	0.984	10.506	4.685	38.87
OH13	O	PGSS-35	1.032	10.372	4.121	33.07
OH13	Q	PGSS-38A	0.979	10.500	5.697	49.55
OH13	R	PGSS-39	0.978	10.603	4.468	36.26
OH13	S	PGSS-40	0.961	10.220	4.599	39.29
OH13	T	PGSS-42	1.010	10.540	4.808	39.85
OH13	U	PGSS-44	1.002	10.571	4.297	34.43

Analytical Resources, Incorporated
Analytical Chemists and Consultants

February 26, 2009

Mr. Roger McGinnis
Hart Crowser, Inc.
1700 Westlake Avenue North Suite 200
Seattle, WA 98109-3056

RE: Project: Port Gamble, 17330-14
ARI Job No.: OJ67

Dear Mr. McGinnis:

Please find enclosed the original Chain-of-Custody (COC) records, sample receipt documentation, and the final data package for the samples from the project referenced above.

The samples were analyzed for Grain Size, as requested.

Sample receipt and details of these analyses are discussed in the Case Narrative.

An electronic copy of this data package and the supporting data 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.

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

Enclosures

cc: files OJ67

KB/co

Chain of Custody
Documentation

prepared
for

HART CROWSER, INC.

Project: Port Gamble, 174330-14

ARI JOB NO: OJ67

prepared
by

Analytical Resources, Inc.

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:

Turn-around Requested: STD

Page: 1 of 1

ARI Client Company: Hart Crowser

Phone: 206-826-4514

Date: 1/12/09

Ice Present? Y

Client Contact: Roger McGinnis

No. of Coolers: 1

Cooler Temps: 4.6

Client Project Name: Port Gamble

Client Project #: ~~17~~ 17330-14

Samplers: C. Eaton

Sample ID	Date	Time	Matrix	No. Containers	Conventionals	Micro tox	Grain Size						Notes/Comments
CR 20W	1/9/09	1320	Sed	2	X	X	X						
CR 23 Mud	1/9/09	1420	Sed	3	X	X	X						
MSMP 43	1/9/09	1200	Sed	3	X	X	X						

Comments/Special Instructions: CR20W does not have a preserved sulfide container

	Relinquished by:	Received by:	Relinquished by:	Received by:
(Signature)	Roger McGinnis	[signature]		
Printed Name:	Roger McGinnis	A Nolgardsen		
Company:	Hart Crowser	ARI		
Date & Time:	1/12/09 12:45	1/12/09 1245		

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.

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Hart Crowser

Project Name: Port Gamble

COC No: ______

Delivered by: Hand

Assigned ARI Job No: OH45

Tracking No: ______

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
Record cooler temperature (recommended 2.0-6.0 °C for chemistry	4.6 °C

Cooler Accepted by: AV Date: 1/12/09 Time: 1245

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?	N
Was sufficient ice used (if appropriate)?	**(YES)** NO
Were all bottles sealed in individual plastic bags?	YES **(NO)**
Did all bottle arrive in good condition (unbroken)?	**(YES)** NO
Were all bottle labels complete and legible?	**(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 checklist)	YES **(NO)**
Were all VOC vials free of air bubbles?	**(NA)** YES NO
Was sufficient amount of sample sent in each bottle?	**(YES)** NO

Samples Logged by: MM Date: 1/12/09 Time: 1335

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

Explain discrepancies or negative responses:

4oz sample jar reading CR20W; sampling time: 1330; Sulfides found in cooler not indicated on COC

By: MM Date: 1-12-09

OH05 : 00000

Case Narrative

prepared
for

HART CROWSER, INC.

Project: Port Gamble, 174330-14

ARI JOB NO: OJ67

prepared
by

Analytical Resources, Inc.

Case Narrative
Hart Crowser
Port Gamble, 17330-14
ARI Job: OJ67
February 26, 2009

Sample Receipt

Analytical Resources Inc. (ARI) accepted three sediment samples on 1/12/09 under the ARI job numbers OH45 and OJ67. The cooler temperature measured by IR thermometer following ARI SOP was 4.6°C and the samples were well iced. Please note that several sample containers were archived up receipt as requested on the COC. The Microtox data is reported under its own data package.

Grain Size: The grain size analysis and case narrative are included in this data package.

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Client: Hart Crowser, Inc.	**ARI Project No.:** OJ67
Client Project: Port Gamble	**Client Project No.:** 174330-14

Case Narrative

1. Three samples were submitted for grain size analysis according to Puget Sound Estuary Protocol (PSEP) methodology on January 26,2009.
2. The samples were run in a single batch and one sample from this job 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.

Approved by: _____ Date: 02/10/09
Title: Lead Technician

Data Summary Package

prepared
for

HART CROWSER, INC.

Project: Port Gamble, 174330-14

ARI JOB NO: OJ67

prepared
by

Analytical Resources, Inc.

Hart Crowser, Inc.
Port Gamble 174330-14

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	
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
CR23MOD	100.0	100.0	100.0	99.8	99.2	97.8	90.6	51.6	26.8	13.8	9.4	7.8	6.0	4.6
	100.0	100.0	99.9	99.8	99.2	97.5	89.5	50.8	25.3	13.6	9.2	7.7	5.8	4.4
	100.0	100.0	100.0	99.8	99.2	97.7	90.0	51.5	26.1	13.2	9.2	7.4	5.8	4.4
CR20W	100.0	100.0	100.0	99.9	99.6	99.0	97.4	79.7	42.7	18.9	12.0	9.8	7.9	6.4
MSMP43	100.0	100.0	100.0	99.9	98.9	79.4	19.2	6.4	5.3	4.7	4.2	3.6	2.8	1.7

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.

OJ67

Hart Crowser, Inc.
Port Gamble 174330-14

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
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)
CR23MOD	0.0	0.2	0.6	1.4	7.2	39.1	24.8	13.0	4.4	1.7	1.8	1.3	4.6	51.6
	0.1	0.2	0.6	1.7	8.0	38.7	25.6	11.7	4.4	1.5	1.8	1.4	4.4	50.8
	0.0	0.2	0.6	1.5	7.7	38.5	25.4	12.9	4.0	1.8	1.6	1.4	4.4	51.5
CR20W	0.0	0.1	0.3	0.6	1.6	17.7	37.0	23.8	7.0	2.1	1.9	1.5	6.4	79.7
MSMP43	0.0	0.1	1.0	19.5	60.2	12.7	1.1	0.6	0.5	0.6	0.8	1.1	1.7	6.4

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.

OJ67

QA SUMMARY

Client:	Hart Crowser, Inc.	Project No.:	Port Gamble 174330-14
ARI Trip. Sample ID:	OJ67 B	Batch No.:	OJ67-1
Client Trip. Sample ID:	CR23MOD	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
CR23MOD	100.0	100.0	100.0	99.8	99.2	97.8	90.6	51.6	26.8	13.8	9.4	7.8	6.0	4.6
	100.0	100.0	99.9	99.8	99.2	97.5	89.5	50.8	25.3	13.6	9.2	7.7	5.8	4.4
	100.0	100.0	100.0	99.8	99.2	97.7	90.0	51.5	26.1	13.2	9.2	7.4	5.8	4.4
AVE	NA	100.00	99.97	99.79	99.20	97.70	90.07	51.30	26.05	13.53	9.27	7.62	5.87	4.49
STDEV	NA	0.00	0.05	0.03	0.02	0.16	0.55	0.39	0.76	0.32	0.14	0.20	0.09	0.14
%RSD	NA	0.00	0.05	0.03	0.02	0.16	0.61	0.76	2.92	2.33	1.53	2.60	1.53	3.04

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)
CR23MOD	1/9/2009	2/5/2009	2/10/2009	102.6		13.1
	1/9/2009	2/5/2009	2/10/2009	101.1		12.5
	1/9/2009	2/5/2009	2/10/2009	99.8		12.8
CR20W	1/9/2009	2/5/2009	2/10/2009	98.8		18.1
MSMP43	1/9/2009	2/5/2009	2/10/2009	99.9		5.9

* ARI Internal QA limits = 95-105%

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.

Laboratory Data Package

prepared
for

HART CROWSER, INC.

Project: Port Gamble, 174330-14

ARI JOB NO: OJ67

prepared
by

Analytical Resources, Inc.

Geotech Analysis

prepared
for

HART CROWSER, INC.

Project: Port Gamble, 174330-14

ARI JOB NO: OJ67

prepared
by

Analytical Resources, Inc.

Hart Crowser, Inc.
Port Gamble 174330-14

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	
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
CR23MOD	100.0	100.0	100.0	99.8	99.2	97.8	90.6	51.6	26.8	13.8	9.4	7.8	6.0	4.6
	100.0	100.0	99.9	99.8	99.2	97.5	89.5	50.8	25.3	13.6	9.2	7.7	5.8	4.4
	100.0	100.0	100.0	99.8	99.2	97.7	90.0	51.5	26.1	13.2	9.2	7.4	5.8	4.4
CR20W	100.0	100.0	100.0	99.9	99.6	99.0	97.4	79.7	42.7	18.9	12.0	9.8	7.9	6.4
MSMP43	100.0	100.0	100.0	99.9	98.9	79.4	19.2	6.4	5.3	4.7	4.2	3.6	2.8	1.7

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.

OJ67

Hart Crowser, Inc.
Port Gamble 174330-14

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
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)
CR23MOD	0.0	0.2	0.6	1.4	7.2	39.1	24.8	13.0	4.4	1.7	1.8	1.3	4.6	51.6
	0.1	0.2	0.6	1.7	8.0	38.7	25.6	11.7	4.4	1.5	1.8	1.4	4.4	50.8
	0.0	0.2	0.6	1.5	7.7	38.5	25.4	12.9	4.0	1.8	1.6	1.4	4.4	51.5
CR20W	0.0	0.1	0.3	0.6	1.6	17.7	37.0	23.8	7.0	2.1	1.9	1.5	6.4	79.7
MSMP43	0.0	0.1	1.0	19.5	60.2	12.7	1.1	0.6	0.5	0.6	0.8	1.1	1.7	6.4

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.

OJ67

QA SUMMARY

Client:	Hart Crowser, Inc.	Project No.:	Port Gamble 174330-14
ARI Trip. Sample ID:	OJ67 B	Batch No.:	OJ67-1
Client Trip. Sample ID:	CR23MOD	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
CR23MOD	100.0	100.0	100.0	99.8	99.2	97.8	90.6	51.6	26.8	13.8	9.4	7.8	6.0	4.6
	100.0	100.0	99.9	99.8	99.2	97.5	89.5	50.8	25.3	13.6	9.2	7.7	5.8	4.4
	100.0	100.0	100.0	99.8	99.2	97.7	90.0	51.5	26.1	13.2	9.2	7.4	5.8	4.4
AVE	NA	100.00	99.97	99.79	99.20	97.70	90.07	51.30	26.05	13.53	9.27	7.62	5.87	4.49
STDEV	NA	0.00	0.05	0.03	0.02	0.16	0.55	0.39	0.76	0.32	0.14	0.20	0.09	0.14
%RSD	NA	0.00	0.05	0.03	0.02	0.16	0.61	0.76	2.92	2.33	1.53	2.60	1.53	3.04

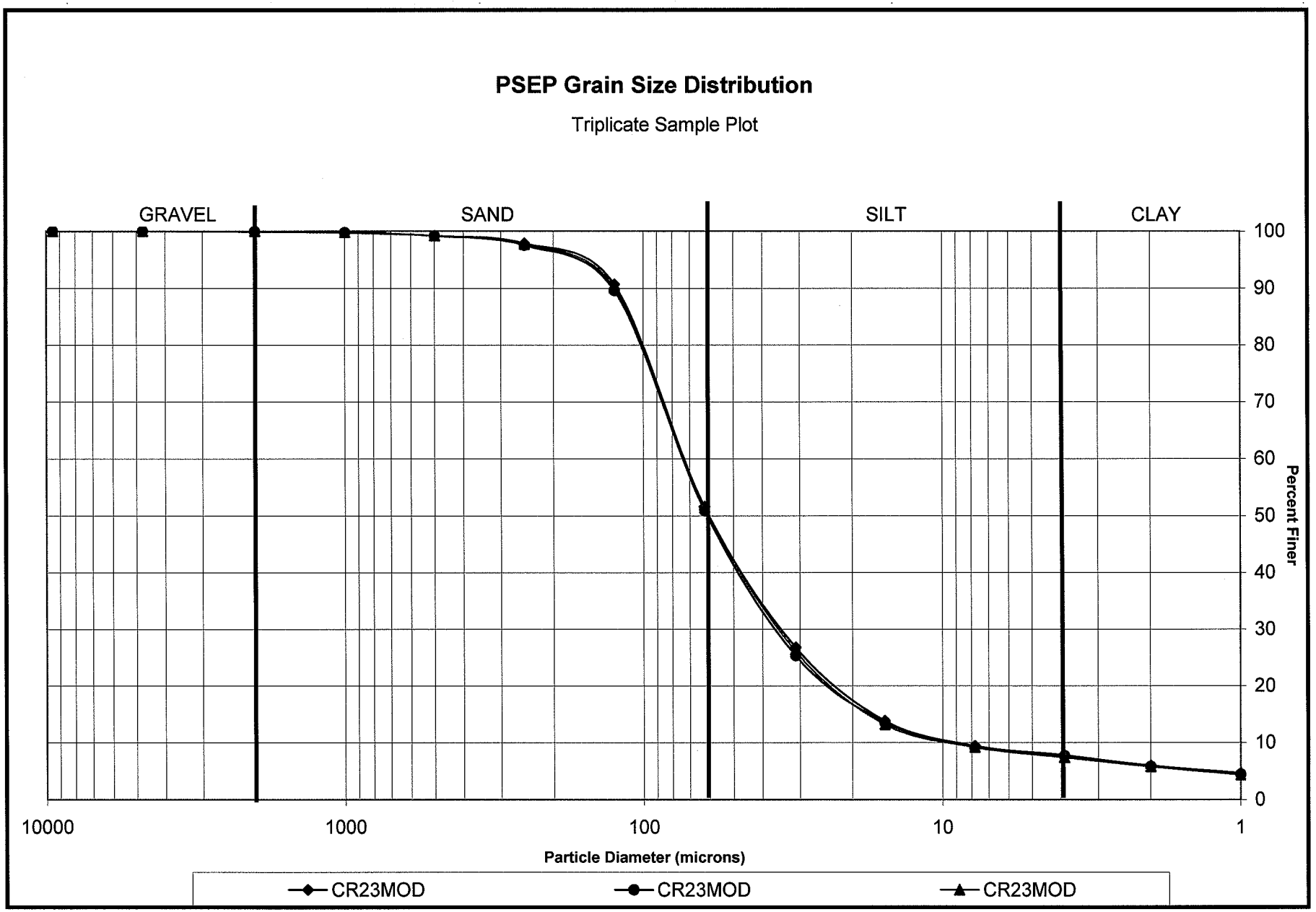
The Triplicate Applies To The Following Samples

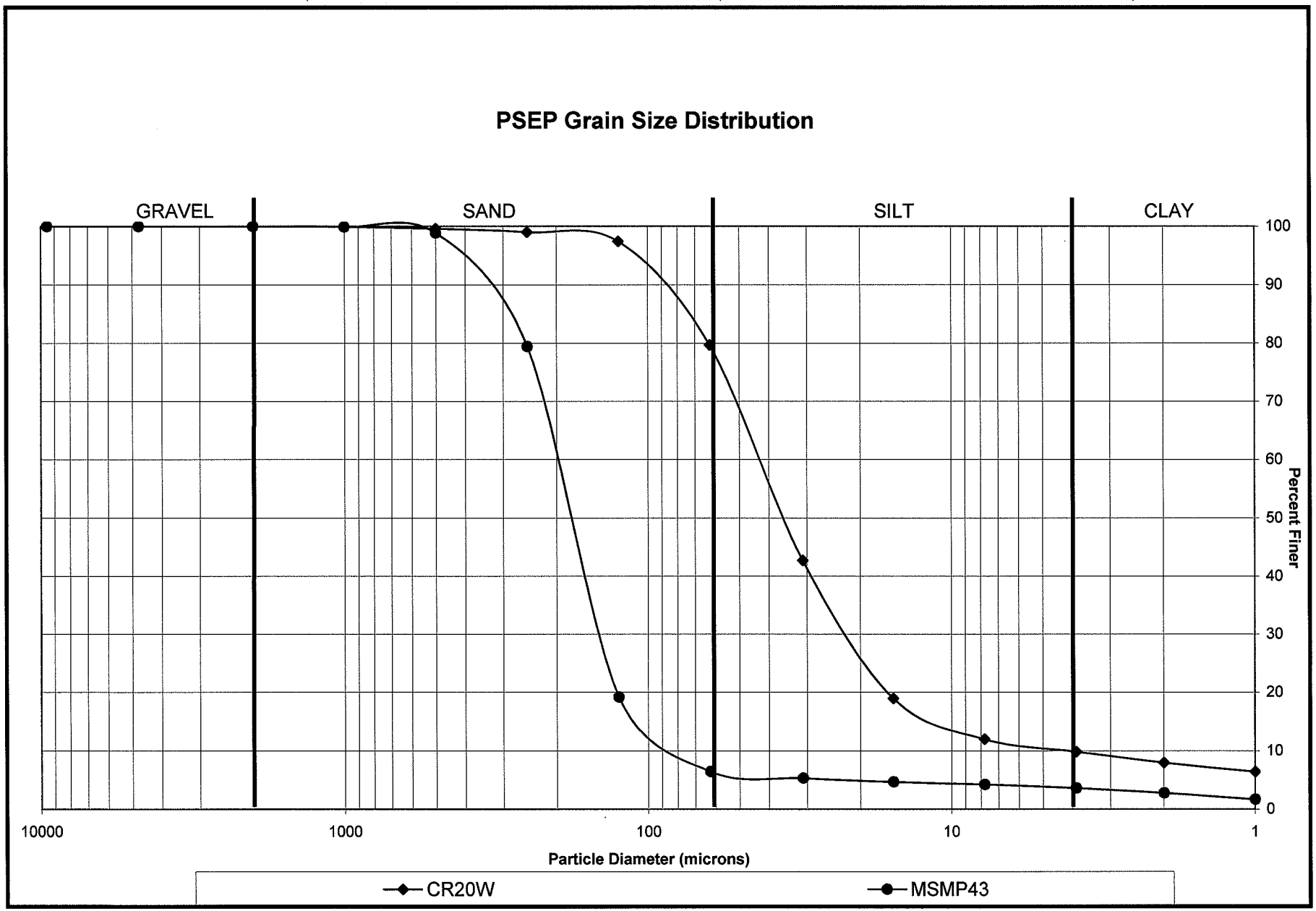
Client ID	Date Sampled	Date Extracted	Date Complete	QA Ratio (95-105)	Data Qualifiers	Pipette Portion (5.0-25.0g)
CR23MOD	1/9/2009	2/5/2009	2/10/2009	102.6		13.1
	1/9/2009	2/5/2009	2/10/2009	101.1		12.5
	1/9/2009	2/5/2009	2/10/2009	99.8		12.8
CR20W	1/9/2009	2/5/2009	2/10/2009	98.8		18.1
MSMP43	1/9/2009	2/5/2009	2/10/2009	99.9		5.9

* ARI Internal QA limits = 95-105%

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.


PSEP Grain Size Distribution
Triplicate Sample Plot
GRAVEL
SAND
SILT
CLAY
100
90
80
70
60
50
40
30
20
10
0
Percent Finer
10000
1000
100
10
1
Particle Diameter (microns)
CR23MOD
CR23MOD
CR23MOD


PSEP Grain Size Distribution
GRAVEL
SAND
SILT
CLAY
100
90
80
70
60
50
40
30
20
10
0
Percent Finer
10000
1000
100
10
1
Particle Diameter (microns)
CR20W
MSMP43

PSEP GRAIN SIZE ANALYSIS

Job No. DJ67 ARI Sample No. B-1 Client Sample No. CR23MOD

Set-up Date: 2/5/09 Sample Description: fine Sandy, Silty clay

Calgon Batch # 193 Sieve Set # 1 Date Sieved: 2/06/09

SOLIDS CONTENT

Moisture Content	Initials eg
Container No.	111
Tare Weight	1.5579
Wet Weight + Tare	23.4855
Dry Weight + Tare	16.5320 AR

Test Sample	Initials eg
Container No.	111
Tare Weight	49.6679
Wet Weight + Tare	86.9846
Dry Weight + Tare	63.5130

SIEVE ANALYSIS

Initials AR

Sieve Size	Weight Retained
Tare	49.6649
4	49.6649
10	49.6649
18	49.7179
35	49.8693
60	50.2147
120	52.0511
230	62.0079
PAN	1.5496

2/9/2009

Temp:23

Salt Correction	
Wt.	
Dry Sample	
Correction (x 50)	

PIPETTE ANALYSIS

Initials AS

Tare ID	Tare Wt	Dry Wt & Tare	TIME
B-1-1	1.5654	1.8241	10:40:00
B-1-2	1.5568	1.6989	10:41:46
B-1-3	1.5378	1.6155	10:47:05
B-1-4	1.5476	1.6035	11:08:18
B-1-5	1.5366	1.5843	12:33:00
B-1-6	1.5400	1.5787	16:06:00
B-1-7	1.5399	1.5721	9:16:00

400 AS

PSEP GRAIN SIZE ANALYSIS

Job No. OJ67 ARI Sample No. B-2 Client Sample No. CR23MOD

Set-up Date: 2/5/09 Sample Description: fine Sandy Silty Clay

Calgon Batch # 193 Sieve Set # 2 Date Sieved: 2/6/09

SOLIDS CONTENT

Moisture Content	Initials EG
Container No.	123
Tare Weight	1.5523
Wet Weight + Tare	20.8724
Dry Weight + Tare	14.7527

Test Sample	Initials EG
Container No.	123
Tare Weight	50.5434
Wet Weight + Tare	86.5473
Dry Weight + Tare	63.6847

SIEVE ANALYSIS
Initials AR

Sieve Size	Weight Retained
Tare	50.5428
4	50.5428
10	50.5628
18	50.6008
35	50.7454
60	51.1518
120	53.1157
230	62.6342
PAN	1.1471

2/9/2009

Temp:23

Correction	
Wt.	
+ Dry Sample	
Correction (x 50)	

PIPETTE ANALYSIS
Initials AS

Tare ID	Tare Wt	Dry Wt & Tare	TIME
B2-1	1.5366	1.7906	10:44:00
B-2-2	1.5831	1.7152	10:44:20
B-2-3	1.5815	1.6566	10:45:46
B-2-4	1.5889	1.6426	10:51:05
B-2-5	1.5863	1.6327	11:12:18
B-2-6	1.5888	1.6262	12:37:00
B-2-7	1.5816	1.6123	16:10:00
			9:20:00

PSEP GRAIN SIZE ANALYSIS

Job No. OJ67 ARI Sample No. B-3 Client Sample No. CR23MOD

Set-up Date: 2/5/09 Sample Description: fine, sandy, silty clay

Calgon Batch # 193 Sieve Set # 1 Date Sieved: 2/06/09

SOLIDS CONTENT

Moisture Content	Initials eg
Container No.	133
Tare Weight	1.5296
Wet Weight + Tare	21.0713
Dry Weight + Tare	14.8890

Test Sample	Initials eg
Container No.	133
Tare Weight	49.8826
Wet Weight + Tare	86.1208
Dry Weight + Tare	63.0924

SIEVE ANALYSIS

Initials AR

Sieve Size	Weight Retained
Tare	49.8817
4	49.8817
10	49.8817
18	49.9245
35	50.0770
60	50.4454
120	52.3528
230	61.9016
PAN	1.2331

2/9/2009

Temp:23

orrection	
Vt.	
Dry Sample	
orrection (x 50)	

PIPETTE ANALYSIS

Initials as

Tare ID	Tare Wt	Dry Wt & Tare	TIME
B-3-1	1.5562	1.8215	10:48:00
B-3-2	1.5852	1.7238	10:49:46
B-3-3	1.5886	1.6632	10:55:05
B-3-4	1.5518 (as)	1.6067	11:16:18
B-3-5	1.5168	1.5626	12:41:00
B-3-6	1.5190	1.5569	16:14:00
B-3-7	1.5164	1.5472	9:24:00

PSEP GRAIN SIZE ANALYSIS

Job No. DJ67 ARI Sample No. A Client Sample No. CR20W

Set-up Date: 2/5/09 Sample Description: fine sandy, silty, clay

Calgon Batch # _____ Sieve Set # 2 Date Sieved: 2/06/09

SOLIDS CONTENT

Moisture Content	Initials EG
Container No.	136
Tare Weight	1.5300
Wet Weight + Tare	32.6835
Dry Weight + Tare	~~32.6835~~

21.5677 EG

Test Sample	Initials EG
Container No.	136
Tare Weight	50.5208
Wet Weight + Tare	85.8690
Dry Weight + Tare	56.2107

SIEVE ANALYSIS

Initials AR

Sieve Size	Weight Retained
Tare	50.5343
4	50.5343
10	50.5343
18	50.5543
35	50.6302
60	50.7645
120	51.1211
230	55.1565
PAN	1.0732

orrection

Vt.	
Dry Sample	
orrection (x 50)	

2/9/2009

Temp:23

PIPETTE ANALYSIS

Initials QC

Tare ID	Tare Wt	Dry Wt & Tare	TIME
A-1	1.5161	1.8930	10:52:00
A-2	1.5855	1.7911	10:52:20
A-3	1.5624	1.6586	10:53:46
A-4	1.5418 ~~1.7605~~	1.6058	10:59:05
A-5	1.5430	1.5973	11:20:18
A-6	1.5418	1.5873	12:45:00
A-7	1.5317	1.5703	16:18:00
			9:28:00

PSEP GRAIN SIZE ANALYSIS

Job No. OJ67 ARI Sample No. C Client Sample No. MSMP43

Set-up Date: 2/5/09 Sample Description: silty sand

Calgon Batch # 193 Sieve Set # 1 Date Sieved: 2/06/09

SOLIDS CONTENT

Moisture Content	Initials EG
Container No.	177
Tare Weight	1.5663
Wet Weight + Tare	31.6896
Dry Weight + Tare	24.6284

Test Sample	Initials EG
Container No.	177
Tare Weight	50.5677
Wet Weight + Tare	170.8752
Dry Weight + Tare	137.1413

SIEVE ANALYSIS

Initials AR

Sieve Size	Weight Retained
Tare	50.5703
4	50.5703
10	50.5872
18	50.6430
35	51.6023
60	69.5512
120	125.0345
230	136.7525
PAN	0.2719

rrection

/t.	
Dry Sample	
rrection (x 50)	

2/9/2009

Temp:23

PIPETTE ANALYSIS

Initials CC

Tare ID	Tare Wt (as)	Dry Wt & Tare	TIME
C-1	1.5168	1.6459	10:56:00
C-2	1.5118	1.6186	10:56:20
C-3	1.5111	1.6064	10:57:46
C-4	1.5098	1.5965	11:03:05
C-5	1.4849	1.5608	11:24:18
C-6	1.4833	1.5439	12:49:00
C-7	1.4886	1.5285 (as)	16:22:00

Analytical Resources, Incorporated
Analytical Chemists and Consultants

April 18, 2009

Mr. Roger McGinnis
Hart Crowser, Inc.
1700 Westlake Avenue North Suite 200
Seattle, WA 98109-3056

RE: Project: Port Gamble, 17330-14
ARI Job No.: OT70

Dear Mr. McGinnis:

Please find enclosed the original Chain-of-Custody (COC) records, sample receipt documentation, and the final data package for the samples from the project referenced above.

The samples were analyzed for PCBs, SVOCs and Total Metals, as requested.

Sample receipt and details of these analyses are discussed in the Case Narrative.

An electronic copy of this data package and the supporting data 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.

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

Enclosures

cc: files OT70

KB/kb

Chain of Custody
Documentation

prepared
for

Hart Crowser, Inc.

Project: PORT GAMBLE, 17330-14

ARI JOB NO: OT70

prepared
by

Analytical Resources, Inc.

Sample Custody Record

ODIS

Samples Shipped to: ARI

HARTCROWSER

Hart Crowser, Inc.
1910 Fairview Avenue East
Seattle, Washington 98102-3699
Phone: 206-324-9530 FAX: 206-328-5581

JOB 17330-14 LAB NUMBER

PROJECT NAME Port Gamble

HART CROWSER CONTACT Roger McGinnis

SAMPLED BY: CFR, CWU

REQUESTED ANALYSIS

LAB NO.	SAMPLE ID	DESCRIPTION	DATE	TIME	MATRIX	SMS Metals ☆	SVOCs ☆☆	PCBs	Ammonia	Total Volatile Solids	TOC	Total Sulfides	Dioxins/Furans	Grain Size	Microtox	Bioassay		NO. OF CONTAINERS	OBSERVATIONS/COMMENTS/ COMPOSITING INSTRUCTIONS
	PGSS-8	Sediment	12/4/08	955	Sediment				X	X	X	X							Low Volume
	PGSS-14A	↓	12/4/08	1040	↓				↓	↓	↓	↓							Low Volume
	PGSS-15		↓	1112															Low Volume
	PGSS-16			1145															Low Volume
	PGSS-18			1255															Low Volume
	PGSS-20			1320															Low Volume
	PGSS-22			1348															Low Volume
	PGSS-21B			1415															
	PGSS-21A			1520															
	PGSS-29			1550															
	PGSS-29A		↓	1620															
	PGSS-30	↓	12/5/08	807	↓				↓	↓	↓	↓							

RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE [signature]	12/8/08	SIGNATURE [signature]	12/8/08
PRINT NAME Eileen Kust	TIME	PRINT NAME A. Volgardsen	TIME
COMPANY HC	1400	COMPANY ARI	1400
RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE	TIME	SIGNATURE	TIME
PRINT NAME		PRINT NAME	
COMPANY		COMPANY	

SPECIAL SHIPMENT HANDLING OR STORAGE REQUIREMENTS:

Low Volume, Lab needs to modify sample volumes for PGSS-8, 14A, 15, 16, 18, 20, 22.

☆ Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Silver, Zinc.

COOLER NO.:

STORAGE LOCATION: 9295 9295

See Lab Work Order No. ________ for Other Contract Requirements

TOTAL NUMBER OF CONTAINERS

SAMPLE RECEIPT INFORMATION
CUSTODY SEALS: ☐ YES ☐ NO ☐ N/A
GOOD CONDITION ☐ YES ☐ NO
TEMPERATURE
SHIPMENT METHOD: ☐ HAND ☐ COURIER ☐ OVERNIGHT

TURNAROUND TIME:
☐ 24 HOURS ☐ 1 WEEK
☐ 48 HOURS ☒ STANDARD
☐ 72 HOURS OTHER ________

White and Yellow Copies to Lab   Pink to Project Manager   Lab to Return White Copy to Hart Crowser   Gold to Sample Custodian

Sample Custody Record

Samples Shipped to: ARI

2 of 2

HARTCROWSER

Hart Crowser, Inc.
1910 Fairview Avenue East
Seattle, Washington 98102-3699
Phone: 206-324-9530 FAX: 206-328-5581

JOB 17330-14 LAB NUMBER

PROJECT NAME Port Gamble

HART CROWSER CONTACT Roger McGinnis

SAMPLED BY: CFR/CWJ

LAB NO.	SAMPLE ID	DESCRIPTION	DATE	TIME	MATRIX	SMS Metals *	SVOCs **	PCBs	Ammonia	TVS	TOC	Total Sulfides	Dioxin/Furans	Grain Size	Microtox	Bioassay	NO. OF CONTAINERS	OBSERVATIONS/COMMENTS/ COMPOSITING INSTRUCTIONS
PGSS-31		SEDIMENT	12/5/08	850	SEDIMENT				X	X	X	X						
PGSS-33				920					↓	↓	↓	↓						
PGSS-35				1020														
PGSS-38				1045														
PGSS-38A				1120														
PGSS-39				1245														
PGSS-40				1310														
PGSS-42				1345														
PGSS-44				1410														

REQUESTED ANALYSIS

RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE	12/8/08	SIGNATURE	12/8/08
PRINT NAME Eileen Rust	TIME	PRINT NAME A. Volgardsen	TIME
COMPANY HC	1400	COMPANY ARI	1400
RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE		SIGNATURE	
PRINT NAME	TIME	PRINT NAME	TIME
COMPANY		COMPANY	

SPECIAL SHIPMENT HANDLING OR STORAGE REQUIREMENTS:

** SVOCs will include SMS SVOCs, Guaicol, Retene, + Resin Acids.

TOTAL NUMBER OF CONTAINERS

SAMPLE RECEIPT INFORMATION
CUSTODY SEALS
GOOD CONDITION
TEMPERATURE
SHIPMENT METHOD

COOLER NO.: STORAGE LOCATION:

See Lab Work Order No. _____ for Other Contract Requirements

TURNAROUND TIME:

- ☐ 24 HOURS
- ☐ 48 HOURS
- ☐ 72 HOURS
- ☐ 1 WEEK
- ☒ STANDARD
- OTHER _____

White and Yellow Copies to Lab — Pink to Project Manager — Lab to Return White Copy to Hart Crowser — Gold to Sample Custodian

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: HC Project Name: Port Gamble

COC No: NA Delivered by: Hand

Assigned ARI Job No: ODI5 Tracking No: NA

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

Record cooler temperature (recommended 2.0-6.0 °C for chemistry 0.2 1.2, 2.0 7.6 7.6, 1.6, °C
5.2 5.4, 1.2, 2.4, 1.0

Cooler Accepted by: JH Date: 12/8/08 Time: 14:00

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? Ice

Was sufficient ice used (if appropriate)? (YES) NO

Were all bottles sealed in individual plastic bags? (YES) (NO)

Did all bottle arrive in good condition (unbroken)? (YES) NO

Were all bottle labels complete and legible? (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 checklist) YES (NO)

Were all VOC vials free of air bubbles? (NA) YES NO

Was sufficient amount of sample sent in each bottle? (YES) NO

Samples Logged by: JH Date: 12/8/08 Time: 1600

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

Explain discrepancies or negative responses:

By: Date:

Sample Custody Record

Samples Shipped to: ARI

HARTCROWSER

Hart Crowser, Inc.
1910 Fairview Avenue East
Seattle, Washington 98102-3699
Phone: 206-324-9530 FAX: 206-328-5581

JOB 17330.14 LAB NUMBER

PROJECT NAME PORT GAMBLE

HART CROWSER CONTACT ROGER MC GINNIS
ANNE CONRAD

SAMPLED BY: VP, CU

LAB NO.	SAMPLE ID	DESCRIPTION	DATE	TIME	MATRIX	TOTAL SULFIDES	TOC	TVS	AMMONIA	GRAIN SIZE	SMS SVOC	SMS METALS	PCBs	MICROTOX	DIOXIN	PSDDA ALKYL	GUAIACOL	RETENE	NO. OF CONTAINERS	OBSERVATIONS/COMMENTS/ COMPOSITING INSTRUCTIONS
	PGSS-45		12/8/08	1145	SED	X	X	X	X							X			6	*SMS METALS – As, Cd,
	PGSS-46			1215	X														6	Cr, Cu, Pb, Ag, Zn, Hg
	PGSS-47			1325	X														6	
	PGSS-47A			1400	X														6	HOLD
	PGSS-51			1425	X	X	X	X	X							X			6	
	PGSS-53			1508	X														6	
	PGSS-54			1534	X														6	
	PGSS-55			1600	X														6	
	PGSS-56			1626	X														6	
	PGSS-58		12/9/08	0727	X														6	
	PGSS-61			0757	X														6	
	PGSS-62			0821															6	

RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE	12/11/08	SIGNATURE Jami Hayes	12/11/08
PRINT NAME Carl Ulberg	TIME	PRINT NAME Jami Hayes	TIME
COMPANY HC	1210	COMPANY ARI	1210

RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE		SIGNATURE	
PRINT NAME	TIME	PRINT NAME	TIME
COMPANY		COMPANY	

SPECIAL SHIPMENT HANDLING OR STORAGE REQUIREMENTS:
FREEZE EXTRA SAMPLE VOLUME
FULL DATA PACKAGE

12 TOTAL NUMBER OF CONTAINERS

SAMPLE RECEIPT INFORMATION
CUSTODY SEALS: ☐ YES ☐ NO ☐ N/A
GOOD CONDITION: ☐ YES ☐ NO
TEMPERATURE:
SHIPMENT METHOD: ☐ HAND ☐ COURIER ☐ OVERNIGHT

COOLER NO.: STORAGE LOCATION:

See Lab Work Order No. _____ for Other Contract Requirements

TURNAROUND TIME:
☐ 24 HOURS ☐ 1 WEEK
☐ 48 HOURS ☐ STANDARD
☐ 72 HOURS OTHER _____

White and Yellow Copies to Lab Pink to Project Manager Lab to Return White Copy to Hart Crowser Gold to Sample Custodian

Sample Custody Record

0897

Samples Shipped to: ARI

2 of 5

HARTCROWSER

Hart Crowser, Inc.
1910 Fairview Avenue East
Seattle, Washington 98102-3699
Phone: 206-324-9530 FAX: 206-328-5581

JOB 17330-14 LAB NUMBER

PROJECT NAME PORT GAMBLE

HART CROWSER CONTACT ROGER McGINNIS
ANNE CONRAD

SAMPLED BY: VP, CV

LAB NO.	SAMPLE ID	DESCRIPTION	DATE	TIME	MATRIX	TOTAL SULFIDE	TOC	TVS	AMMONIA	GRAIN SIZE	SMS SVOCS	SMS METALS	PCBs	MICROTOX	DIOXIN	RESIN ACIDS	GUAIACOL	RETENE	NO. OF CONTAINERS	OBSERVATIONS/COMMENTS/ COMPOSITING INSTRUCTIONS
	PGSS-62A		12/9/08	1009	SED	X	X	X	X							X			6	*SMS METALS - As, Cd,
	PGSS-62B			0846															6	Cr, Cu, Pb, Ag, Zn, Hg
	PGSS-63			0913															6	
	PGSS-64			1035															6	
	PGSS-67			1101															6	
	PGSS-68			1212															6	
	PGSS-69			1236															6	
	PGSS-70			1301															6	
	PGSS-71			1332															6	
	PGSS-73			1428															6	
	PGSS-75			1458															6	
	PGSS-77			1530															6	

RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE: Carl	12/11/08	SIGNATURE: Jami Hayes	12/11/08
PRINT NAME: Carl Ulberg	TIME	PRINT NAME: Jami Hayes	TIME
COMPANY: HC	1210	COMPANY: ARI	1210
RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE	TIME	SIGNATURE	TIME
PRINT NAME		PRINT NAME	
COMPANY		COMPANY	

SPECIAL SHIPMENT HANDLING OR STORAGE REQUIREMENTS:
FREEZE EXTRA SAMPLE VOLUME
FULL DATA PACKAGE

72 TOTAL NUMBER OF CONTAINERS

SAMPLE RECEIPT INFORMATION
CUSTODY SEALS: ☐ YES ☐ NO ☐ N/A
GOOD CONDITION: ☐ ☐ NO
TEMPERATURE:
SHIPMENT METHOD: ☐ FED EX ☐ COURIER ☐ AIRBORNE

COOLER NO.: STORAGE LOCATION:

See Lab Work Order No. _____
for Other Contract Requirements

TURNAROUND TIME:
☐ 24 HOURS ☐ 1 WEEK
☐ 48 HOURS ☐ STANDARD
☐ 72 HOURS OTHER _____

White and Yellow Copies to Lab Pink to Project Manager Lab to Return White Copy to Hart Crowser Gold to Sample Custodian

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Hart Crowser — Project Name: _____

COC No: _____ — Delivered by: Hand

Assigned ARI Job No: OD92 — Tracking No: _____

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

Record cooler temperature (recommended 2.0-6.0 °C for chemistry) 0.8, -2.0, 1.2, 1.2, 0.4, 1.6, 1.2 °C, 2.0, 1.2

Cooler Accepted by: JH Date: 12/11/08 Time: 1225

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?		Ice	
Was sufficient ice used (if appropriate)?		(YES)	NO
Were all bottles sealed in individual plastic bags?		(YES)	NO
Did all bottle arrive in good condition (unbroken)?		(YES)	NO
Were all bottle labels complete and legible?		(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 checklist)		YES	(NO)
Were all VOC vials free of air bubbles?	(NA)	YES	NO
Was sufficient amount of sample sent in each bottle?		(YES)	NO

Samples Logged by: JH Date: 12/12/08 Time: 14:17

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

Explain discrepancies or negative responses:

By: Date:

Subject: FW: Port Gamble Additional SMS Analyses
From: Roger McGinnis <Roger.McGinnis@hartcrowser.com>
Date: Wed, 1 Apr 2009 13:36:27 -0700
To: 'Kelly Bottem' <kellyb@arilabs.com>
CC: Anne Conrad <Anne.Conrad@hartcrowser.com>

Kelly;
Here is the list of archive samples (30) we will need analyzed for the SMS metals; SVOCs (including guaiacol and retene) and PCBs.

Could you please send preliminary results as you get them.

Thanks,

Roger

From: Roger McGinnis
Sent: Wednesday, April 01, 2009 1:31 PM
To: Kevin Maclachlan (kmac461@ecy.wa.gov); Russ McMillan (rmcm461@ecy.wa.gov)
Cc: Anne Conrad
Subject: Port Gamble Additional SMS Analyses

Kevin/Russ;

Thanks for taking the time to go over the results to date. I will contact NW Aquatic Sciences tomorrow when Michelle gets back to verify how the tests were performed and if turbidity/suspended solids were an issue in any of the mytilus tests.

Based on our conversation this morning the following additional archive samples will be submitted for analysis of SMS metals, SVOCs, and PCBs.

SS-14A; SS-15; SS-16; SS-18; SS-21A; SS-21B; SS-29; SS-29A; SS-30; SS-31; SS-38; SS-38A; SS-39; SS-40; SS-42; SS-44; SS-47; SS-47A; SS=53; SS-54; SS-55; SS-56; SS-58; SS-62A; SS-62B; SS-63; SS-69; SS-70; SS-77; SS-83.

Thanks,
Roger

Case Narrative

prepared
for

Hart Crowser, Inc.

Project: PORT GAMBLE, 17330-14

ARI JOB NO: OT70

prepared
by

Analytical Resources, Inc.

Case Narrative
Hart Crowser
Port Gamble, 17330-14
ARI Job: OT70
April 18, 2009

Sample Receipt

Analytical Resources Inc. (ARI) accepted several sediment samples in good condition on December 8, 2008 and December 11, 2008 under the ARI job numbers OD15 and OD92. The cooler temperatures measured by IR thermometer following ARI SOP ranged between -2.0 and 7.6°C and the samples were well iced. Please note that several sample containers were archived up receipt as requested on the COCs. All samples were frozen to protect holding times. For further detail regarding sample receipt, please refer to the Cooer Receipt Form.

SVOCs by Method 8270D:

The samples were extracted on 4/6/09 and analyzed on 4/15/09 within the method recommended holding times for frozen samples.

Initial calibration(s): All compounds of interest were within method acceptance criteria.

Continuing calibration(s): Benzyl Alcohol, Benzoic Acid and the phenol's have > 20% D values for the CCALs on 4/16/09 and 4/15/09.

PCP had a 2.5 tailing factor associated with the 4/16/09 cal. No further corrective action was taken.

Samples: There were no anomalies associated with these samples.

Surrogates: The surrogate TPH is out of control high for sample **PGSS-16**. All other surrogates were in control and no further corrective action was taken.

LCS/LCSD(s): Are in control.

Method Blank: The method blanks were free of contamination.

PCBs by Method 8082:

The samples were extracted on 4/7/09 and analyzed on 4/10/09 within the method recommended holding times for frozen samples.

Initial calibration(s): All compounds of interest were within method acceptance criteria.

Continuing calibration(s): Are in control.

Samples: There were no anomalies associated with these samples.

Case Narrative
Hart Crowser
Port Gamble, 17330-14
ARI Job: OT70
April 18, 2009

Surrogates: Are in control.

LCS/LCSD(s): Are in control.

Method Blank: The method blanks were free of contamination.

Total Metals 6010 and 7000 Series:

The samples were digested on 4/7/09 and analyzed between 4/10/09 and 4/15/09 within the method recommended holding times for frozen samples with the exception of mercury.

Initial calibration(s): All compounds of interest were within method acceptance criteria.

Continuing calibration(s): Are in control.

Samples: There were no anomalies associated with these samples.

LCS: Is in control.

Method Blank: The method blanks were free of contamination.

Data Summary Package

prepared
for

Hart Crowser, Inc.

Project: PORT GAMBLE, 17330-14

ARI JOB NO: OT70

prepared
by

Analytical Resources, Inc.

SEMIVOLATILE ANALYSIS

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS **Sample ID: PGSS-14A**
Page 1 of 2 **SAMPLE**

Lab Sample ID: OT70A
LIMS ID: 09-8204
Matrix: Sediment
Data Release Authorized:
Reported: 04/17/09

QC Report No: OT70-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/04/08
Date Received: 12/08/09

Date Extracted: 04/06/09
Date Analyzed: 04/15/09 16:13
Instrument/Analyst: NT4/LJR
GPC Cleanup: Yes

Sample Amount: 26.2 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 29.1%

CAS Number	Analyte	RL	Result
108-95-2	Phenol	19	< 19 U
541-73-1	1,3-Dichlorobenzene	19	< 19 U
106-46-7	1,4-Dichlorobenzene	19	< 19 U
100-51-6	Benzyl Alcohol	19	< 19 U
95-50-1	1,2-Dichlorobenzene	19	< 19 U
95-48-7	2-Methylphenol	19	< 19 U
106-44-5	4-Methylphenol	19	< 19 U
105-67-9	2,4-Dimethylphenol	19	< 19 U
65-85-0	Benzoic Acid	190	< 190 U
120-82-1	1,2,4-Trichlorobenzene	19	< 19 U
91-20-3	Naphthalene	19	< 19 U
87-68-3	Hexachlorobutadiene	19	< 19 U
91-57-6	2-Methylnaphthalene	19	< 19 U
131-11-3	Dimethylphthalate	19	< 19 U
208-96-8	Acenaphthylene	19	< 19 U
83-32-9	Acenaphthene	19	< 19 U
132-64-9	Dibenzofuran	19	< 19 U
84-66-2	Diethylphthalate	19	< 19 U
86-73-7	Fluorene	19	< 19 U
86-30-6	N-Nitrosodiphenylamine	19	< 19 U
118-74-1	Hexachlorobenzene	19	< 19 U
87-86-5	Pentachlorophenol	95	< 95 U
85-01-8	Phenanthrene	19	< 19 U
120-12-7	Anthracene	19	< 19 U
84-74-2	Di-n-Butylphthalate	19	< 19 U
206-44-0	**Fluoranthene**	**19**	**11 J**
129-00-0	**Pyrene**	**19**	**12 J**
85-68-7	Butylbenzylphthalate	19	< 19 U
56-55-3	Benzo(a)anthracene	19	< 19 U
117-81-7	bis(2-Ethylhexyl)phthalate	19	< 19 U
218-01-9	Chrysene	19	< 19 U
117-84-0	Di-n-Octyl phthalate	19	< 19 U
205-99-2	Benzo(b)fluoranthene	19	< 19 U
207-08-9	Benzo(k)fluoranthene	19	< 19 U
50-32-8	Benzo(a)pyrene	19	< 19 U
193-39-5	Indeno(1,2,3-cd)pyrene	19	< 19 U
53-70-3	Dibenz(a,h)anthracene	19	< 19 U
191-24-2	Benzo(g,h,i)perylene	19	< 19 U
90-05-1	Guaiacol	19	< 19 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS **Sample ID: PGSS-14A**
 SAMPLE

Lab Sample ID: OT70A QC Report No: OT70-Hart Crowser, Inc.
LIMS ID: 09-8204 Project: PORT GAMBLE
Matrix: Sediment 17330-14
Date Analyzed: 04/15/09 16:13

CAS Number	Analyte	RL	Result
483-65-8	Retene	19	< 19 U
90-12-0	1-Methylnaphthalene	19	< 19 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	58.8%	2-Fluorobiphenyl	75.6%
d14-p-Terphenyl	96.8%	d4-1,2-Dichlorobenzene	62.4%
d5-Phenol	65.1%	2-Fluorophenol	59.2%
2,4,6-Tribromophenol	100%	d4-2-Chlorophenol	67.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS **Sample ID: PGSS-15**
Page 1 of 2 **SAMPLE**

Lab Sample ID: OT70B
LIMS ID: 09-8205
Matrix: Sediment
Data Release Authorized:
Reported: 04/17/09

QC Report No: OT70-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/04/08
Date Received: 12/08/09

Date Extracted: 04/06/09
Date Analyzed: 04/15/09 16:47
Instrument/Analyst: NT4/LJR
GPC Cleanup: Yes

Sample Amount: 25.3 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 66.4%

CAS Number	Analyte	RL	Result
108-95-2	Phenol	20	< 20 U
541-73-1	1,3-Dichlorobenzene	20	< 20 U
106-46-7	1,4-Dichlorobenzene	20	< 20 U
100-51-6	Benzyl Alcohol	20	< 20 U
95-50-1	1,2-Dichlorobenzene	20	< 20 U
95-48-7	2-Methylphenol	20	< 20 U
106-44-5	4-Methylphenol	20	< 20 U
105-67-9	2,4-Dimethylphenol	20	< 20 U
65-85-0	Benzoic Acid	200	< 200 U
120-82-1	1,2,4-Trichlorobenzene	20	< 20 U
91-20-3	Naphthalene	20	< 20 U
87-68-3	Hexachlorobutadiene	20	< 20 U
91-57-6	2-Methylnaphthalene	20	< 20 U
131-11-3	Dimethylphthalate	20	< 20 U
208-96-8	Acenaphthylene	20	< 20 U
83-32-9	Acenaphthene	20	< 20 U
132-64-9	Dibenzofuran	20	< 20 U
84-66-2	Diethylphthalate	20	< 20 U
86-73-7	Fluorene	20	< 20 U
86-30-6	N-Nitrosodiphenylamine	20	< 20 U
118-74-1	Hexachlorobenzene	20	< 20 U
87-86-5	Pentachlorophenol	99	< 99 U
85-01-8	**Phenanthrene**	**20**	**11 J**
120-12-7	Anthracene	20	< 20 U
84-74-2	Di-n-Butylphthalate	20	< 20 U
206-44-0	**Fluoranthene**	**20**	**31**
129-00-0	**Pyrene**	**20**	**30**
85-68-7	Butylbenzylphthalate	20	< 20 U
56-55-3	**Benzo(a)anthracene**	**20**	**17 J**
117-81-7	**bis(2-Ethylhexyl)phthalate**	**20**	**50**
218-01-9	**Chrysene**	**20**	**26**
117-84-0	Di-n-Octyl phthalate	20	< 20 U
205-99-2	**Benzo(b)fluoranthene**	**20**	**27**
207-08-9	**Benzo(k)fluoranthene**	**20**	**18 J**
50-32-8	**Benzo(a)pyrene**	**20**	**19 J**
193-39-5	**Indeno(1,2,3-cd)pyrene**	**20**	**11 J**
53-70-3	Dibenz(a,h)anthracene	20	< 20 U
191-24-2	**Benzo(g,h,i)perylene**	**20**	**13 J**
90-05-1	Guaiacol	20	< 20 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS **Sample ID: PGSS-15**
 SAMPLE

Lab Sample ID: OT70B QC Report No: OT70-Hart Crowser, Inc.
LIMS ID: 09-8205 Project: PORT GAMBLE
Matrix: Sediment 17330-14
Date Analyzed: 04/15/09 16:47

CAS Number	Analyte	RL	Result
483-65-8	Retene	20	< 20 U
90-12-0	1-Methylnaphthalene	20	< 20 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	58.8%	2-Fluorobiphenyl	70.8%
d14-p-Terphenyl	88.4%	d4-1,2-Dichlorobenzene	63.2%
d5-Phenol	64.3%	2-Fluorophenol	59.5%
2,4,6-Tribromophenol	95.2%	d4-2-Chlorophenol	65.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS **Sample ID: PGSS-16**
Page 1 of 2 **SAMPLE**

Lab Sample ID: OT70C
LIMS ID: 09-8206
Matrix: Sediment
Data Release Authorized:
Reported: 04/17/09

QC Report No: OT70-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/04/08
Date Received: 12/08/09

Date Extracted: 04/06/09
Date Analyzed: 04/15/09 17:22
Instrument/Analyst: NT4/LJR
GPC Cleanup: Yes

Sample Amount: 25.2 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 70.1%

CAS Number	Analyte	RL	Result
108-95-2	Phenol	20	< 20 U
541-73-1	1,3-Dichlorobenzene	20	< 20 U
106-46-7	1,4-Dichlorobenzene	20	< 20 U
100-51-6	Benzyl Alcohol	20	< 20 U
95-50-1	1,2-Dichlorobenzene	20	< 20 U
95-48-7	2-Methylphenol	20	< 20 U
106-44-5	4-Methylphenol	20	< 20 U
105-67-9	2,4-Dimethylphenol	20	< 20 U
65-85-0	Benzoic Acid	200	< 200 U
120-82-1	1,2,4-Trichlorobenzene	20	< 20 U
91-20-3	Naphthalene	20	< 20 U
87-68-3	Hexachlorobutadiene	20	< 20 U
91-57-6	2-Methylnaphthalene	20	< 20 U
131-11-3	Dimethylphthalate	20	< 20 U
208-96-8	Acenaphthylene	20	< 20 U
83-32-9	Acenaphthene	20	< 20 U
132-64-9	Dibenzofuran	20	< 20 U
84-66-2	Diethylphthalate	20	< 20 U
86-73-7	Fluorene	20	< 20 U
86-30-6	N-Nitrosodiphenylamine	20	< 20 U
118-74-1	Hexachlorobenzene	20	< 20 U
87-86-5	Pentachlorophenol	99	< 99 U
85-01-8	**Phenanthrene**	**20**	**12 J**
120-12-7	Anthracene	20	< 20 U
84-74-2	Di-n-Butylphthalate	20	< 20 U
206-44-0	**Fluoranthene**	**20**	**31**
129-00-0	**Pyrene**	**20**	**34**
85-68-7	Butylbenzylphthalate	20	< 20 U
56-55-3	**Benzo(a)anthracene**	**20**	**18 J**
117-81-7	bis(2-Ethylhexyl)phthalate	20	< 20 U
218-01-9	**Chrysene**	**20**	**26**
117-84-0	Di-n-Octyl phthalate	20	< 20 U
205-99-2	**Benzo(b)fluoranthene**	**20**	**28**
207-08-9	**Benzo(k)fluoranthene**	**20**	**16 J**
50-32-8	**Benzo(a)pyrene**	**20**	**17 J**
193-39-5	**Indeno(1,2,3-cd)pyrene**	**20**	**11 J**
53-70-3	Dibenz(a,h)anthracene	20	< 20 U
191-24-2	**Benzo(g,h,i)perylene**	**20**	**15 J**
90-05-1	Guaiacol	20	< 20 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS **Sample ID: PGSS-16**
 SAMPLE

Lab Sample ID: OT70C
LIMS ID: 09-8206
Matrix: Sediment
Date Analyzed: 04/15/09 17:22

QC Report No: OT70-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14

CAS Number	Analyte	RL	Result
483-65-8	**Retene**	**20**	**10**
90-12-0	1-Methylnaphthalene	20	< 20 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	59.6%	2-Fluorobiphenyl	74.0%
d14-p-Terphenyl	102%	d4-1,2-Dichlorobenzene	64.0%
d5-Phenol	65.6%	2-Fluorophenol	60.8%
2,4,6-Tribromophenol	94.4%	d4-2-Chlorophenol	67.5%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS **Sample ID: PGSS-18**
Page 1 of 2 **SAMPLE**

Lab Sample ID: OT70D
LIMS ID: 09-8207
Matrix: Sediment
Data Release Authorized:
Reported: 04/17/09

QC Report No: OT70-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/04/08
Date Received: 12/08/09

Date Extracted: 04/06/09
Date Analyzed: 04/15/09 17:56
Instrument/Analyst: NT4/LJR
GPC Cleanup: Yes

Sample Amount: 25.2 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 62.1%

CAS Number	Analyte	RL	Result
108-95-2	Phenol	20	< 20 U
541-73-1	1,3-Dichlorobenzene	20	< 20 U
106-46-7	1,4-Dichlorobenzene	20	< 20 U
100-51-6	Benzyl Alcohol	20	< 20 U
95-50-1	1,2-Dichlorobenzene	20	< 20 U
95-48-7	2-Methylphenol	20	< 20 U
106-44-5	4-Methylphenol	20	< 20 U
105-67-9	2,4-Dimethylphenol	20	< 20 U
65-85-0	Benzoic Acid	200	< 200 U
120-82-1	1,2,4-Trichlorobenzene	20	< 20 U
91-20-3	Naphthalene	20	< 20 U
87-68-3	Hexachlorobutadiene	20	< 20 U
91-57-6	2-Methylnaphthalene	20	< 20 U
131-11-3	Dimethylphthalate	20	< 20 U
208-96-8	Acenaphthylene	20	< 20 U
83-32-9	Acenaphthene	20	< 20 U
132-64-9	Dibenzofuran	20	< 20 U
84-66-2	Diethylphthalate	20	< 20 U
86-73-7	Fluorene	20	< 20 U
86-30-6	N-Nitrosodiphenylamine	20	< 20 U
118-74-1	Hexachlorobenzene	20	< 20 U
87-86-5	Pentachlorophenol	99	< 99 U
85-01-8	Phenanthrene	20	< 20 U
120-12-7	Anthracene	20	< 20 U
84-74-2	Di-n-Butylphthalate	20	< 20 U
206-44-0	**Fluoranthene**	**20**	**21**
129-00-0	**Pyrene**	**20**	**21**
85-68-7	Butylbenzylphthalate	20	< 20 U
56-55-3	**Benzo(a)anthracene**	**20**	**10 J**
117-81-7	bis(2-Ethylhexyl)phthalate	20	< 20 U
218-01-9	**Chrysene**	**20**	**13 J**
117-84-0	Di-n-Octyl phthalate	20	< 20 U
205-99-2	**Benzo(b)fluoranthene**	**20**	**14 J**
207-08-9	**Benzo(k)fluoranthene**	**20**	**12 J**
50-32-8	**Benzo(a)pyrene**	**20**	**9.9 J**
193-39-5	Indeno(1,2,3-cd)pyrene	20	< 20 U
53-70-3	Dibenz(a,h)anthracene	20	< 20 U
191-24-2	Benzo(g,h,i)perylene	20	< 20 U
90-05-1	Guaiacol	20	< 20 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS **Sample ID: PGSS-18**
Page 2 of 2 **SAMPLE**

Lab Sample ID: OT70D QC Report No: OT70-Hart Crowser, Inc.
LIMS ID: 09-8207 Project: PORT GAMBLE
Matrix: Sediment 17330-14
Date Analyzed: 04/15/09 17:56

CAS Number	Analyte	RL	Result
483-65-8	Retene	20	< 20 U
90-12-0	1-Methylnaphthalene	20	< 20 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	53.6%	2-Fluorobiphenyl	67.6%
d14-p-Terphenyl	85.2%	d4-1,2-Dichlorobenzene	55.6%
d5-Phenol	59.2%	2-Fluorophenol	55.5%
2,4,6-Tribromophenol	94.4%	d4-2-Chlorophenol	61.1%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS **Sample ID: PGSS-21B**
Page 1 of 2 **SAMPLE**

Lab Sample ID: OT70E
LIMS ID: 09-8208
Matrix: Sediment
Data Release Authorized:
Reported: 04/17/09

QC Report No: OT70-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/04/08
Date Received: 12/08/09

Date Extracted: 04/06/09
Date Analyzed: 04/15/09 18:31
Instrument/Analyst: NT4/LJR
GPC Cleanup: Yes

Sample Amount: 25.2 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 53.4%

CAS Number	Analyte	RL	Result
108-95-2	Phenol	20	< 20 U
541-73-1	1,3-Dichlorobenzene	20	< 20 U
106-46-7	1,4-Dichlorobenzene	20	< 20 U
100-51-6	Benzyl Alcohol	20	< 20 U
95-50-1	1,2-Dichlorobenzene	20	< 20 U
95-48-7	2-Methylphenol	20	< 20 U
106-44-5	4-Methylphenol	20	< 20 U
105-67-9	2,4-Dimethylphenol	20	< 20 U
65-85-0	Benzoic Acid	200	< 200 U
120-82-1	1,2,4-Trichlorobenzene	20	< 20 U
91-20-3	Naphthalene	20	< 20 U
87-68-3	Hexachlorobutadiene	20	< 20 U
91-57-6	2-Methylnaphthalene	20	< 20 U
131-11-3	Dimethylphthalate	20	< 20 U
208-96-8	Acenaphthylene	20	< 20 U
83-32-9	Acenaphthene	20	< 20 U
132-64-9	Dibenzofuran	20	< 20 U
84-66-2	Diethylphthalate	20	< 20 U
86-73-7	Fluorene	20	< 20 U
86-30-6	N-Nitrosodiphenylamine	20	< 20 U
118-74-1	Hexachlorobenzene	20	< 20 U
87-86-5	Pentachlorophenol	99	< 99 U
85-01-8	**Phenanthrene**	**20**	**12 J**
120-12-7	**Anthracene**	**20**	**11 J**
84-74-2	Di-n-Butylphthalate	20	< 20 U
206-44-0	**Fluoranthene**	**20**	**26**
129-00-0	**Pyrene**	**20**	**30**
85-68-7	Butylbenzylphthalate	20	< 20 U
56-55-3	**Benzo(a)anthracene**	**20**	**23**
117-81-7	bis(2-Ethylhexyl)phthalate	20	< 20 U
218-01-9	**Chrysene**	**20**	**60**
117-84-0	Di-n-Octyl phthalate	20	< 20 U
205-99-2	**Benzo(b)fluoranthene**	**20**	**27**
207-08-9	**Benzo(k)fluoranthene**	**20**	**28**
50-32-8	**Benzo(a)pyrene**	**20**	**19 J**
193-39-5	Indeno(1,2,3-cd)pyrene	20	< 20 U
53-70-3	Dibenz(a,h)anthracene	20	< 20 U
191-24-2	**Benzo(g,h,i)perylene**	**20**	**11 J**
90-05-1	Guaiacol	20	< 20 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS **Sample ID: PGSS-21B**
Page 2 of 2 **SAMPLE**

Lab Sample ID: OT70E QC Report No: OT70-Hart Crowser, Inc.
LIMS ID: 09-8208 Project: PORT GAMBLE
Matrix: Sediment 17330-14
Date Analyzed: 04/15/09 18:31

CAS Number	Analyte	RL	Result
483-65-8	Retene	20	< 20 U
90-12-0	1-Methylnaphthalene	20	< 20 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	55.2%	2-Fluorobiphenyl	68.0%
d14-p-Terphenyl	82.0%	d4-1,2-Dichlorobenzene	58.8%
d5-Phenol	59.7%	2-Fluorophenol	57.1%
2,4,6-Tribromophenol	89.9%	d4-2-Chlorophenol	62.1%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS **Sample ID: PGSS-21A**
Page 1 of 2 **SAMPLE**

Lab Sample ID: OT70F
LIMS ID: 09-8209
Matrix: Sediment
Data Release Authorized:
Reported: 04/17/09

QC Report No: OT70-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/04/08
Date Received: 12/08/09

Date Extracted: 04/06/09
Date Analyzed: 04/15/09 19:05
Instrument/Analyst: NT4/LJR
GPC Cleanup: Yes

Sample Amount: 25.6 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 17.9%

CAS Number	Analyte	RL	Result
108-95-2	Phenol	20	< 20 U
541-73-1	1,3-Dichlorobenzene	20	< 20 U
106-46-7	1,4-Dichlorobenzene	20	< 20 U
100-51-6	Benzyl Alcohol	20	< 20 U
95-50-1	1,2-Dichlorobenzene	20	< 20 U
95-48-7	2-Methylphenol	20	< 20 U
106-44-5	4-Methylphenol	20	< 20 U
105-67-9	2,4-Dimethylphenol	20	< 20 U
65-85-0	Benzoic Acid	200	< 200 U
120-82-1	1,2,4-Trichlorobenzene	20	< 20 U
91-20-3	Naphthalene	20	< 20 U
87-68-3	Hexachlorobutadiene	20	< 20 U
91-57-6	2-Methylnaphthalene	20	< 20 U
131-11-3	Dimethylphthalate	20	< 20 U
208-96-8	Acenaphthylene	20	< 20 U
83-32-9	Acenaphthene	20	< 20 U
132-64-9	Dibenzofuran	20	< 20 U
84-66-2	Diethylphthalate	20	< 20 U
86-73-7	Fluorene	20	< 20 U
86-30-6	N-Nitrosodiphenylamine	20	< 20 U
118-74-1	Hexachlorobenzene	20	< 20 U
87-86-5	Pentachlorophenol	98	< 98 U
85-01-8	Phenanthrene	20	< 20 U
120-12-7	Anthracene	20	< 20 U
84-74-2	Di-n-Butylphthalate	20	< 20 U
206-44-0	Fluoranthene	20	< 20 U
129-00-0	Pyrene	20	< 20 U
85-68-7	Butylbenzylphthalate	20	< 20 U
56-55-3	Benzo(a)anthracene	20	< 20 U
117-81-7	bis(2-Ethylhexyl)phthalate	20	< 20 U
218-01-9	Chrysene	20	< 20 U
117-84-0	Di-n-Octyl phthalate	20	< 20 U
205-99-2	Benzo(b)fluoranthene	20	< 20 U
207-08-9	Benzo(k)fluoranthene	20	< 20 U
50-32-8	Benzo(a)pyrene	20	< 20 U
193-39-5	Indeno(1,2,3-cd)pyrene	20	< 20 U
53-70-3	Dibenz(a,h)anthracene	20	< 20 U
191-24-2	Benzo(g,h,i)perylene	20	< 20 U
90-05-1	Guaiacol	20	< 20 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS **Sample ID: PGSS-21A**
 SAMPLE

Lab Sample ID: OT70F QC Report No: OT70-Hart Crowser, Inc.
LIMS ID: 09-8209 Project: PORT GAMBLE
Matrix: Sediment 17330-14
Date Analyzed: 04/15/09 19:05

CAS Number	Analyte	RL	Result
483-65-8	Retene	20	< 20 U
90-12-0	1-Methylnaphthalene	20	< 20 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	51.2%	2-Fluorobiphenyl	66.0%
d14-p-Terphenyl	89.2%	d4-1,2-Dichlorobenzene	52.4%
d5-Phenol	58.9%	2-Fluorophenol	53.3%
2,4,6-Tribromophenol	94.9%	d4-2-Chlorophenol	58.9%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS **Sample ID: PGSS-29**
Page 1 of 2 **SAMPLE**

Lab Sample ID: OT70G
LIMS ID: 09-8210
Matrix: Sediment
Data Release Authorized:
Reported: 04/17/09

QC Report No: OT70-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/04/08
Date Received: 12/08/09

Date Extracted: 04/06/09
Date Analyzed: 04/15/09 20:49
Instrument/Analyst: NT4/LJR
GPC Cleanup: Yes

Sample Amount: 25.7 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 32.5%

CAS Number	Analyte	RL	Result
108-95-2	Phenol	19	< 19 U
541-73-1	1,3-Dichlorobenzene	19	< 19 U
106-46-7	1,4-Dichlorobenzene	19	< 19 U
100-51-6	Benzyl Alcohol	19	< 19 U
95-50-1	1,2-Dichlorobenzene	19	< 19 U
95-48-7	2-Methylphenol	19	< 19 U
106-44-5	4-Methylphenol	19	< 19 U
105-67-9	2,4-Dimethylphenol	19	< 19 U
65-85-0	Benzoic Acid	190	< 190 U
120-82-1	1,2,4-Trichlorobenzene	19	< 19 U
91-20-3	Naphthalene	19	< 19 U
87-68-3	Hexachlorobutadiene	19	< 19 U
91-57-6	2-Methylnaphthalene	19	< 19 U
131-11-3	Dimethylphthalate	19	< 19 U
208-96-8	Acenaphthylene	19	< 19 U
83-32-9	Acenaphthene	19	< 19 U
132-64-9	Dibenzofuran	19	< 19 U
84-66-2	Diethylphthalate	19	< 19 U
86-73-7	Fluorene	19	< 19 U
86-30-6	N-Nitrosodiphenylamine	19	< 19 U
118-74-1	Hexachlorobenzene	19	< 19 U
87-86-5	Pentachlorophenol	97	< 97 U
85-01-8	Phenanthrene	19	< 19 U
120-12-7	Anthracene	19	< 19 U
84-74-2	Di-n-Butylphthalate	19	< 19 U
206-44-0	**Fluoranthene**	**19**	**13 J**
129-00-0	**Pyrene**	**19**	**13 J**
85-68-7	Butylbenzylphthalate	19	< 19 U
56-55-3	Benzo(a)anthracene	19	< 19 U
117-81-7	bis(2-Ethylhexyl)phthalate	19	< 19 U
218-01-9	**Chrysene**	**19**	**17 J**
117-84-0	Di-n-Octyl phthalate	19	< 19 U
205-99-2	Benzo(b)fluoranthene	19	< 19 U
207-08-9	Benzo(k)fluoranthene	19	< 19 U
50-32-8	Benzo(a)pyrene	19	< 19 U
193-39-5	Indeno(1,2,3-cd)pyrene	19	< 19 U
53-70-3	Dibenz(a,h)anthracene	19	< 19 U
191-24-2	Benzo(g,h,i)perylene	19	< 19 U
90-05-1	Guaiacol	19	< 19 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS **Sample ID: PGSS-29**
Page 2 of 2 **SAMPLE**

Lab Sample ID: OT70G QC Report No: OT70-Hart Crowser, Inc.
LIMS ID: 09-8210 Project: PORT GAMBLE
Matrix: Sediment 17330-14
Date Analyzed: 04/15/09 20:49

CAS Number	Analyte	RL	Result
483-65-8	Retene	19	< 19 U
90-12-0	1-Methylnaphthalene	19	< 19 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	56.4%	2-Fluorobiphenyl	68.8%
d14-p-Terphenyl	86.4%	d4-1,2-Dichlorobenzene	59.6%
d5-Phenol	60.3%	2-Fluorophenol	56.3%
2,4,6-Tribromophenol	93.9%	d4-2-Chlorophenol	62.4%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS **Sample ID: PGSS-29A**
Page 1 of 2 **SAMPLE**

Lab Sample ID: OT70H
LIMS ID: 09-8211
Matrix: Sediment
Data Release Authorized:
Reported: 04/17/09

QC Report No: OT70-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/04/08
Date Received: 12/08/09

Date Extracted: 04/06/09
Date Analyzed: 04/15/09 21:23
Instrument/Analyst: NT4/LJR
GPC Cleanup: Yes

Sample Amount: 25.1 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 60.9%

CAS Number	Analyte	RL	Result
108-95-2	Phenol	20	< 20 U
541-73-1	1,3-Dichlorobenzene	20	< 20 U
106-46-7	1,4-Dichlorobenzene	20	< 20 U
100-51-6	Benzyl Alcohol	20	< 20 U
95-50-1	1,2-Dichlorobenzene	20	< 20 U
95-48-7	2-Methylphenol	20	< 20 U
106-44-5	4-Methylphenol	20	< 20 U
105-67-9	2,4-Dimethylphenol	20	< 20 U
65-85-0	Benzoic Acid	200	< 200 U
120-82-1	1,2,4-Trichlorobenzene	20	< 20 U
91-20-3	Naphthalene	20	< 20 U
87-68-3	Hexachlorobutadiene	20	< 20 U
91-57-6	2-Methylnaphthalene	20	< 20 U
131-11-3	Dimethylphthalate	20	< 20 U
208-96-8	Acenaphthylene	20	< 20 U
83-32-9	Acenaphthene	20	< 20 U
132-64-9	Dibenzofuran	20	< 20 U
84-66-2	Diethylphthalate	20	< 20 U
86-73-7	Fluorene	20	< 20 U
86-30-6	N-Nitrosodiphenylamine	20	< 20 U
118-74-1	Hexachlorobenzene	20	< 20 U
87-86-5	Pentachlorophenol	99	< 99 U
85-01-8	**Phenanthrene**	**20**	**17 J**
120-12-7	Anthracene	20	< 20 U
84-74-2	Di-n-Butylphthalate	20	< 20 U
206-44-0	**Fluoranthene**	**20**	**26**
129-00-0	**Pyrene**	**20**	**26**
85-68-7	Butylbenzylphthalate	20	< 20 U
56-55-3	**Benzo(a)anthracene**	**20**	**17 J**
117-81-7	bis(2-Ethylhexyl)phthalate	20	< 20 U
218-01-9	**Chrysene**	**20**	**30**
117-84-0	Di-n-Octyl phthalate	20	< 20 U
205-99-2	**Benzo(b)fluoranthene**	**20**	**24**
207-08-9	**Benzo(k)fluoranthene**	**20**	**20 J**
50-32-8	**Benzo(a)pyrene**	**20**	**18 J**
193-39-5	Indeno(1,2,3-cd)pyrene	20	< 20 U
53-70-3	Dibenz(a,h)anthracene	20	< 20 U
191-24-2	**Benzo(g,h,i)perylene**	**20**	**12 J**
90-05-1	Guaiacol	20	< 20 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS **Sample ID: PGSS-29A**
Page 2 of 2 **SAMPLE**

Lab Sample ID: OT70H QC Report No: OT70-Hart Crowser, Inc.
LIMS ID: 09-8211 Project: PORT GAMBLE
Matrix: Sediment 17330-14
Date Analyzed: 04/15/09 21:23

CAS Number	Analyte	RL	Result
483-65-8	Retene	20	< 20 U
90-12-0	1-Methylnaphthalene	20	< 20 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	48.8%	2-Fluorobiphenyl	61.6%
d14-p-Terphenyl	74.4%	d4-1,2-Dichlorobenzene	52.4%
d5-Phenol	52.5%	2-Fluorophenol	49.3%
2,4,6-Tribromophenol	79.7%	d4-2-Chlorophenol	53.9%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS **Sample ID: PGSS-30**
Page 1 of 2 **SAMPLE**

Lab Sample ID: OT70I
LIMS ID: 09-8212
Matrix: Sediment
Data Release Authorized:
Reported: 04/17/09

QC Report No: OT70-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/05/08
Date Received: 12/08/09

Date Extracted: 04/06/09
Date Analyzed: 04/15/09 21:57
Instrument/Analyst: NT4/LJR
GPC Cleanup: Yes

Sample Amount: 25.3 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 63.4%

CAS Number	Analyte	RL	Result
108-95-2	Phenol	20	< 20 U
541-73-1	1,3-Dichlorobenzene	20	< 20 U
106-46-7	1,4-Dichlorobenzene	20	< 20 U
100-51-6	Benzyl Alcohol	20	< 20 U
95-50-1	1,2-Dichlorobenzene	20	< 20 U
95-48-7	2-Methylphenol	20	< 20 U
106-44-5	4-Methylphenol	20	< 20 U
105-67-9	2,4-Dimethylphenol	20	< 20 U
65-85-0	Benzoic Acid	200	< 200 U
120-82-1	1,2,4-Trichlorobenzene	20	< 20 U
91-20-3	Naphthalene	20	< 20 U
87-68-3	Hexachlorobutadiene	20	< 20 U
91-57-6	2-Methylnaphthalene	20	< 20 U
131-11-3	Dimethylphthalate	20	< 20 U
208-96-8	Acenaphthylene	20	< 20 U
83-32-9	Acenaphthene	20	< 20 U
132-64-9	Dibenzofuran	20	< 20 U
84-66-2	Diethylphthalate	20	< 20 U
86-73-7	Fluorene	20	< 20 U
86-30-6	N-Nitrosodiphenylamine	20	< 20 U
118-74-1	Hexachlorobenzene	20	< 20 U
87-86-5	Pentachlorophenol	99	< 99 U
85-01-8	**Phenanthrene**	**20**	**27**
120-12-7	**Anthracene**	**20**	**10 J**
84-74-2	Di-n-Butylphthalate	20	< 20 U
206-44-0	**Fluoranthene**	**20**	**40**
129-00-0	**Pyrene**	**20**	**37**
85-68-7	Butylbenzylphthalate	20	< 20 U
56-55-3	**Benzo(a)anthracene**	**20**	**21**
117-81-7	bis(2-Ethylhexyl)phthalate	20	< 20 U
218-01-9	**Chrysene**	**20**	**33**
117-84-0	Di-n-Octyl phthalate	20	< 20 U
205-99-2	**Benzo(b)fluoranthene**	**20**	**25**
207-08-9	**Benzo(k)fluoranthene**	**20**	**22**
50-32-8	**Benzo(a)pyrene**	**20**	**21**
193-39-5	**Indeno(1,2,3-cd)pyrene**	**20**	**12 J**
53-70-3	Dibenz(a,h)anthracene	20	< 20 U
191-24-2	**Benzo(g,h,i)perylene**	**20**	**13 J**
90-05-1	Guaiacol	20	< 20 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS **Sample ID: PGSS-30**
 SAMPLE

Lab Sample ID: OT70I QC Report No: OT70-Hart Crowser, Inc.
LIMS ID: 09-8212 Project: PORT GAMBLE
Matrix: Sediment 17330-14
Date Analyzed: 04/15/09 21:57

CAS Number	Analyte	RL	Result
483-65-8	Retene	20	< 20 U
90-12-0	1-Methylnaphthalene	20	< 20 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	59.6%	2-Fluorobiphenyl	71.6%
d14-p-Terphenyl	88.8%	d4-1,2-Dichlorobenzene	65.2%
d5-Phenol	62.4%	2-Fluorophenol	60.8%
2,4,6-Tribromophenol	95.2%	d4-2-Chlorophenol	66.1%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS **Sample ID: PGSS-31**
Page 1 of 2 **SAMPLE**

Lab Sample ID: OT70J
LIMS ID: 09-8213
Matrix: Sediment
Data Release Authorized:
Reported: 04/17/09

QC Report No: OT70-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/05/08
Date Received: 12/08/09

Date Extracted: 04/06/09
Date Analyzed: 04/15/09 22:32
Instrument/Analyst: NT4/LJR
GPC Cleanup: Yes

Sample Amount: 25.6 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 60.4%

CAS Number	Analyte	RL	Result
108-95-2	Phenol	20	< 20 U
541-73-1	1,3-Dichlorobenzene	20	< 20 U
106-46-7	1,4-Dichlorobenzene	20	< 20 U
100-51-6	Benzyl Alcohol	20	< 20 U
95-50-1	1,2-Dichlorobenzene	20	< 20 U
95-48-7	2-Methylphenol	20	< 20 U
106-44-5	4-Methylphenol	20	< 20 U
105-67-9	2,4-Dimethylphenol	20	< 20 U
65-85-0	Benzoic Acid	200	< 200 U
120-82-1	1,2,4-Trichlorobenzene	20	< 20 U
91-20-3	Naphthalene	20	< 20 U
87-68-3	Hexachlorobutadiene	20	< 20 U
91-57-6	2-Methylnaphthalene	20	< 20 U
131-11-3	Dimethylphthalate	20	< 20 U
208-96-8	Acenaphthylene	20	< 20 U
83-32-9	Acenaphthene	20	< 20 U
132-64-9	Dibenzofuran	20	< 20 U
84-66-2	Diethylphthalate	20	< 20 U
86-73-7	Fluorene	20	< 20 U
86-30-6	N-Nitrosodiphenylamine	20	< 20 U
118-74-1	Hexachlorobenzene	20	< 20 U
87-86-5	Pentachlorophenol	98	< 98 U
85-01-8	**Phenanthrene**	**20**	**13 J**
120-12-7	Anthracene	20	< 20 U
84-74-2	Di-n-Butylphthalate	20	< 20 U
206-44-0	**Fluoranthene**	**20**	**24**
129-00-0	**Pyrene**	**20**	**23**
85-68-7	Butylbenzylphthalate	20	< 20 U
56-55-3	**Benzo(a)anthracene**	**20**	**14 J**
117-81-7	bis(2-Ethylhexyl)phthalate	20	< 20 U
218-01-9	**Chrysene**	**20**	**22**
117-84-0	Di-n-Octyl phthalate	20	< 20 U
205-99-2	**Benzo(b)fluoranthene**	**20**	**17 J**
207-08-9	**Benzo(k)fluoranthene**	**20**	**15 J**
50-32-8	**Benzo(a)pyrene**	**20**	**14 J**
193-39-5	Indeno(1,2,3-cd)pyrene	20	< 20 U
53-70-3	Dibenz(a,h)anthracene	20	< 20 U
191-24-2	Benzo(g,h,i)perylene	20	< 20 U
90-05-1	Guaiacol	20	< 20 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS **Sample ID: PGSS-31**
Page 2 of 2 **SAMPLE**

Lab Sample ID: OT70J QC Report No: OT70-Hart Crowser, Inc.
LIMS ID: 09-8213 Project: PORT GAMBLE
Matrix: Sediment 17330-14
Date Analyzed: 04/15/09 22:32

CAS Number	Analyte	RL	Result
483-65-8	Retene	20	< 20 U
90-12-0	1-Methylnaphthalene	20	< 20 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	52.8%	2-Fluorobiphenyl	63.6%
d14-p-Terphenyl	79.2%	d4-1,2-Dichlorobenzene	55.2%
d5-Phenol	59.2%	2-Fluorophenol	54.1%
2,4,6-Tribromophenol	89.6%	d4-2-Chlorophenol	58.1%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS **Sample ID: PGSS-38**
Page 1 of 2 **SAMPLE**

Lab Sample ID: OT70K
LIMS ID: 09-8214
Matrix: Sediment
Data Release Authorized:
Reported: 04/17/09

QC Report No: OT70-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/05/08
Date Received: 12/08/09

Date Extracted: 04/06/09
Date Analyzed: 04/15/09 23:06
Instrument/Analyst: NT4/LJR
GPC Cleanup: Yes

Sample Amount: 25.6 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 23.3%

CAS Number	Analyte	RL	Result
108-95-2	Phenol	20	< 20 U
541-73-1	1,3-Dichlorobenzene	20	< 20 U
106-46-7	1,4-Dichlorobenzene	20	< 20 U
100-51-6	Benzyl Alcohol	20	< 20 U
95-50-1	1,2-Dichlorobenzene	20	< 20 U
95-48-7	2-Methylphenol	20	< 20 U
106-44-5	4-Methylphenol	20	< 20 U
105-67-9	2,4-Dimethylphenol	20	< 20 U
65-85-0	Benzoic Acid	200	< 200 U
120-82-1	1,2,4-Trichlorobenzene	20	< 20 U
91-20-3	**Naphthalene**	**20**	**11 J**
87-68-3	Hexachlorobutadiene	20	< 20 U
91-57-6	2-Methylnaphthalene	20	< 20 U
131-11-3	Dimethylphthalate	20	< 20 U
208-96-8	Acenaphthylene	20	< 20 U
83-32-9	Acenaphthene	20	< 20 U
132-64-9	Dibenzofuran	20	< 20 U
84-66-2	Diethylphthalate	20	< 20 U
86-73-7	Fluorene	20	< 20 U
86-30-6	N-Nitrosodiphenylamine	20	< 20 U
118-74-1	Hexachlorobenzene	20	< 20 U
87-86-5	Pentachlorophenol	98	< 98 U
85-01-8	Phenanthrene	20	< 20 U
120-12-7	Anthracene	20	< 20 U
84-74-2	Di-n-Butylphthalate	20	< 20 U
206-44-0	**Fluoranthene**	**20**	**16 J**
129-00-0	**Pyrene**	**20**	**16 J**
85-68-7	Butylbenzylphthalate	20	< 20 U
56-55-3	Benzo(a)anthracene	20	< 20 U
117-81-7	bis(2-Ethylhexyl)phthalate	20	< 20 U
218-01-9	Chrysene	20	< 20 U
117-84-0	Di-n-Octyl phthalate	20	< 20 U
205-99-2	Benzo(b)fluoranthene	20	< 20 U
207-08-9	Benzo(k)fluoranthene	20	< 20 U
50-32-8	Benzo(a)pyrene	20	< 20 U
193-39-5	Indeno(1,2,3-cd)pyrene	20	< 20 U
53-70-3	Dibenz(a,h)anthracene	20	< 20 U
191-24-2	Benzo(g,h,i)perylene	20	< 20 U
90-05-1	Guaiacol	20	< 20 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS **Sample ID: PGSS-38**
 SAMPLE

Lab Sample ID: OT70K QC Report No: OT70-Hart Crowser, Inc.
LIMS ID: 09-8214 Project: PORT GAMBLE
Matrix: Sediment 17330-14
Date Analyzed: 04/15/09 23:06

CAS Number	Analyte	RL	Result
483-65-8	Retene	20	< 20 U
90-12-0	1-Methylnaphthalene	20	< 20 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	53.6%	2-Fluorobiphenyl	66.8%
d14-p-Terphenyl	82.4%	d4-1,2-Dichlorobenzene	57.6%
d5-Phenol	57.6%	2-Fluorophenol	54.1%
2,4,6-Tribromophenol	88.5%	d4-2-Chlorophenol	59.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS **Sample ID: PGSS-38A**
Page 1 of 2 **SAMPLE**

Lab Sample ID: OT70L
LIMS ID: 09-8215
Matrix: Sediment
Data Release Authorized:
Reported: 04/17/09

QC Report No: OT70-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/05/08
Date Received: 12/08/09

Date Extracted: 04/06/09
Date Analyzed: 04/15/09 23:40
Instrument/Analyst: NT4/LJR
GPC Cleanup: Yes

Sample Amount: 25.6 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 49.0%

CAS Number	Analyte	RL	Result
108-95-2	Phenol	20	< 20 U
541-73-1	1,3-Dichlorobenzene	20	< 20 U
106-46-7	1,4-Dichlorobenzene	20	< 20 U
100-51-6	Benzyl Alcohol	20	< 20 U
95-50-1	1,2-Dichlorobenzene	20	< 20 U
95-48-7	2-Methylphenol	20	< 20 U
106-44-5	4-Methylphenol	20	< 20 U
105-67-9	2,4-Dimethylphenol	20	< 20 U
65-85-0	Benzoic Acid	200	< 200 U
120-82-1	1,2,4-Trichlorobenzene	20	< 20 U
91-20-3	Naphthalene	20	< 20 U
87-68-3	Hexachlorobutadiene	20	< 20 U
91-57-6	2-Methylnaphthalene	20	< 20 U
131-11-3	Dimethylphthalate	20	< 20 U
208-96-8	Acenaphthylene	20	< 20 U
83-32-9	Acenaphthene	20	< 20 U
132-64-9	Dibenzofuran	20	< 20 U
84-66-2	Diethylphthalate	20	< 20 U
86-73-7	Fluorene	20	< 20 U
86-30-6	N-Nitrosodiphenylamine	20	< 20 U
118-74-1	Hexachlorobenzene	20	< 20 U
87-86-5	Pentachlorophenol	98	< 98 U
85-01-8	Phenanthrene	20	< 20 U
120-12-7	Anthracene	20	< 20 U
84-74-2	Di-n-Butylphthalate	20	< 20 U
206-44-0	**Fluoranthene**	**20**	**13 J**
129-00-0	**Pyrene**	**20**	**12 J**
85-68-7	Butylbenzylphthalate	20	< 20 U
56-55-3	Benzo(a)anthracene	20	< 20 U
117-81-7	bis(2-Ethylhexyl)phthalate	20	< 20 U
218-01-9	**Chrysene**	**20**	**14 J**
117-84-0	Di-n-Octyl phthalate	20	< 20 U
205-99-2	Benzo(b)fluoranthene	20	< 20 U
207-08-9	Benzo(k)fluoranthene	20	< 20 U
50-32-8	Benzo(a)pyrene	20	< 20 U
193-39-5	Indeno(1,2,3-cd)pyrene	20	< 20 U
53-70-3	Dibenz(a,h)anthracene	20	< 20 U
191-24-2	Benzo(g,h,i)perylene	20	< 20 U
90-05-1	Guaiacol	20	< 20 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS **Sample ID: PGSS-38A**
 SAMPLE

Lab Sample ID: OT70L QC Report No: OT70-Hart Crowser, Inc.
LIMS ID: 09-8215 Project: PORT GAMBLE
Matrix: Sediment 17330-14
Date Analyzed: 04/15/09 23:40

CAS Number	Analyte	RL	Result
483-65-8	Retene	20	< 20 U
90-12-0	1-Methylnaphthalene	20	< 20 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	52.4%	2-Fluorobiphenyl	60.8%
d14-p-Terphenyl	73.6%	d4-1,2-Dichlorobenzene	57.2%
d5-Phenol	54.1%	2-Fluorophenol	52.3%
2,4,6-Tribromophenol	81.3%	d4-2-Chlorophenol	56.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS **Sample ID: PGSS-39**
Page 1 of 2 **SAMPLE**

Lab Sample ID: OT70M
LIMS ID: 09-8216
Matrix: Sediment
Data Release Authorized:
Reported: 04/17/09

QC Report No: OT70-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/05/08
Date Received: 12/08/09

Date Extracted: 04/06/09
Date Analyzed: 04/16/09 00:14
Instrument/Analyst: NT4/LJR
GPC Cleanup: Yes

Sample Amount: 25.3 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 61.8%

CAS Number	Analyte	RL	Result
108-95-2	Phenol	20	< 20 U
541-73-1	1,3-Dichlorobenzene	20	< 20 U
106-46-7	1,4-Dichlorobenzene	20	< 20 U
100-51-6	Benzyl Alcohol	20	< 20 U
95-50-1	1,2-Dichlorobenzene	20	< 20 U
95-48-7	2-Methylphenol	20	< 20 U
106-44-5	4-Methylphenol	20	< 20 U
105-67-9	2,4-Dimethylphenol	20	< 20 U
65-85-0	Benzoic Acid	200	< 200 U
120-82-1	1,2,4-Trichlorobenzene	20	< 20 U
91-20-3	Naphthalene	20	< 20 U
87-68-3	Hexachlorobutadiene	20	< 20 U
91-57-6	2-Methylnaphthalene	20	< 20 U
131-11-3	Dimethylphthalate	20	< 20 U
208-96-8	Acenaphthylene	20	< 20 U
83-32-9	Acenaphthene	20	< 20 U
132-64-9	Dibenzofuran	20	< 20 U
84-66-2	Diethylphthalate	20	< 20 U
86-73-7	Fluorene	20	< 20 U
86-30-6	N-Nitrosodiphenylamine	20	< 20 U
118-74-1	Hexachlorobenzene	20	< 20 U
87-86-5	Pentachlorophenol	99	< 99 U
85-01-8	**Phenanthrene**	**20**	**14 J**
120-12-7	**Anthracene**	**20**	**91**
84-74-2	Di-n-Butylphthalate	20	< 20 U
206-44-0	**Fluoranthene**	**20**	**23**
129-00-0	**Pyrene**	**20**	**20 J**
85-68-7	Butylbenzylphthalate	20	< 20 U
56-55-3	**Benzo(a)anthracene**	**20**	**17 J**
117-81-7	bis(2-Ethylhexyl)phthalate	20	< 20 U
218-01-9	**Chrysene**	**20**	**140**
117-84-0	Di-n-Octyl phthalate	20	< 20 U
205-99-2	**Benzo(b)fluoranthene**	**20**	**20**
207-08-9	**Benzo(k)fluoranthene**	**20**	**14 J**
50-32-8	**Benzo(a)pyrene**	**20**	**13 J**
193-39-5	Indeno(1,2,3-cd)pyrene	20	< 20 U
53-70-3	Dibenz(a,h)anthracene	20	< 20 U
191-24-2	Benzo(g,h,i)perylene	20	< 20 U
90-05-1	Guaiacol	20	< 20 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS **Sample ID: PGSS-39**
Page 2 of 2 **SAMPLE**

Lab Sample ID: OT70M QC Report No: OT70-Hart Crowser, Inc.
LIMS ID: 09-8216 Project: PORT GAMBLE
Matrix: Sediment 17330-14
Date Analyzed: 04/16/09 00:14

CAS Number	Analyte	RL	Result
483-65-8	Retene	20	< 20 U
90-12-0	1-Methylnaphthalene	20	< 20 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	52.0%	2-Fluorobiphenyl	64.0%
d14-p-Terphenyl	81.6%	d4-1,2-Dichlorobenzene	56.0%
d5-Phenol	56.5%	2-Fluorophenol	51.5%
2,4,6-Tribromophenol	93.9%	d4-2-Chlorophenol	56.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS **Sample ID: PGSS-40**
Page 1 of 2 **SAMPLE**

Lab Sample ID: OT70N
LIMS ID: 09-8217
Matrix: Sediment
Data Release Authorized:
Reported: 04/17/09

QC Report No: OT70-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/05/08
Date Received: 12/08/09

Date Extracted: 04/06/09
Date Analyzed: 04/16/09 00:48
Instrument/Analyst: NT4/LJR
GPC Cleanup: Yes

Sample Amount: 25.3 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 59.2%

CAS Number	Analyte	RL	Result
108-95-2	Phenol	20	< 20 U
541-73-1	1,3-Dichlorobenzene	20	< 20 U
106-46-7	1,4-Dichlorobenzene	20	< 20 U
100-51-6	Benzyl Alcohol	20	< 20 U
95-50-1	1,2-Dichlorobenzene	20	< 20 U
95-48-7	2-Methylphenol	20	< 20 U
106-44-5	4-Methylphenol	20	< 20 U
105-67-9	2,4-Dimethylphenol	20	< 20 U
65-85-0	Benzoic Acid	200	< 200 U
120-82-1	1,2,4-Trichlorobenzene	20	< 20 U
91-20-3	Naphthalene	20	< 20 U
87-68-3	Hexachlorobutadiene	20	< 20 U
91-57-6	2-Methylnaphthalene	20	< 20 U
131-11-3	Dimethylphthalate	20	< 20 U
208-96-8	Acenaphthylene	20	< 20 U
83-32-9	Acenaphthene	20	< 20 U
132-64-9	Dibenzofuran	20	< 20 U
84-66-2	Diethylphthalate	20	< 20 U
86-73-7	Fluorene	20	< 20 U
86-30-6	N-Nitrosodiphenylamine	20	< 20 U
118-74-1	Hexachlorobenzene	20	< 20 U
87-86-5	Pentachlorophenol	99	< 99 U
85-01-8	Phenanthrene	20	< 20 U
120-12-7	Anthracene	20	< 20 U
84-74-2	Di-n-Butylphthalate	20	< 20 U
206-44-0	**Fluoranthene**	**20**	**13 J**
129-00-0	**Pyrene**	**20**	**11 J**
85-68-7	Butylbenzylphthalate	20	< 20 U
56-55-3	**Benzo(a)anthracene**	**20**	**13 J**
117-81-7	bis(2-Ethylhexyl)phthalate	20	< 20 U
218-01-9	**Chrysene**	**20**	**19 J**
117-84-0	Di-n-Octyl phthalate	20	< 20 U
205-99-2	**Benzo(b)fluoranthene**	**20**	**13 J**
207-08-9	**Benzo(k)fluoranthene**	**20**	**12 J**
50-32-8	Benzo(a)pyrene	20	< 20 U
193-39-5	Indeno(1,2,3-cd)pyrene	20	< 20 U
53-70-3	Dibenz(a,h)anthracene	20	< 20 U
191-24-2	Benzo(g,h,i)perylene	20	< 20 U
90-05-1	Guaiacol	20	< 20 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS **Sample ID: PGSS-40**
Page 2 of 2 **SAMPLE**

Lab Sample ID: OT70N QC Report No: OT70-Hart Crowser, Inc.
LIMS ID: 09-8217 Project: PORT GAMBLE
Matrix: Sediment 17330-14
Date Analyzed: 04/16/09 00:48

CAS Number	Analyte	RL	Result
483-65-8	Retene	20	< 20 U
90-12-0	1-Methylnaphthalene	20	< 20 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	54.0%	2-Fluorobiphenyl	63.2%
d14-p-Terphenyl	82.0%	d4-1,2-Dichlorobenzene	57.6%
d5-Phenol	57.6%	2-Fluorophenol	52.8%
2,4,6-Tribromophenol	90.1%	d4-2-Chlorophenol	57.9%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS **Sample ID: PGSS-42**
Page 1 of 2 **SAMPLE**

Lab Sample ID: OT700
LIMS ID: 09-8218
Matrix: Sediment
Data Release Authorized:
Reported: 04/17/09

QC Report No: OT70-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/05/08
Date Received: 12/08/09

Date Extracted: 04/06/09
Date Analyzed: 04/16/09 01:22
Instrument/Analyst: NT4/LJR
GPC Cleanup: Yes

Sample Amount: 25.5 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 58.5%

CAS Number	Analyte	RL	Result
108-95-2	Phenol	20	< 20 U
541-73-1	1,3-Dichlorobenzene	20	< 20 U
106-46-7	1,4-Dichlorobenzene	20	< 20 U
100-51-6	Benzyl Alcohol	20	< 20 U
95-50-1	1,2-Dichlorobenzene	20	< 20 U
95-48-7	2-Methylphenol	20	< 20 U
106-44-5	4-Methylphenol	20	< 20 U
105-67-9	2,4-Dimethylphenol	20	< 20 U
65-85-0	Benzoic Acid	200	< 200 U
120-82-1	1,2,4-Trichlorobenzene	20	< 20 U
91-20-3	Naphthalene	20	< 20 U
87-68-3	Hexachlorobutadiene	20	< 20 U
91-57-6	2-Methylnaphthalene	20	< 20 U
131-11-3	Dimethylphthalate	20	< 20 U
208-96-8	Acenaphthylene	20	< 20 U
83-32-9	Acenaphthene	20	< 20 U
132-64-9	Dibenzofuran	20	< 20 U
84-66-2	Diethylphthalate	20	< 20 U
86-73-7	Fluorene	20	< 20 U
86-30-6	N-Nitrosodiphenylamine	20	< 20 U
118-74-1	Hexachlorobenzene	20	< 20 U
87-86-5	Pentachlorophenol	98	< 98 U
85-01-8	Phenanthrene	20	< 20 U
120-12-7	Anthracene	20	< 20 U
84-74-2	Di-n-Butylphthalate	20	< 20 U
206-44-0	**Fluoranthene**	**20**	**16 J**
129-00-0	**Pyrene**	**20**	**13 J**
85-68-7	Butylbenzylphthalate	20	< 20 U
56-55-3	Benzo(a)anthracene	20	< 20 U
117-81-7	**bis(2-Ethylhexyl)phthalate**	**20**	**11 J**
218-01-9	**Chrysene**	**20**	**10 J**
117-84-0	Di-n-Octyl phthalate	20	< 20 U
205-99-2	Benzo(b)fluoranthene	20	< 20 U
207-08-9	Benzo(k)fluoranthene	20	< 20 U
50-32-8	Benzo(a)pyrene	20	< 20 U
193-39-5	Indeno(1,2,3-cd)pyrene	20	< 20 U
53-70-3	Dibenz(a,h)anthracene	20	< 20 U
191-24-2	Benzo(g,h,i)perylene	20	< 20 U
90-05-1	Guaiacol	20	< 20 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS **Sample ID: PGSS-42**
Page 2 of 2 **SAMPLE**

Lab Sample ID: OT70O QC Report No: OT70-Hart Crowser, Inc.
LIMS ID: 09-8218 Project: PORT GAMBLE
Matrix: Sediment 17330-14
Date Analyzed: 04/16/09 01:22

CAS Number	Analyte	RL	Result
483-65-8	Retene	20	< 20 U
90-12-0	1-Methylnaphthalene	20	< 20 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	56.4%	2-Fluorobiphenyl	64.8%
d14-p-Terphenyl	78.4%	d4-1,2-Dichlorobenzene	59.2%
d5-Phenol	58.7%	2-Fluorophenol	53.3%
2,4,6-Tribromophenol	91.5%	d4-2-Chlorophenol	59.5%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS **Sample ID: PGSS-44**
Page 1 of 2 **SAMPLE**

Lab Sample ID: OT70P
LIMS ID: 09-8219
Matrix: Sediment
Data Release Authorized:
Reported: 04/17/09

QC Report No: OT70-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/05/08
Date Received: 12/08/09

Date Extracted: 04/06/09
Date Analyzed: 04/16/09 17:20
Instrument/Analyst: NT4/LJR
GPC Cleanup: Yes

Sample Amount: 25.2 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 60.6%

CAS Number	Analyte	RL	Result
108-95-2	Phenol	20	< 20 U
541-73-1	1,3-Dichlorobenzene	20	< 20 U
106-46-7	1,4-Dichlorobenzene	20	< 20 U
100-51-6	Benzyl Alcohol	20	< 20 U
95-50-1	1,2-Dichlorobenzene	20	< 20 U
95-48-7	2-Methylphenol	20	< 20 U
106-44-5	4-Methylphenol	20	< 20 U
105-67-9	2,4-Dimethylphenol	20	< 20 U
65-85-0	Benzoic Acid	200	< 200 U
120-82-1	1,2,4-Trichlorobenzene	20	< 20 U
91-20-3	Naphthalene	20	< 20 U
87-68-3	Hexachlorobutadiene	20	< 20 U
91-57-6	2-Methylnaphthalene	20	< 20 U
131-11-3	Dimethylphthalate	20	< 20 U
208-96-8	Acenaphthylene	20	< 20 U
83-32-9	Acenaphthene	20	< 20 U
132-64-9	Dibenzofuran	20	< 20 U
84-66-2	Diethylphthalate	20	< 20 U
86-73-7	Fluorene	20	< 20 U
86-30-6	N-Nitrosodiphenylamine	20	< 20 U
118-74-1	Hexachlorobenzene	20	< 20 U
87-86-5	Pentachlorophenol	99	< 99 U
85-01-8	Phenanthrene	20	< 20 U
120-12-7	Anthracene	20	< 20 U
84-74-2	Di-n-Butylphthalate	20	< 20 U
206-44-0	**Fluoranthene**	**20**	**13 J**
129-00-0	**Pyrene**	**20**	**12 J**
85-68-7	Butylbenzylphthalate	20	< 20 U
56-55-3	Benzo(a)anthracene	20	< 20 U
117-81-7	bis(2-Ethylhexyl)phthalate	20	< 20 U
218-01-9	Chrysene	20	< 20 U
117-84-0	Di-n-Octyl phthalate	20	< 20 U
205-99-2	Benzo(b)fluoranthene	20	< 20 U
207-08-9	Benzo(k)fluoranthene	20	< 20 U
50-32-8	Benzo(a)pyrene	20	< 20 U
193-39-5	Indeno(1,2,3-cd)pyrene	20	< 20 U
53-70-3	Dibenz(a,h)anthracene	20	< 20 U
191-24-2	Benzo(g,h,i)perylene	20	< 20 U
90-05-1	Guaiacol	20	< 20 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS **Sample ID: PGSS-44**
 SAMPLE

Lab Sample ID: OT70P QC Report No: OT70-Hart Crowser, Inc.
LIMS ID: 09-8219 Project: PORT GAMBLE
Matrix: Sediment 17330-14
Date Analyzed: 04/16/09 17:20

CAS Number	Analyte	RL	Result
483-65-8	Retene	20	< 20 U
90-12-0	1-Methylnaphthalene	20	< 20 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	52.4%	2-Fluorobiphenyl	61.6%
d14-p-Terphenyl	72.8%	d4-1,2-Dichlorobenzene	56.0%
d5-Phenol	53.1%	2-Fluorophenol	50.4%
2,4,6-Tribromophenol	71.5%	d4-2-Chlorophenol	54.1%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS **Sample ID: PGSS-47**
Page 1 of 2 **SAMPLE**

Lab Sample ID: OT70Q
LIMS ID: 09-8220
Matrix: Sediment
Data Release Authorized:
Reported: 04/17/09

QC Report No: OT70-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/08/08
Date Received: 12/11/08

Date Extracted: 04/06/09
Date Analyzed: 04/16/09 17:55
Instrument/Analyst: NT4/LJR
GPC Cleanup: Yes

Sample Amount: 25.3 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 37.4%

CAS Number	Analyte	RL	Result
108-95-2	Phenol	20	< 20 U
541-73-1	1,3-Dichlorobenzene	20	< 20 U
106-46-7	1,4-Dichlorobenzene	20	< 20 U
100-51-6	Benzyl Alcohol	20	< 20 U
95-50-1	1,2-Dichlorobenzene	20	< 20 U
95-48-7	2-Methylphenol	20	< 20 U
106-44-5	4-Methylphenol	20	< 20 U
105-67-9	2,4-Dimethylphenol	20	< 20 U
65-85-0	Benzoic Acid	200	< 200 U
120-82-1	1,2,4-Trichlorobenzene	20	< 20 U
91-20-3	Naphthalene	20	< 20 U
87-68-3	Hexachlorobutadiene	20	< 20 U
91-57-6	2-Methylnaphthalene	20	< 20 U
131-11-3	Dimethylphthalate	20	< 20 U
208-96-8	Acenaphthylene	20	< 20 U
83-32-9	Acenaphthene	20	< 20 U
132-64-9	Dibenzofuran	20	< 20 U
84-66-2	Diethylphthalate	20	< 20 U
86-73-7	Fluorene	20	< 20 U
86-30-6	N-Nitrosodiphenylamine	20	< 20 U
118-74-1	Hexachlorobenzene	20	< 20 U
87-86-5	Pentachlorophenol	99	< 99 U
85-01-8	Phenanthrene	20	< 20 U
120-12-7	Anthracene	20	< 20 U
84-74-2	Di-n-Butylphthalate	20	< 20 U
206-44-0	**Fluoranthene**	**20**	**12 J**
129-00-0	**Pyrene**	**20**	**11 J**
85-68-7	Butylbenzylphthalate	20	< 20 U
56-55-3	Benzo(a)anthracene	20	< 20 U
117-81-7	bis(2-Ethylhexyl)phthalate	20	< 20 U
218-01-9	**Chrysene**	**20**	**12 J**
117-84-0	Di-n-Octyl phthalate	20	< 20 U
205-99-2	Benzo(b)fluoranthene	20	< 20 U
207-08-9	Benzo(k)fluoranthene	20	< 20 U
50-32-8	Benzo(a)pyrene	20	< 20 U
193-39-5	Indeno(1,2,3-cd)pyrene	20	< 20 U
53-70-3	Dibenz(a,h)anthracene	20	< 20 U
191-24-2	Benzo(g,h,i)perylene	20	< 20 U
90-05-1	Guaiacol	20	< 20 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS **Sample ID: PGSS-47**
 SAMPLE

Lab Sample ID: OT70Q QC Report No: OT70-Hart Crowser, Inc.
LIMS ID: 09-8220 Project: PORT GAMBLE
Matrix: Sediment 17330-14
Date Analyzed: 04/16/09 17:55

CAS Number	Analyte	RL	Result
483-65-8	Retene	20	< 20 U
90-12-0	1-Methylnaphthalene	20	< 20 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	57.2%	2-Fluorobiphenyl	68.0%
d14-p-Terphenyl	81.2%	d4-1,2-Dichlorobenzene	61.2%
d5-Phenol	59.7%	2-Fluorophenol	54.4%
2,4,6-Tribromophenol	78.4%	d4-2-Chlorophenol	61.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS **Sample ID: PGSS-47A**
Page 1 of 2 **SAMPLE**

Lab Sample ID: OT70R
LIMS ID: 09-8221
Matrix: Sediment
Data Release Authorized:
Reported: 04/17/09

QC Report No: OT70-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/08/08
Date Received: 12/11/08

Date Extracted: 04/06/09
Date Analyzed: 04/16/09 18:30
Instrument/Analyst: NT4/LJR
GPC Cleanup: Yes

Sample Amount: 25.1 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 44.2%

CAS Number	Analyte	RL	Result
108-95-2	Phenol	20	< 20 U
541-73-1	1,3-Dichlorobenzene	20	< 20 U
106-46-7	1,4-Dichlorobenzene	20	< 20 U
100-51-6	Benzyl Alcohol	20	< 20 U
95-50-1	1,2-Dichlorobenzene	20	< 20 U
95-48-7	2-Methylphenol	20	< 20 U
106-44-5	4-Methylphenol	20	< 20 U
105-67-9	2,4-Dimethylphenol	20	< 20 U
65-85-0	Benzoic Acid	200	< 200 U
120-82-1	1,2,4-Trichlorobenzene	20	< 20 U
91-20-3	Naphthalene	20	< 20 U
87-68-3	Hexachlorobutadiene	20	< 20 U
91-57-6	2-Methylnaphthalene	20	< 20 U
131-11-3	Dimethylphthalate	20	< 20 U
208-96-8	Acenaphthylene	20	< 20 U
83-32-9	Acenaphthene	20	< 20 U
132-64-9	Dibenzofuran	20	< 20 U
84-66-2	Diethylphthalate	20	< 20 U
86-73-7	Fluorene	20	< 20 U
86-30-6	N-Nitrosodiphenylamine	20	< 20 U
118-74-1	Hexachlorobenzene	20	< 20 U
87-86-5	Pentachlorophenol	100	< 100 U
85-01-8	**Phenanthrene**	**20**	**11 J**
120-12-7	Anthracene	20	< 20 U
84-74-2	Di-n-Butylphthalate	20	< 20 U
206-44-0	**Fluoranthene**	**20**	**18 J**
129-00-0	**Pyrene**	**20**	**15 J**
85-68-7	Butylbenzylphthalate	20	< 20 U
56-55-3	Benzo(a)anthracene	20	< 20 U
117-81-7	bis(2-Ethylhexyl)phthalate	20	< 20 U
218-01-9	**Chrysene**	**20**	**18 J**
117-84-0	Di-n-Octyl phthalate	20	< 20 U
205-99-2	Benzo(b)fluoranthene	20	< 20 U
207-08-9	**Benzo(k)fluoranthene**	**20**	**10 J**
50-32-8	Benzo(a)pyrene	20	< 20 U
193-39-5	Indeno(1,2,3-cd)pyrene	20	< 20 U
53-70-3	Dibenz(a,h)anthracene	20	< 20 U
191-24-2	Benzo(g,h,i)perylene	20	< 20 U
90-05-1	Guaiacol	20	< 20 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS **Sample ID: PGSS-47A**
 SAMPLE

Lab Sample ID: OT70R
LIMS ID: 09-8221
Matrix: Sediment
Date Analyzed: 04/16/09 18:30

QC Report No: OT70-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14

CAS Number	Analyte	RL	Result
483-65-8	Retene	20	< 20 U
90-12-0	1-Methylnaphthalene	20	< 20 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	53.2%	2-Fluorobiphenyl	63.6%
d14-p-Terphenyl	76.8%	d4-1,2-Dichlorobenzene	52.4%
d5-Phenol	57.3%	2-Fluorophenol	50.9%
2,4,6-Tribromophenol	78.7%	d4-2-Chlorophenol	57.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS **Sample ID: PGSS-53**
Page 1 of 2 **SAMPLE**

Lab Sample ID: OT70S
LIMS ID: 09-8222
Matrix: Sediment
Data Release Authorized:
Reported: 04/17/09

QC Report No: OT70-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/08/08
Date Received: 12/11/08

Date Extracted: 04/06/09
Date Analyzed: 04/16/09 19:05
Instrument/Analyst: NT4/LJR
GPC Cleanup: Yes

Sample Amount: 25.4 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 55.4%

CAS Number	Analyte	RL	Result
108-95-2	Phenol	20	< 20 U
541-73-1	1,3-Dichlorobenzene	20	< 20 U
106-46-7	1,4-Dichlorobenzene	20	< 20 U
100-51-6	Benzyl Alcohol	20	< 20 U
95-50-1	1,2-Dichlorobenzene	20	< 20 U
95-48-7	2-Methylphenol	20	< 20 U
106-44-5	4-Methylphenol	20	< 20 U
105-67-9	2,4-Dimethylphenol	20	< 20 U
65-85-0	Benzoic Acid	200	< 200 U
120-82-1	1,2,4-Trichlorobenzene	20	< 20 U
91-20-3	Naphthalene	20	< 20 U
87-68-3	Hexachlorobutadiene	20	< 20 U
91-57-6	2-Methylnaphthalene	20	< 20 U
131-11-3	Dimethylphthalate	20	< 20 U
208-96-8	Acenaphthylene	20	< 20 U
83-32-9	Acenaphthene	20	< 20 U
132-64-9	Dibenzofuran	20	< 20 U
84-66-2	Diethylphthalate	20	< 20 U
86-73-7	Fluorene	20	< 20 U
86-30-6	N-Nitrosodiphenylamine	20	< 20 U
118-74-1	Hexachlorobenzene	20	< 20 U
87-86-5	Pentachlorophenol	98	< 98 U
85-01-8	**Phenanthrene**	**20**	**14 J**
120-12-7	Anthracene	20	< 20 U
84-74-2	Di-n-Butylphthalate	20	< 20 U
206-44-0	**Fluoranthene**	**20**	**21**
129-00-0	**Pyrene**	**20**	**18 J**
85-68-7	Butylbenzylphthalate	20	< 20 U
56-55-3	**Benzo(a)anthracene**	**20**	**14 J**
117-81-7	bis(2-Ethylhexyl)phthalate	20	< 20 U
218-01-9	**Chrysene**	**20**	**21**
117-84-0	Di-n-Octyl phthalate	20	< 20 U
205-99-2	**Benzo(b)fluoranthene**	**20**	**14 J**
207-08-9	**Benzo(k)fluoranthene**	**20**	**16 J**
50-32-8	**Benzo(a)pyrene**	**20**	**12 J**
193-39-5	Indeno(1,2,3-cd)pyrene	20	< 20 U
53-70-3	Dibenz(a,h)anthracene	20	< 20 U
191-24-2	Benzo(g,h,i)perylene	20	< 20 U
90-05-1	Guaiacol	20	< 20 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS **Sample ID: PGSS-53**
Page 2 of 2 **SAMPLE**

Lab Sample ID: OT70S QC Report No: OT70-Hart Crowser, Inc.
LIMS ID: 09-8222 Project: PORT GAMBLE
Matrix: Sediment 17330-14
Date Analyzed: 04/16/09 19:05

CAS Number	Analyte	RL	Result
483-65-8	Retene	20	< 20 U
90-12-0	1-Methylnaphthalene	20	< 20 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	60.8%	2-Fluorobiphenyl	69.2%
d14-p-Terphenyl	80.4%	d4-1,2-Dichlorobenzene	63.6%
d5-Phenol	63.7%	2-Fluorophenol	55.5%
2,4,6-Tribromophenol	84.0%	d4-2-Chlorophenol	63.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS **Sample ID: PGSS-54**
 SAMPLE

Lab Sample ID: OT70T
LIMS ID: 09-8223
Matrix: Sediment
Data Release Authorized:
Reported: 04/17/09

QC Report No: OT70-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/08/08
Date Received: 12/11/08

Date Extracted: 04/06/09
Date Analyzed: 04/16/09 19:40
Instrument/Analyst: NT4/LJR
GPC Cleanup: Yes

Sample Amount: 25.6 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 52.9%

CAS Number	Analyte	RL	Result
108-95-2	**Phenol**	**20**	**20**
541-73-1	1,3-Dichlorobenzene	20	< 20 U
106-46-7	1,4-Dichlorobenzene	20	< 20 U
100-51-6	Benzyl Alcohol	20	< 20 U
95-50-1	1,2-Dichlorobenzene	20	< 20 U
95-48-7	2-Methylphenol	20	< 20 U
106-44-5	4-Methylphenol	20	< 20 U
105-67-9	2,4-Dimethylphenol	20	< 20 U
65-85-0	Benzoic Acid	200	< 200 U
120-82-1	1,2,4-Trichlorobenzene	20	< 20 U
91-20-3	Naphthalene	20	< 20 U
87-68-3	Hexachlorobutadiene	20	< 20 U
91-57-6	2-Methylnaphthalene	20	< 20 U
131-11-3	Dimethylphthalate	20	< 20 U
208-96-8	Acenaphthylene	20	< 20 U
83-32-9	Acenaphthene	20	< 20 U
132-64-9	Dibenzofuran	20	< 20 U
84-66-2	Diethylphthalate	20	< 20 U
86-73-7	Fluorene	20	< 20 U
86-30-6	N-Nitrosodiphenylamine	20	< 20 U
118-74-1	Hexachlorobenzene	20	< 20 U
87-86-5	Pentachlorophenol	98	< 98 U
85-01-8	**Phenanthrene**	**20**	**11 J**
120-12-7	Anthracene	20	< 20 U
84-74-2	Di-n-Butylphthalate	20	< 20 U
206-44-0	**Fluoranthene**	**20**	**18 J**
129-00-0	**Pyrene**	**20**	**15 J**
85-68-7	Butylbenzylphthalate	20	< 20 U
56-55-3	Benzo(a)anthracene	20	< 20 U
117-81-7	bis(2-Ethylhexyl)phthalate	20	< 20 U
218-01-9	**Chrysene**	**20**	**15 J**
117-84-0	Di-n-Octyl phthalate	20	< 20 U
205-99-2	**Benzo(b)fluoranthene**	**20**	**10 J**
207-08-9	**Benzo(k)fluoranthene**	**20**	**10 J**
50-32-8	Benzo(a)pyrene	20	< 20 U
193-39-5	Indeno(1,2,3-cd)pyrene	20	< 20 U
53-70-3	Dibenz(a,h)anthracene	20	< 20 U
191-24-2	Benzo(g,h,i)perylene	20	< 20 U
90-05-1	Guaiacol	20	< 20 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS **Sample ID: PGSS-54**
 SAMPLE

Lab Sample ID: OT70T QC Report No: OT70-Hart Crowser, Inc.
LIMS ID: 09-8223 Project: PORT GAMBLE
Matrix: Sediment 17330-14
Date Analyzed: 04/16/09 19:40

CAS Number	Analyte	RL	Result
483-65-8	Retene	20	< 20 U
90-12-0	1-Methylnaphthalene	20	< 20 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	59.6%	2-Fluorobiphenyl	69.2%
d14-p-Terphenyl	81.2%	d4-1,2-Dichlorobenzene	63.6%
d5-Phenol	63.5%	2-Fluorophenol	56.3%
2,4,6-Tribromophenol	81.1%	d4-2-Chlorophenol	62.7%

ANALYTICAL RESOURCES INCORPORATED

SW8270 SEMIVOLATILES SOIL/SEDIMENT SURROGATE RECOVERY SUMMARY

Matrix: Sediment

QC Report No: OT70-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14

Client ID	NBZ	FBP	TPH	DCB	PHL	2FP	TBP	2CP	TOT OUT
PGSS-14A	58.8%	75.6%	96.8%	62.4%	65.1%	59.2%	100%	67.2%	0
PGSS-15	58.8%	70.8%	88.4%	63.2%	64.3%	59.5%	95.2%	65.3%	0
PGSS-16	59.6%	74.0%	102%*	64.0%	65.6%	60.8%	94.4%	67.5%	1
PGSS-18	53.6%	67.6%	85.2%	55.6%	59.2%	55.5%	94.4%	61.1%	0
PGSS-21B	55.2%	68.0%	82.0%	58.8%	59.7%	57.1%	89.9%	62.1%	0
MB-040609	58.4%	66.0%	84.4%	66.4%	62.4%	58.9%	81.6%	65.1%	0
LCS-040609	57.6%	66.4%	80.4%	59.6%	61.1%	56.8%	87.2%	60.5%	0
LCSD-040609	58.8%	68.4%	83.6%	62.0%	62.4%	58.4%	88.3%	63.2%	0
PGSS-21A	51.2%	66.0%	89.2%	52.4%	58.9%	53.3%	94.9%	58.9%	0
PGSS-21A MS	59.2%	74.0%	90.4%	65.2%	65.1%	60.8%	97.3%	67.2%	0
PGSS-21A MSD	66.0%	77.6%	93.2%	67.2%	66.9%	64.5%	101%	70.4%	0
PGSS-29	56.4%	68.8%	86.4%	59.6%	60.3%	56.3%	93.9%	62.4%	0
PGSS-29A	48.8%	61.6%	74.4%	52.4%	52.5%	49.3%	79.7%	53.9%	0
PGSS-30	59.6%	71.6%	88.8%	65.2%	62.4%	60.8%	95.2%	66.1%	0
PGSS-31	52.8%	63.6%	79.2%	55.2%	59.2%	54.1%	89.6%	58.1%	0
PGSS-38	53.6%	66.8%	82.4%	57.6%	57.6%	54.1%	88.5%	59.2%	0
PGSS-38A	52.4%	60.8%	73.6%	57.2%	54.1%	52.3%	81.3%	56.0%	0
PGSS-39	52.0%	64.0%	81.6%	56.0%	56.5%	51.5%	93.9%	56.3%	0
PGSS-40	54.0%	63.2%	82.0%	57.6%	57.6%	52.8%	90.1%	57.9%	0
PGSS-42	56.4%	64.8%	78.4%	59.2%	58.7%	53.3%	91.5%	59.5%	0
PGSS-44	52.4%	61.6%	72.8%	56.0%	53.1%	50.4%	71.5%	54.1%	0
PGSS-47	57.2%	68.0%	81.2%	61.2%	59.7%	54.4%	78.4%	61.3%	0
PGSS-47A	53.2%	63.6%	76.8%	52.4%	57.3%	50.9%	78.7%	57.3%	0
PGSS-53	60.8%	69.2%	80.4%	63.6%	63.7%	55.5%	84.0%	63.7%	0
PGSS-54	59.6%	69.2%	81.2%	63.6%	63.5%	56.3%	81.1%	62.7%	0

	LCS/MB LIMITS	QC LIMITS
(NBZ) = d5-Nitrobenzene	(37-85)	(29-87)
(FBP) = 2-Fluorobiphenyl	(39-82)	(32-88)
(TPH) = d14-p-Terphenyl	(38-105)	(21-97)
(DCB) = d4-1,2-Dichlorobenzene	(33-79)	(25-82)
(PHL) = d5-Phenol	(40-85)	(29-85)
(2FP) = 2-Fluorophenol	(20-93)	(10-114)
(TBP) = 2,4,6-Tribromophenol	(40-96)	(25-103)
(2CP) = d4-2-Chlorophenol	(41-81)	(30-84)

Prep Method: SW3550B
Log Number Range: 09-8204 to 09-8223

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS **Sample ID: PGSS-21A**
Page 1 of 1 **MS/MSD**

Lab Sample ID: OT70F
LIMS ID: 09-8209
Matrix: Sediment
Data Release Authorized:
Reported: 04/17/09

QC Report No: OT70-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/04/08
Date Received: 12/08/09

Date Extracted MS/MSD: 04/06/09

Date Analyzed MS: 04/15/09 19:40
MSD: 04/15/09 20:14
Instrument/Analyst MS: NT4/LJR
MSD: NT4/LJR
GPC Cleanup: YES

Sample Amount MS: 25.6 g-dry-wt
MSD: 25.7 g-dry-wt
Final Extract Volume MS: 0.5 mL
MSD: 0.5 mL
Dilution Factor MS: 1.00
MSD: 1.00
Percent Moisture: 17.9 %

Analyte	Sample	MS	Spike Added-MS	MS Recovery	MSD	Spike Added-MSD	MSD Recovery	RPD
Phenol	< 19.5	293 J	488	60.0%	306 J	487	62.8%	4.3%
1,3-Dichlorobenzene	< 19.5	287	488	58.8%	305	487	62.6%	6.1%
1,4-Dichlorobenzene	< 19.5	297	488	60.9%	315	487	64.7%	5.9%
Benzyl Alcohol	< 19.5	567	977	58.0%	357	974	36.7%	45.5%
1,2-Dichlorobenzene	< 19.5	310	488	63.5%	327	487	67.1%	5.3%
2-Methylphenol	< 19.5	341	488	69.9%	319	487	65.5%	6.7%
4-Methylphenol	< 19.5	667	977	68.3%	689	974	70.7%	3.2%
2,4-Dimethylphenol	< 19.5	328	488	67.2%	349	487	71.7%	6.2%
Benzoic Acid	< 195	1390	1470	94.6%	1470	1460	101%	5.6%
1,2,4-Trichlorobenzene	< 19.5	333	488	68.2%	360	487	73.9%	7.8%
Naphthalene	< 19.5	338	488	69.3%	357	487	73.3%	5.5%
Hexachlorobutadiene	< 19.5	347	488	71.1%	361	487	74.1%	4.0%
2-Methylnaphthalene	< 19.5	349	488	71.5%	373	487	76.6%	6.6%
Dimethylphthalate	< 19.5	383	488	78.5%	393	487	80.7%	2.6%
Acenaphthylene	< 19.5	359	488	73.6%	375	487	77.0%	4.4%
Acenaphthene	< 19.5	366	488	75.0%	386	487	79.3%	5.3%
Dibenzofuran	< 19.5	375	488	76.8%	395	487	81.1%	5.2%
Diethylphthalate	< 19.5	399	488	81.8%	414	487	85.0%	3.7%
Fluorene	< 19.5	403	488	82.6%	418	487	85.8%	3.7%
N-Nitrosodiphenylamine	< 19.5	347	488	71.1%	336	487	69.0%	3.2%
Hexachlorobenzene	< 19.5	406	488	83.2%	420	487	86.2%	3.4%
Pentachlorophenol	< 97.7	498	488	102%	524	487	108%	5.1%
Phenanthrene	< 19.5	408	488	83.6%	425	487	87.3%	4.1%
Anthracene	< 19.5	370	488	75.8%	383	487	78.6%	3.5%
Di-n-Butylphthalate	< 19.5	378	488	77.5%	387	487	79.5%	2.4%
Fluoranthene	< 19.5	397	488	81.4%	411	487	84.4%	3.5%
Pyrene	< 19.5	407	488	83.4%	424	487	87.1%	4.1%
Butylbenzylphthalate	< 19.5	397	488	81.4%	416	487	85.4%	4.7%
Benzo(a)anthracene	< 19.5	421	488	86.3%	437	487	89.7%	3.7%
bis(2-Ethylhexyl)phthalate	< 19.5	435	488	89.1%	476	487	97.7%	9.0%
Chrysene	< 19.5	419	488	85.9%	431	487	88.5%	2.8%
Di-n-Octyl phthalate	< 19.5	405	488	83.0%	417	487	85.6%	2.9%
Benzo(b)fluoranthene	< 19.5	434	488	88.9%	459	487	94.3%	5.6%
Benzo(k)fluoranthene	< 19.5	466	488	95.5%	484	487	99.4%	3.8%
Benzo(a)pyrene	< 19.5	390	488	79.9%	401	487	82.3%	2.8%
Indeno(1,2,3-cd)pyrene	< 19.5	382	488	78.3%	398	487	81.7%	4.1%
Dibenz(a,h)anthracene	< 19.5	387	488	79.3%	399	487	81.9%	3.1%
Benzo(g,h,i)perylene	< 19.5	374	488	76.6%	390	487	80.1%	4.2%
Guaiacol	< 19.5	375	488	76.8%	393	487	80.7%	4.7%
1-Methylnaphthalene	< 19.5	376	488	77.0%	404	487	83.0%	7.2%

Results reported in µg/kg
RPD calculated using sample concentrations per SW846.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS **Sample ID: PGSS-21A**
Page 1 of 2 **MATRIX SPIKE**

Lab Sample ID: OT70F
LIMS ID: 09-8209
Matrix: Sediment
Data Release Authorized:
Reported: 04/17/09

QC Report No: OT70-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/04/08
Date Received: 12/08/09

Date Extracted: 04/06/09
Date Analyzed: 04/15/09 19:40
Instrument/Analyst: NT4/LJR
GPC Cleanup: Yes

Sample Amount: 25.6 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 17.9%

CAS Number	Analyte	RL	Result
108-95-2	Phenol	20	---
541-73-1	1,3-Dichlorobenzene	20	---
106-46-7	1,4-Dichlorobenzene	20	---
100-51-6	Benzyl Alcohol	20	---
95-50-1	1,2-Dichlorobenzene	20	---
95-48-7	2-Methylphenol	20	---
106-44-5	4-Methylphenol	20	---
105-67-9	2,4-Dimethylphenol	20	---
65-85-0	Benzoic Acid	200	---
120-82-1	1,2,4-Trichlorobenzene	20	---
91-20-3	Naphthalene	20	---
87-68-3	Hexachlorobutadiene	20	---
91-57-6	2-Methylnaphthalene	20	---
131-11-3	Dimethylphthalate	20	---
208-96-8	Acenaphthylene	20	---
83-32-9	Acenaphthene	20	---
132-64-9	Dibenzofuran	20	---
84-66-2	Diethylphthalate	20	---
86-73-7	Fluorene	20	---
86-30-6	N-Nitrosodiphenylamine	20	---
118-74-1	Hexachlorobenzene	20	---
87-86-5	Pentachlorophenol	98	---
85-01-8	Phenanthrene	20	---
120-12-7	Anthracene	20	---
84-74-2	Di-n-Butylphthalate	20	---
206-44-0	Fluoranthene	20	---
129-00-0	Pyrene	20	---
85-68-7	Butylbenzylphthalate	20	---
56-55-3	Benzo(a)anthracene	20	---
117-81-7	bis(2-Ethylhexyl)phthalate	20	---
218-01-9	Chrysene	20	---
117-84-0	Di-n-Octyl phthalate	20	---
205-99-2	Benzo(b)fluoranthene	20	---
207-08-9	Benzo(k)fluoranthene	20	---
50-32-8	Benzo(a)pyrene	20	---
193-39-5	Indeno(1,2,3-cd)pyrene	20	---
53-70-3	Dibenz(a,h)anthracene	20	---
191-24-2	Benzo(g,h,i)perylene	20	---
90-05-1	Guaiacol	20	---

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: PGSS-21A
MATRIX SPIKE

Lab Sample ID: OT70F
LIMS ID: 09-8209
Matrix: Sediment
Date Analyzed: 04/15/09 19:40

QC Report No: OT70-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14

CAS Number	Analyte	RL	Result
483-65-8	Retene	20	< 20 U
90-12-0	1-Methylnaphthalene	20	---

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	59.2%	2-Fluorobiphenyl	74.0%
d14-p-Terphenyl	90.4%	d4-1,2-Dichlorobenzene	65.2%
d5-Phenol	65.1%	2-Fluorophenol	60.8%
2,4,6-Tribromophenol	97.3%	d4-2-Chlorophenol	67.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS **Sample ID: PGSS-21A**
Page 1 of 2 **MATRIX SPIKE DUPLICATE**

Lab Sample ID: OT70F
LIMS ID: 09-8209
Matrix: Sediment
Data Release Authorized:
Reported: 04/17/09

QC Report No: OT70-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/04/08
Date Received: 12/08/09

Date Extracted: 04/06/09
Date Analyzed: 04/15/09 20:14
Instrument/Analyst: NT4/LJR
GPC Cleanup: Yes

Sample Amount: 25.7 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 17.9%

CAS Number	Analyte	RL	Result
108-95-2	Phenol	20	---
541-73-1	1,3-Dichlorobenzene	20	---
106-46-7	1,4-Dichlorobenzene	20	---
100-51-6	Benzyl Alcohol	20	---
95-50-1	1,2-Dichlorobenzene	20	---
95-48-7	2-Methylphenol	20	---
106-44-5	4-Methylphenol	20	---
105-67-9	2,4-Dimethylphenol	20	---
65-85-0	Benzoic Acid	200	---
120-82-1	1,2,4-Trichlorobenzene	20	---
91-20-3	Naphthalene	20	---
87-68-3	Hexachlorobutadiene	20	---
91-57-6	2-Methylnaphthalene	20	---
131-11-3	Dimethylphthalate	20	---
208-96-8	Acenaphthylene	20	---
83-32-9	Acenaphthene	20	---
132-64-9	Dibenzofuran	20	---
84-66-2	Diethylphthalate	20	---
86-73-7	Fluorene	20	---
86-30-6	N-Nitrosodiphenylamine	20	---
118-74-1	Hexachlorobenzene	20	---
87-86-5	Pentachlorophenol	97	---
85-01-8	Phenanthrene	20	---
120-12-7	Anthracene	20	---
84-74-2	Di-n-Butylphthalate	20	---
206-44-0	Fluoranthene	20	---
129-00-0	Pyrene	20	---
85-68-7	Butylbenzylphthalate	20	---
56-55-3	Benzo(a)anthracene	20	---
117-81-7	bis(2-Ethylhexyl)phthalate	20	---
218-01-9	Chrysene	20	---
117-84-0	Di-n-Octyl phthalate	20	---
205-99-2	Benzo(b)fluoranthene	20	---
207-08-9	Benzo(k)fluoranthene	20	---
50-32-8	Benzo(a)pyrene	20	---
193-39-5	Indeno(1,2,3-cd)pyrene	20	---
53-70-3	Dibenz(a,h)anthracene	20	---
191-24-2	Benzo(g,h,i)perylene	20	---
90-05-1	Guaiacol	20	---

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS **Sample ID: PGSS-21A**
 MATRIX SPIKE DUPLICATE

Lab Sample ID: OT70F QC Report No: OT70-Hart Crowser, Inc.
LIMS ID: 09-8209 Project: PORT GAMBLE
Matrix: Sediment 17330-14
Date Analyzed: 04/15/09 20:14

CAS Number	Analyte	RL	Result
483-65-8	Retene	20	< 20 U
90-12-0	1-Methylnaphthalene	20	---

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	66.0%	2-Fluorobiphenyl	77.6%
d14-p-Terphenyl	93.2%	d4-1,2-Dichlorobenzene	67.2%
d5-Phenol	66.9%	2-Fluorophenol	64.5%
2,4,6-Tribromophenol	101%	d4-2-Chlorophenol	70.4%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS **Sample ID: LCS-040609**
Page 1 of 2 **LCS/LCSD**

Lab Sample ID: LCS-040609 QC Report No: OT70-Hart Crowser, Inc.
LIMS ID: 09-8209 Project: PORT GAMBLE
Matrix: Sediment 17330-14
Data Release Authorized: Date Sampled: 12/04/08
Reported: 04/17/09 Date Received: 12/08/09

Date Extracted LCS/LCSD: 04/06/09 Sample Amount LCS: 25.0 g
LCSD: 25.0 g
Date Analyzed LCS: 04/15/09 15:04 Final Extract Volume LCS: 0.5 mL
LCSD: 04/15/09 15:38 LCSD: 0.5 mL
Instrument/Analyst LCS: NT4/LJR Dilution Factor LCS: 1.00
LCSD: NT4/LJR LCSD: 1.00
GPC Cleanup: YES Percent Moisture: NA

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Phenol	271	500	54.2%	280	500	56.0%	3.3%
1,3-Dichlorobenzene	293	500	58.6%	303	500	60.6%	3.4%
1,4-Dichlorobenzene	297	500	59.4%	311	500	62.2%	4.6%
Benzyl Alcohol	429	1000	42.9%	431	1000	43.1%	0.5%
1,2-Dichlorobenzene	302	500	60.4%	310	500	62.0%	2.6%
2-Methylphenol	304	500	60.8%	303	500	60.6%	0.3%
4-Methylphenol	627	1000	62.7%	648	1000	64.8%	3.3%
2,4-Dimethylphenol	273	500	54.6%	286	500	57.2%	4.7%
Benzoic Acid	1130	1500	75.3%	1180	1500	78.7%	4.3%
1,2,4-Trichlorobenzene	323	500	64.6%	336	500	67.2%	3.9%
Naphthalene	322	500	64.4%	334	500	66.8%	3.7%
Hexachlorobutadiene	325	500	65.0%	346	500	69.2%	6.3%
2-Methylnaphthalene	321	500	64.2%	333	500	66.6%	3.7%
Dimethylphthalate	369	500	73.8%	384	500	76.8%	4.0%
Acenaphthylene	349	500	69.8%	359	500	71.8%	2.8%
Acenaphthene	341	500	68.2%	351	500	70.2%	2.9%
Dibenzofuran	356	500	71.2%	367	500	73.4%	3.0%
Diethylphthalate	396	500	79.2%	414	500	82.8%	4.4%
Fluorene	372	500	74.4%	389	500	77.8%	4.5%
N-Nitrosodiphenylamine	326	500	65.2%	343	500	68.6%	5.1%
Hexachlorobenzene	354	500	70.8%	369	500	73.8%	4.1%
Pentachlorophenol	393	500	78.6%	416	500	83.2%	5.7%
Phenanthrene	359	500	71.8%	384	500	76.8%	6.7%
Anthracene	348	500	69.6%	364	500	72.8%	4.5%
Di-n-Butylphthalate	373	500	74.6%	394	500	78.8%	5.5%
Fluoranthene	401	500	80.2%	416	500	83.2%	3.7%
Pyrene	377	500	75.4%	389	500	77.8%	3.1%
Butylbenzylphthalate	373	500	74.6%	384	500	76.8%	2.9%
Benzo(a)anthracene	385	500	77.0%	396	500	79.2%	2.8%
bis(2-Ethylhexyl)phthalate	409	500	81.8%	419	500	83.8%	2.4%
Chrysene	381	500	76.2%	391	500	78.2%	2.6%
Di-n-Octyl phthalate	365	500	73.0%	383	500	76.6%	4.8%
Benzo(b)fluoranthene	410	500	82.0%	417	500	83.4%	1.7%
Benzo(k)fluoranthene	404	500	80.8%	442	500	88.4%	9.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS **Sample ID: LCSD-040609**
 LCS/LCSD

Lab Sample ID: LCS-040609 QC Report No: OT70-Hart Crowser, Inc.
LIMS ID: 09-8209 Project: PORT GAMBLE
Matrix: Sediment 17330-14
Date Analyzed LCS: 04/15/09 15:04
LCSD: 04/15/09 15:38

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Benzo(a)pyrene	363	500	72.6%	375	500	75.0%	3.3%
Indeno(1,2,3-cd)pyrene	358	500	71.6%	374	500	74.8%	4.4%
Dibenz(a,h)anthracene	360	500	72.0%	377	500	75.4%	4.6%
Benzo(g,h,i)perylene	347	500	69.4%	365	500	73.0%	5.1%
Guaiacol	288	500	57.6%	330	500	66.0%	13.6%
1-Methylnaphthalene	352	500	70.4%	366	500	73.2%	3.9%

Semivolatile Surrogate Recovery

	LCS	LCSD
d5-Nitrobenzene	57.6%	58.8%
2-Fluorobiphenyl	66.4%	68.4%
d14-p-Terphenyl	80.4%	83.6%
d4-1,2-Dichlorobenzene	59.6%	62.0%
d5-Phenol	61.1%	62.4%
2-Fluorophenol	56.8%	58.4%
2,4,6-Tribromophenol	87.2%	88.3%
d4-2-Chlorophenol	60.5%	63.2%

Results reported in µg/kg
RPD calculated using sample concentrations per SW846.

4B

SEMIVOLATILE METHOD BLANK SUMMARY

BLANK NO. OT70MBS1

Lab Name: ANALYTICAL RESOURCES, INC Client: HART CROWSER, INC.

ARI Job No: OT70 Project: PORT GAMBLE

Lab File ID: OT70MB Date Extracted: 04/06/09

Instrument ID: NT4 Date Analyzed: 04/15/09

Matrix: SOLID Time Analyzed: 1430

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

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01	OT70LCSS1	OT70LCSS1	OT70SB	04/15/09
02	OT70LCSDS1	OT70LCSDS1	OT70SBD	04/15/09
03	PGSS-14A	OT70A	OT70A	04/15/09
04	PGSS-15	OT70B	OT70B	04/15/09
05	PGSS-16	OT70C	OT70C	04/15/09
06	PGSS-18	OT70D	OT70D	04/15/09
07	PGSS-21B	OT70E	OT70E	04/15/09
08	PGSS-21A	OT70F	OT70F	04/15/09
09	PGSS-21A MS	OT70FMS	OT70FMS	04/15/09
10	PGSS-21A MSD	OT70FMSD	OT70FMD	04/15/09
11	PGSS-29	OT70G	OT70G	04/15/09
12	PGSS-29A	OT70H	OT70H	04/15/09
13	PGSS-30	OT70I	OT70I	04/15/09
14	PGSS-31	OT70J	OT70J	04/15/09
15	PGSS-38	OT70K	OT70K	04/15/09
16	PGSS-38A	OT70L	OT70L	04/15/09
17	PGSS-39	OT70M	OT70M	04/16/09
18	PGSS-40	OT70N	OT70N	04/16/09
19	PGSS-42	OT70O	OT70O	04/16/09
20	PGSS-44	OT70P	OT70P2	04/16/09
21	PGSS-47	OT70Q	OT70Q	04/16/09
22	PGSS-47A	OT70R	OT70R	04/16/09
23	PGSS-53	OT70S	OT70S	04/16/09
24	PGSS-54	OT70T	OT70T	04/16/09
25				
26				
27				
28				
29				
30				

COMMENTS:

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS **Sample ID: MB-040609**
Page 1 of 2 **METHOD BLANK**

Lab Sample ID: MB-040609
LIMS ID: 09-8209
Matrix: Sediment
Data Release Authorized:
Reported: 04/17/09

QC Report No: OT70-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: NA
Date Received: NA

Date Extracted: 04/06/09
Date Analyzed: 04/15/09 14:30
Instrument/Analyst: NT4/LJR
GPC Cleanup: Yes

Sample Amount: 25.0 g
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: NA

CAS Number	Analyte	RL	Result
108-95-2	Phenol	20	< 20 U
541-73-1	1,3-Dichlorobenzene	20	< 20 U
106-46-7	1,4-Dichlorobenzene	20	< 20 U
100-51-6	Benzyl Alcohol	20	< 20 U
95-50-1	1,2-Dichlorobenzene	20	< 20 U
95-48-7	2-Methylphenol	20	< 20 U
106-44-5	4-Methylphenol	20	< 20 U
105-67-9	2,4-Dimethylphenol	20	< 20 U
65-85-0	Benzoic Acid	200	< 200 U
120-82-1	1,2,4-Trichlorobenzene	20	< 20 U
91-20-3	Naphthalene	20	< 20 U
87-68-3	Hexachlorobutadiene	20	< 20 U
91-57-6	2-Methylnaphthalene	20	< 20 U
131-11-3	Dimethylphthalate	20	< 20 U
208-96-8	Acenaphthylene	20	< 20 U
83-32-9	Acenaphthene	20	< 20 U
132-64-9	Dibenzofuran	20	< 20 U
84-66-2	Diethylphthalate	20	< 20 U
86-73-7	Fluorene	20	< 20 U
86-30-6	N-Nitrosodiphenylamine	20	< 20 U
118-74-1	Hexachlorobenzene	20	< 20 U
87-86-5	Pentachlorophenol	100	< 100 U
85-01-8	Phenanthrene	20	< 20 U
120-12-7	Anthracene	20	< 20 U
84-74-2	Di-n-Butylphthalate	20	< 20 U
206-44-0	Fluoranthene	20	< 20 U
129-00-0	Pyrene	20	< 20 U
85-68-7	Butylbenzylphthalate	20	< 20 U
56-55-3	Benzo(a)anthracene	20	< 20 U
117-81-7	bis(2-Ethylhexyl)phthalate	20	< 20 U
218-01-9	Chrysene	20	< 20 U
117-84-0	Di-n-Octyl phthalate	20	< 20 U
205-99-2	Benzo(b)fluoranthene	20	< 20 U
207-08-9	Benzo(k)fluoranthene	20	< 20 U
50-32-8	Benzo(a)pyrene	20	< 20 U
193-39-5	Indeno(1,2,3-cd)pyrene	20	< 20 U
53-70-3	Dibenz(a,h)anthracene	20	< 20 U
191-24-2	Benzo(g,h,i)perylene	20	< 20 U
90-05-1	Guaiacol	20	< 20 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS **Sample ID: MB-040609**
 METHOD BLANK

Lab Sample ID: MB-040609 QC Report No: OT70-Hart Crowser, Inc.
LIMS ID: 09-8209 Project: PORT GAMBLE
Matrix: Sediment 17330-14
Date Analyzed: 04/15/09 14:30

CAS Number	Analyte	RL	Result
483-65-8	Retene	20	< 20 U
90-12-0	1-Methylnaphthalene	20	< 20 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	58.4%	2-Fluorobiphenyl	66.0%
d14-p-Terphenyl	84.4%	d4-1,2-Dichlorobenzene	66.4%
d5-Phenol	62.4%	2-Fluorophenol	58.9%
2,4,6-Tribromophenol	81.6%	d4-2-Chlorophenol	65.1%

PCB ANALYSIS

ANALYTICAL RESOURCES INCORPORATED

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

Sample ID: PGSS-14A
SAMPLE

Lab Sample ID: OT70A
LIMS ID: 09-8204
Matrix: Sediment
Data Release Authorized:
Reported: 04/14/09

QC Report No: OT70-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/04/08
Date Received: 12/08/09

Date Extracted: 04/07/09
Date Analyzed: 04/10/09 11:28
Instrument/Analyst: ECD5/PK
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.7 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: 29.1%

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

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	83.2%
Tetrachlorometaxylene	74.5%

ANALYTICAL RESOURCES INCORPORATED

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

Sample ID: PGSS-15
SAMPLE

Lab Sample ID: OT70B
LIMS ID: 09-8205
Matrix: Sediment
Data Release Authorized:
Reported: 04/14/09

QC Report No: OT70-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/04/08
Date Received: 12/08/09

Date Extracted: 04/07/09
Date Analyzed: 04/10/09 11:45
Instrument/Analyst: ECD5/PK
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 17.9 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: 66.4%

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	5.6	< 5.6 U
53469-21-9	Aroclor 1242	5.6	< 5.6 U
12672-29-6	Aroclor 1248	5.6	< 5.6 U
11097-69-1	Aroclor 1254	5.6	< 5.6 U
11096-82-5	Aroclor 1260	5.6	< 5.6 U
11104-28-2	Aroclor 1221	5.6	< 5.6 U
11141-16-5	Aroclor 1232	5.6	< 5.6 U
37324-23-5	Aroclor 1262	5.6	< 5.6 U
11100-14-4	Aroclor 1268	5.6	< 5.6 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery	
Decachlorobiphenyl	69.0%
Tetrachlorometaxylene	64.0%

ANALYTICAL RESOURCES INCORPORATED

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

Sample ID: PGSS-16
SAMPLE

Lab Sample ID: OT70C
LIMS ID: 09-8206
Matrix: Sediment
Data Release Authorized:
Reported: 04/14/09

QC Report No: OT70-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/04/08
Date Received: 12/08/09

Date Extracted: 04/07/09
Date Analyzed: 04/10/09 12:02
Instrument/Analyst: ECD5/PK
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 16.5 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: 70.1%

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	6.0	< 6.0 U
53469-21-9	Aroclor 1242	6.0	< 6.0 U
12672-29-6	Aroclor 1248	6.0	< 6.0 U
11097-69-1	Aroclor 1254	6.0	< 6.0 U
11096-82-5	Aroclor 1260	6.0	< 6.0 U
11104-28-2	Aroclor 1221	6.0	< 6.0 U
11141-16-5	Aroclor 1232	6.0	< 6.0 U
37324-23-5	Aroclor 1262	6.0	< 6.0 U
11100-14-4	Aroclor 1268	6.0	< 6.0 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	72.8%
Tetrachlorometaxylene	66.8%

ANALYTICAL RESOURCES INCORPORATED

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

Sample ID: PGSS-18
SAMPLE

Lab Sample ID: OT70D
LIMS ID: 09-8207
Matrix: Sediment
Data Release Authorized:
Reported: 04/14/09

QC Report No: OT70-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/04/08
Date Received: 12/08/09

Date Extracted: 04/07/09
Date Analyzed: 04/10/09 12:19
Instrument/Analyst: ECD5/PK
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.2 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: 62.1%

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

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	68.2%
Tetrachlorometaxylene	64.8%

ANALYTICAL RESOURCES INCORPORATED

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

Sample ID: PGSS-21B
SAMPLE

Lab Sample ID: OT70E
LIMS ID: 09-8208
Matrix: Sediment
Data Release Authorized:
Reported: 04/14/09

QC Report No: OT70-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/04/08
Date Received: 12/08/09

Date Extracted: 04/07/09
Date Analyzed: 04/10/09 12:36
Instrument/Analyst: ECD5/PK
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.3 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: 53.4%

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

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	69.2%
Tetrachlorometaxylene	68.5%

ANALYTICAL RESOURCES INCORPORATED

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

Sample ID: PGSS-21A
SAMPLE

Lab Sample ID: OT70F
LIMS ID: 09-8209
Matrix: Sediment
Data Release Authorized:
Reported: 04/14/09

QC Report No: OT70-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/04/08
Date Received: 12/08/09

Date Extracted: 04/07/09
Date Analyzed: 04/10/09 12:53
Instrument/Analyst: ECD5/PK
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.5 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: 17.9%

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

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	74.8%
Tetrachlorometaxylene	69.2%

ANALYTICAL RESOURCES INCORPORATED

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

Sample ID: PGSS-29
SAMPLE

Lab Sample ID: OT70G
LIMS ID: 09-8210
Matrix: Sediment
Data Release Authorized:
Reported: 04/14/09

QC Report No: OT70-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/04/08
Date Received: 12/08/09

Date Extracted: 04/07/09
Date Analyzed: 04/10/09 13:10
Instrument/Analyst: ECD5/PK
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.9 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: 32.5%

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

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	74.8%
Tetrachlorometaxylene	67.2%

ANALYTICAL RESOURCES INCORPORATED

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

Sample ID: PGSS-29A
SAMPLE

Lab Sample ID: OT70H
LIMS ID: 09-8211
Matrix: Sediment
Data Release Authorized:
Reported: 04/14/09

QC Report No: OT70-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/04/08
Date Received: 12/08/09

Date Extracted: 04/07/09
Date Analyzed: 04/10/09 13:28
Instrument/Analyst: ECD5/PK
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.1 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: 60.9%

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

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	71.5%
Tetrachlorometaxylene	72.0%

ANALYTICAL RESOURCES INCORPORATED

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

Sample ID: PGSS-30
SAMPLE

Lab Sample ID: OT70I
LIMS ID: 09-8212
Matrix: Sediment
Data Release Authorized:
Reported: 04/14/09

QC Report No: OT70-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/05/08
Date Received: 12/08/09

Date Extracted: 04/07/09
Date Analyzed: 04/10/09 13:45
Instrument/Analyst: ECD5/PK
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.3 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: 63.4%

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

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	77.0%
Tetrachlorometaxylene	74.5%

ANALYTICAL RESOURCES INCORPORATED

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

Sample ID: PGSS-31
SAMPLE

Lab Sample ID: OT70J
LIMS ID: 09-8213
Matrix: Sediment
Data Release Authorized:
Reported: 04/14/09

QC Report No: OT70-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/05/08
Date Received: 12/08/09

Date Extracted: 04/07/09
Date Analyzed: 04/10/09 14:02
Instrument/Analyst: ECD5/PK
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.6 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: 60.4%

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

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	73.0%
Tetrachlorometaxylene	65.8%

ANALYTICAL RESOURCES INCORPORATED

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

Sample ID: PGSS-38
SAMPLE

Lab Sample ID: OT70K
LIMS ID: 09-8214
Matrix: Sediment
Data Release Authorized:
Reported: 04/14/09

QC Report No: OT70-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/05/08
Date Received: 12/08/09

Date Extracted: 04/07/09
Date Analyzed: 04/11/09 12:49
Instrument/Analyst: ECD5/PK
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.4 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: 23.3%

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

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	91.2%
Tetrachlorometaxylene	66.5%

ANALYTICAL RESOURCES INCORPORATED

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

Sample ID: PGSS-38A
SAMPLE

Lab Sample ID: OT70L
LIMS ID: 09-8215
Matrix: Sediment
Data Release Authorized:
Reported: 04/14/09

QC Report No: OT70-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/05/08
Date Received: 12/08/09

Date Extracted: 04/07/09
Date Analyzed: 04/10/09 15:10
Instrument/Analyst: ECD5/PK
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.8 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: 49.0%

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

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	76.5%
Tetrachlorometaxylene	68.0%

ANALYTICAL RESOURCES INCORPORATED

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

Sample ID: PGSS-39
SAMPLE

Lab Sample ID: OT70M
LIMS ID: 09-8216
Matrix: Sediment
Data Release Authorized:
Reported: 04/14/09

QC Report No: OT70-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/05/08
Date Received: 12/08/09

Date Extracted: 04/07/09
Date Analyzed: 04/10/09 15:28
Instrument/Analyst: ECD5/PK
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.2 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: 61.8%

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

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	76.2%
Tetrachlorometaxylene	68.0%

ANALYTICAL RESOURCES INCORPORATED

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

Sample ID: PGSS-40
SAMPLE

Lab Sample ID: OT70N
LIMS ID: 09-8217
Matrix: Sediment
Data Release Authorized:
Reported: 04/14/09

QC Report No: OT70-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/05/08
Date Received: 12/08/09

Date Extracted: 04/07/09
Date Analyzed: 04/10/09 15:45
Instrument/Analyst: ECD5/PK
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.3 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: 59.2%

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

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	82.8%
Tetrachlorometaxylene	66.8%

ANALYTICAL RESOURCES INCORPORATED

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

Sample ID: PGSS-42
SAMPLE

Lab Sample ID: OT70O
LIMS ID: 09-8218
Matrix: Sediment
Data Release Authorized:
Reported: 04/14/09

QC Report No: OT70-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/05/08
Date Received: 12/08/09

Date Extracted: 04/07/09
Date Analyzed: 04/10/09 16:02
Instrument/Analyst: ECD5/PK
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.5 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: 58.5%

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

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	60.5%
Tetrachlorometaxylene	55.5%

ANALYTICAL RESOURCES INCORPORATED

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

Sample ID: PGSS-44
SAMPLE

Lab Sample ID: OT70P
LIMS ID: 09-8219
Matrix: Sediment
Data Release Authorized:
Reported: 04/14/09

QC Report No: OT70-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/05/08
Date Received: 12/08/09

Date Extracted: 04/07/09
Date Analyzed: 04/10/09 16:19
Instrument/Analyst: ECD5/PK
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 16.3 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: 60.6%

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	6.1	< 6.1 U
53469-21-9	Aroclor 1242	6.1	< 6.1 U
12672-29-6	Aroclor 1248	6.1	< 6.1 U
11097-69-1	**Aroclor 1254**	**6.1**	**4.3 J**
11096-82-5	Aroclor 1260	6.1	< 6.1 U
11104-28-2	Aroclor 1221	6.1	< 6.1 U
11141-16-5	Aroclor 1232	6.1	< 6.1 U
37324-23-5	Aroclor 1262	6.1	< 6.1 U
11100-14-4	Aroclor 1268	6.1	< 6.1 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	91.0%
Tetrachlorometaxylene	78.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA PCB by GC/ECD **Sample ID: PGSS-47**
Page 1 of 1 **SAMPLE**

Lab Sample ID: OT70Q
LIMS ID: 09-8220
Matrix: Sediment
Data Release Authorized:
Reported: 04/14/09

QC Report No: OT70-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/08/08
Date Received: 12/11/08

Date Extracted: 04/07/09
Date Analyzed: 04/10/09 16:36
Instrument/Analyst: ECD5/PK
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.5 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: 37.4%

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

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	76.0%
Tetrachlorometaxylene	66.8%

ANALYTICAL RESOURCES INCORPORATED

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

Sample ID: PGSS-47A
SAMPLE

Lab Sample ID: OT70R
LIMS ID: 09-8221
Matrix: Sediment
Data Release Authorized:
Reported: 04/14/09

QC Report No: OT70-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/08/08
Date Received: 12/11/08

Date Extracted: 04/07/09
Date Analyzed: 04/10/09 16:53
Instrument/Analyst: ECD5/PK
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.4 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: 44.2%

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

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	84.5%
Tetrachlorometaxylene	70.0%

ANALYTICAL RESOURCES INCORPORATED

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

Sample ID: PGSS-53
SAMPLE

Lab Sample ID: OT70S
LIMS ID: 09-8222
Matrix: Sediment
Data Release Authorized:
Reported: 04/14/09

QC Report No: OT70-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/08/08
Date Received: 12/11/08

Date Extracted: 04/07/09
Date Analyzed: 04/10/09 17:11
Instrument/Analyst: ECD5/PK
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.4 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: 55.4%

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

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	55.8%
Tetrachlorometaxylene	55.2%

ANALYTICAL RESOURCES INCORPORATED

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

Sample ID: PGSS-54
SAMPLE

Lab Sample ID: OT70T
LIMS ID: 09-8223
Matrix: Sediment
Data Release Authorized:
Reported: 04/14/09

QC Report No: OT70-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/08/08
Date Received: 12/11/08

Date Extracted: 04/07/09
Date Analyzed: 04/10/09 17:28
Instrument/Analyst: ECD5/PK
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.5 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: 52.9%

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

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	76.8%
Tetrachlorometaxylene	68.2%

ANALYTICAL RESOURCES INCORPORATED

SW8082/PCB SOIL/SEDIMENT SURROGATE RECOVERY SUMMARY

Matrix: Sediment

QC Report No: OT70-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14

Client ID	DCBP % REC	DCBP LCL-UCL	TCMX % REC	TCMX LCL-UCL	TOT OUT
PGSS-14A	83.2%	33-149	74.5%	32-121	0
PGSS-15	69.0%	33-149	64.0%	32-121	0
PGSS-16	72.8%	33-149	66.8%	32-121	0
PGSS-18	68.2%	33-149	64.8%	32-121	0
PGSS-21B	69.2%	33-149	68.5%	32-121	0
PGSS-21A	74.8%	33-149	69.2%	32-121	0
PGSS-29	74.8%	33-149	67.2%	32-121	0
PGSS-29A	71.5%	33-149	72.0%	32-121	0
PGSS-30	77.0%	33-149	74.5%	32-121	0
PGSS-31	73.0%	33-149	65.8%	32-121	0
MB-040709	57.8%	36-130	57.8%	30-119	0
LCS-040709	70.5%	36-130	71.5%	30-119	0
LCSD-040709	63.5%	36-130	66.0%	30-119	0
PGSS-38	91.2%	33-149	66.5%	32-121	0
PGSS-38 MS	80.2%	33-149	71.2%	32-121	0
PGSS-38 MSD	83.2%	33-149	74.5%	32-121	0
PGSS-38A	76.5%	33-149	68.0%	32-121	0
PGSS-39	76.2%	33-149	68.0%	32-121	0
PGSS-40	82.8%	33-149	66.8%	32-121	0
PGSS-42	60.5%	33-149	55.5%	32-121	0
PGSS-44	91.0%	33-149	78.2%	32-121	0
PGSS-47	76.0%	33-149	66.8%	32-121	0
PGSS-47A	84.5%	33-149	70.0%	32-121	0
PGSS-53	55.8%	33-149	55.2%	32-121	0
PGSS-54	76.8%	33-149	68.2%	32-121	0

Low Level PSDDA Control Limits
Prep Method: SW3550B
Log Number Range: 09-8204 to 09-8223

ANALYTICAL RESOURCES INCORPORATED

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

Sample ID: PGSS-38
MS/MSD

Lab Sample ID: OT70K
LIMS ID: 09-8214
Matrix: Sediment
Data Release Authorized:
Reported: 04/14/09

QC Report No: OT70-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/05/08
Date Received: 12/08/09

Date Extracted MS/MSD: 04/07/09

Date Analyzed MS: 04/10/09 14:36
MSD: 04/10/09 14:53
Instrument/Analyst MS: ECD5/PK
MSD: ECD5/PK
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount MS: 25.7 g-dry-wt
MSD: 25.6 g-dry-wt
Final Extract Volume MS: 1.0 mL
MSD: 1.0 mL
Dilution Factor MS: 1.00
MSD: 1.00
Silica Gel: No

Percent Moisture: 23.3%

Analyte	Sample	MS	Spike Added-MS	MS Recovery	MSD	Spike Added-MSD	MSD Recovery	RPD
Aroclor 1016	< 3.9 U	15.7	19.4	80.9%	16.2	19.6	82.7%	3.1%
Aroclor 1260	< 3.9 U	18.3	19.4	94.3%	19.4	19.6	99.0%	5.8%

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

ANALYTICAL RESOURCES INCORPORATED

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

Sample ID: PGSS-38
MATRIX SPIKE

Lab Sample ID: OT70K
LIMS ID: 09-8214
Matrix: Sediment
Data Release Authorized:
Reported: 04/14/09

QC Report No: OT70-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/05/08
Date Received: 12/08/09

Date Extracted: 04/07/09
Date Analyzed: 04/10/09 14:36
Instrument/Analyst: ECD5/PK
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.7 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: 23.3%

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

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	80.2%
Tetrachlorometaxylene	71.2%

ANALYTICAL RESOURCES INCORPORATED

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

Sample ID: PGSS-38
MATRIX SPIKE DUP

Lab Sample ID: OT70K
LIMS ID: 09-8214
Matrix: Sediment
Data Release Authorized:
Reported: 04/14/09

QC Report No: OT70-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/05/08
Date Received: 12/08/09

Date Extracted: 04/07/09
Date Analyzed: 04/10/09 14:53
Instrument/Analyst: ECD5/PK
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.6 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: 23.3%

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

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	83.2%
Tetrachlorometaxylene	74.5%

ANALYTICAL RESOURCES INCORPORATED

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

Sample ID: LCS-040709
LCS/LCSD

Lab Sample ID: LCS-040709
LIMS ID: 09-8214
Matrix: Sediment
Data Release Authorized:
Reported: 04/14/09

QC Report No: OT70-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: NA
Date Received: NA

Date Extracted LCS/LCSD: 04/07/09

Date Analyzed LCS: 04/10/09 10:53
LCSD: 04/10/09 11:10
Instrument/Analyst LCS: ECD5/PK
LCSD: ECD5/PK
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount LCS: 25.0 g-dry-wt
LCSD: 25.0 g-dry-wt
Final Extract Volume LCS: 1.0 mL
LCSD: 1.0 mL
Dilution Factor LCS: 1.00
LCSD: 1.00
Silica Gel: No

Percent Moisture: NA

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Aroclor 1016	17.0	20.0	85.0%	16.3	20.0	81.5%	4.2%
Aroclor 1260	18.4	20.0	92.0%	16.8	20.0	84.0%	9.1%

PCB Surrogate Recovery

	LCS	LCSD
Decachlorobiphenyl	70.5%	63.5%
Tetrachlorometaxylene	71.5%	66.0%

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

PCB METHOD BLANK SUMMARY

BLANK NO.

OT70MBS1

Lab Name: ANALYTICAL RESOURCES, INC
Client: HART CROWSER, INC.

ARI Job No.: OT70
Project: PORT GAMBLE

Lab Sample ID: OT70MBS1
Lab File ID: 0410B004

Date Extracted: 04/07/09
Matrix: SOLID

Date Analyzed: 04/10/09
Instrument ID: ECD5

Time Analyzed: 1036
GC Columns: ZB5/ZB35

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

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED
01	OT70LCSS1	OT70LCSS1	04/10/09
02	OT70LCSDS1	OT70LCSDS1	04/10/09
03	PGSS-14A	OT70A	04/10/09
04	PGSS-15	OT70B	04/10/09
05	PGSS-16	OT70C	04/10/09
06	PGSS-18	OT70D	04/10/09
07	PGSS-21B	OT70E	04/10/09
08	PGSS-21A	OT70F	04/10/09
09	PGSS-29	OT70G	04/10/09
10	PGSS-29A	OT70H	04/10/09
11	PGSS-30	OT70I	04/10/09
12	PGSS-31	OT70J	04/10/09
13	PGSS-38	OT70K	04/10/09
14	PGSS-38 MS	OT70KMS	04/10/09
15	PGSS-38 MSD	OT70KMSD	04/10/09
16	PGSS-38A	OT70L	04/10/09
17	PGSS-39	OT70M	04/10/09
18	PGSS-40	OT70N	04/10/09
19	PGSS-42	OT70O	04/10/09
20	PGSS-44	OT70P	04/10/09
21	PGSS-47	OT70Q	04/10/09
22	PGSS-47A	OT70R	04/10/09
23	PGSS-53	OT70S	04/10/09
24	PGSS-54	OT70T	04/10/09
25	PGSS-38	OT70K	04/11/09

ALL RUNS ARE DUAL COLUMN

ANALYTICAL RESOURCES INCORPORATED

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

Sample ID: MB-040709
METHOD BLANK

Lab Sample ID: MB-040709
LIMS ID: 09-8214
Matrix: Sediment
Data Release Authorized:
Reported: 04/14/09

QC Report No: OT70-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: NA
Date Received: NA

Date Extracted: 04/07/09
Date Analyzed: 04/10/09 10:36
Instrument/Analyst: ECD5/PK
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.0 g
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: NA

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

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	57.8%
Tetrachlorometaxylene	57.8%

METALS ANALYSIS

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: PGSS-14A
SAMPLE

Lab Sample ID: OT70A
LIMS ID: 09-8204
Matrix: Sediment
Data Release Authorized:
Reported: 04/16/09

QC Report No: OT70-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/04/08
Date Received: 12/08/09

Percent Total Solids: 74.7%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	04/07/09	6010B	04/15/09	7440-38-2	Arsenic	7	7	U
3050B	04/07/09	6010B	04/15/09	**7440-43-9**	**Cadmium**	0.3	**0.4**	
3050B	04/07/09	6010B	04/15/09	**7440-47-3**	**Chromium**	0.7	**15.7**	
3050B	04/07/09	6010B	04/15/09	**7440-50-8**	**Copper**	0.3	**8.0**	
3050B	04/07/09	6010B	04/15/09	7439-92-1	Lead	3	3	U
CLP	04/07/09	7471A	04/10/09	7439-97-6	Mercury	0.05	0.05	U
3050B	04/07/09	6010B	04/15/09	7440-22-4	Silver	0.4	0.4	U
3050B	04/07/09	6010B	04/15/09	**7440-66-6**	**Zinc**	1	**25**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: PGSS-14A
DUPLICATE

Lab Sample ID: OT70A
LIMS ID: 09-8204
Matrix: Sediment
Data Release Authorized:
Reported: 04/16/09

QC Report No: OT70-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/04/08
Date Received: 12/08/09

MATRIX DUPLICATE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Duplicate	RPD	Control Limit	Q
Arsenic	6010B	7 U	7 U	0.0%	+/- 7	L
Cadmium	6010B	0.4	0.4	0.0%	+/- 0.3	L
Chromium	6010B	15.7	16.5	5.0%	+/- 20%	
Copper	6010B	8.0	7.8	2.5%	+/- 20%	
Lead	6010B	3 U	3 U	0.0%	+/- 3	L
Mercury	7471A	0.05 U	0.05 U	0.0%	+/- 0.05	L
Silver	6010B	0.4 U	0.4 U	0.0%	+/- 0.4	L
Zinc	6010B	25	26	3.9%	+/- 20%	

Reported in mg/kg-dry

*-Control Limit Not Met
L-RPD Invalid, Limit = Detection Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: PGSS-14A
MATRIX SPIKE

Lab Sample ID: OT70A
LIMS ID: 09-8204
Matrix: Sediment
Data Release Authorized:
Reported: 04/16/09

QC Report No: OT70-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/04/08
Date Received: 12/08/09

MATRIX SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample		Spike	Spike Added	% Recovery	Q
Arsenic	6010B	7	U	277	263	105%	
Cadmium	6010B	0.4		66.9	65.7	101%	
Chromium	6010B	15.7		83.1	65.7	103%	
Copper	6010B	8.0		73.2	65.7	99.2%	
Lead	6010B	3	U	258	263	98.1%	
Mercury	7471A	0.05	U	0.55	0.515	107%	
Silver	6010B	0.4	U	61.8	65.7	94.1%	
Zinc	6010B	25		95	65.7	107%	

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%

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: PGSS-15
SAMPLE

Lab Sample ID: OT70B
LIMS ID: 09-8205
Matrix: Sediment
Data Release Authorized:
Reported: 04/16/09

QC Report No: OT70-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/04/08
Date Received: 12/08/09

Percent Total Solids: 33.9%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	04/07/09	6010B	04/15/09	7440-38-2	Arsenic	10	10	U
3050B	04/07/09	6010B	04/15/09	**7440-43-9**	**Cadmium**	0.5	**2.1**	
3050B	04/07/09	6010B	04/15/09	**7440-47-3**	**Chromium**	1	**48**	
3050B	04/07/09	6010B	04/15/09	**7440-50-8**	**Copper**	0.5	**38.5**	
3050B	04/07/09	6010B	04/15/09	**7439-92-1**	**Lead**	5	**15**	
CLP	04/07/09	7471A	04/10/09	**7439-97-6**	**Mercury**	0.1	**0.1**	
3050B	04/07/09	6010B	04/15/09	7440-22-4	Silver	0.8	0.8	U
3050B	04/07/09	6010B	04/15/09	**7440-66-6**	**Zinc**	3	**89**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: PGSS-16
SAMPLE

Lab Sample ID: OT70C
LIMS ID: 09-8206
Matrix: Sediment
Data Release Authorized:
Reported: 04/16/09

QC Report No: OT70-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/04/08
Date Received: 12/08/09

Percent Total Solids: 28.6%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	04/07/09	6010B	04/15/09	7440-38-2	Arsenic	20	20	U
3050B	04/07/09	6010B	04/15/09	**7440-43-9**	**Cadmium**	0.6	**2.1**	
3050B	04/07/09	6010B	04/15/09	**7440-47-3**	**Chromium**	2	**52**	
3050B	04/07/09	6010B	04/15/09	**7440-50-8**	**Copper**	0.6	**40.2**	
3050B	04/07/09	6010B	04/15/09	**7439-92-1**	**Lead**	6	**15**	
CLP	04/07/09	7471A	04/10/09	**7439-97-6**	**Mercury**	0.1	**0.1**	
3050B	04/07/09	6010B	04/15/09	7440-22-4	Silver	1	1	U
3050B	04/07/09	6010B	04/15/09	**7440-66-6**	**Zinc**	3	**90**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: PGSS-18
SAMPLE

Lab Sample ID: OT70D
LIMS ID: 09-8207
Matrix: Sediment
Data Release Authorized:
Reported: 04/16/09

QC Report No: OT70-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/04/08
Date Received: 12/08/09

Percent Total Solids: 37.2%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	04/07/09	6010B	04/15/09	7440-38-2	Arsenic	10	10	U
3050B	04/07/09	6010B	04/15/09	**7440-43-9**	**Cadmium**	0.5	**2.3**	
3050B	04/07/09	6010B	04/15/09	**7440-47-3**	**Chromium**	1	**49**	
3050B	04/07/09	6010B	04/15/09	**7440-50-8**	**Copper**	0.5	**37.8**	
3050B	04/07/09	6010B	04/15/09	**7439-92-1**	**Lead**	5	**14**	
CLP	04/07/09	7471A	04/10/09	**7439-97-6**	**Mercury**	0.09	**0.13**	
3050B	04/07/09	6010B	04/15/09	7440-22-4	Silver	0.8	0.8	U
3050B	04/07/09	6010B	04/15/09	**7440-66-6**	**Zinc**	3	**83**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: PGSS-21B
SAMPLE

Lab Sample ID: OT70E
LIMS ID: 09-8208
Matrix: Sediment
Data Release Authorized:
Reported: 04/16/09

QC Report No: OT70-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/04/08
Date Received: 12/08/09

Percent Total Solids: 47.6%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	04/07/09	6010B	04/15/09	7440-38-2	Arsenic	10	10	U
3050B	04/07/09	6010B	04/15/09	**7440-43-9**	**Cadmium**	0.4	**1.3**	
3050B	04/07/09	6010B	04/15/09	**7440-47-3**	**Chromium**	1	**25**	
3050B	04/07/09	6010B	04/15/09	**7440-50-8**	**Copper**	0.4	**18.9**	
3050B	04/07/09	6010B	04/15/09	**7439-92-1**	**Lead**	4	**8**	
CLP	04/07/09	7471A	04/10/09	**7439-97-6**	**Mercury**	0.08	**0.09**	
3050B	04/07/09	6010B	04/15/09	7440-22-4	Silver	0.6	0.6	U
3050B	04/07/09	6010B	04/15/09	**7440-66-6**	**Zinc**	2	**59**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: PGSS-21A
SAMPLE

Lab Sample ID: OT70F
LIMS ID: 09-8209
Matrix: Sediment
Data Release Authorized:
Reported: 04/16/09

QC Report No: OT70-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/04/08
Date Received: 12/08/09

Percent Total Solids: 81.8%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	04/07/09	6010B	04/15/09	7440-38-2	Arsenic	6	6	U
3050B	04/07/09	6010B	04/15/09	**7440-43-9**	**Cadmium**	0.2	**0.4**	
3050B	04/07/09	6010B	04/15/09	**7440-47-3**	**Chromium**	0.6	**15.1**	
3050B	04/07/09	6010B	04/15/09	**7440-50-8**	**Copper**	0.2	**7.9**	
3050B	04/07/09	6010B	04/15/09	7439-92-1	Lead	2	2	U
CLP	04/07/09	7471A	04/10/09	7439-97-6	Mercury	0.05	0.05	U
3050B	04/07/09	6010B	04/15/09	7440-22-4	Silver	0.4	0.4	U
3050B	04/07/09	6010B	04/15/09	**7440-66-6**	**Zinc**	1	**33**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: PGSS-29
SAMPLE

Lab Sample ID: OT70G
LIMS ID: 09-8210
Matrix: Sediment
Data Release Authorized:
Reported: 04/16/09

QC Report No: OT70-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/04/08
Date Received: 12/08/09

Percent Total Solids: 71.0%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	04/07/09	6010B	04/15/09	7440-38-2	Arsenic	7	7	U
3050B	04/07/09	6010B	04/15/09	**7440-43-9**	**Cadmium**	0.3	**0.6**	
3050B	04/07/09	6010B	04/15/09	**7440-47-3**	**Chromium**	0.7	**17.5**	
3050B	04/07/09	6010B	04/15/09	**7440-50-8**	**Copper**	0.3	**9.2**	
3050B	04/07/09	6010B	04/15/09	**7439-92-1**	**Lead**	3	**3**	
CLP	04/07/09	7471A	04/10/09	7439-97-6	Mercury	0.06	0.06	U
3050B	04/07/09	6010B	04/15/09	7440-22-4	Silver	0.4	0.4	U
3050B	04/07/09	6010B	04/15/09	**7440-66-6**	**Zinc**	1	**39**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: PGSS-29A
SAMPLE

Lab Sample ID: OT70H
LIMS ID: 09-8211
Matrix: Sediment
Data Release Authorized:
Reported: 04/16/09

QC Report No: OT70-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/04/08
Date Received: 12/08/09

Percent Total Solids: 38.3%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	04/07/09	6010B	04/15/09	7440-38-2	Arsenic	10	10	U
3050B	04/07/09	6010B	04/15/09	**7440-43-9**	**Cadmium**	0.5	**1.8**	
3050B	04/07/09	6010B	04/15/09	**7440-47-3**	**Chromium**	1	**41**	
3050B	04/07/09	6010B	04/15/09	**7440-50-8**	**Copper**	0.5	**32.0**	
3050B	04/07/09	6010B	04/15/09	**7439-92-1**	**Lead**	5	**13**	
CLP	04/07/09	7471A	04/10/09	**7439-97-6**	**Mercury**	0.1	**0.1**	
3050B	04/07/09	6010B	04/15/09	7440-22-4	Silver	0.8	0.8	U
3050B	04/07/09	6010B	04/15/09	**7440-66-6**	**Zinc**	3	**94**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: PGSS-30
SAMPLE

Lab Sample ID: OT70I
LIMS ID: 09-8212
Matrix: Sediment
Data Release Authorized:
Reported: 04/16/09

QC Report No: OT70-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/05/08
Date Received: 12/08/09

Percent Total Solids: 36.4%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	04/07/09	6010B	04/15/09	7440-38-2	Arsenic	10	10	U
3050B	04/07/09	6010B	04/15/09	**7440-43-9**	**Cadmium**	0.5	**1.7**	
3050B	04/07/09	6010B	04/15/09	**7440-47-3**	**Chromium**	1	**48**	
3050B	04/07/09	6010B	04/15/09	**7440-50-8**	**Copper**	0.5	**36.9**	
3050B	04/07/09	6010B	04/15/09	**7439-92-1**	**Lead**	5	**13**	
CLP	04/07/09	7471A	04/10/09	**7439-97-6**	**Mercury**	0.09	**0.10**	
3050B	04/07/09	6010B	04/15/09	7440-22-4	Silver	0.8	0.8	U
3050B	04/07/09	6010B	04/15/09	**7440-66-6**	**Zinc**	3	**93**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: PGSS-31
SAMPLE

Lab Sample ID: OT70J
LIMS ID: 09-8213
Matrix: Sediment
Data Release Authorized:
Reported: 04/16/09

QC Report No: OT70-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/05/08
Date Received: 12/08/09

Percent Total Solids: 39.6%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	04/07/09	6010B	04/15/09	7440-38-2	Arsenic	10	10	U
3050B	04/07/09	6010B	04/15/09	**7440-43-9**	**Cadmium**	0.5	**1.5**	
3050B	04/07/09	6010B	04/15/09	**7440-47-3**	**Chromium**	1	**49**	
3050B	04/07/09	6010B	04/15/09	**7440-50-8**	**Copper**	0.5	**37.3**	
3050B	04/07/09	6010B	04/15/09	**7439-92-1**	**Lead**	5	**14**	
CLP	04/07/09	7471A	04/10/09	**7439-97-6**	**Mercury**	0.09	**0.12**	
3050B	04/07/09	6010B	04/15/09	7440-22-4	Silver	0.7	0.7	U
3050B	04/07/09	6010B	04/15/09	**7440-66-6**	**Zinc**	2	**91**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: PGSS-38
SAMPLE

Lab Sample ID: OT70K
LIMS ID: 09-8214
Matrix: Sediment
Data Release Authorized:
Reported: 04/16/09

QC Report No: OT70-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/05/08
Date Received: 12/08/09

Percent Total Solids: 75.3%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	04/07/09	6010B	04/15/09	7440-38-2	Arsenic	6	6	U
3050B	04/07/09	6010B	04/15/09	**7440-43-9**	**Cadmium**	0.3	**0.5**	
3050B	04/07/09	6010B	04/15/09	**7440-47-3**	**Chromium**	0.6	**16.5**	
3050B	04/07/09	6010B	04/15/09	**7440-50-8**	**Copper**	0.3	**8.8**	
3050B	04/07/09	6010B	04/15/09	**7439-92-1**	**Lead**	3	**3**	
CLP	04/07/09	7471A	04/10/09	7439-97-6	Mercury	0.05	0.05	U
3050B	04/07/09	6010B	04/15/09	7440-22-4	Silver	0.4	0.4	U
3050B	04/07/09	6010B	04/15/09	**7440-66-6**	**Zinc**	1	**35**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: PGSS-38A
SAMPLE

Lab Sample ID: OT70L
LIMS ID: 09-8215
Matrix: Sediment
Data Release Authorized:
Reported: 04/16/09

QC Report No: OT70-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/05/08
Date Received: 12/08/09

Percent Total Solids: 52.4%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	04/07/09	6010B	04/15/09	7440-38-2	Arsenic	9	9	U
3050B	04/07/09	6010B	04/15/09	**7440-43-9**	**Cadmium**	0.4	**1.0**	
3050B	04/07/09	6010B	04/15/09	**7440-47-3**	**Chromium**	0.9	**32.7**	
3050B	04/07/09	6010B	04/15/09	**7440-50-8**	**Copper**	0.4	**21.7**	
3050B	04/07/09	6010B	04/15/09	**7439-92-1**	**Lead**	4	**8**	
CLP	04/07/09	7471A	04/10/09	**7439-97-6**	**Mercury**	0.07	**0.08**	
3050B	04/07/09	6010B	04/15/09	7440-22-4	Silver	0.5	0.5	U
3050B	04/07/09	6010B	04/15/09	**7440-66-6**	**Zinc**	2	**56**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: PGSS-39
SAMPLE

Lab Sample ID: OT70M
LIMS ID: 09-8216
Matrix: Sediment
Data Release Authorized:
Reported: 04/16/09

QC Report No: OT70-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/05/08
Date Received: 12/08/09

Percent Total Solids: 36.8%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	04/07/09	6010B	04/15/09	7440-38-2	Arsenic	10	10	U
3050B	04/07/09	6010B	04/15/09	**7440-43-9**	**Cadmium**	0.5	**1.5**	
3050B	04/07/09	6010B	04/15/09	**7440-47-3**	**Chromium**	1	**46**	
3050B	04/07/09	6010B	04/15/09	**7440-50-8**	**Copper**	0.5	**35.4**	
3050B	04/07/09	6010B	04/15/09	**7439-92-1**	**Lead**	5	**13**	
CLP	04/07/09	7471A	04/10/09	**7439-97-6**	**Mercury**	0.1	**0.1**	
3050B	04/07/09	6010B	04/15/09	7440-22-4	Silver	0.8	0.8	U
3050B	04/07/09	6010B	04/15/09	**7440-66-6**	**Zinc**	3	**90**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: PGSS-40
SAMPLE

Lab Sample ID: OT70N
LIMS ID: 09-8217
Matrix: Sediment
Data Release Authorized:
Reported: 04/16/09

QC Report No: OT70-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/05/08
Date Received: 12/08/09

Percent Total Solids: 38.8%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	04/07/09	6010B	04/15/09	7440-38-2	Arsenic	10	10	U
3050B	04/07/09	6010B	04/15/09	**7440-43-9**	**Cadmium**	0.5	**1.4**	
3050B	04/07/09	6010B	04/15/09	**7440-47-3**	**Chromium**	1	**45**	
3050B	04/07/09	6010B	04/15/09	**7440-50-8**	**Copper**	0.5	**34.4**	
3050B	04/07/09	6010B	04/15/09	**7439-92-1**	**Lead**	5	**13**	
CLP	04/07/09	7471A	04/10/09	**7439-97-6**	**Mercury**	0.09	**0.11**	
3050B	04/07/09	6010B	04/15/09	7440-22-4	Silver	0.7	0.7	U
3050B	04/07/09	6010B	04/15/09	**7440-66-6**	**Zinc**	2	**84**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: PGSS-42
SAMPLE

Lab Sample ID: OT70O
LIMS ID: 09-8218
Matrix: Sediment
Data Release Authorized:
Reported: 04/16/09

QC Report No: OT70-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/05/08
Date Received: 12/08/09

Percent Total Solids: 40.4%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	04/07/09	6010B	04/15/09	7440-38-2	Arsenic	10	10	U
3050B	04/07/09	6010B	04/15/09	**7440-43-9**	**Cadmium**	0.5	**1.4**	
3050B	04/07/09	6010B	04/15/09	**7440-47-3**	**Chromium**	1	**46**	
3050B	04/07/09	6010B	04/15/09	**7440-50-8**	**Copper**	0.5	**34.6**	
3050B	04/07/09	6010B	04/15/09	**7439-92-1**	**Lead**	5	**13**	
CLP	04/07/09	7471A	04/10/09	**7439-97-6**	**Mercury**	0.09	**0.11**	
3050B	04/07/09	6010B	04/15/09	7440-22-4	Silver	0.7	0.7	U
3050B	04/07/09	6010B	04/15/09	**7440-66-6**	**Zinc**	2	**83**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: PGSS-44
SAMPLE

Lab Sample ID: OT70P
LIMS ID: 09-8219
Matrix: Sediment
Data Release Authorized:
Reported: 04/16/09

QC Report No: OT70-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/05/08
Date Received: 12/08/09

Percent Total Solids: 38.0%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	04/07/09	6010B	04/15/09	7440-38-2	Arsenic	10	10	U
3050B	04/07/09	6010B	04/15/09	**7440-43-9**	**Cadmium**	0.5	**2.0**	
3050B	04/07/09	6010B	04/15/09	**7440-47-3**	**Chromium**	1	**46**	
3050B	04/07/09	6010B	04/15/09	**7440-50-8**	**Copper**	0.5	**34.8**	
3050B	04/07/09	6010B	04/15/09	**7439-92-1**	**Lead**	5	**13**	
CLP	04/07/09	7471A	04/10/09	**7439-97-6**	**Mercury**	0.09	**0.11**	
3050B	04/07/09	6010B	04/15/09	7440-22-4	Silver	0.7	0.7	U
3050B	04/07/09	6010B	04/15/09	**7440-66-6**	**Zinc**	2	**94**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: PGSS-47
SAMPLE

Lab Sample ID: OT70Q
LIMS ID: 09-8220
Matrix: Sediment
Data Release Authorized:
Reported: 04/16/09

QC Report No: OT70-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/08/08
Date Received: 12/11/08

Percent Total Solids: 65.2%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	04/07/09	6010B	04/15/09	7440-38-2	Arsenic	7	7	U
3050B	04/07/09	6010B	04/15/09	**7440-43-9**	**Cadmium**	0.3	**0.8**	
3050B	04/07/09	6010B	04/15/09	**7440-47-3**	**Chromium**	0.7	**19.6**	
3050B	04/07/09	6010B	04/15/09	**7440-50-8**	**Copper**	0.3	**11.5**	
3050B	04/07/09	6010B	04/15/09	**7439-92-1**	**Lead**	3	**5**	
CLP	04/07/09	7471A	04/10/09	7439-97-6	Mercury	0.06	0.06	U
3050B	04/07/09	6010B	04/15/09	7440-22-4	Silver	0.4	0.4	U
3050B	04/07/09	6010B	04/15/09	**7440-66-6**	**Zinc**	1	**39**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: PGSS-47A
SAMPLE

Lab Sample ID: OT70R
LIMS ID: 09-8221
Matrix: Sediment
Data Release Authorized:
Reported: 04/16/09

QC Report No: OT70-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/08/08
Date Received: 12/11/08

Percent Total Solids: 60.1%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	04/07/09	6010B	04/15/09	7440-38-2	Arsenic	8	8	U
3050B	04/07/09	6010B	04/15/09	7440-43-9	Cadmium	0.3	0.3	U
3050B	04/07/09	6010B	04/15/09	**7440-47-3**	**Chromium**	0.8	**7.3**	
3050B	04/07/09	6010B	04/15/09	**7440-50-8**	**Copper**	0.3	**5.0**	
3050B	04/07/09	6010B	04/15/09	7439-92-1	Lead	3	3	U
CLP	04/07/09	7471A	04/10/09	**7439-97-6**	**Mercury**	0.06	**0.06**	
3050B	04/07/09	6010B	04/15/09	7440-22-4	Silver	0.5	0.5	U
3050B	04/07/09	6010B	04/15/09	**7440-66-6**	**Zinc**	2	**16**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: PGSS-53
SAMPLE

Lab Sample ID: OT70S
LIMS ID: 09-8222
Matrix: Sediment
Data Release Authorized:
Reported: 04/16/09

QC Report No: OT70-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/08/08
Date Received: 12/11/08

Percent Total Solids: 46.1%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	04/07/09	6010B	04/15/09	7440-38-2	Arsenic	10	10	U
3050B	04/07/09	6010B	04/15/09	**7440-43-9**	**Cadmium**	0.4	**1.5**	
3050B	04/07/09	6010B	04/15/09	**7440-47-3**	**Chromium**	1	**40**	
3050B	04/07/09	6010B	04/15/09	**7440-50-8**	**Copper**	0.4	**29.1**	
3050B	04/07/09	6010B	04/15/09	**7439-92-1**	**Lead**	4	**10**	
CLP	04/07/09	7471A	04/10/09	**7439-97-6**	**Mercury**	0.08	**0.09**	
3050B	04/07/09	6010B	04/15/09	7440-22-4	Silver	0.6	0.6	U
3050B	04/07/09	6010B	04/15/09	**7440-66-6**	**Zinc**	2	**79**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: PGSS-54
SAMPLE

Lab Sample ID: OT70T
LIMS ID: 09-8223
Matrix: Sediment
Data Release Authorized:
Reported: 04/16/09

QC Report No: OT70-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/08/08
Date Received: 12/11/08

Percent Total Solids: 49.6%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	04/07/09	6010B	04/15/09	7440-38-2	Arsenic	9	9	U
3050B	04/07/09	6010B	04/15/09	**7440-43-9**	**Cadmium**	0.4	**1.3**	
3050B	04/07/09	6010B	04/15/09	**7440-47-3**	**Chromium**	0.9	**34.7**	
3050B	04/07/09	6010B	04/15/09	**7440-50-8**	**Copper**	0.4	**25.6**	
3050B	04/07/09	6010B	04/15/09	**7439-92-1**	**Lead**	4	**9**	
CLP	04/07/09	7471A	04/10/09	**7439-97-6**	**Mercury**	0.08	**0.09**	
3050B	04/07/09	6010B	04/15/09	7440-22-4	Silver	0.6	0.6	U
3050B	04/07/09	6010B	04/15/09	**7440-66-6**	**Zinc**	2	**68**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: METHOD BLANK

Lab Sample ID: OT70MB
LIMS ID: 09-8205
Matrix: Sediment
Data Release Authorized:
Reported: 04/16/09

QC Report No: OT70-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: NA
Date Received: NA

Percent Total Solids: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	04/07/09	6010B	04/15/09	7440-38-2	Arsenic	5	5	U
3050B	04/07/09	6010B	04/15/09	7440-43-9	Cadmium	0.2	0.2	U
3050B	04/07/09	6010B	04/15/09	7440-47-3	Chromium	0.5	0.5	U
3050B	04/07/09	6010B	04/15/09	7440-50-8	Copper	0.2	0.2	U
3050B	04/07/09	6010B	04/15/09	7439-92-1	Lead	2	2	U
CLP	04/07/09	7471A	04/10/09	7439-97-6	Mercury	0.05	0.05	U
3050B	04/07/09	6010B	04/15/09	7440-22-4	Silver	0.3	0.3	U
3050B	04/07/09	6010B	04/15/09	7440-66-6	Zinc	1	1	U

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS **Sample ID: LAB CONTROL**

Lab Sample ID: OT70LCS
LIMS ID: 09-8205
Matrix: Sediment
Data Release Authorized:
Reported: 04/16/09

QC Report No: OT70-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: NA
Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike Found	Spike Added	% Recovery	Q
Arsenic	6010B	198	200	99.0%	
Cadmium	6010B	50.1	50.0	100%	
Chromium	6010B	48.7	50.0	97.4%	
Copper	6010B	50.0	50.0	100%	
Lead	6010B	195	200	97.5%	
Mercury	7471A	1.00	1.00	100%	
Silver	6010B	45.7	50.0	91.4%	
Zinc	6010B	54	50	108%	

Reported in mg/kg-dry

N-Control limit not met
NA-Not Applicable, Analyte Not Spiked
Control Limits: 80-120%

TOTAL SOLIDS

Extractions Total Solids-extts
Data By: Tae K. You
Created: 4/ 3/09

Worklist: 347
Analyst: RVR
Comments:

	ARI ID CLIENT ID	Tare Wt (g)	Wet Wt (g)	Dry Wt (g)	% Solids	pH
1.	OT70A 09-8204 PGSS-14A	1.16	12.14	8.94	70.9	NR
2.	OT70B 09-8205 PGSS-15	1.16	11.00	4.47	33.6	NR
3.	OT70C 09-8206 PGSS-16	1.16	11.91	4.37	29.9	NR
4.	OT70D 09-8207 PGSS-18	1.18	11.86	5.23	37.9	NR
5.	OT70E 09-8208 PGSS-21B	1.16	11.57	6.01	46.6	NR
6.	OT70F 09-8209 PGSS-21A	1.18	11.06	9.29	82.1	NR
7.	OT70G 09-8210 PGSS-29	1.16	11.61	8.21	67.5	NR
8.	OT70H 09-8211 PGSS-29A	1.18	11.71	5.30	39.1	NR
9.	OT70I 09-8212 PGSS-30	1.18	11.20	4.85	36.6	NR
10.	OT70J 09-8213 PGSS-31	1.18	12.33	5.60	39.6	NR
11.	OT70K 09-8214 PGSS-38	1.16	12.02	9.49	76.7	NR
12.	OT70L 09-8215 PGSS-38A	1.16	12.06	6.72	51.0	NR
13.	OT70M 09-8216 PGSS-39	1.16	11.21	5.00	38.2	NR
14.	OT70N 09-8217 PGSS-40	1.16	12.37	5.73	40.8	NR
15.	OT70O 09-8218 PGSS-42	1.16	12.19	5.74	41.5	NR

Extractions Total Solids-extts
Data By: Tae K. You
Created: 4/ 3/09

Worklist: 347
Analyst: RVR
Comments:

	ARI ID CLIENT ID	Tare Wt (g)	Wet Wt (g)	Dry Wt (g)	% Solids	pH
16.	OT70P 09-8219 PGSS-44	1.16	11.28	5.15	39.4	NR
17.	OT70Q 09-8220 PGSS-47	1.16	12.25	8.10	62.6	NR
18.	OT70R 09-8221 PGSS-47A	1.16	11.80	7.10	55.8	NR
19.	OT70S 09-8222 PGSS-53	1.18	12.70	6.32	44.6	NR
20.	OT70T 09-8223 PGSS-54	1.16	11.82	6.18	47.1	NR

Extractions Total Solids-extts
Data By: Tae K. You
Created: 4/ 3/09

Worklist: 347
Analyst: TKY
Comments:

	ARI ID / CLIENT ID	Tare Wt (g)	Wet Wt (g)	Dry Wt (g)	% Solids	pH
1.	OT70A 09-8204 PGSS-14A	1.16	12.14		8.94	NR
2.	OT70B 09-8205 PGSS-15	1.16	11.00		4.47	NR
3.	OT70C 09-8206 PGSS-16	1.16	11.91		4.37	NR
4.	OT70D 09-8207 PGSS-18	1.18	11.86		5.23	NR
5.	OT70E 09-8208 PGSS-21B	1.16	11.57		6.01	NR
6.	OT70F 09-8209 PGSS-21A	1.18	11.06		9.29	NR
7.	OT70G 09-8210 PGSS-29	1.16	11.61		8.21	NR
8.	OT70H 09-8211 PGSS-29A	1.18	11.71		5.30	NR
9.	OT70I 09-8212 PGSS-30	1.18	11.20		4.85	NR
10.	OT70J 09-8213 PGSS-31	1.18	12.33		5.60	NR
11.	OT70K 09-8214 PGSS-38	1.16	12.02		9.49	NR
12.	OT70L 09-8215 PGSS-38A	1.16	12.06		6.72	NR
13.	OT70M 09-8216 PGSS-39	1.16	11.21		5.00	NR
14.	OT70N 09-8217 PGSS-40	1.16	12.37		5.73	NR
15.	OT70O 09-8218 PGSS-42	1.16	12.19		5.74	NR

Extractions Total Solids-extts
Data By: Tae K. You
Created: 4/ 3/09

Worklist: 347
Analyst: TKY
Comments:

	ARI ID / CLIENT ID	Tare Wt (g)	Wet Wt (g)	Dry Wt (g)	% Solids	pH
16.	OT70P 09-8219 PGSS-44	1.16	11.28		5.15	NR
17.	OT70Q 09-8220 PGSS-47	1.16	12.25		8.10	NR
18.	OT70R 09-8221 PGSS-47A	1.16	11.84		7.10	NR
19.	OT70S 09-8222 PGSS-53	1.18	12.70		6.32	NR
20.	OT70T 09-8223 PGSS-54	1.16	11.82		6.18	NR

Solids Data Entry Report Checked by: DM Date: 4/8/09
Date: 04/08/09 Data Analyst: MH

Solids Determination performed on 04/07/09 by MH

JOB	SAMPLE	CLIENTID	TAREWEIGHT	SAMPDISH	DRYWEIGHT	SOLIDS
OT70	A	PGSS-14A	0.986	10.460	8.059	74.66
OT70	B	PGSS-15	0.972	5.202	2.406	33.90
OT70	C	PGSS-16	0.975	5.024	2.134	28.62
OT70	D	PGSS-18	0.991	10.180	4.406	37.16
OT70	E	PGSS-21B	0.982	10.155	5.350	47.62
OT70	F	PGSS-21A	0.983	10.324	8.627	81.83
OT70	G	PGSS-29	0.971	10.698	7.880	71.03
OT70	H	PGSS-29A	0.976	5.710	2.789	38.30
OT70	I	PGSS-30	0.981	5.325	2.561	36.37
OT70	J	PGSS-31	0.976	10.236	4.644	39.61
OT70	K	PGSS-38	0.992	10.667	8.275	75.28
OT70	L	PGSS-38A	1.003	10.170	5.802	52.35
OT70	M	PGSS-39	0.985	10.168	4.368	36.84
OT70	N	PGSS-40	0.969	10.208	4.550	38.76
OT70	O	PGSS-42	0.983	10.119	4.670	40.36
OT70	P	PGSS-44	0.967	5.266	2.599	37.96
OT70	Q	PGSS-47	0.981	10.249	7.021	65.17
OT70	R	PGSS-47A	0.984	10.304	6.588	60.13
OT70	S	PGSS-53	0.986	10.343	5.303	46.14
OT70	T	PGSS-54	0.990	10.559	5.735	49.59

Metals Total Solids

Oven in:
Analyst: MH Date: 4-07-09 Time: 1240 Temp: 101°C

Oven out:
Analyst: MH Date: 4-08-09 Time: 0900 Temp: 100°C

ARI Sample ID		Tare Weight (g)	Tare + Sample Wet (g)	Tare + Sample Dry (g)	Comments
OT70	A	0.986	10.460	8.059	
"	B	0.972	5.202	2.406	
"	C	0.975	5.024	2.134	
"	D	0.991	10.180	4.406	
"	E	0.982	10.155	5.350	
"	F	0.983	10.324	8.627	
"	G	0.971	10.698	7.880	
"	H	0.976	5.710	2.789	
"	I	0.981	5.325	2.561	
"	J	0.976	10.236	4.644	
"	K	0.992	10.667	8.275	
"	L	1.003	10.170	5.802	
"	M	0.985	10.168	4.368	
"	N	0.969	10.208	4.550	
"	~~O~~	0.983	10.119	4.670	
"	P	0.967	5.266	2.599	
"	Q	0.981	10.249	7.021	
"	R	0.984	10.304	6.588	
"	S	0.986	10.343	5.303	
"	T	0.990	10.559	5.735	

MH 4/07/09

Analytical Resources, Incorporated
Analytical Chemists and Consultants

April 28, 2009

Mr. Roger McGinnis
Hart Crowser, Inc.
1700 Westlake Avenue North Suite 200
Seattle, WA 98109-3056

RE: Project: Port Gamble, 17330-14
ARI Job No.: OT71

Dear Mr. McGinnis:

Please find enclosed the original Chain-of-Custody (COC) records, sample receipt documentation, and the final data package for the samples from the project referenced above.

The samples were analyzed for PCBs, SVOCs and Total Metals, as requested.

Sample receipt and details of these analyses are discussed in the Case Narrative.

An electronic copy of this data package and the supporting data 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.

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

Enclosures

cc: files OT71

KB/kb

Chain of Custody
Documentation

prepared
for

Hart Crowser, Inc.

Project: PORT GAMBLE, 1733014

ARI JOB NO: OT71

prepared
by

Analytical Resources, Inc.

Sample Custody Record

0897

Samples Shipped to: ARI

1 OF 2

HARTCROWSER

Hart Crowser, Inc.
1910 Fairview Avenue East
Seattle, Washington 98102-3699
Phone: 206-324-9530 FAX: 206-328-5581

JOB 17330.14 LAB NUMBER

PROJECT NAME PORT GAMBLE

HART CROWSER CONTACT ROGER MC GINNIS

ANNE CONRAD

SAMPLED BY: VP, CU

LAB NO.	SAMPLE ID	DESCRIPTION	DATE	TIME	MATRIX	TOTAL SULFIDES	TOC	TVS	AMMONIA	GRAIN SIZE	SMS SVOC	SMS METALS	PCBs	MICROTOX	DIOXIN	BENZ ACIDS	GUAIACOL	RETENE	NO. OF CONTAINERS	OBSERVATIONS/COMMENTS/ COMPOSITING INSTRUCTIONS
	PGSS-45		12/8/08	1145	SED	X	X	X	X						X				6	*SMS METALS – As, Cd, Cr, Cu, Pb, Ag, Zn, Hg
	PGSS-46			1215	X														6	
	PGSS-47			1325	X														6	
	PGSS-47A			1400	X														6	HOLD
	PGSS-51			1425	X	X	X	X	X						X				6	
	PGSS-53			1508	X														6	
	PGSS-54			1534	X														6	
	PGSS-55			1600	X														6	
	PGSS-56			1626	X														6	
	PGSS-58		12/9/08	0727	X														6	
	PGSS-61			0757	X														6	
	PGSS-62			0821															6	

RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE	12/11/08	SIGNATURE	12/11/08
PRINT NAME Carl Ulberg	TIME	PRINT NAME Jami Hayes	TIME
COMPANY HC	1210	COMPANY ARI	1210

RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE		SIGNATURE	
PRINT NAME	TIME	PRINT NAME	TIME
COMPANY		COMPANY	

SPECIAL SHIPMENT HANDLING OR STORAGE REQUIREMENTS:

FREEZE EXTRA SAMPLE VOLUME

FULL DATA PACKAGE

12 TOTAL NUMBER OF CONTAINERS

SAMPLE RECEIPT INFORMATION:
CUSTODY SEALS: ☐ YES ☐ NO ☐ N/A
GOOD CONDITION: ☐ YES ☐ NO
TEMPERATURE:
SHIPMENT METHOD: ☐ HAND ☐ COURIER ☐ OVERNIGHT

COOLER NO.: STORAGE LOCATION:

See Lab Work Order No. _____ for Other Contract Requirements

TURNAROUND TIME:

☐ 24 HOURS ☐ 1 WEEK
☐ 48 HOURS ☐ STANDARD
☐ 72 HOURS OTHER _____

White and Yellow Copies to Lab Pink to Project Manager Lab to Return White Copy to Hart Crowser Gold to Sample Custodian

Sample Custody Record

0097

Samples Shipped to: ARI

2 of 5

HARTCROWSER

Hart Crowser, Inc.
1910 Fairview Avenue East
Seattle, Washington 98102-3699
Phone: 206-324-9530 FAX: 206-328-5581

JOB 17330-14 LAB NUMBER

PROJECT NAME PORT GAMBLE

HART CROWSER CONTACT ROGER McGINNIS
ANNE CONRAD

SAMPLED BY: VP, CV

LAB NO.	SAMPLE ID	DESCRIPTION	DATE	TIME	MATRIX	TOTAL SULFIDE	TOC	TVS	AMMONIA	GRAIN SIZE	SMS SVOCs	SMS METALS	PCBs	MICROTOX	DIOXIN	RESIN ACIDS	GUAIACOL	RETENE	NO. OF CONTAINERS	OBSERVATIONS/COMMENTS/ COMPOSITING INSTRUCTIONS
	PGSS-62A		12/9/08	1009	SED	X	X	X	X							X			6	*SMS METALS - As, Cd,
	PGSS-62B			0846															6	Cr, Cu, Pb, Ag, Zn, Hg
	PGSS-63			0913															6	
	PGSS-64			1035															6	
	PGSS-67			1101															6	
	PGSS-68			1212															6	
	PGSS-69			1236															6	
	PGSS-70			1301															6	
	PGSS-71			1332															6	
	PGSS-73			1428															6	
	PGSS-75			1458															6	
	PGSS-77			1530															6	

RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE	12/11/08	SIGNATURE	12/11/08
PRINT NAME Carl Ulberg	TIME	PRINT NAME Jami Hayes	TIME
COMPANY HC	1210	COMPANY HCI	1210
RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE	TIME	SIGNATURE	TIME
PRINT NAME		PRINT NAME	
COMPANY		COMPANY	

SPECIAL SHIPMENT HANDLING OR STORAGE REQUIREMENTS:

FREEZE EXTRA SAMPLE VOLUME

FULL DATA PACKAGE

72 TOTAL NUMBER OF CONTAINERS

SAMPLE RECEIPT INFORMATION:
CUSTODY SEALS: ☐ YES ☐ NO ☐ N/A
GOOD CONDITION: ☐ YES ☐ NO
TEMPERATURE:
SHIPMENT METHOD: ☐ HAND ☐ COURIER ☐ OVERNIGHT

COOLER NO.: STORAGE LOCATION:

See Lab Work Order No. _____
for Other Contract Requirements

TURNAROUND TIME:
☐ 24 HOURS ☐ 1 WEEK
☐ 48 HOURS ☐ STANDARD
☐ 72 HOURS OTHER _____

White and Yellow Copies to Lab Pink to Project Manager Lab to Return White Copy to Hart Crowser Gold to Sample Custodian

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Hart Crowser Project Name: _____

COC No: _____ Delivered by: Hand

Assigned ARI Job No: OD92 Tracking No: _____

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

Record cooler temperature (recommended 2.0-6.0 °C for chemistry) 0.8, -2.0, 1.2, 1.2, 0.6, 1.6, 1.2 °C, 2.0, 1.2

Cooler Accepted by: JH Date: 12/11/08 Time: 1225

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?		Ice	
Was sufficient ice used (if appropriate)?		(YES)	NO
Were all bottles sealed in individual plastic bags?		(YES)	NO
Did all bottle arrive in good condition (unbroken)?		(YES)	NO
Were all bottle labels complete and legible?		(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 checklist)		YES	(NO)
Were all VOC vials free of air bubbles?	(NA)	YES	NO
Was sufficient amount of sample sent in each bottle?		(YES)	NO

Samples Logged by: JH Date: 12/12/08 Time: 14:17

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

Explain discrepancies or negative responses:

By: Date:

Sample Custody Record

Samples Shipped to: ARI

0093

3 OF 5

HARTCROWSER

Hart Crowser, Inc.
1910 Fairview Avenue East
Seattle, Washington 98102-3699
Phone: 206-324-9530 FAX: 206-328-5581

JOB 17330-14 LAB NUMBER

PROJECT NAME PORT GAMBLE

HART CROWSER CONTACT ROGER McGINNIS
ANNE CONRAD

SAMPLED BY: VP/CV

LAB NO.	SAMPLE ID	DESCRIPTION	DATE	TIME	MATRIX	REQUESTED ANALYSIS: TOTAL SULFIDE	TOC	TVS	AMMONIA	GRAIN SIZE	SMS SVOC*	SMS METALS*	PCBs	MICROTOX	DIOXIN	RESIN ACIDS	GUAIACOL	RETENE	NO. OF CONTAINERS	OBSERVATIONS/COMMENTS/ COMPOSITING INSTRUCTIONS
	PGSS-77A		12/9/08	1603	SED	X	X	X	X							✓			6	*SMS METALS - As, Cd,
	PGSS-78		12/10/08	0754															6	Cr, Cu, Pb, Ag, Zn, Hg
	PGSS-80			0817															6	
	PGSS-82			0851															6	
	PGSS-83			0917															6	
	PGSS-92			1103															6	
	PGSS-GEO-3			1035															6	HOLD

RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE	12/4/08	SIGNATURE	12/4/08
PRINT NAME Carl Ulberg	TIME	PRINT NAME Jami Heuga	TIME
COMPANY HC	1210	COMPANY ARI	1210
RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE	TIME	SIGNATURE	TIME
PRINT NAME		PRINT NAME	
COMPANY		COMPANY	

SPECIAL SHIPMENT HANDLING OR STORAGE REQUIREMENTS:
FREEZE EXTRA SAMPLE VOLUME
FULL DATA PACKAGE

42 TOTAL NUMBER OF CONTAINERS

SAMPLE RECEIPT INFORMATION
CUSTODY SEAL: ☐ YES ☐ NO ☐ N/A
GOOD CONDITION: ☐ YES ☐ NO
TEMPERATURE:
SHIPMENT METHOD: ☐ HAND ☐ COURIER ☐ OVERNIGHT

COOLER NO.: STORAGE LOCATION:

See Lab Work Order No. _____
for Other Contract Requirements

TURNAROUND TIME:
☐ 24 HOURS ☐ 1 WEEK
☐ 48 HOURS ☐ STANDARD
☐ 72 HOURS OTHER _____

White and Yellow Copies to Lab Pink to Project Manager Lab to Return White Copy to Hart Crowser Gold to Sample Custodian

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Hart Crowser Project Name: _____

COC No: _____ Delivered by: Hand

Assigned ARI Job No: _____ Tracking No: _____

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

Record cooler temperature (recommended 2.0-6.0 °C for chemistry) 0.8, -2.0, 1.2, 1.2, 0.6, 1.6, 1.2 °C, 2.0, 1.2

Cooler Accepted by: JH Date: 12/11/05 Time: 1225

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?	Wrap TC	
Was sufficient ice used (if appropriate)?	(YES)	NO
Were all bottles sealed in individual plastic bags?	(YES)	(NO)
Did all bottle arrive in good condition (unbroken)?	(YES)	NO
Were all bottle labels complete and legible?	(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 checklist)	YES	(NO)
Were all VOC vials free of air bubbles?	(NA)	YES NO
Was sufficient amount of sample sent in each bottle?	(YES)	NO

Samples Logged by: JH Date: 1/9/09 Time: 1100

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

Explain discrepancies or negative responses:

By: Date:

Case Narrative

prepared
for

Hart Crowser, Inc.

Project: PORT GAMBLE, 1733014

ARI JOB NO: OT71

prepared
by

Analytical Resources, Inc.

Case Narrative
Hart Crowser
Port Gamble, 17330-14
ARI Job: OT71
April 28, 2009

Sample Receipt

Analytical Resources Inc. (ARI) accepted several sediment samples in good condition on December 11, 2008 under the ARI job numbers OD15, OD92 and OD93. The cooler temperatures measured by IR thermometer following ARI SOP ranged between -2.0 and 2.0°C and the samples were well iced. Please note that several sample containers were archived up receipt as requested on the COCs. All samples were frozen to protect holding times. For further detail regarding sample receipt, please refer to the Cooer Receipt Form.

SVOCs by Method 8270D:

The samples were extracted on 4/8/09 and analyzed on 4/14/09 and 4/15/09 within the method recommended holding times for frozen samples.

Initial calibration(s): All compounds of interest were within method acceptance criteria.

Continuing calibration(s): The phenol's have a > 20% D value for the CCALs on 4/15/09.

Samples: There were no anomalies associated with these samples.

Surrogates: The surrogate TBP is out of control high for samples **PGSS-62, PGSS-77** and the LCSD. All other surrogates were in control and no further corrective action was taken.

LCS/LCSD(s): Are in control.

Method Blank: The method blanks were free of contamination.

PCBs by Method 8082:

The samples were extracted on 4/8/09 and analyzed on 4/15/09 and 4/16/09 within the method recommended holding times for frozen samples.

Initial calibration(s): All compounds of interest were within method acceptance criteria.

Continuing calibration(s): Are in control.

Samples: There were no anomalies associated with these samples.

Surrogates: Are in control.

LCS/LCSD(s): Are in control.

Case Narrative
Hart Crowser
Port Gamble, 17330-14
ARI Job: OT71
April 28, 2009

Method Blank: The method blanks were free of contamination.

Total Metals 6010 and 7000 Series:

The samples were digested between 4/6/09 and 4/22/09 and analyzed between 4/10/09 and 4/24/09 within the method recommended holding times for frozen samples with the exception of mercury.

Initial calibration(s): All compounds of interest were within method acceptance criteria.

Continuing calibration(s): Are in control.

Samples: There were no anomalies associated with these samples.

LCS: Is in control.

Method Blank: The 4/6/09 and 4/22/09 method blanks contained zinc. The sample zinc concentrations were greater then ten times the concentrations found in the samples, therefore no further corrective action was taken.

Data Reporting Qualifiers

Effective 12/28/04

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 ≥ 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

NR Spiked compound recovery is not reported due to chromatographic interference

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.

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

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.

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 ≥40% RPD with no obvious chromatographic interference

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

LCS SOLUTIONS

03/31/09

LABE	SOLN ID	TEST	CONC. UG/ML	SOLVENT	EXP.
1	1549-3	PCB	20	ACETONE	10/10/09
2#	1472-3	BCOC PEST	10	ACETONE	07/20/08
3	1579-3	PEST	02/04/20	ACETONE	09/23/09
4	1576-3	LOW PEST	0.2/0.4/2	ACETONE	07/31/09
5	1580-2	EPH	1500	MECL2	01/29/10
6	1559-2	PCP	12.5/125	ACETONE	11/05/09
7	1589-1	ABN	100	ACETONE	03/09/10
8	1566-1	TBT	2.5	MECL2	12/04/09
9	1567-3	PORE TBT	.125/.25	MECL2	12/04/09
10	1578-3	ABN ACID	100/200	MEOH	10/21/09
11	1591-1	TPHD	15000	ACETONE	03/26/10
12	1583-1	ABN BASE	200	ACETONE	02/05/10
13	1573-2	LOW PCB	2	ACETONE	10/10/09
14	1547-1	LOW ABN ACID	10/20	MEOH	04/10/09
15	1591-3	SIM PNA	15/75	MEOH	08/28/09
16*	1502-2	DIOXANE	100	MEOH	02/26/10
17	1516-2	1248 PCB	20	ACETONE	05/07/09
18	1591-4	LOW SIM PNA	1.5	ACETONE	08/28/09
19	1574-4	AK103	7500	MECL2	12/02/09
20	1572-2	PNA	100	ACETONE	12/26/09
21	1593-3	SKY/BHT	100	MEOH	03/31/10
22	1570-1	HERB	12.5/12500	MEOH	12/22/09
23	1505-1	LOW ABN BASE	20	MEOH	03/20/09
24	1573-4	LOW ABN	10	ACETONE	08/01/09
25#	1481-1	DIPHENYL	100	MEOH	07/20/08
26*	1545-2	OP-PEST	25	MEOH	02/16/10
27#	1495-1	STEROLS	200	MEOH	12/29/08
28#	1494-1	ADD. PEST	4	ACETONE	01/23/09
29#	1496-3	DECANES	100	MEOH	02/12/09
30#	1497-2	EDB/DBCP	2	ACETONE	02/12/09
31	1510-3	TERPINEOL	100	MEOH	03/21/09

LCS SOLUTIONS

03/31/09

32	1576-2	GUAIACOL	50-200	ACETONE	06/05/09
33	1522-1	RESIN ACID	250	ACETONE	06/11/09
34	1530-2	CONGENERS	1	ACETONE	07/23/09
50	1571-1	FULL RESIN	250	ACETONE	06/10/09
*=REVERIFIED SOLUTION					
#=PROJECT SPECIFIC					

SURR SOLUTIONS

03/31/09

LABEL	SOLN ID	TEST	CONC. UG/ML	SOLVENT	EXP.
A	1584-5	ABN	100/150	MEOH	02/18/10
B	1572-1	SIM PNA	15/75	MEOH	08/28/09
C	1559-1	SIM ABN	25/37.5	MEOH	03/13/09
D	1573-3	LOW PCB	0.2	ACETONE	07/31/09
E*	1478-1	HERB	62.5	MEOH	09/21/09
F	1574-3	PCP	12.5	ACETONE	01/06/10
G*	1534-1	1,4DIOXANE	100	MEOH	02/26/10
H*	1545-1	OP-PEST	25	MEOH	02/16/10
I	1559-4	LOW S. PNA	1.5	MEOH	08/28/09
J	1566-5	TBT-PORE	0.125	MECL2	12/04/09
K	1538-1	MED PCB	20	ACETONE	07/31/09
L	1584-4	TBT	2.5	MECL2	12/04/09
M	1578-1	EPH	1500	MECL2	12/09/09
N	1538-2	PCB	2	ACETONE	07/31/09
O	1567-4	TPH	450	MECL2	09/24/09
P	1560-3	HCID	2250	MECL2	09/24/09
Q	1497-3	EDB	2	ACETONE	02/12/09
R	1521-4	RESIN ACID	250	ACETONE	06/11/09
S	1568-5	PBDE	.25	MEOH	12/11/09
T	*reverified	solution			
U					
V					
W					
X					
Y					
Z					

Data Summary Package

prepared
for

Hart Crowser, Inc.

Project: PORT GAMBLE, 1733014

ARI JOB NO: OT71

prepared
by

Analytical Resources, Inc.

SEMIVOLATILE ANALYSIS

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: PGSS-55
SAMPLE

Lab Sample ID: OT71A
LIMS ID: 09-8227
Matrix: Sediment
Data Release Authorized: MW
Reported: 04/16/09

QC Report No: OT71-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/08/08
Date Received: 12/11/08

Date Extracted: 04/08/09
Date Analyzed: 04/14/09 21:15
Instrument/Analyst: NT4/LJR
GPC Cleanup: No

Sample Amount: 26.2 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 26.5%

CAS Number	Analyte	RL	Result
108-95-2	**Phenol**	**19**	**88 J**
541-73-1	1,3-Dichlorobenzene	19	< 19 U
106-46-7	1,4-Dichlorobenzene	19	< 19 U
100-51-6	Benzyl Alcohol	19	< 19 U
95-50-1	1,2-Dichlorobenzene	19	< 19 U
95-48-7	2-Methylphenol	19	< 19 U
106-44-5	4-Methylphenol	19	< 19 U
105-67-9	2,4-Dimethylphenol	19	< 19 U
65-85-0	Benzoic Acid	190	< 190 U
120-82-1	1,2,4-Trichlorobenzene	19	< 19 U
91-20-3	Naphthalene	19	< 19 U
87-68-3	Hexachlorobutadiene	19	< 19 U
91-57-6	2-Methylnaphthalene	19	< 19 U
131-11-3	Dimethylphthalate	19	< 19 U
208-96-8	Acenaphthylene	19	< 19 U
83-32-9	Acenaphthene	19	< 19 U
132-64-9	Dibenzofuran	19	< 19 U
84-66-2	Diethylphthalate	19	< 19 U
86-73-7	Fluorene	19	< 19 U
86-30-6	N-Nitrosodiphenylamine	19	< 19 U
118-74-1	Hexachlorobenzene	19	< 19 U
87-86-5	Pentachlorophenol	95	< 95 U
85-01-8	Phenanthrene	19	< 19 U
120-12-7	Anthracene	19	< 19 U
84-74-2	Di-n-Butylphthalate	19	< 19 U
206-44-0	**Fluoranthene**	**19**	**9.7 J**
129-00-0	Pyrene	19	< 19 U
85-68-7	Butylbenzylphthalate	19	< 19 U
56-55-3	Benzo(a)anthracene	19	< 19 U
117-81-7	bis(2-Ethylhexyl)phthalate	19	< 19 U
218-01-9	Chrysene	19	< 19 U
117-84-0	Di-n-Octyl phthalate	19	< 19 U
205-99-2	Benzo(b)fluoranthene	19	< 19 U
207-08-9	Benzo(k)fluoranthene	19	< 19 U
50-32-8	Benzo(a)pyrene	19	< 19 U
193-39-5	Indeno(1,2,3-cd)pyrene	19	< 19 U
53-70-3	Dibenz(a,h)anthracene	19	< 19 U
191-24-2	Benzo(g,h,i)perylene	19	< 19 U
90-05-1	Guaiacol	19	< 19 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: PGSS-55
SAMPLE

Lab Sample ID: OT71A
LIMS ID: 09-8227
Matrix: Sediment
Date Analyzed: 04/14/09 21:15

QC Report No: OT71-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014

CAS Number	Analyte	RL	Result
483-65-8	Retene	19	< 19 U
90-12-0	1-Methylnaphthalene	19	< 19 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	59.6%	2-Fluorobiphenyl	79.6%
d14-p-Terphenyl	75.6%	d4-1,2-Dichlorobenzene	54.0%
d5-Phenol	60.5%	2-Fluorophenol	60.0%
2,4,6-Tribromophenol	88.3%	d4-2-Chlorophenol	64.0%

ANALYTICAL RESOURCES INCORPORATED

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

Sample ID: PGSS-56
SAMPLE

Lab Sample ID: OT71B
LIMS ID: 09-8228
Matrix: Sediment
Data Release Authorized:
Reported: 04/16/09

QC Report No: OT71-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/08/08
Date Received: 12/11/08

Date Extracted: 04/08/09
Date Analyzed: 04/14/09 21:49
Instrument/Analyst: NT4/LJR
GPC Cleanup: No

Sample Amount: 25.4 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 29.4%

CAS Number	Analyte	RL	Result
108-95-2	**Phenol**	**20**	**140 J**
541-73-1	1,3-Dichlorobenzene	20	< 20 U
106-46-7	1,4-Dichlorobenzene	20	< 20 U
100-51-6	Benzyl Alcohol	20	< 20 U
95-50-1	1,2-Dichlorobenzene	20	< 20 U
95-48-7	2-Methylphenol	20	< 20 U
106-44-5	4-Methylphenol	20	< 20 U
105-67-9	2,4-Dimethylphenol	20	< 20 U
65-85-0	Benzoic Acid	200	< 200 U
120-82-1	1,2,4-Trichlorobenzene	20	< 20 U
91-20-3	Naphthalene	20	< 20 U
87-68-3	Hexachlorobutadiene	20	< 20 U
91-57-6	2-Methylnaphthalene	20	< 20 U
131-11-3	Dimethylphthalate	20	< 20 U
208-96-8	Acenaphthylene	20	< 20 U
83-32-9	Acenaphthene	20	< 20 U
132-64-9	Dibenzofuran	20	< 20 U
84-66-2	Diethylphthalate	20	< 20 U
86-73-7	Fluorene	20	< 20 U
86-30-6	N-Nitrosodiphenylamine	20	< 20 U
118-74-1	Hexachlorobenzene	20	< 20 U
87-86-5	Pentachlorophenol	98	< 98 U
85-01-8	Phenanthrene	20	< 20 U
120-12-7	Anthracene	20	< 20 U
84-74-2	Di-n-Butylphthalate	20	< 20 U
206-44-0	**Fluoranthene**	**20**	**19 J**
129-00-0	**Pyrene**	**20**	**13 J**
85-68-7	Butylbenzylphthalate	20	< 20 U
56-55-3	Benzo(a)anthracene	20	< 20 U
117-81-7	**bis(2-Ethylhexyl)phthalate**	**20**	**12 J**
218-01-9	**Chrysene**	**20**	**13 J**
117-84-0	Di-n-Octyl phthalate	20	< 20 U
205-99-2	**Benzo(b)fluoranthene**	**20**	**10 J**
207-08-9	**Benzo(k)fluoranthene**	**20**	**12 J**
50-32-8	Benzo(a)pyrene	20	< 20 U
193-39-5	Indeno(1,2,3-cd)pyrene	20	< 20 U
53-70-3	Dibenz(a,h)anthracene	20	< 20 U
191-24-2	Benzo(g,h,i)perylene	20	< 20 U
90-05-1	Guaiacol	20	< 20 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: PGSS-56
SAMPLE

Lab Sample ID: OT71B
LIMS ID: 09-8228
Matrix: Sediment
Date Analyzed: 04/14/09 21:49

QC Report No: OT71-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014

CAS Number	Analyte	RL	Result
483-65-8	Retene	20	< 20 U
90-12-0	1-Methylnaphthalene	20	< 20 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	62.8%	2-Fluorobiphenyl	78.0%
d14-p-Terphenyl	83.6%	d4-1,2-Dichlorobenzene	64.4%
d5-Phenol	61.1%	2-Fluorophenol	61.1%
2,4,6-Tribromophenol	99.2%	d4-2-Chlorophenol	64.8%

ANALYTICAL RESOURCES INCORPORATED

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

Sample ID: PGSS-58
SAMPLE

Lab Sample ID: OT71C
LIMS ID: 09-8229
Matrix: Sediment
Data Release Authorized:
Reported: 04/16/09

QC Report No: OT71-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/09/08
Date Received: 12/11/08

Date Extracted: 04/08/09
Date Analyzed: 04/14/09 22:23
Instrument/Analyst: NT4/LJR
GPC Cleanup: No

Sample Amount: 25.2 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Percent Moisture: 63.7%

CAS Number	Analyte	RL	Result
108-95-2	**Phenol**	**40**	**520 J**
541-73-1	1,3-Dichlorobenzene	40	< 40 U
106-46-7	1,4-Dichlorobenzene	40	< 40 U
100-51-6	Benzyl Alcohol	40	< 40 U
95-50-1	1,2-Dichlorobenzene	40	< 40 U
95-48-7	2-Methylphenol	40	< 40 U
106-44-5	4-Methylphenol	40	< 40 U
105-67-9	2,4-Dimethylphenol	40	< 40 U
65-85-0	Benzoic Acid	400	< 400 U
120-82-1	1,2,4-Trichlorobenzene	40	< 40 U
91-20-3	Naphthalene	40	< 40 U
87-68-3	Hexachlorobutadiene	40	< 40 U
91-57-6	2-Methylnaphthalene	40	< 40 U
131-11-3	Dimethylphthalate	40	< 40 U
208-96-8	Acenaphthylene	40	< 40 U
83-32-9	Acenaphthene	40	< 40 U
132-64-9	Dibenzofuran	40	< 40 U
84-66-2	Diethylphthalate	40	< 40 U
86-73-7	Fluorene	40	< 40 U
86-30-6	N-Nitrosodiphenylamine	40	< 40 U
118-74-1	Hexachlorobenzene	40	< 40 U
87-86-5	Pentachlorophenol	200	< 200 U
85-01-8	Phenanthrene	40	< 40 U
120-12-7	Anthracene	40	< 40 U
84-74-2	Di-n-Butylphthalate	40	< 40 U
206-44-0	**Fluoranthene**	**40**	**25 J**
129-00-0	Pyrene	40	< 40 U
85-68-7	Butylbenzylphthalate	40	< 40 U
56-55-3	Benzo(a)anthracene	40	< 40 U
117-81-7	bis(2-Ethylhexyl)phthalate	40	< 40 U
218-01-9	**Chrysene**	**40**	**27 J**
117-84-0	Di-n-Octyl phthalate	40	< 40 U
205-99-2	Benzo(b)fluoranthene	40	< 40 U
207-08-9	Benzo(k)fluoranthene	40	< 40 U
50-32-8	Benzo(a)pyrene	40	< 40 U
193-39-5	Indeno(1,2,3-cd)pyrene	40	< 40 U
53-70-3	Dibenz(a,h)anthracene	40	< 40 U
191-24-2	Benzo(g,h,i)perylene	40	< 40 U
90-05-1	Guaiacol	40	< 40 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: PGSS-58
SAMPLE

Lab Sample ID: OT71C
LIMS ID: 09-8229
Matrix: Sediment
Date Analyzed: 04/14/09 22:23

QC Report No: OT71-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014

CAS Number	Analyte	RL	Result
483-65-8	Retene	40	< 40 U
90-12-0	1-Methylnaphthalene	40	< 40 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	63.8%	2-Fluorobiphenyl	72.8%
d14-p-Terphenyl	71.4%	d4-1,2-Dichlorobenzene	61.0%
d5-Phenol	61.9%	2-Fluorophenol	63.5%
2,4,6-Tribromophenol	81.1%	d4-2-Chlorophenol	65.6%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS **Sample ID: PGSS-62A**
Page 1 of 2 **SAMPLE**

Lab Sample ID: OT71D
LIMS ID: 09-8230
Matrix: Sediment
Data Release Authorized:
Reported: 04/16/09

QC Report No: OT71-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/09/08
Date Received: 12/11/08

Date Extracted: 04/08/09
Date Analyzed: 04/14/09 22:57
Instrument/Analyst: NT4/LJR
GPC Cleanup: No

Sample Amount: 25.4 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Percent Moisture: 23.6%

CAS Number	Analyte	RL	Result
108-95-2	**Phenol**	**39**	**240 J**
541-73-1	1,3-Dichlorobenzene	39	< 39 U
106-46-7	1,4-Dichlorobenzene	39	< 39 U
100-51-6	Benzyl Alcohol	39	< 39 U
95-50-1	1,2-Dichlorobenzene	39	< 39 U
95-48-7	2-Methylphenol	39	< 39 U
106-44-5	**4-Methylphenol**	**39**	**66**
105-67-9	2,4-Dimethylphenol	39	< 39 U
65-85-0	Benzoic Acid	390	< 390 U
120-82-1	1,2,4-Trichlorobenzene	39	< 39 U
91-20-3	Naphthalene	39	< 39 U
87-68-3	Hexachlorobutadiene	39	< 39 U
91-57-6	2-Methylnaphthalene	39	< 39 U
131-11-3	Dimethylphthalate	39	< 39 U
208-96-8	Acenaphthylene	39	< 39 U
83-32-9	Acenaphthene	39	< 39 U
132-64-9	Dibenzofuran	39	< 39 U
84-66-2	Diethylphthalate	39	< 39 U
86-73-7	Fluorene	39	< 39 U
86-30-6	N-Nitrosodiphenylamine	39	< 39 U
118-74-1	Hexachlorobenzene	39	< 39 U
87-86-5	Pentachlorophenol	200	< 200 U
85-01-8	Phenanthrene	39	< 39 U
120-12-7	Anthracene	39	< 39 U
84-74-2	Di-n-Butylphthalate	39	< 39 U
206-44-0	Fluoranthene	39	< 39 U
129-00-0	Pyrene	39	< 39 U
85-68-7	Butylbenzylphthalate	39	< 39 U
56-55-3	Benzo(a)anthracene	39	< 39 U
117-81-7	bis(2-Ethylhexyl)phthalate	39	< 39 U
218-01-9	Chrysene	39	< 39 U
117-84-0	Di-n-Octyl phthalate	39	< 39 U
205-99-2	Benzo(b)fluoranthene	39	< 39 U
207-08-9	Benzo(k)fluoranthene	39	< 39 U
50-32-8	Benzo(a)pyrene	39	< 39 U
193-39-5	Indeno(1,2,3-cd)pyrene	39	< 39 U
53-70-3	Dibenz(a,h)anthracene	39	< 39 U
191-24-2	Benzo(g,h,i)perylene	39	< 39 U
90-05-1	Guaiacol	39	< 39 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: PGSS-62A
SAMPLE

Lab Sample ID: OT71D
LIMS ID: 09-8230
Matrix: Sediment
Date Analyzed: 04/14/09 22:57

QC Report No: OT71-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014

CAS Number	Analyte	RL	Result
483-65-8	**Retene**	**39**	**53**
90-12-0	1-Methylnaphthalene	39	< 39 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	65.8%	2-Fluorobiphenyl	80.0%
d14-p-Terphenyl	90.4%	d4-1,2-Dichlorobenzene	66.6%
d5-Phenol	64.5%	2-Fluorophenol	64.0%
2,4,6-Tribromophenol	108%	d4-2-Chlorophenol	69.9%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: PGSS-62B
SAMPLE

Lab Sample ID: OT71E
LIMS ID: 09-8231
Matrix: Sediment
Data Release Authorized:
Reported: 04/16/09

QC Report No: OT71-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/09/08
Date Received: 12/11/08

Date Extracted: 04/08/09
Date Analyzed: 04/15/09 00:39
Instrument/Analyst: NT4/LJR
GPC Cleanup: No

Sample Amount: 25.5 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 33.1%

CAS Number	Analyte	RL	Result
108-95-2	**Phenol**	**20**	**82 J**
541-73-1	1,3-Dichlorobenzene	20	< 20 U
106-46-7	1,4-Dichlorobenzene	20	< 20 U
100-51-6	Benzyl Alcohol	20	< 20 U
95-50-1	1,2-Dichlorobenzene	20	< 20 U
95-48-7	2-Methylphenol	20	< 20 U
106-44-5	4-Methylphenol	20	< 20 U
105-67-9	2,4-Dimethylphenol	20	< 20 U
65-85-0	Benzoic Acid	200	< 200 U
120-82-1	1,2,4-Trichlorobenzene	20	< 20 U
91-20-3	Naphthalene	20	< 20 U
87-68-3	Hexachlorobutadiene	20	< 20 U
91-57-6	2-Methylnaphthalene	20	< 20 U
131-11-3	Dimethylphthalate	20	< 20 U
208-96-8	Acenaphthylene	20	< 20 U
83-32-9	Acenaphthene	20	< 20 U
132-64-9	Dibenzofuran	20	< 20 U
84-66-2	Diethylphthalate	20	< 20 U
86-73-7	Fluorene	20	< 20 U
86-30-6	N-Nitrosodiphenylamine	20	< 20 U
118-74-1	Hexachlorobenzene	20	< 20 U
87-86-5	Pentachlorophenol	98	< 98 U
85-01-8	Phenanthrene	20	< 20 U
120-12-7	Anthracene	20	< 20 U
84-74-2	Di-n-Butylphthalate	20	< 20 U
206-44-0	**Fluoranthene**	**20**	**23**
129-00-0	**Pyrene**	**20**	**13 J**
85-68-7	Butylbenzylphthalate	20	< 20 U
56-55-3	Benzo(a)anthracene	20	< 20 U
117-81-7	bis(2-Ethylhexyl)phthalate	20	< 20 U
218-01-9	**Chrysene**	**20**	**11 J**
117-84-0	Di-n-Octyl phthalate	20	< 20 U
205-99-2	**Benzo(b)fluoranthene**	**20**	**11 J**
207-08-9	Benzo(k)fluoranthene	20	< 20 U
50-32-8	Benzo(a)pyrene	20	< 20 U
193-39-5	Indeno(1,2,3-cd)pyrene	20	< 20 U
53-70-3	Dibenz(a,h)anthracene	20	< 20 U
191-24-2	Benzo(g,h,i)perylene	20	< 20 U
90-05-1	Guaiacol	20	< 20 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS **Sample ID: PGSS-62B**
Page 2 of 2 **SAMPLE**

Lab Sample ID: OT71E QC Report No: OT71-Hart Crowser, Inc.
LIMS ID: 09-8231 Project: PORT GAMBLE
Matrix: Sediment 1733014
Date Analyzed: 04/15/09 00:39

CAS Number	Analyte	RL	Result
483-65-8	Retene	20	< 20 U
90-12-0	1-Methylnaphthalene	20	< 20 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	56.4%	2-Fluorobiphenyl	74.8%
d14-p-Terphenyl	70.0%	d4-1,2-Dichlorobenzene	54.0%
d5-Phenol	55.5%	2-Fluorophenol	53.9%
2,4,6-Tribromophenol	98.1%	d4-2-Chlorophenol	57.1%

ANALYTICAL RESOURCES INCORPORATED

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

Sample ID: PGSS-63
SAMPLE

Lab Sample ID: OT71F
LIMS ID: 09-8232
Matrix: Sediment
Data Release Authorized: MW
Reported: 04/16/09

QC Report No: OT71-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/09/08
Date Received: 12/11/08

Date Extracted: 04/08/09
Date Analyzed: 04/15/09 01:14
Instrument/Analyst: NT4/LJR
GPC Cleanup: No

Sample Amount: 25.6 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 34.9%

CAS Number	Analyte	RL	Result
108-95-2	**Phenol**	**20**	**170 J**
541-73-1	1,3-Dichlorobenzene	20	< 20 U
106-46-7	1,4-Dichlorobenzene	20	< 20 U
100-51-6	Benzyl Alcohol	20	< 20 U
95-50-1	1,2-Dichlorobenzene	20	< 20 U
95-48-7	2-Methylphenol	20	< 20 U
106-44-5	4-Methylphenol	20	< 20 U
105-67-9	2,4-Dimethylphenol	20	< 20 U
65-85-0	Benzoic Acid	200	< 200 U
120-82-1	1,2,4-Trichlorobenzene	20	< 20 U
91-20-3	Naphthalene	20	< 20 U
87-68-3	Hexachlorobutadiene	20	< 20 U
91-57-6	2-Methylnaphthalene	20	< 20 U
131-11-3	Dimethylphthalate	20	< 20 U
208-96-8	Acenaphthylene	20	< 20 U
83-32-9	Acenaphthene	20	< 20 U
132-64-9	Dibenzofuran	20	< 20 U
84-66-2	Diethylphthalate	20	< 20 U
86-73-7	Fluorene	20	< 20 U
86-30-6	N-Nitrosodiphenylamine	20	< 20 U
118-74-1	Hexachlorobenzene	20	< 20 U
87-86-5	Pentachlorophenol	98	< 98 U
85-01-8	**Phenanthrene**	**20**	**15 J**
120-12-7	Anthracene	20	< 20 U
84-74-2	Di-n-Butylphthalate	20	< 20 U
206-44-0	**Fluoranthene**	**20**	**36**
129-00-0	**Pyrene**	**20**	**22**
85-68-7	Butylbenzylphthalate	20	< 20 U
56-55-3	**Benzo(a)anthracene**	**20**	**18 J**
117-81-7	bis(2-Ethylhexyl)phthalate	20	< 20 U
218-01-9	**Chrysene**	**20**	**33**
117-84-0	Di-n-Octyl phthalate	20	< 20 U
205-99-2	**Benzo(b)fluoranthene**	**20**	**21**
207-08-9	**Benzo(k)fluoranthene**	**20**	**17 J**
50-32-8	**Benzo(a)pyrene**	**20**	**15 J**
193-39-5	Indeno(1,2,3-cd)pyrene	20	< 20 U
53-70-3	Dibenz(a,h)anthracene	20	< 20 U
191-24-2	Benzo(g,h,i)perylene	20	< 20 U
90-05-1	Guaiacol	20	< 20 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: PGSS-63
SAMPLE

Lab Sample ID: OT71F
LIMS ID: 09-8232
Matrix: Sediment
Date Analyzed: 04/15/09 01:14

QC Report No: OT71-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014

CAS Number	Analyte	RL	Result
483-65-8	Retene	20	< 20 U
90-12-0	1-Methylnaphthalene	20	< 20 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	57.2%	2-Fluorobiphenyl	73.6%
d14-p-Terphenyl	63.6%	d4-1,2-Dichlorobenzene	51.2%
d5-Phenol	55.2%	2-Fluorophenol	54.1%
2,4,6-Tribromophenol	85.9%	d4-2-Chlorophenol	57.3%

ANALYTICAL RESOURCES INCORPORATED

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

Sample ID: PGSS-69
SAMPLE

Lab Sample ID: OT71G
LIMS ID: 09-8233
Matrix: Sediment
Data Release Authorized: MV
Reported: 04/16/09

QC Report No: OT71-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/09/08
Date Received: 12/11/08

Date Extracted: 04/08/09
Date Analyzed: 04/15/09 01:48
Instrument/Analyst: NT4/LJR
GPC Cleanup: No

Sample Amount: 25.7 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 28.8%

CAS Number	Analyte	RL	Result
108-95-2	**Phenol**	**19**	**110 J**
541-73-1	1,3-Dichlorobenzene	19	< 19 U
106-46-7	1,4-Dichlorobenzene	19	< 19 U
100-51-6	Benzyl Alcohol	19	< 19 U
95-50-1	1,2-Dichlorobenzene	19	< 19 U
95-48-7	2-Methylphenol	19	< 19 U
106-44-5	4-Methylphenol	19	< 19 U
105-67-9	2,4-Dimethylphenol	19	< 19 U
65-85-0	Benzoic Acid	190	< 190 U
120-82-1	1,2,4-Trichlorobenzene	19	< 19 U
91-20-3	Naphthalene	19	< 19 U
87-68-3	Hexachlorobutadiene	19	< 19 U
91-57-6	2-Methylnaphthalene	19	< 19 U
131-11-3	Dimethylphthalate	19	< 19 U
208-96-8	Acenaphthylene	19	< 19 U
83-32-9	Acenaphthene	19	< 19 U
132-64-9	Dibenzofuran	19	< 19 U
84-66-2	Diethylphthalate	19	< 19 U
86-73-7	Fluorene	19	< 19 U
86-30-6	N-Nitrosodiphenylamine	19	< 19 U
118-74-1	Hexachlorobenzene	19	< 19 U
87-86-5	Pentachlorophenol	97	< 97 U
85-01-8	Phenanthrene	19	< 19 U
120-12-7	Anthracene	19	< 19 U
84-74-2	Di-n-Butylphthalate	19	< 19 U
206-44-0	Fluoranthene	19	< 19 U
129-00-0	Pyrene	19	< 19 U
85-68-7	Butylbenzylphthalate	19	< 19 U
56-55-3	Benzo(a)anthracene	19	< 19 U
117-81-7	bis(2-Ethylhexyl)phthalate	19	< 19 U
218-01-9	Chrysene	19	< 19 U
117-84-0	Di-n-Octyl phthalate	19	< 19 U
205-99-2	Benzo(b)fluoranthene	19	< 19 U
207-08-9	Benzo(k)fluoranthene	19	< 19 U
50-32-8	Benzo(a)pyrene	19	< 19 U
193-39-5	Indeno(1,2,3-cd)pyrene	19	< 19 U
53-70-3	Dibenz(a,h)anthracene	19	< 19 U
191-24-2	Benzo(g,h,i)perylene	19	< 19 U
90-05-1	Guaiacol	19	< 19 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: PGSS-69
SAMPLE

Lab Sample ID: OT71G
LIMS ID: 09-8233
Matrix: Sediment
Date Analyzed: 04/15/09 01:48

QC Report No: OT71-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014

CAS Number	Analyte	RL	Result
483-65-8	Retene	19	< 19 U
90-12-0	1-Methylnaphthalene	19	< 19 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	59.6%	2-Fluorobiphenyl	69.2%
d14-p-Terphenyl	83.2%	d4-1,2-Dichlorobenzene	62.4%
d5-Phenol	60.8%	2-Fluorophenol	58.4%
2,4,6-Tribromophenol	97.1%	d4-2-Chlorophenol	63.5%

ANALYTICAL RESOURCES INCORPORATED

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

Sample ID: PGSS-70
SAMPLE

Lab Sample ID: OT71H
LIMS ID: 09-8234
Matrix: Sediment
Data Release Authorized:
Reported: 04/16/09

QC Report No: OT71-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/09/08
Date Received: 12/11/08

Date Extracted: 04/08/09
Date Analyzed: 04/15/09 02:22
Instrument/Analyst: NT4/LJR
GPC Cleanup: No

Sample Amount: 25.5 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 29.6%

CAS Number	Analyte	RL	Result
108-95-2	**Phenol**	**20**	**71 J**
541-73-1	1,3-Dichlorobenzene	20	< 20 U
106-46-7	1,4-Dichlorobenzene	20	< 20 U
100-51-6	Benzyl Alcohol	20	< 20 U
95-50-1	1,2-Dichlorobenzene	20	< 20 U
95-48-7	2-Methylphenol	20	< 20 U
106-44-5	4-Methylphenol	20	< 20 U
105-67-9	2,4-Dimethylphenol	20	< 20 U
65-85-0	Benzoic Acid	200	< 200 U
120-82-1	1,2,4-Trichlorobenzene	20	< 20 U
91-20-3	Naphthalene	20	< 20 U
87-68-3	Hexachlorobutadiene	20	< 20 U
91-57-6	2-Methylnaphthalene	20	< 20 U
131-11-3	Dimethylphthalate	20	< 20 U
208-96-8	Acenaphthylene	20	< 20 U
83-32-9	Acenaphthene	20	< 20 U
132-64-9	Dibenzofuran	20	< 20 U
84-66-2	Diethylphthalate	20	< 20 U
86-73-7	Fluorene	20	< 20 U
86-30-6	N-Nitrosodiphenylamine	20	< 20 U
118-74-1	Hexachlorobenzene	20	< 20 U
87-86-5	Pentachlorophenol	98	< 98 U
85-01-8	**Phenanthrene**	**20**	**54**
120-12-7	**Anthracene**	**20**	**21**
84-74-2	Di-n-Butylphthalate	20	< 20 U
206-44-0	**Fluoranthene**	**20**	**130**
129-00-0	**Pyrene**	**20**	**74**
85-68-7	Butylbenzylphthalate	20	< 20 U
56-55-3	**Benzo(a)anthracene**	**20**	**52**
117-81-7	bis(2-Ethylhexyl)phthalate	20	< 20 U
218-01-9	**Chrysene**	**20**	**64**
117-84-0	Di-n-Octyl phthalate	20	< 20 U
205-99-2	**Benzo(b)fluoranthene**	**20**	**48**
207-08-9	**Benzo(k)fluoranthene**	**20**	**57**
50-32-8	**Benzo(a)pyrene**	**20**	**42**
193-39-5	**Indeno(1,2,3-cd)pyrene**	**20**	**11 J**
53-70-3	Dibenz(a,h)anthracene	20	< 20 U
191-24-2	**Benzo(g,h,i)perylene**	**20**	**10 J**
90-05-1	Guaiacol	20	< 20 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS **Sample ID: PGSS-70**
Page 2 of 2 **SAMPLE**

Lab Sample ID: OT71H QC Report No: OT71-Hart Crowser, Inc.
LIMS ID: 09-8234 Project: PORT GAMBLE
Matrix: Sediment 1733014
Date Analyzed: 04/15/09 02:22

CAS Number	Analyte	RL	Result
483-65-8	Retene	20	< 20 U
90-12-0	1-Methylnaphthalene	20	< 20 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	59.2%	2-Fluorobiphenyl	76.8%
d14-p-Terphenyl	66.8%	d4-1,2-Dichlorobenzene	54.4%
d5-Phenol	56.5%	2-Fluorophenol	57.1%
2,4,6-Tribromophenol	87.7%	d4-2-Chlorophenol	59.5%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS **Sample ID: PGSS-77**
Page 1 of 2 **SAMPLE**

Lab Sample ID: OT71I
LIMS ID: 09-8235
Matrix: Sediment
Data Release Authorized: MW
Reported: 04/16/09

QC Report No: OT71-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/09/08
Date Received: 12/11/08

Date Extracted: 04/08/09
Date Analyzed: 04/15/09 02:56
Instrument/Analyst: NT4/LJR
GPC Cleanup: No

Sample Amount: 25.4 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 36.5%

CAS Number	Analyte	RL	Result
108-95-2	**Phenol**	**20**	**220 J**
541-73-1	1,3-Dichlorobenzene	20	< 20 U
106-46-7	1,4-Dichlorobenzene	20	< 20 U
100-51-6	Benzyl Alcohol	20	< 20 U
95-50-1	1,2-Dichlorobenzene	20	< 20 U
95-48-7	2-Methylphenol	20	< 20 U
106-44-5	**4-Methylphenol**	**20**	**70**
105-67-9	2,4-Dimethylphenol	20	< 20 U
65-85-0	Benzoic Acid	200	< 200 U
120-82-1	1,2,4-Trichlorobenzene	20	< 20 U
91-20-3	Naphthalene	20	< 20 U
87-68-3	Hexachlorobutadiene	20	< 20 U
91-57-6	2-Methylnaphthalene	20	< 20 U
131-11-3	Dimethylphthalate	20	< 20 U
208-96-8	Acenaphthylene	20	< 20 U
83-32-9	Acenaphthene	20	< 20 U
132-64-9	Dibenzofuran	20	< 20 U
84-66-2	Diethylphthalate	20	< 20 U
86-73-7	Fluorene	20	< 20 U
86-30-6	N-Nitrosodiphenylamine	20	< 20 U
118-74-1	Hexachlorobenzene	20	< 20 U
87-86-5	Pentachlorophenol	98	< 98 U
85-01-8	**Phenanthrene**	**20**	**15 J**
120-12-7	Anthracene	20	< 20 U
84-74-2	Di-n-Butylphthalate	20	< 20 U
206-44-0	**Fluoranthene**	**20**	**40**
129-00-0	**Pyrene**	**20**	**26**
85-68-7	Butylbenzylphthalate	20	< 20 U
56-55-3	**Benzo(a)anthracene**	**20**	**16 J**
117-81-7	bis(2-Ethylhexyl)phthalate	20	< 20 U
218-01-9	**Chrysene**	**20**	**31**
117-84-0	Di-n-Octyl phthalate	20	< 20 U
205-99-2	**Benzo(b)fluoranthene**	**20**	**34**
207-08-9	**Benzo(k)fluoranthene**	**20**	**26**
50-32-8	**Benzo(a)pyrene**	**20**	**22**
193-39-5	Indeno(1,2,3-cd)pyrene	20	< 20 U
53-70-3	Dibenz(a,h)anthracene	20	< 20 U
191-24-2	Benzo(g,h,i)perylene	20	< 20 U
90-05-1	Guaiacol	20	< 20 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: PGSS-77
SAMPLE

Lab Sample ID: OT71I
LIMS ID: 09-8235
Matrix: Sediment
Date Analyzed: 04/15/09 02:56

QC Report No: OT71-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014

CAS Number	Analyte	RL	Result
483-65-8	Retene	20	< 20 U
90-12-0	1-Methylnaphthalene	20	< 20 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	60.8%	2-Fluorobiphenyl	74.0%
d14-p-Terphenyl	80.8%	d4-1,2-Dichlorobenzene	61.2%
d5-Phenol	58.9%	2-Fluorophenol	56.5%
2,4,6-Tribromophenol	108%	d4-2-Chlorophenol	61.1%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: PGSS-83
SAMPLE

Lab Sample ID: OT71J
LIMS ID: 09-8236
Matrix: Sediment
Data Release Authorized: MW
Reported: 04/16/09

QC Report No: OT71-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/10/08
Date Received: 12/11/08

Date Extracted: 04/08/09
Date Analyzed: 04/15/09 03:30
Instrument/Analyst: NT4/LJR
GPC Cleanup: No

Sample Amount: 25.7 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 24.8%

CAS Number	Analyte	RL	Result
108-95-2	**Phenol**	**19**	**36 J**
541-73-1	1,3-Dichlorobenzene	19	< 19 U
106-46-7	1,4-Dichlorobenzene	19	< 19 U
100-51-6	Benzyl Alcohol	19	< 19 U
95-50-1	1,2-Dichlorobenzene	19	< 19 U
95-48-7	2-Methylphenol	19	< 19 U
106-44-5	4-Methylphenol	19	< 19 U
105-67-9	2,4-Dimethylphenol	19	< 19 U
65-85-0	Benzoic Acid	190	< 190 U
120-82-1	1,2,4-Trichlorobenzene	19	< 19 U
91-20-3	Naphthalene	19	< 19 U
87-68-3	Hexachlorobutadiene	19	< 19 U
91-57-6	2-Methylnaphthalene	19	< 19 U
131-11-3	Dimethylphthalate	19	< 19 U
208-96-8	Acenaphthylene	19	< 19 U
83-32-9	Acenaphthene	19	< 19 U
132-64-9	Dibenzofuran	19	< 19 U
84-66-2	Diethylphthalate	19	< 19 U
86-73-7	Fluorene	19	< 19 U
86-30-6	N-Nitrosodiphenylamine	19	< 19 U
118-74-1	Hexachlorobenzene	19	< 19 U
87-86-5	Pentachlorophenol	97	< 97 U
85-01-8	**Phenanthrene**	**19**	**19**
120-12-7	Anthracene	19	< 19 U
84-74-2	Di-n-Butylphthalate	19	< 19 U
206-44-0	**Fluoranthene**	**19**	**58**
129-00-0	**Pyrene**	**19**	**32**
85-68-7	Butylbenzylphthalate	19	< 19 U
56-55-3	**Benzo(a)anthracene**	**19**	**17 J**
117-81-7	bis(2-Ethylhexyl)phthalate	19	< 19 U
218-01-9	**Chrysene**	**19**	**42**
117-84-0	Di-n-Octyl phthalate	19	< 19 U
205-99-2	**Benzo(b)fluoranthene**	**19**	**23**
207-08-9	**Benzo(k)fluoranthene**	**19**	**20**
50-32-8	**Benzo(a)pyrene**	**19**	**13 J**
193-39-5	Indeno(1,2,3-cd)pyrene	19	< 19 U
53-70-3	Dibenz(a,h)anthracene	19	< 19 U
191-24-2	Benzo(g,h,i)perylene	19	< 19 U
90-05-1	Guaiacol	19	< 19 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: PGSS-83
SAMPLE

Lab Sample ID: OT71J
LIMS ID: 09-8236
Matrix: Sediment
Date Analyzed: 04/15/09 03:30

QC Report No: OT71-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014

CAS Number	Analyte	RL	Result
483-65-8	Retene	19	< 19 U
90-12-0	1-Methylnaphthalene	19	< 19 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	57.2%	2-Fluorobiphenyl	75.2%
d14-p-Terphenyl	68.0%	d4-1,2-Dichlorobenzene	52.0%
d5-Phenol	54.4%	2-Fluorophenol	55.5%
2,4,6-Tribromophenol	87.5%	d4-2-Chlorophenol	57.6%

ANALYTICAL RESOURCES INCORPORATED

SW8270 SEMIVOLATILES SOIL/SEDIMENT SURROGATE RECOVERY SUMMARY

Matrix: Sediment

QC Report No: OT71-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014

Client ID	NBZ	FBP	TPH	DCB	PHL	2FP	TBP	2CP	TOT OUT
PGSS-55	59.6%	79.6%	75.6%	54.0%	60.5%	60.0%	88.3%	64.0%	0
PGSS-56	62.8%	78.0%	83.6%	64.4%	61.1%	61.1%	99.2%	64.8%	0
PGSS-58	63.8%	72.8%	71.4%	61.0%	61.9%	63.5%	81.1%	65.6%	0
MB-040809	58.8%	67.6%	77.2%	65.6%	56.5%	55.5%	72.3%	59.7%	0
LCS-040809	61.6%	74.0%	84.4%	64.4%	63.7%	60.3%	95.7%	65.6%	0
LCSD-040809	62.4%	76.4%	83.6%	64.4%	62.9%	59.2%	96.3%*	64.5%	1
PGSS-62A	65.8%	80.0%	90.4%	66.6%	64.5%	64.0%	108%*	69.9%	1
PGSS-62A MS	66.1%	85.6%	74.4%	62.4%	65.1%	62.4%	94.4%	66.7%	0
PGSS-62A MSD	71.1%	88.0%	75.6%	67.3%	66.7%	64.0%	98.7%	69.9%	0
PGSS-62B	56.4%	74.8%	70.0%	54.0%	55.5%	53.9%	98.1%	57.1%	0
PGSS-63	57.2%	73.6%	63.6%	51.2%	55.2%	54.1%	85.9%	57.3%	0
PGSS-69	59.6%	69.2%	83.2%	62.4%	60.8%	58.4%	97.1%	63.5%	0
PGSS-70	59.2%	76.8%	66.8%	54.4%	56.5%	57.1%	87.7%	59.5%	0
PGSS-77	60.8%	74.0%	80.8%	61.2%	58.9%	56.5%	108%*	61.1%	1
PGSS-83	57.2%	75.2%	68.0%	52.0%	54.4%	55.5%	87.5%	57.6%	0

	LCS/MB LIMITS	QC LIMITS
(NBZ) = d5-Nitrobenzene	(37-85)	(29-87)
(FBP) = 2-Fluorobiphenyl	(39-82)	(32-88)
(TPH) = d14-p-Terphenyl	(38-105)	(21-97)
(DCB) = d4-1,2-Dichlorobenzene	(33-79)	(25-82)
(PHL) = d5-Phenol	(40-85)	(29-85)
(2FP) = 2-Fluorophenol	(20-93)	(10-114)
(TBP) = 2,4,6-Tribromophenol	(40-96)	(25-103)
(2CP) = d4-2-Chlorophenol	(41-81)	(30-84)

Prep Method: SW3550B
Log Number Range: 09-8227 to 09-8236

ANALYTICAL RESOURCES INCORPORATED

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

Sample ID: PGSS-62A
MS/MSD

Lab Sample ID: OT71D
LIMS ID: 09-8230
Matrix: Sediment
Data Release Authorized: MV
Reported: 04/16/09

QC Report No: OT71-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/09/08
Date Received: 12/11/08

Date Extracted MS/MSD: 04/08/09

Date Analyzed MS: 04/14/09 23:31
MSD: 04/15/09 00:05
Instrument/Analyst MS: NT4/LJR
MSD: NT4/LJR
GPC Cleanup: NO

Sample Amount MS: 25.4 g-dry-wt
MSD: 25.3 g-dry-wt
Final Extract Volume MS: 1.0 mL
MSD: 1.0 mL
Dilution Factor MS: 1.00
MSD: 1.00
Percent Moisture: 23.6 %

Analyte	Sample	MS	Spike Added-MS	MS Recovery	MSD	Spike Added-MSD	MSD Recovery	RPD
Phenol	239	532 J	492	59.6%	540 J	493	61.1%	1.5%
1,3-Dichlorobenzene	< 39.4	284	492	57.7%	301	493	61.1%	5.8%
1,4-Dichlorobenzene	< 39.4	297	492	60.4%	317	493	64.3%	6.5%
Benzyl Alcohol	< 39.4	31.5 J	984	3.2%	274	987	27.8%	159%
1,2-Dichlorobenzene	< 39.4	312	492	63.4%	330	493	66.9%	5.6%
2-Methylphenol	< 39.4	344	492	69.9%	304	493	61.7%	12.3%
4-Methylphenol	65.7	717	984	66.2%	728	987	67.1%	1.5%
2,4-Dimethylphenol	< 39.4	357	492	72.6%	352	493	71.4%	1.4%
Benzoic Acid	< 394	506	1480	34.2%	867	1480	58.6%	52.6%
1,2,4-Trichlorobenzene	< 39.4	366	492	74.4%	374	493	75.9%	2.2%
Naphthalene	< 39.4	375	492	76.2%	383	493	77.7%	2.1%
Hexachlorobutadiene	< 39.4	362	492	73.6%	379	493	76.9%	4.6%
2-Methylnaphthalene	< 39.4	375	492	76.2%	381	493	77.3%	1.6%
Dimethylphthalate	< 39.4	389	492	79.1%	403	493	81.7%	3.5%
Acenaphthylene	< 39.4	421	492	85.6%	423	493	85.8%	0.5%
Acenaphthene	< 39.4	418	492	85.0%	428	493	86.8%	2.4%
Dibenzofuran	< 39.4	430	492	87.4%	435	493	88.2%	1.2%
Diethylphthalate	< 39.4	402	492	81.7%	408	493	82.8%	1.5%
Fluorene	< 39.4	447	492	90.9%	448	493	90.9%	0.2%
N-Nitrosodiphenylamine	< 39.4	434	492	88.2%	406	493	82.4%	6.7%
Hexachlorobenzene	< 39.4	481	492	97.8%	482	493	97.8%	0.2%
Pentachlorophenol	< 197	396	492	80.5%	478	493	97.0%	18.8%
Phenanthrene	< 39.4	498	492	101%	488	493	99.0%	2.0%
Anthracene	< 39.4	455	492	92.5%	455	493	92.3%	0.0%
Di-n-Butylphthalate	< 39.4	431	492	87.6%	437	493	88.6%	1.4%
Fluoranthene	< 39.4	521	492	106%	526	493	107%	1.0%
Pyrene	< 39.4	385	492	78.3%	380	493	77.1%	1.3%
Butylbenzylphthalate	< 39.4	350	492	71.1%	358	493	72.6%	2.3%
Benzo(a)anthracene	< 39.4	493	492	100%	483	493	98.0%	2.0%
bis(2-Ethylhexyl)phthalate	< 39.4	411	492	83.5%	413	493	83.8%	0.5%
Chrysene	< 39.4	501	492	102%	481	493	97.6%	4.1%
Di-n-Octyl phthalate	< 39.4	457	492	92.9%	452	493	91.7%	1.1%
Benzo(b)fluoranthene	< 39.4	497	492	101%	515	493	104%	3.6%
Benzo(k)fluoranthene	< 39.4	510	492	104%	516	493	105%	1.2%
Benzo(a)pyrene	< 39.4	467	492	94.9%	467	493	94.7%	0.0%
Indeno(1,2,3-cd)pyrene	< 39.4	353	492	71.7%	332	493	67.3%	6.1%
Dibenz(a,h)anthracene	< 39.4	374	492	76.0%	356	493	72.2%	4.9%
Benzo(g,h,i)perylene	< 39.4	296	492	60.2%	273	493	55.4%	8.1%
Guaiacol	< 39.4	390	492	79.3%	405	493	82.2%	3.8%
1-Methylnaphthalene	< 39.4	406	492	82.5%	411	493	83.4%	1.2%

Results reported in µg/kg
RPD calculated using sample concentrations per SW846.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: PGSS-62A
MATRIX SPIKE

Lab Sample ID: OT71D
LIMS ID: 09-8230
Matrix: Sediment
Data Release Authorized: MW
Reported: 04/16/09

QC Report No: OT71-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/09/08
Date Received: 12/11/08

Date Extracted: 04/08/09
Date Analyzed: 04/14/09 23:31
Instrument/Analyst: NT4/LJR
GPC Cleanup: No

Sample Amount: 25.4 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Percent Moisture: 23.6%

CAS Number	Analyte	RL	Result
108-95-2	Phenol	39	---
541-73-1	1,3-Dichlorobenzene	39	---
106-46-7	1,4-Dichlorobenzene	39	---
100-51-6	Benzyl Alcohol	39	---
95-50-1	1,2-Dichlorobenzene	39	---
95-48-7	2-Methylphenol	39	---
106-44-5	4-Methylphenol	39	---
105-67-9	2,4-Dimethylphenol	39	---
65-85-0	Benzoic Acid	390	---
120-82-1	1,2,4-Trichlorobenzene	39	---
91-20-3	Naphthalene	39	---
87-68-3	Hexachlorobutadiene	39	---
91-57-6	2-Methylnaphthalene	39	---
131-11-3	Dimethylphthalate	39	---
208-96-8	Acenaphthylene	39	---
83-32-9	Acenaphthene	39	---
132-64-9	Dibenzofuran	39	---
84-66-2	Diethylphthalate	39	---
86-73-7	Fluorene	39	---
86-30-6	N-Nitrosodiphenylamine	39	---
118-74-1	Hexachlorobenzene	39	---
87-86-5	Pentachlorophenol	200	---
85-01-8	Phenanthrene	39	---
120-12-7	Anthracene	39	---
84-74-2	Di-n-Butylphthalate	39	---
206-44-0	Fluoranthene	39	---
129-00-0	Pyrene	39	---
85-68-7	Butylbenzylphthalate	39	---
56-55-3	Benzo(a)anthracene	39	---
117-81-7	bis(2-Ethylhexyl)phthalate	39	---
218-01-9	Chrysene	39	---
117-84-0	Di-n-Octyl phthalate	39	---
205-99-2	Benzo(b)fluoranthene	39	---
207-08-9	Benzo(k)fluoranthene	39	---
50-32-8	Benzo(a)pyrene	39	---
193-39-5	Indeno(1,2,3-cd)pyrene	39	---
53-70-3	Dibenz(a,h)anthracene	39	---
191-24-2	Benzo(g,h,i)perylene	39	---
90-05-1	Guaiacol	39	---

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: PGSS-62A
MATRIX SPIKE

Lab Sample ID: OT71D
LIMS ID: 09-8230
Matrix: Sediment
Date Analyzed: 04/14/09 23:31

QC Report No: OT71-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014

CAS Number	Analyte	RL	Result
483-65-8	Retene	39	< 39 U
90-12-0	1-Methylnaphthalene	39	---

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	66.1%	2-Fluorobiphenyl	85.6%
d14-p-Terphenyl	74.4%	d4-1,2-Dichlorobenzene	62.4%
d5-Phenol	65.1%	2-Fluorophenol	62.4%
2,4,6-Tribromophenol	94.4%	d4-2-Chlorophenol	66.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: PGSS-62A
MATRIX SPIKE DUPLICATE

Lab Sample ID: OT71D
LIMS ID: 09-8230
Matrix: Sediment
Data Release Authorized:
Reported: 04/16/09

QC Report No: OT71-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/09/08
Date Received: 12/11/08

Date Extracted: 04/08/09
Date Analyzed: 04/15/09 00:05
Instrument/Analyst: NT4/LJR
GPC Cleanup: No

Sample Amount: 25.3 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Percent Moisture: 23.6%

CAS Number	Analyte	RL	Result
108-95-2	Phenol	40	---
541-73-1	1,3-Dichlorobenzene	40	---
106-46-7	1,4-Dichlorobenzene	40	---
100-51-6	Benzyl Alcohol	40	---
95-50-1	1,2-Dichlorobenzene	40	---
95-48-7	2-Methylphenol	40	---
106-44-5	4-Methylphenol	40	---
105-67-9	2,4-Dimethylphenol	40	---
65-85-0	Benzoic Acid	400	---
120-82-1	1,2,4-Trichlorobenzene	40	---
91-20-3	Naphthalene	40	---
87-68-3	Hexachlorobutadiene	40	---
91-57-6	2-Methylnaphthalene	40	---
131-11-3	Dimethylphthalate	40	---
208-96-8	Acenaphthylene	40	---
83-32-9	Acenaphthene	40	---
132-64-9	Dibenzofuran	40	---
84-66-2	Diethylphthalate	40	---
86-73-7	Fluorene	40	---
86-30-6	N-Nitrosodiphenylamine	40	---
118-74-1	Hexachlorobenzene	40	---
87-86-5	Pentachlorophenol	200	---
85-01-8	Phenanthrene	40	---
120-12-7	Anthracene	40	---
84-74-2	Di-n-Butylphthalate	40	---
206-44-0	Fluoranthene	40	---
129-00-0	Pyrene	40	---
85-68-7	Butylbenzylphthalate	40	---
56-55-3	Benzo(a)anthracene	40	---
117-81-7	bis(2-Ethylhexyl)phthalate	40	---
218-01-9	Chrysene	40	---
117-84-0	Di-n-Octyl phthalate	40	---
205-99-2	Benzo(b)fluoranthene	40	---
207-08-9	Benzo(k)fluoranthene	40	---
50-32-8	Benzo(a)pyrene	40	---
193-39-5	Indeno(1,2,3-cd)pyrene	40	---
53-70-3	Dibenz(a,h)anthracene	40	---
191-24-2	Benzo(g,h,i)perylene	40	---
90-05-1	Guaiacol	40	---

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: PGSS-62A
MATRIX SPIKE DUPLICATE

Lab Sample ID: OT71D
LIMS ID: 09-8230
Matrix: Sediment
Date Analyzed: 04/15/09 00:05

QC Report No: OT71-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014

CAS Number	Analyte	RL	Result
483-65-8	Retene	40	< 40 U
90-12-0	1-Methylnaphthalene	40	---

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	71.1%	2-Fluorobiphenyl	88.0%
d14-p-Terphenyl	75.6%	d4-1,2-Dichlorobenzene	67.3%
d5-Phenol	66.7%	2-Fluorophenol	64.0%
2,4,6-Tribromophenol	98.7%	d4-2-Chlorophenol	69.9%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS **Sample ID: LCS-040809**
 LCS/LCSD

Lab Sample ID: LCS-040809
LIMS ID: 09-8230
Matrix: Sediment
Data Release Authorized: MW
Reported: 04/16/09

QC Report No: OT71-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/09/08
Date Received: 12/11/08

Date Extracted LCS/LCSD: 04/08/09

Date Analyzed LCS: 04/14/09 20:06
LCSD: 04/14/09 20:41
Instrument/Analyst LCS: NT4/LJR
LCSD: NT4/LJR
GPC Cleanup: NO

Sample Amount LCS: 25.0 g
LCSD: 25.0 g
Final Extract Volume LCS: 0.5 mL
LCSD: 0.5 mL
Dilution Factor LCS: 1.00
LCSD: 1.00
Percent Moisture: NA

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Phenol	320	500	64.0%	313	500	62.6%	2.2%
1,3-Dichlorobenzene	315	500	63.0%	313	500	62.6%	0.6%
1,4-Dichlorobenzene	323	500	64.6%	322	500	64.4%	0.3%
Benzyl Alcohol	564	1000	56.4%	523	1000	52.3%	7.5%
1,2-Dichlorobenzene	321	500	64.2%	321	500	64.2%	0.0%
2-Methylphenol	321	500	64.2%	317	500	63.4%	1.3%
4-Methylphenol	657	1000	65.7%	648	1000	64.8%	1.4%
2,4-Dimethylphenol	275	500	55.0%	276	500	55.2%	0.4%
Benzoic Acid	1210	1500	80.7%	1230	1500	82.0%	1.6%
1,2,4-Trichlorobenzene	355	500	71.0%	357	500	71.4%	0.6%
Naphthalene	356	500	71.2%	361	500	72.2%	1.4%
Hexachlorobutadiene	368	500	73.6%	372	500	74.4%	1.1%
2-Methylnaphthalene	357	500	71.4%	362	500	72.4%	1.4%
Dimethylphthalate	400	500	80.0%	403	500	80.6%	0.7%
Acenaphthylene	382	500	76.4%	390	500	78.0%	2.1%
Acenaphthene	375	500	75.0%	389	500	77.8%	3.7%
Dibenzofuran	390	500	78.0%	403	500	80.6%	3.3%
Diethylphthalate	432	500	86.4%	429	500	85.8%	0.7%
Fluorene	408	500	81.6%	421	500	84.2%	3.1%
N-Nitrosodiphenylamine	330	500	66.0%	359	500	71.8%	8.4%
Hexachlorobenzene	395	500	79.0%	415	500	83.0%	4.9%
Pentachlorophenol	423	500	84.6%	435	500	87.0%	2.8%
Phenanthrene	410	500	82.0%	426	500	85.2%	3.8%
Anthracene	378	500	75.6%	390	500	78.0%	3.1%
Di-n-Butylphthalate	426	500	85.2%	436	500	87.2%	2.3%
Fluoranthene	464	500	92.8%	484	500	96.8%	4.2%
Pyrene	399	500	79.8%	392	500	78.4%	1.8%
Butylbenzylphthalate	397	500	79.4%	400	500	80.0%	0.8%
Benzo(a)anthracene	420	500	84.0%	432	500	86.4%	2.8%
bis(2-Ethylhexyl)phthalate	438	500	87.6%	447	500	89.4%	2.0%
Chrysene	418	500	83.6%	431	500	86.2%	3.1%
Di-n-Octyl phthalate	410	500	82.0%	421	500	84.2%	2.6%
Benzo(b)fluoranthene	471	500	94.2%	469	500	93.8%	0.4%
Benzo(k)fluoranthene	480	500	96.0%	523	500	105%	8.6%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: LCSD-040809
LCS/LCSD

Lab Sample ID: LCS-040809
LIMS ID: 09-8230
Matrix: Sediment
Date Analyzed LCS: 04/14/09 20:06
LCSD: 04/14/09 20:41

QC Report No: OT71-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Benzo(a)pyrene	412	500	82.4%	432	500	86.4%	4.7%
Indeno(1,2,3-cd)pyrene	383	500	76.6%	396	500	79.2%	3.3%
Dibenz(a,h)anthracene	382	500	76.4%	398	500	79.6%	4.1%
Benzo(g,h,i)perylene	352	500	70.4%	356	500	71.2%	1.1%
Guaiacol	214	500	42.8%	218	500	43.6%	1.9%
1-Methylnaphthalene	386	500	77.2%	396	500	79.2%	2.6%

Semivolatile Surrogate Recovery

	LCS	LCSD
d5-Nitrobenzene	61.6%	62.4%
2-Fluorobiphenyl	74.0%	76.4%
d14-p-Terphenyl	84.4%	83.6%
d4-1,2-Dichlorobenzene	64.4%	64.4%
d5-Phenol	63.7%	62.9%
2-Fluorophenol	60.3%	59.2%
2,4,6-Tribromophenol	95.7%	96.3%
d4-2-Chlorophenol	65.6%	64.5%

Results reported in µg/kg
RPD calculated using sample concentrations per SW846.

4B

SEMIVOLATILE METHOD BLANK SUMMARY

BLANK NO.

OT71MBS1

Lab Name: ANALYTICAL RESOURCES, INC

Client: HART CROWSER, INC.

ARI Job No: OT71

Project: PORT GAMBLE

Lab File ID: OT71MB

Date Extracted: 04/08/09

Instrument ID: NT4

Date Analyzed: 04/14/09

Matrix: SOLID

Time Analyzed: 1931

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

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01	OT71LCSS1	OT71LCSS1	OT71SB	04/14/09
02	OT71LCSDS1	OT71LCSDS1	OT71SBD	04/14/09
03	PGSS-55	OT71A	OT71A	04/14/09
04	PGSS-56	OT71B	OT71B	04/14/09
05	PGSS-58	OT71C	OT71C	04/14/09
06	PGSS-62A	OT71D	OT71D	04/14/09
07	PGSS-62A MS	OT71DMS	OT71DMS	04/14/09
08	PGSS-62A MSD	OT71DMSD	OT71DMD	04/15/09
09	PGSS-62B	OT71E	OT71E	04/15/09
10	PGSS-63	OT71F	OT71F	04/15/09
11	PGSS-69	OT71G	OT71G	04/15/09
12	PGSS-70	OT71H	OT71H	04/15/09
13	PGSS-77	OT71I	OT71I	04/15/09
14	PGSS-83	OT71J	OT71J	04/15/09
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				

COMMENTS:

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS **Sample ID: MB-040809**
 METHOD BLANK

Lab Sample ID: MB-040809 QC Report No: OT71-Hart Crowser, Inc.
LIMS ID: 09-8230 Project: PORT GAMBLE
Matrix: Sediment 1733014
Data Release Authorized: MW Date Sampled: NA
Reported: 04/16/09 Date Received: NA

Date Extracted: 04/08/09 Sample Amount: 25.0 g
Date Analyzed: 04/14/09 19:31 Final Extract Volume: 0.5 mL
Instrument/Analyst: NT4/LJR Dilution Factor: 1.00
GPC Cleanup: No Percent Moisture: NA

CAS Number	Analyte	RL	Result
108-95-2	Phenol	20	< 20 U
541-73-1	1,3-Dichlorobenzene	20	< 20 U
106-46-7	1,4-Dichlorobenzene	20	< 20 U
100-51-6	Benzyl Alcohol	20	< 20 U
95-50-1	1,2-Dichlorobenzene	20	< 20 U
95-48-7	2-Methylphenol	20	< 20 U
106-44-5	4-Methylphenol	20	< 20 U
105-67-9	2,4-Dimethylphenol	20	< 20 U
65-85-0	Benzoic Acid	200	< 200 U
120-82-1	1,2,4-Trichlorobenzene	20	< 20 U
91-20-3	Naphthalene	20	< 20 U
87-68-3	Hexachlorobutadiene	20	< 20 U
91-57-6	2-Methylnaphthalene	20	< 20 U
131-11-3	Dimethylphthalate	20	< 20 U
208-96-8	Acenaphthylene	20	< 20 U
83-32-9	Acenaphthene	20	< 20 U
132-64-9	Dibenzofuran	20	< 20 U
84-66-2	Diethylphthalate	20	< 20 U
86-73-7	Fluorene	20	< 20 U
86-30-6	N-Nitrosodiphenylamine	20	< 20 U
118-74-1	Hexachlorobenzene	20	< 20 U
87-86-5	Pentachlorophenol	100	< 100 U
85-01-8	Phenanthrene	20	< 20 U
120-12-7	Anthracene	20	< 20 U
84-74-2	Di-n-Butylphthalate	20	< 20 U
206-44-0	Fluoranthene	20	< 20 U
129-00-0	Pyrene	20	< 20 U
85-68-7	Butylbenzylphthalate	20	< 20 U
56-55-3	Benzo(a)anthracene	20	< 20 U
117-81-7	bis(2-Ethylhexyl)phthalate	20	< 20 U
218-01-9	Chrysene	20	< 20 U
117-84-0	Di-n-Octyl phthalate	20	< 20 U
205-99-2	Benzo(b)fluoranthene	20	< 20 U
207-08-9	Benzo(k)fluoranthene	20	< 20 U
50-32-8	Benzo(a)pyrene	20	< 20 U
193-39-5	Indeno(1,2,3-cd)pyrene	20	< 20 U
53-70-3	Dibenz(a,h)anthracene	20	< 20 U
191-24-2	Benzo(g,h,i)perylene	20	< 20 U
90-05-1	Guaiacol	20	< 20 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: MB-040809
METHOD BLANK

Lab Sample ID: MB-040809
LIMS ID: 09-8230
Matrix: Sediment
Date Analyzed: 04/14/09 19:31

QC Report No: OT71-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014

CAS Number	Analyte	RL	Result
483-65-8	Retene	20	< 20 U
90-12-0	1-Methylnaphthalene	20	< 20 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	58.8%	2-Fluorobiphenyl	67.6%
d14-p-Terphenyl	77.2%	d4-1,2-Dichlorobenzene	65.6%
d5-Phenol	56.5%	2-Fluorophenol	55.5%
2,4,6-Tribromophenol	72.3%	d4-2-Chlorophenol	59.7%

PCB ANALYSIS

ANALYTICAL RESOURCES INCORPORATED

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

Sample ID: PGSS-55
SAMPLE

Lab Sample ID: OT71A
LIMS ID: 09-8227
Matrix: Sediment
Data Release Authorized:
Reported: 04/17/09

QC Report No: OT71-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/08/08
Date Received: 12/11/08

Date Extracted: 04/08/09
Date Analyzed: 04/15/09 23:35
Instrument/Analyst: ECD5/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.8 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: 26.5%

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

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	77.5%
Tetrachlorometaxylene	67.8%

ANALYTICAL RESOURCES INCORPORATED

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

Sample ID: PGSS-56
SAMPLE

Lab Sample ID: OT71B
LIMS ID: 09-8228
Matrix: Sediment
Data Release Authorized:
Reported: 04/17/09

QC Report No: OT71-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/08/08
Date Received: 12/11/08

Date Extracted: 04/08/09
Date Analyzed: 04/15/09 23:52
Instrument/Analyst: ECD5/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.4 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: 29.4%

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

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	83.8%
Tetrachlorometaxylene	96.2%

ANALYTICAL RESOURCES INCORPORATED

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

Sample ID: PGSS-58
SAMPLE

Lab Sample ID: OT71C
LIMS ID: 09-8229
Matrix: Sediment
Data Release Authorized:
Reported: 04/17/09

QC Report No: OT71-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/09/08
Date Received: 12/11/08

Date Extracted: 04/08/09
Date Analyzed: 04/16/09 00:09
Instrument/Analyst: ECD5/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.2 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: 63.7%

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	4.0	< 4.0 U
53469-21-9	Aroclor 1242	4.0	< 4.0 U
12672-29-6	Aroclor 1248	4.0	< 4.0 U
11097-69-1	Aroclor 1254	4.0	< 4.0 U
11096-82-5	Aroclor 1260	4.0	< 4.0 U
11104-28-2	Aroclor 1221	12	< 12 Y
11141-16-5	Aroclor 1232	8.0	< 8.0 Y
37324-23-5	Aroclor 1262	4.0	< 4.0 U
11100-14-4	Aroclor 1268	4.0	< 4.0 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	73.2%
Tetrachlorometaxylene	70.2%

ANALYTICAL RESOURCES INCORPORATED

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

Sample ID: PGSS-62A
SAMPLE

Lab Sample ID: OT71D
LIMS ID: 09-8230
Matrix: Sediment
Data Release Authorized:
Reported: 04/17/09

QC Report No: OT71-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/09/08
Date Received: 12/11/08

Date Extracted: 04/08/09
Date Analyzed: 04/16/09 00:26
Instrument/Analyst: ECD5/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.4 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: 23.6%

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

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	76.0%
Tetrachlorometaxylene	70.8%

ANALYTICAL RESOURCES INCORPORATED

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

Sample ID: PGSS-62B
SAMPLE

Lab Sample ID: OT71E
LIMS ID: 09-8231
Matrix: Sediment
Data Release Authorized:
Reported: 04/17/09

QC Report No: OT71-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/09/08
Date Received: 12/11/08

Date Extracted: 04/08/09
Date Analyzed: 04/16/09 00:44
Instrument/Analyst: ECD5/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.6 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: 33.1%

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

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	79.0%
Tetrachlorometaxylene	76.8%

ANALYTICAL RESOURCES INCORPORATED

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

Sample ID: PGSS-63
SAMPLE

Lab Sample ID: OT71F
LIMS ID: 09-8232
Matrix: Sediment
Data Release Authorized:
Reported: 04/17/09

QC Report No: OT71-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/09/08
Date Received: 12/11/08

Date Extracted: 04/08/09
Date Analyzed: 04/16/09 01:35
Instrument/Analyst: ECD5/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.5 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: 34.9%

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

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	76.0%
Tetrachlorometaxylene	81.2%

ANALYTICAL RESOURCES INCORPORATED

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

Sample ID: PGSS-69
SAMPLE

Lab Sample ID: OT71G
LIMS ID: 09-8233
Matrix: Sediment
Data Release Authorized:
Reported: 04/17/09

QC Report No: OT71-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/09/08
Date Received: 12/11/08

Date Extracted: 04/08/09
Date Analyzed: 04/16/09 01:52
Instrument/Analyst: ECD5/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 26.1 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: 28.8%

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	3.8	< 3.8 U
53469-21-9	Aroclor 1242	3.8	< 3.8 U
12672-29-6	Aroclor 1248	3.8	< 3.8 U
11097-69-1	Aroclor 1254	3.8	< 3.8 U
11096-82-5	Aroclor 1260	3.8	< 3.8 U
11104-28-2	Aroclor 1221	3.8	< 3.8 U
11141-16-5	Aroclor 1232	3.8	< 3.8 U
37324-23-5	Aroclor 1262	3.8	< 3.8 U
11100-14-4	Aroclor 1268	3.8	< 3.8 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	76.5%
Tetrachlorometaxylene	71.2%

ANALYTICAL RESOURCES INCORPORATED

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

Sample ID: PGSS-70
SAMPLE

Lab Sample ID: OT71H
LIMS ID: 09-8234
Matrix: Sediment
Data Release Authorized:
Reported: 04/17/09

QC Report No: OT71-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/09/08
Date Received: 12/11/08

Date Extracted: 04/08/09
Date Analyzed: 04/16/09 02:09
Instrument/Analyst: ECD5/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.8 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: 29.6%

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

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	69.8%
Tetrachlorometaxylene	68.0%

ANALYTICAL RESOURCES INCORPORATED

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

Sample ID: PGSS-77
SAMPLE

Lab Sample ID: OT71I
LIMS ID: 09-8235
Matrix: Sediment
Data Release Authorized:
Reported: 04/17/09

QC Report No: OT71-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/09/08
Date Received: 12/11/08

Date Extracted: 04/08/09
Date Analyzed: 04/16/09 02:26
Instrument/Analyst: ECD5/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.9 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: 36.5%

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

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	76.5%
Tetrachlorometaxylene	71.8%

ANALYTICAL RESOURCES INCORPORATED

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

Sample ID: PGSS-83
SAMPLE

Lab Sample ID: OT71J
LIMS ID: 09-8236
Matrix: Sediment
Data Release Authorized:
Reported: 04/17/09

QC Report No: OT71-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/10/08
Date Received: 12/11/08

Date Extracted: 04/08/09
Date Analyzed: 04/16/09 02:43
Instrument/Analyst: ECD5/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.6 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: 24.8%

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

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	83.0%
Tetrachlorometaxylene	73.2%

ANALYTICAL RESOURCES INCORPORATED

SW8082/PCB SOIL/SEDIMENT SURROGATE RECOVERY SUMMARY

Matrix: Sediment

QC Report No: OT71-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014

Client ID	DCBP % REC	DCBP LCL-UCL	TCMX % REC	TCMX LCL-UCL	TOT OUT
PGSS-55	77.5%	33-149	67.8%	32-121	0
PGSS-56	83.8%	33-149	96.2%	32-121	0
PGSS-58	73.2%	33-149	70.2%	32-121	0
PGSS-62A	76.0%	33-149	70.8%	32-121	0
PGSS-62B	79.0%	33-149	76.8%	32-121	0
PGSS-63	76.0%	33-149	81.2%	32-121	0
PGSS-69	76.5%	33-149	71.2%	32-121	0
PGSS-70	69.8%	33-149	68.0%	32-121	0
PGSS-77	76.5%	33-149	71.8%	32-121	0
MB-040809	66.8%	36-130	66.5%	30-119	0
LCS-040809	67.0%	36-130	66.2%	30-119	0
LCSD-040809	68.2%	36-130	75.8%	30-119	0
PGSS-83	83.0%	33-149	73.2%	32-121	0
PGSS-83 MS	70.0%	33-149	68.0%	32-121	0
PGSS-83 MSD	76.8%	33-149	72.8%	32-121	0

Low Level PSDDA Control Limits
Prep Method: SW3550B
Log Number Range: 09-8227 to 09-8236

ANALYTICAL RESOURCES INCORPORATED

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

Sample ID: PGSS-83
MS/MSD

Lab Sample ID: OT71J
LIMS ID: 09-8236
Matrix: Sediment
Data Release Authorized:
Reported: 04/17/09

QC Report No: OT71-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/10/08
Date Received: 12/11/08

Date Extracted MS/MSD: 04/08/09

Date Analyzed MS: 04/16/09 03:00
MSD: 04/16/09 03:17
Instrument/Analyst MS: ECD5/JGR
MSD: ECD5/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount MS: 25.9 g-dry-wt
MSD: 25.9 g-dry-wt
Final Extract Volume MS: 1.0 mL
MSD: 1.0 mL
Dilution Factor MS: 1.00
MSD: 1.00
Silica Gel: No

Percent Moisture: 24.8%

Analyte	Sample	MS	Spike Added-MS	MS Recovery	MSD	Spike Added-MSD	MSD Recovery	RPD
Aroclor 1016	< 3.9 U	16.0	19.3	82.9%	15.7	19.3	81.3%	1.9%
Aroclor 1260	< 3.9 U	16.7	19.3	86.5%	18.0	19.3	93.3%	7.5%

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

ANALYTICAL RESOURCES INCORPORATED

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

Sample ID: PGSS-83
MATRIX SPIKE

Lab Sample ID: OT71J
LIMS ID: 09-8236
Matrix: Sediment
Data Release Authorized:
Reported: 04/17/09

QC Report No: OT71-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/10/08
Date Received: 12/11/08

Date Extracted: 04/08/09
Date Analyzed: 04/16/09 03:00
Instrument/Analyst: ECD5/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.9 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: 24.8%

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

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	70.0%
Tetrachlorometaxylene	68.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA PCB by GC/ECD

Sample ID: PGSS-83
MATRIX SPIKE DUP

Lab Sample ID: OT71J
LIMS ID: 09-8236
Matrix: Sediment
Data Release Authorized:
Reported: 04/17/09

QC Report No: OT71-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/10/08
Date Received: 12/11/08

Date Extracted: 04/08/09
Date Analyzed: 04/16/09 03:17
Instrument/Analyst: ECD5/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.9 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: 24.8%

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

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	76.8%
Tetrachlorometaxylene	72.8%

ANALYTICAL RESOURCES INCORPORATED

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

Sample ID: LCS-040809
LCS/LCSD

Lab Sample ID: LCS-040809
LIMS ID: 09-8236
Matrix: Sediment
Data Release Authorized:
Reported: 04/17/09

QC Report No: OT71-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: NA
Date Received: NA

Date Extracted LCS/LCSD: 04/08/09

Date Analyzed LCS: 04/15/09 23:01
LCSD: 04/15/09 23:18
Instrument/Analyst LCS: ECD5/JGR
LCSD: ECD5/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount LCS: 25.0 g-dry-wt
LCSD: 25.0 g-dry-wt
Final Extract Volume LCS: 1.0 mL
LCSD: 1.0 mL
Dilution Factor LCS: 1.00
LCSD: 1.00
Silica Gel: No

Percent Moisture: NA

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Aroclor 1016	15.9	20.0	79.5%	15.9	20.0	79.5%	0.0%
Aroclor 1260	17.1	20.0	85.5%	16.3	20.0	81.5%	4.8%

PCB Surrogate Recovery

	LCS	LCSD
Decachlorobiphenyl	67.0%	68.2%
Tetrachlorometaxylene	66.2%	75.8%

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

PCB METHOD BLANK SUMMARY

BLANK NO.

OT71MBS1

Lab Name: ANALYTICAL RESOURCES, INC — Client: HART CROWSER, INC.

ARI Job No.: OT71 — Project: PORT GAMBLE

Lab Sample ID: OT71MBS1 — Lab File ID: 0414B134

Date Extracted: 04/08/09 — Matrix: SOLID

Date Analyzed: 04/15/09 — Instrument ID: ECD5

Time Analyzed: 2244 — GC Columns: ZB5/ZB35

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

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED
01	OT71LCSS1	OT71LCSS1	04/15/09
02	OT71LCSDS1	OT71LCSDS1	04/15/09
03	PGSS-55	OT71A	04/15/09
04	PGSS-56	OT71B	04/15/09
05	PGSS-58	OT71C	04/16/09
06	PGSS-62A	OT71D	04/16/09
07	PGSS-62B	OT71E	04/16/09
08	PGSS-63	OT71F	04/16/09
09	PGSS-69	OT71G	04/16/09
10	PGSS-70	OT71H	04/16/09
11	PGSS-77	OT71I	04/16/09
12	PGSS-83	OT71J	04/16/09
13	PGSS-83 MS	OT71JMS	04/16/09
14	PGSS-83 MSD	OT71JMSD	04/16/09

ALL RUNS ARE DUAL COLUMN

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA PCB by GC/ECD

Sample ID: MB-040809
METHOD BLANK

Lab Sample ID: MB-040809
LIMS ID: 09-8236
Matrix: Sediment
Data Release Authorized:
Reported: 04/17/09

QC Report No: OT71-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: NA
Date Received: NA

Date Extracted: 04/08/09
Date Analyzed: 04/15/09 22:44
Instrument/Analyst: ECD5/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.0 g
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: NA

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

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	66.8%
Tetrachlorometaxylene	66.5%

METALS ANALYSIS

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: PGSS-55
SAMPLE

Lab Sample ID: OT71A
LIMS ID: 09-8227
Matrix: Sediment
Data Release Authorized:
Reported: 04/28/09

QC Report No: OT71-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/08/08
Date Received: 12/11/08

Percent Total Solids: 74.8%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	04/22/09	6010B	04/24/09	7440-38-2	Arsenic	7	7	U
3050B	04/22/09	6010B	04/24/09	**7440-43-9**	**Cadmium**	0.3	**0.5**	
3050B	04/22/09	6010B	04/24/09	**7440-47-3**	**Chromium**	0.7	**20.2**	
3050B	04/22/09	6010B	04/24/09	**7440-50-8**	**Copper**	0.3	**10.4**	
3050B	04/22/09	6010B	04/24/09	**7439-92-1**	**Lead**	3	**3**	
CLP	04/06/09	7471A	04/10/09	7439-97-6	Mercury	0.05	0.05	U
3050B	04/22/09	6010B	04/24/09	7440-22-4	Silver	0.4	0.4	U
3050B	04/22/09	6010B	04/24/09	**7440-66-6**	**Zinc**	1	**31**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: PGSS-56
SAMPLE

Lab Sample ID: OT71B
LIMS ID: 09-8228
Matrix: Sediment
Data Release Authorized:
Reported: 04/28/09

QC Report No: OT71-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/08/08
Date Received: 12/11/08

Percent Total Solids: 72.6%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	04/06/09	6010B	04/21/09	7440-38-2	Arsenic	7	7	U
3050B	04/06/09	6010B	04/21/09	**7440-43-9**	**Cadmium**	0.3	**0.4**	
3050B	04/06/09	6010B	04/21/09	**7440-47-3**	**Chromium**	0.7	**16.6**	
3050B	04/06/09	6010B	04/21/09	**7440-50-8**	**Copper**	0.3	**9.4**	
3050B	04/06/09	6010B	04/21/09	**7439-92-1**	**Lead**	3	**3**	
CLP	04/06/09	7471A	04/10/09	7439-97-6	Mercury	0.05	0.05	U
3050B	04/06/09	6010B	04/21/09	7440-22-4	Silver	0.4	0.4	U
3050B	04/06/09	6010B	04/21/09	**7440-66-6**	**Zinc**	1	**39**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: PGSS-58
SAMPLE

Lab Sample ID: OT71C
LIMS ID: 09-8229
Matrix: Sediment
Data Release Authorized:
Reported: 04/28/09

QC Report No: OT71-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/09/08
Date Received: 12/11/08

Percent Total Solids: 37.0%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	04/06/09	6010B	04/21/09	7440-38-2	Arsenic	10	10	U
3050B	04/06/09	6010B	04/21/09	**7440-43-9**	**Cadmium**	0.5	**1.4**	
3050B	04/06/09	6010B	04/21/09	**7440-47-3**	**Chromium**	1	**41**	
3050B	04/06/09	6010B	04/21/09	**7440-50-8**	**Copper**	0.5	**32.9**	
3050B	04/06/09	6010B	04/21/09	**7439-92-1**	**Lead**	5	**12**	
CLP	04/06/09	7471A	04/10/09	**7439-97-6**	**Mercury**	0.1	**0.1**	
3050B	04/06/09	6010B	04/21/09	7440-22-4	Silver	0.8	0.8	U
3050B	04/06/09	6010B	04/21/09	**7440-66-6**	**Zinc**	3	**91**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: PGSS-62A
SAMPLE

Lab Sample ID: OT71D
LIMS ID: 09-8230
Matrix: Sediment
Data Release Authorized:
Reported: 04/28/09

QC Report No: OT71-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/09/08
Date Received: 12/11/08

Percent Total Solids: 75.4%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	04/06/09	6010B	04/21/09	7440-38-2	Arsenic	6	6	U
3050B	04/06/09	6010B	04/21/09	7440-43-9	Cadmium	0.3	0.3	U
3050B	04/06/09	6010B	04/21/09	**7440-47-3**	**Chromium**	0.6	**22.1**	
3050B	04/06/09	6010B	04/21/09	**7440-50-8**	**Copper**	0.3	**13.3**	
3050B	04/06/09	6010B	04/21/09	**7439-92-1**	**Lead**	3	**3**	
CLP	04/06/09	7471A	04/10/09	7439-97-6	Mercury	0.05	0.05	U
3050B	04/06/09	6010B	04/21/09	7440-22-4	Silver	0.4	0.4	U
3050B	04/06/09	6010B	04/21/09	**7440-66-6**	**Zinc**	1	**49**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: PGSS-62B
SAMPLE

Lab Sample ID: OT71E
LIMS ID: 09-8231
Matrix: Sediment
Data Release Authorized:
Reported: 04/28/09

QC Report No: OT71-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/09/08
Date Received: 12/11/08

Percent Total Solids: 67.9%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	04/06/09	6010B	04/21/09	7440-38-2	Arsenic	7	7	U
3050B	04/06/09	6010B	04/21/09	**7440-43-9**	**Cadmium**	0.3	**0.7**	
3050B	04/06/09	6010B	04/21/09	**7440-47-3**	**Chromium**	0.7	**19.9**	
3050B	04/06/09	6010B	04/21/09	**7440-50-8**	**Copper**	0.3	**11.7**	
3050B	04/06/09	6010B	04/21/09	**7439-92-1**	**Lead**	3	**4**	
CLP	04/06/09	7471A	04/10/09	**7439-97-6**	**Mercury**	0.05	**0.05**	
3050B	04/06/09	6010B	04/21/09	7440-22-4	Silver	0.4	0.4	U
3050B	04/06/09	6010B	04/21/09	**7440-66-6**	**Zinc**	1	**45**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: PGSS-63
SAMPLE

Lab Sample ID: OT71F
LIMS ID: 09-8232
Matrix: Sediment
Data Release Authorized:
Reported: 04/28/09

QC Report No: OT71-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/09/08
Date Received: 12/11/08

Percent Total Solids: 67.9%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	04/06/09	6010B	04/21/09	7440-38-2	Arsenic	7	7	U
3050B	04/06/09	6010B	04/21/09	**7440-43-9**	**Cadmium**	0.3	**0.4**	
3050B	04/06/09	6010B	04/21/09	**7440-47-3**	**Chromium**	0.7	**27.2**	
3050B	04/06/09	6010B	04/21/09	**7440-50-8**	**Copper**	0.3	**14.6**	
3050B	04/06/09	6010B	04/21/09	**7439-92-1**	**Lead**	3	**5**	
CLP	04/06/09	7471A	04/10/09	7439-97-6	Mercury	0.06	0.06	U
3050B	04/06/09	6010B	04/21/09	7440-22-4	Silver	0.4	0.4	U
3050B	04/06/09	6010B	04/21/09	**7440-66-6**	**Zinc**	1	**50**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: PGSS-69
SAMPLE

Lab Sample ID: OT71G
LIMS ID: 09-8233
Matrix: Sediment
Data Release Authorized:
Reported: 04/28/09

QC Report No: OT71-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/09/08
Date Received: 12/11/08

Percent Total Solids: 71.8%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	04/06/09	6010B	04/21/09	7440-38-2	Arsenic	6	6	U
3050B	04/06/09	6010B	04/21/09	**7440-43-9**	**Cadmium**	0.3	**0.6**	
3050B	04/06/09	6010B	04/21/09	**7440-47-3**	**Chromium**	0.6	**16.2**	
3050B	04/06/09	6010B	04/21/09	**7440-50-8**	**Copper**	0.3	**8.3**	
3050B	04/06/09	6010B	04/21/09	7439-92-1	Lead	3	3	U
CLP	04/06/09	7471A	04/10/09	7439-97-6	Mercury	0.05	0.05	U
3050B	04/06/09	6010B	04/21/09	7440-22-4	Silver	0.4	0.4	U
3050B	04/06/09	6010B	04/21/09	**7440-66-6**	**Zinc**	1	**38**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: PGSS-70
SAMPLE

Lab Sample ID: OT71H
LIMS ID: 09-8234
Matrix: Sediment
Data Release Authorized:
Reported: 04/28/09

QC Report No: OT71-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/09/08
Date Received: 12/11/08

Percent Total Solids: 72.8%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	04/06/09	6010B	04/21/09	7440-38-2	Arsenic	7	7	U
3050B	04/06/09	6010B	04/21/09	**7440-43-9**	**Cadmium**	0.3	**0.4**	
3050B	04/06/09	6010B	04/21/09	**7440-47-3**	**Chromium**	0.7	**20.3**	
3050B	04/06/09	6010B	04/21/09	**7440-50-8**	**Copper**	0.3	**11.0**	
3050B	04/06/09	6010B	04/21/09	**7439-92-1**	**Lead**	3	**6**	
CLP	04/06/09	7471A	04/10/09	7439-97-6	Mercury	0.06	0.06	U
3050B	04/06/09	6010B	04/21/09	7440-22-4	Silver	0.4	0.4	U
3050B	04/06/09	6010B	04/21/09	**7440-66-6**	**Zinc**	1	**47**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: PGSS-77
SAMPLE

Lab Sample ID: OT71I
LIMS ID: 09-8235
Matrix: Sediment
Data Release Authorized:
Reported: 04/28/09

QC Report No: OT71-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/09/08
Date Received: 12/11/08

Percent Total Solids: 66.7%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	04/06/09	6010B	04/21/09	7440-38-2	Arsenic	7	7	U
3050B	04/06/09	6010B	04/21/09	**7440-43-9**	**Cadmium**	0.3	**0.5**	
3050B	04/06/09	6010B	04/21/09	**7440-47-3**	**Chromium**	0.7	**22.1**	
3050B	04/06/09	6010B	04/21/09	**7440-50-8**	**Copper**	0.3	**12.9**	
3050B	04/06/09	6010B	04/21/09	**7439-92-1**	**Lead**	3	**5**	
CLP	04/06/09	7471A	04/10/09	**7439-97-6**	**Mercury**	0.05	**0.05**	
3050B	04/06/09	6010B	04/21/09	7440-22-4	Silver	0.4	0.4	U
3050B	04/06/09	6010B	04/21/09	**7440-66-6**	**Zinc**	1	**42**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: PGSS-83
SAMPLE

Lab Sample ID: OT71J
LIMS ID: 09-8236
Matrix: Sediment
Data Release Authorized:
Reported: 04/28/09

QC Report No: OT71-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/10/08
Date Received: 12/11/08

Percent Total Solids: 77.1%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	04/06/09	6010B	04/21/09	7440-38-2	Arsenic	6	6	U
3050B	04/06/09	6010B	04/21/09	**7440-43-9**	**Cadmium**	0.2	**0.3**	
3050B	04/06/09	6010B	04/21/09	**7440-47-3**	**Chromium**	0.6	**21.4**	
3050B	04/06/09	6010B	04/21/09	**7440-50-8**	**Copper**	0.2	**11.5**	
3050B	04/06/09	6010B	04/21/09	**7439-92-1**	**Lead**	2	**3**	
CLP	04/06/09	7471A	04/10/09	7439-97-6	Mercury	0.06	0.06	U
3050B	04/06/09	6010B	04/21/09	7440-22-4	Silver	0.4	0.4	U
3050B	04/06/09	6010B	04/21/09	**7440-66-6**	**Zinc**	1	**46**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: PGSS-55
MATRIX SPIKE

Lab Sample ID: OT71A
LIMS ID: 09-8227
Matrix: Sediment
Data Release Authorized:
Reported: 04/28/09

QC Report No: OT71-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/08/08
Date Received: 12/11/08

MATRIX SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Spike	Spike Added	% Recovery	Q
Arsenic	6010B	7 U	238	261	91.2%	
Cadmium	6010B	0.5	58.6	65.2	89.1%	
Chromium	6010B	20.2	77.4	65.2	87.7%	
Copper	6010B	10.4	71.7	65.2	94.0%	
Lead	6010B	3	225	261	85.1%	
Mercury	7471A	0.05 U	0.57	0.508	112%	
Silver	6010B	0.4 U	56.1	65.2	86.0%	
Zinc	6010B	31	90	65.2	90.5%	

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%

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: PGSS-55
DUPLICATE

Lab Sample ID: OT71A
LIMS ID: 09-8227
Matrix: Sediment
Data Release Authorized:
Reported: 04/28/09

QC Report No: OT71-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: 12/08/08
Date Received: 12/11/08

MATRIX DUPLICATE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Duplicate	RPD	Control Limit	Q
Arsenic	6010B	7 U	7 U	0.0%	+/- 7	L
Cadmium	6010B	0.5	0.4	22.2%	+/- 0.3	L
Chromium	6010B	20.2	18.2	10.4%	+/- 20%	
Copper	6010B	10.4	9.4	10.1%	+/- 20%	
Lead	6010B	3	3 U	0.0%	+/- 3	L
Mercury	7471A	0.05 U	0.05	0.0%	+/- 0.05	L
Silver	6010B	0.4 U	0.4 U	0.0%	+/- 0.4	L
Zinc	6010B	31	29	6.7%	+/- 20%	

Reported in mg/kg-dry

*-Control Limit Not Met
L-RPD Invalid, Limit = Detection Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: LAB CONTROL

Lab Sample ID: OT71LCS
LIMS ID: 09-8227
Matrix: Sediment
Data Release Authorized:
Reported: 04/28/09

QC Report No: OT71-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: NA
Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike Found	Spike Added	% Recovery	Q
Arsenic	6010B	198	200	99.0%	
Cadmium	6010B	49.5	50.0	99.0%	
Chromium	6010B	50.7	50.0	101%	
Copper	6010B	49.7	50.0	99.4%	
Lead	6010B	198	200	99.0%	
Silver	6010B	47.6	50.0	95.2%	
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%

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: LAB CONTROL

Lab Sample ID: OT71LCS
LIMS ID: 09-8228
Matrix: Sediment
Data Release Authorized:
Reported: 04/28/09

QC Report No: OT71-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: NA
Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike Found	Spike Added	% Recovery	Q
Arsenic	6010B	208	200	104%	
Cadmium	6010B	53.3	50.0	107%	
Chromium	6010B	50.4	50.0	101%	
Copper	6010B	52.3	50.0	105%	
Lead	6010B	211	200	106%	
Mercury	7471A	1.02	1.00	102%	
Silver	6010B	47.8	50.0	95.6%	
Zinc	6010B	58	50	116%	

Reported in mg/kg-dry

N-Control limit not met
NA-Not Applicable, Analyte Not Spiked
Control Limits: 80-120%

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS **Sample ID: METHOD BLANK**

Lab Sample ID: OT71MB
LIMS ID: 09-8227
Matrix: Sediment
Data Release Authorized:
Reported: 04/28/09

QC Report No: OT71-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: NA
Date Received: NA

Percent Total Solids: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	04/22/09	6010B	04/24/09	7440-38-2	Arsenic	5	5	U
3050B	04/22/09	6010B	04/24/09	7440-43-9	Cadmium	0.2	0.2	U
3050B	04/22/09	6010B	04/24/09	7440-47-3	Chromium	0.5	0.5	U
3050B	04/22/09	6010B	04/24/09	7440-50-8	Copper	0.2	0.2	U
3050B	04/22/09	6010B	04/24/09	7439-92-1	Lead	2	2	U
3050B	04/22/09	6010B	04/24/09	7440-22-4	Silver	0.3	0.3	U
3050B	04/22/09	6010B	04/24/09	**7440-66-6**	**Zinc**	1	**3**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS **Sample ID: METHOD BLANK**

Lab Sample ID: OT71MB
LIMS ID: 09-8228
Matrix: Sediment
Data Release Authorized:
Reported: 04/28/09

QC Report No: OT71-Hart Crowser, Inc.
Project: PORT GAMBLE
1733014
Date Sampled: NA
Date Received: NA

Percent Total Solids: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	04/06/09	6010B	04/21/09	7440-38-2	Arsenic	5	5	U
3050B	04/06/09	6010B	04/21/09	7440-43-9	Cadmium	0.2	0.2	U
3050B	04/06/09	6010B	04/21/09	7440-47-3	Chromium	0.5	0.5	U
3050B	04/06/09	6010B	04/21/09	7440-50-8	Copper	0.2	0.2	U
3050B	04/06/09	6010B	04/21/09	7439-92-1	Lead	2	2	U
CLP	04/06/09	7471A	04/10/09	7439-97-6	Mercury	0.05	0.05	U
3050B	04/06/09	6010B	04/21/09	7440-22-4	Silver	0.3	0.3	U
3050B	04/06/09	6010B	04/21/09	**7440-66-6**	**Zinc**	1	**2**	

U-Analyte undetected at given RL
RL-Reporting Limit

TOTAL SOLIDS

Extractions Total Solids-extts
Data By: Woo suk Chang
Created: 4/ 3/09

Worklist: 610
Analyst: RVR
Comments:

	ARI ID CLIENT ID	Tare Wt (g)	Wet Wt (g)	Dry Wt (g)	% Solids	pH
1.	OT71A 09-8227 PGSS-55	1.14	11.78	8.96	73.5	NR
2.	OT71B 09-8228 PGSS-56	1.16	12.27	9.00	70.6	NR
3.	OT71C 09-8229 PGSS-58	1.16	11.28	4.83	36.3	NR
4.	OT71D 09-8230 PGSS-62A	1.16	11.76	9.26	76.4	NR
5.	OT71E 09-8231 PGSS-62B	1.14	11.16	7.84	66.9	NR
6.	OT71F 09-8232 PGSS-63	1.18	12.08	8.28	65.1	NR
7.	OT71G 09-8233 PGSS-69	1.16	12.10	8.95	71.2	NR
8.	OT71H 09-8234 PGSS-70	1.18	11.44	8.40	70.4	NR
9.	OT71I 09-8235 PGSS-77	1.16	11.42	7.68	63.5	NR
10.	OT71J 09-8236 PGSS-83	1.14	12.24	9.49	75.2	NR

Solids Data Entry Report Checked by: DM Date: 4/1/09
Date: 04/07/09 Data Analyst: MH

Solids Determination performed on 04/06/09 by DM

JOB	SAMPLE	CLIENTID	TAREWEIGHT	SAMPDISH	DRYWEIGHT	SOLIDS
OT71	A	PGSS-55	0.987	10.139	7.832	74.79
OT71	B	PGSS-56	1.010	10.887	8.185	72.64
OT71	C	PGSS-58	0.988	10.143	4.374	36.99
OT71	D	PGSS-62A	1.006	10.424	8.102	75.35
OT71	E	PGSS-62B	0.969	10.091	7.164	67.91
OT71	F	PGSS-63	0.999	10.376	7.370	67.94
OT71	G	PGSS-69	0.967	10.084	7.510	71.77
OT71	H	PGSS-70	0.981	10.717	8.064	72.75
OT71	I	PGSS-77	1.010	10.915	7.617	66.70
OT71	J	PGSS-83	0.999	10.211	8.098	77.06

Analytical Resources, Incorporated
Analytical Chemists and Consultants

April 24, 2009

Mr. Roger McGinnis
Hart Crowser, Inc.
1700 Westlake Avenue North Suite 200
Seattle, WA 98109-3056

RE: Project: Port Gamble, 17330-14
ARI Job No.: OV87

Dear Mr. McGinnis:

Please find enclosed the original Chain-of-Custody (COC) records, sample receipt documentation, and the final data package for the samples from the project referenced above.

The samples were analyzed for PCBs, SVOCs and Total Metals, as requested.

Sample receipt and details of these analyses are discussed in the Case Narrative.

An electronic copy of this data package and the supporting data 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.

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

Enclosures

cc: files OV87

KB/kb

Chain of Custody
Documentation

prepared
for

Hart Crowser, Inc.

Project: PORT GAMBLE, 17330-14

ARI JOB NO: OV87

prepared
by

Analytical Resources, Inc.

Sample Custody Record

1 OF 2

Samples Shipped to: ARI

HARTCROWSER

Hart Crowser, Inc.
1910 Fairview Avenue East
Seattle, Washington 98102-3699
Phone: 206-324-9530 FAX: 206-328-5581

JOB 17330-14 LAB NUMBER

PROJECT NAME PORT GAMBLE

HART CROWSER CONTACT ROGER MCGINNIS

SAMPLED BY: CFR, CWU

LAB NO.	SAMPLE ID	DESCRIPTION	DATE	TIME	MATRIX	SMS Metals*	SVOCs**	PCBs	Ammonia	Total Volatile Solids	TOC	Total Sulfides	Dioxins/Furans	Grain Size	Microtox	Bioassay	NO. OF CONTAINERS	OBSERVATIONS/COMMENTS/ COMPOSITING INSTRUCTIONS
PGSS-8		SEDIMENT	12/4/08	955	SEDIMENT				X	X	X	X						LOW VOLUME
PGSS-14A			12/4/08	1040														LOW VOLUME
PGSS-15				1112														LOW VOLUME
PGSS-16				1145														LOW VOLUME
PGSS-18				1255														LOW VOLUME
PGSS-20				1320														LOW VOLUME
PGSS-22				1348														LOW VOLUME
PGSS-21B				1415														
PGSS-21A				1520														
PGSS-29				1550														
PGSS-29A				1620														
PGSS-30			12/5/08	807														

RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE	12/8/08	SIGNATURE	12/8/08
PRINT NAME Eileen Rust	TIME	PRINT NAME A. Volgardsen	TIME
COMPANY HC	1400	COMPANY ARI	1400
RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE	TIME	SIGNATURE	TIME
PRINT NAME		PRINT NAME	
COMPANY		COMPANY	

SPECIAL SHIPMENT HANDLING OR STORAGE REQUIREMENTS:
LOW VOLUME, LAB NEEDS TO MODIFY SAMPLE VOLUMES FOR PGSS-8, 14A, 15, 16, 18, 20, 22.

* ARSENIC, CADMIUM, CHROMIUM, COPPER, LEAD, MERCURY, NICKEL, SILVER, ZINC.

TOTAL NUMBER OF CONTAINERS

SAMPLE RECEIPT INFORMATION
CUSTODY SEALS: ☐ YES ☐ NO ☐ N/A
GOOD CONDITION: ☐ YES ☐ NO
TEMPERATURE
SHIPMENT METHOD: ☐ HAND ☐ COURIER ☐ OVERNIGHT

COOLER NO.: STORAGE LOCATION:

See Lab Work Order No. _____
for Other Contract Requirements

TURNAROUND TIME:
☐ 24 HOURS ☐ 1 WEEK
☐ 48 HOURS ☒ STANDARD
☐ 72 HOURS OTHER _____

White and Yellow Copies to Lab — Pink to Project Manager — Lab to Return White Copy to Hart Crowser — Gold to Sample Custodian

Sample Custody Record

0D15

Samples Shipped to: ARI

2 of 2

HARTCROWSER

Hart Crowser, Inc.
1910 Fairview Avenue East
Seattle, Washington 98102-3699
Phone: 206-324-9530 FAX: 206-328-5581

JOB 17330-14 LAB NUMBER ______

PROJECT NAME Port Gamble

HART CROWSER CONTACT Roger McGinnis

SAMPLED BY: CFR/CWU

REQUESTED ANALYSIS

LAB NO.	SAMPLE ID	DESCRIPTION	DATE	TIME	MATRIX	SMS Metals*	SVOCs **	PCBs	Ammonia	TVS	TOC	Total Sulfides	Dioxin/Furans	Grain Size	Microtox	Bioassay			NO. OF CONTAINERS	OBSERVATIONS/COMMENTS/ COMPOSITING INSTRUCTIONS
P6SS	-31	Sediment	12/5/08	850	Sediment				X	X	X	X								
P6SS	-33			920					↓	↓	↓	↓								
P6SS	-35			1020					↓	↓	↓	↓								
P6SS	-38			1045					↓	↓	↓	↓								
P6SS	-38A			1120					↓	↓	↓	↓								
P6SS	-39			1245					↓	↓	↓	↓								
P6SS	-40			1310					↓	↓	↓	↓								
P6SS	-42			1345					↓	↓	↓	↓								
P6SS	-44			1410					↓	↓	↓	↓								

RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE [signature]	12/8/08	SIGNATURE [signature]	12/8/08
PRINT NAME Colleen Rust	TIME 1400	PRINT NAME A. Volgardsen	TIME 1400
COMPANY HC		COMPANY ARI	

RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE		SIGNATURE	
PRINT NAME	TIME	PRINT NAME	TIME
COMPANY		COMPANY	

SPECIAL SHIPMENT HANDLING OR STORAGE REQUIREMENTS:
** SVOCs will include SMS SVOCs, Guaicol, Retene, + Resin Acids.

COOLER NO.: STORAGE LOCATION:

See Lab Work Order No. ______ for Other Contract Requirements

TOTAL NUMBER OF CONTAINERS

SAMPLE RECEIPT INFORMATION
CUSTODY SEALS: ☐ YES ☐ NO ☐ N/A
GOOD CONDITION: ☐ YES ☐ NO
TEMPERATURE: ______
SHIPMENT METHOD: ☐ HAND ☐ COURIER ☐ OVERNIGHT

TURNAROUND TIME:
☐ 24 HOURS ☐ 1 WEEK
☐ 48 HOURS ☒ STANDARD
☐ 72 HOURS OTHER ______

White and Yellow Copies to Lab Pink to Project Manager Lab to Return White Copy to Hart Crowser Gold to Sample Custodian

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: HC Project Name: Port Gamble

COC No: NA Delivered by: Hand

Assigned ARI Job No: OD15 Tracking No: NA

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

Record cooler temperature (recommended 2.0-6.0 °C for chemistry 0.2, 1.2, 2.0, 7.6, 7.6, 1.6, 5.2, 5.4, 1.2, 2.4, 1.0 °C

Cooler Accepted by: JH Date: 12/8/08 Time: 14:00

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? Ice

Was sufficient ice used (if appropriate)? (YES) NO

Were all bottles sealed in individual plastic bags? (YES) ~~NO~~

Did all bottle arrive in good condition (unbroken)? (YES) NO

Were all bottle labels complete and legible? (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 checklist) YES (NO)

Were all VOC vials free of air bubbles? (NA) YES NO

Was sufficient amount of sample sent in each bottle? (YES) NO

Samples Logged by: JH Date: 12/8/08 Time: 1600

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

Explain discrepancies or negative responses:

By: Date:

Case Narrative

prepared
for

Hart Crowser, Inc.

Project: PORT GAMBLE, 17330-14

ARI JOB NO: OV87

prepared
by

Analytical Resources, Inc.

Case Narrative
Hart Crowser
Port Gamble, 17330-14
ARI Job: OV87
April 24, 2009

Sample Receipt

Analytical Resources Inc. (ARI) accepted several sediment samples in good condition on December 8, 2008 under the ARI job number OD15. The cooler temperatures measured by IR thermometer following ARI SOP ranged between 0.2 and 7.6°C and the samples were well iced. Please note that several sample containers were archived up receipt as requested on the COCs. All samples were frozen to protect holding times. For further detail regarding sample receipt, please refer to the Cooer Receipt Form.

SVOCs by Method 8270D:

The samples were extracted on 4/17/09 and analyzed on 4/20/09 and 4/21/09 within the method recommended holding times for frozen samples.

Initial calibration(s): All compounds of interest were within method acceptance criteria.

Continuing calibration(s): Several compounds were out of control low for the 4/21/09 and 4/20/09 CCALs. No further corrective action was taken.

Samples: There were no anomalies associated with these samples.

Surrogates: The surrogate TBP is out of control high for the LCS. The LCSD and all other surrogate recoveries are in control; therefore no further corrective action was taken.

LCS/LCSD(s): The LCSD is out of control low for Benzyl Alcohol with wide RPDs. All other QC is in control and no further corrective action was taken.

Method Blank: The method blank was free of contamination.

PCBs by Method 8082:

The samples were extracted on 4/17/09 and analyzed on 4/21/09 within the method recommended holding times for frozen samples.

Initial calibration(s): All compounds of interest were within method acceptance criteria.

Continuing calibration(s): Are in control.

Samples: There were no anomalies associated with these samples.

Surrogates: The surrogate DCBP is out of control low for sample **PGSS-35**. No further corrective action was taken.

Case Narrative
Hart Crowser
Port Gamble, 17330-14
ARI Job: OV87
April 24, 2009

LCS/LCSD(s): Are in control.

Method Blank: The method blank was free of contamination.

Total Metals 6010 and 7000 Series:

The samples were digested on 4/17/09 and analyzed between 4/17/09 and 4/21/09 within the method recommended holding times for frozen samples with the exception of mercury.

Initial calibration(s): All compounds of interest were within method acceptance criteria.

Continuing calibration(s): Are in control.

Samples: There were no anomalies associated with these samples.

LCS: Is in control.

Method Blank: The method blanks were free of contamination.

Data Reporting Qualifiers

Effective 12/28/04

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 ≥ 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

NR Spiked compound recovery is not reported due to chromatographic interference

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.

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

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.

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 ≥40% RPD with no obvious chromatographic interference

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

LCS SOLUTIONS

03/31/09

LABEL	SOLN ID	TEST	CONC. UG/ML	SOLVENT	EXP.
1	1549-3	PCB	20	ACETONE	10/10/09
2#	1472-3	BCOC PEST	10	ACETONE	07/20/08
3	1579-3	PEST	02/04/20	ACETONE	09/23/09
4	1576-3	LOW PEST	0.2/0.4/2	ACETONE	07/31/09
5	1580-2	EPH	1500	MECL2	01/29/10
6	1559-2	PCP	12.5/125	ACETONE	11/05/09
7	1589-1	ABN	100	ACETONE	03/09/10
8	1566-1	TBT	2.5	MECL2	12/04/09
9	1567-3	PORE TBT	.125/.25	MECL2	12/04/09
10	1578-3	ABN ACID	100/200	MEOH	10/21/09
11	1591-1	TPHD	15000	ACETONE	03/26/10
12	1583-1	ABN BASE	200	ACETONE	02/05/10
13	1573-2	LOW PCB	2	ACETONE	10/10/09
14	1547-1	LOW ABN ACID	10/20	MEOH	04/10/09
15	1591-3	SIM PNA	15/75	MEOH	08/28/09
16*	1502-2	DIOXANE	100	MEOH	02/26/10
17	1516-2	1248 PCB	20	ACETONE	05/07/09
18	1591-4	LOW SIM PNA	1.5	ACETONE	08/28/09
19	1574-4	AK103	7500	MECL2	12/02/09
20	1572-2	PNA	100	ACETONE	12/26/09
21	1593-3	SKY/BHT	100	MEOH	03/31/10
22	1570-1	HERB	12.5/12500	MEOH	12/22/09
23	1505-1	LOW ABN BASE	20	MEOH	03/20/09
24	1573-4	LOW ABN	10	ACETONE	08/01/09
25#	1481-1	DIPHENYL	100	MEOH	07/20/08
26*	1545-2	OP-PEST	25	MEOH	02/16/10
27#	1495-1	STEROLS	200	MEOH	12/29/08
28#	1494-1	ADD. PEST	4	ACETONE	01/23/09
29#	1496-3	DECANES	100	MEOH	02/12/09
30#	1497-2	EDB/DBCP	2	ACETONE	02/12/09
31	1510-3	TERPINEOL	100	MEOH	03/21/09

LCS SOLUTIONS

03/31/09

32	1576-2	GUAIACOL	50-200	ACETONE	06/05/09
33	1522-1	RESIN ACID	250	ACETONE	06/11/09
34	1530-2	CONGENERS	1	ACETONE	07/23/09
50	1571-1	FULL RESIN	250	ACETONE	06/10/09
*=REVERIFIED SOLUTION					
#=PROJECT SPECIFIC					

SURR SOLUTIONS

03/31/09

LABEL	SOLN ID	TEST	CONC. UG/ML	SOLVENT	EXP.
A	1584-5	ABN	100/150	MEOH	02/18/10
B	1572-1	SIM PNA	15/75	MEOH	08/28/09
C	1559-1	SIM ABN	25/37.5	MEOH	03/13/09
D	1573-3	LOW PCB	0.2	ACETONE	07/31/09
E*	1478-1	HERB	62.5	MEOH	09/21/09
F	1574-3	PCP	12.5	ACETONE	01/06/10
G*	1534-1	1,4DIOXANE	100	MEOH	02/26/10
H*	1545-1	OP-PEST	25	MEOH	02/16/10
I	1559-4	LOW S. PNA	1.5	MEOH	08/28/09
J	1566-5	TBT-PORE	0.125	MECL2	12/04/09
K	1538-1	MED PCB	20	ACETONE	07/31/09
L	1584-4	TBT	2.5	MECL2	12/04/09
M	1578-1	EPH	1500	MECL2	12/09/09
N	1538-2	PCB	2	ACETONE	07/31/09
O	1567-4	TPH	450	MECL2	09/24/09
P	1560-3	HCID	2250	MECL2	09/24/09
Q	1497-3	EDB	2	ACETONE	02/12/09
R	1521-4	RESIN ACID	250	ACETONE	06/11/09
S	1568-5	PBDE	.25	MEOH	12/11/09
T	*reverified solution				
U					
V					
W					
X					
Y					
Z					

Data Summary Package

prepared
for

Hart Crowser, Inc.

Project: PORT GAMBLE, 17330-14

ARI JOB NO: OV87

prepared
by

Analytical Resources, Inc.

SEMIVOLATILE ANALYSIS

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS **Sample ID: PGSS-33**
Page 1 of 2 **SAMPLE**

Lab Sample ID: OV87A
LIMS ID: 09-9558
Matrix: Sediment
Data Release Authorized:
Reported: 04/23/09

QC Report No: OV87-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/05/08
Date Received: 12/08/08

Date Extracted: 04/17/09
Date Analyzed: 04/20/09 15:33
Instrument/Analyst: NT4/LJR
GPC Cleanup: No

Sample Amount: 25.2 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 57.5%

CAS Number	Analyte	RL	Result
108-95-2	Phenol	20	< 20 U
541-73-1	1,3-Dichlorobenzene	20	< 20 U
106-46-7	1,4-Dichlorobenzene	20	< 20 U
100-51-6	Benzyl Alcohol	20	< 20 U
95-50-1	1,2-Dichlorobenzene	20	< 20 U
95-48-7	2-Methylphenol	20	< 20 U
106-44-5	4-Methylphenol	20	< 20 U
105-67-9	2,4-Dimethylphenol	20	< 20 U
65-85-0	**Benzoic Acid**	**200**	**180 J**
120-82-1	1,2,4-Trichlorobenzene	20	< 20 U
91-20-3	Naphthalene	20	< 20 U
87-68-3	Hexachlorobutadiene	20	< 20 U
91-57-6	2-Methylnaphthalene	20	< 20 U
131-11-3	Dimethylphthalate	20	< 20 U
208-96-8	Acenaphthylene	20	< 20 U
83-32-9	Acenaphthene	20	< 20 U
132-64-9	Dibenzofuran	20	< 20 U
84-66-2	Diethylphthalate	20	< 20 U
86-73-7	Fluorene	20	< 20 U
86-30-6	N-Nitrosodiphenylamine	20	< 20 U
118-74-1	Hexachlorobenzene	20	< 20 U
87-86-5	Pentachlorophenol	99	< 99 U
85-01-8	**Phenanthrene**	**20**	**33**
120-12-7	**Anthracene**	**20**	**29**
84-74-2	Di-n-Butylphthalate	20	< 20 U
206-44-0	**Fluoranthene**	**20**	**32**
129-00-0	**Pyrene**	**20**	**26**
85-68-7	Butylbenzylphthalate	20	< 20 U
56-55-3	**Benzo(a)anthracene**	**20**	**21**
117-81-7	**bis(2-Ethylhexyl)phthalate**	**20**	**18 J**
218-01-9	**Chrysene**	**20**	**38**
117-84-0	Di-n-Octyl phthalate	20	< 20 U
205-99-2	**Benzo(b)fluoranthene**	**20**	**26**
207-08-9	**Benzo(k)fluoranthene**	**20**	**23**
50-32-8	**Benzo(a)pyrene**	**20**	**21**
193-39-5	**Indeno(1,2,3-cd)pyrene**	**20**	**10 J**
53-70-3	Dibenz(a,h)anthracene	20	< 20 U
191-24-2	**Benzo(g,h,i)perylene**	**20**	**12 J**
90-05-1	Guaiacol	20	< 20 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: PGSS-33
SAMPLE

Lab Sample ID: OV87A
LIMS ID: 09-9558
Matrix: Sediment
Date Analyzed: 04/20/09 15:33

QC Report No: OV87-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14

CAS Number	Analyte	RL	Result
483-65-8	Retene	20	< 20 U
90-12-0	1-Methylnaphthalene	20	< 20 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	53.2%	2-Fluorobiphenyl	65.6%
d14-p-Terphenyl	62.4%	d4-1,2-Dichlorobenzene	45.2%
d5-Phenol	69.3%	2-Fluorophenol	61.9%
2,4,6-Tribromophenol	84.8%	d4-2-Chlorophenol	66.1%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: PGSS-35
SAMPLE

Lab Sample ID: OV87B
LIMS ID: 09-9559
Matrix: Sediment
Data Release Authorized:
Reported: 04/23/09

QC Report No: OV87-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/05/08
Date Received: 12/08/08

Date Extracted: 04/17/09
Date Analyzed: 04/20/09 16:08
Instrument/Analyst: NT4/LJR
GPC Cleanup: No

Sample Amount: 25.2 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 65.6%

CAS Number	Analyte	RL	Result
108-95-2	Phenol	20	< 20 U
541-73-1	1,3-Dichlorobenzene	20	< 20 U
106-46-7	1,4-Dichlorobenzene	20	< 20 U
100-51-6	Benzyl Alcohol	20	< 20 U
95-50-1	1,2-Dichlorobenzene	20	< 20 U
95-48-7	2-Methylphenol	20	< 20 U
106-44-5	4-Methylphenol	20	< 20 U
105-67-9	2,4-Dimethylphenol	20	< 20 U
65-85-0	Benzoic Acid	200	< 200 U
120-82-1	1,2,4-Trichlorobenzene	20	< 20 U
91-20-3	Naphthalene	20	< 20 U
87-68-3	Hexachlorobutadiene	20	< 20 U
91-57-6	2-Methylnaphthalene	20	< 20 U
131-11-3	Dimethylphthalate	20	< 20 U
208-96-8	Acenaphthylene	20	< 20 U
83-32-9	Acenaphthene	20	< 20 U
132-64-9	Dibenzofuran	20	< 20 U
84-66-2	Diethylphthalate	20	< 20 U
86-73-7	Fluorene	20	< 20 U
86-30-6	N-Nitrosodiphenylamine	20	< 20 U
118-74-1	Hexachlorobenzene	20	< 20 U
87-86-5	Pentachlorophenol	99	< 99 U
85-01-8	Phenanthrene	20	< 20 U
120-12-7	Anthracene	20	< 20 U
84-74-2	Di-n-Butylphthalate	20	< 20 U
206-44-0	**Fluoranthene**	**20**	**29**
129-00-0	**Pyrene**	**20**	**23**
85-68-7	Butylbenzylphthalate	20	< 20 U
56-55-3	**Benzo(a)anthracene**	**20**	**14 J**
117-81-7	bis(2-Ethylhexyl)phthalate	20	< 20 U
218-01-9	**Chrysene**	**20**	**20 J**
117-84-0	Di-n-Octyl phthalate	20	< 20 U
205-99-2	**Benzo(b)fluoranthene**	**20**	**18 J**
207-08-9	**Benzo(k)fluoranthene**	**20**	**16 J**
50-32-8	**Benzo(a)pyrene**	**20**	**15 J**
193-39-5	Indeno(1,2,3-cd)pyrene	20	< 20 U
53-70-3	Dibenz(a,h)anthracene	20	< 20 U
191-24-2	Benzo(g,h,i)perylene	20	< 20 U
90-05-1	Guaiacol	20	< 20 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: PGSS-35
SAMPLE

Lab Sample ID: OV87B
LIMS ID: 09-9559
Matrix: Sediment
Date Analyzed: 04/20/09 16:08

QC Report No: OV87-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14

CAS Number	Analyte	RL	Result
483-65-8	Retene	20	< 20 U
90-12-0	1-Methylnaphthalene	20	< 20 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	59.2%	2-Fluorobiphenyl	70.8%
d14-p-Terphenyl	64.8%	d4-1,2-Dichlorobenzene	62.0%
d5-Phenol	76.3%	2-Fluorophenol	69.9%
2,4,6-Tribromophenol	81.1%	d4-2-Chlorophenol	74.9%

ANALYTICAL RESOURCES INCORPORATED

SW8270 SEMIVOLATILES SOIL/SEDIMENT SURROGATE RECOVERY SUMMARY

Matrix: Sediment

QC Report No: OV87-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14

Client ID	NBZ	FBP	TPH	DCB	PHL	2FP	TBP	2CP	TOT OUT
MB-041709	56.4%	62.8%	80.4%	61.2%	57.1%	57.6%	68.8%	60.5%	0
LCS-041709	57.2%	75.6%	88.8%	57.6%	63.2%	57.9%	99.5%*	61.9%	1
LCSD-041709	58.4%	73.6%	85.6%	60.4%	62.9%	58.7%	93.9%	63.5%	0
PGSS-33	53.2%	65.6%	62.4%	45.2%	69.3%	61.9%	84.8%	66.1%	0
PGSS-35	59.2%	70.8%	64.8%	62.0%	76.3%	69.9%	81.1%	74.9%	0

		LCS/MB LIMITS	QC LIMITS
(NBZ)	= d5-Nitrobenzene	(37-85)	(29-87)
(FBP)	= 2-Fluorobiphenyl	(39-82)	(32-88)
(TPH)	= d14-p-Terphenyl	(38-105)	(21-97)
(DCB)	= d4-1,2-Dichlorobenzene	(33-79)	(25-82)
(PHL)	= d5-Phenol	(40-85)	(29-85)
(2FP)	= 2-Fluorophenol	(20-93)	(10-114)
(TBP)	= 2,4,6-Tribromophenol	(40-96)	(25-103)
(2CP)	= d4-2-Chlorophenol	(41-81)	(30-84)

Prep Method: SW3550B
Log Number Range: 09-9558 to 09-9559

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: LCS-041709
LCS/LCSD

Lab Sample ID: LCS-041709
LIMS ID: 09-9558
Matrix: Sediment
Data Release Authorized:
Reported: 04/23/09

QC Report No: OV87-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/05/08
Date Received: 12/08/08

Date Extracted LCS/LCSD: 04/17/09

Date Analyzed LCS: 04/21/09 15:26
LCSD: 04/21/09 15:59
Instrument/Analyst LCS: NT4/LJR
LCSD: NT4/LJR
GPC Cleanup: NO

Sample Amount LCS: 25.0 g
LCSD: 25.0 g
Final Extract Volume LCS: 0.5 mL
LCSD: 0.5 mL
Dilution Factor LCS: 1.00
LCSD: 1.00
Percent Moisture: NA

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Phenol	295	500	59.0%	310	500	62.0%	5.0%
1,3-Dichlorobenzene	259	500	51.8%	283	500	56.6%	8.9%
1,4-Dichlorobenzene	272	500	54.4%	294	500	58.8%	7.8%
Benzyl Alcohol	335	1000	33.5%	241	1000	24.1%	32.6%
1,2-Dichlorobenzene	275	500	55.0%	303	500	60.6%	9.7%
2-Methylphenol	307	500	61.4%	306	500	61.2%	0.3%
4-Methylphenol	647	1000	64.7%	656	1000	65.6%	1.4%
2,4-Dimethylphenol	328	500	65.6%	348	500	69.6%	5.9%
Benzoic Acid	1180	1500	78.7%	1200	1500	80.0%	1.7%
1,2,4-Trichlorobenzene	315	500	63.0%	335	500	67.0%	6.2%
Naphthalene	321	500	64.2%	344	500	68.8%	6.9%
Hexachlorobutadiene	320	500	64.0%	345	500	69.0%	7.5%
2-Methylnaphthalene	338	500	67.6%	357	500	71.4%	5.5%
Dimethylphthalate	398	500	79.6%	388	500	77.6%	2.5%
Acenaphthylene	370	500	74.0%	346	500	69.2%	6.7%
Acenaphthene	382	500	76.4%	382	500	76.4%	0.0%
Dibenzofuran	413	500	82.6%	403	500	80.6%	2.5%
Diethylphthalate	408	500	81.6%	396	500	79.2%	3.0%
Fluorene	421	500	84.2%	412	500	82.4%	2.2%
N-Nitrosodiphenylamine	398	500	79.6%	333	500	66.6%	17.8%
Hexachlorobenzene	440	500	88.0%	432	500	86.4%	1.8%
Pentachlorophenol	455	500	91.0%	417	500	83.4%	8.7%
Phenanthrene	424	500	84.8%	416	500	83.2%	1.9%
Anthracene	395	500	79.0%	368	500	73.6%	7.1%
Di-n-Butylphthalate	413	500	82.6%	411	500	82.2%	0.5%
Fluoranthene	442	500	88.4%	439	500	87.8%	0.7%
Pyrene	428	500	85.6%	411	500	82.2%	4.1%
Butylbenzylphthalate	399	500	79.8%	381	500	76.2%	4.6%
Benzo(a)anthracene	436	500	87.2%	407	500	81.4%	6.9%
bis(2-Ethylhexyl)phthalate	442	500	88.4%	445	500	89.0%	0.7%
Chrysene	418	500	83.6%	407	500	81.4%	2.7%
Di-n-Octyl phthalate	419	500	83.8%	414	500	82.8%	1.2%
Benzo(b)fluoranthene	428	500	85.6%	444	500	88.8%	3.7%
Benzo(k)fluoranthene	458	500	91.6%	426	500	85.2%	7.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS **Sample ID: LCSD-041709**
 LCS/LCSD

Lab Sample ID: LCS-041709 QC Report No: OV87-Hart Crowser, Inc.
LIMS ID: 09-9558 Project: PORT GAMBLE
Matrix: Sediment 17330-14
Date Analyzed LCS: 04/21/09 15:26
LCSD: 04/21/09 15:59

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Benzo(a)pyrene	402	500	80.4%	377	500	75.4%	6.4%
Indeno(1,2,3-cd)pyrene	439	500	87.8%	394	500	78.8%	10.8%
Dibenz(a,h)anthracene	436	500	87.2%	409	500	81.8%	6.4%
Benzo(g,h,i)perylene	418	500	83.6%	359	500	71.8%	15.2%
Guaiacol	366	500	73.2%	333	500	66.6%	9.4%
1-Methylnaphthalene	364	500	72.8%	386	500	77.2%	5.9%

Semivolatile Surrogate Recovery

	LCS	LCSD
d5-Nitrobenzene	57.2%	58.4%
2-Fluorobiphenyl	75.6%	73.6%
d14-p-Terphenyl	88.8%	85.6%
d4-1,2-Dichlorobenzene	57.6%	60.4%
d5-Phenol	63.2%	62.9%
2-Fluorophenol	57.9%	58.7%
2,4,6-Tribromophenol	99.5%	93.9%
d4-2-Chlorophenol	61.9%	63.5%

Results reported in µg/kg
RPD calculated using sample concentrations per SW846.

4B

SEMIVOLATILE METHOD BLANK SUMMARY

BLANK NO.

OV87MBS1

Lab Name: ANALYTICAL RESOURCES, INC

Client: HART CROWSER, INC.

ARI Job No: OV87

Project: PORT GAMBLE

Lab File ID: 042001

Date Extracted: 04/17/09

Instrument ID: NT4

Date Analyzed: 04/20/09

Matrix: SOLID

Time Analyzed: 1240

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

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01	PGSS-33	OV87A	042006	04/20/09
02	PGSS-35	OV87B	042007	04/20/09
03	OV87LCSS1	OV87LCSS1	OV87SB2	04/21/09
04	OV87LCSDS1	OV87LCSDS1	OV87SBD2	04/21/09
05				
06				
07				
08				
09				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				

COMMENTS:

FORM IV SV

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: MB-041709
METHOD BLANK

Lab Sample ID: MB-041709
LIMS ID: 09-9558
Matrix: Sediment
Data Release Authorized:
Reported: 04/23/09

QC Report No: OV87-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: NA
Date Received: NA

Date Extracted: 04/17/09
Date Analyzed: 04/20/09 12:40
Instrument/Analyst: NT4/LJR
GPC Cleanup: No

Sample Amount: 25.0 g
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: NA

CAS Number	Analyte	RL	Result
108-95-2	Phenol	20	< 20 U
541-73-1	1,3-Dichlorobenzene	20	< 20 U
106-46-7	1,4-Dichlorobenzene	20	< 20 U
100-51-6	Benzyl Alcohol	20	< 20 U
95-50-1	1,2-Dichlorobenzene	20	< 20 U
95-48-7	2-Methylphenol	20	< 20 U
106-44-5	4-Methylphenol	20	< 20 U
105-67-9	2,4-Dimethylphenol	20	< 20 U
65-85-0	Benzoic Acid	200	< 200 U
120-82-1	1,2,4-Trichlorobenzene	20	< 20 U
91-20-3	Naphthalene	20	< 20 U
87-68-3	Hexachlorobutadiene	20	< 20 U
91-57-6	2-Methylnaphthalene	20	< 20 U
131-11-3	Dimethylphthalate	20	< 20 U
208-96-8	Acenaphthylene	20	< 20 U
83-32-9	Acenaphthene	20	< 20 U
132-64-9	Dibenzofuran	20	< 20 U
84-66-2	Diethylphthalate	20	< 20 U
86-73-7	Fluorene	20	< 20 U
86-30-6	N-Nitrosodiphenylamine	20	< 20 U
118-74-1	Hexachlorobenzene	20	< 20 U
87-86-5	Pentachlorophenol	100	< 100 U
85-01-8	Phenanthrene	20	< 20 U
120-12-7	Anthracene	20	< 20 U
84-74-2	Di-n-Butylphthalate	20	< 20 U
206-44-0	Fluoranthene	20	< 20 U
129-00-0	Pyrene	20	< 20 U
85-68-7	Butylbenzylphthalate	20	< 20 U
56-55-3	Benzo(a)anthracene	20	< 20 U
117-81-7	bis(2-Ethylhexyl)phthalate	20	< 20 U
218-01-9	Chrysene	20	< 20 U
117-84-0	Di-n-Octyl phthalate	20	< 20 U
205-99-2	Benzo(b)fluoranthene	20	< 20 U
207-08-9	Benzo(k)fluoranthene	20	< 20 U
50-32-8	Benzo(a)pyrene	20	< 20 U
193-39-5	Indeno(1,2,3-cd)pyrene	20	< 20 U
53-70-3	Dibenz(a,h)anthracene	20	< 20 U
191-24-2	Benzo(g,h,i)perylene	20	< 20 U
90-05-1	Guaiacol	20	< 20 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS **Sample ID: MB-041709**
 METHOD BLANK

Lab Sample ID: MB-041709 QC Report No: OV87-Hart Crowser, Inc.
LIMS ID: 09-9558 Project: PORT GAMBLE
Matrix: Sediment 17330-14
Date Analyzed: 04/20/09 12:40

CAS Number	Analyte	RL	Result
483-65-8	Retene	20	< 20 U
90-12-0	1-Methylnaphthalene	20	< 20 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	56.4%	2-Fluorobiphenyl	62.8%
d14-p-Terphenyl	80.4%	d4-1,2-Dichlorobenzene	61.2%
d5-Phenol	57.1%	2-Fluorophenol	57.6%
2,4,6-Tribromophenol	68.8%	d4-2-Chlorophenol	60.5%

PCB ANALYSIS

ANALYTICAL RESOURCES INCORPORATED

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

Sample ID: PGSS-33
SAMPLE

Lab Sample ID: OV87A
LIMS ID: 09-9558
Matrix: Sediment
Data Release Authorized:
Reported: 04/22/09

QC Report No: OV87-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/05/08
Date Received: 12/08/08

Date Extracted: 04/17/09
Date Analyzed: 04/21/09 16:07
Instrument/Analyst: ECD5/PK
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.3 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: 57.5%

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

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	71.8%
Tetrachlorometaxylene	66.5%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA PCB by GC/ECD

Sample ID: PGSS-35
SAMPLE

Lab Sample ID: OV87B
LIMS ID: 09-9559
Matrix: Sediment
Data Release Authorized:
Reported: 04/22/09

QC Report No: OV87-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/05/08
Date Received: 12/08/08

Date Extracted: 04/17/09
Date Analyzed: 04/21/09 16:24
Instrument/Analyst: ECD5/PK
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.1 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: 65.6%

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

Reported in µg/kg (ppb)

PCB Surrogate Recovery	
Decachlorobiphenyl	27.8%
Tetrachlorometaxylene	38.0%

ANALYTICAL RESOURCES INCORPORATED

SW8082/PCB SOIL/SEDIMENT SURROGATE RECOVERY SUMMARY

Matrix: Sediment

QC Report No: OV87-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14

Client ID	DCBP % REC	DCBP LCL-UCL	TCMX % REC	TCMX LCL-UCL	TOT OUT
MB-041709	67.8%	36-130	69.2%	30-119	0
LCS-041709	75.5%	36-130	68.8%	30-119	0
LCSD-041709	71.0%	36-130	69.8%	30-119	0
PGSS-33	71.8%	33-149	66.5%	32-121	0
PGSS-35	27.8%*	33-149	38.0%	32-121	1

Low Level PSDDA Control Limits
Prep Method: SW3550B
Log Number Range: 09-9558 to 09-9559

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA PCB by GC/ECD **Sample ID: LCS-041709**
Page 1 of 1 **LCS/LCSD**

Lab Sample ID: LCS-041709
LIMS ID: 09-9558
Matrix: Sediment
Data Release Authorized:
Reported: 04/22/09

QC Report No: OV87-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: NA
Date Received: NA

Date Extracted LCS/LCSD: 04/17/09

Date Analyzed LCS: 04/21/09 15:32
LCSD: 04/21/09 15:50
Instrument/Analyst LCS: ECD5/PK
LCSD: ECD5/PK

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

Sample Amount LCS: 25.0 g-dry-wt
LCSD: 25.0 g-dry-wt
Final Extract Volume LCS: 1.0 mL
LCSD: 1.0 mL
Dilution Factor LCS: 1.00
LCSD: 1.00
Silica Gel: No

Percent Moisture: NA

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Aroclor 1016	16.7	20.0	83.5%	17.0	20.0	85.0%	1.8%
Aroclor 1260	18.2	20.0	91.0%	17.8	20.0	89.0%	2.2%

PCB Surrogate Recovery

	LCS	LCSD
Decachlorobiphenyl	75.5%	71.0%
Tetrachlorometaxylene	68.8%	69.8%

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

PCB METHOD BLANK SUMMARY

BLANK NO.: OV87MBS1

Lab Name: ANALYTICAL RESOURCES, INC
Client: HART CROWSER, INC.

ARI Job No.: OV87
Project: PORT GAMBLE

Lab Sample ID: OV87MBS1
Lab File ID: 0421B015

Date Extracted: 04/17/09
Matrix: SOLID

Date Analyzed: 04/21/09
Instrument ID: ECD5

Time Analyzed: 1515
GC Columns: ZB5/ZB35

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

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED
01	OV87LCSS1	OV87LCSS1	04/21/09
02	OV87LCSDS1	OV87LCSDS1	04/21/09
03	PGSS-33	OV87A	04/21/09
04	PGSS-35	OV87B	04/21/09

ALL RUNS ARE DUAL COLUMN

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA PCB by GC/ECD

Sample ID: MB-041709
METHOD BLANK

Lab Sample ID: MB-041709
LIMS ID: 09-9558
Matrix: Sediment
Data Release Authorized:
Reported: 04/22/09

QC Report No: OV87-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: NA
Date Received: NA

Date Extracted: 04/17/09
Date Analyzed: 04/21/09 15:15
Instrument/Analyst: ECD5/PK
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 25.0 g
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: NA

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

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	67.8%
Tetrachlorometaxylene	69.2%

METALS ANALYSIS

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: PGSS-33
SAMPLE

Lab Sample ID: OV87A
LIMS ID: 09-9558
Matrix: Sediment
Data Release Authorized:
Reported: 04/22/09

QC Report No: OV87-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/05/08
Date Received: 12/08/08

Percent Total Solids: 41.0%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	04/17/09	6010B	04/21/09	7440-38-2	Arsenic	10	10	U
3050B	04/17/09	6010B	04/21/09	**7440-43-9**	**Cadmium**	0.5	1.5	
3050B	04/17/09	6010B	04/21/09	**7440-47-3**	**Chromium**	1	49	
3050B	04/17/09	6010B	04/21/09	**7440-50-8**	**Copper**	0.5	38.2	
3050B	04/17/09	6010B	04/21/09	**7439-92-1**	**Lead**	5	12	
CLP	04/17/09	7471A	04/17/09	**7439-97-6**	**Mercury**	0.04	0.12	
3050B	04/17/09	6010B	04/21/09	7440-22-4	Silver	0.7	0.7	U
3050B	04/17/09	6010B	04/21/09	**7440-66-6**	**Zinc**	2	83	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: PGSS-35
SAMPLE

Lab Sample ID: OV87B
LIMS ID: 09-9559
Matrix: Sediment
Data Release Authorized:
Reported: 04/22/09

QC Report No: OV87-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: 12/05/08
Date Received: 12/08/08

Percent Total Solids: 36.2%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	04/17/09	6010B	04/21/09	7440-38-2	Arsenic	10	10	U
3050B	04/17/09	6010B	04/21/09	**7440-43-9**	**Cadmium**	0.5	**2.3**	
3050B	04/17/09	6010B	04/21/09	**7440-47-3**	**Chromium**	1	**45**	
3050B	04/17/09	6010B	04/21/09	**7440-50-8**	**Copper**	0.5	**36.0**	
3050B	04/17/09	6010B	04/21/09	**7439-92-1**	**Lead**	5	**11**	
CLP	04/17/09	7471A	04/17/09	**7439-97-6**	**Mercury**	0.05	**0.10**	
3050B	04/17/09	6010B	04/21/09	7440-22-4	Silver	0.8	0.8	U
3050B	04/17/09	6010B	04/21/09	**7440-66-6**	**Zinc**	3	**77**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: LAB CONTROL

Lab Sample ID: OV87LCS
LIMS ID: 09-9558
Matrix: Sediment
Data Release Authorized:
Reported: 04/22/09

QC Report No: OV87-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: NA
Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike Found	Spike Added	% Recovery	Q
Arsenic	6010B	211	200	106%	
Cadmium	6010B	52.6	50.0	105%	
Chromium	6010B	50.3	50.0	101%	
Copper	6010B	50.7	50.0	101%	
Lead	6010B	215	200	108%	
Mercury	7471A	0.53	0.50	106%	
Silver	6010B	47.8	50.0	95.6%	
Zinc	6010B	53	50	106%	

Reported in mg/kg-dry

N-Control limit not met
NA-Not Applicable, Analyte Not Spiked
Control Limits: 80-120%

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: METHOD BLANK

Lab Sample ID: OV87MB
LIMS ID: 09-9558
Matrix: Sediment
Data Release Authorized:
Reported: 04/22/09

QC Report No: OV87-Hart Crowser, Inc.
Project: PORT GAMBLE
17330-14
Date Sampled: NA
Date Received: NA

Percent Total Solids: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	04/17/09	6010B	04/21/09	7440-38-2	Arsenic	5	5	U
3050B	04/17/09	6010B	04/21/09	7440-43-9	Cadmium	0.2	0.2	U
3050B	04/17/09	6010B	04/21/09	7440-47-3	Chromium	0.5	0.5	U
3050B	04/17/09	6010B	04/21/09	7440-50-8	Copper	0.2	0.2	U
3050B	04/17/09	6010B	04/21/09	7439-92-1	Lead	2	2	U
CLP	04/17/09	7471A	04/17/09	7439-97-6	Mercury	0.02	0.02	U
3050B	04/17/09	6010B	04/21/09	7440-22-4	Silver	0.3	0.3	U
3050B	04/17/09	6010B	04/21/09	7440-66-6	Zinc	1	1	U

U-Analyte undetected at given RL
RL-Reporting Limit

TOTAL SOLIDS

Extractions Total Solids-extts
Data By: Steve Potter
Created: 4/17/09

Worklist: 5821
Analyst: SDP
Comments:

	ARI ID CLIENT ID	Tare Wt (g)	Wet Wt (g)	Dry Wt (g)	% Solids	pH
1.	OV87A 09-9558 PGSS-33	28.75	39.26	33.22	42.5	NR
2.	OV87B 09-9559 PGSS-35	28.85	39.12	32.38	34.4	NR

Solids Data Entry Report Checked by: KM Date: 4/21/09
Date: 04/21/09 Data Analyst: MH

Solids Determination performed on 04/20/09 by MH

JOB	SAMPLE	CLIENTID	TAREWEIGHT	SAMPDISH	DRYWEIGHT	SOLIDS
OV87	A	PGSS-33	0.943	10.290	4.774	40.99
OV87	B	PGSS-35	1.020	5.067	2.484	36.17

Chain of Custody
Documentation

prepared
for

Hart Crowser, Inc.

Project: Port Gamble, 17330-14

ARI JOB NO: PS58

prepared
by

Analytical Resources, Inc.

Subject: Additional Analysis of Port Gamble Archive Tissue Samples
From: Roger McGinnis <Roger.McGinnis@hartcrowser.com>
Date: Wed, 14 Oct 2009 08:48:55 -0700
To: 'Kelly Bottem' <kellyb@arilabs.com>
CC: Anne Conrad <Anne.Conrad@hartcrowser.com>

Kelly;
I left a message yesterday. We would like you to perform additional analysis on the 9 tissue samples you originally analyzed:

Sample #	Original Data Report
Oyster #1A	OG44
Oyster #2A	OG44
Clam #1A	OG45
Clam #2A	OG45
GD (Geoduck) #1A	OG88
GD (Geoduck) #2A	OG88
GD (Geoduck) #3A	OG88
Crab 1A muscle	OG53
Crab 1A hepatopancreas	OG53

1) Carcinogenic PAHs by 8270-SIM Only cPAHs
Please report both MDLs and PQLs on results form if possible. We would like a full data report and EIM format deliverable in addition to std Excel.

2) High resolution PCB congeners (SGS lab) for the following congeners with dioxin-like toxicity:

IUPAC #
77
81
105
114
118
123
126
156
157
167
169
189

Have SGS report both MDLs and PQLs on results form if possible. Data should be reported to MDL with appropriate J flags. We would like a full data report and EIM format deliverable in addition to std Excel.
SGS may have samples remaining from their earlier dioxin analysis.

Could you also send me costs. Call if you have questions.

Thanks,
Roger

Case Narrative

prepared
for

Hart Crowser, Inc.

Project: Port Gamble, 17330-14

ARI JOB NO: PS58

prepared
by

Analytical Resources, Inc.

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Data Reporting Qualifiers

Effective 7/10/2009

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 ≥ 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

Data Reporting Qualifiers

Effective 7/10/2009

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.

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 ≥40% RPD with no obvious chromatographic interference

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

LCS SOLUTIONS

10/14/2009

LABL	SOLN ID	TEST	CONC. UG/ML	SOLVENT	EXP.
1	1642-1	PCB	20	ACETONE	09/05/10
2#	1472-3	BCOC PEST	10	ACETONE	NA
3	1620-4	PEST	02/04/20	ACETONE	06/26/10
4	1594-2	LOW PEST	0.2/0.4/2	ACETONE	09/23/09
5	1580-2	EPH	1500	MECL2	01/29/10
6	1655-3	PCP	12.5/125	ACETONE	09/24/10
7	1635-1	ABN	100	ACETONE	02/01/10
8	1566-1	TBT	2.5	MECL2	12/04/09
9	1567-3	PORE TBT	.125/.25	MECL2	12/04/09
10	1621-4	ABN ACID	100/200	MEOH	07/14/10
11	1642-2	TPHD	15000	ACETONE	09/07/10
12	1622-2	ABN BASE	200	ACETONE	02/05/10
13	1613-1	LOW PCB	2	ACETONE	06/08/10
14*	1547-1	LOW ABN ACID	10/20	MEOH	04/10/10
15*	1591-3	SIM PNA	15/75	MEOH	08/28/10
16	1602-3	DIOXANE	100	MEOH	03/20/10
17	1644-1	1248 PCB	10	ACETONE	09/10/10
18*	1591-4	LOW SIM PNA	1.5	ACETONE	08/28/10
19	1574-4	AK103	7500	MECL2	12/02/09
20	1572-2	PNA	100	ACETONE	12/26/09
21	1593-3	SKY/BHT	100	MEOH	03/31/10
22	1631-1	HERB	12.5/12500	MEOH	02/19/10
23*	1505-1	LW ABN BASE	20	MEOH	03/20/10
24	1613-2	LOW ABN	10	ACETONE	02/28/10
25#	1481-1	DIPHENYL	100	MEOH	NA
26*	1545-2	OP-PEST	25	MEOH	02/16/10
27#	1495-1	STEROLS	200	MEOH	NA
28#	1595-1	ADD. PEST	4	ACETONE	NA
29#	1496-3	DECANES	100	MEOH	NA
30	1620-1	EDB/DBCP	0.2	MEOH	06/22/10
31	1596-1	TERPINEOL	100	MEOH	04/03/10

LCS SOLUTIONS

10/14/2009

32	1619-3	GUAIACOL	50-200	ACETONE	04/30/10
33	1639-3	RETENE	100	MEOH	09/03/10
34	1633-1	CONGENERS	2.5	ACETONE	08/11/10
35	1601-2	ALKYL PNA A	10	MEOH	04/03/10
36	1601-3	ALKYL PNA B	10	MEOH	05/13/10
50	1617-1	FULL RESIN	250	ACETONE	06/17/10
51	1611-3	DDTS	2.5	ACETONE	06/04/10
52	1613-5	1232 PCB	20	ACETONE	06/16/10
	*=REVERIFIED SOLUTION				
	#=PROJECT SPECIFIC SOLUTION				

SURR SOLUTIONS

10/14/2009

LABEL	SOLN ID	TEST	CONC. UG/ML	SOLVENT	EXP.
A	1662-3	ABN	100/150	MEOH	10/08/10
B	1633-3	SIM PNA	15/75	MEOH	08/12/10
C*	1559-1	SIM ABN	25/37.5	MEOH	03/13/10
D	1635-2	LOW PCB	0.2	ACETONE	05/29/10
E	1661-2	HERB	62.5	MEOH	10/02/10
F	1574-3	PCP	12.5	ACETONE	01/06/10
G*	1534-1	1,4DIOXANE	100	MEOH	02/20/10
H	1594-1	OP-PEST	25	MEOH	04/01/10
I	1634-1	LOW S. PNA	1.5	MEOH	08/12/10
J	1566-5	TBT-PORE	0.125	MECL2	12/04/09
K	1612-1	MED PCB	20	ACETONE	05/29/10
L	1584-4	TBT	2.5	MECL2	12/04/09
M	1578-1	EPH	1500	MECL2	12/09/09
N	1612-2	PCB	2	ACETONE	05/29/10
O	1647-2	TPH	450	MECL2	07/02/10
P	1621-1	HCID	2250	MECL2	05/06/10
Q	1620-2	EDB	1	MEOH	06/22/10
R	1615-1	RESIN ACID	250	ACETONE	06/17/10
S	1568-5	PBDE	.25	MEOH	12/11/09
T	1601-1	ALKYL PNA	10	MEOH	11/26/09
U	1633-1	CONGENER	2.5	ACETONE	08/11/10
V					
*reverified solution					
X					
Y					
Z					

Analytical Resources,Incorporated
Analytical Chemists and Consultants

Summary of Laboratory Control Limits

Default limits of 30-160% recovery and 30% RPD apply for all organic analytes when laboratory generated control limits are not available on ARI's web site. Default limits for all inorganic analytes are 75-125% recovery and 25% RPD.

ARI's laboratory generated Quality Control Limits may be superseded by project specific data quality objectives (DQO) provided by ARI's clients. The use of project specific DQO must be approved by ARI's Laboratory and QA Program Managers.

Data Summary Package

prepared
for

Hart Crowser, Inc.

Project: Port Gamble, 17330-14

ARI JOB NO: PS58

prepared
by

Analytical Resources, Inc.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Selected Ion Monitoring GC/MS

Sample ID: Oyster #1A SAMPLE

Lab Sample ID: PS58A
LIMS ID: 09-24190
Matrix: Tissue
Data Release Authorized: VJB
Reported: 10/27/09

QC Report No: PS58-Hart Crowser, Inc.
Project: Port Gamble 17330-14
Date Sampled: 12/15/08
Date Received: 12/16/08

Date Extracted: 10/16/09
Date Analyzed: 10/24/09 14:00
Instrument/Analyst: NT8/YZ
GPC Cleanup: Yes

Sample Amount: 10.2 g-as-rec
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: NA

CAS Number	Analyte	MDL	RL	Result
56-55-3	Benzo(a)anthracene	1.0	4.9	< 4.9 U
218-01-9	Chrysene	0.83	4.9	< 4.9 U
205-99-2	Benzo(b)fluoranthene	2.1	4.9	< 4.9 U
207-08-9	Benzo(k)fluoranthene	1.3	4.9	< 4.9 U
50-32-8	Benzo(a)pyrene	2.0	4.9	< 4.9 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.83	4.9	< 4.9 U
53-70-3	Dibenz(a,h)anthracene	1.3	4.9	< 4.9 U

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	22.0%
d14-Dibenzo(a,h)anthracen	29.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Selected Ion Monitoring GC/MS
Page 1 of 1

Sample ID: Oyster #2A
SAMPLE

Lab Sample ID: PS58B
LIMS ID: 09-24191
Matrix: Tissue
Data Release Authorized: VTS
Reported: 10/27/09

QC Report No: PS58-Hart Crowser, Inc.
Project: Port Gamble
17330-14
Date Sampled: 12/15/08
Date Received: 12/16/08

Date Extracted: 10/16/09
Date Analyzed: 10/24/09 14:22
Instrument/Analyst: NT8/YZ
GPC Cleanup: Yes

Sample Amount: 10.2 g-as-rec
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: NA

CAS Number	Analyte	MDL	RL	Result
56-55-3	Benzo(a)anthracene	1.0	4.9	< 4.9 U
218-01-9	Chrysene	0.83	4.9	< 4.9 U
205-99-2	Benzo(b)fluoranthene	2.1	4.9	< 4.9 U
207-08-9	Benzo(k)fluoranthene	1.3	4.9	< 4.9 U
50-32-8	Benzo(a)pyrene	2.0	4.9	< 4.9 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.83	4.9	< 4.9 U
53-70-3	Dibenz(a,h)anthracene	1.3	4.9	< 4.9 U

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	41.3%
d14-Dibenzo(a,h)anthracen	61.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Selected Ion Monitoring GC/MS

Sample ID: Clam #1A
SAMPLE

Lab Sample ID: PS58C
LIMS ID: 09-24192
Matrix: Tissue
Data Release Authorized: VJS
Reported: 10/27/09

QC Report No: PS58-Hart Crowser, Inc.
Project: Port Gamble
17330-14
Date Sampled: 12/15/08
Date Received: 12/16/08

Date Extracted: 10/16/09
Date Analyzed: 10/24/09 14:44
Instrument/Analyst: NT8/YZ
GPC Cleanup: Yes

Sample Amount: 10.2 g-as-rec
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: NA

CAS Number	Analyte	MDL	RL	Result
56-55-3	Benzo(a)anthracene	1.0	4.9	< 4.9 U
218-01-9	Chrysene	0.83	4.9	< 4.9 U
205-99-2	Benzo(b)fluoranthene	2.1	4.9	< 4.9 U
207-08-9	Benzo(k)fluoranthene	1.3	4.9	< 4.9 U
50-32-8	Benzo(a)pyrene	2.0	4.9	< 4.9 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.83	4.9	< 4.9 U
53-70-3	Dibenz(a,h)anthracene	1.3	4.9	< 4.9 U

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	36.0%
d14-Dibenzo(a,h)anthracen	62.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Selected Ion Monitoring GC/MS
Page 1 of 1

Sample ID: Clam #2A
SAMPLE

Lab Sample ID: PS58D
LIMS ID: 09-24193
Matrix: Tissue
Data Release Authorized: VTS
Reported: 10/27/09

QC Report No: PS58-Hart Crowser, Inc.
Project: Port Gamble
17330-14
Date Sampled: 12/15/08
Date Received: 12/16/08

Date Extracted: 10/16/09
Date Analyzed: 10/24/09 15:06
Instrument/Analyst: NT8/YZ
GPC Cleanup: Yes

Sample Amount: 10.2 g-as-rec
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: NA

CAS Number	Analyte	MDL	RL	Result
56-55-3	Benzo(a)anthracene	1.0	4.9	< 4.9 U
218-01-9	Chrysene	0.83	4.9	< 4.9 U
205-99-2	Benzo(b)fluoranthene	2.1	4.9	< 4.9 U
207-08-9	Benzo(k)fluoranthene	1.3	4.9	< 4.9 U
50-32-8	Benzo(a)pyrene	2.0	4.9	< 4.9 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.83	4.9	< 4.9 U
53-70-3	Dibenz(a,h)anthracene	1.3	4.9	< 4.9 U

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	55.0%
d14-Dibenzo(a,h)anthracen	76.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Selected Ion Monitoring GC/MS

Sample ID: GD (Geoduck) #1A SAMPLE

Lab Sample ID: PS58E
LIMS ID: 09-24194
Matrix: Tissue
Data Release Authorized: VTS
Reported: 10/27/09

QC Report No: PS58-Hart Crowser, Inc.
Project: Port Gamble 17330-14
Date Sampled: 12/16/08
Date Received: 12/16/08

Date Extracted: 10/16/09
Date Analyzed: 10/24/09 15:29
Instrument/Analyst: NT8/YZ
GPC Cleanup: Yes

Sample Amount: 10.3 g-as-rec
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: NA

CAS Number	Analyte	MDL	RL	Result
56-55-3	Benzo(a)anthracene	1.0	4.8	< 4.8 U
218-01-9	Chrysene	0.83	4.8	< 4.8 U
205-99-2	Benzo(b)fluoranthene	2.1	4.8	< 4.8 U
207-08-9	Benzo(k)fluoranthene	1.2	4.8	< 4.8 U
50-32-8	Benzo(a)pyrene	1.9	4.8	< 4.8 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.83	4.8	< 4.8 U
53-70-3	Dibenz(a,h)anthracene	1.3	4.8	< 4.8 U

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	51.0%
d14-Dibenzo(a,h)anthracen	76.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Selected Ion Monitoring GC/MS
Page 1 of 1

Sample ID: GD (Geoduck) #2A
SAMPLE

Lab Sample ID: PS58F
LIMS ID: 09-24195
Matrix: Tissue
Data Release Authorized: VB
Reported: 10/27/09

QC Report No: PS58-Hart Crowser, Inc.
Project: Port Gamble
17330-14
Date Sampled: 12/16/08
Date Received: 12/16/08

Date Extracted: 10/16/09
Date Analyzed: 10/24/09 15:51
Instrument/Analyst: NT8/YZ
GPC Cleanup: Yes

Sample Amount: 10.1 g-as-rec
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: NA

CAS Number	Analyte	MDL	RL	Result
56-55-3	Benzo(a)anthracene	1.0	5.0	< 5.0 U
218-01-9	Chrysene	0.84	5.0	< 5.0 U
205-99-2	Benzo(b)fluoranthene	2.1	5.0	< 5.0 U
207-08-9	Benzo(k)fluoranthene	1.3	5.0	< 5.0 U
50-32-8	Benzo(a)pyrene	2.0	5.0	< 5.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.84	5.0	< 5.0 U
53-70-3	Dibenz(a,h)anthracene	1.3	5.0	< 5.0 U

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	46.7%
d14-Dibenzo(a,h)anthracen	67.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Selected Ion Monitoring GC/MS
Page 1 of 1

Sample ID: GD (Geoduck) #3A
SAMPLE

Lab Sample ID: PS58G
LIMS ID: 09-24196
Matrix: Tissue
Data Release Authorized: VTS
Reported: 10/27/09

QC Report No: PS58-Hart Crowser, Inc.
Project: Port Gamble
17330-14
Date Sampled: 12/16/08
Date Received: 12/16/08

Date Extracted: 10/16/09
Date Analyzed: 10/24/09 16:13
Instrument/Analyst: NT8/YZ
GPC Cleanup: Yes

Sample Amount: 10.0 g-as-rec
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: NA

CAS Number	Analyte	MDL	RL	Result
56-55-3	Benzo(a)anthracene	1.1	5.0	< 5.0 U
218-01-9	Chrysene	0.85	5.0	< 5.0 U
205-99-2	Benzo(b)fluoranthene	2.2	5.0	< 5.0 U
207-08-9	Benzo(k)fluoranthene	1.3	5.0	< 5.0 U
50-32-8	Benzo(a)pyrene	2.0	5.0	< 5.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.85	5.0	< 5.0 U
53-70-3	Dibenz(a,h)anthracene	1.3	5.0	< 5.0 U

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	48.3%
d14-Dibenzo(a,h)anthracen	72.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Selected Ion Monitoring GC/MS
Page 1 of 1

Sample ID: Crab 1A Muscle
SAMPLE

Lab Sample ID: PS58H
LIMS ID: 09-24197
Matrix: Tissue
Data Release Authorized: VTS
Reported: 10/27/09

QC Report No: PS58-Hart Crowser, Inc.
Project: Port Gamble
17330-14
Date Sampled: 12/23/08
Date Received: 12/23/08

Date Extracted: 10/16/09
Date Analyzed: 10/24/09 16:35
Instrument/Analyst: NT8/YZ
GPC Cleanup: Yes

Sample Amount: 10.0 g-as-rec
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: NA

CAS Number	Analyte	MDL	RL	Result
56-55-3	Benzo(a)anthracene	1.1	5.0	< 5.0 U
218-01-9	Chrysene	0.85	5.0	< 5.0 U
205-99-2	Benzo(b)fluoranthene	2.2	5.0	< 5.0 U
207-08-9	Benzo(k)fluoranthene	1.3	5.0	< 5.0 U
50-32-8	Benzo(a)pyrene	2.0	5.0	< 5.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.85	5.0	< 5.0 U
53-70-3	Dibenz(a,h)anthracene	1.3	5.0	< 5.0 U

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	42.3%
d14-Dibenzo(a,h)anthracen	75.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Selected Ion Monitoring GC/MS
Page 1 of 1

Sample ID: Crab 1A Hepatopancreas SAMPLE

Lab Sample ID: PS58I
LIMS ID: 09-24198
Matrix: Tissue
Data Release Authorized: VTS
Reported: 10/27/09

QC Report No: PS58-Hart Crowser, Inc.
Project: Port Gamble 17330-14
Date Sampled: 12/23/08
Date Received: 12/23/08

Date Extracted: 10/16/09
Date Analyzed: 10/24/09 18:26
Instrument/Analyst: NT8/YZ
GPC Cleanup: Yes

Sample Amount: 10.4 g-as-rec
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: NA

CAS Number	Analyte	MDL	RL	Result
56-55-3	Benzo(a)anthracene	1.0	4.8	< 4.8 U
218-01-9	Chrysene	0.82	4.8	< 4.8 U
205-99-2	Benzo(b)fluoranthene	2.1	4.8	< 4.8 U
207-08-9	Benzo(k)fluoranthene	1.2	4.8	< 4.8 U
50-32-8	Benzo(a)pyrene	1.9	4.8	< 4.8 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.82	4.8	< 4.8 U
53-70-3	Dibenz(a,h)anthracene	1.2	4.8	< 4.8 U

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	52.7%
d14-Dibenzo(a,h)anthracen	75.3%

ANALYTICAL RESOURCES INCORPORATED

SIM SW8270 SURROGATE RECOVERY SUMMARY

Matrix: Tissue

QC Report No: PS58-Hart Crowser, Inc.
Project: Port Gamble
17330-14

Client ID	MNP	DBA	TOT OUT
MB-101609	44.3%	73.7%	0
LCS-101609	53.7%	83.7%	0
Oyster #1A	22.0%*	29.7%*	2
Oyster #2A	41.3%	61.3%	0
Clam #1A	36.0%	62.3%	0
Clam #2A	55.0%	76.0%	0
GD (Geoduck) #1A	51.0%	76.3%	0
GD (Geoduck) #2A	46.7%	67.3%	0
GD (Geoduck) #3A	48.3%	72.7%	0
Crab 1A Muscle	42.3%	75.7%	0
Crab 1A Hepatopancrea	52.7%	75.3%	0

	LCS/MB LIMITS (Advisory)	QC LIMITS (Advisory)
(MNP) = d10-2-Methylnaphthalene	(30-160)	(30-160)
(DBA) = d14-Dibenzo(a,h)anthracene	(30-160)	(30-160)

Prep Method: TissM
Log Number Range: 09-24190 to 09-24198

ANALYTICAL RESOURCES INCORPORATED

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

Sample ID: LCS-101609
LAB CONTROL SAMPLE

Lab Sample ID: LCS-101609
LIMS ID: 09-24190
Matrix: Tissue
Data Release Authorized: VTS
Reported: 10/27/09

QC Report No: PS58-Hart Crowser, Inc.
Project: Port Gamble
Event: 17330-14
Date Sampled: NA
Date Received: NA

Date Extracted: 10/16/09

Date Analyzed LCS: 10/24/09 12:09
LCSD: 10/24/09 12:31
Instrument/Analyst LCS: NT8/YZ
LCSD: NT8/YZ

Sample Amount LCS: 10.0 g-as-rec
LCSD: 10.0 g-as-rec
Final Extract Volume LCS: 0.50 mL
LCSD: 0.50 mL
Dilution Factor LCS: 1.00
LCSD: 1.00

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Benzo(a)anthracene	108	150	72.0%	98.5	150	65.7%	9.2%
Chrysene	112	150	74.7%	112	150	74.7%	0.0%
Benzo(b)fluoranthene	101	150	67.3%	91.5	150	61.0%	9.9%
Benzo(k)fluoranthene	122	150	81.3%	116	150	77.3%	5.0%
Benzo(a)pyrene	106	150	70.7%	99.0	150	66.0%	6.8%
Indeno(1,2,3-cd)pyrene	116	150	77.3%	112	150	74.7%	3.5%
Dibenz(a,h)anthracene	112	150	74.7%	111	150	74.0%	0.9%

Reported in µg/kg (ppb)

RPD calculated using sample concentrations per SW846.

SIM Semivolatile Surrogate Recovery

	LCS	LCSD
d10-2-Methylnaphthalene	53.7%	44.3%
d14-Dibenzo(a,h)anthracen	83.7%	75.7%

4B

SEMIVOLATILE METHOD BLANK SUMMARY

BLANK NO.

PS58MBS1

Lab Name: ANALYTICAL RESOURCES, INC

Client: HART CROWSER, INC.

ARI Job No: PS58

Project: PORT GAMBLE

Lab File ID: PS58MB

Date Extracted: 10/16/09

Instrument ID: NT8

Date Analyzed: 10/24/09

Matrix: SOLID

Time Analyzed: 1147

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

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01	PS58LCSS1	PS58LCSS1	PS58SB	10/24/09
02	PS58LCSDS1	PS58LCSDS1	PS58SBD	10/24/09
03	OYSTER #1A	PS58A	PS58A	10/24/09
04	OYSTER #2A	PS58B	PS58B	10/24/09
05	CLAM #1A	PS58C	PS58C	10/24/09
06	CLAM #2A	PS58D	PS58D	10/24/09
07	GD (GEODUCK) #1A	PS58E	PS58E	10/24/09
08	GD (GEODUCK) #2A	PS58F	PS58F	10/24/09
09	GD (GEODUCK) #3A	PS58G	PS58G	10/24/09
10	CRAB 1A MUSCLE	PS58H	PS58H	10/24/09
11	CRAB 1A HEPATOPA	PS58I	PS58I	10/24/09
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				

COMMENTS:

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Selected Ion Monitoring GC/MS
Page 1 of 1

Sample ID: MB-101609
METHOD BLANK

Lab Sample ID: MB-101609
LIMS ID: 09-24190
Matrix: Tissue
Data Release Authorized: VTB
Reported: 10/27/09

QC Report No: PS58-Hart Crowser, Inc.
Project: Port Gamble
17330-14
Date Sampled: NA
Date Received: NA

Date Extracted: 10/16/09
Date Analyzed: 10/24/09 11:47
Instrument/Analyst: NT8/YZ
GPC Cleanup: Yes

Sample Amount: 10.0 g-as-rec
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: NA

CAS Number	Analyte	MDL	RL	Result
56-55-3	Benzo(a)anthracene	1.1	5.0	< 5.0 U
218-01-9	Chrysene	0.85	5.0	< 5.0 U
205-99-2	Benzo(b)fluoranthene	2.2	5.0	< 5.0 U
207-08-9	Benzo(k)fluoranthene	1.3	5.0	< 5.0 U
50-32-8	Benzo(a)pyrene	2.0	5.0	< 5.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.85	5.0	< 5.0 U
53-70-3	Dibenz(a,h)anthracene	1.3	5.0	< 5.0 U

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	44.3%
d14-Dibenzo(a,h)anthracen	73.7%

Chain of Custody
Documentation

prepared
for

Hart Crowser, Inc.

Project: Port Gamble, 17330-14

ARI JOB NO: PS58

prepared
by

Analytical Resources, Inc.

Subject: Additional Analysis of Port Gamble Archive Tissue Samples
From: Roger McGinnis <Roger.McGinnis@hartcrowser.com>
Date: Wed, 14 Oct 2009 08:48:55 -0700
To: 'Kelly Bottem' <kellyb@arilabs.com>
CC: Anne Conrad <Anne.Conrad@hartcrowser.com>

Kelly;
I left a message yesterday. We would like you to perform additional analysis on the 9 tissue samples you originally analyzed:

Sample #	Original Data Report
Oyster #1A	OG44
Oyster #2A	OG44
Clam #1A	OG45
Clam #2A	OG45
GD (Geoduck) #1A	OG88
GD (Geoduck) #2A	OG88
GD (Geoduck) #3A	OG88
Crab 1A muscle	OG53
Crab 1A hepatopancreas	OG53

1) Carcinogenic PAHs by 8270-SIM Only cPAHs
Please report both MDLs and PQLs on results form if possible. We would like a full data report and EIM format deliverable in addition to std Excel.

2) High resolution PCB congeners (SGS lab) for the following congeners with dioxin-like toxicity:

IUPAC #
77
81
105
114
118
123
126
156
157
167
169
189

Have SGS report both MDLs and PQLs on results form if possible. Data should be reported to MDL with appropriate J flags. We would like a full data report and EIM format deliverable in addition to std Excel.
SGS may have samples remaining from their earlier dioxin analysis.

Could you also send me costs. Call if you have questions.

Thanks,
Roger

Case Narrative

prepared
for

Hart Crowser, Inc.

Project: Port Gamble, 17330-14

ARI JOB NO: PS58

prepared
by

Analytical Resources, Inc.

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Data Reporting Qualifiers

Effective 7/10/2009

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 ≥ 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

Data Reporting Qualifiers

Effective 7/10/2009

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.

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 ≥40% RPD with no obvious chromatographic interference

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

LCS SOLUTIONS

10/14/2009

LABL	SOLN ID	TEST	CONC. UG/ML	SOLVENT	EXP.
1	1642-1	PCB	20	ACETONE	09/05/10
2#	1472-3	BCOC PEST	10	ACETONE	NA
3	1620-4	PEST	02/04/20	ACETONE	06/26/10
4	1594-2	LOW PEST	0.2/0.4/2	ACETONE	09/23/09
5	1580-2	EPH	1500	MECL2	01/29/10
6	1655-3	PCP	12.5/125	ACETONE	09/24/10
7	1635-1	ABN	100	ACETONE	02/01/10
8	1566-1	TBT	2.5	MECL2	12/04/09
9	1567-3	PORE TBT	.125/.25	MECL2	12/04/09
10	1621-4	ABN ACID	100/200	MEOH	07/14/10
11	1642-2	TPHD	15000	ACETONE	09/07/10
12	1622-2	ABN BASE	200	ACETONE	02/05/10
13	1613-1	LOW PCB	2	ACETONE	06/08/10
14*	1547-1	LOW ABN ACID	10/20	MEOH	04/10/10
15*	1591-3	SIM PNA	15/75	MEOH	08/28/10
16	1602-3	DIOXANE	100	MEOH	03/20/10
17	1644-1	1248 PCB	10	ACETONE	09/10/10
18*	1591-4	LOW SIM PNA	1.5	ACETONE	08/28/10
19	1574-4	AK103	7500	MECL2	12/02/09
20	1572-2	PNA	100	ACETONE	12/26/09
21	1593-3	SKY/BHT	100	MEOH	03/31/10
22	1631-1	HERB	12.5/12500	MEOH	02/19/10
23*	1505-1	LW ABN BASE	20	MEOH	03/20/10
24	1613-2	LOW ABN	10	ACETONE	02/28/10
25#	1481-1	DIPHENYL	100	MEOH	NA
26*	1545-2	OP-PEST	25	MEOH	02/16/10
27#	1495-1	STEROLS	200	MEOH	NA
28#	1595-1	ADD. PEST	4	ACETONE	NA
29#	1496-3	DECANES	100	MEOH	NA
30	1620-1	EDB/DBCP	0.2	MEOH	06/22/10
31	1596-1	TERPINEOL	100	MEOH	04/03/10

LCS SOLUTIONS

10/14/2009

32	1619-3	GUAIACOL	50-200	ACETONE	04/30/10
33	1639-3	RETENE	100	MEOH	09/03/10
34	1633-1	CONGENERS	2.5	ACETONE	08/11/10
35	1601-2	ALKYL PNA A	10	MEOH	04/03/10
36	1601-3	ALKYL PNA B	10	MEOH	05/13/10
50	1617-1	FULL RESIN	250	ACETONE	06/17/10
51	1611-3	DDTS	2.5	ACETONE	06/04/10
52	1613-5	1232 PCB	20	ACETONE	06/16/10
	*=REVERIFIED SOLUTION				
	#=PROJECT SPECIFIC SOLUTION				

SURR SOLUTIONS

10/14/2009

LABEL	SOLN ID	TEST	CONC. UG/ML	SOLVENT	EXP.
A	1662-3	ABN	100/150	MEOH	10/08/10
B	1633-3	SIM PNA	15/75	MEOH	08/12/10
C*	1559-1	SIM ABN	25/37.5	MEOH	03/13/10
D	1635-2	LOW PCB	0.2	ACETONE	05/29/10
E	1661-2	HERB	62.5	MEOH	10/02/10
F	1574-3	PCP	12.5	ACETONE	01/06/10
G*	1534-1	1,4DIOXANE	100	MEOH	02/20/10
H	1594-1	OP-PEST	25	MEOH	04/01/10
I	1634-1	LOW S. PNA	1.5	MEOH	08/12/10
J	1566-5	TBT-PORE	0.125	MECL2	12/04/09
K	1612-1	MED PCB	20	ACETONE	05/29/10
L	1584-4	TBT	2.5	MECL2	12/04/09
M	1578-1	EPH	1500	MECL2	12/09/09
N	1612-2	PCB	2	ACETONE	05/29/10
O	1647-2	TPH	450	MECL2	07/02/10
P	1621-1	HCID	2250	MECL2	05/06/10
Q	1620-2	EDB	1	MEOH	06/22/10
R	1615-1	RESIN ACID	250	ACETONE	06/17/10
S	1568-5	PBDE	.25	MEOH	12/11/09
T	1601-1	ALKYL PNA	10	MEOH	11/26/09
U	1633-1	CONGENER	2.5	ACETONE	08/11/10
V					
*reverified solution					
X					
Y					
Z					

Analytical Resources,Incorporated
Analytical Chemists and Consultants

Summary of Laboratory Control Limits

Default limits of 30-160% recovery and 30% RPD apply for all organic analytes when laboratory generated control limits are not available on ARI's web site. Default limits for all inorganic analytes are 75-125% recovery and 25% RPD.

ARI's laboratory generated Quality Control Limits may be superseded by project specific data quality objectives (DQO) provided by ARI's clients. The use of project specific DQO must be approved by ARI's Laboratory and QA Program Managers.

Data Summary Package

prepared
for

Hart Crowser, Inc.

Project: Port Gamble, 17330-14

ARI JOB NO: PS58

prepared
by

Analytical Resources, Inc.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Selected Ion Monitoring GC/MS

Sample ID: Oyster #1A SAMPLE

Lab Sample ID: PS58A
LIMS ID: 09-24190
Matrix: Tissue
Data Release Authorized: VJB
Reported: 10/27/09

QC Report No: PS58-Hart Crowser, Inc.
Project: Port Gamble 17330-14
Date Sampled: 12/15/08
Date Received: 12/16/08

Date Extracted: 10/16/09
Date Analyzed: 10/24/09 14:00
Instrument/Analyst: NT8/YZ
GPC Cleanup: Yes

Sample Amount: 10.2 g-as-rec
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: NA

CAS Number	Analyte	MDL	RL	Result
56-55-3	Benzo(a)anthracene	1.0	4.9	< 4.9 U
218-01-9	Chrysene	0.83	4.9	< 4.9 U
205-99-2	Benzo(b)fluoranthene	2.1	4.9	< 4.9 U
207-08-9	Benzo(k)fluoranthene	1.3	4.9	< 4.9 U
50-32-8	Benzo(a)pyrene	2.0	4.9	< 4.9 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.83	4.9	< 4.9 U
53-70-3	Dibenz(a,h)anthracene	1.3	4.9	< 4.9 U

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	22.0%
d14-Dibenzo(a,h)anthracen	29.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Selected Ion Monitoring GC/MS
Page 1 of 1

Sample ID: Oyster #2A
SAMPLE

Lab Sample ID: PS58B
LIMS ID: 09-24191
Matrix: Tissue
Data Release Authorized: VTS
Reported: 10/27/09

QC Report No: PS58-Hart Crowser, Inc.
Project: Port Gamble
17330-14
Date Sampled: 12/15/08
Date Received: 12/16/08

Date Extracted: 10/16/09
Date Analyzed: 10/24/09 14:22
Instrument/Analyst: NT8/YZ
GPC Cleanup: Yes

Sample Amount: 10.2 g-as-rec
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: NA

CAS Number	Analyte	MDL	RL	Result
56-55-3	Benzo(a)anthracene	1.0	4.9	< 4.9 U
218-01-9	Chrysene	0.83	4.9	< 4.9 U
205-99-2	Benzo(b)fluoranthene	2.1	4.9	< 4.9 U
207-08-9	Benzo(k)fluoranthene	1.3	4.9	< 4.9 U
50-32-8	Benzo(a)pyrene	2.0	4.9	< 4.9 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.83	4.9	< 4.9 U
53-70-3	Dibenz(a,h)anthracene	1.3	4.9	< 4.9 U

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	41.3%
d14-Dibenzo(a,h)anthracen	61.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Selected Ion Monitoring GC/MS

Sample ID: Clam #1A
SAMPLE

Lab Sample ID: PS58C
LIMS ID: 09-24192
Matrix: Tissue
Data Release Authorized: VJS
Reported: 10/27/09

QC Report No: PS58-Hart Crowser, Inc.
Project: Port Gamble
17330-14
Date Sampled: 12/15/08
Date Received: 12/16/08

Date Extracted: 10/16/09
Date Analyzed: 10/24/09 14:44
Instrument/Analyst: NT8/YZ
GPC Cleanup: Yes

Sample Amount: 10.2 g-as-rec
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: NA

CAS Number	Analyte	MDL	RL	Result
56-55-3	Benzo(a)anthracene	1.0	4.9	< 4.9 U
218-01-9	Chrysene	0.83	4.9	< 4.9 U
205-99-2	Benzo(b)fluoranthene	2.1	4.9	< 4.9 U
207-08-9	Benzo(k)fluoranthene	1.3	4.9	< 4.9 U
50-32-8	Benzo(a)pyrene	2.0	4.9	< 4.9 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.83	4.9	< 4.9 U
53-70-3	Dibenz(a,h)anthracene	1.3	4.9	< 4.9 U

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	36.0%
d14-Dibenzo(a,h)anthracen	62.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Selected Ion Monitoring GC/MS
Page 1 of 1

Sample ID: Clam #2A
SAMPLE

Lab Sample ID: PS58D
LIMS ID: 09-24193
Matrix: Tissue
Data Release Authorized: VTS
Reported: 10/27/09

QC Report No: PS58-Hart Crowser, Inc.
Project: Port Gamble
17330-14
Date Sampled: 12/15/08
Date Received: 12/16/08

Date Extracted: 10/16/09
Date Analyzed: 10/24/09 15:06
Instrument/Analyst: NT8/YZ
GPC Cleanup: Yes

Sample Amount: 10.2 g-as-rec
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: NA

CAS Number	Analyte	MDL	RL	Result
56-55-3	Benzo(a)anthracene	1.0	4.9	< 4.9 U
218-01-9	Chrysene	0.83	4.9	< 4.9 U
205-99-2	Benzo(b)fluoranthene	2.1	4.9	< 4.9 U
207-08-9	Benzo(k)fluoranthene	1.3	4.9	< 4.9 U
50-32-8	Benzo(a)pyrene	2.0	4.9	< 4.9 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.83	4.9	< 4.9 U
53-70-3	Dibenz(a,h)anthracene	1.3	4.9	< 4.9 U

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	55.0%
d14-Dibenzo(a,h)anthracen	76.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Selected Ion Monitoring GC/MS

Sample ID: GD (Geoduck) #1A SAMPLE

Lab Sample ID: PS58E
LIMS ID: 09-24194
Matrix: Tissue
Data Release Authorized: VTS
Reported: 10/27/09

QC Report No: PS58-Hart Crowser, Inc.
Project: Port Gamble 17330-14
Date Sampled: 12/16/08
Date Received: 12/16/08

Date Extracted: 10/16/09
Date Analyzed: 10/24/09 15:29
Instrument/Analyst: NT8/YZ
GPC Cleanup: Yes

Sample Amount: 10.3 g-as-rec
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: NA

CAS Number	Analyte	MDL	RL	Result
56-55-3	Benzo(a)anthracene	1.0	4.8	< 4.8 U
218-01-9	Chrysene	0.83	4.8	< 4.8 U
205-99-2	Benzo(b)fluoranthene	2.1	4.8	< 4.8 U
207-08-9	Benzo(k)fluoranthene	1.2	4.8	< 4.8 U
50-32-8	Benzo(a)pyrene	1.9	4.8	< 4.8 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.83	4.8	< 4.8 U
53-70-3	Dibenz(a,h)anthracene	1.3	4.8	< 4.8 U

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	51.0%
d14-Dibenzo(a,h)anthracen	76.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Selected Ion Monitoring GC/MS
Page 1 of 1

Sample ID: GD (Geoduck) #2A
SAMPLE

Lab Sample ID: PS58F
LIMS ID: 09-24195
Matrix: Tissue
Data Release Authorized: VB
Reported: 10/27/09

QC Report No: PS58-Hart Crowser, Inc.
Project: Port Gamble
17330-14
Date Sampled: 12/16/08
Date Received: 12/16/08

Date Extracted: 10/16/09
Date Analyzed: 10/24/09 15:51
Instrument/Analyst: NT8/YZ
GPC Cleanup: Yes

Sample Amount: 10.1 g-as-rec
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: NA

CAS Number	Analyte	MDL	RL	Result
56-55-3	Benzo(a)anthracene	1.0	5.0	< 5.0 U
218-01-9	Chrysene	0.84	5.0	< 5.0 U
205-99-2	Benzo(b)fluoranthene	2.1	5.0	< 5.0 U
207-08-9	Benzo(k)fluoranthene	1.3	5.0	< 5.0 U
50-32-8	Benzo(a)pyrene	2.0	5.0	< 5.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.84	5.0	< 5.0 U
53-70-3	Dibenz(a,h)anthracene	1.3	5.0	< 5.0 U

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	46.7%
d14-Dibenzo(a,h)anthracen	67.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Selected Ion Monitoring GC/MS
Page 1 of 1

Sample ID: GD (Geoduck) #3A
SAMPLE

Lab Sample ID: PS58G
LIMS ID: 09-24196
Matrix: Tissue
Data Release Authorized: VTS
Reported: 10/27/09

QC Report No: PS58-Hart Crowser, Inc.
Project: Port Gamble
17330-14
Date Sampled: 12/16/08
Date Received: 12/16/08

Date Extracted: 10/16/09
Date Analyzed: 10/24/09 16:13
Instrument/Analyst: NT8/YZ
GPC Cleanup: Yes

Sample Amount: 10.0 g-as-rec
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: NA

CAS Number	Analyte	MDL	RL	Result
56-55-3	Benzo(a)anthracene	1.1	5.0	< 5.0 U
218-01-9	Chrysene	0.85	5.0	< 5.0 U
205-99-2	Benzo(b)fluoranthene	2.2	5.0	< 5.0 U
207-08-9	Benzo(k)fluoranthene	1.3	5.0	< 5.0 U
50-32-8	Benzo(a)pyrene	2.0	5.0	< 5.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.85	5.0	< 5.0 U
53-70-3	Dibenz(a,h)anthracene	1.3	5.0	< 5.0 U

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	48.3%
d14-Dibenzo(a,h)anthracen	72.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Selected Ion Monitoring GC/MS
Page 1 of 1

Sample ID: Crab 1A Muscle
SAMPLE

Lab Sample ID: PS58H
LIMS ID: 09-24197
Matrix: Tissue
Data Release Authorized: VTS
Reported: 10/27/09

QC Report No: PS58-Hart Crowser, Inc.
Project: Port Gamble
17330-14
Date Sampled: 12/23/08
Date Received: 12/23/08

Date Extracted: 10/16/09
Date Analyzed: 10/24/09 16:35
Instrument/Analyst: NT8/YZ
GPC Cleanup: Yes

Sample Amount: 10.0 g-as-rec
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: NA

CAS Number	Analyte	MDL	RL	Result
56-55-3	Benzo(a)anthracene	1.1	5.0	< 5.0 U
218-01-9	Chrysene	0.85	5.0	< 5.0 U
205-99-2	Benzo(b)fluoranthene	2.2	5.0	< 5.0 U
207-08-9	Benzo(k)fluoranthene	1.3	5.0	< 5.0 U
50-32-8	Benzo(a)pyrene	2.0	5.0	< 5.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.85	5.0	< 5.0 U
53-70-3	Dibenz(a,h)anthracene	1.3	5.0	< 5.0 U

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	42.3%
d14-Dibenzo(a,h)anthracen	75.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Selected Ion Monitoring GC/MS
Page 1 of 1

Sample ID: Crab 1A Hepatopancreas SAMPLE

Lab Sample ID: PS58I
LIMS ID: 09-24198
Matrix: Tissue
Data Release Authorized: VTS
Reported: 10/27/09

QC Report No: PS58-Hart Crowser, Inc.
Project: Port Gamble 17330-14
Date Sampled: 12/23/08
Date Received: 12/23/08

Date Extracted: 10/16/09
Date Analyzed: 10/24/09 18:26
Instrument/Analyst: NT8/YZ
GPC Cleanup: Yes

Sample Amount: 10.4 g-as-rec
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: NA

CAS Number	Analyte	MDL	RL	Result
56-55-3	Benzo(a)anthracene	1.0	4.8	< 4.8 U
218-01-9	Chrysene	0.82	4.8	< 4.8 U
205-99-2	Benzo(b)fluoranthene	2.1	4.8	< 4.8 U
207-08-9	Benzo(k)fluoranthene	1.2	4.8	< 4.8 U
50-32-8	Benzo(a)pyrene	1.9	4.8	< 4.8 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.82	4.8	< 4.8 U
53-70-3	Dibenz(a,h)anthracene	1.2	4.8	< 4.8 U

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	52.7%
d14-Dibenzo(a,h)anthracen	75.3%

ANALYTICAL RESOURCES INCORPORATED

SIM SW8270 SURROGATE RECOVERY SUMMARY

Matrix: Tissue

QC Report No: PS58-Hart Crowser, Inc.
Project: Port Gamble
17330-14

Client ID	MNP	DBA	TOT OUT
MB-101609	44.3%	73.7%	0
LCS-101609	53.7%	83.7%	0
Oyster #1A	22.0%*	29.7%*	2
Oyster #2A	41.3%	61.3%	0
Clam #1A	36.0%	62.3%	0
Clam #2A	55.0%	76.0%	0
GD (Geoduck) #1A	51.0%	76.3%	0
GD (Geoduck) #2A	46.7%	67.3%	0
GD (Geoduck) #3A	48.3%	72.7%	0
Crab 1A Muscle	42.3%	75.7%	0
Crab 1A Hepatopancrea	52.7%	75.3%	0

	LCS/MB LIMITS (Advisory)	QC LIMITS (Advisory)
(MNP) = d10-2-Methylnaphthalene	(30-160)	(30-160)
(DBA) = d14-Dibenzo(a,h)anthracene	(30-160)	(30-160)

Prep Method: TissM
Log Number Range: 09-24190 to 09-24198

ANALYTICAL RESOURCES INCORPORATED

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

Sample ID: LCS-101609
LAB CONTROL SAMPLE

Lab Sample ID: LCS-101609
LIMS ID: 09-24190
Matrix: Tissue
Data Release Authorized: VTS
Reported: 10/27/09

QC Report No: PS58-Hart Crowser, Inc.
Project: Port Gamble
Event: 17330-14
Date Sampled: NA
Date Received: NA

Date Extracted: 10/16/09

Date Analyzed LCS: 10/24/09 12:09
LCSD: 10/24/09 12:31
Instrument/Analyst LCS: NT8/YZ
LCSD: NT8/YZ

Sample Amount LCS: 10.0 g-as-rec
LCSD: 10.0 g-as-rec
Final Extract Volume LCS: 0.50 mL
LCSD: 0.50 mL
Dilution Factor LCS: 1.00
LCSD: 1.00

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Benzo(a)anthracene	108	150	72.0%	98.5	150	65.7%	9.2%
Chrysene	112	150	74.7%	112	150	74.7%	0.0%
Benzo(b)fluoranthene	101	150	67.3%	91.5	150	61.0%	9.9%
Benzo(k)fluoranthene	122	150	81.3%	116	150	77.3%	5.0%
Benzo(a)pyrene	106	150	70.7%	99.0	150	66.0%	6.8%
Indeno(1,2,3-cd)pyrene	116	150	77.3%	112	150	74.7%	3.5%
Dibenz(a,h)anthracene	112	150	74.7%	111	150	74.0%	0.9%

Reported in µg/kg (ppb)

RPD calculated using sample concentrations per SW846.

SIM Semivolatile Surrogate Recovery

	LCS	LCSD
d10-2-Methylnaphthalene	53.7%	44.3%
d14-Dibenzo(a,h)anthracen	83.7%	75.7%

4B

SEMIVOLATILE METHOD BLANK SUMMARY

BLANK NO.

PS58MBS1

Lab Name: ANALYTICAL RESOURCES, INC

Client: HART CROWSER, INC.

ARI Job No: PS58

Project: PORT GAMBLE

Lab File ID: PS58MB

Date Extracted: 10/16/09

Instrument ID: NT8

Date Analyzed: 10/24/09

Matrix: SOLID

Time Analyzed: 1147

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

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01	PS58LCSS1	PS58LCSS1	PS58SB	10/24/09
02	PS58LCSDS1	PS58LCSDS1	PS58SBD	10/24/09
03	OYSTER #1A	PS58A	PS58A	10/24/09
04	OYSTER #2A	PS58B	PS58B	10/24/09
05	CLAM #1A	PS58C	PS58C	10/24/09
06	CLAM #2A	PS58D	PS58D	10/24/09
07	GD (GEODUCK) #1A	PS58E	PS58E	10/24/09
08	GD (GEODUCK) #2A	PS58F	PS58F	10/24/09
09	GD (GEODUCK) #3A	PS58G	PS58G	10/24/09
10	CRAB 1A MUSCLE	PS58H	PS58H	10/24/09
11	CRAB 1A HEPATOPA	PS58I	PS58I	10/24/09
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				

COMMENTS:

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Selected Ion Monitoring GC/MS
Page 1 of 1

Sample ID: MB-101609
METHOD BLANK

Lab Sample ID: MB-101609
LIMS ID: 09-24190
Matrix: Tissue
Data Release Authorized: VTB
Reported: 10/27/09

QC Report No: PS58-Hart Crowser, Inc.
Project: Port Gamble
17330-14
Date Sampled: NA
Date Received: NA

Date Extracted: 10/16/09
Date Analyzed: 10/24/09 11:47
Instrument/Analyst: NT8/YZ
GPC Cleanup: Yes

Sample Amount: 10.0 g-as-rec
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: NA

CAS Number	Analyte	MDL	RL	Result
56-55-3	Benzo(a)anthracene	1.1	5.0	< 5.0 U
218-01-9	Chrysene	0.85	5.0	< 5.0 U
205-99-2	Benzo(b)fluoranthene	2.2	5.0	< 5.0 U
207-08-9	Benzo(k)fluoranthene	1.3	5.0	< 5.0 U
50-32-8	Benzo(a)pyrene	2.0	5.0	< 5.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.85	5.0	< 5.0 U
53-70-3	Dibenz(a,h)anthracene	1.3	5.0	< 5.0 U

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	44.3%
d14-Dibenzo(a,h)anthracen	73.7%

SGS

Laboratory Results

Ms. Kelly Bottem
Analytical Resources, Inc.
4611 S. 134th Place
Suite 100
Tukwila WA 98168-3240

Phone: 206-695-6211
Fax: 206-695-6201

Dear Ms. Bottem:

Enclosed is a full data package containing the final results for samples received by SGS Environmental Services, Inc. on January 15, 2009 under your project name "Port Gamble". The samples were analyzed by Method 1613 following SGS's Standard Operating Procedures and are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards.

Number of Samples Received:	4
Your Project Reference:	Port Gamble
SGS Project Number:	G1040-1

We appreciate your business and look forward to working with you again. Please contact me at 910-350-1903 if you have questions or need additional technical support.

Sincerely,

Jeannie Milholland

Jeannie Milholland
Project Manager

2-17-2009
Date

DC138.033007.7

5500 Business Dr., Wilmington, NC 28405 t (910) 350-1903 f (910) 350-1557 www.us.sgs.com

SGS

Case Narrative
SGS Project: **G1040-1**
Project Name: **Port Gamble**

For Method: 1613

- The submitted samples were accepted into the lab on January 15th, 2009 and extracted on January 19th, 2009 by method 3540C. The sample extract and associated QC extracts were then processed through clean-up as prescribed in the SGS standard operating procedures and analyzed by HRGC/HRMS for method 1613.
- No analytical issues were encountered.

Craig R. Tronzo 2/18/09

Craig R. Tronzo Date
Data Validation

5500 Business Dr., Wilmington, NC 28405 t (910) 350-1903 f (910) 350-1557 www.us.sgs.com

Page 2

SGS

List of Qualifiers: Dioxin's

B	Analyte was detected in the Lab Method Blank at a level above the Reporting Limit.
EDL	"Estimated Detection Limit"
EMPC	"Estimated Maximum Possible Concentration"
RL	Report Limit
CL	Control Limit
U	Undetected
ppt	Parts-per-trillion (pg/g; ng/L)
V	Recovery is below quality control limit. The data has been validated based on a favorable signal-to-noise and detection limit.
#	Outside quality control limits
*	Indicates that the ion-ratio fails high or low; analyte reported as an EMPC

An average uncertainty of 30% can be routinely achieved as concluded from the evaluation of HRGC-HRMS standard operating procedures. The following flags warn the data user of situations where the uncertainty may be greater than stated.

A	Amount detected is less than the Lower Method Calibration Limit.
J	Amount detected is between the Method Detection Limit and the Lower Calibration Limit.
O	The recovery of this analyte in the OPR is above the Method QC Limits and the reported concentration in the sample may be biased high.
E	Amount detected is greater than the Upper Calibration Limit.
S	The amount of analyte present has saturated the detector. This situation results in an underestimation of the affected analyte(s).
Q	Indicates the presence of a quantitative interference. This situation may result in an underestimation of the affected analyte(s).
I	Indicates the presence of a qualitative interference that could cause a false positive or an overestimation of the affected analyte(s).
DPE	Indicates the presence of a peak in the polychlorinated diphenylether channel that could cause a false positive or an overestimation of the affected analyte(s).

DC250.081908.1

SGS

Toxic Equivalency Factors

Analyte	WHO* 1998	WHO* 2005	International-89	MADEP+
2,3,7,8-TCDD	1	1	1	1
1,2,3,7,8-PeCDD	1	1	0.5	0.5
1,2,3,4,7,8-HxCDD	0.1	0.1	0.1	0.1
1,2,3,6,7,8-HxCDD	0.1	0.1	0.1	0.1
1,2,3,7,8,9-HxCDD	0.1	0.1	0.1	0.1
1,2,3,4,6,7,8-HpCDD	0.01	0.01	0.01	0.1
OCDD	0.0001	0.0003	0.001	0.001
2,3,7,8-TCDF	0.1	0.1	0.1	0.1
1,2,3,7,8-PeCDF	0.05	0.03	0.05	0.5
2,3,4,7,8-PeCDF	0.5	0.3	0.5	0.5
1,2,3,4,7,8-HxCDF	0.1	0.1	0.1	0.1
1,2,3,6,7,8-HxCDF	0.1	0.1	0.1	0.1
2,3,4,6,7,8-HxCDF	0.1	0.1	0.1	0.1
1,2,3,7,8,9-HxCDF	0.1	0.1	0.1	0.1
1,2,3,4,6,7,8-HpCDF	0.01	0.01	0.01	0.1
1,2,3,4,7,8,9-HpCDF	0.01	0.01	0.01	0.1
OCDF	0.0001	0.0003	0.001	0.001

* World Health Organization
+ Massachusetts Department of Environmental Protection

Method 1613

PGSS-77A

Analytical Resources, Inc.

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	Adj. MDL (pg/g)	Adj. RL (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	0.108	0.907			
1,2,3,7,8-PeCDD	ND	0.251	4.54			
1,2,3,4,7,8-HxCDD	ND	0.369	4.54			
1,2,3,6,7,8-HxCDD	0.837	0.390	4.54	36:59	1.39	J
1,2,3,7,8,9-HxCDD	ND	0.214	4.54			
1,2,3,4,6,7,8-HpCDD	20.1	0.389	4.54	40:21	1.04	
OCDD	199	0.755	9.07	44:40	0.88	
2,3,7,8-TCDF	0.862	0.103	0.907	30:53	0.73	J
1,2,3,7,8-PeCDF	0.294	0.289	4.54	33:28	1.46	J
2,3,4,7,8-PeCDF	ND	0.237	4.54			
1,2,3,4,7,8-HxCDF	ND	0.520	4.54			
1,2,3,6,7,8-HxCDF	ND	0.125	4.54			
2,3,4,6,7,8-HxCDF	ND	0.284	4.54			
1,2,3,7,8,9-HxCDF	ND	0.240	4.54			
1,2,3,4,6,7,8-HpCDF	2.51	0.520	4.54	39:03	1.02	J
1,2,3,4,7,8,9-HpCDF	ND	0.538	4.54			
OCDF	6.80	0.670	9.07	44:58	0.90	J
Total TCDDs	23.7	0.108	0.907			
Total PeCDDs	9.83	0.251	4.54			
Total HxCDDs	16.2	0.214	4.54			
Total HpCDDs	126	0.389	4.54			
Total TCDFs	12.0	0.103	0.907			DPE
Total PeCDFs	4.08	0.237	4.54			JDPE
Total HxCDFs	2.77	0.125	4.54			J
Total HpCDFs	7.24	0.520	4.54			
WHO-2005 TEQ (ND=0)	0.467					
WHO-2005 TEQ (ND=½)	5.26					

Client Information

Project Name:	Port Gamble
Sample ID:	PGSS-77A

Laboratory Information

Project ID:	G1040-1	
Sample ID:	G1040-1-1B	
Collection Date/Time:	09-Dec-08	16:03
Receipt Date:	15-Jan-09	10:15
Extraction Date:	19-Jan-09	
Analysis Date:	29-Jan-09	13:33

Sample Information

Matrix:	Sediment	
Weight / Volume:	16.46	grams
Solids / Lipids:	66.9	%
Original pH :	NA	
Batch ID:	WG16440	
Filename:	a27jan09a_5-7	
Retchk:	a27jan09a_4-15	
Begin ConCal:	a27jan09a_4-15	
Initial Cal:	m1613-100708a	

Method 1613

PGSS-77A

Analytical Resources, Inc.

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
$^{13}C_{12}$-2,3,7,8-TCDD	2	1.49	74.4	31:28	0.78	
$^{13}C_{12}$-1,2,3,7,8-PeCDD	2	1.53	76.6	34:15	1.57	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	2	1.61	80.3	36:53	1.27	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	2	1.60	80.0	36:58	1.26	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	2	1.47	73.6	40:20	1.05	
$^{13}C_{12}$-OCDD	4.0	2.58	64.4	44:39	0.91	
$^{13}C_{12}$-2,3,7,8-TCDF	2	1.61	80.3	30:52	0.79	
$^{13}C_{12}$-1,2,3,7,8-PeCDF	2	1.71	85.4	33:28	1.58	
$^{13}C_{12}$-2,3,4,7,8-PeCDF	2	1.52	75.8	34:05	1.59	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	2	1.70	85.2	36:09	0.52	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	2	1.73	86.3	36:15	0.53	
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	2	1.66	83.2	36:45	0.53	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	2	1.62	81.0	37:33	0.53	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	2	1.47	73.5	39:03	0.45	
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	2	1.50	74.8	41:01	0.45	
Cleanup Standard						
$^{37}Cl_4$-2,3,7,8-TCDD	0.4	0.330	82.5	31:29		
Injection Standards						
$^{13}C_{12}$-1,2,3,4-TCDD	2.0			31:01	0.80	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	2.0			36:45	1.25	

Client Information

Project Name:	Port Gamble
Sample ID:	PGSS-77A

Laboratory Information

Project ID:	G1040-1	
Sample ID:	G1040-1-1B	
Collection Date/Time:	09-Dec-08	16:03
Receipt Date:	15-Jan-09	10:15
Extraction Date:	19-Jan-09	
Analysis Date:	29-Jan-09	13:33

Analyzed by: JWP

Date: 03/02/09

Sample Information

Matrix:	Sediment	
Weight / Volume:	16.46	grams
Solids / Lipids:	66.9	%
Original pH :	NA	
Batch ID:	WG16440	
Filename:	a27jan09a_5-7	
Retchk:	a27jan09a_4-15	
Begin ConCal:	a27jan09a_4-15	
Initial Cal:	m1613-100708a	

Reviewed by: TM

Date: 03/02/09

Form Version:[1613_MDL_AMEC]Repor

Method 1613

PGSS-80

Analytical Resources, Inc.

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	Adj. MDL (pg/g)	Adj. RL (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	0.105	0.879			
1,2,3,7,8-PeCDD	ND	0.243	4.39			
1,2,3,4,7,8-HxCDD	ND	0.357	4.39			
1,2,3,6,7,8-HxCDD	ND	0.377	4.39			
1,2,3,7,8,9-HxCDD	ND	0.207	4.39			
1,2,3,4,6,7,8-HpCDD	1.42	0.377	4.39	40:20	1.11	J
OCDD	10.5	0.731	8.79	44:40	0.90	
2,3,7,8-TCDF	ND	0.0995	0.879			
1,2,3,7,8-PeCDF	ND	0.280	4.39			
2,3,4,7,8-PeCDF	ND	0.229	4.39			
1,2,3,4,7,8-HxCDF	ND	0.504	4.39			
1,2,3,6,7,8-HxCDF	ND	0.121	4.39			
2,3,4,6,7,8-HxCDF	ND	0.275	4.39			
1,2,3,7,8,9-HxCDF	ND	0.233	4.39			
1,2,3,4,6,7,8-HpCDF	ND	0.504	4.39			
1,2,3,4,7,8,9-HpCDF	ND	0.521	4.39			
OCDF	ND	0.649	8.79			
Total TCDDs	ND	0.105	0.879			
Total PeCDDs	ND	0.243	4.39			
Total HxCDDs	ND	0.207	4.39			
Total HpCDDs	5.91	0.377	4.39			
Total TCDFs	ND	0.0995	0.879			
Total PeCDFs	ND	0.229	4.39			
Total HxCDFs	ND	0.121	4.39			
Total HpCDFs	ND	0.504	4.39			
WHO-2005 TEQ (ND=0)	0.0173					
WHO-2005 TEQ (ND=½)	5.00					

Client Information

Project Name:	Port Gamble
Sample ID:	PGSS-80

Laboratory Information

Project ID:	G1040-1	
Sample ID:	G1040-1-2B	
Collection Date/Time:	10-Dec-08	08:17
Receipt Date:	15-Jan-09	10:15
Extraction Date:	19-Jan-09	
Analysis Date:	29-Jan-09	14:22

Sample Information

Matrix:	Sediment	
Weight / Volume:	14.12	grams
Solids / Lipids:	80.6	%
Original pH :	NA	
Batch ID:	WG16440	
Filename:	a27jan09a_5-8	
Retchk:	a27jan09a_4-15	
Begin ConCal:	a27jan09a_4-15	
Initial Cal:	m1613-100708a	

Method 1613

PGSS-80

Analytical Resources, Inc.

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
$^{13}C_{12}$-2,3,7,8-TCDD	2	1.60	79.9	31:28	0.79	
$^{13}C_{12}$-1,2,3,7,8-PeCDD	2	1.55	77.5	34:15	1.58	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	2	1.70	84.9	36:53	1.27	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	2	1.75	87.6	36:58	1.27	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	2	1.56	78.0	40:20	1.06	
$^{13}C_{12}$-OCDD	4.0	2.66	66.5	44:39	0.89	
$^{13}C_{12}$-2,3,7,8-TCDF	2	1.62	81.1	30:52	0.79	
$^{13}C_{12}$-1,2,3,7,8-PeCDF	2	1.82	91.0	33:28	1.57	
$^{13}C_{12}$-2,3,4,7,8-PeCDF	2	1.61	80.6	34:04	1.57	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	2	1.74	86.8	36:10	0.52	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	2	1.82	90.9	36:15	0.53	
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	2	1.79	89.4	36:45	0.52	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	2	1.68	83.9	37:33	0.52	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	2	1.59	79.6	39:03	0.44	
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	2	1.57	78.4	41:01	0.45	
Cleanup Standard						
$^{37}Cl_4$-2,3,7,8-TCDD	0.4	0.347	86.8	31:29		
Injection Standards						
$^{13}C_{12}$-1,2,3,4-TCDD	2.0			31:01	0.78	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	2.0			36:45	1.27	

Client Information

Project Name: Port Gamble

Sample ID: PGSS-80

Laboratory Information

Project ID:	G1040-1	
Sample ID:	G1040-1-2B	
Collection Date/Time:	10-Dec-08	08:17
Receipt Date:	15-Jan-09	10:15
Extraction Date:	19-Jan-09	
Analysis Date:	29-Jan-09	14:22

Analyzed by: DWP

Date: 030609

Sample Information

Matrix:	Sediment	
Weight / Volume:	14.12	grams
Solids / Lipids:	80.6	%
Original pH :	NA	
Batch ID:	WG16440	
Filename:	a27jan09a_5-8	
Retchk:	a27jan09a_4-15	
Begin ConCal:	a27jan09a_4-15	
Initial Cal:	m1613-100708a	

Reviewed by: MM

Date: 03/02/09

Form Version:[1613_MDL_AMEC]Repor

Method 1613

PGSS-GEO-3

Analytical Resources, Inc.

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	Adj. MDL (pg/g)	Adj. RL (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	0.106	0.891			
1,2,3,7,8-PeCDD	ND	0.247	4.45			
1,2,3,4,7,8-HxCDD	ND	0.362	4.45			
1,2,3,6,7,8-HxCDD	0.607	0.382	4.45	36:59	1.14	J
1,2,3,7,8,9-HxCDD	ND	0.210	4.45			
1,2,3,4,6,7,8-HpCDD	5.90	0.382	4.45	40:20	1.01	
OCDD	43.6	0.741	8.91	44:40	0.86	
2,3,7,8-TCDF	0.625	0.101	0.891	30:53	0.73	J
1,2,3,7,8-PeCDF	ND	0.284	4.45			
2,3,4,7,8-PeCDF	0.308	0.232	4.45	34:05	1.46	J
1,2,3,4,7,8-HxCDF	ND	0.511	4.45			
1,2,3,6,7,8-HxCDF	ND	0.123	4.45			
2,3,4,6,7,8-HxCDF	ND	0.278	4.45			
1,2,3,7,8,9-HxCDF	ND	0.236	4.45			
1,2,3,4,6,7,8-HpCDF	1.30	0.510	4.45	39:03	1.04	J
1,2,3,4,7,8,9-HpCDF	ND	0.528	4.45			
OCDF	2.50	0.658	8.91	44:58	0.93	J
Total TCDDs	4.37	0.106	0.891			
Total PeCDDs	4.02	0.247	4.45			J
Total HxCDDs	7.17	0.210	4.45			
Total HpCDDs	21.3	0.382	4.45			
Total TCDFs	7.03	0.101	0.891			DPE
Total PeCDFs	2.92	0.232	4.45			J
Total HxCDFs	1.57	0.123	4.45			J
Total HpCDFs	2.85	0.510	4.45			J
WHO-2005 TEQ (ND=0)	0.301					
WHO-2005 TEQ (ND=½)	4.40					

Client Information

Project Name:	Port Gamble
Sample ID:	PGSS-GEO-3

Laboratory Information

Project ID:	G1040-1	
Sample ID:	G1040-1-3B	
Collection Date/Time:	10-Dec-08	10:35
Receipt Date:	15-Jan-09	10:15
Extraction Date:	19-Jan-09	
Analysis Date:	29-Jan-09	15:10

Sample Information

Matrix:	Sediment	
Weight / Volume:	15.41	grams
Solids / Lipids:	72.9	%
Original pH :	NA	
Batch ID:	WG16440	
Filename:	a27jan09a_5-9	
Retchk:	a27jan09a_4-15	
Begin ConCal:	a27jan09a_4-15	
Initial Cal:	m1613-100708a	

Method 1613

PGSS-GEO-3

Analytical Resources, Inc.

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
$^{13}C_{12}$-2,3,7,8-TCDD	2	1.66	83.1	31:28	0.79	
$^{13}C_{12}$-1,2,3,7,8-PeCDD	2	1.64	81.8	34:15	1.59	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	2	1.69	84.6	36:53	1.26	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	2	1.68	84.2	36:58	1.26	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	2	1.57	78.3	40:19	1.06	
$^{13}C_{12}$-OCDD	4.0	2.59	64.7	44:39	0.89	
$^{13}C_{12}$-2,3,7,8-TCDF	2	1.70	85.0	30:52	0.79	
$^{13}C_{12}$-1,2,3,7,8-PeCDF	2	1.83	91.4	33:28	1.57	
$^{13}C_{12}$-2,3,4,7,8-PeCDF	2	1.68	84.2	34:04	1.59	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	2	1.76	88.0	36:09	0.52	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	2	1.76	88.1	36:15	0.53	
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	2	1.75	87.3	36:45	0.53	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	2	1.69	84.5	37:32	0.53	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	2	1.58	78.9	39:03	0.45	
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	2	1.53	76.6	41:01	0.45	
Cleanup Standard						
$^{37}Cl_4$-2,3,7,8-TCDD	0.4	0.368	92.0	31:29		
Injection Standards						
$^{13}C_{12}$-1,2,3,4-TCDD	2.0			31:01	0.79	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	2.0			36:45	1.26	

Client Information

Project Name:	Port Gamble
Sample ID:	PGSS-GEO-3

Laboratory Information

Project ID:	G1040-1	
Sample ID:	G1040-1-3B	
Collection Date/Time:	10-Dec-08	10:35
Receipt Date:	15-Jan-09	10:15
Extraction Date:	19-Jan-09	
Analysis Date:	29-Jan-09	15:10

Analyzed by: _____

Date: 02/02/09

Sample Information

Matrix:	Sediment	
Weight / Volume:	15.41	grams
Solids / Lipids:	72.9	%
Original pH :	NA	
Batch ID:	WG16440	
Filename:	a27jan09a_5-9	
Retchk:	a27jan09a_4-15	
Begin ConCal:	a27jan09a_4-15	
Initial Cal:	m1613-100708a	

Reviewed by: _____

Date: 03/02/09

Form Version:[1613_MDL_AMEC]Repor

Method 1613

PGSS-92

Analytical Resources, Inc.

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	Adj. MDL (pg/g)	Adj. RL (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	0.110	0.922			
1,2,3,7,8-PeCDD	0.555	0.255	4.61	34:16	1.38	J
1,2,3,4,7,8-HxCDD	ND	0.375	4.61			
1,2,3,6,7,8-HxCDD	2.38	0.396	4.61	36:58	1.32	J
1,2,3,7,8,9-HxCDD	1.17	0.217	4.61	37:13	1.28	J
1,2,3,4,6,7,8-HpCDD	89.8	0.396	4.61	40:20	1.03	
OCDD	922	0.767	9.22	44:40	0.89	
2,3,7,8-TCDF	0.832	0.104	0.922	30:53	0.82	J
1,2,3,7,8-PeCDF	0.413	0.294	4.61	33:28	1.37	J
2,3,4,7,8-PeCDF	ND	0.241	4.61			
1,2,3,4,7,8-HxCDF	ND	0.529	4.61			
1,2,3,6,7,8-HxCDF	ND	0.127	4.61			
2,3,4,6,7,8-HxCDF	0.537	0.288	4.61	36:46	1.07	J
1,2,3,7,8,9-HxCDF	ND	0.244	4.61			
1,2,3,4,6,7,8-HpCDF	8.08	0.529	4.61	39:03	1.02	
1,2,3,4,7,8,9-HpCDF	ND	0.547	4.61			
OCDF	26.0	0.681	9.22	44:58	0.87	
Total TCDDs	11.0	0.110	0.922			
Total PeCDDs	10.7	0.255	4.61			Q
Total HxCDDs	51.1	0.217	4.61			
Total HpCDDs	563	0.396	4.61			
Total TCDFs	13.3	0.104	0.922			Q DPE
Total PeCDFs	5.22	0.241	4.61			Q
Total HxCDFs	10.7	0.127	4.61			
Total HpCDFs	26.0	0.529	4.61			
WHO-2005 TEQ (ND=0)	2.32					
WHO-2005 TEQ (ND=½)	4.42					

Client Information

Project Name:	Port Gamble
Sample ID:	PGSS-92

Laboratory Information

Project ID:	G1040-1	
Sample ID:	G1040-1-4B	
Collection Date/Time:	10-Dec-08	11:03
Receipt Date:	15-Jan-09	10:15
Extraction Date:	19-Jan-09	
Analysis Date:	29-Jan-09	15:58

Sample Information

Matrix:	Sediment	
Weight / Volume:	18.61	grams
Solids / Lipids:	58.3	%
Original pH :	NA	
Batch ID:	WG16440	
Filename:	a27jan09a_5-10	
Retchk:	a27jan09a_4-15	
Begin ConCal:	a27jan09a_4-15	
Initial Cal:	m1613-100708a	

Method 1613

PGSS-92

Analytical Resources, Inc.

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
$^{13}C_{12}$-2,3,7,8-TCDD	2	1.69	84.5	31:28	0.78	
$^{13}C_{12}$-1,2,3,7,8-PeCDD	2	1.68	83.9	34:15	1.58	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	2	1.63	81.6	36:53	1.26	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	2	1.60	79.9	36:58	1.26	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	2	1.49	74.6	40:19	1.06	
$^{13}C_{12}$-OCDD	4.0	2.52	63.0	44:39	0.90	
$^{13}C_{12}$-2,3,7,8-TCDF	2	1.68	83.8	30:52	0.79	
$^{13}C_{12}$-1,2,3,7,8-PeCDF	2	1.84	91.9	33:28	1.57	
$^{13}C_{12}$-2,3,4,7,8-PeCDF	2	1.70	84.9	34:04	1.57	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	2	1.67	83.3	36:09	0.52	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	2	1.65	82.3	36:15	0.53	
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	2	1.67	83.5	36:45	0.53	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	2	1.64	82.0	37:33	0.53	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	2	1.48	74.2	39:02	0.45	
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	2	1.46	72.9	41:01	0.46	
Cleanup Standard						
$^{37}Cl_4$-2,3,7,8-TCDD	0.4	0.366	91.5	31:29		
Injection Standards						
$^{13}C_{12}$-1,2,3,4-TCDD	2.0			31:01	0.79	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	2.0			36:45	1.26	

Client Information

Project Name: Port Gamble

Sample ID: PGSS-92

Laboratory Information

Project ID:	G1040-1	
Sample ID:	G1040-1-4B	
Collection Date/Time:	10-Dec-08	11:03
Receipt Date:	15-Jan-09	10:15
Extraction Date:	19-Jan-09	
Analysis Date:	29-Jan-09	15:58

Analyzed by: JW

Date: 02/02/09

Sample Information

Matrix:	Sediment	
Weight / Volume:	18.61	grams
Solids / Lipids:	58.3	%
Original pH :	NA	
Batch ID:	WG16440	
Filename:	a27jan09a_5-10	
Retchk:	a27jan09a_4-15	
Begin ConCal:	a27jan09a_4-15	
Initial Cal:	m1613-100708a	

Reviewed by: JM

Date: 03/02/09

Form Version:{1613_MDL_AMEC}Repor

Method 1613 - Blank Results

LMB

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	Adj. MDL (pg/g)	Adj. RL (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	0.119	1.00			
1,2,3,7,8-PeCDD	ND	0.277	5.00			
1,2,3,4,7,8-HxCDD	ND	0.407	5.00			
1,2,3,6,7,8-HxCDD	ND	0.429	5.00			
1,2,3,7,8,9-HxCDD	ND	0.235	5.00			
1,2,3,4,6,7,8-HpCDD	ND	0.429	5.00			
OCDD	ND	0.831	10.0			
2,3,7,8-TCDF	ND	0.113	1.00			
1,2,3,7,8-PeCDF	ND	0.319	5.00			
2,3,4,7,8-PeCDF	ND	0.261	5.00			
1,2,3,4,7,8-HxCDF	ND	0.573	5.00			
1,2,3,6,7,8-HxCDF	ND	0.138	5.00			
2,3,4,6,7,8-HxCDF	ND	0.313	5.00			
1,2,3,7,8,9-HxCDF	ND	0.265	5.00			
1,2,3,4,6,7,8-HpCDF	ND	0.573	5.00			
1,2,3,4,7,8,9-HpCDF	ND	0.593	5.00			
OCDF	ND	0.738	10.0			
Total TCDDs	ND	0.119	1.00			
Total PeCDDs	ND	0.277	5.00			
Total HxCDDs	ND	0.235	5.00			
Total HpCDDs	ND	0.429	5.00			
Total TCDFs	ND	0.113	1.00			
Total PeCDFs	ND	0.261	5.00			
Total HxCDFs	ND	0.138	5.00			
Total HpCDFs	ND	0.573	5.00			
WHO-2005 TEQ (ND=0)	0.000					
WHO-2005 TEQ (ND=½)	5.70					

Laboratory Information

Sample ID:	LMB16440	
Extraction Date:	19-Jan-09	
Analysis Date:	25-Jan-09	6:55

Sample Information

Report Basis:	Dry Weight	
Matrix:	Soil	
Weight / Volume:	10.00	grams
Solids / Lipids:	100	%
Original pH :	NA	
Batch ID:	WG16440	
Filename:	a24jan09b_2-10	
Retchk:	a24jan09b-15	
Begin ConCal:	a24jan09b-15	
Initial Cal:	m1613-100708a	

- Blank Results

LMB

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
$^{13}C_{12}$-2,3,7,8-TCDD	2	1.83	91.5	31:27	0.78	
$^{13}C_{12}$-1,2,3,7,8-PeCDD	2	1.87	93.3	34:15	1.59	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	2	1.67	83.6	36:52	1.26	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	2	1.74	87.2	36:57	1.26	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	2	1.50	75.2	40:18	1.04	
$^{13}C_{12}$-OCDD	4.0	2.20	55.0	44:38	0.89	
$^{13}C_{12}$-2,3,7,8-TCDF	2	1.78	88.8	30:51	0.79	
$^{13}C_{12}$-1,2,3,7,8-PeCDF	2	1.97	98.6	33:27	1.58	
$^{13}C_{12}$-2,3,4,7,8-PeCDF	2	1.85	92.6	34:04	1.58	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	2	1.68	84.1	36:09	0.55	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	2	1.72	86.2	36:15	0.50	
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	2	1.69	84.4	36:44	0.52	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	2	1.64	81.8	37:32	0.53	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	2	1.52	76.1	39:02	0.45	
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	2	1.40	70.0	41:00	0.45	
Cleanup Standard						
$^{37}Cl_4$-2,3,7,8-TCDD	0.4	0.384	96.0	31:28		
Injection Standards						
$^{13}C_{12}$-1,2,3,4-TCDD	2.0			31:00	0.79	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	2.0			36:44	1.26	

Laboratory Information

Sample ID: LMB16440

Extraction Date: 19-Jan-09
Analysis Date: 25-Jan-09 6:55

Analyzed by: _____
Date: 01/26/09

Sample Information

Report Basis:	Dry Weight	
Matrix:	Soil	
Weight / Volume:	10.00	grams
Solids / Lipids:	100	%
Original pH :	NA	
Batch ID:	WG16440	
Filename:	a24jan09b_2-10	
Retchk:	a24jan09b-15	
Begin ConCal:	a24jan09b-15	
Initial Cal:	m1613-100708a	

Reviewed by: _____
Date: 1/27/09

Form Version:[1613_MDL_AMEC]Repor

Analytical Results
for
Ongoing Precision Result (OPR)

Analyte	Spiked	AMT	REC	Range pg/ul		Flag
	pg/ul	pg/ul	%	Lower	Upper	
2,3,7,8-TCDD	10.0	9.12	91.2	6.70	15.8	
1,2,3,7,8-PeCDD	50.0	45.4	90.8	35.0	71.0	
1,2,3,4,7,8-HxCDD	50.0	49.5	99.0	35.0	82.0	
1,2,3,6,7,8-HxCDD	50.0	42.9	85.9	38.0	67.0	
1,2,3,7,8,9-HxCDD	50.0	47.0	94.1	32.0	81.0	
1,2,3,4,6,7,8-HpCDD	50.0	44.1	88.3	35.0	70.0	
OCDD	100	89.4	89.4	78.0	144	
2,3,7,8-TCDF	10.0	9.03	90.3	7.50	15.8	
1,2,3,7,8-PeCDF	50.0	45.4	90.9	40.0	67.0	
2,3,4,7,8-PeCDF	50.0	45.4	90.7	34.0	80.0	
1,2,3,4,7,8-HxCDF	50.0	46.3	92.7	36.0	67.0	
1,2,3,6,7,8-HxCDF	50.0	46.2	92.4	42.0	65.0	
2,3,4,6,7,8-HxCDF	50.0	46.6	93.2	35.0	78.0	
1,2,3,7,8,9-HxCDF	50.0	45.7	91.3	39.0	65.0	
1,2,3,4,6,7,8-HpCDF	50.0	44.7	89.3	41.0	61.0	
1,2,3,4,7,8,9-HpCDF	50.0	45.0	89.9	39.0	69.0	
OCDF	100	93.2	93.2	63.0	170	

= Outside range limits
* = Ion Ratio Out

QC Information

OPR Lab ID:	OPR16440
Extraction Date:	19-Jan-09
Analysis Date:	25-Jan-09
Method:	1613

Sample Information

Matrix:	Soil

File Information

OPR Filename :	a24jan09b_2-8
Retchk:	a24jan09b-15
Begin ConCal:	a24jan09b-15
Initial Cal:	m1613-100708a

Analytical Results
for
Ongoing Precision Result (OPR)

Labeled Standard	Spiked pg/ul	AMT pg/ul	REC %	Range pg/ul Lower	Range pg/ul Upper	Flag
Extraction Standards						
$^{13}C_{12}$-2,3,7,8-TCDD	100	90.1	90.1	20.0	175	
$^{13}C_{12}$-1,2,3,7,8-PeCDD	100	92.1	92.1	21.0	227	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	100	83.4	83.4	21.0	193	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	100	87.8	87.8	25.0	163	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	100	80.3	80.3	26.0	166	
$^{13}C_{12}$-OCDD	200	123	61.4	26.0	397	
$^{13}C_{12}$-2,3,7,8-TCDF	100	86.5	86.5	22.0	152	
$^{13}C_{12}$-1,2,3,7,8-PeCDF	100	96.3	96.3	21.0	192	
$^{13}C_{12}$-2,3,4,7,8-PeCDF	100	91.1	91.1	13.0	328	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	100	88.2	88.2	19.0	202	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	100	84.8	84.8	21.0	159	
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	100	84.3	84.3	22.0	176	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	100	84.8	84.8	17.0	205	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	100	78.9	78.9	21.0	158	
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	100	73.4	73.4	20.0	186	
Cleanup Standards						
$^{37}C_{14}$-2,3,7,8-TCDD	20.0	18.6	93.2	6.20	38.2	

Form Version:[OPR]1613

QC Information

OPR Lab ID:	OPR16440
Extraction Date:	19-Jan-09
Analysis Date:	25-Jan-09
Method:	1613

Sample Information

Matrix: Soil

File Information

OPR Filename :	a24jan09b_2-8
Retchk:	a24jan09b-15
Begin ConCal:	a24jan09b-15
Initial Cal:	m1613-100708a

Reviewed by: JW

Date Reviewed: 01/26/09

Analytical Results
for
Ongoing Precision Result (OPRD)

Analyte	Spiked pg/ul	AMT pg/ul	Recovery %	#	Range pg/ul Lower	Range pg/ul Upper	OPR Rec(%)	#	RPD	#
2,3,7,8-TCDD	10.0	8.78	87.8		6.70	15.8	91.2		3.79	
1,2,3,7,8-PeCDD	50.0	44.3	88.5		35.0	71.0	90.8		2.54	
1,2,3,4,7,8-HxCDD	50.0	45.8	91.7		35.0	82.0	99.0		7.68	
1,2,3,6,7,8-HxCDD	50.0	43.7	87.5		38.0	67.0	85.9		1.87	
1,2,3,7,8,9-HxCDD	50.0	45.7	91.4		32.0	81.0	94.1		2.86	
1,2,3,4,6,7,8-HpCDD	50.0	43.5	87.1		35.0	70.0	88.3		1.34	
OCDD	100	87.1	87.1		78.0	144	89.4		2.56	
2,3,7,8-TCDF	10.0	8.54	85.4		7.50	15.8	90.3		5.61	
1,2,3,7,8-PeCDF	50.0	44.2	88.3		40.0	67.0	90.9		2.83	
2,3,4,7,8-PeCDF	50.0	43.8	87.5		34.0	80.0	90.7		3.58	
1,2,3,4,7,8-HxCDF	50.0	46.6	93.2		36.0	67.0	92.7		0.536	
1,2,3,6,7,8-HxCDF	50.0	42.3	84.6		42.0	65.0	92.4		8.90	
2,3,4,6,7,8-HxCDF	50.0	45.2	90.4		35.0	78.0	93.2		3.03	
1,2,3,7,8,9-HxCDF	50.0	45.5	91.1		39.0	65.0	91.3		0.279	
1,2,3,4,6,7,8-HpCDF	50.0	43.2	86.5		41.0	61.0	89.3		3.22	
1,2,3,4,7,8,9-HpCDF	50.0	43.5	87.0		39.0	69.0	89.9		3.35	
OCDF	100	91.9	91.9		63.0	170	93.2		1.50	

= Outside range limits
* = Ion Ratio Out

QC Information

OPRD Lab ID:	OPRD16440
Extraction Date:	19-Jan-09
Analysis Date:	25-JAN-09 06:06:42
Method:	1613

Sample Information

Matrix:	Soil

File Information

OPRD Filename:	a24jan09b_2-9
Retchk:	a24jan09b-15
Begin ConCal:	a24jan09b-15
Initial Cal:	m1613-100708a

Analytical Results
for
Ongoing Precision Result (OPRD)

Labeled Standard	Spiked pg/ul	AMT pg/ul	REC %	Range pg/ul Lower	Range pg/ul Upper	Flag
Extraction Standards						
$^{13}C_{12}$-2,3,7,8-TCDD	100	90.4	90.4	20.0	175	
$^{13}C_{12}$-1,2,3,7,8-PeCDD	100	92.4	92.4	21.0	227	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	100	82.5	82.5	21.0	193	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	100	87.0	87.0	25.0	163	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	100	79.1	79.1	26.0	166	
$^{13}C_{12}$-OCDD	200	123	61.4	26.0	397	
$^{13}C_{12}$-2,3,7,8-TCDF	100	86.4	86.4	22.0	152	
$^{13}C_{12}$-1,2,3,7,8-PeCDF	100	95.9	95.9	21.0	192	
$^{13}C_{12}$-2,3,4,7,8-PeCDF	100	92.0	92.0	13.0	328	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	100	83.7	83.7	19.0	202	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	100	88.1	88.1	21.0	159	
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	100	85.4	85.4	22.0	176	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	100	84.1	84.1	17.0	205	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	100	78.6	78.6	21.0	158	
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	100	75.3	75.3	20.0	186	
Cleanup Standards						
$^{37}C_{l4}$-2,3,7,8-TCDD	20.0	18.4	92.1	6.20	38.2	

Form Version:[OPRD]1613

QC Information

OPRD Lab ID:	OPRD16440
Extraction Date:	19-Jan-09
Analysis Date:	25-JAN-09 06:06:42
Method:	1613

File Information

OPRD Filename : a24jan09b_2-9
Retchk: a24jan09b-15
Begin ConCal: a24jan09b-15

Initial Cal: m1613-100708a

Sample Information

Matrix: Soil

Reviewed by: _____

Date Reviewed: 01/26/09

SUBCONTRACTOR ANALYSIS REQUEST
CUSTODY TRANSFER 01/14/09

ANALYTICAL RESOURCES INCORPORATED

ARI Project: OH01

G1040-1

Laboratory: SGS ENVIROMENTAL SERVICES INC.
Lab Contact: TRENT TEMPERLY
Lab Address: 5500 BUSINESS DR.
WILMINGTON, NC 28405
Phone: 910-350-1903
Fax: 910-350-1557

ARI Client: Hart Crowser, Inc.
Project ID: PORT GAMBLE
ARI PM: Kelly Bottem
Phone: 206-695-6211
Fax: 206-695-6201

Analytical Protocol: In-house
Special Instructions:

Requested Turn Around:
Fax Results (Y/N): **Yes**

Limits of Liability. *Subcontractor is expected to perform all requested services in accordance with appropriate methodology following Standard Operating Procedures that meet standards for the industry. The total liability of ARI, its officers, agents, employees, or sucessors, arising out of or in connection with the requested services, shall not exceed the negotiated amount for said services. The agreement by the Subcontractor to perform services requested by ARI releases 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 Subcontractor.*

ARI ID	Client ID/ Add'l ID	Sampled	Matrix	Bottles	Analyses
09-646-OH01A	PGSS-77A	12/09/08 16:03	Sediment	1	Dioxin/Furans 1613(Sub)
Special Instructions: DIOXIN ANALYSIS 1613					
09-648-OH01C	PGSS-80	12/10/08 08:17	Sediment	1	Dioxin/Furans 1613(Sub)
Special Instructions: DIOXIN ANALYSIS 1613					
09-651-OH01F	PGSS-GEO-3	12/10/08 10:35	Sediment	1	Dioxin/Furans 1613(Sub)
Special Instructions: DIOXIN ANALYSIS 1613					
09-652-OH01G	PGSS-92	12/10/08 11:03	Sediment	1	Dioxin/Furans 1613(Sub)
Special Instructions: DIOXIN ANALYSIS1613					

Carrier UPS	Airbill 1Z 832 695 01 4551 6751		Date 1/14/09
Relinquished by [signature]	Company ARI	Date 1/14/09	Time 1600
Received by [signature]	Company SGS 2.1 no seal	Date 1/15/09	Time 10:15

Subcontractor Custody Form - **OH01**
Page 1 of 1

SGS

Laboratory Results

Ms. Kelly Bottem
Analytical Resources, Inc.
4611 S. 134th Place
Suite 100
Tukwila WA 98168-3240

Phone: 206-695-6211
Fax: 206-695-6201

Dear Ms. Bottem:

Enclosed is a full data package containing the final results for samples received by SGS Environmental Services, Inc. on January 15, 2009 under your project name "Port Gamble". The samples were analyzed by Method 1613 following SGS's Standard Operating Procedures and are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards.

Number of Samples Received:	4
Your Project Reference:	Port Gamble
SGS Project Number:	G1040-2

We appreciate your business and look forward to working with you again. Please contact me at 910-350-1903 if you have questions or need additional technical support.

Sincerely,

Jeannie Milholland

Jeannie Milholland
Project Manager

2-17-2009
Date

5500 Business Dr., Wilmington, NC 28405 t (910) 350-1903 f (910) 350-1557 www.us.sgs.com

Page 1

SGS

Case Narrative
SGS Project: **G1040-2**
Project Name: **Port Gamble**

For Method: 1613

- The submitted samples were accepted into the lab on January 15th, 2009 and extracted on January 19th, 2009 by method 3540C. The sample extract and associated QC extracts were then processed through clean-up as prescribed in the SGS standard operating procedures and analyzed by HRGC/HRMS for method 1613.
- No analytical issues were encountered.

Craig Tronzo 2/18/09

Craig R. Tronzo Date
Data Validation

5500 Business Dr., Wilmington, NC 28405 t (910) 350-1903 f (910) 350-1557 www.us.sgs.com

Page 2

SGS

List of Qualifiers: Dioxin's

B Analyte was detected in the Lab Method Blank at a level above the Reporting Limit.

EDL "Estimated Detection Limit"

EMPC "Estimated Maximum Possible Concentration"

RL Report Limit

CL Control Limit

U Undetected

ppt Parts-per-trillion (pg/g; ng/L)

V Recovery is below quality control limit. The data has been validated based on a favorable signal-to-noise and detection limit.

Outside quality control limits

* Indicates that the ion-ratio fails high or low; analyte reported as an EMPC

An average uncertainty of 30% can be routinely achieved as concluded from the evaluation of HRGC-HRMS standard operating procedures. The following flags warn the data user of situations where the uncertainty may be greater than stated.

A Amount detected is less than the Lower Method Calibration Limit.

J Amount detected is between the Method Detection Limit and the Lower Calibration Limit.

O The recovery of this analyte in the OPR is above the Method QC Limits and the reported concentration in the sample may be biased high.

E Amount detected is greater than the Upper Calibration Limit.

S The amount of analyte present has saturated the detector. This situation results in an underestimation of the affected analyte(s).

Q Indicates the presence of a quantitative interference. This situation may result in an underestimation of the affected analyte(s).

I Indicates the presence of a qualitative interference that could cause a false positive or an overestimation of the affected analyte(s).

DPE Indicates the presence of a peak in the polychlorinated diphenylether channel that could cause a false positive or an overestimation of the affected analyte(s).

DC250.081908.1

SGS

Toxic Equivalency Factors

Analyte	WHO* 1998	WHO* 2005	International-89	MADEP+
2,3,7,8-TCDD	1	1	1	1
1,2,3,7,8-PeCDD	1	1	0.5	0.5
1,2,3,4,7,8-HxCDD	0.1	0.1	0.1	0.1
1,2,3,6,7,8-HxCDD	0.1	0.1	0.1	0.1
1,2,3,7,8,9-HxCDD	0.1	0.1	0.1	0.1
1,2,3,4,6,7,8-HpCDD	0.01	0.01	0.01	0.1
OCDD	0.0001	0.0003	0.001	0.001
2,3,7,8-TCDF	0.1	0.1	0.1	0.1
1,2,3,7,8-PeCDF	0.05	0.03	0.05	0.5
2,3,4,7,8-PeCDF	0.5	0.3	0.5	0.5
1,2,3,4,7,8-HxCDF	0.1	0.1	0.1	0.1
1,2,3,6,7,8-HxCDF	0.1	0.1	0.1	0.1
2,3,4,6,7,8-HxCDF	0.1	0.1	0.1	0.1
1,2,3,7,8,9-HxCDF	0.1	0.1	0.1	0.1
1,2,3,4,6,7,8-HpCDF	0.01	0.01	0.01	0.1
1,2,3,4,7,8,9-HpCDF	0.01	0.01	0.01	0.1
OCDF	0.0001	0.0003	0.001	0.001

* World Health Organization
+ Massachusetts Department of Environmental Protection

Method 1613

PGSS-51

Analytical Resources, Inc.

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	Adj. MDL (pg/g)	Adj. RL (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	0.115	0.963			
1,2,3,7,8-PeCDD	ND	0.267	4.81			
1,2,3,4,7,8-HxCDD	ND	0.392	4.81			
1,2,3,6,7,8-HxCDD	ND	0.413	4.81			
1,2,3,7,8,9-HxCDD	1.41	0.227	4.81	37:14	1.41	J
1,2,3,4,6,7,8-HpCDD	48.3	0.413	4.81	40:20	1.07	
OCDD	449	0.801	9.63	44:40	0.89	
2,3,7,8-TCDF	1.86	0.109	0.963	30:53	0.80	
1,2,3,7,8-PeCDF	0.657	0.307	4.81	33:28	1.46	J
2,3,4,7,8-PeCDF	0.972	0.251	4.81	34:05	1.56	J
1,2,3,4,7,8-HxCDF	0.582	0.552	4.81	36:10	1.07	J
1,2,3,6,7,8-HxCDF	ND	0.132	4.81			
2,3,4,6,7,8-HxCDF	0.612	0.301	4.81	36:45	1.27	J
1,2,3,7,8,9-HxCDF	ND	0.255	4.81			
1,2,3,4,6,7,8-HpCDF	5.70	0.552	4.81	39:03	1.07	
1,2,3,4,7,8,9-HpCDF	ND	0.571	4.81			
OCDF	13.8	0.711	9.63	44:59	0.88	
Total TCDDs	24.0	0.115	0.963			
Total PeCDDs	15.7	0.267	4.81			Q
Total HxCDDs	37.4	0.227	4.81			
Total HpCDDs	286	0.413	4.81			
Total TCDFs	28.8	0.109	0.963			Q DPE
Total PeCDFs	10.2	0.251	4.81			Q DPE
Total HxCDFs	8.59	0.132	4.81			
Total HpCDFs	16.0	0.552	4.81			
WHO-2005 TEQ (ND=0)	1.44					
WHO-2005 TEQ (ND=½)	5.31					

Client Information

Project Name:	Port Gamble				
Sample ID:	PGSS-51				

Laboratory Information

Project ID:	G1040-2	
Sample ID:	G1040-2-1B	
Collection Date/Time:	08-Dec-08	14:25
Receipt Date:	15-Jan-09	10:15
Extraction Date:	19-Jan-09	
Analysis Date:	30-Jan-09	3:20

Sample Information

Matrix:	Sediment	
Weight / Volume:	24.77	grams
Solids / Lipids:	41.9	%
Original pH :	NA	
Batch ID:	WG16440	
Filename:	a27jan09a_6-10	
Retchk:	a27jan09a_5-14	
Begin ConCal:	a27jan09a_5-14	
Initial Cal:	m1613-100708a	

Method 1613

PGSS-51

Analytical Resources, Inc.

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
$^{13}C_{12}$-2,3,7,8-TCDD	2	1.61	80.4	31:27	0.78	
$^{13}C_{12}$-1,2,3,7,8-PeCDD	2	1.54	76.9	34:16	1.56	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	2	1.58	79.2	36:53	1.38	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	2	1.55	77.3	36:58	1.17	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	2	1.36	68.1	40:19	1.07	
$^{13}C_{12}$-OCDD	4.0	2.29	57.3	44:39	0.89	
$^{13}C_{12}$-2,3,7,8-TCDF	2	1.63	81.6	30:52	0.80	
$^{13}C_{12}$-1,2,3,7,8-PeCDF	2	1.63	81.5	33:27	1.57	
$^{13}C_{12}$-2,3,4,7,8-PeCDF	2	1.53	76.7	34:04	1.57	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	2	1.68	84.1	36:09	0.52	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	2	1.61	80.5	36:16	0.53	
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	2	1.61	80.5	36:45	0.52	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	2	1.59	79.7	37:32	0.52	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	2	1.40	70.0	39:03	0.45	
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	2	1.43	71.5	41:01	0.45	
Cleanup Standard						
$^{37}Cl_4$-2,3,7,8-TCDD	0.4	0.353	88.3	31:28		
Injection Standards						
$^{13}C_{12}$-1,2,3,4-TCDD	2.0			31:01	0.80	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	2.0			36:45	1.26	

Client Information

Project Name:	Port Gamble	
Sample ID:	PGSS-51	

Laboratory Information

Project ID:	G1040-2	
Sample ID:	G1040-2-1B	
Collection Date/Time:	08-Dec-08	14:25
Receipt Date:	15-Jan-09	10:15
Extraction Date:	19-Jan-09	
Analysis Date:	30-Jan-09	3:20

Analyzed by: _____

Date: 030209

Sample Information

Matrix:	Sediment	
Weight / Volume:	24.77	grams
Solids / Lipids:	41.9	%
Original pH :	NA	
Batch ID:	WG16440	
Filename:	a27jan09a_6-10	
Retchk:	a27jan09a_5-14	
Begin ConCal:	a27jan09a_5-14	
Initial Cal:	m1613-100708a	

Reviewed by: _____

Date: 03/03/09

Form Version:[1613_MDL_AMEC]Repor

TCDF Confirmation - Method 1613
PGSS-51
Analytical Resources, Inc.

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	Adj. MDL (pg/g)	Adj. RL (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDF	2.13	0.109	0.964	19.71	0.83	

Labeled Standard	Spiked Amount (ng)	RT (min.)	Ratio	Qualifier
Extraction Standards				
13C12-2,3,7,8-TCDF	2	19.70	0.78	

Client Information			**Sample Information**		
Project Name:	Port Gamble		Report Basis:	Dry	
			Matrix:	Sediment	
Sample ID:	PGSS-51		Weight / Volume:	24.77	g
			Solids / Lipids:	41.9	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG16440	
Project ID:	G1040-2		Instrument:		
Sample ID:	G1040-2-1B		Filename:	c09feb09a-12	
Collection Date/Time:	12/08/08	14:25	Retchk:	c09feb09a-2	
Receipt Date:	01/15/09	10:15	Begin ConCal:	c09feb09a-1	
Extraction Date:	01/19/09				
Analysis Date/Time:	02/09/09	12:12	Initial Cal:	mcf-c042108a	

Analyzed by: JW
Date: 03/09/09

Reviewed by: [illegible]
Date: 03/03/09

Method 1613

PGSS-64

Analytical Resources, Inc.

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	Adj. MDL (pg/g)	Adj. RL (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	0.108	0.907			
1,2,3,7,8-PeCDD	ND	0.251	4.53			
1,2,3,4,7,8-HxCDD	ND	0.369	4.53			
1,2,3,6,7,8-HxCDD	0.970	0.389	4.53	36:58	1.22	J
1,2,3,7,8,9-HxCDD	ND	0.213	4.53			
1,2,3,4,6,7,8-HpCDD	16.4	0.389	4.53	40:20	1.00	
OCDD	135	0.754	9.07	44:40	0.89	
2,3,7,8-TCDF	1.05	0.103	0.907	30:53	0.85	
1,2,3,7,8-PeCDF	0.419	0.289	4.53	33:28	1.72	J
2,3,4,7,8-PeCDF	0.508	0.237	4.53	34:05	1.66	J
1,2,3,4,7,8-HxCDF	ND	0.520	4.53			
1,2,3,6,7,8-HxCDF	ND	0.125	4.53			
2,3,4,6,7,8-HxCDF	ND	0.283	4.53			
1,2,3,7,8,9-HxCDF	ND	0.240	4.53			
1,2,3,4,6,7,8-HpCDF	2.44	0.520	4.53	39:03	0.93	J
1,2,3,4,7,8,9-HpCDF	ND	0.538	4.53			
OCDF	5.49	0.670	9.07	44:58	0.91	J
Total TCDDs	8.74	0.108	0.907			
Total PeCDDs	6.37	0.251	4.53			Q
Total HxCDDs	14.5	0.213	4.53			
Total HpCDDs	80.0	0.389	4.53			
Total TCDFs	16.7	0.103	0.907			Q DPE
Total PeCDFs	6.17	0.237	4.53			Q
Total HxCDFs	3.14	0.125	4.53			J
Total HpCDFs	6.64	0.520	4.53			
WHO-2005 TEQ (ND=0)	0.598					
WHO-2005 TEQ (ND=½)	4.70					

Client Information

Project Name:	Port Gamble
Sample ID:	PGSS-64

Laboratory Information

Project ID:	G1040-2	
Sample ID:	G1040-2-2B	
Collection Date/Time:	09-Dec-08	10:35
Receipt Date:	15-Jan-09	10:15
Extraction Date:	19-Jan-09	
Analysis Date:	30-Jan-09	4:08

Sample Information

Matrix:	Sediment	
Weight / Volume:	17.34	grams
Solids / Lipids:	63.6	%
Original pH :	NA	
Batch ID:	WG16440	
Filename:	a27jan09a_6-11	
Retchk:	a27jan09a_5-14	
Begin ConCal:	a27jan09a_5-14	
Initial Cal:	m1613-100708a	

Method 1613

PGSS-64

Analytical Resources, Inc.

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
$^{13}C_{12}$-2,3,7,8-TCDD	2	1.69	84.3	31:27	0.79	
$^{13}C_{12}$-1,2,3,7,8-PeCDD	2	1.73	86.6	34:16	1.58	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	2	1.73	86.3	36:53	1.27	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	2	1.67	83.3	36:58	1.26	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	2	1.51	75.3	40:19	1.05	
$^{13}C_{12}$-OCDD	4.0	2.35	58.7	44:39	0.90	
$^{13}C_{12}$-2,3,7,8-TCDF	2	1.70	85.1	30:52	0.80	
$^{13}C_{12}$-1,2,3,7,8-PeCDF	2	1.80	89.9	33:28	1.56	
$^{13}C_{12}$-2,3,4,7,8-PeCDF	2	1.71	85.3	34:05	1.58	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	2	1.76	88.1	36:09	0.52	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	2	1.78	89.1	36:16	0.53	
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	2	1.73	86.6	36:45	0.53	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	2	1.70	85.2	37:32	0.52	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	2	1.54	76.8	39:03	0.45	
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	2	1.50	75.1	41:01	0.45	
Cleanup Standard						
$^{37}Cl_4$-2,3,7,8-TCDD	0.4	0.371	92.8	31:28		
Injection Standards						
$^{13}C_{12}$-1,2,3,4-TCDD	2.0			31:01	0.79	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	2.0			36:45	1.25	

Client Information

Project Name:	Port Gamble	
Sample ID:	PGSS-64	

Laboratory Information

Project ID:	G1040-2	
Sample ID:	G1040-2-2B	
Collection Date/Time:	09-Dec-08	10:35
Receipt Date:	15-Jan-09	10:15
Extraction Date:	19-Jan-09	
Analysis Date:	30-Jan-09	4:08

Analyzed by: _____

Date: 02/3/09

Sample Information

Matrix:	Sediment	
Weight / Volume:	17.34	grams
Solids / Lipids:	63.6	%
Original pH :	NA	
Batch ID:	WG16440	
Filename:	a27jan09a_6-11	
Retchk:	a27jan09a_5-14	
Begin ConCal:	a27jan09a_5-14	
Initial Cal:	m1613-100708a	

Reviewed by: _____

Date: 02/03/09

Form Version:[1613_MDL_AMEC]Repor

TCDF Confirmation - Method 1613
PGSS-64
Analytical Resources, Inc.

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	Adj. MDL (pg/g)	Adj. RL (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDF	1.08	0.102	0.907	19.71	0.70	

Labeled Standard	Spiked Amount (ng)	RT (min.)	Ratio	Qualifier
Extraction Standards				
13C12-2,3,7,8-TCDF	2	19.69	0.78	

Client Information			**Sample Information**		
Project Name:	Port Gamble		Report Basis:	Dry	
			Matrix:	Sediment	
Sample ID:	PGSS-64		Weight / Volume:	17.34	g
			Solids / Lipids:	63.6	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG16440	
Project ID:	G1040-2		Instrument:		
Sample ID:	G1040-2-2B		Filename:	c09feb09a-13	
Collection Date/Time:	12/09/08	10:35	Retchk:	c09feb09a-2	
Receipt Date:	01/15/09	10:15	Begin ConCal:	c09feb09a-1	
Extraction Date:	01/19/09				
Analysis Date/Time:	02/09/09	12:35	Initial Cal:	mcf-c042108a	

Analyzed by: _____
Date: 030309

Reviewed by: _____
Date: 03/09/09

Method 1613

PGSS-73

Analytical Resources, Inc.

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	Adj. MDL (pg/g)	Adj. RL (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	0.104	0.875			
1,2,3,7,8-PeCDD	ND	0.242	4.37			
1,2,3,4,7,8-HxCDD	ND	0.356	4.37			
1,2,3,6,7,8-HxCDD	ND	0.376	4.37			
1,2,3,7,8,9-HxCDD	ND	0.206	4.37			
1,2,3,4,6,7,8-HpCDD	5.85	0.375	4.37	40:21	1.17	
OCDD	48.5	0.727	8.75	44:40	0.93	
2,3,7,8-TCDF	0.334	0.0990	0.875	30:54	0.73	J
1,2,3,7,8-PeCDF	ND	0.279	4.37			
2,3,4,7,8-PeCDF	ND	0.228	4.37			
1,2,3,4,7,8-HxCDF	ND	0.502	4.37			
1,2,3,6,7,8-HxCDF	ND	0.120	4.37			
2,3,4,6,7,8-HxCDF	ND	0.274	4.37			
1,2,3,7,8,9-HxCDF	ND	0.232	4.37			
1,2,3,4,6,7,8-HpCDF	1.12	0.501	4.37	39:04	1.03	J
1,2,3,4,7,8,9-HpCDF	ND	0.519	4.37			
OCDF	2.38	0.646	8.75	44:59	0.83	J
Total TCDDs	4.32	0.104	0.875			
Total PeCDDs	3.17	0.242	4.37			JQ
Total HxCDDs	5.35	0.206	4.37			
Total HpCDDs	27.2	0.375	4.37			
Total TCDFs	2.91	0.0990	0.875			DPE
Total PeCDFs	0.465	0.228	4.37			J
Total HxCDFs	0.684	0.120	4.37			J
Total HpCDFs	2.75	0.501	4.37			J
WHO-2005 TEQ (ND=0)	0.118					
WHO-2005 TEQ (ND=½)	5.01					

Client Information

Project Name:	Port Gamble
Sample ID:	PGSS-73

Laboratory Information

Project ID:	G1040-2	
Sample ID:	G1040-2-3B	
Collection Date/Time:	09-Dec-08	14:28
Receipt Date:	15-Jan-09	10:15
Extraction Date:	19-Jan-09	
Analysis Date:	30-Jan-09	4:57

Sample Information

Matrix:	Sediment	
Weight / Volume:	15.16	grams
Solids / Lipids:	75.4	%
Original pH :	NA	
Batch ID:	WG16440	
Filename:	a27jan09a_6-12	
Retchk:	a27jan09a_5-14	
Begin ConCal:	a27jan09a_5-14	
Initial Cal:	m1613-100708a	

Method 1613

PGSS-73

Analytical Resources, Inc.

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
$^{13}C_{12}$-2,3,7,8-TCDD	2	1.61	80.3	31:28	0.79	
$^{13}C_{12}$-1,2,3,7,8-PeCDD	2	1.64	81.9	34:16	1.58	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	2	1.63	81.5	36:53	1.27	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	2	1.64	81.9	36:58	1.25	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	2	1.46	73.0	40:19	1.05	
$^{13}C_{12}$-OCDD	4.0	2.36	59.0	44:39	0.89	
$^{13}C_{12}$-2,3,7,8-TCDF	2	1.63	81.7	30:52	0.79	
$^{13}C_{12}$-1,2,3,7,8-PeCDF	2	1.78	88.9	33:28	1.58	
$^{13}C_{12}$-2,3,4,7,8-PeCDF	2	1.61	80.6	34:05	1.58	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	2	1.69	84.6	36:09	0.52	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	2	1.74	86.9	36:16	0.52	
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	2	1.64	82.0	36:46	0.53	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	2	1.59	79.4	37:33	0.53	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	2	1.49	74.6	39:03	0.45	
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	2	1.40	70.0	41:01	0.45	
Cleanup Standard						
$^{37}Cl_4$-2,3,7,8-TCDD	0.4	0.347	86.8	31:28		
Injection Standards						
$^{13}C_{12}$-1,2,3,4-TCDD	2.0			31:01	0.79	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	2.0			36:46	1.25	

Client Information

Project Name: Port Gamble

Sample ID: PGSS-73

Laboratory Information

Project ID: G1040-2
Sample ID: G1040-2-3B
Collection Date/Time: 09-Dec-08 14:28
Receipt Date: 15-Jan-09 10:15
Extraction Date: 19-Jan-09
Analysis Date: 30-Jan-09 4:57

Analyzed by: JW
Date: 030309

Sample Information

Matrix: Sediment
Weight / Volume: 15.16 grams
Solids / Lipids: 75.4 %
Original pH : NA
Batch ID: WG16440

Filename: a27jan09a_6-12
Retchk: a27jan09a_5-14
Begin ConCal: a27jan09a_5-14

Initial Cal: m1613-100708a

Reviewed by: TM
Date: 03/02/09

Form Version:[1613_ MDL_AMEC]Repor

Method 1613

PGSS-75

Analytical Resources, Inc.

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	Adj. MDL (pg/g)	Adj. RL (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	0.104	0.875			
1,2,3,7,8-PeCDD	ND	0.242	4.37			
1,2,3,4,7,8-HxCDD	ND	0.356	4.37			
1,2,3,6,7,8-HxCDD	ND	0.376	4.37			
1,2,3,7,8,9-HxCDD	ND	0.206	4.37			
1,2,3,4,6,7,8-HpCDD	3.03	0.375	4.37	40:20	1.12	J
OCDD	22.8	0.727	8.75	44:40	0.92	
2,3,7,8-TCDF	ND	0.0990	0.875			
1,2,3,7,8-PeCDF	ND	0.279	4.37			
2,3,4,7,8-PeCDF	ND	0.228	4.37			
1,2,3,4,7,8-HxCDF	ND	0.502	4.37			
1,2,3,6,7,8-HxCDF	ND	0.120	4.37			
2,3,4,6,7,8-HxCDF	ND	0.274	4.37			
1,2,3,7,8,9-HxCDF	ND	0.232	4.37			
1,2,3,4,6,7,8-HpCDF	4.51	0.501	4.37	39:03	1.04	
1,2,3,4,7,8,9-HpCDF	ND	0.519	4.37			
OCDF	13.0	0.646	8.75	44:58	0.93	
Total TCDDs	0.392	0.104	0.875			J
Total PeCDDs	0.332	0.242	4.37			JQ
Total HxCDDs	1.79	0.206	4.37			J
Total HpCDDs	13.0	0.375	4.37			
Total TCDFs	ND	0.0990	0.875			DPE
Total PeCDFs	ND	0.228	4.37			Q
Total HxCDFs	2.92	0.120	4.37			J
Total HpCDFs	18.8	0.501	4.37			
WHO-2005 TEQ (ND=0)	0.0861					
WHO-2005 TEQ (ND=½)	5.02					

Client Information

Project Name:	Port Gamble
Sample ID:	PGSS-75

Laboratory Information

Project ID:	G1040-2	
Sample ID:	G1040-2-4B	
Collection Date/Time:	09-Dec-08	14:58
Receipt Date:	15-Jan-09	10:15
Extraction Date:	19-Jan-09	
Analysis Date:	01-Feb-09	22:06

Sample Information

Matrix:	Sediment	
Weight / Volume:	14.69	grams
Solids / Lipids:	77.8	%
Original pH :	NA	
Batch ID:	WG16440	
Filename:	a27jan09a_12-6	
Retchk:	a27jan09a_11-15	
Begin ConCal:	a27jan09a_11-15	
Initial Cal:	m1613-100708a	

Method 1613

PGSS-75

Analytical Resources, Inc.

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
$^{13}C_{12}$-2,3,7,8-TCDD	2	1.61	80.3	31:27	0.79	
$^{13}C_{12}$-1,2,3,7,8-PeCDD	2	1.52	75.9	34:15	1.59	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	2	1.66	82.9	36:52	1.26	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	2	1.61	80.7	36:57	1.27	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	2	1.36	68.2	40:19	1.05	
$^{13}C_{12}$-OCDD	4.0	2.33	58.2	44:39	0.91	
$^{13}C_{12}$-2,3,7,8-TCDF	2	1.64	82.1	30:51	0.80	
$^{13}C_{12}$-1,2,3,7,8-PeCDF	2	1.63	81.7	33:27	1.59	
$^{13}C_{12}$-2,3,4,7,8-PeCDF	2	1.53	76.5	34:04	1.59	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	2	1.71	85.4	36:09	0.52	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	2	1.73	86.3	36:15	0.53	
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	2	1.66	83.0	36:45	0.52	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	2	1.61	80.6	37:32	0.52	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	2	1.39	69.6	39:03	0.45	
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	2	1.36	67.9	41:01	0.45	
Cleanup Standard						
$^{37}Cl_4$-2,3,7,8-TCDD	0.4	0.338	84.5	31:28		
Injection Standards						
$^{13}C_{12}$-1,2,3,4-TCDD	2.0			31:00	0.79	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	2.0			36:45	1.25	

Client Information

Project Name: Port Gamble

Sample ID: PGSS-75

Laboratory Information

Project ID: G1040-2
Sample ID: G1040-2-4B
Collection Date/Time: 09-Dec-08 14:58
Receipt Date: 15-Jan-09 10:15
Extraction Date: 19-Jan-09
Analysis Date: 01-Feb-09 22:06

Analyzed by: JW
Date: 030309

Sample Information

Matrix: Sediment
Weight / Volume: 14.69 grams
Solids / Lipids: 77.8 %
Original pH : NA
Batch ID: WG16440

Filename: a27jan09a_12-6
Retchk: a27jan09a_11-15
Begin ConCal: a27jan09a_11-15

Initial Cal: m1613-100708a

Reviewed by: MM
Date: 03/03/09

Form Version:[1613_MDL_AMEC]Repor

Method 1613 - Blank Results

LMB

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	Adj. MDL (pg/g)	Adj. RL (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	0.119	1.00			
1,2,3,7,8-PeCDD	ND	0.277	5.00			
1,2,3,4,7,8-HxCDD	ND	0.407	5.00			
1,2,3,6,7,8-HxCDD	ND	0.429	5.00			
1,2,3,7,8,9-HxCDD	ND	0.235	5.00			
1,2,3,4,6,7,8-HpCDD	ND	0.429	5.00			
OCDD	ND	0.831	10.0			
2,3,7,8-TCDF	ND	0.113	1.00			
1,2,3,7,8-PeCDF	ND	0.319	5.00			
2,3,4,7,8-PeCDF	ND	0.261	5.00			
1,2,3,4,7,8-HxCDF	ND	0.573	5.00			
1,2,3,6,7,8-HxCDF	ND	0.138	5.00			
2,3,4,6,7,8-HxCDF	ND	0.313	5.00			
1,2,3,7,8,9-HxCDF	ND	0.265	5.00			
1,2,3,4,6,7,8-HpCDF	ND	0.573	5.00			
1,2,3,4,7,8,9-HpCDF	ND	0.593	5.00			
OCDF	ND	0.738	10.0			
Total TCDDs	ND	0.119	1.00			
Total PeCDDs	ND	0.277	5.00			
Total HxCDDs	ND	0.235	5.00			
Total HpCDDs	ND	0.429	5.00			
Total TCDFs	ND	0.113	1.00			
Total PeCDFs	ND	0.261	5.00			
Total HxCDFs	ND	0.138	5.00			
Total HpCDFs	ND	0.573	5.00			
WHO-2005 TEQ (ND=0)	0.000					
WHO-2005 TEQ (ND=½)	5.70					

Laboratory Information

Sample ID: LMB16440

Extraction Date: 19-Jan-09

Analysis Date: 25-Jan-09 6:55

Sample Information

Report Basis:	Dry Weight	
Matrix:	Soil	
Weight / Volume:	10.00	grams
Solids / Lipids:	100	%
Original pH :	NA	
Batch ID:	WG16440	
Filename:	a24jan09b_2-10	
Retchk:	a24jan09b-15	
Begin ConCal:	a24jan09b-15	
Initial Cal:	m1613-100708a	

- Blank Results

LMB

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
$^{13}C_{12}$-2,3,7,8-TCDD	2	1.83	91.5	31:27	0.78	
$^{13}C_{12}$-1,2,3,7,8-PeCDD	2	1.87	93.3	34:15	1.59	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	2	1.67	83.6	36:52	1.26	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	2	1.74	87.2	36:57	1.26	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	2	1.50	75.2	40:18	1.04	
$^{13}C_{12}$-OCDD	4.0	2.20	55.0	44:38	0.89	
$^{13}C_{12}$-2,3,7,8-TCDF	2	1.78	88.8	30:51	0.79	
$^{13}C_{12}$-1,2,3,7,8-PeCDF	2	1.97	98.6	33:27	1.58	
$^{13}C_{12}$-2,3,4,7,8-PeCDF	2	1.85	92.6	34:04	1.58	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	2	1.68	84.1	36:09	0.55	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	2	1.72	86.2	36:15	0.50	
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	2	1.69	84.4	36:44	0.52	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	2	1.64	81.8	37:32	0.53	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	2	1.52	76.1	39:02	0.45	
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	2	1.40	70.0	41:00	0.45	
Cleanup Standard						
$^{37}Cl_4$-2,3,7,8-TCDD	0.4	0.384	96.0	31:28		
Injection Standards						
$^{13}C_{12}$-1,2,3,4-TCDD	2.0			31:00	0.79	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	2.0			36:44	1.26	

Laboratory Information

Sample ID: LMB16440

Extraction Date: 19-Jan-09
Analysis Date: 25-Jan-09 6:55

Analyzed by: JW
Date: 020209

Sample Information

Report Basis:	Dry Weight	
Matrix:	Soil	
Weight / Volume:	10.00	grams
Solids / Lipids:	100	%
Original pH :	NA	
Batch ID:	WG16440	
Filename:	a24jan09b_2-10	
Retchk:	a24jan09b-15	
Begin ConCal:	a24jan09b-15	
Initial Cal:	m1613-100708a	

Reviewed by: MM
Date: 2/12/09

Form Version:[1613_MDL_AMEC]Repor

Analytical Results
for
Ongoing Precision Result (OPR)

Analyte	Spiked	AMT	REC	Range pg/ul		Flag
	pg/ul	pg/ul	%	Lower	Upper	
2,3,7,8-TCDD	10.0	9.12	91.2	6.70	15.8	
1,2,3,7,8-PeCDD	50.0	45.4	90.8	35.0	71.0	
1,2,3,4,7,8-HxCDD	50.0	49.5	99.0	35.0	82.0	
1,2,3,6,7,8-HxCDD	50.0	42.9	85.9	38.0	67.0	
1,2,3,7,8,9-HxCDD	50.0	47.0	94.1	32.0	81.0	
1,2,3,4,6,7,8-HpCDD	50.0	44.1	88.3	35.0	70.0	
OCDD	100	89.4	89.4	78.0	144	
2,3,7,8-TCDF	10.0	9.03	90.3	7.50	15.8	
1,2,3,7,8-PeCDF	50.0	45.4	90.9	40.0	67.0	
2,3,4,7,8-PeCDF	50.0	45.4	90.7	34.0	80.0	
1,2,3,4,7,8-HxCDF	50.0	46.3	92.7	36.0	67.0	
1,2,3,6,7,8-HxCDF	50.0	46.2	92.4	42.0	65.0	
2,3,4,6,7,8-HxCDF	50.0	46.6	93.2	35.0	78.0	
1,2,3,7,8,9-HxCDF	50.0	45.7	91.3	39.0	65.0	
1,2,3,4,6,7,8-HpCDF	50.0	44.7	89.3	41.0	61.0	
1,2,3,4,7,8,9-HpCDF	50.0	45.0	89.9	39.0	69.0	
OCDF	100	93.2	93.2	63.0	170	

= Outside range limits
* = Ion Ratio Out

QC Information

OPR Lab ID:	OPR16440
Extraction Date:	19-Jan-09
Analysis Date:	25-Jan-09
Method:	1613

Sample Information

Matrix:	Soil

File Information

OPR Filename :	a24jan09b_2-8
Retchk:	a24jan09b-15
Begin ConCal:	a24jan09b-15
Initial Cal:	m1613-100708a

Analytical Results
for
Ongoing Precision Result (OPR)

Labeled Standard	Spiked pg/ul	AMT pg/ul	REC %	Range pg/ul Lower	Range pg/ul Upper	Flag
Extraction Standards						
$^{13}C_{12}$-2,3,7,8-TCDD	100	90.1	90.1	20.0	175	
$^{13}C_{12}$-1,2,3,7,8-PeCDD	100	92.1	92.1	21.0	227	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	100	83.4	83.4	21.0	193	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	100	87.8	87.8	25.0	163	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	100	80.3	80.3	26.0	166	
$^{13}C_{12}$-OCDD	200	123	61.4	26.0	397	
$^{13}C_{12}$-2,3,7,8-TCDF	100	86.5	86.5	22.0	152	
$^{13}C_{12}$-1,2,3,7,8-PeCDF	100	96.3	96.3	21.0	192	
$^{13}C_{12}$-2,3,4,7,8-PeCDF	100	91.1	91.1	13.0	328	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	100	88.2	88.2	19.0	202	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	100	84.8	84.8	21.0	159	
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	100	84.3	84.3	22.0	176	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	100	84.8	84.8	17.0	205	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	100	78.9	78.9	21.0	158	
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	100	73.4	73.4	20.0	186	
Cleanup Standards						
$^{37}C_{l4}$-2,3,7,8-TCDD	20.0	18.6	93.2	6.20	38.2	

Form Version:[OPR]1613

QC Information

OPR Lab ID:	OPR16440
Extraction Date:	19-Jan-09
Analysis Date:	25-Jan-09
Method:	1613

Sample Information

Matrix:	Soil

File Information

OPR Filename :	a24jan09b_2-8
Retchk:	a24jan09b-15
Begin ConCal:	a24jan09b-15
Initial Cal:	m1613-100708a

Reviewed by: JW

Date Reviewed: 01/26/09

Analytical Results
for
Ongoing Precision Result (OPRD)

Analyte	Spiked pg/ul	AMT pg/ul	Recovery %	#	Range pg/ul Lower	Range pg/ul Upper	OPR Rec(%)	#	RPD	#
2,3,7,8-TCDD	10.0	8.78	87.8		6.70	15.8	91.2		3.79	
1,2,3,7,8-PeCDD	50.0	44.3	88.5		35.0	71.0	90.8		2.54	
1,2,3,4,7,8-HxCDD	50.0	45.8	91.7		35.0	82.0	99.0		7.68	
1,2,3,6,7,8-HxCDD	50.0	43.7	87.5		38.0	67.0	85.9		1.87	
1,2,3,7,8,9-HxCDD	50.0	45.7	91.4		32.0	81.0	94.1		2.86	
1,2,3,4,6,7,8-HpCDD	50.0	43.5	87.1		35.0	70.0	88.3		1.34	
OCDD	100	87.1	87.1		78.0	144	89.4		2.56	
2,3,7,8-TCDF	10.0	8.54	85.4		7.50	15.8	90.3		5.61	
1,2,3,7,8-PeCDF	50.0	44.2	88.3		40.0	67.0	90.9		2.83	
2,3,4,7,8-PeCDF	50.0	43.8	87.5		34.0	80.0	90.7		3.58	
1,2,3,4,7,8-HxCDF	50.0	46.6	93.2		36.0	67.0	92.7		0.536	
1,2,3,6,7,8-HxCDF	50.0	42.3	84.6		42.0	65.0	92.4		8.90	
2,3,4,6,7,8-HxCDF	50.0	45.2	90.4		35.0	78.0	93.2		3.03	
1,2,3,7,8,9-HxCDF	50.0	45.5	91.1		39.0	65.0	91.3		0.279	
1,2,3,4,6,7,8-HpCDF	50.0	43.2	86.5		41.0	61.0	89.3		3.22	
1,2,3,4,7,8,9-HpCDF	50.0	43.5	87.0		39.0	69.0	89.9		3.35	
OCDF	100	91.9	91.9		63.0	170	93.2		1.50	

= Outside range limits
* = Ion Ratio Out

QC Information

OPRD Lab ID:	OPRD16440
Extraction Date:	19-Jan-09
Analysis Date:	25-JAN-09 06:06:42
Method:	1613

Sample Information

Matrix:	Soil

File Information

OPRD Filename:	a24jan09b_2-9
Retchk:	a24jan09b-15
Begin ConCal:	a24jan09b-15
Initial Cal:	m1613-100708a

Analytical Results
for
Ongoing Precision Result (OPRD)

Labeled Standard	Spiked pg/ul	AMT pg/ul	REC %	Range pg/ul Lower	Range pg/ul Upper	Flag
Extraction Standards						
$^{13}C_{12}$-2,3,7,8-TCDD	100	90.4	90.4	20.0	175	
$^{13}C_{12}$-1,2,3,7,8-PeCDD	100	92.4	92.4	21.0	227	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	100	82.5	82.5	21.0	193	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	100	87.0	87.0	25.0	163	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	100	79.1	79.1	26.0	166	
$^{13}C_{12}$-OCDD	200	123	61.4	26.0	397	
$^{13}C_{12}$-2,3,7,8-TCDF	100	86.4	86.4	22.0	152	
$^{13}C_{12}$-1,2,3,7,8-PeCDF	100	95.9	95.9	21.0	192	
$^{13}C_{12}$-2,3,4,7,8-PeCDF	100	92.0	92.0	13.0	328	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	100	83.7	83.7	19.0	202	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	100	88.1	88.1	21.0	159	
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	100	85.4	85.4	22.0	176	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	100	84.1	84.1	17.0	205	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	100	78.6	78.6	21.0	158	
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	100	75.3	75.3	20.0	186	
Cleanup Standards						
$^{37}C_{l4}$-2,3,7,8-TCDD	20.0	18.4	92.1	6.20	38.2	

Form Version:[OPRD]1613

QC Information

OPRD Lab ID:	OPRD16440
Extraction Date:	19-Jan-09
Analysis Date:	25-JAN-09 06:06:42
Method:	1613

Sample Information

Matrix: Soil

File Information

OPRD Filename : a24jan09b_2-9
Retchk: a24jan09b-15
Begin ConCal: a24jan09b-15
Initial Cal: m1613-100708a

Reviewed by: _____ Date Reviewed: 01/26/09

SUBCONTRACTOR ANALYSIS REQUEST
CUSTODY TRANSFER 01/09/09

ANALYTICAL RESOURCES INCORPORATED

ARI Project: OH02

G1040-2

Laboratory: SGS ENVIROMENTAL SERVICES INC.
Lab Contact: TRENT TEMPERLY
Lab Address: 5500 BUSINESS DR.
WILMINGTON, NC 28405
Phone: 910-350-1903
Fax: 910-350-1557

ARI Client: Hart Crowser, Inc.
Project ID: PORT GAMBLE
ARI PM: Kelly Bottem
Phone: 206-695-6211
Fax: 206-695-6201

Analytical Protocol: PSDDA
Special Instructions:

Requested Turn Around: **01/23/09**
Fax Results (Y/N): **Yes**

Limits of Liability. *Subcontractor is expected to perform all requested services in accordance with appropriate methodology following Standard Operating Procedures that meet standards for the industry. The total liability of ARI, its officers, agents, employees, or sucessors, arising out of or in connection with the requested services, shall not exceed the negotiated amount for said services. The agreement by the Subcontractor to perform services requested by ARI releases 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 Subcontractor.*

ARI ID	Client ID/ Add'l ID	Sampled	Matrix	Bottles	Analyses
09-657-OH02E	PGSS-51	12/08/08 14:25	Sediment	1	Dioxin/Furans 1613(Sub)
Special Instructions: None					
09-668-OH02P	PGSS-64	12/09/08 10:35	Sediment	1	Dioxin/Furans 1613(Sub)
Special Instructions: None					
09-674-OH02V	PGSS-73	12/09/08 14:28	Sediment	1	Dioxin/Furans 1613(Sub)
Special Instructions: None					
09-675-OH02W	PGSS-75	12/09/08 14:58	Sediment	1	Dioxin/Furans 1613(Sub)
Special Instructions: None					

Carrier UPS	Airbill 1Z 832 695 01 4551 0751		Date 1/14/09
Relinquished by	Company ARI	Date 1/14/09	Time 1600
Received by	Company SGS 2.1 no seal	Date 1/15/09	Time 10:15

Subcontractor Custody Form - **OH02**
Page 1 of 1

SGS

Laboratory Results

Ms. Kelly Bottem
Analytical Resources, Inc.
4611 S. 134th Place
Suite 100
Tukwila WA 98168-3240

Phone: 206-695-6211
Fax: 206-695-6201

Dear Ms. Bottem:

Enclosed is a full data package containing the final results for samples received by SGS Environmental Services, Inc. on January 15, 2009 under your project name "Port Gamble". The samples were analyzed by Method 1613 following SGS's Standard Operating Procedures and are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards.

Number of Samples Received:	2
Your Project Reference:	Port Gamble
SGS Project Number:	G1040-4

We appreciate your business and look forward to working with you again. Please contact me at 910-350-1903 if you have questions or need additional technical support.

Sincerely,

Jeannie Milholland

Jeannie Milholland
Project Manager

2-05-2009
Date

5500 Business Dr., Wilmington, NC 28405 t (910) 350-1903 f (910) 350-1557 www.us.sgs.com

SGS

Case Narrative
SGS Project: **G1040-4**
Project Name: **Port Gamble**

For Method: 1613

- The submitted samples were accepted into the lab on January 15th, 2009 and extracted on February 1st, 2009 by method 3540C. The sample extracts and associated QC extracts were then processed through clean-up as prescribed in the SGS standard operating procedures and analyzed by HRGC/HRMS for method 1613.
- No analytical issues were encountered.

Craig R. Tronzo 2/9/09

Craig R. Tronzo Date
Data Validation

Page 2

SGS

List of Qualifiers: Dioxin's

B Analyte was detected in the Lab Method Blank at a level above the Reporting Limit.

EDL "Estimated Detection Limit"

EMPC "Estimated Maximum Possible Concentration"

RL Report Limit

CL Control Limit

U Undetected

ppt Parts-per-trillion (pg/g; ng/L)

V Recovery is below quality control limit. The data has been validated based on a favorable signal-to-noise and detection limit.

Outside quality control limits

* Indicates that the ion-ratio fails high or low; analyte reported as an EMPC

An average uncertainty of 30% can be routinely achieved as concluded from the evaluation of HRGC-HRMS standard operating procedures. The following flags warn the data user of situations where the uncertainty may be greater than stated.

A Amount detected is less than the Lower Method Calibration Limit.

J Amount detected is between the Method Detection Limit and the Lower Calibration Limit.

O The recovery of this analyte in the OPR is above the Method QC Limits and the reported concentration in the sample may be biased high.

E Amount detected is greater than the Upper Calibration Limit.

S The amount of analyte present has saturated the detector. This situation results in an underestimation of the affected analyte(s).

Q Indicates the presence of a quantitative interference. This situation may result in an underestimation of the affected analyte(s).

I Indicates the presence of a qualitative interference that could cause a false positive or an overestimation of the affected analyte(s).

DPE Indicates the presence of a peak in the polychlorinated diphenylether channel that could cause a false positive or an overestimation of the affected analyte(s).

DC250.081908.1

SGS

Toxic Equivalency Factors

Analyte	WHO* 1998	WHO* 2005	International-89	MADEP+
2,3,7,8-TCDD	1	1	1	1
1,2,3,7,8-PeCDD	1	1	0.5	0.5
1,2,3,4,7,8-HxCDD	0.1	0.1	0.1	0.1
1,2,3,6,7,8-HxCDD	0.1	0.1	0.1	0.1
1,2,3,7,8,9-HxCDD	0.1	0.1	0.1	0.1
1,2,3,4,6,7,8-HpCDD	0.01	0.01	0.01	0.1
OCDD	0.0001	0.0003	0.001	0.001
2,3,7,8-TCDF	0.1	0.1	0.1	0.1
1,2,3,7,8-PeCDF	0.05	0.03	0.05	0.5
2,3,4,7,8-PeCDF	0.5	0.3	0.5	0.5
1,2,3,4,7,8-HxCDF	0.1	0.1	0.1	0.1
1,2,3,6,7,8-HxCDF	0.1	0.1	0.1	0.1
2,3,4,6,7,8-HxCDF	0.1	0.1	0.1	0.1
1,2,3,7,8,9-HxCDF	0.1	0.1	0.1	0.1
1,2,3,4,6,7,8-HpCDF	0.01	0.01	0.01	0.1
1,2,3,4,7,8,9-HpCDF	0.01	0.01	0.01	0.1
OCDF	0.0001	0.0003	0.001	0.001

* World Health Organization
+ Massachusetts Department of Environmental Protection

Method 1613

OYSTER #1A

Analytical Resources, Inc.

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	Adj. MDL (pg/g)	Adj. RL (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	0.117	0.981			
1,2,3,7,8-PeCDD	ND	0.272	4.91			
1,2,3,4,7,8-HxCDD	ND	0.399	4.91			
1,2,3,6,7,8-HxCDD	ND	0.421	4.91			
1,2,3,7,8,9-HxCDD	ND	0.231	4.91			
1,2,3,4,6,7,8-HpCDD	ND	0.421	4.91			
OCDD	ND	0.816	9.81			
2,3,7,8-TCDF	ND	0.111	0.981			
1,2,3,7,8-PeCDF	ND	0.313	4.91			
2,3,4,7,8-PeCDF	ND	0.256	4.91			
1,2,3,4,7,8-HxCDF	ND	0.563	4.91			
1,2,3,6,7,8-HxCDF	ND	0.135	4.91			
2,3,4,6,7,8-HxCDF	ND	0.307	4.91			
1,2,3,7,8,9-HxCDF	ND	0.260	4.91			
1,2,3,4,6,7,8-HpCDF	ND	0.562	4.91			
1,2,3,4,7,8,9-HpCDF	ND	0.582	4.91			
OCDF	ND	0.725	9.81			
Total TCDDs	ND	0.117	0.981			
Total PeCDDs	ND	0.272	4.91			
Total HxCDDs	ND	0.231	4.91			
Total HpCDDs	ND	0.421	4.91			
Total TCDFs	ND	0.111	0.981			DPE
Total PeCDFs	ND	0.256	4.91			
Total HxCDFs	ND	0.135	4.91			
Total HpCDFs	ND	0.562	4.91			
WHO-2005 TEQ (ND=0)	0.000					
WHO-2005 TEQ (ND=½)	5.60					

Client Information

Project Name:	Port Gamble
Sample ID:	OYSTER #1A

Laboratory Information

Project ID:	G1040-4	
Sample ID:	G1040-4-1B	
Collection Date:	15-Dec-08	
Receipt Date:	15-Jan-09	10:15
Extraction Date:	01-Feb-09	
Analysis Date:	04-Feb-09	14:23

Sample Information

Matrix:	Tissue	
Weight / Volume:	10.19	grams
Solids / Lipids:	NA	%
Original pH :	NA	
Batch ID:	WG16457	
Filename:	a27jan09a_17-14	
Retchk:	a27jan09a_17-1	
Begin ConCal:	a27jan09a_17-1	
Initial Cal:	m1613-100708a	

Method 1613

OYSTER #1A

Analytical Resources, Inc.

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
$^{13}C_{12}$-2,3,7,8-TCDD	2	1.42	70.9	31:27	0.78	
$^{13}C_{12}$-1,2,3,7,8-PeCDD	2	1.40	69.9	34:16	1.59	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	2	1.44	72.0	36:53	1.26	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	2	1.44	71.9	36:58	1.25	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	2	1.32	66.2	40:20	1.05	
$^{13}C_{12}$-OCDD	4.0	1.63	40.7	44:40	0.90	
$^{13}C_{12}$-2,3,7,8-TCDF	2	1.46	72.9	30:52	0.79	
$^{13}C_{12}$-1,2,3,7,8-PeCDF	2	1.57	78.3	33:28	1.58	
$^{13}C_{12}$-2,3,4,7,8-PeCDF	2	1.39	69.7	34:05	1.58	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	2	1.43	71.5	36:09	0.52	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	2	1.48	74.1	36:16	0.53	
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	2	1.46	73.2	36:45	0.52	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	2	1.42	70.8	37:33	0.53	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	2	1.31	65.3	39:03	0.46	
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	2	1.37	68.4	41:02	0.45	
Cleanup Standard						
$^{37}Cl_4$-2,3,7,8-TCDD	0.4	0.287	71.8	31:28		
Injection Standards						
$^{13}C_{12}$-1,2,3,4-TCDD	2.0			31:00	0.79	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	2.0			36:45	1.26	

Client Information

Project Name: Port Gamble

Sample ID: OYSTER #1A

Laboratory Information

Project ID: G1040-4
Sample ID: G1040-4-1B
Collection Date: 15-Dec-08
Receipt Date: 15-Jan-09 10:15
Extraction Date: 01-Feb-09
Analysis Date: 04-Feb-09 14:23

Analyzed by: _____
Date: 03/02/09

Sample Information

Matrix: Tissue
Weight / Volume: 10.19 grams
Solids / Lipids: NA %
Original pH : NA
Batch ID: WG16457

Filename: a27jan09a_17-14
Retchk: a27jan09a_17-1
Begin ConCal: a27jan09a_17-1

Initial Cal: m1613-100708a

Reviewed by: _____
Date: 03/02/09

Form Version:[1613_MDL_AMEC]Repor

Method 1613

OYSTER #2A

Analytical Resources, Inc.

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	Adj. MDL (pg/g)	Adj. RL (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	0.108	0.910			
1,2,3,7,8-PeCDD	ND	0.252	4.55			
1,2,3,4,7,8-HxCDD	ND	0.370	4.55			
1,2,3,6,7,8-HxCDD	ND	0.391	4.55			
1,2,3,7,8,9-HxCDD	ND	0.214	4.55			
1,2,3,4,6,7,8-HpCDD	ND	0.391	4.55			
OCDD	1.78	0.757	9.10	44:41	0.88	J
2,3,7,8-TCDF	0.375	0.103	0.910	30:52	0.80	J
1,2,3,7,8-PeCDF	ND	0.290	4.55			
2,3,4,7,8-PeCDF	ND	0.237	4.55			
1,2,3,4,7,8-HxCDF	ND	0.522	4.55			
1,2,3,6,7,8-HxCDF	ND	0.125	4.55			
2,3,4,6,7,8-HxCDF	ND	0.285	4.55			
1,2,3,7,8,9-HxCDF	ND	0.241	4.55			
1,2,3,4,6,7,8-HpCDF	ND	0.521	4.55			
1,2,3,4,7,8,9-HpCDF	ND	0.540	4.55			
OCDF	ND	0.672	9.10			
Total TCDDs	ND	0.108	0.910			
Total PeCDDs	ND	0.252	4.55			
Total HxCDDs	ND	0.214	4.55			
Total HpCDDs	0.735	0.391	4.55			J
Total TCDFs	0.375	0.103	0.910			JDPE
Total PeCDFs	0.264	0.237	4.55			J
Total HxCDFs	ND	0.125	4.55			
Total HpCDFs	ND	0.521	4.55			
WHO-2005 TEQ (ND=0)	0.0380					
WHO-2005 TEQ (ND=½)	5.18					

Client Information

Project Name:	Port Gamble
Sample ID:	OYSTER #2A

Laboratory Information

Project ID:	G1040-4	
Sample ID:	G1040-4-2B	
Collection Date:	15-Dec-08	
Receipt Date:	15-Jan-09	10:15
Extraction Date:	01-Feb-09	
Analysis Date:	05-Feb-09	0:56

Sample Information

Matrix:	Tissue	
Weight / Volume:	10.99	grams
Solids / Lipids:	NA	%
Original pH :	NA	
Batch ID:	WG16457	
Filename:	a27jan09a_18-12	
Retchk:	a27jan09a_17-15	
Begin ConCal:	a27jan09a_17-15	
Initial Cal:	m1613-100708a	

Method 1613

OYSTER #2A

Analytical Resources, Inc.

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
$^{13}C_{12}$-2,3,7,8-TCDD	2	1.50	75.0	31:27	0.78	
$^{13}C_{12}$-1,2,3,7,8-PeCDD	2	1.55	77.3	34:16	1.58	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	2	1.56	78.0	36:53	1.37	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	2	1.60	80.1	36:58	1.16	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	2	1.46	73.1	40:20	1.06	
$^{13}C_{12}$-OCDD	4.0	2.13	53.3	44:39	0.90	
$^{13}C_{12}$-2,3,7,8-TCDF	2	1.49	74.6	30:51	0.79	
$^{13}C_{12}$-1,2,3,7,8-PeCDF	2	1.74	87.0	33:27	1.58	
$^{13}C_{12}$-2,3,4,7,8-PeCDF	2	1.54	77.0	34:05	1.57	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	2	1.63	81.5	36:09	0.52	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	2	1.64	82.2	36:16	0.52	
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	2	1.58	79.0	36:45	0.53	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	2	1.51	75.4	37:33	0.52	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	2	1.47	73.3	39:03	0.45	
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	2	1.45	72.4	41:01	0.45	
Cleanup Standard						
$^{37}Cl_4$-2,3,7,8-TCDD	0.4	0.335	83.8	31:28		
Injection Standards						
$^{13}C_{12}$-1,2,3,4-TCDD	2.0			31:00	0.79	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	2.0			36:45	1.25	

Client Information

Project Name:	Port Gamble
Sample ID:	OYSTER #2A

Laboratory Information

Project ID:	G1040-4	
Sample ID:	G1040-4-2B	
Collection Date:	15-Dec-08	
Receipt Date:	15-Jan-09	10:15
Extraction Date:	01-Feb-09	
Analysis Date:	05-Feb-09	0:56

Sample Information

Matrix:	Tissue	
Weight / Volume:	10.99	grams
Solids / Lipids:	NA	%
Original pH :	NA	
Batch ID:	WG16457	
Filename:	a27jan09a_18-12	
Retchk:	a27jan09a_17-15	
Begin ConCal:	a27jan09a_17-15	
Initial Cal:	m1613-100708a	

Analyzed by: JW

Date: 03/02/09

Reviewed by: TM

Date: 03/02/09

Form Version:[1613_MDL_AMEC]Repor

Method 1613 - Blank Results

LMB

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	Adj. MDL (pg/g)	Adj. RL (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	0.119	1.00			
1,2,3,7,8-PeCDD	ND	0.277	5.00			
1,2,3,4,7,8-HxCDD	ND	0.407	5.00			
1,2,3,6,7,8-HxCDD	ND	0.429	5.00			
1,2,3,7,8,9-HxCDD	ND	0.235	5.00			
1,2,3,4,6,7,8-HpCDD	ND	0.429	5.00			
OCDD	ND	0.831	10.0			
2,3,7,8-TCDF	ND	0.113	1.00			
1,2,3,7,8-PeCDF	ND	0.319	5.00			
2,3,4,7,8-PeCDF	ND	0.261	5.00			
1,2,3,4,7,8-HxCDF	ND	0.573	5.00			
1,2,3,6,7,8-HxCDF	ND	0.138	5.00			
2,3,4,6,7,8-HxCDF	ND	0.313	5.00			
1,2,3,7,8,9-HxCDF	ND	0.265	5.00			
1,2,3,4,6,7,8-HpCDF	ND	0.573	5.00			
1,2,3,4,7,8,9-HpCDF	ND	0.593	5.00			
OCDF	ND	0.738	10.0			
Total TCDDs	ND	0.119	1.00			
Total PeCDDs	ND	0.277	5.00			
Total HxCDDs	ND	0.235	5.00			
Total HpCDDs	ND	0.429	5.00			
Total TCDFs	ND	0.113	1.00			
Total PeCDFs	ND	0.261	5.00			
Total HxCDFs	ND	0.138	5.00			
Total HpCDFs	ND	0.573	5.00			
WHO-2005 TEQ (ND=0)	0.000					
WHO-2005 TEQ (ND=½)	5.70					

Laboratory Information

Sample ID:	LMB16457	
Extraction Date:	01-Feb-09	
Analysis Date:	05-Feb-09	0:08

Sample Information

Matrix:	Tissue	
Weight / Volume:	10.00	grams
Solids / Lipids:	NA	%
Original pH :	NA	
Batch ID:	WG16457	
Filename:	a27jan09a_18-11	
Retchk:	a27jan09a_17-15	
Begin ConCal:	a27jan09a_17-15	
Initial Cal:	m1613-100708a	

- Blank Results

LMB

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
$^{13}C_{12}$-2,3,7,8-TCDD	2	1.65	82.6	31:27	0.79	
$^{13}C_{12}$-1,2,3,7,8-PeCDD	2	1.64	82.0	34:16	1.57	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	2	1.66	83.1	36:53	1.26	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	2	1.68	83.9	36:58	1.27	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	2	1.49	74.5	40:20	1.05	
$^{13}C_{12}$-OCDD	4.0	1.75	43.7	44:40	0.90	
$^{13}C_{12}$-2,3,7,8-TCDF	2	1.69	84.6	30:52	0.80	
$^{13}C_{12}$-1,2,3,7,8-PeCDF	2	1.93	96.7	33:28	1.57	
$^{13}C_{12}$-2,3,4,7,8-PeCDF	2	1.67	83.5	34:05	1.57	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	2	1.66	83.2	36:09	0.52	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	2	1.78	88.8	36:16	0.52	
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	2	1.69	84.3	36:45	0.53	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	2	1.51	75.5	37:33	0.53	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	2	1.47	73.5	39:03	0.45	
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	2	1.38	69.0	41:02	0.45	
Cleanup Standard						
$^{37}Cl_4$-2,3,7,8-TCDD	0.4	0.328	82.0	31:28		
Injection Standards						
$^{13}C_{12}$-1,2,3,4-TCDD	2.0			31:00	0.79	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	2.0			36:45	1.25	

Laboratory Information

Sample ID: LMB16457

Extraction Date: 01-Feb-09
Analysis Date: 05-Feb-09 0:08

Analyzed by: _____
Date: 050209

Sample Information

Matrix:	Tissue	
Weight / Volume:	10.00	grams
Solids / Lipids:	NA	%
Original pH :	NA	
Batch ID:	WG16457	
Filename:	a27jan09a_18-11	
Retchk:	a27jan09a_17-15	
Begin ConCal:	a27jan09a_17-15	
Initial Cal:	m1613-100708a	

Reviewed by: _____
Date: 03/02/09

Form Version:[1613_MDL_AMEC]Repor

Analytical Results
for
Ongoing Precision Result (OPR)

Analyte	Spiked	AMT	REC	Range pg/ul		Flag
	pg/ul	pg/ul	%	Lower	Upper	
2,3,7,8-TCDD	10.0	9.89	98.9	6.70	15.8	
1,2,3,7,8-PeCDD	50.0	49.0	97.9	35.0	71.0	
1,2,3,4,7,8-HxCDD	50.0	50.3	101	35.0	82.0	
1,2,3,6,7,8-HxCDD	50.0	47.9	95.8	38.0	67.0	
1,2,3,7,8,9-HxCDD	50.0	48.7	97.4	32.0	81.0	
1,2,3,4,6,7,8-HpCDD	50.0	48.2	96.3	35.0	70.0	
OCDD	100	97.5	97.5	78.0	144	
2,3,7,8-TCDF	10.0	9.52	95.2	7.50	15.8	
1,2,3,7,8-PeCDF	50.0	48.9	97.8	40.0	67.0	
2,3,4,7,8-PeCDF	50.0	48.4	96.9	34.0	80.0	
1,2,3,4,7,8-HxCDF	50.0	49.6	99.1	36.0	67.0	
1,2,3,6,7,8-HxCDF	50.0	49.2	98.5	42.0	65.0	
2,3,4,6,7,8-HxCDF	50.0	50.2	100	35.0	78.0	
1,2,3,7,8,9-HxCDF	50.0	50.4	101	39.0	65.0	
1,2,3,4,6,7,8-HpCDF	50.0	49.0	97.9	41.0	61.0	
1,2,3,4,7,8,9-HpCDF	50.0	49.1	98.1	39.0	69.0	
OCDF	100	109	109	63.0	170	

= Outside range limits
* = Ion Ratio Out

QC Information

OPR Lab ID:	OPR16457
Extraction Date:	01-Feb-09
Analysis Date:	04-Feb-09
Method:	1613

Sample Information

Matrix:	Tissue

File Information

OPR Filename :	a27jan09a_18-9
Retchk:	a27jan09a_17-15
Begin ConCal:	a27jan09a_17-15
Initial Cal:	m1613-100708a

Analytical Results
for
Ongoing Precision Result (OPR)

Labeled Standard	Spiked pg/ul	AMT pg/ul	REC %	Range pg/ul Lower	Range pg/ul Upper	Flag
Extraction Standards						
$^{13}C_{12}$-2,3,7,8-TCDD	100	79.0	79.0	20.0	175	
$^{13}C_{12}$-1,2,3,7,8-PeCDD	100	78.2	78.2	21.0	227	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	100	83.4	83.4	21.0	193	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	100	85.8	85.8	25.0	163	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	100	76.6	76.6	26.0	166	
$^{13}C_{12}$-OCDD	200	124	61.8	26.0	397	
$^{13}C_{12}$-2,3,7,8-TCDF	100	81.2	81.2	22.0	152	
$^{13}C_{12}$-1,2,3,7,8-PeCDF	100	85.9	85.9	21.0	192	
$^{13}C_{12}$-2,3,4,7,8-PeCDF	100	80.4	80.4	13.0	328	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	100	86.1	86.1	19.0	202	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	100	87.7	87.7	21.0	159	
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	100	85.8	85.8	22.0	176	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	100	79.4	79.4	17.0	205	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	100	77.0	77.0	21.0	158	
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	100	73.7	73.7	20.0	186	
Cleanup Standards						
$^{37}C_{l4}$-2,3,7,8-TCDD	20.0	16.1	80.4	6.20	38.2	

Form Version:[OPR]1613

QC Information

OPR Lab ID:	OPR16457
Extraction Date:	01-Feb-09
Analysis Date:	04-Feb-09
Method:	1613

Sample Information

Matrix:	Tissue

File Information

OPR Filename :	a27jan09a_18-9
Retchk:	a27jan09a_17-15
Begin ConCal:	a27jan09a_17-15
Initial Cal:	m1613-100708a

Reviewed by: TM

Date Reviewed: 02/05/09

Analytical Results
for
Ongoing Precision Result (OPRD)

Analyte	Spiked pg/ul	AMT pg/ul	Recovery %	#	Range pg/ul Lower	Range pg/ul Upper	OPR Rec(%)	#	RPD	#
2,3,7,8-TCDD	10.0	9.65	96.5		6.70	15.8	98.9		2.46	
1,2,3,7,8-PeCDD	50.0	49.9	99.9		35.0	71.0	97.9		1.94	
1,2,3,4,7,8-HxCDD	50.0	50.6	101		35.0	82.0	101		0.588	
1,2,3,6,7,8-HxCDD	50.0	48.4	96.7		38.0	67.0	95.8		0.927	
1,2,3,7,8,9-HxCDD	50.0	49.2	98.5		32.0	81.0	97.4		1.10	
1,2,3,4,6,7,8-HpCDD	50.0	48.8	97.5		35.0	70.0	96.3		1.21	
OCDD	100	97.8	97.8		78.0	144	97.5		0.400	
2,3,7,8-TCDF	10.0	9.75	97.5		7.50	15.8	95.2		2.42	
1,2,3,7,8-PeCDF	50.0	49.3	98.7		40.0	67.0	97.8		0.908	
2,3,4,7,8-PeCDF	50.0	48.8	97.5		34.0	80.0	96.9		0.673	
1,2,3,4,7,8-HxCDF	50.0	49.8	99.5		36.0	67.0	99.1		0.356	
1,2,3,6,7,8-HxCDF	50.0	49.7	99.4		42.0	65.0	98.5		0.986	
2,3,4,6,7,8-HxCDF	50.0	49.6	99.2		35.0	78.0	100		1.08	
1,2,3,7,8,9-HxCDF	50.0	48.8	97.5		39.0	65.0	101		3.37	
1,2,3,4,6,7,8-HpCDF	50.0	50.4	101		41.0	61.0	97.9		2.93	
1,2,3,4,7,8,9-HpCDF	50.0	48.2	96.3		39.0	69.0	98.1		1.90	
OCDF	100	106	106		63.0	170	109		2.86	

= Outside range limits
* = Ion Ratio Out

QC Information

OPRD Lab ID:	OPRD16457
Extraction Date:	01-Feb-09
Analysis Date:	4-FEB-09 23:20:02
Method:	1613

Sample Information

Matrix:	Tissue

File Information

OPRD Filename:	a27jan09a_18-10
Retchk:	a27jan09a_17-15
Begin ConCal:	a27jan09a_17-15
Initial Cal:	m1613-100708a

Analytical Results
for
Ongoing Precision Result (OPRD)

Labeled Standard	Spiked pg/ul	AMT pg/ul	REC %	Range pg/ul Lower	Range pg/ul Upper	Flag
Extraction Standards						
$^{13}C_{12}$-2,3,7,8-TCDD	100	80.5	80.5	20.0	175	
$^{13}C_{12}$-1,2,3,7,8-PeCDD	100	79.3	79.3	21.0	227	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	100	84.7	84.7	21.0	193	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	100	85.6	85.6	25.0	163	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	100	73.5	73.5	26.0	166	
$^{13}C_{12}$-OCDD	200	117	58.5	26.0	397	
$^{13}C_{12}$-2,3,7,8-TCDF	100	81.2	81.2	22.0	152	
$^{13}C_{12}$-1,2,3,7,8-PeCDF	100	82.5	82.5	21.0	192	
$^{13}C_{12}$-2,3,4,7,8-PeCDF	100	81.1	81.1	13.0	328	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	100	86.9	86.9	19.0	202	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	100	91.3	91.3	21.0	159	
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	100	87.8	87.8	22.0	176	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	100	80.1	80.1	17.0	205	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	100	74.1	74.1	21.0	158	
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	100	71.7	71.7	20.0	186	
Cleanup Standards						
$^{37}C_{14}$-2,3,7,8-TCDD	20.0	15.5	77.6	6.20	38.2	

Form Version:[OPRD]1613

QC Information

OPRD Lab ID: OPRD16457
Extraction Date: 01-Feb-09
Analysis Date: 4-FEB-09 23:20:02
Method: 1613

Sample Information

Matrix: Tissue

File Information

OPRD Filename : a27jan09a_18-10
Retchk: a27jan09a_17-15
Begin ConCal: a27jan09a_17-15

Initial Cal: m1613-100708a

Reviewed by: TM

Date Reviewed: 02/05/09

SUBCONTRACTOR ANALYSIS REQUEST
CUSTODY TRANSFER 01/06/09

ANALYTICAL RESOURCES INCORPORATED

ARI Project: OG44

G1040-4

Laboratory: SGS ENVIROMENTAL SERVICES INC.
Lab Contact: TRENT TEMPERLY
Lab Address: 5500 BUSINESS DR.
WILMINGTON, NC 28405
Phone: 910-350-1903
Fax: 910-350-1557

ARI Client: Hart Crowser, Inc.
Project ID: PORT GAMBLE
ARI PM: Kelly Bottem
Phone: 206-695-6211
Fax: 206-695-6201

Analytical Protocol: In-house
Special Instructions:

Requested Turn Around: **01/20/09**
Fax Results (Y/N):

Limits of Liability. *Subcontractor is expected to perform all requested services in accordance with appropriate methodology following Standard Operating Procedures that meet standards for the industry. The total liability of ARI, its officers, agents, employees, or sucessors, arising out of or in connection with the requested services, shall not exceed the negotiated amount for said services. The agreement by the Subcontractor to perform services requested by ARI releases 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 Subcontractor.*

ARI ID	Client ID/ Add'l ID	Sampled	Matrix	Bottles	Analyses
09-348-OG44A	OYSTER #1A	12/15/08	Tissue	1	Dioxin/Furans 1613(Sub)
Special Instructions: None					
09-350-OG44C	OYSTER #2A	12/15/08	Tissue	1	Dioxin/Furans 1613(Sub)
Special Instructions: None					

Carrier UPS	Airbill 1Z 832 695 01 4592 5947		Date 1/14/09
Relinquished by	Company ARI	Date 1/14/09	Time 1600
Received by	Company SGS 3.5 no seal	Date 1/15/09	Time 10:15

Subcontractor Custody Form - **OG44**
Page 1 of 1

Laboratory Results

Ms. Kelly Bottem
Analytical Resources, Inc.
4611 S. 134th Place
Suite 100
Tukwila WA 98168-3240

Phone: 206-695-6211
Fax: 206-695-6201

Dear Ms. Bottem:

Enclosed is a full data package containing the final results for samples received by SGS Environmental Services, Inc. on January 15, 2009 under your project name "Port Gamble". The samples were analyzed by Method 1613 following SGS's Standard Operating Procedures and are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards.

Number of Samples Received:	2
Your Project Reference:	Port Gamble
SGS Project Number:	G1040-5

We appreciate your business and look forward to working with you again. Please contact me at 910-350-1903 if you have questions or need additional technical support.

Sincerely,

Jeannie Milholland

Jeannie Milholland
Project Manager

2-17-2009
Date

DC138.033007.7

Case Narrative
SGS Project: **G1040-5**
Project Name: **Port Gamble**

For Method: 1613

- The submitted samples were accepted into the lab on January 15th, 2009 and extracted on February 1st, 2009 by method 3540C. The sample extract and associated QC extracts were then processed through clean-up as prescribed in the SGS standard operating procedures and analyzed by HRGC/HRMS for method 1613.
- No analytical issues were encountered.

Craig R. Tronzo 2/17/09

Craig R. Tronzo Date
Data Validation

Paradigm Analytical Laboratories, Inc. | 5500 Business Dr., Wilmington, NC 28405 t (910) 350-1903 f (910) 350-1557 www.us.sgs.com

Page 2

SGS

List of Qualifiers: Dioxin's

B Analyte was detected in the Lab Method Blank at a level above the Reporting Limit.

EDL "Estimated Detection Limit"

EMPC "Estimated Maximum Possible Concentration"

RL Report Limit

CL Control Limit

U Undetected

ppt Parts-per-trillion (pg/g; ng/L)

V Recovery is below quality control limit. The data has been validated based on a favorable signal-to-noise and detection limit.

Outside quality control limits

* Indicates that the ion-ratio fails high or low; analyte reported as an EMPC

An average uncertainty of 30% can be routinely achieved as concluded from the evaluation of HRGC-HRMS standard operating procedures. The following flags warn the data user of situations where the uncertainty may be greater than stated.

A Amount detected is less than the Lower Method Calibration Limit.

J Amount detected is between the Method Detection Limit and the Lower Calibration Limit.

O The recovery of this analyte in the OPR is above the Method QC Limits and the reported concentration in the sample may be biased high.

E Amount detected is greater than the Upper Calibration Limit.

S The amount of analyte present has saturated the detector. This situation results in an underestimation of the affected analyte(s).

Q Indicates the presence of a quantitative interference. This situation may result in an underestimation of the affected analyte(s).

I Indicates the presence of a qualitative interference that could cause a false positive or an overestimation of the affected analyte(s).

DPE Indicates the presence of a peak in the polychlorinated diphenylether channel that could cause a false positive or an overestimation of the affected analyte(s).

DC250.081908.1

SGS

Toxic Equivalency Factors

Analyte	WHO* 1998	WHO* 2005	International-89	MADEP+
2,3,7,8-TCDD	1	1	1	1
1,2,3,7,8-PeCDD	1	1	0.5	0.5
1,2,3,4,7,8-HxCDD	0.1	0.1	0.1	0.1
1,2,3,6,7,8-HxCDD	0.1	0.1	0.1	0.1
1,2,3,7,8,9-HxCDD	0.1	0.1	0.1	0.1
1,2,3,4,6,7,8-HpCDD	0.01	0.01	0.01	0.1
OCDD	0.0001	0.0003	0.001	0.001
2,3,7,8-TCDF	0.1	0.1	0.1	0.1
1,2,3,7,8-PeCDF	0.05	0.03	0.05	0.5
2,3,4,7,8-PeCDF	0.5	0.3	0.5	0.5
1,2,3,4,7,8-HxCDF	0.1	0.1	0.1	0.1
1,2,3,6,7,8-HxCDF	0.1	0.1	0.1	0.1
2,3,4,6,7,8-HxCDF	0.1	0.1	0.1	0.1
1,2,3,7,8,9-HxCDF	0.1	0.1	0.1	0.1
1,2,3,4,6,7,8-HpCDF	0.01	0.01	0.01	0.1
1,2,3,4,7,8,9-HpCDF	0.01	0.01	0.01	0.1
OCDF	0.0001	0.0003	0.001	0.001

* World Health Organization
+ Massachusetts Department of Environmental Protection

Method 1613

CLAM #1A

Analytical Resources, Inc.

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	Adj. MDL (pg/g)	Adj. RL (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	0.111	0.937			
1,2,3,7,8-PeCDD	ND	0.260	4.69			
1,2,3,4,7,8-HxCDD	ND	0.381	4.69			
1,2,3,6,7,8-HxCDD	ND	0.402	4.69			
1,2,3,7,8,9-HxCDD	ND	0.221	4.69			
1,2,3,4,6,7,8-HpCDD	ND	0.402	4.69			
OCDD	ND	0.779	9.37			
2,3,7,8-TCDF	ND	0.106	0.937			
1,2,3,7,8-PeCDF	ND	0.299	4.69			
2,3,4,7,8-PeCDF	ND	0.245	4.69			
1,2,3,4,7,8-HxCDF	ND	0.537	4.69			
1,2,3,6,7,8-HxCDF	ND	0.129	4.69			
2,3,4,6,7,8-HxCDF	ND	0.293	4.69			
1,2,3,7,8,9-HxCDF	ND	0.248	4.69			
1,2,3,4,6,7,8-HpCDF	ND	0.537	4.69			
1,2,3,4,7,8,9-HpCDF	ND	0.556	4.69			
OCDF	ND	0.692	9.37			
Total TCDDs	ND	0.111	0.937			
Total PeCDDs	ND	0.260	4.69			
Total HxCDDs	ND	0.221	4.69			
Total HpCDDs	ND	0.402	4.69			
Total TCDFs	ND	0.106	0.937			
Total PeCDFs	ND	0.245	4.69			
Total HxCDFs	ND	0.129	4.69			
Total HpCDFs	ND	0.537	4.69			
WHO-2005 TEQ (ND=0)	0.000					
WHO-2005 TEQ (ND=½)	5.35					

Client Information

Project Name:	Port Gamble
Sample ID:	CLAM #1A

Laboratory Information

Project ID:	G1040-5	
Sample ID:	G1040-5-1B	
Collection Date:	15-Dec-08	
Receipt Date:	15-Jan-09	10:15
Extraction Date:	01-Feb-09	
Analysis Date:	05-Feb-09	1:44

Sample Information

Matrix:	Tissue	
Weight / Volume:	10.67	grams
Solids / Lipids:	NA	%
Original pH :	NA	
Batch ID:	WG16457	
Filename:	a27jan09a_18-13	
Retchk:	a27jan09a_17-15	
Begin ConCal:	a27jan09a_17-15	
Initial Cal:	m1613-100708a	

Method 1613

CLAM #1A

Analytical Resources, Inc.

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
$^{13}C_{12}$-2,3,7,8-TCDD	2	1.47	73.7	31:28	0.80	
$^{13}C_{12}$-1,2,3,7,8-PeCDD	2	1.52	75.8	34:16	1.57	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	2	1.53	76.7	36:52	1.27	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	2	1.55	77.4	36:58	1.26	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	2	1.39	69.3	40:20	1.06	
$^{13}C_{12}$-OCDD	4.0	1.61	40.1	44:40	0.89	
$^{13}C_{12}$-2,3,7,8-TCDF	2	1.53	76.6	30:52	0.79	
$^{13}C_{12}$-1,2,3,7,8-PeCDF	2	1.75	87.5	33:28	1.58	
$^{13}C_{12}$-2,3,4,7,8-PeCDF	2	1.55	77.3	34:05	1.58	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	2	1.54	77.2	36:09	0.52	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	2	1.61	80.3	36:16	0.53	
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	2	1.55	77.7	36:45	0.52	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	2	1.50	75.1	37:33	0.52	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	2	1.40	70.2	39:03	0.45	
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	2	1.44	72.1	41:02	0.45	
Cleanup Standard						
$^{37}Cl_4$-2,3,7,8-TCDD	0.4	0.320	80.0	31:28		
Injection Standards						
$^{13}C_{12}$-1,2,3,4-TCDD	2.0			31:00	0.80	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	2.0			36:45	1.25	

Client Information

Project Name: Port Gamble

Sample ID: CLAM #1A

Laboratory Information

Project ID: G1040-5
Sample ID: G1040-5-1B
Collection Date: 15-Dec-08
Receipt Date: 15-Jan-09 10:15
Extraction Date: 01-Feb-09
Analysis Date: 05-Feb-09 1:44

Analyzed by: _____
Date: 03/02/09

Sample Information

Matrix: Tissue
Weight / Volume: 10.67 grams
Solids / Lipids: NA %
Original pH : NA
Batch ID: WG16457

Filename: a27jan09a_18-13
Retchk: a27jan09a_17-15
Begin ConCal: a27jan09a_17-15

Initial Cal: m1613-100708a

Reviewed by: TM
Date: 03/02/09

Form Version:[1613_ MDL_AMEC]Repor

Method 1613

CLAM #2A

Analytical Resources, Inc.

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	Adj. MDL (pg/g)	Adj. RL (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	0.117	0.984			
1,2,3,7,8-PeCDD	ND	0.273	4.92			
1,2,3,4,7,8-HxCDD	ND	0.400	4.92			
1,2,3,6,7,8-HxCDD	ND	0.423	4.92			
1,2,3,7,8,9-HxCDD	ND	0.232	4.92			
1,2,3,4,6,7,8-HpCDD	ND	0.422	4.92			
OCDD	ND	0.818	9.84			
2,3,7,8-TCDF	ND	0.111	0.984			
1,2,3,7,8-PeCDF	ND	0.314	4.92			
2,3,4,7,8-PeCDF	ND	0.257	4.92			
1,2,3,4,7,8-HxCDF	ND	0.564	4.92			
1,2,3,6,7,8-HxCDF	ND	0.135	4.92			
2,3,4,6,7,8-HxCDF	ND	0.308	4.92			
1,2,3,7,8,9-HxCDF	ND	0.261	4.92			
1,2,3,4,6,7,8-HpCDF	ND	0.564	4.92			
1,2,3,4,7,8,9-HpCDF	ND	0.584	4.92			
OCDF	ND	0.727	9.84			
Total TCDDs	ND	0.117	0.984			
Total PeCDDs	ND	0.273	4.92			
Total HxCDDs	ND	0.232	4.92			
Total HpCDDs	ND	0.422	4.92			
Total TCDFs	ND	0.111	0.984			
Total PeCDFs	ND	0.257	4.92			
Total HxCDFs	ND	0.135	4.92			
Total HpCDFs	ND	0.564	4.92			
WHO-2005 TEQ (ND=0)	0.000					
WHO-2005 TEQ (ND=½)	5.61					

Client Information

Project Name:	Port Gamble
Sample ID:	CLAM #2A

Laboratory Information

Project ID:	G1040-5	
Sample ID:	G1040-5-2B	
Collection Date:	15-Dec-08	
Receipt Date:	15-Jan-09	10:15
Extraction Date:	01-Feb-09	
Analysis Date:	09-Feb-09	22:48

Sample Information

Matrix:	Tissue	
Weight / Volume:	10.16	grams
Solids / Lipids:	NA	%
Original pH :	NA	
Batch ID:	WG16457	
Filename:	a09feb09a-9	
Retchk:	a09feb09a-1	
Begin ConCal:	a09feb09a-1	
Initial Cal:	m1613-100708a	

Method 1613

CLAM #2A

Analytical Resources, Inc.

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
$^{13}C_{12}$-2,3,7,8-TCDD	2	1.76	87.8	31:27	0.78	
$^{13}C_{12}$-1,2,3,7,8-PeCDD	2	2.24	112	34:16	1.57	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	2	1.74	87.1	36:53	1.37	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	2	1.67	83.3	36:58	1.18	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	2	1.86	92.8	40:19	1.06	
$^{13}C_{12}$-OCDD	4.0	2.67	66.8	44:39	0.90	
$^{13}C_{12}$-2,3,7,8-TCDF	2	1.58	78.8	30:52	0.79	
$^{13}C_{12}$-1,2,3,7,8-PeCDF	2	2.24	112	33:28	1.61	
$^{13}C_{12}$-2,3,4,7,8-PeCDF	2	2.16	108	34:05	1.59	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	2	1.65	82.4	36:10	0.52	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	2	1.61	80.6	36:16	0.53	
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	2	1.69	84.3	36:45	0.52	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	2	1.74	86.8	37:32	0.53	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	2	1.73	86.7	39:03	0.45	
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	2	1.93	96.3	41:01	0.45	
Cleanup Standard						
$^{37}Cl_4$-2,3,7,8-TCDD	0.4	0.371	92.8	31:28		
Injection Standards						
$^{13}C_{12}$-1,2,3,4-TCDD	2.0			31:01	0.79	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	2.0			36:45	1.25	

Client Information

Project Name:	Port Gamble
Sample ID:	CLAM #2A

Laboratory Information

Project ID:	G1040-5	
Sample ID:	G1040-5-2B	
Collection Date:	15-Dec-08	
Receipt Date:	15-Jan-09	10:15
Extraction Date:	01-Feb-09	
Analysis Date:	09-Feb-09	22:48

Analyzed by: JMP

Date: 020209

Sample Information

Matrix:	Tissue	
Weight / Volume:	10.16	grams
Solids / Lipids:	NA	%
Original pH :	NA	
Batch ID:	WG16457	
Filename:	a09feb09a-9	
Retchk:	a09feb09a-1	
Begin ConCal:	a09feb09a-1	
Initial Cal:	m1613-100708a	

Reviewed by: TM

Date: 2/12/09

Form Version:[1613_MDL_AMEC]Repor

Method 1613 - Blank Results

LMB

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	Adj. MDL (pg/g)	Adj. RL (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	0.119	1.00			
1,2,3,7,8-PeCDD	ND	0.277	5.00			
1,2,3,4,7,8-HxCDD	ND	0.407	5.00			
1,2,3,6,7,8-HxCDD	ND	0.429	5.00			
1,2,3,7,8,9-HxCDD	ND	0.235	5.00			
1,2,3,4,6,7,8-HpCDD	ND	0.429	5.00			
OCDD	ND	0.831	10.0			
2,3,7,8-TCDF	ND	0.113	1.00			
1,2,3,7,8-PeCDF	ND	0.319	5.00			
2,3,4,7,8-PeCDF	ND	0.261	5.00			
1,2,3,4,7,8-HxCDF	ND	0.573	5.00			
1,2,3,6,7,8-HxCDF	ND	0.138	5.00			
2,3,4,6,7,8-HxCDF	ND	0.313	5.00			
1,2,3,7,8,9-HxCDF	ND	0.265	5.00			
1,2,3,4,6,7,8-HpCDF	ND	0.573	5.00			
1,2,3,4,7,8,9-HpCDF	ND	0.593	5.00			
OCDF	ND	0.738	10.0			
Total TCDDs	ND	0.119	1.00			
Total PeCDDs	ND	0.277	5.00			
Total HxCDDs	ND	0.235	5.00			
Total HpCDDs	ND	0.429	5.00			
Total TCDFs	ND	0.113	1.00			
Total PeCDFs	ND	0.261	5.00			
Total HxCDFs	ND	0.138	5.00			
Total HpCDFs	ND	0.573	5.00			
WHO-2005 TEQ (ND=0)	0.000					
WHO-2005 TEQ (ND=½)	5.70					

Laboratory Information

Sample ID:	LMB16457	
Extraction Date:	01-Feb-09	
Analysis Date:	05-Feb-09	0:08

Sample Information

Matrix:	Tissue	
Weight / Volume:	10.00	grams
Solids / Lipids:	NA	%
Original pH :	NA	
Batch ID:	WG16457	
Filename:	a27jan09a_18-11	
Retchk:	a27jan09a_17-15	
Begin ConCal:	a27jan09a_17-15	
Initial Cal:	m1613-100708a	

- Blank Results

LMB

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
$^{13}C_{12}$-2,3,7,8-TCDD	2	1.65	82.6	31:27	0.79	
$^{13}C_{12}$-1,2,3,7,8-PeCDD	2	1.64	82.0	34:16	1.57	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	2	1.66	83.1	36:53	1.26	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	2	1.68	83.9	36:58	1.27	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	2	1.49	74.5	40:20	1.05	
$^{13}C_{12}$-OCDD	4.0	1.75	43.7	44:40	0.90	
$^{13}C_{12}$-2,3,7,8-TCDF	2	1.69	84.6	30:52	0.80	
$^{13}C_{12}$-1,2,3,7,8-PeCDF	2	1.93	96.7	33:28	1.57	
$^{13}C_{12}$-2,3,4,7,8-PeCDF	2	1.67	83.5	34:05	1.57	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	2	1.66	83.2	36:09	0.52	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	2	1.78	88.8	36:16	0.52	
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	2	1.69	84.3	36:45	0.53	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	2	1.51	75.5	37:33	0.53	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	2	1.47	73.5	39:03	0.45	
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	2	1.38	69.0	41:02	0.45	
Cleanup Standard						
$^{37}Cl_4$-2,3,7,8-TCDD	0.4	0.328	82.0	31:28		
Injection Standards						
$^{13}C_{12}$-1,2,3,4-TCDD	2.0			31:00	0.79	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	2.0			36:45	1.25	

Laboratory Information

Sample ID: LMB16457

Extraction Date: 01-Feb-09
Analysis Date: 05-Feb-09 0:08

Analyzed by: _____
Date: 030209

Sample Information

Matrix:	Tissue	
Weight / Volume:	10.00	grams
Solids / Lipids:	NA	%
Original pH :	NA	
Batch ID:	WG16457	
Filename:	a27jan09a_18-11	
Retchk:	a27jan09a_17-15	
Begin ConCal:	a27jan09a_17-15	
Initial Cal:	m1613-100708a	

Reviewed by: _____
Date: 2/13/09

Form Version:[1613_MDL_AMEC]Repor

Analytical Results
for
Ongoing Precision Result (OPR)

Analyte	Spiked	AMT	REC	Range pg/ul		Flag
	pg/ul	pg/ul	%	Lower	Upper	
2,3,7,8-TCDD	10.0	9.89	98.9	6.70	15.8	
1,2,3,7,8-PeCDD	50.0	49.0	97.9	35.0	71.0	
1,2,3,4,7,8-HxCDD	50.0	50.3	101	35.0	82.0	
1,2,3,6,7,8-HxCDD	50.0	47.9	95.8	38.0	67.0	
1,2,3,7,8,9-HxCDD	50.0	48.7	97.4	32.0	81.0	
1,2,3,4,6,7,8-HpCDD	50.0	48.2	96.3	35.0	70.0	
OCDD	100	97.5	97.5	78.0	144	
2,3,7,8-TCDF	10.0	9.52	95.2	7.50	15.8	
1,2,3,7,8-PeCDF	50.0	48.9	97.8	40.0	67.0	
2,3,4,7,8-PeCDF	50.0	48.4	96.9	34.0	80.0	
1,2,3,4,7,8-HxCDF	50.0	49.6	99.1	36.0	67.0	
1,2,3,6,7,8-HxCDF	50.0	49.2	98.5	42.0	65.0	
2,3,4,6,7,8-HxCDF	50.0	50.2	100	35.0	78.0	
1,2,3,7,8,9-HxCDF	50.0	50.4	101	39.0	65.0	
1,2,3,4,6,7,8-HpCDF	50.0	49.0	97.9	41.0	61.0	
1,2,3,4,7,8,9-HpCDF	50.0	49.1	98.1	39.0	69.0	
OCDF	100	109	109	63.0	170	

= Outside range limits
* = Ion Ratio Out

QC Information

OPR Lab ID:	OPR16457
Extraction Date:	01-Feb-09
Analysis Date:	04-Feb-09
Method:	1613

Sample Information

Matrix:	Tissue

File Information

OPR Filename :	a27jan09a_18-9
Retchk:	a27jan09a_17-15
Begin ConCal:	a27jan09a_17-15
Initial Cal:	m1613-100708a

Analytical Results
for
Ongoing Precision Result (OPR)

Labeled Standard	Spiked pg/ul	AMT pg/ul	REC %	Range pg/ul Lower	Range pg/ul Upper	Flag
Extraction Standards						
$^{13}C_{12}$-2,3,7,8-TCDD	100	79.0	79.0	20.0	175	
$^{13}C_{12}$-1,2,3,7,8-PeCDD	100	78.2	78.2	21.0	227	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	100	83.4	83.4	21.0	193	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	100	85.8	85.8	25.0	163	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	100	76.6	76.6	26.0	166	
$^{13}C_{12}$-OCDD	200	124	61.8	26.0	397	
$^{13}C_{12}$-2,3,7,8-TCDF	100	81.2	81.2	22.0	152	
$^{13}C_{12}$-1,2,3,7,8-PeCDF	100	85.9	85.9	21.0	192	
$^{13}C_{12}$-2,3,4,7,8-PeCDF	100	80.4	80.4	13.0	328	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	100	86.1	86.1	19.0	202	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	100	87.7	87.7	21.0	159	
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	100	85.8	85.8	22.0	176	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	100	79.4	79.4	17.0	205	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	100	77.0	77.0	21.0	158	
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	100	73.7	73.7	20.0	186	
Cleanup Standards						
$^{37}C_{l4}$-2,3,7,8-TCDD	20.0	16.1	80.4	6.20	38.2	

Form Version:[OPR]1613

QC Information

OPR Lab ID:	OPR16457
Extraction Date:	01-Feb-09
Analysis Date:	04-Feb-09
Method:	1613

Sample Information

Matrix:	Tissue

File Information

OPR Filename :	a27jan09a_18-9
Retchk:	a27jan09a_17-15
Begin ConCal:	a27jan09a_17-15
Initial Cal:	m1613-100708a

Reviewed by: TM

Date Reviewed: 02/05/09

Analytical Results
for
Ongoing Precision Result (OPRD)

Analyte	Spiked pg/ul	AMT pg/ul	Recovery %	#	Range pg/ul Lower	Range pg/ul Upper	OPR Rec(%)	#	RPD	#
2,3,7,8-TCDD	10.0	9.65	96.5		6.70	15.8	98.9		2.46	
1,2,3,7,8-PeCDD	50.0	49.9	99.9		35.0	71.0	97.9		1.94	
1,2,3,4,7,8-HxCDD	50.0	50.6	101		35.0	82.0	101		0.588	
1,2,3,6,7,8-HxCDD	50.0	48.4	96.7		38.0	67.0	95.8		0.927	
1,2,3,7,8,9-HxCDD	50.0	49.2	98.5		32.0	81.0	97.4		1.10	
1,2,3,4,6,7,8-HpCDD	50.0	48.8	97.5		35.0	70.0	96.3		1.21	
OCDD	100	97.8	97.8		78.0	144	97.5		0.400	
2,3,7,8-TCDF	10.0	9.75	97.5		7.50	15.8	95.2		2.42	
1,2,3,7,8-PeCDF	50.0	49.3	98.7		40.0	67.0	97.8		0.908	
2,3,4,7,8-PeCDF	50.0	48.8	97.5		34.0	80.0	96.9		0.673	
1,2,3,4,7,8-HxCDF	50.0	49.8	99.5		36.0	67.0	99.1		0.356	
1,2,3,6,7,8-HxCDF	50.0	49.7	99.4		42.0	65.0	98.5		0.986	
2,3,4,6,7,8-HxCDF	50.0	49.6	99.2		35.0	78.0	100		1.08	
1,2,3,7,8,9-HxCDF	50.0	48.8	97.5		39.0	65.0	101		3.37	
1,2,3,4,6,7,8-HpCDF	50.0	50.4	101		41.0	61.0	97.9		2.93	
1,2,3,4,7,8,9-HpCDF	50.0	48.2	96.3		39.0	69.0	98.1		1.90	
OCDF	100	106	106		63.0	170	109		2.86	

= Outside range limits
* = Ion Ratio Out

QC Information

OPRD Lab ID:	OPRD16457
Extraction Date:	01-Feb-09
Analysis Date:	4-FEB-09 23:20:02
Method:	1613

Sample Information

Matrix:	Tissue

File Information

OPRD Filename:	a27jan09a_18-10
Retchk:	a27jan09a_17-15
Begin ConCal:	a27jan09a_17-15
Initial Cal:	m1613-100708a

Analytical Results
for
Ongoing Precision Result (OPRD)

Labeled Standard	Spiked pg/ul	AMT pg/ul	REC %	Range pg/ul Lower	Range pg/ul Upper	Flag
Extraction Standards						
$^{13}C_{12}$-2,3,7,8-TCDD	100	80.5	80.5	20.0	175	
$^{13}C_{12}$-1,2,3,7,8-PeCDD	100	79.3	79.3	21.0	227	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	100	84.7	84.7	21.0	193	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	100	85.6	85.6	25.0	163	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	100	73.5	73.5	26.0	166	
$^{13}C_{12}$-OCDD	200	117	58.5	26.0	397	
$^{13}C_{12}$-2,3,7,8-TCDF	100	81.2	81.2	22.0	152	
$^{13}C_{12}$-1,2,3,7,8-PeCDF	100	82.5	82.5	21.0	192	
$^{13}C_{12}$-2,3,4,7,8-PeCDF	100	81.1	81.1	13.0	328	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	100	86.9	86.9	19.0	202	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	100	91.3	91.3	21.0	159	
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	100	87.8	87.8	22.0	176	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	100	80.1	80.1	17.0	205	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	100	74.1	74.1	21.0	158	
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	100	71.7	71.7	20.0	186	
Cleanup Standards						
$^{37}C_{14}$-2,3,7,8-TCDD	20.0	15.5	77.6	6.20	38.2	

Form Version:[OPRD]1613

QC Information

OPRD Lab ID:	OPRD16457
Extraction Date:	01-Feb-09
Analysis Date:	4-FEB-09 23:20:02
Method:	1613

Sample Information

Matrix: Tissue

File Information

OPRD Filename : a27jan09a_18-10
Retchk: a27jan09a_17-15
Begin ConCal: a27jan09a_17-15
Initial Cal: m1613-100708a

Reviewed by: TM

Date Reviewed: 02/05/09

SUBCONTRACTOR ANALYSIS REQUEST
CUSTODY TRANSFER 01/07/09

ANALYTICAL RESOURCES INCORPORATED

ARI Project: OG45

G1040-5

Laboratory: SGS ENVIROMENTAL SERVICES INC.
Lab Contact: TRENT TEMPERLY
Lab Address: 5500 BUSINESS DR.
WILMINGTON, NC 28405
Phone: 910-350-1903
Fax: 910-350-1557

ARI Client: Hart Crowser, Inc.
Project ID: PORT GAMBLE
ARI PM: Kelly Bottem
Phone: 206-695-6211
Fax: 206-695-6201

Analytical Protocol: In-house
Special Instructions:

Requested Turn Around: **01/20/09**
Fax Results (Y/N):

Limits of Liability. *Subcontractor is expected to perform all requested services in accordance with appropriate methodology following Standard Operating Procedures that meet standards for the industry. The total liability of ARI, its officers, agents, employees, or sucessors, arising out of or in connection with the requested services, shall not exceed the negotiated amount for said services. The agreement by the Subcontractor to perform services requested by ARI releases 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 Subcontractor.*

ARI ID	Client ID/ Add'l ID	Sampled	Matrix	Bottles	Analyses
09-357-OG45A	CLAM #1A	12/15/08	Tissue	1	Dioxin/Furans 1613(Sub)
Special Instructions: None					
09-408-OG45B	CLAM 2A	12/15/08	Tissue	1	Dioxin/Furans 1613(Sub)
Special Instructions: None					

Carrier		Airbill		Date	
UPS		1Z 832 695 01 4592 6947		1/14/09	
Relinquished by	Company		Date	Time	
	ARI		1/14/09	1600	
Received by	Company		Date	Time	
	SGS	3.5 no seal	1/15/09	10:15	

Subcontractor Custody Form - **OG45**
Page 1 of 1

Laboratory Results

Ms. Kelly Bottem
Analytical Resources, Inc.
4611 S. 134th Place
Suite 100
Tukwila WA 98168-3240

Phone: 206-695-6211
Fax: 206-695-6201

Dear Ms. Bottem:

Enclosed is a full data package containing the final results for samples received by SGS Environmental Services, Inc. on January 15, 2009 under your project name "OG53". The samples were analyzed by Method 1613 following SGS's Standard Operating Procedures and are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards.

Number of Samples Received:	2
Your Project Reference:	OG53
SGS Project Number:	G1040-6

We appreciate your business and look forward to working with you again. Please contact me at 910-350-1903 if you have questions or need additional technical support.

Sincerely,

Jeannie Milholland

Jeannie Milholland
Project Manager

2-17-2009
Date

DC138.033007.7

Page 1

Case Narrative
SGS Project: **G1040-6**
Project Name: **OG53**

For Method: 1613

- The submitted samples were accepted into the lab on January 15th, 2009 and extracted on February 1st, 2009 by method 3540C. The sample extract and associated QC extracts were then processed through clean-up as prescribed in the SGS standard operating procedures and analyzed by HRGC/HRMS for method 1613.
- No analytical issues were encountered.

Craig R. Tvonzo 2/17/09
Craig R. Tvonzo Date
Data Validation

Paradigm Analytical Laboratories, Inc. | 5500 Business Dr., Wilmington, NC 28405 t (910) 350-1903 f (910) 350-1557 www.us.sgs.com
Member of the SGS Group

Page 2

SGS

List of Qualifiers: Dioxin's

B Analyte was detected in the Lab Method Blank at a level above the Reporting Limit.

EDL "Estimated Detection Limit"

EMPC "Estimated Maximum Possible Concentration"

RL Report Limit

CL Control Limit

U Undetected

ppt Parts-per-trillion (pg/g; ng/L)

V Recovery is below quality control limit. The data has been validated based on a favorable signal-to-noise and detection limit.

Outside quality control limits

* Indicates that the ion-ratio fails high or low; analyte reported as an EMPC

An average uncertainty of 30% can be routinely achieved as concluded from the evaluation of HRGC-HRMS standard operating procedures. The following flags warn the data user of situations where the uncertainty may be greater than stated.

A Amount detected is less than the Lower Method Calibration Limit.

J Amount detected is between the Method Detection Limit and the Lower Calibration Limit.

O The recovery of this analyte in the OPR is above the Method QC Limits and the reported concentration in the sample may be biased high.

E Amount detected is greater than the Upper Calibration Limit.

S The amount of analyte present has saturated the detector. This situation results in an underestimation of the affected analyte(s).

Q Indicates the presence of a quantitative interference. This situation may result in an underestimation of the affected analyte(s).

I Indicates the presence of a qualitative interference that could cause a false positive or an overestimation of the affected analyte(s).

DPE Indicates the presence of a peak in the polychlorinated diphenylether channel that could cause a false positive or an overestimation of the affected analyte(s).

DC250.081908.1

SGS

Toxic Equivalency Factors

Analyte	WHO* 1998	WHO* 2005	International-89	MADEP+
2,3,7,8-TCDD	1	1	1	1
1,2,3,7,8-PeCDD	1	1	0.5	0.5
1,2,3,4,7,8-HxCDD	0.1	0.1	0.1	0.1
1,2,3,6,7,8-HxCDD	0.1	0.1	0.1	0.1
1,2,3,7,8,9-HxCDD	0.1	0.1	0.1	0.1
1,2,3,4,6,7,8-HpCDD	0.01	0.01	0.01	0.1
OCDD	0.0001	0.0003	0.001	0.001
2,3,7,8-TCDF	0.1	0.1	0.1	0.1
1,2,3,7,8-PeCDF	0.05	0.03	0.05	0.5
2,3,4,7,8-PeCDF	0.5	0.3	0.5	0.5
1,2,3,4,7,8-HxCDF	0.1	0.1	0.1	0.1
1,2,3,6,7,8-HxCDF	0.1	0.1	0.1	0.1
2,3,4,6,7,8-HxCDF	0.1	0.1	0.1	0.1
1,2,3,7,8,9-HxCDF	0.1	0.1	0.1	0.1
1,2,3,4,6,7,8-HpCDF	0.01	0.01	0.01	0.1
1,2,3,4,7,8,9-HpCDF	0.01	0.01	0.01	0.1
OCDF	0.0001	0.0003	0.001	0.001

* World Health Organization
+ Massachusetts Department of Environmental Protection

Method 1613

CRAB1-A MEAT

Analytical Resources, Inc.

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	Adj. MDL (pg/g)	Adj. RL (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	0.112	0.945			
1,2,3,7,8-PeCDD	ND	0.262	4.73			
1,2,3,4,7,8-HxCDD	ND	0.384	4.73			
1,2,3,6,7,8-HxCDD	ND	0.406	4.73			
1,2,3,7,8,9-HxCDD	ND	0.223	4.73			
1,2,3,4,6,7,8-HpCDD	ND	0.406	4.73			
OCDD	ND	0.786	9.45			
2,3,7,8-TCDF	0.223	0.107	0.945	30:53	0.77	J
1,2,3,7,8-PeCDF	ND	0.301	4.73			
2,3,4,7,8-PeCDF	ND	0.247	4.73			
1,2,3,4,7,8-HxCDF	ND	0.542	4.73			
1,2,3,6,7,8-HxCDF	ND	0.130	4.73			
2,3,4,6,7,8-HxCDF	ND	0.296	4.73			
1,2,3,7,8,9-HxCDF	ND	0.250	4.73			
1,2,3,4,6,7,8-HpCDF	ND	0.542	4.73			
1,2,3,4,7,8,9-HpCDF	ND	0.561	4.73			
OCDF	ND	0.698	9.45			
Total TCDDs	ND	0.112	0.945			
Total PeCDDs	ND	0.262	4.73			
Total HxCDDs	0.429	0.223	4.73			J
Total HpCDDs	ND	0.406	4.73			
Total TCDFs	0.223	0.107	0.945			JDPE
Total PeCDFs	ND	0.247	4.73			
Total HxCDFs	ND	0.130	4.73			
Total HpCDFs	ND	0.542	4.73			
WHO-2005 TEQ (ND=0)	0.0223					
WHO-2005 TEQ (ND=½)	5.37					

Client Information

Project Name:	OG53
Sample ID:	CRAB1-A MEAT

Laboratory Information

Project ID:	G1040-6	
Sample ID:	G1040-6-1B	
Collection Date/Time:	23-Dec-08	
Receipt Date:	15-Jan-09	10:15
Extraction Date:	01-Feb-09	
Analysis Date:	09-Feb-09	23:36

Sample Information

Matrix:	Tissue	
Weight / Volume:	10.58	grams
Solids / Lipids:	NA	%
Original pH :	NA	
Batch ID:	WG16457	
Filename:	a09feb09a-10	
Retchk:	a09feb09a-1	
Begin ConCal:	a09feb09a-1	
Initial Cal:	m1613-100708a	

Method 1613

CRAB1-A MEAT

Analytical Resources, Inc.

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
$^{13}C_{12}$-2,3,7,8-TCDD	2	1.80	90.1	31:28	0.78	
$^{13}C_{12}$-1,2,3,7,8-PeCDD	2	2.30	115	34:16	1.58	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	2	1.64	82.1	36:53	1.27	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	2	1.66	83.2	36:58	1.26	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	2	1.87	93.6	40:19	1.05	
$^{13}C_{12}$-OCDD	4.0	2.83	70.7	44:39	0.89	
$^{13}C_{12}$-2,3,7,8-TCDF	2	1.65	82.3	30:52	0.79	
$^{13}C_{12}$-1,2,3,7,8-PeCDF	2	2.33	117	33:27	1.59	
$^{13}C_{12}$-2,3,4,7,8-PeCDF	2	2.24	112	34:05	1.58	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	2	1.68	84.1	36:09	0.54	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	2	1.72	85.8	36:16	0.51	
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	2	1.66	83.2	36:45	0.53	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	2	1.73	86.6	37:33	0.53	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	2	1.70	85.2	39:03	0.45	
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	2	1.86	93.1	41:01	0.45	
Cleanup Standard						
$^{37}Cl_4$-2,3,7,8-TCDD	0.4	0.375	93.8	31:29		
Injection Standards						
$^{13}C_{12}$-1,2,3,4-TCDD	2.0			31:01	0.79	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	2.0			36:45	1.25	

Client Information

Project Name: OG53

Sample ID: CRAB1-A MEAT

Laboratory Information

Project ID: G1040-6
Sample ID: G1040-6-1B
Collection Date/Time: 23-Dec-08
Receipt Date: 15-Jan-09 10:15
Extraction Date: 01-Feb-09
Analysis Date: 09-Feb-09 23:36

Analyzed by: _____
Date: 030309

Sample Information

Matrix: Tissue
Weight / Volume: 10.58 grams
Solids / Lipids: NA %
Original pH : NA
Batch ID: WG16457

Filename: a09feb09a-10
Retchk: a09feb09a-1
Begin ConCal: a09feb09a-1

Initial Cal: m1613-100708a

Reviewed by: _____
Date: 03/03/09

Form Version:[1613_MDL_AMEC]Repor

Method 1613

CRAB1-A PAN2

Analytical Resources, Inc.

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	Adj. MDL (pg/g)	Adj. RL (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	0.106	0.895			
1,2,3,7,8-PeCDD	0.428	0.248	4.48	34:16	1.53	J
1,2,3,4,7,8-HxCDD	ND	0.364	4.48			
1,2,3,6,7,8-HxCDD	1.05	0.384	4.48	36:58	1.38	J
1,2,3,7,8,9-HxCDD	ND	0.211	4.48			
1,2,3,4,6,7,8-HpCDD	1.80	0.384	4.48	40:20	1.14	J
OCDD	2.30	0.744	8.95	44:39	1.00	J
2,3,7,8-TCDF	1.03	0.101	0.895	30:53	0.83	
1,2,3,7,8-PeCDF	ND	0.286	4.48			
2,3,4,7,8-PeCDF	0.455	0.234	4.48	34:05	1.52	J
1,2,3,4,7,8-HxCDF	ND	0.513	4.48			
1,2,3,6,7,8-HxCDF	ND	0.123	4.48			
2,3,4,6,7,8-HxCDF	ND	0.280	4.48			
1,2,3,7,8,9-HxCDF	ND	0.237	4.48			
1,2,3,4,6,7,8-HpCDF	ND	0.513	4.48			
1,2,3,4,7,8,9-HpCDF	ND	0.531	4.48			
OCDF	ND	0.661	8.95			
Total TCDDs	0.786	0.106	0.895			J
Total PeCDDs	1.41	0.248	4.48			J
Total HxCDDs	4.69	0.211	4.48			
Total HpCDDs	5.89	0.384	4.48			
Total TCDFs	4.19	0.101	0.895			DPE
Total PeCDFs	3.80	0.234	4.48			J
Total HxCDFs	1.78	0.123	4.48			J
Total HpCDFs	ND	0.513	4.48			
WHO-2005 TEQ (ND=0)	0.791					
WHO-2005 TEQ (ND=½)	2.70					

Client Information

Project Name:	OG53
Sample ID:	CRAB1-A PAN2

Laboratory Information

Project ID:	G1040-6	
Sample ID:	G1040-6-2B	
Collection Date/Time:	23-Dec-08	10:35
Receipt Date:	15-Jan-09	10:15
Extraction Date:	01-Feb-09	
Analysis Date:	10-Feb-09	0:24

Sample Information

Matrix:	Tissue	
Weight / Volume:	11.17	grams
Solids / Lipids:	NA	%
Original pH :	NA	
Batch ID:	WG16457	
Filename:	a09feb09a-11	
Retchk:	a09feb09a-1	
Begin ConCal:	a09feb09a-1	
Initial Cal:	m1613-100708a	

Method 1613

CRAB1-A PAN2

Analytical Resources, Inc.

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
$^{13}C_{12}$-2,3,7,8-TCDD	2	1.77	88.4	31:28	0.78	
$^{13}C_{12}$-1,2,3,7,8-PeCDD	2	2.14	107	34:16	1.58	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	2	1.72	86.1	36:53	1.26	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	2	1.77	88.4	36:58	1.27	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	2	1.71	85.3	40:19	1.06	
$^{13}C_{12}$-OCDD	4.0	2.60	64.9	44:39	0.90	
$^{13}C_{12}$-2,3,7,8-TCDF	2	1.72	86.0	30:52	0.79	
$^{13}C_{12}$-1,2,3,7,8-PeCDF	2	2.22	111	33:27	1.58	
$^{13}C_{12}$-2,3,4,7,8-PeCDF	2	2.12	106	34:05	1.57	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	2	1.88	93.9	36:09	0.52	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	2	1.78	88.8	36:16	0.53	
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	2	1.77	88.3	36:45	0.53	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	2	1.70	85.2	37:32	0.53	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	2	1.71	85.7	39:03	0.45	
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	2	1.75	87.6	41:01	0.45	
Cleanup Standard						
$^{37}Cl_4$-2,3,7,8-TCDD	0.4	0.338	84.5	31:29		
Injection Standards						
$^{13}C_{12}$-1,2,3,4-TCDD	2.0			31:01	0.80	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	2.0			36:45	1.26	

Client Information

Project Name: OG53

Sample ID: CRAB1-A PAN2

Laboratory Information

Project ID: G1040-6
Sample ID: G1040-6-2B
Collection Date/Time: 23-Dec-08 10:35
Receipt Date: 15-Jan-09 10:15
Extraction Date: 01-Feb-09
Analysis Date: 10-Feb-09 0:24

Analyzed by: _____
Date: 030309

Sample Information

Matrix: Tissue
Weight / Volume: 11.17 grams
Solids / Lipids: NA %
Original pH : NA
Batch ID: WG16457

Filename: a09feb09a-11
Retchk: a09feb09a-1
Begin ConCal: a09feb09a-1

Initial Cal: m1613-100708a

Reviewed by: _____
Date: 03/10/09

Form Version:[1613_MDL_AMEC]Report

TCDF Confirmation - Method 1613

CRAB1-A PAN2

Analytical Resources, Inc.

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	Adj. MDL (pg/g)	Adj. RL (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDF	1.22	0.0731	0.895	19.69	0.80	

Labeled Standard	Spiked Amount (ng)	RT (min.)	Ratio	Qualifier
Extraction Standards				
13C12-2,3,7,8-TCDF	2	19.68	0.77	

Client Information			**Sample Information**		
Project Name:	OG53		Report Basis:	Wet	
			Matrix:	Tissue	
Sample ID:	CRAB1-A PAN2		Weight / Volume:	11.17	g
			Solids / Lipids:	NA	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG16457	
Project ID:	G1040-6		Instrument:		
Sample ID:	G1040-6-2B		Filename:	c17feb09b-8	
Collection Date/Time:	12/23/08	10:35	Retchk:	c17feb09b-2	
Receipt Date:	01/15/09	10:15	Begin ConCal:	c17feb09b-1	
Extraction Date:	02/01/09				
Analysis Date/Time:	02/17/09	13:41	Initial Cal:	mcf-c042108a	

Analyzed by: JWP
Date: 030309

Reviewed by: TM
Date: 03/02/09

Method 1613 - Blank Results

LMB

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	Adj. MDL (pg/g)	Adj. RL (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	0.119	1.00			
1,2,3,7,8-PeCDD	ND	0.277	5.00			
1,2,3,4,7,8-HxCDD	ND	0.407	5.00			
1,2,3,6,7,8-HxCDD	ND	0.429	5.00			
1,2,3,7,8,9-HxCDD	ND	0.235	5.00			
1,2,3,4,6,7,8-HpCDD	ND	0.429	5.00			
OCDD	ND	0.831	10.0			
2,3,7,8-TCDF	ND	0.113	1.00			
1,2,3,7,8-PeCDF	ND	0.319	5.00			
2,3,4,7,8-PeCDF	ND	0.261	5.00			
1,2,3,4,7,8-HxCDF	ND	0.573	5.00			
1,2,3,6,7,8-HxCDF	ND	0.138	5.00			
2,3,4,6,7,8-HxCDF	ND	0.313	5.00			
1,2,3,7,8,9-HxCDF	ND	0.265	5.00			
1,2,3,4,6,7,8-HpCDF	ND	0.573	5.00			
1,2,3,4,7,8,9-HpCDF	ND	0.593	5.00			
OCDF	ND	0.738	10.0			
Total TCDDs	ND	0.119	1.00			
Total PeCDDs	ND	0.277	5.00			
Total HxCDDs	ND	0.235	5.00			
Total HpCDDs	ND	0.429	5.00			
Total TCDFs	ND	0.113	1.00			
Total PeCDFs	ND	0.261	5.00			
Total HxCDFs	ND	0.138	5.00			
Total HpCDFs	ND	0.573	5.00			
WHO-2005 TEQ (ND=0)	0.000					
WHO-2005 TEQ (ND=½)	5.70					

Laboratory Information

Sample ID:	LMB16457	
Extraction Date:	01-Feb-09	
Analysis Date:	05-Feb-09	0:08

Sample Information

Matrix:	Tissue	
Weight / Volume:	10.00	grams
Solids / Lipids:	NA	%
Original pH :	NA	
Batch ID:	WG16457	
Filename:	a27jan09a_18-11	
Retchk:	a27jan09a_17-15	
Begin ConCal:	a27jan09a_17-15	
Initial Cal:	m1613-100708a	

- Blank Results

LMB

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
$^{13}C_{12}$-2,3,7,8-TCDD	2	1.65	82.6	31:27	0.79	
$^{13}C_{12}$-1,2,3,7,8-PeCDD	2	1.64	82.0	34:16	1.57	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	2	1.66	83.1	36:53	1.26	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	2	1.68	83.9	36:58	1.27	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	2	1.49	74.5	40:20	1.05	
$^{13}C_{12}$-OCDD	4.0	1.75	43.7	44:40	0.90	
$^{13}C_{12}$-2,3,7,8-TCDF	2	1.69	84.6	30:52	0.80	
$^{13}C_{12}$-1,2,3,7,8-PeCDF	2	1.93	96.7	33:28	1.57	
$^{13}C_{12}$-2,3,4,7,8-PeCDF	2	1.67	83.5	34:05	1.57	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	2	1.66	83.2	36:09	0.52	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	2	1.78	88.8	36:16	0.52	
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	2	1.69	84.3	36:45	0.53	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	2	1.51	75.5	37:33	0.53	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	2	1.47	73.5	39:03	0.45	
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	2	1.38	69.0	41:02	0.45	
Cleanup Standard						
$^{37}Cl_4$-2,3,7,8-TCDD	0.4	0.328	82.0	31:28		
Injection Standards						
$^{13}C_{12}$-1,2,3,4-TCDD	2.0			31:00	0.79	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	2.0			36:45	1.25	

Laboratory Information

Sample ID: LMB16457

Extraction Date: 01-Feb-09
Analysis Date: 05-Feb-09 0:08

Analyzed by: _____
Date: 03/02/09

Sample Information

Matrix:	Tissue	
Weight / Volume:	10.00	grams
Solids / Lipids:	NA	%
Original pH :	NA	
Batch ID:	WG16457	
Filename:	a27jan09a_18-11	
Retchk:	a27jan09a_17-15	
Begin ConCal:	a27jan09a_17-15	
Initial Cal:	m1613-100708a	

Reviewed by: _____
Date: 03/02/09

Form Version:[1613_MDL_AMEC]Repor

Analytical Results
for
Ongoing Precision Result (OPR)

Analyte	Spiked	AMT	REC	Range pg/ul		Flag
	pg/ul	pg/ul	%	Lower	Upper	
2,3,7,8-TCDD	10.0	9.89	98.9	6.70	15.8	
1,2,3,7,8-PeCDD	50.0	49.0	97.9	35.0	71.0	
1,2,3,4,7,8-HxCDD	50.0	50.3	101	35.0	82.0	
1,2,3,6,7,8-HxCDD	50.0	47.9	95.8	38.0	67.0	
1,2,3,7,8,9-HxCDD	50.0	48.7	97.4	32.0	81.0	
1,2,3,4,6,7,8-HpCDD	50.0	48.2	96.3	35.0	70.0	
OCDD	100	97.5	97.5	78.0	144	
2,3,7,8-TCDF	10.0	9.52	95.2	7.50	15.8	
1,2,3,7,8-PeCDF	50.0	48.9	97.8	40.0	67.0	
2,3,4,7,8-PeCDF	50.0	48.4	96.9	34.0	80.0	
1,2,3,4,7,8-HxCDF	50.0	49.6	99.1	36.0	67.0	
1,2,3,6,7,8-HxCDF	50.0	49.2	98.5	42.0	65.0	
2,3,4,6,7,8-HxCDF	50.0	50.2	100	35.0	78.0	
1,2,3,7,8,9-HxCDF	50.0	50.4	101	39.0	65.0	
1,2,3,4,6,7,8-HpCDF	50.0	49.0	97.9	41.0	61.0	
1,2,3,4,7,8,9-HpCDF	50.0	49.1	98.1	39.0	69.0	
OCDF	100	109	109	63.0	170	

= Outside range limits
* = Ion Ratio Out

QC Information

OPR Lab ID:	OPR16457
Extraction Date:	01-Feb-09
Analysis Date:	04-Feb-09
Method:	1613

Sample Information

Matrix:	Tissue

File Information

OPR Filename :	a27jan09a_18-9
Retchk:	a27jan09a_17-15
Begin ConCal:	a27jan09a_17-15
Initial Cal:	m1613-100708a

Analytical Results
for
Ongoing Precision Result (OPR)

Labeled Standard	Spiked pg/ul	AMT pg/ul	REC %	Range pg/ul Lower	Range pg/ul Upper	Flag
Extraction Standards						
$^{13}C_{12}$-2,3,7,8-TCDD	100	79.0	79.0	20.0	175	
$^{13}C_{12}$-1,2,3,7,8-PeCDD	100	78.2	78.2	21.0	227	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	100	83.4	83.4	21.0	193	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	100	85.8	85.8	25.0	163	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	100	76.6	76.6	26.0	166	
$^{13}C_{12}$-OCDD	200	124	61.8	26.0	397	
$^{13}C_{12}$-2,3,7,8-TCDF	100	81.2	81.2	22.0	152	
$^{13}C_{12}$-1,2,3,7,8-PeCDF	100	85.9	85.9	21.0	192	
$^{13}C_{12}$-2,3,4,7,8-PeCDF	100	80.4	80.4	13.0	328	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	100	86.1	86.1	19.0	202	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	100	87.7	87.7	21.0	159	
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	100	85.8	85.8	22.0	176	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	100	79.4	79.4	17.0	205	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	100	77.0	77.0	21.0	158	
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	100	73.7	73.7	20.0	186	
Cleanup Standards						
$^{37}C_{l4}$-2,3,7,8-TCDD	20.0	16.1	80.4	6.20	38.2	

Form Version:[OPR]1613

QC Information

OPR Lab ID:	OPR16457
Extraction Date:	01-Feb-09
Analysis Date:	04-Feb-09
Method:	1613

Sample Information

Matrix:	Tissue

File Information

OPR Filename :	a27jan09a_18-9
Retchk:	a27jan09a_17-15
Begin ConCal:	a27jan09a_17-15
Initial Cal:	m1613-100708a

Reviewed by: TM

Date Reviewed: 02/05/09

Analytical Results
for
Ongoing Precision Result (OPRD)

Analyte	Spiked pg/ul	AMT pg/ul	Recovery %	#	Range pg/ul Lower	Range pg/ul Upper	OPR Rec(%)	#	RPD	#
2,3,7,8-TCDD	10.0	9.65	96.5		6.70	15.8	98.9		2.46	
1,2,3,7,8-PeCDD	50.0	49.9	99.9		35.0	71.0	97.9		1.94	
1,2,3,4,7,8-HxCDD	50.0	50.6	101		35.0	82.0	101		0.588	
1,2,3,6,7,8-HxCDD	50.0	48.4	96.7		38.0	67.0	95.8		0.927	
1,2,3,7,8,9-HxCDD	50.0	49.2	98.5		32.0	81.0	97.4		1.10	
1,2,3,4,6,7,8-HpCDD	50.0	48.8	97.5		35.0	70.0	96.3		1.21	
OCDD	100	97.8	97.8		78.0	144	97.5		0.400	
2,3,7,8-TCDF	10.0	9.75	97.5		7.50	15.8	95.2		2.42	
1,2,3,7,8-PeCDF	50.0	49.3	98.7		40.0	67.0	97.8		0.908	
2,3,4,7,8-PeCDF	50.0	48.8	97.5		34.0	80.0	96.9		0.673	
1,2,3,4,7,8-HxCDF	50.0	49.8	99.5		36.0	67.0	99.1		0.356	
1,2,3,6,7,8-HxCDF	50.0	49.7	99.4		42.0	65.0	98.5		0.986	
2,3,4,6,7,8-HxCDF	50.0	49.6	99.2		35.0	78.0	100		1.08	
1,2,3,7,8,9-HxCDF	50.0	48.8	97.5		39.0	65.0	101		3.37	
1,2,3,4,6,7,8-HpCDF	50.0	50.4	101		41.0	61.0	97.9		2.93	
1,2,3,4,7,8,9-HpCDF	50.0	48.2	96.3		39.0	69.0	98.1		1.90	
OCDF	100	106	106		63.0	170	109		2.86	

= Outside range limits
* = Ion Ratio Out

QC Information

OPRD Lab ID:	OPRD16457
Extraction Date:	01-Feb-09
Analysis Date:	4-FEB-09 23:20:02
Method:	1613

Sample Information

Matrix:	Tissue

File Information

OPRD Filename:	a27jan09a_18-10
Retchk:	a27jan09a_17-15
Begin ConCal:	a27jan09a_17-15
Initial Cal:	m1613-100708a

Analytical Results
for
Ongoing Precision Result (OPRD)

Labeled Standard	Spiked pg/ul	AMT pg/ul	REC %	Range pg/ul Lower	Range pg/ul Upper	Flag
Extraction Standards						
$^{13}C_{12}$-2,3,7,8-TCDD	100	80.5	80.5	20.0	175	
$^{13}C_{12}$-1,2,3,7,8-PeCDD	100	79.3	79.3	21.0	227	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	100	84.7	84.7	21.0	193	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	100	85.6	85.6	25.0	163	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	100	73.5	73.5	26.0	166	
$^{13}C_{12}$-OCDD	200	117	58.5	26.0	397	
$^{13}C_{12}$-2,3,7,8-TCDF	100	81.2	81.2	22.0	152	
$^{13}C_{12}$-1,2,3,7,8-PeCDF	100	82.5	82.5	21.0	192	
$^{13}C_{12}$-2,3,4,7,8-PeCDF	100	81.1	81.1	13.0	328	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	100	86.9	86.9	19.0	202	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	100	91.3	91.3	21.0	159	
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	100	87.8	87.8	22.0	176	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	100	80.1	80.1	17.0	205	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	100	74.1	74.1	21.0	158	
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	100	71.7	71.7	20.0	186	
Cleanup Standards						
$^{37}C_{14}$-2,3,7,8-TCDD	20.0	15.5	77.6	6.20	38.2	

Form Version:[OPRD]1613

QC Information

OPRD Lab ID:	OPRD16457
Extraction Date:	01-Feb-09
Analysis Date:	4-FEB-09 23:20:02
Method:	1613

Sample Information

Matrix: Tissue

File Information

OPRD Filename : a27jan09a_18-10
Retchk: a27jan09a_17-15
Begin ConCal: a27jan09a_17-15
Initial Cal: m1613-100708a

Reviewed by: TM

Date Reviewed: 02/05/09

SUBCONTRACTOR ANALYSIS REQUEST
CUSTODY TRANSFER 01/07/09

ANALYTICAL RESOURCES INCORPORATED

ARI Project: OG53

G1040-6

Laboratory: SGS ENVIROMENTAL SERVICES INC.
Lab Contact: TRENT TEMPERLY
Lab Address: 5500 BUSINESS DR.
WILMINGTON, NC 28405
Phone: 910-350-1903
Fax: 910-350-1557

ARI Client: Hart Crowser, Inc.
Project ID: PORT GAMBLE
ARI PM: Kelly Bottem
Phone: 206-695-6211
Fax: 206-695-6201

Analytical Protocol: In-house
Special Instructions:

Requested Turn Around: **01/21/09**
Fax Results (Y/N):

Limits of Liability. *Subcontractor is expected to perform all requested services in accordance with appropriate methodology following Standard Operating Procedures that meet standards for the industry. The total liability of ARI, its officers, agents, employees, or sucessors, arising out of or in connection with the requested services, shall not exceed the negotiated amount for said services. The agreement by the Subcontractor to perform services requested by ARI releases 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 Subcontractor.*

ARI ID	Client ID/ Add'l ID	Sampled	Matrix	Bottles	Analyses
09-396-OG53A	CRAB1-A MEAT	12/23/08 10:35	Tissue	1	Dioxin/Furans 1613(Sub)
Special Instructions: None					
09-409-OG53B	CRAB1-A PAN2	12/23/08 10:35	Tissue	1	Dioxin/Furans 1613(Sub)
Special Instructions: None					

Carrier UPS	Airbill 1Z 832 695 01 4[illegible]92 5947		Date 1/14/09
Relinquished by [signature]	Company ART	Date 1/14/09	Time 1600
Received by [signature]	Company SGS 3.5 noSeal	Date 1/15/09	Time 10:15

Subcontractor Custody Form - **OG53**
Page 1 of 1

SGS

Laboratory Results

Ms. Kelly Bottem
Analytical Resources, Inc.
4611 S. 134th Place
Suite 100
Tukwila WA 98168-3240

Phone: 206-695-6211
Fax: 206-695-6201

Dear Ms. Bottem:

Enclosed is a full data package containing the final results for samples received by SGS Environmental Services, Inc. on January 15, 2009 under your project name "OG88". The samples were analyzed by Method 1613 following SGS's Standard Operating Procedures and are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards.

Number of Samples Received:	3
Your Project Reference:	OG88
SGS Project Number:	G1040-7

We appreciate your business and look forward to working with you again. Please contact me at 910-350-1903 if you have questions or need additional technical support.

Sincerely,

Jeannie Milholland

Jeannie Milholland
Project Manager

2-17-2009
Date

DC138.033007.7

Page 1

Case Narrative
SGS Project: **G1040-7**
Project Name: **OG88**

For Method: 1613

- The submitted samples were accepted into the lab on January 15th, 2009 and extracted on February 1st, 2009 by method 3540C. The sample extract and associated QC extracts were then processed through clean-up as prescribed in the SGS standard operating procedures and analyzed by HRGC/HRMS for method 1613.
- No analytical issues were encountered.

Craig R. Tronzo 2/17/09
Craig R. Tronzo Date
Data Validation

Paradigm Analytical Laboratories, Inc. | 5500 Business Dr., Wilmington, NC 28405 t (910) 350-1903 f (910) 350-1557 www.us.sgs.com

Page 2

SGS

List of Qualifiers: Dioxin's

B Analyte was detected in the Lab Method Blank at a level above the Reporting Limit.

EDL "Estimated Detection Limit"

EMPC "Estimated Maximum Possible Concentration"

RL Report Limit

CL Control Limit

U Undetected

ppt Parts-per-trillion (pg/g; ng/L)

V Recovery is below quality control limit. The data has been validated based on a favorable signal-to-noise and detection limit.

Outside quality control limits

* Indicates that the ion-ratio fails high or low; analyte reported as an EMPC

An average uncertainty of 30% can be routinely achieved as concluded from the evaluation of HRGC-HRMS standard operating procedures. The following flags warn the data user of situations where the uncertainty may be greater than stated.

A Amount detected is less than the Lower Method Calibration Limit.

J Amount detected is between the Method Detection Limit and the Lower Calibration Limit.

O The recovery of this analyte in the OPR is above the Method QC Limits and the reported concentration in the sample may be biased high.

E Amount detected is greater than the Upper Calibration Limit.

S The amount of analyte present has saturated the detector. This situation results in an underestimation of the affected analyte(s).

Q Indicates the presence of a quantitative interference. This situation may result in an underestimation of the affected analyte(s).

I Indicates the presence of a qualitative interference that could cause a false positive or an overestimation of the affected analyte(s).

DPE Indicates the presence of a peak in the polychlorinated diphenylether channel that could cause a false positive or an overestimation of the affected analyte(s).

DC250.081908.1

SGS

Toxic Equivalency Factors

Analyte	WHO* 1998	WHO* 2005	International-89	MADEP+
2,3,7,8-TCDD	1	1	1	1
1,2,3,7,8-PeCDD	1	1	0.5	0.5
1,2,3,4,7,8-HxCDD	0.1	0.1	0.1	0.1
1,2,3,6,7,8-HxCDD	0.1	0.1	0.1	0.1
1,2,3,7,8,9-HxCDD	0.1	0.1	0.1	0.1
1,2,3,4,6,7,8-HpCDD	0.01	0.01	0.01	0.1
OCDD	0.0001	0.0003	0.001	0.001
2,3,7,8-TCDF	0.1	0.1	0.1	0.1
1,2,3,7,8-PeCDF	0.05	0.03	0.05	0.5
2,3,4,7,8-PeCDF	0.5	0.3	0.5	0.5
1,2,3,4,7,8-HxCDF	0.1	0.1	0.1	0.1
1,2,3,6,7,8-HxCDF	0.1	0.1	0.1	0.1
2,3,4,6,7,8-HxCDF	0.1	0.1	0.1	0.1
1,2,3,7,8,9-HxCDF	0.1	0.1	0.1	0.1
1,2,3,4,6,7,8-HpCDF	0.01	0.01	0.01	0.1
1,2,3,4,7,8,9-HpCDF	0.01	0.01	0.01	0.1
OCDF	0.0001	0.0003	0.001	0.001

* World Health Organization
+ Massachusetts Department of Environmental Protection

Method 1613

GD STATION #1A

Analytical Resources, Inc.

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	Adj. MDL (pg/g)	Adj. RL (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	0.111	0.930			
1,2,3,7,8-PeCDD	ND	0.258	4.65			
1,2,3,4,7,8-HxCDD	ND	0.378	4.65			
1,2,3,6,7,8-HxCDD	ND	0.399	4.65			
1,2,3,7,8,9-HxCDD	ND	0.219	4.65			
1,2,3,4,6,7,8-HpCDD	ND	0.399	4.65			
OCDD	2.58	0.773	9.30	44:39	0.83	J
2,3,7,8-TCDF	ND	0.105	0.930			
1,2,3,7,8-PeCDF	ND	0.297	4.65			
2,3,4,7,8-PeCDF	ND	0.243	4.65			
1,2,3,4,7,8-HxCDF	ND	0.533	4.65			
1,2,3,6,7,8-HxCDF	ND	0.128	4.65			
2,3,4,6,7,8-HxCDF	ND	0.291	4.65			
1,2,3,7,8,9-HxCDF	ND	0.246	4.65			
1,2,3,4,6,7,8-HpCDF	ND	0.533	4.65			
1,2,3,4,7,8,9-HpCDF	ND	0.552	4.65			
OCDF	ND	0.687	9.30			
Total TCDDs	ND	0.111	0.930			
Total PeCDDs	ND	0.258	4.65			
Total HxCDDs	ND	0.219	4.65			
Total HpCDDs	0.768	0.399	4.65			J
Total TCDFs	ND	0.105	0.930			
Total PeCDFs	ND	0.243	4.65			
Total HxCDFs	ND	0.128	4.65			
Total HpCDFs	ND	0.533	4.65			
WHO-2005 TEQ (ND=0)	0.000774					
WHO-2005 TEQ (ND=½)	5.30					

Client Information

Project Name:	OG88
Sample ID:	GD STATION #1A

Laboratory Information

Project ID:	G1040-7	
Sample ID:	G1040-7-1B	
Collection Date:	16-Dec-08	
Receipt Date:	15-Jan-09	10:15
Extraction Date:	01-Feb-09	
Analysis Date:	10-Feb-09	1:13

Sample Information

Matrix:	Tissue	
Weight / Volume:	10.75	grams
Solids / Lipids:	NA	%
Original pH :	NA	
Batch ID:	WG16457	
Filename:	a09feb09a-12	
Retchk:	a09feb09a-1	
Begin ConCal:	a09feb09a-1	
Initial Cal:	m1613-100708a	

Method 1613

GD STATION #1A

Analytical Resources, Inc.

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
$^{13}C_{12}$-2,3,7,8-TCDD	2	1.63	81.5	31:27	0.78	
$^{13}C_{12}$-1,2,3,7,8-PeCDD	2	2.07	103	34:16	1.58	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	2	1.61	80.4	36:52	1.26	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	2	1.66	82.8	36:58	1.27	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	2	1.66	83.1	40:19	1.06	
$^{13}C_{12}$-OCDD	4.0	1.68	42.0	44:39	0.90	
$^{13}C_{12}$-2,3,7,8-TCDF	2	1.64	82.1	30:52	0.80	
$^{13}C_{12}$-1,2,3,7,8-PeCDF	2	2.17	108	33:27	1.58	
$^{13}C_{12}$-2,3,4,7,8-PeCDF	2	2.02	101	34:05	1.59	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	2	1.62	81.1	36:09	0.54	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	2	1.64	82.0	36:15	0.51	
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	2	1.61	80.4	36:45	0.53	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	2	1.58	78.9	37:32	0.53	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	2	1.53	76.3	39:03	0.45	
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	2	1.69	84.3	41:01	0.45	
Cleanup Standard						
$^{37}Cl_4$-2,3,7,8-TCDD	0.4	0.347	86.8	31:28		
Injection Standards						
$^{13}C_{12}$-1,2,3,4-TCDD	2.0			31:01	0.79	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	2.0			36:45	1.25	

Client Information

Project Name: OG88

Sample ID: GD STATION #1A

Laboratory Information

Project ID: G1040-7
Sample ID: G1040-7-1B
Collection Date: 16-Dec-08
Receipt Date: 15-Jan-09 10:15
Extraction Date: 01-Feb-09
Analysis Date: 10-Feb-09 1:13

Analyzed by: JMP
Date: 030209

Sample Information

Matrix: Tissue
Weight / Volume: 10.75 grams
Solids / Lipids: NA %
Original pH : NA
Batch ID: WG16457

Filename: a09feb09a-12
Retchk: a09feb09a-1
Begin ConCal: a09feb09a-1

Initial Cal: m1613-100708a

Reviewed by: TM
Date: 03/02/09

Form Version:[1613_MDL_AMEC]Repor

Method 1613

GD STATION #2A

Analytical Resources, Inc.

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	Adj. MDL (pg/g)	Adj. RL (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	0.107	0.902			
1,2,3,7,8-PeCDD	ND	0.250	4.51			
1,2,3,4,7,8-HxCDD	ND	0.367	4.51			
1,2,3,6,7,8-HxCDD	ND	0.387	4.51			
1,2,3,7,8,9-HxCDD	ND	0.212	4.51			
1,2,3,4,6,7,8-HpCDD	ND	0.387	4.51			
OCDD	1.51	0.750	9.02	44:39	0.88	J
2,3,7,8-TCDF	ND	0.102	0.902			
1,2,3,7,8-PeCDF	ND	0.288	4.51			
2,3,4,7,8-PeCDF	ND	0.235	4.51			
1,2,3,4,7,8-HxCDF	ND	0.517	4.51			
1,2,3,6,7,8-HxCDF	ND	0.124	4.51			
2,3,4,6,7,8-HxCDF	ND	0.282	4.51			
1,2,3,7,8,9-HxCDF	ND	0.239	4.51			
1,2,3,4,6,7,8-HpCDF	ND	0.517	4.51			
1,2,3,4,7,8,9-HpCDF	ND	0.535	4.51			
OCDF	ND	0.666	9.02			
Total TCDDs	ND	0.107	0.902			
Total PeCDDs	ND	0.250	4.51			
Total HxCDDs	ND	0.212	4.51			
Total HpCDDs	0.528	0.387	4.51			J
Total TCDFs	ND	0.102	0.902			DPE
Total PeCDFs	ND	0.235	4.51			
Total HxCDFs	ND	0.124	4.51			
Total HpCDFs	ND	0.517	4.51			
WHO-2005 TEQ (ND=0)	0.000453					
WHO-2005 TEQ (ND=½)	5.14					

Client Information

Project Name:	OG88
Sample ID:	GD STATION #2A

Laboratory Information

Project ID:	G1040-7	
Sample ID:	G1040-7-2B	
Collection Date:	16-Dec-08	
Receipt Date:	15-Jan-09	10:15
Extraction Date:	01-Feb-09	
Analysis Date:	10-Feb-09	2:01

Sample Information

Matrix:	Tissue	
Weight / Volume:	11.09	grams
Solids / Lipids:	NA	%
Original pH :	NA	
Batch ID:	WG16457	
Filename:	a09feb09a-13	
Retchk:	a09feb09a-1	
Begin ConCal:	a09feb09a-1	
Initial Cal:	m1613-100708a	

Method 1613

GD STATION #2A

Analytical Resources, Inc.

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
$^{13}C_{12}$-2,3,7,8-TCDD	2	1.55	77.3	31:28	0.79	
$^{13}C_{12}$-1,2,3,7,8-PeCDD	2	1.94	96.8	34:16	1.58	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	2	1.58	79.2	36:52	1.26	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	2	1.61	80.6	36:58	1.26	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	2	1.60	80.0	40:19	1.06	
$^{13}C_{12}$-OCDD	4.0	2.87	71.9	44:39	0.89	
$^{13}C_{12}$-2,3,7,8-TCDF	2	1.53	76.4	30:52	0.80	
$^{13}C_{12}$-1,2,3,7,8-PeCDF	2	2.02	101	33:27	1.59	
$^{13}C_{12}$-2,3,4,7,8-PeCDF	2	1.91	95.6	34:04	1.59	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	2	1.57	78.6	36:09	0.52	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	2	1.61	80.5	36:15	0.53	
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	2	1.63	81.4	36:45	0.52	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	2	1.63	81.5	37:32	0.53	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	2	1.63	81.3	39:03	0.45	
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	2	1.66	83.0	41:01	0.45	
Cleanup Standard						
$^{37}Cl_4$-2,3,7,8-TCDD	0.4	0.335	83.8	31:28		
Injection Standards						
$^{13}C_{12}$-1,2,3,4-TCDD	2.0			31:01	0.81	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	2.0			36:45	1.25	

Client Information

Project Name: OG88

Sample ID: GD STATION #2A

Laboratory Information

Project ID: G1040-7
Sample ID: G1040-7-2B
Collection Date: 16-Dec-08
Receipt Date: 15-Jan-09 10:15
Extraction Date: 01-Feb-09
Analysis Date: 10-Feb-09 2:01

Analyzed by: _____
Date: 030309

Sample Information

Matrix: Tissue
Weight / Volume: 11.09 grams
Solids / Lipids: NA %
Original pH : NA
Batch ID: WG16457

Filename: a09feb09a-13
Retchk: a09feb09a-1
Begin ConCal: a09feb09a-1

Initial Cal: m1613-100708a

Reviewed by: _____
Date: 03/09/09

Form Version:[1613_MDL_AMEC]Repor

Method 1613

GD STATION #3A

Analytical Resources, Inc.

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	Adj. MDL (pg/g)	Adj. RL (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	0.107	0.902			
1,2,3,7,8-PeCDD	ND	0.250	4.51			
1,2,3,4,7,8-HxCDD	ND	0.367	4.51			
1,2,3,6,7,8-HxCDD	ND	0.387	4.51			
1,2,3,7,8,9-HxCDD	ND	0.212	4.51			
1,2,3,4,6,7,8-HpCDD	ND	0.387	4.51			
OCDD	1.05	0.750	9.02	44:39	0.91	J
2,3,7,8-TCDF	ND	0.102	0.902			
1,2,3,7,8-PeCDF	ND	0.288	4.51			
2,3,4,7,8-PeCDF	ND	0.235	4.51			
1,2,3,4,7,8-HxCDF	ND	0.517	4.51			
1,2,3,6,7,8-HxCDF	ND	0.124	4.51			
2,3,4,6,7,8-HxCDF	ND	0.282	4.51			
1,2,3,7,8,9-HxCDF	ND	0.239	4.51			
1,2,3,4,6,7,8-HpCDF	ND	0.517	4.51			
1,2,3,4,7,8,9-HpCDF	ND	0.535	4.51			
OCDF	ND	0.666	9.02			
Total TCDDs	ND	0.107	0.902			
Total PeCDDs	ND	0.250	4.51			
Total HxCDDs	ND	0.212	4.51			
Total HpCDDs	ND	0.387	4.51			
Total TCDFs	ND	0.102	0.902			
Total PeCDFs	ND	0.235	4.51			
Total HxCDFs	ND	0.124	4.51			
Total HpCDFs	ND	0.517	4.51			
WHO-2005 TEQ (ND=0)	0.000315					
WHO-2005 TEQ (ND=½)	5.14					

Client Information

Project Name:	OG88
Sample ID:	GD STATION #3A

Laboratory Information

Project ID:	G1040-7	
Sample ID:	G1040-7-3B	
Collection Date:	16-Dec-08	
Receipt Date:	15-Jan-09	10:15
Extraction Date:	01-Feb-09	
Analysis Date:	10-Feb-09	2:49

Sample Information

Matrix:	Tissue	
Weight / Volume:	11.09	grams
Solids / Lipids:	NA	%
Original pH :	NA	
Batch ID:	WG16457	
Filename:	a09feb09a-14	
Retchk:	a09feb09a-1	
Begin ConCal:	a09feb09a-1	
Initial Cal:	m1613-100708a	

Method 1613

GD STATION #3A

Analytical Resources, Inc.

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
$^{13}C_{12}$-2,3,7,8-TCDD	2	1.63	81.7	31:27	0.79	
$^{13}C_{12}$-1,2,3,7,8-PeCDD	2	2.00	99.8	34:16	1.58	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	2	1.62	81.2	36:52	1.28	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	2	1.65	82.3	36:58	1.27	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	2	1.68	84.1	40:19	1.06	
$^{13}C_{12}$-OCDD	4.0	2.85	71.2	44:39	0.90	
$^{13}C_{12}$-2,3,7,8-TCDF	2	1.66	83.1	30:52	0.79	
$^{13}C_{12}$-1,2,3,7,8-PeCDF	2	2.08	104	33:27	1.60	
$^{13}C_{12}$-2,3,4,7,8-PeCDF	2	2.00	100	34:04	1.58	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	2	1.71	85.3	36:09	0.54	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	2	1.72	86.0	36:15	0.51	
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	2	1.70	84.8	36:45	0.52	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	2	1.65	82.3	37:32	0.53	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	2	1.62	81.2	39:03	0.45	
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	2	1.69	84.7	41:01	0.45	
Cleanup Standard						
$^{37}Cl_4$-2,3,7,8-TCDD	0.4	0.336	84.0	31:28		
Injection Standards						
$^{13}C_{12}$-1,2,3,4-TCDD	2.0			31:00	0.79	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	2.0			36:45	1.25	

Client Information

Project Name: OG88

Sample ID: GD STATION #3A

Laboratory Information

Project ID: G1040-7
Sample ID: G1040-7-3B
Collection Date: 16-Dec-08
Receipt Date: 15-Jan-09 10:15
Extraction Date: 01-Feb-09
Analysis Date: 10-Feb-09 2:49

Analyzed by: _____
Date: 030209

Sample Information

Matrix: Tissue
Weight / Volume: 11.09 grams
Solids / Lipids: NA %
Original pH : NA
Batch ID: WG16457

Filename: a09feb09a-14
Retchk: a09feb09a-1
Begin ConCal: a09feb09a-1

Initial Cal: m1613-100708a

Reviewed by: _____
Date: 03/02/09

Form Version:[1613_ MDL_AMEC]Repor

Method 1613 - Blank Results

LMB

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	Adj. MDL (pg/g)	Adj. RL (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	0.119	1.00			
1,2,3,7,8-PeCDD	ND	0.277	5.00			
1,2,3,4,7,8-HxCDD	ND	0.407	5.00			
1,2,3,6,7,8-HxCDD	ND	0.429	5.00			
1,2,3,7,8,9-HxCDD	ND	0.235	5.00			
1,2,3,4,6,7,8-HpCDD	ND	0.429	5.00			
OCDD	ND	0.831	10.0			
2,3,7,8-TCDF	ND	0.113	1.00			
1,2,3,7,8-PeCDF	ND	0.319	5.00			
2,3,4,7,8-PeCDF	ND	0.261	5.00			
1,2,3,4,7,8-HxCDF	ND	0.573	5.00			
1,2,3,6,7,8-HxCDF	ND	0.138	5.00			
2,3,4,6,7,8-HxCDF	ND	0.313	5.00			
1,2,3,7,8,9-HxCDF	ND	0.265	5.00			
1,2,3,4,6,7,8-HpCDF	ND	0.573	5.00			
1,2,3,4,7,8,9-HpCDF	ND	0.593	5.00			
OCDF	ND	0.738	10.0			
Total TCDDs	ND	0.119	1.00			
Total PeCDDs	ND	0.277	5.00			
Total HxCDDs	ND	0.235	5.00			
Total HpCDDs	ND	0.429	5.00			
Total TCDFs	ND	0.113	1.00			
Total PeCDFs	ND	0.261	5.00			
Total HxCDFs	ND	0.138	5.00			
Total HpCDFs	ND	0.573	5.00			
WHO-2005 TEQ (ND=0)	0.000					
WHO-2005 TEQ (ND=½)	5.70					

Laboratory Information

Sample ID:	LMB16457	
Extraction Date:	01-Feb-09	
Analysis Date:	05-Feb-09	0:08

Sample Information

Matrix:	Tissue	
Weight / Volume:	10.00	grams
Solids / Lipids:	NA	%
Original pH :	NA	
Batch ID:	WG16457	
Filename:	a27jan09a_18-11	
Retchk:	a27jan09a_17-15	
Begin ConCal:	a27jan09a_17-15	
Initial Cal:	m1613-100708a	

- Blank Results

LMB

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
$^{13}C_{12}$-2,3,7,8-TCDD	2	1.65	82.6	31:27	0.79	
$^{13}C_{12}$-1,2,3,7,8-PeCDD	2	1.64	82.0	34:16	1.57	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	2	1.66	83.1	36:53	1.26	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	2	1.68	83.9	36:58	1.27	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	2	1.49	74.5	40:20	1.05	
$^{13}C_{12}$-OCDD	4.0	1.75	43.7	44:40	0.90	
$^{13}C_{12}$-2,3,7,8-TCDF	2	1.69	84.6	30:52	0.80	
$^{13}C_{12}$-1,2,3,7,8-PeCDF	2	1.93	96.7	33:28	1.57	
$^{13}C_{12}$-2,3,4,7,8-PeCDF	2	1.67	83.5	34:05	1.57	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	2	1.66	83.2	36:09	0.52	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	2	1.78	88.8	36:16	0.52	
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	2	1.69	84.3	36:45	0.53	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	2	1.51	75.5	37:33	0.53	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	2	1.47	73.5	39:03	0.45	
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	2	1.38	69.0	41:02	0.45	
Cleanup Standard						
$^{37}Cl_4$-2,3,7,8-TCDD	0.4	0.328	82.0	31:28		
Injection Standards						
$^{13}C_{12}$-1,2,3,4-TCDD	2.0			31:00	0.79	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	2.0			36:45	1.25	

Laboratory Information

Sample ID: LMB16457

Extraction Date: 01-Feb-09
Analysis Date: 05-Feb-09 0:08

Analyzed by: _____
Date: 05/02/09

Sample Information

Matrix:	Tissue	
Weight / Volume:	10.00	grams
Solids / Lipids:	NA	%
Original pH :	NA	
Batch ID:	WG16457	
Filename:	a27jan09a_18-11	
Retchk:	a27jan09a_17-15	
Begin ConCal:	a27jan09a_17-15	
Initial Cal:	m1613-100708a	

Reviewed by: _____
Date: 13/02/09

Form Version:[1613_MDL_AMEC]Repor

Analytical Results
for
Ongoing Precision Result (OPR)

Analyte	Spiked	AMT	REC	Range pg/ul		Flag
	pg/ul	pg/ul	%	Lower	Upper	
2,3,7,8-TCDD	10.0	9.89	98.9	6.70	15.8	
1,2,3,7,8-PeCDD	50.0	49.0	97.9	35.0	71.0	
1,2,3,4,7,8-HxCDD	50.0	50.3	101	35.0	82.0	
1,2,3,6,7,8-HxCDD	50.0	47.9	95.8	38.0	67.0	
1,2,3,7,8,9-HxCDD	50.0	48.7	97.4	32.0	81.0	
1,2,3,4,6,7,8-HpCDD	50.0	48.2	96.3	35.0	70.0	
OCDD	100	97.5	97.5	78.0	144	
2,3,7,8-TCDF	10.0	9.52	95.2	7.50	15.8	
1,2,3,7,8-PeCDF	50.0	48.9	97.8	40.0	67.0	
2,3,4,7,8-PeCDF	50.0	48.4	96.9	34.0	80.0	
1,2,3,4,7,8-HxCDF	50.0	49.6	99.1	36.0	67.0	
1,2,3,6,7,8-HxCDF	50.0	49.2	98.5	42.0	65.0	
2,3,4,6,7,8-HxCDF	50.0	50.2	100	35.0	78.0	
1,2,3,7,8,9-HxCDF	50.0	50.4	101	39.0	65.0	
1,2,3,4,6,7,8-HpCDF	50.0	49.0	97.9	41.0	61.0	
1,2,3,4,7,8,9-HpCDF	50.0	49.1	98.1	39.0	69.0	
OCDF	100	109	109	63.0	170	

= Outside range limits
* = Ion Ratio Out

QC Information

OPR Lab ID:	OPR16457
Extraction Date:	01-Feb-09
Analysis Date:	04-Feb-09
Method:	1613

Sample Information

Matrix:	Tissue

File Information

OPR Filename :	a27jan09a_18-9
Retchk:	a27jan09a_17-15
Begin ConCal:	a27jan09a_17-15
Initial Cal:	m1613-100708a

Analytical Results
for
Ongoing Precision Result (OPR)

Labeled Standard	Spiked pg/ul	AMT pg/ul	REC %	Range pg/ul Lower	Range pg/ul Upper	Flag
Extraction Standards						
$^{13}C_{12}$-2,3,7,8-TCDD	100	79.0	79.0	20.0	175	
$^{13}C_{12}$-1,2,3,7,8-PeCDD	100	78.2	78.2	21.0	227	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	100	83.4	83.4	21.0	193	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	100	85.8	85.8	25.0	163	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	100	76.6	76.6	26.0	166	
$^{13}C_{12}$-OCDD	200	124	61.8	26.0	397	
$^{13}C_{12}$-2,3,7,8-TCDF	100	81.2	81.2	22.0	152	
$^{13}C_{12}$-1,2,3,7,8-PeCDF	100	85.9	85.9	21.0	192	
$^{13}C_{12}$-2,3,4,7,8-PeCDF	100	80.4	80.4	13.0	328	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	100	86.1	86.1	19.0	202	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	100	87.7	87.7	21.0	159	
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	100	85.8	85.8	22.0	176	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	100	79.4	79.4	17.0	205	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	100	77.0	77.0	21.0	158	
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	100	73.7	73.7	20.0	186	
Cleanup Standards						
$^{37}C_{l4}$-2,3,7,8-TCDD	20.0	16.1	80.4	6.20	38.2	

Form Version:[OPR]1613

QC Information

OPR Lab ID:	OPR16457
Extraction Date:	01-Feb-09
Analysis Date:	04-Feb-09
Method:	1613

Sample Information

Matrix:	Tissue

File Information

OPR Filename :	a27jan09a_18-9
Retchk:	a27jan09a_17-15
Begin ConCal:	a27jan09a_17-15
Initial Cal:	m1613-100708a

Reviewed by: TM

Date Reviewed: 02/05/09

Analytical Results
for
Ongoing Precision Result (OPRD)

Analyte	Spiked pg/ul	AMT pg/ul	Recovery %	#	Range pg/ul Lower	Range pg/ul Upper	OPR Rec(%)	#	RPD	#
2,3,7,8-TCDD	10.0	9.65	96.5		6.70	15.8	98.9		2.46	
1,2,3,7,8-PeCDD	50.0	49.9	99.9		35.0	71.0	97.9		1.94	
1,2,3,4,7,8-HxCDD	50.0	50.6	101		35.0	82.0	101		0.588	
1,2,3,6,7,8-HxCDD	50.0	48.4	96.7		38.0	67.0	95.8		0.927	
1,2,3,7,8,9-HxCDD	50.0	49.2	98.5		32.0	81.0	97.4		1.10	
1,2,3,4,6,7,8-HpCDD	50.0	48.8	97.5		35.0	70.0	96.3		1.21	
OCDD	100	97.8	97.8		78.0	144	97.5		0.400	
2,3,7,8-TCDF	10.0	9.75	97.5		7.50	15.8	95.2		2.42	
1,2,3,7,8-PeCDF	50.0	49.3	98.7		40.0	67.0	97.8		0.908	
2,3,4,7,8-PeCDF	50.0	48.8	97.5		34.0	80.0	96.9		0.673	
1,2,3,4,7,8-HxCDF	50.0	49.8	99.5		36.0	67.0	99.1		0.356	
1,2,3,6,7,8-HxCDF	50.0	49.7	99.4		42.0	65.0	98.5		0.986	
2,3,4,6,7,8-HxCDF	50.0	49.6	99.2		35.0	78.0	100		1.08	
1,2,3,7,8,9-HxCDF	50.0	48.8	97.5		39.0	65.0	101		3.37	
1,2,3,4,6,7,8-HpCDF	50.0	50.4	101		41.0	61.0	97.9		2.93	
1,2,3,4,7,8,9-HpCDF	50.0	48.2	96.3		39.0	69.0	98.1		1.90	
OCDF	100	106	106		63.0	170	109		2.86	

= Outside range limits
* = Ion Ratio Out

QC Information

OPRD Lab ID:	OPRD16457
Extraction Date:	01-Feb-09
Analysis Date:	4-FEB-09 23:20:02
Method:	1613

Sample Information

Matrix:	Tissue

File Information

OPRD Filename:	a27jan09a_18-10
Retchk:	a27jan09a_17-15
Begin ConCal:	a27jan09a_17-15
Initial Cal:	m1613-100708a

Analytical Results
for
Ongoing Precision Result (OPRD)

Labeled Standard	Spiked pg/ul	AMT pg/ul	REC %	Range pg/ul Lower	Range pg/ul Upper	Flag
Extraction Standards						
$^{13}C_{12}$-2,3,7,8-TCDD	100	80.5	80.5	20.0	175	
$^{13}C_{12}$-1,2,3,7,8-PeCDD	100	79.3	79.3	21.0	227	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	100	84.7	84.7	21.0	193	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	100	85.6	85.6	25.0	163	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	100	73.5	73.5	26.0	166	
$^{13}C_{12}$-OCDD	200	117	58.5	26.0	397	
$^{13}C_{12}$-2,3,7,8-TCDF	100	81.2	81.2	22.0	152	
$^{13}C_{12}$-1,2,3,7,8-PeCDF	100	82.5	82.5	21.0	192	
$^{13}C_{12}$-2,3,4,7,8-PeCDF	100	81.1	81.1	13.0	328	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	100	86.9	86.9	19.0	202	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	100	91.3	91.3	21.0	159	
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	100	87.8	87.8	22.0	176	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	100	80.1	80.1	17.0	205	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	100	74.1	74.1	21.0	158	
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	100	71.7	71.7	20.0	186	
Cleanup Standards						
$^{37}C_{l4}$-2,3,7,8-TCDD	20.0	15.5	77.6	6.20	38.2	

Form Version:[OPRD]1613

QC Information

OPRD Lab ID:	OPRD16457
Extraction Date:	01-Feb-09
Analysis Date:	4-FEB-09 23:20:02
Method:	1613

Sample Information

Matrix: Tissue

File Information

OPRD Filename : a27jan09a_18-10
Retchk: a27jan09a_17-15
Begin ConCal: a27jan09a_17-15
Initial Cal: m1613-100708a

Reviewed by: JM

Date Reviewed: 02/05/09

SUBCONTRACTOR ANALYSIS REQUEST
CUSTODY TRANSFER 01/08/09

ANALYTICAL RESOURCES INCORPORATED

ARI Project: OG88

G1040-7

Laboratory: SGS ENVIROMENTAL SERVICES INC.
Lab Contact: TRENT TEMPERLY
Lab Address: 5500 BUSINESS DR.
WILMINGTON, NC 28405
Phone: 910-350-1903
Fax: 910-350-1557

ARI Client: Hart Crowser, Inc.
Project ID: PORT GAMBLE
ARI PM: Kelly Bottem
Phone: 206-695-6211
Fax: 206-695-6201

Analytical Protocol: In-house
Special Instructions:

Requested Turn Around:
Fax Results (Y/N): **YES**

Limits of Liability. *Subcontractor is expected to perform all requested services in accordance with appropriate methodology following Standard Operating Procedures that meet standards for the industry. The total liability of ARI, its officers, agents, employees, or sucessors, arising out of or in connection with the requested services, shall not exceed the negotiated amount for said services. The agreement by the Subcontractor to perform services requested by ARI releases 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 Subcontractor.*

ARI ID	Client ID/ Add'l ID	Sampled	Matrix	Bottles	Analyses
09-584-OG88A	GD STATION #1A	12/16/08	Tissue	1	Dioxin/Furans 1613(Sub)
Special Instructions: None					
09-585-OG88B	GD STATION #2A	12/16/08	Tissue	1	Dioxin/Furans 1613(Sub)
Special Instructions: None					
09-586-OG88C	GD STATION #3A	12/16/08	Tissue	1	Dioxin/Furans 1613(Sub)
Special Instructions: None					

Carrier UPS	Airbill 1Z 832 695 01 4592 5947		Date 1/14/09
Relinquished by	Company ARI	Date 1/14/09	Time 1600
Received by	Company SGS 3.5 no seal	Date 1/15/09	Time 10:15

Subcontractor Custody Form - **OG88**
Page 1 of 1

APPENDIX C
SEDIMENT TOXICITY TESTING
DATA QUALITY REVIEW AND
LABORATORY BIOASSAY REPORTS
NORTHWESTERN AQUATIC SCIENCES
NAUTILUS ENVIRONMENTAL

APPENDIX C
SEDIMENT TOXICITY TESTING DATA QUALITY REVIEW AND LABORATORY BIOASSAY REPORTS NORTHWESTERN AQUATIC SCIENCES NAUTILUS ENVIRONMENTAL

Sediments were evaluated based on Sediment Management Standards (SMS) biological criteria. These criteria are based on both statistical significance (a statistical comparison) and the degree of biological response (a numerical comparison). The SMS criteria are derived from Chapter 173-204 WAC and the Ecology SAPA (Ecology 2003). Two numerical comparisons are made under SMS—the Sediment Quality Standards (SQS) and the Cleanup Screening Level (CSL). The SQS is more stringent than the CSL, allowing for a smaller biological response in the test treatments.

Bioassay pass/fail test results relative to SQS and CSL criteria are based on a comparison of responses observed in the test treatments versus those in the reference treatment. Reference site selection is based on sediment grain size. Based on similarity in grain size, reference samples CR20W, CR23MOD, and MSMP43 were used for comparison to test treatments.

52 surface sediment samples were evaluated for toxicity using Microtox tests. 32 surface sediment samples were evaluated for toxicity by bioassay. Three reference samples were evaluated in conjunction with the Microtox and bioassay tests. Sample identifications, laboratory job numbers, and analytical tests are summarized in Table 2.

Amphipod (Eohaustorius estuarius) 10-Day Toxicity Test

Under the SMS program, a test sediment fails SQS if mean mortality is statistically significantly higher than that of the reference sediment and mean mortality in the test sediment is greater than 25 percent. Sediments fail the CSL if the test sediment mortality is both statistically significantly different and 30 percent greater than the reference sediment. Percent mortality for all samples was not significantly greater than in the associated reference samples and mean mortality for test sediment samples was less than the 25 and 30 percent criteria. Therefore, all test sediments passed both SQS and the one-test criterion for CSL.

The test quality control parameters described below were within acceptance criteria, and data are acceptable for use in making decisions under SMS.

Controls

The tests met acceptance criteria of less than 10 percent for mean control mortality; average mortality for the five replicates for each test were 0.0 and 3.0 percent. Replicate control acceptability criteria (less than 20 percent mortality in any one replicate) were also met with individual mortalities of 0.0, 0.0, 0.0, 0.0, and 0.0 percent in test 780-1 and 0.0, 0.0, 10.0, 5.0, and 0.0 percent in test 780-4 for the replicate samples.

Reference Sediment

The response in the reference sediment samples met SMS criteria of less than 25 percent mean mortality. The mean mortality was 1.0 percent for the reference samples in test 780-1. The mean mortality was 2.0 percent for the reference samples in test 780-4.

Reference Toxicant

The reference toxicant (ammonia) test results were within laboratory control chart warning limits.

Juvenile Polychaete (Neanthes arenaceodentata) 20-Day Toxicity Test

Bioassay pass/fail test results relative to SQS and CSL criteria for the juvenile polychaete test were based on mean individual growth (MIG) rates. A test sediment will fail SQS if MIG in the test sediment is 70 percent less than the reference sediment, and MIG is statistically different in the test sediment relative to the reference. The sediments will fail CSL if MIG is 50 percent less than the reference sediment and statistically different than the reference sediment.

The MIG for the samples was not significantly lower (and not less than 70 or 50 percent lower) than the corresponding reference sediment. The test sediments passed both SQS and the one-test criterion for CSL.

The test quality control parameters described below were within acceptance criteria with exceptions noted. Data from Test No 780-2 are provisionally acceptable for use in making decisions under SMS. Data from Test No. 780-5 are acceptable for use in making decisions under SMS.

Controls

The test met acceptance criteria of greater than 90 percent for mean control survival; average survival for the five replicates was 100 percent.

The individual growth rate for the controls was 1.04 mg/day/worm for Tests No. 780-2 and 780-5, above the SMS minimum of 0.72 mg/day/worm for *Neanthes*.

Reference Sediment

The response in the reference sediment samples met SMS of less than 20 percent mean mortality with one exception. One replicate beaker (Beaker #5) for CR23MOD for Test No. 780-2 showed complete and unexplained mortality at the end of the test. The laboratory recovered the dead worms, dried, and weighed them, but the weights proved unusable. The laboratory subsequently excluded the results from the statistical analysis, and utilized the water quality replicate (Beaker #6) for data analysis. If the aberrant beaker is excluded, all reference sediments meet the performance standard requirement for mortality. The mean mortality was 0.0, 4.0, and 4.0 percent for the reference samples for Test No. 780-2, and 8.0, 0.0, and 0.0 percent for the references samples for Test No. 780-5.

The growth rate criterion for reference sediments (greater than 80 percent of the control growth weight) was also met with one exception. The growth rate for CR 20W was 71.2 percent of the control.

Reference Toxicant

The reference toxicant (ammonia) test result was within laboratory control chart warning limits.

Larval (Mytilus galloprovincialis) 10-Day Toxicity Test

For the larval test, treatments fail SQS if the mean number of normal larvae in the test treatment is significantly less than that of the reference and the combined mortality and abnormality (CMA) in the test treatment is greater than 15 percent of the CMA in the reference. Treatments fail CSL criteria if the CMA is greater than 30 percent of the response observed in the reference.

Although SMS does not have a specific reference sediment performance criterion, the Dredged Materials Management Program (DMMP) criterion is often used. The DMMP criterion specifies that the CMA in the reference sediment be less than 35 percent of the seawater control value. Except for reference sample CR23MOD, CMA in reference sediment compared to controls met the DMMP criterion. The CMA for reference CR23MOD was 47.8 percent.

Controls

The test met acceptance criteria of greater than 70 percent normality in the seawater control; control percent normality was 108 and 97.5 percent. for laboratory batches 780-3 and 780-6, respectively.

Reference Toxicant

The reference toxicant (copper sulfate) test result was within laboratory control chart warning limits.

Microtox Tests

For the Microtox test, a test mean output of less than 80 percent of the reference mean output, and a statistically significant difference between the test and the reference mean outputs is an SQS failure. Based on these criteria, samples PGSS-16, PGSS-62B, PGSS-51, PGSS-58, PGSS-63, and PGSS-69 exceeded the SQS for Microtox.

Sample PGSS-16 had high turbidity (> 100 NTU), which may have inhibited the transmission of light from the bacteria. Therefore, the results for this sample may be an artifact of the testing, not an indication of toxicity.

The reference sample CR23MOD did not meet the acceptability criteria. The associated samples were compared to the control.

Controls

The Control Final mean output was greater than or equal to 80 percent of the Control Initial mean output. Control final mean outputs were 83 to 102 percent.

Reference Toxicant

The reference toxicant (phenol) test results were within the acceptable range of historical results.

J:\Jobs\1733014\RI Report\Final Port Gamble RI Report.doc

LABORATORY BIOASSAY REPORTS
NORTHWESTERN AQUATIC SCIENCES
NAUTILUS ENVIRONMENTAL

(see attached DVD)

SUMMARY REPORT
of
Tests 774-1, -2, and -3

Submitted to

Hart Crowser, Inc.
1700 Westlake Ave. N, Suite 200
Seattle, WA 98109-3056

Submitted by

Northwestern Aquatic Sciences
3814 Yaquina Bay Road
P.O. Box 1437
Newport, OR 97365

October 29, 2008

SUMMARY OF SEDIMENT BIOASSAYS

INTRODUCTION

Northwestern Aquatic Sciences (NAS) conducted toxicity tests on five sediment samples (4 samples from Bellingham Bay, Washington, and 1 reference sediment) for Hart Crowser, Inc. Testing was performed in accordance with the standard test methods described in Ecology's Sediment Management Standards (Ch. 173-204 WAC, 1995) and Sampling and Analysis Plan Appendix (2008), Puget Sound Estuary Program (PSEP) Protocols and Guidelines (1995) and minor clarifications to the latter from Sediment Management Annual Review Meetings. The tests conducted were the 10-day amphipod survival test using *Eohaustorius estuarius* (test no.774-1); the 20-day polychaete survival and growth test using *Neanthes arenaceodentata* (test no. 774-2); and the larval sediment test using *Mytilus galloprovincialis* (test no. 774-3).

Biological endpoint data for each test were compared against those in the control and in the reference sediment. Data interpretation was conducted based on guidelines from the "Sediment Sampling and Analysis Plan Appendix," February 2008 (Washington Department of Ecology).

RESULTS SUMMARY

Primary biological endpoint data, those used in statistical comparisons, are summarized in Table 1; results of statistical comparisons to the reference sediment are included.

SMS INTERPRETATION

Tables 2-4 present an interpretation of the amphipod, polychaete, and larval test data (NAS test numbers 774-1, -2, and -3), for single test failures of the Sediment Quality Standards (SQS) and the Sediment Impact Zone Maximum Levels (SIZML), Cleanup Screening Levels (CSL), and Minimum Cleanup Levels (MCL). There were no single test failures in the amphipod or polychaete tests. In the sediment larval test, test sediment RGH-SS-01 failed under both SQS and SIZML/CSL/MCL; RGH-SS-03 failed under the SQS but not under SIZML/CSL/MCL.

Because there were no single test failures under SQS for the amphipod or polychaete tests, there were no failures under SIZML, CSL, and MCL based on the criterion of multiple test failures of SQS.

STUDY APPROVAL

Michele S. Redmond 10-30-08
Project Manager Date

Linda K. Kenneth 10/27/08
Assistant Laboratory Director Date

Table 1. Summary of biological endpoint data from toxicity tests with marine sediments from Bellingham Bay. Means and standard deviations (n=5) of endpoints summarized are percent mortality for the *Eohaustorius estuarius* 10-day survival test, average individual growth rate for the *Neanthes arenaceodentata* 20-day survival and growth test, and number normal larvae for the *Mytilus galloprovincialis* larval test.

Sample description	*Eohaustorius* Percent mortality	*Neanthes* Individual growth rate (mg/day/worm)	*Mytilus* Number normal larvae
Sediment Control (NAS #2046G)	2.0 ± 2.7	1.09 ± 0.09	---
Seawater Control	---	---	231 ± 12
Samish Bay Ref (NAS #2041G)	6.0 ± 6.5	0.91± 0.16	196 ± 32
BBP-SS-01 (NAS #2042G)	5.0 ± 3.5	0.88 ± 0.23	185 ± 25
BBP-SS-02 (NAS #2043G)	11.0 ± 8.2	0.83 ± 0.26	173 ± 20
RGH-SS-01 (NAS #2044G)	4.0 ± 6.5	0.81 ± 0.20	135 ± 42 **a**
RGH-SS-03 (NAS #2045G)	6.0 ± 4.2	0.86 ± 0.03	152 ± 39 **a**

a Test sediment result was significantly different from that in the reference sediment ($p<0.05$, except $p<0.10$ for the *Mytilus* test).

Table 2. Interpretation of *Eohaustorius* test data from exposure to marine sediments from Bellingham Bay, based on SMS (WDOE 2008) guidelines.

Sample description	Percent mortality (Mean ± SD)	Significantly higher than reference sediment at $\alpha=0.05$?	Percent higher (absolute) than reference sediment	Failure under SQS? [1]	Failure under SIZML, CSL, or MCL? [2]
Control (NAS #2046G)	2.0 ± 2.7	---	---	---	---
Samish Bay Ref (NAS #2041G)	6.0 ± 6.5	---	---	---	---
BBP-SS-01 (NAS #2042G)	5.0 ± 3.5	NO	-1.0	NO	NO
BBP-SS-02 (NAS #2043G)	11.0 ± 8.2	NO	5.0	NO	NO
RGH-SS-01 (NAS #2044G)	4.0 ± 6.5	NO	-2.0	NO	NO
RGH-SS-03 (NAS #2045G)	6.0 ± 4.2	NO	0.0	NO	NO

[1] Sediment Quality Standards (SQS) failure if the test sediment mean amphipod mortality is significantly higher (1-tailed t-test at $P\leq0.05$) than the reference sediment mean amphipod mortality and the absolute difference is >25%.

[2] Sediment Impact Zone Maximum Levels (SIZML), Cleanup Screening Levels (CSL), or Minimum Cleanup Levels (MCL) failure (one-test criteria) if the test sediment mean amphipod mortality is significantly higher (1-tailed t-test at $P\leq0.05$) than the reference sediment mean amphipod mortality and the absolute difference is >30%.

Table 3. Interpretation of *Neanthes* test data from exposure to marine sediments based on SMS (WDOE 2008) guidelines.

Sample description	Individual growth rate (mg/day, mean ± SD)	Significantly lower than reference sediment at α=0.05?	Percent of reference sediment	Failure under SQS? [1]	Failure under SIZML, CSL, or MCL? [2]
Control (NAS #2046G)	1.09 ± 0.09	---	---	---	---
Samish Bay Ref (NAS #2041G)	0.91± 0.16	---	---	---	---
BBP-SS-01 (NAS #2042G)	0.88 ± 0.23	NO	96.7	NO	NO
BBP-SS-02 (NAS #2043G)	0.83 ± 0.26	NO	91.2	NO	NO
RGH-SS-01 (NAS #2044G)	0.81 ± 0.20	NO	89.0	NO	NO
RGH-SS-03 (NAS #2045G)	0.86 ± 0.03	NO	94.5	NO	NO

[1] Sediment Quality Standards (SQS) failure if the mean growth rate in the test sediment is significantly lower (1-tailed t-test at P≤0.05) than that in the reference sediment, and <70% of the mean reference sediment response.
[2] Sediment Impact Zone Maximum Levels (SIZML), Cleanup Screening Levels (CSL), or Minimum Cleanup Levels (MCL) failure (one-test criteria) if the mean individual growth rate in the test sediment is significantly lower (1-tailed t-test at P≤0.05) than that in the reference sediment, and <50% of the mean reference sediment response.

Table 4. Interpretation of *Mytilus galloprovincialis* test data from exposure to marine sediments, based on SMS (WDOE 2008) guidelines.

Sample description	Number normal (mean ± SD)	Significantly less than reference sediment at α = 0.10?	Percent of reference sediment	Failure under SQS? [1]	Failure under SIZML, CSL, or MCL? [2]
Seawater control	231 ± 12	---	---	---	---
Samish Bay Ref (NAS #2041G)	196 ± 32	---	---	---	---
BBP-SS-01 (NAS #2042G)	185 ± 25	NO	94.4	NO	NO
BBP-SS-02 (NAS #2043G)	173 ± 20	NO	88.3	NO	NO
RGH-SS-01 (NAS #2044G)	135 ± 42	YES	68.9	**YES**	**YES**
RGH-SS-03 (NAS #2045G)	152 ± 39	YES	77.6	**YES**	NO

[1] Sediment Quality Standards (SQS) failure if the mean number of normal survivors in the test sediment is significantly less (1-tailed t-test at P≤0.10) than the mean number of normal survivors in the reference sediment, and <85% of the mean number of normal survivors in the reference sediment.
[2] Sediment Impact Zone Maximum Levels (SIZML), Cleanup Screening Levels (CSL), or Minimum Cleanup Levels (MCL) failure (one-test criteria) if the mean number of normal survivors in the test sediment is significantly less (1-tailed t-test at P≤0.10) than the mean number of normal survivors in the reference sediment and <70% of the mean number of normal survivors in the reference sediment.

Report

of

Test No. 774-1

***Eohaustorius estuarius* 10-Day Toxicity Test of Marine Sediments**

Submitted to

Hart Crowser, Inc.
1700 Westlake Ave. N, Suite 200
Seattle, WA 98109-3056

Submitted by

Northwestern Aquatic Sciences
3814 Yaquina Bay Road
P.O. Box 1437
Newport, OR 97365

October 29, 2008

TOXICITY TEST REPORT

TEST IDENTIFICATION

Test No.: 774-1

Title: *Eohaustorius estuarius* 10-day sediment toxicity test of marine sediments

Protocol: NAS-XXX-EE4, February 20, 1992. Rev.3 (March 1, 2005). Based on: Recommended Guidelines for Conducting Laboratory Bioassays on Puget Sound Sediments (PSEP 1995), with modifications as specified by the Dredged Material Management Program (DMMP, formerly Puget Sound Dredged Disposal Analysis Program or PSDDA) and Washington State Sediment Management Standards (SMS).

STUDY MANAGEMENT

Study Sponsor: Hart Crowser, Inc., 1700 Westlake Ave. N, Suite 200, Seattle, WA 98109-3056

Sponsor's Study Monitor: Mr. Roger McGinnis

Testing Laboratory: Northwestern Aquatic Sciences, P.O. Box 1437, Newport, Oregon 97365.

Test Location: Newport Laboratory.

Laboratory's Study Personnel: M.S. Redmond, M.S., Proj. Mngr./ Study Dir.; L.K. Nemeth, B.A., M.B.A., QA Officer; G.J. Irissarri, B.S., Aq. Toxicol.; G.A. Buhler, B.S., Aq. Toxicol.; S. J. Gage, B.A., Sr. Tech.; L.P. Sandoval, B.S., Tech.

Study Schedule:

Test Beginning: 9-9-08, 1100 hrs.

Test Ending: 9-19-08, 1030 hrs.

Disposition of Study Records: All specimens, raw data, reports and other study records are stored according to Good Laboratory Practice regulations at Northwestern Aquatic Sciences, 3814 Yaquina Bay Rd., Newport, OR 97365.

Good Laboratory Practices: The test was conducted following the principles of Good Laboratory Practices (GLP) as defined in the EPA/TSCA Good Laboratory Practice regulations revised August 17, 1989 (40 CFR Part 792).

Statement of Quality Assurance: The test data were reviewed by the Quality Assurance Unit to assure that the study was performed in accordance with the protocol and standard operating procedures. This report is an accurate reflection of the raw data.

TEST MATERIAL

Control Sediment: Control sediment (NAS Sample #2046G) was collected from the *Eohaustorius estuarius* amphipod collection site, Yaquina Bay, Oregon, on 9-4-08. Interstitial salinity was 33.5 ‰. The sediment was sieved through a 0.5-mm stainless steel screen and stored at 4°C in the dark.

Test Sediments: Four test sediments and one reference sediment were tested. Details follow:

NAS Sample No.	2041G	2042G	2043G	2044G
Sample Description	Samish Bay Ref	BBP-SS-01	BBP-SS-02	RGH-SS-01
Collection Date	8-29-08	8-26-08	8-26-08	8-26-08
Receipt Date	9-4-08	9-4-08	9-4-08	9-4-08
Interstitial Salinity (‰)	30.5	24.5	25.0	23.5

NAS Sample No.	2045G
Sample Description	RGH-SS-03
Collection Date	8-26-08
Receipt Date	9-4-08
Interstitial Salinity (‰)	25.0

Storage: Storage: Upon receipt, headspace in sample containers was flushed with nitrogen, and samples were stored at 4°C in the dark.

Treatments: The samples were minimally homogenized by mixing with stainless steel implements.

TEST WATER

Source: Yaquina Bay, Oregon
Date of Collection: 9-8-08
Water Quality: Salinity 27.5 ‰, pH 8.1
Pretreatment: Filtered to ≤0.40 µm, salinity adjusted with MilliQ® deionized water, aerated.

TEST ORGANISMS

Species: *Eohaustorius estuarius*, amphipod
Age: adult
Source: Yaquina Bay, Oregon
Acclimation: Amphipods were collected on 9-4-08 at interstitial water conditions of 15.0 °C and 33.0 ‰. They were acclimated to test temperature and salinity over the five days before addition to the test. Average holding conditions during this time were: temperature, 15.3 ± 0.2 °C; pH, 8.1 ± 0.1; salinity, 28.7 ± 0.7 ‰; and dissolved oxygen 8.5 ± 0.2 mg/L. The photoperiod was constant light.

TEST PROCEDURES AND CONDITIONS

The following is an abbreviated statement of the test procedures and a statement of the test conditions actually employed. See the test protocol (Appendix I) for a more detailed description of the test procedures used in this study.

Test Chambers: 1 L covered borosilicate glass beakers
Test Volumes: 175 ml of test, reference, or control sediment; 950 ml total volume.
Replicates/Treatment: 5 (plus one water quality replicate, also used to measure interstitial water ammonia-N on day 10)
Salinity adjustment: none
Organisms/Treatment: 100 (20/replicate)
Water Volume Changes per 24 hr: None.
Aeration: Provided through a 1-mL glass pipette placed not closer than 2 cm from sediment, bubbled at a minimal rate (about 100 bubbles/minute) that did not disturb the sediment surface.
Feeding: None.
Acceptance Criteria: Results are valid if mean control mortality does not exceed 10%, and does not exceed 20% in any one control replicate.
Performance Criteria: For SMS testing, mean percent mortality in the reference sediment should be <25%.
Effects Criteria: 1) mortality after 10 days, 2) daily emergence of amphipods from the test sediments, and 3) failure of surviving amphipods to rebury at the end of the exposure period. Death is defined as no visible appendage movement or response to tactile stimulation. Unrecovered animals at the end of the exposure period were considered dead.
Water Quality and Other Test Conditions: The temperature, pH, salinity, and dissolved oxygen were measured in the water quality replicate test chamber daily. Total soluble sulfide and total ammonia-N were measured in the overlying water of the water quality replicate test chamber on days 0 and 10. Interstitial total ammonia-N, pH, and salinity were measured in bulk sediments and from the water quality beaker on test day 10. Interstitial water samples were obtained by centrifugation or by settling. Total soluble sulfide and total ammonia-N were measured using Hach reagents based on the methylene blue (EPA Method 376.2) and salicylate (Clin. Chim. Acta 14:403, 1996) colorimetric methods, respectively; samples were not distilled prior to analysis. Un-ionized ammonia-N was computed using "Un-ionized Ammonia Calculator", v1.0 (Dr. Landon Ross, Florida Department of Environmental Protection). The photoperiod was constant light.

DATA ANALYSIS METHODS

The percent amphipod mortality, percent of surviving amphipods failing to rebury at the end of the test, and percent total effective mortality were determined from the final observations according to the formulas:

Percent Mortality = 100 x ([initial amphipods - surviving amphipods]/initial amphipods)
Percent Survivors not Reburied = 100 x ([surviving amphipods - number survivors reburied]/surviving amphipods)

Percent Total Effective Mortality = 100 x ([initial amphipods - surviving amphipods]+ [surviving amphipods - number survivors reburied])/initial amphipods

Another endpoint was the sum of observed daily sediment emergence events in a test beaker throughout the test. Control and treatment means and standard deviations for the biological endpoints described above and for water quality data were computed using Microsoft EXCEL 2000. Percent mortality in each test sediment was compared against that in the control and in the reference sediment. Generally, an arcsine square root transformation was performed on percentage data before analysis. In some cases, a rank order transformation was necessary. The software used for statistical comparisons was BioStat (Beta v.4.1 (EXCEL)) bioassay software developed by the U.S. Army Corps of Engineers, Seattle District. Following determination of normality and homogeneity of variances, a one-tailed Student T-test, Approximate T-test, One-sample T-test, Mann Whitney test, or Rankit Analysis was conducted at the 0.05 level of significance.

PROTOCOL DEVIATIONS

1. Three overlying water salinity measurements, at 29.5 ‰, were slightly above the protocol-specified range of 28.0 ± 1.0‰.

REFERENCE TOXICANT TEST

The reference toxicant test is a standard multi-concentration toxicity test using ammonia expressed as NH_3-N and administered as NH_3Cl, to evaluate the performance of the test organisms used in the sediment toxicity test. The performance is evaluated by comparing the results of this test with historical results obtained at the laboratory. A summary of the reference toxicant test result is given below. The reference toxicant test raw data are found in Appendix II.

Test No.: 999-2471
Reference Toxicant and Source: Ammonia as ammonium chloride, 7.12 mg/ml stock prepared 7-25-06
Test Date: 9-9-08
Dilution Water Used: Yaquina Bay, Oregon, seawater; 27.5 ‰
Result: The 96-hr LC50 was 202 mg NH_3-N/L. This result is within the laboratory's control chart warning limits (7.68–310 mg NH_3-N/L).

RESULTS AND DISCUSSION

Observations of overlying water quality parameters during the test are summarized in Table 1. Interstitial water quality measurements during the test are summarized in Table 2. Individual water quality measurements are located in the raw data (Appendix II).

Except as noted above, all measurements of standard water quality parameters were within protocol-specified ranges. Dissolved sulfide was not detected in the overlying water (detection limit 0.02 mg/L). Total ammonia-N concentrations in the overlying water ranged from 0.1 mg/L to 6.1 mg/L (maximum 0.591 mg/L un-ionized ammonia).

In the bulk sediment samples, interstitial total ammonia-N concentrations ranged from 0.8 to 13.0 mg/L (maximum 0.310 mg/L un-ionized ammonia). In samples taken on day 10 of the bioassay, interstitial total ammonia-N concentrations ranged from 0.9 mg/L to 12.0 mg/L, with a maximum un-ionized ammonia concentration of 0.082 mg/L (Table 2).

Table 3 shows the effects of test sediment exposures on emergence, mortality, and reburial. The test met the acceptability criterion (≤10%) for mean control mortality; mean mortality in the control was 2.0%. In addition, replicate control mortality was 0.0, 5.0, 0.0, 5.0, and 0.0%; therefore, the control replicate acceptability criterion was met (≤20% in any one replicate). The response in the reference sediment met SMS criteria; mean mortality in reference sediment "Samish Bay Ref" (6.0%) was <25%. The reference toxicant test result (202 mg NH_3-N/L) was within the laboratory's control chart warning limits. It is concluded, therefore, that the test has developed fully acceptable data for use in making management decisions.

Data interpretation was conducted based on guidelines from the "Sediment Sampling and Analysis Plan Appendix," February 2008 (Washington Department of Ecology). For a test sediment from the amphipod test to fail the Sediment Quality Standards under these guidelines, the mean test mortality must be >25% absolute higher than the mean reference sediment response, and statistically higher than ($\alpha = 0.05$) the reference sediment. For a test sediment from the amphipod test to fail the Sediment Impact Zone Maximum Levels (SIZML), Cleanup Screening Levels (CSL), or Minimum Cleanup Levels (MCL) under the one-test criteria in these guidelines, the mean test mortality must be >30% absolute over the mean reference sediment response, and statistically higher than ($\alpha = 0.05$) the reference sediment.

In no case was the percent mortality in a test sediment significantly higher than that in reference sediment "Samish Bay Ref," and in no test sediment was mean percent mortality 25% or 30% higher than that in the reference sediment (Table 4). Therefore, both test sediments passed both Sediment Quality Standards and one-test criteria for SIZML/CSL/MCL as defined by the SMS guidelines. Percent mortality in BBP-SS-02 was significantly higher than that in the control (Table 3).

STUDY APPROVAL

Michele S. Redmond 10-30-08
Project Manager/ Study Director Date

Julie R. Jane 10.30.08
Quality Assurance Unit Date

Linda K. Jemelka 10/27/08
Assistant Laboratory Director Date

Table 1. Summary of overlying water quality conditions during exposure of amphipods, *Eohaustorius estuarius*, to marine sediments.

Parameter	Mean ± SD	Minimum	Maximum	N
Temperature (°C)	15.1 ± 0.3	14.7	15.8	66
pH	8.2 ± 0.2	7.6	8.8	66
Salinity (‰)	28.2 ± 0.7	27.0	29.5	66
Dissolved oxygen (mg/L)	7.6 ± 0.5	5.9	8.5	69
Total soluble sulfide (mg/L)	---	<0.02	<0.02	12
Total ammonia-N (mg/L)	---	0.1	6.1	12
Un-ionized ammonia (mg/L)	---	0.005	0.591	12

Table 2. Summary of interstitial water quality conditions on day 10 of exposure of amphipods, *Eohaustorius estuarius*, to marine sediments.

Parameter	Mean ± SD	Minimum	Maximum	N
Salinity (‰)	28.5 ± 0.8	27.5	29.5	6
pH	7.5 ± 0.2	7.2	7.7	6
Total ammonia-N (mg/L)	---	0.9	12.0	6
Un-ionized ammonia (mg/L)	---	0.010	0.082	6

Table 3. Means and standard deviations (n=5) of sediment emergence, percent mortality, percent of survivors failing to rebury, and percent total effective mortality of *Eohaustorius estuarius* exposed to marine sediments.

Sample description	Emergence[1] (no./replicate)	Percent mortality	Percent Survivors Failing to Rebury	Percent Total Effective Mortality
Control (NAS #2046G)	2.0 ± 2.5	2.0 ± 2.7	0.0 ± 0.0	2.0 ± 2.7
Samish Bay Ref (NAS #2041G)	0.6 ± 0.9	6.0 ± 6.5	0.0 ± 0.0	6.0 ± 6.5
BBP-SS-01 (NAS #2042G)	3.2 ± 3.3	5.0 ± 3.5	0.0 ± 0.0	5.0 ± 3.5
BBP-SS-02 (NAS #2043G)	4.4 ± 4.0	11.0 ± 8.2 **b**	0.0 ± 0.0	11.0 ± 8.2
RGH-SS-01 (NAS #2044G)	0.8 ± 1.1	4.0 ± 6.5	0.0 ± 0.0	4.0 ± 6.5
RGH-SS-03 (NAS #2045G)	4.6 ± 4.4	6.0 ± 4.2	0.0 ± 0.0	6.0 ± 4.2

[1] Daily emergence counts include all amphipods observed on or above the sediment surface, whether living or dead.
a Percent mortality significantly higher than that in reference sediment "Samish Bay Ref" ($p<0.05$)
b Percent mortality significantly higher than that in the control sediment ($p<0.05$)

Table 4. Interpretation of *Eohaustorius* test data from exposure to marine sediments, based on SMS (WDOE 2008) guidelines.

Sample description	Percent mortality (Mean ± SD)	Significantly higher than reference sediment at α=0.05?	Percent higher (absolute) than reference sediment	Failure under SQS? [1]	Failure under SIZML, CSL, or MCL? [2]
Control (NAS #2046G)	2.0 ± 2.7	---	---	---	---
Samish Bay Ref (NAS #2041G)	6.0 ± 6.5	---	---	---	---
BBP-SS-01 (NAS #2042G)	5.0 ± 3.5	NO	-1.0	NO	NO
BBP-SS-02 (NAS #2043G)	11.0 ± 8.2	NO	5.0	NO	NO
RGH-SS-01 (NAS #2044G)	4.0 ± 6.5	NO	-2.0	NO	NO
RGH-SS-03 (NAS #2045G)	6.0 ± 4.2	NO	0.0	NO	NO

[1] Sediment Quality Standards (SQS) failure if the test sediment mean amphipod mortality is significantly higher (1-tailed t-test at P≤0.05) than the reference sediment mean amphipod mortality and the absolute difference is >25%.
[2] Sediment Impact Zone Maximum Levels (SIZML), Cleanup Screening Levels (CSL), or Minimum Cleanup Levels (MCL) failure (one-test criteria) if the test sediment mean amphipod mortality is significantly higher (1-tailed t-test at P≤0.05) than the reference sediment mean amphipod mortality and the absolute difference is >30%.

APPENDIX I

PROTOCOL

TEST PROTOCOL

AMPHIPOD, *EOHAUSTORIUS ESTUARIUS*, 10-DAY SOLID PHASE SEDIMENT BIOASSAY

1. INTRODUCTION

1.1 Purpose of Study: The purpose of this study is to identify marine test sediments that are toxic to an estuarine amphipod.

1.2 Summary of Method: The 10-day static test is performed using adult amphipods obtained from a wild population. Test sediments are placed in the bottom of 1-liter glass beakers used as test vessels that are then filled with clean seawater. Five replicate containers for each test sediment, reference site sediment, and the collection site control sediment, each containing 20 test organisms, are employed. Survival, emergence from the sediment during exposure, and failure to rebury in clean sediment after the test are the response criteria used. The mean and standard deviation for each treatment and test endpoint are given in the final report. Between-treatment statistical comparisons may be made, where each treatment is compared to the control and/or reference sediment. This protocol is based on PSEP (1995) guidelines, PSDDA (PSDDA 1989, U.S. ACOE et al. 2000) modifications, SMS (WDOE 2003) and ASTM E-1367 (ASTM 2004).

2. STUDY MANAGEMENT

2.1 Sponsor's Name and Address:

_____
_____
_____

2.2 Sponsor's Study Monitor:

_____

2.3 Name of Testing Laboratory:
Northwestern Aquatic Sciences
3814 Yaquina Bay Road, P.O. Box 1437
Newport, OR 97365

2.4 Test Location: Newport Laboratory

2.5 Laboratory's Personnel to be Assigned to the Study:
Project Manager/Technical Director: _____
Quality Assurance Officer: _____
Aquatic Toxicologist: _____
Aquatic Toxicologist: _____

2.6 Proposed Testing Schedule: Tests should begin within 2 weeks (8 weeks with samples under nitrogen for PSDDA or SMS) of sample collection. A reference toxicant test is run concurrently.

2.7 Good Laboratory Practices: The test is conducted following the principles of Good Laboratory Practices (GLP) as defined in the EPA/TSCA Good Laboratory Practice regulations revised August 17, 1989 (40 CFR Part 792).

3. TEST MATERIAL

The test materials are marine or estuarine sediments. *E. estuarius* is a desirable test species for sediments with interstitial water salinity of 2-28 ppt, and the use of the *E. estuarius* bioassay is preferred for sediments with salinities <25 ppt. The collected sediments are placed in a suitable container for shipping and storage. The preferred container is a solvent and acid cleaned 1 L glass jar fitted with a TFE-lined screw cap. The jars are filled completely so that there is no air space. At the laboratory, the samples may be stored at 4°C in the dark in the original sealed containers for up to 2 weeks (8 weeks with no headspace or with samples under nitrogen for PSDDA

or SMS) prior to testing. The negative control sediment is from a clean site, normally the amphipod collection site. In addition, one or more reference sediments, clean sediments with physical characteristics similar to the test sediments, may also be employed.

4. TEST WATER

Test water is filtered Yaquina Bay seawater adjusted to the selected test salinity. The water is pumped from Yaquina Bay into a 6000 gal seasoned fiberglass reservoir from which it is supplied under pump pressure to the laboratory. Filtration is accomplished using a sand filter followed by 5 μm, 1 μm, and 0.40 μm cartridge filters. An alternative seawater supply of similar quality may be used. Seawater should be held at ≤15°C for ≤2 days prior to test initiation.

5. TEST ORGANISMS

5.1 Species: Estuarine amphipod, *Eohaustorius estuarius*.

5.2 Source: Field collected from the lower portion of Beaver Creek, OR, or Yaquina Bay, OR in the intertidal zone. Interstitial water salinity and temperature are measured at the collection site. The sediments are sieved in the field using a 1.0 mm screen and the recovered amphipods, along with miscellaneous debris, are washed into plastic pails of collection site sediment and returned promptly to the laboratory.

5.3 Laboratory Handling: Pails containing the amphipods are placed in a laboratory water bath or controlled temperature room for temperature control and supplied with gentle aeration. As soon as possible after collection, the amphipods are sieved from the pails of sediment and are removed from the holding vessel using a fine mesh aquarium dip net and placed into Pyrex glass sorting trays. The test organisms are picked from the detritus using a large bore eye dropper and 100 amphipods each are placed into small plastic freezer containers (9 cm x 9 cm x 6 cm) holding a 1 cm layer of clean sediment from the collection area. Freezer containers are immersed in a seawater tray provided with seawater and aeration, and held under constant illumination for at least 2 days, but no longer than 10 days prior to the beginning of the test. It may be necessary to acclimate the amphipods to the test salinity, depending upon the collection site salinity and the test water salinity. Although moderate rates of salinity change are preferred, this species is tolerant of rapid salinity changes (DeWitt, et al., 1989).

5.4 Age at Study Initiation: Adult

6. DESCRIPTION OF TEST SYSTEM

6.1 Test Chambers and Environmental Control: Test chambers used in the toxicity test are 1000 ml glass beakers. The beakers are covered to minimize contamination and evaporation of seawater or loss of volatile compounds. Test chambers are maintained at constant temperature by partial immersion in a temperature-controlled water bath or by placement in a temperature-controlled room. Minimal aeration (approx. 100 bubbles/min.) is supplied through a glass pipet with the tip placed at least 2 cm above the sediment surface. The test is performed under continuous illumination, using ambient laboratory lighting. SMS may require UV light for PAH-contaminated intertidal sediments.

6.2 Cleaning: All laboratory glassware, including test chambers, is cleaned as described in EPA/600/4-90/027F. New glassware and test systems are soaked 15 minutes in tap water and scrubbed with detergent (or cleaned in an automatic dishwasher); rinsed twice with tap water; carefully rinsed once with fresh, dilute (10%, V:V) hydrochloric or nitric acid to remove scale, metals, and bases; rinsed twice with deionized water; rinsed once with acetone to remove organic compounds (using a fume hood or canopy); and rinsed three times more with deionized water. Test systems and chambers are rinsed again with dilution water just before use.

7. EXPERIMENTAL DESIGN AND TEST PROCEDURES

7.1 Experimental Design: An experimental design is used consisting of exposure of test organisms to a number of test sediments, one or more reference sediments, and to the collection site control sediment. Each treatment consists of five replicate test chambers each containing 20 animals. An additional replicate containing 20 test organisms is used for daily water quality measurements. More replicates, with or without

test organisms as appropriate, may be employed for periodic interstitial water quality measurements. Blind, random testing is used.

7.2 Preparation of Test Sediments: The interstitial salinity of the test, reference, and control sediments is measured. Adjustment of interstitial salinities is not recommended for *Eohaustorius estuarius* under standard guidelines, as *E. estuarius* tolerates a broad salinity range and any adjustments disturb the test sediments. However, if client project specifications require interstitial salinity adjustment, the PSEP (1995) procedure described for *Rhepoxynius abronius* and *Neanthes arenaceodentata* testing may be used.

Certain projects may require purging of excess ammonia from sediment interstitial water. PSDDA and SMS allow purging to be considered when interstitial total ammonia concentrations are 60 mg/L or above (at pH = 7.7; un-ionized >0.8 mg/L). However, purging is allowed only by agency permission, so the decision to purge should be made by the client. Testing of purged sediments may require concurrent testing of the same sediments unpurged.

If no salinity adjustment or purging is done, sediments are used without further treatment. Each test sediment is mixed thoroughly using a non-contaminating implement, then an aliquot (175 ml) sufficient to make a 2-cm-deep layer is added to each test beaker, and the surface is smoothed. Bubbles are removed from the sediment by gently tapping each beaker against the palm of the hand. Seawater at the test temperature and salinity is carefully added into the beaker to the 750 ml mark utilizing a water dispersal technique to avoid suspending the sediment. The beakers are then placed into the water bath or constant-temperature room and covered with watchglasses. An air delivery pipet is inserted into each beaker under the watchglass. Overhead lights provide constant illumination. Water in the test beakers is aerated without disturbing the sediments. The test system is then allowed to temperature equilibrate overnight.

7.3 Beginning the Test: Amphipods are wet sieved, using a 1.0 mm sieve, from the holding sediment and impartially distributed to a series of seawater-filled containers each holding 10 amphipods. Two containers of 10 animals each are randomly added to each replicate. Once amphipods are added to a replicate, the number of animals that do not burrow into the test sediment within 15 minutes is recorded. Amphipods not burrowed are removed and replaced with healthy amphipods, unless they are actively swimming or burrowing and re-emerging, as this may be a response to toxic material. Following addition of amphipods to the test chambers, additional water is added to achieve a final volume of 950 ml.

7.4 Effects Criteria: Effects criteria are 1) survival after 10 days, 2) daily emergence of amphipods from the test sediments, and 3) failure of amphipods to rebury in sediment at the end of the exposure period. Death is defined as no visible appendage movement or response to tactile stimulation.

7.5 Test Conditions: Test containers are maintained at a constant 15 ± 1°C. The selected test salinity is kept within ± 1 ppt. Frequently, a test salinity of 28 ppt is used to be consistent with *Rhepoxynius* and *Ampelisca* tests. The dissolved oxygen concentration in each test container must be greater than 60% saturation throughout the 10-day test. Each beaker is supplied with oil-free compressed air provided at a rate of approximately 100 bubbles per minute through disposable glass pipettes positioned with their tips at least 2 cm above the sediment surface. Each beaker is covered by a watchglass to minimize evaporation and the possibility of cross contamination between beakers. The test is conducted under constant illumination.

7.6 Feeding: Animals are not fed at any time before or during the test.

7.7 Test Duration, Type and Frequency of Observations, and Methods: The duration of the sediment toxicity test is 10 days. The type and frequency of observations to be made are summarized as follows:

TYPE OF OBSERVATION	TIMES OF OBSERVATION
Biological Data	
Emergence from sediment	daily
Survival	end of test
Reburial	end of test
Physical and Chemical Data	
Sediment interstitial salinity	at test beginning (bulk sediments) & end
Salinity, dissolved oxygen, pH, &temperature of overlying water (1 replicate only)	daily
Ammonia and sulfides in overlying water (1 replicate)	at test beginning & end
Ammonia, sulfide, pH, & salinity in interstitial water (optional)	for PSDDA and SMS, ammonia, pH, & salinity in bulk sediments and at test beginning and end; sulfide as requested by client
Check air and lights	daily

The presence of amphipods that have emerged from the sediments is recorded daily. Any other unusual observations are recorded. No amphipods are removed at any time until the termination of the test. The bioassay is terminated after 10 days of sediment exposure. The sediment is wet sieved through a 0.5 mm screen to recover buried amphipods. The number of surviving amphipods is recorded. For the reburial endpoint, surviving amphipods from each beaker are transferred to containers with a layer of control sediment and observed under constant illumination. The numbers of amphipods able to bury within a 1-hour exposure period are then recorded.

Dissolved oxygen is measured directly in test beakers using an air-calibrated polarographic oxygen probe. The pH is measured using a properly calibrated pH meter with scale divisions of 0.1 pH units. Temperature is measured using a calibrated mercury thermometer or a telethermometer. Salinity is measured using a refractometer. The method used for the measurement of total ammonia-N in the overlying water and sediment porewater from sediment bioassays is based on the salicylate colorimetric method of Hach Chemical Co. and was adapted from Clin. Chim. Acta., 14: 403 (1966). The method used for the measurement of dissolved sulfide in the overlying water and sediment porewater in marine sediment bioassays is the methylene blue colorimetric method based on SM 4500-S^{2-} (Standard Methods 1995 (19^{th} edition). Any observed changes in sediment color or the formation of a sediment discontinuity layer is also recorded.

7.8 Criteria of Test Acceptance: For the test to be considered acceptable, the minimum mean survival of organisms in the control treatment at the end of the test must be 90%, and survival in each control replicate must be at least 80%.

7.9 Performance Criterion: For PSDDA, mean percent mortality in the reference sediments must be ≤20% over the negative control. For SMS, mean percent mortality in the reference sediments must be <25%.

7.10 Reference Toxicant Test: A routine reference toxicant test is run concurrently with each sediment test. This may be a 48-hr test with sodium dodecyl sulfate (preferred), or a 96-hr test with cadmium chloride (frequently required by client). PSDDA and SMS also require a water-only ammonia test when any test sediment interstitial ammonia is > 30 mg/L total ammonia (at pH=7.7; un-ionized >0.4 mg/L).

8. DATA ANALYSIS

The mean and standard deviation are calculated for each endpoint employed (e.g. mortality) and for each treatment (i.e. test sediment). Between-treatment comparisons may be made using a t-test (Student's t-test, approximate t-test, one-sample t-test), Wilcoxon Two-Sample test, Mann-Whitney test, or Rankit Analysis, where each treatment is compared to the control or the reference sediment. An arcsine-square root transformation of proportional data, and tests for normality and heterogeneity of variances, are performed prior to statistical comparisons. An estimate of

total effective mortality (optional) may also be calculated by summing percent mortality and percent failure to rebury.

9. REPORTING

A report of the test results must include the following information: name and identification of the test; the investigator and laboratory; sediment holding temperature data; information on the test sediment including the interstitial salinity for control, reference and test sediments; information on the source of seawater used; detailed information about the test organisms including acclimation conditions; a description of the experimental design and test chambers and other test conditions including water quality; information about any aeration that may have been required; definition of the effects criteria and other observations; unusual responses, if any, in the control treatment; daily emergence for each beaker and the 10-day mean and S.D. for each treatment; 10-day mortality for each beaker and the mean and S.D. for each treatment; failure to rebury and total effective mortality (optional) in each beaker and the mean and S.D. for each treatment; 96-hr LC50 with reference toxicant; a description of data analysis methods employed and documentation of statistical test results; any unusual information about the test or deviations from procedures.

10. STUDY DESIGN ALTERATION

Amendments made to the protocol must be approved by the sponsor and study director and should include a description of the change, the reason for the change, the date the change took effect, and the dated signatures of the study director and sponsor. Any deviations in the protocol must be described and recorded in the study raw data.

11. REFERENCES FOR PROCEDURES

ASTM. 2004. Standard test method for measuring the toxicity of sediment-associated contaminants with estuarine and marine invertebrates. ASTM Standard Method No. E1367-03e1. In: 2004 Annual Book of ASTM Standards, volume 11.05, Biological effects and environmental fate; biotechnology; pesticides. ASTM International, West Conshohocken, PA.

DeWitt, T.H., R.C. Swartz and J.O. Lamberson. 1989. Measuring the acute toxicity of estuarine sediments. Environ. Toxicol. Chem. 8: 1035-1048.

Puget Sound Dredged Disposal Analysis (PSDDA). 1989. Management plan report - unconfined open-water disposal of dredged material, Phase II - (north and south Puget Sound). Puget Sound Dredged Disposal Analysis, Army Corps of Engineers, Seattle, WA. (and other modifications made through the PSDDA process and Sediment Management Annual Review Meetings).

Puget Sound Estuary Program. 1995. Recommended guidelines for conducting laboratory bioassays on Puget Sound sediments. Prepared for U.S. Env. Prot. Agency, Region 10, Office of Puget Sound, Seattle, WA and Puget Sound Water Quality Authority, P.O. Box 40900, Olympia, WA.

U.S. Army Corps of Engineers, Seattle District; U.S. EPA, Region 10; Washington Department of Natural Resources; Washington Department of Ecology. 2000. Dredged material evaluation and disposal procedures: a user's manual for the dredged disposal analysis (PSDDA) program.

Washington State Department of Ecology. 2003. Sediment sampling and analysis plan appendix. Publication no. 03-09-043, WDOE, Olympia, WA.

Weber, C.I. (Ed.) 1993. Methods for measuring the acute toxicity of effluents and receiving waters to freshwater and marine organisms (Fourth Edition). EPA/600/4-90/027F.

12. APPROVALS

_____ for _____
Name Date

_____ for **NORTHWESTERN AQUATIC SCIENCES**
Name Date

APPENDIX II

RAW DATA

TEST DESCRIPTION, MONITORING, AND RESULTS BENCHSHEETS

NORTHWESTERN AQUATIC SCIENCES
PROTOCOL NO. NAS-XXX-EE4
MARINE AMPHIPOD 10-DAY SOLID PHASE SEDIMENT TEST

Test No. 774-1 Client Hart Crowser Investigator renewed pg 1-45 MSR 10-27-08

STUDY MANAGEMENT

Client: Hart Crowser, Inc., 1700 Westlake Ave. N, Suite 200, Seattle, WA 98109-3056

Client's Study Monitor: Mr. Roger McGinnis
Testing Laboratory: Northwestern Aquatic Sciences
Test Location: Newport Laboratory
Laboratory's Study Personnel:
Proj. Man./Study Dir. M.S. Redmond MSR
QA Officer L.K. Nemeth
1. Susan Gaff sg 2. GA Buhler GB
3. G.J. IRISSARRI GJI 4. Lidia P. Sandoval LPS
5. 6.
7. 8.

Study Schedule:
Test Beginning: 9-9-08 11:00 Test Ending: 9-19-08 10:30

TEST MATERIAL

General description (see sample logbook/chain-of-custody for details):

NAS Sample No.:	2041G	2042G	2043G	2044G	2045G
Description:	Samish Bay Ref	BBP-SS-01	BBP-SS-02	RGH-SS-01	RGH-SS-03
Collection Date:	8/29/08	8/26/08	8/26/08	8/26/08	8/26/08
Receipt Date:	9/4/08	9/4/08	9/4/08	9/4/08	9/4/08
Inters.Salinity (ppt):	30.5	24.5	25.0	23.5	25.0
Inters. pH:	8.0	7.6	7.6	8.1	7.5
NAS Sample No.:					
Description:					
Collection Date:					
Receipt Date:					
Inters.Salinity (ppt):					
:					
NAS Sample No.:					
Description:					
Collection Date:					
Receipt Date:					
Inters.Salinity (ppt):					
:					
NAS Sample No.:					
Description:					
Collection Date:					
Receipt Date:					
Inters.Salinity (ppt):					
:					

Error codes: 1) correction of handwriting error
2) written in wrong location; entry deleted
3) wrong date deleted, replaced with corrrect date
4) error found in measurement; measurement repeated

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-EE4

MARINE AMPHIPOD 10-DAY SOLID PHASE SEDIMENT TEST

Test No. 774-1 Client Hart Crowser Investigator

SEDIMENT DESCRIPTIONS -- SUPPLEMENTAL NOTES

Sample No.	Description
2041G	DARK GRAY MUDDY SAND WITH A FEW WORMS
2042G	black muddy sand with worms and organic debris, shell material
2043G	charcoal gray muddy sand with some worms; shell material
2044G	BLACK SANDY GRAVEL WITH BIVALVES & SHELL DEBRIS
2045G	dark brown sandy gravel with bivalves and few worms
2046G	Brown sand

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-EE4

MARINE AMPHIPOD 10-DAY SOLID PHASE SEDIMENT TEST

Test No. 774-1 Client Hart Crowser Investigator _____

TEST ORGANISMS

Species: *Eohaustorius estuarius* Date Collected: 9-4-08

Source: Yaquina Bay, Oregon

Field conditions when collected:

Interstitial temperature: 15.0°C Interstitial salinity: 33.0‰

Acclimation Data:

Date	Temp. (deg.C)	pH	Sal (ppt)	DO (mg/L)	Feeding amount	Feeding description	Water changes	Comments
9-4-08	15.3	8.1	27.5	8.2				
9-5-08	15.3	8.1	28.5	8.6				
9-6-08	15.1	8.2	29.0	8.5				
9-7-08	15.5	8.2	28.5	8.3				
9-8-08	15.5	8.0	29.5	8.6				
9-9-08	15.2	8.2	29.0	8.6				
Mean	15.3	8.1	28.7	8.5				
S.D.	0.2	0.1	0.7	0.2				
(N)	(6)	(6)	(6)	(6)				

Photoperiod during acclimation: constant light

TEST PROCEDURES AND CONDITIONS

Test chambers: 1 L glass beakers covered with watchglasses

Test volumes: 175 ml of test sediment; 950 ml total volume

Replicates/treatment: (5) 5 Organisms/treatment: (100) 100

Additional replicates included for water quality purposes (indicate numbers of each that apply):

_____ Ammonia-purging sacrificial beakers (no test organisms)

_____ Day zero sacrificial beaker (no test organisms)

1 Day 10 sacrificial beaker (also water quality beaker; with test organisms)

_____ Day _____ sacrificial beaker(s) (with test organisms)

Test water changes: None

Feeding: None

Beaker placement: Total randomization

Aeration: Yes, at least 2 cm above the sediment surface

Photoperiod: Constant light

Test temperature (deg.C): 15.0 +/- 1.0

Salinity (ppt): 28.0 +/- 1.0

MISCELLANEOUS NOTES

Light intensity measurements:

Date	Location in room	foot-candles
9-12-08	beaker # 10	75.3
	32	48.3

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-EE4

MARINE AMPHIPOD 10-DAY SOLID PHASE SEDIMENT TEST

Test No. 774-1 Client Hart Crowser Investigator

Control Sediment:

Source: Yaquina Bay, Oregon

Date collected: 9/4/08 Interstitial salinity: 33.5 ppo

Sieved through 0.5-mm screen Interstitial pH: 7.8

Storage: 4 degrees C in the dark NAS# 2046G

Test conducted in (circle one): room 1 room 2 trailer water bath other: room #4

Randomization chart:

wall

3	6					33	36		
2	5	→	→	→	→	32	35		
1	4					31	34		

top shelf

wall

door

Randomization chart:

Randomization chart:

Randomization chart:

TEST WATER

Source: Yaquina Bay, Oregon, sea water

Date of Collection: 9-8-08 Salinity (ppt) 27.5 pH 8.1

Treatments: filtered to ≤ 0.4 µm, salinity-adjusted with MilliQ deionized water, aerated

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-EE4

MARINE AMPHIPOD 10-DAY SOLID PHASE SEDIMENT TEST

Test No. 774-1 Client Hart Crowser Investigator _____

DAILY RECORD SHEET

overlying NH3 sampled (days 0,10)? yes

Day 0 (9 19 08) 631/mR

Beaker No.	Temp. (deg.C)	pH	Sal. (ppt)	DO (ppm)	S (mg/L)	No. ** emerged	Air	Comments
1						1	air	
2						0	OK	
3						0		
4						2		
* 5	15.7	8.1	27.5	8.3	<0.02	1		
6						0		
7						0		
8						0		
9						0		
10						0		
11						0		
* 12	15.7	8.1	27.5	8.4	<0.02	0		
13						1		
* 14	15.7	7.9	27.0	7.8	<0.02	1		
* 15	15.7	8.0	27.0	8.0	<0.02	0		
16						0		
17						0		
* 18	15.8	7.6	27.5	7.6	<0.02	0		
19						0		
20						0		
21						0		
22						1		
23						0		
24						0		
25						0		
26						0		
27						0		
28						0		
29						0		
30						0		
31						0		
32						0		
33						2		
34						0		
35						1		
* 36	15.6	8.0	27.5	8.0	<0.02	0		

* Water Quality Beakers

** for day zero only, this is number not buried within 10-15 minutes

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-EE4

MARINE AMPHIPOD 10-DAY SOLID PHASE SEDIMENT TEST

Test No. 774-1 Client Hart Crowser Investigator _____

DAILY RECORD SHEET

Day 1 (9/10/08) GJ/SP

Beaker No.	Temp. (deg.C)	pH	Sal. (ppt)	DO (ppm)	No. emerged	Air	Comments
1					0	OK	
2					0		
3					0		
4					0		
* 5	15.8	~~7.07~~ 7.9	27.0	6.6	0		
6					0		
7					0		
8					0		
9					0		
10					0		
11					0		
* 12	15.6	8.0	27.5	8.1	0		
13					0		
* 14	15.7	8.0	27.5	7.4	0		
* 15	15.6	8.0	28.0	7.4	0		
16					0		
17					0		
* 18	15.5	8.0	28.0	7.7	0		
19					0		
20					0		
21					0		
22					0		
23					0		
24					0		
25					0		
26					0		
27					0		
28					0		
29					0		
30					0		
31					0		
32					0		
33					0		
34					0		
35					0		
* 36	15.5	8.0	27.5	7.8	0		

UPS @ 10-08

* Water Quality Beakers

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-EE4

MARINE AMPHIPOD 10-DAY SOLID PHASE SEDIMENT TEST

Test No. 774-1 Client Hart Crowser Investigator _____

DAILY RECORD SHEET

Day 2 (9/11/08) GJ

Beaker No.	Temp. (deg.C)	pH	Sal. (ppt)	DO (ppm)	No. emerged	Air	Comments
1					2	OK	
2					2		
3					0		
4					0		
* 5	15.4	7.9	27.0	6.2	0		
6					0		
7					0		
8					0		
9				7.3	0		AERATION OFF, REESTABLISHED
10					0	OK	
11					0		
* 12	15.4	8.1	27.5	7.8	0		
13					0		
* 14	15.4	8.0	27.5	7.4	0		
* 15	15.4	8.0	27.0	7.4	0		
16					0		
17					0		
* 18	15.4	8.0	27.5	7.6	0		
19					0		
20					0		
21					0		
22					0		
23					0		
24					0		
25					2		
26					0		
27					0		
28					0		
29					0		
30					0		
31					0		
32					0		
33					0		
34					0		
35					0		
* 36	15.2	8.0	27.5	7.4	0		

* Water Quality Beakers

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-EE4

MARINE AMPHIPOD 10-DAY SOLID PHASE SEDIMENT TEST

Test No. 774-1 Client Hart Crowser Investigator _____

DAILY RECORD SHEET

Day 3 (9/12/08) GJL

Beaker No.	Temp. (deg.C)	pH	Sal. (ppt)	DO (ppm)	No. emerged	Air	Comments
1					0	OK	
2				6.1	0	AERATION OFF, RESTABLISHED	
3					0	OK	
4					0	↓	
* 5	15.3	8.0	27.0	6.4	0	AERATION OFF, RESTABLISHED	
6					0	OK	
7					0		
8					1		
9					1		
10					0		
11					0		
* 12	15.3	8.2	27.5	8.5	0		
13					0		
* 14	15.2	8.1	27.5	7.6	0		
* 15	15.2	8.0	28.0	7.8	0		
16					0		
17					0		
* 18	15.2	8.0	28.0	8.0	0		
19					0		
20					1		
21					0		
22					1		
23					0		
24					0		
25					0		
26					0		
27					0		
28					0		
29					0		
30					0		
31					0		
32					0		
33					0		
34					0		
35					0		
* 36	15.0	8.0	28.0	7.8	0	↓	

* Water Quality Beakers

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-EE4

MARINE AMPHIPOD 10-DAY SOLID PHASE SEDIMENT TEST

Test No. 774-1 Client Hart Crowser Investigator _____

DAILY RECORD SHEET

Day 4 (9/13/08) GJL

Beaker No.	Temp. (deg.C)	pH	Sal. (ppt)	DO (ppm)	No. emerged	Air	Comments
1					0	OK	
2					0		
3					0		
4					0		
* 5	15.1	8.3	28.0	7.8	0		
6				6.2	0	AERATION OFF, REESTABLISHED	
7					0	OK	
8					0		
9					0		
10					0		
11					0		
* 12	15.0	8.2	28.0	8.1	0		
13					0		
* 14	14.9	8.2	28.0	7.8	0		
* 15	14.9	8.1	28.0	7.9	2		
16					1		
17					0		
* 18	15.0	8.1	28.0	8.0	0		
19					0		
20					1		
21					1		
22					1		
23					0		
24					0		
25					1		
26					0		
27					0		
28					0		
29					0		
30					0		
31					0		
32					0		
33					0		
34					0		
35					0		
* 36	14.9	8.1	28.0	7.8	0		

* Water Quality Beakers

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-EE4

MARINE AMPHIPOD 10-DAY SOLID PHASE SEDIMENT TEST

Test No. 774-1 Client Hart Crowser Investigator _____

DAILY RECORD SHEET

Day 5 (9/14/08) LPS/AF

Beaker No.	Temp. (deg.C)	pH	Sal. (ppt)	DO (ppm)	No. emerged	Air	Comments
1					2	Ok	
2					1		
3					0		
4					0		
* 5	15.1	8.4	27.5	5.9	1		
6					1		
7					1		
8					0		
9					0		
10					0		
11					0		
* 12	15.4/15.0	8.2	28.0	7.9	1		
13					0		
* 14	15.0	8.3	28.5	7.8	0		
* 15	14.9	8.2	28.5	7.8	0		
16					0		
17					1		
* 18	14.9	8.1	28.5	8.1	0		
19					0		
20					0		
21					0		
22					0		
23					0		
24					0	↓	
25					0		aeration off; reestablished
26					0	Ok	
27					0		
28					0		
29					0		
30					0		
31					0		
32					0		
33					0		
34					0		
35					0		
* 36	14.8	8.2	28.5	7.8	0	↓	

* Water Quality Beakers

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-EE4

MARINE AMPHIPOD 10-DAY SOLID PHASE SEDIMENT TEST

Test No. 774-1 Client Hart Crowser Investigator _____

DAILY RECORD SHEET

Day 6 (9/15/08) GJ

Beaker No.	Temp. (deg.C)	pH	Sal. (ppt)	DO (ppm)	No. emerged	Air	Comments
1					0	OK	
2					1		
3					1		
4					0		
* 5	15.0	8.5	28.0	7.0	0		
6					0		
7					1		
8					0		
9					0		
10					0		
11					0		
* 12	15.0	8.2	28.0	8.0	0		
13					0		
* 14	15.0	8.3	28.5	7.4	1		
* 15	15.0	8.2	28.5	7.4	0		
16					0		
17					0		
* 18	15.0	8.1	28.5	7.7	0		
19					0		
20					0		
21					0		
22					0		
23					0		
24					0		
25					0		
26					0		
27					0		
28					0		
29					0		
30					0		
31					0		
32					0		
33					0		
34					0		
35					0		
* 36	14.8	8.2	28.5	7.5	0		

* Water Quality Beakers

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-EE4

MARINE AMPHIPOD 10-DAY SOLID PHASE SEDIMENT TEST

Test No. 774-1 Client Hart Crowser Investigator _____

DAILY RECORD SHEET

Day 7 (9/16/18) 09

Beaker No.	Temp. (deg.C)	pH	Sal. (ppt)	DO (ppm)	No. emerged	Air	Comments
1					1	OK	
2					2		
3					1		
4					0		
* 5	14.9	8.6	28.0	7.2	0		
6					0		
7					0		
8					0		
9					0		
10					0		
11					0		
* 12	14.9	8.2	28.0	7.8	0		
13					0		
* 14	15.0	8.3	28.5	8.0	1		
* 15	14.9	8.2	29.0	7.5	3		
16					0		
17					0		
* 18	15.0	8.1	28.5	7.8	0		
19					0		
20					0		
21					0		
22					0		
23					0		
24					0		
25					0		
26					0		
27					0		
28					0		
29					0		
30					0		
31					0		
32					0		
33					0		
34					0		
35					0		
* 36	14.9	8.3	28.5	7.7	0		

* Water Quality Beakers

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-EE4

MARINE AMPHIPOD 10-DAY SOLID PHASE SEDIMENT TEST

Test No. 774-1 Client Hart Crowser Investigator _____

DAILY RECORD SHEET

Day 8 (9/17-18) DB

Beaker No.	Temp. (deg.C)	pH	Sal. (ppt)	DO (ppm)	No. emerged	Air	Comments
1					1	OK	
2					1		
3					0		
4					0		
* 5	14.9	8.7	28.0	7.6	0		
6					2		
7					0		
8					0		
9					0		
10					0		
11					0		
* 12	14.8	8.3 8.2	28.5	7.5	0		
13					0		
* 14	14.9	8.4	29.0	7.6	1		
* 15	14.8	8.3	29.0	7.4	6		
16					0		
17					1		
* 18	14.9	8.2	28.5	7.8	0		
19					0		
20					0		
21					0		
22					0		
23					0		
24					0		
25					0		
26					0		
27					0		
28					0		
29					0		
30					0		
31					1		
32					0		
33					0		
34					0		
35					0		
* 36	14.7	8.4	29.0	7.7	0		

* Water Quality Beakers

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-EE4
MARINE AMPHIPOD 10-DAY SOLID PHASE SEDIMENT TEST

Test No. 774-1 Client Hart Crowser Investigator ________

DAILY RECORD SHEET

Day 9 (9/18/08) GAB

Beaker No.	Temp. (deg.C)	pH	Sal. (ppt)	DO (ppm)	No. emerged	Air	Comments
1					0	OK	
2					2		
3					4		
4					0		
* 5	15.0	8.8	28.5	7.4	0		
6					3		
7					0		
8					0		
9					2		
10					0		
11					0		
* 12	15.0	8.2	29.0	7.6	3		
13					0		
* 14	15.0	8.4	29.5	7.3	0		
* 15	15.0	8.3	29.0	7.2	8		
16					0		
17					0		
* 18	15.0	8.1	29.0	7.4	2		
19					0		
20					2		
21					0		
22					0		
23					6		
24					0		
25					4		
26					0		
27					0		
28					0		
29					0		
30					0		
31					0		
32					0		
33					2		
34					0		
35					~~0~~ 2		
* 36	14.9	8.5	29.0	7.1	~~2~~ 1		
					X GD 9-29-08		

* Water Quality Beakers

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-EE4

MARINE AMPHIPOD 10-DAY SOLID PHASE SEDIMENT TEST

Test No. 774-1 Client Hart Crowser Investigator _____

DAILY RECORD SHEET

overlying NH3 sampled (days 0,10)? yes

Day 10 (9/19/08) BS

Beaker No.	Temp. (deg.C)	pH	Sal. (ppt)	DO (ppm)	S (mg/L)	No. emerged	Air	Comments
1						1	OK	
2						2		
3						2		
4						0		
* 5	14.7	8.6	29.0	8.1	<0.02	0		
6						3		
7						1		
8						0		
9						0		
10						0		
11	14.7 duplicate					0		
* 12	8.2	8.2	29.0	7.8	<0.02	0		
13						0		
* 14	14.8	8.6	29.5	7.6	<0.02	0		
* 15	14.7	8.4	29.0	7.8	<0.02	4		
16						0		
17						0		
* 18	14.8	7.7	29.0	7.5	<0.02	4		
19						0		
20						0		
21						0		
22						0		
23						0		
24						1		
25						1		
26						2		
27						0		
28						0		
29						0		
30						0		
31						1		
32						0		
33						3		
34						0		
35						0		
* 36	14.7	8.6	29.5	7.3	<0.02	0		

* Water Quality Beakers

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-EE4

MARINE AMPHIPOD 10-DAY SOLID PHASE SEDIMENT TEST

Test No. 774-1 Client Hart Crowser Investigator

DAY 10 TEST TERMINATION SHEET

Beaker No.	No. of Survivors	Number reburied	Initial	Comment
1	18	18	MLR	
2	18	18	GJL	
3	16	16	MLR	
4	19	19	GJL	
5				
6	17	17	GJL	
7	19	19	GJL	
8	19	19	MLR	
9	19	19	GJL	
10	20	20	GJL	
11	20	20	GJL	
12				
13	20	20	GJL	
14				
15				
16	20	20	MLR	
17	17	17	MLR	
18				
19	20	20	GJL	
20	19	19	GJL	
21	20	20	MLR	
22	19	19	GJL	
23	20	20	GJL	
24	19	19	GJL	
25	19	19	MLR	
26	20	20	GJL	
27	20	20	GJL	
28	17	17	GJL	
29	17	17	MLR	+1 dead
30	18	18	GJL	
31	19	19	GJL	
32	20	20	GJL	
33	18	18	GJL	
34	20	20	GJL	
35	19	19	GJL	
36				

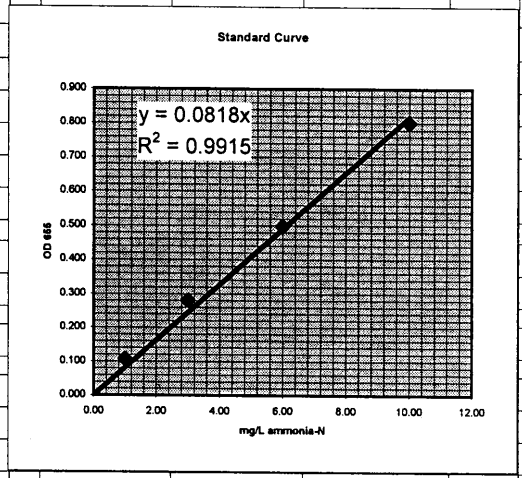
water quality beakers

Total Ammonia-N in Sediment Pore Water: Computation Worksheet

Salicylate Method (SOP #5492)

Result

	Sample description	Dilution factor	OD_{655}	NH_3-N (mg/L)	pH	Salinity (ppt)
	Blank	-----	-----	-----		
	1.0 mg/L NH_3-N Std.	-----	0.107	1.00		
	3.0 mg/L NH_3-N Std.	-----	0.281	3.00		
	6.0 mg/L NH_3-N Std.	-----	0.498	6.00		
	10.0 mg/L NH_3-N Std.	-----	0.800	10.00		
	3.0 mg/L spike	-----				
	3.0 mg/L spike dupl.	-----	0.290	3.54		
	5.0 mg/L 2nd source		0.450	5.49		
1.	2041G	5	0.195	11.90		
2.	2042G	5	0.213	12.99		
3.	2043G	5	0.210	12.81		
4.	2044G	5	0.127	7.75		
5.	2045G	5	0.183	11.16		
6.	2046G	5	0.013	0.79		
7.						
8.						
9.						
10.						
11.						
12.						
13.						
14.						
15.						
16.						
17.						
18.						
19.						
20.						
21.						
22.						
23.						
24.						
25.						
26.						
27.						
28.						
29.						
30.						
31.						
32.						
33						
34						
35						
36						



Reporting limit (mg/L) =	0.5
Recovery (%) =	#VALUE!
Precision (RPD) =	#VALUE!
2nd source (%) =	109.8
Sample volume (ml):	0.10
Dilution factor	5

Sample Set Description:

Proj. No.: P774
Test Day: bulk sediments
Species: *Eohaustorius*

Sediment porewaters, sampled 9/8/08

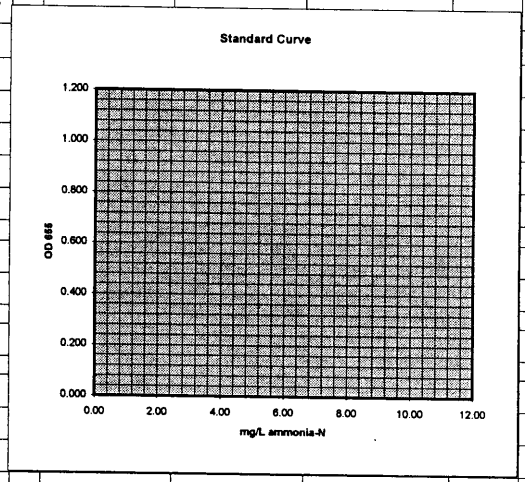
Analyst: msr
Date analysed: 10/3/08

Total Ammonia-N in Sediment Pore Water: Computation Worksheet

Salicylate Method (SOP #5492)

Result

	Sample description	Dilution factor	OD655	NH_3-N (mg/L)	pH	Salinity (ppt)
	Blank	-----	-----	-----		
	1.0 mg/L NH_3-N Std.	-----	0.107	1.00		
	3.0 mg/L NH_3-N Std.	-----	0.281	3.00		
	6.0 mg/L NH_3-N Std.	-----	0.498	6.00		
	10.0 mg/L NH_3-N Std.	-----	0.800	10.00		
	3.0 mg/L spike	-----	not run			
	3.0 mg/L spike dupl.	-----	0.290			
	5.0 mg/L 2nd source		0.450			
1.	2041G	5	0.195		8.0	30.5
2.	2042G	5	0.213		7.6	24.5
3.	2043G	5	0.210		7.6	25.0
4.	2044G	5	0.127		8.1	23.5
5.	2045G	5	0.183		7.5	25.0
6.	2046G	5	0.013		7.8	33.5
7.						
8.						
9.						
10.						
11.						
12.						
13.						
14.						
15.						
16.						
17.						
18.						
19.						
20.						
21.						
22.						
23.						
24.						
25.						
26.						
27.						
28.						
29.						
30.						
31.						
32.						
33						
34						
35						
36						



Reporting limit (mg/L) =	0.5
Recovery (%) =	#VALUE!
Precision (RPD) =	#VALUE!
2nd source (%) =	#VALUE!
Sample volume (ml):	0.10
Dilution factor	5

Sample Set Description:

Proj. No.: P774
Test Day: bulk sediments
Species: *Eohaustorius*

Sediment porewaters, sampled 9/8/08

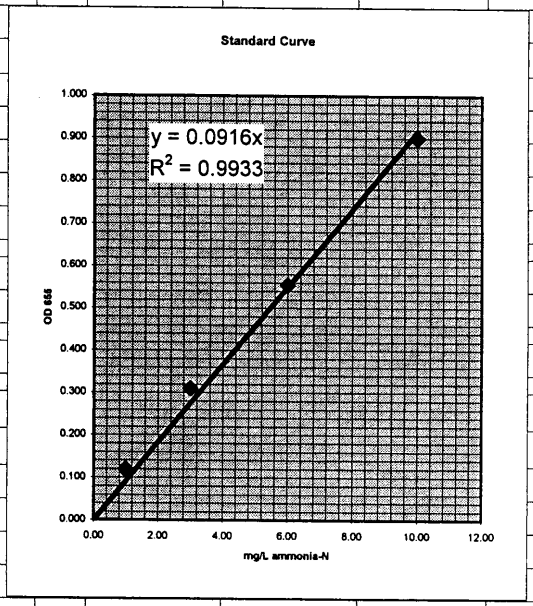
Analyst: YMR
Date analysed: 10-3-08

Total Ammonia-N in Water: Computation Worksheet

Salicylate Method (SOP #5492)

Result

	Sample description	Dilution factor	OD655	NH_3-N (mg/L)
	Blank	-----	-----	-----
	1.0 mg/L NH_3-N Std.	-----	0.119	1.00
	3.0 mg/L NH_3-N Std.	-----	0.310	3.00
	6.0 mg/L NH_3-N Std.	-----	0.555	6.00
	10.0 mg/L NH_3-N Std.	-----	0.900	10.00
	3.0 mg/L spike	-----		
	3.0 mg/L spike dupl.	-----	0.315	3.43
	5.0 mg/L 2nd source	-----	0.510	5.56
	Day 0 (9/9/08)			
	Beaker number:			
1.	5	1	0.079	0.86
2.	12	1	0.022	0.24
3.	14	1	0.290	3.16
4.	15	1	0.148	1.61
5.	18	1	0.086	0.94
6.	36	1	0.109	1.19
	Day 10 (9/19/08)			
7.	5	1	0.074	0.81
8.	12	1	0.011	0.12
9.	14	1	0.560	6.10
10.	15	1	0.223	2.43
11.	18	1	0.022	0.24
12.	36	1	0.030	0.33
13.				
14.				
15.				
16.				
17.				
18.				
19.				
20.				
21.				
22.				
23.				
24.				
25.				
26.				
27.				
28.				
29.				
30.				
31.				
32.				



Reporting limit (mg/L) =	0.1
Recovery (%) =	#VALUE!
Precision (RPD) =	#VALUE!
2nd source (%) =	111.1
Sample volume (ml):	0.50
Dilution factor	1

Sample Set Description:

Test No.: 774-1
Test Day: 0 & 10
Species: *Eohaustorius*
Proj. No.: P774
Overlying water

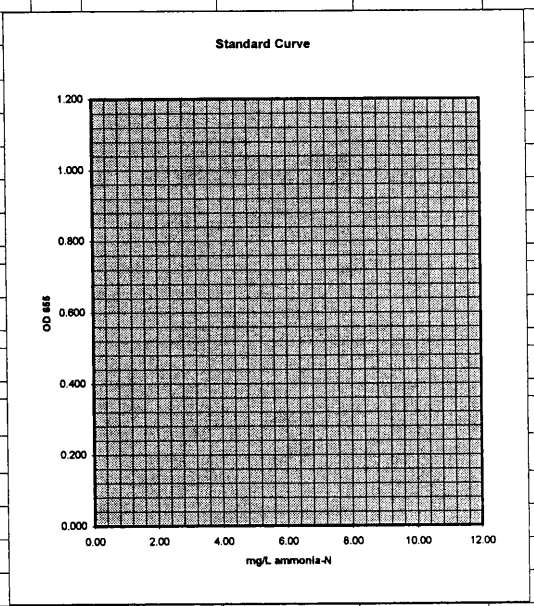
Analyst:	msr
Date analysed:	10/2/08

Total Ammonia-N in Water: Computation Worksheet

Salicylate Method (SOP #5492)

Result

	Sample description	Dilution factor	OD655	NH_3-N (mg/L)
	Blank	-----	-----	-----
	1.0 mg/L NH_3-N Std.	-----	0.119	1.00
	3.0 mg/L NH_3-N Std.	-----	0.310	3.00
	6.0 mg/L NH_3-N Std.	-----	0.555	6.00
	10.0 mg/L NH_3-N Std.	-----	0.900	10.00
	3.0 mg/L spike	-----	not run	
	3.0 mg/L spike dupl.	-----	0.315	
	5.0 mg/L 2nd source	-----	0.510	
	Day 0 (9/9/08)			
	Beaker number:			
1.	5	1	0.079	
2.	12	1	0.022	
3.	14	1	0.290	
4.	15	1	0.148	
5.	18	1	0.086	
6.	36	1	0.109	
	Day 10 (9/19/08)			
7.	5	1	0.074	
8.	12	1	0.011	
9.	14	1	0.560	
10.	15	1	0.223	
11.	18	1	0.022	
12.	36	1	0.030	
13.				
14.				
15.				
16.				
17.				
18.				
19.				
20.				
21.				
22.				
23.				
24.				
25.				
26.				
27.				
28.				
29.				
30.				
31.				
32.				



Reporting limit (mg/L) =	0.1
Recovery (%) =	#VALUE!
Precision (RPD) =	#VALUE!
2nd source (%) =	#VALUE!
Sample volume (ml):	0.50
Dilution factor	1

Sample Set Description:

Test No.: 774-1
Test Day: 0 & 10
Species: *Eohaustorius*
Proj. No.: P774
Overlying water

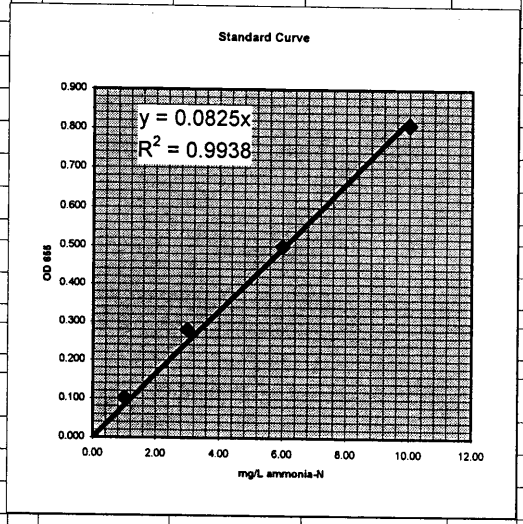
Analyst: MSR
Date analysed: 10-2-08

Total Ammonia-N in Sediment Pore Water: Computation Worksheet

Salicylate Method (SOP #5492)

Result

	Sample description	Dilution factor	OD_{655}	NH_3-N (mg/L)	pH	Salinity (ppt)
	Blank	-----	-----	-----		
	1.0 mg/L NH_3-N Std.	-----	0.103	1.00		
	3.0 mg/L NH_3-N Std.	-----	0.280	3.00		
	6.0 mg/L NH_3-N Std.	-----	0.500	6.00		
	10.0 mg/L NH_3-N Std.	-----	0.810	10.00		
	3.0 mg/L spike	-----				
	3.0 mg/L spike dupl.	-----	0.285	3.45		
	5.0 mg/L 2nd source		0.450	5.45		
	Beaker number:					
1.	5	5	0.074	4.48		
2.	12	5	0.015	0.91		
3.	14	5	0.198	11.98		
4.	15	5	0.139	8.41		
5.	18	5	0.035	2.12		
6.	36	5	0.069	4.18		
7.						
8.						
9.						
10.						
11.						
12.						
13.						
14.						
15.						
16.						
17.						
18.						
19.						
20.						
21.						
22.						
23.						
24.						
25.						
26.						
27.						
28.						
29.						
30.						
31.						
32.						
33						
34						
35						
36						



Reporting limit (mg/L) =	0.5
Recovery (%) =	#VALUE!
Precision (RPD) =	#VALUE!
2nd source (%) =	108.9
Sample volume (ml):	0.10
Dilution factor	5

Sample Set Description:

Proj. No.: 774-1
Test Day: 10 (9/19/08)
Species: *Eohaustorius*

Sediment porewaters

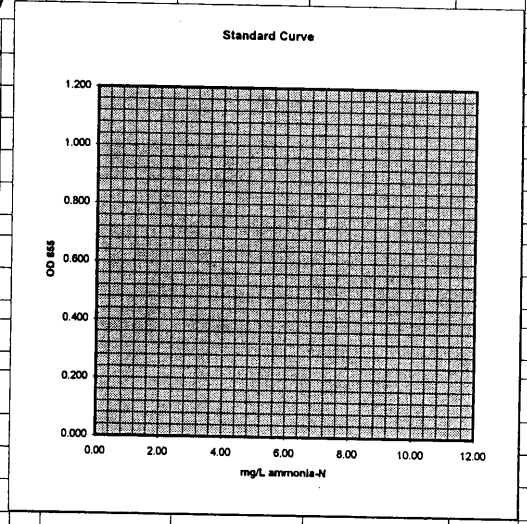
Analyst: msr
Date analysed: 10/3/08

Total Ammonia-N in Sediment Pore Water: Computation Worksheet

Salicylate Method (SOP #5492)

Result

	Sample description	Dilution factor	OD655	NH_3-N (mg/L)	pH	Salinity (ppt)
	Blank	-----	-----	-----		
	1.0 mg/L NH_3-N Std.	-----	0.103	1.00		
	3.0 mg/L NH_3-N Std.	-----	0.280	3.00		
	6.0 mg/L NH_3-N Std.	-----	0.500	6.00		
	10.0 mg/L NH_3-N Std.	-----	0.810	10.00		
	3.0 mg/L spike	-----	not run			
	3.0 mg/L spike dupl.	-----	0.285			
	5.0 mg/L 2nd source		0.450			
	Beaker number:					
1.	5	5	0.074		7.5	29.0
2.	12	5	0.015		7.6	29.0
3.	14	5	0.198		7.4	27.5
4.	15	5	0.139		7.4	28.0
5.	18	5	0.035		7.7	28.0
6.	36	5	0.069		7.2	29.5
7.						
8.						
9.						
10.						
11.						
12.						
13.						
14.						
15.						
16.						
17.						
18.						
19.						
20.						
21.						
22.						
23.						
24.						
25.						
26.						
27.						
28.						
29.						
30.						
31.						
32.						
33						
34						
35						
36						



Reporting limit (mg/L) =	0.5
Recovery (%) =	#VALUE!
Precision (RPD) =	#VALUE!
2nd source (%) =	#VALUE!
Sample volume (ml):	0.10
Dilution factor	5

Sample Set Description:

Proj. No.: 774-1
Test Day: 10 (9/19/08)
Species: *Eohaustorius*

Sediment porewaters

Analyst: MLR
Date analysed: 10-3-08

TEST DATA ANALYSIS RECORDS

BKR	NAS SMPL	CLIENT DESCRIP	REPL	
28	2041G	Samish Bay Ref	1	
32	2041G	Samish Bay Ref	2	
21	2041G	Samish Bay Ref	3	
30	2041G	Samish Bay Ref	4	
31	2041G	Samish Bay Ref	5	
18	2041G	Samish Bay Ref	6	wq repl
33	2042G	BBP-SS-01	1	
13	2042G	BBP-SS-01	2	
8	2042G	BBP-SS-01	3	
25	2042G	BBP-SS-01	4	
35	2042G	BBP-SS-01	5	
14	2042G	BBP-SS-01	6	wq repl
16	2043G	BBP-SS-02	1	
20	2043G	BBP-SS-02	2	
6	2043G	BBP-SS-02	3	
29	2043G	BBP-SS-02	4	
3	2043G	BBP-SS-02	5	
15	2043G	BBP-SS-02	6	wq repl
4	2044G	RGH-SS-01	1	
26	2044G	RGH-SS-01	2	
17	2044G	RGH-SS-01	3	
19	2044G	RGH-SS-01	4	
27	2044G	RGH-SS-01	5	
5	2044G	RGH-SS-01	6	wq repl
9	2045G	RGH-SS-03	1	
22	2045G	RGH-SS-03	2	
1	2045G	RGH-SS-03	3	
34	2045G	RGH-SS-03	4	
2	2045G	RGH-SS-03	5	
36	2045G	RGH-SS-03	6	wq repl
10	2046G	control	1	
24	2046G	control	2	
23	2046G	control	3	
7	2046G	control	4	
11	2046G	control	5	
12	2046G	control	6	wq repl

Endpoints Data Entry and Calculations File

INIT=initial number
SURV=number survivors
REBUR=number survivors which reburied
MORT=number dead=INIT-SURV
NOBURY=number survivors not reburied=SURV-REBUR
TEM=total effective mortality=MORT+NOBURY

PSURV=%survival=100(SURV/INIT)
PMORT=%mortality=100(MORT/INIT)
PBURY=%reburial=100(REBUR/SURV)
PNOBURY=%survivors not reburied=100(NOBURY/SURV)
PTEM=%total effective mortality=100(TEM/INIT)

Data entry verified against laboratory bench sheets MSR 9-29-08

INDEX	BKR	NAS SMPL	CLIENT DESCRIP	REPL		INIT	SURV	REBUR	MORT	NO-BURY	TEM	PSURV	PMORT	PBURY	PNO-BURY	PTEM
1	28	2041G	Samish Bay Ref	1		20	17	17	3	0	3	85.0	15.0	100.0	0.0	15.0
2	32	2041G	Samish Bay Ref	2		20	20	20	0	0	0	100.0	0.0	100.0	0.0	0.0
3	21	2041G	Samish Bay Ref	3		20	20	20	0	0	0	100.0	0.0	100.0	0.0	0.0
4	30	2041G	Samish Bay Ref	4		20	18	18	2	0	2	90.0	10.0	100.0	0.0	10.0
5	31	2041G	Samish Bay Ref	5		20	19	19	1	0	1	95.0	5.0	100.0	0.0	5.0
6	18	2041G	Samish Bay Ref	6	wq repl	20										
7	33	2042G	BBP-SS-01	1		20	18	18	2	0	2	90.0	10.0	100.0	0.0	10.0
8	13	2042G	BBP-SS-01	2		20	20	20	0	0	0	100.0	0.0	100.0	0.0	0.0
9	8	2042G	BBP-SS-01	3		20	19	19	1	0	1	95.0	5.0	100.0	0.0	5.0
10	25	2042G	BBP-SS-01	4		20	19	19	1	0	1	95.0	5.0	100.0	0.0	5.0
11	35	2042G	BBP-SS-01	5		20	19	19	1	0	1	95.0	5.0	100.0	0.0	5.0
12	14	2042G	BBP-SS-01	6	wq repl	20										
13	16	2043G	BBP-SS-02	1		20	20	20	0	0	0	100.0	0.0	100.0	0.0	0.0
14	20	2043G	BBP-SS-02	2		20	19	19	1	0	1	95.0	5.0	100.0	0.0	5.0
15	6	2043G	BBP-SS-02	3		20	17	17	3	0	3	85.0	15.0	100.0	0.0	15.0
16	29	2043G	BBP-SS-02	4		20	17	17	3	0	3	85.0	15.0	100.0	0.0	15.0
17	3	2043G	BBP-SS-02	5		20	16	16	4	0	4	80.0	20.0	100.0	0.0	20.0
18	15	2043G	BBP-SS-02	6	wq repl	20										
19	4	2044G	RGH-SS-01	1		20	19	19	1	0	1	95.0	5.0	100.0	0.0	5.0
20	26	2044G	RGH-SS-01	2		20	20	20	0	0	0	100.0	0.0	100.0	0.0	0.0
21	17	2044G	RGH-SS-01	3		20	17	17	3	0	3	85.0	15.0	100.0	0.0	15.0
22	19	2044G	RGH-SS-01	4		20	20	20	0	0	0	100.0	0.0	100.0	0.0	0.0
23	27	2044G	RGH-SS-01	5		20	20	20	0	0	0	100.0	0.0	100.0	0.0	0.0
24	5	2044G	RGH-SS-01	6	wq repl	20										
25	9	2045G	RGH-SS-03	1		20	19	19	1	0	1	95.0	5.0	100.0	0.0	5.0
26	22	2045G	RGH-SS-03	2		20	19	19	1	0	1	95.0	5.0	100.0	0.0	5.0
27	1	2045G	RGH-SS-03	3		20	18	18	2	0	2	90.0	10.0	100.0	0.0	10.0
28	34	2045G	RGH-SS-03	4		20	20	20	0	0	0	100.0	0.0	100.0	0.0	0.0
29	2	2045G	RGH-SS-03	5		20	18	18	2	0	2	90.0	10.0	100.0	0.0	10.0
30	36	2045G	RGH-SS-03	6	wq repl	20										
31	10	2046G	control	1		20	20	20	0	0	0	100.0	0.0	100.0	0.0	0.0
32	24	2046G	control	2		20	19	19	1	0	1	95.0	5.0	100.0	0.0	5.0
33	23	2046G	control	3		20	20	20	0	0	0	100.0	0.0	100.0	0.0	0.0
34	7	2046G	control	4		20	19	19	1	0	1	95.0	5.0	100.0	0.0	5.0
35	11	2046G	control	5		20	20	20	0	0	0	100.0	0.0	100.0	0.0	0.0
36	12	2046G	control	6	wq repl	20										

	SURV	MORT	NO-BURY	PSURV	PMORT	PBURY	PNO-BURY	PTEM
Mean	18.8	1.2	0.0	94.0	6.0	100.0	0.0	6.0
SD	1.3	1.3	0.0	6.5	6.5	0.0	0.0	6.5
n	5	5	5	5	5	5	5	5

	SURV	MORT	NO-BURY	PSURV	PMORT	PBURY	PNO-BURY	PTEM
Mean	19.0	1.0	0.0	95.0	5.0	100.0	0.0	5.0
SD	0.7	0.7	0.0	3.5	3.5	0.0	0.0	3.5
n	5	5	5	5	5	5	5	5

	SURV	MORT	NO-BURY	PSURV	PMORT	PBURY	PNO-BURY	PTEM
Mean	17.8	2.2	0.0	89.0	11.0	100.0	0.0	11.0
SD	1.6	1.6	0.0	8.2	8.2	0.0	0.0	8.2
n	5	5	5	5	5	5	5	5

	SURV	MORT	NO-BURY	PSURV	PMORT	PBURY	PNO-BURY	PTEM
Mean	19.2	0.8	0.0	96.0	4.0	100.0	0.0	4.0
SD	1.3	1.3	0.0	6.5	6.5	0.0	0.0	6.5
n	5	5	5	5	5	5	5	5

	SURV	MORT	NO-BURY	PSURV	PMORT	PBURY	PNO-BURY	PTEM
Mean	18.8	1.2	0.0	94.0	6.0	100.0	0.0	6.0
SD	0.8	0.8	0.0	4.2	4.2	0.0	0.0	4.2
n	5	5	5	5	5	5	5	5

	SURV	MORT	NO-BURY	PSURV	PMORT	PBURY	PNO-BURY	PTEM
Mean	19.6	0.4	0.0	98.0	2.0	100.0	0.0	2.0
SD	0.5	0.5	0.0	2.7	2.7	0.0	0.0	2.7
n	5	5	5	5	5	5	5	5

Project Name: 774-1 Eohaustorius %Mortality

Sample:	x1
Samp ID:	BBP-SS-01
Alias:	NAS# 2042G
Replicates:	5
Mean:	5
SD:	3.536
Tr Mean:	11.44
Trans SD:	6.826

Ref Samp:	x2
Ref ID:	SBay Ref
Alias:	NAS# 2041G
Replicates:	5
Mean:	6
SD:	6.519
Tr Mean:	10.828
Trans SD:	10.485

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	5.741
SS:	626.123
K:	5
b:	23.386
Alpha Level:	0.05
Calculated Value:	0.8735
Critical Value:	<= 0.842
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	4.576
Test Residual SD:	4.519
Ref. Residual Mean:	8.663
Ref. Residual SD:	4.016
Deg. of Freedom:	8
Alpha Level:	0.1
Calculated Value:	1.5115
Critical Value:	>= 1.86
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	ArcSin

Experimental Hypothesis

Null:	x1 <= x2
Alternate:	x1 > x2
Degrees of Freedom:	8
Experimental Alpha Level:	0.05
Calculated Value:	0.1092
Critical Value:	>= 1.86
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	18.435	15	22.786	6.995	11.958			-11.44
2	0	0	0	0	11.44	10.828			-10.828
3	5	12.921	0	0	1.481	10.828			-10.828
4	5	12.921	10	18.435	1.481	7.606			1.481
5	5	12.921	5	12.921	1.481	2.092			1.481
6									1.481
7									2.092
8									6.995
9									7.606
10									11.958

Data entry verified against EXCEL spreadsheet.

%mortality in test sediment BBP-SS-01 was not significantly greater than that in reference sediment "Samish Bay Ref" at alpha=0.05.

CMR 10-6-08

BioStat Beta v.4.1 (EXCEL)

Project Name: 774-1 Eohaustorius %Mortality

Sample:	x1
Samp ID:	BBP-SS-02
Alias:	NAS# 2043G
Replicates:	5
Mean:	11
SD:	8.216
Tr Mean:	17.012
Trans SD:	10.771

Ref Samp:	x2
Ref ID:	SBay Ref
Alias:	NAS# 2041G
Replicates:	5
Mean:	6
SD:	6.519
Tr Mean:	10.828
Trans SD:	10.485

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	6.897
SS:	903.834
K:	5
b:	28.635
Alpha Level:	0.05
Calculated Value:	0.9072
Critical Value:	<= 0.842
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	8.441
Test Residual SD:	5.192
Ref. Residual Mean:	8.663
Ref. Residual SD:	4.016
Deg. of Freedom:	8
Alpha Level:	0.1
Calculated Value:	0.0755
Critical Value:	>= 1.86
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	ArcSin
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Degrees of Freedom:	8
Experimental Alpha Level:	0.05
Calculated Value:	0.9198
Critical Value:	>= 1.86
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	0	15	22.786	17.012	11.958			-17.012
2	5	12.921	0	0	4.091	10.828			-10.828
3	15	22.786	0	0	5.775	10.828			-10.828
4	15	22.786	10	18.435	5.775	7.606			-4.091
5	20	26.565	5	12.921	9.553	2.092			2.092
6									5.775
7									5.775
8									7.606
9									9.553
10									11.958

Data entry verified against EXCEL spreadsheet. MSK 10.6.08

%mortality in test sediment BBP-SS-02 was not significantly greater than that in reference sediment Samish Bay Ref at alpha=0.05.

Project Name: 774-1 Eohaustorius %Mortality

Sample:	x1
Samp ID:	RGH-SS-01
Alias:	NAS# 2044G
Replicates:	5
Mean:	4
SD:	6.519
Tr Mean:	7.141
Trans SD:	10.382

Ref Samp:	x2
Ref ID:	SBay Ref
Alias:	NAS# 2041G
Replicates:	5
Mean:	6
SD:	6.519
Tr Mean:	10.828
Trans SD:	10.485

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	6.77
SS:	870.91
K:	5
b:	27.8
Alpha Level:	0.05
Calculated Value:	0.8874
Critical Value:	<= 0.842
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	8.57
Test Residual SD:	3.999
Ref. Residual Mean:	8.663
Ref. Residual SD:	4.016
Deg. of Freedom:	8
Alpha Level:	0.1
Calculated Value:	0.0367
Critical Value:	>= 1.86
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	ArcSin

Experimental Hypothesis

Null:	x1 <= x2
Alternate:	x1 > x2
Degrees of Freedom:	8
Experimental Alpha Level:	0.05
Calculated Value:	-0.5587
Critical Value:	>= 1.86
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	5	12.921	15	22.786	5.779	11.958			-10.828
2	0	0	0	0	7.141	10.828			-10.828
3	15	22.786	0	0	15.645	10.828			-7.141
4	0	0	10	18.435	7.141	7.606			-7.141
5	0	0	5	12.921	7.141	2.092			-7.141
6									2.092
7									5.779
8									7.606
9									11.958
10									15.645

Data entry verified against EXCEL spreadsheet. MSP 10-6-08

%mortality in test sediment RGH-SS-01 was not significantly greater than that in reference sediment Samish Bay Ref at alpha=0.05.

Project Name: 774-1 Eohaustorius %Mortality

Sample:	x1
Samp ID:	RGH-SS-03
Alias:	NAS# 2045G
Replicates:	5
Mean:	6
SD:	4.183
Tr Mean:	12.542
Trans SD:	7.534

Ref Samp:	x2
Ref ID:	SBay Ref
Alias:	NAS# 2041G
Replicates:	5
Mean:	6
SD:	6.519
Tr Mean:	10.828
Trans SD:	10.485

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	5.924
SS:	666.783
K:	5
b:	24.451
Alpha Level:	0.05
Calculated Value:	0.8966
Critical Value:	<= 0.842
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	5.017
Test Residual SD:	5.03
Ref. Residual Mean:	8.663
Ref. Residual SD:	4.016
Deg. of Freedom:	8
Alpha Level:	0.1
Calculated Value:	1.2666
Critical Value:	>= 1.86
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	ArcSin
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Degrees of Freedom:	8
Experimental Alpha Level:	0.05
Calculated Value:	0.2968
Critical Value:	>= 1.86
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	5	12.921	15	22.786	0.379	11.958			-12.542
2	5	12.921	0	0	0.379	10.828			-10.828
3	10	18.435	0	0	5.893	10.828			-10.828
4	0	0	10	18.435	12.542	7.606			0.379
5	10	18.435	5	12.921	5.893	2.092			0.379
6									2.092
7									5.893
8									5.893
9									7.606
10									11.958

Data entry verified against EXCEL spreadsheet. yrsR 10-6-08

%mortality in test sediment RGH-SS-03 was not significantly greater than that in reference sediment Samish Bay Ref at alpha=0.05.

Project Name: 774-1 Eohaustorius %Mortality

Sample:	x1
Samp ID:	SBay Ref
Alias:	NAS# 2041G
Replicates:	5
Mean:	6
SD:	6.519
Tr Mean:	10.828
Trans SD:	10.485

Ref Samp:	x2
Ref ID:	control
Alias:	NAS# 2046G
Replicates:	5
Mean:	2
SD:	2.739
Tr Mean:	5.168
Trans SD:	7.077

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	5.804
SS:	640.082
K:	5
b:	23.812
Alpha Level:	0.05
Calculated Value:	0.8858
Critical Value:	<= 0.842
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	8.663
Test Residual SD:	4.016
Ref. Residual Mean:	6.202
Ref. Residual SD:	1.415
Deg. of Freedom:	8
Alpha Level:	0.1
Calculated Value:	1.2921
Critical Value:	>= 1.86
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	ArcSin

Experimental Hypothesis

Null:	x1 <= x2
Alternate:	x1 > x2
Degrees of Freedom:	8
Experimental Alpha Level:	0.05
Calculated Value:	1.0005
Critical Value:	>= 1.86
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	15	22.786	0	0	11.958	5.168			-10.828
2	0	0	5	12.921	10.828	7.753			-10.828
3	0	0	0	0	10.828	5.168			-5.168
4	10	18.435	5	12.921	7.606	7.753			-5.168
5	5	12.921	0	0	2.092	5.168			-5.168
6									2.092
7									7.606
8									7.753
9									7.753
10									11.958

Data entry verified against EXCEL spreadsheet. mrk 10-6-08

%mortality in reference sediment "Samish Bay Ref" was not significantly greater than that in the control sediment at alpha=0.05.

Project Name: 774-1 Eohaustorius %Mortality

Sample:	x1
Samp ID:	BBP-SS-01
Alias:	NAS# 2042G
Replicates:	5
Mean:	5
SD:	3.536
Tr Mean:	11.44
Trans SD:	6.826

Ref Samp:	x2
Ref ID:	control
Alias:	NAS# 2046G
Replicates:	5
Mean:	2
SD:	2.739
Tr Mean:	5.168
Trans SD:	7.077

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	4.512
SS:	386.723
K:	5
b:	18.685
Alpha Level:	0.05
Calculated Value:	0.9028
Critical Value:	<= 0.842
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	4.576
Test Residual SD:	4.519
Ref. Residual Mean:	6.202
Ref. Residual SD:	1.415
Deg. of Freedom:	8
Alpha Level:	0.1
Calculated Value:	0.7679
Critical Value:	>= 1.86
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	ArcSin
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Degrees of Freedom:	8
Experimental Alpha Level:	0.05
Calculated Value:	1.4261
Critical Value:	>= 1.86
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	10	18.435	0	0	6.995	5.168			-11.44
2	0	0	5	12.921	11.44	7.753			-5.168
3	5	12.921	0	0	1.481	5.168			-5.168
4	5	12.921	5	12.921	1.481	7.753			-5.168
5	5	12.921	0	0	1.481	5.168			1.481
6									1.481
7									1.481
8									6.995
9									7.753
10									7.753

Data entry verified against EXCEL spreadsheet. MSK 10-6-08

%mortality in test sediment BBP-SS-01 was not significantly greater than that in the control sediment at alpha=0.05.

Project Name: 774-1 Eohaustorius %Mortality

Sample:	x1
Samp ID:	BBP-SS-02
Alias:	NAS# 2043G
Replicates:	5
Mean:	11
SD:	8.216
Tr Mean:	17.012
Trans SD:	10.771

Ref Samp:	x2
Ref ID:	control
Alias:	NAS# 2046G
Replicates:	5
Mean:	2
SD:	2.739
Tr Mean:	5.168
Trans SD:	7.077

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	5.914
SS:	664.434
K:	5
b:	23.997
Alpha Level:	0.05
Calculated Value:	0.8667
Critical Value:	<= 0.842
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	8.441
Test Residual SD:	5.192
Ref. Residual Mean:	6.202
Ref. Residual SD:	1.415
Deg. of Freedom:	8
Alpha Level:	0.1
Calculated Value:	0.9303
Critical Value:	>= 1.86
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	ArcSin
Experimental Hypothesis	
Null:	x1 <= x2
Alternate:	x1 > x2
Degrees of Freedom:	8
Experimental Alpha Level:	0.05
Calculated Value:	2.0548
Critical Value:	>= 1.86
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0	0	0	0	17.012	5.168			-17.012
2	5	12.921	5	12.921	4.091	7.753			-5.168
3	15	22.786	0	0	5.775	5.168			-5.168
4	15	22.786	5	12.921	5.775	7.753			-5.168
5	20	26.565	0	0	9.553	5.168			-4.091
6									5.775
7									5.775
8									7.753
9									7.753
10									9.553

Data entry verified against EXCEL spreadsheet. 10-6-08

%mortality in test sediment BBP-SS-02 was significantly greater than that in the control sediment at alpha=0.05.

Project Name: 774-1 Eohaustorius %Mortality

Sample:	x1
Samp ID:	RGH-SS-01
Alias:	NAS# 2044G
Replicates:	5
Mean:	4
SD:	6.519
Tr Mean:	7.141
Trans SD:	10.382

Ref Samp:	x2
Ref ID:	control
Alias:	NAS# 2046G
Replicates:	5
Mean:	2
SD:	2.739
Tr Mean:	5.168
Trans SD:	7.077

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	5.765
SS:	631.51
K:	5
b:	22.508
Alpha Level:	0.05
Calculated Value:	0.8022
Critical Value:	<= 0.842
Normally Distributed:	No
Override Option:	Not Invoked

Levene's Results:

Test Residual Mean:	8.57
Test Residual SD:	3.999
Ref. Residual Mean:	6.202
Ref. Residual SD:	1.415
Deg. of Freedom:	8
Alpha Level:	0.1
Calculated Value:	1.2481
Critical Value:	>= 1.86
Variances Homogeneous:	Yes

Test Results:

Statistic:	Mann-Whitney
Balanced Design:	Yes
Transformation:	rank-order

Experimental Hypothesis

Null:	x1 <= x2
Alternate:	x1 > x2
Mann-Whitney N1:	5
Mann-Whitney N2:	5
Degrees of Freedom:	
Experimental Alpha Level:	0.05
Calculated Value:	13.5
Critical Value:	>= 21.0
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	5	8	0	3.5	5.779	5.168	0		-7.141
2	0	3.5	5	8	7.141	7.753	0		-7.141
3	15	10	0	3.5	15.645	5.168	0		-7.141
4	0	3.5	5	8	7.141	7.753	0		-5.168
5	0	3.5	0	3.5	7.141	5.168	0		-5.168
6							0		-5.168
7							12.921		5.779
8							12.921		7.753
9							12.921		7.753
10							22.786		15.645

Data entry verified against EXCEL spreadsheet. emsk 10-6-08

%mortality in test sediment RGH-SS-01 was not significantly greater than that in the control sediment at alpha=0.05.

Project Name: 774-1 Eohaustorius %Mortality

Sample:	x1
Samp ID:	RGH-SS-03
Alias:	NAS# 2045G
Replicates:	5
Mean:	6
SD:	4.183
Tr Mean:	12.542
Trans SD:	7.534

Ref Samp:	x2
Ref ID:	control
Alias:	NAS# 2046G
Replicates:	5
Mean:	2
SD:	2.739
Tr Mean:	5.168
Trans SD:	7.077

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	4.743
SS:	427.382
K:	5
b:	19.622
Alpha Level:	0.05
Calculated Value:	0.9008
Critical Value:	<= 0.842
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	5.017
Test Residual SD:	5.03
Ref. Residual Mean:	6.202
Ref. Residual SD:	1.415
Deg. of Freedom:	8
Alpha Level:	0.1
Calculated Value:	0.5072
Critical Value:	>= 1.86
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	ArcSin

Experimental Hypothesis

Null:	x1 <= x2
Alternate:	x1 > x2
Degrees of Freedom:	8
Experimental Alpha Level:	0.05
Calculated Value:	1.5952
Critical Value:	>= 1.86
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	5	12.921	0	0	0.379	5.168			-12.542
2	5	12.921	5	12.921	0.379	7.753			-5.168
3	10	18.435	0	0	5.893	5.168			-5.168
4	0	0	5	12.921	12.542	7.753			-5.168
5	10	18.435	0	0	5.893	5.168			0.379
6									0.379
7									5.893
8									5.893
9									7.753
10									7.753

Data entry verified against EXCEL spreadsheet. MLR 10-6-08

%mortality in test sediment RGH-SS-03 was not significantly greater than that in the control sediment Samish Bay Ref at alpha=0.05.

Emergence Data File

INDEX	BKR	NAS SMPL	CLIENT DESCRIP	REPL	DAY	EMERG	TOTAL EMERG		
1	28	2041G	Samish Bay Ref	1	1	0			
1	28	2041G	Samish Bay Ref	1	2	0			
1	28	2041G	Samish Bay Ref	1	3	0			
1	28	2041G	Samish Bay Ref	1	4	0			
1	28	2041G	Samish Bay Ref	1	5	0			
1	28	2041G	Samish Bay Ref	1	6	0			
1	28	2041G	Samish Bay Ref	1	7	0			
1	28	2041G	Samish Bay Ref	1	8	0			
1	28	2041G	Samish Bay Ref	1	9	0			
1	28	2041G	Samish Bay Ref	1	10	0	0		
2	32	2041G	Samish Bay Ref	2	1	0			
2	32	2041G	Samish Bay Ref	2	2	0			
2	32	2041G	Samish Bay Ref	2	3	0			
2	32	2041G	Samish Bay Ref	2	4	0			
2	32	2041G	Samish Bay Ref	2	5	0			
2	32	2041G	Samish Bay Ref	2	6	0			
2	32	2041G	Samish Bay Ref	2	7	0			
2	32	2041G	Samish Bay Ref	2	8	0			
2	32	2041G	Samish Bay Ref	2	9	0			
2	32	2041G	Samish Bay Ref	2	10	0	0		
3	21	2041G	Samish Bay Ref	3	1	0			
3	21	2041G	Samish Bay Ref	3	2	0			
3	21	2041G	Samish Bay Ref	3	3	0			
3	21	2041G	Samish Bay Ref	3	4	1			
3	21	2041G	Samish Bay Ref	3	5	0			
3	21	2041G	Samish Bay Ref	3	6	0			
3	21	2041G	Samish Bay Ref	3	7	0			
3	21	2041G	Samish Bay Ref	3	8	0			
3	21	2041G	Samish Bay Ref	3	9	0			
3	21	2041G	Samish Bay Ref	3	10	0	1		
4	30	2041G	Samish Bay Ref	4	1	0			
4	30	2041G	Samish Bay Ref	4	2	0			
4	30	2041G	Samish Bay Ref	4	3	0			
4	30	2041G	Samish Bay Ref	4	4	0			
4	30	2041G	Samish Bay Ref	4	5	0			
4	30	2041G	Samish Bay Ref	4	6	0			
4	30	2041G	Samish Bay Ref	4	7	0			
4	30	2041G	Samish Bay Ref	4	8	0			
4	30	2041G	Samish Bay Ref	4	9	0			
4	30	2041G	Samish Bay Ref	4	10	0	0		
5	31	2041G	Samish Bay Ref	5	1	0			
5	31	2041G	Samish Bay Ref	5	2	0			
5	31	2041G	Samish Bay Ref	5	3	0		Mean	0.6
5	31	2041G	Samish Bay Ref	5	4	0		SD	0.9
5	31	2041G	Samish Bay Ref	5	5	0		n	5
5	31	2041G	Samish Bay Ref	5	6	0			
5	31	2041G	Samish Bay Ref	5	7	0			
5	31	2041G	Samish Bay Ref	5	8	1			
5	31	2041G	Samish Bay Ref	5	9	0			

Data entry verified against laboratory bench sheets MLR 9-29-08

INDEX	BKR	NAS SMPL	CLIENT DESCRIP	REPL	DAY	EMERG	TOTAL EMERG		
5	31	2041G	Samish Bay Ref	5	10	1	2		
7	33	2042G	BBP-SS-01	1	1	0			
7	33	2042G	BBP-SS-01	1	2	0			
7	33	2042G	BBP-SS-01	1	3	0			
7	33	2042G	BBP-SS-01	1	4	0			
7	33	2042G	BBP-SS-01	1	5	0			
7	33	2042G	BBP-SS-01	1	6	0			
7	33	2042G	BBP-SS-01	1	7	0			
7	33	2042G	BBP-SS-01	1	8	0			
7	33	2042G	BBP-SS-01	1	9	2			
7	33	2042G	BBP-SS-01	1	10	3	5		
8	13	2042G	BBP-SS-01	2	1	0			
8	13	2042G	BBP-SS-01	2	2	0			
8	13	2042G	BBP-SS-01	2	3	0			
8	13	2042G	BBP-SS-01	2	4	0			
8	13	2042G	BBP-SS-01	2	5	0			
8	13	2042G	BBP-SS-01	2	6	0			
8	13	2042G	BBP-SS-01	2	7	0			
8	13	2042G	BBP-SS-01	2	8	0			
8	13	2042G	BBP-SS-01	2	9	0			
8	13	2042G	BBP-SS-01	2	10	0	0		
9	8	2042G	BBP-SS-01	3	1	0			
9	8	2042G	BBP-SS-01	3	2	0			
9	8	2042G	BBP-SS-01	3	3	1			
9	8	2042G	BBP-SS-01	3	4	0			
9	8	2042G	BBP-SS-01	3	5	0			
9	8	2042G	BBP-SS-01	3	6	0			
9	8	2042G	BBP-SS-01	3	7	0			
9	8	2042G	BBP-SS-01	3	8	0			
9	8	2042G	BBP-SS-01	3	9	0			
9	8	2042G	BBP-SS-01	3	10	0	1		
10	25	2042G	BBP-SS-01	4	1	0			
10	25	2042G	BBP-SS-01	4	2	2			
10	25	2042G	BBP-SS-01	4	3	0			
10	25	2042G	BBP-SS-01	4	4	1			
10	25	2042G	BBP-SS-01	4	5	0			
10	25	2042G	BBP-SS-01	4	6	0			
10	25	2042G	BBP-SS-01	4	7	0			
10	25	2042G	BBP-SS-01	4	8	0			
10	25	2042G	BBP-SS-01	4	9	4			
10	25	2042G	BBP-SS-01	4	10	1	8		
11	35	2042G	BBP-SS-01	5	1	0			
11	35	2042G	BBP-SS-01	5	2	0			
11	35	2042G	BBP-SS-01	5	3	0		Mean	3.2
11	35	2042G	BBP-SS-01	5	4	0		SD	3.3
11	35	2042G	BBP-SS-01	5	5	0		n	5
11	35	2042G	BBP-SS-01	5	6	0			
11	35	2042G	BBP-SS-01	5	7	0			
11	35	2042G	BBP-SS-01	5	8	0			
11	35	2042G	BBP-SS-01	5	9	2			
11	35	2042G	BBP-SS-01	5	10	0	2		

INDEX	BKR	NAS SMPL	CLIENT DESCRIP	REPL	DAY	EMERG	TOTAL EMERG		
13	16	2043G	BBP-SS-02	1	1	0			
13	16	2043G	BBP-SS-02	1	2	0			
13	16	2043G	BBP-SS-02	1	3	0			
13	16	2043G	BBP-SS-02	1	4	1			
13	16	2043G	BBP-SS-02	1	5	0			
13	16	2043G	BBP-SS-02	1	6	0			
13	16	2043G	BBP-SS-02	1	7	0			
13	16	2043G	BBP-SS-02	1	8	0			
13	16	2043G	BBP-SS-02	1	9	0			
13	16	2043G	BBP-SS-02	1	10	0	1		
14	20	2043G	BBP-SS-02	2	1	0			
14	20	2043G	BBP-SS-02	2	2	0			
14	20	2043G	BBP-SS-02	2	3	1			
14	20	2043G	BBP-SS-02	2	4	1			
14	20	2043G	BBP-SS-02	2	5	0			
14	20	2043G	BBP-SS-02	2	6	0			
14	20	2043G	BBP-SS-02	2	7	0			
14	20	2043G	BBP-SS-02	2	8	0			
14	20	2043G	BBP-SS-02	2	9	2			
14	20	2043G	BBP-SS-02	2	10	0	4		
15	6	2043G	BBP-SS-02	3	1	0			
15	6	2043G	BBP-SS-02	3	2	0			
15	6	2043G	BBP-SS-02	3	3	0			
15	6	2043G	BBP-SS-02	3	4	0			
15	6	2043G	BBP-SS-02	3	5	1			
15	6	2043G	BBP-SS-02	3	6	0			
15	6	2043G	BBP-SS-02	3	7	0			
15	6	2043G	BBP-SS-02	3	8	2			
15	6	2043G	BBP-SS-02	3	9	3			
15	6	2043G	BBP-SS-02	3	10	3	9		
16	29	2043G	BBP-SS-02	4	1	0			
16	29	2043G	BBP-SS-02	4	2	0			
16	29	2043G	BBP-SS-02	4	3	0			
16	29	2043G	BBP-SS-02	4	4	0			
16	29	2043G	BBP-SS-02	4	5	0			
16	29	2043G	BBP-SS-02	4	6	0			
16	29	2043G	BBP-SS-02	4	7	0			
16	29	2043G	BBP-SS-02	4	8	0			
16	29	2043G	BBP-SS-02	4	9	0			
16	29	2043G	BBP-SS-02	4	10	0	0		
17	3	2043G	BBP-SS-02	5	1	0			
17	3	2043G	BBP-SS-02	5	2	0			
17	3	2043G	BBP-SS-02	5	3	0		Mean	4.4
17	3	2043G	BBP-SS-02	5	4	0		SD	4.0
17	3	2043G	BBP-SS-02	5	5	0		n	5
17	3	2043G	BBP-SS-02	5	6	1			
17	3	2043G	BBP-SS-02	5	7	1			
17	3	2043G	BBP-SS-02	5	8	0			
17	3	2043G	BBP-SS-02	5	9	4			
17	3	2043G	BBP-SS-02	5	10	2	8		
19	4	2044G	RGH-SS-01	1	1	0			

INDEX	BKR	NAS SMPL	CLIENT DESCRIP	REPL	DAY	EMERG	TOTAL EMERG		
19	4	2044G	RGH-SS-01	1	2	0			
19	4	2044G	RGH-SS-01	1	3	0			
19	4	2044G	RGH-SS-01	1	4	0			
19	4	2044G	RGH-SS-01	1	5	0			
19	4	2044G	RGH-SS-01	1	6	0			
19	4	2044G	RGH-SS-01	1	7	0			
19	4	2044G	RGH-SS-01	1	8	0			
19	4	2044G	RGH-SS-01	1	9	0			
19	4	2044G	RGH-SS-01	1	10	0	0		
20	26	2044G	RGH-SS-01	2	1	0			
20	26	2044G	RGH-SS-01	2	2	0			
20	26	2044G	RGH-SS-01	2	3	0			
20	26	2044G	RGH-SS-01	2	4	0			
20	26	2044G	RGH-SS-01	2	5	0			
20	26	2044G	RGH-SS-01	2	6	0			
20	26	2044G	RGH-SS-01	2	7	0			
20	26	2044G	RGH-SS-01	2	8	0			
20	26	2044G	RGH-SS-01	2	9	0			
20	26	2044G	RGH-SS-01	2	10	2	2		
21	17	2044G	RGH-SS-01	3	1	0			
21	17	2044G	RGH-SS-01	3	2	0			
21	17	2044G	RGH-SS-01	3	3	0			
21	17	2044G	RGH-SS-01	3	4	0			
21	17	2044G	RGH-SS-01	3	5	1			
21	17	2044G	RGH-SS-01	3	6	0			
21	17	2044G	RGH-SS-01	3	7	0			
21	17	2044G	RGH-SS-01	3	8	1			
21	17	2044G	RGH-SS-01	3	9	0			
21	17	2044G	RGH-SS-01	3	10	0	2		
22	19	2044G	RGH-SS-01	4	1	0			
22	19	2044G	RGH-SS-01	4	2	0			
22	19	2044G	RGH-SS-01	4	3	0			
22	19	2044G	RGH-SS-01	4	4	0			
22	19	2044G	RGH-SS-01	4	5	0			
22	19	2044G	RGH-SS-01	4	6	0			
22	19	2044G	RGH-SS-01	4	7	0			
22	19	2044G	RGH-SS-01	4	8	0			
22	19	2044G	RGH-SS-01	4	9	0			
22	19	2044G	RGH-SS-01	4	10	0	0		
23	27	2044G	RGH-SS-01	5	1	0			
23	27	2044G	RGH-SS-01	5	2	0			
23	27	2044G	RGH-SS-01	5	3	0		Mean	0.8
23	27	2044G	RGH-SS-01	5	4	0		SD	1.1
23	27	2044G	RGH-SS-01	5	5	0		n	5
23	27	2044G	RGH-SS-01	5	6	0			
23	27	2044G	RGH-SS-01	5	7	0			
23	27	2044G	RGH-SS-01	5	8	0			
23	27	2044G	RGH-SS-01	5	9	0			
23	27	2044G	RGH-SS-01	5	10	0	0		
25	9	2045G	RGH-SS-03	1	1	0			
25	9	2045G	RGH-SS-03	1	2	0			

INDEX	BKR	NAS SMPL	CLIENT DESCRIP	REPL	DAY	EMERG	TOTAL EMERG		
25	9	2045G	RGH-SS-03	1	3	1			
25	9	2045G	RGH-SS-03	1	4	0			
25	9	2045G	RGH-SS-03	1	5	0			
25	9	2045G	RGH-SS-03	1	6	0			
25	9	2045G	RGH-SS-03	1	7	0			
25	9	2045G	RGH-SS-03	1	8	0			
25	9	2045G	RGH-SS-03	1	9	2			
25	9	2045G	RGH-SS-03	1	10	0	3		
26	22	2045G	RGH-SS-03	2	1	0			
26	22	2045G	RGH-SS-03	2	2	0			
26	22	2045G	RGH-SS-03	2	3	1			
26	22	2045G	RGH-SS-03	2	4	1			
26	22	2045G	RGH-SS-03	2	5	0			
26	22	2045G	RGH-SS-03	2	6	0			
26	22	2045G	RGH-SS-03	2	7	0			
26	22	2045G	RGH-SS-03	2	8	0			
26	22	2045G	RGH-SS-03	2	9	0			
26	22	2045G	RGH-SS-03	2	10	0	2		
27	1	2045G	RGH-SS-03	3	1	0			
27	1	2045G	RGH-SS-03	3	2	2			
27	1	2045G	RGH-SS-03	3	3	0			
27	1	2045G	RGH-SS-03	3	4	0			
27	1	2045G	RGH-SS-03	3	5	2			
27	1	2045G	RGH-SS-03	3	6	0			
27	1	2045G	RGH-SS-03	3	7	1			
27	1	2045G	RGH-SS-03	3	8	1			
27	1	2045G	RGH-SS-03	3	9	0			
27	1	2045G	RGH-SS-03	3	10	1	7		
28	34	2045G	RGH-SS-03	4	1	0			
28	34	2045G	RGH-SS-03	4	2	0			
28	34	2045G	RGH-SS-03	4	3	0			
28	34	2045G	RGH-SS-03	4	4	0			
28	34	2045G	RGH-SS-03	4	5	0			
28	34	2045G	RGH-SS-03	4	6	0			
28	34	2045G	RGH-SS-03	4	7	0			
28	34	2045G	RGH-SS-03	4	8	0			
28	34	2045G	RGH-SS-03	4	9	0			
28	34	2045G	RGH-SS-03	4	10	0	0		
29	2	2045G	RGH-SS-03	5	1	0			
29	2	2045G	RGH-SS-03	5	2	2			
29	2	2045G	RGH-SS-03	5	3	0		Mean	4.6
29	2	2045G	RGH-SS-03	5	4	0		SD	4.4
29	2	2045G	RGH-SS-03	5	5	1		n	5
29	2	2045G	RGH-SS-03	5	6	1			
29	2	2045G	RGH-SS-03	5	7	2			
29	2	2045G	RGH-SS-03	5	8	1			
29	2	2045G	RGH-SS-03	5	9	2			
29	2	2045G	RGH-SS-03	5	10	2	11		
31	10	2046G	control	1	1	0			
31	10	2046G	control	1	2	0			
31	10	2046G	control	1	3	0			

INDEX	BKR	NAS SMPL	CLIENT DESCRIP	REPL	DAY	EMERG	TOTAL EMERG		
31	10	2046G	control	1	4	0			
31	10	2046G	control	1	5	0			
31	10	2046G	control	1	6	0			
31	10	2046G	control	1	7	0			
31	10	2046G	control	1	8	0			
31	10	2046G	control	1	9	0			
31	10	2046G	control	1	10	0	0		
32	24	2046G	control	2	1	0			
32	24	2046G	control	2	2	0			
32	24	2046G	control	2	3	0			
32	24	2046G	control	2	4	0			
32	24	2046G	control	2	5	0			
32	24	2046G	control	2	6	0			
32	24	2046G	control	2	7	0			
32	24	2046G	control	2	8	0			
32	24	2046G	control	2	9	0			
32	24	2046G	control	2	10	1	1		
33	23	2046G	control	3	1	0			
33	23	2046G	control	3	2	0			
33	23	2046G	control	3	3	0			
33	23	2046G	control	3	4	0			
33	23	2046G	control	3	5	0			
33	23	2046G	control	3	6	0			
33	23	2046G	control	3	7	0			
33	23	2046G	control	3	8	0			
33	23	2046G	control	3	9	6			
33	23	2046G	control	3	10	0	6		
34	7	2046G	control	4	1	0			
34	7	2046G	control	4	2	0			
34	7	2046G	control	4	3	0			
34	7	2046G	control	4	4	0			
34	7	2046G	control	4	5	1			
34	7	2046G	control	4	6	1			
34	7	2046G	control	4	7	0			
34	7	2046G	control	4	8	0			
34	7	2046G	control	4	9	0			
34	7	2046G	control	4	10	1	3		
35	11	2046G	control	5	1	0			
35	11	2046G	control	5	2	0			
35	11	2046G	control	5	3	0		Mean	2.0
35	11	2046G	control	5	4	0		SD	2.5
35	11	2046G	control	5	5	0		n	5
35	11	2046G	control	5	6	0			
35	11	2046G	control	5	7	0			
35	11	2046G	control	5	8	0			
35	11	2046G	control	5	9	0			
35	11	2046G	control	5	10	0	0		

Water Quality Data

					Overlying water									Interstitial						assumed
BKR	NAS SMPL	CLIENT DESCRIP	REPL	DAY	TEMP	pH	SAL	DO	S	< or >	NH4+NH3	< or >	NH3	pH	SAL	< or >	NH4+NH3	< or >	NH3	interstitial temp.
bulk	2041G	Samish Bay Ref												8.0	30.5		11.9		0.310	15
bulk	2042G	BBP-SS-01												7.6	24.5		13.0		0.143	
bulk	2043G	BBP-SS-02												7.6	25.0		12.8		0.140	
bulk	2044G	RGH-SS-01												8.1	23.5		7.8		0.266	
bulk	2045G	RGH-SS-03												7.5	25.0		11.2		0.097	
bulk	2046G	control												7.8	33.5		0.8		0.013	
5	2044G	RGH-SS-01	6	0	15.7	8.1	27.5	8.3	<0.02		0.9		0.030							
12	2046G	control	6	0	15.7	8.1	27.5	8.4	<0.02		0.2		0.008							
14	2042G	BBP-SS-01	6	0	15.7	7.9	27.0	7.8	<0.02		3.2		0.071							
15	2043G	BBP-SS-02	6	0	15.7	8.0	27.0	8.0	<0.02		1.6		0.045							
18	2041G	Samish Bay Ref	6	0	15.8	7.6	27.5	7.6	<0.02		0.9		0.011							
36	2045G	RGH-SS-03	6	0	15.6	8.0	27.5	8.0	<0.02		1.2		0.033							
5	2044G	RGH-SS-01	6	1	15.8	7.9	27.0	6.6												
12	2046G	control	6	1	15.6	8.0	27.5	8.1												
14	2042G	BBP-SS-01	6	1	15.7	8.0	27.5	7.4												
15	2043G	BBP-SS-02	6	1	15.6	8.0	28.0	7.4												
18	2041G	Samish Bay Ref	6	1	15.5	8.0	28.0	7.7												
36	2045G	RGH-SS-03	6	1	15.5	8.0	27.5	7.8												
5	2044G	RGH-SS-01	6	2	15.4	7.9	27.0	6.2												
9	2045G	RGH-SS-03	1	2				7.3												
12	2046G	control	6	2	15.4	8.1	27.5	7.8												
14	2042G	BBP-SS-01	6	2	15.4	8.0	27.5	7.4												
15	2043G	BBP-SS-02	6	2	15.4	8.0	27.0	7.4												
18	2041G	Samish Bay Ref	6	2	15.4	8.0	27.5	7.6												
36	2045G	RGH-SS-03	6	2	15.2	8.0	27.5	7.4												
2	2045G	RGH-SS-03	5	3				6.1												
5	2044G	RGH-SS-01	6	3	15.3	8.0	27.0	6.4												
12	2046G	control	6	3	15.3	8.2	27.5	8.5												
14	2042G	BBP-SS-01	6	3	15.2	8.1	27.5	7.6												
15	2043G	BBP-SS-02	6	3	15.2	8.0	28.0	7.8												
18	2041G	Samish Bay Ref	6	3	15.2	8.0	28.0	8.0												
36	2045G	RGH-SS-03	6	3	15.0	8.0	28.0	7.8												
5	2044G	RGH-SS-01	6	4	15.1	8.3	28.0	7.8												
6	2043G	BBP-SS-02	3	4				6.2												
12	2046G	control	6	4	15.0	8.2	28.0	8.1												
14	2042G	BBP-SS-01	6	4	14.9	8.2	28.0	7.8												
15	2043G	BBP-SS-02	6	4	14.9	8.1	28.0	7.9												
18	2041G	Samish Bay Ref	6	4	15.0	8.1	28.0	8.0												
36	2045G	RGH-SS-03	6	4	14.9	8.1	28.0	7.8												
5	2044G	RGH-SS-01	6	5	15.1	8.4	27.5	5.9												
12	2046G	control	6	5	15.0	8.2	28.0	7.9												

					Overlying water									Interstitial						assumed
BKR	NAS SMPL	CLIENT DESCRIP	REPL	DAY	TEMP	pH	SAL	DO	S	< or >	NH4+NH3	< or >	NH3	pH	SAL	< or >	NH4+NH3	< or >	NH3	interstitial temp.
14	2042G	BBP-SS-01	6	5	15.0	8.3	28.5	7.8												
15	2043G	BBP-SS-02	6	5	14.9	8.2	28.5	7.8												
18	2041G	Samish Bay Ref	6	5	14.9	8.1	28.5	8.1												
36	2045G	RGH-SS-03	6	5	14.8	8.2	28.5	7.8												
5	2044G	RGH-SS-01	6	6	15.0	8.5	28.0	7.0												
12	2046G	control	6	6	15.0	8.2	28.0	8.0												
14	2042G	BBP-SS-01	6	6	15.0	8.3	28.5	7.4												
15	2043G	BBP-SS-02	6	6	15.0	8.2	28.5	7.4												
18	2041G	Samish Bay Ref	6	6	15.0	8.1	28.5	7.7												
36	2045G	RGH-SS-03	6	6	14.8	8.2	28.5	7.5												
5	2044G	RGH-SS-01	6	7	14.9	8.6	28.0	7.2												
12	2046G	control	6	7	14.9	8.2	28.0	7.8												
14	2042G	BBP-SS-01	6	7	15.0	8.3	28.5	8.0												
15	2043G	BBP-SS-02	6	7	14.9	8.2	29.0	7.5												
18	2041G	Samish Bay Ref	6	7	15.0	8.1	28.5	7.8												
36	2045G	RGH-SS-03	6	7	14.9	8.3	28.5	7.7												
5	2044G	RGH-SS-01	6	8	14.9	8.7	28.0	7.6												
12	2046G	control	6	8	14.8	8.2	28.5	7.5												
14	2042G	BBP-SS-01	6	8	14.9	8.4	29.0	7.6												
15	2043G	BBP-SS-02	6	8	14.8	8.3	29.0	7.4												
18	2041G	Samish Bay Ref	6	8	14.9	8.2	28.5	7.8												
36	2045G	RGH-SS-03	6	8	14.7	8.4	29.0	7.7												
5	2044G	RGH-SS-01	6	9	15.0	8.8	28.5	7.4												
12	2046G	control	6	9	15.0	8.2	29.0	7.6												
14	2042G	BBP-SS-01	6	9	15.0	8.4	29.5	7.3												
15	2043G	BBP-SS-02	6	9	15.0	8.3	29.0	7.2												
18	2041G	Samish Bay Ref	6	9	15.0	8.1	29.0	7.4												
36	2045G	RGH-SS-03	6	9	14.9	8.5	29.0	7.1												
5	2044G	RGH-SS-01	6	10	14.7	8.6	29.0	8.1	<0.02		0.8		0.078	7.5	29.0		4.5		0.038	
12	2046G	control	6	10	14.7	8.2	29.0	7.8	<0.02		0.1		0.005	7.6	29.0		0.9		0.010	
14	2042G	BBP-SS-01	6	10	14.8	8.6	29.5	7.6	<0.02		6.1		0.591	7.4	27.5		12.0		0.082	
15	2043G	BBP-SS-02	6	10	14.7	8.4	29.0	7.8	<0.02		2.4		0.152	7.4	28.0		8.4		0.057	
18	2041G	Samish Bay Ref	6	10	14.8	8.3	29.0	7.5	<0.02		0.2		0.012	7.7	28.0		2.1		0.029	
36	2045G	RGH-SS-03	6	10	14.7	8.6	29.5	7.3	<0.02		0.3		0.032	7.2	29.5		4.2		0.018	
														Summary statistics for day 10 porewater only:						
				Mean	15.1	8.2	28.2	7.6	---		---		---	7.5	28.5		---		---	
				SD	0.3	0.2	0.7	0.5	---		---		---	0.2	0.8		---		---	
				n	66	66	66	69	12		12		12	6	6		6		6	
				Min	14.7	7.6	27.0	5.9	<0.02		0.1		0.005	7.2	27.5		0.9		0.010	
				Max	15.8	8.8	29.5	8.5	<0.02		6.1		0.591	7.7	29.5		12.0		0.082	

Page 14 of 45

CHAIN-OF-CUSTODY RECORDS

Sample Custody Record

Samples Shipped to: NW AQUATIC SCIENCES

HARTCROWSER
Hart Crowser, Inc.
1910 Fairview Avenue East
Seattle, Washington 98102-3699
Phone: 206-324-9530 FAX: 206-328-5581

JOB 17330-17 LAB NUMBER

PROJECT NAME BELLINGHAM BAY

HART CROWSER CONTACT R. McGINNIS, A. CONRAD

SAMPLED BY: M. HERRENKOHL, AC, ~~RH~~, CFR

REQUESTED ANALYSIS

LAB NO.	SAMPLE ID	DESCRIPTION	DATE	TIME	MATRIX	BIOASSAY	HOLD	NO. OF CONTAINERS	OBSERVATIONS/COMMENTS/ COMPOSITING INSTRUCTIONS
2041G	SAMISH BAY REF		8/29/08	1705	SED	X	X	2	HOLD ONE CONTAINER
2042G	BBP-SS-01		8/26/08	1030	↓	↓		1	
2043G	BBP-SS-02		8/26/08	1142	↓	↓		1	
2044G	RGH-SS-01		8/26/08	1550	↓	↓		1	
2045G	RGH-SS-03		8/26/08	1425	↓	↓		1	

RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE: [signature]	9/3/08	SIGNATURE: Michele S. Redmond	9-4-08
PRINT NAME: Anne M Conrad	TIME: 1300	PRINT NAME: Michele S. Redmond	TIME: 13:00
COMPANY: Hart Crowser		COMPANY: NAS	

RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE		SIGNATURE	
PRINT NAME	TIME	PRINT NAME	TIME
COMPANY		COMPANY	

SPECIAL SHIPMENT HANDLING OR STORAGE REQUIREMENTS:
Headspace in containers flushed with nitrogen - MSR

TOTAL NUMBER OF CONTAINERS

SAMPLE RECEIPT INFORMATION
[illegible]

COOLER NO.:

STORAGE LOCATION:

See Lab Work Order No. ______
for Other Contract Requirements

TURNAROUND TIME:
☐ 24 HOURS ☐ 1 WEEK
☐ 48 HOURS ☐ STANDARD
☐ 72 HOURS OTHER ______

White and Yellow Copies to Lab Pink to Project Manager Lab to Return White Copy to Hart Crowser Gold to Sample Custodian

From: Origin ID: LKEA (206) 324-9530
Charisse Norman
HART CROWSER INC
1700 WESTLAKE AVE NORTH
SUITE 200
SEATTLE, WA 98109

Ship Date: 03SEP08
ActWgt: 62.0 LB
System#: 5922109/INET8061
Account#: S *********

Delivery Address Bar Code

Ref # 1733017 ANNE /ROGER
Invoice #
PO #
Dept #

SHIP TO: (541) 265-7225 BILL SENDER
NORTHWESTERN AQUATIC SCIENCES
NORTHWESTERN AQUATIC SCIENCES
3814 YAQUINA BAY RD.

NEWPORT, OR 97365

1 of 3

TRK# 0201 7960 7787 1814
MASTER

THU - 04SEP AM
PRIORITY OVERNIGHT
DSR

97365
OR-US
PDX

86 ONPA

After printing this label:
1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warnli
result

Use
resp
you de
Guide ap
costs, and
Recovery ca
instruments a

CUSTODY SEAL CUSTODY SEAL CUSTODY SEAL CUSTODY SEAL

Date 9/3/08 Initials A

CUSTODY SEAL CUSTODY SEAL CUSTODY SEAL CUSTODY SEAL

Date 9/3/08 Initials A

4.5 °C

From: Origin ID: LKEA (206) 324-9530
Charisse Norman
HART CROWSER INC
1700 WESTLAKE AVE NORTH
SUITE 200
SEATTLE, WA 98109

FedEx Express

E

JCL S08408/28/23

Ship Date: 03SEP08
ActWgt: 56.0 LB
System#: 5922109/INET3061
Account#: S *********

Delivery Address Bar Code

SHIP TO: (541) 265-7225 BILL SENDER
NORTHWESTERN AQUATIC SCIENCES
NORTHWESTERN AQUATIC SCIENCES
3314 YAQUINA BAY RD.

NEWPORT, OR 97365

Ref # 1733017 ANNE RUBER
Invoice #
PO #
Dept #

2 of 3
MPS# 0263 7960 7787 184
Mstr# 7960 7787 1814 0221

THU - 04SEP AM
PRIORITY OVERNIGHT
DSR

97365
OR-US
PDX

86 ONPA

After printing this label:
1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.

Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com.FedEx will not be responsible for any claim in excess of $100 per package, whether the result of loss, damage, delay, non-delivery,misdelivery,or misinformation unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim.Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic valueof the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental,consequential, or special is limited to the greater of $100 or the authorized declared value. Recovery cannot exceed actual documented loss.Maximum for items of extraordinary value is $500, e.g. jewelry, precious metals, negotiable instruments and other items listed in our ServiceGuide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

CUSTODY SEAL CUSTODY SEAL CUSTODY SEAL CUSTODY SEAL

Date 9/3/08

Initials A

3.5°C

D LKEA (206) 324-9530
man
SER INC
LAKE AVE NORTH
WA 98109

FedEx Express
E
JCLS000400/28/23

(541) 265-7225 BILL SENDER
THWESTERN AQUATIC SCIENCES
THWESTERN AQUATIC SCIENCES
YAQUINA BAY RD.
NEWPORT, OR 97365

Ship Date: 03SEP08
ActWgt: 61.0 LB
System#: 5922109/INET80
Account#: S *********

Delivery Address Bar Code

Ref # 1733017 ANNE ROGER
Invoice #
PO #
Dept #

3 of 3
MPS# 0263 7960 7787 1891
Mstr# 7960 7787 1814 0201

THU - 04SEP AM
PRIORITY OVERNIGHT
DSR

97365
OR-US
PDX

86 ONPA

After printing this label:
1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the

Use o
respo
you d
Guide
costs.
Recov
instru

CUSTODY SEAL CUSTODY SEAL CUSTODY SEAL CUSTODY SEAL

Date 9/3/08 Initials A

CUSTODY SEAL CUSTODY SEAL CUSTODY SEAL CUSTODY SEAL

Date 9/3/08 Initials A

6.5°C

REFERENCE TOXICANT RESULTS AND ANALYSIS

NORTHWESTERN AQUATIC SCIENCES

ACUTE TOXICITY TEST (ALL SPECIES)

PROTOCOL NO. NAS-XXX-RA1

Test No. 999-2471 Client: QC Test Investigator pgs. 1-6 MSR 10-7-08 received

Test Type (rangefinding/definitive) definitive Test Length (hr) 96

Species *Eohaustorius estuarius*

STUDY MANAGEMENT

Client: QC Test

Client's Study Monitor: N/A

Testing Laboratory: Northwestern Aquatic Sciences

Test Location: Newport Laboratory

Laboratory's Study Personnel:

Proj. Man./Study Dir. M.S. Redmond MSR

QA Officer L.K. Nemeth

1. G.J. IRISSARRI GJI 2. Susan Gigl sg

3. Lidia P. Sandoval LPS 4.

5. 6.

Study Schedule:

Test Beginning: 9-9-08 11:00 Test Ending: 9-13-08 1240

TEST MATERIAL

Description: Ammonia as ammonium chloride (7120 mg/L as N = 7.12 mg/mL as N), stock prepared 7-25-06

DILUTION WATER

Description: Yaquina Bay, Oregon, sea water

Date of Preparation/Collection: 9-8-08

Water Quality: Cond.(umhos/cm): ----- Salinity (ppt) 27.5 pH 8.1

Hardness (mg/L as $CaCO_3$): ----- Alkalinity (mg/L as $CaCO_3$): -----

Treatments: Filtered to ≤ 0.4 µm, salinity adjusted with Milli-Q deionized water, aerated

TEST LOCATION

Test conducted in (circle one): room 1 room 2 trailer water bath other: room #4

Randomization chart:

wall

										door →
				0	125	500	31	62	250	B
				500	31	62	0	250	125	A

top shelf

Error codes: 1) Corrrection of handwriting error
2) Written in wrong location; entry deleted
3) Wrong date deleted; replaced with correct date
4) Error found in measurement; measurement repeated

NORTHWESTERN AQUATIC SCIENCES
ACUTE TOXICITY TEST (ALL SPECIES)
PROTOCOL NO. NAS-XXX-RA1

Test No. 999-2471 Client: QC Test Investigator

TEST ORGANISMS

Species: *Eohaustorius estuarius* Age: adult Size:
Source: Yaquina Bay, Oregon

If field-collected:
Date Collected: 9-4-08
Field conditions: Interstitial temperature: 15.0 °C Interstitial salinity: 33.0 ‰

Acclimation Data:

Date	Temp. (deg.C)	pH	Sal. (ppt)	DO (mg/L)	Feeding amount	Feeding description	Water changes	Comments
9-4-08	15.3	8.1	27.5	8.2				
9-5-08	15.3	8.1	28.5	8.6				
9-6-08	15.1	8.2	29.0	8.5				
9-7-08	15.5	8.2	28.5	8.3				
9-8-08	15.5	8.0	29.5	8.6				
9-9-08	15.2	8.2	29.0	8.6				
Mean	15.3	8.1	28.7	8.5				
S.D.	0.2	0.1	0.7	0.2				
(N)	(6)	(6)	(6)	(6)				

Photoperiod during acclimation: Constant light

TEST PROCEDURES AND CONDITIONS

Test concentrations (50% series recommended): 500, 250, 125, 62, 31, and 0 mg/L

Test chamber: 250 mL beakers Test volume: 100 mL
Replicates/treatment: 2 Organisms/treatment: 20 (10/repl)
Test water changes: None Aeration during test: None
Feeding: None.
Duration: 24-hr, 48-hr, (96-hr)
Beaker placement: Stratified randomization
Test temperature (deg.C): 15.0 +/- 1.0
Photoperiod: Constant light
Test salinity (ppt): 28.0 +/- 1.0

MISCELLANEOUS NOTES

Test Solution Preparation:

Test Conc. (mg/L)	mL of stock (7120 mg/L) per 200 mL	
500	14.0	Bring up to 200 mL with dilution water, then split between 2 replicates
250	7.0	
125	3.5	
62	1.75	
31	0.88	
0	0	

ymsr 9-9-08

Light intensity measurements:

Date	Location	foot-candles
9-12-08	over glass	4.5

NORTHWESTERN AQUATIC SCIENCES
ACUTE TOXICITY TEST (ALL SPECIES)
PROTOCOL NO. NAS-XXX-RA1

Test No. 999- 2471 Client QC Test Investigator

DAILY RECORD SHEET

Day 0 (9 /9 08) MuR /GJ

Conc. (mg/L)	Temp. (deg.C)	pH	Sal. (ppt)	DO (ppm)	Survivors A	Survivors B
1. 500	15.5	7.4	27.5	8.2	10	10
2. 250	15.6	7.6	27.5	8.2	10	10
3. 125	15.6	7.8	27.5	8.2	10	10
4. 62	15.7	7.9	27.5	8.2	10	10
5. 31	15.7	8.0	27.5	8.2	10	10
6. 0	15.8	8.1	27.5	8.2	10	10

Day 1 (9 /10 08) AK

Conc. (mg/L)	Temp. (deg.C)	pH	Sal. (ppt)	DO (ppm)	Survivors A	Survivors B
1. 500	15.0	7.6	28.0	7.0	5 (5d)	2 (8d)
2. 250	14.9	7.7	28.0	6.8	9 (1d)	9 (1d)
3. 125	14.9	7.8	28.0	7.2	10	10
4. 62	14.8	7.8	28.0	7.2	10	10
5. 31	14.8	7.9	28.0	7.4	9 (1d)	10
6. 0	14.8	7.9	28.0	7.4	10	10

Day 2 (9 /11 08) GJ /LPS

Conc. (mg/L)	Temp. (deg.C)	pH	Sal. (ppt)	DO (ppm)	Survivors A	Survivors B
1. 500	15.0	7.6	27.5	7.1	0 (5d)	0 (2d)
2. 250	14.9	7.8	27.5	7.2	6 (4d) *	3 (6d)
3. 125	14.9	7.8	27.5	7.3	9 (1m) *	10
4. 62	15.0	7.8	27.5	7.4	10	10
5. 31	15.0	7.9	27.5	7.4	9	10
6. 0	14.9	7.9	27.5	7.3	10	9 (1d)

* apparent transfer during water-quality measurements of one animal from 125A to 250A

Day 3 (9 /12 08) GJ /MuR

Conc. (mg/L)	Temp. (deg.C)	pH	Sal. (ppt)	DO (ppm)	Survivors A	Survivors B
1. 500	–	–	–	–	0	0
2. 250	14.8	7.8	28.0	7.5	6	2 (1D)
3. 125	14.7	7.8	27.5	7.5	9	10
4. 62	14.7	7.7	28.0	7.5	10	10
5. 31	14.7	7.8	28.0	7.6	9	9 (1D)
6. 0	14.7	7.9	28.0	7.6	10	9

Day 4 (9 /13 08) GJ

Conc. (mg/L)	Temp. (deg.C)	pH	Sal. (ppt)	DO (ppm)	Survivors A	Survivors B
1. 500	–	–	–	–	Ø	Ø
2. 250	14.8	7.8	28.5	7.5	4 (2D)	2
3. 125	14.8	7.8	28.0	7.4	8 (1D)	8 (2D)
4. 62	14.8	7.8	29.0	7.4	10	10
5. 31	14.8	7.9	28.5	7.5	9	9
6. 0	14.7	8.0	28.5	7.5	10	9
WQ: Mean	15.0	7.8	27.9	7.5		
SD	0.4	0.1	0.4	0.4		
n	28	28	28	28		

CETIS Summary Report

Test Code: 08-3162-4387/999-2471

Reference Toxicant 96-h Acute Survival Test — Northwestern Aquatic Sciences

Test Run No:	13-9049-2387	Test Type:	Survival	Analyst:	
Start Date:	09 Sep-08 11:00	Protocol:		Diluent:	Yaquina Bay Seawater
Ending Date:	13 Sep-08 12:40	Species:	Eohaustorius estuarius	Brine:	
Duration:	4d 2h	Source:	Field Collected	Age:	

Sample No:	16-2778-5028	Code:	1627785028	Client:	Internal Lab
Sample Date:	09 Sep-08 11:00	Material:	Ammonia as nitrogen	Project:	
Receive Date:	09 Sep-08 11:00	Source:	Reference Toxicant		
Sample Age:	N/A	Station:			

Comparison Summary

Analysis No	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
15-0103-1631	Proportion Survived	125	250	177	17.9%		Dunnett's Multiple Comparison Test

Point Estimate Summary

Analysis No	Endpoint	Level	Conc-mg/	95% LCL	95% UCL	TU	Method
05-2476-3967	Proportion Survived	EC50	202	156	244		Linear Regression (MLE)

Proportion Survived Summary

Conc-mg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Dilution Water	2	0.95	0.924	0.976	0.9	1	0.0129	0.0707	7.44%	0.0%
31		2	0.9	0.9	0.9	0.9	0.9	0	0	0.0%	5.26%
62		2	1	1	1	1	1	0	0	0.0%	-5.26%
125		2	0.844	0.821	0.868	0.8	0.889	0.0115	0.0629	7.44%	11.1%
250		2	0.282	0.239	0.325	0.2	0.364	0.0211	0.116	41.1%	70.3%
500		2	0	0	0	0	0	0	0		100.0%

Proportion Survived Detail

Conc-mg/L	Control Type	Rep 1	Rep 2
0	Dilution Water	1	0.9
31		0.9	0.9
62		1	1
125		0.889	0.8
250		0.364	0.2
500		0	0

CETIS Test Data Worksheet

Test Code: 08-3162-4387/999-2471

Reference Toxicant 96-h Acute Survival Test

Northwestern Aquatic Sciences

Start Date: 09 Sep-08 11:00 **Species:** Eohaustorius estuarius
Ending Date: 13 Sep-08 12:40 **Protocol:**
Sample Date: 09 Sep-08 11:00 **Material:** Ammonia as nitrogen

Sample Code: 1627785028
Sample Source: Reference Toxicant
Sample Station:

Conc-mg/L	Code	Rep	Pos	# Exposed	# Survived	Notes
0	D	1	4	10	10	
0	D	2	5	10	9	
31		1	7	10	9	
31		2	3	10	9	
62		1	12	10	10	
62		2	2	10	10	
125		1	6	9	8	
125		2	10	10	8	
250		1	8	11	4	
250		2	9	10	2	
500		1	11	10	0	
500		2	1	10	0	

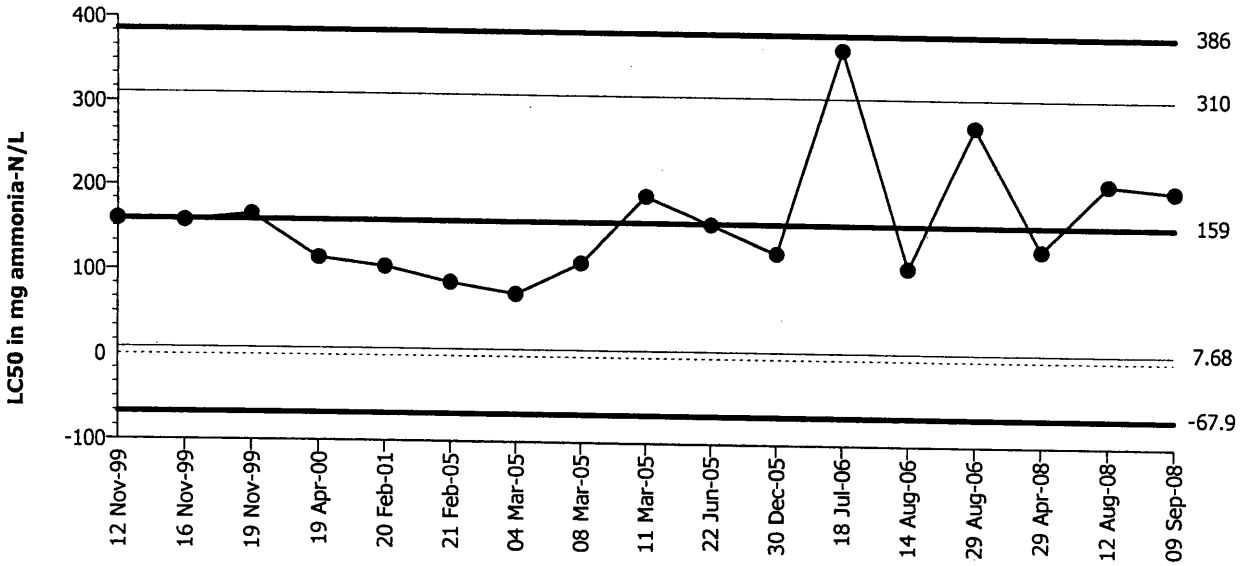
Data entry verified against laboratory bench sheets.
MSR
9-29-08

Amphipod, Eohaustorius estuarius, acute reference toxicant test

Northwestern Aquatic Sciences

Test Type:	Survival	Organism:	Eohaustorius estuarius (Amphipod)	Material:	Ammonia as nitrogen
Protocol:	All Protocols	Endpoint:	Proportion Survived	Source:	All Sample Sources

Amphipod, Eohaustorius estuarius, acute reference toxicant test



Mean:	158.9	Count:	16	-2s Warning Limit:	7.68	-3s Action Limit:	-67.93
Sigma:	75.61	CV:	47.60%	+2s Warning Limit:	310.1	+3s Action Limit:	385.7

Quality Control Data

Point	Year	Month	Day	QC Data	Delta	Sigma	Warning	Action	Link No	Analysis No
1	1999	Nov	12	159.3	0.4041	0.005345			06-8260-9810	13-5338-5163
2			16	157.5	-1.359	-0.01798			09-3302-9008	02-5478-6375
3			19	165.5	6.578	0.087			08-8047-8205	19-1096-0771
4	2000	Apr	19	114.8	-44.09	-0.5831			16-2064-0490	14-1542-6174
5	2001	Feb	20	104.8	-54.14	-0.7161			01-8827-6895	16-6208-1639
6	2005		21	86.83	-72.07	-0.9532			09-2612-0890	14-1988-7862
7		Mar	4	73.51	-85.39	-1.129			18-6741-9263	03-3923-4536
8			8	110.9	-47.98	-0.6346			06-7346-2735	09-1676-9814
9			11	190.7	31.76	0.4201			09-4022-8352	06-3336-1149
10		Jun	22	157.9	-0.9778	-0.01293			11-2691-7082	13-9495-1529
11		Dec	30	124.8	-34.08	-0.4507			07-5802-9309	05-7960-9956
12	2006	Jul	18	368.5	209.6	2.772	(+)		09-9291-1665	12-4928-9594
13		Aug	14	108.8	-50.09	-0.6624			09-2436-3006	07-0528-9136
14			29	277.6	118.7	1.569			18-6928-6460	08-4845-0989
15	2008	Apr	29	131	-27.86	-0.3685			05-4539-2604	07-8525-2912
16		Aug	12	209.6	50.69	0.6704			01-8497-3298	02-5050-8460
17		Sep	9	201.9	43.02	0.569			08-3162-4387	05-2476-3967

MSR
9-29-08

Analyst:_____ QA:_____

Report

of

Test No. 774-2

Juvenile *Neanthes* 20-Day Sediment Toxicity Test of Marine Sediments

Submitted to

Hart Crowser, Inc.
1700 Westlake Ave. N, Suite 200
Seattle, WA 98109-3056

Submitted by

Northwestern Aquatic Sciences
3814 Yaquina Bay Road
P.O. Box 1437
Newport, OR 97365

October 29, 2008

TOXICITY TEST REPORT

TEST IDENTIFICATION

Test No.: 774-2

Title: Juvenile *Neanthes* 20-day sediment toxicity test of marine sediments.

Protocol: NAS-XXX-NA4, June 20, 1990. Rev.4 (3-1-05). Based on: Recommended Guidelines for Conducting Laboratory Bioassays on Puget Sound Sediments (PSEP 1995), with modifications as specified by the Dredged Material Management Program (DMMP, formerly Puget Sound Dredged Disposal Analysis Program or PSDDA) and Washington State Sediment Management Standards (SMS).

STUDY MANAGEMENT

Study Sponsor: Hart Crowser, Inc., 1700 Westlake Ave. N, Suite 200, Seattle, WA 98109-3056

Sponsor's Study Monitor: Mr. Roger McGinnis

Testing Laboratory: Northwestern Aquatic Sciences, P.O. Box 1437, Newport, Oregon 97365.

Test Location: Newport Laboratory.

Laboratory's Study Personnel: M.S. Redmond, M.S., Proj. Mngr./ Study Dir.; L.K. Nemeth, B.A., M.B.A., QA Officer; G.J. Irissarri, B.S., Aq. Toxicol.; G.A. Buhler, B.S., Aq. Toxicol.; S J. Gage, B.A., Sr.Tech.; L.P. Sandoval, B.S., Tech.

Study Schedule:

Test Beginning: 9-10-08, 1115 hrs.

Test Ending: 9-30-08, 1030 hrs.

Disposition of Study Records: All specimens, raw data, reports and other study records are stored according to Good Laboratory Practice regulations at Northwestern Aquatic Sciences, 3814 Yaquina Bay Rd., Newport, OR 97365.

Good Laboratory Practices: The test was conducted following the principles of Good Laboratory Practices (GLP) as defined in the EPA/TSCA Good Laboratory Practice regulations revised August 17, 1989 (40 CFR Part 792).

Statement of Quality Assurance: The test data were reviewed by the Quality Assurance Unit to assure that the study was performed in accordance with the protocol and standard operating procedures. This report is an accurate reflection of the raw data.

TEST MATERIAL

Control Sediment: Control sediment (NAS Sample #2046G) was collected from the *Eohaustorius estuarius* amphipod collection site, Yaquina Bay, Oregon, on 9-4-08. Interstitial salinity was 33.5 ‰. The sediment was sieved through a 0.5-mm stainless steel screen and stored at 4°C in the dark.

Test Sediments: Four test sediments and one reference sediment were tested. Details follow:

NAS Sample No.	2041G	2042G	2043G	2044G
Sample Description	Samish Bay Ref	BBP-SS-01	BBP-SS-02	RGH-SS-01
Collection Date	8-29-08	8-26-08	8-26-08	8-26-08
Receipt Date	9-4-08	9-4-08	9-4-08	9-4-08
Interstitial Salinity (‰)	30.5	24.5	25.0	23.5

NAS Sample No.	2045G
Sample Description	RGH-SS-03
Collection Date	8-26-08
Receipt Date	9-4-08
Interstitial Salinity (‰)	25.0

Storage: Storage: Upon receipt, headspace in sample containers was flushed with nitrogen, and samples were stored at 4°C in the dark.

Treatments: The samples were minimally homogenized by mixing with stainless steel implements.

TEST WATER

Source: Yaquina Bay, Oregon
Date(s) of Collection: 9-9-08
Water Quality: Salinity 27.0‰, pH 8.1
Pretreatment: Filtered to ≤0.40 µm, salinity-adjusted with MilliQ® deionized water, aerated.

TEST ORGANISMS

Species: *Neanthes arenaceodentata,* marine polychaete worm
Age: 2-3 week post-emergence juveniles
Initial wt.: 0.56 mg
Source: Laboratory cultures at the Department of Biology, California State University, Long Beach, California. Worms were received on 9-9-08.
Acclimation: Average conditions during the day prior to testing were: temperature, 19.6 °C; pH, 7.8; salinity, 28.3 ‰; dissolved oxygen, 7.0 mg/L. Photoperiod was constant light.

TEST PROCEDURES AND CONDITIONS

The following is an abbreviated statement of the test procedures and a statement of the test conditions actually employed. See the test protocol (Appendix I) for a more detailed description of the test procedures used in this study.

Test Chambers: 1 L covered borosilicate glass beakers.
Test Volumes: 175 ml of test, reference, or control sediment; 950 ml total volume.
Replicates/Treatment: 5 (plus one water-quality replicate)
Sediment Salinity Adjustment: None
Organisms/Treatment: 25 (5/replicate)
Water Volume Changes: One third of the seawater in each beaker was replaced every third day.
Aeration: Provided through a 1-mL glass pipette placed not closer than 2 cm from sediment, bubbled at a minimal rate (about 100 bubbles/minute) that did not disturb the sediment surface.
Feeding: Animals were fed 40 mg TetraMarine® per beaker every other day.
Acceptance Criteria: Results are valid if mean control survival is at least 90%. DMMP and SMS require control sediment mortality of ≤10% and a growth rate of >0.38 mg/individual/day.
Performance Criteria: For DMMP and SMS testing, the reference sediment mortality should be ≤20% with a growth rate of ≥80% that of the negative control sediment.
Effects Criteria: 1) survival after 20 days, 2) average individual biomass, and 3) average individual growth rate. Death is defined as no visible appendage movement or response to tactile stimulation. Missing worms are considered dead.
Water Quality and Other Test Conditions: The temperature, pH, salinity, and dissolved oxygen were measured in the overlying water of one replicate water quality beaker on test days 0 and 20, and on test days 3, 6, 9, 12, 15, and 18 prior to test solution renewal. Total dissolved sulfide and total ammonia-N were measured in the overlying water of the water quality replicate test chamber on days 0 and 20. Total ammonia-N was also measured in the overlying water of the water quality replicate test chamber on day 3 prior to water renewal. Total soluble sulfide and total ammonia-N were measured using Hach reagents based on the methylene blue (EPA Method 376.2) and salicylate (Clin. Chim. Acta 14:403, 1996) colorimetric methods, respectively; samples were not distilled prior to analysis. Un-ionized ammonia-N was computed using "Un-ionized Ammonia Calculator", v1.0 (Dr. Landon Ross, Florida Department of Environmental Protection). The photoperiod was constant light.

DATA ANALYSIS METHODS

Percent survival, individual biomass, and individual growth rate at the end of the test were determined from the final observations according to the formulas:

Percent survival = 100 x (no. of surviving worms/initial number of worms)
Individual biomass = total dry wt. of worms/number of surviving worms weighed
Individual growth rate = (individual biomass - the initial dry wt.)/the number of test days

The means and standard deviations were then calculated for each treatment level. The statistical software employed for these calculations was Microsoft Excel 2000. Individual growth rate in each test sediment was compared against that in the control and in the reference sediment. The software used for statistical comparisons was BioStat (Beta v.4.1 (EXCEL)) bioassay software developed by the U.S. Army Corps of Engineers, Seattle District. Following determination of normality and homogeneity of variances, a one-tailed Student T-test, Approximate T-test, One-sample T-test, Mann Whitney test, or Rankit Analysis was conducted at the 0.05 level of significance.

PROTOCOL DEVIATIONS

1. Several overlying water salinity measurements exceeded the protocol-specified 28.0 ± 2.0‰ (maximum 30.5‰).
2. On test day 5, air delivery was interrupted to one water quality beaker, and dissolved oxygen dropped to 1.8 mg/L. Aeration was restarted. This beaker was not used for biological endpoint measurements.

REFERENCE TOXICANT TEST

The reference toxicant test is a standard multi-concentration toxicity test using ammonia expressed as NH_3-N and administered as NH_3Cl, to evaluate the performance of the test organisms used in the sediment toxicity test. The performance is evaluated by comparing the results of this test with historical results obtained at the laboratory. A summary of the reference toxicant test result is given below. The reference toxicant test raw data are found in Appendix II.

Test No.: 999-2473
Reference Toxicant and Source: Ammonia as ammonium chloride, 7.12 mg/ml stock prepared 7-25-06
Test Date: 9-10-08
Dilution Water Used: Yaquina Bay, Oregon, seawater; 27.0 ‰
Result: The 96-hr LC50 was 145 mg NH_3-N/L. This result is within the laboratory's control chart warning limits (135–335 mg NH_3-N/L).

RESULTS AND DISCUSSION

Observations of water quality parameters during the test are summarized in Table 1. Individual water quality measurements are located in the raw data (Appendix II).

Except as noted above, all measurements of standard water quality parameters were within protocol-specified ranges. Dissolved sulfide was not detected in the overlying water (detection limit 0.02 mg/L). Total ammonia-N concentrations in the overlying water ranged from 0.2 mg/L to 6.9 mg/L (maximum 0.302 mg/L un-ionized ammonia).

Table 2 shows the effects of test sediment exposures on survival and growth of *Neanthes*. The test met the acceptability criterion (≥90%) for control survival; mean survival in the control was 100.0%. The individual growth rate in the controls averaged 1.09 mg/day/worm. This meets the SMS recommendation for a minimum growth rate of 0.72 mg/day/worm for *Neanthes*. The average initial weight of worms was 0.56 mg, within the recommended range of 0.5 - 1.0 mg. The reference sediment included in the study met the performance standard requirement that mortality in the reference sediment should be ≤20% (mortality was 0.0% in Samish Bay Ref). The growth rate criterion was also met. According to SMS criteria, the mean individual growth rate in the reference sediment should be ≥80% of the mean individual growth rate in the control sediment. Control growth rate was 1.09 mg/day/worm, and that in reference sediment "Samish Bay Ref" was 0.91 mg/day/worm, corresponding to 83.5% of the control growth rate.

The test control acceptance criteria and reference sediment performance criteria for survival and growth were met. Positive control performance was within the laboratory's acceptance limits. It is concluded, therefore, that the test has developed fully acceptable data for use in making management decisions.

Data interpretation was conducted based on guidelines from the "Sediment Sampling and Analysis Plan Appendix," February 2008 (Washington Department of Ecology). For a test sediment from the polychaete test to

fail the Sediment Quality Standards under these guidelines, the mean individual growth rate in the test sediment must be statistically lower ($\alpha = 0.05$) than the mean individual growth rate in the reference sediment, and <70% of the mean reference sediment response. For a test sediment from the polychaete test to fail the Sediment Impact Zone Maximum Levels (SIZML), Cleanup Screening Levels (CSL), or Minimum Cleanup Levels (MCL) under the one-test criteria in these guidelines, the mean individual growth rate in the test sediment must be significantly lower ($\alpha = 0.05$) than that in the reference sediment, and <50% of the mean reference sediment response.

In no test sediment was mean individual growth rate significantly lower, or 70% or 50% lower, than that in reference sediment "Samish Bay Ref" (Tables 2 and 3). Therefore, all test sediments passed both Sediment Quality Standards and one-test criteria for SIZML/CSL/MCL as defined by the SMS guidelines (Table 3).

STUDY APPROVAL

Michele S. Redmond 10-30-08
Project Manager/ Study Director Date

Julie R. Jane 10-30-08
Quality Assurance Unit Date

Linda K. Nemeth 10/27/08
Assistant Laboratory Director Date

Table 1. Summary of overlying water quality conditions during tests of the polychaete, *Neanthes arenaceodentata*, exposed to marine sediments.

Parameter	Mean ± SD	Minimum	Maximum	N
Temperature (°C)	20.5 ± 0.2	20.1	20.9	48
pH	8.1 ± 0.2	7.8	8.5	48
Salinity (‰)	29.2 ± 1.2	27.0	30.5	48
Dissolved Oxygen (mg/L)	6.0 ± 0.8	1.8	7.3	50
Total soluble sulfide (mg/L)	---	<0.02	<0.02	12
Total Ammonia-N (mg/L)	---	0.2	6.9	18
Un-ionized Ammonia (mg/L)	---	0.008	0.302	18

Table 2. Means and standard deviations (n=5) of percent survival, individual dry weight, and individual growth rate of *Neanthes arenaceodentata* exposed for 20 days to marine sediments.

Sample description	Percent Survival (20-days)	Individual dry wt. (mg)	Individual growth rate (mg/day/worm)	
Control (NAS #2046G)	100.0 ± 0.0	22.4 ± 1.9	1.09 ± 0.09	
Samish Bay Ref (NAS #2041G)	100.0 ± 0.0	18.8 ± 3.1	0.91± 0.16	b
BBP-SS-01 (NAS #2042G)	100.0 ± 0.0	18.3 ± 4.7	0.88 ± 0.23	
BBP-SS-02 (NAS #2043G)	100.0 ± 0.0	17.2 ± 5.1	0.83 ± 0.26	b
RGH-SS-01 (NAS #2044G)	96.0 ± 8.9	16.7 ± 4.1	0.81 ± 0.20	b
RGH-SS-03 (NAS #2045G)	92.0 ± 17.9	17.7 ± 0.6	0.86 ± 0.03	b

a Growth rate significantly lower than in reference sediment "Samish Bay Ref" ($p<0.05$)
b Growth rate significantly lower than in the control sediment ($p<0.05$)

Table 3. Interpretation of *Neanthes* test data from exposure to marine sediments based on SMS (WDOE 2008) guidelines.

Sample description	Individual growth rate (mg/day, mean ± SD)	Significantly lower than reference sediment at α=0.05?	Percent of reference sediment	Failure under SQS? [1]	Failure under SIZML, CSL, or MCL? [2]
Control (NAS #2046G)	1.09 ± 0.09	---	---	---	---
Samish Bay Ref (NAS #2041G)	0.91± 0.16	---	---	---	---
BBP-SS-01 (NAS #2042G)	0.88 ± 0.23	NO	96.7	NO	NO
BBP-SS-02 (NAS #2043G)	0.83 ± 0.26	NO	91.2	NO	NO
RGH-SS-01 (NAS #2044G)	0.81 ± 0.20	NO	89.0	NO	NO
RGH-SS-03 (NAS #2045G)	0.86 ± 0.03	NO	94.5	NO	NO

[1] Sediment Quality Standards (SQS) failure if the mean growth rate in the test sediment is significantly lower (1-tailed t-test at P≤0.05) than that in the reference sediment, and <70% of the mean reference sediment response.

[2] Sediment Impact Zone Maximum Levels (SIZML), Cleanup Screening Levels (CSL), or Minimum Cleanup Levels (MCL) failure (one-test criteria) if the mean individual growth rate in the test sediment is significantly lower (1-tailed t-test at P≤0.05) than that in the reference sediment, and <50% of the mean reference sediment response.

APPENDIX I

PROTOCOL

TEST PROTOCOL

JUVENILE POLYCHAETE, *NEANTHES ARENACEODENTATA*, 20-DAY SOLID PHASE SEDIMENT BIOASSAY

1. INTRODUCTION

1.1 Purpose of Study: The purpose of this study is to identify marine sediments that are toxic to a marine polychaete worm. .

1.2 Summary of Method: The 20-day static renewal test is performed using laboratory-cultured, 2-3 week post-emergence juvenile worms purchased from a supplier. Test sediments are placed in the bottom of 1-liter glass beakers used as test vessels which are then filled with clean seawater. Five replicate containers for each test sediment, reference sediment, and the control sediment, each containing 5 test organisms, are employed. During test setup, three subsamples of five worms each are randomly selected to provide an estimate of initial biomass. During the exposure period, each chamber is provided with 40 mg of food on an every-other-day basis. Every third day, one-third of the seawater in each chamber is exchanged with fresh seawater. Survival and growth are the response criteria used. The mean and standard deviation for each treatment and test endpoint are given in the final report. Between-treatment statistical comparisons may be made, where each treatment is compared to the control and/or reference sediment. This protocol is based on PSEP (1995) guidelines, PSDDA (PSDDA 1989, U.S. ACOE et al. 2000) modifications, and SMS guidelines (WDOE 2003).

2. STUDY MANAGEMENT

2.1 Sponsor's Name and Address:

_____
_____
_____
_____

2.2 Sponsor's Study Monitor:

_____

2.3 Name of Testing Laboratory:
Northwestern Aquatic Sciences
3814 Yaquina Bay Road, P.O. Box 1437
Newport, OR 97365.

2.4 Test Location: Newport Laboratory

2.5 Laboratory's Personnel to be Assigned to the Study:
Project Manager/Technical Director: _____
Qual. Assurance Officer: _____
Aquatic Toxicologist: _____
Aquatic Toxicologist: _____

2.6 Proposed Testing Schedule: Tests should begin within 2 weeks (8 weeks with samples under nitrogen for PSDDA or SMS) of sample collection. Reference toxicant test to be run concurrently.

2.7 Good Laboratory Practices: The test is conducted following the principles of Good Laboratory Practices (GLP) as defined in the EPA/TSCA Good Laboratory Practice regulations revised August 17, 1989 (40 CFR Part 792).

3. TEST MATERIAL

The test materials are marine or estuarine sediments. The collected sediments are placed in a suitable container for shipping and storage. The preferred container is a solvent and acid cleaned 1 L glass jar fitted with a TFE-lined screw cap. The jars are filled completely so that there is no air space. At the laboratory, the samples may be stored at 4°C in the dark in the original sealed containers for up to 2 weeks (8 weeks with no headspace or with samples under nitrogen for PSDDA or SMS) prior to testing. The negative control sediment is from a clean site. In addition, one or more reference sediments, clean sediments with physical characteristics similar to the test sediments, may also be employed.

4. TEST WATER

Test water is filtered Yaquina Bay seawater adjusted to a salinity of 28 ppt. The water is pumped from Yaquina Bay into a 6000 gal seasoned fiberglass reservoir from which it is supplied under pump pressure to the laboratory. Filtration is accomplished using a sand filter followed by 5 µm, 1µm, and 0.40µm cartridge filters. An alternative seawater supply of similar quality may be used.

5. TEST ORGANISMS

5.1 Species: *Neanthes arenaceodentata*

5.2 5.2. Source: *Neanthes* are obtained from laboratory cultures. California State University, Long Beach, Dept. of Biology is a source for purchasing these worms.

5.3 5.3. Laboratory Handling: Worms are received from the supplier in plastic bags containing seawater and algae (*Enteromorpha*). Upon receipt, water quality data are taken on 1 or 2 bags and all bags with worms are then placed in holding aquaria containing seawater at 20 ± 1°C, and the salinity is adjusted to 28 ± 2 ppt. Worms are generally maintained for 1-2 days prior to use in tests, but may be held longer if water changes are provided. Gentle aeration is supplied to the holding aquaria. During the holding period, organisms are fed ground TetraMarine® (approximately 0.1 g per 200-300 worms) on an every-other-day basis. If the food is not being consumed, feeding should be reduced. No water changes are required if holding time is less than 1 week.

5.4 Age at Study Initiation: 2-3 week post-emergence juveniles (0.5-1.0 mg dry weight).

6. DESCRIPTION OF TEST SYSTEM

6.1 Test Chambers and Environmental Control: Test chambers used in the toxicity test are 1000 ml glass beakers. The beakers are covered to minimize contamination and evaporation of seawater or loss of volatile compounds. Test chambers are maintained at constant temperature by partial immersion in a temperature-controlled water bath or by placement in a temperature-controlled room. Minimal aeration is supplied through a glass pipet. The aeration rate should be 150 - 300 mL/minute or approximately 100 bubbles per minute). The test is performed under continuous illumination, using ambient laboratory lighting of low to moderate intensity. SMS may require UV light for PAH-contaminated intertidal sediments.

6.2 Cleaning: All laboratory glassware, including test chambers, is cleaned as described in EPA/600/4-90/027F. New glassware and test systems are soaked 15 minutes in tap water and scrubbed with detergent (or cleaned in an automatic dishwasher); rinsed twice with tap water; carefully rinsed once with fresh, dilute (10%, V:V) hydrochloric or nitric acid to remove scale, metals, and bases; rinsed twice with deionized water; rinsed once with acetone to remove organic compounds (using a fume hood or canopy); and rinsed three times more with deionized water. Test systems and chambers are rinsed again with dilution water just before use.

7. EXPERIMENTAL DESIGN AND TEST PROCEDURES

7.1 Experimental Design: An experimental design is used consisting of exposure of test organisms to a number of test sediments, one or more reference sediments, and a control sediment. Each treatment consists of five replicate test chambers each containing 5 animals. An additional replicate containing 5 test organisms is used for daily water quality measurements. More replicates, with or without test organisms as appropriate, may be employed for periodic interstitial water quality measurements. Blind, random testing is used.

7.2 Preparation of Test Sediments: The interstitial salinity of the test, reference, and control sediments is measured. If initial interstitial salinities are not ≥20 ppt, the interstitial salinities must be adjusted as specified in the PSEP (1995) protocols.

Certain projects may require purging of excess ammonia from sediment interstitial water. PSDDA and SMS allow purging to be considered when interstitial total ammonia concentrations exceed specified limits. However, purging is allowed only by agency permission, so the decision to purge should be made by the client. Testing of purged sediments may require concurrent testing of the same sediments unpurged.

If no salinity adjustment or purging is done, sediments are used without further treatment. Each test sediment is mixed thoroughly using a non-contaminating implement, then an aliquot (175 ml) sufficient to make a 2-cm-deep layer is added to each test beaker, and the surface is smoothed. Bubbles are removed from the sediment by gently tapping each beaker against the palm of the hand. Seawater at the test temperature and salinity is carefully added into the beaker to the 750 ml mark utilizing a water dispersal technique to avoid suspending the sediment. The beakers are then placed into the water bath or constant-temperature room and covered with watchglasses. An air delivery pipet is inserted into each beaker under the watchglass. Overhead lights provide constant illumination. Water in the test beakers is aerated without disturbing the sediments. The test system is then allowed to temperature equilibrate overnight.

7.3 Beginning the Test: More worms than are needed for the bioassay are transferred to a shallow glass dish containing seawater of the test salinity and temperature. Worms are impartially distributed to a series of seawater-filled cups, each holding 5 worms. Enough cups for the test plus three additional cups are prepared. One container of 5 worms is randomly added to each replicate. Three of the cups containing worms are randomly selected and set aside. Worms from these cups are used to estimate initial total biomass. To determine initial total biomass, worms from these three cups are quickly rinsed with deionized water, placed on a preweighed aluminum pan, dried at 50°C to a constant weight, and weighed to the nearest 0.1 mg.

Once worms are added to a replicate, the number of animals that do not burrow into the test sediment within one hour is recorded. Worms not burrowed are removed and replaced with healthy worms, unless the observer believes the failure to burrow is a response to toxic material. Following addition of worms to the test chambers, additional water is added to achieve a final volume of 950 ml.

TetraMarine® is provided to each beaker (40 mg/beaker). The food is preweighed into plastic cups, wetted with bioassay test water, and rinsed into the test beakers.

7.4 Effects Criteria: Effects criteria are 1) survival after 20 days, 2) total biomass (dry weight), 3) average individual biomass (total biomass divided by the number of surviving worms), and 4) average individual growth rate.

7.5 Test Conditions: Test containers are maintained at a constant 20 ± 1°C. The test salinity is 28 ± 2 ppt. The dissolved oxygen concentration in each test container must be greater than 60% saturation (PSEP 1995) or 4.0 mg/L (PSDDA) throughout the 20-day test. Each beaker is supplied with oil-free compressed air provided at a rate of approximately 100 bubbles per minute through disposable glass pipettes. Each beaker is covered by a watchglass to minimize evaporation and the possibility of cross contamination between beakers. The test is conducted under constant illumination of moderate to low intensity.

During the 20-day exposure, one-third of the seawater in each beaker is replaced every third day. Prior to seawater replacement, water quality measurements are determined for one replicate test chamber for each test, reference, and control sediment. Water replacement is achieved by siphoning one-third of the volume of test water, then replacing it with fresh 28 ± 2 ppt test water that has been maintained at 20 ± 1 °C. Care should be taken not to disturb the sediments.

7.6 Feeding: Animals are fed 40 mg TetraMarine® per beaker on an every-other-day basis during the test.

7.7 Test Duration, Type and Frequency of Observations, and Methods: The duration of the sediment toxicity test is 20 days. The test chambers are observed daily to ensure that adequate aeration is provided and to note the general status of each chamber. The temperature of the environmental chamber should also be monitored daily. The type and frequency of observations to be made are summarized as follows:

TYPE OF OBSERVATION	TIMES OF OBSERVATION
Biological Data	
Survival	end of test
Biomass	end of test
Physical and Chemical Data	
Sediment interstitial salinity	at test beginning (bulk sediments) & end
Salinity, dissolved oxygen, pH, and temperature of overlying water (one replicate only)	day 0, day 20 and prior to partial replacement of test water every third day
Temperature in temperature beaker	daily
Ammonia and sulfides in overlying water (one replicate)	at test beginning & end; for PSDDA and SMS, on day 3 prior to seawater replacement *
Ammonia, sulfide, pH & salinity in interstitial water (optional)	for PSDDA and SMS, ammonia, pH, & salinity in bulk sediments; additional measurements as requested by client
Check air and lights	daily

*PSEP (1995) recommends ammonia-N and sulfide monitoring prior to the first and second water renewals when initial monitoring reveals >0.7 mg/L un-ionized ammonia or >5.0 mg/L sulfides.

Following the exposure period, worms from each chamber are removed from the test sediment by gently sieving the sediment through a 0.5 mm screen. Worms often are in their tubes and can be removed by gently prodding either end of the tube with a fine-point paintbrush. The number of surviving worms is recorded. Surviving worms are placed in a container of clean seawater until all chambers have been sieved. Then worms from each chamber are quickly rinsed with deionized water, placed on a pre-weighed aluminum pan, dried at 50°C to a constant weight, and weighed to the nearest 0.1 mg.

Dissolved oxygen is measured directly in test bakers using a polarographic oxygen probe calibrated according to the manufacturer's recommendations. The pH is measured using a properly calibrated pH meter with scale divisions of 0.1 pH units. Temperature is measured using a calibrated mercury thermometer or a telethermometer. Salinity is measured using a refractometer. The method used for the measurement of total ammonia-N in the overlying water and sediment porewater from sediment bioassays is based on the salicylate colorimetric method of Hach Chemical Co. and was adapted from Clin. Chim. Acta., 14: 403 (1966). The method used for the measurement of dissolved sulfide in the overlying water and sediment porewater in marine sediment bioassays is the methylene blue colorimetric method based on SM 4500-S^{2-} (Standard Methods 1995 [19th edition]). Any observed changes in sediment color or the formation of a sediment discontinuity layer is also recorded.

7.8 Criteria of Test Acceptance: For the test to be considered acceptable, mean mortality of organisms in the control treatment at the end of the test should be ≤10%

7.9 Performance criteria: For PSDDA and SMS, control sediment should have mean mortality ≤10% and target mean growth rate >0.72 mg/worm/day (failure if growth rate <0.38 mg/worm/day). Initial weight of worms should be 0.5-1.0 mg (failure if <0.25 mg). Reference sediment should have mean mortality ≤20% and mean growth rate ≥80% of the control sediment.

7.10 Reference Toxicant test: A routine reference toxicant test is run concurrently with each sediment test. This is normally a 96-hr test with cadmium chloride. PSDDA and SMS also require a water-only ammonia test when ammonia concentrations exceed specified limits.

8. DATA ANALYSIS

The mean and standard deviation are calculated for each endpoint employed (e.g. 20-day survival, 20-day total biomass, 20-day average individual biomass, and average individual growth rate) and for each treatment (i.e. test sediment). Between-treatment comparisons may be made using a Student's t-test, Wilcoxon's Two-Sample test, Mann-Whitney U test, or Rankit Analysis, where each treatment is compared to the control or the reference sediment. An arcsine-square root transformation of proportional data, and tests for normality and heterogeneity of variances, are performed prior to statistical comparisons.

9. REPORTING

A report of the test results must include the following information: name and identification of the test; the investigator and laboratory; information on the test, reference, and control sediments including the initial and final interstitial salinities; information on the source of seawater used; detailed information about the test organisms including acclimation conditions; a description of the experimental design and test chambers and other test conditions including water quality; information about any aeration that may have been required; definition of the effect criteria and other observations; unusual responses, if any, in the control treatment; 20-day survival in each exposure chamber and the mean and standard deviation for each treatment; initial total biomass (dry weight) for three groups of five worms; 20-day total biomass (dry weight) in each exposure chamber and the mean and standard deviation for each treatment; 20-day average individual biomass (dry weight) in each exposure chamber and the mean and standard deviation for each treatment; average individual growth rate in each exposure chamber and the mean and standard deviation for each treatment; 96-hour LC50 with reference toxicant; a description of data analysis methods employed and documentation of statistical test results: any unusual information about the test or deviations from procedures.

10. STUDY DESIGN ALTERATION

Amendments made to the protocol must be approved by the sponsor and study director and should include a description of the change, the reason for the change, the date the change took effect, and the dated signatures of the study director and sponsor. Any deviations in the protocol must be described and recorded in the study raw data.

11. REFERENCED PROCEDURES

Johns, D.M., T.C. Ginn, and D.R. Reish. 1990. Protocol for juvenile Neanthes sediment bioassay. Prepared for U.S. Env. Prot. Agency, Region 10 -Office of Puget Sound, Seattle, WA, 17 pp.

Puget Sound Dredged Disposal Analysis (PSDDA). 1989. Management plan report - unconfined open-water disposal of dredged material, Phase II - (north and south Puget Sound). Puget Sound Dredged Disposal Analysis, Army Corps of Engineers, Seattle, WA. (and other modifications made through the PSDDA process and Sediment Management Annual Review Meetings).

Puget Sound Estuary Program. 1995. Recommended guidelines for conducting laboratory bioassays on Puget Sound sediments. Prepared for U.S. Env. Prot. Agency, Region 10, Office of Puget Sound, Seattle, WA, and Puget Sound Water Quality Authority, Olympia, WA.

Snedecor, G.W. and W.G. Cochran. 1967. Statistical methods. Sixth Ed., The Iowa State Univ. Press. Ames, Iowa., 593 pp.

U.S. Army Corps of Engineers, Seattle District; U.S. EPA, Region 10; Washington Department of Natural Resources; Washington Department of Ecology. 2000. Dredged material evaluation and disposal procedures: a user's manual for the dredged disposal analysis (PSDDA) program.

Washington State Department of Ecology. 2003. Sediment sampling and analysis plan appendix. Publication no. 03-09-043, WDOE, Olympia, WA.

Weber, C.I. (Ed.) 1991. Methods for measuring the acute toxicity of effluents to freshwater and marine organisms (fourth edition). EPA/600/4-90/027.

12. APPROVALS

_____ for _____
Name Date

_____ for **NORTHWESTERN AQUATIC SCIENCES**
Name Date

APPENDIX II

RAW DATA

TEST DESCRIPTION, MONITORING, AND RESULTS BENCHSHEETS

NORTHWESTERN AQUATIC SCIENCES

PROTOCOL NO. NAS-XXX-NA4

NEANTHES SP. 20-DAY SOLID PHASE SEDIMENT TEST

Test No. 774-2 Client Hart Crowser Investigator reviewed pp. 1-38 MLR 10-27-08

STUDY MANAGEMENT

Client: Hart Crowser, Inc., 1700 Westlake Ave. N, Suite 200, Seattle, WA 98109-3056

Client's Study Monitor: Mr. Roger McGinnis

Testing Laboratory: Northwestern Aquatic Sciences

Test Location: Newport Laboratory

Laboratory's Study Personnel:

Proj. Man./Study Dir. M.S. Redmond MLR

QA Officer L.K. Nemeth

1. Lidia P. Sandoval LPS
2. GABuhler
3. Susan Gage sg
4. G.J. IRISSARRI GJI
5.
6.
7.
8.

Study Schedule:

Test Beginning: 9-10-08 11:15 Test Ending: 9-30-08 10:30

TEST MATERIAL

General description (see sample logbook/chain-of-custody for details):

NAS Sample No.:	2041G	2042G	2043G	2044G	2045G
Description:	Samish Bay Ref	BBP-SS-01	BBP-SS-02	RGH-SS-01	RGH-SS-03
Collection Date:	8/29/08	8/26/08	8/26/08	8/26/08	8/26/08
Receipt Date:	9/4/08	9/4/08	9/4/08	9/4/08	9/4/08
Inters.Salinity (ppt):	30.5	24.5	25.0	23.5	25.0
____:					

NAS Sample No.:					
Description:					
Collection Date:					
Receipt Date:					
Inters.Salinity (ppt):					
____:					

NAS Sample No.:					
Description:					
Collection Date:					
Receipt Date:					
Inters.Salinity (ppt):					
____:					

NAS Sample No.:					
Description:					
Collection Date:					
Receipt Date:					
Inters.Salinity (ppt):					
____:					

Error codes: 1) correction of handwriting error
2) written in wrong location; entry deleted
3) wrong date deleted, replaced with correct date
4) error found in measurement; measurement repeated

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-NA4

NEANTHES SP. 20-DAY SOLID PHASE SEDIMENT TEST

Test No. 774-2 Client Hart Crowser Investigator

SEDIMENT DESCRIPTIONS -- SUPPLEMENTAL NOTES

Sample No.	Description
2041G	dark gray muddy sand with a few worms
2042G	black muddy sand with worms and organic debris, shell material
2043G	charcoal gray muddy sand with some worms; shell material
2044G	black sandy gravel with bivalves; shell debris
2045G	dark brown sandy gravel with bivalves and a few worms.
2046G	Brown sand

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-NA4

NEANTHES SP. 20-DAY SOLID PHASE SEDIMENT TEST

Test No. 774-2 Client Hart Crowser Investigator

TEST WATER

Source: Yaquina Bay, Oregon, sea water

Date(s) of Collection: 9-9-08 Salinity (ppt) 27.0 pH 8.1

Treatments: filtered to 0.4 µm, salinity-adjusted with MilliQ deionized water, aerated

TEST ORGANISMS

Species: *Neanthes arenaceodentata* Date received: 9-9-08

Source: Dept. of Biology, CA State University, Long Beach, CA

Acclimation Data:

Date	Temp. (deg.C)	pH	Sal (ppt)	DO (mg/L)	Feeding amount	Feeding description	Water changes	Comments
9-9-08	18.8	7.5	26.5	6.8	0.1g/one tank	Tetramarine	yes, ~ 3/3	receiving water
9-10-08	20.4	8.0	30.0	7.1				
Mean	19.6	7.8	28.3	7.0				
S.D.	–	–	–	–				
(N)	(2)	(2)	(2)	(2)				

Photoperiod during acclimation: constant light

TEST PROCEDURES AND CONDITIONS

Test chambers: 1 L glass beakers covered with watchglasses

Test volumes: 175 ml of test sediment; 950 ml total volume

Replicates/treatment: (5) 5 Organisms/treatment: (25) 25

Test water changes: Every third day beginning with day 3

Aeration: yes, 3 cm below water surface

Feeding: every other day beginning with day zero

Test temperature (deg.C): 20

Beaker placement: Total randomization

Photoperiod: Constant light

Salinity: 28 +/- 2 ppt

Additional replicates included for water quality purposes (indicate numbers of each that apply):

1 Water quality beaker (with test organisms; may also be day 20 sacrificial beaker)

_____ Day zero sacrificial beaker (no test organisms)

_____ Day _____ sacrificial beaker(s) (with test organisms)

Control Sediment:

Source: Yaquina Bay, Oregon; from *Eohaustorius* collection site

Date collected: 9-4-08 Interstitial salinity: 33.5 ‰

Sieved through 0.5 -mm screen

Storage: 4°C in the dark NAS# 2046G

MISCELLANEOUS NOTES

Light intensity measurements:

Date	Location in room	foot-candles
9-12-08	beaker # 14	14.4
	29	22.6

NORTHWESTERN AQUATIC SCIENCES
PROTOCOL NO. NAS-XXX-NA4
NEANTHES SP. 20-DAY SOLID PHASE SEDIMENT TEST

Test No. 774-2 Client Hart Crowser Investigator _____

Test conducted in (circle one): room 1 room 2 (trailer) water bath other:_____

Randomization chart:

			3	6			33	36	
			2	5	→	→	32	35	
			1	4			31	34	

top shelf; wall; → door

Randomization chart:

Randomization chart:

Randomization chart:

TEST SCHEDULE SUMMARY

Date	9-10-08	9-11-08	9-12-08	9-13-08	9-14-08	9-15-08	9-16-08	9-17-08	9-18-08	9-19-08	9-20-08	9-21-08	9-22-08	9-23-08	9-24-08	9-25-08	9-26-08	9-27-08	9-28-08	9-29-08	9-30-08
Day	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Feed	x		x		x		x		x		x		x		x		x		x		
Record WQ	x			x			x			x			x			x			x		x
Change water				x			x			x			x			x			x		
Overlying NH4,S	x			NH3																	x
Initials	GJ	GJ	MR	MR	LPS	MR	MR	AF	LPS	AF	LPS	KM	AF	AF	LPS	LPS	LPS	GJ	MR	AF	MR
Porewater NH4, ppt, pH	MR 9-10-08 X																				ppt only
Initials																					

NORTHWESTERN AQUATIC SCIENCES
PROTOCOL NO. NAS-XXX-NA4
NEANTHES SP. 20-DAY SOLID PHASE SEDIMENT TEST

Test No. 774-2 Client Hart Crowser Investigator

DAILY RECORD SHEET

Day 0 (9/10/08) MR/LPS Temperature beaker: 20.3 deg.C

air okay? (if not, details in comments below) yes
water change? (every third day) —
fed? (every second day) YES

overlying ammonia sampled? yes
(days 0,3,20)

Beaker No.	Temp. (deg.C)	pH	Sal. (ppt)	DO (ppm)	S (mg/L)	No. not buried	Comments
1						0	
2						0	
3						0	
4						0	
* 5	20.5	8.0	27.0	7.2	<0.02	0	
* 6	20.2	8.1	27.0	7.3	<0.02	0	
7						0	
8						0	
9						0	
10						0	
11						0	
12						0	
13						0	
* 14	20.3	8.0	27.0	7.0	<0.02	0	
15						0	
16						0	
17						0	
* 18	20.3	7.9	27.0	6.8	<0.02	0	
19						0	
20						0	
21						0	
22						0	
* 23	20.3	7.9	27.0	6.4	<0.02	0	
24						0	
25						0	
26						0	
* 27	20.2	8.0	27.0	7.0	<0.02	0	
28						0	
29						0	
30						0	
31						0	
32						0	
33						0	
34						0	
35						0	
36						0	

* Water quality beakers

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-NA4

NEANTHES SP. 20-DAY SOLID PHASE SEDIMENT TEST

Test No. 774-2 Client Hart Crowser Investigator _____

DAILY RECORD SHEET

Day 1 (9/11/08) 631 Temperature beaker: 20.3 deg.C

air okay? (if not, details in comments below) YES

water change? (every third day) –

fed? (every second day) –

Beaker No.	Temp. (deg.C)	pH	Sal. (ppt)	DO (ppm)	Comments
5					
6					
14					
18					
23					
27					

Day 2 (9/12/08) 631 Temperature beaker: 20.5 deg.C

air okay? (if not, details in comments below) YES

water change? (every third day) –

fed? (every second day) yes

Beaker No.	Temp. (deg.C)	pH	Sal. (ppt)	DO (ppm)	Comments
5					
6					
14					
18					
23					
27					

NORTHWESTERN AQUATIC SCIENCES
PROTOCOL NO. NAS-XXX-NA4

NEANTHES SP. 20-DAY SOLID PHASE SEDIMENT TEST

Test No. 774-2 Client Hart Crowser Investigator

DAILY RECORD SHEET

Day 3 (9/13/08) 655/mlr Temperature beaker: 20.3 deg.C

air okay? (if not, details in comments below) YES overlying NH3 sampled (days 0,3,20)? YES

water change? (every third day) yes

fed? (every second day) –

Beaker No.	Temp. (deg.C)	pH	Sal. (ppt)	DO (ppm)	Comments
5	20.6	7.8	28.5	6.1	
6	20.5	7.8	28.0	6.2	
14	20.3	8.0	28.0	6.1	
18	20.4	7.9	28.0	5.8	
23	20.4	7.9	28.0	5.5	
27	20.3	7.9	27.5	5.8	

Day 4 (9/14/08) 645 Temperature beaker: 19.6 deg.C

air okay? (if not, details in comments below) YES

water change? (every third day) NO

fed? (every second day) YES

Beaker No.	Temp. (deg.C)	pH	Sal. (ppt)	DO (ppm)	Comments
5					
6					
14					
18					
23					
27					

NORTHWESTERN AQUATIC SCIENCES
PROTOCOL NO. NAS-XXX-NA4
NEANTHES SP. 20-DAY SOLID PHASE SEDIMENT TEST

Test No. 774-2 Client Hart Crowser Investigator

DAILY RECORD SHEET

Day 5 (9/15/08) MLR Temperature beaker: 20.6 deg.C

air okay? (if not, details in comments below) all but #27 ok
water change? (every third day) —
fed? (every second day) —

Beaker No.	Temp. (deg.C)	pH	Sal. (ppt)	DO (ppm)	Comments
5					
6					
14					
18					
23					
27	at 8:50			1.8	air off to #27; restarted 8:50
27	at 10:45			6.7	

Day 6 (9/16/08) MLR Temperature beaker: 20.2 deg.C

air okay? (if not, details in comments below) yes
water change? (every third day) yes
fed? (every second day) yes

Beaker No.	Temp. (deg.C)	pH	Sal. (ppt)	DO (ppm)	Comments
5	20.6	7.9	30.0	6.0	
6	20.6	7.8	30.0	6.1	
14	20.2	8.3	29.5	6.2	
18	20.4	8.2	29.0	6.0	
23	20.3	8.3	29.0	6.1	
27	20.4	8.3	28.5	6.4	

NORTHWESTERN AQUATIC SCIENCES
PROTOCOL NO. NAS-XXX-NA4
NEANTHES SP. 20-DAY SOLID PHASE SEDIMENT TEST

Test No. 774-2 Client Hart Crowser Investigator _____

Day 7 (9/17/08) sf DAILY RECORD SHEET

Temperature beaker: 20.4 deg.C

air okay? (if not, details in comments below) ok
water change? (every third day) –
fed? (every second day) –

Beaker No.	Temp. (deg.C)	pH	Sal. (ppt)	DO (ppm)	Comments
5					
6					
14					
18					
23					
27					

Day 8 (9/18/08) sf

Temperature beaker: 20.5 deg.C

air okay? (if not, details in comments below) ok
water change? (every third day) –
fed? (every second day) yes

Beaker No.	Temp. (deg.C)	pH	Sal. (ppt)	DO (ppm)	Comments
5					
6					
14					
18					
23					
27					

NORTHWESTERN AQUATIC SCIENCES
PROTOCOL NO. NAS-XXX-NA4

NEANTHES SP. 20-DAY SOLID PHASE SEDIMENT TEST

Test No. 774-2 Client Hart Crowser Investigator _____

DAILY RECORD SHEET

Day 9 (9/19/08) MF Temperature beaker: 20.3 deg.C

air okay? (if not, details in comments below) OK
water change? (every third day) Yes
fed? (every second day) —

Beaker No.	Temp. (deg.C)	pH	Sal. (ppt)	DO (ppm)	Comments
5	20.7	7.9	29.0	5.5	
6	20.5	7.8	29.0	6.0	
14	20.3	8.4	29.0	6.1	
18	20.3	8.1	29.0	5.4	
23	20.4	8.3	28.5	5.9	
27	20.1	8.3	28.5	6.2	

Day 10 (9/20/08) MER Temperature beaker: 20.2 deg.C

air okay? (if not, details in comments below) yes
water change? (every third day) —
fed? (every second day) yes

Beaker No.	Temp. (deg.C)	pH	Sal. (ppt)	DO (ppm)	Comments
5					
6					
14					
18					
23					
27					

NORTHWESTERN AQUATIC SCIENCES
PROTOCOL NO. NAS-XXX-NA4

NEANTHES SP. 20-DAY SOLID PHASE SEDIMENT TEST

Test No. 774-2 Client Hart Crowser Investigator

DAILY RECORD SHEET

Day 11 (9/24/08) MS Temperature beaker: 19.9 deg.C

air okay? (if not, details in comments below) yes
water change? (every third day) —
fed? (every second day) —

Beaker No.	Temp. (deg.C)	pH	Sal. (ppt)	DO (ppm)	Comments
5					
6					
14					
18					
23					
27					

Day 12 (9/25/08) SF Temperature beaker: 20.7 deg.C

air okay? (if not, details in comments below) ok
water change? (every third day) Yes
fed? (every second day) Yes

Beaker No.	Temp. (deg.C)	pH	Sal. (ppt)	DO (ppm)	Comments
5	20.8	8.0	30.5	6.1	
6	20.9	8.0	29.5	6.5	
14	20.7	8.5	30.5	6.3	
18	20.8	8.3	30.0	5.6	
23	20.6	8.5	30.5	6.2	
27	20.5	8.5	30.0	6.4	

NORTHWESTERN AQUATIC SCIENCES
PROTOCOL NO. NAS-XXX-NA4
NEANTHES SP. 20-DAY SOLID PHASE SEDIMENT TEST

Test No. 774-2 Client Hart Crowser Investigator

Day 13 (9/12/08) SF
DAILY RECORD SHEET
Temperature beaker: 20.0 deg.C

air okay? (if not, details in comments below) OK
water change? (every third day) –
fed? (every second day) –

Beaker No.	Temp. (deg.C)	pH	Sal. (ppt)	DO (ppm)	Comments
5					
6					
14					
18					
23					
27					

Day 14 (9/24/08) LS
Temperature beaker: 20.1 deg.C

air okay? (if not, details in comments below) OK
water change? (every third day) –
fed? (every second day) yes

Beaker No.	Temp. (deg.C)	pH	Sal. (ppt)	DO (ppm)	Comments
5					
6					
14					
18					
23					
27					

NORTHWESTERN AQUATIC SCIENCES
PROTOCOL NO. NAS-XXX-NA4
NEANTHES SP. 20-DAY SOLID PHASE SEDIMENT TEST

Test No. 774-2 Client Hart Crowser Investigator

DAILY RECORD SHEET

Day 15 (9/25/08) LPS
Temperature beaker: 20.7 deg.C

air okay? (if not, details in comments below) yes
water change? (every third day) yes
fed? (every second day) –

Beaker No.	Temp. (deg.C)	pH	Sal. (ppt)	DO (ppm)	Comments
5	20.9	7.9	29.5	5.5	
6	~~20.9~~ 20.6	7.9	30.0	6.1	
14	20.7	8.4	30.0	5.8	
18	20.6	8.1	29.5	5.1	
23	20.8	8.4	30.0	~~5.9~~ 5.9	LPS ①
27	20.6	8.3	~~30.0~~ 30.5	6.2	

4S④ 9.25.08

L S① 25.09

Day 16 (9/26/08) LPS
Temperature beaker: 20.4 deg.C

air okay? (if not, details in comments below) yes
water change? (every third day) –
fed? (every second day) yes

Beaker No.	Temp. (deg.C)	pH	Sal. (ppt)	DO (ppm)	Comments
5					
6					
14					
18					
23					
27					

NORTHWESTERN AQUATIC SCIENCES
PROTOCOL NO. NAS-XXX-NA4

NEANTHES SP. 20-DAY SOLID PHASE SEDIMENT TEST

Test No. 774-2 Client Hart Crowser Investigator _____

DAILY RECORD SHEET

Day 17 (9/27/08) GS Temperature beaker: 20.5 deg.C

air okay? (if not, details in comments below) YES
water change? (every third day) –
fed? (every second day) –

Beaker No.	Temp. (deg.C)	pH	Sal. (ppt)	DO (ppm)	Comments
5					
6					
14					
18					
23					
27					

Day 18 (9/28/08) MSR Temperature beaker: 20.6 deg.C

air okay? (if not, details in comments below) yes
water change? (every third day) yes
fed? (every second day) yes

Beaker No.	Temp. (deg.C)	pH	Sal. (ppt)	DO (ppm)	Comments
5	20.7	7.9	30.0	5.8	
6	20.7	8.0	30.0	6.3	
14	~~20.6~~ 20.6 MSR 9-28-08	8.5	30.5	5.9	
18	20.6	8.2	30.0	5.7	
23	20.7	8.5	30.5	5.8	
27	20.6	8.3	30.0	6.2	

NORTHWESTERN AQUATIC SCIENCES
PROTOCOL NO. NAS-XXX-NA4
NEANTHES SP. 20-DAY SOLID PHASE SEDIMENT TEST

Test No. 774-2 Client Hart Crowser Investigator

Day 19 (9/29/08) JS

DAILY RECORD SHEET

Temperature beaker: 20.7 deg.C

air okay? (if not, details in comments below) OK
water change? (every third day) —
fed? (every second day) —

Beaker No.	Temp. (deg.C)	pH	Sal. (ppt)	DO (ppm)	Comments
5					
6					
14					
18					
23					
27					

Day 20 (9/30/08) MR

Temperature beaker: 20.7 deg.C

air okay? (if not, details in comments below) yes
water change? (every third day) —
fed? (every second day) —

overlying NH3 sampled (days 0,3,20)? yes

Beaker No.	Temp. (deg.C)	pH	Sal. (ppt)	DO (ppm)	S (mg/L)	Comments
5	20.9	8.1	30.0	6.4	<0.02	
6	20.8	7.9	30.0	6.2	<0.02	
14	20.7	8.4	30.5	5.7	<0.02	
18	20.7	8.4	30.0	6.4	<0.02	
23	20.7	8.4	30.0	5.8	<0.02	
27	20.6	8.3	30.0	6.1	<0.02	

NORTHWESTERN AQUATIC SCIENCES
PROTOCOL NO. NAS-XXX-NA4
NEANTHES SP. 20-DAY SOLID PHASE SEDIMENT TEST

Test No 774-2 Client Hart Crowser Investigator

DAY 10 TEST TERMINATION SHEET

Beaker No.	Interstitial Salinity	No. of survivors	Initial	Comment
1		5	GAB	
2		5	GAB	
3		5	GAB	
4		3	GAB	
5	30.0			
6	30.0			
7		5	GAB	
8		5	MSR	
9		5	GAB	
10		5	GAB	
11		4	GAB	
12		5	GAB	
13		5	MSR	
14	30.5			
15		5	GAB	
16		5	MSR	
17		5	GAB	
18	30.0			
19		5	GAB	
20		5	GAB	
21		5	GAB	
22		5	MSR	
23	30.5			
24		5	GAB	
25		5	GAB	
26		5	MSR	
27	30.0			
28		5	GAB	
29		5	GAB	
30		5	GAB	
31		5	GAB	
32		5	MSR	
33		5	GAB	
34		5	GAB	
35		5	GAB	
36		5	GAB	

Beaker No.	Interstitial Salinity	No. of survivors	Initial	Comment

* Water quality beakers

Test No. 774-2 Client Hart Crowser Investigator

ZERO-TIME WEIGHING DATA SHEET

Tare: Date 9-9-08 Oven temp (C.) 50 Drying time (hr.) 20 Initials JDF
Standard Weights: 10 mg: 10.003 100mg: 100.017

Final: Date 9-12-08 Oven temp (C.) 50 Drying time (hr.) 23 Initials MSR
Standard Weights: 10 mg: 10.007 100mg: 100.022

Equip. used: Oven: Blue M #2 Balance: Sartorius M3P

(Dry overnight at 50 degrees C)

Pan #	Tare wt. (mg)	Total wt. (mg)	#weighed	Comments
1	50.73	54.72	5	
2	51.65	54.75	5	
3	50.19	51.48	5	

NORTHWESTERN AQUATIC SCIENCES
PROTOCOL NO. NAS-XXX-NA4

NEANTHES SP. 20-DAY SOLID PHASE SEDIMENT TEST

Test No. 774-2 Client Hart Crowser Investigator

WEIGHING DATA SHEET

Tare:	Date 9-16-08 Standard Weights:	Oven temp (C.) 49-51 10 mg: 10.003	Drying time (hr.) 24 100mg: 100.014	Initials JRF	
Final #1:	Date 10-1-08 Standard Weights:	Oven temp (C.) 50-51 10 mg: 10.003	Drying time (hr.) 23 100mg: 100.017	Initials MJR	
Final #2:	Date 10-1-08 Standard Weights:	Oven temp (C.) 50-55 10 mg: 10.003	Drying time (hr.) 2 100mg: 100.017	Initials MJR	
Final #3:	Date 10-2-08 Standard Weights:	Oven temp (C.) 49-51 10 mg: 10.005	Drying time (hr.) 2. 100mg: 100.019	Initials MJR	

Equip. used: Oven Blue M #2 Balance Sartorius M3P

(Dry overnight at 50 degrees C)

Bkr. #	Pan #	Tare wt. (mg)	Total wt. (mg) 1	2	3	no. weighed	put into pans-initials	Comments
1	1	93.14	196.33	196.16	196.13	5	LPS	
2	2	90.55	201.72	201.28	201.19	5	LPS	
3	3	96.65	187.25	186.86	186.80	5	LPS	
4	4	96.26	147.89	147.76	147.81	3	LPS	
5	5							
6	6							
7	7	85.16	186.83	186.48	186.49	5	LPS	
8	8	85.17	153.18	153.00	153.13	5	LPS	
9	9	89.11	192.06		191.92	5	LPS	
10	10	90.51	162.73		162.62	~~10~~ 5	LPS	LPS@9-30-08
11	11	90.15	157.35		157.35	4	LPS	
12	12	96.87	209.29		209.18	5	LPS	
13	13	87.52	206.98		206.77	5	LPS	
14	14							
15	15	86.73	171.44		171.29	5	LPS	
16	16	86.34	183.40		183.23	5	LPS	
17	17	95.29	208.54		207.87	5	LPS	
18	18							
19	19	90.65	180.47		180.39	5	LPS	
20	20	93.89	205.16		204.95	5	LPS	
21	21	93.27	156.05		156.08	5	LPS	
22	22	92.46	153.98		154.02	5	LPS	
23	23							
24	24	91.11	214.21		214.26	5	LPS	
25	25	90.07	154.49		154.47	5	LPS	
26	26	88.68	191.80		191.78	5	LPS	
27	27							
28	28	91.35	183.91		183.84	5	LPS	
29	29	99.06	203.76		203.60	5	LPS	
30	30	91.92	201.65		201.41	5	LPS	
31	31	89.41	153.50		153.60	5	LPS	
32	32	85.72	140.14		140.52	5	LPS	
33	33	87.38	177.59		177.87	5	LPS	

* Water quality beakers

NORTHWESTERN AQUATIC SCIENCES PROTOCOL NO. NAS-XXX-NA4

NEANTHES SP. 20-DAY SOLID PHASE SEDIMENT TEST

Test No. 774-2 Client Hart Crowser Investigator

WEIGHING DATA SHEET

See page 18 for information on drying times and temperatures, standard weights,etc.

Bkr. #	Pan #	Tare wt. (mg)	Total wt. (mg) 1	2	3	no. weighed	put into pans-initials	Comments
34	34	90.75	200.89		201.32	5	LPS	
35	35	88.77	186.91		187.11	5	LPS	
36	36	95.66	183.69		184.01	5	LPS	

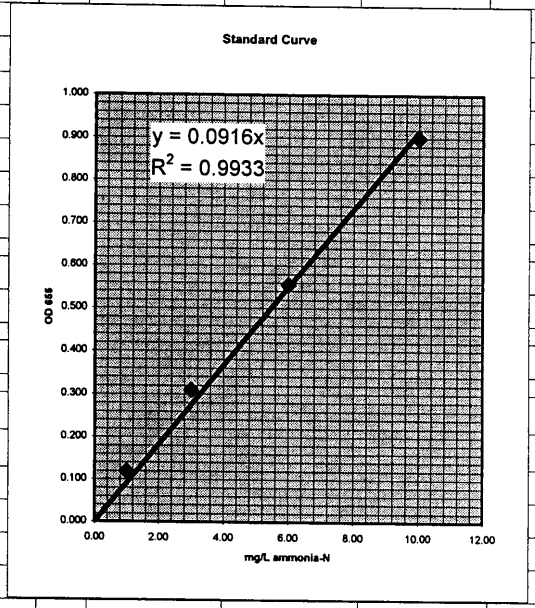
* Water quality beakers

Total Ammonia-N in Water: Computation Worksheet

Salicylate Method (SOP #5492)

Result

	Sample description	Dilution factor	OD_{655}	NH_3-N (mg/L)
	Blank	-----	-----	-----
	1.0 mg/L NH_3-N Std.	-----	0.119	1.00
	3.0 mg/L NH_3-N Std.	-----	0.310	3.00
	6.0 mg/L NH_3-N Std.	-----	0.555	6.00
	10.0 mg/L NH_3-N Std.	-----	0.900	10.00
	3.0 mg/L spike	-----		
	3.0 mg/L spike dupl.	-----	0.315	3.43
	5.0 mg/L 2nd source	-----	0.510	5.56
	Day 0 (9/10/08)			
	Beaker number:			
1.	5	1	0.098	1.07
2.	6	1	0.015	0.16
3.	14	1	0.254	2.77
4.	18	1	0.162	1.76
5.	23	1	0.090	0.98
6.	27	1	0.231	2.52
	Day 3 (9/13/08)			
7.	5	1	0.285	3.10
8.	6	1	0.194	2.11
9.	14	1	0.630	6.86
10.	18	1	0.418	4.55
11.	23	1	0.291	3.17
12.	27	1	0.522	5.69
	Day 20 (9/30/08)			
13.	5	1	0.040	0.44
14.	6	1	0.235	2.56
15.	14	1	0.193	2.10
16.	18	1	0.265	2.89
17.	23	1	0.292	3.18
18.	27	1	0.097	1.06
19.				
20.				
21.				
22.				
23.				
24.				
25.				
26.				
27.				
28.				
29.				
30.				



Reporting limit (mg/L) =	0.1
Recovery (%) =	#VALUE!
Precision (RPD) =	#VALUE!
2nd source (%) =	111.1
Sample volume (ml):	0.50
Dilution factor	1

Sample Set Description:

Test No.: 774-2
Test Day: 0, 3, and 20
Species: *Neanthes*
Proj. No.: P774

Overlying water

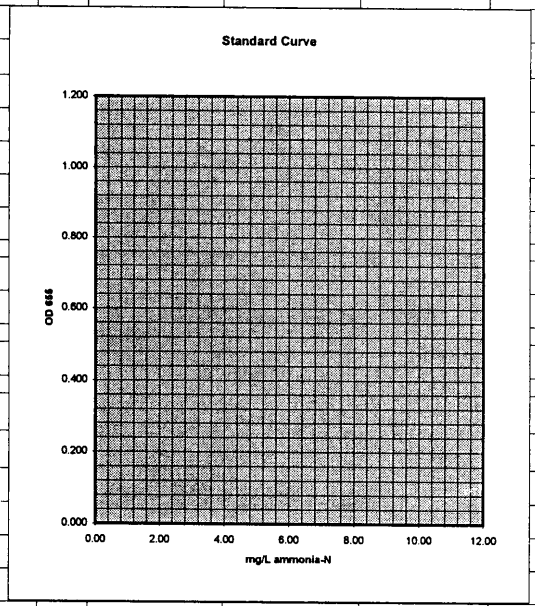
Analyst: msr
Date analysed: 10/2/08

Total Ammonia-N in Water: Computation Worksheet

Salicylate Method (SOP #5492)

Result

	Sample description	Dilution factor	OD655	NH_3-N (mg/L)
	Blank	-----	-----	-----
	1.0 mg/L NH_3-N Std.	-----	0.119	1.00
	3.0 mg/L NH_3-N Std.	-----	0.310	3.00
	6.0 mg/L NH_3-N Std.	-----	0.555	6.00
	10.0 mg/L NH_3-N Std.	-----	0.900	10.00
	3.0 mg/L spike	-----	not new	
	3.0 mg/L spike dupl.	-----	0.315	
	5.0 mg/L 2nd source	-----	0.510	
	Day 0 (9/10/08)			
	Beaker number:			
1.	5	1	0.098	
2.	6	1	0.015	
3.	14	1	0.254	
4.	18	1	0.162	
5.	23	1	0.090	
6.	27	1	0.231	
	Day 3 (9/13/08)			
7.	5	1	0.285	
8.	6	1	0.194	
9.	14	1	0.630	
10.	18	1	0.418	
11.	23	1	0.291	
12.	27	1	0.522	
	Day 20 (9/30/08)			
13.	5	1	0.040	
14.	6	1	0.235	
15.	14	1	0.193	
16.	18	1	0.265	
17.	23	1	0.292	
18.	27	1	0.097	
19.				
20.				
21.				
22.				
23.				
24.				
25.				
26.				
27.				
28.				
29.				
30.				



Reporting limit (mg/L) =	0.1
Recovery (%) =	#VALUE!
Precision (RPD) =	#VALUE!
2nd source (%) =	#VALUE!
Sample volume (ml):	0.50
Dilution factor	1

Sample Set Description:

Test No.: 774-2
Test Day: 0, 3, and 20
Species: *Neanthes*
Proj. No.: P774
Overlying water

Analyst: MLR
Date analysed: 10/2/08

TEST DATA ANALYSIS RECORDS

BKR	NAS SMPL	CLIENT DESCRIP	REPL	
29	2041G	Samish Bay Ref	1	
10	2041G	Samish Bay Ref	2	
17	2041G	Samish Bay Ref	3	
19	2041G	Samish Bay Ref	4	
3	2041G	Samish Bay Ref	5	
5	2041G	Samish Bay Ref	6	wq replicate
7	2042G	BBP-SS-01	1	
12	2042G	BBP-SS-01	2	
2	2042G	BBP-SS-01	3	
8	2042G	BBP-SS-01	4	
31	2042G	BBP-SS-01	5	
14	2042G	BBP-SS-01	6	wq replicate
35	2043G	BBP-SS-02	1	
32	2043G	BBP-SS-02	2	
22	2043G	BBP-SS-02	3	
20	2043G	BBP-SS-02	4	
26	2043G	BBP-SS-02	5	
27	2043G	BBP-SS-02	6	wq replicate
30	2044G	RGH-SS-01	1	
11	2044G	RGH-SS-01	2	
21	2044G	RGH-SS-01	3	
16	2044G	RGH-SS-01	4	
25	2044G	RGH-SS-01	5	
23	2044G	RGH-SS-01	6	wq replicate
15	2045G	RGH-SS-03	1	
4	2045G	RGH-SS-03	2	
28	2045G	RGH-SS-03	3	
33	2045G	RGH-SS-03	4	
36	2045G	RGH-SS-03	5	
18	2045G	RGH-SS-03	6	wq replicate
24	2046G	control	1	
1	2046G	control	2	
9	2046G	control	3	
13	2046G	control	4	
34	2046G	control	5	
6	2046G	control	6	wq replicate

Endpoints Data Entry and Calculations File

BKR=beaker number (=pan number)
INIT NO.=initial number of worms exposed
FINAL IW PPT=interstitial salinity in ppt on day 20
SURV=number of worms surviving after 20 days
MORT=number of worms dead after 20 days
INIT WT=mean weight of worms sampled on day zero (mg)
TARE WT=weight of pan used for that replicate on day 20 (mg)
WT COUNT=number of worms weighed at test end
FINAL WT=TARE WT + weight of worms recovered on day 20 (mg)
PSURV=% SURV=100(SURV/INIT NO.)
PMORT=%MORT=100(MORT/INIT NO.)
TWT=total biomass=FINAL-TARE
WT=individual biomass=TWT/WT COUNT
GR=individual growth rate=(WT-INIT WT)/20

INIT WT

pan#	tare wt	total wt	# weighed	individual wt
1	50.73	54.72	5	0.80
2	51.65	54.75	5	0.62
3	50.19	51.48	5	0.26
			MEAN	0.56

Data entry verified against laboratory bench sheets
MSR 10-7-08

INDEX	BKR	NAS SMPL	CLIENT DESCRIP	REPL		INIT NO.	FINAL IW PPT	SURV	MORT	INIT WT	TARE WT	WT COUNT	FINAL WT	PSURV	PMORT	TWT	WT	GR
1	29	2041G	Samish Bay Ref	1		5		5	0	0.56	99.06	5	203.60	100.0	0.0	104.5	20.9	1.02
2	10	2041G	Samish Bay Ref	2		5		5	0	0.56	90.51	5	162.62	100.0	0.0	72.1	14.4	0.69
3	17	2041G	Samish Bay Ref	3		5		5	0	0.56	95.29	5	207.87	100.0	0.0	112.6	22.5	1.10
4	19	2041G	Samish Bay Ref	4		5		5	0	0.56	90.65	5	180.39	100.0	0.0	89.7	17.9	0.87
5	3	2041G	Samish Bay Ref	5		5		5	0	0.56	96.65	5	186.80	100.0	0.0	90.2	18.0	0.87
6	5	2041G	Samish Bay Ref	6	wq repl	5	30.0											
7	7	2042G	BBP-SS-01	1		5		5	0	0.56	85.16	5	186.49	100.0	0.0	101.3	20.3	0.99
8	12	2042G	BBP-SS-01	2		5		5	0	0.56	96.87	5	209.18	100.0	0.0	112.3	22.5	1.10
9	2	2042G	BBP-SS-01	3		5		5	0	0.56	90.55	5	201.19	100.0	0.0	110.6	22.1	1.08
10	8	2042G	BBP-SS-01	4		5		5	0	0.56	85.17	5	153.13	100.0	0.0	68.0	13.6	0.65
11	31	2042G	BBP-SS-01	5		5		5	0	0.56	89.41	5	153.60	100.0	0.0	64.2	12.8	0.61
12	14	2042G	BBP-SS-01	6	wq repl	5	30.5											
13	35	2043G	BBP-SS-02	1		5		5	0	0.56	88.77	5	187.11	100.0	0.0	98.3	19.7	0.96
14	32	2043G	BBP-SS-02	2		5		5	0	0.56	85.72	5	140.52	100.0	0.0	54.8	11.0	0.52
15	22	2043G	BBP-SS-02	3		5		5	0	0.56	92.46	5	154.02	100.0	0.0	61.6	12.3	0.59
16	20	2043G	BBP-SS-02	4		5		5	0	0.56	93.89	5	204.95	100.0	0.0	111.1	22.2	1.08
17	26	2043G	BBP-SS-02	5		5		5	0	0.56	88.68	5	191.78	100.0	0.0	103.1	20.6	1.00
18	27	2043G	BBP-SS-02	6	wq repl	5	30.0											
19	30	2044G	RGH-SS-01	1		5		5	0	0.56	91.92	5	201.41	100.0	0.0	109.5	21.9	1.07
20	11	2044G	RGH-SS-01	2		5		4	1	0.56	90.15	4	157.35	80.0	20.0	67.2	16.8	0.81
21	21	2044G	RGH-SS-01	3		5		5	0	0.56	93.27	5	156.08	100.0	0.0	62.8	12.6	0.60
22	16	2044G	RGH-SS-01	4		5		5	0	0.56	86.34	5	183.23	100.0	0.0	96.9	19.4	0.94
23	25	2044G	RGH-SS-01	5		5		5	0	0.56	90.07	5	154.47	100.0	0.0	64.4	12.9	0.62
24	23	2044G	RGH-SS-01	6	wq repl	5	30.5											
25	15	2045G	RGH-SS-03	1		5		5	0	0.56	86.73	5	171.29	100.0	0.0	84.6	16.9	0.82
26	4	2045G	RGH-SS-03	2		5		3	2	0.56	96.26	3	147.81	60.0	40.0	51.6	17.2	0.83
27	28	2045G	RGH-SS-03	3		5		5	0	0.56	91.35	5	183.84	100.0	0.0	92.5	18.5	0.90
28	33	2045G	RGH-SS-03	4		5		5	0	0.56	87.38	5	177.87	100.0	0.0	90.5	18.1	0.88
29	36	2045G	RGH-SS-03	5		5		5	0	0.56	95.66	5	184.01	100.0	0.0	88.4	17.7	0.86
30	18	2045G	RGH-SS-03	6	wq repl	5	30.0											

	TWT	WT	GR	PSURV	PMORT
Mean	93.8	18.8	0.91	100.0	0.0
S.D.	15.6	3.1	0.16	0.0	0.0
n	5	5	5	5	5
Mean	91.3	18.3	0.88	100.0	0.0
S.D.	23.4	4.7	0.23	0.0	0.0
n	5	5	5	5	5
Mean	85.8	17.2	0.83	100.0	0.0
S.D.	25.7	5.1	0.26	0.0	0.0
n	5	5	5	5	5
Mean	80.2	16.7	0.81	96.0	4.0
S.D.	21.5	4.1	0.20	8.9	8.9
n	5	5	5	5	5
Mean	81.5	17.7	0.86	92.0	8.0
S.D.	17.0	0.6	0.03	17.9	17.9
n	5	5	5	5	5

IN-		NAS	CLIENT			INIT	FINAL			INIT	TARE	WT	FINAL										
DEX	BKR	SMPL	DESCRIP	REPL		NO.	IW PPT	SURV	MORT	WT	WT	COUNT	WT	PSURV	PMORT	TWT	WT	GR		TWT	WT	GR	PSURV	PMORT
31	24	2046G	control	1		5		5	0	0.56	91.11	5	214.26	100.0	0.0	123.2	24.6	1.20						
32	1	2046G	control	2		5		5	0	0.56	93.14	5	196.13	100.0	0.0	103.0	20.6	1.00	Mean	111.8	22.4	1.09	100.0	0.0
33	9	2046G	control	3		5		5	0	0.56	89.11	5	191.92	100.0	0.0	102.8	20.6	1.00	S.D.	9.3	1.9	0.09	0.0	0.0
34	13	2046G	control	4		5		5	0	0.56	87.52	5	206.77	100.0	0.0	119.3	23.9	1.16	n	5	5	5	5	5
35	34	2046G	control	5		5		5	0	0.56	90.75	5	201.32	100.0	0.0	110.6	22.1	1.08						
36	6	2046G	control	6	wq repl	5	30.0																	

Project Name: 774-2 Neanthes ind.growth rate

Sample:	x1
Samp ID:	BBP-SS-01
Alias:	NAS# 2042G
Replicates:	5
Mean:	0.886
SD:	0.238
Tr Mean:	0.886
Trans SD:	0.238

Ref Samp:	x2
Ref ID:	SBay Ref
Alias:	NAS# 2041G
Replicates:	5
Mean:	0.91
SD:	0.158
Tr Mean:	0.91
Trans SD:	0.158

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.131
SS:	0.326
K:	5
b:	0.535
Alpha Level:	0.05
Calculated Value:	0.8769
Critical Value:	<= 0.842
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.205
Test Residual SD:	0.064
Ref. Residual Mean:	0.12
Ref. Residual SD:	0.083
Deg. of Freedom:	8
Alpha Level:	0.1
Calculated Value:	1.8037
Critical Value:	>= 1.86
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation

Experimental Hypothesis

Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	8
Experimental Alpha Level:	0.05
Calculated Value:	0.188
Critical Value:	>= 1.86
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.99	0.99	1.02	1.02	0.104	0.11			-0.276
2	1.1	1.1	0.69	0.69	0.214	0.22			-0.236
3	1.08	1.08	1.1	1.1	0.194	0.19			-0.22
4	0.65	0.65	0.87	0.87	0.236	0.04			-0.04
5	0.61	0.61	0.87	0.87	0.276	0.04			-0.04
6									0.104
7									0.11
8									0.19
9									0.194
10									0.214

Data entry verified against EXCEL spreadsheet. msp 10-7-08

Individual growth rate in test sediment BBP-SS-01 was not significantly less than that in reference sediment "Samish Bay Ref" at alpha=0.05.

Project Name: 774-2 Neanthes ind.growth rate

Sample:	x1
Samp ID:	BBP-SS-02
Alias:	NAS# 2043G
Replicates:	5
Mean:	0.83
SD:	0.256
Tr Mean:	0.83
Trans SD:	0.256

Ref Samp:	x2
Ref ID:	SBay Ref
Alias:	NAS# 2041G
Replicates:	5
Mean:	0.91
SD:	0.158
Tr Mean:	0.91
Trans SD:	0.158

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.138
SS:	0.362
K:	5
b:	0.573
Alpha Level:	0.05
Calculated Value:	0.9081
Critical Value:	<= 0.842
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.22
Test Residual SD:	0.071
Ref. Residual Mean:	0.12
Ref. Residual SD:	0.083
Deg. of Freedom:	8
Alpha Level:	0.1
Calculated Value:	2.0455
Critical Value:	>= 1.86
Variances Homogeneous:	No

Test Results:

Statistic:	Approximate t
Balanced Design:	Yes
Transformation:	No Transformation

Experimental Hypothesis

Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	7
Experimental Alpha Level:	0.05
Calculated Value:	0.5948
Critical Value:	>= 1.895
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.96	0.96	1.02	1.02	0.13	0.11			-0.31
2	0.52	0.52	0.69	0.69	0.31	0.22			-0.24
3	0.59	0.59	1.1	1.1	0.24	0.19			-0.22
4	1.08	1.08	0.87	0.87	0.25	0.04			-0.04
5	1	1	0.87	0.87	0.17	0.04			-0.04
6									0.11
7									0.13
8									0.17
9									0.19
10									0.25

Data entry verified against EXCEL spreadsheet. MLR 10-7-08

Individual growth rate in test sediment BBP-SS-02 was not significantly less than that in reference sediment "Samish Bay Ref" at alpha=0.05.

Project Name: 774-2 Neanthes ind.growth rate

Sample:	x1
Samp ID:	RGH-SS-01
Alias:	NAS# 2044G
Replicates:	5
Mean:	0.808
SD:	0.203
Tr Mean:	0.808
Trans SD:	0.203

Ref Samp:	x2
Ref ID:	SBay Ref
Alias:	NAS# 2041G
Replicates:	5
Mean:	0.91
SD:	0.158
Tr Mean:	0.91
Trans SD:	0.158

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.118
SS:	0.264
K:	5
b:	0.496
Alpha Level:	0.05
Calculated Value:	0.9307
Critical Value:	<= 0.842
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.158
Test Residual SD:	0.099
Ref. Residual Mean:	0.12
Ref. Residual SD:	0.083
Deg. of Freedom:	8
Alpha Level:	0.1
Calculated Value:	0.6633
Critical Value:	>= 1.86
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation

Experimental Hypothesis

Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	8
Experimental Alpha Level:	0.05
Calculated Value:	0.887
Critical Value:	>= 1.86
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	1.07	1.07	1.02	1.02	0.262	0.11			-0.22
2	0.81	0.81	0.69	0.69	0.002	0.22			-0.208
3	0.6	0.6	1.1	1.1	0.208	0.19			-0.188
4	0.94	0.94	0.87	0.87	0.132	0.04			-0.04
5	0.62	0.62	0.87	0.87	0.188	0.04			-0.04
6									0.002
7									0.11
8									0.132
9									0.19
10									0.262

Data entry verified against EXCEL spreadsheet. MLD 10-7-08

Individual growth rate in test sediment RGH-SS-01 was not significantly less than that in reference sediment Samish Bay Ref at alpha=0.05.

Project Name: 774-2 Neanthes ind.growth rate

Sample:	x1
Samp ID:	RGH-SS-03
Alias:	NAS# 2045G
Replicates:	5
Mean:	0.858
SD:	0.033
Tr Mean:	0.858
Trans SD:	0.033

Ref Samp:	x2
Ref ID:	SBay Ref
Alias:	NAS# 2041G
Replicates:	5
Mean:	0.91
SD:	0.158
Tr Mean:	0.91
Trans SD:	0.158

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.074
SS:	0.104
K:	5
b:	0.311
Alpha Level:	0.05
Calculated Value:	0.9261
Critical Value:	<= 0.842
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.026
Test Residual SD:	0.016
Ref. Residual Mean:	0.12
Ref. Residual SD:	0.083
Deg. of Freedom:	8
Alpha Level:	0.1
Calculated Value:	2.4668
Critical Value:	>= 1.86
Variances Homogeneous:	No

Test Results:

Statistic:	Approximate t
Balanced Design:	Yes
Transformation:	No Transformation

Experimental Hypothesis

Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	4
Experimental Alpha Level:	0.05
Calculated Value:	0.7201
Critical Value:	>= 2.132
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.82	0.82	1.02	1.02	0.038	0.11			-0.22
2	0.83	0.83	0.69	0.69	0.028	0.22			-0.04
3	0.9	0.9	1.1	1.1	0.042	0.19			-0.04
4	0.88	0.88	0.87	0.87	0.022	0.04			-0.038
5	0.86	0.86	0.87	0.87	0.002	0.04			-0.028
6									0.002
7									0.022
8									0.042
9									0.11
10									0.19

Data entry verified against EXCEL spreadsheet. MSR 10-7-08

Individual growth rate in test sediment RGH-SS-03 was not significantly less than that in reference sediment Samish Bay Ref at alpha=0.05.

Project Name: 774-2 Neanthes ind.growth rate

Sample:	x1
Samp ID:	SBay Ref
Alias:	NAS# 2041G
Replicates:	5
Mean:	0.91
SD:	0.158
Tr Mean:	0.91
Trans SD:	0.158

Ref Samp:	x2
Ref ID:	control
Alias:	NAS# 2046G
Replicates:	5
Mean:	1.088
SD:	0.091
Tr Mean:	1.088
Trans SD:	0.091

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.084
SS:	0.133
K:	5
b:	0.358
Alpha Level:	0.05
Calculated Value:	0.9657
Critical Value:	<= 0.842
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.12
Test Residual SD:	0.083
Ref. Residual Mean:	0.074
Ref. Residual SD:	0.039
Deg. of Freedom:	8
Alpha Level:	0.1
Calculated Value:	1.1254
Critical Value:	>= 1.86
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	8
Experimental Alpha Level:	0.05
Calculated Value:	2.1821
Critical Value:	>= 1.86
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	1.02	1.02	1.2	1.2	0.11	0.112			-0.22
2	0.69	0.69	1	1	0.22	0.088			-0.088
3	1.1	1.1	1	1	0.19	0.088			-0.088
4	0.87	0.87	1.16	1.16	0.04	0.072			-0.04
5	0.87	0.87	1.08	1.08	0.04	0.008			-0.04
6									-0.008
7									0.072
8									0.11
9									0.112
10									0.19

Data entry verified against EXCEL spreadsheet. MSR 10-7-08

Individual growth rate in reference sediment "Samish Bay Ref" was significantly less than that in the control sediment at alpha=0.05.

Project Name: 774-2 Neanthes ind.growth rate

Sample:	x1
Samp ID:	BBP-SS-01
Alias:	NAS# 2042G
Replicates:	5
Mean:	0.886
SD:	0.238
Tr Mean:	0.886
Trans SD:	0.238

Ref Samp:	x2
Ref ID:	control
Alias:	NAS# 2046G
Replicates:	5
Mean:	1.088
SD:	0.091
Tr Mean:	1.088
Trans SD:	0.091

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.117
SS:	0.259
K:	5
b:	0.492
Alpha Level:	0.05
Calculated Value:	0.9341
Critical Value:	<= 0.842
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.205
Test Residual SD:	0.064
Ref. Residual Mean:	0.074
Ref. Residual SD:	0.039
Deg. of Freedom:	8
Alpha Level:	0.1
Calculated Value:	3.903
Critical Value:	>= 1.86
Variances Homogeneous:	No

Test Results:

Statistic:	Approximate t
Balanced Design:	Yes
Transformation:	No Transformation

Experimental Hypothesis

Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	5
Experimental Alpha Level:	0.05
Calculated Value:	1.7737
Critical Value:	>= 2.015
Accept Null Hypothesis:	Yes
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.99	0.99	1.2	1.2	0.104	0.112			-0.276
2	1.1	1.1	1	1	0.214	0.088			-0.236
3	1.08	1.08	1	1	0.194	0.088			-0.088
4	0.65	0.65	1.16	1.16	0.236	0.072			-0.088
5	0.61	0.61	1.08	1.08	0.276	0.008			-0.008
6									0.072
7									0.104
8									0.112
9									0.194
10									0.214

Data entry verified against EXCEL spreadsheet. WSK 10-7-08

Individual growth rate in test sediment BBP-SS-01 was not significantly less than that in the control sediment at alpha=0.05.

Project Name: 774-2 Neanthes ind.growth rate

Sample:	x1
Samp ID:	BBP-SS-02
Alias:	NAS# 2043G
Replicates:	5
Mean:	0.83
SD:	0.256
Tr Mean:	0.83
Trans SD:	0.256

Ref Samp:	x2
Ref ID:	control
Alias:	NAS# 2046G
Replicates:	5
Mean:	1.088
SD:	0.091
Tr Mean:	1.088
Trans SD:	0.091

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.125
SS:	0.295
K:	5
b:	0.531
Alpha Level:	0.05
Calculated Value:	0.9537
Critical Value:	<= 0.842
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.22
Test Residual SD:	0.071
Ref. Residual Mean:	0.074
Ref. Residual SD:	0.039
Deg. of Freedom:	8
Alpha Level:	0.1
Calculated Value:	4.0452
Critical Value:	>= 1.86
Variances Homogeneous:	No

Test Results:

Statistic:	Approximate t
Balanced Design:	Yes
Transformation:	No Transformation

Experimental Hypothesis

Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	5
Experimental Alpha Level:	0.05
Calculated Value:	2.1233
Critical Value:	>= 2.015
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.96	0.96	1.2	1.2	0.13	0.112			-0.31
2	0.52	0.52	1	1	0.31	0.088			-0.24
3	0.59	0.59	1	1	0.24	0.088			-0.088
4	1.08	1.08	1.16	1.16	0.25	0.072			-0.088
5	1	1	1.08	1.08	0.17	0.008			-0.008
6									0.072
7									0.112
8									0.13
9									0.17
10									0.25

Data entry verified against EXCEL spreadsheet. MSR 10-7-08

Individual growth rate in test sediment BBP-SS-02 was significantly less than that in the control sediment at alpha=0.05.

Project Name: 774-2 Neanthes ind.growth rate

Sample:	x1
Samp ID:	RGH-SS-01
Alias:	NAS# 2046G
Replicates:	5
Mean:	0.808
SD:	0.203
Tr Mean:	0.808
Trans SD:	0.203

4 mrp 10-7-08 ①

Ref Samp:	x2
Ref ID:	control
Alias:	NAS# 2046G
Replicates:	5
Mean:	1.088
SD:	0.091
Tr Mean:	1.088
Trans SD:	0.091

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.102
SS:	0.198
K:	5
b:	0.438
Alpha Level:	0.05
Calculated Value:	0.9684
Critical Value:	<= 0.842
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.158
Test Residual SD:	0.099
Ref. Residual Mean:	0.074
Ref. Residual SD:	0.039
Deg. of Freedom:	8
Alpha Level:	0.1
Calculated Value:	1.7794
Critical Value:	>= 1.86
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation

Experimental Hypothesis

Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	8
Experimental Alpha Level:	0.05
Calculated Value:	2.8144
Critical Value:	>= 1.86
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	1.07	1.07	1.2	1.2	0.262	0.112			-0.208
2	0.81	0.81	1	1	0.002	0.088			-0.188
3	0.6	0.6	1	1	0.208	0.088			-0.088
4	0.94	0.94	1.16	1.16	0.132	0.072			-0.088
5	0.62	0.62	1.08	1.08	0.188	0.008			-0.008
6									0.002
7									0.072
8									0.112
9									0.132
10									0.262

Data entry verified against EXCEL spreadsheet. mrp 10-7-08

Individual growth rate in test sediment RGH-SS-01 was significantly less than that in the control sediment at alpha=0.05.

Project Name: 774-2 Neanthes ind.growth rate

Sample:	x1
Samp ID:	RGH-SS-03
Alias:	NAS# 2045G
Replicates:	5
Mean:	0.858
SD:	0.033
Tr Mean:	0.858
Trans SD:	0.033

Ref Samp:	x2
Ref ID:	control
Alias:	NAS# 2046G
Replicates:	5
Mean:	1.088
SD:	0.091
Tr Mean:	1.088
Trans SD:	0.091

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.045
SS:	0.038
K:	5
b:	0.191
Alpha Level:	0.05
Calculated Value:	0.967
Critical Value:	<= 0.842
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.026
Test Residual SD:	0.016
Ref. Residual Mean:	0.074
Ref. Residual SD:	0.039
Deg. of Freedom:	8
Alpha Level:	0.1
Calculated Value:	2.4893
Critical Value:	>= 1.86
Variances Homogeneous:	No

Test Results:

Statistic:	Approximate t
Balanced Design:	Yes
Transformation:	No Transformation

Experimental Hypothesis

Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	5
Experimental Alpha Level:	0.05
Calculated Value:	5.2933
Critical Value:	>= 2.015
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.82	0.82	1.2	1.2	0.038	0.112			-0.088
2	0.83	0.83	1	1	0.028	0.088			-0.088
3	0.9	0.9	1	1	0.042	0.088			-0.038
4	0.88	0.88	1.16	1.16	0.022	0.072			-0.028
5	0.86	0.86	1.08	1.08	0.002	0.008			-0.008
6									0.002
7									0.022
8									0.042
9									0.072
10									0.112

Data entry verified against EXCEL spreadsheet. 10-7-08

Individual growth rate in test sediment RGH-SS-03 was significantly less than that in the control sediment at alpha=0.05.

Water Quality Data

	NAS	CLIENT			Overlying water								
BKR	SMPL	DESCRIP	REPL	DAY	TEMP	pH	SAL	DO	S	< or >	NH4+NH3	< or >	NH3
5	2041G	Samish Bay Ref	6	0	20.5	8.0	27.0	7.2	<0.02		1.1		0.043
6	2046G	control	6	0	20.2	8.1	27.0	7.3	<0.02		0.2		0.008
14	2042G	BBP-SS-01	6	0	20.3	8.0	27.0	7.0	<0.02		2.8		0.109
18	2045G	RGH-SS-03	6	0	20.3	7.9	27.0	6.8	<0.02		1.8		0.055
23	2044G	RGH-SS-01	6	0	20.3	7.9	27.0	6.4	<0.02		1.0		0.031
27	2043G	BBP-SS-02	6	0	20.2	8.0	27.0	7.0	<0.02		2.5		0.098
5	2041G	Samish Bay Ref	6	3	20.6	7.8	28.5	6.1			3.1		0.079
6	2046G	control	6	3	20.5	7.8	28.0	6.2			2.1		0.053
14	2042G	BBP-SS-01	6	3	20.3	8.0	28.0	6.1			6.9		0.268
18	2045G	RGH-SS-03	6	3	20.4	7.9	28.0	5.8			4.6		0.143
23	2044G	RGH-SS-01	6	3	20.4	7.9	28.0	5.5			3.2		0.100
27	2043G	BBP-SS-02	6	3	20.3	7.9	27.5	5.8			5.7		0.178
27	2043G	BBP-SS-02	6	5				1.8					
27	2043G	BBP-SS-02	6	5				6.7					
5	2041G	Samish Bay Ref	6	6	20.6	7.9	30.0	6.0					
6	2046G	control	6	6	20.6	7.8	30.0	6.1					
14	2042G	BBP-SS-01	6	6	20.2	8.3	29.5	6.2					
18	2045G	RGH-SS-03	6	6	20.4	8.2	29.0	6.0					
23	2044G	RGH-SS-01	6	6	20.3	8.3	29.0	6.1					
27	2043G	BBP-SS-02	6	6	20.4	8.3	28.5	6.4					
5	2041G	Samish Bay Ref	6	9	20.7	7.9	29.0	5.5					
6	2046G	control	6	9	20.5	7.8	29.0	6.0					
14	2042G	BBP-SS-01	6	9	20.3	8.4	29.0	6.1					
18	2045G	RGH-SS-03	6	9	20.3	8.1	29.0	5.4					
23	2044G	RGH-SS-01	6	9	20.4	8.3	28.5	5.9					
27	2043G	BBP-SS-02	6	9	20.1	8.3	28.5	6.2					
5	2041G	Samish Bay Ref	6	12	20.8	8.0	30.5	6.1					
6	2046G	control	6	12	20.9	8.0	29.5	6.5					
14	2042G	BBP-SS-01	6	12	20.7	8.5	30.5	6.3					
18	2045G	RGH-SS-03	6	12	20.8	8.3	30.0	5.6					
23	2044G	RGH-SS-01	6	12	20.6	8.5	30.5	6.2					
27	2043G	BBP-SS-02	6	12	20.5	8.5	30.0	6.4					
5	2041G	Samish Bay Ref	6	15	20.9	7.9	29.5	5.5					
6	2046G	control	6	15	20.6	7.9	30.0	6.1					
14	2042G	BBP-SS-01	6	15	20.7	8.4	30.0	5.8					
18	2045G	RGH-SS-03	6	15	20.6	8.1	29.5	5.1					
23	2044G	RGH-SS-01	6	15	20.8	8.4	30.0	5.9					
27	2043G	BBP-SS-02	6	15	20.6	8.3	30.5	6.2					
5	2041G	Samish Bay Ref	6	18	20.7	7.9	30.0	5.8					
6	2046G	control	6	18	20.7	8.0	30.0	6.3					
14	2042G	BBP-SS-01	6	18	20.6	8.5	30.5	5.9					
18	2045G	RGH-SS-03	6	18	20.6	8.2	30.0	5.7					
23	2044G	RGH-SS-01	6	18	20.7	8.5	30.5	5.8					
27	2043G	BBP-SS-02	6	18	20.6	8.3	30.0	6.2					
5	2041G	Samish Bay Ref	6	20	20.9	8.1	30.0	6.4	<0.02		0.4		0.022
6	2046G	control	6	20	20.8	7.9	30.0	6.2	<0.02		2.6		0.082
14	2042G	BBP-SS-01	6	20	20.7	8.4	30.5	5.7	<0.02		2.1		0.198
18	2045G	RGH-SS-03	6	20	20.7	8.4	30.0	6.4	<0.02		2.9		0.274
23	2044G	RGH-SS-01	6	20	20.7	8.4	30.0	5.8	<0.02		3.2		0.302
27	2043G	BBP-SS-02	6	20	20.6	8.3	30.0	6.1	<0.02		1.1		0.081
				Mean	20.5	8.1	29.2	6.0	---		---		---
				SD	0.2	0.2	1.2	0.8	---		---		---
				n	48	48	48	50	12		18		18
				Min	20.1	7.8	27.0	1.8	<0.02		0.2		0.008
				Max	20.9	8.5	30.5	7.3	<0.02		6.9		0.302

Data Entry Verified Against Lab. Bench Sheets 10-16-09 JRF

CHAIN-OF-CUSTODY RECORDS

Sample Custody Record

Samples Shipped to: NW AQUATIC SCIENCES

HARTCROWSER
Har wse.
1910 Fairview Avenue East
Seattle, Washington 98102-3699
Phone: 206-324-9530 FAX: 206-328-5581

JOB 17330-17 LAB NUMBER

PROJECT NAME BELLINGHAM BAY

HART CROWSER CONTACT R. McGINNIS, A. CONRAD

SAMPLED BY: M. HEIDENKOHL, AC, RH, CFR

REQUESTED ANALYSIS

LAB NO.	SAMPLE ID	DESCRIPTION	DATE	TIME	MATRIX	BIOASSAY HOLD	NO. OF CONTAINERS	OBSERVATIONS/COMMENTS/ COMPOSITING INSTRUCTIONS
2041G	SAMISH BAY REF		8/29/08	1705	SED	X	2	HOLD ONE CONTAINER
2042G	BBP-SS-01		8/26/08	1030		X	1	
2043G	BBP-SS-02		8/26/08	1142			1	
2044G	RGH-SS-01		8/26/08	1550			1	
2045G	RGH-SS-03		8/26/08	1425			1	

pg 35 of 38

RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE	9/3/08	Michele S. Redmond	9-4-08
PRINT NAME Anne M Conrad	TIME	(SIGNATURE) Michele S. Redmond	TIME
COMPANY Hart Crowser	1300	PRINT NAME NAS	13:00
		COMPANY	

RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE		SIGNATURE	
	TIME		TIME
PRINT NAME		PRINT NAME	
COMPANY		COMPANY	

SPECIAL SHIPMENT HANDLING OR STORAGE REQUIREMENTS:
Headspace in containers flushed with nitrogen - MER

TOTAL NUMBER OF CONTAINERS

SAMPLE RECEIPT INFORMATION
CUSTODY SEALS: ☒ YES ☐ NO ☐ N/A
GOOD CONDITION: ☒ YES ☐ NO
TEMPERATURE: 4.5 °C 4.5 °C 4.5 °C
SHIPMENT METHOD: ☐ HAND ☒ COURIER ☒ OVERNIGHT

COOLER NO.: STORAGE LOCATION:

See Lab Work Order No. _____ for Other Contract Requirements

TURNAROUND TIME:
☐ 24 HOURS ☐ 1 WEEK
☐ 48 HOURS ☐ STANDARD
☐ 72 HOURS OTHER _____

White and Yellow Copies to Lab Pink to Project Manager Lab to Return White Copy to Hart Crowser Gold to Sample Custodian

From: Origin ID: LKEA (206) 324-9530
Charisse Norman
HART CROWSER INC
1700 WESTLAKE AVE NORTH
SUITE 200
SEATTLE, WA 98109

Ship Date: 03SEP08
ActWgt: 62.0 LB
System#: 5922109/INET8061
Account#: S *********

Delivery Address Bar Code

Ref # 1733017 ANNE /ROGER
Invoice #
PO #
Dept #

SHIP TO: (541) 265-7225 BILL SENDER
NORTHWESTERN AQUATIC SCIENCES
NORTHWESTERN AQUATIC SCIENCES
3814 YAQUINA BAY RD.

NEWPORT, OR 97365

1 of 3

TRK# 0201 7960 7787 1814
MASTER

THU - 04SEP AM
PRIORITY OVERNIGHT
DSR

97365
OR-US
PDX

86 ONPA

After printing this label:
1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warnl
result

Use
resp
you de
Guide ap
costs, and
Recovery ca
instruments a

CUSTODY SEAL CUSTODY SEAL CUSTODY SEAL CUSTODY SEAL

Date 9/3/08 Initials

CUSTODY SEAL CUSTODY SEAL CUSTODY SEAL CUSTODY SEAL

Date 9/3/08 Initials

4.5 °C

From: [illegible] 206-284-9530
Charisse Norman
HART CROWSER INC
1700 WESTLAKE AVE NORTH
SUITE 200
SEATTLE, WA 98109

FedEx Express

JCL 5940405/20/23

Ship Date: 03SEP08
ActWgt: 56.0 LB
System#: 5922109/INET3061
Account#: S *********

Delivery Address Bar Code

Ref # 1733017 ANNE ROSER
Invoice #
PO #
Dept #

SHIP TO: 541) 265-7225 BILL SENDER
NORTHWESTERN AQUATIC SCIENCES
NORTHWESTERN AQUATIC SCIENCES
3814 YAQUINA BAY RD.

NEWPORT, OR 97365

2 of 3

MPS# 0263 7960 7787 1817
Mstr# 7960 7787 1814 0227

THU - 04SEP AM
PRIORITY OVERNIGHT
DSR

86 ONPA

97365
OR-US
PDX

After printing this label:
1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.

Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com. FedEx will not be responsible for any claim in excess of $100 per package, whether the result of loss, damage, delay, non-delivery, misdelivery, or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim. Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental, consequential, or special is limited to the greater of $100 or the authorized declared value. Recovery cannot exceed actual documented loss. Maximum for items of extraordinary value is $500, e.g. jewelry, precious metals, negotiable instruments and other items listed in our ServiceGuide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

CUSTODY SEAL Date 9/3/08

CUSTODY SEAL

CUSTODY SEAL

CUSTODY SEAL Initials

4.5°C

D... (206) 324-9530
...
...ER INC
...LAKE AVE NORTH
...WA 98109

FedEx Express

E

JCL...

(541) 265-7225 BILL SENDER
...THWESTERN AQUATIC SCIENCES
...THWESTERN AQUATIC SCIENCES
... YAQUINA BAY RD.

NEWPORT, OR 97365

Ship Date: 03SEP08
ActWgt: 61.0 LB
System#: 5922109/INET8061
Account#: S *********

Delivery Address Bar Code

Ref # 1733017 ANNE ROGER
Invoice #
PO #
Dept #

3 of 3
MPS# 0263 7960 7787 1391
Mstr# 7960 7787 1814 0201

THU - 04SEP AM
PRIORITY OVERNIGHT
DSR

97365
OR-US
PDX

86 ONPA

After printing this label:
1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the ...

Use ... reason... you ... Guide ... costs. Recov... instru...

CUSTODY SEAL CUSTODY SEAL CUSTODY SEAL CUSTODY SEAL

Date 9/3/08

Initials A

CUSTODY SEAL CUSTODY SEAL CUSTODY SEAL CUSTODY SEAL

Date 9/3/08

Initials A

6.5°C

REFERENCE TOXICANT RESULTS AND ANALYSIS

NORTHWESTERN AQUATIC SCIENCES

ACUTE TOXICITY TEST (ALL SPECIES)

PROTOCOL NO. NAS-XXX-____

renewed

Test No. 999-2473 Client: QC Test Investigator pp. 1-6 MSR

Test Type (rangefinding/definitive) definitive Test Length (hr) 96 10-8-08

Species *Neanthes arenaceodentata*

STUDY MANAGEMENT

Client: QC Test

Client's Study Monitor: N/A

Testing Laboratory: Northwestern Aquatic Sciences

Test Location: Newport Laboratory

Laboratory's Study Personnel:

Proj. Man./Study Dir. M.S. Redmond MSR

QA Officer L.K. Nemeth

1. G.J. IRISSARRI GJI 2. Lidia P. Sandoval LPS

3. Susan Gage 4.

5. 6.

Study Schedule:

Test Beginning: 9-10-08 1120 Test Ending: 9-14-08 10:00

TEST MATERIAL

Description: Ammonia as ammonium chloride (7120 mg/L as N = 7.12 mg/mL as N), stock prepared 7-25-06

DILUTION WATER

Description: Yaquina Bay, Oregon, sea water

Date of Preparation/Collection: 9-9-08

Water Quality: Cond. (umhos/cm): ----- Salinity (ppt) 27.0 pH 8.1

Hardness (mg/L as $CaCO_3$): ----- Alkalinity (mg/L as $CaCO_3$): -----

Treatments: Filtered to 0.4 µm, salinity adjusted with Milli-Q deionized water, aerated

TEST LOCATION

Test conducted in (circle one): room 1 room 2 (trailer) water bath other:_____

Randomization chart: wall

			D	700	110	175	441	0	278	door →
			C	441	278	0	700	110	175	
			B	175	0	700	278	441	110	
			A	278	441	110	175	700	0	

Error codes: 1) Corrrection of handwriting error
2) Written in wrong location; entry deleted
3) Wrong date deleted; replaced with correct date
4) Error found in measurement; measurement repeated

NORTHWESTERN AQUATIC SCIENCES
ACUTE TOXICITY TEST (ALL SPECIES)
PROTOCOL NO. NAS-XXX-____

Test No. 999-2473 Client: QC Test Investigator _____

TEST ORGANISMS

Species: *Neanthes arenaceodentata* Age: _____ Size: _____
Source: Dept. of Biology, CA State University, Long Beach, CA, received 9-9-08

Acclimation Data:

Date	Temp. (deg.C)	pH	Sal. (ppt)	DO (mg/L)	Feeding amount	Feeding description	Water changes	Comments
9-9-08	18.8	7.5	26.5	6.8	0.1g/one tank	Tetramarine	yes, ~ 2/3	receiving water
9-10-08	20.4	8.0	30.0	7.1				
Mean	19.6	7.8	28.3	7.0				
S.D.	—	—	—	—				
(N)	(2)	(2)	(2)	(2)				

Photoperiod during acclimation: constant light

TEST PROCEDURES AND CONDITIONS

Test concentrations (50% series recommended): 700, 441, 278, 175, 110, 0
(63% series)
Test chamber: 250 mL beakers Test volume: 100 mL
Replicates/treatment: 4 Organisms/treatment: 20 (5/repl)
Test water changes: None Aeration during test: None
Feeding: None.
Duration: 24-hr, 48-hr, (96-hr)
Test temperature (deg.C): 20 +/- 1
Beaker placement: Stratified randomization
Photoperiod: Constant light
Salinity: 28 +/- 2 ppt

MISCELLANEOUS NOTES

Test Solution Preparation:

9-10-08 6.2

Test Conc. (mg/L)	mL of stock (7120 mg/L) per 400 mL	
700	39.3	Bring up to 400 mL with dilution water, then split between 4 replicates
441	24.8	
278	15.6	
175	9.8	
110	6.2	
0	0	

Light intensity measurements:

Date	Location in room	foot-candles
9-12-08	on glass plate	39.5

NORTHWESTERN AQUATIC SCIENCES

ACUTE TOXICITY TEST (ALL SPECIES)

PROTOCOL NO. NAS-XXX-____

Test No. 999-2473 Client QC Test Investigator _____

DAILY RECORD SHEET

Day 0 (9 /10 108) MLR/GJL

Conc. (mg/L)	Temp. (deg.C)	pH	Sal. (ppt)	DO (ppm)	Survivors A	B	C	D
1. 700	20.8	7.3	27.5	7.3	5	5	5	5
2. 441	20.4	7.4	27.0	7.3	5	5	5	5
3. 278	20.6	7.5	27.0	7.3	5	5	5	5
4. 175	20.6	7.7	27.0	7.4	5	5	5	5
5. 110	20.5	7.7	27.0	7.4	5	5	5	5
6. 0	20.9	8.1	27.5	7.4	5	5	5	5

Day 1 (9 /11 108) GJL / LPS

Conc. (mg/L)	Temp. (deg.C)	pH	Sal. (ppt)	DO (ppm)	Survivors A	B	C	D
1. 700	20.8	7.5	27.5	5.8	0 (5d)	0 (5d)	0 (5d)	0 (5d)
2. 441	20.7	7.5	27.5	6.4	0 (5d)	3 (2d)	2 (3d)	0 (5d)
3. 278	20.9	7.7	27.5	6.6	5	5	5	5
4. 175	20.6	7.8	27.5	6.7	5	5	5	5
5. 110	20.6	7.9	27.5	6.7	5	5	5	5
6. 0	20.9	8.0	27.5	6.6	5	5	5	5

Day 2 (9 /12 108) GJL/MLR

Conc. (mg/L)	Temp. (deg.C)	pH	Sal. (ppt)	DO (ppm)	Survivors A	B	C	D
1. 700	—	—	—	—	0	0	0	0
2. 441	20.5	7.4	28.0	6.7	0	2(1D)	0(2D)	0
3. 278	20.8	7.6	27.5	6.3	5	5	4(1D)	4(1D)
4. 175	20.6	7.8	28.0	6.8	5	5	5	5
5. 110	20.7	7.9	28.0	6.8	5	5	5	5
6. 0	20.9	8.1	28.0	6.9	5	5	5	5

Day 3 (9 /13 108) GJL/MLR

Conc. (mg/L)	Temp. (deg.C)	pH	Sal. (ppt)	DO (ppm)	Survivors A	B	C	D
1. 700	—	—	—	—	0	0	0	0
2. 441 *	20.3	7.3	28.0	6.5	0	0(2D)	0	0
3. 278	20.6	7.6	28.5	6.2	0(5D)	0(5D)	0(4D)	0(4D)
4. 175	20.3	7.7	28.5	6.9	5	4(1D)	4(1D)	2(3D)
5. 110	20.4	7.8	28.5	7.0	5	5	5	5
6. 0	20.7	8.1	28.0	6.9	5	5	5	5

* DO MEASURED IN REPLICATE B.

Day 4 (9 /14 108) AF/LPS

Conc. (mg/L)	Temp. (deg.C)	pH	Sal. (ppt)	DO (ppm)	Survivors A	B	C	D
1. 700	—	—	—	—	~~0~~	~~0~~	~~0~~	~~0~~
2. 441	—	—	—	—	~~0~~	~~0~~	~~0~~	~~0~~
3. 278	—	—	—	—	~~0~~	~~0~~	~~0~~	~~0~~
4. 175	20.8	7.6	28.5	7.1	1 (4d)	3 (1d)	0 (4d)	0 (2d)
5. 110	20.7	7.8	28.5	6.8	5	5	3 (2d)	5
6. 0	20.8	8.1	28.5	4.7	5	5	5	5

WQ:	Mean	20.7	7.7	27.8	6.8
	SD	0.2	0.2	0.5	0.4
	n	25	25	25	25

CETIS Summary Report

Report Date: 15 Sep-08 14:39 (p 1 of 1)
Test Code: 07-3790-0013/999-2473

Reference Toxicant 96-h Acute Survival Test — Northwestern Aquatic Sciences

Test Run No:	17-1038-6773	Test Type:	Survival	Analyst:	
Start Date:	10 Sep-08 11:20	Protocol:		Diluent:	Yaquina Bay Seawater
Ending Date:	14 Sep-08 10:00	Species:	Neanthes arenaceodentata	Brine:	
Duration:	95h	Source:	California State U, Long Beach	Age:	

Sample No:	13-8734-3013	Code:	1387343013	Client:	QC Test
Sample Date:	10 Sep-08 11:20	Material:	Ammonia as nitrogen	Project:	
Receive Date:	10 Sep-08 11:20	Source:	Reference Toxicant		
Sample Age:	N/A	Station:			

Comparison Summary

Analysis No	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
19-1701-3704	Proportion Survived	110	175	139	29.1%		Dunnett's Multiple Comparison Test

Point Estimate Summary

Analysis No	Endpoint	Level	Conc-mg/	95% LCL	95% UCL	TU	Method
06-3902-8512	Proportion Survived	EC50	145	130	163		Linear Regression (MLE)

Proportion Survived Summary

Conc-mg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Dilution Water	4	1	1	1	1	1	0	0	0.0%	0.0%
110		4	0.9	0.825	0.975	0.6	1	0.0365	0.2	22.2%	10.0%
175		4	0.2	0.0944	0.306	0	0.6	0.0516	0.283	141.0%	80.0%
278		4	0	0	0	0	0	0	0		100.0%
441		4	0	0	0	0	0	0	0		100.0%
700		4	0	0	0	0	0	0	0		100.0%

Proportion Survived Detail

Conc-mg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Dilution Water	1	1	1	1
110		1	1	0.6	1
175		0.2	0.6	0	0
278		0	0	0	0
441		0	0	0	0
700		0	0	0	0

CETIS Test Data Worksheet

Test Code: 07-3790-0013/999-2473

Reference Toxicant 96-h Acute Survival Test

Northwestern Aquatic Sciences

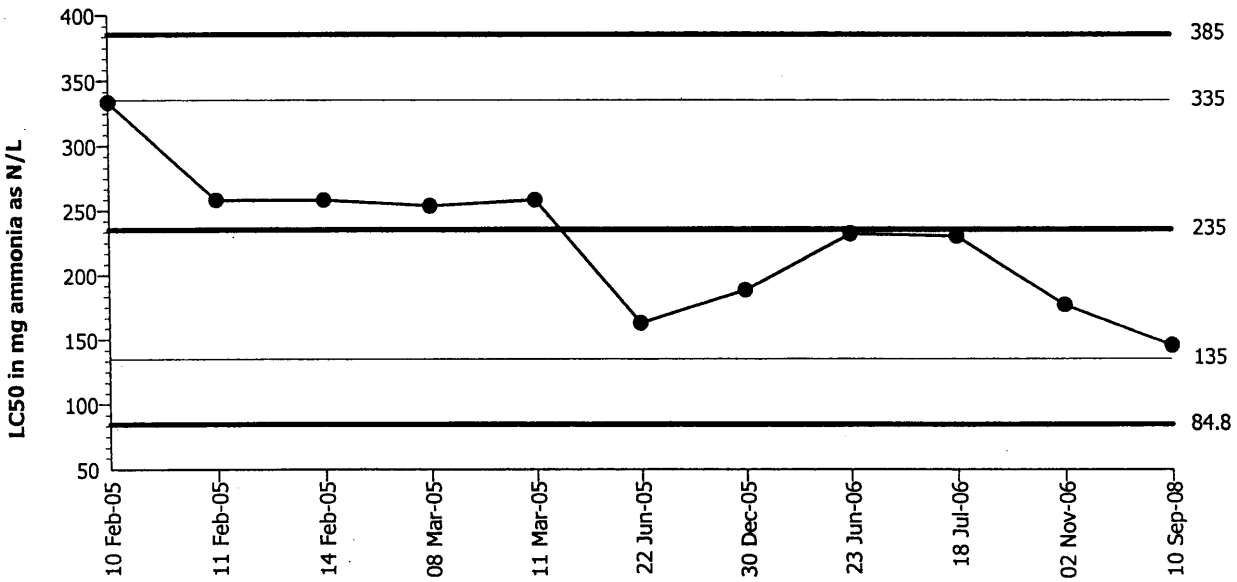
Start Date: 10 Sep-08 11:20 **Species:** Neanthes arenaceodentata **Sample Code:** 1387343013
Ending Date: 14 Sep-08 10:00 **Protocol:** **Sample Source:** Reference Toxicant
Sample Date: 10 Sep-08 11:20 **Material:** Ammonia as nitrogen **Sample Station:**

Conc-mg/L	Code	Rep	Pos	# Exposed	# Survived	Notes
0	D	1	6	5	5	
0	D	2	14	5	5	
0	D	3	19	5	5	
0	D	4	4	5	5	
110		1	8	5	5	
110		2	2	5	5	
110		3	5	5	3	
110		4	23	5	5	
175		1	24	5	1	
175		2	1	5	3	
175		3	7	5	0	
175		4	3	5	0	
278		1	15	5	0	
278		2	13	5	0	
278		3	22	5	0	
278		4	18	5	0	
441		1	17	5	0	
441		2	16	5	0	
441		3	20	5	0	
441		4	10	5	0	
700		1	9	5	0	
700		2	12	5	0	
700		3	21	5	0	
700		4	11	5	0	

Data entry verified against laboratory bench sheets.
MSR
9-15-08

Northwestern Aquatic Sciences

Test Type:	Survival	**Organism:**	Neanthes arenaceodentata (Polycha	**Material:**	Ammonia as nitrogen
Protocol:	All Protocols	**Endpoint:**	Proportion Survived	**Source:**	All Sample Sources



Mean:	235.1	**Count:**	10	**-2s Warning Limit:**	134.9	**-3s Action Limit:**	84.8
Sigma:	50.1	**CV:**	21.30%	**+2s Warning Limit:**	335.3	**+3s Action Limit:**	385.4

Quality Control Data

Point	Year	Month	Day	QC Data	Delta	Sigma	Warning	Action	Link No	Analysis No
1	2005	Feb	10	333.8	98.68	1.97			07-2142-2429	14-4996-1630
2			11	258.1	23.02	0.4594			09-7820-5859	15-2821-6614
3			14	258.1	23.02	0.4594			10-4039-9251	09-1851-7488
4		Mar	8	253.5	18.4	0.3672			07-7871-6246	18-8368-7756
5			11	258.1	23.02	0.4594			14-8657-5991	03-1667-0035
6		Jun	22	162.6	-72.48	-1.447			17-9049-4827	04-4446-2090
7		Dec	30	188.2	-46.94	-0.9369			09-3229-1974	06-9837-0860
8	2006	Jun	23	231.8	-3.319	-0.06624			02-7771-3278	18-1187-0488
9		Jul	18	230	-5.138	-0.1025			15-3651-0178	09-1838-8420
10		Nov	2	176.5	-58.58	-1.169			03-6247-3723	09-5744-6640
11	2008	Sep	10	145.4	-89.7	-1.79			07-3790-0013	06-3902-8512

MSR
9-15-08

Analyst:_____ QA:_____

Analytical Resources, Incorporated
Analytical Chemists and Consultants

February 20, 2009

Mr. Roger McGinnis
Hart Crowser, Inc.
1700 Westlake Avenue North Suite 200
Seattle, WA 98109-3056

RE: Project: Port Gamble, 17330-14
ARI Job No.: OJ67, OJ69, OJ70, OJ71, OJ95, OH02

Dear Mr. McGinnis:

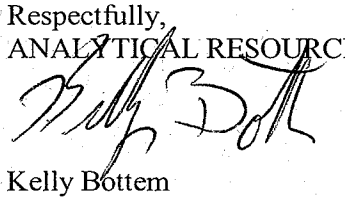
Please find enclosed the original Chain-of-Custody (COC) records, sample receipt documentation, and the final data package for the samples from the project referenced above.

The samples were submitted to Nautilus Environmental and analyzed for Microtox, as requested.

Please see the details of these analyses in the Case Narrative.

An electronic copy of this data package and the supporting data 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.



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

Enclosures

KB/co

Microtox Analysis

prepared
for

Hart Crowser

Project Name: Port Gamble, 17330-14

ARI Job No.: OJ67, OJ69, OJ70, OJ71, OJ95 & OH02

prepared
by

Nautilus Environmental

Nautilus Environmental

February 10, 2009

Kelly Bottem
Analytical Resources Inc.
4611 S. 134th Place
Tukwila, WA 98168

Dear Kelly,

Enclosed is one copies of the report for Port Gamble toxicity testing conducted on samples collected in December 2008.

Samples PGSS-16, PGSS-62B, PGSS-51, PGSS-58, PGSS-63, and PGSS-69 exceeded sediment quality standards for microtox analysis per WDOE 2008 guidelines.

Please feel free to contact us if you have any questions.

Sincerely,

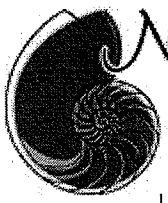
Eric Tollefson

Eric Tollefson
Project Manager

California
5550 Morehouse Drive
Suite 150
San Diego, California 92121
858.587.7333
fax: 858.587.3961

Washington
5009 Pacific Highway East
Suite 2
Tacoma, Washington 98424
253.922.4296
fax: 253.922.5814

British Columbia
8664 Commerce Court
Burnaby, British Columbia
V5A 4N7
604-603-9381
fax: 604-603-9381



Nautilus Environmental

Toxicological Evaluation of Sediment Port Gamble

Microtox

Report date: February 9, 2009

Submitted to:

ANALYTICAL RESOURCES INCORPORATED
Tukwila, WA

Washington Laboratory
5009 Pacific Hwy East
Suite 2
Tacoma, WA 98424

TABLE OF CONTENTS

Page

LIST OF TABLES

LIST OF APPENDICES

SIGNATURE PAGE

Eric Tollefson
Project Manager

Mary Ann Rempel-Hester
Laboratory Manager

This report has been prepared based on data and/or samples provided by our client and the results of this study are for their sole benefit. Any reliance on the data by a third party is at the sole and exclusive risk of that party.

1.0 INTRODUCTION

Sediment samples were collected and evaluated for toxicity as part of a project being conducted by Analytical Resources Incorporated. Sediment samples were tested for toxicity using Microtox tests.

2.0 METHODS

2.1 Samples

Fifty-two sediment samples were collected by Hart Crowser personnel on December 4, 5, 8, 9 and 10, 2008. Three reference samples were collected on January 9, 2009. All samples were delivered on January 26 and 27, 2008 to the Nautilus Environmental laboratory in Tacoma, WA. The condition of the sample containers was inspected upon receipt and the identities compared with the information provided on the chain-of-custody forms. The samples were stored at 4± 2°C in the dark prior to test initiation.

2.2 Test Procedures

The luminescent marine bacterium *Vibrio fischeri* was used as the test organism for the Microtox test. The bacteria were exposed to porewater extracted from sediment samples and light readings were measured after 5 minutes and 15 minutes of exposure. Test equipment included the Microtox Model 500 Analyzer, which measures light output and is equipped with a 15°C chamber to maintain test temperature in the samples and a 4°C chamber to keep the rehydrated bacteria chilled.

Vials of freeze-dried bacteria (Microtox® Acute Reagent Lot # 8K1031, Expiration date 10/2010) were obtained from Strategic Diagnostics, Inc. and stored at -20°C until use. On the day of the test, a vial was rehydrated with 1.0 ml of Microtox Reconstitution Solution, mixed thoroughly, and allowed to equilibrate for 30 minutes at 4°C. The bacteria were used within 2 hours of rehydration.

The tests were conducted in accordance with WDOE (2008) test protocol. These methods are summarized in Table 1. Approximately 50 ml of porewater was extracted from each sample by centrifuging for 30 minutes at 4500 G. The DO in each sample was between 50 and 100 percent

saturation (5.0 to 10.2mg/L) and, as a result, the samples did not require aeration. The pH was adjusted to 7.8 to 8.2 using NaOH or HCl, if necessary. Sample salinity was adjusted to 20 ± 2 ppt when necessary using artificial seasalt. The control was deionized water adjusted to 20 ppt or within 2ppt of the samples with artificial seasalt. Each porewater was tested within 3 hours of extraction.

Tests were conducted using five replicates. Disposable glass cuvettes were placed in the Microtox test wells and 1 ml of salinity adjusted porewater was added. The rehydrated bacteria (reagent) were thoroughly mixed and 10 µl was added to each test cuvette. After an initial incubation period of 5 minutes, the control cuvette was placed in the read chamber of the Microtox Analyzer to set the instrument. Initial light readings (I_0) were then taken by placing each cuvette in the read chamber of the Microtox Analyzer and measurements were recorded on a data sheet. Light output was measured in each cuvette after an additional 5 minutes (I_5) and 15 minutes (I_{15}) of exposure.

Test acceptability criterion was final mean control light output greater than or equal to 80 percent of initial control mean output. The reference sample acceptability criterion was a final mean output greater than or equal to 80 percent of control final mean output. The test data that was less than 80 percent of acceptable reference or control were evaluated statistically by conducting one-tailed t-tests on the change in output over time for porewater extracts compared to the reference. Where the reference did not meet acceptability criteria, comparisons were made against the control.

A reference toxicant test using phenol was conducted in conjunction with the porewater tests to ensure that the sensitivity of the test was within the acceptable range of historical values determined in this laboratory.

Table 1. Summary of methods for the Microtox test.

Test dates	January 27, 28, 29 and 30, 2009
Test organism source	Strategic Diagnostics
Batch number and expiration date	Lot #8K1031, Expiry 10/2010
Control	Saltwater (30 ppt) prepared with Crystal Sea artificial seasalt
Sample preparation	Centrifugation at 4500 G for 30 minutes; salinity adjustment to 20 ppt using Crystal Sea salt; pH adjustment to 7.8-8.2 ppt
Test chamber	Glass cuvette
Test volume	1 mL
Volume of inoculum/replicate	10 µL
Number of replicates/sample	5
Test temperature	15 ± 1°C
Aeration	None
Reference toxicant	Phenol

3.0 RESULTS

The results of toxicity tests conducted using Microtox are provided in Tables 2 and 3.

Table 2. Results of Microtox tests showing change in light output of samples as a percentage of change in light output of control after 5 and 15 minute of exposure.

Sample	Change in light output as a % of Control (5 minutes)	Change in light output as a % of Control (15 minutes)
Test #1		
CR20W	105	109
PGSS-8	106	108
PGSS-30	103	102
PGSS-39	104	103
PGSS-35	107	108
Test #2		
CR20W	105	108
PGSS-20	103	104
PGSS-15	103	107
PGSS-40	103	107
PGSS-22	107	112
Test #3		
CR20W	107	113
PGSS-33	103	106
PGSS-31	106	108
PGSS-18	104	104
PGSS-16	79	81
Test #4		
MSMP-43	101	103
PGSS-14A	101	103
PGSS-21A	102	105
PGSS-29	100	102
PGSS-46	102	103
Test #5		
MSMP43	102	107
PGSS-38	104	107
PGSS-47	102	105
PGSS-56	103	103
PGSS-61	102	106

Table 2, Cont. **Results of Microtox tests showing change in light output of samples as a percentage of change in light output of control after 5 and 15 minute of exposure.**

Sample	Change in light output as a % of Control (5 minutes)	Change in light output as a % of Control (15 minutes)
Test #6		
MSMP43	104	107
PGSS-62	102	102
PGSS-62A	105	106
PGSS-62B	58	57
PGSS-67	104	105
Test #7		
MSMP43	106	108
PGSS-68	104	103
Test #8		
CR20W	100	104
PGSS-42	104	105
PGSS-44	106	109
PGSS-51	58	53
Test #9		
CR20W	99	106
PGSS-54	107	110
PGSS-45	83	85
PGSS-58	70	71
PGSS-53	107	109
Test #10		
CR23MOD	50	47
PGSS-55	106	108
PGSS-38A	107	109
PGSS-77	109	111
PGSS-47A	106	107

Table 2, Cont. Results of Microtox tests showing change in light output of samples as a percentage of change in light output of control after 5 and 15 minute of exposure.

Sample	Change in light output as a % of Control (5 minutes)	Change in light output as a % of Control (15 minutes)
Test #11		
CR23MOD	57	56
PGSS-64	103	106
PGSS-63	72	74
PGSS-21B	107	108
PGSS-29A	109	112
Test #12		
MSMP43	102	104
PGSS-GEO-3	104	107
PGSS-82	104	104
PGSS-69	62	59
PGSS-71	107	107
Test #13		
MSMP43	105	110
PGSS-70	102	102
PGSS-92	101	105
PGSS-80	101	104
PGSS-77A	102	105
Test #14		
MSMP43	104	107
PGSS-73	102	109
PGSS-78	102	105
PGSS-83	104	103
PGSS-75	101	100

Table 3. Results of Microtox tests as percentage of initial light output. Shaded data indicates samples that exceed SQS guidelines (> 20% difference and statistically significant difference (p<0.05) relative to the control or reference).

Sample	5-minute reading		15 minute reading	
	Mean % of initial light output	Comparison To	Mean % of initital light output	Comparison To
Test 1				
Control	96 ± 4	---	91 ± 4	---
CR20W	101 ± 1	---	99 ± 3	---
PGSS-8	102 ± 5	CR20W	98 ± 6	CR20W
PGSS-30	99 ± 1	CR20W	92 ± 2	CR20W
PGSS-39	100 ± 1	CR20W	93 ± 2	CR20W
PGSS-35	103 ± 2	CR20W	98 ± 3	CR20W
Test 2				
Control	102 ± 2	---	98± 2	---
CR20W	108 ± 2	---	106 ± 2	---
PGSS-20	105 ± 2	CR20W	102 ± 2	CR20W
PGSS-15	106 ± 2	CR20W	105 ± 4	CR20W
PGSS-40	106 ± 2	CR20W	105 ± 1	CR20W
PGSS-22	109 ± 3	CR20W	110 ± 1	CR20W
Test 3				
Control	97 ± 1	---	91 ± 2	---
CR20W	104 ± 2	---	102 ± 3	---
PGSS-33	100 ± 2	CR20W	96 ± 4	CR20W
PGSS-31	102 ± 2	CR20W	98 ± 4	CR20W
PGSS-18	101 ± 1	CR20W	95 ± 3	CR20W
PGSS-16[1]	76 ± 3	CR20W	74 ± 4	CR20W
Test 4				
Control	99 ± 2	---	91 ± 3	---
MSMP43	99 ± 2	---	93 ± 2	---
PGSS-14A	99 ± 1	MSMP43	93 ± 2	MSMP43
PGSS-21A	101 ± 2	MSMP43	95 ± 2	MSMP43
PGSS-29	99 ± 1	MSMP43	92 ± 2	MSMP43
PGSS-46	101 ± 1	MSMP43	94 ± 3	MSMP43
Test 5				
Control	96± 1	---	83 ± 1	---
MSMP43	97± 1	---	88 ± 1	---
PGSS-38	99 ± 2	MSMP43	89 ± 4	MSMP43
PGSS-47	97 ± 1	MSMP43	87± 2	MSMP43
PGSS-56	98 ± 2	MSMP43	85 ± 3	MSMP43
PGSS-61	98 ± 2	MSMP43	88 ± 2	MSMP43

[1]Sample turbidity greater than 100 NTU, toxicity may be artifactual.

[2]Reference did not meet acceptability criteria, comparison made against control

Table 3, Cont. Results of Microtox tests as percentage of initial light output. Shaded data indicates samples that exceed SQS guidelines (> 20% difference and statistically significant difference ($p<0.05$) relative to the control of reference).

Sample	5-minute reading		15 minute reading	
	Mean % of initial light output	Comparison To	Mean % of initital light output	Comparison To
Test 6				
Control	94 ± 2	---	86 ± 3	---
MSMP43	98 ± 3	---	92 ± 3	---
PGSS-62	96 ± 4	MSMP43	88 ± 5	MSMP43
PGSS-62A	99 ± 3	MSMP43	91 ± 3	MSMP43
PGSS-62B	55 ± 5	MSMP43	49 ± 4	MSMP43
PGSS-67	98 ± 2	MSMP43	90 ± 2	MSMP43
Test 7				
Control	100 ± 5	---	98 ± 4	---
MSMP43	106 ± 7	---	106 ± 11	---
PGSS-68	104 ± 3	MSMP43	101 ± 9	MSMP43
Test 8				
Control	96 ± 4	---	89 ± 3	---
CR20W	96 ± 5	---	92 ± 4	---
PGSS-42	100 ± 2	CR20W	93 ± 3	CR20W
PGSS-44	102 ± 2	CR20W	96 ± 4	CR20W
PGSS-51	56 ± 3	CR20W	47 ± 2	CR20W
Test 9				
Control	96 ± 1	---	86 ± 1	---
CR20W	95 ± 5	---	91 ± 3	---
PGSS-54	103 ± 1	CR20W	95 ± 3	CR20W
PGSS-45	80 ± 3	CR20W	73 ± 3	CR20W
PGSS-58	67 ± 2	CR20W	61 ± 2	CR20W
PGSS-53	103 ± 3	CR20W	93 ± 2	CR20W
Test 10				
Control	96 ± 2	---	92 ± 5	---
CR23MOD[2]	48 ± 1	---	43 ± 2	---
PGSS-55	102 ± 1	Control	100 ± 1	Control
PGSS-38A	103± 5	Control	101± 6	Control
PGSS-77	104 ± 1	Control	102 ± 2	Control
PGSS-47A	102 ± 5	Control	99 ± 6	Control
Test 11				
Control	96 ± 3	---	89± 2	---
CR23MOD[2]	55 ± 3	---	49 ± 3	---
PGSS-64	99 ± 2	Control	94 ± 2	Control
PGSS-63	69 ± 4	Control	66 ± 3	Control
PGSS-21B	102 ± 1	Control	96 ± 2	Control
PGSS-29A	104 ± 2	Control	99 ± 4	Control

[1]Sample turbidity greater than 100 NTU, toxicity may be artifactual.

[2]Reference did not meet acceptability criteria, comparison made against control

Table 3, Cont. Results of Microtox tests as percentage of initial light output. Shaded data indicates samples that exceed SQS guidelines (> 20% difference and statistically significant difference ($p<0.05$) relative to the control of reference).

Sample	5-minute reading		15 minute reading	
	Mean % of initial light output	Comparison To	Mean % of initital light output	Comparison To
Test 12				
Control	95 ± 2	---	91 ± 1	---
MSMP43	97 ± 3	---	95 ± 4	---
PGSS-GEO-3	99 ± 2	MSMP43	97 ± 5	MSMP43
PGSS-82	99 ± 1	MSMP43	94 ± 2	MSMP43
PGSS-69	59 ± 2	MSMP43	54 ± 2	MSMP43
PGSS-71	101 ± 6	MSMP43	98 ± 6	MSMP43
Test 13				
Control	95 ± 2	---	88 ± 3	---
MSMP43	100 ± 7	---	97 ± 9	---
PGSS-70	97 ± 1	MSMP43	90 ± 1	MSMP43
PGSS-92	97 ± 4	MSMP43	92 ± 3	MSMP43
PGSS-80	97 ± 1	MSMP43	92 ± 2	MSMP43
PGSS-77A	97 ± 2	MSMP43	93 ± 4	MSMP43
Test 14				
Control	94 ± 4	---	87 ± 5	---
MSMP43	97 ± 4	---	93 ± 4	---
PGSS-73	95 ± 5	MSMP43	95 ± 8	MSMP43
PGSS-78	95 ± 2	MSMP43	92 ± 4	MSMP43
PGSS-83	97 ± 4	MSMP43	90 ± 5	MSMP43
PGSS-75	95 ± 3	MSMP43	87 ± 2	MSMP43

[1]Sample turbidity greater than 100 NTU, toxicity may be artifactual.

[2]Reference did not meet acceptability criteria, comparison made against control

3.1 QA/QC

The Microtox tests met control acceptance criteria and there were no deviations from protocol.

Results of reference toxicant tests conducted in conjunction with this testing program are provided in Table 4. The results of these tests fell within the range of mean ± two standard deviations. This puts the results within the acceptable range of historical results for *Vibrio fischeri*, indicating that the sensitivity of the test organisms was appropriate.

Table 4. Reference toxicant test results.

Exposure Duration	Test date	Toxicant	EC50	Acceptable Range	CV (%)
5 Minutes	January 27, 2009	Phenol	45.1 mg/L	21.5 - 46.4	18.3
15 Minutes			46.6 mg/L	25.3 - 74.1	24.5
5 Minutes	January 28, 2009	Phenol	35.4 mg/L	21.6 - 46.5	18.3
15 Minutes			36.9 mg/L	24.5 - 74.3	25.2
5 Minutes	January 29, 2009	Phenol	40.6 mg/L	22.2 - 47.1	18.0
15 Minutes			71.1 mg/L	26.0 - 76.7	24.7
5 Minutes	January 30, 2009	Phenol	28.7 mg/L	21.5 - 46.9	18.6
15 Minutes			40.8 mg/L	25.3 - 76.8	25.2

4.0 DISCUSSION

Samples PGSS-16, PGSS-62B, PGSS-51, PGSS-58, PGSS-63, and PGSS-69 exceeded sediment quality standards for microtox analysis per WDOE 2008 guidelines. Sample PGSS-16 had a turbidity reading in excess of 100 NTU, indicating the sample was turbid, which may have inhibited the transmission of light from the bacteria. Therefore, the low light output for sample PGSS-16 may have been due to an artifact of testing and not an indication of toxicity. All other samples exceeding sediment quality standards had turbidities less than 100 NTU.

5.0 REFERENCES

American Society of Testing and Materials (ASTM). 2000. Test Method for Measuring the Toxicity of Sediment-Associated Contaminants with Freshwater Invertebrates. ASTM Designation E 1706-00.

U.S. Environmental Protection Agency (USEPA). 2000. Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates. EPA/600/R-99/064.

Washington Department of Ecology (WDOE). 2008. Sediment Sampling and Analysis Plan Appendix: Guidance on the Development of Sediment Sampling and Analysis Plans Meeting the Requirements of the Sediment Management Standards Publication No. 03-09-043. Revised February 2008.

APPENDIX A – Results Summaries and Statistical Analysis

Appendix Table A. Microtox 100 Percent Sediment Porewater Test
Sites CR20W, PGSS-8, PGSS-30, PGSS-39, PGSS-35
Client ARI
Test Date: 1/27/09

Site	Light Reading Replicate								$T_{(mean)}/C_{(mean)}$	Quality Control Steps: Change in control light readings compared to initial control $F_{c(mean)}/I_{c(mean)}$	Quality Control Steps: Evaluation of initial light output in site sediments $I_{(0)T(mean)}/I_{(0)C(mean)}$
	Reading	1	2	3	4	5	Mean	St.Dev.			
CON	$I_{(0)}$	95	98	91	95	95	95				
	$I_{(5)}$	97	91	87	89	92	91			0.96	
	$I_{(15)}$	91	84	81	87	86	86			0.91	
	$C_{(5)}$	1.02	0.93	0.96	0.94	0.97	0.96	0.04			
	$C_{(15)}$	0.96	0.86	0.89	0.92	0.91	0.91	0.04			
CR20W	$I_{(0)}$	81	80	79	78	76	79				0.83
	$I_{(5)}$	82	80	79	80	77	80				
	$I_{(15)}$	80	77	79	80	73	78				
	$T_{(5)}$	1.01	1.00	1.00	1.03	1.01	1.01	0.01	1.05		
	$T_{(15)}$	0.99	0.96	1.00	1.03	0.96	0.99	0.03	1.09		
PGSS-8	$I_{(0)}$	73	82	78	78	82	79				0.83
	$I_{(5)}$	81	80	77	78	83	80				
	$I_{(15)}$	79	78	75	73	80	77				
	$T_{(5)}$	1.11	0.98	0.99	1.00	1.01	1.02	0.05	1.06		
	$T_{(15)}$	1.08	0.95	0.96	0.94	0.98	0.98	0.06	1.08		
PGSS-30	$I_{(0)}$	90	86	87	84	90	87				0.92
	$I_{(5)}$	88	85	85	84	89	86				
	$I_{(15)}$	83	82	80	77	82	81				
	$T_{(5)}$	0.98	0.99	0.98	1.00	0.99	0.99	0.01	1.03		
	$T_{(15)}$	0.92	0.95	0.92	0.92	0.91	0.92	0.02	1.02		
PGSS-39	$I_{(0)}$	81	83	83	79	82	82				0.86
	$I_{(5)}$	81	81	83	80	83	82				
	$I_{(15)}$	74	76	77	76	78	76				
	$T_{(5)}$	1.00	0.98	1.00	1.01	1.01	1.00	0.01	1.04		
	$T_{(15)}$	0.91	0.92	0.93	0.96	0.95	0.93	0.02	1.03		
PGSS-35	$I_{(0)}$	89	81	85	85	81	84				0.89
	$I_{(5)}$	93	81	87	88	85	87				
	$I_{(15)}$	88	78	80	85	82	83				
	$T_{(5)}$	1.04	1.00	1.02	1.04	1.05	1.03	0.02	1.07		
	$T_{(15)}$	0.99	0.96	0.94	1.00	1.01	0.98	0.03	1.08		

$I_{(0)}$ is the light reading after the initial five minute incubation period

$I_{(5)}$ is the light reading five minutes after $I_{(0)}$

$I_{(15)}$ is the light reading fifteen minutes after $I_{(0)}$

$C_{(t)}$, $R_{(t)}$, and $T_{(t)}$ are the changes in light readings from the intial reading in each sample container for the control, reference sediment

Quality Control Steps:

1. Is control final mean output greater than or equal to 72% control initial mean output?

$I_{(5)}$:$F_{c(mean)}/I_{c(mean)}$: **96%** **YES**

$I_{(15)}$:$F_{c(mean)}/I_{c(mean)}$: **91%** **YES**

YES: Control results are acceptable and can be used for statistical analyses.

NO: Control results are unacceptable (retest required because there is no reference sediment to use instead of control).

2. Are test initial mean values greater than or equal to 80% of control initial mean values?

S1 $I_{T(mean)}/I_{C(mean)}$: **83%** **YES**

S2 $I_{T(mean)}/I_{C(mean)}$: **83%** **YES**

S3 $I_{T(mean)}/I_{C(mean)}$: **92%** **YES**

S4 $I_{T(mean)}/I_{C(mean)}$: **86%** **YES**

S5 $I_{T(mean)}/I_{C(mean)}$: **89%** **YES**

YES: Use initial site values to calculate change in final light readings

NO: Use control initial mean value to calculate change in final light readings for each site.

Appendix Table A. Microtox 100 Percent Sediment Porewater Test
Sites CR20W, PGSS-20, PGSS-15, PGSS-40, PGSS-22
Client ARI
Test Date: 1/27/09

Site	Reading	Light Reading Replicate 1	2	3	4	5	Mean	St.Dev.	$T_{(mean)}/C_{(mean)}$	Quality Control Steps: Change in control light readings compared to initial control $F_{c(mean)}/I_{c(mean)}$	Quality Control Steps: Evaluation of initial light output in site sediments $I_{(0)T(mean)}/I_{(0)C(mean)}$
CON	$I_{(0)}$	94	100	94	94	94	95				
	$I_{(5)}$	98	99	98	95	97	97			1.02	
	$I_{(15)}$	92	97	95	92	91	93			0.98	
	$C_{(5)}$	1.04	0.99	1.04	1.01	1.03	1.02	0.02			
	$C_{(15)}$	0.98	0.97	1.01	0.98	0.97	0.98	0.02			
CR20W	$I_{(0)}$	90	85	83	86	81	85				0.89
	$I_{(5)}$	96	90	91	92	89	92				
	$I_{(15)}$	93	91	87	92	88	90				
	$T_{(5)}$	1.07	1.06	1.10	1.07	1.10	1.08	0.02	1.05		
	$T_{(15)}$	1.03	1.07	1.05	1.07	1.09	1.06	0.02	1.08		
PGSS-20	$I_{(0)}$	87	88	86	84	86	86				0.91
	$I_{(5)}$	92	90	93	88	90	91				
	$I_{(15)}$	89	89	90	84	89	88				
	$T_{(5)}$	1.06	1.02	1.08	1.05	1.05	1.05	0.02	1.03		
	$T_{(15)}$	1.02	1.01	1.05	1.00	1.03	1.02	0.02	1.04		
PGSS-15	$I_{(0)}$	89	86	83	89	87	87				0.91
	$I_{(5)}$	94	90	86	96	93	92				
	$I_{(15)}$	95	91	81	95	93	91				
	$T_{(5)}$	1.06	1.05	1.04	1.08	1.07	1.06	0.02	1.03		
	$T_{(15)}$	1.07	1.06	0.98	1.07	1.07	1.05	0.04	1.07		
PGSS-40	$I_{(0)}$	82	87	77	83	84	83				0.87
	$I_{(5)}$	85	91	84	88	89	87				
	$I_{(15)}$	85	91	81	88	88	87				
	$T_{(5)}$	1.04	1.05	1.09	1.06	1.06	1.06	0.02	1.03		
	$T_{(15)}$	1.04	1.05	1.05	1.06	1.05	1.05	0.01	1.07		
PGSS-22	$I_{(0)}$	81	80	78	78	77	79				0.83
	$I_{(5)}$	86	87	88	86	83	86				
	$I_{(15)}$	89	87	86	85	85	86				
	$T_{(5)}$	1.06	1.09	1.13	1.10	1.08	1.09	0.03	1.07		
	$T_{(15)}$	1.10	1.09	1.10	1.09	1.10	1.10	0.01	1.12		

$I_{(0)}$ is the light reading after the initial five minute incubation period

$I_{(5)}$ is the light reading five minutes after $I_{(0)}$

$I_{(15)}$ is the light reading fifteen minutes after $I_{(0)}$

$C_{(t)}$, $R_{(t)}$, and $T_{(t)}$ are the changes in light readings from the intial reading in each sample container for the control, reference sediment

Quality Control Steps:

1. Is control final mean output greater than or equal to 72% control initial mean output?

$I_{(5)}$:$F_{c(mean)}/I_{c(mean)}$: **102%** **YES**

$I_{(15)}$:$F_{c(mean)}/I_{c(mean)}$: **98%** **YES**

YES: Control results are acceptable and can be used for statistical analyses.

NO: Control results are unacceptable (retest required because there is no reference sediment to use instead of control).

2. Are test initial mean values greater than or equal to 80% of control initial mean values?

S1 $I_{T(mean)}/I_{C(mean)}$: **89%** **YES**

S2 $I_{T(mean)}/I_{C(mean)}$: **91%** **YES**

S3 $I_{T(mean)}/I_{C(mean)}$: **91%** **YES**

S4 $I_{T(mean)}/I_{C(mean)}$: **87%** **YES**

S5 $I_{T(mean)}/I_{C(mean)}$: **83%** **YES**

YES: Use initial site values to calculate change in final light readings

NO: Use control initial mean value to calculate change in final light readings for each site.

Appendix Table A. Microtox 100 Percent Sediment Porewater Test
Sites CR20W, PGSS-33, PGSS-31, PGSS-18, PGSS-16
Client ARI
Test Date: 1/27/09

Site	Reading	Light Reading Replicate 1	2	3	4	5	Mean	St.Dev.	$T_{(mean)}/C_{(mean)}$	Quality Control Steps: Change in control light readings compared to initial control $F_{c(mean)}/I_{c(mean)}$	Quality Control Steps: Evaluation of initial light output in site sediments $(0)T(mean)/I_{(0)C(mean)}$
CON	$I_{(0)}$	94	99	99	100	98	98				
	$I_{(5)}$	93	96	95	97	94	95			0.97	
	$I_{(15)}$	86	88	90	90	91	89			0.91	
	$C_{(5)}$	0.99	0.97	0.96	0.97	0.96	0.97	0.01			
	$C_{(15)}$	0.91	0.89	0.91	0.90	0.93	0.91	0.02			
CR20W	$I_{(0)}$	85	83	85	80	87	84				0.86
	$I_{(5)}$	91	84	88	84	89	87				
	$I_{(15)}$	91	83	86	81	89	86				
	$T_{(5)}$	1.07	1.01	1.04	1.05	1.02	1.04	0.02	1.07		
	$T_{(15)}$	1.07	1.00	1.01	1.01	1.02	1.02	0.03	1.13		
PGSS-33	$I_{(0)}$	89	96	88	89	93	91				0.93
	$I_{(5)}$	89	92	89	89	94	91				
	$I_{(15)}$	84	87	87	87	93	88				
	$T_{(5)}$	1.00	0.96	1.01	1.00	1.01	1.00	0.02	1.03		
	$T_{(15)}$	0.94	0.91	0.99	0.98	1.00	0.96	0.04	1.06		
PGSS-31	$I_{(0)}$	87	85	80	82	80	83				0.84
	$I_{(5)}$	86	87	84	85	82	85				
	$I_{(15)}$	82	82	82	83	77	81				
	$T_{(5)}$	0.99	1.02	1.05	1.04	1.03	1.02	0.02	1.06		
	$T_{(15)}$	0.94	0.96	1.03	1.01	0.96	0.98	0.04	1.08		
PGSS-18	$I_{(0)}$	89	88	89	89	85	88				0.90
	$I_{(5)}$	89	88	89	91	86	89				
	$I_{(15)}$	81	83	84	87	82	83				
	$T_{(5)}$	1.00	1.00	1.00	1.02	1.01	1.01	0.01	1.04		
	$T_{(15)}$	0.91	0.94	0.94	0.98	0.96	0.95	0.03	1.04		
PGSS-16	$I_{(0)}$	73	71	71	73	69	71				0.73
	$I_{(5)}$	78	73	77	72	73	75				
	$I_{(15)}$	77	70	75	70	69	72				
	$T_{(5)}$	0.80	0.74	0.79	0.73	0.74	0.76	0.03	0.79		
	$T_{(15)}$	0.79	0.71	0.77	0.71	0.70	0.74	0.04	0.81		

$I_{(0)}$ is the light reading after the initial five minute incubation period

$I_{(5)}$ is the light reading five minutes after $I_{(0)}$

$I_{(15)}$ is the light reading fifteen minutes after $I_{(0)}$

$C_{(t)}$, $R_{(t)}$, and $T_{(t)}$ are the changes in light readings from the intial reading in each sample container for the control, reference sediment

Quality Control Steps:

1. Is control final mean output greater than or equal to 72% control initial mean output?

$I_{(5)}$:$F_{c(mean)}/I_{c(mean)}$: **97%** **YES**

$I_{(15)}$:$F_{c(mean)}/I_{c(mean)}$: **91%** **YES**

YES: Control results are acceptable and can be used for statistical analyses.

NO: Control results are unacceptable (retest required because there is no reference sediment to use instead of control).

2. Are test initial mean values greater than or equal to 80% of control initial mean values?

S1 $I_{T(mean)}/I_{C(mean)}$: **86%** **YES**

S2 $I_{T(mean)}/I_{C(mean)}$: **93%** **YES**

S3 $I_{T(mean)}/I_{C(mean)}$: **84%** **YES**

S4 $I_{T(mean)}/I_{C(mean)}$: **90%** **YES**

S5 $I_{T(mean)}/I_{C(mean)}$: **73%** **NO**

YES: Use initial site values to calculate change in final light readings

NO: Use control initial mean value to calculate change in final light readings for each site.

Appendix Table A. Microtox 100 Percent Sediment Porewater Test
Sites MSMP43, PGSS-14A, PGSS-21A, PGSS-29, PGSS-46
Client ARI
Test Date: 1/28/09

Site	Light Reading								$T_{(mean)}/C_{(mean)}$	Quality Control Steps: Change in control light readings compared to initial control $F_{c(mean)}/I_{c(mean)}$	Quality Control Steps: Evaluation of initial light output in site sediments $I_{(0)T(mean)}/I_{(0)C(mean)}$
	Reading	Replicate 1	2	3	4	5	Mean	St.Dev.			
CON	$I_{(0)}$	92	96	101	106	102	99				
	$I_{(5)}$	91	98	97	103	101	98			0.99	
	$I_{(15)}$	84	90	92	92	92	90			0.91	
	$C_{(5)}$	0.99	1.02	0.96	0.97	0.99	0.99	0.02			
	$C_{(15)}$	0.91	0.94	0.91	0.87	0.90	0.91	0.03			
MSMP43	$I_{(0)}$	96	89	85	86	86	88				0.89
	$I_{(5)}$	96	86	85	85	87	88				
	$I_{(15)}$	92	82	79	78	82	83				
	$T_{(5)}$	1.00	0.97	1.00	0.99	1.01	0.99	0.02	1.01		
	$T_{(15)}$	0.96	0.92	0.93	0.91	0.95	0.93	0.02	1.03		
PGSS-14A	$I_{(0)}$	88	89	90	85	86	88				0.88
	$I_{(5)}$	87	88	91	85	84	87				
	$I_{(15)}$	79	84	86	79	80	82				
	$T_{(5)}$	0.99	0.99	1.01	1.00	0.98	0.99	0.01	1.01		
	$T_{(15)}$	0.90	0.94	0.96	0.93	0.93	0.93	0.02	1.03		
PGSS-21A	$I_{(0)}$	94	87	88	88	86	89				0.89
	$I_{(5)}$	93	89	90	87	88	89				
	$I_{(15)}$	87	83	85	82	84	84				
	$T_{(5)}$	0.99	1.02	1.02	0.99	1.02	1.01	0.02	1.02		
	$T_{(15)}$	0.93	0.95	0.97	0.93	0.98	0.95	0.02	1.05		
PGSS-29	$I_{(0)}$	91	93	91	91	89	91				0.92
	$I_{(5)}$	91	91	90	90	89	90				
	$I_{(15)}$	86	83	85	84	82	84				
	$T_{(5)}$	1.00	0.98	0.99	0.99	1.00	0.99	0.01	1.00		
	$T_{(15)}$	0.95	0.89	0.93	0.92	0.92	0.92	0.02	1.02		
PGSS-46	$I_{(0)}$	88	86	89	84	87	87				0.87
	$I_{(5)}$	89	85	90	86	88	88				
	$I_{(15)}$	84	76	84	80	83	81				
	$T_{(5)}$	1.01	0.99	1.01	1.02	1.01	1.01	0.01	1.02		
	$T_{(15)}$	0.95	0.88	0.94	0.95	0.95	0.94	0.03	1.03		

$I_{(0)}$ is the light reading after the initial five minute incubation period

$I_{(5)}$ is the light reading five minutes after $I_{(0)}$

$I_{(15)}$ is the light reading fifteen minutes after $I_{(0)}$

$C_{(t)}$, $R_{(t)}$, and $T_{(t)}$ are the changes in light readings from the intial reading in each sample container for the control, reference sediment

Quality Control Steps:

1. Is control final mean output greater than or equal to 72% control initial mean output?

$I_{(5)}$:$F_{c(mean)}/I_{c(mean)}$: **99%** **YES**

$I_{(15)}$:$F_{c(mean)}/I_{c(mean)}$: **91%** **YES**

YES: Control results are acceptable and can be used for statistical analyses.

NO: Control results are unacceptable (retest required because there is no reference sediment to use instead of control).

2. Are test initial mean values greater than or equal to 80% of control initial mean values?

S1 $I_{T(mean)}/I_{C(mean)}$: **89%** **YES**

S2 $I_{T(mean)}/I_{C(mean)}$: **88%** **YES**

S3 $I_{T(mean)}/I_{C(mean)}$: **89%** **YES**

S4 $I_{T(mean)}/I_{C(mean)}$: **92%** **YES**

S5 $I_{T(mean)}/I_{C(mean)}$: **87%** **YES**

YES: Use initial site values to calculate change in final light readings

NO: Use control initial mean value to calculate change in final light readings for each site.

Appendix Table A. Microtox 100 Percent Sediment Porewater Test
Sites MSMP43,PGSS-38, PGSS-47, PGSS-56, PGSS-61
Client ARI
Test Date: 1/28/09

Site	Light Reading								Quality Control Steps	
		Replicate								Change in control light readings compared to initial control	Evaluation of initial light output in site sediments
	Reading	1	2	3	4	5	Mean	St.Dev.	$T_{(mean)}/C_{(mean)}$	$F_{c(mean)}/I_{c(mean)}$	$I_{(0)T(mean)}/I_{(0)C(mean)}$
CON	$I_{(0)}$	93	93	95	92	95	94				
	$I_{(5)}$	90	90	89	88	90	89			0.96	
	$I_{(15)}$	78	78	78	76	77	77			0.83	
	$C_{(5)}$	0.97	0.97	0.94	0.96	0.95	0.96	0.01			
	$C_{(15)}$	0.84	0.84	0.82	0.83	0.81	0.83	0.01			
MSMP43	$I_{(0)}$	83	86	83	87	83	84				0.90
	$I_{(5)}$	80	83	81	86	81	82				
	$I_{(15)}$	73	75	73	77	74	74				
	$T_{(5)}$	0.96	0.97	0.98	0.99	0.98	0.97	0.01	1.02		
	$T_{(15)}$	0.88	0.87	0.88	0.89	0.89	0.88	0.01	1.07		
PGSS-38	$I_{(0)}$	92	94	88	84	83	88				0.94
	$I_{(5)}$	89	93	87	83	85	87				
	$I_{(15)}$	79	79	79	76	77	78				
	$T_{(5)}$	0.97	0.99	0.99	0.99	1.02	0.99	0.02	1.04		
	$T_{(15)}$	0.86	0.84	0.90	0.90	0.93	0.89	0.04	1.07		
PGSS-47	$I_{(0)}$	90	87	84	91	82	87				0.93
	$I_{(5)}$	86	85	81	89	81	84				
	$I_{(15)}$	76	73	75	80	72	75				
	$T_{(5)}$	0.96	0.98	0.96	0.98	0.99	0.97	0.01	1.02		
	$T_{(15)}$	0.84	0.84	0.89	0.88	0.88	0.87	0.02	1.05		
PGSS-56	$I_{(0)}$	89	81	88	89	86	87				0.93
	$I_{(5)}$	87	80	88	88	81	85				
	$I_{(15)}$	74	71	77	77	69	74				
	$T_{(5)}$	0.98	0.99	1.00	0.99	0.94	0.98	0.02	1.03		
	$T_{(15)}$	0.83	0.88	0.88	0.87	0.80	0.85	0.03	1.03		
PGSS-61	$I_{(0)}$	85	84	86	81	85	84				0.90
	$I_{(5)}$	81	84	84	81	81	82				
	$I_{(15)}$	73	76	76	72	73	74				
	$T_{(5)}$	0.95	1.00	0.98	1.00	0.95	0.98	0.02	1.02		
	$T_{(15)}$	0.86	0.90	0.88	0.89	0.86	0.88	0.02	1.06		

$I_{(0)}$ is the light reading after the initial five minute incubation period

$I_{(5)}$ is the light reading five minutes after $I_{(0)}$

$I_{(15)}$ is the light reading fifteen minutes after $I_{(0)}$

$C_{(t)}$, $R_{(t)}$, and $T_{(t)}$ are the changes in light readings from the intial reading in each sample container for the control, reference sediment

Quality Control Steps:

1. Is control final mean output greater than or equal to 72% control initial mean output?

$I_{(5)}$:$F_{c(mean)}/I_{c(mean)}$: **96%** **YES**

$I_{(15)}$:$F_{c(mean)}/I_{c(mean)}$: **83%** **YES**

YES: Control results are acceptable and can be used for statistical analyses.

NO: Control results are unacceptable (retest required because there is no reference sediment to use instead of control).

2. Are test initial mean values greater than or equal to 80% of control initial mean values?

S1 $I_{T(mean)}/I_{C(mean)}$: **90%** **YES**

S2 $I_{T(mean)}/I_{C(mean)}$: **94%** **YES**

S3 $I_{T(mean)}/I_{C(mean)}$: **93%** **YES**

S4 $I_{T(mean)}/I_{C(mean)}$: **93%** **YES**

S5 $I_{T(mean)}/I_{C(mean)}$: **90%** **YES**

YES: Use initial site values to calculate change in final light readings

NO: Use control initial mean value to calculate change in final light readings for each site.

Appendix Table A. Microtox 100 Percent Sediment Porewater Test
Sites MSMP43, PGSS-62,PGSS-62A, PGSS-62B, PGSS-67
Client ARI
Test Date: 1/28/09

Site	Reading	Light Reading Replicate 1	2	3	4	5	Mean	St.Dev.	$T_{(mean)}/C_{(mean)}$	Quality Control Steps: Change in control light readings compared to initial control $F_{c(mean)}/I_{c(mean)}$	Quality Control Steps: Evaluation of initial light output in site sediments $I_{(0)T(mean)}/I_{(0)C(mean)}$
CON	$I_{(0)}$	96	93	102	97	100	98				
	$I_{(5)}$	92	87	95	94	92	92			0.94	
	$I_{(15)}$	80	81	87	87	84	84			0.86	
	$C_{(5)}$	0.96	0.94	0.93	0.97	0.92	0.94	0.02			
	$C_{(15)}$	0.83	0.87	0.85	0.90	0.84	0.86	0.03			
MSMP43	$I_{(0)}$	87	91	88	85	86	87				0.90
	$I_{(5)}$	89	88	85	80	85	85				
	$I_{(15)}$	83	80	78	78	81	80				
	$T_{(5)}$	1.02	0.97	0.97	0.94	0.99	0.98	0.03	1.04		
	$T_{(15)}$	0.95	0.88	0.89	0.92	0.94	0.92	0.03	1.07		
PGSS-62	$I_{(0)}$	98	89	88	90	93	92				0.94
	$I_{(5)}$	89	86	89	84	90	88				
	$I_{(15)}$	80	79	82	76	85	80				
	$T_{(5)}$	0.91	0.97	1.01	0.93	0.97	0.96	0.04	1.02		
	$T_{(15)}$	0.82	0.89	0.93	0.84	0.91	0.88	0.05	1.02		
PGSS-62A	$I_{(0)}$	84	84	81	83	83	83				0.85
	$I_{(5)}$	81	80	81	83	86	82				
	$I_{(15)}$	74	74	76	75	78	75				
	$T_{(5)}$	0.96	0.95	1.00	1.00	1.04	0.99	0.03	1.05		
	$T_{(15)}$	0.88	0.88	0.94	0.90	0.94	0.91	0.03	1.06		
PGSS-62B	$I_{(0)}$	57	62	64	57	54	59				0.60
	$I_{(5)}$	52	55	61	51	50	54				
	$I_{(15)}$	47	50	54	46	43	48				
	$T_{(5)}$	0.53	0.56	0.63	0.52	0.51	0.55	0.05	0.58		
	$T_{(15)}$	0.48	0.51	0.55	0.47	0.44	0.49	0.04	0.57		
PGSS-67	$I_{(0)}$	89	95	83	85	72	85				0.87
	$I_{(5)}$	86	92	83	84	72	83				
	$I_{(15)}$	79	84	75	78	66	76				
	$T_{(5)}$	0.97	0.97	1.00	0.99	1.00	0.98	0.02	1.04		
	$T_{(15)}$	0.89	0.88	0.90	0.92	0.92	0.90	0.02	1.05		

$I_{(0)}$ is the light reading after the initial five minute incubation period

$I_{(5)}$ is the light reading five minutes after $I_{(0)}$

$I_{(15)}$ is the light reading fifteen minutes after $I_{(0)}$

$C_{(t)}$, $R_{(t)}$, and $T_{(t)}$ are the changes in light readings from the intial reading in each sample container for the control, reference sediment

Quality Control Steps:

1. Is control final mean output greater than or equal to 72% control initial mean output?

$I_{(5)}$:$F_{c(mean)}/I_{c(mean)}$: **94%** **YES**

$I_{(15)}$:$F_{c(mean)}/I_{c(mean)}$: **86%** **YES**

YES: Control results are acceptable and can be used for statistical analyses.

NO: Control results are unacceptable (retest required because there is no reference sediment to use instead of control).

2. Are test initial mean values greater than or equal to 80% of control initial mean values?

S1 $I_{T(mean)}/I_{C(mean)}$: **90%** **YES**

S2 $I_{T(mean)}/I_{C(mean)}$: **94%** **YES**

S3 $I_{T(mean)}/I_{C(mean)}$: **85%** **YES**

S4 $I_{T(mean)}/I_{C(mean)}$: **60%** **NO**

S5 $I_{T(mean)}/I_{C(mean)}$: **87%** **YES**

YES: Use initial site values to calculate change in final light readings

NO: Use control initial mean value to calculate change in final light readings for each site.

Appendix Table A. Microtox 100 Percent Sediment Porewater Test
Sites MSMP43, PGSS-68
Client ARI
Test Date: 1/28/09

Site	Light Reading								$T_{(mean)}$/ $C_{(mean)}$	Quality Control Steps	
		Replicate								Change in control light readings compared to initial control	Evaluation of initial light output in site sediments
	Reading	1	2	3	4	5	Mean	St.Dev.		$F_{c(mean)}/I_{c(mean)}$	$I_{(0)T(mean)}/I_{(0)C(mean)}$
CON	$I_{(0)}$	95	91	88	86	87	89				
	$I_{(5)}$	99	87	86	82	92	89			1.00	
	$I_{(15)}$	96	86	84	82	91	88			0.98	
	$C_{(5)}$	1.04	0.96	0.98	0.95	1.06	1.00	0.05			
	$C_{(15)}$	1.01	0.95	0.95	0.95	1.05	0.98	0.04			
MSMP43	$I_{(0)}$	81	82	75	81	83	80				0.90
	$I_{(5)}$	86	92	84	80	82	85				
	$I_{(15)}$	95	91	84	78	77	85				
	$T_{(5)}$	1.06	1.12	1.12	0.99	0.99	1.06	0.07	1.06		
	$T_{(15)}$	1.17	1.11	1.12	0.96	0.93	1.06	0.11	1.08		
PGSS-68	$I_{(0)}$	85	85	94	88	94	89				1.00
	$I_{(5)}$	89	85	100	91	100	93				
	$I_{(15)}$	92	72	98	91	99	90				
	$T_{(5)}$	1.05	1.00	1.06	1.03	1.06	1.04	0.03	1.04		
	$T_{(15)}$	1.08	0.85	1.04	1.03	1.05	1.01	0.09	1.03		

$I_{(0)}$ is the light reading after the initial five minute incubation period

$I_{(5)}$ is the light reading five minutes after $I_{(0)}$

$I_{(15)}$ is the light reading fifteen minutes after $I_{(0)}$

$C_{(t)}$, $R_{(t)}$, and $T_{(t)}$ are the changes in light readings from the intial reading in each sample container for the control, reference sediment

Quality Control Steps:

1. Is control final mean output greater than or equal to 72% control initial mean output?

$I_{(5)}$:$F_{c(mean)}/I_{c(mean)}$: **100%** **YES**

$I_{(15)}$:$F_{c(mean)}/I_{c(mean)}$: **98%** **YES**

YES: Control results are acceptable and can be used for statistical analyses.

NO: Control results are unacceptable (retest required because there is no reference sediment to use instead of control).

2. Are test initial mean values greater than or equal to 80% of control initial mean values?

S1 $I_{T(mean)}/I_{C(mean)}$: **90%** **YES**

S2 $I_{T(mean)}/I_{C(mean)}$: **100%** **YES**

YES: Use initial site values to calculate change in final light readings

NO: Use control initial mean value to calculate change in final light readings for each site.

Appendix Table A. Microtox 100 Percent Sediment Porewater Test
Sites CR20W, PGSS-54, PGSS-45, PGSS-58, PGSS-53
Client ARI
Test Date: 1/29/09

Site	Light Reading Replicate								Quality Control Steps	
	Reading	1	2	3	4	5	Mean	St.Dev.	$T_{(mean)}/C_{(mean)}$	Change in control light readings compared to initial control $F_{c(mean)}/I_{c(mean)}$	Evaluation of initial light output in site sediments $_{(0)}T_{(mean)}/I_{(0)C(mean)}$
CON	$I_{(0)}$	96	99	96	95	99	97				
	$I_{(5)}$	93	96	91	92	96	94			0.96	
	$I_{(15)}$	82	84	82	84	84	83			0.86	
	$C_{(5)}$	0.97	0.97	0.95	0.97	0.97	0.96	0.01			
	$C_{(15)}$	0.85	0.85	0.85	0.88	0.85	0.86	0.01			
CR20W	$I_{(0)}$	78	83	85	79	86	82				0.85
	$I_{(5)}$	78	76	80	80	77	78				
	$I_{(15)}$	74	73	76	74	75	74				
	$T_{(5)}$	1.00	0.92	0.94	1.01	0.90	0.95	0.05	0.99		
	$T_{(15)}$	0.95	0.88	0.89	0.94	0.87	0.91	0.03	1.06		
PGSS-54	$I_{(0)}$	84	82	79	82	87	83				0.85
	$I_{(5)}$	85	84	83	85	90	85				
	$I_{(15)}$	78	75	78	77	84	78				
	$T_{(5)}$	1.01	1.02	1.05	1.04	1.03	1.03	0.01	1.07		
	$T_{(15)}$	0.93	0.91	0.99	0.94	0.97	0.95	0.03	1.10		
PGSS-45	$I_{(0)}$	76	79	72	74	73	75				0.77
	$I_{(5)}$	79	82	75	77	75	78				
	$I_{(15)}$	70	75	66	70	71	70				
	$T_{(5)}$	0.81	0.85	0.77	0.79	0.77	0.80	0.03	0.83		
	$T_{(15)}$	0.72	0.77	0.68	0.72	0.73	0.73	0.03	0.85		
PGSS-58	$I_{(0)}$	64	60	64	65	62	63				0.65
	$I_{(5)}$	65	64	68	66	63	65				
	$I_{(15)}$	60	56	59	60	59	59				
	$T_{(5)}$	0.67	0.66	0.70	0.68	0.65	0.67	0.02	0.70		
	$T_{(15)}$	0.62	0.58	0.61	0.62	0.61	0.61	0.02	0.71		
PGSS-53	$I_{(0)}$	81	87	78	84	79	82				0.84
	$I_{(5)}$	80	91	82	87	82	84				
	$I_{(15)}$	74	79	74	79	75	76				
	$T_{(5)}$	0.99	1.05	1.05	1.04	1.04	1.03	0.03	1.07		
	$T_{(15)}$	0.91	0.91	0.95	0.94	0.95	0.93	0.02	1.09		

$I_{(0)}$ is the light reading after the initial five minute incubation period

$I_{(5)}$ is the light reading five minutes after $I_{(0)}$

$I_{(15)}$ is the light reading fifteen minutes after $I_{(0)}$

$C_{(t)}$, $R_{(t)}$, and $T_{(t)}$ are the changes in light readings from the intial reading in each sample container for the control, reference sediment

Quality Control Steps:

1. Is control final mean output greater than or equal to 72% control initial mean output?

$I_{(5)}$:$F_{c(mean)}/I_{c(mean)}$: **96%** **YES**

$I_{(15)}$:$F_{c(mean)}/I_{c(mean)}$: **86%** **YES**

YES: Control results are acceptable and can be used for statistical analyses.

NO: Control results are unacceptable (retest required because there is no reference sediment to use instead of control).

2. Are test initial mean values greater than or equal to 80% of control initial mean values?

S1 $I_{T(mean)}/I_{C(mean)}$: **85%** **YES**

S2 $I_{T(mean)}/I_{C(mean)}$: **85%** **YES**

S3 $I_{T(mean)}/I_{C(mean)}$: **77%** **NO**

S4 $I_{T(mean)}/I_{C(mean)}$: **65%** **NO**

S5 $I_{T(mean)}/I_{C(mean)}$: **84%** **YES**

YES: Use initial site values to calculate change in final light readings

NO: Use control initial mean value to calculate change in final light readings for each site.

Appendix Table A. Microtox 100 Percent Sediment Porewater Test
Sites CR20W, PGSS-42, PGSS-44, PGSS-51
Client ARI
Test Date: 1/29/09

Site	Reading	Light Reading Replicate 1	2	3	4	5	Mean	St.Dev.	$T_{(mean)}/C_{(mean)}$	Quality Control Steps: Change in control light readings compared to initial control $F_{c(mean)}/I_{c(mean)}$	Quality Control Steps: Evaluation of initial light output in site sediments $I_{(0)T(mean)}/I_{(0)C(mean)}$
CON	$I_{(0)}$	96	90	92	93	97	94				
	$I_{(5)}$	88	89	92	86	95	90			0.96	
	$I_{(15)}$	80	79	83	83	90	83			0.89	
	$C_{(5)}$	0.92	0.99	1.00	0.92	0.98	0.96	0.04			
	$C_{(15)}$	0.83	0.88	0.90	0.89	0.93	0.89	0.03			
CR20W	$I_{(0)}$	82	86	83	84	78	83				0.88
	$I_{(5)}$	85	79	76	80	78	80				
	$I_{(15)}$	79	76	74	76	74	76				
	$T_{(5)}$	1.04	0.92	0.92	0.95	1.00	0.96	0.05	1.00		
	$T_{(15)}$	0.96	0.88	0.89	0.90	0.95	0.92	0.04	1.04		
PGSS-42	$I_{(0)}$	86	75	82	76	80	80				0.85
	$I_{(5)}$	83	75	83	78	80	80				
	$I_{(15)}$	80	71	72	71	76	74				
	$T_{(5)}$	0.97	1.00	1.01	1.03	1.00	1.00	0.02	1.04		
	$T_{(15)}$	0.93	0.95	0.88	0.93	0.95	0.93	0.03	1.05		
PGSS-44	$I_{(0)}$	86	83	81	80	80	82				0.88
	$I_{(5)}$	85	84	82	82	84	83				
	$I_{(15)}$	80	77	77	82	79	79				
	$T_{(5)}$	0.99	1.01	1.01	1.03	1.05	1.02	0.02	1.06		
	$T_{(15)}$	0.93	0.93	0.95	1.03	0.99	0.96	0.04	1.09		
PGSS-51	$I_{(0)}$	53	55	56	54	56	55				0.59
	$I_{(5)}$	49	55	54	51	51	52				
	$I_{(15)}$	42	47	45	42	44	44				
	$T_{(5)}$	0.52	0.59	0.58	0.54	0.54	0.56	0.03	0.58		
	$T_{(15)}$	0.45	0.50	0.48	0.45	0.47	0.47	0.02	0.53		

$I_{(0)}$ is the light reading after the initial five minute incubation period

$I_{(5)}$ is the light reading five minutes after $I_{(0)}$

$I_{(15)}$ is the light reading fifteen minutes after $I_{(0)}$

$C_{(t)}$, $R_{(t)}$, and $T_{(t)}$ are the changes in light readings from the intial reading in each sample container for the control, reference sediment

Quality Control Steps:

1. Is control final mean output greater than or equal to 72% control initial mean output?

$I_{(5)}$:$F_{c(mean)}/I_{c(mean)}$: **96%** **YES**

$I_{(15)}$:$F_{c(mean)}/I_{c(mean)}$: **89%** **YES**

YES: Control results are acceptable and can be used for statistical analyses.

NO: Control results are unacceptable (retest required because there is no reference sediment to use instead of control).

2. Are test initial mean values greater than or equal to 80% of control initial mean values?

S1	$I_{T(mean)}/I_{C(mean)}$:	**88%**	**YES**
S2	$I_{T(mean)}/I_{C(mean)}$:	**85%**	**YES**
S3	$I_{T(mean)}/I_{C(mean)}$:	**88%**	**YES**
S4	$I_{T(mean)}/I_{C(mean)}$:	**59%**	**NO**

YES: Use initial site values to calculate change in final light readings

NO: Use control initial mean value to calculate change in final light readings for each site.

Appendix Table A. Microtox 100 Percent Sediment Porewater Test
Sites CR23MOD, PGSS-55, PGSS-38A, PGSS-77, PGSS-47A
Client ARI
Test Date: 1/29/09

Site	Light Reading Replicate								$T_{(mean)}/C_{(mean)}$	Quality Control Steps: Change in control light readings compared to initial control $F_{c(mean)}/I_{c(mean)}$	Quality Control Steps: Evaluation of initial light output in site sediments $I_{(0)T(mean)}/I_{(0)C(mean)}$
	Reading	1	2	3	4	5	Mean	St.Dev.			
CON	$I_{(0)}$	96	104	108	110	106	105				
	$I_{(5)}$	90	99	103	106	105	101			0.96	
	$I_{(15)}$	88	90	97	105	104	97			0.92	
	$C_{(5)}$	0.94	0.95	0.95	0.96	0.99	0.96	0.02			
	$C_{(15)}$	0.92	0.87	0.90	0.95	0.98	0.92	0.05			
CR23MOD	$I_{(0)}$	56	60	55	55	58	57				0.54
	$I_{(5)}$	49	50	49	50	51	50				
	$I_{(15)}$	44	47	43	48	45	45				
	$T_{(5)}$	0.47	0.48	0.47	0.48	0.49	0.48	0.01	0.50		
	$T_{(15)}$	0.42	0.45	0.41	0.46	0.43	0.43	0.02	0.47		
PGSS-55	$I_{(0)}$	92	88	96	91	92	92				0.88
	$I_{(5)}$	94	90	97	92	94	93				
	$I_{(15)}$	93	88	94	91	92	92				
	$T_{(5)}$	1.02	1.02	1.01	1.01	1.02	1.02	0.01	1.06		
	$T_{(15)}$	1.01	1.00	0.98	1.00	1.00	1.00	0.01	1.08		
PGSS-38A	$I_{(0)}$	96	93	80	90	92	90				0.86
	$I_{(5)}$	103	93	81	98	89	93				
	$I_{(15)}$	103	90	78	96	88	91				
	$T_{(5)}$	1.07	1.00	1.01	1.09	0.97	1.03	0.05	1.07		
	$T_{(15)}$	1.07	0.97	0.98	1.07	0.96	1.01	0.06	1.09		
PGSS-77	$I_{(0)}$	93	87	87	95	90	90				0.86
	$I_{(5)}$	96	90	92	99	95	94				
	$I_{(15)}$	97	87	88	99	91	92				
	$T_{(5)}$	1.03	1.03	1.06	1.04	1.06	1.04	0.01	1.09		
	$T_{(15)}$	1.04	1.00	1.01	1.04	1.01	1.02	0.02	1.11		
PGSS-47A	$I_{(0)}$	88	84	90	83	85	86				0.82
	$I_{(5)}$	95	84	86	85	88	88				
	$I_{(15)}$	93	85	81	82	83	85				
	$T_{(5)}$	1.08	1.00	0.96	1.02	1.04	1.02	0.05	1.06		
	$T_{(15)}$	1.06	1.01	0.90	0.99	0.98	0.99	0.06	1.07		

$I_{(0)}$ is the light reading after the initial five minute incubation period

$I_{(5)}$ is the light reading five minutes after $I_{(0)}$

$I_{(15)}$ is the light reading fifteen minutes after $I_{(0)}$

$C_{(t)}$, $R_{(t)}$, and $T_{(t)}$ are the changes in light readings from the intial reading in each sample container for the control, reference sediment

Quality Control Steps:

1. Is control final mean output greater than or equal to 72% control initial mean output?

$I_{(5)}$:$F_{c(mean)}/I_{c(mean)}$: **96%** **YES**

$I_{(15)}$:$F_{c(mean)}/I_{c(mean)}$: **92%** **YES**

YES: Control results are acceptable and can be used for statistical analyses.

NO: Control results are unacceptable (retest required because there is no reference sediment to use instead of control).

2. Are test initial mean values greater than or equal to 80% of control initial mean values?

S1 $I_{T(mean)}/I_{C(mean)}$: **54%** **NO**

S2 $I_{T(mean)}/I_{C(mean)}$: **88%** **YES**

S3 $I_{T(mean)}/I_{C(mean)}$: **86%** **YES**

S4 $I_{T(mean)}/I_{C(mean)}$: **86%** **YES**

S5 $I_{T(mean)}/I_{C(mean)}$: **82%** **YES**

YES: Use initial site values to calculate change in final light readings

NO: Use control initial mean value to calculate change in final light readings for each site.

Appendix Table A. Microtox 100 Percent Sediment Porewater Test
Sites CR23MOD, PGSS-64, PGSS-63, PGSS-21B, PGSS-29A
Client ARI
Test Date: 1/29/09

Site	Light Reading Replicate Reading	1	2	3	4	5	Mean	St.Dev.	$T_{(mean)}/C_{(mean)}$	Quality Control Steps: Change in control light readings compared to initial control $F_{c(mean)}/I_{c(mean)}$	Quality Control Steps: Evaluation of initial light output in site sediments $I_{(0)T(mean)}/I_{(0)C(mean)}$
CON	$I_{(0)}$	97	95	99	96	96	97				
	$I_{(5)}$	90	95	93	93	92	93			0.96	
	$I_{(15)}$	86	87	86	85	84	86			0.89	
	$C_{(5)}$	0.93	1.00	0.94	0.97	0.96	0.96	0.03			
	$C_{(15)}$	0.89	0.92	0.87	0.89	0.88	0.89	0.02			
CR23MOD	$I_{(0)}$	60	54	61	56	56	57				0.59
	$I_{(5)}$	56	50	55	51	52	53				
	$I_{(15)}$	51	45	50	46	47	48				
	$T_{(5)}$	0.58	0.52	0.57	0.53	0.54	0.55	0.03	0.57		
	$T_{(15)}$	0.53	0.47	0.52	0.48	0.49	0.49	0.03	0.56		
PGSS-64	$I_{(0)}$	89	86	88	85	86	87				0.90
	$I_{(5)}$	86	88	88	85	83	86				
	$I_{(15)}$	80	81	85	80	80	81				
	$T_{(5)}$	0.97	1.02	1.00	1.00	0.97	0.99	0.02	1.03		
	$T_{(15)}$	0.90	0.94	0.97	0.94	0.93	0.94	0.02	1.06		
PGSS-63	$I_{(0)}$	67	71	63	67	63	66				0.69
	$I_{(5)}$	67	72	64	69	62	67				
	$I_{(15)}$	63	65	61	68	60	63				
	$T_{(5)}$	0.69	0.75	0.66	0.71	0.64	0.69	0.04	0.72		
	$T_{(15)}$	0.65	0.67	0.63	0.70	0.62	0.66	0.03	0.74		
PGSS-21B	$I_{(0)}$	82	86	84	87	81	84				0.87
	$I_{(5)}$	84	88	85	88	84	86				
	$I_{(15)}$	79	80	80	82	80	80				
	$T_{(5)}$	1.02	1.02	1.01	1.01	1.04	1.02	0.01	1.07		
	$T_{(15)}$	0.96	0.93	0.95	0.94	0.99	0.96	0.02	1.08		
PGSS-29A	$I_{(0)}$	76	80	75	81	76	78				0.80
	$I_{(5)}$	79	82	78	84	82	81				
	$I_{(15)}$	78	77	74	77	79	77				
	$T_{(5)}$	1.04	1.03	1.04	1.04	1.08	1.04	0.02	1.09		
	$T_{(15)}$	1.03	0.96	0.99	0.95	1.04	0.99	0.04	1.12		

$I_{(0)}$ is the light reading after the initial five minute incubation period

$I_{(5)}$ is the light reading five minutes after $I_{(0)}$

$I_{(15)}$ is the light reading fifteen minutes after $I_{(0)}$

$C_{(t)}$, $R_{(t)}$, and $T_{(t)}$ are the changes in light readings from the intial reading in each sample container for the control, reference sediment

Quality Control Steps:

1. Is control final mean output greater than or equal to 72% control initial mean output?

$I_{(5)}$:$F_{c(mean)}/I_{c(mean)}$: **96%** **YES**

$I_{(15)}$:$F_{c(mean)}/I_{c(mean)}$: **89%** **YES**

YES: Control results are acceptable and can be used for statistical analyses.

NO: Control results are unacceptable (retest required because there is no reference sediment to use instead of control).

2. Are test initial mean values greater than or equal to 80% of control initial mean values?

S1 $I_{T(mean)}/I_{C(mean)}$: **59%** **NO**

S2 $I_{T(mean)}/I_{C(mean)}$: **90%** **YES**

S3 $I_{T(mean)}/I_{C(mean)}$: **69%** **NO**

S4 $I_{T(mean)}/I_{C(mean)}$: **87%** **YES**

S5 $I_{T(mean)}/I_{C(mean)}$: **80%** **YES**

YES: Use initial site values to calculate change in final light readings

NO: Use control initial mean value to calculate change in final light readings for each site.

Appendix Table A. Microtox 100 Percent Sediment Porewater Test
Sites MSMP43, PGSS-73, PGSS-78, PGSS-83, PGSS-75
Client ARI
Test Date: 1/30/09

Site	Light Reading								Quality Control Steps	
		Replicate							Change in control light readings compared to initial control	Evaluation of initial light output in site sediments
	Reading	1	2	3	4	5	Mean	St.Dev.	$T_{(mean)}/C_{(mean)}$	$F_{c(mean)}/I_{c(mean)}$	$I_{(0)T(mean)}/I_{(0)C(mean)}$
CON	$I_{(0)}$	96	99	97	101	98	98				
	$I_{(5)}$	97	90	87	93	92	92			0.93	
	$I_{(15)}$	90	87	78	84	88	85			0.87	
	$C_{(5)}$	1.01	0.91	0.90	0.92	0.94	0.94	0.04			
	$C_{(15)}$	0.94	0.88	0.80	0.83	0.90	0.87	0.05			
MSMP43	$I_{(0)}$	99	103	93	103	96	99				1.01
	$I_{(5)}$	93	96	96	100	94	96				
	$I_{(15)}$	87	97	89	94	94	92				
	$T_{(5)}$	0.94	0.93	1.03	0.97	0.98	0.97	0.04	1.04		
	$T_{(15)}$	0.88	0.94	0.96	0.91	0.98	0.93	0.04	1.07		
PGSS-73	$I_{(0)}$	99	95	95	93	94	95				0.97
	$I_{(5)}$	91	91	88	86	97	91				
	$I_{(15)}$	83	92	94	84	97	90				
	$T_{(5)}$	0.92	0.96	0.93	0.92	1.03	0.95	0.05	1.02		
	$T_{(15)}$	0.84	0.97	0.99	0.90	1.03	0.95	0.08	1.09		
PGSS-78	$I_{(0)}$	101	101	92	93	94	96				0.98
	$I_{(5)}$	94	97	91	88	89	92				
	$I_{(15)}$	88	93	91	84	84	88				
	$T_{(5)}$	0.93	0.96	0.99	0.95	0.95	0.95	0.02	1.02		
	$T_{(15)}$	0.87	0.92	0.99	0.90	0.89	0.92	0.04	1.05		
PGSS-83	$I_{(0)}$	88	95	89	88	77	87				0.89
	$I_{(5)}$	90	89	83	86	75	85				
	$I_{(15)}$	78	82	77	86	70	79				
	$T_{(5)}$	1.02	0.94	0.93	0.98	0.97	0.97	0.04	1.04		
	$T_{(15)}$	0.89	0.86	0.87	0.98	0.91	0.90	0.05	1.03		
PGSS-75	$I_{(0)}$	84	85	84	87	87	85				0.87
	$I_{(5)}$	78	84	82	82	79	81				
	$I_{(15)}$	73	75	74	74	74	74				
	$T_{(5)}$	0.93	0.99	0.98	0.94	0.91	0.95	0.03	1.01		
	$T_{(15)}$	0.87	0.88	0.88	0.85	0.85	0.87	0.02	1.00		

$I_{(0)}$ is the light reading after the initial five minute incubation period

$I_{(5)}$ is the light reading five minutes after $I_{(0)}$

$I_{(15)}$ is the light reading fifteen minutes after $I_{(0)}$

$C_{(i)}$, $R_{(i)}$, and $T_{(i)}$ are the changes in light readings from the intial reading in each sample container for the control, reference sediment

Quality Control Steps:

1. Is control final mean output greater than or equal to 72% control initial mean output?

$I_{(5)}$:$F_{c(mean)}/I_{c(mean)}$: **93%** **YES**

$I_{(15)}$:$F_{c(mean)}/I_{c(mean)}$: **87%** **YES**

YES: Control results are acceptable and can be used for statistical analyses.
NO: Control results are unacceptable (retest required because there is no reference sediment to use instead of control).

2. Are test initial mean values greater than or equal to 80% of control initial mean values?

S1 $I_{T(mean)}/I_{C(mean)}$: **101%** **YES**

S2 $I_{T(mean)}/I_{C(mean)}$: **97%** **YES**

S3 $I_{T(mean)}/I_{C(mean)}$: **98%** **YES**

S4 $I_{T(mean)}/I_{C(mean)}$: **89%** **YES**

S5 $I_{T(mean)}/I_{C(mean)}$: **87%** **YES**

YES: Use initial site values to calculate change in final light readings
NO: Use control initial mean value to calculate change in final light readings for each site.

Appendix Table A. Microtox 100 Percent Sediment Porewater Test
Sites MSMP43, PGSS-GEO-3, PGSS-82, PGSS-69, PGSS-71
Client ARI
Test Date: 1/30/09

Site	Reading	Light Reading Replicate 1	2	3	4	5	Mean	St.Dev.	$T_{(mean)}/C_{(mean)}$	Quality Control Steps: Change in control light readings compared to initial control $F_{c(mean)}/I_{c(mean)}$	Quality Control Steps: Evaluation of initial light output in site sediments $(0)T(mean)/I_{(0)C(mean)}$
CON	$I_{(0)}$	95	101	97	95	97	97				
	$I_{(5)}$	89	98	90	90	92	92			0.95	
	$I_{(15)}$	88	93	87	87	87	88			0.91	
	$C_{(5)}$	0.94	0.97	0.93	0.95	0.95	0.95	0.02			
	$C_{(15)}$	0.93	0.92	0.90	0.92	0.90	0.91	0.01			
MSMP43	$I_{(0)}$	93	89	93	86	93	91				0.94
	$I_{(5)}$	89	85	87	86	93	88				
	$I_{(15)}$	88	90	83	83	87	86				
	$T_{(5)}$	0.96	0.96	0.94	1.00	1.00	0.97	0.03	1.02		
	$T_{(15)}$	0.95	1.01	0.89	0.97	0.94	0.95	0.04	1.04		
PGSS-GEO-3	$I_{(0)}$	84	83	83	81	77	82				0.84
	$I_{(5)}$	83	84	81	78	77	81				
	$I_{(15)}$	78	88	78	79	74	79				
	$T_{(5)}$	0.99	1.01	0.98	0.96	1.00	0.99	0.02	1.04		
	$T_{(15)}$	0.93	1.06	0.94	0.98	0.96	0.97	0.05	1.07		
PGSS-82	$I_{(0)}$	87	89	85	85	85	86				0.89
	$I_{(5)}$	85	87	85	84	84	85				
	$I_{(15)}$	84	82	81	79	81	81				
	$T_{(5)}$	0.98	0.98	1.00	0.99	0.99	0.99	0.01	1.04		
	$T_{(15)}$	0.97	0.92	0.95	0.93	0.95	0.94	0.02	1.04		
PGSS-69	$I_{(0)}$	61	66	59	59	65	62				0.64
	$I_{(5)}$	56	59	56	55	59	57				
	$I_{(15)}$	51	53	50	53	54	52				
	$T_{(5)}$	0.58	0.61	0.58	0.57	0.61	0.59	0.02	0.62		
	$T_{(15)}$	0.53	0.55	0.52	0.55	0.56	0.54	0.02	0.59		
PGSS-71	$I_{(0)}$	90	96	94	85	85	90				0.93
	$I_{(5)}$	85	93	95	92	89	91				
	$I_{(15)}$	86	89	91	92	81	88				
	$T_{(5)}$	0.94	0.97	1.01	1.08	1.05	1.01	0.06	1.07		
	$T_{(15)}$	0.96	0.93	0.97	1.08	0.95	0.98	0.06	1.07		

$I_{(0)}$ is the light reading after the initial five minute incubation period

$I_{(5)}$ is the light reading five minutes after $I_{(0)}$

$I_{(15)}$ is the light reading fifteen minutes after $I_{(0)}$

$C_{(t)}$, $R_{(t)}$, and $T_{(t)}$ are the changes in light readings from the intial reading in each sample container for the control, reference sediment

Quality Control Steps:

1. Is control final mean output greater than or equal to 72% control initial mean output?

$I_{(5)}$:$F_{c(mean)}/I_{c(mean)}$: **95%** **YES**

$I_{(15)}$:$F_{c(mean)}/I_{c(mean)}$: **91%** **YES**

YES: Control results are acceptable and can be used for statistical analyses.

NO: Control results are unacceptable (retest required because there is no reference sediment to use instead of control).

2. Are test initial mean values greater than or equal to 80% of control initial mean values?

S1 $I_{T(mean)}/I_{C(mean)}$: **94%** **YES**

S2 $I_{T(mean)}/I_{C(mean)}$: **84%** **YES**

S3 $I_{T(mean)}/I_{C(mean)}$: **89%** **YES**

S4 $I_{T(mean)}/I_{C(mean)}$: **64%** **NO**

S5 $I_{T(mean)}/I_{C(mean)}$: **93%** **YES**

YES: Use initial site values to calculate change in final light readings

NO: Use control initial mean value to calculate change in final light readings for each site.

Appendix Table A. Microtox 100 Percent Sediment Porewater Test
Sites MSMP43, PGSS-70, PGSS-92, PGSS-80, PGSS-77A
Client ARI
Test Date: 1/30/09

Site	Light Reading Replicate								Quality Control Steps	
	Reading	1	2	3	4	5	Mean	St.Dev.	$T_{(mean)}/C_{(mean)}$	Change in control light readings compared to initial control $F_{c(mean)}/I_{c(mean)}$	Evaluation of initial light output in site sediments $I_{(0)T(mean)}/I_{(0)C(mean)}$
CON	$I_{(0)}$	93	89	95	93	97	93				
	$I_{(5)}$	86	84	90	90	95	89			0.95	
	$I_{(15)}$	78	78	86	83	87	82			0.88	
	$C_{(5)}$	0.92	0.94	0.95	0.97	0.98	0.95	0.02			
	$C_{(15)}$	0.84	0.88	0.91	0.89	0.90	0.88	0.03			
MSMP43	$I_{(0)}$	82	88	91	98	85	89				0.95
	$I_{(5)}$	92	87	86	94	83	88				
	$I_{(15)}$	92	83	83	89	82	86				
	$T_{(5)}$	1.12	0.99	0.95	0.96	0.98	1.00	0.07	1.05		
	$T_{(15)}$	1.12	0.94	0.91	0.91	0.96	0.97	0.09	1.10		
PGSS-70	$I_{(0)}$	91	89	84	85	81	86				0.92
	$I_{(5)}$	88	87	82	83	78	84				
	$I_{(15)}$	82	79	77	77	72	77				
	$T_{(5)}$	0.97	0.98	0.98	0.98	0.96	0.97	0.01	1.02		
	$T_{(15)}$	0.90	0.89	0.92	0.91	0.89	0.90	0.01	1.02		
PGSS-92	$I_{(0)}$	77	79	83	75	77	78				0.84
	$I_{(5)}$	75	76	75	75	76	75				
	$I_{(15)}$	71	74	73	72	71	72				
	$T_{(5)}$	0.97	0.96	0.90	1.00	0.99	0.97	0.04	1.01		
	$T_{(15)}$	0.92	0.94	0.88	0.96	0.92	0.92	0.03	1.05		
PGSS-80	$I_{(0)}$	85	87	87	85	93	87				0.94
	$I_{(5)}$	81	84	83	83	91	84				
	$I_{(15)}$	79	80	82	77	84	80				
	$T_{(5)}$	0.95	0.97	0.95	0.98	0.98	0.97	0.01	1.01		
	$T_{(15)}$	0.93	0.92	0.94	0.91	0.90	0.92	0.02	1.04		
PGSS-77A	$I_{(0)}$	87	84	87	86	84	86				0.92
	$I_{(5)}$	84	83	84	82	83	83				
	$I_{(15)}$	79	76	78	85	78	79				
	$T_{(5)}$	0.97	0.99	0.97	0.95	0.99	0.97	0.02	1.02		
	$T_{(15)}$	0.91	0.90	0.90	0.99	0.93	0.93	0.04	1.05		

$I_{(0)}$ is the light reading after the initial five minute incubation period

$I_{(5)}$ is the light reading five minutes after $I_{(0)}$

$I_{(15)}$ is the light reading fifteen minutes after $I_{(0)}$

$C_{(t)}$, $R_{(t)}$, and $T_{(t)}$ are the changes in light readings from the intial reading in each sample container for the control, reference sediment

Quality Control Steps:

1. Is control final mean output greater than or equal to 72% control initial mean output?

$I_{(5)}$:$F_{c(mean)}/I_{c(mean)}$: **95%** **YES**

$I_{(15)}$:$F_{c(mean)}/I_{c(mean)}$: **88%** **YES**

YES: Control results are acceptable and can be used for statistical analyses.
NO: Control results are unacceptable (retest required because there is no reference sediment to use instead of control).

2. Are test initial mean values greater than or equal to 80% of control initial mean values?

S1 $I_{T(mean)}/I_{C(mean)}$: **95%** **YES**

S2 $I_{T(mean)}/I_{C(mean)}$: **92%** **YES**

S3 $I_{T(mean)}/I_{C(mean)}$: **84%** **YES**

S4 $I_{T(mean)}/I_{C(mean)}$: **94%** **YES**

S5 $I_{T(mean)}/I_{C(mean)}$: **92%** **YES**

YES: Use initial site values to calculate change in final light readings
NO: Use control initial mean value to calculate change in final light readings for each site.

Project Name: Port Gamble

Sample:	x1
Samp ID:	PGSS-16
Alias:	5 minute
Replicates:	5
Mean:	0.76
SD:	0.032
Tr Mean:	0.76
Trans SD:	0.032

Ref Samp:	x2
Ref ID:	CR20W
Alias:	5 minute
Replicates:	5
Mean:	1.038
SD:	0.024
Tr Mean:	1.038
Trans SD:	0.024

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.018
SS:	0.006
K:	5
b:	0.075
Alpha Level:	0.05
Calculated Value:	0.8759
Critical Value:	<= 0.842
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.028
Test Residual SD:	0.008
Ref. Residual Mean:	0.018
Ref. Residual SD:	0.012
Deg. of Freedom:	8
Alpha Level:	0.1
Calculated Value:	1.4579
Critical Value:	>= 1.860
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation

Experimental Hypothesis

Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	8
Experimental Alpha Level:	0.05
Calculated Value:	15.4444
Critical Value:	>= 1.860
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.8	0.8	1.07	1.07	0.04	0.032			-0.03
2	0.74	0.74	1.01	1.01	0.02	0.028			-0.028
3	0.79	0.79	1.04	1.04	0.03	0.002			-0.02
4	0.73	0.73	1.05	1.05	0.03	0.012			-0.02
5	0.74	0.74	1.02	1.02	0.02	0.018			-0.018
6									0.002
7									0.012
8									0.03
9									0.032
10									0.04

Project Name: Port Gamble

Sample:	x1
Samp ID:	PGSS-16
Alias:	15 minute
Replicates:	5
Mean:	0.736
SD:	0.041
Tr Mean:	0.736
Trans SD:	0.041

Ref Samp:	x2
Ref ID:	CR20W
Alias:	15 minute
Replicates:	5
Mean:	1.022
SD:	0.028
Tr Mean:	1.022
Trans SD:	0.028

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.023
SS:	0.01
K:	5
b:	0.091
Alpha Level:	0.05
Calculated Value:	0.8506
Critical Value:	<= 0.842
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.035
Test Residual SD:	0.011
Ref. Residual Mean:	0.019
Ref. Residual SD:	0.018
Deg. of Freedom:	8
Alpha Level:	0.1
Calculated Value:	1.7048
Critical Value:	>= 1.860
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation

Experimental Hypothesis

Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	8
Experimental Alpha Level:	0.05
Calculated Value:	12.9202
Critical Value:	>= 1.860
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.79	0.79	1.07	1.07	0.054	0.048			-0.036
2	0.71	0.71	1	1	0.026	0.022			-0.026
3	0.77	0.77	1.01	1.01	0.034	0.012			-0.026
4	0.71	0.71	1.01	1.01	0.026	0.012			-0.022
5	0.7	0.7	1.02	1.02	0.036	0.002			-0.012
6									-0.012
7									-0.002
8									0.034
9									0.048
10									0.054

Project Name: Port Gamble

Sample:	x1
Samp ID:	PGSS-62B
Alias:	5 minute
Replicates:	5
Mean:	0.55
SD:	0.048
Tr Mean:	0.55
Trans SD:	0.048

Ref Samp:	x2
Ref ID:	MSMP43
Alias:	5 minute
Replicates:	5
Mean:	0.978
SD:	0.029
Tr Mean:	0.978
Trans SD:	0.029

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.026
SS:	0.013
K:	5
b:	0.108
Alpha Level:	0.05
Calculated Value:	0.9032
Critical Value:	<= 0.842
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.036
Test Residual SD:	0.027
Ref. Residual Mean:	0.022
Ref. Residual SD:	0.017
Deg. of Freedom:	8
Alpha Level:	0.1
Calculated Value:	1.0098
Critical Value:	>= 1.860
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation

Experimental Hypothesis

Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	8
Experimental Alpha Level:	0.05
Calculated Value:	16.8656
Critical Value:	>= 1.860
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.53	0.53	1.02	1.02	0.02	0.042			-0.04
2	0.56	0.56	0.97	0.97	0.01	0.008			-0.038
3	0.63	0.63	0.97	0.97	0.08	0.008			-0.03
4	0.52	0.52	0.94	0.94	0.03	0.038			-0.02
5	0.51	0.51	0.99	0.99	0.04	0.012			-0.008
6									-0.008
7									0.01
8									0.012
9									0.042
10									0.08

Project Name: Port Gamble

Sample:	x1
Samp ID:	PGSS-62B
Alias:	15 minute
Replicates:	5
Mean:	0.49
SD:	0.042
Tr Mean:	0.49
Trans SD:	0.042

Ref Samp:	x2
Ref ID:	MSMP43
Alias:	15 minute
Replicates:	5
Mean:	0.916
SD:	0.03
Tr Mean:	0.916
Trans SD:	0.03

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.024
SS:	0.011
K:	5
b:	0.102
Alpha Level:	0.05
Calculated Value:	0.9767
Critical Value:	<= 0.842
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.032
Test Residual SD:	0.022
Ref. Residual Mean:	0.025
Ref. Residual SD:	0.013
Deg. of Freedom:	8
Alpha Level:	0.1
Calculated Value:	0.6408
Critical Value:	>= 1.860
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation

Experimental Hypothesis

Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	8
Experimental Alpha Level:	0.05
Calculated Value:	18.4004
Critical Value:	>= 1.860
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.48	0.48	0.95	0.95	0.01	0.034			-0.05
2	0.51	0.51	0.88	0.88	0.02	0.036			-0.036
3	0.55	0.55	0.89	0.89	0.06	0.026			-0.026
4	0.47	0.47	0.92	0.92	0.02	0.004			-0.02
5	0.44	0.44	0.94	0.94	0.05	0.024			-0.01
6									0.004
7									0.02
8									0.024
9									0.034
10									0.06

Project Name: Port Gamble

Sample:	x1
Samp ID:	PGSS-51
Alias:	5 minute
Replicates:	5
Mean:	0.554
SD:	0.03
Tr Mean:	0.554
Trans SD:	0.03

Ref Samp:	x2
Ref ID:	CR20W
Alias:	5 minute
Replicates:	5
Mean:	0.966
SD:	0.053
Tr Mean:	0.966
Trans SD:	0.053

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.028
SS:	0.015
K:	5
b:	0.116
Alpha Level:	0.05
Calculated Value:	0.9121
Critical Value:	<= 0.842
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.025
Test Residual SD:	0.011
Ref. Residual Mean:	0.043
Ref. Residual SD:	0.021
Deg. of Freedom:	8
Alpha Level:	0.1
Calculated Value:	1.7411
Critical Value:	>= 1.860
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	8
Experimental Alpha Level:	0.05
Calculated Value:	15.228
Critical Value:	>= 1.860
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.52	0.52	1.04	1.04	0.034	0.074			-0.046
2	0.59	0.59	0.92	0.92	0.036	0.046			-0.046
3	0.58	0.58	0.92	0.92	0.026	0.046			-0.034
4	0.54	0.54	0.95	0.95	0.014	0.016			-0.016
5	0.54	0.54	1	1	0.014	0.034			-0.014
6									-0.014
7									0.026
8									0.034
9									0.036
10									0.074

Project Name: Port Gamble

Sample:	x1
Samp ID:	PGSS-51
Alias:	15 minute
Replicates:	5
Mean:	0.47
SD:	0.021
Tr Mean:	0.47
Trans SD:	0.021

Ref Samp:	x2
Ref ID:	CR20W
Alias:	15 minute
Replicates:	5
Mean:	0.916
SD:	0.036
Tr Mean:	0.916
Trans SD:	0.036

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.019
SS:	0.007
K:	5
b:	0.081
Alpha Level:	0.05
Calculated Value:	0.9141
Critical Value:	<= 0.842
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.016
Test Residual SD:	0.011
Ref. Residual Mean:	0.031
Ref. Residual SD:	0.011
Deg. of Freedom:	8
Alpha Level:	0.1
Calculated Value:	2.1794
Critical Value:	>= 1.860
Variances Homogeneous:	No

Test Results:

Statistic:	Approximate t
Balanced Design:	Yes
Transformation:	No Transformation

Experimental Hypothesis

Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	6
Experimental Alpha Level:	0.05
Calculated Value:	23.638
Critical Value:	>= 1.943
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.45	0.45	0.96	0.96	0.02	0.044			-0.036
2	0.5	0.5	0.88	0.88	0.03	0.036			-0.026
3	0.48	0.48	0.89	0.89	0.01	0.026			-0.02
4	0.45	0.45	0.9	0.9	0.02	0.016			-0.02
5	0.47	0.47	0.95	0.95	0	0.034			-0.016
6									0
7									0.01
8									0.03
9									0.034
10									0.044

Project Name: Port Gamble

Sample:	x1
Samp ID:	PGSS-58
Alias:	5 minute
Replicates:	5
Mean:	0.672
SD:	0.019
Tr Mean:	0.672
Trans SD:	0.019

Ref Samp:	x2
Ref ID:	CR20W
Alias:	5 minute
Replicates:	5
Mean:	0.954
SD:	0.049
Tr Mean:	0.954
Trans SD:	0.049

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.024
SS:	0.011
K:	5
b:	0.103
Alpha Level:	0.05
Calculated Value:	0.9692
Critical Value:	<= 0.842
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.014
Test Residual SD:	0.011
Ref. Residual Mean:	0.041
Ref. Residual SD:	0.017
Deg. of Freedom:	8
Alpha Level:	0.1
Calculated Value:	2.9154
Critical Value:	>= 1.860
Variances Homogeneous:	No

Test Results:

Statistic:	Approximate t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	5
Experimental Alpha Level:	0.05
Calculated Value:	12.0245
Critical Value:	>= 2.015
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.67	0.67	1	1	0.002	0.046			-0.054
2	0.66	0.66	0.92	0.92	0.012	0.034			-0.034
3	0.7	0.7	0.94	0.94	0.028	0.014			-0.022
4	0.68	0.68	1.01	1.01	0.008	0.056			-0.014
5	0.65	0.65	0.9	0.9	0.022	0.054			-0.012
6									-0.002
7									0.008
8									0.028
9									0.046
10									0.056

Project Name: Port Gamble

Sample:	x1
Samp ID:	PGSS-58
Alias:	15 minute
Replicates:	5
Mean:	0.608
SD:	0.016
Tr Mean:	0.608
Trans SD:	0.016

Ref Samp:	x2
Ref ID:	CR20W
Alias:	15 minute
Replicates:	5
Mean:	0.906
SD:	0.036
Tr Mean:	0.906
Trans SD:	0.036

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.018
SS:	0.006
K:	5
b:	0.078
Alpha Level:	0.05
Calculated Value:	0.9477
Critical Value:	<= 0.842
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.011
Test Residual SD:	0.011
Ref. Residual Mean:	0.031
Ref. Residual SD:	0.011
Deg. of Freedom:	8
Alpha Level:	0.1
Calculated Value:	2.9722
Critical Value:	>= 1.860
Variances Homogeneous:	No

Test Results:

Statistic:	Approximate t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	6
Experimental Alpha Level:	0.05
Calculated Value:	16.6587
Critical Value:	>= 1.943
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.62	0.62	0.95	0.95	0.012	0.044			-0.036
2	0.58	0.58	0.88	0.88	0.028	0.026			-0.028
3	0.61	0.61	0.89	0.89	0.002	0.016			-0.026
4	0.62	0.62	0.94	0.94	0.012	0.034			-0.016
5	0.61	0.61	0.87	0.87	0.002	0.036			0.002
6									0.002
7									0.012
8									0.012
9									0.034
10									0.044

Project Name: Port Gamble

Sample:	x1
Samp ID:	PGSS-63
Alias:	5 minute
Replicates:	5
Mean:	0.69
SD:	0.043
Tr Mean:	0.69
Trans SD:	0.043

Ref Samp:	x2
Ref ID:	CON
Alias:	5 minute
Replicates:	5
Mean:	0.96
SD:	0.027
Tr Mean:	0.96
Trans SD:	0.027

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.023
SS:	0.01
K:	5
b:	0.101
Alpha Level:	0.05
Calculated Value:	0.972
Critical Value:	<= 0.842
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.032
Test Residual SD:	0.024
Ref. Residual Mean:	0.02
Ref. Residual SD:	0.016
Deg. of Freedom:	8
Alpha Level:	0.1
Calculated Value:	0.937
Critical Value:	>= 1.860
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation

Experimental Hypothesis

Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	8
Experimental Alpha Level:	0.05
Calculated Value:	11.8403
Critical Value:	>= 1.860
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.69	0.69	0.93	0.93	0	0.03			-0.05
2	0.75	0.75	1	1	0.06	0.04			-0.03
3	0.66	0.66	0.94	0.94	0.03	0.02			-0.03
4	0.71	0.71	0.97	0.97	0.02	0.01			-0.02
5	0.64	0.64	0.96	0.96	0.05	0			0
6									0
7									0.01
8									0.02
9									0.04
10									0.06

Project Name: Port Gamble

Sample:	x1
Samp ID:	PGSS-63
Alias:	15 minute
Replicates:	5
Mean:	0.654
SD:	0.032
Tr Mean:	0.654
Trans SD:	0.032

Ref Samp:	x2
Ref ID:	CON
Alias:	15 minute
Replicates:	5
Mean:	0.89
SD:	0.019
Tr Mean:	0.89
Trans SD:	0.019

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.017
SS:	0.006
K:	5
b:	0.073
Alpha Level:	0.05
Calculated Value:	0.9594
Critical Value:	<= 0.842
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.025
Test Residual SD:	0.016
Ref. Residual Mean:	0.012
Ref. Residual SD:	0.013
Deg. of Freedom:	8
Alpha Level:	0.1
Calculated Value:	1.3783
Critical Value:	>= 1.860
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation

Experimental Hypothesis

Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	8
Experimental Alpha Level:	0.05
Calculated Value:	14.2055
Critical Value:	>= 1.860
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.65	0.65	0.89	0.89	0.004	0			-0.034
2	0.67	0.67	0.92	0.92	0.016	0.03			-0.024
3	0.63	0.63	0.87	0.87	0.024	0.02			-0.02
4	0.7	0.7	0.89	0.89	0.046	0			-0.01
5	0.62	0.62	0.88	0.88	0.034	0.01			-0.004
6									0
7									0
8									0.016
9									0.03
10									0.046

Project Name: Port Gamble

Sample:	x1
Samp ID:	PGSS-69
Alias:	5 minute
Replicates:	5
Mean:	0.59
SD:	0.019
Tr Mean:	0.59
Trans SD:	0.019

Ref Samp:	x2
Ref ID:	MSMP43
Alias:	5 minute
Replicates:	5
Mean:	0.972
SD:	0.027
Tr Mean:	0.972
Trans SD:	0.027

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.015
SS:	0.004
K:	5
b:	0.061
Alpha Level:	0.05
Calculated Value:	0.8694
Critical Value:	<= 0.842
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.016
Test Residual SD:	0.005
Ref. Residual Mean:	0.022
Ref. Residual SD:	0.01
Deg. of Freedom:	8
Alpha Level:	0.1
Calculated Value:	1.2914
Critical Value:	>= 1.860
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation

Experimental Hypothesis

Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	8
Experimental Alpha Level:	0.05
Calculated Value:	26.113
Critical Value:	>= 1.860
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.58	0.58	0.96	0.96	0.01	0.012			-0.032
2	0.61	0.61	0.96	0.96	0.02	0.012			-0.02
3	0.58	0.58	0.94	0.94	0.01	0.032			-0.012
4	0.57	0.57	1	1	0.02	0.028			-0.012
5	0.61	0.61	1	1	0.02	0.028			-0.01
6									-0.01
7									0.02
8									0.02
9									0.028
10									0.028

Project Name: Port Gamble

Sample:	x1
Samp ID:	PGSS-69
Alias:	15 minute
Replicates:	5
Mean:	0.542
SD:	0.016
Tr Mean:	0.542
Trans SD:	0.016

Ref Samp:	x2
Ref ID:	MSMP43
Alias:	15 minute
Replicates:	5
Mean:	0.952
SD:	0.044
Tr Mean:	0.952
Trans SD:	0.044

Shapiro-Wilk Results:

Residual Mean:	0
Residual SD:	0.021
SS:	0.009
K:	5
b:	0.091
Alpha Level:	0.05
Calculated Value:	0.9516
Critical Value:	<= 0.842
Normally Distributed:	Yes
Override Option:	N/A

Levene's Results:

Test Residual Mean:	0.014
Test Residual SD:	0.006
Ref. Residual Mean:	0.03
Ref. Residual SD:	0.028
Deg. of Freedom:	8
Alpha Level:	0.1
Calculated Value:	1.3252
Critical Value:	>= 1.860
Variances Homogeneous:	Yes

Test Results:

Statistic:	Student's t
Balanced Design:	Yes
Transformation:	No Transformation
Experimental Hypothesis	
Null:	x1 >= x2
Alternate:	x1 < x2
Degrees of Freedom:	8
Experimental Alpha Level:	0.05
Calculated Value:	19.5906
Critical Value:	>= 1.860
Accept Null Hypothesis:	No
Power:	
Min. Difference for Power:	

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shipiro-Wilk Residuals
1	0.53	0.53	0.95	0.95	0.012	0.002			-0.062
2	0.55	0.55	1.01	1.01	0.008	0.058			-0.022
3	0.52	0.52	0.89	0.89	0.022	0.062			-0.012
4	0.55	0.55	0.97	0.97	0.008	0.018			-0.012
5	0.56	0.56	0.94	0.94	0.018	0.012			-0.002
6									0.008
7									0.008
8									0.018
9									0.018
10									0.058

APPENDIX B – Laboratory Bench Sheets

Nautilus Environmental
Washington Laboratory
5009 Pacific Hwy. E., Suite 2
Tacoma, WA 98424

Raw Data Sheet
Microtox
100% Sediment Porewater Toxicity

Client Name: ARI **Test Date:** 1/27/09

Sample ID: CR20W, PGSS-8, PGSS-30, PGSS-39, PGSS-35 **Test No.:** 0902-T001-T055

Site	Light Reading	Time	Replicate 1	2	3	4	5
CON	$I_{(0)}$	5 min	95	98	91	95	95
	$I_{(5)}$	10min	97	91	87	89	92
	$I_{(15)}$	20 min	91	84	81	87	86
CR20W	$I_{(0)}$	5 min	81	80	79	78	76
	$I_{(5)}$	10min	82	80	79	80	77
	$I_{(15)}$	20 min	80	77	79	80	73
PGSS-8 8	$I_{(0)}$	5 min	73	82	78	78	82
	$I_{(5)}$	10min	81	80	77	78	83
	$I_{(15)}$	20 min	79	78	75	73	80
PGSS-30 30	$I_{(0)}$	5 min	90	86	87	84	90
	$I_{(5)}$	10min	88	85	85	84	89
	$I_{(15)}$	20 min	83	82	80	77	82
PGSS-39 39	$I_{(0)}$	5 min	81	83	83	79	82
	$I_{(5)}$	10min	81	81	83	80	83
	$I_{(15)}$	20 min	74	76	77	76	78
PGSS-35 35	$I_{(0)}$	5 min	89	81	85	85	81
	$I_{(5)}$	10min	93	81	87	88	85
	$I_{(15)}$	20 min	88	78	80	85	82

Comments:

Nautilus Environmental
Washington Laboratory
5009 Pacific Hwy. E., Suite 2
Tacoma, WA 98424

Raw Data Sheet
Microtox
100% Sediment Porewater Toxicity

Client Name: ARI **Test Date:** 1/27/09

Sample ID: CR20W, PGSS-20, PGSS-15, PGSS-40, PGSS-22 **Test No.:** 0902-T001-T055

Site	Light Reading	Time	Replicate 1	2	3	4	5
CON	$I_{(0)}$	5 min	94	100	94	94	94
	$I_{(5)}$	10min	98	99	98	95	97
	$I_{(15)}$	20 min	92	97	95	92	91
CR20W	$I_{(0)}$	5 min	90	85	83	86	81
	$I_{(5)}$	10min	96	90	91	92	89
	$I_{(15)}$	20 min	93	91	87	92	88
PGSS-20 20	$I_{(0)}$	5 min	87	88	86	84	86
	$I_{(5)}$	10min	92	90	93	88	90
	$I_{(15)}$	20 min	89	89	90	84	89
PGSS-15 15	$I_{(0)}$	5 min	89	86	83	89	87
	$I_{(5)}$	10min	94	90	86	96	93
	$I_{(15)}$	20 min	95	91	81	95	93
PGSS-40 40	$I_{(0)}$	5 min	82	87	77	83	84
	$I_{(5)}$	10min	85	91	84	88	89
	$I_{(15)}$	20 min	85	91	81	88	88
PGSS-22 22	$I_{(0)}$	5 min	81	80	78	78	77
	$I_{(5)}$	10min	86	87	88	86	83
	$I_{(15)}$	20 min	89	87	86	85	85

Comments:

Nautilus Environmental
Washington Laboratory
5009 Pacific Hwy. E., Suite 2
Tacoma, WA 98424

Raw Data Sheet
Microtox
100% Sediment Porewater Toxicity

Client Name: ARI **Test Date:** 1/27/09

Sample ID: CR20W, PGSS-33, PGSS-31, PGSS-18 PGSS-16 **Test No.:** 0902-T001 - T055

Site	Light Reading	Time	Replicate 1	2	3	4	5
CON	$I_{(0)}$	5 min	94	99	99	100	98
	$I_{(5)}$	10min	93	96	95	97	94
	$I_{(15)}$	20 min	86	88	90	90	91
CR20W	$I_{(0)}$	5 min	85	83	85	80	87
	$I_{(5)}$	10min	91	84	88	84	89
	$I_{(15)}$	20 min	91	83	86	81	89
PGSS-33 33	$I_{(0)}$	5 min	89	96	88	89	93
	$I_{(5)}$	10min	89	92	89	89	94
	$I_{(15)}$	20 min	84	87	87	87	93
PGSS-31 31	$I_{(0)}$	5 min	87	85	80	82	80
	$I_{(5)}$	10min	86	87	84	85	82
	$I_{(15)}$	20 min	82	82	82	83	77
PGSS-18 18	$I_{(0)}$	5 min	89	88	89	89	85
	$I_{(5)}$	10min	89	88	89	91	86
	$I_{(15)}$	20 min	81	83	84	87	82
PGSS-16 16	$I_{(0)}$	5 min	73	71	71	73	69
	$I_{(5)}$	10min	78	73	77	72	73
	$I_{(15)}$	20 min	77	70	75	70	69

Comments:

Nautilus Environmental
Washington Laboratory
5009 Pacific Hwy. E., Suite 2
Tacoma, WA 98424

Raw Data Sheet
Microtox
100% Sediment Porewater Toxicity

Client Name: ARI **Test Date:** 1/28/09

Sample ID: MSMP43, PGSS-14A, PGSS-21A, PGSS-29, ~~PGSS-31~~ PGSS-46 **Test No.:** 0902-T001-T055

Site	Light Reading	Time	Replicate 1	2	3	4	5
CON	$I_{(0)}$	5 min	92	96	101	106	102
	$I_{(5)}$	10min	91	98	97	103	101
	$I_{(15)}$	20 min	84	90	92	92	92
MSMP43	$I_{(0)}$	5 min	96	89	85	86	86
	$I_{(5)}$	10min	96	86	85	85	87
	$I_{(15)}$	20 min	92	82	79	78	82
PGSS-14A 14A	$I_{(0)}$	5 min	88	89	90	85	86
	$I_{(5)}$	10min	87	88	91	85	84
	$I_{(15)}$	20 min	79	84	86	79	80
PGSS-21A 21A	$I_{(0)}$	5 min	94	87	88	88	86
	$I_{(5)}$	10min	93	89	90	87	88
	$I_{(15)}$	20 min	87	83	85	82	84
PGSS-29 29	$I_{(0)}$	5 min	91	93	91	91	89
	$I_{(5)}$	10min	91	91	90	90	89
	$I_{(15)}$	20 min	86	83	85	84	82
~~PGSS-31~~ PGSS-46 ~~31~~ 46	$I_{(0)}$	5 min	88	86	89	84	87
	$I_{(5)}$	10min	89	85	90	86	88
	$I_{(15)}$	20 min	84	76	84	80	83

Comments:

Nautilus Environmental
Washington Laboratory
5009 Pacific Hwy. E., Suite 2
Tacoma, WA 98424

Raw Data Sheet
Microtox
100% Sediment Porewater Toxicity

Client Name: ARI **Test Date:** 1/28/09

Sample ID: MSMP43, PG-SS-38, PG-SS-47, PG-SS-56, PG-SS-61 **Test No.:** 0902-T001-T005

Site	Light Reading	Time	Replicate 1	2	3	4	5
CON	$I_{(0)}$	5 min	93	93	95	92	95
	$I_{(5)}$	10min	90	90	89	88	90
	$I_{(15)}$	20 min	78	78	78	76	77
MSMP43	$I_{(0)}$	5 min	83	86	83	87	83
	$I_{(5)}$	10min	80	83	81	86	81
	$I_{(15)}$	20 min	73	75	73	77	74
PG-SS-38 38	$I_{(0)}$	5 min	92	94	88	84	83
	$I_{(5)}$	10min	89	93	87	83	85
	$I_{(15)}$	20 min	79	79	79	76	77
PG-SS-47 47	$I_{(0)}$	5 min	90	87	84	91	82
	$I_{(5)}$	10min	86	85	81	89	81
	$I_{(15)}$	20 min	76	73	75	80	72
PG-SS-56 56	$I_{(0)}$	5 min	89	81	88	89	86
	$I_{(5)}$	10min	87	80	88	88	81
	$I_{(15)}$	20 min	74	71	77	77	69
PG-SS-61 61	$I_{(0)}$	5 min	85	84	86	81	85
	$I_{(5)}$	10min	81	84	84	81	81
	$I_{(15)}$	20 min	73	76	76	72	73

Comments:

Nautilus Environmental
Washington Laboratory
5009 Pacific Hwy. E., Suite 2
Tacoma, WA 98424

Raw Data Sheet
Microtox
100% Sediment Porewater Toxicity

Client Name: ART **Test Date:** 1/28/09

Sample ID: MSMP43, PGSS-62, PGSS-62A, PGSS-62B, PGSS-67 **Test No.:** 0902-T001-T005

Site	Light Reading	Time	Replicate 1	2	3	4	5
CON	$I_{(0)}$	5 min	96	93	102	97	100
	$I_{(5)}$	10min	92	87	95	94	92
	$I_{(15)}$	20 min	80	81	87	87	84
MSMP43	$I_{(0)}$	5 min	87	91	88	85	86
	$I_{(5)}$	10min	89	88	85	80	85
	$I_{(15)}$	20 min	83	80	78	78	81
PGSS-62 62	$I_{(0)}$	5 min	98	89	88	90	93
	$I_{(5)}$	10min	89	86	89	84	90
	$I_{(15)}$	20 min	80	79	82	76	85
PGSS-62A 62A	$I_{(0)}$	5 min	84	84	81	83	83
	$I_{(5)}$	10min	81	80	81	83	86
	$I_{(15)}$	20 min	74	74	76	75	78
PGSS-62B 62B	$I_{(0)}$	5 min	57	62	64	57	54
	$I_{(5)}$	10min	52	55	61	51	50
	$I_{(15)}$	20 min	47	50	54	46	43
PGSS-67 67	$I_{(0)}$	5 min	89	95	83	85	72
	$I_{(5)}$	10min	86	92	83	84	72
	$I_{(15)}$	20 min	~~78~~ 79	84	75	78	66

Comments:

Nautilus Environmental
Washington Laboratory
5009 Pacific Hwy. E., Suite 2
Tacoma, WA 98424

Raw Data Sheet
Microtox
100% Sediment Porewater Toxicity

Client Name: ARI **Test Date:** 1/28/09

Sample ID: MSMP43, PGSS-68 **Test No.:** 0902-T001-T055

Site	Light Reading	Time	Replicate 1	2	3	4	5
CON	$I_{(0)}$	5 min	95	91	88	86	87
	$I_{(5)}$	10min	99	87	86	82	92
	$I_{(15)}$	20 min	96	86	84	82	91
MSMP43	$I_{(0)}$	5 min	81	82	75	81	83
	$I_{(5)}$	10min	86	92	84	80	82
	$I_{(15)}$	20 min	95	91	84	78	77
PGSS-68 68	$I_{(0)}$	5 min	85	85	94	88	94
	$I_{(5)}$	10min	89	85	100	91	100
	$I_{(15)}$	20 min	92	72	98	91	99
	$I_{(0)}$	5 min					
	$I_{(5)}$	10min					
	$I_{(15)}$	20 min					
	$I_{(0)}$	5 min					
	$I_{(5)}$	10min					
	$I_{(15)}$	20 min					
	$I_{(0)}$	5 min					
	$I_{(5)}$	10min					
	$I_{(15)}$	20 min					

Comments:

Nautilus Environmental
Washington Laboratory
5009 Pacific Hwy. E., Suite 2
Tacoma, WA 98424

Raw Data Sheet
Microtox
100% Sediment Porewater Toxicity

Client Name: ARI **Test Date:** 1/29/09

Sample ID: CR20W, PGSS-42, PGSS-44, PGSS-51 **Test No.:** 0902-T001-T005

Site	Light Reading	Time	Replicate 1	2	3	4	5
CON	$I_{(0)}$	5 min	96	90	92	93	97
	$I_{(5)}$	10min	88	89	92	86	95
	$I_{(15)}$	20 min	80	79	83	83	90
CR20W	$I_{(0)}$	5 min	82	86	83	84	78
	$I_{(5)}$	10min	85	79	76	80	78
	$I_{(15)}$	20 min	79	76	74	76	74
PGSS-42 42	$I_{(0)}$	5 min	86	75	82	76	80
	$I_{(5)}$	10min	83	75	83	78	80
	$I_{(15)}$	20 min	80	71	72	71	76
PGSS-44 44	$I_{(0)}$	5 min	86	83	81	80	80
	$I_{(5)}$	10min	85	84	82	82	84
	$I_{(15)}$	20 min	80	77	77	82	79
PGSS-51 51	$I_{(0)}$	5 min	53	55	56	54	56
	$I_{(5)}$	10min	49	55	54	51	51
	$I_{(15)}$	20 min	42	47	45	42	44
	$I_{(0)}$	5 min					
	$I_{(5)}$	10min					
	$I_{(15)}$	20 min					

Comments:

Nautilus Environmental
Washington Laboratory
5009 Pacific Hwy. E., Suite 2
Tacoma, WA 98424

Raw Data Sheet
Microtox
100% Sediment Porewater Toxicity

Client Name: ARI **Test Date:** 1/29/09

Sample ID: CR20W, PG-SS-54, PG-SS-45, PG-SS-58 PG-SS-53 **Test No.:** 0902 – T001 – ~~T001~~ T055

Site	Light Reading	Time	Replicate 1	2	3	4	5
CON	$I_{(0)}$	5 min	96	99	96	95	99
	$I_{(5)}$	10min	93	96	91	92	96
	$I_{(15)}$	20 min	82	84	82	84	84
CR20W	$I_{(0)}$	5 min	78	83	85	79	86
	$I_{(5)}$	10min	78	76	80	80	77
	$I_{(15)}$	20 min	74	73	76	74	75
PG-SS-54 54	$I_{(0)}$	5 min	84	82	79	82	87
	$I_{(5)}$	10min	85	84	83	85	90
	$I_{(15)}$	20 min	78	75	78	77	84
PG-SS-45 45	$I_{(0)}$	5 min	~~97~~ 76	79	72	74	73
	$I_{(5)}$	10min	79	82	75	77	75
	$I_{(15)}$	20 min	70	75	66	70	71
PG-SS-58 58	$I_{(0)}$	5 min	64	60	64	65	62
	$I_{(5)}$	10min	65	64	68	66	63
	$I_{(15)}$	20 min	60	56	59	60	59
PG-SS-53 53	$I_{(0)}$	5 min	81	87	78	84	79
	$I_{(5)}$	10min	80	91	82	87	82
	$I_{(15)}$	20 min	74	79	74	79	75

Comments:

Nautilus Environmental
Washington Laboratory
5009 Pacific Hwy. E., Suite 2
Tacoma, WA 98424

Raw Data Sheet
Microtox
100% Sediment Porewater Toxicity

Client Name: ARI **Test Date:** 1/29/09

Sample ID: CR23-MOD, PG-SS-55, PG-SS-38A PG-SS-77, ~~PG-SS-33A~~ PG-SS-47A **Test No.:** 0902-T001-T055

Site	Light Reading	Time	Replicate 1	2	3	4	5
CON	$I_{(0)}$	5 min	96	104	108	110	106
	$I_{(5)}$	10min	90	99	103	106	105
	$I_{(15)}$	20 min	88	90	97	105	104
CR23-MOD	$I_{(0)}$	5 min	56	60	55	55	58
	$I_{(5)}$	10min	49	50	49	50	51
	$I_{(15)}$	20 min	44	47	43	48	45
PG-SS-55 55	$I_{(0)}$	5 min	92	88	96	91	92
	$I_{(5)}$	10min	94	90	97	92	94
	$I_{(15)}$	20 min	93	88	94	91	92
PG-SS-38A 38A	$I_{(0)}$	5 min	96	93	80	90	92
	$I_{(5)}$	10min	103	93	81	98	89
	$I_{(15)}$	20 min	103	90	78	96	88
PG-SS-77 77	$I_{(0)}$	5 min	93	87	87	95	90
	$I_{(5)}$	10min	96	90	92	99	95
	$I_{(15)}$	20 min	97	87	88	99	91
~~PG-SS-33A~~ PG-SS-47A 47A ~~33A~~	$I_{(0)}$	5 min	88	84	90	83	85
	$I_{(5)}$	10min	95	84	86	85	88
	$I_{(15)}$	20 min	93	85	81	82	83

Comments:

Nautilus Environmental
Washington Laboratory
5009 Pacific Hwy. E., Suite 2
Tacoma, WA 98424

Raw Data Sheet
Microtox
100% Sediment Porewater Toxicity

Client Name: ARI **Test Date:** 1/29/09

Sample ID: CR23-MOD, PG-SS-64, PG-SS-63, PG-SS-21B ~~PG-SS-21A~~ ~~QA~~ PG-SS-29A **Test No.:** 0902-T001-T055

Site	Light Reading	Time	Replicate 1	2	3	4	5
CON	$I_{(0)}$	5 min	97	95	99	96	96
	$I_{(5)}$	10min	90	95	93	93	92
	$I_{(15)}$	20 min	86	87	86	85	84
CR23-MOD	$I_{(0)}$	5 min	60	54	61	56	56
	$I_{(5)}$	10min	56	50	55	51	52
	$I_{(15)}$	20 min	51	45	50	46	47
PG-SS-64 64	$I_{(0)}$	5 min	89	86	88	85	86
	$I_{(5)}$	10min	86	88	88	85	83
	$I_{(15)}$	20 min	80	81	85	80	80
PG-SS-63 63	$I_{(0)}$	5 min	67	71	63	67	63
	$I_{(5)}$	10min	67	72	64	69	62
	$I_{(15)}$	20 min	63	65	61	68	60
PG-SS-21B 21 B	$I_{(0)}$	5 min	82	86	84	87	81
	$I_{(5)}$	10min	84	88	85	88	84
	$I_{(15)}$	20 min	79	80	80	82	80
~~PG-SS-21A~~ ~~QA~~ PG-SS-29A 29A ~~21A QA~~	$I_{(0)}$	5 min	76	80	75	81	76
	$I_{(5)}$	10min	79	82	78	84	82
	$I_{(15)}$	20 min	78	77	74	77	79

Comments:

Nautilus Environmental
Washington Laboratory
5009 Pacific Hwy. E., Suite 2
Tacoma, WA 98424

Raw Data Sheet
Microtox
100% Sediment Porewater Toxicity

Client Name: ARI **Test Date:** 1/30/09

Sample ID: MSMP43, PGSS-GEO-3, PGSS-82, PGSS-69, PGSS-71 **Test No.:** 0902-T001-T055

Site	Light Reading	Time	Replicate 1	2	3	4	5
CON	$I_{(0)}$	5 min	95	101	97	95	97
	$I_{(5)}$	10min	89	98	90	90	92
	$I_{(15)}$	20 min	88	93	87	87	87
MSMP43	$I_{(0)}$	5 min	93	89	93	86	93
	$I_{(5)}$	10min	89	85	87	86	93
	$I_{(15)}$	20 min	88	90	83	83	87
PGSS-GEO-3 GEO-3	$I_{(0)}$	5 min	84	83	83	81	77
	$I_{(5)}$	10min	83	84	81	78	77
	$I_{(15)}$	20 min	78	88	78	79	74
PGSS-82 82	$I_{(0)}$	5 min	87	89	85	85	85
	$I_{(5)}$	10min	85	87	85	84	84
	$I_{(15)}$	20 min	84	82	81	79	81
PGSS-69 69	$I_{(0)}$	5 min	61	66	59	59	65
	$I_{(5)}$	10min	56	59	56	55	59
	$I_{(15)}$	20 min	51	53	50	53	54
PGSS-71 71	$I_{(0)}$	5 min	90	96	94	85	85
	$I_{(5)}$	10min	85	93	95	92	89
	$I_{(15)}$	20 min	86	89	91	92	81

Comments:

Nautilus Environmental
Washington Laboratory
5009 Pacific Hwy. E., Suite 2
Tacoma, WA 98424

Raw Data Sheet
Microtox
100% Sediment Porewater Toxicity

Client Name: ARI **Test Date:** 1/30/09

Sample ID: MSMP43, PGSS-70, PGSS-92, PGSS-80 PGSS-77A **Test No.:** 0902-T001-T055

Site	Light Reading	Time	Replicate 1	2	3	4	5
CON	$I_{(0)}$	5 min	93	89	95	93	97
	$I_{(5)}$	10min	86	84	90	90	95
	$I_{(15)}$	20 min	78	78	86	83	87
MSMP43	$I_{(0)}$	5 min	82	88	91	98	85
	$I_{(5)}$	10min	92	87	86	94	83
	$I_{(15)}$	20 min	92	83	83	89	82
PGSS-70 70	$I_{(0)}$	5 min	91	89	84	85	81
	$I_{(5)}$	10min	88	87	82	83	78
	$I_{(15)}$	20 min	82	79	77	77	72
PGSS-92 92	$I_{(0)}$	5 min	77	79	83	75	77
	$I_{(5)}$	10min	75	76	75	75	76
	$I_{(15)}$	20 min	71	74	73	72	71
PGSS-80 80	$I_{(0)}$	5 min	85	87	87	85	93
	$I_{(5)}$	10min	81	84	83	83	91
	$I_{(15)}$	20 min	79	80	82	77	84
PGSS-77A 77A	$I_{(0)}$	5 min	87	84	87	86	84
	$I_{(5)}$	10min	84	83	84	82	83
	$I_{(15)}$	20 min	79	76	78	85	78

Comments:

Nautilus Environmental
Washington Laboratory
5009 Pacific Hwy. E., Suite 2
Tacoma, WA 98424

Raw Data Sheet
Microtox
100% Sediment Porewater Toxicity

Client Name: ARI **Test Date:** 1/30/09

Sample ID: MSMP43, PGSS-73, PGSS-78, PGSS-83, PGSS-75 **Test No.:** 0902-T001-T055

Site	Light Reading	Time	Replicate 1	2	3	4	5
CON	$I_{(0)}$	5 min	96	99	97	101	98
	$I_{(5)}$	10min	97	90	87	93	92
	$I_{(15)}$	20 min	90	87	78	84	88
MSMP43	$I_{(0)}$	5 min	99	103	93	103	96
	$I_{(5)}$	10min	93	96	96	100	94
	$I_{(15)}$	20 min	87	97	89	94	94
PGSS-73 73	$I_{(0)}$	5 min	99	95	95	93	94
	$I_{(5)}$	10min	91	91	88	86	97
	$I_{(15)}$	20 min	83	92	94	84	97
PGSS-78 78	$I_{(0)}$	5 min	101	101	92	93	94
	$I_{(5)}$	10min	94	97	91	88	89
	$I_{(15)}$	20 min	88	93	91	84	84
PGSS-83 83	$I_{(0)}$	5 min	88	95	89	88	77
	$I_{(5)}$	10min	90	89	83	86	75
	$I_{(15)}$	20 min	78	82	77	86	70
PGSS-75 75	$I_{(0)}$	5 min	84	85	84	87	87
	$I_{(5)}$	10min	78	84	82	82	79
	$I_{(15)}$	20 min	73	75	74	74	74

Comments:

APPENDIX C – Water Quality Results

Nautilus Environmental
Washington Laboratory
5009 Pacific Hwy. E., Suite 2
Tacoma, WA 98424

Physical and Chemical
Measurements of Porewaters
Sediment Bioassays

Analyst: Eric/(M)

Client : ARI

Test Date: 1/30/09

Test Type: Microtox 100% Porewater Toxicity Test

Test No: 0902-T001-T055

Test Species: *Vibrio fischeri*

Site	Initial Salinity (ppt)	Final Salinity (ppt)	Initial D.O. (mg/L)	Final D.O (mg/L)	Initial pH	Adjusted pH	NaOH or HCl Vol. Used	Final Porewater Conc.	Ammonia
CON	0.0	29.5	7.3	7.3	8.87	8.20	180 µl HCl	99.3	<1.0
MSMP43	30.0	30.0	6.9	6.9	7.73	7.93	30 µl NaOH	99.9	17.7
GED-3	30.5	30.5	6.7	6.7	7.90	7.90	Ø	100 +%	10.7
82	30.3	30.3	7.0	7.0	7.90	7.90	Ø	100 +%	24.4
69	30.1	30.1	6.5	6.5	7.69	8.00	60 µl NaOH	99.8	14.9
71	30.4	30.4	6.3	6.3	7.69	7.98	60 µl NaOH	99.8	1.0
70	30.2	30.2	6.2	6.2	7.20	7.90	150 µl NaOH	99.4	10.9

Sample Description: _____

Comments: _____

QA Check: _____

Nautilus Environmental
Washington Laboratory
5009 Pacific Hwy. E., Suite 2
Tacoma, WA 98424

Physical and Chemical Measurements of Porewaters Sediment Bioassays

Analyst: Eric/@

Client : ARI

Test Date: 1/30/09

Test Type: Microtox 100% Porewater Toxicity Test

Test No: 0902-T001-~~T009~~ T055

Test Species: *Vibrio fischeri*

Site	Initial Salinity (ppt)	Final Salinity (ppt)	Initial D.O. (mg/L)	Final D.O (mg/L)	Initial pH	Adjusted pH	NaOH or HCl Vol. Used	Final Porewater Conc.	Ammonia
92	30.3	30.3	6.9	6.9	7.59	7.90	60 µl NaOH	99.8	18.1
80	30.6	30.6	7.2	7.2	7.606	7.95	60 µl NaOH	99.8	23.4
77A	30.3	30.3	6.4	6.4	7.22	7.90	180 µl NaOH	99.3	19.8
78	30.3	30.3	6.5	6.5	7.23	7.93	180 µl NaOH	99.3	2.6
73	30.6	30.6	6.3	6.3	7.41	7.92	120 µl NaOH	99.5	1.9
83	30.2	30.2	6.2	6.2	7.35	7.93	180 µl NaOH	99.3	21.2
75	29.5	29.5	6.7	6.7	7.81	7.91	10 µl NaOH	98.6 ~~99.9~~	20.2

7ML of Sample

Sample Description: _____

Comments: _____

QA Check: _____

Nautilus Environmental
Washington Laboratory
5009 Pacific Hwy. E., Suite 2
Tacoma, WA 98424

Physical and Chemical
Measurements of Porewaters
Sediment Bioassays

Analyst: Eric/(M)

Client : ARI

Test Date: 1/29/09

Test Type: Microtox 100% Porewater Toxicity Test

Test No: 0902-T001-T055

Test Species: *Vibrio fischeri*

Site	Initial Salinity (ppt)	Final Salinity (ppt)	Initial D.O. (mg/L)	Final D.O (mg/L)	Initial pH	Adjusted pH	NaOH or HCl Vol. Used	Final Porewater Conc.	Ammonia
CON	0.0	28.0	7.1	7.1	8.46	8.20	80 µl HCl	99.7	—
54	30.5	30.5	7.6	7.6	7.14	7.90	240 µl NaOH	99.0	1.0
45	30.3	30.3	6.8	6.8	7.22	7.98	240 µl NaOH	99.0	18.8
58	30.0	30.0	7.6	7.6	7.34	8.20	180 µl NaOH	99.3	18.5
CR20	30.3	30.3	8.0	8.0	7.55	7.94	120 µl NaOH	99.5	21.9
53	30.3	30.3	7.8	7.8	7.20	8.18	240 µl NaOH	99.0	5.1
51	31.0	31.0	7.2	7.2	7.30	7.94	180 µl NaOH	99.3	18.8

Sample Description: _____

Comments: _____

QA Check: _____

Nautilus Environmental
Washington Laboratory
5009 Pacific Hwy. E., Suite 2
Tacoma, WA 98424

Physical and Chemical
Measurements of Porewaters
Sediment Bioassays

Analyst: Eric / (M)

Client : ARI

Test Date: 1/29/09

Test Type: Microtox 100% Porewater Toxicity Test

Test No: 0902-T001-T055

Test Species: *Vibrio fischeri*

Site	Initial Salinity (ppt)	Final Salinity (ppt)	Initial D.O. (mg/L)	Final D.O (mg/L)	Initial pH	Adjusted pH	NaOH or HCl Vol. Used	Final Porewater Conc.	Ammonia
CON	0.0	28.0	7.1	7.1	8.46	8.20	80 µl HCl	99.7	<1.0
CR23MOD	30.6	30.6	6.6	6.6	7.52	7.90	60 µl NaOH	99.8	16.8
55	29.9	29.9	6.7	6.7	7.49	7.90	80 µl NaOH	99.7	13.3
38A	30.4	30.4	7.1	7.1	7.30	7.90	120 µl NaOH	99.5	6.8
77	30.4	30.4	5.7	5.7	7.23	7.91	180 µl NaOH	99.3	27.3
47A ~~81-33~~	30.1	30.1	5.5	5.5	7.50	7.92	90 µl NaOH	99.6	2.0
~~64~~	30.3	30.3	6.6	6.6	7.99	7.99	∅	100	1.4

Sample Description: _____

Comments: _____

QA Check: _____

Nautilus Environmental
Washington Laboratory
5009 Pacific Hwy. E., Suite 2
Tacoma, WA 98424

Physical and Chemical Measurements of Porewaters Sediment Bioassays

Analyst: Eric / (M)

Client : ARI

Test Date: 1/29/09

Test Type: Microtox 100% Porewater Toxicity Test

Test No: 0902-T001 - T055

Test Species: *Vibrio fischeri*

Site	Initial Salinity (ppt)	Final Salinity (ppt)	Initial D.O. (mg/L)	Final D.O (mg/L)	Initial pH	Adjusted pH	NaOH or HCl Vol. Used	Final Porewater Conc.	Ammonia
63	30.3	30.3	6.3	6.3	7.43	7.91	120 µl NaOH	99.5	14.0
21B	30.4	30.4	6.3	6.3	7.37	8.06	180 µl NaOH	99.3	10.3
29A	30.7	30.7	6.5	6.5	7.50	7.95	120 µl NaOH	99.5	11.4

Sample Description: _____

Comments: _____

QA Check: _____

Nautilus Environmental
Washington Laboratory
5009 Pacific Hwy. E., Suite 2
Tacoma, WA 98424

Physical and Chemical Measurements of Porewaters Sediment Bioassays

Analyst: Eric/@

Client : ARI

Test Date: 1/29/09

Test Type: Microtox 100% Porewater Toxicity Test

Test No: 0902-T001-T055

Test Species: *Vibrio fischeri*

Site	Initial Salinity (ppt)	Final Salinity (ppt)	Initial D.O. (mg/L)	Final D.O (mg/L)	Initial pH	Adjusted pH	NaOH or HCl Vol. Used	Final Porewater Conc.	Ammonia
44	30.5	30.5	7.7	7.7	7.22	8.20	240 ul NaOH	99.0	1.7
42	30.7	30.7	7.8	7.8	7.40	8.18	180 ul NaOH	99.3	4.3

Sample Description: _____

Comments: _____

QA Check: _____

Nautilus Environmental
Washington Laboratory
5009 Pacific Hwy. E., Suite 2
Tacoma, WA 98424

Physical and Chemical
Measurements of Porewaters
Sediment Bioassays

Analyst: Eric/(m)

Client : ARI

Test Date: 1/28/09

Test Type: Microtox 100% Porewater Toxicity Test

Test No: 0902-T001-T005

Test Species: *Vibrio fischeri*

Site	Initial Salinity (ppt)	Final Salinity (ppt)	Initial D.O. (mg/L)	Final D.O. (mg/L)	Initial pH	Adjusted pH	NaOH or HCl Vol. Used	Final Porewater Conc.	Ammonia
CON	0.0	(m) 30.4 ~~20.4~~	7.5	7.5	8.52	8.14	60 ul HCl	99.8	<1.0
68	30.1	30.1	6.3	6.3	7.24	8.04	180 ul NaOH	99.3	9.1
67	30.16	30.16	6.3	6.3	7.56	7.96	60 ul NaOH	99.8	2.2
29	30.3	30.3	7.0	7.0	7.82	7.95	20 ul NaOH	99.9	3.4
62A	29.2	29.2	6.4	6.4	7.85	7.98	20 ul NaOH	99.9	35.1
14A	30.16	30.16	5.9	5.9	7.71	7.94	40 ul NaOH	99.8	26.2
62B	30.3	30.3	5.8	5.8	7.39	7.91	120 ul NaOH	99.5	34.9

Sample Description: _____

Comments: _____

QA Check: _____

Nautilus Environmental
Washington Laboratory
5009 Pacific Hwy. E., Suite 2
Tacoma, WA 98424

Physical and Chemical
Measurements of Porewaters
Sediment Bioassays

Analyst: Eric/(w)

Client : ARI

Test Date: 1/28/09

Test Type: Microtox 100% Porewater Toxicity Test

Test No: 0902-T001-T055

Test Species: *Vibrio fischeri*

Site	Initial Salinity (ppt)	Final Salinity (ppt)	Initial D.O. (mg/L)	Final D.O (mg/L)	Initial pH	Adjusted pH	NaOH or HCl Vol. Used	Final Porewater Conc.	Ammonia
38	29.9	29.9	6.7	6.7	7.52	7.95	80 µl NaOH	99.7	22.1
21A	30.0	30.0	6.5	6.5	7.81	7.93	20 µl NaOH	99.9	29.5
47	30.3	30.3	6.7	6.7	7.65	8.02	60 µl NaOH	99.8	8.9
~~37~~ 46 ~~38~~ (w)	30.9	30.9	6.8	6.8	7.00	7.90	180 µl NaOH	99.3	17.6
61	30.3	30.3	6.3	6.3	7.30	~~8.04~~ 8.00	180 µl NaOH	99.3	2.8
MSMP43	30.4	30.4	6.6	6.6	7.49	8.06	180 µl NaOH	99.3	17.7
56	30.6	30.6	6.6	6.6	7.30	8.04	180 µl NaOH	99.3	3.4

Sample Description: _____

Comments: _____

QA Check: _____

Nautilus Environmental
Washington Laboratory
5009 Pacific Hwy. E., Suite 2
Tacoma, WA 98424

Physical and Chemical
Measurements of Porewaters
Sediment Bioassays

Analyst: gt

Client : ARI

Test Date: 1/28/09

Test Type: Microtox 100% Porewater Toxicity Test

Test No: 0902-T001-T055

Test Species: *Vibrio fischeri*

Site	Initial Salinity (ppt)	Final Salinity (ppt)	Initial D.O. (mg/L)	Final D.O. (mg/L)	Initial pH	Adjusted pH	NaOH or HCl Vol. Used	Final Porewater Conc.	Ammonia
62	29.2	29.2	6.6	6.6	7.41	8.06	150µL NaOH	99.4	6.6

Sample Description: _____

Comments: _____

QA Check: _____

Nautilus Environmental
Washington Laboratory
5009 Pacific Hwy. E., Suite 2
Tacoma, WA 98424

Physical and Chemical
Measurements of Porewaters
Sediment Bioassays

Analyst: Eric

Client : ARI

Test Date: 1/27/09

Test Type: Microtox 100% Porewater Toxicity Test

Test No: 0902-T001-T055

Test Species: *Vibrio fischeri*

Site	Initial Salinity (ppt)	Final Salinity (ppt)	Initial D.O. (mg/L)	Final D.O (mg/L)	Initial pH	Adjusted pH	NaOH or HCl Vol. Used	Final Porewater Conc.	Ammonia
31	29.9	29.9	6.8	6.8	7.41	8.02	120 µl NaOH	99.5	4.8
18	30.9	30.9	5.7	5.7	6.91	8.20	240µl NaOH 60µl HCl	99.0	3.3
16	9.0	28.0	7.0	7.0	7.75	7.93	40 µl NaOH	99.8	14.8
20	30.6	30.6	5.9	5.9	7.26	7.90	100 µl NaOH	99.6	8.0
15	30.4	30.4	6.5	6.5	7.43	7.90	120 µl NaOH	99.5	12.0
40	30.6	30.6	6.3	6.3	7.53	7.93	120 µl NaOH	99.5	8.8
22	29.0	29.0	6.1	6.1	7.44	7.90	120 µl NaOH	99.5	16.2

Sample Description: _____

Comments: _____

QA Check: _____

Nautilus Environmental
Washington Laboratory
5009 Pacific Hwy. E., Suite 2
Tacoma, WA 98424

Physical and Chemical Measurements of Porewaters Sediment Bioassays

Analyst: Eric Tollefson

Client : ARI

Test Date: 1/27/09

Test Type: Microtox 100% Porewater Toxicity Test

Test No: 0902-T001-T055

Test Species: *Vibrio fischeri*

Site	Initial Salinity (ppt)	Final Salinity (ppt)	Initial D.O. (mg/L)	Final D.O (mg/L)	Initial pH	Adjusted pH	NaOH or HCl Vol. Used	Final Porewater Conc.	Ammonia
CON	0.0	29.1 ~~20.1~~ (m)	8.5	8.5	7.93	7.93	0	100	<1.0
CR20W	29.7	29.7	7.0	7.0	7.62	7.92	60 µl NaOH	99.8	23.0
8	30.2	30.2	7.0	7.0	7.44	7.91	120 µl NaOH	99.5	15.1
30	30.1	30.1	7.1	7.1	7.31	7.94	120 µl NaOH	99.5	1.5
39	30.4	30.4	6.7	6.7	7.34	7.95	120 µl NaOH	99.5	12.0
35	30.2	30.2	6.5	6.5	7.33	7.91	140 µl NaOH	99.4	13.7
33	30.1	30.1	6.4	6.4	7.31	7.92	120 µl NaOH	99.5	4.1

Sample Description: _____

Comments: _____

QA Check: _____

Nautilus Environmental
Washington Laboratory
5009 Pacific Hwy E., Suite 2
Tacoma, WA 98424

Turbidity Measurements

Client: ARI
Date: 2/6/09 Test date 1/27/09
Analyst: ET

Sample ID	Measurement (NTU)
Standard 0-10	4.96
Standard 0-100	49.9
Standard 0-1000	485
DI	0.17
CON	0.67
CR20W	79.8
20	56.9
22	65.2
40	61.3
15	23.7
30	8.27
31	55.5
8	58.2
33	34.2
35	26.6
16	104
39	43.2
18	54.1
Standard 0-10	5.01
Standard 0-100	49.8
Standard 0-1000	485
DI	0.12

Measure standards and DI at beginning and end of analysis.

Nautilus Environmental
Washington Laboratory
5009 Pacific Hwy E., Suite 2
Tacoma, WA 98424

Turbidity Measurements

Client: ARI
Date: 2/6/09 Test date 1/28/09
Analyst: QT

Sample ID	Measurement (NTU)
Standard 0-10	4.99
Standard 0-100	49.8
Standard 0-1000	485
DI	0.11
CON	0.68
MSMP43	~~1.98~~ 19.8
62B	~~49.8~~ 25.5
67	~~25.5~~ 26.4
38	16.5
47	38.9
56	30.0
61	31.7
29	9.04
~~53~~ 46	26.7
62	4.08
62A	38.4
14A	15.2
21A	11.7
68	16.7
Standard 0-10	4.95
Standard 0-100	49.7
Standard 0-1000	484
DI	0.10

Measure standards and DI at beginning and end of analysis.

Nautilus Environmental
Washington Laboratory
5009 Pacific Hwy E., Suite 2
Tacoma, WA 98424

Turbidity Measurements

Client: ARI
Date: 2/6/09 Test date 1/29/09
Analyst: RT

Sample ID	Measurement (NTU)
Standard 0-10	5.02
Standard 0-100	49.8
Standard 0-1000	485
DI	0.09
CON	0.43
CR23MOD	31.2
55	7.10
38A	34.0
77	7.37
~~CR33~~ 47A	34.0
21B	51.3
63	46.4
64	13.5
29A	55.3
CON	0.43
CR20	98.1
58	46.3
53	39.7
54	58.0
45	42.6
42	48.7
51	45.2
44	30.2
Standard 0-10	4.97
Standard 0-100	49.7
Standard 0-1000	485
DI	0.11

Measure standards and DI at beginning and end of analysis.

Nautilus Environmental
Washington Laboratory
5009 Pacific Hwy E., Suite 2
Tacoma, WA 98424

Turbidity Measurements

Client: ARI
Date: ~~2/6/09~~ 2/6/09 test date 1/30/09
Analyst: ~~RT~~

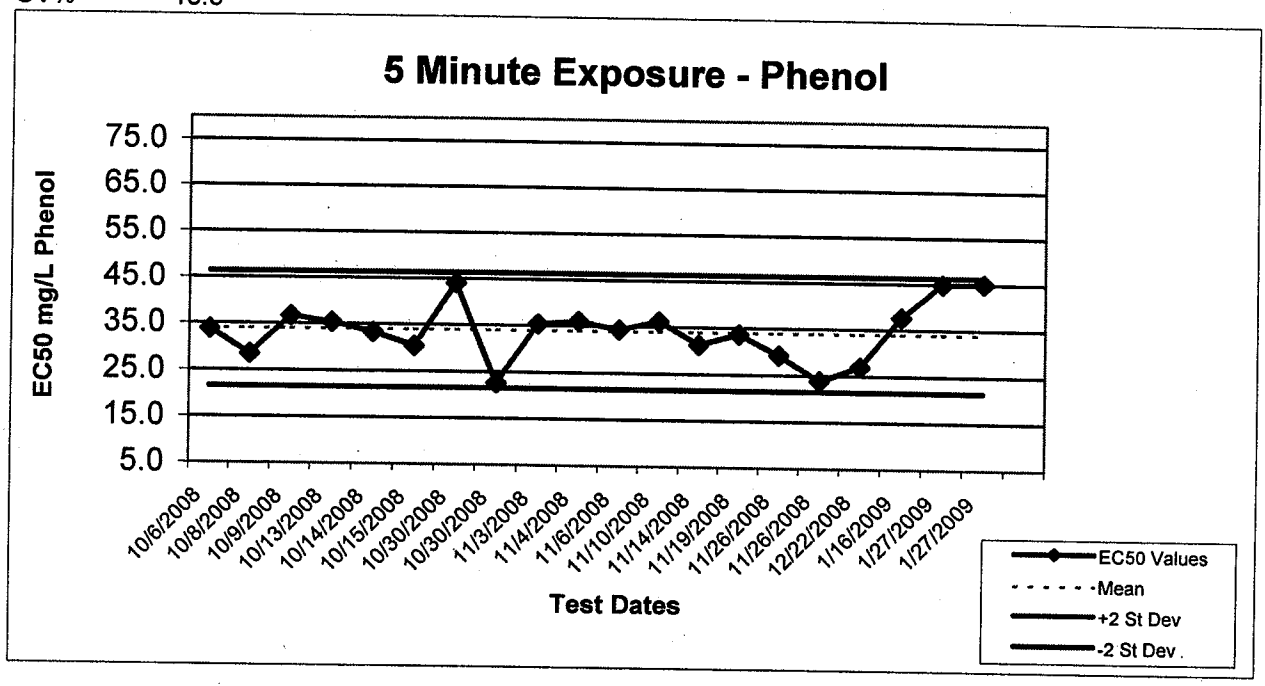
Sample ID	Measurement (NTU)
Standard 0-10	5.01
Standard 0-100	49.8
Standard 0-1000	485
DI	0.12
CON	0.75
MSMP43	12.7
78	6.87
83	8.57
75	27.6
73	9.06
71	3.29
70	26.2
69	64.9
80	9.53
92	85.9
82	16.8
77A	18.0
G-EO-3	83.1
Standard 0-10	4.97
Standard 0-100	49.7
Standard 0-1000	485
DI	0.11

Measure standards and DI at beginning and end of analysis.

APPENDIX D – Reference Toxicant Tests

Reference Toxicant Control Chart
Microtox 5-Minute Exposure

CV% = 18.3

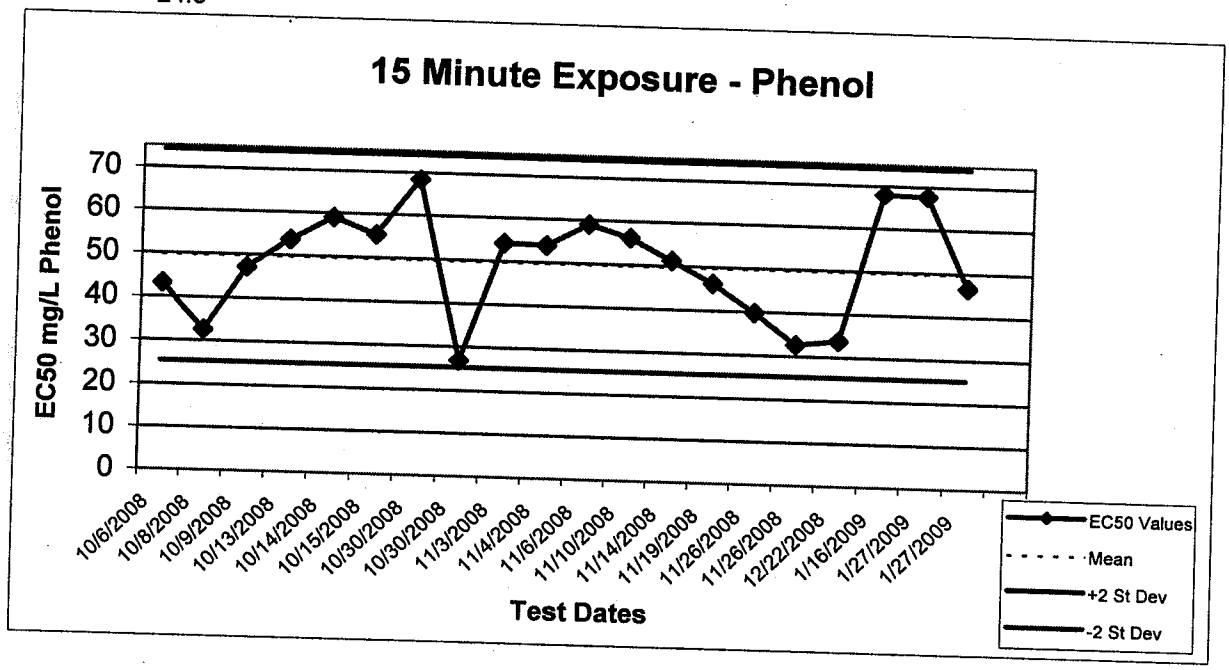


Date	Time	EC50 %	EC50 mg/L Phenol [a]	Mean	StDev	-2 SD	+2 SD
10/6/2008	1251	19.9	33.8	34.0	6.2	21.5	46.4
10/8/2008	1309	16.7	28.5	34.0	6.2	21.5	46.4
10/9/2008	1236	21.6	36.7	34.0	6.2	21.5	46.4
10/13/2008	1346	20.8	35.3	34.0	6.2	21.5	46.4
10/14/2008	1218	19.6	33.3	34.0	6.2	21.5	46.4
10/15/2008	1242	17.9	30.4	34.0	6.2	21.5	46.4
10/30/2008	1114	25.9	44.0	34.0	6.2	21.5	46.4
10/30/2008	1228	13.3	22.6	34.0	6.2	21.5	46.4
11/3/2008	1440	20.8	35.4	34.0	6.2	21.5	46.4
11/4/2008	1310	21.2	36.0	34.0	6.2	21.5	46.4
11/6/2008	1253	20.2	34.3	34.0	6.2	21.5	46.4
11/10/2008	1256	21.3	36.2	34.0	6.2	21.5	46.4
11/14/2008	1313	18.4	31.3	34.0	6.2	21.5	46.4
11/19/2008	1223	19.8	33.7	34.0	6.2	21.5	46.4
11/26/2008	1352	17.2	29.2	34.0	6.2	21.5	46.4
11/26/2008	1139	14.0	23.8	34.0	6.2	21.5	46.4
12/22/2008	1418	15.8	26.9	34.0	6.2	21.5	46.4
1/16/2009	1009	22.1	37.6	34.0	6.2	21.5	46.4
1/27/2009	1252	26.4	44.9	34.0	6.2	21.5	46.4
1/27/2009	1331	26.5	45.1	34.0	6.2	21.5	46.4

a - Highest concentration of Phenol is 170 mg/L as of 10/1/08, 102 mg/L previously

Reference Toxicant Control Chart
Microtox 15-Minute Exposure

CV% = 24.5



Date	Time	EC50 %	EC50 mg/L Phenol [a]	Mean	StDev	-2 SD	+2 SD
10/6/2008	1251	25.4	43.2	49.7	12.2	25.3	74.1
10/8/2008	1309	19.2	32.6	49.7	12.2	25.3	74.1
10/9/2008	1236	27.7	47.1	49.7	12.2	25.3	74.1
10/13/2008	1346	31.6	53.6	49.7	12.2	25.3	74.1
10/14/2008	1218	34.7	59.0	49.7	12.2	25.3	74.1
10/15/2008	1242	32.5	55.3	49.7	12.2	25.3	74.1
10/30/2008	1114	40.2	68.3	49.7	12.2	25.3	74.1
10/30/2008	1228	15.8	26.9	49.7	12.2	25.3	74.1
11/3/2008	1440	31.8	54.1	49.7	12.2	25.3	74.1
11/4/2008	1310	31.7	53.9	49.7	12.2	25.3	74.1
11/6/2008	1253	34.7	59.0	49.7	12.2	25.3	74.1
11/10/2008	1256	33.0	56.1	49.7	12.2	25.3	74.1
11/14/2008	1313	30.1	51.2	49.7	12.2	25.3	74.1
11/19/2008	1223	27.2	46.2	49.7	12.2	25.3	74.1
11/26/2008	1352	23.4	39.8	49.7	12.2	25.3	74.1
11/26/2008	1139	19.2	32.6	49.7	12.2	25.3	74.1
12/22/2008	1418	19.9	33.7	49.7	12.2	25.3	74.1
1/16/2009	1009	39.9	67.9	49.7	12.2	25.3	74.1
1/27/2009	1252	39.8	67.7	49.7	12.2	25.3	74.1
1/27/2009	1331	27.4	46.6	49.7	12.2	25.3	74.1

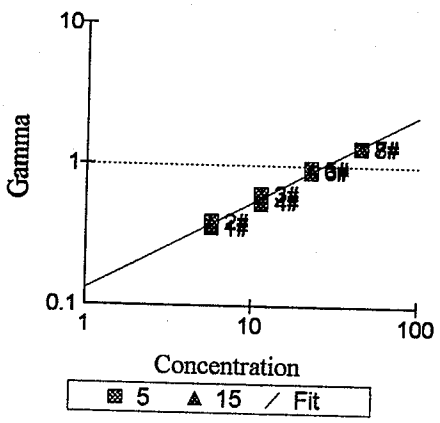
a - Highest concentration of Phenol is 170 mg/L as of 10/1/08, 102 mg/L previously

MicrotoxOmni Test Report

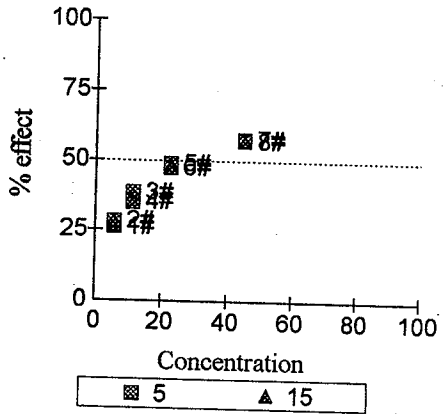
Date: 01/27/2009 01:31 PM

Test Protocol: Basic Test
Sample: 170mg/L Phenol
Toxicant: 170mg/L Phenol
Reagent Lot no.: 8K1031
Test description: Reference Toxicant
Test name: RT012709VF
Database file: C:\Program Files\MicrotoxOmni\Edge Analytical.mdb

Plot of Gamma vs Concentration



Plot of %Effect vs Concentration



			5 Mins Data:			15 Mins Data:		
Sample	Conc	Io	It	Gamma	% effect	It	Gamma	% effect
Control	0.000	96.22	83.02	0.8628 #		79.21	0.8232 #	
Control	0.000	106.33	86.52	0.8137 #		83.48	0.7851 #	
1	5.625	108.27	66.99	0.3548 #	26.19%	63.75	0.3657 #	26.78%
2	5.625	111.59	66.95	0.3972 #	28.43%	64.43	0.3928 #	28.20%
3	11.25	107.69	55.47	0.6274 #	38.55%	53.99	0.6040 #	37.66%
4	11.25	107.04	57.89	0.5500 #	35.48%	56.17	0.5324 #	34.74%
5	22.50	109.91	47.05	0.9582 #	48.93%	45.65	0.9362 #	48.35%
6	22.50	105.92	46.45	0.9115 #	47.68%	44.91	0.8966 #	47.27%
7	45.00	107.83	38.25	1.363 #	57.68%	37.24	1.328 #	57.05%
8	45.00	111.31	40.01	1.332 #	57.12%	38.49	1.326 #	57.00%

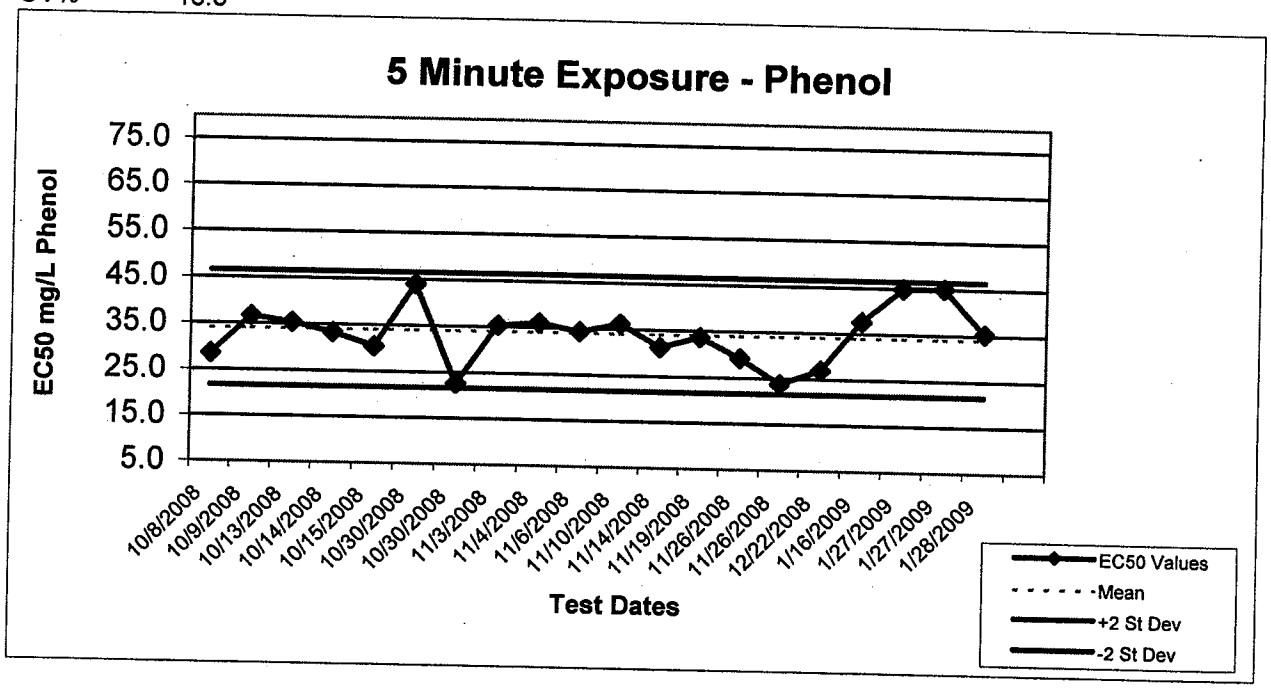
- used in calculation; * - invalid data; D - deleted from calcs.
Autocalc has been used.

Calculations on 5 Mins data:
EC50 Concentration:26.51% (95% confidence range: 24.01 to 29.27)
95% Confidence Factor: 1.104
Estimating Equation:LOG C =1.594 x LOG G +1.423
Coeff. of Determination (R^2):0.9886
Slope: 0.6201
Correction Factor: 0.8383

Calculations on 15 Mins data:
EC50 Concentration:27.41% (95% confidence range: 25.12 to 29.91)
95% Confidence Factor: 1.091
Estimating Equation:LOG C =1.621 x LOG G +1.438
Coeff. of Determination (R^2):0.9915
Slope: 0.6116
Correction Factor: 0.8042

Reference Toxicant Control Chart
Microtox 5-Minute Exposure

CV% = 18.3

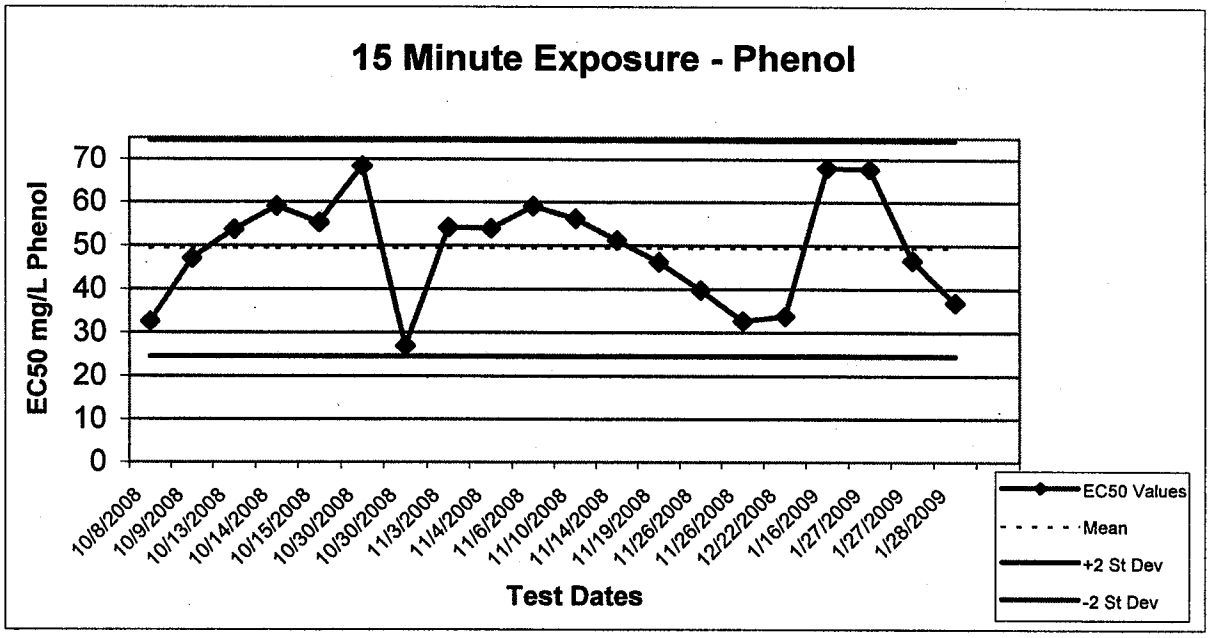


Date	Time	EC50 %	EC50 mg/L Phenol [a]	Mean	StDev	-2 SD	+2 SD
10/8/2008	1309	16.7	28.5	34.0	6.2	21.6	46.5
10/9/2008	1236	21.6	36.7	34.0	6.2	21.6	46.5
10/13/2008	1346	20.8	35.3	34.0	6.2	21.6	46.5
10/14/2008	1218	19.6	33.3	34.0	6.2	21.6	46.5
10/15/2008	1242	17.9	30.4	34.0	6.2	21.6	46.5
10/30/2008	1114	25.9	44.0	34.0	6.2	21.6	46.5
10/30/2008	1228	13.3	22.6	34.0	6.2	21.6	46.5
11/3/2008	1440	20.8	35.4	34.0	6.2	21.6	46.5
11/4/2008	1310	21.2	36.0	34.0	6.2	21.6	46.5
11/6/2008	1253	20.2	34.3	34.0	6.2	21.6	46.5
11/10/2008	1256	21.3	36.2	34.0	6.2	21.6	46.5
11/14/2008	1313	18.4	31.3	34.0	6.2	21.6	46.5
11/19/2008	1223	19.8	33.7	34.0	6.2	21.6	46.5
11/26/2008	1352	17.2	29.2	34.0	6.2	21.6	46.5
11/26/2008	1139	14.0	23.8	34.0	6.2	21.6	46.5
12/22/2008	1418	15.8	26.9	34.0	6.2	21.6	46.5
1/16/2009	1009	22.1	37.6	34.0	6.2	21.6	46.5
1/27/2009	1252	26.4	44.9	34.0	6.2	21.6	46.5
1/27/2009	1331	26.5	45.1	34.0	6.2	21.6	46.5
1/28/2009	1245	20.8	35.4	34.0	6.2	21.6	46.5

a - Highest concentration of Phenol is 170 mg/L as of 10/1/08, 102 mg/L previously

Reference Toxicant Control Chart
Microtox 15-Minute Exposure

CV% = 25.2



Date	Time	EC50 %	EC50 mg/L Phenol [a]	Mean	StDev	-2 SD	+2 SD
10/8/2008	1309	19.2	32.6	49.4	12.5	24.5	74.3
10/9/2008	1236	27.7	47.1	49.4	12.5	24.5	74.3
10/13/2008	1346	31.6	53.6	49.4	12.5	24.5	74.3
10/14/2008	1218	34.7	59.0	49.4	12.5	24.5	74.3
10/15/2008	1242	32.5	55.3	49.4	12.5	24.5	74.3
10/30/2008	1114	40.2	68.3	49.4	12.5	24.5	74.3
10/30/2008	1228	15.8	26.9	49.4	12.5	24.5	74.3
11/3/2008	1440	31.8	54.1	49.4	12.5	24.5	74.3
11/4/2008	1310	31.7	53.9	49.4	12.5	24.5	74.3
11/6/2008	1253	34.7	59.0	49.4	12.5	24.5	74.3
11/10/2008	1256	33.0	56.1	49.4	12.5	24.5	74.3
11/14/2008	1313	30.1	51.2	49.4	12.5	24.5	74.3
11/19/2008	1223	27.2	46.2	49.4	12.5	24.5	74.3
11/26/2008	1352	23.4	39.8	49.4	12.5	24.5	74.3
11/26/2008	1139	19.2	32.6	49.4	12.5	24.5	74.3
12/22/2008	1418	19.9	33.7	49.4	12.5	24.5	74.3
1/16/2009	1009	39.9	67.9	49.4	12.5	24.5	74.3
1/27/2009	1252	39.8	67.7	49.4	12.5	24.5	74.3
1/27/2009	1331	27.4	46.6	49.4	12.5	24.5	74.3
1/28/2009	1245	21.7	36.9	49.4	12.5	24.5	74.3

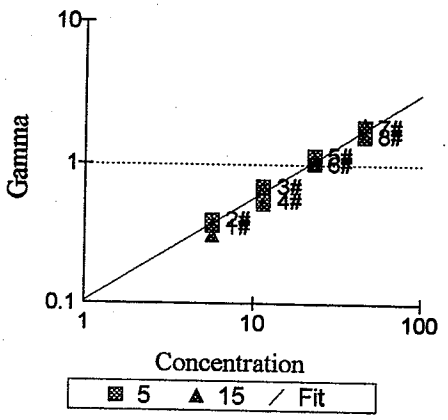
a - Highest concentration of Phenol is 170 mg/L as of 10/1/08, 102 mg/L previously

MicrotoxOmni Test Report

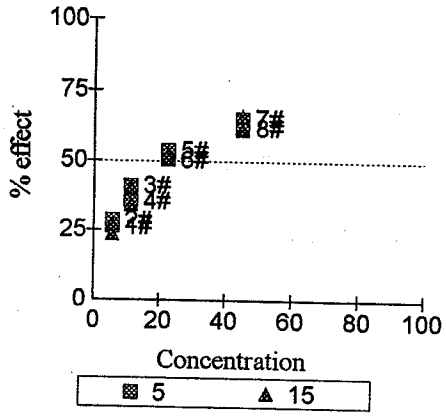
Date: 01/28/2009 12:45 PM

Test Protocol: Basic Test
Sample: 170mg/L Phenol
Toxicant: 170mg/L Phenol
Reagent Lot no.: 8K1031
Test description: Reference Toxicant
Test name: RT012809VF
Database file: C:\Program Files\MicrotoxOmni\Edge Analytical.mdb

Plot of Gamma vs Concentration



Plot of %Effect vs Concentration



Sample	Conc	5 Mins Data: Io	It	Gamma	% effect	15 Mins Data: It	Gamma	% effect
Control	0.000	91.85	67.08	0.7303 #		54.23	0.5904 #	
Control	0.000	100.16	77.36	0.7724 #		63.00	0.6290 #	
1	5.625	98.02	54.26	0.3573 #	26.32%	45.72	0.3072	23.50%
2	5.625	101.43	54.42	0.4004 #	28.59%	45.05	0.3728	27.15%
3	11.25	95.52	42.26	0.6983 #	41.12%	34.66	0.6803	40.49%
4	11.25	96.73	46.87	0.5506 #	35.51%	38.78	0.5208 #	34.25%
5	22.50	96.57	33.55	1.163 #	53.76%	27.91	1.110 #	52.60%
6	22.50	95.11	35.48	1.014 #	50.35%	28.75	1.017 #	50.42%
7	45.00	92.77	24.24	1.875 #	65.22%	19.19	1.947 #	66.07%
8	45.00	91.43	26.31	1.611 #	61.70%	21.60	1.581	61.25%

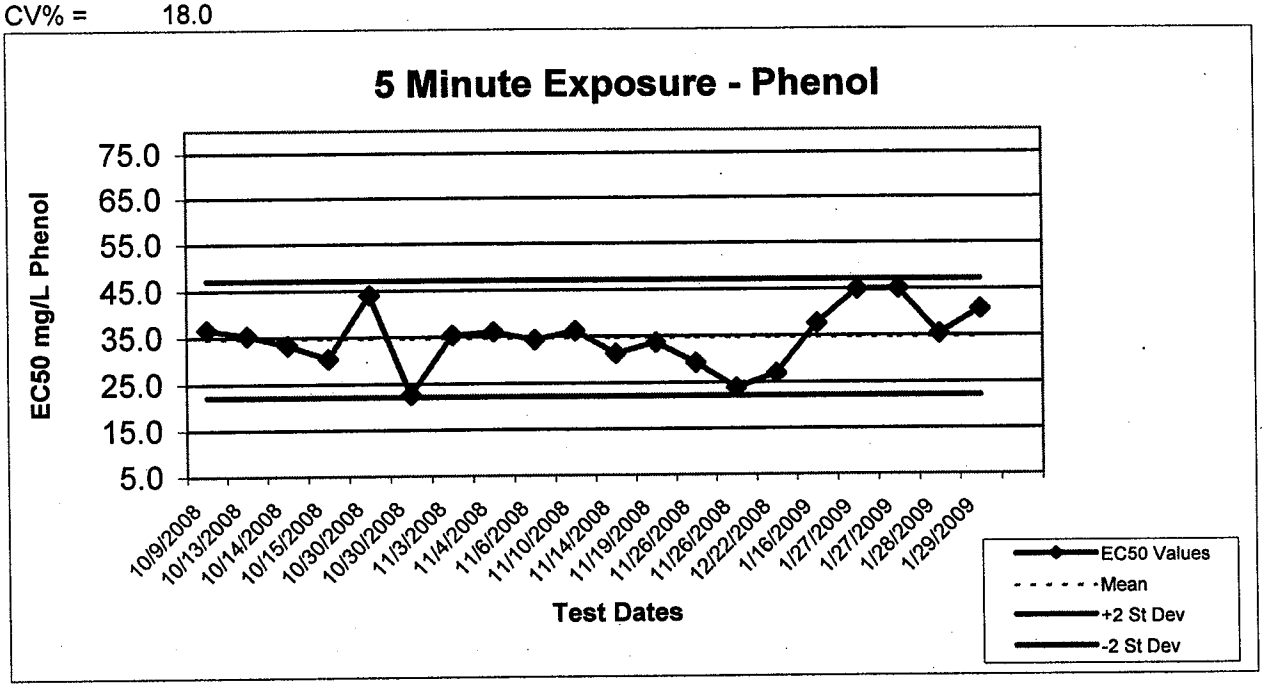
- used in calculation; * - invalid data; D - deleted from calcs.
Autocalc has been used.

Calculations on 5 Mins data:
EC50 Concentration:20.82% (95% confidence range: 18.45 to 23.49)
95% Confidence Factor: 1.128
Estimating Equation:LOG C =1.320 x LOG G +1.319
Coeff. of Determination (R^2):0.9784
Slope: 0.7409
Correction Factor: 0.7513

Calculations on 15 Mins data:
EC50 Concentration:21.72% (95% confidence range: 19.07 to 24.74)
95% Confidence Factor: 1.139
Estimating Equation:LOG C =1.043 x LOG G +1.337
Coeff. of Determination (R^2):0.9924
Slope: 0.9514
Correction Factor: 0.6097

Reference Toxicant Control Chart
Microtox 5-Minute Exposure

CV% = 18.0

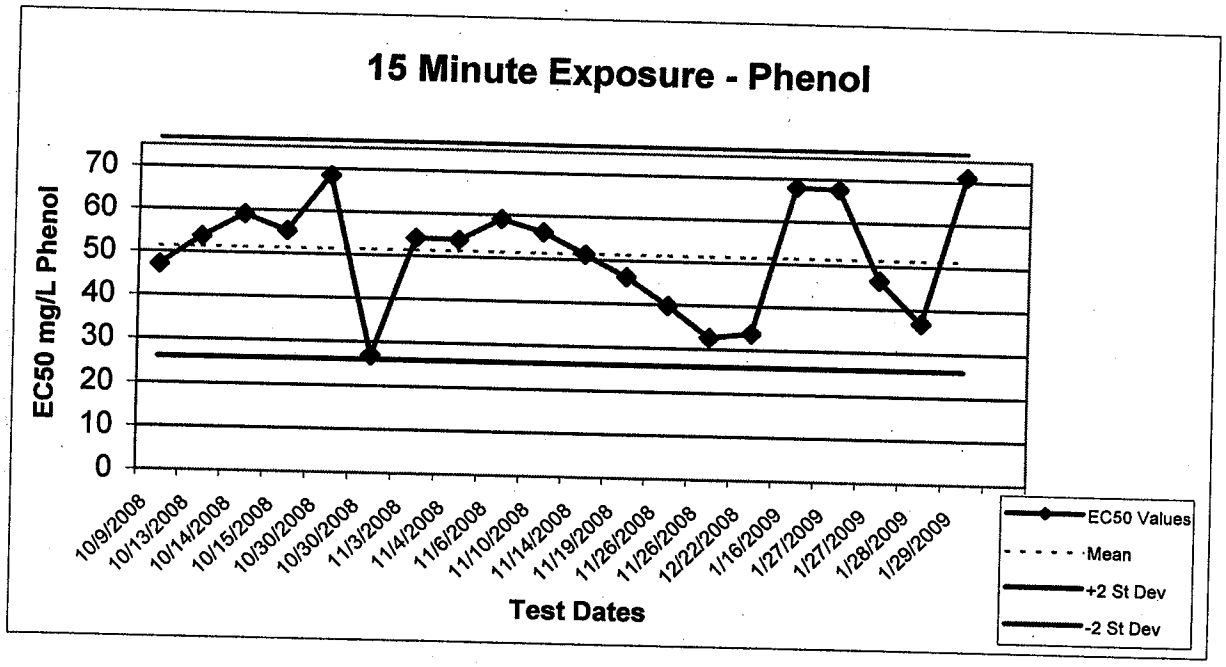


Date	Time	EC50 %	EC50 mg/L Phenol [a]	Mean	StDev	-2 SD	+2 SD
10/9/2008	1236	21.6	36.7	34.6	6.2	22.2	47.1
10/13/2008	1346	20.8	35.3	34.6	6.2	22.2	47.1
10/14/2008	1218	19.6	33.3	34.6	6.2	22.2	47.1
10/15/2008	1242	17.9	30.4	34.6	6.2	22.2	47.1
10/30/2008	1114	25.9	44.0	34.6	6.2	22.2	47.1
10/30/2008	1228	13.3	22.6	34.6	6.2	22.2	47.1
11/3/2008	1440	20.8	35.4	34.6	6.2	22.2	47.1
11/4/2008	1310	21.2	36.0	34.6	6.2	22.2	47.1
11/6/2008	1253	20.2	34.3	34.6	6.2	22.2	47.1
11/10/2008	1256	21.3	36.2	34.6	6.2	22.2	47.1
11/14/2008	1313	18.4	31.3	34.6	6.2	22.2	47.1
11/19/2008	1223	19.8	33.7	34.6	6.2	22.2	47.1
11/26/2008	1352	17.2	29.2	34.6	6.2	22.2	47.1
11/26/2008	1139	14.0	23.8	34.6	6.2	22.2	47.1
12/22/2008	1418	15.8	26.9	34.6	6.2	22.2	47.1
1/16/2009	1009	22.1	37.6	34.6	6.2	22.2	47.1
1/27/2009	1252	26.4	44.9	34.6	6.2	22.2	47.1
1/27/2009	1331	26.5	45.1	34.6	6.2	22.2	47.1
1/28/2009	1245	20.8	35.4	34.6	6.2	22.2	47.1
1/29/2009	1236	23.9	40.6	34.6	6.2	22.2	47.1

a - Highest concentration of Phenol is 170 mg/L as of 10/1/08, 102 mg/L previously

Reference Toxicant Control Chart
Microtox 15-Minute Exposure

CV% = 24.7



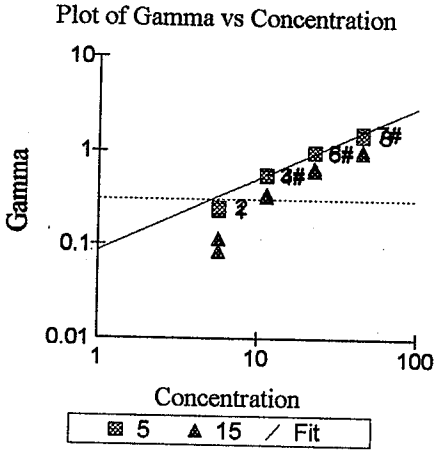
Date	Time	EC50 %	EC50 mg/L Phenol [a]	Mean	StDev	-2 SD	+2 SD
10/9/2008	1236	27.7	47.1	51.3	12.7	26.0	76.7
10/13/2008	1346	31.6	53.6	51.3	12.7	26.0	76.7
10/14/2008	1218	34.7	59.0	51.3	12.7	26.0	76.7
10/15/2008	1242	32.5	55.3	51.3	12.7	26.0	76.7
10/30/2008	1114	40.2	68.3	51.3	12.7	26.0	76.7
10/30/2008	1228	15.8	26.9	51.3	12.7	26.0	76.7
11/3/2008	1440	31.8	54.1	51.3	12.7	26.0	76.7
11/4/2008	1310	31.7	53.9	51.3	12.7	26.0	76.7
11/6/2008	1253	34.7	59.0	51.3	12.7	26.0	76.7
11/10/2008	1256	33.0	56.1	51.3	12.7	26.0	76.7
11/14/2008	1313	30.1	51.2	51.3	12.7	26.0	76.7
11/19/2008	1223	27.2	46.2	51.3	12.7	26.0	76.7
11/26/2008	1352	23.4	39.8	51.3	12.7	26.0	76.7
11/26/2008	1139	19.2	32.6	51.3	12.7	26.0	76.7
12/22/2008	1418	19.9	33.7	51.3	12.7	26.0	76.7
1/16/2009	1009	39.9	67.9	51.3	12.7	26.0	76.7
1/27/2009	1252	39.8	67.7	51.3	12.7	26.0	76.7
1/27/2009	1331	27.4	46.6	51.3	12.7	26.0	76.7
1/28/2009	1245	21.7	36.9	51.3	12.7	26.0	76.7
1/29/2009	1236	41.8	71.1	51.3	12.7	26.0	76.7

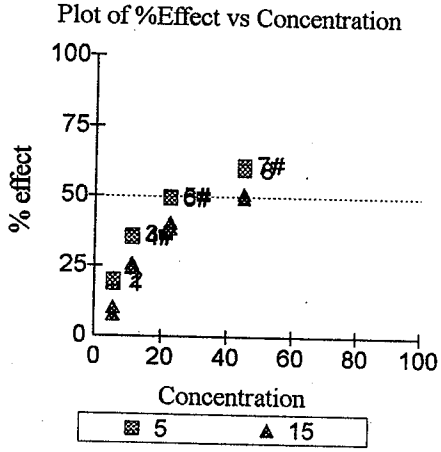
a - Highest concentration of Phenol is 170 mg/L as of 10/1/08, 102 mg/L previously

MicrotoxOmni Test Report

Date: 01/29/2009 12:36 PM

Test Protocol: Basic Test
Sample: 170mg/L Phenol
Toxicant: 170mg/L Phenol
Reagent Lot no.: 8K1031
Test description: Reference Toxicant
Test name: RT012909VF
Database file: C:\Program Files\MicrotoxOmni\Edge Analytical.mdb





		5 Mins Data:				15 Mins Data:		
Sample	Conc	Io	It	Gamma	% effect	It	Gamma	% effect
Control	0.000	96.52	92.84	0.9619 #		63.94	0.6625 #	
Control	0.000	83.83	83.98	1.002 #		57.52	0.6862 #	
1	5.625	97.03	77.32	0.2321	18.84%	60.34	0.0843	7.776%
2	5.625	106.41	83.58	0.2500	20.00%	64.31	0.1157	10.37%
3	11.25	104.49	65.61	0.5637 #	36.05%	52.22	0.3492 #	25.88%
4	11.25	104.43	66.44	0.5432 #	35.20%	53.17	0.3244 #	24.49%
5	22.50	108.85	53.65	0.9920 #	49.80%	43.76	0.6773 #	40.38%
6	22.50	107.77	53.82	0.9660 #	49.14%	44.71	0.6254 #	38.47%
7	45.00	106.36	40.38	1.586 #	61.33%	35.05	1.046 #	51.13%
8	45.00	108.44	43.06	1.473	59.56%	36.90	0.9816 #	49.54%

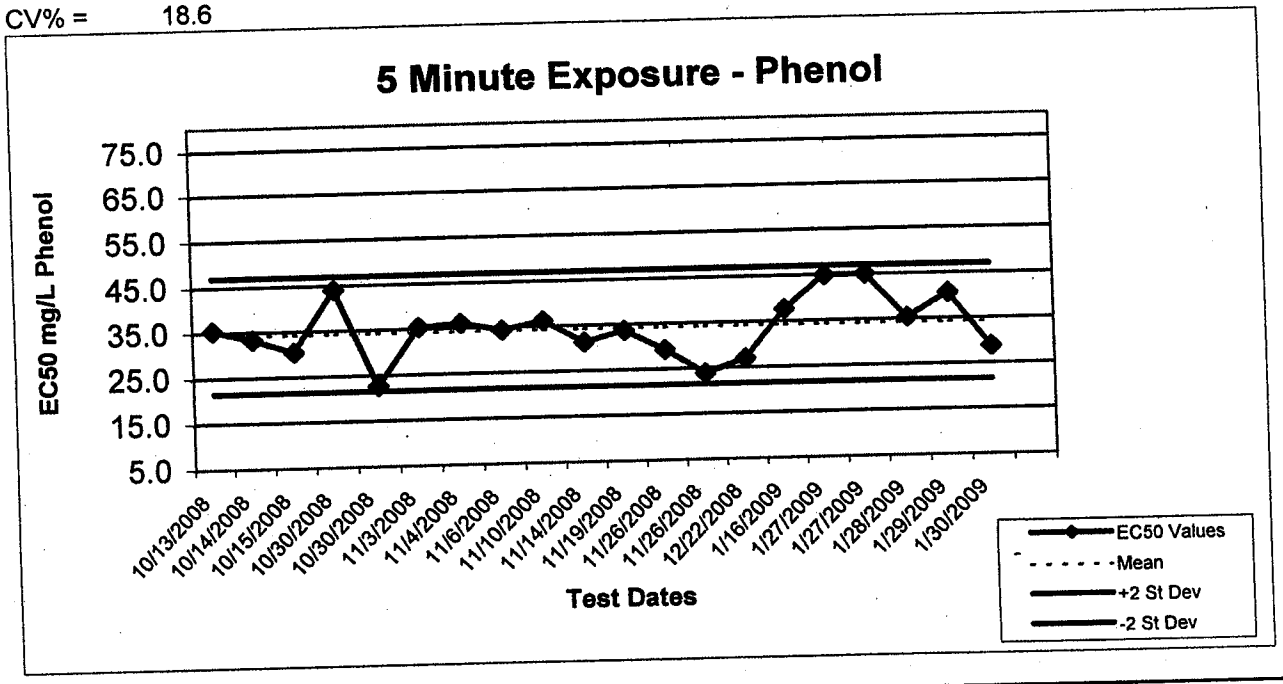
- used in calculation; * - invalid data; D - deleted from calcs.
Autocalc has been used.

Calculations on 5 Mins data:
EC50 Concentration:23.88% (95% confidence range: 22.38 to 25.49)
95% Confidence Factor: 1.067
Estimating Equation:LOG C =1.296 x LOG G +1.378
Coeff. of Determination (R^2):0.9959
Slope: 0.7687
Correction Factor: 0.9818

Calculations on 15 Mins data:
EC50 Concentration:41.79% (95% confidence range: 35.56 to 49.11)
95% Confidence Factor: 1.175
Estimating Equation:LOG C =1.234 x LOG G +1.621
Coeff. of Determination (R^2):0.9810
Slope: 0.7951
Correction Factor: 0.6743

Reference Toxicant Control Chart
Microtox 5-Minute Exposure

CV% = 18.6

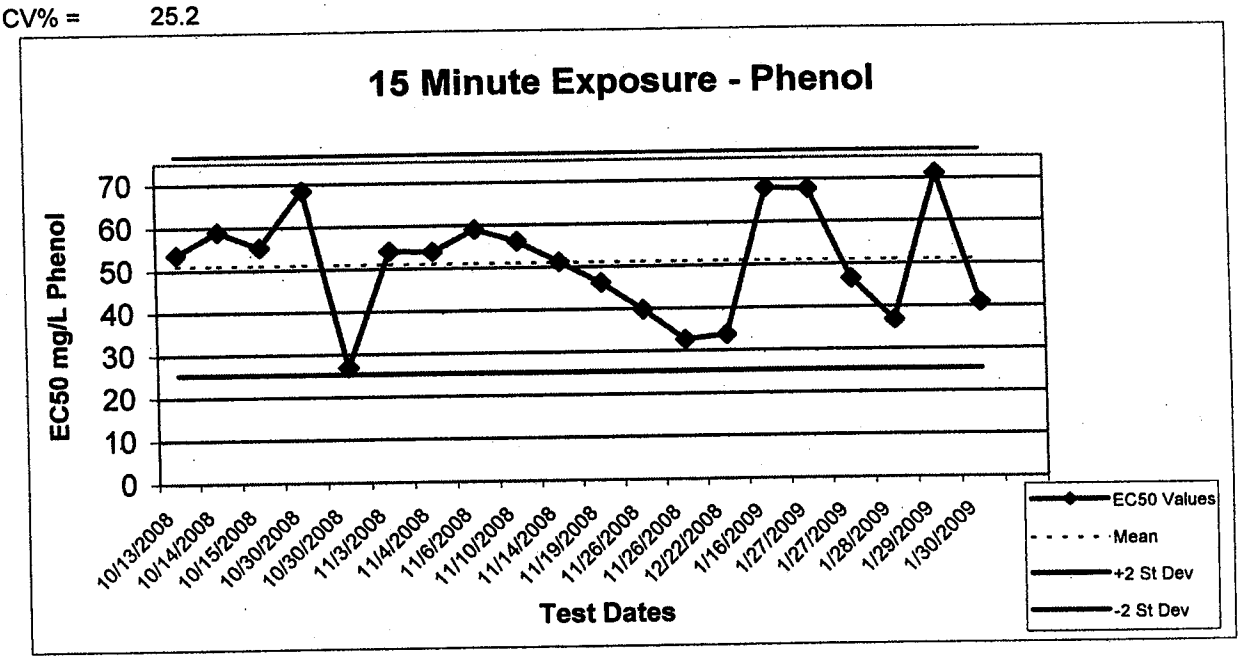


Date	Time	EC50 %	EC50 mg/L Phenol [a]	Mean	StDev	-2 SD	+2 SD
10/13/2008	1346	20.8	35.3	34.2	6.4	21.5	46.9
10/14/2008	1218	19.6	33.3	34.2	6.4	21.5	46.9
10/15/2008	1242	17.9	30.4	34.2	6.4	21.5	46.9
10/30/2008	1114	25.9	44.0	34.2	6.4	21.5	46.9
10/30/2008	1228	13.3	22.6	34.2	6.4	21.5	46.9
11/3/2008	1440	20.8	35.4	34.2	6.4	21.5	46.9
11/4/2008	1310	21.2	36.0	34.2	6.4	21.5	46.9
11/6/2008	1253	20.2	34.3	34.2	6.4	21.5	46.9
11/10/2008	1256	21.3	36.2	34.2	6.4	21.5	46.9
11/14/2008	1313	18.4	31.3	34.2	6.4	21.5	46.9
11/19/2008	1223	19.8	33.7	34.2	6.4	21.5	46.9
11/26/2008	1352	17.2	29.2	34.2	6.4	21.5	46.9
11/26/2008	1139	14.0	23.8	34.2	6.4	21.5	46.9
12/22/2008	1418	15.8	26.9	34.2	6.4	21.5	46.9
1/16/2009	1009	22.1	37.6	34.2	6.4	21.5	46.9
1/27/2009	1252	26.4	44.9	34.2	6.4	21.5	46.9
1/27/2009	1331	26.5	45.1	34.2	6.4	21.5	46.9
1/28/2009	1245	20.8	35.4	34.2	6.4	21.5	46.9
1/29/2009	1236	23.9	40.6	34.2	6.4	21.5	46.9
1/30/2009	1229	16.9	28.7	34.2	6.4	21.5	46.9

a - Highest concentration of Phenol is 170 mg/L as of 10/1/08, 102 mg/L previously

Reference Toxicant Control Chart
Microtox 15-Minute Exposure

CV% = 25.2



Date	Time	EC50 %	EC50 mg/L Phenol [a]	Mean	StDev	-2 SD	+2 SD
10/13/2008	1346	31.6	53.6	51.0	12.9	25.3	76.8
10/14/2008	1218	34.7	59.0	51.0	12.9	25.3	76.8
10/15/2008	1242	32.5	55.3	51.0	12.9	25.3	76.8
10/30/2008	1114	40.2	68.3	51.0	12.9	25.3	76.8
10/30/2008	1228	15.8	26.9	51.0	12.9	25.3	76.8
11/3/2008	1440	31.8	54.1	51.0	12.9	25.3	76.8
11/4/2008	1310	31.7	53.9	51.0	12.9	25.3	76.8
11/6/2008	1253	34.7	59.0	51.0	12.9	25.3	76.8
11/10/2008	1256	33.0	56.1	51.0	12.9	25.3	76.8
11/14/2008	1313	30.1	51.2	51.0	12.9	25.3	76.8
11/19/2008	1223	27.2	46.2	51.0	12.9	25.3	76.8
11/26/2008	1352	23.4	39.8	51.0	12.9	25.3	76.8
11/26/2008	1139	19.2	32.6	51.0	12.9	25.3	76.8
12/22/2008	1418	19.9	33.7	51.0	12.9	25.3	76.8
1/16/2009	1009	39.9	67.9	51.0	12.9	25.3	76.8
1/27/2009	1252	39.8	67.7	51.0	12.9	25.3	76.8
1/27/2009	1331	27.4	46.6	51.0	12.9	25.3	76.8
1/28/2009	1245	21.7	36.9	51.0	12.9	25.3	76.8
1/29/2009	1236	41.8	71.1	51.0	12.9	25.3	76.8
1/30/2009	1229	24.0	40.8	51.0	12.9	25.3	76.8

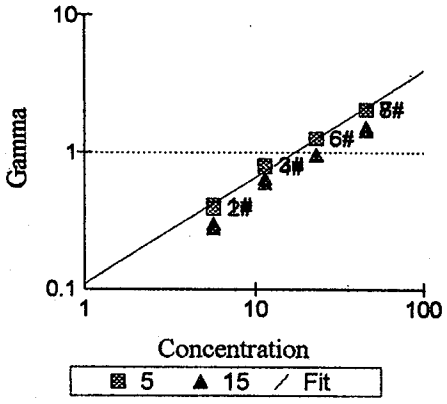
a - Highest concentration of Phenol is 170 mg/L as of 10/1/08, 102 mg/L previously

MicrotoxOmni Test Report

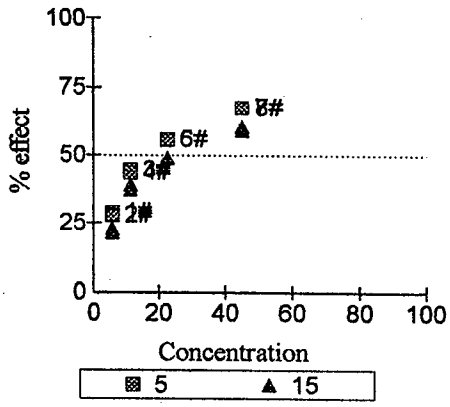
Date: 01/30/2009 12:29 PM

Test Protocol: Basic Test
Sample: 170mg/L Phenol
Toxicant: 170mg/L Phenol
Reagent Lot no.: 8K1031
Test description: Reference Toxicant
Test name: RT013009VF
Database file: C:\Program Files\MicrotoxOmni\Edge Analytical.mdb

Plot of Gamma vs Concentration



Plot of %Effect vs Concentration



			5 Mins Data:			15 Mins Data:		
Sample	Conc	Io	It	Gamma	% effect	It	Gamma	% effect
Control	0.000	95.93	84.73	0.8832 #		57.36	0.5979 #	
Control	0.000	96.39	83.88	0.8702 #		56.57	0.5869 #	
1	5.625	90.05	56.02	0.4093 #	29.04%	41.06	0.2992	23.03%
2	5.625	95.27	60.25	0.3863 #	27.87%	44.14	0.2786	21.79%
3	11.25	96.72	46.93	0.8069 #	44.66%	34.90	0.6418	39.09%
4	11.25	96.43	47.65	0.7743 #	43.64%	35.82	0.5948 #	37.30%
5	22.50	92.67	36.00	1.257 #	55.69%	28.09	0.9544 #	48.83%
6	22.50	92.71	35.85	1.267 #	55.89%	28.01	0.9608 #	49.00%
7	45.00	96.14	27.43	2.073 #	67.46%	22.44	1.538 #	60.60%
8	45.00	98.20	28.01	2.074 #	67.47%	23.70	1.455	59.26%

- used in calculation; * - invalid data; D - deleted from calcs.
Autocalc has been used.

Calculations on 5 Mins data:
EC50 Concentration:16.93% (95% confidence range: 15.72 to 18.22)
95% Confidence Factor: 1.077
Estimating Equation:LOG C =1.267 x LOG G +1.229
Coeff. of Determination (R^2):0.9910
Slope: 0.7822
Correction Factor: 0.8767

Calculations on 15 Mins data:
EC50 Concentration:23.99% (95% confidence range: 23.73 to 24.25)
95% Confidence Factor: 1.011
Estimating Equation:LOG C =1.459 x LOG G +1.380
Coeff. of Determination (R^2):0.9999
Slope: 0.6853
Correction Factor: 0.5924

APPENDIX E – Chain-of Custody Forms

SUBCONTRACTOR ANALYSIS REQUEST
CUSTODY TRANSFER 01/26/09

ANALYTICAL RESOURCES INCORPORATED

ARI Project: OJ67

Laboratory: Nautilus
Lab Contact: Karen Bergman
Lab Address: 5009 Pacific Hwy East
Fife, WA 98424
Phone: (253)922-4296
Fax:

ARI Client: Hart Crowser, Inc.
Project ID: PORT GAMBLE
ARI PM: Kelly Bottem
Phone: 206-695-6211
Fax: 206-695-6201

Analytical Protocol: PSDDA
Special Instructions:

Requested Turn Around:
Fax Results (Y/N): **Yes**

Limits of Liability. *Subcontractor is expected to perform all requested services in accordance with appropriate methodology following Standard Operating Procedures that meet standards for the industry. The total liability of ARI, its officers, agents, employees, or sucessors, arising out of or in connection with the requested services, shall not exceed the negotiated amount for said services. The agreement by the Subcontractor to perform services requested by ARI releases 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 Subcontractor.*

ARI ID	Client ID/ Add'l ID	Test #	Sampled	Matrix	Bottles	Analyses	Login #	Temp
09-2557-OJ67A	CR20W ✓	77% lives ✓	01/09/09 13:20	Sediment	1	MICROTOX	M09-054	8°
Special Instructions: None		0902-T046						
09-2558-OJ67B	CR23MOD ✓	51% lives ✓	01/09/09 14:20	Sediment	1	MICROTOX	M09-055	7°
Special Instructions: None		0902-T047						
09-2559-OJ67C	MSMP43 ✓	12% lives ✓	01/09/09 12:00	Sediment	1	MICROTOX	M09-056	7°
Special Instructions: None		0902-T048						

Carrier		Airbill		Date	
Relinquished by		Company ARI		Date 1/26/09	Time 1650
Received by Barbara Jacobs		Company Nautilus Environmental		Date 1/26/09	Time 1650

SUBCONTRACTOR ANALYSIS REQUEST
CUSTODY TRANSFER 01/26/09

ANALYTICAL RESOURCES INCORPORATED

ARI Project: OJ69

Laboratory: Nautilus
Lab Contact: Karen Bergman
Lab Address: 5009 Pacific Hwy East
Fife, WA 98424
Phone: (253)922-4296
Fax:

ARI Client: Hart Crowser, Inc.
Project ID: PORT GAMBLE
ARI PM: Kelly Bottem
Phone: 206-695-6211
Fax: 206-695-6201

Analytical Protocol: PSDDA
Special Instructions:

Requested Turn Around: **02/09/09**
Fax Results (Y/N): **Yes**

Limits of Liability. *Subcontractor is expected to perform all requested services in accordance with appropriate methodology following Standard Operating Procedures that meet standards for the industry. The total liability of ARI, its officers, agents, employees, or sucessors, arising out of or in connection with the requested services, shall not exceed the negotiated amount for said services. The agreement by the Subcontractor to perform services requested by ARI releases 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 Subcontractor.*

ARI ID	Client ID/ Add'l ID	Test #	Sampled	Matrix	Bottles	Analyses	log-in Temp
09-2573-OJ69A	PGSS-8 ✓	0902-TD33	12/04/08 09:55	Sediment	1	MICROTOX	M-09-004 10°
Special Instructions: None							
09-2574-OJ69B	PGSS-14A ✓	0902-TD34	12/04/08 10:40	Sediment	1	MICROTOX	M09-005 9°
Special Instructions: None							
09-2575-OJ69C	PGSS-15 ✓	0902-TD35	12/04/08 11:12	Sediment	1	MICROTOX	M09-006 9.5°
Special Instructions: None							
09-2576-OJ69D	PGSS-16 ✓	0902-TD36	12/04/08 11:45	Sediment	1	MICROTOX	M09-007 11°
Special Instructions: None							
09-2577-OJ69E	PGSS-18 ✓	0902-TD37	12/04/08 12:55	Sediment	1	MICROTOX	M09-008 10°
Special Instructions: None							
09-2578-OJ69F	PGSS-20 ✓	0902-TD38	12/04/08 13:20	Sediment	1	MICROTOX	M09-009 7°
Special Instructions: None							
09-2579-OJ69G	PGSS-22 ✓	0902-TD39	12/04/08 13:48	Sediment	1	MICROTOX	M09-010 7°
Special Instructions: None							
09-2580-OJ69H	PGSS-21B ✓	0902-TD40	12/04/08 14:15	Sediment	1	MICROTOX	M09-011 7°
Special Instructions: None							

Carrier	Airbill		Date	
Relinquished by	Company ARI	Date 1/26/09	Time 1630	
Received by Barbara Parsons	Company Nautilus Environmental	Date 1/26/09	Time 1630	

SUBCONTRACTOR ANALYSIS REQUEST
CUSTODY TRANSFER 01/26/09

ANALYTICAL RESOURCES INCORPORATED

ARI Project: OJ69

Laboratory: Nautilus
Lab Contact: Karen Bergman

ARI Client: Hart Crowser, Inc.
Project ID: 17330-14

ARI Sample ID	Client Sample ID/ Add'l Sample ID	Test #	Sampled	Matrix	Bottles	Analyses	Lg., Int# Temp
09-2581-OJ69I	PGSS-21A	0902TO21	12/04/08 15:20	Sediment	1	MICROTOX	M09-012 9°
Special Instructions: None							
09-2582-OJ69J	PGSS-29 ✓	0902-TO22	12/04/08 15:50	Sediment	1	MICROTOX	M09-013 7°
Special Instructions: None							
09-2583-OJ69K	PGSS-29A ✓	0902-TO23	12/04/08 16:20	Sediment	1	MICROTOX	M09-014 8°
Special Instructions: None							
09-2584-OJ69L	PGSS-30 ✓	0902-TO24	12/05/08 08:07	Sediment	1	MICROTOX	M09-015 13°
Special Instructions: None							
09-2585-OJ69M	PGSS-31	0902-TO25	12/05/08 08:50	Sediment	1	MICROTOX	M09-016 9°
Special Instructions: None							
09-2586-OJ69N	PGSS-33 ✓	0902-TO26	12/05/08 09:20	Sediment	1	MICROTOX	M09-017 10°
Special Instructions: None							
09-2587-OJ69O	PGSS-35 ✓	0902-TO27	12/05/08 10:20	Sediment	1	MICROTOX	M09-018 11°
Special Instructions: None							
09-2588-OJ69P	PGSS-38 ✓	0902-TO28	12/05/08 10:45	Sediment	1	MICROTOX	M09-019 10°
Special Instructions: None							
09-2589-OJ69R	PGSS-39 ✓	0902-TO29	12/05/08 12:45	Sediment	1	MICROTOX	M09-020 10°
Special Instructions: None							
09-2590-OJ69S	PGSS-40 ✓	0902-TO30	12/05/08 13:10	Sediment	1	MICROTOX	M09-021 10°
Special Instructions: None							
09-2591-OJ69T	PGSS-42 ✓	0902-TO31	12/05/08 13:45	Sediment	1	MICROTOX	M09-022 10°
Special Instructions: None							
09-2592-OJ69U	PGSS-44 ✓	0902-TO32	12/05/08 14:10	Sediment	1	MICROTOX	M-09-023 9°
Special Instructions: None							

Carrier	Airbill	Date	
Relinquished by	Company ARI	Date 1/26/09	Time 1630
Received by Barbara Parsons	Company Nautilus Environmental	Date 1/26/09	Time 1630

SUBCONTRACTOR ANALYSIS REQUEST
CUSTODY TRANSFER 01/26/09

ANALYTICAL RESOURCES INCORPORATED

ARI Project: OJ69

Laboratory: Nautilus
Lab Contact: Karen Bergman

ARI Client: Hart Crowser, Inc.
Project ID: 17330-14

Test #

ARI Sample ID	Client Sample ID/ Add'l Sample ID	Sampled	Matrix	Bottles	Analyses	Login #	Temp.
09-2593-OJ69Q	PGSS-38A ✓ 0902-T049	12/05/08 11:20	Sediment	1	MICROTOX	M09-024	8°

Special Instructions: None

Carrier	Airbill		Date	
Relinquished by	Company ARI	Date 1/26/09	Time 1650	
Received by Barbara Parsons	Company Nautilus Environmental	Date 1/26/09	Time 1630	

SUBCONTRACTOR ANALYSIS REQUEST
CUSTODY TRANSFER 01/26/09

ANALYTICAL RESOURCES INCORPORATED

ARI Project: OJ70

Laboratory: Nautilus
Lab Contact: Karen Bergman
Lab Address: 5009 Pacific Hwy East
Fife, WA 98424
Phone: (253)922-4296
Fax:

ARI Client: Hart Crowser, Inc.
Project ID: PORT GAMBLE
ARI PM: Kelly Bottem
Phone: 206-695-6211
Fax: 206-695-6201

Analytical Protocol: PSDDA
Special Instructions:

Requested Turn Around: **02/09/09**
Fax Results (Y/N): **Yes**

Limits of Liability. *Subcontractor is expected to perform all requested services in accordance with appropriate methodology following Standard Operating Procedures that meet standards for the industry. The total liability of ARI, its officers, agents, employees, or sucessors, arising out of or in connection with the requested services, shall not exceed the negotiated amount for said services. The agreement by the Subcontractor to perform services requested by ARI releases 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 Subcontractor.*

ARI ID	Client ID/ Add'l ID	Test #	Sampled	Matrix	Bottles	Analyses	Login #	Temp
09-2594-OJ70A	PGSS-51 ✓ WAS OH02E	0902-T050	12/08/08 14:25	Sediment	1	MICROTOX	M09-050	10°
Special Instructions: None								
09-2595-OJ70B	PGSS-64 ✓ WAS OH02P	0902-T051	12/09/08 10:35	Sediment	1	MICROTOX	M09-051	9°
Special Instructions: None								
09-2596-OJ70C	PGSS-73 ✓ WAS OH02V	0902-T052	12/09/08 14:28	Sediment	1	MICROTOX	M09-052	10°
Special Instructions: None								
09-2597-OJ70D	PGSS-75 ✓ WAS OH02W	0902-T053	12/09/08 14:58	Sediment	1	MICROTOX	M09-053	10°
Special Instructions: None								

Carrier	Airbill		Date	
Relinquished by	Company ARI	Date 1/26/09	Time 1630	
Received by Barbara Parsons	Company Nautilus Environmental	Date 1/26/09	Time 1630	

SUBCONTRACTOR ANALYSIS REQUEST
CUSTODY TRANSFER 01/26/09

ANALYTICAL RESOURCES INCORPORATED

ARI Project: OJ71

Laboratory: Nautilus
Lab Contact: Karen Bergman
Lab Address: 5009 Pacific Hwy East
Fife, WA 98424
Phone: (253)922-4296
Fax:

ARI Client: Hart Crowser, Inc.
Project ID: PORT GAMBLE
ARI PM: Kelly Bottem
Phone: 206-695-6211
Fax: 206-695-6201

Analytical Protocol: PSDDA
Special Instructions:

Requested Turn Around: **02/09/09**
Fax Results (Y/N): **Yes**

Limits of Liability. *Subcontractor is expected to perform all requested services in accordance with appropriate methodology following Standard Operating Procedures that meet standards for the industry. The total liability of ARI, its officers, agents, employees, or sucessors, arising out of or in connection with the requested services, shall not exceed the negotiated amount for said services. The agreement by the Subcontractor to perform services requested by ARI releases 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 Subcontractor.*

ARI ID	Client ID/ Add'l ID	Test #	Sampled	Matrix	Bottles	Analyses	Log#	Temp
09-2598-OJ71A	PGSS-77A ✓	0902-T041	12/09/08 16:03	Sediment	1	MICROTOX	M09-025	12°
Special Instructions: None								
09-2599-OJ71B	PGSS-78 ✓	0902-T042	12/10/08 07:54	Sediment	1	MICRTOX	M09-026	11°
Special Instructions: None								
09-2600-OJ71C	PGSS-80 ✓	0902-T043	12/10/08 08:17	Sediment	1	MICROTOX	M09-027	11°
Special Instructions: None								
09-2601-OJ71D	PGSS-82 ✓	0902-T044	12/10/08 08:51	Sediment	1	MICROTOX	M09-028	10°
Special Instructions: None								
09-2602-OJ71E	PGSS-83 ✓	0902-T045	12/10/08 09:17	Sediment	1	MICROTOX	M09-029	11°
Special Instructions: None								

Carrier	Airbill		Date
Relinquished by	Company ARI	Date 1/26/09	Time 1630
Received by Barbara Parsons	Company Nautilus Environmental	Date 1/26/09	Time 1630

SUBCONTRACTOR ANALYSIS REQUEST
CUSTODY TRANSFER 01/27/09

ANALYTICAL RESOURCES INCORPORATED

ARI Project: OJ95

Laboratory: Nautilus
Lab Contact: Karen Bergman
Lab Address: 5009 Pacific Hwy East
Fife, WA 98424
Phone: (253)922-4296
Fax:

ARI Client: Hart Crowser, Inc.
Project ID: PORT GAMBLE
ARI PM: Kelly Bottem
Phone: 206-695-6211
Fax: 206-695-6201

Analytical Protocol: PSDDA
Special Instructions:

Requested Turn Around: **02/10/09**
Fax Results (Y/N): **Yes**

Limits of Liability. *Subcontractor is expected to perform all requested services in accordance with appropriate methodology following Standard Operating Procedures that meet standards for the industry. The total liability of ARI, its officers, agents, employees, or sucessors, arising out of or in connection with the requested services, shall not exceed the negotiated amount for said services. The agreement by the Subcontractor to perform services requested by ARI releases 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 Subcontractor.*

ARI ID	Client ID/ Add'l ID		Sampled	Matrix	Bottles	Analyses	Test #
09-2730-OJ95A	CR20W	M09-054	01/09/09 13:20	Sediment	1	MICROTOX	~~0902-TO54~~
Special Instructions: None							
09-2731-OJ95B	CR23MOD	M09-055	01/09/09 14:20	Sediment	1	MICROTOX	
Special Instructions: None							
09-2732-OJ95C	MSMP43	M09-056	01/09/09 12:00	Sediment	1	MICROTOX	~~09~~
Special Instructions: None							
09-2733-OJ95D	PGSS-GEO-3	M09-058	12/10/08 10:35	Sediment	1	MICROTOX	0902-TO54
Special Instructions: None							
09-2734-OJ95E	PGSS-92	M09-059	12/10/08 11:03	Sediment	1	MICROTOX	0902-TO54
Special Instructions: None							

Carrier	Airbill		Date
Relinquished by	Company ARI	Date 1/27/09	Time 1515
Received by	Company Nautilus	Date 1/27/09	Time 1515

SUBCONTRACTOR ANALYSIS REQUEST
CUSTODY TRANSFER 01/26/09

ANALYTICAL RESOURCES INCORPORATED

ARI Project: OH02

Laboratory: Nautilus
Lab Contact: Karen Bergman
Lab Address: 5009 Pacific Hwy East
Fife, WA 98424
Phone: (253)922-4296
Fax:

ARI Client: Hart Crowser, Inc.
Project ID: PORT GAMBLE
ARI PM: Kelly Bottem
Phone: 206-695-6211
Fax: 206-695-6201

Analytical Protocol: PSDDA
Special Instructions:

Requested Turn Around: **02/09/09**
Fax Results (Y/N): **Yes**

Limits of Liability. *Subcontractor is expected to perform all requested services in accordance with appropriate methodology following Standard Operating Procedures that meet standards for the industry. The total liability of ARI, its officers, agents, employees, or sucessors, arising out of or in connection with the requested services, shall not exceed the negotiated amount for said services. The agreement by the Subcontractor to perform services requested by ARI releases 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 Subcontractor.*

ARI ID	Client ID/ Add'l ID		Sampled	Matrix	Bottles	Analyses	Log-In #	Temp.
09-653-OH02A	PGSS-45 ✓	0902-TD13	12/08/08 11:45	Sediment	1	MICROTOX	M09-030	11°
Special Instructions: None								
09-654-OH02B	PGSS-46 ✓	0902-TD14	12/08/08 12:15	Sediment	1	MICROTOX	M09-031	11°
Special Instructions: None								
09-655-OH02C	PGSS-47 ✓	0902-TD15	12/08/08 13:25	Sediment	1	MICROTOX	M09-032	12°
Special Instructions: None								
09-656-OH02D	PGSS-47A ✓	0902-TD16	12/08/08 14:00	Sediment	1	MICROTOX	M09-033	11°
Special Instructions: None								
09-658-OH02F	PGSS-53 ✓	0902-TD17	12/08/08 15:08	Sediment	1	MICROTOX	M09-034	11°
Special Instructions: None								
09-659-OH02G	PGSS-54 ✓	0902-TD18	12/08/08 15:34	Sediment	1	MICROTOX	M09-035	10°
Special Instructions: None								
09-660-OH02H	PGSS-55 ✓	0902-TD19	12/08/08 16:00	Sediment	1	MICROTOX	M09-036	9°
Special Instructions: None								
09-661-OH02I	PGSS-56 ✓	0902-TD20	12/08/08 16:26	Sediment	1	MICROTOX	M09037	10°
Special Instructions: None								

Carrier	Airbill		Date	
Relinquished by	Company ARI	Date 1/26/09	Time 1650	
Received by Barbara Parsons	Company Nautilus Environmental	Date 1/26/09	Time 1650	

SUBCONTRACTOR ANALYSIS REQUEST
CUSTODY TRANSFER 01/26/09

ANALYTICAL RESOURCES INCORPORATED

ARI Project: OH02

Laboratory: Nautilus
Lab Contact: Karen Bergman

ARI Client: Hart Crowser, Inc.
Project ID: 1733014

ARI Sample ID	Client Sample ID / Add'l Sample ID	Vst #	Sampled	Matrix	Bottles	Analyses	Log-In #	Temp
09-662-OH02J	PGSS-58 ✓	0902-T001	12/08/08 07:27	Sediment	1	MICROTOX	M09-038	6°
Special Instructions: None								
09-663-OH02K	PGSS-61 ✓	0902-T002	12/08/08 07:57	Sediment	1	MICROTOX	M09-039	9°
Special Instructions: None								
09-664-OH02L	PGSS-62 ✓	0902-T003	12/08/08 08:21	Sediment	1	MICROTOX	M09-040	9°
Special Instructions: None								
09-665-OH02M	PGSS-62B ✓	0902-T004	12/09/08 08:46	Sediment	1	MICROTOX	M09-041	9°
Special Instructions: None								
09-666-OH02N	PGSS-63 ✓	0902-T005	12/09/08 09:13	Sediment	1	MICROTOX	M09-042	9°
Special Instructions: None								
09-667-OH02O	PGSS-62A ✓	0902-T006	12/09/08 10:09	Sediment	1	MICROTOX	M09-043	10°
Special Instructions: None								
09-669-OH02Q	PGSS-67 ✓	0902-T007	12/09/08 11:01	Sediment	1	MICROTOX	M09-044	9°
Special Instructions: None								
09-670-OH02R	PGSS-68 ✓	0902-T008	12/09/08 12:12	Sediment	1	MICROTOX	M09-045	10°
Special Instructions: None								
09-671-OH02S	PGSS-69 ✓	0902-T009	12/09/08 12:36	Sediment	1	MICROTOX	M09-046	9°
Special Instructions: None								
09-672-OH02T	PGSS-70 ✓	0902-T010	12/09/08 13:01	Sediment	1	MICROTOX	M09-047	9°
Special Instructions: None								
09-673-OH02U	PGSS-71 ✓	0902-T011	12/09/08 13:32	Sediment	1	MICROTOX	M09-048	9°
Special Instructions: None								
09-676-OH02X	PGSS-77 ✓	0902-T012	12/09/08 15:30	Sediment	1	MICROTOX	M09-049	11°
Special Instructions: None								

Carrier	Airbill		Date	
Relinquished by	Company ARI	Date 1/26/09	Time 1650	
Received by Barbara Parsons	Company Nautilus Environmental	Date 1/26/09	Time 1630	

APPENDIX D
SEDIMENT PROFILE IMAGE (SPI) REPORT
SCIENCE APPLICATIONS INTERNATIONAL CORPORATION (SAIC)

Science Applications International Corporation

December 29, 2008

Mr. Roger McGinnis
Hart Crowser, Inc.
1700 Westlake Avenue N., Suite 200
Seattle, WA 98109-3056

Subject: Port Gamble Bay, WA, Sediment Profile Imaging and Plan View Photography Survey Data Report

Dear Roger:

SAIC is pleased to submit three DVDs containing copies of the Sediment Profile Imaging (SPI) and Plan View Photography Survey, Port Gamble Bay, WA, Data Report. The DVDs also contain Appendix C, which includes electronic files of the SPI and plan view images.

SAIC appreciates the opportunity to assist Hart Crowser, Inc. and the WA Dept of Ecology with this SPI and plan view photography study. If you have any questions, please do not hesitate to contact me at (425) 482-3313.

Sincerely,

SCIENCE APPLICATIONS INTERNATIONAL CORPORATION

John S. Nakayama
Senior Oceanographer
Environmental Sciences Division

cc: Ms. Denise Kilpatrick

18912 North Creek Parkway, Suite 101
Bothell, Washington 98011
Phone: (425)485-5800 • Fax: (425)487-1491 • www.saic.com

Sediment Profile Imaging and Plan View Photography Survey Port Gamble Bay, WA

Data Report

Prepared for

Hart Crowser, Inc.
1700 Westlake Avenue N, Suite 200
Seattle, WA 98109-3056

Prepared by

Science Applications International Corporation
18912 North Creek Parkway, Suite 101
Bothell, WA 98011

December 2008

This page is intentionally blank.

Table of Contents

Figures

Tables

List of Acronyms

DGPS Differential Global Positioning System
R/V research vessel
RPD redox potential discontinuity
SAIC Science Applications International Corporation
SPI sediment profile imaging

1.0 Introduction

Science Applications International Corporation (SAIC), under contract to Hart Crowser, Inc., conducted a sediment profile imaging (SPI) and plan view photography survey in Port Gamble Bay, WA. The survey was conducted to evaluate the presence of wood debris in surface sediments and assist in the evaluation of sediment quality in Port Gamble Bay. The study is sponsored by the Washington State Department of Ecology in support of cleanup activities under the state's Puget Sound Initiative.

Port Gamble Bay, WA, located on the northern end of the Kitsap peninsula near the entrance to Hood Canal, has historically supported wood product industries. The Pope & Talbot Sawmill, formerly located at the northwestern end of Port Gamble Bay, manufactured wood products from 1853 to 1995 (Ecology 2008a). The site consisted of a sawmill, woodchip loading facilities, a log transfer facility, and log rafting and storage areas (Figure 1). A separate log storage area in the southwest portion of the bay was in operation from 1974 to 1995. The site, consisting of 74 acres of state-owned aquatic lands, was managed by the Washington State Department of Natural Resources and leased to Pope & Talbot (Ecology 2008b).

Log rafting and chip loading operations have likely resulted in the deposition of wood debris on the seafloor of Port Gamble Bay. The SPI and plan view photography survey was conducted to map the distribution of wood debris in surface sediments. In addition, several physical and biological parameters were evaluated from SPI and plan view images to assist with the evaluation of sediment quality, and help focus additional sediment investigation in Port Gamble Bay.

This page is intentionally blank.

2.0 Survey Methods

This section describes the methodology for vessel positioning and collection of photographic images of sediments using SPI and plan view photography. The results of the survey are summarized in Section 3.0.

2.1 Vessel and Navigation

The SPI and plan view camera survey were conducted aboard the research vessel (R/V) *Kittiwake* owned and operated by BioMarine Enterprises, Seattle, Washington. The Port Gamble survey was conducted November 14 through 16, 2008. Vessel positioning and navigation was accomplished using a Trimble NT300D differential global positioning system (DGPS) with a minimum positional accuracy of ± 2 meters. Geographic coordinates for sampling locations are provided in Appendix A. A total of 120 locations were occupied during the 3-day survey (Figure 2).

2.2 Sediment Profile Imaging

SPI provides a cross-sectional photograph of the sediment/water interface and near-surface sediment (15 by 20 cm area). Images were collected using a Benthos model 3731 SPI camera equipped with an Ocean Imaging System digital system. The SPI camera consists of a wedge-shaped prism with a Plexiglas faceplate and a back mirror mounted at a 45-degree angle. Light is provided by an internal strobe. The mirror reflected the image of the profile of the sediment/water interface to a digital camera mounted horizontally on top of the prism (Figure 3). Three replicate images were collected from each SPI sampling location. One representative image was selected from each location and evaluated for the presence of wood debris and analyzed for grain size major mode, depth of the apparent redox potential discontinuity depth, infaunal successional stage, and habitat classification type.

2.3 Plan View Photography

Plan view underwater still photography was conducted simultaneously with the SPI photography. Plan view images were taken using a downward-looking PhotoSea underwater 35 millimeter camera and strobe that were mounted on the SPI camera frame. The plan view camera provided a photograph of the sediment surface (20 by 30 cm area) near the front of the SPI camera faceplate. The 35 millimeter slide film was digitized following completion of the survey and one representative image from each location was evaluated for the presence of wood debris, eelgrass, and other macrofauna.

During the last day of the survey, plan view images were not obtained due to a malfunction in the plan view camera. Plan view images were not obtained at 26 locations (22 percent) occupied during the last survey day. In addition, the deployment and retrieval of the SPI camera on the seafloor resulted in sediment resuspension and turbidity in the water column at a few locations where fine-grained surface sediments were present. At three locations (3 percent), only cloudy plan view images were collected and the presence or absence of woody debris and macrofauna on the sediment surface could not be determined.

2.4 Image Analysis Methods

The primary focus for the image analysis of the SPI and plan view images was the determination of wood debris in surface sediments. SPI and plan view images were also evaluated for the presence of eelgrass and other macrofauna (e.g., sea pens, sea whips). In addition, a computer-based image analysis system was used to measure several parameters from the SPI images that can assist with the evaluation of sediment quality. The parameters measured included:

- Sediment grain size (major mode and range),
- Depth of the apparent redox potential discontinuity (RPD),
- Infaunal successional stage, and
- Benthic habitat categories.

2.4.1 Wood Debris (SPI and Plan View)

A proportional estimate of wood debris (percent by area) was visually determined from the SPI image (profile to a maximum depth of 20 cm) and plan view image (20 by 30 cm surface area) at each location (Munsell 2000). Wood debris observed during the survey consisted of bark pieces, weathered log and branch pieces, and small particles. In addition, the presence of eelgrass and other macrofauna (e.g., sea pens, sea whips) was also recorded.

2.4.2 Sediment Grain Size

The sediment grain size major mode and range, in phi units, were visually determined from the SPI images by comparison with grain size scales included in the image analysis software interface. The grain size comparator is a series of seven Udden-Wentworth size classes (equal to or less than coarse silt up to granule and larger sizes): ≥ 4 phi (silt/clay), 4 to 3 phi (very fine sand), 3 to 2 phi (fine sand), 2 to 1 phi (medium sand), 1 to 0 phi (coarse sand), 0 to -1 phi (very coarse sand), and <-1 phi (gravels). The lower limit of optical resolution is about 62 μm, allowing recognition of grain sizes equal to or greater than coarse silt. The accuracy of this method has been documented by comparing SPI estimates with grain size statistics determined from laboratory sieve analyses (SAIC 1986).

2.4.3 Apparent Redox Potential Discontinuity Depth

The apparent RPD depth estimates the depth of oxygenation in the upper sediment column and can be considered the biological mixing depth by infaunal organisms. The upper surface of aerobic fine-grained sediments has a higher light reflectance value than underlying hypoxic or anoxic sediments. This is apparent in SPI images and is due to oxidized surface sediment that contains minerals in an oxidized state (typically an olive color), while the reduced sediments below this oxygenated layer are generally gray or black. The boundary between these layers is called the apparent RPD. The apparent RPD depth provides an estimate of the biogenic sediment mixing depth because bioturbating organisms mix the oxidized sediment particles downward into the sediment column. Bioturbation also vertically transports buried reduced compounds to the sediment surface and exposes them to an oxidized water column (Aller 1982).

2.4.4 Infaunal Successional Stage

Benthic infaunal communities generally follow a three-stage succession following a disturbance of the seafloor (Figure 2-2) (Pearson and Rosenberg 1978; Rhoads and Germano 1986). Stage I infauna are typically the first organisms to colonize the sediment surface. These opportunistic organisms may consist of small, tubicolous, surface-dwelling polychaetes. Stage II organisms are typically shallow-dwelling bivalves or tube-dwelling amphipods. Stage II communities are considered a transitional community before reaching Stage III, the high-order successional stage consisting of long-lived, infaunal deposit-feeding organisms. Stage III invertebrates may feed at depth in a head-down orientation and create distinctive feeding voids visible in SPI images.

2.4.5 Benthic Habitat Categories

The benthic habitat categories determined from SPI images are based on the physical substrate type, the infaunal successional stage present, and the presence or absence of epifauna (Diaz 1995). The categories are organized by sediment type and include hard sand bottom, hard rock or gravel bottom (HR), and unconsolidated soft bottom. In addition, a separate category is provided for the presence of amphipod tube mats (*Ampelisca* spp.) at the sediment-water interface. The full list of categories and descriptions is provided in Table 1. Example SPI images showing benthic habitat categories observed in Port Gamble Bay are provided in Figure 4.

Figure 1. Location Map of Port Gamble Bay, WA (from Ecology 2008b)

Figure 2. SPI and Plan View Sampling Locations

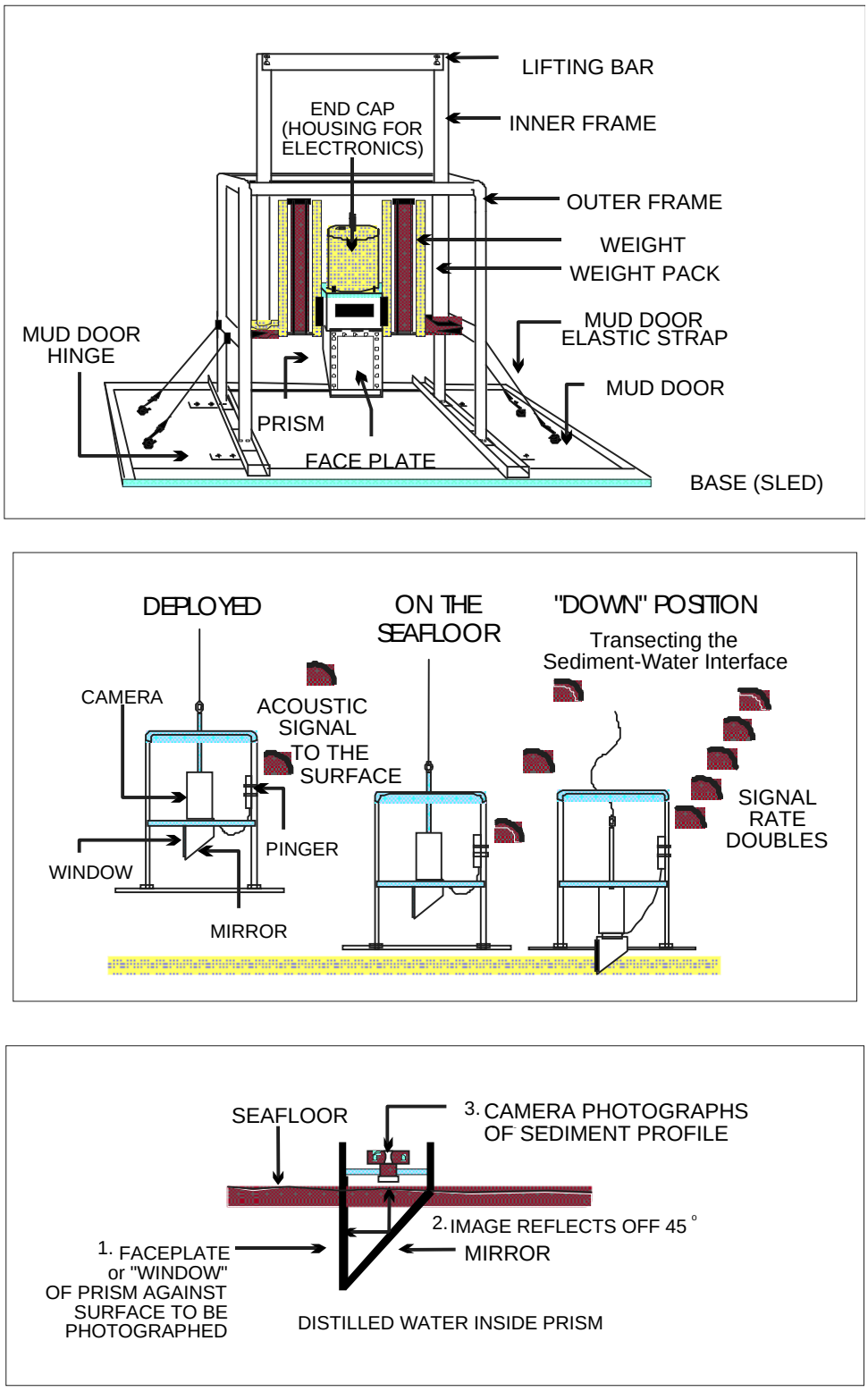
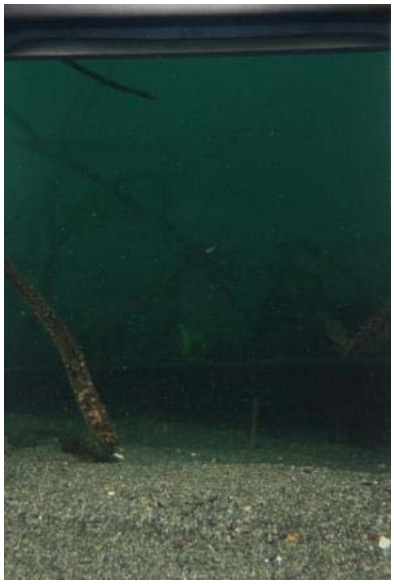


Figure 3. Schematic Diagram of Sediment-Profile Camera and Sequence of Operation on Deployment

SA.F: Fine Sand Hard Bottom

SA.M: Medium Sand Hard Bottom



SA.G: Medium Sand with Gravel Hard Bottom

UN.SS: Unconsolidated, Fine Sand/Silty

UN.SI: Unconsolidated, Silty

UN.SF: Unconsolidated, Very Soft Mud

Figure 4. Example SPI Images Showing Benthic Habitat Categories Measured in Port Gamble Bay

Table 1. Benthic Habitat Categories Assigned to Sediment Profile Images

Habitat AM: *Ampelisca* Mat Uniformly fine-grained (i.e., silty) sediments having well-formed amphipod (*Ampelisca* spp.) tube mats at the sediment-water interface.
Habitat SH: Shell Bed A layer of dead shells and shell fragments at the sediment surface overlying sediment ranging from hard sand to silts. Epifauna (e.g., bryozoans, tube-building polychaetes) commonly found attached to or living among the shells. Two distinct shell bed habitats: **SH.SI: Shell Bed over silty sediment**—shell layer overlying sediments ranging from fine sands to silts to silt-clay. **SH.SA: Shell Bed over sandy sediment—**shell layer overlying sediments ranging from fine to coarse sand.
Habitat SA: Hard Sand Bottom Homogeneous hard sandy sediment, does not appear to be bioturbated, bedforms common, successional stage mostly indeterminate because of low prism penetration. **SA.F: Fine sand**—uniform very fine sand (4 to 3 phi) or fine sand sediments (3 to 2 phi). **SA.M: Medium sand**—uniform medium sand sediments (grain size: 2 to 1 phi). **SA.G: Medium sand with gravel**—predominately medium to coarse sand with a minor gravel fraction.
Habitat HR: Hard Rock/Gravel Bottom Hard bottom consisting of pebbles, cobbles, and/or boulders, resulting in no or minimal penetration of the SPI camera prism. Some images show pebbles overlying silty sediments. The HR surfaces are typically covered with epifauna (e.g., bryozoans, sponges, tunicates).
Habitat UN: Unconsolidated Soft Bottom Fine-grained sediments ranging from very fine sand to silt-clay, with a complete range of successional stages (I, II, and III). Biogenic features may be common (e.g., amphipod and polychaete tubes at the sediment surface, small surface pits and mounds, large burrow openings, and feeding voids at depth). Several sub-categories: **UN.SS: Fine Sand/Silty**—very fine sand mixed with silt (grain size range from 4 to 2 phi), with little or no shell hash. **UN.SI: Silty**—homogeneous soft, silty sediments (grain size range from >4 to 3 phi), with little or no shell hash. Generally deep prism penetration. **UN.SF: Very Soft Mud**—very soft muddy sediments (>4 phi) of high apparent water content and deep prism penetration.

Source: Diaz 1995

3.0 Results

A total of 120 locations were photographed using SPI and plan view photography to determine the distribution of wood debris in surface sediments and evaluate sediment quality parameters in Port Gamble Bay (Figure 2). SPI and plan view image analysis results for are summarized in Appendix B. The SPI and plan view images selected for analysis are provided on a DVD in Appendix C.

3.1 Wood Debris Distribution

The SPI and plan view photography survey identified a total of 28 of 120 locations (23 percent) showing the apparent presence of woody debris in surface sediments (Figure 5). Wood debris was identified in SPI images at 27 locations and in a plan view image at one location. Of those locations showing woody debris, the majority (75 percent) showed very low accumulation (7 percent or less by area) in surface sediments. The wood debris consisted mostly of small weathered wood chips/pieces or fine particles, and was confined to the surface or upper portions of the sediment column (Figures 6 and 7).

Higher accumulations of woody debris (15 to 50 percent by area) were only observed at 7 of 120 locations (6 percent) and found primarily along the western shoreline of Port Gamble Bay and near the former Pope & Talbot sawmill site (Figure 5). The wood debris at these locations consisted of larger wood pieces (weathered log, branch pieces, or large wood chips) observed on the sediment surface (Figures 8 through 10). The only plan view image that showed the presence of wood debris was station PG47, in the former log transfer facility site. A small barnacle encrusted branch piece is visible in the upper left portion of the image (Figure 11).

3.2 Sediment Grain Size

The distribution of sediment grain size major mode determined from SPI images ranged from > 4 phi in the southern bay to < -1 phi in areas near the Port Gamble Bay entrance (Figure 12). In the southern bay, sediments in the central portion of the bay generally consisted of tan, unconsolidated, water rich silts and clays (> 4 phi), indicating a highly depositional environment (Figure 13). Sediments near the shoreline (intertidal and shallow subtidal regions) consisted of fine to very fine sands (3 to 2 phi; 4 to 3 phi, respectively).

Just to the north of the former log transfer facility, surface sediments in the central northern portion of Port Gamble Bay transition to very fine sands (3 to 4 phi), suggesting a higher energy environment due to tidal currents. In addition, some plan view images in the area show the presence of ripples/bedforms on the sediment surface (Figure 14). Surface sediments near the shoreline areas consisted of fine to very fine sands (3 to 2 phi; 4 to 3 phi, respectively). Sediments to the north of the bay entrance and within the entrance channel contain a higher proportion of coarse sands or gravel (1 to 0 phi; < -1 phi, respectively), reflecting the presence of strong tidal currents (Figure 15).

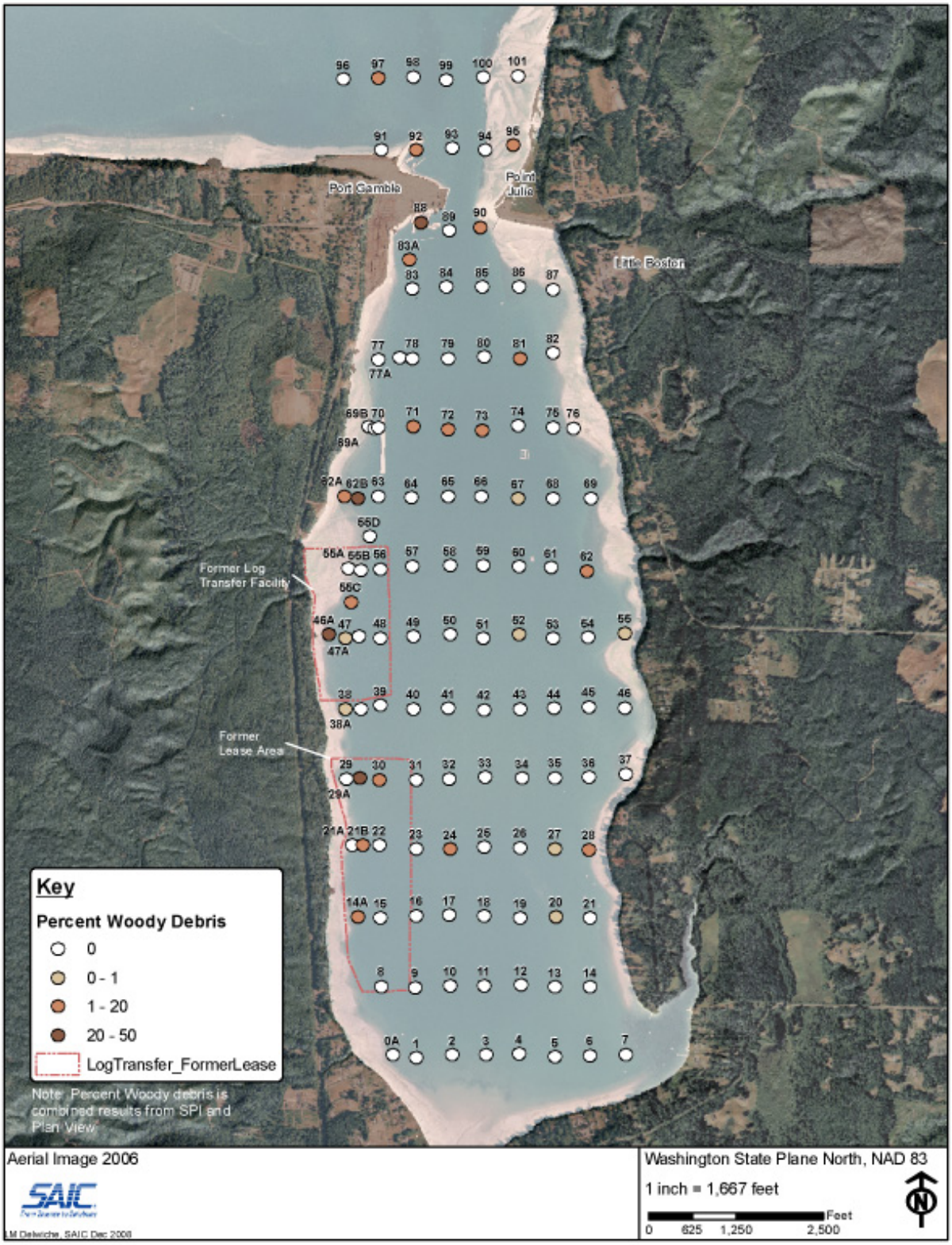


Figure 5. Distribution of Wood Debris Based on SPI and Plan View Image Analysis

PG14A-A

PG79-B

These images show the presence of small pieces of wood debris on the sediment surface. Station PG14A-A shows small, black wood particles on the surface (arrows) that represent approximately two percent by area. Algae (*Enteromorpha* sp.) and an anemone are present on the sediment surface. Similarly, station PG79-B shows small wood particles on the sediment surface (arrows) that represent approximately three percent by area. Surface sediments consisted of fine-medium gray sand with fine shell particles.

Figure 6. SPI Images from Stations PG14A (Replicate A) and PG79 (Replicate A)

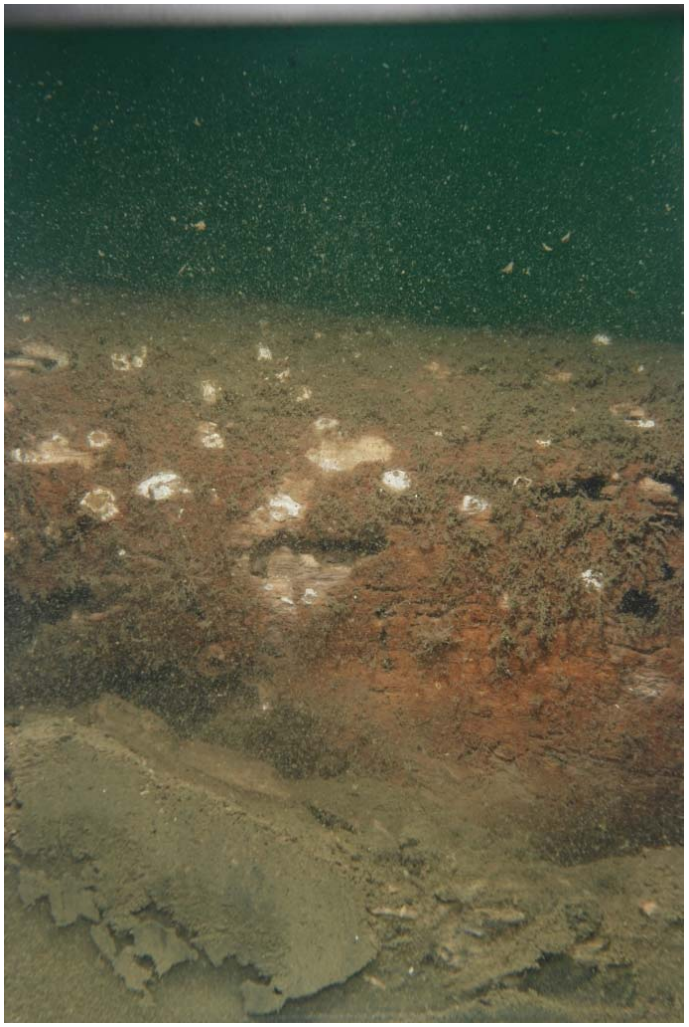
PG21B-B

PG62-B

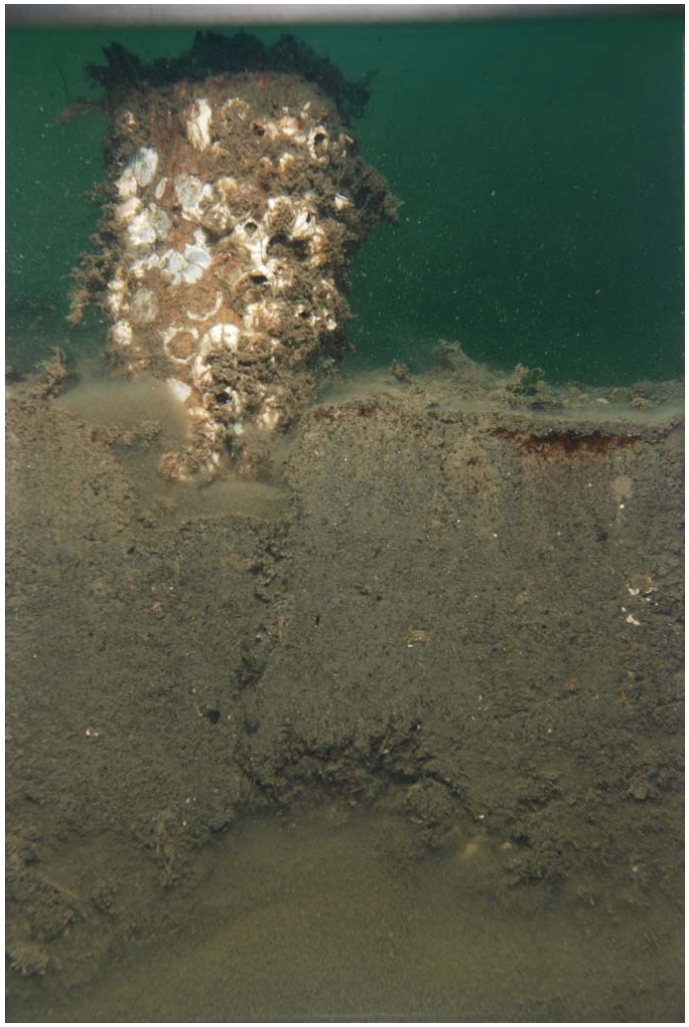
Images showing the presence of wood debris within surface sediments. Station PG21B, within the former DNR lease area, shows very fine wood particles and organic material in the upper 6 cm of the sediment column (approximately 5 percent by area). The large void at the bottom of the image is an artifact of the camera prism penetration. StationPG62-B shows a broken branch/twig buried upright in the sediment column.

Figure 7. SPI Images from Stations PG21B-B and PG62-B

PG29A-B



PG46A-B



Both images show the presence of large wood debris on the sediment surface. Station PG29A-B, in the northern portion of the former DNR lease area, shows a large piece of wood (barnacle encrusted log) on the sediment surface (approximately 50 percent by area). Station PG46A-B, in the former log transfer facility, also shows a piece of barnacle encrusted wood (approximately 25 percent by area) protruding from the sediment surface.

Figure 8. SPI Images from Stations PG29A-B and PG46A-B

PG83A-A

PG92-A

SPI images showing the presence of wood debris. Station PG83A-A shows silt-covered pieces of wood or bark (approximately 20 percent by area) on the sediment surface. The glass is obscured by sediment and shell debris. Station CW-110C shows a piece of brick (approximately 15 percent by area) that has been classified as municipal waste (construction debris).

Figure 9. SPI Images from Stations PG83A-A and PG92-A

PG88-A

PG88-C

SPI images from Station PG88 showing wood debris near the former mill site. Replicate A shows large wood pieces (bark and wood chips) and leaf litter on the surface greater than camera prism penetration. A pipe fish and gunnel are visible (arrows). Replicate C shows abundant wood chips grading into a mixture of reduced sand and silt.

Figure 10. SPI Images from Station PG88 Replicates A and C

PG47-C (SPI)

PG47 (Plan View)

SPI and plan view images from Station PG47. The SPI image shows olive brown silts and sands with shells and worm tubes visible on the sediment surface. The plan view image shows a large sea star (*Pisaster* sp.) and a barnacle encrusted wood piece (twig) on the sediment surface (arrow). Shell pieces and leaf litter are also visible.

Figure 11. SPI and Plan View Images from Station PG47

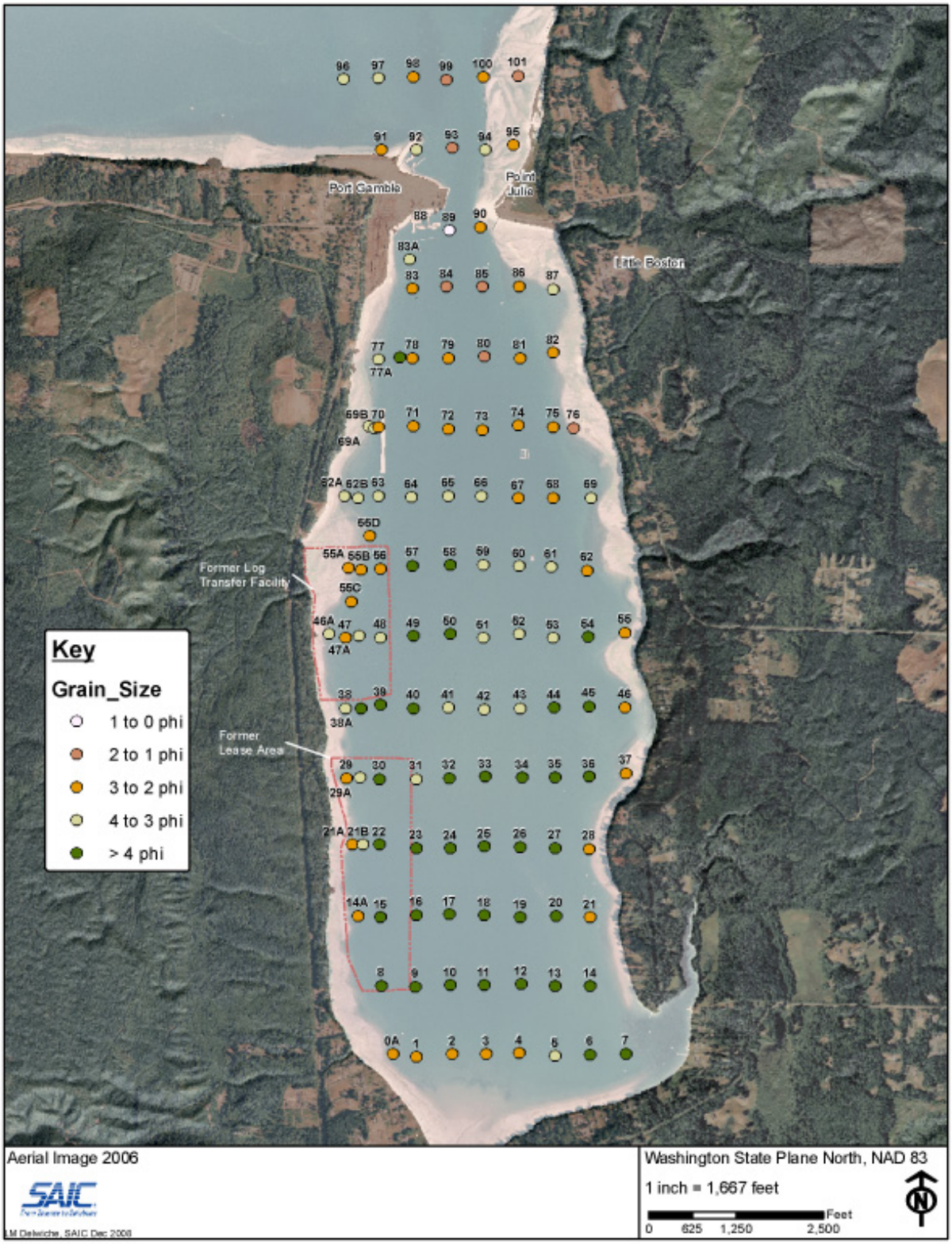
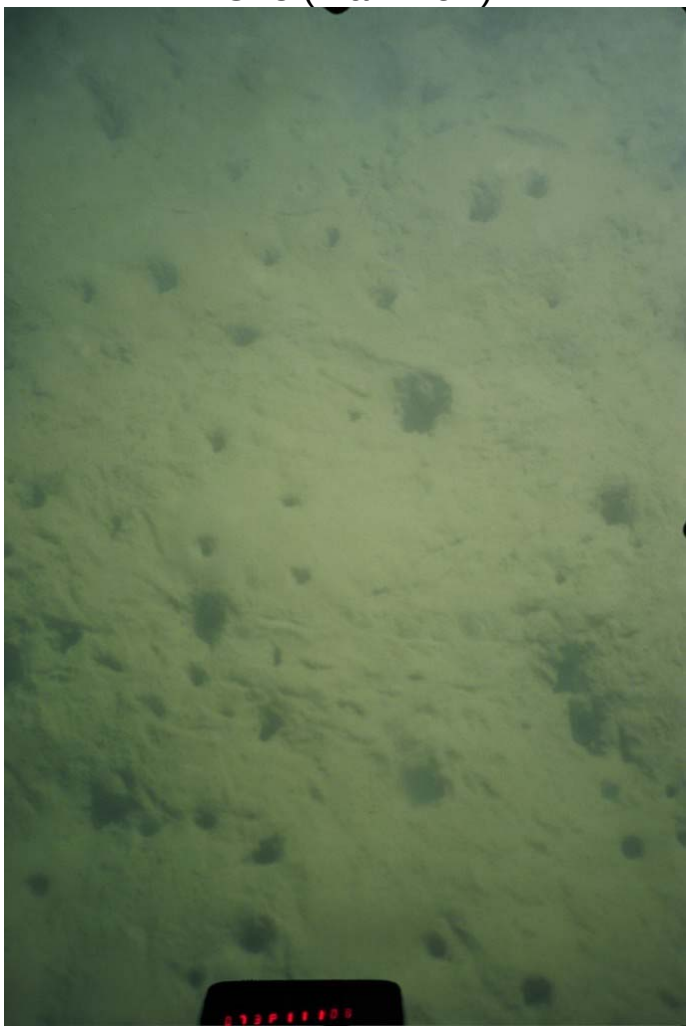


Figure 12. Grain Size Major Mode Distribution Based on SPI Image Analysis

PG18-A (SPI)

PG18 (Plan View)



SPI and plan view images from station PG18, in southern Port Gamble Bay. The SPI image shows tan, unconsolidated silts and clays with feeding voids, indicating the presence of Stage III infaunal organisms. The plan view image shows numerous burrow openings on the sediment surface. Many of the burrows are likely related to the feeding activities of the Stage III infauna.

Figure 13. SPI and Plan View Images from Station PG18

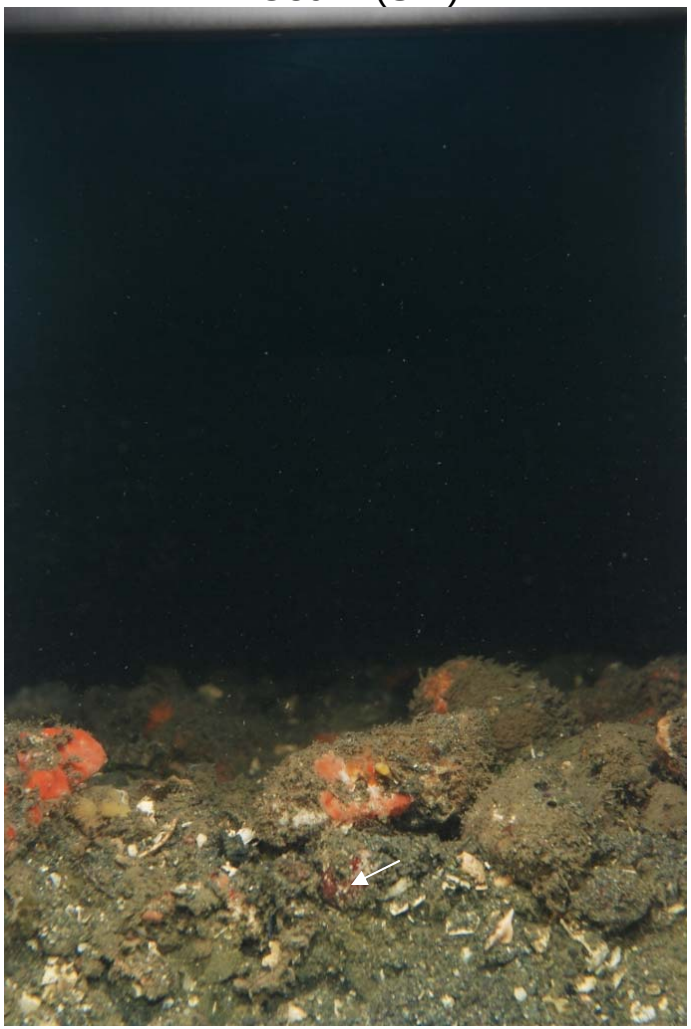
PG76 (Plan View)

PG79 (Plan View)

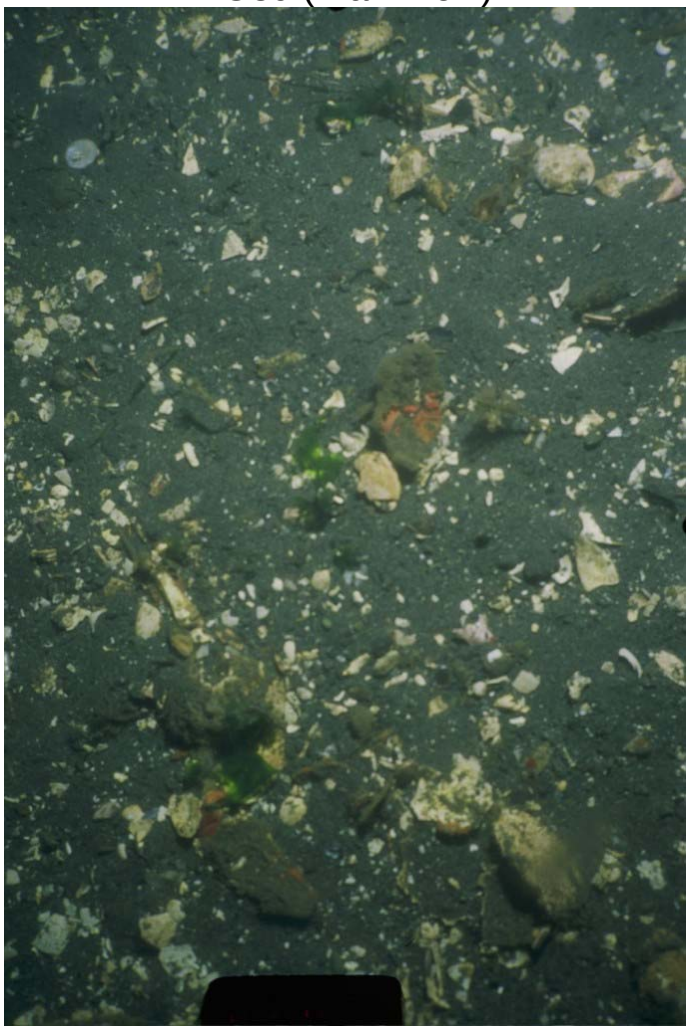
Plan view images from stations PG76 and PG79, located in the northern portion of Port Gamble Bay. Both locations show the presence of ripples or bedforms on the sediment surface, suggesting bedload transport due to tidal currents.

Figure 14. Plan View Images from Stations PG76 and PG79

PG89-A (SPI)



PG89 (Plan View)



SPI and plan view images from station PG89 at the entrance channel to Port Gamble Bay. The presence of coarse grained sediments (coarse sands and gravel) is due to high tidal currents within the channel. Abundant shell debris is present. An orange colored encrusting sponge is present on some of the large gravels.

Figure 15. SPI and Plan View Images from Station PG89

3.3 Apparent RPD Depth

Apparent RPD depth estimates the depth of oxygenation in the upper sediment column and reflects the degree of biogenic sediment mixing. The distribution of mean apparent RPD depths in Port Gamble Bay ranged from 0.0 cm at station PG88, near the former mill site, to a high of 5.53 cm at station PG19, in the fine-grained southern portion of the bay (Figure 16). The mean apparent RPD depth for Port Gamble Bay was 2.77 cm. Relatively shallow apparent RPD depths (less than 2.0 cm) were generally measured in areas close to shore, likely due to regular disturbance from near shore waves and currents. At station PG88 near the former mill site, SPI images show the accumulation wood chips on the sediment surface (see Figure 10). The deepest RPD depths were measured in fine-grained sediments present in the southern portion of the bay (see Figure 13).

At nine locations in the southern bay, the apparent RPD depth could not be measured due to over penetration by the camera prism. However, apparent RPD depths are likely relatively high at these locations based on the distribution of surrounding RPD measurements.

3.4 Infaunal Successional Stage

The majority of infaunal successional stages observed in SPI images collected in Port Gamble Bay were Stage I (65 percent), followed by Stage III or Stage I on III (31 percent) (Figure 17). Stage I taxa can persist, as they are opportunistic feeders, and are commonly associated with a Stage III community (Rhoads and Germano 1986). Infaunal successional stage was indeterminate at five locations (4 percent) due to camera prism over penetration or the presence of abundant wood debris.

In sandy substrates, such as the areas along the shoreline and the northern portion of Port Gamble Bay, the climax communities may consist primarily of surface dwellers (e.g., amphipods) that reside in the upper 1 cm of the sediment surface and have few, if any, naturally burrowing community members. These community types are classified as Stage I communities and are reflective of an area influenced by physical factors and the presence of a sandy substrate. A higher order successional stage would typically be assigned to a climax community in a depositional environment consisting of a silt/clay substrate, such as areas in southern Port Gamble Bay. Localized feeding of large, deep-burrowing infauna (Stage III taxa) in these depositional environments result in distinctive excavations called feeding voids. Station PG18 provides a representative example of feeding voids visible in southern Port Gamble Bay (Figure 13).

3.5 Benthic Habitat Type

The benthic habitat classifications in Port Gamble Bay generally followed the grain size major mode distribution measured from SPI images (Figure 18). The highest number of locations were classified as SA.F (42 percent), consisting of a hard, fine sandy bottom (4 to 3 phi; 3 to 2 phi). Medium sandy hard bottom (SA.M) and medium sandy hard bottom with gravel (SA.G) were observed at four percent and two percent of the locations, respectively. Two stations classified as SA.G were located within the entrance channel to Port Gamble Bay. Hard sandy bottom

classifications were generally found in shoreline areas and the northern half of Port Gamble Bay. One location within the entrance channel to the bay (station PG89) was classified as HR due to the presence of a hard rock or gravel bottom. Station PG88, near the former mill site, did not have a benthic habitat classification due to the high accumulations of wood debris on the sediment surface.

The second most predominant habitat classification (33 percent of locations) was an unconsolidated soft bottom with very soft silts/clays and a grain size range of >4 phi (UN.SF). Silty unconsolidated soft bottom (UN.SI) and sandy/silty unconsolidated soft bottom (UN.SS) were also observed at 11 percent and seven percent of the locations, respectively. The unconsolidated soft bottom classification was predominant in the southern reaches of Port Gamble Bay (see Figures 13).

Several locations in Port Gamble Bay also exhibited the presence of eelgrass (*Zostera* sp.) and other macrofauna such as sea pens (*Ptilosarcus gurneyi*) and sea whips (order Pennatulacea) (Figure 19). Intact eelgrass beds were observed in locations north of the bay entrance (stations PG94, PG97, PG98, and PG100), and just south of the entrance along the eastern shore (stations PG82, PG86, and PG87) (Figure 20). Eelgrass detritus (i.e., decomposing eelgrass blades, loose strands) was observed at stations PG54 and PG88. Sea pens and sea whips were observed at several locations in the northern portions of Port Gamble Bay (Figure 21). These organisms are known to position themselves in the path of currents, in order to ensure a steady supply of food (e.g., plankton).

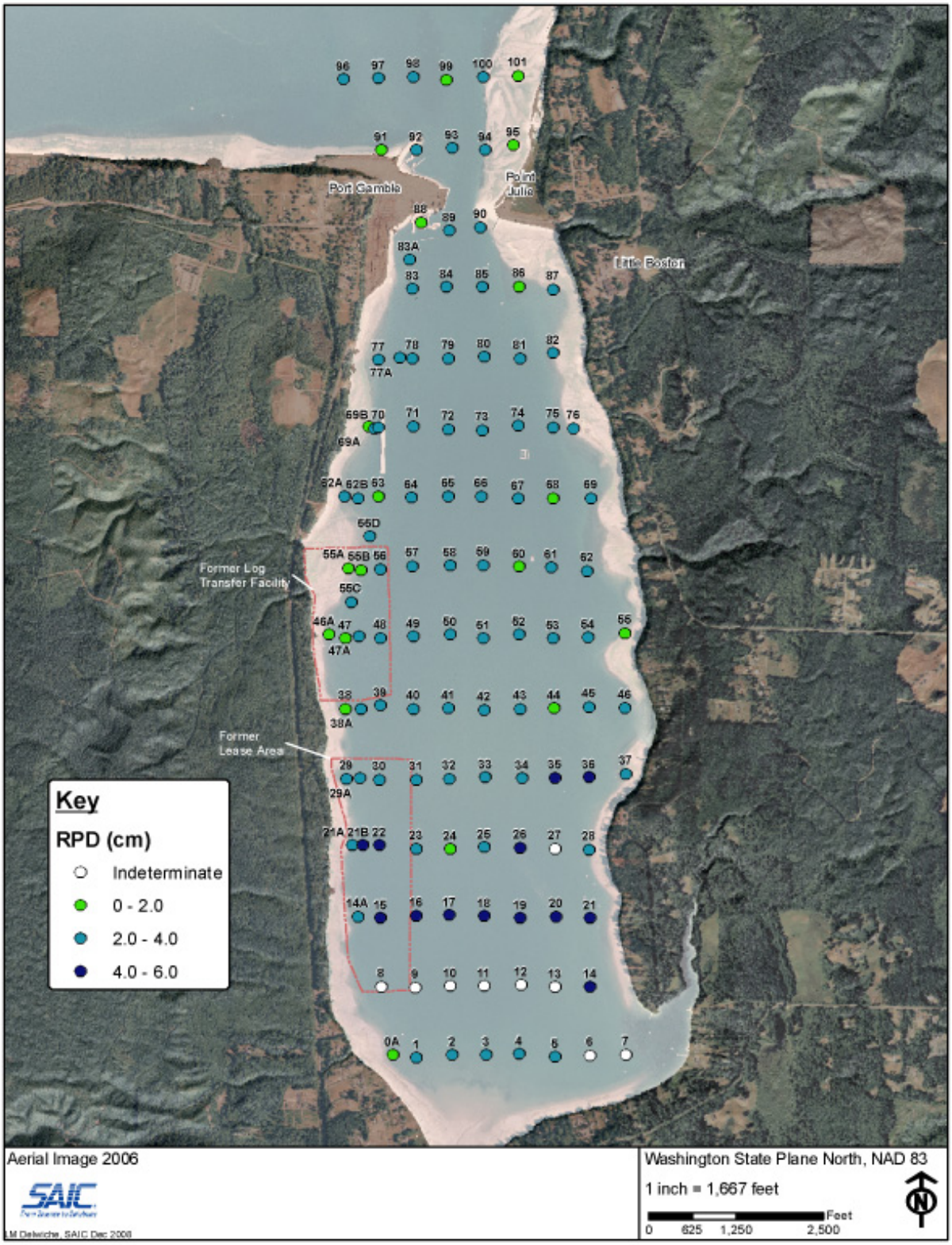


Figure 16. Distribution of Apparent RPD Depths in Port Gamble Bay

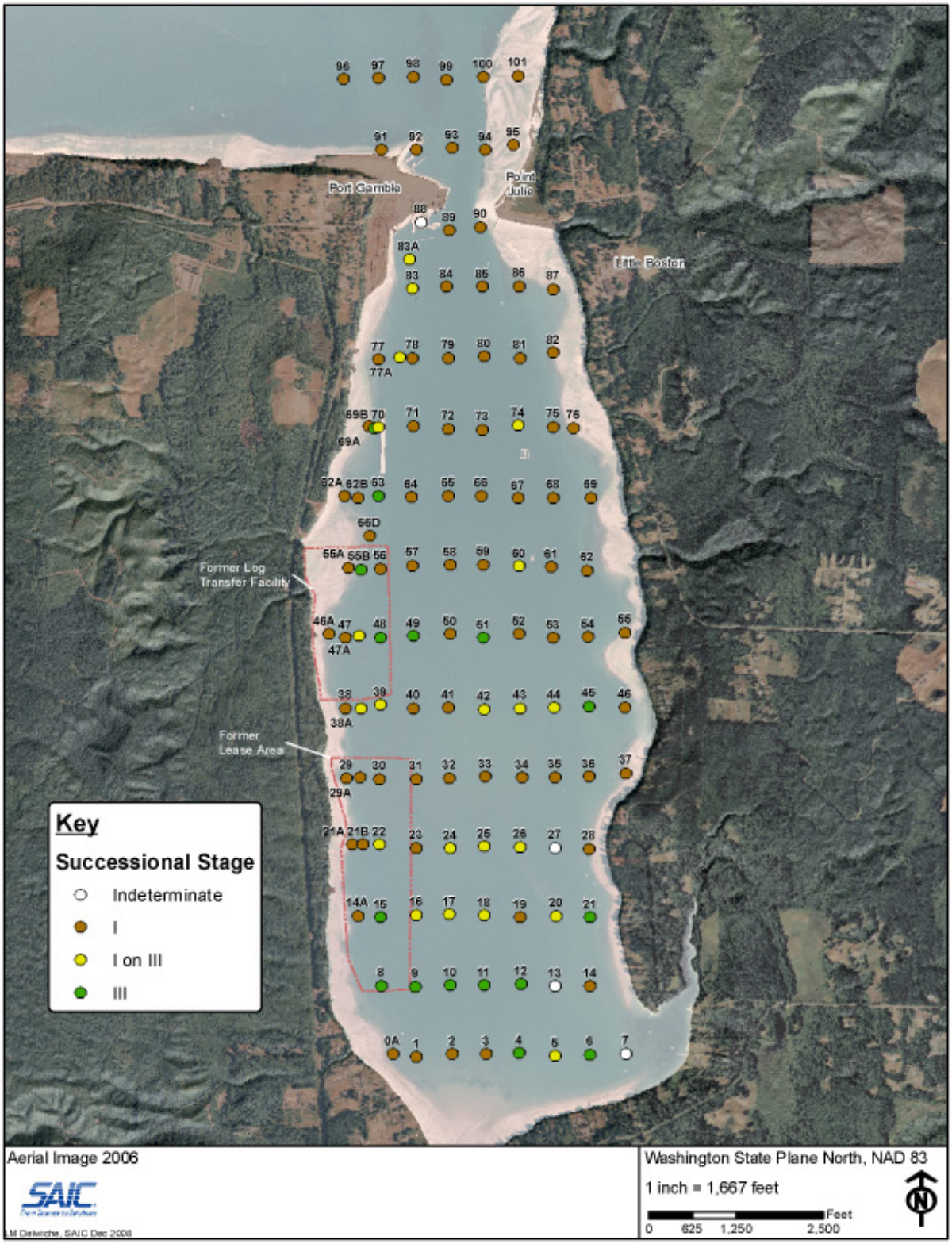


Figure 17. Distribution of Infaunal Successional Stage in Port Gamble Bay

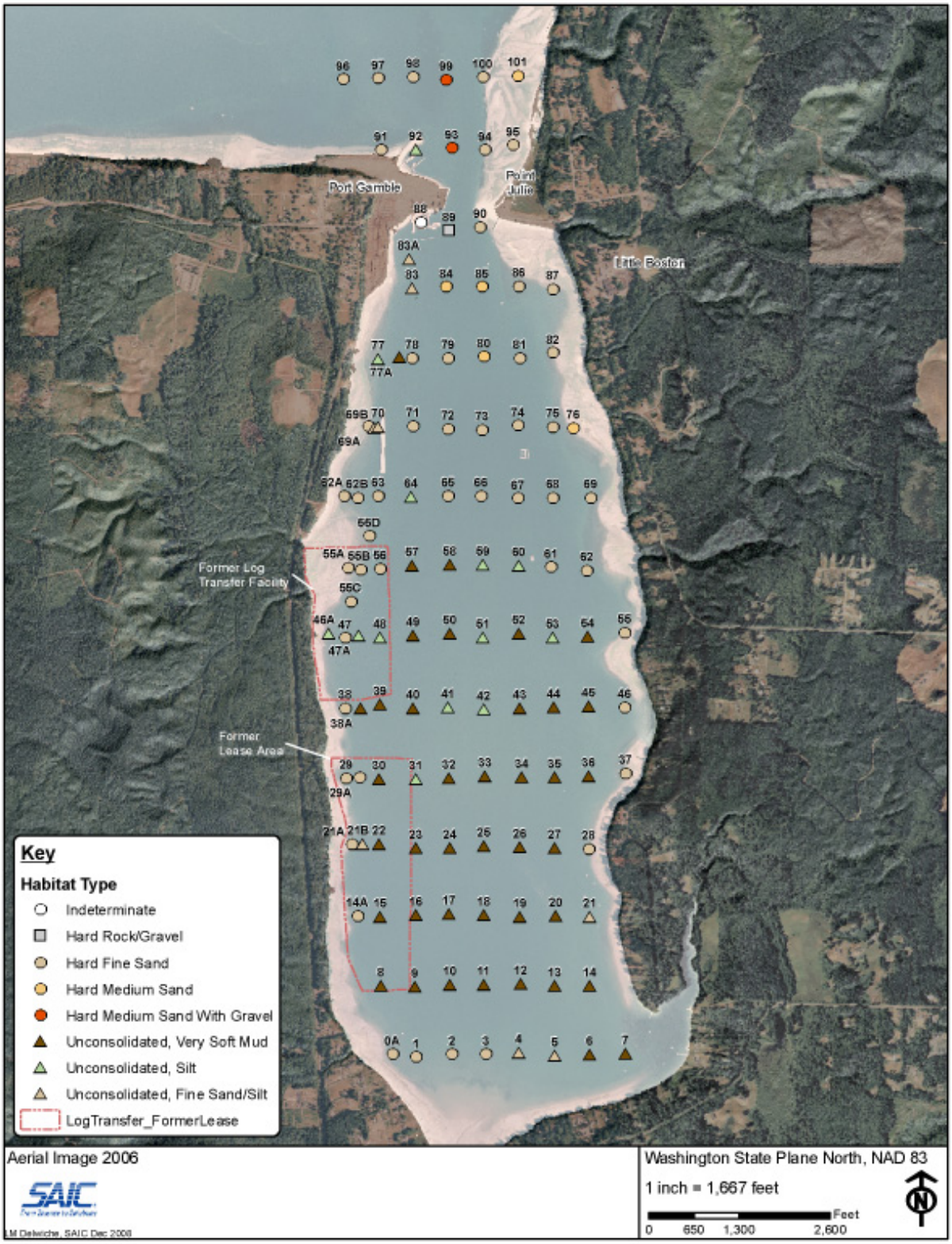


Figure 18. Distribution of Benthic Habitat Classifications in Port Gamble Bay

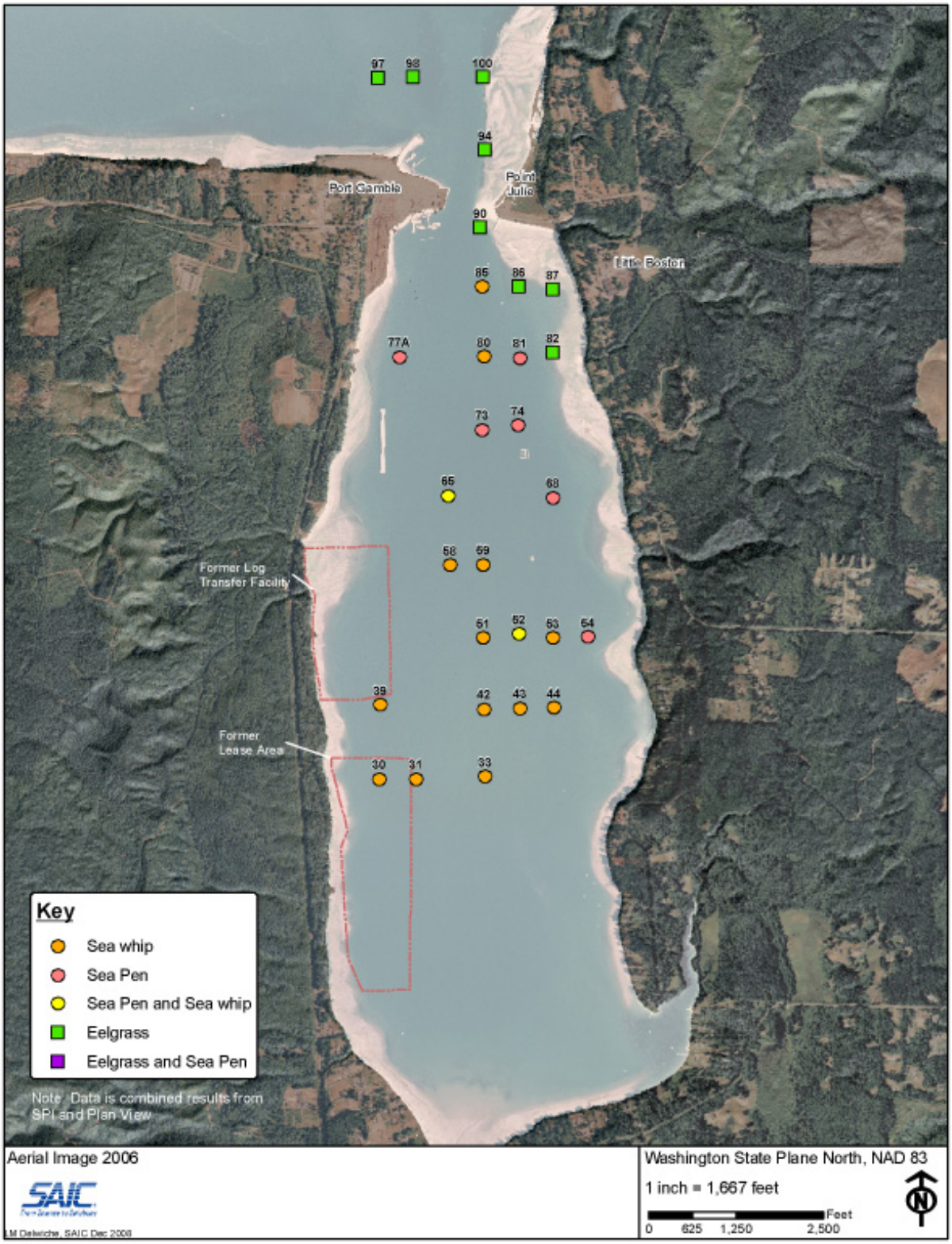


Figure 19. Distribution of Eelgrass, Sea Pens, and Sea Whips Observed in Port Gamble Bay

PG87 (Plan View)

PG100-A (SPI)

Plan view image from station PG87 and SPI image from station PG100-A showing intact eelgrass beds near the entrance to Port Gamble Bay.

Figure 20. Plan View Image from Station PG87 and SPI Image from Station PG100-A

PG68 (Plan View)

PG80 (Plan View)

Plan view images from station PG68 and PG80 showing a sea pen and sea whips on the seafloor, respectively. These organisms are generally found in areas with a hard sandy substrate and where bottom currents are present.

Figure 21. Plan View Images from Stations PG68 and PG80

4.0 Summary

- The SPI and plan view photography survey identified wood debris at 28 of 120 locations (23 percent) and the majority of these locations showed very low accumulations of wood debris (7 percent or less by area). The wood debris consisted mostly of small weathered wood chips/pieces or fine particles, and was generally confined to the upper portions of the sediment column.
- Sediment grain size major mode in phi units ranged from > 4 phi in the southern bay to < -1 phi in areas near the Port Gamble Bay entrance. Sediments in the southern bay consisted of tan, unconsolidated, water rich silts and clays. Sand content increases to the north. Surface sediments to the north of the ban entrance and within the entrance channel contain a higher proportion of coarse sands and gravel, reflecting the presence of strong tidal currents.
- The mean apparent RPD depth for Port Gamble Bay was 2.77 cm. Relatively deep RPD depths were present in the fine-grained southern portion of the bay. Shallow apparent RPD depths were generally measured in areas close to shore, likely due to regular disturbance from near shore waves and currents.
- The majority of infaunal successional stage measurements in Port Gamble Bay were Stage I (65 percent), followed by Stage III or Stage I on III (31 percent). A higher proportion of Stage III organisms were observed in the southern portion of the bay, where fine-grained, unconsolidated sediments are present.
- The benthic habitat classifications generally followed the grain size major mode distribution in Port Gamble Bay. Hard sandy bottom classifications (SA.F, SA.M, and SA.G) were generally found in shoreline areas and the northern half of the bay. Unconsolidated soft bottom classifications (UN.SF, UN.SI, and UN.SS) were generally observed in the southern end of the bay.
- Intact eelgrass beds were observed in locations north of the bay entrance and just south of entrance along the eastern shore. Sea pens and sea whips were observed in the northern reaches of Port Gamble Bay, where higher bottom currents are present.

This page is intentionally blank.

5.0 References

Aller, R. 1982. The effects of macrobenthos on chemical properties of marine sediments and overlying waters. In: P.L. McCall and M.J.S. Tevesz (eds.), Animal-Sediment Relations. Topics in Geobiology, Plenum Press, N.Y., N.Y. 2: 53-102.

Diaz, R.J. 1995. Benthic habitat classification of selected areas of Narragansett Bay, Rhode Island. Report to Normandeau Associates, Inc. Bedford, New Hampshire.

Ecology. 2008a. Pope & Talbot, Inc. Sawmill Site, Port Gamble, Kitsap County, WA. Fact Sheet. May 2008. Washington State Department of Ecology. Publication Number 08-09-105. http://www.ecy.wa.gov/biblio/0809105.html

Ecology. 2008b. DNR Lease Area, Port Gamble, Kitsap County, WA. Fact Sheet. May 2008. Washington State Department of Ecology. Publication Number 08-09-106. http://www.ecy.wa.gov/biblio/0809106.html

Munsell. 2000. Charts for estimating proportions of mottles and coarse fragments. Munsell soil color charts. Year 2000. GretagMacBeth, New Windsor, NY.

Pearson, T.H. and R. Rosenberg. 1978. Macrobenthic succession in relation to organic enrichment and pollution of the marine environment. Oceanogr. Mar. Biol. Ann. Rev. 16: 229-311.

Rhoads, D.C. and J.D. Germano. 1986. Interpreting long-term changes in benthic community structure: a new protocol. Hydrobiology 142: 291-308.

SAIC. 1986. Standard Operating Manual for DAMOS Monitoring Activities. DAMOS Contribution No. 48. U.S. Army Corps of Engineers, New England Division, Waltham, MA.

This page is intentionally blank.

Station	Grain Size Major Mode (# replicates)	Camera Penetration Mean (cm)	dary Rougl Mean (cm)	Benthic Habitat (# replicates)	uccession ages Prese	Highest Stage Present	Successional Stages Present (# replicates)	RPD Mean (cm)	Methane Present	OSI Mean	OSI Median	Additional1 Description
00A	3 to 2 phi (1)	0.00	0.00	SA.F (1)	I	ST I	ST I (1)	1.72	No	4.00	4.00	
1	3 to 2 phi (1)	8.48	1.42	SA.F (1)	I	ST I	ST I (1)	2.56	No	5.00	5.00	
2	3 to 2 phi (1)	6.94	0.58	SA.F (1)	I	ST I	ST I (1)	2.14	No	4.00	4.00	
3	4 to 3 phi (1)	8.85	1.02	SA.F (1)	I	ST I	ST I (1)	2.75	No	5.00	5.00	
4	3 to 2 phi (1)	12.80	0.97	UN.SF (1)	III	ST III	ST III (1)	2.99	No	9.00	9.00	
5	4 to 3 phi (1)	15.72	0.49	SA.F (1)	I,III	ST I on III	ST I on III (1)	3.63	No	10.00	10.00	
6	> 4 phi (1)	20.08	0.27	UN.SF (1)	INDET	INDET	INDET (1)	-99.00	No	-99.00	-99.00	
7	> 4 phi (1)	20.11	0.22	UN.SF (1)	INDET	INDET	INDET (1)	-99.00	No	-99.00	-99.00	
7A	3 to 2 phi (1)	9.52	0.56	SA.F (1)	I	ST I	ST I (1)	2.34	No	5.00	5.00	
8	> 4 phi (1)	20.15	0.17	UN.SF (1)	INDET	INDET	INDET (1)	-99.00	No	-99.00	-99.00	
9	> 4 phi (1)	20.05	0.25	UN.SF (1)	INDET	INDET	INDET (1)	-99.00	No	-99.00	-99.00	
10	> 4 phi (1)	19.57	0.52	UN.SF (1)	III	ST III	ST III (1)	-99.00	No	-99.00	-99.00	
11	> 4 phi (1)	19.55	0.44	UN.SF (1)	III	ST III	ST III (1)	-99.00	No	-99.00	-99.00	
12	> 4 phi (1)	19.92	0.60	UN.SF (1)	INDET	INDET	INDET (1)	-99.00	No	-99.00	-99.00	
13	> 4 phi (1)	20.14	0.44	UN.SF (1)	INDET	INDET	INDET (1)	-99.00	No	-99.00	-99.00	
14	> 4 phi (1)	19.99	0.46	UN.SF (1)	I	ST I	ST I (1)	5.40	No	7.00	7.00	
14A	3 to 2 phi (1)	9.23	1.56	SA.F (1)	I	ST I	ST I (1)	2.84	No	5.00	5.00	woody debris?
15	> 4 phi (1)	20.14	0.32	UN.SF (1)	III	ST III	ST III (1)	5.50	No	11.00	11.00	
16	> 4 phi (1)	18.40	0.76	UN.SF (1)	III	ST III	ST III (1)	4.67	No	11.00	11.00	
17	> 4 phi (1)	18.24	1.20	UN.SF (1)	I,III	ST I on III	ST I on III (1)	5.01	No	11.00	11.00	
18	4 to 3 phi (1)	15.64	0.54	UN.SF (1)	I,III	ST I on III	ST I on III (1)	4.13	No	11.00	11.00	
19	> 4 phi (1)	17.76	1.09	UN.SF (1)	I	ST I	ST I (1)	5.52	No	7.00	7.00	
20	> 4 phi (1)	16.02	2.32	UN.SF (1)	I,III	ST I on III	ST I on III (1)	4.20	No	11.00	11.00	wood debris?
21	3 to 2 phi (1)	12.62	0.40	SA.F (1)		No Description for SSCode -1		4.16	No	6.00	6.00	
21A	3 to 2 phi (1)	8.41	0.76	SA.F (1)	I	ST I	ST I (1)	3.19	No	6.00	6.00	
21B	4 to 3 phi (1)	16.21	0.54	UN.SS (1)	I	ST I	ST I (1)	4.58	No	7.00	7.00	
22	> 4 phi (1)	19.25	0.40	UN.SF (1)	I,III	ST I on III	ST I on III (1)	4.44	No	11.00	11.00	
23	4 to 3 phi (1)	16.08	0.17	UN.SF (1)	I	ST I	ST I (1)	3.35	No	6.00	6.00	
24	4 to 3 phi (1)	15.67	0.21	UN.SF (1)		No Description for SSCode -1		1.54	No	3.00	3.00	woody debris?
25	4 to 3 phi (1)	14.13	0.38	UN.SF (1)	III	ST III	ST III (1)	3.79	No	11.00	11.00	
26	4 to 3 phi (1)	15.93	0.78	UN.SF (1)	I,III	ST I on III	ST I on III (1)	4.81	No	11.00	11.00	
27	> 4 phi (1)	20.10	0.17	UN.SF (1)	INDET	INDET	INDET (1)	-99.00	No	-99.00	-99.00	
28	3 to 2 phi (1)	11.21	0.38	SA.F (1)	I	ST I	ST I (1)	3.65	No	6.00	6.00	
29	3 to 2 phi (1)	8.66	0.26	SA.F (1)	I	ST I	ST I (1)	2.47	No	5.00	5.00	
29A	4 to 3 phi (1)	8.84	2.08	SA.F (1)	I	ST I	ST I (1)	3.03	No	6.00	6.00	woody debris
30	> 4 phi (1)	17.17	0.40	UN.SF (1)	I	ST I	ST I (1)	3.89	No	7.00	7.00	
31	4 to 3 phi (1)	13.09	2.86	UN.SF (1)	I	ST I	ST I (1)	2.48	No	5.00	5.00	
32	> 4 phi (1)	14.35	1.35	UN.SF (1)	I	ST I	ST I (1)	2.96	No	5.00	5.00	
33	> 4 phi (1)	15.36	0.89	UN.SF (1)	I	ST I	ST I (1)	0.93	No	3.00	3.00	
34	> 4 phi (1)	14.43	0.83	UN.SF (1)	I	ST I	ST I (1)	2.65	No	5.00	5.00	
35	> 4 phi (1)	18.76	0.21	UN.SF (1)	I	ST I	ST I (1)	4.18	No	7.00	7.00	
36	> 4 phi (1)	16.58	0.71	UN.SF (1)	I	ST I	ST I (1)	4.58	No	7.00	7.00	
37	3 to 2 phi (1)	8.63	0.82	SA.F (1)	I	ST I	ST I (1)	2.67	No	5.00	5.00	
38	4 to 3 phi (1)	9.28	0.32	SA.F (1)	I	ST I	ST I (1)	1.89	No	4.00	4.00	
38A	> 4 phi (1)	16.18	0.55	UN.SF (1)	I,III	ST I on III	ST I on III (1)	3.17	No	10.00	10.00	
39	> 4 phi (1)	14.73	0.67	UN.SF (1)	I,III	ST I on III	ST I on III (1)	3.37	No	10.00	10.00	
40	4 to 3 phi (1)	14.88	0.38	UN.SF (1)	II	ST II	ST II (1)	2.91	No	7.00	7.00	
41	4 to 3 phi (1)	13.74	0.72	UN.SF (1)	I	ST I	ST I (1)	3.46	No	6.00	6.00	
42	4 to 3 phi (1)	13.45	0.87	UN.SF (1)	I	ST I	ST I (1)	3.05	No	6.00	6.00	
43	4 to 3 phi (1)	14.53	0.27	UN.SF (1)	I	ST I	ST I (1)	2.66	No	5.00	5.00	
44	> 4 phi (1)	15.42	0.32	UN.SF (1)	I	ST I	ST I (1)	2.00	No	4.00	4.00	
45	> 4 phi (1)	17.34	0.43	UN.SF (1)	III	ST III	ST III (1)	2.05	No	8.00	8.00	
46	3 to 2 phi (1)	9.56	1.21	SA.F (1)	I	ST I	ST I (1)	2.91	No	5.00	5.00	
46A	4 to 3 phi (1)	14.44	0.29	UN.SI (1)	I	ST I	ST I (1)	1.49	No	3.00	3.00	wood debris?
47	3 to 2 phi (1)	10.31	0.72	SA.F (1)	I	ST I	ST I (1)	1.38	No	3.00	3.00	
47A	4 to 3 phi (1)	15.52	0.51	UN.SF (1)	I,III	ST I on III	ST I on III (1)	3.00	No	9.00	9.00	

48	4 to 3 phi (1)	14.66	0.29	UN.SF (1)	III	ST III	ST III (1)	2.70	No	9.00	9.00	
49	4 to 3 phi (1)	18.17	0.72	UN.SF (1)	III	ST III	ST III (1)	2.95	No	9.00	9.00	
50	4 to 3 phi (1)	15.16	0.41	UN.SF (1)	I	ST I	ST I (1)	2.80	No	5.00	5.00	
51	4 to 3 phi (1)	13.95	0.64	UN.SF (1)	III	ST III	ST III (1)	2.42	No	9.00	9.00	
52	4 to 3 phi (1)	13.02	0.41	UN.SF (1)	I	ST I	ST I (1)	2.58	No	5.00	5.00	
53	4 to 3 phi (1)	14.15	1.04	UN.SF (1)	I	ST I	ST I (1)	2.51	No	5.00	5.00	
54	> 4 phi (1)	12.08	0.63	UN.SF (1)	I	ST I	ST I (1)	2.88	No	5.00	5.00	
55	3 to 2 phi (1)	6.66	0.88	SA.F (1)	I	ST I	ST I (1)	1.96	No	4.00	4.00	wood debris?
55A	3 to 2 phi (1)	6.72	0.34	SA.F (1)	I	ST I	ST I (1)	1.96	No	4.00	4.00	
55B	3 to 2 phi (1)	8.60	0.34	SA.F (1)	I	ST I	ST I (1)	1.99	No	4.00	4.00	
55C	3 to 2 phi (1)	9.93	0.76	SA.F (1)		No Description for SSCode -1		2.33	No	4.00	4.00	
55D	3 to 2 phi (1)	10.03	1.60	SA.F (1)	I	ST I	ST I (1)	2.39	No	5.00	5.00	
56	3 to 2 phi (1)	9.39	0.70	SA.F (1)	I	ST I	ST I (1)	2.45	No	5.00	5.00	
57	> 4 phi (1)	14.35	0.33	UN.SF (1)	I	ST I	ST I (1)	2.56	No	5.00	5.00	
58	> 4 phi (1)	19.46	1.34	UN.SF (1)	I	ST I	ST I (1)	3.36	No	6.00	6.00	
59	4 to 3 phi (1)	12.04	1.10	UN.SF (1)	I	ST I	ST I (1)	2.26	No	5.00	5.00	
60	> 4 phi (1)	12.43	1.27	UN.SF (1)	I,III	ST I on III	ST I on III (1)	1.82	No	8.00	8.00	
61	4 to 3 phi (1)	10.81	1.22	SA.F (1)	I	ST I	ST I (1)	2.51	No	5.00	5.00	
62	3 to 2 phi (1)	9.21	0.84	SA.F (1)	I	ST I	ST I (1)	2.48	No	5.00	5.00	woody debris?
62A	4 to 3 phi (1)	11.84	0.73	SA.F (1)	I	ST I	ST I (1)	2.71	No	5.00	5.00	woody debris?
62B	4 to 3 phi (1)	9.61	1.94	SA.F (1)	I	ST I	ST I (1)	2.50	No	5.00	5.00	woody debris?
63	4 to 3 phi (1)	11.45	0.61	SA.F (1)	III	ST III	ST III (1)	1.99	No	8.00	8.00	
64	> 4 phi (1)	13.88	0.82	UN.SF (1)	I	ST I	ST I (1)	2.16	No	4.00	4.00	
65	4 to 3 phi (1)	11.69	0.79	SA.F (1)	I	ST I	ST I (1)	2.26	No	5.00	5.00	
66	4 to 3 phi (1)	11.42	0.80	SA.F (1)	I	ST I	ST I (1)	2.78	No	5.00	5.00	
67	4 to 3 phi (1)	11.82	0.59	SA.F (1)	I	ST I	ST I (1)	2.37	No	5.00	5.00	
68	3 to 2 phi (1)	9.66	0.40	SA.F (1)	I	ST I	ST I (1)	1.97	No	4.00	4.00	
69	4 to 3 phi (1)	11.42	2.66	SA.F (1)	I	ST I	ST I (1)	2.49	No	5.00	5.00	
69A	4 to 3 phi (1)	9.43	0.75	SA.F (1)	I	ST I	ST I (1)	1.91	No	4.00	4.00	
69B	4 to 3 phi (1)	13.19	1.45	SA.F (1)	I	ST I	ST I (1)	2.30	No	5.00	5.00	
70	3 to 2 phi (1)	13.18	1.73	SA.F (1)	I,III	ST I on III	ST I on III (1)	2.51	No	9.00	9.00	
71	3 to 2 phi (1)	9.99	0.72	SA.F (1)	I	ST I	ST I (1)	3.23	No	6.00	6.00	
72	3 to 2 phi (1)	10.34	1.45	SA.F (1)	I	ST I	ST I (1)	2.73	No	5.00	5.00	
73		9.38	1.18	SA.F (1)	I	ST I	ST I (1)	2.04	No	4.00	4.00	woody debris
74	3 to 2 phi (1)	11.92	0.86	SA.F (1)	I,III	ST I on III	ST I on III (1)	2.17	No	8.00	8.00	
75	3 to 2 phi (1)	9.00	0.80	SA.F (1)	I	ST I	ST I (1)	2.47	No	5.00	5.00	
76	3 to 2 phi (1)	7.52	0.77	SA.M (1)	I	ST I	ST I (1)	2.80	No	5.00	5.00	
77	4 to 3 phi (1)	13.31	0.36	UN.SF (1)	I	ST I	ST I (1)	2.83	No	5.00	5.00	
77A	> 4 phi (1)	16.90	1.26	UN.SF (1)	I,III	ST I on III	ST I on III (1)	2.56	No	9.00	9.00	
78	3 to 2 phi (1)	10.54	0.38	SA.F (1)	I	ST I	ST I (1)	2.80	No	5.00	5.00	
79	3 to 2 phi (1)	6.95	1.05	SA.F (1)	I	ST I	ST I (1)	2.50	No	5.00	5.00	
80	2 to 1 phi (1)	7.91	0.29	SA.M (1)	I	ST I	ST I (1)	2.99	No	5.00	5.00	
81	3 to 2 phi (1)	9.22	1.43	SA.F (1)	I	ST I	ST I (1)	2.67	No	5.00	5.00	woody debris?
82	3 to 2 phi (1)	7.39	0.41	SA.F (1)	I	ST I	ST I (1)	2.45	No	5.00	5.00	
83	3 to 2 phi (1)	13.53	0.50	SA.F (1)	I,III	ST I on III	ST I on III (1)	2.56	No	9.00	9.00	
83A	4 to 3 phi (1)	12.98	2.69	UN.SI (1)	I,III	ST I on III	ST I on III (1)	3.15	No	10.00	10.00	woody debris
84	2 to 1 phi (1)	6.80	0.57	SA.M (1)	I	ST I	ST I (1)	2.25	No	4.00	4.00	
85	2 to 1 phi (1)	7.70	0.29	SA.M (1)	I	ST I	ST I (1)	2.51	No	5.00	5.00	
86	3 to 2 phi (1)	8.37	0.88	SA.F (1)	I	ST I	ST I (1)	1.96	No	4.00	4.00	
87	4 to 3 phi (1)	11.28	1.03	SA.F (1)	I	ST I	ST I (1)	2.05	No	4.00	4.00	
88	N/A (1)	5.31	0.08		INDET	INDET	INDET (1)	0.00	No	-99.00	-99.00	woody debris
89	1 to 0 phi (1)	7.40	1.02	HR (1)	I	ST I	ST I (1)	2.04	No	4.00	4.00	
90	3 to 2 phi (1)	9.50	2.04	SA.F (1)	I	ST I	ST I (1)	3.03	No	6.00	6.00	
91	3 to 2 phi (1)	6.85	0.37	SA.F (1)	I	ST I	ST I (1)	1.97	No	4.00	4.00	
92	4 to 3 phi (1)	12.81	0.50	UN.SI (1)	I	ST I	ST I (1)	2.91	No	5.00	5.00	woody debris?
93	2 to 1 phi (1)	7.45	1.16	SA.M (1)	I	ST I	ST I (1)	2.09	No	4.00	4.00	
94	4 to 3 phi (1)	8.13	0.30	SA.F (1)	I	ST I	ST I (1)	2.73	No	5.00	5.00	
95	4 to 3 phi (1)	7.32	0.33	SA.F (1)	I	ST I	ST I (1)	1.62	No	4.00	4.00	

96	4 to 3 phi (1)	8.03	0.52	SA.F (1)	I	ST I	ST I (1)	0.00	No	1.00	1.00
97	4 to 3 phi (1)	9.01	1.20	SA.F (1)	I	ST I	ST I (1)	2.55	No	5.00	5.00
98	3 to 2 phi (1)	10.56	1.73	SA.F (1)	I	ST I	ST I (1)	2.88	No	5.00	5.00
99	2 to 1 phi (1)	6.72	0.47	SA.M (1)	I	ST I	ST I (1)	1.50	No	3.00	3.00
100	3 to 2 phi (1)	7.54	0.36	SA.F (1)	I	ST I	ST I (1)	2.80	No	5.00	5.00
101	2 to 1 phi (1)	6.73	1.54	SA.M (1)	I	ST I	ST I (1)	1.67	No	4.00	4.00

Notes:

Benthic Habitat: HR (hard rock), SA.F (fine sand), SA.M (medium sand), UN.SS (unconsolidated sandy silt), UN.SI (unconsolidated silt), UN.SF (unconsolidated soft mud)
RPD: Redox Potential Discontinuity
OSI: Organism-Sediment Index
DO: Dissolved Oxygen
-99: No Data

Appendix A
Geographic Coordinates

Hart Crowser

Port Gamble, WDOE Study — **SPI & Plan View Camera Survey** — SOFTWARE: Corpscon 5.11.08

November 2008 — **Stations arranged by Date & Time**

Station No.	Sample Rep.	Date	GPS Time	Meter Wheel Depth m.	Predicted Nearest Tide m.	Predicted Mudline Depth, m. (MLLW)	Sample Target NAD 1983, Decimal Min. Latitude Northing (y)	Sample Target NAD 1983, Decimal Min. Longitude Easting (x)	Sample Location DGPS Trimble NT300D NAD 1983, SPCS, Wa. N. Northing (y)	Sample Location DGPS Trimble NT300D NAD 1983, SPCS, Wa. N. Easting (x)	Sample Location DGPS Trimble NT300D NAD 1983, Decimal Min. Latitude	Sample Location DGPS Trimble NT300D NAD 1983, Decimal Min. Longitude	Distance to Target (m.)	GPS Status HDOP good < 2	Comments
001	1	14-Nov	0750	6.2	3.06	-3.1	47 49.3056	122 34.7644	304599.0	1211504.2	47 49.3024	122 34.7645	5.9		
	2		0751	6.3	3.05	-3.3	304618.3	1211505.1	304633.5	1211510.4	47 49.3081	122 34.7632	4.9	1.0	
	3		0752	6.2	3.04	-3.2			304606.5	1211496.6	47 49.3036	122 34.7664	4.4		
002	1	14-Nov	0802	5.8	3.00	-2.8	47 49.3077	122 34.6423	304604.8	1211999.5	47 49.3052	122 34.6436	5.0		
	2		0803	5.9	2.99	-2.9	304620.1	1212005.0	304642.1	1212018.0	47 49.3114	122 34.6393	7.8	1.0	
	3		0804	5.9	2.99	-2.9			304617.5	1212004.3	47 49.3073	122 34.6425	0.8		
003	1	14-Nov	0809	5.9	2.96	-2.9	47 49.3099	122 34.5203	304620.4	1212518.8	47 49.3097	122 34.5169	4.2		
	2		0810	6.0	2.95	-3.1	304622.0	1212504.9	304643.8	1212507.0	47 49.3135	122 34.5199	6.7	1.0	
	3		0812	5.8	2.95	-2.9			304607.6	1212492.3	47 49.3075	122 34.5233	5.8		
004	1	14-Nov	0817	7.0	2.92	-4.1	47 49.3121	122 34.3982	304609.5	1212999.3	47 49.3097	122 34.3995	4.7		
	2		0818	7.5	2.91	-4.6	304623.8	1213004.8	304653.0	1212984.7	47 49.3168	122 34.4033	10.8	1.3	
	3		0819	7.1	2.91	-4.2			304617.5	1212998.3	47 49.3110	122 34.3998	2.8		
005	1	14-Nov	0823	8.3	2.88	-5.4	47 49.3142	122 34.2762	304621.5	1213491.9	47 49.3135	122 34.2793	4.1		
	2		0824	8.5	2.88	-5.6	304625.6	1213504.7	304641.1	1213485.8	47 49.3167	122 34.2809	7.5		
	3		0826	8.5	2.87	-5.6			304607.6	1213516.9	47 49.3113	122 34.2731	6.6	1.3	
	4		0827	8.5	2.85	-5.7			304631.1	1213499.5	47 49.3151	122 34.2775	2.3		
	5		0828	8.5	2.85	-5.7			304613.2	1213510.5	47 49.3122	122 34.2747	4.2		
006	1	14-Nov	0846	9.6	2.74	-6.9	47 49.3164	122 34.1541	304613.0	1214006.1	47 49.3140	122 34.1537	4.4		
	2		0848	9.6	2.74	-6.9	304627.5	1214004.6	304645.9	1214028.1	47 49.3195	122 34.1485	9.1		
	3		0849	9.7	2.73	-7.0			304608.3	1213997.8	47 49.3132	122 34.1557	6.2	1.2	
	4		0851	9.6	2.72	-6.9			304633.8	1213999.6	47 49.3174	122 34.1554	2.5		
005	1	14-Nov	0922	5.5	2.54	-3.0	47 49.3142	122 34.2762	304633.7	1213490.1	47 49.3155	122 34.2798	5.1		
	2		0923	5.0	2.53	-2.5	304625.6	1213504.7	304611.1	1213495.7	47 49.3118	122 34.2783	5.2	1.1	
	3		0924	7.3	2.53	-4.8			304631.0	1213528.5	47 49.3152	122 34.2704	7.4		
006	1	14-Nov	0929	9.4	2.50	-6.9	47 49.3164	122 34.1541	304633.3	1213995.1	47 49.3173	122 34.1565	3.4		
	2		0930	9.3	2.50	-6.8	304627.5	1214004.6	304596.8	1213995.5	47 49.3113	122 34.1562	9.8	1.0	
	3		0931	9.4	2.49	-6.9			304630.1	1213999.5	47 49.3168	122 34.1554	1.8		
007	1	14-Nov	0935	8.2	2.47	-5.7	47 49.3185	122 34.0321	304644.2	1214507.2	47 49.3210	122 34.0315	4.6		
	2		0936	8.2	2.47	-5.7	304629.3	1214504.5	304615.7	1214505.4	47 49.3163	122 34.0318	4.2	1.0	
	3		0937	8.2	2.46	-5.7			304638.5	1214491.1	47 49.3200	122 34.0354	5.0		
008	1	14-Nov	0947	11.3	2.41	-8.9	47 49.4678	122 34.8929	305639.6	1210989.3	47 49.4716	122 34.8960	8.0		
	2		0949	11.4	2.40	-9.0	305616.3	1211001.6	305622.3	1211002.9	47 49.4688	122 34.8926	1.9	0.9	
	3		0950	11.3	2.40	-8.9			305605.6	1211013.5	47 49.4661	122 34.8899	4.9		

Hart Crowser

Port Gamble, WDOE Study — **SPI & Plan View Camera Survey** — SOFTWARE: Corpscon 5.11.08

November 2008 — **Stations arranged by Date & Time**

Station No.	Sample Rep.	Date	GPS Time	Meter Wheel Depth m.	Predicted Nearest Tide m.	Predicted Mudline Depth, m. (MLLW)	Sample Target NAD 1983, Decimal Min. Latitude Northing (y)	Sample Target NAD 1983, Decimal Min. Longitude Easting (x)	Sample Location DGPS Trimble NT300D NAD 1983, SPCS, Wa. N. Northing (y)	Sample Location DGPS Trimble NT300D NAD 1983, SPCS, Wa. N. Easting (x)	Sample Location DGPS Trimble NT300D NAD 1983, Decimal Min. Latitude	Sample Location DGPS Trimble NT300D NAD 1983, Decimal Min. Longitude	Distance to Target (m.)	GPS Status HDOP good < 2	Comments
009	1	14-Nov	0955	11.8	2.37	-9.4	47 49.4700	122 34.7708	305604.4	1211497.2	47 49.4677	122 34.7718	4.4		
	2		0956	11.8	2.36	-9.4	305618.1	1211501.5	305629.0	1211485.0	47 49.4717	122 34.7749	6.0	0.9	
	3		0958	11.8	2.36	-9.4			305592.6	1211508.4	47 49.4658	122 34.7690	8.1		
010	1	14-Nov	1002	11.8	2.34	-9.5	47 49.4721	122 34.6488	305627.8	1211991.2	47 49.4734	122 34.6513	3.9		
	2		1003	11.8	2.34	-9.5	305619.9	1212001.4	305641.8	1212018.1	47 49.4758	122 34.6448	8.4	0.9	
	3		1004	11.8	2.33	-9.5			305664.4	1211985.9	47 49.4794	122 34.6528	14.4		
011	1	14-Nov	1009	11.6	2.31	-9.3	47 49.4743	122 34.5267	305626.4	1212484.6	47 49.4750	122 34.5308	5.3		
	2		1010	11.5	2.31	-9.2	305621.8	1212501.3	305590.7	1212501.4	47 49.4692	122 34.5265	9.5	1.0	
	3		1011	11.5	2.30	-9.2			305623.4	1212483.3	47 49.4745	122 34.5311	5.5		
012	1	14-Nov	1016	11.0	2.29	-8.7	47 49.4765	122 34.4047	305614.3	1212990.1	47 49.4749	122 34.4073	4.4		
	2		1017	11.0	2.28	-8.7	305623.6	1213001.2	305638.9	1213005.8	47 49.4790	122 34.4036	4.9	1.0	
	3		1018	11.1	2.28	-8.8			305602.9	1213012.8	47 49.4731	122 34.4017	7.2		
013	1	14-Nov	1023	10.8	2.26	-8.5	47 49.4786	122 34.2826	305609.8	1213488.8	47 49.4760	122 34.2855	6.1		
	2		1024	10.8	2.26	-8.5	305625.4	1213501.1	305643.4	1213480.6	47 49.4815	122 34.2877	8.3	1.1	
	3		1025	10.7	2.26	-8.4			305622.4	1213520.6	47 49.4782	122 34.2778	6.0		
014	1	14-Nov	1031	9.9	2.24	-7.7	47 49.4808	122 34.1605	305613.4	1214000.0	47 49.4785	122 34.1607	4.2		
	2		1032	9.9	2.24	-7.7	305627.3	1214001.0	305648.8	1213993.0	47 49.4843	122 34.1626	7.0	1.2	
	3		1033	10.0	2.24	-7.8			305605.3	1214008.8	47 49.4772	122 34.1585	7.1		
015	1	14-Nov	1047	12.0	2.21	-9.8	47 49.6322	122 34.8993	306601.0	1210992.8	47 49.6297	122 34.9005	4.9		
	2		1048	12.0	2.21	-9.8	306616.1	1210997.9	306637.7	1210980.9	47 49.6357	122 34.9036	8.4	1.2	
	3		1049	12.0	2.20	-9.8			306590.5	1210998.2	47 49.6280	122 34.8991	7.8		
016	1	14-Nov	1054	11.8	2.20	-9.6	47 49.6344	122 34.7773	306595.4	1211506.1	47 49.6307	122 34.7751	7.3		
	2		1055	11.8	2.19	-9.6	306617.9	1211497.8	306633.7	1211504.1	47 49.6370	122 34.7758	5.2	1.2	
	3		1057	11.8	2.19	-9.6			306594.1	1211481.5	47 49.6304	122 34.7811	8.8		
017	1	14-Nov	1101	11.8	2.19	-9.6	47 49.6365	122 34.6552	306619.4	1211975.6	47 49.6364	122 34.6606	6.7		
	2		1102	11.8	2.19	-9.6	306619.7	1211997.7	306589.2	1211994.1	47 49.6315	122 34.6559	9.4	1.1	
	3		1103	11.8	2.19	-9.6			306643.7	1211976.5	47 49.6404	122 34.6605	9.7		
018	1	14-Nov	1108	11.7	2.19	-9.5	47 49.6387	122 34.5331	306629.9	1212479.9	47 49.6400	122 34.5375	6.0		
	2		1109	11.6	2.18	-9.4	306621.6	1212497.6	306590.8	1212486.8	47 49.6336	122 34.5356	9.9	1.1	
	3		1110	11.6	2.18	-9.4			306644.1	1212495.8	47 49.6424	122 34.5337	6.9		
019	1	14-Nov	1116	11.2	2.18	-9.0	47 49.6409	122 34.4111	306597.7	1212988.6	47 49.6366	122 34.4131	8.3		
	2		1117	11.4	2.18	-9.2	306623.4	1212997.5	306654.4	1212979.6	47 49.6459	122 34.4156	10.9	1.1	
	3		1118	11.3	2.18	-9.1			306610.5	1212988.5	47 49.6387	122 34.4132	4.8		

Hart Crowser

Port Gamble, WDOE Study **SPI & Plan View Camera Survey** SOFTWARE: Corpscon 5.11.08

November 2008 **Stations arranged by Date & Time**

Station No.	Sample Rep.	Date	GPS Time	Meter Wheel Depth m.	Predicted Nearest Tide m.	Predicted Mudline Depth, m. (MLLW)	Sample Target NAD 1983, Decimal Min. Latitude Northing (y)	Sample Target NAD 1983, Decimal Min. Longitude Easting (x)	Sample Location DGPS Trimble NT300D NAD 1983, SPCS, Wa. N. Northing (y)	Sample Location DGPS Trimble NT300D NAD 1983, SPCS, Wa. N. Easting (x)	Sample Location DGPS Trimble NT300D NAD 1983, Decimal Min. Latitude	Sample Location DGPS Trimble NT300D NAD 1983, Decimal Min. Longitude	Distance to Target (m.)	GPS Status HDOP good < 2	Comments
020	1	14-Nov	1123	11.1	2.19	-8.9	47 49.6430	122 34.2890	306610.5	1213524.9	47 49.6407	122 34.2822	9.5		
	2		1124	11.1	2.19	-8.9	306625.2	1213497.4	306617.0	1213505.8	47 49.6417	122 34.2869	3.6	1.1	
	3		1125	11.1	2.19	-8.9			306641.0	1213492.9	47 49.6456	122 34.2902	5.0		
021	1	14-Nov	1130	8.8	2.19	-6.6	47 49.6452	122 34.1669	306626.0	1213996.6	47 49.6450	122 34.1671	0.4		
	2		1131	8.6	2.19	-6.4	306627.1	1213997.3	306599.2	1213996.4	47 49.6406	122 34.1670	8.5	1.1	
	3		1132	9.0	2.19	-6.8			306647.1	1213976.2	47 49.6484	122 34.1722	8.9		
022	1	14-Nov	1233	12.6	2.37	-10.2	47 49.7966	122 34.9058	307596.5	1210990.8	47 49.7934	122 34.9065	6.0		
	2		1234	12.6	2.37	-10.2	307615.9	1210994.2	307639.2	1210985.6	47 49.8004	122 34.9080	7.6	1.2	
	3		1235	12.5	2.38	-10.1			307598.9	1210990.9	47 49.7938	122 34.9065	5.3		
023	1	14-Nov	1239	12.2	2.39	-9.8	47 49.7988	122 34.7837	307589.5	1211510.7	47 49.7942	122 34.7795	10.0		
	2		1240	12.2	2.40	-9.8	307617.7	1211494.1	307625.0	1211503.7	47 49.8000	122 34.7814	3.7	1.2	
	3		1241	12.2	2.40	-9.8			307641.1	1211516.0	47 49.8027	122 34.7785	9.8		
024	1	14-Nov	1246	12.1	2.43	-9.7	47 49.8009	122 34.6616	307582.4	1211988.4	47 49.7948	122 34.6628	11.5		
	2		1248	12.1	2.43	-9.7	307619.5	1211994.0	307639.5	1211987.6	47 49.8042	122 34.6633	6.4	1.2	
	3		1249	12.1	2.44	-9.7			307597.6	1211984.2	47 49.7973	122 34.6639	7.3		
025	1	14-Nov	1254	12.0	2.46	-9.5	47 49.8031	122 34.5396	307610.1	1212481.2	47 49.8012	122 34.5426	5.2		
	2		1255	12.0	2.47	-9.5	307621.4	1212493.9	307662.9	1212485.3	47 49.8099	122 34.5419	12.9	1.3	
	3		1256	12.0	2.48	-9.5			307593.6	1212459.5	47 49.7984	122 34.5478	13.5		
026	1	14-Nov	1301	12.0	2.51	-9.5	47 49.8053	122 34.4175	307602.8	1212991.7	47 49.8019	122 34.4179	6.3		
	2		1303	12.0	2.51	-9.5	307623.2	1212993.8	307638.6	1212967.5	47 49.8077	122 34.4240	9.3	1.3	
	3		1304	12.0	2.52	-9.5			307575.4	1212991.5	47 49.7974	122 34.4178	14.6		
027	1	14-Nov	1309	12.0	2.55	-9.5	47 49.8074	122 34.2954	307595.2	1213490.2	47 49.8025	122 34.2961	9.2		
	2		1311	12.1	2.55	-9.6	307625.0	1213493.7	307656.0	1213490.0	47 49.8125	122 34.2965	9.5	1.2	
	3		1312	12.0	2.56	-9.4			307611.6	1213490.6	47 49.8052	122 34.2961	4.2		
028	1	14-Nov	1317	7.0	2.58	-4.4	47 49.8096	122 34.1733	307607.4	1213971.3	47 49.8063	122 34.1787	9.0		Float on
	2		1318	6.9	2.59	-4.3	307626.9	1213993.6	307576.9	1213975.5	47 49.8013	122 34.1775	16.2	1.0	station
	3		1319	7.1	2.60	-4.5			307639.8	1213964.6	47 49.8116	122 34.1805	9.7		
029	1	14-Nov	1339	6.7	2.71	-4.0	47 49.9588	122 35.0343	308599.2	1210483.7	47 49.9564	122 35.0359	4.9		
	2		1340	7.1	2.71	-4.4	308613.8	1210490.7	308631.8	1210493.9	47 49.9618	122 35.0336	5.6	1.0	
	3		1342	7.1	2.72	-4.4			308591.5	1210504.5	47 49.9552	122 35.0308	8.0		
030	1	14-Nov	1347	13.0	2.75	-10.3	47 49.9610	122 34.9122	308579.9	1210984.9	47 49.9551	122 34.9134	11.0		
	2		1349	13.1	2.76	-10.3	308615.7	1210990.6	308623.1	1210986.3	47 49.9622	122 34.9133	2.6	1.0	
	3		1350	13.1	2.76	-10.3			308635.6	1210996.8	47 49.9643	122 34.9108	6.4		
031	1	14-Nov	1354	12.9	2.78	-10.1	47 49.9632	122 34.7901	308580.9	1211502.1	47 49.9572	122 34.7871	11.7		
	2		1355	13.0	2.80	-10.2	308617.5	1211490.4	308601.0	1211473.9	47 49.9604	122 34.7941	7.1	1.0	
	3		1357	13.0	2.80	-10.2			308632.2	1211494.2	47 49.9656	122 34.7893	4.6		

Hart Crowser

Port Gamble, WDOE Study

SPI & Plan View Camera Survey

SOFTWARE: Corpscon 5.11.08

November 2008

Stations arranged by Date & Time

Station No.	Sample Rep.	Date	GPS Time	Meter Wheel Depth m.	Predicted Nearest Tide m.	Predicted Mudline Depth, m. (MLLW)	Sample Target NAD 1983, Decimal Min. Latitude Northing (y)	Sample Target NAD 1983, Decimal Min. Longitude Easting (x)	Sample Location DGPS Trimble NT300D NAD 1983, SPCS, Wa. N. Northing (y)	Sample Location DGPS Trimble NT300D NAD 1983, SPCS, Wa. N. Easting (x)	Sample Location DGPS Trimble NT300D NAD 1983, Decimal Min. Latitude	Sample Location DGPS Trimble NT300D NAD 1983, Decimal Min. Longitude	Distance to Target (m.)	GPS Status HDOP good < 2	Comments
032	1	14-Nov	1401	12.8	2.82	-10.0	47 49.9653	122 34.6681	308594.3	1211986.8	47 49.9612	122 34.6688	7.7		
	2		1402	12.8	2.83	-10.0	308619.3	1211990.3	308633.9	1211980.7	47 49.9677	122 34.6705	5.3	1.0	
	3		1403	12.7	2.84	-9.9			308586.8	1211993.6	47 49.9600	122 34.6671	10.0		
033	1	14-Nov	1409	12.6	2.87	-9.7	47 49.9675	122 34.5460	308593.2	1212489.6	47 49.9629	122 34.5460	8.5		
	2		1410	12.6	2.87	-9.7	308621.2	1212490.2	308646.0	1212493.6	47 49.9716	122 34.5453	7.6	1.0	
	3		1412	12.5	2.88	-9.6			308612.7	1212488.8	47 49.9661	122 34.5463	2.6		
034	1	14-Nov	1416	12.5	2.91	-9.6	47 49.9697	122 34.4239	308595.8	1213022.3	47 49.9653	122 34.4159	12.9		
	2		1417	12.4	2.91	-9.5	308623.0	1212990.1	308615.1	1212999.4	47 49.9684	122 34.4216	3.7	1.0	
	3		1418	12.4	2.92	-9.5			308648.6	1212972.7	47 49.9738	122 34.4283	9.4		
035	1	14-Nov	1426	12.3	2.96	-9.3	47 49.9718	122 34.3018	308608.2	1213493.5	47 49.9691	122 34.3009	5.2		
	2		1427	12.2	2.96	-9.2	308624.8	1213490.0	308662.3	1213493.9	47 49.9780	122 34.3011	11.5	1.1	
	3		1428	12.2	2.97	-9.2			308621.8	1213484.4	47 49.9713	122 34.3032	2.0		
036	1	14-Nov	1433	11.8	2.99	-8.8	47 49.9740	122 34.1798	308608.6	1213987.3	47 49.9710	122 34.1803	5.6		
	2		1435	11.9	3.00	-8.9	308626.7	1213989.9	308664.8	1214002.9	47 49.9803	122 34.1768	12.3	1.2	
	3		1436	11.9	3.00	-8.9			308616.1	1213979.3	47 49.9722	122 34.1823	4.6		
037	1	14-Nov	1440	4.0	3.03	-1.0	47 49.9761	122 34.0577	308624.9	1214476.6	47 49.9755	122 34.0609	4.2		
	2		1442	4.0	3.03	-1.0	308628.5	1214489.8	308658.5	1214501.1	47 49.9811	122 34.0551	9.7	1.2	
	3		1443	4.0	3.04	-1.0			308625.2	1214491.7	47 49.9756	122 34.0572	1.2		
038	1	14-Nov	1457	8.0	3.10	-4.9	47 50.1232	122 35.0407	309591.5	1210489.1	47 50.1196	122 35.0401	6.8		
	2		1459	8.1	3.10	-5.0	309613.6	1210487.0	309640.1	1210491.9	47 50.1276	122 35.0397	8.2	1.1	
	3		1500	8.0	3.10	-4.9			309601.2	1210493.9	47 50.1212	122 35.0390	4.3		
039	1	14-Nov	1504	14.3	3.12	-11.2	47 50.1254	122 34.9187	309590.8	1211003.0	47 50.1214	122 34.9146	9.0		
	2		1505	14.3	3.12	-11.2	309615.5	1210986.9	309611.2	1210989.9	47 50.1247	122 34.9179	1.6	1.0	
	3		1506	14.5	3.13	-11.4			309640.1	1211000.0	47 50.1295	122 34.9156	8.5		
040	1	14-Nov	1511	14.6	3.14	-11.5	47 50.1276	122 34.7966	309591.9	1211462.8	47 50.1233	122 34.8023	10.6		
	2		1512	14.6	3.15	-11.5	309617.3	1211486.8	309602.0	1211472.4	47 50.1250	122 34.8000	6.4	1.0	
	3		1513	14.5	3.15	-11.4			309594.0	1211478.8	47 50.1237	122 34.7984	7.5		
041	1	14-Nov	1519	14.1	3.17	-10.9	47 50.1297	122 34.6745	309599.3	1211969.0	47 50.1264	122 34.6787	8.1		
	2		1520	14.1	3.17	-10.9	309619.1	1211986.7	309624.9	1211992.9	47 50.1307	122 34.6730	2.6	1.0	
	3		1522	14.1	3.17	-10.9			309595.6	1211971.8	47 50.1258	122 34.6780	8.5		
042	1	14-Nov	1526	13.8	3.19	-10.6	47 50.1319	122 34.5524	309577.3	1212481.1	47 50.1247	122 34.5535	13.4		
	2		1528	13.9	3.19	-10.7	309621.0	1212486.6	309622.1	1212492.8	47 50.1321	122 34.5509	1.9	1.0	
	3		1529	14.0	3.20	-10.8			309668.7	1212500.0	47 50.1398	122 34.5494	15.1		
043	1	14-Nov	1534	13.3	3.20	-10.1	47 50.1341	122 34.4303	309594.3	1212994.1	47 50.1294	122 34.4283	9.0		
	2		1535	13.3	3.21	-10.1	309622.8	1212986.5	309643.4	1212999.3	47 50.1375	122 34.4273	7.4	1.2	
	3		1536	13.4	3.21	-10.2			309605.6	1212979.2	47 50.1312	122 34.4320	5.7		
044	1	14-Nov	1541	13.0	3.22	-9.8	47 50.1362	122 34.3082	309597.4	1213475.3	47 50.1317	122 34.3108	9.0		

Hart Crowser

Port Gamble, WDOE Study — **SPI & Plan View Camera Survey** — SOFTWARE: Corpscon 5.11.08

November 2008 — **Stations arranged by Date & Time**

Station No.	Sample Rep.	Date	GPS Time	Meter Wheel Depth m.	Predicted Nearest Tide m.	Predicted Mudline Depth, m. (MLLW)	Sample Target NAD 1983, Decimal Min. Latitude Northing (y)	Sample Target NAD 1983, Decimal Min. Longitude Easting (x)	Sample Location DGPS Trimble NT300D NAD 1983, SPCS, Wa. N. Northing (y)	Sample Location DGPS Trimble NT300D NAD 1983, SPCS, Wa. N. Easting (x)	Sample Location DGPS Trimble NT300D NAD 1983, Decimal Min. Latitude	Sample Location DGPS Trimble NT300D NAD 1983, Decimal Min. Longitude	Distance to Target (m.)	GPS Status HDOP good < 2	Comments
	2		1542	13.0	3.22	-9.8	309624.6	1213486.4	309635.7	1213502.4	47 50.1381	122 34.3044	5.9	1.2	
	3		1543	13.0	3.22	-9.8			309590.2	1213472.3	47 50.1305	122 34.3115	11.4		
045	1	14-Nov	1548	13.2	3.22	-10.0	47 50.1384	122 34.1862	309609.3	1213999.2	47 50.1356	122 34.1829	6.6		
	2		1549	13.1	3.23	-9.9	309626.5	1213986.3	309648.4	1213989.1	47 50.1420	122 34.1856	6.7	1.0	
	3		1550	13.2	3.23	-10.0			309618.1	1213984.3	47 50.1370	122 34.1866	2.6		
046	1	14-Nov	1555	8.4	3.23	-5.2	47 50.1405	122 34.0641	309606.0	1214495.8	47 50.1369	122 34.0616	7.4		
	2		1556	8.7	3.23	-5.5	309628.3	1214486.2	309639.9	1214476.5	47 50.1424	122 34.0665	4.6	1.0	
	3		1557	8.0	3.23	-4.8			309635.5	1214510.4	47 50.1418	122 34.0582	7.7		
047	1	14-Nov	1614	8.3	3.23	-5.1	47 50.2876	122 35.0472	310600.5	1210459.3	47 50.2854	122 35.0530	8.3		
	2		1615	8.9	3.23	-5.7	310613.4	1210483.3	310645.9	1210491.8	47 50.2930	122 35.0453	10.2	0.9	
	3		1616	8.9	3.22	-5.7			310598.6	1210487.9	47 50.2852	122 35.0460	4.7		
048	1	14-Nov	1621	18.0	3.22	-14.8	47 50.2898	122 34.9251	310606.0	1210991.6	47 50.2883	122 34.9230	3.8		
	2		1622	18.1	3.22	-14.9	310615.3	1210983.2	310639.5	1210990.4	47 50.2938	122 34.9235	7.7	0.9	
	3		1623	17.7	3.21	-14.5			310582.9	1210965.3	47 50.2844	122 34.9293	11.3		
049	1	15-Nov	0802	21.1	3.29	-17.8	47 50.2920	122 34.8030	310624.3	1211469.0	47 50.2931	122 34.8065	4.8		
	2		0803	21.2	3.29	-17.9	310617.1	1211483.1	310650.4	1211500.3	47 50.2975	122 34.7990	11.4	1.0	
	3		0804	21.0	3.28	-17.7			310592.9	1211486.7	47 50.2880	122 34.8020	7.5		
050	1	15-Nov	0809	19.9	3.26	-16.6	47 50.2941	122 34.6809	310613.6	1211968.3	47 50.2932	122 34.6845	4.8		
	2		0810	20.1	3.26	-16.8	310618.9	1211983.0	310655.6	1211993.0	47 50.3002	122 34.6787	11.6	1.0	
	3		0811	9.9	3.25	-6.7			310584.0	1211987.2	47 50.2884	122 34.6797	10.7		
051	1	15-Nov	0816	15.9	3.24	-12.7	47 50.2963	122 34.5588	310603.8	1212506.4	47 50.2936	122 34.5530	8.8		
	2		0817	16.0	3.23	-12.8	310620.8	1212482.9	310653.7	1212506.7	47 50.3018	122 34.5532	12.4	1.3	
	3		0819	16.1	3.22	-12.9			310602.4	1212464.2	47 50.2932	122 34.5633	8.0		
052	1	15-Nov	0823	14.9	3.20	-11.7	47 50.2985	122 34.4368	310589.9	1212960.2	47 50.2930	122 34.4421	12.1		
	2		0825	14.9	3.20	-11.7	310622.6	1212982.8	310652.0	1212984.1	47 50.3033	122 34.4366	9.0	1.3	
	3		0826	14.9	3.19	-11.7			310613.0	1212959.9	47 50.2968	122 34.4423	7.6		
053	1	15-Nov	0830	14.5	3.17	-11.3	47 50.3006	122 34.3147	310601.0	1213464.8	47 50.2967	122 34.3189	9.0		
	2		0831	14.5	3.17	-11.3	310624.4	1213482.7	310653.5	1213481.1	47 50.3054	122 34.3152	8.9	1.3	
	3		0832	14.6	3.16	-11.4			310626.1	1213459.2	47 50.3008	122 34.3204	7.2		
054	1	15-Nov	0837	12.2	3.14	-9.1	47 50.3028	122 34.1926	310613.5	1213963.3	47 50.3006	122 34.1972	7.0		
	2		0838	12.0	3.13	-8.9	310626.3	1213982.6	310658.0	1213984.8	47 50.3080	122 34.1922	9.7	1.3	
	3		0840	12.2	3.13	-9.1			310597.2	1213958.1	47 50.2979	122 34.1984	11.6		
055	1	15-Nov	0845	2.9	3.10	0.2	47 50.3049	122 34.0705	310646.9	1214504.5	47 50.3081	122 34.0652	8.8		
	2		0846	3.8	3.09	-0.7	310628.1	1214482.5	310673.2	1214494.5	47 50.3124	122 34.0678	14.2	1.3	
	3		0848	3.7	3.09	-0.6			310627.5	1214445.1	47 50.3047	122 34.0796	11.4		

Hart Crowser

Port Gamble, WDOE Study — **SPI & Plan View Camera Survey** — SOFTWARE: Corpscon 5.11.08

November 2008 — **Stations arranged by Date & Time**

Station No.	Sample Rep.	Date	GPS Time	Meter Wheel Depth m.	Predicted Nearest Tide m.	Predicted Mudline Depth, m. (MLLW)	Sample Target NAD 1983, Decimal Min. Latitude Northing (y)	Sample Target NAD 1983, Decimal Min. Longitude Easting (x)	Sample Location DGPS Trimble NT300D NAD 1983, SPCS, Wa. N. Northing (y)	Sample Location DGPS Trimble NT300D NAD 1983, SPCS, Wa. N. Easting (x)	Sample Location DGPS Trimble NT300D NAD 1983, Decimal Min. Latitude	Sample Location DGPS Trimble NT300D NAD 1983, Decimal Min. Longitude	Distance to Target (m.)	GPS Status HDOP good < 2	Comments
055A	1	15-Nov	0912	3.4	2.96	-0.4	47 50.4490	122 35.0460	311605.6	1210541.5	47 50.4510	122 35.0385	10.1		
	2		0913	3.1	2.95	-0.2	311594.1	1210510.5	311600.0	1210493.9	47 50.4499	122 35.0501	5.4	1.1	New station
	3		0915	3.2	2.95	-0.3			311575.3	1210483.5	47 50.4458	122 35.0525	10.0		
056	1	15-Nov	0920	11.6	2.92	-8.7	47 50.4542	122 34.9316	311593.5	1210992.0	47 50.4507	122 34.9284	7.6		
	2		0921	9.5	2.91	-6.6	311615.1	1210979.5	311584.2	1211003.6	47 50.4492	122 34.9255	11.9	1.0	
	3		0922	11.9	2.91	-9.0			311587.8	1211004.1	47 50.4498	122 34.9254	11.2		
057	1	15-Nov	0926	21.8	2.88	-18.9	47 50.4564	122 34.8095	311635.4	1211449.8	47 50.4593	122 34.8168	10.7		
	2		0928	21.8	2.87	-18.9	311616.9	1211479.4	311665.5	1211491.0	47 50.4644	122 34.8069	15.2	1.0	
	3		0929	22.0	2.87	-19.1			311593.5	1211476.3	47 50.4525	122 34.8101	7.2		
058	1	15-Nov	0934	21.8	2.84	-19.0	47 50.4585	122 34.6874	311640.2	1211992.0	47 50.4621	122 34.6844	7.6		
	2		0935	22.5	2.93	-19.6	311618.7	1211979.3	311612.0	1211945.1	47 50.4573	122 34.6957	10.6	1.0	
	3		0936	21.5	2.93	-18.6			311644.0	1212012.5	47 50.4628	122 34.6794	12.7		
059	1	15-Nov	0945	16.5	2.77	-13.7	47 50.4607	122 34.5653	311618.4	1212468.0	47 50.4603	122 34.5680	3.5		
	2		0946	16.5	2.76	-13.7	311620.6	1212479.2	311645.7	1212473.1	47 50.4648	122 34.5669	7.9	0.9	
	3		0947	16.2	2.76	-13.4			311638.5	1212522.1	47 50.4638	122 34.5549	14.2		
060	1	15-Nov	0951	17.0	2.73	-14.3	47 50.4629	122 34.4432	311648.6	1212987.8	47 50.4672	122 34.4412	8.4		
	2		0953	16.5	2.73	-13.8	311622.4	1212979.1	311592.2	1212980.4	47 50.4579	122 34.4427	9.2	0.9	
	3		0954	16.9	2.72	-14.2			311626.4	1212975.0	47 50.4635	122 34.4442	1.8		
061	1	15-Nov	0959	14.0	2.69	-11.3	47 50.4650	122 34.3211	311660.3	1213492.0	47 50.4710	122 34.3181	11.7		
	2		1000	13.9	2.69	-11.2	311624.2	1213479.0	311657.1	1213500.1	47 50.4705	122 34.3161	11.9	1.0	
	3		1001	14.9	2.68	-12.2			311612.2	1213442.6	47 50.4629	122 34.3299	11.7		
062	1	15-Nov	1007	9.0	2.65	-6.4	47 50.4672	122 34.1990	311632.4	1213920.0	47 50.4680	122 34.2134	18.1		Station target
	2		1008	9.6	2.65	-7.0	311626.1	1213978.9	311567.2	1213953.3	47 50.4574	122 34.2049	19.6	0.9	placed 22 m.
	3		1009	9.0	2.64	-6.4			311616.3	1213932.4	47 50.4654	122 34.2103	14.5		w. of intended
062A	1	15-Nov	1028	3.0	2.54	-0.5	47 50.6210	122 35.0690	312605.2	1210439.0	47 50.6150	122 35.0691	11.1		
	2		1030	3.6	2.53	-1.1	312641.7	1210440.2	312635.9	1210480.6	47 50.6202	122 35.0591	12.4	1.2	New station
	3		1031	3.1	2.53	-0.6			312623.5	1210438.6	47 50.6180	122 35.0693	5.6		
062B	1	15-Nov	1034	5.2	2.51	-2.7	47 50.6190	122 35.0050	312607.2	1210674.0	47 50.6162	122 35.0117	9.8		DGPS ?
	2		1036	5.8	2.50	-3.3	312623.6	1210701.8	312635.4	1210717.6	47 50.6210	122 35.0012	6.0	1.2	New station
	3		1037	6.0	2.50	-3.5			312652.3	1210750.4	47 50.6239	122 34.9933	17.2		
063	1	15-Nov	1040	12.8	2.48	-10.3	47 50.6186	122 34.9380	312593.8	1210969.3	47 50.6151	122 34.9395	6.7		
	2		1041	13.2	2.47	-10.7	312614.9	1210975.9	312612.7	1210966.8	47 50.6182	122 34.9402	2.8	1.1	
	3		1042	12.2	2.47	-9.7			312631.0	1210964.0	47 50.6212	122 34.9410	6.1		
064	1	15-Nov	1049	15.5	2.44	-13.1	47 50.6208	122 34.8159	312616.1	1211434.0	47 50.6205	122 34.8261	12.7		
	2		1050	15.2	2.44	-12.8	312616.7	1211475.8	312632.9	1211470.8	47 50.6234	122 34.8172	5.2	1.1	
	3		1051	15.0	2.43	-12.6			312639.2	1211515.2	47 50.6246	122 34.8064	13.8		
	4		1052	15.1	2.43	-12.7			312642.0	1211471.4	47 50.6249	122 34.8171	7.8		

Hart Crowser

Port Gamble, WDOE Study **SPI & Plan View Camera Survey** SOFTWARE: Corpscon 5.11.08

November 2008 **Stations arranged by Date & Time**

Station No.	Sample Rep.	Date	GPS Time	Meter Wheel Depth m.	Predicted Nearest Tide m.	Predicted Mudline Depth, m. (MLLW)	Sample Target NAD 1983, Decimal Min. Latitude Northing (y)	Sample Target NAD 1983, Decimal Min. Longitude Easting (x)	Sample Location DGPS Trimble NT300D NAD 1983, SPCS, Wa. N. Northing (y)	Sample Location DGPS Trimble NT300D NAD 1983, SPCS, Wa. N. Easting (x)	Sample Location DGPS Trimble NT300D NAD 1983, Decimal Min. Latitude	Sample Location DGPS Trimble NT300D NAD 1983, Decimal Min. Longitude	Distance to Target (m.)	GPS Status HDOP good < 2	Comments
065	1	15-Nov	1057	16.1	2.41	-13.7	47 50.6229	122 34.6938	312630.8	1211962.0	47 50.6249	122 34.6972	5.6		
	2		1058	16.9	2.40	-14.5	312618.5	1211975.7	312594.6	1211978.4	47 50.6190	122 34.6930	7.3	1.1	
	3		1100	17.2	2.40	-14.8			312575.9	1211997.2	47 50.6160	122 34.6883	14.6		
066	1	15-Nov	1108	18.1	2.37	-15.7	47 50.6251	122 34.5717	312630.9	1212443.4	47 50.6267	122 34.5796	10.3		
	2		1109	18.2	2.37	-15.8	312620.4	1212475.6	312630.7	1212450.0	47 50.6267	122 34.5780	8.4	1.1	
	3		1110	18.4	2.36	-16.0			312625.9	1212449.9	47 50.6259	122 34.5780	8.0		
067	1	15-Nov	1114	18.0	2.35	-15.7	47 50.6273	122 34.4496	312601.9	1212969.7	47 50.6239	122 34.4509	6.4		
	2		1115	17.9	2.34	-15.6	312622.2	1212975.4	312626.0	1213006.6	47 50.6280	122 34.4420	9.6	1.1	
	3		1116	18.0	2.34	-15.7			312644.4	1212945.6	47 50.6308	122 34.4570	11.3		
068	1	15-Nov	1120	13.8	2.33	-11.5	47 50.6294	122 34.3275	312602.7	1213471.6	47 50.6259	122 34.3283	6.6		
	2		1121	13.0	2.33	-10.7	312624.0	1213475.3	312618.9	1213508.8	47 50.6287	122 34.3193	10.3	1.1	
	3		1123	14.1	2.32	-11.8			312644.2	1213464.7	47 50.6327	122 34.3302	7.0		
069	1	15-Nov	1127	5.7	2.31	-3.4	47 50.6316	122 34.2054	312654.6	1213975.0	47 50.6363	122 34.2056	8.8		
	2		1128	5.2	2.31	-2.9	312625.9	1213975.2	312602.8	1214009.5	47 50.6279	122 34.1969	12.6	1.1	
	3		1129	5.6	2.31	-3.3			312664.1	1213985.9	47 50.6379	122 34.2030	12.1		
069A	1	15-Nov	1139	3.0	2.29	-0.7	47 50.7840	122 34.9800	313639.9	1210828.5	47 50.7866	122 34.9797	4.8		
	2		1140	2.9	2.29	-0.6	313624.1	1210826.9	313585.5	1210812.5	47 50.7776	122 34.9833	12.6	1.1	New station
	3		1141	3.0	2.29	-0.7			313627.2	1210823.3	47 50.7845	122 34.9809	1.5		
069B	1	15-Nov	1248	7.0	2.31	-4.7	47 50.7830	122 34.9580	313603.4	1210909.5	47 50.7809	122 34.9597	4.4		
	2		1249	7.1	2.31	-4.8	313616.0	1210916.8	313577.3	1210904.8	47 50.7766	122 34.9607	12.3	1.3	New station
	3		1250	5.6	2.31	-3.3			313603.4	1210880.1	47 50.7808	122 34.9669	11.8		
070	1	15-Nov	1253	9.8	2.32	-7.5	47 50.7830	122 34.9445	313614.4	1210959.3	47 50.7829	122 34.9476	3.9		
	2		1255	9.2	2.32	-6.9	313614.6	1210972.2	313646.3	1210947.8	47 50.7881	122 34.9506	12.2	1.3	
	3		1256	9.8	2.33	-7.5			313603.5	1210958.7	47 50.7811	122 34.9477	5.3		
071	1	15-Nov	1301	11.8	2.34	-9.5	47 50.7852	122 34.8223	313632.8	1211462.4	47 50.7878	122 34.8248	5.8		
	2		1303	11.9	2.34	-9.6	313616.5	1211472.1	313618.0	1211442.0	47 50.7853	122 34.8297	9.2	1.3	
	3		1304	12.0	2.35	-9.7			313645.3	1211499.9	47 50.7900	122 34.8157	12.2		
072	1	15-Nov	1308	12.8	2.36	-10.4	47 50.7873	122 34.7002	313589.2	1211962.9	47 50.7825	122 34.7023	9.3		
	2		1309	12.8	2.36	-10.4	313618.3	1211972.0	313615.7	1212002.4	47 50.7870	122 34.6928	9.3	1.0	
	3		1310	12.7	2.36	-10.3			313644.3	1211947.3	47 50.7915	122 34.7064	10.9		
073	1	15-Nov	1314	15.2	2.38	-12.8	47 50.7895	122 34.5781	313578.6	1212455.9	47 50.7826	122 34.5818	13.6		
	2		1315	15.1	2.38	-12.7	313620.1	1212471.9	313610.5	1212497.2	47 50.7880	122 34.5719	8.2	1.0	
	3		1316	14.4	2.39	-12.0			313638.2	1212455.6	47 50.7924	122 34.5822	7.4		
074	1	15-Nov	1321	14.8	2.40	-12.4	47 50.7917	122 34.4560	313650.0	1212956.1	47 50.7962	122 34.4600	9.8		
	2		1322	15.1	2.40	-12.7	313622.0	1212971.8	313601.5	1212975.9	47 50.7883	122 34.4549	6.4	0.9	
	3		1323	14.9	2.41	-12.5			313640.6	1212968.2	47 50.7947	122 34.4570	5.8		

Hart Crowser

Port Gamble, WDOE Study — **SPI & Plan View Camera Survey** — SOFTWARE: Corpscon 5.11.08

November 2008 — **Stations arranged by Date & Time**

Station No.	Sample Rep.	Date	GPS Time	Meter Wheel Depth m.	Predicted Nearest Tide m.	Predicted Mudline Depth, m. (MLLW)	Sample Target NAD 1983, Decimal Min. Latitude Northing (y)	Sample Target NAD 1983, Decimal Min. Longitude Easting (x)	Sample Location DGPS Trimble NT300D NAD 1983, SPCS, Wa. N. Northing (y)	Sample Location DGPS Trimble NT300D NAD 1983, SPCS, Wa. N. Easting (x)	Sample Location DGPS Trimble NT300D NAD 1983, Decimal Min. Latitude	Sample Location DGPS Trimble NT300D NAD 1983, Decimal Min. Longitude	Distance to Target (m.)	GPS Status HDOP good < 2	Comments
075	1	15-Nov	1328	8.0	2.43	-5.6	47 50.7938	122 34.3339	313630.8	1213455.1	47 50.7949	122 34.3380	5.5		
	2		1330	7.0	2.43	-4.6	313623.8	1213471.7	313591.6	1213496.8	47 50.7886	122 34.3276	12.5	0.9	
	3		1331	7.6	2.44	-5.2			313619.5	1213471.2	47 50.7931	122 34.3340	1.3		
076	1	15-Nov	1335	2.8	2.46	-0.3	47 50.7960	122 34.2118	313608.2	1213754.6	47 50.7923	122 34.2647	66.3		Target sta.
	2		1336	2.5	2.46	0.0	313625.7	1213971.6	313630.6	1213787.1	47 50.7961	122 34.2569	56.3	0.9	too shallow
	3		1388	2.5	2.46	0.0			313655.5	1213762.7	47 50.8001	122 34.2630	64.3		
077	1	15-Nov	1402	4.9	2.57	-2.3	47 50.9474	122 34.9509	314584.0	1210972.3	47 50.9424	122 34.9498	9.3		
	2		1404	5.6	2.58	-3.0	314614.4	1210968.5	314612.7	1210997.6	47 50.9472	122 34.9438	8.9	1.0	
	3		1405	4.5	2.59	-1.9			314614.2	1210954.6	47 50.9473	122 34.9543	4.2		
077A	1	15-Nov	1412	13.8	2.62	-11.2	47 50.9490	122 34.8720	314618.5	1211277.7	47 50.9492	122 34.8754	4.3		
	2		1413	13.8	2.62	-11.2	314616.9	1211291.6	314612.1	1211315.2	47 50.9483	122 34.8662	7.3	1.0	New station
	3		1414	14.0	2.63	-11.4			314590.6	1211270.9	47 50.9446	122 34.8769	10.2		
078	1	15-Nov	1420	9.9	2.65	-7.3	47 50.9496	122 34.8288	314609.0	1211454.3	47 50.9483	122 34.8322	4.8		
	2		1421	9.8	2.66	-7.1	314616.3	1211468.4	314645.6	1211446.5	47 50.9543	122 34.8343	11.2	1.0	
	3		1422	9.8	2.66	-7.1			314609.5	1211485.4	47 50.9485	122 34.8246	5.6		
079	1	15-Nov	1426	11.1	2.68	-8.4	47 50.9517	122 34.7067	314608.9	1211968.8	47 50.9502	122 34.7065	2.8		
	2		1427	11.1	2.69	-8.4	314618.1	1211968.3	314651.1	1211954.2	47 50.9571	122 34.7103	10.9	1.2	
	3		1428	11.0	2.69	-8.3			314577.3	1211966.0	47 50.9450	122 34.7070	12.5		
080	1	15-Nov	1433	11.3	2.71	-8.6	47 50.9539	122 34.5846	314624.0	1212482.0	47 50.9546	122 34.5812	4.4		
	2		1434	11.4	2.72	-8.7	314619.9	1212468.2	314596.8	1212446.6	47 50.9500	122 34.5897	9.6	1.2	
	3		1436	11.4	2.73	-8.7			314609.2	1212488.3	47 50.9522	122 34.5796	6.9		
081	1	15-Nov	1439	9.8	2.75	-7.1	47 50.9560	122 34.4624	314629.1	1212954.1	47 50.9572	122 34.4659	4.8		
	2		1441	10.8	2.75	-8.1	314621.8	1212968.1	314602.6	1212998.1	47 50.9530	122 34.4550	10.9	1.0	
	3		1442	10.0	2.75	-7.3			314649.3	1212973.0	47 50.9606	122 34.4614	8.5		
082	1	15-Nov	1446	3.6	2.77	-0.8	47 50.9582	122 34.3403	314621.5	1213452.9	47 50.9578	122 34.3440	4.6		
	2		1447	3.4	2.78	-0.6	314623.6	1213468.0	314679.0	1213461.6	47 50.9673	122 34.3422	17.0	1.0	
	3		1448	3.6	2.79	-0.8			314587.9	1213460.3	47 50.9523	122 34.3420	11.1		
083	1	15-Nov	1503	8.9	2.86	-6.0	47 51.1139	122 34.8352	315599.7	1211450.6	47 51.1112	122 34.8386	6.6		
	2		1505	9.6	2.86	-6.7	315616.1	1211464.7	315620.4	1211473.2	47 51.1147	122 34.8332	2.9	1.0	
	3		1506	9.0	2.87	-6.1			315634.3	1211449.7	47 51.1169	122 34.8390	7.2		
084	1	15-Nov	1510	15.0	2.88	-12.1	47 51.1161	122 34.7131	315578.4	1211959.3	47 51.1096	122 34.7142	12.2		
	2		1511	15.1	2.89	-12.2	315617.9	1211964.6	315629.2	1211945.3	47 51.1179	122 34.7179	6.8	1.0	
	3		1513	14.8	2.90	-11.9			315565.0	1211932.8	47 51.1073	122 34.7206	18.8		
085	1	15-Nov	1517	12.7	2.92	-9.8	47 51.1183	122 34.5910	315624.5	1212446.6	47 51.1190	122 34.5954	5.7		
	2		1519	12.1	2.92	-9.2	315619.7	1212464.5	315622.3	1212492.0	47 51.1188	122 34.5843	8.4	1.0	
	3		1520	12.4	2.92	-9.5			315608.9	1212462.2	47 51.1165	122 34.5915	3.4		

Hart Crowser

Port Gamble, WDOE Study **SPI & Plan View Camera Survey** SOFTWARE: Corpscon 5.11.08

November 2008 **Stations arranged by Date & Time**

Station No.	Sample Rep.	Date	GPS Time	Meter Wheel Depth m.	Predicted Nearest Tide m.	Predicted Mudline Depth, m. (MLLW)	Sample Target NAD 1983, Decimal Min. Latitude Northing (y)	Sample Target NAD 1983, Decimal Min. Longitude Easting (x)	Sample Location DGPS Trimble NT300D NAD 1983, SPCS, Wa. N. Northing (y)	Sample Location DGPS Trimble NT300D NAD 1983, SPCS, Wa. N. Easting (x)	Sample Location DGPS Trimble NT300D NAD 1983, Decimal Min. Latitude	Sample Location DGPS Trimble NT300D NAD 1983, Decimal Min. Longitude	Distance to Target (m.)	GPS Status HDOP good < 2	Comments
086	1	15-Nov	1524	5.1	2.95	-2.2	47 51.1204	122 34.4689	315633.0	1212956.0	47 51.1223	122 34.4710	4.3		
	2		1526	5.2	2.95	-2.3	315621.6	1212964.4	315612.1	1212940.3	47 51.1188	122 34.4747	7.9	1.0	
	3		1527	5.1	2.96	-2.1			315633.6	1212984.6	47 51.1225	122 34.4640	7.2		
087	1	15-Nov	1532	4.0	2.98	-1.0	47 51.1226	122 34.3467	315638.8	1213454.6	47 51.1251	122 34.3492	5.5		
	2		1534	4.3	2.98	-1.3	315623.4	1213464.3	315590.5	1213463.8	47 51.1172	122 34.3467	10.0	1.1	
	3		1535	4.0	2.99	-1.0			315623.2	1213472.3	47 51.1226	122 34.3448	2.4		
089	1	15-Nov	1548	15.8	3.04	-12.8	47 51.2554	122 34.7186	316432.4	1211978.2	47 51.2501	122 34.7143	11.2		Very high
	2		1550	15.9	3.04	-12.9	316465.1	1211961.5	316405.8	1211968.2	47 51.2457	122 34.7166	18.2	1.1	current
	3		1552	12.8	3.04	-9.8			316381.4	1211864.5	47 51.2413	122 34.7418	39.0		
090	1	15-Nov	1558	11.1	3.06	-8.0	47 51.2576	122 34.5964	316478.0	1212430.3	47 51.2593	122 34.6041	10.1		
	2		1559	8.4	3.06	-5.3	316466.9	1212461.4	316494.3	1212436.0	47 51.2620	122 34.6028	11.4	1.0	
	3		1602	8.9	3.07	-5.8			316477.3	1212461.4	47 51.2593	122 34.5965	3.2		
091	1	15-Nov	1611	4.0	3.09	-0.9	47 51.4340	122 34.9583	317596.0	1211024.0	47 51.4379	122 34.9539	9.1		Plan view
	2		1612	3.6	3.09	-0.5	317572.6	1211005.5	317570.5	1210998.1	47 51.4336	122 34.9601	2.4	0.9	camera not
	3		1623	3.9	3.11	-0.8			317586.7	1211009.1	47 51.4363	122 34.9575	4.4		working
092	1	16-Nov	0735	7.1	3.41	-3.7	47 51.4361	122 34.8362	317582.7	1211503.0	47 51.4375	122 34.8368	2.6		
	2		0736	6.9	3.41	-3.5	317574.4	1211505.4	317563.8	1211478.0	47 51.4343	122 34.8428	9.0	1.0	
	3		0737	7.5	3.41	-4.1			317584.3	1211515.7	47 51.4378	122 34.8337	4.3		
093	1	16-Nov	0742	8.3	3.41	-4.9	47 51.4383	122 34.7140	317554.5	1211998.4	47 51.4347	122 34.7156	7.0		
	2		0743	8.4	3.41	-5.0	317576.3	1212005.3	317580.4	1212008.0	47 51.4390	122 34.7134	1.5	1.0	
	3		0744	8.6	3.41	-5.2			317611.7	1212023.8	47 51.4442	122 34.7097	12.2		
094	1	16-Nov	0748	4.3	3.41	-0.9	47 51.4405	122 34.5919	317588.2	1212496.8	47 51.4421	122 34.5940	4.0		
	2		0750	5.0	3.41	-1.6	317578.1	1212505.2	317575.1	1212483.4	47 51.4399	122 34.5972	6.7	1.0	
	3		0752	4.0	3.41	-0.6			317559.7	1212520.3	47 51.4375	122 34.5881	7.3		
095	1	16-Nov	0757	2.5	3.41	0.9	47 51.4426	122 34.4698	317655.1	1212898.6	47 51.4546	122 34.4962	39.7		Target sta.
	2		0758	2.3	3.41	1.1	317579.9	1213005.1	317677.0	1212896.2	47 51.4582	122 34.4969	44.5	1.2	too shallow
	3		0759	2.2	3.41	1.2			317716.5	1212872.6	47 51.4646	122 34.5029	58.0		
096	1	16-Nov	0808	9.0	3.40	-5.6	47 51.6028	122 35.0988	318600.4	1210471.1	47 51.6010	122 35.0946	6.3		
	2		0810	9.0	3.39	-5.6	318611.8	1210453.9	318626.9	1210457.3	47 51.6053	122 35.0981	4.7	1.4	
	3		0811	9.0	3.39	-5.6			318608.2	1210449.6	47 51.6022	122 35.0999	1.7		
097	1	16-Nov	0815	7.4	3.38	-4.0	47 51.6050	122 34.9767	318615.3	1210967.8	47 51.6053	122 34.9733	4.3		
	2		0817	7.3	3.38	-3.9	318613.6	1210953.8	318597.1	1210937.9	47 51.6022	122 34.9805	7.0	1.3	
	3		0818	7.3	3.38	-3.9			318634.4	1210955.6	47 51.6084	122 34.9764	6.4		
098	1	16-Nov	0822	7.1	3.37	-3.7	47 51.6071	122 34.8546	318633.1	1211467.9	47 51.6101	122 34.8512	6.9		
	2		0823	7.0	3.37	-3.6	318615.4	1211453.7	318614.6	1211451.5	47 51.6070	122 34.8551	0.7	1.3	
	3		0825	7.1	3.37	-3.7			318585.1	1211441.4	47 51.6021	122 34.8574	10.0		

Hart Crowser

Port Gamble, WDOE Study **SPI & Plan View Camera Survey** SOFTWARE: Corpscon 5.11.08

November 2008 **Stations arranged by Date & Time**

Station No.	Sample Rep.	Date	GPS Time	Meter Wheel Depth m.	Predicted Nearest Tide m.	Predicted Mudline Depth, m. (MLLW)	Sample Target NAD 1983, Decimal Min. Latitude Northing (y)	Sample Target NAD 1983, Decimal Min. Longitude Easting (x)	Sample Location DGPS Trimble NT300D NAD 1983, SPCS, Wa. N. Northing (y)	Sample Location DGPS Trimble NT300D NAD 1983, SPCS, Wa. N. Easting (x)	Sample Location DGPS Trimble NT300D NAD 1983, Decimal Min. Latitude	Sample Location DGPS Trimble NT300D NAD 1983, Decimal Min. Longitude	Distance to Target (m.)	GPS Status HDOP good < 2	Comments
099	1	16-Nov	0830	7.3	3.36	-3.9	47 51.6093	122 34.7324	318620.4	1211946.8	47 51.6098	122 34.7341	2.3		
	2		0831	6.9	3.35	-3.6	318617.3	1211953.6	318592.0	1211939.2	47 51.6051	122 34.7358	8.9	1.3	
	3		0832	7.4	3.35	-4.1			318645.8	1211954.0	47 51.6140	122 34.7325	8.7		
100	1	16-Nov	0837	4.2	3.34	-0.9	47 51.6115	122 34.6103	318628.1	1212467.6	47 51.6130	122 34.6069	5.1		
	2		0838	5.6	3.34	-2.3	318619.1	1212453.5	318626.2	1212443.4	47 51.6126	122 34.6128	3.8	1.3	
	3		0840	8.1	3.33	-4.8			318626.8	1212415.2	47 51.6126	122 34.6197	11.9		
101	1	16-Nov	0845	2.6	3.32	0.7	47 51.6136	122 34.4881	318621.2	1212961.4	47 51.6137	122 34.4862	2.4		
	2		0846	2.4	3.31	0.9	318620.9	1212953.4	318647.2	1212964.4	47 51.6180	122 34.4856	8.7	1.2	
	3		0847	2.5	3.31	0.8			318681.7	1212970.9	47 51.6237	122 34.4842	19.3		
091	4	16-Nov	0901	4.0	3.26	-0.7	47 51.4340	122 34.9583	317596.0	1211024.0	47 51.4379	122 34.9539	9.1		Repeat of
	5		0902	3.6	3.26	-0.3	317572.6	1211005.5	317570.5	1210998.1	47 51.4336	122 34.9601	2.4	1.1	station for
	6		0903	3.8	3.25	-0.6			317586.7	1211009.1	47 51.4363	122 34.9575	4.4		plan view
088	1	16-Nov	0916	11.7	3.21	-8.5	47 51.2533	122 34.8407	316549.0	1211581.0	47 51.2678	122 34.8120	44.8		
	2		0918	9.9	3.21	-6.7	316463.3	1211461.6	316557.4	1211558.7	47 51.2691	122 34.8175	41.2	1.0	Moved target
	3		0919	10.8	3.19	-7.6			316558.3	1211574.7	47 51.2693	122 34.8136	45.0		station NE
083A	1	16-Nov	0939	9.3	3.10	-6.2	47 51.1820	122 34.8510	316033.6	1211408.9	47 51.1824	122 34.8512	0.8		
	2		0940	9.5	3.10	-6.4	316031.1	1211409.6	316014.1	1211412.1	47 51.1792	122 34.8503	5.3	1.0	New station
	3		0941	9.6	3.09	-6.5			316084.6	1211409.6	47 51.1908	122 34.8513	16.3		
055B	1	16-Nov	1001	4.8	3.00	-1.8	47 50.4500	122 34.9880	311581.0	1210716.2	47 50.4476	122 34.9957	10.6		
	2		1002	4.8	2.99	-1.8	311594.8	1210748.0	311606.0	1210740.1	47 50.4518	122 34.9900	4.2	0.9	New station
	3		1003	4.8	2.98	-1.8			311589.1	1210733.1	47 50.4490	122 34.9916	4.9		
047B	1	16-Nov	1008	12.6	2.96	-9.6	47 50.2900	122 34.9900	310625.7	1210712.0	47 50.2905	122 34.9914	2.0		
	2		1009	13.2	2.95	-10.3	310622.5	1210717.7	310605.0	1210739.0	47 50.2872	122 34.9847	8.4	0.9	New station
	3		1010	12.2	2.95	-9.3			310636.5	1210691.8	47 50.2922	122 34.9964	9.0		
038A	1	16-Nov	1016	12.8	2.92	-9.9	47 50.1240	122 34.9840	309591.9	1210712.3	47 50.1205	122 34.9856	6.8		
	2		1017	12.7	2.91	-9.8	309613.1	1210719.3	309617.6	1210708.4	47 50.1247	122 34.9867	3.6	1.1	New station
	3		1018	12.8	2.90	-9.9			309577.9	1210714.8	47 50.1182	122 34.9849	10.8		
046A	1	16-Nov	1034	5.5	2.82	-2.7	47 50.2890	122 35.0960	310622.1	1210280.8	47 50.2883	122 35.0967	1.6		
	2		1035	5.3	2.81	-2.5	310626.3	1210283.8	310653.6	1210263.1	47 50.2934	122 35.1012	10.4	1.7	New station
	3		1036	5.6	2.80	-2.8			310610.6	1210280.6	47 50.2864	122 35.0967	4.9		
029A	1	16-Nov	1045	12.0	2.76	-9.2	47 49.9590	122 34.9760	308606.8	1210738.6	47 49.9586	122 34.9737	3.0		
	2		1046	11.8	2.75	-9.1	308609.4	1210729.2	308605.2	1210703.8	47 49.9582	122 34.9822	7.9	1.2	New station
	3		1047	12.1	2.74	-9.4			308618.7	1210775.3	47 49.9607	122 34.9648	14.3		
021A	1	16-Nov	1057	4.7	2.69	-2.0	47 49.7980	122 35.0010	307643.3	1210591.0	47 49.7996	122 35.0044	5.2		
	2		1058	5.1	2.68	-2.4	307633.2	1210604.7	307633.7	1210609.2	47 49.7981	122 34.9999	1.4	1.2	New station
	3		1059	5.9	2.68	-3.2			307628.5	1210625.5	47 49.7973	122 34.9959	6.5		

Hart Crowser

Port Gamble, WDOE Study — **SPI & Plan View Camera Survey** — SOFTWARE: Corpscon 5.11.08

November 2008 — **Stations arranged by Date & Time**

Station No.	Sample Rep.	Date	GPS Time	Meter Wheel Depth m.	Predicted Nearest Tide m.	Predicted Mudline Depth, m. (MLLW)	Sample Target NAD 1983, Decimal Min. Latitude Northing (y)	Sample Target NAD 1983, Decimal Min. Longitude Easting (x)	Sample Location DGPS Trimble NT300D NAD 1983, SPCS, Wa. N. Northing (y)	Sample Location DGPS Trimble NT300D NAD 1983, SPCS, Wa. N. Easting (x)	Sample Location DGPS Trimble NT300D NAD 1983, Decimal Min. Latitude	Sample Location DGPS Trimble NT300D NAD 1983, Decimal Min. Longitude	Distance to Target (m.)	GPS Status HDOP good < 2	Comments
021B	1	16-Nov	1103	10.9	2.65	-8.3	47 49.7980	122 34.9620	307622.7	1210749.0	47 49.7968	122 34.9657	5.1		
	2		1104	11.0	2.65	-8.4	307629.6	1210764.3	307643.4	1210747.0	47 49.8002	122 34.9663	6.7	1.1	New station
	3		1105	11.8	2.64	-9.2			307616.1	1210794.7	47 49.7959	122 34.9545	10.1		
014A	1	16-Nov	1110	5.8	2.62	-3.2	47 49.6340	122 34.9740	306621.0	1210671.7	47 49.6318	122 34.9790	7.5		
	2		1111	6.3	2.62	-3.7	306633.9	1210692.5	306641.7	1210699.7	47 49.6353	122 34.9723	3.2	1.1	New station
	3		1113	7.8	2.61	-5.2			306622.2	1210725.8	47 49.6322	122 34.9658	10.8		
007A	1	16-Nov	1120	5.7	2.57	-3.1	47 49.4700	122 34.9640	305628.1	1210695.0	47 49.4686	122 34.9678	5.4		
	2		1121	6.2	2.57	-3.6	305636.2	1210710.8	305640.4	1210713.3	47 49.4707	122 34.9634	1.5	1.1	New station
	3		1122	7.8	2.56	-5.2			305651.3	1210743.5	47 49.4726	122 34.9561	11.0		
000A	1	16-Nov	1128	4.1	2.53	-1.6	47 49.3070	122 34.8440	304642.6	1211163.3	47 49.3083	122 34.8480	5.5		
	2		1130	4.2	2.53	-1.7	304634.4	1211179.5	304637.4	1211178.3	47 49.3075	122 34.8443	1.0	1.2	New station
	3		1131	4.8	2.52	-2.3			304622.5	1211221.0	47 49.3052	122 34.8338	13.2		
055C	1	16-Nov	1200	6.6	2.40	-4.2	47 50.3730	122 35.0320	311130.4	1210554.0	47 50.3729	122 35.0328	1.0		
	2		1201	5.9	2.40	-3.5	311130.9	1210557.3	311156.3	1210537.4	47 50.3771	122 35.0370	9.8	1.2	New station
	3		1203	7.1	2.39	-4.7			311118.2	1210580.0	47 50.3710	122 35.0264	7.9		
055D	1	16-Nov	1208	3.9	2.37	-1.5	47 50.5260	122 34.9780	312058.7	1210781.5	47 50.5264	122 34.9824	5.5		
	2		1209	4.1	2.37	-1.7	312055.8	1210799.4	312054.4	1210808.0	47 50.5258	122 34.9759	2.6	1.1	New station
	3		1210	5.0	2.36	-2.6			312057.3	1210839.6	47 50.5264	122 34.9682	12.2		

Appendix B
SPI and Plan View Analysis Results

Port Gamble SPI Image Analysis - Final Results (12/23/08)

Station	Replicate	Date	Time	Successional	Grain Size (phi)			Benthic	Mud Clasts		Camera Penetration (cm)			
				Stage	Min	Max	Maj Mode	Habitat	Present	Avg. Diam	Min	Max	Range	Mean
00A	B	11/16/2008	11:30	ST I	> 4 phi	3 phi	3 to 2 phi	SA.F	FALSE	0	1	3	.	2
1	A	11/14/2008	07:50:00	ST I	> 4 phi	3 phi	3 to 2 phi	SA.F	FALSE	0	7.77	9.19	1.42	8.48
10	A	11/14/2008	10:02:00	ST III	> 4 phi	3 phi	> 4 phi	UN.SF	FALSE	0	19.31	19.83	0.52	19.57
100	A	11/16/2008	08:37:00	ST I	> 4 phi	1 phi	3 to 2 phi	SA.F	FALSE	0	7.36	7.72	0.36	7.54
101	B	11/16/2008	08:46:00	ST I	4 phi	1 phi	2 to 1 phi	SA.M	FALSE	0	5.96	7.5	1.54	6.73
11	A	11/14/2008	10:09:00	ST III	> 4 phi	4 phi	> 4 phi	UN.SF	FALSE	0	19.33	19.77	0.44	19.55
12	B	11/14/2008	10:17:00	ST III	> 4 phi	4 phi	> 4 phi	UN.SF	FALSE	0	19.62	20.22	0.6	19.92
13	A	11/14/2008	10:23:00	INDET	> 4 phi	4 phi	> 4 phi	UN.SF	FALSE	0	19.92	20.36	0.44	20.14
14	A	11/14/2008	10:31:00	ST I	> 4 phi	4 phi	> 4 phi	UN.SF	FALSE	0	19.76	20.22	0.46	19.99
14A	A	11/16/2008	11:10:00	ST I	> 4 phi	2 phi	3 to 2 phi	SA.F	FALSE	0	8.45	10.01	1.56	9.23
15	A	11/14/2008	10:47:00	ST III	> 4 phi	4 phi	> 4 phi	UN.SF	FALSE	0	19.98	20.3	0.32	20.14
16	B	11/14/2008	10:55:00	ST I on III	> 4 phi	3 phi	> 4 phi	UN.SF	FALSE	0	18.02	18.78	0.76	18.4
17	C	11/14/2008	11:03:00	ST I on III	> 4 phi	3 phi	> 4 phi	UN.SF	FALSE	0	17.64	18.84	1.2	18.24
18	A	11/14/2008	11:08:00	ST I on III	> 4 phi	3 phi	> 4 phi	UN.SF	FALSE	0	15.37	15.91	0.54	15.64
19	A	11/14/2008	11:16:00	ST I	> 4 phi	3 phi	> 4 phi	UN.SF	FALSE	0	17.22	18.31	1.09	17.76
2	B	11/14/2008	08:03:00	ST I	4 phi	2 phi	3 to 2 phi	SA.F	FALSE	0	1.5	2.5	0.58	2
20	B	11/14/2008	11:24:00	ST I on III	> 4 phi	3 phi	> 4 phi	UN.SF	FALSE	0	14.86	17.18	2.32	16.02
21	B	11/14/2008	11:31:00	ST III	> 4 phi	2 phi	3 to 2 phi	UN.SS	FALSE	0	12.42	12.82	0.4	12.62
21A	A	11/16/2008	10:57:00	ST I	> 4 phi	2 phi	3 to 2 phi	SA.F	FALSE	0	4	5	0.76	4.5
21B	B	11/16/2008	11:04:00	ST I	> 4 phi	3 phi	4 to 3 phi	UN.SS	FALSE	0	15.94	16.48	0.54	16.21
22	B	11/14/2008	12:34:00	ST I on III	> 4 phi	3 phi	> 4 phi	UN.SF	FALSE	0	19.05	19.45	0.4	19.25
23	A	11/14/2008	12:39:00	ST I	> 4 phi	3 phi	> 4 phi	UN.SF	FALSE	0	16	16.17	0.17	16.08
24	A	11/14/2008	12:46:00	ST I on III	> 4 phi	3 phi	> 4 phi	UN.SF	FALSE	0	15.56	15.77	0.21	15.67
25	A	11/14/2008	12:54:00	ST I on III	> 4 phi	3 phi	> 4 phi	UN.SF	FALSE	0	13.94	14.32	0.38	14.13
26	A	11/14/2008	13:01:00	ST I on III	> 4 phi	3 phi	> 4 phi	UN.SF	FALSE	0	15.54	16.32	0.78	15.93
27	A	11/14/2008	13:09:00	INDET	> 4 phi	3 phi	> 4 phi	UN.SF	FALSE	0	20.02	20.19	0.17	20.1
28	B	11/14/2008	13:18:00	ST I	4 phi	2 phi	3 to 2 phi	SA.F	FALSE	0	11.02	11.4	0.38	11.21
29	C	11/14/2008	13:42:00	ST I	4 phi	2 phi	3 to 2 phi	SA.F	FALSE	0	8.53	8.79	0.26	8.66
29A	B	11/16/2008	10:46:00	ST I	> 4 phi	3 phi	4 to 3 phi	SA.F	FALSE	0	7.8	9.88	2.08	8.84
3	B	11/14/2008	08:10:00	ST I	> 4 phi	2 phi	3 to 2 phi	SA.F	FALSE	0	4.5	6	1.02	5.25
30	A	11/14/2008	13:47:00	ST I	> 4 phi	3 phi	> 4 phi	UN.SF	FALSE	0	16.97	17.37	0.4	17.17
31	A	11/14/2008	13:54:00	ST I	> 4 phi	3 phi	4 to 3 phi	UN.SI	FALSE	0	11.66	14.52	2.86	13.09
32	A	11/14/2008	14:01:00	ST I	> 4 phi	3 phi	> 4 phi	UN.SF	FALSE	0	13.68	15.03	1.35	14.35
33	C	11/14/2008	14:12:00	ST I	> 4 phi	4 phi	> 4 phi	UN.SF	FALSE	0	14.92	15.81	0.89	15.36
34	A	11/14/2008	14:16:00	ST I	> 4 phi	3 phi	> 4 phi	UN.SF	FALSE	0	14.01	14.84	0.83	14.43
35	A	11/14/2008	14:26:00	ST I	> 4 phi	3 phi	> 4 phi	UN.SF	TRUE	0	18.65	18.86	0.21	18.76
36	C	11/14/2008	14:36:00	ST I	> 4 phi	3 phi	> 4 phi	UN.SF	FALSE	0	16.23	16.94	0.71	16.58
37	B	11/14/2008	14:42:00	ST I	> 4 phi	2 phi	3 to 2 phi	SA.F	FALSE	0	5.2	2	1.65	3.6
38	A	11/14/2008	14:57:00	ST I	> 4 phi	3 phi	4 to 3 phi	SA.F	FALSE	0	9.12	9.44	0.32	9.28
38A	A	11/16/2008	10:16:00	ST I on III	> 4 phi	3 phi	> 4 phi	UN.SF	FALSE	0	15.91	16.46	0.55	16.18
39	C	11/14/2008	15:06:00	ST I on III	> 4 phi	3 phi	> 4 phi	UN.SF	FALSE	0	14.4	15.07	0.67	14.73
4	B	11/14/2008	08:18:00	ST III	> 4 phi	2 phi	3 to 2 phi	UN.SS	FALSE	0	12.31	13.28	0.97	12.8
40	A	11/14/2008	15:11:00	ST I	> 4 phi	3 phi	> 4 phi	UN.SF	FALSE	0	14.69	15.07	0.38	14.88
41	A	11/14/2008	15:19:00	ST I	> 4 phi	3 phi	4 to 3 phi	UN.SI	FALSE	0	13.38	14.1	0.72	13.74
42	A	11/14/2008	15:26:00	ST I on III	> 4 phi	3 phi	4 to 3 phi	UN.SI	FALSE	0	13.02	13.89	0.87	13.45
43	A	11/14/2008	15:34:00	ST I on III	> 4 phi	3 phi	4 to 3 phi	UN.SF	FALSE	0	14.4	14.67	0.27	14.53
44	A	11/14/2008	15:41:00	ST I on III	> 4 phi	3 phi	> 4 phi	UN.SF	FALSE	0	15.26	15.58	0.32	15.42

Port Gamble SPI Image Analysis - Final Results (12/23/08)

Station	Replicate	Date	Time	Successional	Grain Size (phi)			Benthic	Mud Clasts		Camera Penetration (cm)			
				Stage	Min	Max	Maj Mode	Habitat	Present	Avg. Diam	Min	Max	Range	Mean
45	C	11/14/2008	15:50:00	ST III	> 4 phi	3 phi	> 4 phi	UN.SF	FALSE	0	17.13	17.56	0.43	17.34
46	A	11/14/2008	15:55:00	ST I	> 4 phi	2 phi	3 to 2 phi	SA.F	FALSE	0	8.95	10.16	1.21	9.56
46A	B	11/16/2008	10:35:00	ST I	> 4 phi	3 phi	4 to 3 phi	UN.SI	FALSE	0	14.3	14.59	0.29	14.44
47	C	11/14/2008	16:16:00	ST I	> 4 phi	3 phi	3 to 2 phi	SA.F	FALSE	0	7	8	0.95	7.5
47A	C	11/16/2008	10:10:00	ST I on III	> 4 phi	3 phi	4 to 3 phi	UN.SI	FALSE	0	15.26	15.77	0.51	15.52
48	A	11/14/2008	16:21:00	ST III	> 4 phi	3 phi	4 to 3 phi	UN.SI	FALSE	0	14.51	14.8	0.29	14.66
49	A	11/15/2008	08:02:00	ST III	> 4 phi	3 phi	> 4 phi	UN.SF	FALSE	0	17.81	18.53	0.72	18.17
5	B	11/14/2008	09:23:00	ST I on III	> 4 phi	2 phi	4 to 3 phi	UN.SS	FALSE	0	15.47	15.96	0.49	15.72
50	B	11/15/2008	08:10:00	ST I	> 4 phi	3 phi	> 4 phi	UN.SF	FALSE	0	14.96	15.37	0.41	15.16
51	C	11/15/2008	08:19:00	ST III	> 4 phi	3 phi	4 to 3 phi	UN.SI	FALSE	0	13.63	14.27	0.64	13.95
52	B	11/15/2008	08:25:00	ST I	> 4 phi	3 phi	4 to 3 phi	UN.SF	FALSE	0	12.82	13.23	0.41	13.02
53	A	11/15/2008	08:30:00	ST I	> 4 phi	3 phi	4 to 3 phi	UN.SI	FALSE	0	13.63	14.67	1.04	14.15
54	A	11/15/2008	08:37:00	ST I	> 4 phi	3 phi	> 4 phi	UN.SF	TRUE	0	11.76	12.39	0.63	12.08
55	B	11/15/2008	08:46:00	ST I	4 phi	2 phi	3 to 2 phi	SA.F	FALSE	0	0.66	2.68	0.88	1.67
55A	A	11/15/2008	09:12:00	ST I	4 phi	2 phi	3 to 2 phi	SA.F	FALSE	0	0.86	2.22	0.34	1.54
55B	A	11/16/2008	10:01:00	ST III	4 phi	2 phi	3 to 2 phi	SA.F	FALSE	0	5.43	5.77	0.34	5.6
55C	C	11/16/2008	12:03:00	ST I	4 phi	2 phi	3 to 2 phi	SA.F	FALSE	0	6.55	7.31	0.76	6.93
55D	C	11/16/2008	12:10:00	ST I	4 phi	2 phi	3 to 2 phi	SA.F	FALSE	0	9.23	10.83	1.6	10.03
56	A	11/15/2008	09:20:00	ST I	4 phi	2 phi	3 to 2 phi	SA.F	FALSE	0	6.04	6.74	0.7	6.39
57	A	11/15/2008	09:26:00	ST I	> 4 phi	3 phi	> 4 phi	UN.SF	FALSE	0	14.18	14.51	0.33	14.35
58	A	11/15/2008	09:34:00	ST I	> 4 phi	3 phi	> 4 phi	UN.SF	FALSE	0	18.79	20.13	1.34	19.46
59	B	11/15/2008	09:46:00	ST I	> 4 phi	3 phi	4 to 3 phi	UN.SI	FALSE	0	11.49	12.59	1.1	12.04
6	A	11/14/2008	09:29:00	ST III	> 4 phi	4 phi	> 4 phi	UN.SF	FALSE	0	19.94	20.21	0.27	20.08
60	C	11/15/2008	09:54:00	ST I on III	> 4 phi	3 phi	4 to 3 phi	UN.SI	FALSE	0	11.8	13.07	1.27	12.43
61	C	11/15/2008	10:01:00	ST I	> 4 phi	3 phi	4 to 3 phi	SA.F	FALSE	0	7.2	8.42	1.22	7.81
62	B	11/15/2008	10:08:00	ST I	> 4 phi	2 phi	3 to 2 phi	SA.F	FALSE	0	5.79	6.63	0.84	6.21
62A	B	11/15/2008	10:30:00	ST I	> 4 phi	3 phi	4 to 3 phi	SA.F	FALSE	0	9.47	10.2	0.73	9.84
62B	A	11/15/2008	10:34:00	ST I	> 4 phi	3 phi	4 to 3 phi	SA.F	FALSE	0	8.64	10.58	1.94	9.61
63	C	11/15/2008	10:42:00	ST III	> 4 phi	3 phi	4 to 3 phi	SA.F	FALSE	0	8.15	8.76	0.61	8.45
64	A	11/15/2008	10:49:00	ST I	> 4 phi	3 phi	4 to 3 phi	UN.SI	FALSE	0	13.47	14.29	0.82	13.88
65	A	11/15/2008	10:57:00	ST I	> 4 phi	3 phi	4 to 3 phi	SA.F	FALSE	0	8.3	9.09	0.79	8.69
66	A	11/15/2008	11:08:00	ST I	> 4 phi	2 phi	4 to 3 phi	SA.F	FALSE	0	9.02	9.82	0.8	9.42
67	A	11/15/2008	11:14:00	ST I	> 4 phi	3 phi	3 to 2 phi	SA.F	FALSE	0	8.53	9.12	0.59	8.82
68	A	11/15/2008	11:20:00	ST I	> 4 phi	2 phi	3 to 2 phi	SA.F	FALSE	0	6.46	6.86	0.4	6.66
69	B	11/15/2008	11:28:00	ST I	> 4 phi	3 phi	4 to 3 phi	SA.F	FALSE	0	8.09	10.75	2.66	9.42
69A	C	11/15/2008	11:41:00	ST I	> 4 phi	3 phi	4 to 3 phi	SA.F	FALSE	0	6.05	6.8	0.75	6.43
69B	A	11/15/2008	12:48:00	ST III	> 4 phi	2 phi	4 to 3 phi	UN.SS	FALSE	0	12.47	13.92	1.45	13.19
7	A	11/14/2008	09:35:00	INDET	> 4 phi	3 phi	> 4 phi	UN.SF	FALSE	0	20	20.22	0.22	20.11
70	A	11/15/2008	12:53:00	ST I on III	> 4 phi	2 phi	3 to 2 phi	UN.SS	FALSE	0	10.31	12.04	1.73	11.18
71	A	11/15/2008	13:01:00	ST I	> 4 phi	2 phi	3 to 2 phi	SA.F	FALSE	0	6.63	7.35	0.72	6.99
72	A	11/15/2008	13:08:00	ST I	4 phi	2 phi	3 to 2 phi	SA.F	FALSE	0	7.62	8.07	1.45	7.84
73	A	11/15/2008	13:14:00	ST I	4 phi	2 phi	3 to 2 phi	SA.F	FALSE	0	5.79	6.97	1.18	6.38
74	C	11/15/2008	13:23:00	ST I on III	> 4 phi	2 phi	3 to 2 phi	SA.F	FALSE	0	11.49	12.35	0.86	11.92
75	C	11/15/2008	13:31:00	ST I	4 phi	2 phi	3 to 2 phi	SA.F	FALSE	0	5.6	6.4	0.8	6
76	A	11/15/2008	13:35:00	ST I	4 phi	1 phi	2 to 1 phi	SA.M	FALSE	0	4.14	4.91	0.77	4.52
77	A	11/15/2008	14:02:00	ST I	> 4 phi	3 phi	4 to 3 phi	UN.SI	FALSE	0	13.13	13.49	0.36	13.31
77A	A	11/15/2008	14:12:00	ST I on III	> 4 phi	3 phi	> 4 phi	UN.SF	FALSE	0	16.27	17.53	1.26	16.9

Port Gamble SPI Image Analysis - Final Results (12/23/08)

Station	Replicate	Date	Time	Successional	Grain Size (phi)			Benthic	Mud Clasts		Camera Penetration (cm)			
				Stage	Min	Max	Maj Mode	Habitat	Present	Avg. Diam	Min	Max	Range	Mean
78	A	11/15/2008	14:20:00	ST I	> 4 phi	1 phi	3 to 2 phi	SA.F	FALSE	0	7.35	7.73	0.38	7.54
79	A	11/15/2008	14:26:00	ST I	4 phi	2 phi	3 to 2 phi	SA.F	FALSE	0	3.43	4.48	1.05	3.95
7A	A	11/16/2008	11:20:00	ST I	> 4 phi	2 phi	3 to 2 phi	SA.F	FALSE	0	6.24	6.8	0.56	6.52
8	B	11/14/2008	09:49:00	ST III	> 4 phi	3 phi	> 4 phi	UN.SF	FALSE	0	20.07	20.24	0.17	20.15
80	A	11/15/2008	14:33:00	ST I	4 phi	1 phi	2 to 1 phi	SA.M	FALSE	0	4.76	5.05	0.29	4.91
81	B	11/15/2008	14:41:00	ST I	4 phi	3 phi	3 to 2 phi	SA.F	FALSE	0	5.5	6.93	1.43	6.22
82	B	11/15/2008	14:47:00	ST I	4 phi	2 phi	3 to 2 phi	SA.F	FALSE	0	4.19	4.6	0.41	4.39
83	A	11/15/2008	15:03:00	ST I on III	> 4 phi	2 phi	3 to 2 phi	UN.SS	FALSE	0	13.28	13.78	0.5	13.53
83A	B	11/16/2008	09:40:00	ST I on III	> 4 phi	2 phi	4 to 3 phi	UN.SS	FALSE	0	11.63	14.32	2.69	12.98
84	B	11/15/2008	15:11:00	ST I	4 phi	2 phi	2 to 1 phi	SA.M	FALSE	0	3.51	4.08	0.57	3.8
85	A	11/15/2008	15:17:00	ST I	4 phi	2 phi	2 to 1 phi	SA.M	FALSE	0	4.55	4.84	0.29	4.7
86	C	11/15/2008	15:27:00	ST I	4 phi	2 phi	3 to 2 phi	SA.F	FALSE	0	4.93	5.81	0.88	5.37
87	B	11/15/2008	15:34:00	ST I	> 4 phi	3 phi	4 to 3 phi	SA.F	FALSE	0	8.77	9.8	1.03	9.28
88	A	11/16/2008	09:16:00	INDET	N/A	N/A	N/A	INDET	FALSE	0	5.27	5.35	0.08	5.31
89	A	11/15/2008	15:48:00	ST I	4 phi	< -1 phi	1 to 0 phi	HR	FALSE	0	4.89	5.91	1.02	5.4
9	A	11/14/2008	09:55:00	ST III	> 4 phi	3 phi	> 4 phi	UN.SF	FALSE	0	19.92	20.17	0.25	20.05
90	A	11/15/2008	15:58:00	ST I	> 4 phi	2 phi	3 to 2 phi	SA.F	FALSE	0	5.48	7.52	2.04	6.5
91	C	11/15/2008	16:23:00	ST I	4 phi	2 phi	3 to 2 phi	SA.F	FALSE	0	0.7	2.4	0.37	1.55
92	A	11/16/2008	07:35:00	ST I	> 4 phi	3 phi	4 to 3 phi	UN.SI	FALSE	0	12.56	13.06	0.5	12.81
93	C	11/16/2008	07:44:00	ST I	4 phi	< -1 phi	2 to 1 phi	SA.G	FALSE	0	3.87	5.03	1.16	4.45
94	A	11/16/2008	07:48:00	ST I	4 phi	3 phi	4 to 3 phi	SA.F	FALSE	0	4.98	528	0.3	266.49
95	A	11/16/2008	07:57:00	ST I	4 phi	1 phi	3 to 2 phi	SA.F	FALSE	0	4.15	4.48	0.33	4.32
96	A	11/16/2008	08:08:00	ST I	4 phi	3 phi	4 to 3 phi	SA.F	FALSE	0	4.77	5.29	0.52	5.03
97	A	11/16/2008	08:15:00	ST I	4 phi	3 phi	4 to 3 phi	SA.F	FALSE	0	5.41	6.61	1.2	6.01
98	A	11/16/2008	08:22:00	ST I	4 phi	3 phi	3 to 2 phi	SA.F	FALSE	0	9.69	11.42	1.73	10.56
99	B	11/16/2008	08:31:00	ST I	4 phi	< -1 phi	2 to 1 phi	SA.G	FALSE	0	3.49	3.96	0.47	3.72

Port Gamble SPI Image Analysis - Final Results (12/23/08)

		Redox Rebound											
Station	Replicate	Thickness (cm)			Apparent RPD Thickness (cm)			Methane			OSI	Surface	Low
		Min	Max	Mean	Min	Max	Mean	Count	Mean Depth	Diameter		Roughness	DO
00A	B	0	0	0	0.10	2.90	1.72	0	0	0	4	Physical	FALSE
1	A	0	0	0	0.76	3.79	2.56	0	0	0	5	Physical	FALSE
10	A	0	0	0	-99.00	-99.00	-99.00	0	0	0	99	Indeterminate	FALSE
100	A	0	0	0	0.76	3.44	2.80	0	0	0	5	Not Set	FALSE
101	B	0	0	0	0.30	2.63	1.67	0	0	0	4	Physical	FALSE
11	A	0	0	0	-99.00	-99.00	-99.00	0	0	0	99	Indeterminate	FALSE
12	B	0	0	0	-99.00	-99.00	-99.00	0	0	0	99	Indeterminate	FALSE
13	A	0	0	0	-99.00	-99.00	-99.00	0	0	0	99	Indeterminate	FALSE
14	A	0	0	0	0.76	6.22	5.40	0	0	0	7	Physical	FALSE
14A	A	0	0	0	1.26	3.84	2.84	0	0	0	5	Physical	FALSE
15	A	0	0	0	0.40	7.03	5.50	0	0	0	11	Indeterminate	FALSE
16	B	0	0	0	1.21	5.76	4.67	0	0	0	11	Physical	FALSE
17	C	0	0	0	1.97	5.41	5.01	0	0	0	11	Physical	FALSE
18	A	0	0	0	0.20	5.36	4.13	0	0	0	11	Physical	FALSE
19	A	0	0	0	0.10	6.47	5.52	0	0	0	7	Physical	FALSE
2	B	0	0	0	0.81	2.63	2.14	0	0	0	4	Physical	FALSE
20	B	0	0	0	3.03	5.21	4.20	0	0	0	11	Physical	FALSE
21	B	0	0	0	0.10	6.72	4.16	0	0	0	11	Physical	FALSE
21A	A	0	0	0	1.26	4.25	3.19	0	0	0	6	Physical	FALSE
21B	B	0	0	0	2.12	5.31	4.58	0	0	0	7	Physical	FALSE
22	B	0	0	0	1.21	5.06	4.44	0	0	0	11	Physical	FALSE
23	A	0	0	0	0.61	3.74	3.35	0	0	0	6	Physical	FALSE
24	A	0	0	0	0.25	2.58	1.54	0	0	0	8	Physical	FALSE
25	A	0	0	0	0.35	5.46	3.79	0	0	0	11	Physical	FALSE
26	A	0	0	0	0.45	6.02	4.81	0	0	0	11	Physical	FALSE
27	A	0	0	0	-99.00	-99.00	-99.00	0	0	0	99	Indeterminate	FALSE
28	B	0	0	0	0.25	4.25	3.65	0	0	0	6	Physical	FALSE
29	C	0	0	0	0.51	4.04	2.47	0	0	0	5	Physical	FALSE
29A	B	0	0	0	0.76	3.94	3.03	0	0	0	6	Not Set	FALSE
3	B	0	0	0	0.91	3.54	2.75	0	0	0	5	Physical	FALSE
30	A	0	0	0	1.36	4.55	3.89	0	0	0	7	Physical	FALSE
31	A	0	0	0	1.06	4.55	2.48	0	0	0	5	Physical	FALSE
32	A	0	0	0	0.86	3.84	2.96	0	0	0	5	Physical	FALSE
33	C	0	0	0	0.25	3.24	2.41	0	0	0	5	Physical	FALSE
34	A	0	0	0	0.25	3.03	2.65	0	0	0	5	Physical	FALSE
35	A	0	0	0	1.06	4.70	4.18	0	0	0	7	Physical	FALSE
36	C	0	0	0	0.20	5.06	4.58	0	0	0	7	Physical	FALSE
37	B	0	0	0	0.45	3.49	2.67	0	0	0	5	Physical	FALSE
38	A	0	0	0	0.25	2.68	1.89	0	0	0	4	Physical	FALSE
38A	A	0	0	0	1.42	3.79	3.17	0	0	0	10	Physical	FALSE
39	C	0	0	0	1.01	4.20	3.37	0	0	0	10	Physical	FALSE
4	B	0	0	0	1.31	4.30	2.99	0	0	0	9	Physical	FALSE
40	A	0	0	0	0.96	3.79	2.91	0	0	0	5	Physical	FALSE
41	A	0	0	0	0.35	4.30	3.46	0	0	0	6	Physical	FALSE
42	A	0	0	0	0.56	3.59	3.05	0	0	0	10	Physical	FALSE
43	A	0	0	0	0.30	3.24	2.66	0	0	0	9	Physical	FALSE
44	A	0	0	0	0.71	3.54	2.00	0	0	0	8	Physical	FALSE

Port Gamble SPI Image Analysis - Final Results (12/23/08)

		Redox Rebound											
Station	Replicate	Thickness (cm)			Apparent RPD Thickness (cm)			Methane			OSI	Surface	Low
		Min	Max	Mean	Min	Max	Mean	Count	Mean Depth	Diameter		Roughness	DO
45	C	0	0	0	0.40	2.63	2.05	0	0	0	8	Physical	FALSE
46	A	0	0	0	2.22	3.54	2.91	0	0	0	5	Biogenic	FALSE
46A	B	0	0	0	0.10	2.22	1.49	0	0	0	3	Not Set	FALSE
47	C	0	0	0	0.45	1.97	1.38	0	0	0	3	Physical	FALSE
47A	C	0	0	0	0.71	3.89	3.00	0	0	0	9	Physical	FALSE
48	A	0	0	0	0.35	3.44	2.70	0	0	0	9	Physical	FALSE
49	A	0	0	0	0.20	3.94	2.95	0	0	0	9	Physical	FALSE
5	B	0	0	0	0.25	4.50	3.63	0	0	0	10	Physical	FALSE
50	B	0	0	0	0.91	6.57	2.80	0	0	0	5	Physical	FALSE
51	C	0	0	0	1.06	4.09	2.42	0	0	0	9	Physical	FALSE
52	B	0	0	0	0.35	4.80	2.58	0	0	0	5	Physical	FALSE
53	A	0	0	0	0.61	3.44	2.51	0	0	0	5	Physical	FALSE
54	A	0	0	0	0.10	4.04	2.88	0	0	0	5	Not Set	FALSE
55	B	0	0	0	0.66	2.68	1.96	0	0	0	4	Physical	FALSE
55A	A	0	0	0	0.86	2.22	1.96	0	0	0	4	Physical	FALSE
55B	A	0	0	0	0.05	3.74	1.99	0	0	0	8	Physical	FALSE
55C	C	0	0	0	0.96	3.29	2.33	0	0	0	4	Physical	FALSE
55D	C	0	0	0	0.81	3.39	2.39	0	0	0	5	Physical	FALSE
56	A	0	0	0	0.30	2.93	2.45	0	0	0	5	Physical	FALSE
57	A	0	0	0	1.31	3.39	2.56	0	0	0	5	Physical	FALSE
58	A	0	0	0	0.20	5.00	3.36	0	0	0	6	Physical	FALSE
59	B	0	0	0	0.71	2.93	2.26	0	0	0	5	Physical	FALSE
6	A	0	0	0	-99.00	-99.00	-99.00	0	0	0	99	Indeterminate	FALSE
60	C	0	0	0	0.05	2.63	1.82	0	0	0	8	Physical	FALSE
61	C	0	0	0	0.25	3.79	2.51	0	0	0	5	Physical	FALSE
62	B	0	0	0	0.40	3.34	2.48	0	0	0	5	Physical	FALSE
62A	B	0	0	0	1.16	4.50	2.71	0	0	0	5	Physical	FALSE
62B	A	0	0	0	0.30	3.29	2.50	0	0	0	5	Physical	FALSE
63	C	0	0	0	0.56	2.78	1.99	0	0	0	8	Physical	FALSE
64	A	0	0	0	0.91	3.08	2.16	0	0	0	4	Physical	FALSE
65	A	0	0	0	0.15	2.88	2.26	0	0	0	5	Biogenic	FALSE
66	A	0	0	0	0.45	4.20	2.78	0	0	0	5	Physical	FALSE
67	A	0	0	0	0.61	3.99	2.37	0	0	0	5	Physical	FALSE
68	A	0	0	0	0.51	2.53	1.97	0	0	0	4	Physical	FALSE
69	B	0	0	0	0.10	3.49	2.49	0	0	0	5	Physical	FALSE
69A	C	0	0	0	0.61	3.18	1.91	0	0	0	4	Physical	FALSE
69B	A	0	0	0	1.06	4.70	2.30	0	0	0	9	Physical	FALSE
7	A	0	0	0	-99.00	-99.00	-99.00	0	0	0	99	Indeterminate	FALSE
70	A	0	0	0	0.40	3.79	2.51	0	0	0	9	Physical	FALSE
71	A	0	0	0	0.61	4.04	3.23	0	0	0	6	Physical	FALSE
72	A	0	0	0	0.10	3.64	2.73	0	0	0	5	Physical	FALSE
73	A	0	0	0	0.51	2.63	2.04	0	0	0	4	Physical	FALSE
74	C	0	0	0	1.21	2.93	2.17	0	0	0	8	Physical	FALSE
75	C	0	0	0	1.16	2.98	2.47	0	0	0	5	Physical	FALSE
76	A	0	0	0	0.61	3.44	2.80	0	0	0	5	Physical	FALSE
77	A	0	0	0	0.86	4.50	2.83	0	0	0	5	Physical	FALSE
77A	A	0	0	0	0.45	3.29	2.56	0	0	0	9	Physical	FALSE

Port Gamble SPI Image Analysis - Final Results (12/23/08)

		Redox Rebound											
Station	Replicate	Thickness (cm)			Apparent RPD Thickness (cm)			Methane			OSI	Surface	Low
		Min	Max	Mean	Min	Max	Mean	Count	Mean Depth	Diameter		Roughness	DO
78	A	0	0	0	0.96	3.64	2.80	0	0	0	5	Physical	FALSE
79	A	0	0	0	0.10	3.24	2.50	0	0	0	5	Physical	FALSE
7A	A	0	0	0	0.20	3.18	2.34	0	0	0	5	Physical	FALSE
8	B	0	0	0	-99.00	-99.00	-99.00	0	0	0	99	Indeterminate	FALSE
80	A	0	0	0	0.05	3.39	2.99	0	0	0	5	Physical	FALSE
81	B	0	0	0	0.71	3.74	2.67	0	0	0	5	Physical	FALSE
82	B	0	0	0	1.36	2.68	2.45	0	0	0	5	Physical	FALSE
83	A	0	0	0	1.31	3.74	2.56	0	0	0	9	Physical	FALSE
83A	B	0	0	0	0.30	4.65	3.15	0	0	0	10	Physical	FALSE
84	B	0	0	0	0.45	2.63	2.25	0	0	0	4	Physical	FALSE
85	A	0	0	0	0.15	3.08	2.51	0	0	0	5	Physical	FALSE
86	C	0	0	0	0.05	2.63	1.96	0	0	0	4	Physical	FALSE
87	B	0	0	0	0.45	3.74	2.05	0	0	0	4	Physical	FALSE
88	A	0	0	0	0.00	0.00	0.00	0	0	0	99	Physical	FALSE
89	A	0	0	0	0.15	2.78	2.04	0	0	0	4	Physical	FALSE
9	A	0	0	0	-99.00	-99.00	-99.00	0	0	0	99	Indeterminate	FALSE
90	A	0	0	0	1.36	4.85	3.03	0	0	0	6	Physical	FALSE
91	C	0	0	0	0.56	2.38	1.97	0	0	0	4	Physical	FALSE
92	A	0	0	0	0.61	4.70	2.91	0	0	0	5	Physical	FALSE
93	C	0	0	0	0.20	3.18	2.09	0	0	0	4	Physical	FALSE
94	A	0	0	0	0.96	3.18	2.73	0	0	0	5	Physical	FALSE
95	A	0	0	0	0.05	2.22	1.62	0	0	0	4	Physical	FALSE
96	A	0	0	0	0.57	3.82	2.75	0	0	0	5	Physical	FALSE
97	A	0	0	0	1.36	3.18	2.55	0	0	0	5	Physical	FALSE
98	A	0	0	0	0.15	3.79	2.88	0	0	0	5	Physical	FALSE
99	B	0	0	0	1.80	2.00	1.50	0	0	0	3	Physical	FALSE

Station	Replicate	Comments	Additional1 Description	Woody Debris percent
00A	B	brn gry f sand and silt, entormorpha, shell frags		0
1	A	tan f. sand and silt, entromorpha, tubes,		0
10	A	tan soft mud, overpen, active void		0
100	A	tan fine sand and silt, Zostera m.		0
101	B	gray med sand low pen sand dollars		0
11	A	tan soft mud, overpen, active voids		0
12	B	tan soft mud, w clay overpen, camera shear artifact, void		0
13	A	tan soft mud w clay, overpen, camera shear		0
14	A	tan soft mud clay slight overpen, camera shear		0
14A	A	tan gry fine sand and silt, 1-2% wood debris (particles) entromorpha, anemone, shell pieces	Woody debris percent	2
15	A	tan soft mud slight overpen, active voids		0
16	B	tan soft mud, active voids		0
17	C	tan soft mud w clay active void, shear at depth		0
18	A	tan soft mud w clay, active voids camera shear		0
19	A	tan soft mud w clay, camera shear at depth		0
2	B	tan gry fine sand silt, eteromorpha, shell particles		0
20	B	tan soft mud w clay, active void, possible fine wood particles in upper 2 cm	Woody debris percent	1
21	B	fine sand and mud, active void, camera shear		0
21A	A	gry fine sand w silt, enteromorpha, shell frag		0
21B	B	tan fine sand /silt w clay, stage I tubes, large shear void at depth, traces of fine wood debris w/ depth (3-5%)	Woody debris percent	5
22	B	tan soft mud, active void, tube surface, camera shear		0
23	A	tan and gry soft mud w clay, slightly reduced at depth, possible voids at depth		0
24	A	tan and gry soft mud, slightly reduced at depth, shear at depth due to possible wood debris	Woody debris percent	2
25	A	tan and gray soft mud w clay, active void, camera shear at depth		0
26	A	tan and gray soft mud w clay, active void slightly reduced at depth, camera shear		0
27	A	tan soft mud overpen, shear at depth, possible woody debris lower right	Woody debris percent	1
28	B	tan and gry fine sand with shell frags, fine wood debris particles w/ depth (5-7%)	Woody debris percent	7
29	C	tan and gry fine sand w brown floc/algae, burrow or cobble pulldown		0
29A	B	tan gray fine sand silt large piece of wood debris on surface, barnacle encrusted	Woody debris percent	50
3	B	gray clean fine sand, leaf, clam shell, tube farfield, shell frags		0
30	A	tan soft mud, slightl;y reduced at depth, poss fine wood particles at depth	Woody debris percent	3
31	A	tan soft mud, sea pen, camera shear at depth		0
32	A	tan and gray soft mud, slightly reduced at depth; camera sheer at different substrate.		0
33	C	tan and gray soft mud, slightly reduced at depth, camera shear at depth, possible voids		0
34	A	tan and gray soft mud, slightly reduced at depth, poss small void, poss wood piece at depth		0
35	A	tan and gray soft mud, slightly reduced at depth		0
36	C	tan soft mud camera shear at depth		0
37	B	tan and grayfine sand w clay fraction, enteromorpha, Ulva, worm tubes		0
38	A	tan fine silty sand, leaf pulled down, tubes, shell farfield, trace f wood particles on surface	Woody debris percent	1
38A	A	tan and gray soft mud, silty surface, polys at depth, voids		0
39	C	tan and gray soft mud, slightly reduced at depth, voids, camera shear		0
4	B	tan and gray fine sillty sand , polys at depth, surface bedforms		0
40	A	tan and gray soft mud, slightly reduced at depth, camera shear, possible voids		0
41	A	tan and gray soft mud w clay fraction, tubes, camera shear artifact, polys at depth		0
42	A	tan and gray sandy soft mud w clay fraction, possible voids, slighlty reduced at depth, camera shear artifact		0
43	A	tan and gray soft mud w clay fraction, possible voids, slightly reduced at depth camera shear, streaks of reduced sediment		0
44	A	tan and gray soft mud w clay fraction, silty surface, possible voids, camera shear artifact		0

Station	Replicate	Comments	Additional1 Description	Woody Debris percent
45	C	tan and gray soft mud w clay fraction,void near surface, camera shear at depth.		0
46	A	tan and gray fine sand and mud, tubes surface, shell frags		0
46A	B	brown silty mud, wood debris fibers at depth, large barnacle encrusted wood debris or rock upended on surface	Woody debris percent	25
47	C	brn fine sand and mud, slightly reduced, shell frags, tubes surface, burrow, camera shear		0
47A	C	tan and gry soft mud, slightly reduced at depth, void, large polys		0
48	A	tan and gray soft mud, slightly reduced at depth, void camera shear, polychaete at depth		0
49	A	tan and gray soft mud, void, slighlty reduced at depth, camera shear		0
5	B	tan and gray fine sand w mud, slightly reduced at depth, camera shear, poly at depth		0
50	B	tan and gray soft mud w sand, feeding halo? camera shear, stage I tube		0
51	C	tan and gray soft mud w sand, silty surface, camera shear, voids? Ulva pulled down into sed.		0
52	B	tan and gray fine sandy mud, slightly reduced at depth, camera shear, trace wood particles	Woody debris percent	1
53	A	tan and gray fine sandy mud w clay fraction, slightly reduced at depth, camera shear, polys at depth		0
54	A	tan and gray sandy mud w clay fraction, slighly reduced at depth, Zostera m.blade in sed, reduced wiper clast		0
55	B	tan and gray fine-med sand, brown floc (diatom/cyano) on surface, Ulva, shell frags, small wood particles on surface	Woody debris percent	1
55A	A	tan and gray fine -med sand, brown diatom/cyano surface, separate discrete layer under surface? macro algae far field		0
55B	A	tan and gray fine sand, slightly reduced on left side, macroalgae, Laminaria far field, void		0
55C	C	tan fine sand, slightly reduced at depth, tubes surface Macroalgae far field, possible wood debris	Woody debris percent	2
55D	C	tan and gray fine sand, tubes surface, slightly reduced at depth Enteromorpha, brown diatom/cyano surface		0
56	A	tan and gray fine sand, slightly reduced at depth, sloping topography (bedform), silty surface		0
57	A	tan and gray soft mud, slightly reduced at depth, camera shear at depth		0
58	A	tan and gry soft mud, polychaete, reduced at depth, camera shear at depth		0
59	B	tan and gray soft mud, slightly reduced at depth, sea whip, leaf debris on surface		0
6	A	tan soft mud ,over pen, possible void or camera shear		0
60	C	tan and gray soft mud, reduced at depth, void feeding halo, tubes surface		0
61	C	tan and gray fine sand and mud, slightly reduced at depth, tubes surface		0
62	B	tan fine sand, twig, wood debris at surface, tubes surface	Woody debris percent	5
62A	B	tan and gray fine sand and mud, reduced at depth, scattered wood particles, Enteromorpha, brown diatom/cyano surface layer	Woody debris percent	2
62B	A	tan and gray fine sand and mud, possible large piece of wood debris, Enteromorpha	Woody debris percent	30
63	C	tan and gray fine sand and mud, slighltly reduced at depth, large void or burrow, tubes surface		0
64	A	tan and gray sandy soft mud, slightly reduced at depth, barnancle encrusted tube		0
65	A	gray fine sand and mud, large sea pen pulled down		0
66	A	tan and gray fine sand and mud, slightly reduced at depth, tube surface		0
67	A	gray fine sand and mud, slightly reduced at depth, trace wood particles on surface	Woody debris percent	1
68	A	tan fine-med sand, collapsed void? large sea pen far field, tube surface		0
69	B	tan and gray fine sand an mud, sightly reduced, Enteromorpha pulled down thru RPD, farfield		0
69A	C	tan and gry fine sand w mud, stage I tubes, slightly reduced at depth, shell frags, enteromorpha, small frags Ulva		0
69B	A	tan brn fine sand on soft mud w clay fraction, possible void or camera shear, Enteromorpha pulled down, polys at depth		0
7	A	gray soft mud w clay fraction, overpen, camera shear in clay at depth, oxygenated		0
70	A	tan and gray fine sand w mud and clay fraction, tubes surface, polys and voids at deph, shell frags		0
71	A	tan and gry fine -med sand, clean, sand ripples, scattered fine wood particles surface	Woody debris percent	2
72	A	tan and gry fine -med sand, shell frags macroalgae farfield, scattered fine wood particles surface	Woody debris percent	2
73	A	tan and gry fine -med sand, large piece woody debris, macroalage, Ulva , large sea pen farfield	Woody debris percent	15
74	C	gry fine sand w clay fraction, slighlty reduced clay streaks, tubes, bedforms, void, anemone or sea pen farfield		0
75	C	tan and gry fine sand. clean, sand ripples, possible trace fine wood particles		0
76	A	clean gry fine -med sand, sand ripples		0
77	A	tan and gry sandy mud, tubes, slightly reduced streaks of clay enteromorpha		0
77A	A	gray soft mud w clay fraction. layers & pockets of sand, reduced streak ofclay, polys at depth, enteromorpha surface		0

Station	Replicate	Comments	Additional1 Description	Woody Debris percent
78	A	tan and brn fine sand, reddish streak of material, tube surface, shell frag		0
79	A	clean gry fine -med sand, Ulva, shell frags, surface tubes		0
7A	A	tan and brn fine sand, streaks reddish material, tubes, Ulva		0
8	B	tan soft mud w clay, overpen, camera shear artifacts		0
80	A	gry med-coarse sand, clean, fine shell particles		0
81	B	tan and gry fine sand, Ulva, piece wood debris, macro algae farfield	Woody debris percent	3
82	B	tan fine sand, Zostera m. bed, Entromorpha		0
83	A	tan and gry fine sand and mud w clay fraction, slighty reduced at depth, void, polychaetes, tubes surface, macroalagae		0
83A	B	tan and brn sand and silt large piece wood debris tube, shell hash	Woody debris percent	20
84	B	gray med -coarse sand, shell hash, leaf debris, crab, macroalage		0
85	A	gray clean med-coarse sand, sea whip stalk, Ulva shell hash		0
86	C	gray fine med-fine sand, Zostera m., shell, macroalgae far field		0
87	B	gray fine sand w mud, dense Zostera m. bed		0
88	A	surface shot branches, leaves, large piece wood debris pipefish and gunnel in leaf debris. Zostera blade	Woody debris percent	30
89	A	silt draped orange gravel on silty sand and shell hash		0
9	A	tan soft mud, overpen, voids		0
90	A	tan and gry fine sand, Ulva, decaying Zostera blade, possible seastar, 1 cm wood pieces	Woody debris percent	5
91	C	gray fine -med sand, Ulva, shell frags		0
92	A	brn fine sand and silt w clay fraction, wood debris on surface, organic matter mixed in sediment, shell frags	Woody debris percent	15
93	C	gray med sand w pea gravel, shell frags, macroalgae, shell		0
94	A	gray clean fine sand , Zostera m. bed		0
95	A	gray fine sand, shell frags, Ulva, blades of decaying Zostera, wood pieces/particles	Woody debris percent	5
96	A	gray fine sand, tubes surface, Ulva, enteromorpha		0
97	A	tan and gray fine silty sand , Zostera m. blades, enteromorpha, possible fine wood particles	Woody debris percent	2
98	A	tan and gray fine silty sand, Zostera m. enteromorpha, camera shear		0
99	B	gray med clean sand, decaying Zostera m. blade, Zostera and macroalgae farfield		0

Appendix C
SPI and Plan View Images (DVD Insert)

PLAN VIEW IMAGES
SPI IMAGES

(see attached DVD)

APPENDIX E
RADIOMETRIC DATING REPORT
BATTELLE MARINE SCIENCES LABORATORY

Port Gamble Bay Cores (PN 56449)
Completed by Linda Bingler 3/16/09

Two cores were received frozen, partially thawed, sectioned and the sections selectively analyzed for ^{137}Cs and ^{210}Pb. Porosity values were calculated from the percent dry weight.

Core 22-S-1
The percent dry weight varied between 36.0 and 51.6. Generally, the percent dry weight increased with depth indicating a decrease of the organic fraction. Radioactive isotopes of interest in this study are normally associated with the organic fraction of the sediments. The mixed layer, deduced from the ^{210}Pb data, appears to occur from 0 to 14 cm depth. Peak activity for ^{137}Cs was found between 16 and 24 cm. The calculated sedimentation rate for this core was 0.21 g/cm2/yr based on supported lead activity of 50 dpm/g. Dates corresponding to the ^{137}Cs peak range from 1947 to 1960. Assuming that mixing occurred during this time, these estimated dates are reasonable.

Core 51-S-1
The percent dry weight ranged from 44.6 to 65.9. Generally, the percent dry weight increased with depth indicating a decrease of the organic fraction. There wasn't an apparent mixed layer in this core. Gamma activity for ^{137}Cs was found to a depth of 20 cm. The calculated sedimentation rate for this core was 0.28 g/cm2/yr based on supported lead activity of 0.35 dpm/g. Dates corresponding to the ^{137}Cs activity ranged from 1955 to the present. Typically in seawater systems, ^{137}Cs is adsorbed onto particles in the water column and settles into the sediment slowly over considerable time. This is evident in this core and supports the sedimentation rate that was calculated.

Battelle Marine Sciences Laboratory
1529 West Sequim Bay Rd.
Sequim, WA 98382
(360) 683-4151

3/16/2009

SEDIMENTATION RATE (g/cm2/yr)
FOR
Port Gamble Bay Core 22-S-1

Core 22-S-1				Time					SEDIMENT		Sediment
Supported Pb210 (dpm/g)= 0.50			Mean	Corrected			Dry wt.	AGE		Accumulation
		Segment	Depth	Pb 210		% Dry	Density	(years)	YEAR	Rate (cm/yr)
Sample #	Sponsor code	Depth (cm)	(cm)	(dpm/g)			(g/cm3)	S = **0.21**		
2987-1	22-S-1 0-2	0-2	1	3.08	x	36.0	0.439	2	2006	0.48
		2-4	3	2.84	x	38.3	0.479	6	2002	0.47
2987-3	22-S-1 4-6	4-6	5	2.61	x	40.5	0.520	11	1997	0.45
		6-8	7	2.41	x	40.6	0.521	16	1992	0.43
2987-5	22-S-1 8-10	8-10	9	2.21	x	40.6	0.522	21	1987	0.43
		10-12	11	2.23	x	41.6	0.540	26	1982	0.42
2987-7	22-S-1 12-14	12-14	13	2.24	x	42.5	0.558	31	1977	0.42
2987-8	22-S-1 14-16	14-16	15	2.18		42.7	0.561	37	1971	0.41
2987-9	22-S-1 16-18	16-18	17	1.64		45.2	0.612	42	1966	0.40
		18-20	19	1.54		45.6	0.620	48	1960	0.40
2987-11	22-S-1 20-22	20-22	21	1.44		46.0	0.628	54	1954	0.39
		22-24	23	1.20		53.2	0.783	61	1947	0.38
2987-13	22-S-1 24-26	24-26	25	0.942		47.8	0.664	67	1941	0.37
2987-14	22-S-1 26-28	26-28	27	0.868		47.8	0.664	74	1934	0.37
2987-15	22-S-1 28-30	28-30	29	0.969		48.0	0.669	80	1928	0.36
		30-32	31	0.733		48.3	0.674	86	1922	0.36
2987-17	22-S-1 32-34	32-34	33	0.826		48.5	0.679	93	1915	0.36
		34-36	35	0.733		50.9	0.731	100	1908	0.35
2987-19	22-S-1 36-38	36-38	37	0.496	x	50.7	0.727	106	1902	0.35
		38-44	41	0.472	x	48.8	0.685	113	1895	0.36
2987-23	22-S-1 44-46	44-46	45	0.448	x	49.2	0.695	133	1875	0.34
		46-55	58	0.511	x	48.5	0.680	145	1863	0.40
2987-27	22-S-1 55-60	55-60	57.5	0.573	x	47.8	0.665	262	1746	0.22
		60-65	63	0.575	x	47.9	0.666	266	1742	0.24
2987-29	22-S-1 65-70	65-70	67.5	0.578	x	47.9	0.666	281	1727	0.24
		70-75	73	0.573	x	48.7	0.684	297	1711	0.24
2987-31	22-S-1 75-80	75-80	77.5	0.568	x	49.6	0.702	314	1694	0.25
		80-85	83	0.529	x	49.6	0.702	330	1678	0.25
2987-33	22-S-1 85-90	85-90	87.5	0.490	x	49.6	0.702	347	1661	0.25
		90-95	93	0.483	x	49.8	0.706	363	1645	0.25
2987-35	22-S-1 95-100	95-100	97.5	0.477	x	50.0	0.711	380	1628	0.26
		100-105	103	0.508	x	50.8	0.729	397	1611	0.26
2987-37	22-S-1 105-110	105-110	107.5	0.539	x	51.6	0.747	415	1593	0.26

Battelle Marine Sciences Laboratory
1529 West Sequim Bay Rd.
Sequim, WA 98382
(360) 683-4151

3/16/2009

SEDIMENTATION RATES
FOR
Port Gamble Bay Core 51-S-1

Core 51-S-1				Time					SEDIMENT		Sediment
	Supported Pb210 (dpm/g)= 0.35		Mean	Corrected			Dry wt.	AGE		Accumulation
		Segment	Depth	Pb 210		% Dry	Density	(years)	YEAR	Rate (cm/yr)
Sample #	Sponsor code	Depth (cm)	(cm)	(dpm/g)			(g/cm3)	S = **0.28**		
2987-41	51-S-1 0-2	0-2	1	2.39	x	44.6	0.599	2	2006	0.47
2987-42	51-S-1 2-4	2-4	3	1.88	x	51.1	0.736	7	2001	0.44
2987-43	51-S-1 4-6	4-6	5	2.06	x	50.7	0.727	12	1996	0.42
		6-8	7	1.85	x	52.0	0.756	17	1991	0.41
2987-45	51-S-1 8-10	8-10	9	1.64		53.3	0.785	23	1985	0.40
2987-46	51-S-1 10-12	10-12	11	1.17		54.4	0.811	28	1980	0.39
2987-47	51-S-1 12-14	12-14	13	0.969		56.6	0.865	34	1974	0.38
2987-48	51-S-1 14-16	14-16	15	0.906		56.2	0.854	40	1968	0.37
2987-49	51-S-1 16-18	16-18	17	0.724		61.1	0.977	47	1961	0.36
2987-50	51-S-1 18-20	18-20	19	0.615		59.8	0.944	53	1955	0.36
2987-51	51-S-1 20-22	20-22	21	0.470		59.0	0.923	60	1948	0.35
		22-28	25	0.446		58.4	0.909	67	1941	0.38
2987-55	51-S-1 28-30	28-30	29	0.421		57.9	0.895	86	1922	0.34
		30-36	33	0.447		57.4	0.883	92	1916	0.36
2987-59	51-S-1 36-38	36-38	37	0.473		56.9	0.871	111	1897	0.33
		38-40	39	0.380		57.4	0.885	117	1891	0.33
2987-61	51-S-1 40-42	40-42	41	0.397	x	58.0	0.899	123	1885	0.33
		42-44	43	0.355	x	59.7	0.942	130	1878	0.33
2987-63	51-S-1 44-46	44-46	45	0.287	x	61.4	0.986	136	1872	0.33
		46-55	50.5	0.300	x	61.7	0.994	143	1865	0.35
2987-67	51-S-1 55-60	55-60	57.5	0.314	x	62.0	1.001	175	1833	0.33
		60-65	62.5	0.286	x	60.8	0.970	192	1816	0.32
2987-69	51-S-1 65-70	65-70	67.5	0.258	x	59.6	0.940	209	1799	0.32
		70-75	72.5	0.325	x	61.8	0.996	226	1782	0.32
2987-71	51-S-1 75-80	75-80	77.5	0.391	x	63.9	1.055	244	1764	0.32
		80-85	82.5	0.367	x	60.4	0.959	262	1746	0.31
2987-73	51-S-1 85-90	85-90	87.5	0.342	x	56.8	0.870	279	1729	0.31
		90-95	92.5	0.338	x	61.4	0.985	295	1713	0.31
2987-75	51-S-1 95-100	95-100	97.5	0.334	x	65.9	1.111	312	1696	0.31
		100-105	102.5	0.319	x	63.3	1.036	332	1676	0.31
2987-77	51-S-1 105-110	105-110	107.5	0.303	x	60.6	0.965	350	1658	0.31

Sample Custody Record

HARTCROWSER

Hart Crowser, Inc.
1910 Fairview Avenue East
Seattle, Washington 98102-3699
Phone: 206-324-9530 FAX: 206-328-5581

Samples Shipped to: ______

JOB 17330§-14 LAB NUMBER ______

PROJECT NAME Port Gamble

HART CROWSER CONTACT Roger McGinnis

SAMPLED BY: CFR/CWU

REQUESTED ANALYSIS: Radiometric Dating; Hold

LAB NO.	SAMPLE ID	DESCRIPTION	DATE	TIME	MATRIX	Radiometric Dating	Hold	NO. OF CONTAINERS	OBSERVATIONS/COMMENTS/ COMPOSITING INSTRUCTIONS
Station 22	S-1	Core Tube	12/3/08	1600	Sediment		X	1	0-4' bgs
Station 22	S-2	↓	↓	1605	↓		X	1	4-7.3' bgs
Station 51	S-1	↓	↓	1610	↓		X	1	0-4' bgs
Station 51	S-2	↓	↓	1615	↓		X	1	4-7.5' bgs

RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE [signature] PRINT NAME Colleen Rust COMPANY HC	12/4/08 TIME 8:30	SIGNATURE [signature] PRINT NAME Anne Conrad COMPANY HC	12/5/08 TIME 8:30
SIGNATURE [signature] PRINT NAME Anne C. COMPANY HC	12/5/08 TIME 11:30	SIGNATURE [signature] PRINT NAME Jonathon Walter COMPANY ARI	12/4/08 TIME 1130

SPECIAL SHIPMENT HANDLING OR STORAGE REQUIREMENTS:
[signature] Jonathon Walter ARI 820 12/16/08
[signature] Colleen Rust HC 820 12/16/08
[signature] HC 1100 Colleen Rust
Rec'd by [signature] 12/16/08

COOLER NO.:

STORAGE LOCATION: archived in frozen storage

See Lab Work Order No. ______ for Other Contract Requirements

4 TOTAL NUMBER OF CONTAINERS

SAMPLE RECEIPT INFORMATION
CUSTODY SEALS: ☐YES ☐NO ☐N/A
GOOD CONDITION: ☐YES ☐NO
TEMPERATURE ______
SHIPMENT METHOD: ☐HAND ☐COURIER ☐OVERNIGHT

TURNAROUND TIME:
☐ 24 HOURS ☐ 1 WEEK
☐ 48 HOURS ☐ STANDARD
☐ 72 HOURS OTHER ______

Percent Dry Weight

1/27/09

Project: Port Gamble Age Dating
Analyst L. Bingler

Matrix: Sediments
CF#: 2987
Balance #: 11

Sample Number	Tare Weight (g)	Tare + Wet Weight (g)	Tare + Dry Weight (g)	Wet Weight (g)	Dry Weight (g)	% Dry Weight	% Wet Weight
	(weights reported to two decimal places, percents reported to three significant figures)						
2987-1	30.39	151.23	73.86	120.84	43.47	35.98	64.0
2987-3	29.69	114.79	64.18	85.10	34.49	40.53	59.5
2987-5	29.60	147.47	77.49	117.87	47.88	40.62	59.4
2987-7	30.52	126.97	71.53	96.45	41.01	42.52	57.5
2987-8	20.65	122.32	64.09	101.67	43.44	42.72	57.3
2987-9	29.77	127.75	74.10	97.98	44.33	45.24	54.8
2987-10	20.65	132.28	71.46	111.63	50.81	45.51	54.5
2987-11	30.61	155.88	88.29	125.27	57.67	46.04	54.0
2987-12	20.68	152.37	83.73	131.69	63.05	47.88	52.1
2987-13	20.62	140.60	77.97	119.98	57.35	47.80	52.2
2987-14	20.28	156.27	85.28	135.99	65.00	47.80	52.2
2987-15	29.90	161.76	93.25	131.86	63.35	48.04	52.0
2987-17	20.64	134.47	75.85	113.83	55.21	48.50	51.5
2987-19	30.23	164.29	98.22	134.06	67.99	50.72	49.3
2987-23	30.37	172.14	100.15	141.76	69.78	49.22	50.8
2987-27	29.97	163.72	93.95	133.75	63.98	47.83	52.2
2987-29	30.12	154.93	89.91	124.81	59.79	47.90	52.1
2987-31	30.42	163.39	96.34	132.97	65.91	49.57	50.4
2987-33	30.91	174.19	101.93	143.28	71.03	49.57	50.4
2987-35	30.34	147.85	89.06	117.51	58.72	49.97	50.0
2987-37	30.08	163.19	98.77	133.11	68.69	51.60	48.4
2987-41	31.12	134.01	77.03	102.90	45.91	44.62	55.4
2987-42	20.65	135.35	79.30	114.70	58.65	51.13	48.9
2987-43	30.34	184.16	108.37	153.82	78.03	50.73	49.3
2987-45	31.05	178.65	109.68	147.60	78.63	53.27	46.7
2987-46	20.65	210.31	123.86	189.66	103.21	54.42	45.6
2987-47	29.81	155.85	101.20	126.04	71.39	56.64	43.4
2987-48	20.73	180.89	110.66	160.16	89.94	56.15	43.8
2987-49	30.07	183.83	123.98	153.76	93.91	61.07	38.9
2987-50	20.65	181.23	116.73	160.58	96.08	59.84	40.2
2987-51	30.14	183.62	120.63	153.49	90.49	58.96	41.0
2987-52	20.62	192.88	123.58	172.26	102.96	59.77	40.2
2987-55	30.56	176.18	114.81	145.62	84.25	57.86	42.1
2987-59	30.77	174.16	112.33	143.39	81.56	56.88	43.1
2987-61	20.62	150.21	95.76	129.59	75.14	57.98	42.0
2987-63	30.10	171.69	117.05	141.59	86.95	61.41	38.6
2987-67	29.97	190.45	129.38	160.48	99.41	61.95	38.1
2987-69	30.21	187.31	123.88	157.09	93.67	59.63	40.4
2987-71	30.02	197.52	137.13	167.50	107.11	63.94	36.1
2987-73	29.82	176.01	112.90	146.19	83.08	56.83	43.2
2987-75	30.05	192.60	137.20	162.55	107.15	65.92	34.1
2987-77	29.99	175.21	117.97	145.23	87.99	60.58	39.4

QA/QC NARRATIVE

PROJECT: PORT GAMBLE BAY Cores 22-S-1 and 51-S-1
PARAMETER: Radionuclide Analysis: ^{210}Pb
LABORATORY: Battelle Marine Sciences Laboratory, Sequim, Washington
MATRIX: Sediment
Includes samples 2987-1,3,5,7-9,11,13-15,17,19,23,27,29,31,33,35,37,41-43, 45-51,55,59,61,63,67,69,71,73,75,77

SAMPLE CUSTODY AND PROCESSING: Two cores were received frozen in good condition and sectioned into eighty (80) samples. The samples were weighed, re-frozen and freeze-dried. An aliquot of dried sample was digested and counted by alpha spectroscopy for ^{210}Pb.

DATA QUALITY OBJECTIVES:

^{210}Pb Check Standard Accuracy:	≤ 30% PD
Replicate Precision (Duplicate):	≤ 30% RPD

METHOD: Analysis of sediment samples for ^{210}Pb was conducted according to Battelle SOP MSL-C-012, *^{210}Pb Dating Digestion and Analysis*. An approximate 3-g aliquot of each dry sediment sample was removed for acid digestion and plated onto a small metal disk. Polonium-208 was added to each sample during processing as an internal standard. The disks were counted individually using a Tennelec TC 256 Si (Li) alpha particle spectrometer, Model 7401. Samples were counted for approximately 24 hours each. Sample results are reported as ^{210}Pb activity in units of disintegrations per minute per gram dry weight.

CHECK STANDARD ACCURACY: A ^{210}Pb check standard was analyzed with each core and each analytical batch. The results of the check standard analyses were 3, 7, and 4 percent difference (PD) and were within the QC acceptance criteria of 30% PD.

REPLICATE PRECISION: One sample was analyzed in duplicate with each core and each analytical batch. Precision of duplicate analyses, expressed as the relative percent difference (RPD) of replicate results were 12, 6 and 1% and were within the QC acceptance criteria of 30% RPD.

Battelle Marine Sciences Laboratory
1529 West Sequim Bay Rd.
Sequim, WA 98382
(360) 683-4151

Port Gamble Bay Cores 22-S-1 and 51-S-1 3/16/09
Pb-210 RESULTS IN SEDIMENT
Cores received 12/16/08; sectioned 1/12/09
disintegrations/minute/gram

BATTELLE CODE	SPONSOR ID	Depth (cm)	Percent Dry Weight (g)	ACTIVITY *Pb210* *dpm/g*	RPD (%)	
BLANK	N/A	N/A	N/A	0.000		
BLANK SPIKE	N/A	N/A	N/A	0.000		
CHECK STD	N/A	N/A	N/A	6.89	3%	*
2987-1 R1	22-S-1 0-2	0-2	36.0	2.90		
2987-1 R2	22-S-1 0-2	0-2	36.0	3.26	12%	@
2987-3	22-S-1 4-6	4-6	40.5	2.61		
2987-5	22-S-1 8-10	8-10	40.6	2.21		
2987-7	22-S-1 12-14	12-14	42.5	2.24		
2987-9	22-S-1 16-18	16-18	45.2	1.64		
2987-11	22-S-1 20-22	20-22	46.0	1.44		
2987-15	22-S-1 28-30	28-30	48.0	0.969		
2987-19	22-S-1 36-38	36-38	50.7	0.496		
2987-23	22-S-1 44-46	44-46	49.2	0.448		
2987-27	22-S-1 55-60	55-60	47.8	0.573		
2987-29	22-S-1 65-70	65-70	47.9	0.578		
2987-31	22-S-1 75-80	75-80	49.6	0.568		
2987-33	22-S-1 85-90	85-90	49.6	0.490		
2987-35	22-S-1 95-100	95-100	50.0	0.477		
2987-37	22-S-1 105-110	105-110	51.6	0.539		
BLANK	N/A	N/A	N/A	0.000		
BLANK SPIKE	N/A	N/A	N/A	0.000		
CHECK STD	N/A	N/A	N/A	6.23	7%	*
2987-41 R1	51-S-1 0-2	0-2	44.6	2.32		
2987-41 R2	51-S-1 0-2	0-2	44.6	2.45	6%	@
2987-43	51-S-1 4-6	4-6	50.7	2.06		
2987-45	51-S-1 8-10	8-10	53.3	1.64		
2987-47	51-S-1 12-14	12-14	56.6	0.969		
2987-49	51-S-1 16-18	16-18	61.1	0.724		
2987-51	51-S-1 20-22	20-22	59.0	0.470		
2987-55	51-S-1 28-30	28-30	57.9	0.421		
2987-59	51-S-1 36-38	36-38	56.9	0.473		
2987-63	51-S-1 44-46	44-46	61.4	0.287		
2987-67	51-S-1 55-60	55-60	62.0	0.314		
2987-69	51-S-1 65-70	65-70	59.6	0.258		
2987-71	51-S-1 75-80	75-80	63.9	0.391		
2987-73	51-S-1 85-90	85-90	56.8	0.342		
2987-75	51-S-1 95-100	95-100	65.9	0.334		
2987-77	51-S-1 105-110	105-110	60.6	0.303		

@ = RPD
* = % difference
Check Standard known value = 6.71 dpm/g
Matrix interference

QA/QC NARRATIVE

PROJECT:	PORT GAMBLE BAY Cores 22-S-1 and 51-S-1
PARAMETER:	Radionuclide Analysis: ^{137}Cs
LABORATORY:	Battelle Marine Sciences Laboratory, Sequim, Washington
MATRIX:	Sediment Includes samples 2987*7-13,15,45-51
SAMPLE CUSTODY AND PROCESSING:	Two cores were received frozen in good condition and sectioned into eighty samples. The samples were weighed, re-frozen and freeze-dried. Selected samples were counted by gamma spectroscopy for ^{137}Cs.
DATA QUALITY OBJECTIVES:	^{137}Cs Check Standard Accuracy: ≤ 30% PD Replicate Precision (Duplicate): ≤ 30% RPD
METHOD:	Analysis of sediment samples for gamma-emitting isotopes such as ^{137}Cs was conducted according to Battelle SOP MSL-C-013, *Analyses of ^{137}Cs and other Gamma Emitting Isotopes by Gamma Counting*. Samples were counted using a Canberra Series 40 MCA gamma counter for 8-24 hours each. Sample results are reported as ^{137}Cs activity in units of disintegrations per minute per gram dry weight.
DETECTION LIMIT:	The detection limit is defined as three times the square root of the background counts and is calculated for each sample.
STANDARD DISK COUNTS:	A ^{137}Cs standard disk was counted to set the instrument channels for the region of interest around the ^{137}Cs peak. Counts from the ^{137}Cs standard disk were also used in the calculation of the ^{137}Cs decay rate.
CHECK STANDARD ACCURACY:	Check standard IAEA 135 was analyzed twice with this batch of 16 samples: initially, and following the completion of all sample analyses. Results of check standard analyses were 21 and 15 percent difference (PD) and were within the QC acceptance criteria of 30% PD.
REPLICATE PRECISION:	One (1) replicate sample was analyzed with this batch of samples. Relative percent difference (RPD) was calculated for the replicate pair and found to be 18%, respectively. These results were within the acceptance criteria of 30%.

Battelle Marine Sciences Laboratory
1529 West Sequim Bay Rd.
Sequim, WA 98382
(360) 683-4151

3/16/09

Cs-137 Results in Sediments
Port Gamble Bay Cores
Samples received 12/16/08

Results in disintegrations per minute per gram (dpm/g)

MSL CODE	Core ID	SPONSOR CODE	Depth (cm)	Dry Wt (g)	Dry Wt. (%)	detection limit (dpm/g)	Cs137 dis/min/g (dry wt.)	SRM Certified Value (dpm/g)	%RPD
IAEA-135	NA	IAEA 135	NA	11.0	NA	0.444	35.6	45.2	21% *
2987-7	22-S-1	22-S-1-12-14	12-14	41.0	42.5	0.121	0.121 U		
2987-8	22-S-1	22-S-1-14-16	14-16	43.4	42.7	0.114	0.114 U		
2987-9 R1	22-S-1	22-S-1-16-18	16-18	44.3	45.2	0.115	0.142		
2987-9 R2	22-S-1	22-S-1-16-18	16-18	44.3	45.2	0.109	0.134		6% @
2987-10	22-S-1	22-S-1-18-20	18-20	50.8	45.5	0.0972	0.135		
2987-11	22-S-1	22-S-1-20-22	20-22	57.7	46.0	0.0867	0.123		
2987-12	22-S-1	22-S-1-22-24	22-24	63.1	47.9	0.0762	0.0960		
2987-13	22-S-1	22-S-1-24-26	24-26	57.4	47.8	0.0893	0.0893 U		
2987-15	22-S-1	22-S-1-28-30	28-30	63.4	48.0	0.0802	0.0802 U		
2987-43	51-S-1	51-S-1-4-6	4-6	78.0	50.7	0.0627	0.130		
2987-45	51-S-1	51-S-1-8-10	8-10	76.8	47.3	0.0657	0.128		
2987-46	51-S-1	51-S-1-10-12	10-12	103	54.4	0.0490	0.0898		
2987-47	51-S-1	51-S-1-12-14	12-14	71.4	56.6	0.0708	0.0719		
2987-48	51-S-1	51-S-1-14-16	14-16	89.9	56.2	0.0575	0.0763		
2987-49	51-S-1	51-S-1-16-18	16-18	93.9	61.1	0.0534	0.0886		
2987-50	51-S-1	51-S-1-18-20	18-20	96.1	59.8	0.0532	0.0791		
2987-51	51-S-1	51-S-1-20-22	20-22	90.5	59.0	0.0583	0.0583 U		
2987-52	51-S-1	51-S-1-22-24	22-24	103	59.8	0.0474	0.0666		
IAEA-135	NA	IAEA 135	NA	11.0	NA	0.440	38.6	45.2	15% *

U = less than or equal to calculated detection limit.
* = % difference.
@ = RPD.

Port Gamble Bay Cores (PN 56449)
Completed by Linda Bingler 3/16/09

Two cores were received frozen, partially thawed, sectioned and the sections selectively analyzed for ^{137}Cs and ^{210}Pb. Porosity values were calculated from the percent dry weight.

Core 22-S-1
The percent dry weight varied between 36.0 and 51.6. Generally, the percent dry weight increased with depth indicating a decrease of the organic fraction. Radioactive isotopes of interest in this study are normally associated with the organic fraction of the sediments. The mixed layer, deduced from the ^{210}Pb data, appears to occur from 0 to 14 cm depth. Peak activity for ^{137}Cs was found between 16 and 24 cm. The calculated sedimentation rate for this core was 0.21 g/cm2/yr based on supported lead activity of 50 dpm/g. Dates corresponding to the ^{137}Cs peak range from 1947 to 1960. Assuming that mixing occurred during this time, these estimated dates are reasonable.

Core 51-S-1
The percent dry weight ranged from 44.6 to 65.9. Generally, the percent dry weight increased with depth indicating a decrease of the organic fraction. There wasn't an apparent mixed layer in this core. Gamma activity for ^{137}Cs was found to a depth of 20 cm. The calculated sedimentation rate for this core was 0.28 g/cm2/yr based on supported lead activity of 0.35 dpm/g. Dates corresponding to the ^{137}Cs activity ranged from 1955 to the present. Typically in seawater systems, ^{137}Cs is adsorbed onto particles in the water column and settles into the sediment slowly over considerable time. This is evident in this core and supports the sedimentation rate that was calculated.

Battelle Marine Sciences Laboratory
1529 West Sequim Bay Rd.
Sequim, WA 98382
(360) 683-4151

3/16/09

SEDIMENTATION RATE (g/cm2/yr)
FOR
Port Gamble Bay Core 22-S-1

Core 22-S-1				Time				SEDIMENT		Sediment
Supported Pb210 (dpm/g)= 0.50			Mean	Corrected			Dry wt.	AGE		Accumulation
		Segment	Depth	Pb 210		% Dry	Density	(years)	YEAR	Rate (cm/yr)
Sample #	Sponsor code	Depth (cm)	(cm)	(dpm/g)			(g/cm3)	S = **0.21**		
2987-1	22-S-1 0-2	0-2	1	3.08	x	36.0	0.439	2	2006	0.48
		2-4	3	2.84	x	38.3	0.479	6	2002	0.47
2987-3	22-S-1 4-6	4-6	5	2.61	x	40.5	0.520	11	1997	0.45
		6-8	7	2.41	x	40.6	0.521	16	1992	0.43
2987-5	22-S-1 8-10	8-10	9	2.21	x	40.6	0.522	21	1987	0.43
		10-12	11	2.23	x	41.6	0.540	26	1982	0.42
2987-7	22-S-1 12-14	12-14	13	2.24	x	42.5	0.558	31	1977	0.42
2987-8	22-S-1 14-16	14-16	15	2.18		42.7	0.561	37	1971	0.41
2987-9	22-S-1 16-18	16-18	17	1.64		45.2	0.612	42	1966	0.40
		18-20	19	1.54		45.6	0.620	48	1960	0.40
2987-11	22-S-1 20-22	20-22	21	1.44		46.0	0.628	54	1954	0.39
		22-24	23	1.20		53.2	0.783	61	1947	0.38
2987-13	22-S-1 24-26	24-26	25	0.942		47.8	0.664	67	1941	0.37
2987-14	22-S-1 26-28	26-28	27	0.868		47.8	0.664	74	1934	0.37
2987-15	22-S-1 28-30	28-30	29	0.969		48.0	0.669	80	1928	0.36
		30-32	31	0.733		48.3	0.674	86	1922	0.36
2987-17	22-S-1 32-34	32-34	33	0.826		48.5	0.679	93	1915	0.36
		34-36	35	0.733		50.9	0.731	100	1908	0.35
2987-19	22-S-1 36-38	36-38	37	0.496	x	50.7	0.727	106	1902	0.35
		38-44	41	0.472	x	48.8	0.685	113	1895	0.36
2987-23	22-S-1 44-46	44-46	45	0.448	x	49.2	0.695	133	1875	0.34
		46-55	58	0.511	x	48.5	0.680	145	1863	0.40
2987-27	22-S-1 55-60	55-60	57.5	0.573	x	47.8	0.665	262	1746	0.22
		60-65	63	0.575	x	47.9	0.666	266	1742	0.24
2987-29	22-S-1 65-70	65-70	67.5	0.578	x	47.9	0.666	281	1727	0.24
		70-75	73	0.573	x	48.7	0.684	297	1711	0.24
2987-31	22-S-1 75-80	75-80	77.5	0.568	x	49.6	0.702	314	1694	0.25
		80-85	83	0.529	x	49.6	0.702	330	1678	0.25
2987-33	22-S-1 85-90	85-90	87.5	0.490	x	49.6	0.702	347	1661	0.25
		90-95	93	0.483	x	49.8	0.706	363	1645	0.25
2987-35	22-S-1 95-100	95-100	97.5	0.477	x	50.0	0.711	380	1628	0.26
		100-105	103	0.508	x	50.8	0.729	397	1611	0.26
2987-37	22-S-1 105-110	105-110	107.5	0.539	x	51.6	0.747	415	1593	0.26

Battelle Marine Sciences Laboratory
1529 West Sequim Bay Rd.
Sequim, WA 98382
(360) 683-4151

3/16/09

SEDIMENTATION RATES
FOR
Port Gamble Bay Core 51-S-1

Core 51-S-1				Time				SEDIMENT		Sediment
Supported Pb210 (dpm/g)= 0.35			Mean	Corrected			Dry wt.	AGE		Accumulation
		Segment	Depth	Pb 210		% Dry	Density	(years)	YEAR	Rate (cm/yr)
Sample #	Sponsor code	Depth (cm)	(cm)	(dpm/g)			(g/cm3)	S = **0.28**		
2987-41	51-S-1 0-2	0-2	1	2.39	x	44.6	0.599	2	2006	0.47
2987-42	51-S-1 2-4	2-4	3	1.88	x	51.1	0.736	7	2001	0.44
2987-43	51-S-1 4-6	4-6	5	2.06	x	50.7	0.727	12	1996	0.42
		6-8	7	1.85	x	52.0	0.756	17	1991	0.41
2987-45	51-S-1 8-10	8-10	9	1.64		53.3	0.785	23	1985	0.40
2987-46	51-S-1 10-12	10-12	11	1.17		54.4	0.811	28	1980	0.39
2987-47	51-S-1 12-14	12-14	13	0.969		56.6	0.865	34	1974	0.38
2987-48	51-S-1 14-16	14-16	15	0.906		56.2	0.854	40	1968	0.37
2987-49	51-S-1 16-18	16-18	17	0.724		61.1	0.977	47	1961	0.36
2987-50	51-S-1 18-20	18-20	19	0.615		59.8	0.944	53	1955	0.36
2987-51	51-S-1 20-22	20-22	21	0.470		59.0	0.923	60	1948	0.35
		22-28	25	0.446		58.4	0.909	67	1941	0.38
2987-55	51-S-1 28-30	28-30	29	0.421		57.9	0.895	86	1922	0.34
		30-36	33	0.447		57.4	0.883	92	1916	0.36
2987-59	51-S-1 36-38	36-38	37	0.473		56.9	0.871	111	1897	0.33
		38-40	39	0.380		57.4	0.885	117	1891	0.33
2987-61	51-S-1 40-42	40-42	41	0.397	x	58.0	0.899	123	1885	0.33
		42-44	43	0.355	x	59.7	0.942	130	1878	0.33
2987-63	51-S-1 44-46	44-46	45	0.287	x	61.4	0.986	136	1872	0.33
		46-55	50.5	0.300	x	61.7	0.994	143	1865	0.35
2987-67	51-S-1 55-60	55-60	57.5	0.314	x	62.0	1.001	175	1833	0.33
		60-65	62.5	0.286	x	60.8	0.970	192	1816	0.32
2987-69	51-S-1 65-70	65-70	67.5	0.258	x	59.6	0.940	209	1799	0.32
		70-75	72.5	0.325	x	61.8	0.996	226	1782	0.32
2987-71	51-S-1 75-80	75-80	77.5	0.391	x	63.9	1.055	244	1764	0.32
		80-85	82.5	0.367	x	60.4	0.959	262	1746	0.31
2987-73	51-S-1 85-90	85-90	87.5	0.342	x	56.8	0.870	279	1729	0.31
		90-95	92.5	0.338	x	61.4	0.985	295	1713	0.31
2987-75	51-S-1 95-100	95-100	97.5	0.334	x	65.9	1.111	312	1696	0.31
		100-105	102.5	0.319	x	63.3	1.036	332	1676	0.31
2987-77	51-S-1 105-110	105-110	107.5	0.303	x	60.6	0.965	350	1658	0.31

APPENDIX F
FIELD INVESTIGATION PHOTOGRAPHS
PORT GAMBLE, WASHINGTON

Photograph 1 - Surface sediment grab sample PGSS-39, slightly sandy SILT (ML). Example of an over penetrated surface sediment grab sample.

Photograph 2 - Extruding sediment core sample on board as described in the SAP.

Photograph 3 - Example of a layer of wood material (wood chips and bark) with large shell hash.

APPENDIX G
HUMAN HEALTH FOCUSED RISK EVALUATION

APPENDIX G
HUMAN HEALTH FOCUSED RISK EVALUATION

This appendix presents a focused human health risk evaluation for shellfish ingestion, to accompany the Port Gamble Bay remedial investigation (RI). The Port Gamble Bay RI was initially scoped as an Ecology Sediment Management Standard (SMS) investigation to determine if there were adverse impacts to bay-wide sediment benthic invertebrates due to former activities at the Mill Site, the Former Log Transfer Facility (FLTA) or the Former Lease Area (FLA). Following discussions with the Port Gamble S'Klallam Tribe, the scope of the RI was expanded to include shellfish tissue analysis to evaluate potential human health risks from shellfish ingestion.

The risk assessment focuses on exposure of tribal members to chemicals in shellfish using a tribal ingestion of shellfish scenario. This appendix presents the methods and results of the risk assessment, and calculates risk-based sediment cleanup levels (CULs) for contaminants identified as chemicals of concern (COCs) for shellfish ingestion risks. The sediment CULs are based on MTCA Method B procedures and on parameters for direct contact with sediment that might occur during tribal clamming activities. Concentrations of COCs in sediment and in tissue collected from the site are also compared to available reference data from background locations considered appropriate to Port Gamble Bay.

G.1 Methods for Assessing Risk

Figure G-1 identifies the general objectives and methods for evaluating human health risks and developing sediment cleanup standards that are protective of human health. This effort was intended as a focused exposure assessment and risk evaluation rather than a comprehensive human health risk assessment. As requested by the Port Gamble S'Klallam Tribe, the assessment focuses on risks associated with the collection and ingestion of shellfish from Port Gamble Bay. The risk assessment was primarily intended to estimate human health risks to tribal members who consume shellfish from Port Gamble Bay. The risk assessment also identifies COCs for bay sediments, which are those chemicals with estimated health risks for shellfish ingestion that exceed regulatory thresholds.

The assessment was performed using the following procedures:

- Identify potential exposure pathways and the reasonable maximum exposure (RME) scenario;

- Calculate carcinogenic and noncarcinogenic risks for chemicals detected in shellfish using representative tribal ingestion rates;

- Identify COCs based on tribal shellfish ingestion risk estimates;

- Evaluate the sediment direct contact exposure route by comparing sediment concentrations of COCs for seafood ingestion with MTCA criteria and with sediment cleanup levels calculated for a tribal clamming scenario;

- Compare Port Gamble Bay sediment concentrations of COCs to local Puget Sound sediment background levels obtained as part of the EPA Bold Survey (EPA 2009), using statistical procedures approved by Ecology and consistent with those described in MTCA;

- Compare concentrations of COCs in shellfish tissue collected from Port Gamble Bay to reference levels considered representative of tissue background concentrations for Puget Sound, using statistical procedures approved by Ecology and consistent with those described in MTCA; and

- Determine cleanup levels for sediment that are protective of human health according to procedures described in MTCA and supporting guidance.

G.2 Exposure Assessment

G.2.1 Exposure Pathways and Reasonable Maximum Exposure Scenarios

Two likely exposure pathways were identified for the Port Gamble Bay site:

- Tribal ingestion of shellfish; and

- Direct sediment contact (incidental sediment ingestion and dermal contact) during shellfish gathering.

Two reasonable maximum exposure (RME) scenarios were developed to address these exposure pathways: (1) the tribal seafood ingestion scenario with the focus on shellfish ingestion, and (2) the tribal RME clamming scenario. The RME scenarios were developed for the Port Gamble bay site based on the EPA tribal framework document (EPA 2007). As described below, procedures and relevant exposure parameter values are taken from the recent EPA and Ecology-approved human health risk assessment for the Lower Duwamish Waterway (LDW) site, including directions from EPA regarding exposure parameters for the shellfish ingestion and the clamming RME scenarios (Windward 2007).

In addition to shellfish collection and ingestion, risk from incidental contact with potentially contaminated sediment could occur from activities such as recreational use of the intertidal areas of the bay or use of fishing nets. However, these risks are expected to be significantly less than the risk from consumption of shellfish under the tribal shellfish ingestion scenario or the tribal RME clamming scenario.

Evaluation of the tribal RME clamming scenario consists of the development of sediment cleanup levels using the RME clamming exposure parameters and following MTCA methods. Decisions on the shellfish ingestion and tribal RME clamming scenarios and parameters for quantifying exposures, as well as identification of chemicals of potential concern (COPCs), were based on discussions between Ecology and the Port Gamble S'Klallam Tribe.

G.2.2 Tribal Ingestion of Shellfish Scenario

For the tribal ingestion of shellfish scenario, COPCs, exposure data for shellfish, and calculation of exposures as chronic daily intakes are presented below.

Chemicals of Potential Concern

COPCs were identified in discussions between Ecology and the Port Gamble S'Klallam Tribe, and were analyzed in shellfish tissue samples collected from Port Gamble Bay:

- Metals, consisting of arsenic, cadmium, chromium, copper, mercury, silver, and zinc;
- Polychlorinated dioxins/furans (PCDD/PCDF), congeners and homolog groups;
- Polychlorinated biphenyls (PCBs), both as Aroclors and selected PCB congeners with dioxin-like activity; and
- Carcinogenic PAHs (cPAHs).

Target Species

Shellfish were collected from Port Gamble Bay by the Port Gamble S'Klallam Tribe in two phases. Samples collected in 2009 were transferred to Hart Crowser for subsequent preparation and laboratory analysis. Results for 2009 samples are presented in Tables 11 and 12 of the RI report. Samples collected by the tribe in 2010 were submitted directly to the laboratory and results were

forwarded to Hart Crowser. Results for the 2010 tissue data are presented in Table G-1.

Tissue samples were prepared and homogenized following EPA methods and protocols for Puget Sound. Composite tissue samples from multiple specimens were analyzed to provide representative tissue for testing purposes and obtain an accurate estimate of average chemical concentrations. Sampling stations are depicted on Figure G-2. Only one species was collected at each station, with numbers of individuals per composite varying across the locations, resulting in the following samples collected in 2009 and 2010:

- Three geoduck composite samples, each comprising three specimens, analyzed for all COPCs;

- Nine oyster composite samples comprising 15 oysters, analyzed for metals, PCB Aroclors, and PAHs with dioxins/furans and PCB congeners analyzed in two of the nine oyster samples;

- Twenty composite samples of littleneck clams, manila clams, cockles, and mussels. Each sample was made up of approximately 30 individual organisms and was analyzed for metals, cPAHs, and PCBs, with dioxins/furans and PCB congeners analyzed in two clam samples; and

- One crab composite sample (hepatopancreas and meat analyzed separately) made up of eight adult male specimens, analyzed for all COPCs.

Site-Specific Consumption Rates

Consumption rates for each of these seafood categories were developed following the EPA Tribal Fish and Shellfish Consumption Framework (EPA 2007) and consultation with the Port Gamble S'Klallam Tribe. In addition, although salmon are a highly preferred and consumed fish from Port Gamble Bay, human health risks were not calculated for salmon consumption. The Port Gamble Bay sediment contaminant concentration is not expected to significantly contribute to the salmon tissue concentrations because of the relatively small portion of their lifetime spent in the bay, consistent with EPA guidance in the Framework document (EPA 2007).

A daily tribal shellfish consumption rate of 499 g/day was used with the following breakdown for the species collected from the bay:

- Geoduck – 96.8 g/day. Samples submitted for analysis included the gutball; the skin was removed from the siphon prior to analysis.

- Clams – 255.9 g/day, whole organism without shell. Littleneck clams, manila clams, cockles, and mussels were pooled together under the clam category.

- Oysters – 62.4 g/day, whole organism without shell.

- Dungeness crab – 83.9 g/day, assuming 25 percent hepatopancreas (20.975 g/day) and 75 percent meat (62.925 g/day), which were analyzed separately.

The total ingestion rate for shellfish was taken from the Tribal Framework Document (EPA 2007) using the Suquamish survey data, as agreed with Ecology and the Port Gamble S'Klallam Tribe. The total shellfish ingestion rate was allocated among the shellfish categories of clams, geoducks, oysters, and crabs following the rates identified by EPA in the risk assessment for the LDW site (Windward 2007).

Chronic Daily Intake for Seafood Ingestion Pathway

Contaminant data for evaluating exposures from shellfish consumption were available for crabs, clams, oysters, and geoducks collected from Port Gamble Bay. Chronic daily intakes (CDIs) were calculated for the COPCs identified above. Dioxins, PCBs, and PAHs are evaluated as chemical groups by the following methods:

- Polychlorinated dioxins/furans (PCDD/PCDF) as total tetrachlorodibenzodioxin (TCDD) toxic equivalents (TEQs). World Health Organization (WHO) 2005 dioxin toxicity equivalence factors (TEFs) from MTCA Table 708-1 were used to calculate total TEQs. Non-detected congeners were quantified at one-half their detection limit prior to TEQ calculation.

- Polychlorinated biphenyls (PCBs) both as the sum of Aroclors and TCDD TEQs for PCB congeners with dioxin-like activity. Aroclors were summed following the procedure described in the Sediment Management Standards. Non-detected congeners were quantified at one-half their detection limit prior to TEQ calculation. WHO 2005 PCB congener TEFs listed in MTCA Table 708-4 were used to calculate PCB TEQs.

- Carcinogenic PAHs (cPAHs) as benzo(a)pyrene TEQs. The California-EPA 2005 cPAH TEFs listed in MTCA Table 708-2 were used to calculate benzo(a)pyrene equivalents. Non-detected PAHs were quantified at one-half their detection limit prior to TEQ calculation.

As described below in the Toxicity Assessment, the toxic and carcinogenic form of arsenic is inorganic arsenic. The amount of inorganic arsenic in the shellfish categories was estimated from the measured total arsenic by assuming 1.2 percent inorganic arsenic in clams, and 0.2 percent inorganic arsenic in crabs, as documented for Puget Sound organisms (Ecology 2002).

The CDI for the adult tribal shellfish consumption scenario was calculated as follows:

$$CDI = \frac{\sum (EPC \, x \, IR) x \, FI \, x \, EF \, x \, ED \, x \, CF}{BW \, x \, AT}$$

Where:

CDI = Chronic daily intake (mg/kg-day)
EPC = Exposure point concentration (mg/kg) calculated as the mean tissue concentration for each shellfish tissue category
IR = Ingestion rate (499 g/day) allocated among ingestion rates for each seafood category
FI = Fractional seafood intake from Port Gamble (1.0, assumed at 100%)
EF = Exposure frequency (365 days/year)
ED = Exposure duration (70 years)
CF = Conversion factor (0.001 kg/g)
BW = Body weight (79 kg, EPA 2007)
AT = Averaging time (25550 days)

Exposure point concentrations (EPCs) for COPCs in clam, geoduck, and oyster tissues were the calculated mean values, whereas crab meat and hepatopancreas EPCs are based on the single measurement. Upper confidence limits (UCLs) or percentiles were not used for tissue EPCs since the numbers of organisms in the samples were either sufficiently high to be considered representative of average exposures or, in the case of crab, the number of samples was too low.

For dioxins/furans and dioxin-like PCB TEQs, only two samples of clams and two samples of oysters were analyzed; values are the means from the two samples. For dioxin/furans in clams and oysters, all of the samples were non-detect for all congeners and homolog groups; therefore, the EPCs for dioxins/furans in both clams and oysters are the sum of one-half the detection limit for each congener multiplied by the TEF. In other words, the EPCs are based only on the detection limits, not on detected values. In geoducks, dioxin/furans were non-detected except for octachlorodibenzodioxin (OCDD) in all three samples.

PCBs as Aroclors were detected in only two oyster samples collected from the mill area. PCBs as Aroclors were not detected in any of the three geoduck samples, in any of the 20 clam samples, or in any of the crab samples. Because of the lack of detections, bay wide health risks associated with PCBs as Aroclors in shellfish tissue are not estimated. While PCB congeners were not analyzed in the Tribe's 2010 shellfish samples, bay wide carcinogenic risks related to exposure to PCBs are evaluated using PCB TEQs obtained for the 2009 shellfish samples.

In geoducks, all cPAHs were non-detect in all three samples. Some cPAHs were detected in some of the clam and oyster samples and TEQ EPCs are based on one-half detection limits for non-detected individual PAHs.

For crab, the EPCs for all COPCs are single values, and all cPAHs were non-detect, resulting in EPCs for cPAHs in crab based only on one-half the detection limits.

The EPC for each COPC in each shellfish tissue category was multiplied by the IR for that category and the products were summed to arrive at the total CDI for each COPC for shellfish ingestion. Results are summarized in Table G-2.

G.2.3 Direct Sediment Contact Scenario

The direct sediment contact scenario was evaluated as the adult tribal RME clamming scenario, as described in the recent EPA and Ecology-approved human health risk assessment for the LDW site (Windward 2007). The tribal RME clamming direct contact scenario was used to derive sediment cleanup levels for those COCs identified in the tribal shellfish ingestion scenario.

The exposure parameters for direct contact were identified for both incidental sediment ingestion and dermal contact with sediment during tribal clamming activities. Equations and exposure parameter values for evaluating the tribal clamming scenario are presented in Tables G-3 and G-4 for noncarcinogens and carcinogens, respectively. The resultant sediment CULs and comparison with site concentration data are presented in the risk characterization (Section G.4) below.

G.3 Toxicity Assessment

Carcinogenic risks and noncarcinogenic health effects were evaluated separately because of differences in assumptions about the mechanism of these toxic effects. The toxicity values used to evaluate exposure to chemicals with noncarcinogenic and carcinogenic effects are called the reference dose (RfD)

and cancer slope factor (CSF), respectively. All toxicity values were taken from the EPA IRIS database.

Carcinogenic chemicals are assumed to have no threshold for carcinogenicity. Carcinogenic risks are presented as the chance of contracting cancer over a 70-year lifetime due to the site-related exposure. These risks are considered by EPA to be excess cancer risks that are in addition to the national rates of cancer for the general population.

Chemicals with noncarcinogenic health effects are generally not toxic below a certain threshold; a critical chemical dose must be exceeded before adverse health effects are observed. The potential for noncarcinogenic health effects is represented by the ratio of the estimated chemical intake to the RfD, and is expressed as a hazard quotient (HQ). Exposures resulting in an HQ less than or equal to 1 are unlikely to result in non-cancer adverse health effects.

For chemicals of potential concern (COPCs) evaluated as a group that consists of dioxins/furans, PCBs, and cPAHs, the CSFs are applied to the TEQs, determined as described above. For arsenic, the carcinogenic and toxic form of the metal is inorganic arsenic, and risks are evaluated by comparison of the CDI for inorganic arsenic with the toxicity value for inorganic arsenic.

G.4 Risk Characterization and Identification of COCs for Shellfish Ingestion

Carcinogenic risks and noncarcinogenic HQs for the tribal shellfish ingestion scenario were calculated separately. Carcinogenic risk estimates were calculated by multiplying the estimated chemical CDI by its CSF. Excess cancer risk estimates for individual COPCs were compared to the MTCA acceptable risk level of 1×10^{-6}. A 1×10^{-6} excess cancer risk represents an additional one-in-one-million probability that an individual may develop cancer over a 70-year lifetime as a result of indirect exposure to chemicals through the consumption of seafood. Noncarcinogenic HQs are calculated as the ratio of the CDI to the RfD.

COCs were identified for the tribal shellfish ingestion scenario as chemicals with an excess cancer risk greater than 1×10^{-6} or a noncarcinogenic HQ greater than 1.0. COCs were retained for additional evaluation of sediment cleanup levels.

Hazard quotients for noncarcinogenic and excess cancer risks for carcinogenic chemicals for the tribal shellfish ingestion scenario are summarized in Table G-5. Cadmium and copper are the only COPCs that have non-cancer HQs greater than 1.0 and were carried through for additional evaluation:

- Cadmium, HQ = 2.0
- Copper, HQ = 1.1.

Inorganic arsenic, dioxin/furans, PCB dioxin-like congeners, and cPAHs are the COPCs with an excess cancer risk above the 1×10^{-6} threshold and were carried through for additional evaluation:

- Arsenic, inorganic, excess cancer risk = 1.5×10^{-4}
- Dioxin/furan TEQ, excess cancer risk = 3.6×10^{-4}
- PCB congener TEQ, excess cancer risk = 1.2×10^{-4}
- cPAH TEQ, excess cancer risk = 7.0×10^{-5}.

The majority of the calculated excess risk values for dioxins, PCB congeners, and cPAHs is due to substitution of one-half the detection limit for non-detected analytes.

G.5 Risk-Based Concentrations for Sediment

G.5.1 Shellfish Ingestion

Risk-based concentrations in sediment for shellfish ingestion are those concentrations in sediment that correspond to concentrations in shellfish that are protective of human health at the tribal ingestion rate. However, data are insufficient to quantify a relationship between the chemical concentrations in shellfish from Port Gamble Bay with those in bay sediment; hence, a risk-based sediment concentration that directly relates to shellfish ingestion cannot be determined with certainty. Instead, the assumption was made that 100 percent of the shellfish tissue COC concentrations were derived from sediment uptake at the site, and that the potential need for cleanup to protect shellfish ingestion would be based on a comparison of sediment concentrations with natural background levels, consistent with cleanup goals under MTCA.

The above approach for evaluating sediment cleanup to protect shellfish ingestion was used in lieu of developing site-specific, biota-sediment bioaccumulation factors (BSAFs) or borrowing them from other sources. BSAFs quantify the relationship between sediment and tissue chemical concentrations. Development of site-specific BASFs is data intensive, very costly, and constitutes a level of effort considerably beyond the current assessment. In addition, there is a high level of uncertainty in BSAFs taken from other sources because of

limited documentation or high uncertainty due to variability. Therefore, it was assumed that sediment concentrations of shellfish tissue COCs exceeded risk-based levels for protection of shellfish ingestion and they were carried forward into an evaluation of sediment cleanup levels and background levels.

G.5.2 Sediment Direct Contact

Identification of a risk-based threshold for direct contact exposure to COPCs in sediment was performed by comparing maximum sediment chemical concentrations at the site to MTCA Method B unrestricted soil screening levels, and to sediment cleanup levels (CULs) developed using the tribal RME clamming scenario and MTCA Method B procedures. In other words, the exposure parameter values (e.g., body weight, averaging time, exposure frequency, exposure duration) for the tribal RME clamming scenario were used with the MTCA procedure for calculating tribal clamming direct contact scenario cleanup levels for sediment.

Only subtidal sediment chemical data are available for Port Gamble Bay; however, subtidal sediment concentrations are not directly comparable to MTCA human health risk-based soil criteria because exposure to subtidal sediment tends to be more limited than to soil or to intertidal sediment (i.e., sediment depth is between 20 and 60 feet below the surface for most of Port Gamble Bay and intertidal samples were not collected). Therefore, Method B direct contact criteria was assumed to provide a conservative comparative screening level below which adverse effects would not be anticipated. MTCA Method B screening criteria and maximum surface sediment concentrations for noncarcinogens and carcinogenic COPCs detected in shellfish tissue samples are presented in Tables G-3 and G-4, respectively. The maximum concentrations of all surface sediment metal, cPAH, total PCBs as Aroclors, and dioxin/furan TEQs are below MTCA Method B criteria for direct contact (incidental ingestion).

Sediment CULs developed for the tribal clamming scenario are compared with maximum surface sediment concentrations for noncarcinogens and carcinogens in Tables G-3 and G-4, respectively. Maximum concentrations of all surface sediment metal, cPAH, total PCBs as Aroclors, and dioxin/furan TEQs are below the CULs developed for the tribal RME clamming scenario for incidental ingestion and dermal contact.

G.6 Background Concentrations for COPCs

G.6.1 Sediment

Concentrations of COPCs in Port Gamble Bay surface sediments were compared with representative background concentrations to evaluate cleanup levels for the protection of tribal shellfish ingestion. This approach was based on the assumption that sediment chemical concentrations would represent the source of chemicals detected in shellfish collected from Port Gamble Bay. Comparison of the sediment levels to background and identifying sediment cleanup levels based on background concentrations is consistent with the MTCA requirement that the cleanup level be set at the highest of three values: the concentration representing a 1×10^{-6} risk level, background, or PQL.

Background sediment data were taken from the Puget Sound background sediment database developed from the EPA Bold survey (EPA 2009). Fifteen stations were selected from the Bold survey dataset as reasonably representative of local background conditions for Port Gamble Bay. The following set of stations selected for background are a mix of stations in Hood Canal, Dabob Bay, and Admiralty Inlet:

- Hood Canal – HC_0, HC_1, HC_2, HC_3, and HC_6
- Dabob Bay - R_DAB_0, R_DAB_1, R_DAB_2, R_DAB_5, and R_DAB_7_C
- Admiralty Inlet - AI_1, AI_5_C, AI_11_C, AI_13_C, and AI_20_C_GS

Statistical comparisons between Port Gamble Bay and local Puget Sound background were made for sediment concentrations of COCs identified for the tribal shellfish ingestion scenario. Analyses were performed using EPA's ProUCL (EPA 2007) software. The ProUCL statistical methods were used in place of MTCAStat for data evaluation [WAC 173-340-720 (9)] because the default lognormal assumption in MTCAStat overestimates site upper confidence levels (UCLs) when non-detects are present,. For site data, upper 95 percent confidence limits (UCLs) on the mean were determined from ProUCL. Since ProUCL calculates the 95 percent UCL by several methods, the value recommended by ProUCL was selected. Since dioxin/furan TEQs and cPAH TEQs are calculated from multiple chemical values, the TEQs were calculated using one-half the detection limit for non-detected congeners and individual PAHs in the original data.

As described in MTCA for comparing site with background data, the 95 percent UCLs on the mean of site data for COPCs were compared with local Puget

Sound background 90th percentile values. ProUCL was used to evaluate the background data distribution characteristics, and the reported distribution in ProUCL was used as the basis for the statistical metrics. ProUCL determines the distribution of the data, similar to the calculation of the UCL above, and calculates 90th percentile values for all distribution types that the data fit. However, ProUCL does not recommend a specific distribution or 90th percentile value when the data fit multiple types of distributions. The ProUCL user guide (EPA 2010) recommends against using lognormal distributions for calculating descriptive statistics such as percentiles, due to potential bias that can result in high values. For the 90th percentile values presented herein, those recommended by ProUCL for normal distribution are used preferentially if the data are found to be normally distributed, followed sequentially by the values for lognormal distribution if only lognormal 90th percentiles are provided or they are not higher than the 90th percentile value for gamma distribution, followed by gamma distribution, and finally non-parametric values where a distribution was not discernible.

Summary statistics for site and background sediment data comparisons for metals, dioxin/furans, and total PCBs are presented in Tables G-6 through G-9. Data are expressed in units of dry weight. Conclusions are summarized below:

- Arsenic data could not be statistically evaluated since all Port Gamble Bay sediment sample results were non-detect. The practical quantitation limits (PQLs) were slightly higher than those for the Puget Sound Bold study dataset though still below the SMS criterion. The median bay-wide detection limit was 8 mg/kg compared to a local Puget Sound background median concentration of 6 mg/kg. The Puget Sound background 90th percentile concentration is 10.9 mg/kg with a lognormal distribution (Table G-6). Overall, despite the lack of statistical analysis, the range of undetected arsenic in Port Gamble Bay sediment based on detection limits appears to be within the range of local background concentrations for Puget Sound.

- Copper in sediment in Port Gamble Bay appears to be within background concentrations, with a Port Gamble Bay 95 UCL of 29.2 mg/kg falling below the local Puget Sound background 90th percentiles of 58.0 mg/kg for the gamma distribution (Table G-6).

- Cadmium concentrations in Port Gamble Bay were statistically slightly higher than those in Puget Sound background samples. Port Gamble median and 95 percent UCL on the mean concentrations were 0.75 and 1.5 mg/kg, respectively, while local Puget Sound background median and 90th percentile concentrations were 0.18 and 1.1 mg/kg, respectively. Despite these differences, the maximum concentration of cadmium in Port Gamble

Bay sediment of 2.3 mg/kg was equal to the maximum concentration in background Puget Sound sediment (Table G-6). The highest background station, HC_2, had a cadmium concentration of 2.3 mg/kg, about two times that of the next lowest background station.

- For dioxins/furans with non-detects set equal to one-half the detection limits, Port Gamble median and 95th percentile concentrations were 0.82 and 1.48 ng/kg TEQ, respectively, while local Puget Sound background median and 90th percentile concentrations were 1.06 and 1.58 ng/kg TEQ, respectively (Table G-7). The published Bold Survey value for Puget Sound background dioxin was 4 ng/kg TEQ; however, that value was calculated as the 90 percent upper confidence level on the 90th percentile of the data distribution based on a lognormal data distribution.

- For PCB Aroclors, site and Puget Sound background sediment concentrations could not be calculated since both datasets had greater than 90 percent non-detected values (Table G-8).

- PCB congeners could not be compared, since congeners were not analyzed in Port Gamble sediment samples.

- Carcinogenic PAH TEQs in sediment in Port Gamble Bay, with a 95 UCL of 23.5 µg/kg, exceeds the 90th percentile background TEQ of 6.04 µg/kg for lognormal distribution (Table G-9).

G.6.2 Shellfish Tissue

Concentrations in shellfish tissue from reference locations, which may be considered background values if collected from EPA or Ecology-recognized background locations, were identified for select COCs, where data were available. Reference data were identified for dioxins/furans in crabs, and arsenic in clams and crabs. Although health risks were evaluated for the inorganic form of arsenic in shellfish, the comparison with reference data was evaluated using data on total arsenic. Data are also available in the Ecology EIM database for reference levels of dioxin/furan TEQs in clams, as identified in a DMMP (2009) issue paper; however, all congeners and homolog groups for dioxins/furans were non-detect in clams and oysters from Port Gamble Bay. Therefore, dioxins/furans in clam tissues were not evaluated for reference comparison. PAHs in tissues were not compared with reference tissue levels since background data could not be found.

The following datasets were used for the reference tissue concentrations, with tissue data in wet weight units:

- Data on dioxin TEQs in crabs were available for background locations from the Rayonier Site RI (Dungeness Bay, Freshwater Bay). Data, summarized in Tables G-10 and G-11 consist of 23 crab samples.

- Data on total arsenic in clams collected from background locations were taken from an EPA and Ecology-approved data report for the RI for the LDW site (Windward 2005a). Clams were collected from a bay of Bainbridge Island, and data from a total of six composite samples were available, each composite consisting of 20 individual clams of mixed species. The background data on clams collected from areas that may have been influenced by the ASARCO plume were not used. Data are presented in Table G-12.

- Data on total arsenic in crabs from background locations were taken from an EPA and Ecology-approved data report for the RI for the LDW site (Windward 2005b). Crabs were collected from Blake Island and East Passage; data from a total of 12 composite samples were available, six of Dungeness crab and six of slender crab. Arsenic concentrations are reported for both edible meat and hepatopancreas tissue.

Summary statistics for site and reference tissue data comparison are presented in Tables G-12 through G-14. Conclusions are summarized below:

- The 90th percentile value for dioxin/furan TEQ concentrations in the 23 reference crab muscle samples was 0.37 ng/kg, Two samples collected from Hat Island and Sammish Island had slightly elevated TEQs compared to other background locations however, no rationale could be found for removing these two samples as potential outliers. The Port Gamble Bay single crab muscle TEQ concentration was 0.37 ng/kg, which is identical to the reference 90th percentile values (Table G-14). For reference crab hepatopancreas, the 90th percentile dioxin TEQ was 0.94 ng/kg for the lognormal distribution for the 23 samples. In comparison, the Port Gamble Bay single crab hepatopanceas TEQ was 0.94 ng/kg, which is the same as the reference value.

- Concentrations of total arsenic in reference clams were found to fit a normal distribution, whereas the Port Gamble Bay data were not found to fit a discernible distribution. The 90th percentile value for total arsenic in the reference clams was 2.81 mg/kg, which is higher than the total arsenic 95 UCL of 1.77 mg/kg for Port Gamble Bay clams (Table G-15).

- The 90th percentile for arsenic in 12 reference composite crab meat samples was 10.9 mg/kg, with a mean of 8.4 mg/kg. The concentration of arsenic in

the single sample of crab meat from Port Gamble Bay at 7 mg/kg is below these reference values (Table G-16). For crab hepatopancreas, the 90th percentile for arsenic in four composite crab hepatopancreas samples was 11.6 mg/kg, with a mean of 7.9 mg/kg. The concentration of arsenic in the single sample of crab hepatopancreas from Port Gamble Bay at 4 mg/kg is below these reference values.

G.6.3 Summary of the Background Comparisons

Based on the above analysis, concentrations of dioxin/furan TEQs and PCB Aroclors in sediment of Port Gamble Bay were no different from those in background sediment in Puget Sound. The dioxin/furan TEQs in crab meat and hepatopancreas from the bay are within background reference levels, although site data are limited to single composite samples.

For arsenic in sediment, which were all non-detect, the range of detection limits for Port Gamble Bay sediment falls within the range of concentrations in background Puget Sound sediment. Thus, it is uncertain whether arsenic in Port Gamble Bay sediment is within background concentrations. For tissues, arsenic appears to be below reference values for crab meat and hepatopancreas from background locations, although site data are limited to single composite samples. Arsenic in clams from Port Gamble Bay is below reference values from background locations in Puget Sound.

For cadmium, the range of detected concentrations in Port Gamble Bay sediment falls within the range of concentrations in background Puget Sound sediment, but statistically the Port Gamble Bay sediment concentrations exceed background. Copper in Port Gamble Bay sediment clearly is within background.

The cPAH concentrations detected in Port Gamble Bay sediment exceed background concentrations.

G.7 Sediment Cleanup Levels

Sediment cleanup levels are designed to integrate both protection of human health and benthic organisms.

G.7.1 Protection of Human Health

For protection of human health, MTCA requires establishing cleanup levels that are the highest of the following:

- Risk-based concentration corresponding to less than an excess cancer risk of 1×10^{-6} or an HQ of 1;

- Practical Quantitation Limit (PQL); or

- Background.

A summary of preliminary cleanup screening levels is presented in Table G-17. Based on the statistical evaluation of risk drivers in the preceding section, the following sediment cleanup levels have been established:

- PAHs – While sediment cPAH concentrations are below MTCA Method B direct contact risk-based concentrations, cPAHs present an excess cancer risk to tribal shellfish ingestion and their concentrations in Port Gamble Bay sediment exceed local background. The selected cleanup level is set at the 90th percentile background cPAH TEQ in sediment of 6.04 µg/kg based on the assumption that shellfish are accumulating their body burdens from the sediments. Since cPAH PQLs for sediment samples collected from Port Gamble Bay were approximately 10 times higher than PQLs for samples collected from background locations, substitution of one-half the PQL has a significant contribution to bay wide sediment TEQ calculations. Therefore, additional sediment PAH analysis using lower detection limits is recommended during long-term monitoring.

- Arsenic – The interim cleanup level for arsenic in sediment is the higher of the PQL or the lognormal 90th percentile background value of 10.9 mg/kg, since arsenic was not detected in Port Gamble Bay sediment samples at detection limits above the 90th percentile background level. Because the range of detection limits for the bay sediment (6 mg/kg to 20 mg/kg) was within the range of detected background values (2.2 mg/kg to 21 mg/kg), whether arsenic in Port Gamble Bay exceeds background is uncertain. Additional sediment arsenic analysis using lower detection limits is recommended during long-term monitoring so that comparisons can be made to Puget Sound background.

- Cadmium – While sediment cadmium concentrations are below MTCA Method B direct contact risk-based concentrations, cadmium presents an excess risk to tribal shellfish ingestion and their concentrations in Port Gamble Bay sediment exceed local background. The selected cleanup level is set at the local Puget Sound 90th percentile background sediment concentration of 1.1 mg/kg based on the assumption that shellfish are accumulating their body burdens from the sediment.

- Dioxins/Furans – Dioxins/furans were eliminated as COCs since statistical evaluation demonstrated that there is no difference between Port Gamble Bay sediment dioxin TEQ concentration and the Puget Sound 90th percentile background concentration of 1.58 ng/kg TEQ; dioxin/furan TEQs in the single crab sample from the bay was below the average background crab tissue concentration; and all dioxin/furan congeners were non-detect in all clam and oyster samples from the Bay. Sediment dioxin analysis may be helpful in establishing trends in long-term monitoring.

- PCB Aroclors – PCBs were eliminated as COCs for the bay wide area since the only Aroclor detections were in two tissue samples collected from the Mill Area. This area will undergo active remediation and PCBs will be removed as part of that cleanup.

G.7.2 Protection of Benthic Organisms

The SMS criteria (chemical and biological toxicity) are deemed to be protective of benthic invertebrates. As described in Section 6.5 of the RI report, only three locations in Port Gamble Bay exceeded SQS chemical criteria and no locations exceeded CSL chemical criteria. Therefore, Port Gamble sediment cleanup for protection of benthic organisms is based on CSL failures from biological toxicity testing.

G.8 Uncertainty Identification

The following uncertainties in the human health risk evaluation have been identified:

- The risk assessment was based on data from various shellfish organisms that were collected from intertidal and subtidal locations in the bay. The lack of collocated sediment and tissue data on organisms from intertidal locations presents uncertainty in the exposure estimates compared to background locations for tribal members who may collect and ingest shellfish from the intertidal areas.

- The crab samples from the bay consisted of a single sample consisting of five organisms, and three geoduck samples consisting of three organisms each. Because of these limited numbers of samples, the exposure estimates for chemicals in crab and geoduck are uncertain.

- The analyses of dioxin/furans in clam and oyster tissues from Port Gamble Bay were limited to two samples and all congeners in both samples were

non-detect. Because of the limited number of samples of clams and oysters, it is uncertain if the data are representative of conditions in the bay.

- Survey data on the ingestion of shellfish by the Port Gamble S'Klallam Tribe are unavailable; shellfish ingestion rates were based on the Suquamish Tribe survey and were developed in consultation with the Port Gamble S'Klallam Tribe. Although the applicability of the ingestion rates to the Port Gamble S'Klallam Tribe may entail some uncertainty, they are considered to be sufficiently health protective of potential tribal exposures at Port Gamble Bay.

- Limited tissue analysis data are available for organisms collected from background or reference locations within Puget Sound. For those COCs with limited data, there is uncertainty as to whether Port Gamble Bay tissue concentrations are elevated compared to background areas and, consequently, whether there is increased risk from ingestion of shellfish collected from Port Gamble Bay compared to other areas. Available reference tissue data from background locations suggests that dioxin/furan TEQs in crabs from the bay are comparable to those identified as background crab data, including data reported in muscle tissue (0.3 ng/kg) and hepatopancreas (1.6 ng/kg) of Dungeness crabs collected from Dungeness Bay (PTI 1991). In addition, comparison of arsenic levels in clams and crabs from the bay with reference tissue data from background locations that were collected to support the RI at the LDW site suggests that arsenic is within background. These results suggest that the risks due to arsenic exposure in the shellfish ingestion scenario for the site are at background levels.

- Although statistical analysis following the MTCA method indicated that the Port Gamble Bay sediment 95 UCL concentration of cadmium exceeded 90th percentile background in sediment, the range of detected cadmium concentrations in Port Gamble Bay sediment was within the range of detected concentrations in the background dataset. Additional sediment cadmium analysis is recommended during long-term monitoring.

- Background tissue data for cadmium and copper in shellfish tissue are not readily available and, therefore, it is unknown if ingestion of shellfish from Port Gamble Bay presents an elevated risk compared to shellfish from background locations.

- While tissue samples were analyzed for both Aroclors and PCB congeners, sediment was only analyzed for Aroclors and the number of detections was too low for background analysis following the MTCA method. Therefore,

comparison with Puget Sound background PCBs concentrations could not be performed reliably.

- While inorganic arsenic concentrations in shellfish resulted in excess cancer risk greater than 1×10^{-6} for tribal shellfish ingestion, total arsenic was not detected in surface sediment samples (median reporting limit = 8 mg/kg) of Port Gamble Bay and, therefore, a statistical comparison with Puget Sound background sediment arsenic concentrations was not possible. Because the range of detection limits for total arsenic was within the range of detected arsenic in the background dataset, there is uncertainty whether arsenic in Port Gamble Bay sediment is within background. Additional sediment arsenic analysis using lower detection limits is recommended during long-term monitoring so that comparisons can be made to Puget Sound background sediment.

G.9 Summary

In summary, the data collected in shellfish tissues from Port Gamble Bay demonstrate that carcinogenic PAHs present the majority of site-related risks to tribal members who may consume shellfish from the Bay, and they are identified as the risk drivers for the tribal shellfish ingestion scenario. Carcinogenic PAHs are also elevated above background in sediment. Risks associated with other COCs such as cadmium and copper also exceed regulatory thresholds. However, all other COPCs for the site are either:

- Below risk thresholds for shellfish ingestion or sediment contact;

- Within background for sediment (e.g., dioxins/furans, PCBs, copper) or within background reference values for tissue (e.g., dioxins/furans, arsenic); or

- Have reasonable uncertainty as to whether sediment concentrations are greater or less than background (e.g., arsenic).

The primary risk driver for human health risks is identified as cPAHs through shellfish ingestion. However, a large component of the calculated excess risk for cPAHs is due to substitution of one-half the detection limit for non-detected analytes.

G.10 References

DMMP, 2009. Proposal to Revise the Open-Water Disposal Guidelines for Dioxins in Dredged Material, Attachment 3, Dioxin Project Risk Assessment,

Technical Memorandum. Presented at SMARM, May 2009. http://www.nws.usace.army.mil/publicmenu/DOCUMENTS/DMMO/Dioxin_Issue_Paper-May_1_20091.pdf.

EPA, 2007. Framework for selecting and using tribal fish and shellfish consumption rates for risk-based decision making at CERCLA and RCRA cleanup sites in Puget Sound and the Strait of Georgia. US Environmental Protection Agency, Region 10, Seattle, WA.

EPA, 2010. ProUCL Version 4.00.05 User Guide (Draft). EPA/600/R-07/038. U.S. Environmental Protection Agency, Office of Research and Development, Las Vegas, NV. Prepared by A. Singh, R. Maichle, N. Armbya, A.K. Singh, and S.E. Lee. Lockheed Martin Environmental, Las Vegas, NV. May.

Windward, 2005a. Lower Duwamish Waterway remedial investigation. Data report: Chemical analyses of benthic invertebrate and clam tissue samples and co-located sediment samples. Prepared for Lower Duwamish Waterway Group. Windward Environmental LLC, Seattle, WA.

Windward, 2005b. Lower Duwamish Waterway remedial investigation. Data report: Fish and crab tissue collection and chemical analyses. Prepared for Lower Duwamish Waterway Group. Windward Environmental LLC, Seattle, WA.

Windward, 2007. Lower Duwamish Waterway Remedial Investigation. Baseline Human Health Risk Assessment. Final. Prepared for Lower Duwamish Waterway Group. Windward Environmental LLC, Seattle, WA. November.

J:\Jobs\1733014\RI Report\Appendix G\Appendix G.doc

Table G-1 - Summary of Port Gamble S'Klallam Tribe Validated Shellfish Sampling Results - April 2010 Sampling

Task	PortGambleTissue2010	PortGambleTissue2010	PortGambleTissue2010	PortGambleTissue2010	PortGambleTissue2010	PortGambleTissue2010	PortGambleTissue2010	PortGambleTissue2010	PortGambleTissue2010	PortGambleTissue2010
Station ID	Mill Site B-1	Mill Site B-1	Mill Site B-1	Mill Site B-2	Mill Site B-2	Mill Site B-2	Mill Site B-3	Mill Site B-3	Landfill-2	Landfill-2
Sample ID	B1_C_PGST_100429	B1_LN_PGST_100429	B1_O_PGST_100429	B2_C_PGST_100429	B2_O_PGST_100429	B3_C_PGST_100429	B3_MUS_PGST_100429	B3_O_PGST_100429	LF2_C_PGST_100429	LF2_LN_PGST_100429
Sample Date	4/29/2010	4/29/2010	4/29/2010	4/29/2010	4/29/2010	4/29/2010	4/29/2010	4/29/2010	4/29/2010	4/29/2010
Species	Cockles	Littleneck Clams	Oysters	Cockles	Oysters	Cockles	Mussels	Oysters	Cockles	Littleneck Clams
Sample Type	N	N	N	N	N	N	N	N	N	N
Conventional Parameters (pct)										
Lipids	**0.33**	**0.46**	**1.75**	**0.43**	**2.28**	**0.40**	**1.54**	**2.13**	**0.28**	**1.37**
Metals (mg/kg)										
Arsenic	1 U	**2**	**1**	1 U	**1**	1 U	**1**	**2**	1 U	**1**
Cadmium	**0.04**	**0.29**	**1.00**	**0.05**	**1.27**	**0.04**	**0.57**	**1.35**	0.04 U	**0.09**
Chromium	**0.40**	**1.90**	**0.20**	**0.40**	**0.20**	**0.40**	**0.20**	**0.20**	**0.30**	**0.70**
Copper	**1.9**	**25.6**	**9.4**	**5.8**	**12.4**	**3.8**	**42.9**	**33.5**	**1.2**	**3.8**
Lead	0.4 U	**2.0**	0.4 U	**0.5**	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
Mercury	0.005 U	**0.006**	**0.012**	**0.005**	**0.010**	0.005 U	**0.005**	**0.010**	**0.006**	**0.008**
Silver	0.06 UJ	0.06 UJ	**0.1 J**	0.06 UJ	**0.11 J**	0.06 UJ	0.06 UJ	**0.15 J**	0.06 UJ	0.06 UJ
Zinc	**13**	**27**	**161**	**16**	**185**	**13**	**23**	**263**	**9**	**13**
Aromatic Hydrocarbons (µg/kg)										
Benzo(a)anthracene	**1.3**	**1.4**	**3.9**	**4.2**	**25.0**	**3.7**	**0.8**	**48.0**	**0.7**	**0.7**
Benzo(a)pyrene	0.5 U	**0.6**	**0.9**	**1.0**	**3.9**	**0.9**	0.5 U	**7.7**	0.5 U	0.5 U
Benzo(b)fluoranthene	0.5 U	**0.7**	**3.0**	**1.6**	**13.0**	**1.2**	**0.9**	**28.0**	0.5 U	**0.7**
Benzo(k)fluoranthene	0.5 U	**0.7**	**3.0**	**1.6**	**13.0**	**1.2**	**0.9**	**28.0**	0.5 U	**0.7**
Chrysene	**1.6**	**1.8**	**8.1**	**5.0**	**41.0**	**5.0**	**1.7**	**62.0**	**1.1**	**1.4**
Dibenzo(a,h)anthracene	0.5 U	0.5 U	0.5 U	0.5 U	**0.5**	0.5 U	0.5 U	**1.1**	0.5 U	0.5 U
Indeno(1,2,3-c,d)pyrene	0.5 U	0.5 U	0.5 U	0.5 U	**0.6**	0.5 U	0.5 U	**1.3**	0.5 U	0.5 U
Total cPAH TEQ (CAL EPA 2005; U = 1/2)	**0.5**	**0.9**	**2.0**	**1.8**	**9.5**	**1.6**	**0.6**	**19.0**	**0.4**	**0.5**
PCB Aroclors (µg/kg)										
Aroclor 1016	4 U	4 U	4 U	3.9 U	3.9 U	3.9 U	4 U	4 U	3.9 U	3.9 U
Aroclor 1221	4 U	4 U	4 U	3.9 U	3.9 U	3.9 U	4 U	4 U	3.9 U	3.9 U
Aroclor 1232	4 U	6 U	4 U	5.9 U	3.9 U	3.9 U	4 U	4 U	3.9 U	3.9 U
Aroclor 1242	4 U	4 U	4 U	3.9 U	**21**	**4.2**	4 U	4 U	3.9 U	3.9 U
Aroclor 1248	4 U	4 U	4 U	3.9 U	3.9 U	3.9 U	4 U	**7.2**	3.9 U	3.9 U
Aroclor 1254	4 U	4 U	6 U	5.9 U	16 U	3.9 U	4 U	8 U	3.9 U	3.9 U
Aroclor 1260	4 U	4 U	4 U	3.9 U	3.9 U	3.9 U	4 U	4 U	3.9 U	3.9 U
Total PCB Aroclors (U = 0)	4 U	6 U	6 U	5.9 U	**21**	**4.2**	4 U	**7.2**	3.9 U	3.9 U

Table G-1 - Summary of Port Gamble S'Klallam Tribe Validated Shellfish Sampling Results - April 2010 Sampling

Task	PortGambleTissue2010	PortGambleTissue2010	PortGambleTissue2010	PortGambleTissue2010	PortGambleTissue2010	PortGambleTissue2010	PortGambleTissue2010	PortGambleTissue2010	PortGambleTissue2010	PortGambleTissue2010
Station ID	Landfill-2	Landfill-2	Landfill-3	Landfill-3	Landfill-3	Landfill-4	Landfill-4	Landfill-4	Landfill-4	Log Site
Sample ID	LF2_M_PGST_100429	LF2_O_PGST_100429	LF3_C_PGST_100429	LF3_LN_PGST_100429	LF3_M_PGST_100429	LF4_C_PGST_100429	LF4_LN_PGST_100429	LF4_M_PGST_100429	LF4_O_PGST_100429	LS_C_PGST_100429
Sample Date	4/29/2010	4/29/2010	4/29/2010	4/29/2010	4/29/2010	4/29/2010	4/29/2010	4/29/2010	4/29/2010	4/29/2010
Species	Manila Clams	Oysters	Cockles	Littleneck Clams	Manila Clams	Cockles	Littleneck Clams	Manila Clams	Oysters	Cockles
Sample Type	N	N	N	N	N	N	N	N	N	N
Conventional Parameters (pct)										
Lipids	**0.49**	**1.69**	**0.40**	**0.29**	**0.23**	**0.22**	**0.32**	**0.41**	**1.66**	**0.39**
Metals (mg/kg)										
Arsenic	**2**	**1**	1 U	**1**	**2**	1 U	**2**	**1**	**1**	1 U
Cadmium	**0.29**	**1.18**	0.04 U	**0.25**	**0.27**	0.04 U	**0.37**	**0.25**	**1.20**	**0.04**
Chromium	**0.30**	**0.20**	**0.20**	**0.40**	**0.20**	**0.30**	**0.20**	**0.20**	**0.10**	**0.20**
Copper	**2.6**	**8.4**	**0.9**	**6.1**	**3.3**	**1.0**	**4.4**	**4.8**	**8.4**	**1.1**
Lead	0.4 U	0.4 U	0.4 U	**0.4**	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
Mercury	**0.008**	**0.011**	**0.005**	**0.006**	**0.009**	**0.006**	**0.009**	**0.010**	**0.014**	0.005 U
Silver	0.06 UJ	**0.13 J**	0.06 UJ	0.06 UJ	0.06 UJ	0.06 UJ	0.06 UJ	**0.1 J**	**0.13 J**	0.06 UJ
Zinc	**10**	**135**	**10**	**16**	**10**	**9**	**14**	**11**	**165**	**10**
Aromatic Hydrocarbons (µg/kg)										
Benzo(a)anthracene	**1.5**	**1.7**	**0.6**	**4.2**	**2.9**	0.5 U	0.5 U	**1.9**	**2.0**	0.5 U
Benzo(a)pyrene	0.5 U	**0.7**	0.5 U	**3.3**	**2.0**	0.5 U	0.5 U	0.5 U	**0.5**	0.5 U
Benzo(b)fluoranthene	0.5 U	**2.3**	0.5 U	**2.0**	**1.2**	0.5 U	0.5 U	0.5 U	**1.9**	0.5 U
Benzo(k)fluoranthene	0.5 U	**2.3**	0.5 U	**2.0**	**1.2**	0.5 U	0.5 U	0.5 U	**1.9**	0.5 U
Chrysene	**1.8**	**4.2**	**0.9**	**4.5**	**3.2**	**0.7**	0.5 U	**2.1**	**4.4**	**0.9**
Dibenzo(a,h)anthracene	0.5 U	0.5 U	0.5 U	**0.6**	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Indeno(1,2,3-c,d)pyrene	0.5 U	0.5 U	0.5 U	**1.3**	**0.8**	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Total cPAH TEQ (CAL EPA 2005; U = 1/2)	**0.5**	**1.4**	**0.4**	**4.4**	**2.7**	**0.4**	0.5 U	**0.6**	**1.2**	**0.4**
PCB Aroclors (µg/kg)										
Aroclor 1016	4 U	3.9 U	3.9 U	3.9 U	4 U	3.9 U	4 U	3.9 U	4 U	4 U
Aroclor 1221	4 U	3.9 U	3.9 U	3.9 U	4 U	3.9 U	4 U	3.9 U	4 U	4 U
Aroclor 1232	4 U	5.9 U	3.9 U	3.9 U	4 U	3.9 U	4 U	3.9 U	4 U	4 U
Aroclor 1242	4 U	3.9 U	3.9 U	3.9 U	4 U	3.9 U	4 U	3.9 U	4 U	4 U
Aroclor 1248	4 U	3.9 U	3.9 U	3.9 U	4 U	3.9 U	4 U	3.9 U	6 U	4 U
Aroclor 1254	4 U	9.8 U	3.9 U	3.9 U	4 U	3.9 U	4 U	3.9 U	9.9 U	4 U
Aroclor 1260	4 U	3.9 U	3.9 U	3.9 U	4 U	3.9 U	4 U	3.9 U	4 U	4 U
Total PCB Aroclors (U = 0)	4 U	9.8 U	3.9 U	3.9 U	4 U	3.9 U	4 U	3.9 U	9.9 U	4 U

Table G-1 - Summary of Port Gamble S'Klallam Tribe Validated Shellfish Sampling Results - April 2010 Sampling

Task	PortGambleTissue2010	PortGambleTissue2010	PortGambleTissue2010	PortGambleTissue2010	PortGambleTissue2010	PortGambleTissue2010	PortGambleTissue2010	PortGambleTissue2010	PortGambleTissue2010
Station ID	Log Site	Log Site	Log Site	Point Julia Reference	Reference Site 1	Reference Site 1	Reference Site 1	South Reservation	South Reservation
Sample ID	LS_LN_PGST_100429	LS_M_PGST_100429	LS_O_PGST_100429	PJ_O_PGST_100429	RS1_C_PGST_100430	RS1_M_PGST_100430	RS1_O_PGST_100430	SRS_C_PGST_100429	SRS_O_PGST_100429
Sample Date	4/29/2010	4/29/2010	4/29/2010	4/29/2010	4/30/2010	4/30/2010	4/30/2010	4/29/2010	4/29/2010
Species	Littleneck Clams	Manila Clams	Oysters	Oysters	Cockles	Manila Clams	Oysters	Cockles	Oysters
Sample Type	N	N	N	N	N	N	N	N	N
Conventional Parameters (pct)									
Lipids	**0.47**	**0.38**	**1.65**	**2.43**	**0.39**	**0.71**	**1.91**	**0.28**	**2.63**
Metals (mg/kg)									
Arsenic	**3**	**3**	**1**	**2**	1 U	**2**	**2**	1 U	**2**
Cadmium	**0.45**	**0.35**	**1.28**	**1.13**	**0.05**	**0.25**	**1.23**	**0.04**	**1.49**
Chromium	**0.20**	**0.20**	**0.20**	**0.10**	**0.40**	**0.30**	**0.80**	**0.20**	**0.20**
Copper	**3.3**	**6.7**	**9.9**	**6.9**	**1.3**	**9.7**	**8.8**	**1.5**	**9.5**
Lead	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	**0.5**	0.4 U	0.4 U	0.4 U
Mercury	**0.008**	**0.008**	**0.011**	**0.010**	**0.009**	**0.010**	**0.012**	0.005 U	**0.012**
Silver	**0.07 J**	**0.08 J**	**0.14 J**	**0.13 J**	**-- R**	**0.09 J**	**0.17 J**	**-- R**	**0.16 J**
Zinc	**13**	**12**	**130**	**139**	**11**	**16**	**100**	**9**	**174**
Aromatic Hydrocarbons (µg/kg)									
Benzo(a)anthracene	0.5 U	**1.1**	**0.9**	**0.9**	0.5 U	0.5 U	0.5 U	0.5 U	**1.3**
Benzo(a)pyrene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	**0.5**
Benzo(b)fluoranthene	0.5 U	0.5 U	**0.8**	**1.1**	0.5 U	0.5 U	0.5 U	0.5 U	**2.0**
Benzo(k)fluoranthene	0.5 U	0.5 U	**0.8**	**1.1**	0.5 U	0.5 U	0.5 U	0.5 U	**2.0**
Chrysene	0.5 U	**1.2**	**2.4**	**2.9**	0.5 U	**0.6**	**1.4**	0.5 U	**3.8**
Dibenzo(a,h)anthracene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Indeno(1,2,3-c,d)pyrene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Total cPAH TEQ (CAL EPA 2005; U = 1/2)	0.5 U	**0.5**	**0.6**	**0.6**	0.5 U	**0.4**	**0.4**	0.5 U	**1.1**
PCB Aroclors (µg/kg)									
Aroclor 1016	4 U	4 U	3.9 U	4 U	4 U	4 U	3.9 U	4 U	4 U
Aroclor 1221	4 U	4 U	3.9 U	4 U	4 U	4 U	3.9 U	4 U	4 U
Aroclor 1232	4 U	4 U	3.9 U	4 U	4 U	4 U	3.9 U	4 U	4 U
Aroclor 1242	4 U	4 U	3.9 U	4 U	4 U	4 U	3.9 U	4 U	4 U
Aroclor 1248	4 U	4 U	3.9 U	4 U	4 U	4 U	3.9 U	4 U	4 U
Aroclor 1254	4 U	4 U	3.9 U	4 U	4 U	4 U	3.9 U	4 U	4 U
Aroclor 1260	4 U	4 U	3.9 U	4 U	4 U	4 U	3.9 U	4 U	4 U
Total PCB Aroclors (U = 0)	4 U	4 U	3.9 U	4 U	4 U	4 U	3.9 U	4 U	4 U

Notes:
Bold = Detected result
J = Estimated value
U = Compound analyzed, but not detected above detection limit
UJ = Compound analyzed, but not detected above estimated detection limit
R = Rejected

Table G-2 - Chronic Daily Intake From Seafood Ingestion

CDI = (EPC x IR x FI x EF x ED x CF)/(BW x AT)

EPC = Chemical Specific exposure point concentration (average tissue concentration by species) in mg/kg
IR = Ingestion Rate (499 g/day)
1.0 nal intake from seafood (1.0)
365 - not used ulate on a daily basis or express as a fraction of days exposed per yea
70 duration (70 yrs or 25550 days)
0.001 version factor (0.001 kg/g)
79 = body weight (79 kg)
70 ng time (70 yrs or 25550 days)

Chemical	Geoduck EPC (mg/kg)	Geoduck IR (g/day)	Geoduck EPC x IR	Clam EPC (mg/kg)	Clam IR (g/day)	Clam EPC x IR	Oyster EPC (mg/kg)	Oyster IR (g/day)	Oyster EPC x IR	Crab Hepato EPC (mg/kg)	Crab Hepato IR (g/day)	Crab Hepato EPC x IR	Crab Meat EPC (mg/kg)	Crab Meat IR (g/day)	Crab Meat EPC x IR	Total EPC x IR (mg-g/kg-day)	CDI (mg/kg-day)
Arsenic (inorganic)	0.020	96.8	1.94	0.016	255.9	3.99	0.014	62.4	0.88	0.008	20.975	0.1678	0.014	62.925	0.88	7.86	9.9E-05
Cadmium	0.21	96.8	20.65	0.20	255.9	51.82	1.19	62.4	74.33	0.34	20.975	7.1315	0.04	62.925	2.52	156.4	2.0E-03
Chromium	0.13	96.8	12.91	0.38	255.9	95.96	0.18	62.4	11.09	0.10	20.975	2.0975	0.10	62.925	6.29	128.4	1.6E-03
Copper	4.13	96.8	399.8	6.15	255.9	1,574	11.10	62.4	693	19.20	20.975	402.72	8.65	62.925	544.3	3,613	4.6E-02
Lead	0.20	96.8	19.36	0.32	255.9	80.61	0.20	62.4	12.48	0.20	20.975	4.195	0.20	62.925	12.59	129.2	1.6E-03
Silver	1.18	96.8	114.5	0.04	255.9	11.26	0.12	62.4	7.77	0.50	20.975	10.4875	0.19	62.925	11.96	156.0	2.0E-03
Zinc	20.60	96.8	1,994	12.79	255.9	3,273	159.8	62.4	9,970	15.10	20.975	316.7225	50.20	62.925	3,159	18,713	2.4E-01
Mercury	0.01	96.8	1.29	0.01	255.9	1.52	0.01	62.4	0.69	0.03	20.975	0.62925	0.05	62.925	2.96	7.09	9.0E-05
TCDD TEQ	3.41E-07	96.8	3.30136E-05	3.59E-07	255.9	9.19E-05	3.59E-07	62.4	2.24E-05	9.40E-07	20.975	1.97E-05	3.70E-07	62.925	2.33E-05	1.90E-04	2.41E-09
PCB TEQ	6.23E-08	96.8	6.03479E-06	5.83E-08	255.9	1.49E-05	7.07E-08	62.4	4.41E-06	1.66E-06	20.975	3.47E-05	6.31E-08	62.925	3.97E-06	6.41E-05	8.11E-10
PAH TEQ	1.32E-03	96.8	0.13	0.0010	255.9	0.26	0.0042	62.4	0.26	1.27E-03	20.975	0.0266	1.34E-03	62.925	0.0844	0.76	9.60E-06

Arsenic is assumed to be 1.2% inorganic in clams and oysters, and 0.2% inorganic in crabs (Ecology 2002).
Tissue concentration data are in wet weight.
Non-detects quantified at 1/2 detection limit
CDI = chronic daily intake
EPC = exposure point concentration
IR = ingestion rate
TEQ = Toxic equivalents
Shaded EPCs - Analyte was not detected in any sample. Concentrations are based on substitution of one-half the detection limit.

Table G-3 - Noncarcinogenic Sediment Screening Levels with Incidental Ingestion and Dermal Exposure

	Input parameters											Calculated Sediment Screening Values							
	Haz Quotient	**Average body weight**	**averaging time**	**Unit conversion factor**	**Soil Ingestion Rate**	**Gastro absorption factor**	**Exposure Frequency**	**Exposure duration**	**Dermal surface area**	**Adherence factor**		**Arsenic Ingestion CUL**	**Arsenic Dermal CUL**	**Arsenic concurrent exposure CUL**	**Cadmium Ingestion CUL**	**Cadmium Dermal CUL**	**Cadmium concurrent exposure CUL**	**Copper Ingestion CUL**	**Copper Dermal CUL**	**Copper concurrent exposure CUL**
	Risk	**ABW**	**AT**	**UCF**	**SIR**	**AB1**	**EF**	**ED**	**SA**	**AF**										
		kg	years	mg sed/kg sed	mg sed/day		event/yr	years	cm2	mg/cm2/event		mg/kg sed DW	mg/kg sed DW	mg/kg sed DW	mg/kg sed DW	mg/kg sed DW	mg/kg sed DW	mg/kg sed DW	mg/kg sed DW	mg/kg sed DW
MTCA Method B Unrestricted Use	**1**	**16**	**6**	**1,000,000**	**200**	**1**	**365**	**6**	**2200**	**0.2**		**24.0**	**218**	**21.6**	**80**	**727**	**72**	**2,960**	**2.69E+04**	**2,667**
Tribal intertidal clamming adult	1	81.8	64	1,000,000	100	1	120	64	6040	0.30		**746**	**824**	**391.6**	**2,488**	**2,746**	**1,305**	**92,059**	**101,610**	**48,300**
Maximum Port Gamble Sediment Concentration (HC Bay wide Samples only)														**20 U**			**2**			**40**

$$\text{cleanup standard} = \frac{1}{\frac{1}{\text{Ingestion Component}} \text{ plus } \frac{1}{\text{Dermal Component}}}$$

Incidental ingestion

$$\text{Sediment Cleanup Level (ug/kg)} = \frac{\text{RFDo* Hazard Quotient * ABW * AT * UCF}}{\text{SIR * AB1* EF * ED}}$$

Parameter	Definition	Value
Haz Quotient	Acceptable hazard quotient unitless	1.00E+00
ABW	Average body weight, kg	16
AT	Averaging Time, Years	75
UCF	Unit Conversion Factor, mg/kg	1.00E+06
Ref Dose	Reference Dose, mg/kg-day	Chemical Specific
SIR	Soil Ingestion Rate, mg/day	200
AB1	Gastrointestinal absorption fraction, unitless	1
EF	Exposure Frequency, unitless	1
ED	Exposure Duration, years	6

Chemical - Specific Input Parameters	Reference Dose		
	mg chem/kg day		
	oral (RFDo)	dermal (RFDd)	dermal absorption fraction (ABS)
arsenic	3.00E-04	6.00E-05	0.01
cadmium	1.00E-03	2.00E-04	0.01
copper	3.70E-02	7.40E-03	0.01

Dermal exposure

$$\frac{\text{RFDd* HazQuotient * ABW * AT* UCF1}}{\text{EF * ED * SA * AF * ABS}}$$

Parameter	Definition	Value
Hazard Quotient	Acceptable hazard quotient unitless	1.00E-06
ABW	Average body weight, kg	16
AT	Averaging Time, Years	75
UCF1	Unit Conversion Factor, mg/kg	1.00E+06
UCF2	Unit Conversion Factor, µg/mg	1000
RFDo	Oral Reference Dose, mg/kg-day	Chemical Specific
CPFd	Dermal Cancer Potency Factor, kg-day/mg	Chemical Specific
EF	Exposure Frequency, unitless	1
ED	Exposure Duration, years	6
SIR	Soil Ingestion Rate, mg/day	200
AB1	Gastrointestinal absorption fraction, unitless	1
SA	Dermal Surface Area exposed, cm^2	2200
AF	Soil Adherence Factor, mg/cm^2-day	0.2
ABS	Dermal absorption fraction, unitless	Chemical Specific

Table G-4 - Carcinogenic Sediment Screening Levels for Incidental Ingestion and Dermal Exposure

	Input parameters											Calculated Sediment Screening Values										
	Risk	**Average body weight**	**averaging time**	**Unit conversion factor**	**Soil Ingestion Rate**	**Gastro absorption factor**	**Exposure Frequency**	**Exposure duration**	**Dermal surface area**	**Adherence factor**		**Dioxin TEQ Ingestion CUL**	**Dioxin TEQ Dermal CUL**	**Dioxin TEQ concurrent exposure**	**Total PCB Ingestion CUL**	**Total PCB Dermal CUL**	**Total PCB concurrent exposure**	**cPAH TEQ Ingestion CUL**	**cPAH TEQ Dermal CUL**	**cPAH TEQ concurrent exposure CUL**	**Arsenic Ingestion CUL**	**Arsenic Dermal CUL**	**Arsenic concurrent exposure CUL**
	Risk	**ABW**	**AT**	**UCF**	**SIR**	**AB1**	**EF**	**ED**	**SA**	**AF**													
		kg	years	mg sed/kg sed	mg sed/day		event/yr	years	cm2	mg/cm2/event		pg chem/g sed DW	pg chem/g sed DW	pg chem/g sed DW	ug/kg sed DW	ug/kg sed DW	ug/kg sed DW	ug/kg sed DW	ug/kg sed DW	ug/kg sed DW	ug/kg sed DW	ug/kg sed DW	ug/kg sed DW
MTCA Method B Unrestricted Use	**1.00E-06**	**16**	**75**	**1,000,000**	**200**	**1**	**365**	**6**	**2200**	**0.2**		**7**	**51**	**6**	**500**	**1,315**	**362**	**137**	**426**	**104**	**667**	**426**	**260**
Tribal intertidal clamming adult	1.00E-06	81.8	70	1,000,000	100	1	120	64	6040	0.3		18	15	8	1361	395	306	373	128	95	1814	656	482
Maximum Port Gamble Sediment Concentration (HC Bay wide Samples only)														**2.5**			**16**			**60**			**20 U**

$$\text{cleanup standard} = \frac{1}{\frac{1}{\text{Ingestion Component}} \text{ plus } \frac{1}{\text{Dermal Component}}}$$

Incidental ingestion

$$\text{Sediment Cleanup Level (ug/kg)} = \frac{\text{Risk} * \text{ABW} * \text{AT} * \text{UCF}}{\text{CPFo} * \text{SIR} * \text{AB1} * \text{EF} * \text{ED}}$$

Parameter	Definition	Value
Risk	Acceptable cancer risk level, untiless	1.00E-06
ABW	Average body weight, kg	16
AT	Averaging Time, Years	75
UCF	Unit Conversion Factor, mg/kg	1.00E+06
CPFo	Carcinogenic Potency Factor, kg-day/mg	Chemical Specific
SIR	Soil Ingestion Rate, mg/day	200
AB1	Gastrointestinal absorption fraction, unitless	1
EF	Exposure Frequency, unitless	1
ED	Exposure Duration, years	6

Chemical - Specific Input Parameters

	Cancer potency factor		
	mg chem/kg BW/day		
	oral (CPFo)	dermal (CPFd)	dermal absorption
2,3,7,8 TCDD TEF	150,000	300,000	0.03
PCB	2	2.47	0.14
cPAH	7.3	8.20	0.13
arsenic	1.5	1.60	0.13

Dermal exposure

$$\frac{\text{Risk} * \text{ABW} * \text{AT} * \text{UCF1}}{\text{EF} * \text{ED} * \text{SA} * \text{AF} * \text{ABS} * \text{CPFd}}$$

Parameter	Definition	Value
Risk	Acceptable cancer risk level, untiless	1.00E-06
ABW	Average body weight, kg	16
AT	Averaging Time, Years	75
UCF1	Unit Conversion Factor, mg/kg	1.00E+06
UCF2	Unit Conversion Factor, µg/mg	1000
CPFo	Carcinogenic Potency Factor, kg-day/mg	Chemical Specific
CPFd	Dermal Cancer Potency Factor, kg-day/mg	Chemical Specific
EF	Exposure Frequency, unitless	1
ED	Exposure Duration, years	6
SIR	Soil Ingestion Rate, mg/day	200
AB1	Gastrointestinal absorption fraction, unitless	1
SA	Dermal Surface Area exposed, cm^2	2200
AF	Soil Adherence Factor, mg/cm^2-day	0.2
ABS	Dermal absorption fraction, unitless	Chemical Specific

Table G-5 - Estimated Risks for the Tribal Shellfish Ingestion Scenario

Chemical	Non-cancer RfD (mg/kg-day)	Oral Cancer Slope Factor (kg-day/mg)	Hazard Quotient (HQ)	Excess Cancer Risk
Arsenic (inorganic)	0.0003	1.5	0.3	1.5E-04
Cadmium	0.001		2.0	
Chromium	0.003		0.5	
Copper	0.04		1.1	
Lead				
Silver	0.005		0.4	
Zinc	0.3		0.8	
Mercury	0.0001		0.9	
TCDD TEQ		1.50E+05		3.6E-04[a]
PCB TEQ		1.50E+05		1.2E-04[a]
	0.00002			
PAH TEQ		7.3		7.0E-05[a]
			Total Cancer Risk	**7.0E-04**

RfD = Reference dose
TEQ = Toxic equivalents

a - A large component of the calculated excess risk values for dioxins, PCB congeners, and cPAHs is due to substitution of one-half the detection limit for non-detected analytes.

Table G-6 - Comparison of Port Gamble Bay and Local Puget Sound Background Metal Concentrations

	Port Gamble Bay Sediment			Local Puget Sound Background Sediment		
	As	Cd	Cu	As	Cd	Cu
Raw Statistics						
Number of Samples (discrete)	42	42	42	15	15	15
Minimum	6 U	0.3	3.4	2.2	0.16	4
Maximum	20 U	2.3	40.2	21	2.3	91.2
Mean	8.5 U	1.135	20.9	6.007	0.478	26.65
Median	8 U	0.75	16.8	6.0	0.18	15.7
Standard Deviation	NA	0.66	12.37	4.526	0.645	23.99
ProUCL Statistics	95% UCL of Mean			90th Percentile of Data		
Normal	NA	--	--	--	--	--
Lognormal	NA	--	--	10.89[a]	--	65.12
Gamma	NA	--	--	11.01	--	58.01[b]
Nonparametric	NA	1.491	29.23	13.56	1.097	70.5

NA - Not Avaiable due to limited dataset, all nondetected values.
a - Lognormal distribution used to calculate background arsenic 90th percentile.
b - Gamma distribution used to calculate background copper 90th percentile.

Table G-7 - Comparison of Port Gamble Bay and Local Puget Sound Background Sediment Dioxin Concentrations

	Port Gamble Bay Sediment	Local Puget Sound Background Sediment
	TEQ	TEQ
Raw Statistics		
Number of Samples (discrete)	10	15
Minimum	0.344	0.258
Maximum	2.48	1.848
Mean	1.061	0.946
Median	0.82	1.06
Standard Deviation	0.722	0.497
ProUCL Statistics	95% UCL of Mean	90th Percentile of Data
Normal	1.479	1.583[a]
Lognormal	--	1.661
Gamma	--	1.653
Nonparametric	--	1.813

Values for non-detected congeners were set at 1/2 detection limit.

a - Normal distribution used to calculate background dioxin 90th percentile.

Table G-8 - Comparison of Port Gamble Bay and Local Puget Sound Background Sediment PCB Aroclor Concentrations

	Total PCBs (µg/kg)	
	Port Gamble Bay	Local Puget Sound Background Sediment
Number of detections	2	0
Maximum detected concentration	16	NA
Minimum detected concentration	4.3	NA
Average	NA	NA
Median	NA	NA
Standard deviation	NA	NA
MTCAStat 90th percentile of Data		NA
ProUCL 95% UCL of Mean	NA	

There were too few detected values to allow statistical evaluation

Table G-9 - Sediment cPAHs TEQ Statistics Summary

	Port Gamble Bay Sediment		Local Puget Sound Background Sediment	
	TEQ (1/2 DL)	TEQ (0 DL)	TEQ (1/2 DL)	TEQ (0 DL)
Raw Statistics				
Number of Samples (discrete)	42	42	15	15
Minimum	14.35	0	1.569	0.278
Maximum	60.44	59.44	8.059	7.809
Mean	21.22	12.74	3.412	2.197
Median	16.2	12.89	2.936	0.986
Standard Deviation	8.849	13.78	1.961	2.932
ProUCL Statistics	95% UCL of Mean		90th Percentile of Data	
Normal	--	--	--	--
Lognormal	--	--	6.04	--
Gamma	--	--	9.05	--
Nonparametric	23.52	16.23	5.7	4.99
MTCA Statistics	95% UCL of Mean		90th Percentile of Data	
Site (Site97.xls)				
95% UCL of Mean (Normal)	--	--		
95% UCL of Mean (Lognormal)	--	--		
95% UCL of Mean (Neither)	23.464	-- [a]		
Background (Background97.xls)				
90th Percentile of Data (Normal)			--	--
90th Percentile of Data (Lognormal)			6.11	--
90th Percentile of Data (Neither - Nonparametric)			--	3.76 (6.55[b])

Notes:

a - Too many censored values (10) to calculate

b - Since the value exceeds the 4 X 50th limit, use 3.76 as the background value.

Table G-10 - Background Dungeness Crab Muscle Tissue Dioxin TEQs

Sampling Site	Sampling Location	Collection Date	Sample ID	Chemical	Units	TEQ ND=1/2DL	TEQ ND=0
Esquimalt Harbour Reference Site	Pedder Bay	9/4/2008	CR08-36DA-F	Total Dioxin TEQ	ng/kg	0.341143	0.340643
Esquimalt Harbour Reference Site	Pedder Bay	9/4/2008	CR08-36DG-K	Total Dioxin TEQ	ng/kg	0.321875	0.00936
Esquimalt Harbour Reference Site	Pedder Bay	9/4/2008	CR08-38DA-F	Total Dioxin TEQ	ng/kg	0.275522	0.064022
RAYONIER-MILL-DB-01-BI	Dungeness Bay	10/2/2006	DB-02-C	Total Dioxin TEQ	ng/kg	0.044454935	0.0080185
RAYONIER-MILL-DB-01-BI	Dungeness Bay	10/2/2006	DB-03-C	Total Dioxin TEQ	ng/kg	0.049786825	0.0048244
RAYONIER-MILL-DB-02-BI	Dungeness Bay	10/2/2006	DB-06-C	Total Dioxin TEQ	ng/kg	0.064764915	0.0339402
RAYONIER-MILL-DB-02-BI	Dungeness Bay	10/2/2006	DB-07-C	Total Dioxin TEQ	ng/kg	0.06742296	0.029968
RAYONIER-MILL-DB-02-BI	Dungeness Bay	10/2/2006	DB-08-C	Total Dioxin TEQ	ng/kg	0.07214801	0.0044035
RAYONIER-MILL-DB-03-BI	Dungeness Bay	10/2/2006	DB-01-C	Total Dioxin TEQ	ng/kg	0.04948451	0.02071991
RAYONIER-MILL-DB-04-BI	Dungeness Bay	10/2/2006	DB-04-C	Total Dioxin TEQ	ng/kg	0.04557149	0.0042541
RAYONIER-MILL-FB-01-BI	Freshwater Bay	10/2/2006	FB-01-C	Total Dioxin TEQ	ng/kg	0.05096256	0.00291
RAYONIER-MILL-FB-01-BI	Freshwater Bay	10/2/2006	FB-02-C	Total Dioxin TEQ	ng/kg	0.02948295	0.00288
RAYONIER-MILL-FB-01-BI	Freshwater Bay	10/2/2006	FB-03-C	Total Dioxin TEQ	ng/kg	0.04365643	0.01326
RAYONIER-MILL-FB-01-BI	Freshwater Bay	10/2/2006	FB-04-C	Total Dioxin TEQ	ng/kg	0.0326878	0.00223
RAYONIER-MILL-FB-01-BI	Freshwater Bay	10/2/2006	FB-05-C	Total Dioxin TEQ	ng/kg	0.027320175	0.00204
RAYONIER-MILL-FB-01-BI	Freshwater Bay	10/2/2006	FB-06-C	Total Dioxin TEQ	ng/kg	0.028159965	0.00233
RAYONIER-MILL-FB-01-BI	Freshwater Bay	10/2/2006	FB-07-C	Total Dioxin TEQ	ng/kg	0.03503907	0.00205
RAYONIER-MILL-FB-01-BI	Freshwater Bay	10/2/2006	FB-08-C	Total Dioxin TEQ	ng/kg	0.051323	0.01555121
Samish Island	Samish Island	5/26/1999	218020	Total Dioxin TEQ	ng/kg	1.34945	0.051
Hat Island	Hat Island	5/26/1999	218021	Total Dioxin TEQ	ng/kg	1.131225	0.049
RAYONR05-FBDC	Freshwater Bay	9/3/2002	FB1DCWA	Total Dioxin TEQ	ng/kg	0.31598425	0.0037735
RAYONR05-FBDC	Freshwater Bay	9/3/2002	FB1DCWB	Total Dioxin TEQ	ng/kg	0.3807499	0.0009915
RAYONR05-FBDC	Freshwater Bay	9/3/2002	FB1DCWC	Total Dioxin TEQ	ng/kg	0.23789225	0.0035032

Table G-11 - Background Dungeness Crab Hepatopancreas Tissue Dioxin TEQs

Sampling Site	Sampling Location	Collection Date	Sample ID	Chemical	Units	TEQ ND=1/2DL	TEQ ND=0
Esquimalt Harbour Reference Site	Pedder Bay	9/4/2008	CR08-36DA-F	Total Dioxin TEQ	ng/kg	0.912695	0.01148
Esquimalt Harbour Reference Site	Pedder Bay	9/4/2008	CR08-36DG-K	Total Dioxin TEQ	ng/kg	0.296173	0.030673
Esquimalt Harbour Reference Site	Pedder Bay	9/4/2008	CR08-38DA-F	Total Dioxin TEQ	ng/kg	0.739128	0.627128
RAYONIER-MILL-DB-01-BI	Dungeness Bay	10/2/2006	DB-02-C	Total Dioxin TEQ	ng/kg	1.4335569	1.4304093
RAYONIER-MILL-DB-01-BI	Dungeness Bay	10/2/2006	DB-03-C	Total Dioxin TEQ	ng/kg	0.33680715	0.319483
RAYONIER-MILL-DB-02-BI	Dungeness Bay	10/2/2006	DB-06-C	Total Dioxin TEQ	ng/kg	0.9853153	0.9822958
RAYONIER-MILL-DB-02-BI	Dungeness Bay	10/2/2006	DB-07-C	Total Dioxin TEQ	ng/kg	1.3500182	1.3499957
RAYONIER-MILL-DB-02-BI	Dungeness Bay	10/2/2006	DB-08-C	Total Dioxin TEQ	ng/kg	0.5328666	0.5013952
RAYONIER-MILL-DB-03-BI	Dungeness Bay	10/2/2006	DB-01-C	Total Dioxin TEQ	ng/kg	1.06150125	1.057774
RAYONIER-MILL-DB-04-BI	Dungeness Bay	10/2/2006	DB-04-C	Total Dioxin TEQ	ng/kg	0.26646012	0.2532046
RAYONIER-MILL-FB-01-BI	Dungeness Bay	10/2/2006	FB-01-C	Total Dioxin TEQ	ng/kg	0.512325715	0.47407
RAYONIER-MILL-FB-01-BI	Dungeness Bay	10/2/2006	FB-02-C	Total Dioxin TEQ	ng/kg	0.265965185	0.22251
RAYONIER-MILL-FB-01-BI	Dungeness Bay	10/2/2006	FB-03-C	Total Dioxin TEQ	ng/kg	0.6051414	0.57405
RAYONIER-MILL-FB-01-BI	Dungeness Bay	10/2/2006	FB-04-C	Total Dioxin TEQ	ng/kg	0.2056532	0.1099751
RAYONIER-MILL-FB-01-BI	Dungeness Bay	10/2/2006	FB-05-C	Total Dioxin TEQ	ng/kg	0.261853605	0.1416
RAYONIER-MILL-FB-01-BI	Dungeness Bay	10/2/2006	FB-06-C	Total Dioxin TEQ	ng/kg	0.182099295	0.085
RAYONIER-MILL-FB-01-BI	Dungeness Bay	10/2/2006	FB-07-C	Total Dioxin TEQ	ng/kg	0.4004299	0.3823565
RAYONIER-MILL-FB-01-BI	Dungeness Bay	10/2/2006	FB-08-C	Total Dioxin TEQ	ng/kg	0.21383405	0.1182518
RAYONR05-FBDC	Freshwater Bay	9/3/2002	FB1DCBA	Total Dioxin TEQ	ng/kg	0.5742511	0.3024
RAYONR05-FBDC	Freshwater Bay	9/3/2002	FB1DCBB	Total Dioxin TEQ	ng/kg	0.44139885	0.2020377
RAYONR05-FBDC	Freshwater Bay	9/3/2002	FB1DCBC	Total Dioxin TEQ	ng/kg	0.7063359	0.6341159

Table G-12 - Background Data for Arsenic in Clams

Clam Tissue				Sediment - Co-located	
Sample	Arsenic total (mg/kg ww)	Arsenic, inorganic (mg/kg ww)	Qualifier	Sample	Arsenic total (mg/kg dw)
BI-C-T1	2.55	0.074	J	BI-C-S1	1.39
BI-C-T2	2.83	0.085	J	BI-C-S2	1.58
BI-C-T3	1.7	0.069	J	BI-C-S3	1.61
BI-C-T4	2.31	0.446	J	BI-C-S4	1.63
BI-C-T5	2.35	0.044	J	BI-C-S5	1.6
BI-C-T6	1.89	0.331	J	BI-C-S6	1.53
Minimum	1.7				
Maximum	2.83				
Mean	2.27	0.17			1.56
90th Percentile of Data	2.69	0.39			1.62
Standard deviation	0.416961229				

Number of clams per composite sample = 20

Sample species: *Clinocardium nuttallii*
Macoma nasuta
Saxidomus giganteus
Tresus capax
Protothaca staminea

Location: Bainbridge Island; determined to be uninfluenced by the releases of arsenic from the ASARCO plume.
Taken from Table 4-31 of Windward (2005a).

Windward. 2005a. Lower Duwamish Waterway remedial investigation. Data report: Chemical analyses of benthic invertebrate and clam tissue samples and co-located sediment samples. Prepared for Lower Duwamish Waterway Group. Windward Environmental LLC, Seattle, WA.

Table G-13 - Background Data for Arsenic in Crabs

Meat	Arsenic total (mg/kg ww)	Arsenic inorganic (mg/kg ww)	Hepatopancreas	Arsenic total (mg/kg ww)	Arsenic inorganic (mg/kg ww)
Dungeness crab					
BL-DC-EM-comp1	6.95	0.03	BL-DC-HP-comp1	7.66	0.34
BL-DC-EM-comp2	7.6	0.02	EP-DC-HP-comp1	13.1	0.08
BL-DC-EM-comp3	8.8	0.02			
EP-DC-EM-comp1	7.31	0.01			
EP-DC-EM-comp2	8.76	0.01			
EP-DC-EM-comp3	10.9	0.01			
Slender crab					
BL-SC-EM-comp1	10.4	0.02	BL-SC-HP-comp1	8.2	0.27
BL-SC-EM-comp2	10.8	0.02	EP-SC-HP-comp1	2.6	0.08
BL-SC-EM-comp3	11.3	0.03			
EP-SC-EM-comp1	7	0.02			
EP-SC-EM-comp2	5.4	0.02			
EP-SC-EM-comp3	5.6	0.04			
Minimum	5.4			2.6	
Maximum	11.3			13.1	
Mean	8.4			7.9	
90th Percentile of Data	10.9			11.6	
Standard deviation	2.1			4.3	

Dungeness crab data from Table A1-16 (Windward 2005b)
Slender crab data from Table A1-17 (Windward 2005b)
BL = Blake Island
EP = East Passage, potentially influenced by ASARCO

Windward. 2005b. Lower Duwamish Waterway remedial investigation. Data report: Fish and crab tissue collection and chemical analyses. Prepared for Lower Duwamish Waterway Group. Windward Environmental LLC, Seattle, WA.

Table G-14 - Comparison of Port Gamble Bay and Reference Dioxin TEQ Concentrations in Crabs

	Reference Crab Tissue (Muscle)	Reference Crab Tissue (Hepato)	Port Gamble Crab Tissue (Composite Muscle)	Port Gamble Crab Tissue (Composite Hepato)
Raw Statistics				
Number of Samples	23	23	1	1
Minimum	0.0273	0.182	--	--
Maximum	1.349	1.434	--	--
Mean	0.219	0.515	0.370	0.94
Median	0.051	0.4	--	--
Standard Deviation	0.345	0.346	--	--
ProUCL Statistics	90th Percentile of Data			
Normal	--	--	--	--
Lognormal	--	0.94[a]	--	--
Gamma	--	0.951	--	--
Nonparametric	0.373	1.00	--	--

Values for non-detected congeners were set at 1/2 detection limits

a - Lognormal distribution used to calculate reference crab 90th percentile.

Table G-15 - Comparison of Port Gamble Bay and Reference Arsenic Concentrations in Clams

	Arsenic (total) in Clams (mg/kg ww)	
	Port Gamble Bay	Reference[a]
Raw Statistics		
Number of Samples (discrete)	20	6
Minimum	1 (U)	1.7
Maximum	3	2.83
Mean	1.3	2.27
Standard Deviation	0.86	0.42
ProUCL Statistics	95% UCL of Mean	90th Percentile of Data
Normal	--	2.81[b]
Lognormal	--	2.85
Gamma	--	2.99
Nonparametric	1.77	2.69

a - Clam composite samples made of 20 organisms of mixed species
Sample species: *Clinocardium nuttallii*
Macoma nasuta
Saxidomus giganteus
Tresus capax
Protothaca staminea
Locations for reference clam collection were determined to be uninfluenced by the ASARCO plume.
From Table 4-31 of Windward (2005a).
b - Normal distribution used to calculate reference 90th percentile.

Table G-16 - Comparison of Port Gamble Bay and Reference Arsenic Concentrations in Crabs

	Reference Crab Tissue (Muscle)	Reference Crab Tissue (Hepato)	Port Gamble Crab Tissue (Composite Muscle)	Port Gamble Crab Tissue (Composite Hepato)
Raw Statistics				
Number of Samples	12	4	1	1
Minimum	5.4	2.6	--	--
Maximum	11.3	13.1	--	--
Mean	8.4	7.9	7	4
Standard Deviation	2.07	4.29	--	--
	90th Percentile of Data			
90th Percentile of Data	10.9	11.6	--	--

Values for non-detected congeners were set at 1/2 detection limits

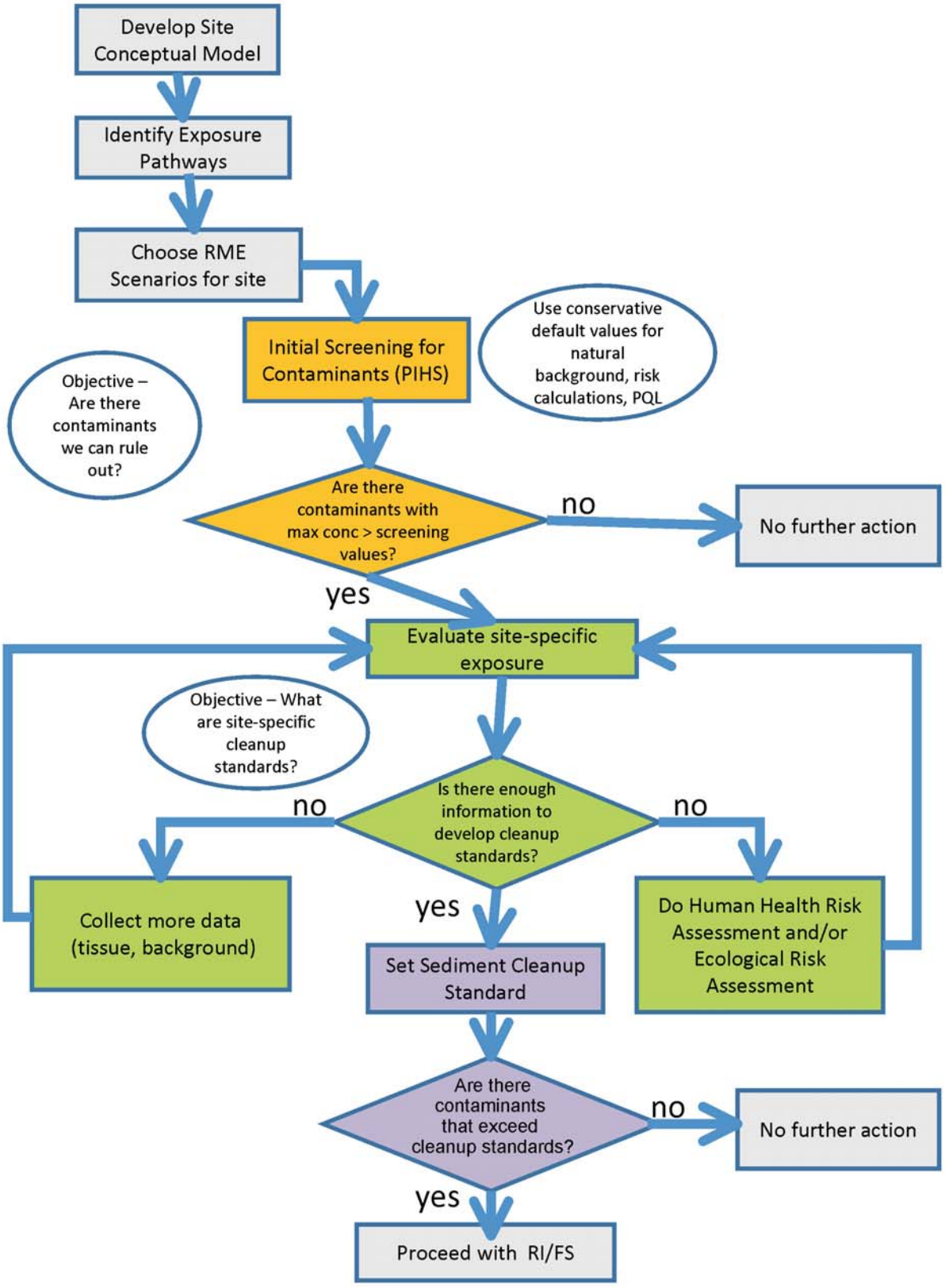
Table G-17 - Preliminary Sediment Cleanup Screening Concentrations

Chemical of Concern	Maximum Port Gamble Sediment Concentration	Risk-based Concentration[a]	Local Puget Sound Background	Estimated Practical Quantitation Limit
Arsenic (carcinogenic)	20 U mg/kg	0.482 mg/kg	**10.9 mg/kg**	0.5 mg/kg (Method 6020)
Cadmium	2 mg/kg	73.5 mg/kg	**1.1 mg/kg**[b]	0.5 mg/kg (Method 6020)
CPAH	60 ug/kg TEQ	95 ug/kg TEQ	**6.04 ug/kg TEQ**[b]	5 ug/kg for each analyte

Bold indicates selected cleanup level

a - Risk based concentration for direct contact

b - Cleanup level based on shellfish ingestion



PIHS - Potential Indicator of Hazardous Substances

Port Gamble Bay
Port Gamble, Washington

Human Health Risk Evaluation Process

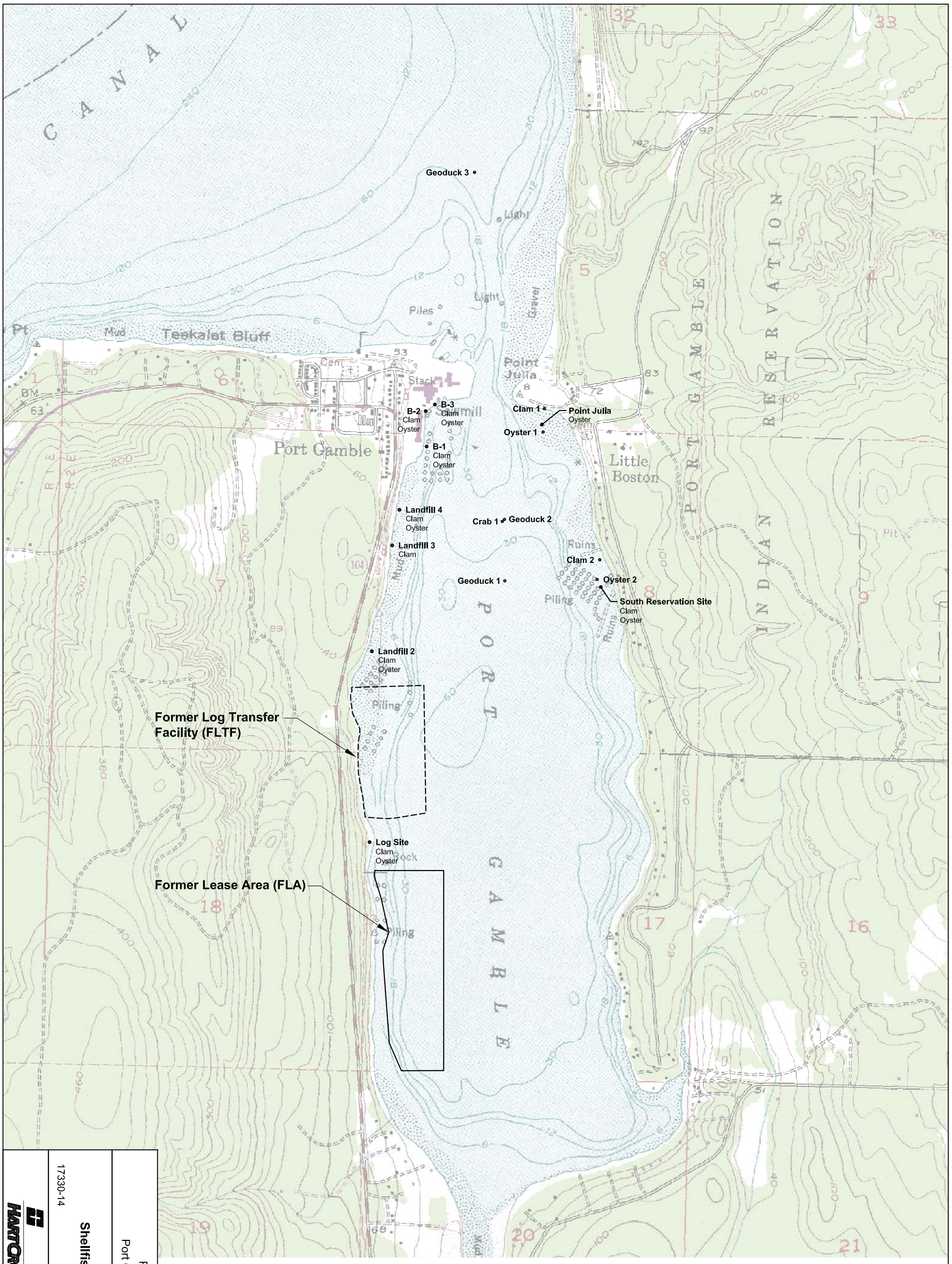
17330-14 2/11

HARTCROWSER

Figure
G-1

EAL 02/11/11 1733014-AG.cdr

JAB 08/01/09 1733014-037.dwg



Source: Base map prepared from USGS 7.5 minute quadrangle map of Port Gamble, WA.

Port Gamble Bay
Port Gamble, Washington

Shellfish Sample Locations

17330-14 2/11

HARTCROWSER

Figure **G-2**