SEDIMENT SAMPLING REPORT

WASHINGTON STATE DEPARTMENT OF NATURAL RESOURCES
AQUATIC LANDS LEASE NO. 22-A02150

Prepared for

GRAYS HARBOR HISTORICAL SEAPORT AUTHORITY

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Project No. 0863.01.01

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ACRONYMS AND ABBREVIATIONS

bml	below mudline
BTEX	benzene, toluene, ethylbenzene, xylenes
CSL	cleanup screening level
dioxins	polychlorinated dibenzo-p-dioxins and -furans
DNR	Washington State Department of Natural Resources
Ecology	Washington State Department of Ecology
GHHSA	Grays Harbor Historical Seaport Authority
the leased property	leased tideland and in-water property
MFA	Maul Foster & Alongi, Inc.
mg/kg	milligrams per kilogram
µg/kg	micrograms per kilogram
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PES	PES Environmental
pg/g	picograms per gram
SAIC	Science Applications International Corporation
the site	the uplands property and the leased property
SMS	Sediment Management Standards
SQS	Washington State sediment quality standards
SVOC	semivolatile organic compound
TEQ	toxicity equivalence
TOC	total organic carbon
WAC	Washington Administrative Code

1 INTRODUCTION

On behalf of Grays Harbor Historical Seaport Authority (GHHSA), Maul Foster & Alongi, Inc. (MFA) has prepared this sediment sampling report for the leased tideland and in-water property (the leased property) located at 500 North Custer Street in Aberdeen, Washington (see the attached figure). The leased property, on the Chehalis River in Grays Harbor County, is being leased from the Washington State Department of Natural Resources (DNR) by Weyerhaeuser under Lease No. 22-A02150. GHHSA has entered into a sublease agreement of the state-owned aquatic lands from Weyerhaeuser. The terms of the sublease agreement include a requirement to conduct a sediment characterization study.

1.1 Regulatory Background

DNR requests "bookend" sediment sampling at the initiation and termination of an aquatic lease in order to differentiate baseline sediment conditions from impacts that occurred during the lease period, as well as to evaluate long-term trends in sediment conditions over the lease period. On February 2, 2011, in correspondence with Weyerhaeuser, DNR requested sediment sampling and proposed a sampling approach for the leased property. Floyd|Snider, consultant to Weyerhaeuser, proposed a modification to the DNR-requested sampling in a proposal letter prepared for Weyerhaeuser on March 15, 2012 (Floyd|Snider, 2012). On March 26, 2012, DNR modified the Floyd|Snider proposed sediment sampling plan (DNR, 2012) by expanding the analyte list for the three proposed surface sediment samples from the Chehalis River and requesting three sediment core samples in the Former Mill Area, a portion of the leased property (see the figure). MFA prepared a draft SAP (MFA, 2013a) incorporating the March 26, 2012 DNR modifications to the Floyd|Snider proposed SAP and submitted it to DNR on June 27, 2013. Comments were received from DNR via e-mail on July 16, 2013 (DNR, 2013a). MFA replied to DNR comments in a July 23, 2013, letter (MFA, 2013b); these were accepted by DNR in a July 31, 2013, e-mail (DNRb, 2013). Additional DNR conditions of approval were received on August 22, 2013 (DNRc, 2013). A final SAP was submitted by MFA on September 12, 2013 (MFA, 2013c) and approved by DNR. This report has been prepared consistent with the requirements of DNR's Draft State Owned Aquatic Lands Sediment Sampling and Analysis Guide (Integral, 2011).

1.2 Site Setting

The property leased from DNR by Weyerhaeuser (and subleased by GHHSA) encompasses approximately 16.9 acres (see the attached figure). The leased property is located in the alluvial meander plain of the Chehalis River in the northwestern margins of the Willapa Hills physiographic region of southwest Washington.

In the Former Mill Area, there is an approximately 100-by-200-foot area that is exposed at low tide and inundated to an existing bulkhead wall at high tide. Immediately upstream of the Former Mill Area is the Filled Tidelands area, and immediately downstream is the Dock Area, containing

buildings and a dock structure. The leased property is proposed for future use as the homeport for the *Lady Washington* and *Hawaiian Chieftain* tall ships as part of a new maritime heritage facility called Seaport Landing.

1.3 Site Background

Sawmills have existed on the uplands property (directly south of the leased property) and the leased property (collectively referred to in this report as the site) since before 1900. Weyerhaeuser acquired the site in 1955 and operated several sawmills and associated support facilities through January 2009, when a mill, known as the small log sawmill, was permanently closed. There are no active wood products manufacturing operations at the site. When the facility was operational, raw logs were brought to the site in log rafts in the Chehalis River and tied up to pilings in the river in front of the Big Mill until the mid-1960s. After the mid-1960s, raw logs were brought to the site by truck and staged on log decks at various locations in and adjacent to the site. The Big Mill was originally configured to manufacture shingles and slats for housing construction. During World War II, the Big Mill was converted for manufacturing ship keels for the war effort. The precursor to the small log mill was added in 1972. The last upgrade to the small log mill took place in 2003. In 2006, the Big Mill and attached finger pier were closed; the associated structures were removed from the site between 2006 and 2008. This area is now known as the Former Mill Area. The site continued to operate the small log mill into early 2009. The operational history of the site is detailed in the Phase I assessment (PES Environmental [PES], 2010). GHHSA acquired the uplands property on March 29, 2013.

1.4 Historical Data

Sediment data from the vicinity of the leased property, dating back to 1999, were made available to MFA and are summarized below:

In 1999, the Washington State Department of Ecology (Ecology) conducted a sediment quality investigation on the Chehalis River (Ecology, 1999). Two of the samples collected during this investigation were taken from the leased property (see the figure for historical sample locations). Samples were analyzed for all Sediment Management Standards (SMS) compounds and for the presence of wood debris. There were no exceedances of the SMS, and no woodwaste accumulations were observed.

In August 2010, PES prepared an extensive Level I environmental site assessment. The document summarized past releases of contaminants, including the following:

- In 1989, red-end paint wastes (containing 1,1,1-trichloroethane and naphthalene) were released to Shannon Slough, resulting in a U.S. Environmental Protection Agency fine and cleanup action. Polycyclic aromatic hydrocarbons (PAHs); pentachlorophenol; and benzene, toluene, ethylbenzene, and xylenes (BTEX) were detected in sediments, but polychlorinated biphenyls (PCBs) were not.
- In 1992, storm system sediments were evaluated (catch basins and oil/water separators). Aroclor 1260 was detected at 959 parts per billion at CB-1, located southwest of the

planer. PAHs and BTEX were commonly detected in sediments, with dibenzofuran, phenol, and 2- and 4-methylphenol detected at the catch basin at the main shipping shed (located upland).

- Between 2006 and 2008, the Big Mill (which sat over the pocket beach area) was demolished. Over 1,000 piles were removed during the demolition.
- The facility stormwater pollution prevention plan significant spills report lists three spills: a June 2001 release of 17.5 gallons of hydraulic oil (with 1 gallon spilling into the Chehalis River); an August 2002 release of 4 gallons of hydraulic oil to the Chehalis River; and a March 2005 release of 50 gallons of diesel fuel to land near the stacker.
- The Big Mill, originally constructed in 1924, contained hydraulic equipment installed over plank flooring. Drip pans were installed under the hydraulic equipment in 1980.

In January 2010, Floyd|Snider evaluated water quality at the upper pocket beach area under the former mill. The study examined a small portion of the beach (the portion nearest the cement bulkhead). After evaluating the seeps and river water, the study concluded that the water coming from the seeps does not have the same general chemistry parameters as the river water, suggesting that the seeps are not bank storage of river water captured during high tide. Also, the study indicated that intermittent sheen previously observed at one of the seeps in 2009 was not observed during the site visit in January 2010.

In April 2011, Science Applications International Corporation (SAIC) conducted a soil and sediment investigation at the leased property (SAIC, 2011). Eight surface sediment samples were collected in the Dock Area immediately downstream of the Ecology sample locations from 1999 (see the figure). The surface sediment samples were analyzed for all SMS constituents and for the presence of wood debris and polychlorinated dibenzo-p-dioxins and -furans (referred to as dioxins in this report). Butyl-benzyl phthalate was detected at a concentration slightly above the sediment quality standard screening level. No accumulation of wood debris was encountered in the Dock Area. Surface sediment dioxins with a toxicity equivalence concentration (TEQ) of 6.1 picograms per gram (pg/g) were detected in the Dock Area.

SAIC also collected surface and subsurface sediments in the Former Mill Area (see the figure). Fine wood debris was encountered in surface sediment at two of the three locations, with woodwaste observed in all subsurface sediment throughout the length of the cores (i.e., 5 feet below mudline [bml]). Surface sediment from all three locations was composited for dioxin analysis, which resulted in a toxicity equivalent concentration (TEQ) of 68 pg/g. Two of the sample locations had initial surface mercury detections in excess of the SMS cleanup screening level (CSL), but later averaging with split samples found that the surface mercury concentrations exceeded the sediment quality standard but were below the CSL. One of the locations had surface exceedances of the SMS CSL for bis(2-ethylhexyl) phthalate and 1,4-dichlorobenzene. There were several subsurface sediment exceedances of the CSL in the Former Mill Area; however, the surface sediments are the point of compliance for SMS (Ecology, 2008).

The SAIC deliverable was a data report only and did not include interpretation of the analytical data. Floyd|Snider was retained to interpret the soil and sediment data in September 2011. Floyd|Snider concluded the following:

- SMS criteria apply to surface sediment only.
- High concentrations of total organic carbon (TOC) in sediment make carbon normalization of concentrations inappropriate.
- Consistent with the SMS standards, sediment in the Former Mill Area (pocket beach) is considered "station cluster of low concern."
- There are no SMS standards for dioxin, and therefore dioxins are not of concern (although Floyd|Snider indicated that the dioxin concentration is an order of magnitude above one of the background levels).
- Chemicals that exceed SMS criteria are sporadic and ubiquitous, and there is no evidence of a hazardous-substance release.
- Spatial averaging of concentrations results in a lower and evidently acceptable concentration.
- The lower pocket beach area (nearest the Chehalis River) is a depositional area, and contaminants there could be from deposition of contaminated river sediment. Also, remedy recontamination from upriver sources must be addressed before any cleanup actions are performed.
- Woodwastes and other waste materials were commonly used as fill material to create upland areas. Should woodwaste be removed, it would be necessary to determine how much to remove (e.g., at what volume or depth should the removal action cease [be considered complete?]).

2 SEDIMENT SAMPLING AND ANALYSIS

Sampling and analysis were conducted consistent with the final, DNR-approved SAP (MFA, 2013c), except as noted below. Surface sediment samples were collected in three locations in the Chehalis River from the top 10 centimeters of the river bottom. In the Former Mill Area, cores were advanced in three locations to 5 feet bml or refusal. Locations of the six sediment samples are shown in the attached figure. A tiered approach was used to trigger chemical analysis as described in the SAP. Table 1 summarizes the sediment sample locations, coordinates, and analyses conducted. All sediment samples were evaluated in the field for woodwaste content (percent by volume [Birkland, 1999]). Sample observations, including woodwaste content, are summarized in Table 2. Photographs of sediment samples collected in the Former Mill Area are included in Appendix A.

2.1 Chehalis River Grab Samples

Sediments were collected in the Chehalis River on November 8, 2013. A manually deployed Ponar® grab sampling device (i.e., modified Van Veen) with a 10-centimeter penetration capacity was used to collect surface sediment samples from a small sampling vessel. Sampling locations were approached at slow boat speeds and locations confirmed using a differential global positioning unit. Sample locations are presented in the figure. The grab sampler was deployed slowly, allowed to close, and retrieved aboard the vessel for sample acceptance criteria presented in the SAP (MFA, 2013c). The Ponar® device was emptied into a decontaminated stainless steel bowl and evaluated for woodwaste. The stainless steel sampling equipment was decontaminated between sample locations. Woodwaste and visual impacts were not observed in any sediment collected in the Chehalis River (see Table 2).

Surface sediment samples were analyzed for SMS constituents, dioxins, and TOC, consistent with the SAP (MFA, 2013c). In addition, salinity in pore water was analyzed to better understand ecologically relevant water conditions. Woodwaste was not present in the samples; therefore, analysis was not conducted for conventional parameters used to evaluate toxicity in sediment impacted with woodwaste.

2.2 Former Mill Area Sediment Cores

DNR and Ecology requested further sampling in the Former Mill Area to delineate historically elevated concentrations of butyl benzyl phthalate, pentachlorophenol, mercury, and dioxins (DNR, 2012). Three sediment cores were advanced on November 7 and 8, 2013, during low tides at the locations shown on the attached figure (CR-04, CR-05, and CR-06). Sample locations were adjusted from those presented in the SAP (MFA, 2013c), based on field observations.

Significant accumulations of woodwaste (greater than 25 percent) were observed in all locations in the Former Mill Area. Sheen, petroleum-hydrocarbon-like odor, and dark-colored water or water-product mixtures were observed below approximately 1 foot bml at all three locations. Water filled the holes to approximately 3 feet bml. As a result, samples collected below this depth may be cross-contaminated and not representative of in situ conditions. Field observations and sediment descriptions are summarized in Table 2.

Sediment cores from the Former Mill Area were analyzed using the tiered approach described in the SAP, except that bottom samples were not analyzed for chemical constituents, given the possible cross-contamination (see above). Based on field observations (see above), the list of analytes was expanded to include PCBs, semivolatile organic compounds (SVOCs), and petroleum hydrocarbons. Analysis for conventional parameters (TOC, total volatile solids, total solids, ammonia, total sulfides, and percent fines) was conducted on surface sediment samples and some subsurface sediment containing more than 25 percent woodwaste by volume (Birkland, 1999; DNR, 2012; Integral, 2011). Insufficient pore water volume was recovered by the laboratory for analysis of salinity and sulfides.

2.3 Delivery of Samples to Analytical Laboratory

Via courier under chain-of-custody procedures, all samples were shipped to the analytical laboratory, Analytical Resources Incorporated in Tukwila, Washington, on November 8, 2013. To maintain sample integrity, immediately after the sample containers were filled with sediment, they were placed in ice-filled coolers. Samples were maintained at approximately 4°C. The laboratory received the samples the same day.

3 RESULTS

Sediment samples were collected from three locations in the Chehalis River (surface sediment only, CR-01, CR-02, and CR-03), and three locations from the pocket beach in the Former Mill Area (surface and subsurface sediment, CR-04, CR-05, and CR-06). The locations are shown on the attached figure. Observations of physical impacts, including quantity of woodwaste, are summarized in Table 2.

Analytical results are presented in Table 3, and on an organic-carbon-normalized basis (for Chehalis River samples), in Table 4. Former Mill Area samples are not presented on an organic-carbon-normalized basis. Samples from the Former Mill Area had high TOC, ranging from 21 to 40 percent, likely due to the large amount of woodwaste present in this area. The high TOC makes it inappropriate to use carbon-normalized criteria for organics in this area (Michelsen, 1992); therefore, concentrations of organics were compared to the dry weight equivalents of the sediment quality standards (SQS) and CSL values.

Laboratory reports are provided in Appendix B. The data were reviewed for quality and found to be acceptable, with the appropriate qualifiers, for their intended use. The data quality review memorandum is provided as Appendix C.

3.1 Chemical Screening

Chemical concentrations are compared with the SMS marine criteria in Table 3. Locations with numerical exceedances are presented in the figure. Surface sediment exceedances of the SMS marine CSL are shaded in dark gray in Table 3, and include the following:

- 4-Methylphenol at CR-02 was marginally above the Washington State sediment quality standard (SQS) and CSL of 670 micrograms per kilogram (µg/kg) at 730 µg/kg.
- At CR-04, mercury was detected above the CSL of 0.59 milligram per kilogram (mg/kg) at 6.2 mg/kg, and benzoic acid was detected above the SQS and CSL of 650 µg/kg at 1700 µg/kg.
- AT CR-05, benzoic acid was detected above the SQS and CSL of 650 µg/kg at 950 µg/kg.

Detected chemicals that are bioaccumulative (as defined by Washington Administrative Code [WAC] 173-333-310) are shaded in light gray in Table 3 and include dioxins, mercury, PCBs, and selected PAHs.

3.2 Chehalis River Sediment Concentrations

Sediment concentrations of dioxins, PCBs, and mercury in the Chehalis River were evaluated. These compounds were detected in sediment and are defined under WAC 173-333-310 as bioaccumulative chemicals. Also, because neither SMS nor DNR guidance presents numerical criteria for dioxins, some level of comparison to background concentrations is common practice. Existing Chehalis River sediment data collected within 1 mile of the site were queried from Ecology's EIM database; 46 sample locations were identified. Minimum, maximum, and average concentrations are summarized below. Note that data from the nearby Chehalis River sediment are used for comparison purposes only and are not considered background concentrations. Further evaluation of the Chehalis River data would be required to select appropriate background concentrations.

- Twelve of the 46 nearby samples were analyzed for dioxins. Dioxin TEQs were calculated for the EIM data,[1] resulting in a minimum TEQ of 0.36 pg/g, a maximum TEQ of 7.82 pg/g, and an average TEQ of 2.38 pg/g.
- Twenty-five of the samples were analyzed for PCBs. PCBs were not detected in any of the samples evaluated; however, many reporting limits were elevated compared to those currently achievable and attained for site samples. The total PCB minimum non-detect value was 0.64 U µg/kg, and the maximum non-detect value was 69 U µg/kg, with an average non-detect value of 21.5 µg/kg.
- Thirty-four of the samples were analyzed for mercury. Mercury concentrations ranged from not detected at a reporting limit of 0.008 mg/kg to a maximum concentration of 0.14 mg/kg. The average mercury concentration was 0.05 mg/kg.

3.3 Woodwaste Scoring

Samples containing more than 25 percent woodwaste by volume (Birkland, 1999) were analyzed for conventional sediment parameters. These parameters, along with other chemical analytes, are used to score each location according to Table A-3 of the DNR guidance (Integral, 2011). Woodwaste scoring is summarized in Table 5. Woodwaste scores ranged from "Medium Concern" to "High Concern" at all locations evaluated (i.e., in the Former Mill Area). Note that while pore water sulfides were not analyzed because of a lack of pore water, this parameter does not impact the results of the woodwaste screening.

[1] TEQ calculation methods were presented in the SAP (MFA, 2013c).

4 SUMMARY AND CONCLUSIONS

As a condition of a sublease agreement, DNR required sediment sampling within the leased area boundary (see the attached figure). Chemical analysis was performed on samples taken from six locations, and woodwaste scoring was performed at those locations with greater than 25 percent woodwaste by volume. Two primary areas were evaluated: the Chehalis River (represented by CR-01, CR-02, and CR-03), and the Former Mill Area (represented by CR-04, CR-05, and CR-06).

4.1 Chehalis River Samples

No impacts, including woodwaste, were observed in sediments collected in the Chehalis River portion of the leased property. Only one detection of 4-methylphenol at CR-02 was marginally above a screening criterion.

Bioaccumulative compounds PCBs and dioxins were also detected in Chehalis River sediment. PCBs were detected at a laboratory-estimated dry weight concentration of 12 µg/kg in CR-02, where 4-methylphenol exceeded screening criteria (see above). PCBs were also detected in storm system solids during the 1990s. Note that PCBs are ubiquitous and are frequently present in the aquatic environment; however, because nearby Chehalis River sediment samples generally had elevated reporting limits for PCBs, a comparison of the PCB concentration at CR-02 with Chehalis River concentrations was not possible.

Dioxins were detected at all locations in the Chehalis River, with TEQs ranging from 12.4 pg/g to 15.8 pg/g. These TEQs are within an order of magnitude of the average dioxin TEQ (2.38 pg/g) in nearby Chehalis River samples.

4.2 Former Mill Area Samples

Significant accumulations of woodwaste (greater than 25 percent) were observed in all locations in the Former Mill Area. In addition, sheen, petroleum-hydrocarbon-like odor, and dark-colored water or water-product mixtures were observed below approximately 1 foot bml at all three locations.

Surface sediment exceedances of the SMS CSL in the Former Mill Area were limited to mercury and benzoic acid at CR-04 and benzoic acid at CR-05. Bioaccumulative chemicals PCBs, dioxins, and PAHs were detected in surface sediment. In subsurface sediment (10 centimeters to 5 feet bml), concentrations of dioxins, PCBs, SVOCs, PAHs, and total petroleum hydrocarbons generally increased relative to surface sediment concentrations.

Concentrations of dioxin TEQs in surface sediment in the Former Mill Area ranged from 27.2 pg/g to 68.9 pg/g, somewhat elevated relative to the Chehalis River nearby sample average dioxin TEQ of 2.38 pg/g. Subsurface concentrations ranged from 44.4 pg/g to 370 pg/g and appear to be substantially elevated relative to other Chehalis River samples.

PCB concentrations in surface sediment were 180 µg/kg and 200 µg/kg, while subsurface concentrations increased to between 690 µg/kg and 1,170 µg/kg. As noted in Section 3.2, the elevated PCB method reporting limits prevent an appropriate quantitative evaluation of samples historically collected nearby in the Chehalis River. However, relative to CR-02, the Chehalis River sample collected during this sampling event, the PCB concentrations in the Former Mill Area appear to be substantially elevated.

Similarly, PAH concentrations in surface sediment (total PAHs ranging from 2,580 µg/kg to 4,680 µg/kg) are elevated relative to Chehalis River samples collected during this sampling event (CR-01, CR-02, and CR-03, ranging from 42 mg/kg to 488 mg/kg), and concentrations increase in the subsurface in the Former Mill Area and range from 10,000 µg/kg to 60,000 µg/kg.

All samples collected in the Former Mill Area contained greater than 25 percent woodwaste by volume. Scoring of the woodwaste according to the DNR guidance (Integral, 2011) resulted in scores ranging from "Medium Concern" to "High Concern." Note that woodwastes and other waste materials were commonly used as fill material to create upland areas (Floyd|Snider, 2011).

LIMITATIONS

The services undertaken in completing this report were performed consistent with generally accepted professional consulting principles and practices. No other warranty, express or implied, is made. These services were performed consistent with our agreement with our client. This report is solely for the use and information of our client unless otherwise noted. Any reliance on this report by a third party is at such party's sole risk.

Opinions and recommendations contained in this report apply to conditions existing when services were performed and are intended only for the client, purposes, locations, time frames, and project parameters indicated. We are not responsible for the impacts of any changes in environmental standards, practices, or regulations subsequent to performance of services. We do not warrant the accuracy of information supplied by others, or the use of segregated portions of this report.

The purpose of an environmental assessment is to reasonably evaluate the potential for or actual impact of past practices on a given site area. In performing an environmental assessment, it is understood that a balance must be struck between a reasonable inquiry into the environmental issues and an exhaustive analysis of each conceivable issue of potential concern. The following paragraphs discuss the assumptions and parameters under which such an opinion is rendered.

No investigation is thorough enough to exclude the presence of hazardous materials at a given site. If hazardous conditions have not been identified during the assessment, such a finding should not, therefore, be construed as a guarantee of the absence of such materials on the site.

Environmental conditions that cannot be identified by visual observation may exist at the site. Where subsurface work was performed, our professional opinions are based in part on interpretation of data from discrete sampling locations that may not represent actual conditions at unsampled locations.

Except where there is express concern of our client, or where specific environmental contaminants have been previously reported by others, naturally occurring toxic substances, potential environmental contaminants inside buildings, or contaminant concentrations that are not of current environmental concern may not be reflected in this document.

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TABLES

Table 1
Sample Locations and Analyses
Grays Harbor Historical Seaport Authority
Aberdeen, Washington

Sample Location	Sample Type	Sample Depth	Sample Coordinates	
Chehalis River				
CR-01	Surface Grab (Ponar)	0-10 cm bml	817108.6634	615592.2936
CR-02	Surface Grab (Ponar)	0-10 cm bml	817677.5240	615747.8208
CR-03	Surface Grab (Ponar)	0-10 cm bml	818247.8576	615977.6148
Former Mill Area				
CR-04	Sediment Core	0- 10 cm bml	816924.1940	615373.2920
		10 cm -1 foot bml		
		1-2.5 feet bml		
		2.5-5 feet bml		
CR-05	Sediment Core	0-10 cm bml	816946.1480	615432.6330
		10 cm-2.5 feet bml		
		2.5-3.5 feet bml		
CR-06	Sediment Core	0-10 cm bml	816971.8790	615382.2180
		10 cm-1 foot bml		
		1-2.5 feet bml		
		2.5-4 feet bml		

NOTES:
bml = below mudline.
cm = centimeters.

Table 2
Sample Observations
Grays Harbor Historical Seaport Authority Site
Aberdeen, Washington

Sample Location	CR-01	CR-02	CR-03	CR-04				CR-05			CR-06		
Collection Depth (feet bml)	0-0.33	0-0.33	0-0.33	0-0.03	0-0.33	2.5	4-5	0-0.33	2.5	3.5	0-0.33	2.5	5
Woodwaste (%)	0	0	0	50	75	55	55	50	80	10	70	70	70
Sheen	No	No	No	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No
Odor	No	No	No	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No
Description	Gray silty sand (SM), loose, trace organic debris.	Gray to tan silty sand (SM), loose, trace organic debris, tan mottles.	Gray silty sand (SM), loose, trace organic debris.	Tan sandy silt (ML) with 50% to 75% woodwaste, wet, medium density, pockets of dark-colored water/product mixture at 2.5 feet bml. Angular lumber and construction debris.				Tan silty sand (ML) with 10% to 80% woodwaste under 4 mm, wet, medium density, pockets of black-colored water/product mixture. Angular lumber and construction debris.			Tan silty sand (ML) with 70% woodwaste under 4 mm, wet, medium density, pockets of black-colored water/product mixture Angular lumber and construction debris.		

NOTES:
bml = below mudline.
mm = millimeter(s).

Table 3
Analytical Results
Grays Harbor Historical Seaport Authority Site
Aberdeen, Washington

Location:	SMS Marine Cleanup Screening Levels		CR-01	CR-02	CR-03	CR-04	CR-04	CR-04	CR-05	CR-05	CR-06	CR-06
Sample Name:			CR01-10cm	CR02-10cm	CR03-10cm	CR04-10cm	CR04-2.5	CR04-5	CR05-10cm	CR05-2.5	CR06-10cm	CR06-2.5
Collection Date:	SQS	SIZmax, CSL, MCUL	11/08/2013	11/08/2013	11/08/2013	11/07/2013	11/08/2013	11/08/2013	11/08/2013	11/08/2013	11/07/2013	11/07/2013
Collection Depth (ft bgs):			0-0.33	0-0.33	0-0.33	0-0.33	1-2.5	4-5	0-0.33	1-2.5	0-0.33	1-2.5
Dioxin/Furans (pg/g)												
1,2,3,4,6,7,8-HpCDD	NV	NV	**211**	**201**	**66.1**	**817**	**4070**	--	**1820**	**12200**	**1080**	**1090**
1,2,3,4,6,7,8-HpCDF	NV	NV	**31.9**	**113**	**24.7**	**165**	**919**	--	**437**	**1170**	**258**	**276**
1,2,3,4,7,8,9-HpCDF	NV	NV	**1.59**	**4.94**	**0.894** J	7.55 U	**42.8**	--	**19.8**	**81.3**	**13.2**	**15.5**
1,2,3,4,7,8-HxCDD	NV	NV	**1.76**	**1.96**	**1.42**	**4.26**	**32.5**	--	**11.2**	**24.5**	**12.7**	**8.21**
1,2,3,4,7,8-HxCDF	NV	NV	**2.77**	**4.6**	**1.02**	**7.26**	**35.9**	--	**15.3**	**115**	**18.1**	**21.7**
1,2,3,6,7,8-HxCDD	NV	NV	**9.98**	**10.4**	**4.81**	**54.5**	**350**	--	**136**	**1020**	**63.8**	**72.8**
1,2,3,6,7,8-HxCDF	NV	NV	**1.19**	**3.22**	**0.862** J	**3.38**	**18.9**	--	**10.9**	**51.7**	**8.9**	**8.35**
1,2,3,7,8,9-HxCDD	NV	NV	**11.1**	**12.4**	**12.9**	**10.2**	**48.1**	--	**29.9**	**98.1**	**16.5**	**15.4**
1,2,3,7,8,9-HxCDF	NV	NV	0.778 U	**0.886** J	**0.268** J	**2.45**	**14.6**	--	**6.11**	**62.9**	**4.79**	**4.66**
1,2,3,7,8-PeCDD	NV	NV	**3.93**	**4.53**	**5.08**	**4.34**	**18.8**	--	**13.9**	**34.1**	**9.35**	**8.27**
1,2,3,7,8-PeCDF	NV	NV	**0.683** J	**0.804** J	**0.508** J	**2.06**	**12.4**	--	**4.73**	**41.4**	**3.28**	**3.24**
2,3,4,6,7,8-HxCDF	NV	NV	**1.8**	**5.58**	**0.785** J	**5.09**	**22.2**	--	**11.1**	**69.3**	**16.9**	**16.3**
2,3,4,7,8-PeCDF	NV	NV	**0.814** J	**1.13**	**0.594** J	**3.43**	**15.7**	--	**5.82**	**43.5**	**5.96**	**5.87**
2,3,7,8-TCDD	NV	NV	**2.62**	**2.89**	**3.56**	1.14 U	**3.97**	--	**3**	**5.26**	**2.09**	**2.11**
2,3,7,8-TCDF	NV	NV	**1.96**	**2.18**	**1.34**	**3.53**	**16**	--	**6.3**	**54.3**	**4.87**	**4.95**
OCDD	NV	NV	**1690**	**1550**	**489**	**5340** J	**23500 J**	--	**10300** J	**68300 J**	**7830** J	**6810** J
OCDF	NV	NV	**51**	**211**	**36.4**	**476**	**1900**	--	**863**	**3100**	**680**	**652**
Total HpCDDs	NV	NV	**485**	**433**	**167**	**1530**	**7520**	--	**3750**	**21300**	**2480**	**2050**
Total HpCDFs	NV	NV	87.1 U	**310**	**55.9**	678 U	**3910**	--	**1560**	5060 U	**950**	1120 U
Total HxCDDs	NV	NV	**97**	**114**	80.8 U	350 U	1540 U	--	1010 U	**4840**	742 U	783 U
Total HxCDFs	NV	NV	52.5 U	**125**	24.4 U	301 U	**2130**	--	**853**	6030 U	463 U	518 U
Total PeCDDs	NV	NV	**25.8**	**34.9**	**30.6**	68.7 U	133 U	--	334 U	862 U	**88.7**	67 U
Total PeCDFs	NV	NV	18 U	47.6 U	13.2 U	101 U	658 U	--	281 U	2660 U	203 U	147 U
Total TCDDs	NV	NV	17.4 U	28.1 U	24.7 U	17.5 U	32.6 U	--	73.6 U	**180**	42.6 U	**28.7**
Total TCDFs	NV	NV	12.4 U	33 U	16.7 U	27.9 U	119 U	--	78.1 U	558 U	82.8 U	62.3 U
Dioxin TEQ	NV	NV	**13.1**	**15.8**	**12.4**	**27.2**	**143**	--	**68.9**	**370**	**44.9**	**44.4**
Total Metals (mg/kg)												
Arsenic	57	93	10 U	9 U	10 U	--	--	--	--	--	--	20 U
Cadmium	5.1	6.7	**0.5**	**0.4**	0.5 U	--	--	--	--	--	--	1 U
Chromium	260	270	**40** J	**38.5** J	**48** J	--	--	--	--	--	--	**26** J
Copper	390	390	**58** J	**56.3** J	**65.4** J	--	--	--	--	--	--	**96** J
Lead	450	530	**7**	**9**	**8**	--	--	--	--	--	--	**110**
Mercury	0.41	0.59	**0.05**	**0.1**	**0.09**	**6.2**	**0.5** J	--	**0.16**	**0.5** J	**0.55**	**0.53**
Silver	6.1	6.1	0.7 U	0.6 U	0.8 U	--	--	--	--	--	--	1 U
Zinc	410	960	**87**	**79**	**91**	--	--	--	--	--	--	**237**

Table 3
Analytical Results
Grays Harbor Historical Seaport Authority Site
Aberdeen, Washington

Location:	SMS Marine Cleanup Screening Levels		CR-01	CR-02	CR-03	CR-04	CR-04	CR-04	CR-05	CR-05	CR-06	CR-06
Sample Name:			CR01-10cm	CR02-10cm	CR03-10cm	CR04-10cm	CR04-2.5	CR04-5	CR05-10cm	CR05-2.5	CR06-10cm	CR06-2.5
Collection Date:	SQS	SIZmax, CSL, MCUL	11/08/2013	11/08/2013	11/08/2013	11/07/2013	11/08/2013	11/08/2013	11/08/2013	11/08/2013	11/07/2013	11/07/2013
Collection Depth (ft bgs):			0-0.33	0-0.33	0-0.33	0-0.33	1-2.5	4-5	0-0.33	1-2.5	0-0.33	1-2.5
PCBs (µg/kg)												
Aroclor 1016	NV	NV	18 U	19 U	19 U	20 UJ	19 UJ	--	20 UJ	19 UJ	--	20 U
Aroclor 1221	NV	NV	18 U	19 U	19 U	20 UJ	19 UJ	--	20 UJ	19 UJ	--	20 U
Aroclor 1232	NV	NV	23 U	38 U	46 U	20 UJ	19 UJ	--	20 UJ	19 UJ	--	20 U
Aroclor 1242	NV	NV	18 U	19 U	19 U	20 UJ	19 UJ	--	20 UJ	19 UJ	--	20 U
Aroclor 1248	NV	NV	18 U	19 U	19 U	29 UJ	48 UJ	--	29 UJ	97 UJ	--	99 U
Aroclor 1254	NV	NV	18 U	**12** J	19 U	97 UJ	**440** J	--	98 UJ	**490** J	--	200 U
Aroclor 1260	NV	NV	18 U	19 U	19 U	**200** J	**730** J	--	**180** J	**670** J	--	**690**
Total PCBs[a]	12000	65000	ND	**12** J	ND	**200** J	**1170** J	--	**180** J	**1160** J	--	**690**
SVOCs (µg/kg)												
1,2,4-Trichlorobenzene	810	1800	4.8 U	4.9 U	4.8 U	100 UJ	81 UJ	--	**43** J	**74** J	--	70 U
1,2-Dichlorobenzene	2300	2300	4.8 U	4.9 U	4.8 U	100 UJ	81 UJ	--	58 UJ	88 UJ	--	70 U
1,3-Dichlorobenzene	NV	NV	4.8 U	4.9 U	4.8 U	100 UJ	81 UJ	--	**620** J	**280** J	--	70 U
1,4-Dichlorobenzene	3100	9000	4.8 U	**19** J	4.8 U	100 UJ	81 UJ	--	**1000** J	**540** J	--	70 U
2,4-Dimethylphenol	29	29	24 U	24 U	24 U	530 UJ	400 UJ	--	290 UJ	440 UJ	--	350 U
2-Methylphenol	63	63	4.8 U	4.9 U	**3.3** J	100 UJ	81 UJ	--	**44** J	88 UJ	--	**45** J
4-Methylphenol	670	670	**30**	**730**	**60**	420 UJ	320 UJ	--	**310** J	**280** J	--	**420**
Benzoic acid	650	650	190 U	**240**	**180** J	**1700** J	3200 UJ	--	**950** J	3500 UJ	--	**860** J
Benzyl alcohol	57	73	**15** J	**43** J	**43** J	420 UJ	320 UJ	--	230 UJ	350 UJ	--	280 U
Bis(2-ethylhexyl)phthalate	47000	78000	**29** J	49 U	48 U	1000 UJ	**870** J	--	**960** J	**9400** J	--	**1900**
Butylbenzylphthalate	4900	6400	4.8 U	4.9 U	4.8 U	58 UJ	81 UJ	--	58 UJ	88 UJ	310 UJ	70 U
Dibenzofuran	15000	58000	**12** J	**20**	19 U	420 UJ	**210** J	--	**310** J	**230** J	--	**490**
Diethylphthalate	61000	110000	**56**	**20**	**36**	420 UJ	320 UJ	--	230 UJ	350 UJ	--	**270** J
Dimethyl phthalate	53000	53000	4.8 U	**3.1** J	**2.5** J	100 UJ	81 UJ	--	58 UJ	88 UJ	--	70 U
Di-n-butyl phthalate	220000	1700000	19 U	20 U	19 U	420 UJ	320 UJ	--	230 UJ	350 UJ	--	280 U
Di-n-octyl phthalate	58000	4500000	19 U	20 U	19 U	420 UJ	320 UJ	--	230 UJ	350 UJ	--	280 U
Hexachlorobenzene	380	2300	4.8 U	4.9 U	4.8 U	100 UJ	81 UJ	--	58 UJ	88 UJ	--	70 U
Hexachlorobutadiene	3900	6200	4.8 U	4.9 U	4.8 U	100 UJ	81 UJ	--	58 UJ	88 UJ	--	70 U
N-Nitrosodiphenylamine	11000	11000	4.8 U	4.9 U	4.8 U	100 UJ	81 UJ	--	58 UJ	88 UJ	--	70 U
Pentachlorophenol	360	690	19 U	20 U	19 U	**270** J	**400** J	--	230 UJ	350 UJ	1500 UJ	**240** J
Phenol	420	1,200	**24**	**94**	**43**	**290** J	**390** J	**980** J	**570** J	**530** J	**370** J	**240** J
PAHs (µg/kg)												
2-Methylnaphthalene	38000	64000	19 U	**28**	19 U	420 UJ	320 UJ	--	**310**	350 UJ	--	**780**
Acenaphthene	16000	57000	**14** J	**20**	19 U	420 UJ	**180** J	--	**210**	**390** J	--	**490**
Acenaphthylene	66000	66000	19 U	**68**	19 U	420 UJ	320 UJ	--	**170**	350 UJ	--	**520**
Anthracene	220000	1200000	**14** J	**16** J	19 U	420 UJ	**290** J	--	**230**	**320** J	--	**750**
Benzo(a)anthracene	110000	270000	**28**	**11** J	19 U	**250** J	**640** J	--	**390**	**680** J	--	**1300**
Benzo(a)pyrene	99000	210000	**21**	20 U	19 U	**300** J	**680** J	--	**340** J	**530** J	--	**1200**
Benzo(ghi)perylene	NV	NV	**14** J	**15** J	19 U	**230** J	**660** J	--	**260** J	**300** J	--	**590**

Table 3
Analytical Results
Grays Harbor Historical Seaport Authority Site
Aberdeen, Washington

Location:	SMS Marine Cleanup Screening Levels		CR-01	CR-02	CR-03	CR-04	CR-04	CR-04	CR-05	CR-05	CR-06	CR-06
Sample Name:			CR01-10cm	CR02-10cm	CR03-10cm	CR04-10cm	CR04-2.5	CR04-5	CR05-10cm	CR05-2.5	CR06-10cm	CR06-2.5
Collection Date:	SQS	SIZmax, CSL, MCUL	11/08/2013	11/08/2013	11/08/2013	11/07/2013	11/08/2013	11/08/2013	11/08/2013	11/08/2013	11/07/2013	11/07/2013
Collection Depth (ft bgs):			0-0.33	0-0.33	0-0.33	0-0.33	1-2.5	4-5	0-0.33	1-2.5	0-0.33	1-2.5
Chrysene	110000	460000	**35**	**17** J	19 U	**530** J	**940** J	--	**420** J	**460** J	--	**1600**
Dibenzo(a,h)anthracene	NV	NV	**3** J	4.9 U	4.8 U	**120** J	**360** J	--	**94** J	**190** J	--	**150**
Fluoranthene	160000	1200000	**100**	**63**	**25**	**590** J	**2200** J	--	**1300** J	**3900** J	--	**3200**
Fluorene	23000	79000	**14** J	**15** J	19 U	420 UJ	**180** J	--	**260** J	**230** J	--	**650**
Indeno(1,2,3-cd)pyrene	34000	88000	19 U	20 U	19 U	420 UJ	**480** J	--	**200** J	**190** J	--	**490**
Naphthalene	99000	170000	**25**	**280**	**23**	**420** J	**340** J	--	**720** J	**440** J	--	**1800**
Phenanthrene	100000	480000	**47**	**89**	**19**	**320** J	**370** J	--	**700** J	**470** J	--	**3600**
Pyrene	1000000	1400000	**110**	**61**	**21**	**700** J	**1800** J	--	**1300** J	**3100** J	--	**3600**
Total Benzofluoranthenes	230000	450000	**52**	**22** J	**13** J	**550** J	**1700** J	--	**660**	**810** J	--	**2000**
Total PAHs[a]	NV	NV	**477**	**705**	**101**	**2580** J	**6410** J	--	**4680** J	**8720** J	--	**22720**
Total HPAHs	960000	5300000	**363**	**189**	**59**	**1840** J	**5700** J	--	**3260** J	**7810** J	--	**13640**
Total LPAHs	370000	780000	**114**	**488**	**42**	**740** J	**710** J	--	**1420** J	**910** J	--	**7290**
NWTPH-Dx (mg/kg)												
Diesel	NV	NV	--	--	--	**2400** J	**3200** J	--	**1200** J	**3200** J	--	**20000**
Motor-Oil Range	NV	NV	--	--	--	**7400** J	**10000** J	--	**4800** J	**13000** J	--	**60000**
NWTPH-Gx (mg/kg)												
Gasoline	NV	NV	--	--	--	--	--	--	--	--	--	54 UJ
Conventionals												
Ammonia (as N) (mg N/kg)	NV	NV	--	--	--	0.47 U	--	**15.2**	**7.21**	--	**1.37**	**14.0**
Sulfide (mg/kg)	NV	NV	--	--	--	**6.46**	--	**179**	**320**	--	**906**	**2910**
Total Organic Carbon (%)	NV	NV	**2.06** J	**3.21** J	**2.91** J	**31.4** J	--	**16.5** J	**13.6** J	--	**35.6** J	**49.5** J
Total Volatile Solids (%)	NV	NV	--	--	--	**59.91**	--	**38.2**	**36.49**	--	**60.05**	**69.23**
Total solids (%)	NV	NV	**44.09**	**51.8**	**36.4**	**20.62**	--	**19.98**	**30.32**	--	**21.4**	**21.59**
Grain Size (%)												
Gravel	NV	NV	--	--	--	**22.8**	--	**23.6**	**20.2**	--	**22.7**	--
Very coarse sand	NV	NV	--	--	--	**13.8**	--	**13**	**11.4**	--	**13**	--
Coarse sand	NV	NV	--	--	--	**14.2**	--	**10.7**	**13.2**	--	**15.7**	--
Medium sand	NV	NV	--	--	--	**8.5**	--	**6.1**	**10.5**	--	**11.9**	--
Fine sand	NV	NV	--	--	--	**3.7**	--	**3.2**	**6**	--	**5.1**	--
Very fine sand	NV	NV	--	--	--	**1.4**	--	**1.4**	**3.5**	--	**2**	--
Coarse silt	NV	NV	--	--	--	**7.2**	--	**1.3**	**8.1**	--	**4.1**	--
Medium silt	NV	NV	--	--	--	**5.9**	--	**10.6**	**7.7**	--	**5.1**	--
Fine silt	NV	NV	--	--	--	**6.2**	--	**8.9**	**5.1**	--	**4.5**	--
Very fine silt	NV	NV	--	--	--	**4.8**	--	**6.1**	**4.5**	--	**3.7**	--
Coarse clay	NV	NV	--	--	--	**2.9**	--	**4.3**	**2.1**	--	**2.7**	--
Medium clay	NV	NV	--	--	--	**2.6**	--	**3.7**	**2.4**	--	**2.1**	--
Fine clay	NV	NV	--	--	--	**6.1**	--	**7.2**	**5.4**	--	**7.4**	--
Total fines	NV	NV	--	--	--	**35.6**	--	**42.1**	**35.3**	--	**29.7**	--
Pore Water Analysis												
Conductivity (µmhos/cm)	NV	NV	**18700**	**12200**	**17500**	--	--	--	--	--	--	--
Salinity (ppt)	NV	NV	**11**	**6.9**	**10.2**	--	--	--	--	--	--	--

NOTES:
Detections are in **bold** font.
Detections that exceed the CSL are shaded in dark gray. Non-detect results are not screened against SLVs.
Detections of bioaccumulative chemicals defined in WAC 173-333-310 are shaded in light gray.
-- = not analyzed.
CSL = cleanup screening level.
ft bgs = feet below ground surface.
HPAH = high-molecular-weight PAH.
J = Result is an estimated value.
LPAH = low-molecular-weight PAH.
MCUL = minimum cleanup level.
mg N/kg = milligrams of nitrogen per kilogram.
mg/kg = milligrams per kilogram.
µg/kg = micrograms per kilogram.
µmhos/cm = micromhos per centimeter = microSiemen.
ND = not detected.
NV = no value.
NWTPH-Dx = total petroleum hydrocarbons—diesel and motor oil.
NWTPH-Gx = total petroleum hydrocarbons—gasoline.
PAH = polycyclic aromatic hydrocarbon.
PCB = polychlorinated biphenyl.
pg/g = picograms per gram (parts per trillion).
ppt = parts per thousand.
SIZmax = Sediment Impact Zone maximum allowable concentration (WAC 173-204-420).
SLV = screening level value.
SQS = Sediment Quality Standards (WAC 173-294-320).
SVOC = semivolatile organic compound. When samples were analyzed by both 8270D and 8270D SIM methods, or when samples were reanalyzed, the higher detected value or lower non-detect value was used.
U = Result is non-detect at method reporting limit.
UJ = Result is non-detect at or above method reporting limit. Reported value is estimated.
WAC = Washington Administrative Code.
[a]Calculated value. Only detected values are summed.

Table 4
Analytical Results—Organic Carbon Normalized
Grays Harbor Historical Seaport Authority Site
Aberdeen, Washington

Location: / Sample Name: / Collection Date: / Collection Depth (ft bgs):	SMS Marine Cleanup Screening Levels		CR-01-OC Normal CR01-10cm 11/08/2013 0-0.83	CR-02-OC Normal CR02-10cm 11/08/2013 0-0.83	CR-03-OC Normal CR03-10cm 11/08/2013 0-0.83
	SQS—Organic Carbon	CSL—Organic Carbon			
PCBs (µg/kg-OC)					
Aroclor 1016	NV	NV	874 U	592 U	653 U
Aroclor 1221	NV	NV	874 U	592 U	653 U
Aroclor 1232	NV	NV	1117 U	1184 U	1581 U
Aroclor 1242	NV	NV	874 U	592 U	653 U
Aroclor 1248	NV	NV	874 U	592 U	653 U
Aroclor 1254	NV	NV	874 U	**374** J	653 U
Aroclor 1260	NV	NV	874 U	592 U	653 U
Total PCBs[a]	12000	65000	ND	**374** J	ND
SVOCs (µg/kg-OC)					
1,2,4-Trichlorobenzene	810	1800	233 U	153 U	165 U
1,2-Dichlorobenzene	2300	2300	233 U	153 U	165 U
1,3-Dichlorobenzene	NV	NV	NA	NA	NA
1,4-Dichlorobenzene	3100	9000	233 U	**592** J	165 U
Bis(2-ethylhexyl)phthalate	47000	78000	**1408** J	1526 U	1649 U
Butylbenzylphthalate	4900	6400	233 U	153 U	165 U
Dibenzofuran	15000	58000	**583** J	**623**	653 U
Diethylphthalate	61000	110000	**2718**	**623**	**1237**
Dimethyl phthalate	53000	53000	233 U	**97** J	**86** J
Di-n-butyl phthalate	220000	1700000	922 U	623 U	653 U
Di-n-octyl phthalate	58000	4500000	922 U	623 U	653 U
Hexachlorobenzene	380	2300	233 U	153 U	165 U
Hexachlorobutadiene	3900	6200	233 U	153 U	165 U
N-Nitrosodiphenylamine	11000	11000	233 U	153 U	165 U

Table 4
Analytical Results—Organic Carbon Normalized
Grays Harbor Historical Seaport Authority Site
Aberdeen, Washington

Location:	SMS Marine Cleanup Screening Levels		CR-01-OC Normal	CR-02-OC Normal	CR-03-OC Normal
Sample Name:			CR01-10cm	CR02-10cm	CR03-10cm
Collection Date:	SQS—Organic Carbon	CSL—Organic Carbon	11/08/2013	11/08/2013	11/08/2013
Collection Depth (ft bgs):			0-0.83	0-0.83	0-0.83
PAHs (µg/kg-OC)					
2-Methylnaphthalene	38000	64000	922 U	**872**	653 U
Acenaphthene	16000	57000	**680** J	**623**	653 U
Acenaphthylene	66000	66000	922 U	**2118**	653 U
Anthracene	220000	1200000	**680** J	498 J	653 U
Benzo(a)anthracene	110000	270000	**1359**	343 J	653 U
Benzo(a)pyrene	99000	210000	**1019**	623 U	653 U
Benzo(ghi)perylene	NV	NV	**680** J	467 J	653 U
Chrysene	110000	460000	**1699**	530 J	653 U
Dibenzo(a,h)anthracene	NV	NV	**146** J	153 U	165 U
Fluoranthene	160000	1200000	**4854**	**1963**	**859**
Fluorene	23000	79000	**680** J	467 J	653 U
Indeno(1,2,3-cd)pyrene	34000	88000	922 U	623 U	653 U
Naphthalene	99000	170000	**1214**	**8723**	**790**
Phenanthrene	100000	480000	**2282**	**2773**	**653**
Pyrene	1000000	1400000	**5340**	**1900**	**722**
Total Benzofluoranthenes	230000	450000	**2524**	685 J	**447** J
Total PAHs[a]	NV	NV	**23155**	**21963**	**3471**
Total HPAHs	960000	5300000	**17621**	**5888**	**2027**
Total LPAHs	370000	780000	**5534**	**15202**	**1443**
Total Organic Carbon (%)			**2.06** J	**3.21** J	**2.91** J

Table 4
Analytical Results—Organic Carbon Normalized
Grays Harbor Historical Seaport Authority Site
Aberdeen, Washington

NOTES:

Detections are in **bold** font.

CSL = cleanup screening level.

ft bgs = feet below ground surface.

HPAH = high-molecular-weight PAH.

J = Result is an estimated value.

LOQ = limit of quantitation.

LPAH = low-molecular-weight PAH.

ND = not detected.

NV = no value.

PAH = polycyclic aromatic hydrocarbon.

PCB = polychlorinated biphenyl.

SQS = Sediment Quality Standards (WAC 173-294-320).

SVOC = semivolatile organic compound. When samples were analyzed by both 8270D and 8270D SIM methods, or when samples were reanalyzed, the higher detected value or lower non-detect value was used.

U = Result is non-detect at method reporting limit.

[a]Calculated value. Only detected values are summed.

Table 5
Woodwaste Scoring
Grays Harbor Historical Seaport Authority Site
Aberdeen, Washington

		Location:	CR-04		CR-04		CR-05		CR-06		CR-06	
		Sample Name:	CR04-10cm		CR04-5		CR05-10cm		CR06-10cm		CR06-2.5	
		Collection Date:	11/07/2013		11/08/2013		11/08/2013		11/07/2013		11/07/2013	
		Collection Depth (ft bgs):	0-0.83		4-5		0-0.83		0-0.83		1-2.5	
	Woodwaste Scoring Criteria (DNR, 2011)											
	Score Criteria Level 1	Score Criteria Level 2		Points		Points		Points		Points		Points
Phenol	420	1,200	290 J	0	980 J	1	570 J	1	370 J	0	240 J	0
Ammonia (as N) (mg N/kg)	≥30<40	≥40	0.47 U	0	15.2	0	7.21	0	1.37	0	14.0	0
Sulfide (mg/kg)	≥200<300	≥300	6.46	0	179	0	320	2	906	2	2910	2
Total Organic Carbon (%)	≥5<10	≥10	31.4 J	2	16.5 J	2	13.6 J	2	35.6 J	2	49.5 J	2
Total Volatile Solids (%)	≥10<15	>15	59.91	2	38.2	2	36.49	2	60.05	2	69.23	2
Total Solids (%)	≤50≥40	<40	20.62	2	19.98	2	30.32	2	21.4	2	21.59	2
Total Score												
				6		7		9		8		8

NOTES:
<5 = Low Concern.
≥5 < 6 = Low Medium Concern.
≥6 < 7 = Medium Concern.
>7 = High Concern.
mg N/kg = milligrams of nitrogen per kilogram.
mg/kg = milligrams per kilogram.
J = Result is an estimated value.
U = Result is non-detect at method reporting limit.

FIGURE

Path: X:\0863.01 Harbor Architects\01101\Projects\Fig_Sample Locations and Select Analytical Results.mxd

Print Date: 1/17/2014

Approved By: M.Murray

Produced By: jschane

Project: P0863.01.01

Figure
Sample Locations and Select Analytical Results

Grays Harbor Historical Seaport Authority
Aberdeen, Washington

CR-04		
Depth	0-10 cm	1-2.5 ft
Dioxin TEQ (ng/kg)	27.2	143
Total PCBs (ug/kg)	200 J	1,170 J
Total HPAH (ug/kg)	1,840 J	5,700 J
CSL Exceedances	Mercury (6.2 mg/kg), Benzoic Acid (1700 J ug/kg)	Not Applicable

CR-05		
Depth	0-10 cm	1-2.5 ft
Dioxin TEQ (ng/kg)	68.9	370
Total PCBs (ug/kg)	180 J	1,160 J
Total HPAH (ug/kg)	3,260 J	7,810 J
CSL Exceedances	Benzoic Acid (950 J ug/kg)	Not Applicable

CR-06		
Depth	0-10 cm	1-2.5 ft
Dioxin TEQ (ng/kg)	44.9	44.4
Total PCBs (ug/kg)	NA	690
Total HPAH (ug/kg)	NA	13,640
CSL Exceedances	None	Not Applicable

CR-02	
Depth	0-10 cm
Dioxin TEQ (ng/kg)	15.8
Total PCBs (ug/kg)	12 J
Total HPAH (ug/kg)	189
CSL Exceedances	4-methylphenol (730 ug/kg)

CR-03	
Depth	0-10 cm
Dioxin TEQ (ng/kg)	12.4
Total PCBs (ug/kg)	19 U
Total HPAH (ug/kg)	59
CSL Exceedances	None

CR-01	
Depth	0-10 cm
Dioxin TEQ (ng/kg)	13.1
Total PCBs (ug/kg)	18 U
Total HPAH (ug/kg)	363
CSL Exceedances	None

Chehalis River

SCFM1/ SSFM1
SCFM3/ SSFM3
SCFM2/ SSFM2
DF-comp-g4
DF-comp-g3
DF-comp-g2
DF-comp-g1
DD-comp-g1
DD-comp-g2
DU-comp-g1
DU-comp-g2
7S
14S
2S
SB1
SB2
SB3
SB4
SB5
SB6

Notes:
1. ng/kg = nanograms per kilogram
2. ug/kg = micrograms per kilogram
3. NA = not analyzed

Legend

- 2013 Sediment Sample Location
- 2011 Sediment Core Location
- Upland Soil Boring Location
- Upstream Composite Sediment Location
- Dock Front Composite Sediment Location
- Downstream Composite Sediment Sample Location
- 1999 Sediment Sample Location
- DNR Lease Area Boundaries
- Dock Area
- Filled Tidelands
- Former Mill Area

0 150 300
Feet

Source: Aerial photograph (2013) obtained from Esri ArcGIS Online

MAUL FOSTER ALONGI
p. 971 544 2139 | www.maulfoster.com

APPENDIX A
SAMPLING PHOTOGRAPHS

PHOTOGRAPHS

Project Name: GHHSA Sediment Sampling
Project Number: 0863.01.03

Photo No.
1

Description
Sediment from CR-06 showing wood waste and visual impacts.
11/7/2013

Photo No.
2

Description
Wood waste and visual impacts at CR-05.
11/8/2013

PHOTOGRAPHS

Project Name: GHHSA Sediment Sampling
Project Number: 0863.01.03

Photo No.
3

Description
Wood waste and pocket of impacted fluid at CR-04.
11/8/2013

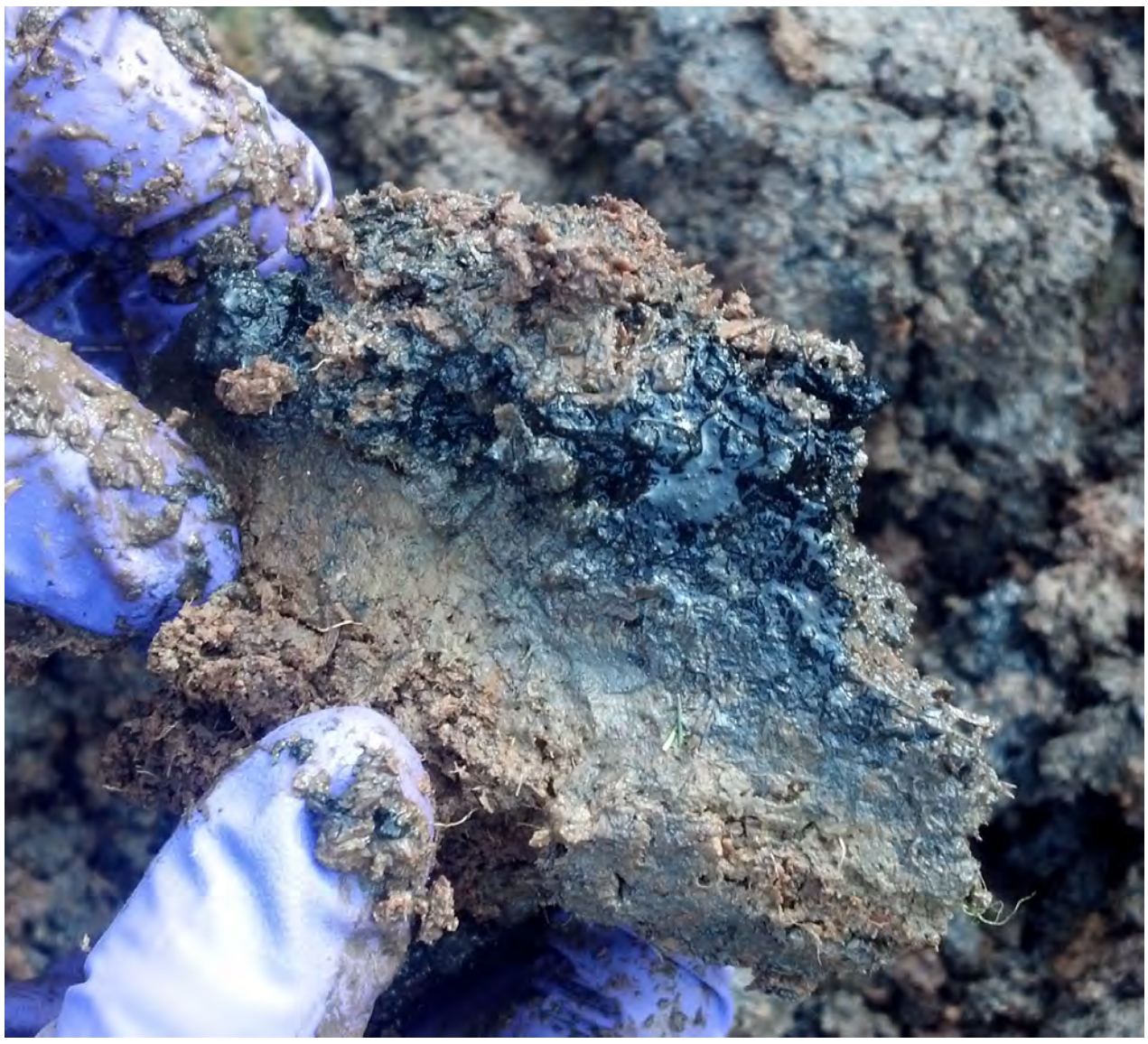


Photo No.
4

Description
Wood waste and impacted fluid at CR-06.
11/7/2013

PHOTOGRAPHS

Project Name: GHHSA Sediment Sampling
Project Number: 0863.01.03

Photo No.
5

Description
Wood waste and pocket of impacted fluid at CR-04.
11/8/2013

APPENDIX B

LABORATORY REPORTS ON ATTACHED CD

Analytical Resources, Incorporated
Analytical Chemists and Consultants

2 December 2013

Mike Murray
Maul, Foster and Alongi, Inc
2001 NW 19th Avenue
Suite 200
Portland, OR 97209

RE: Project: GHHSA
ARI Job Nos.: XN64, XO00

Dear Mike:

Please find enclosed the original chain of custody records and the final results for the samples from the project referenced above.

Analytical Resources, Inc. (ARI) accepted fourteen sediment samples on November 8, 2013. Six samples were placed on hold as instructed. The remaining samples were analyzed for NWTPH-G, SVOCs, dioxins/furans, PCBs, NWTPH-Dx, total metals, porewater salinity and conventional parameters as requested. No porewater was extracted from samples CR04, CR05 or CR06. Porewater salinity is not available for these samples.

The percent recovery for the surrogates, bromobenzene and trifluorotoluene, were low following the initial NWTPH-G analysis of sample CR06-2.5. This sample was re-extracted and re-analyzed. The percent recoveries for both surrogates were low for the re-analysis. Since the percent recoveries for all spikes and surrogates were within established QC limits for the corresponding MB and LCS, it was concluded that the sample matrix was the cause of the low surrogate recoveries. No further corrective actions were taken. The results for the original analysis only have been submitted.

The percent differences (%Ds) for two compounds were high for the CCALs that bracketed the SIM-SVOA analyses of these samples. All positive results have been flagged with a "Q" qualifier to denote the high %Ds.

The percent recovery for the surrogate, TCMX, was low following the initial PCB analysis of sample CR01-10cm. Since the percent recovery for the surrogate, DCBP, was within established QC limits for this sample, no corrective actions were taken.

A small amount of contamination was detected in the method blank associated with the sulfide analyses of these samples. Sulfide was detected in all samples associated with this blank. The concentrations of sulfide measured in all samples associated with this blank were significantly greater than the concentration found in the blank for all samples except CR04-10cm. This sample only was re-prepared and re-analyzed. The re-analysis proceeded without incident of note. The result for the re-analysis only has been submitted for this sample. The results for the original analyses have been submitted for all other samples.

4611 South 134th Place, Suite 100 • Tukwila WA 98168 • **206-695-6200** • **206-695-6201** fax

Murray, MFA
GHHSA
XN64, XO00
Sediment

2 December 2013

A matrix duplicate (MD) was prepared and analyzed for sulfide in conjunction with sample CR04-10cm. The RPD was high following the analysis of the MD. Since the percent recovery for sulfide was within acceptable QC limits for the corresponding LCS, it was concluded that a lack of sample homogeneity was the cause of the high RPD. No corrective actions were taken.

A matrix spike (MS) was prepared and analyzed for TOC in conjunction with sample CR04-10cm. The percent recovery was low following the analysis of the MS. The MS was re-prepared and re-analyzed. The percent recovery was low for the re-analysis. Since the percent recovery for TOC was within acceptable QC limits for the corresponding SRM and LCS, it was concluded that the sample matrix was the cause of the low MS recoveries. No further corrective actions were taken. The result for the original analysis only has been submitted for the MS.

An MD was prepared and analyzed for total metals in conjunction with sample CR06-2.5. The RPDs for chromium, copper and mercury were high following the analysis of the MD. Since the percent recoveries for all elements were within acceptable QC limits for the corresponding LCS, it was concluded that a lack of sample homogeneity was the cause of the high RPDs. No corrective actions were taken.

An MS was prepared and analyzed for total metals in conjunction with sample CR06-2.5. The percent recovery for mercury was low following the analysis of the MS. Since the percent recovery for mercury was within acceptable QC limits for the corresponding LCS, it was concluded that the sample matrix was the cause of the low MS recovery. No corrective actions were taken.

The remaining analyses proceeded without incident of note.

An electronic copy of this report and all associated raw data will be kept on file at ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,

ANALYTICAL RESOURCES, INC.

Mark D. Harris
Project Manager
206/695-6210
markh@arilabs.com

cc: files XN64, XO00

Enclosures

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: XN64	Turn-around Requested: Standard	Page: 1 of 2	
ARI Client Company: Maul Foster & Alongi	Phone: 9715442139	Date: 11/8/13	Ice Present? Y
Client Contact: Mike Murray		No. of Coolers: 3	Cooler Temps: 3.2, 0.4, 5.2
Client Project Name: GHHSA			
Client Project #: 0863.01.01	Samplers: MRM/MN		

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

Sample ID	Date	Time	Matrix	No Containers	Analysis Requested: Dioxin/Furan	Butyl-Benzyl-Phthalate, Beta Chlorophenol	Mercury	SMS compounds with marine criteria	TOC	Conventionals TOC, TVS, Total NH4, TS, PNWS, % fines	Archive	Salinity for pore water	Notes/Comments
CR06-10cm	11/7/13	12:00	Sed.	8	X	X	X			X	X		"Conventionals" include: TOC, TVS, total solids, NH4, TS, pore water sulfides, % fines
CR06-1		12:15		4							X		Archive all remaining sample volume
CR06-2.5		12:30		8							X		
CR06-4		12:45		8							X		
CR04-10cm		13:00		8	X	X	X			X	X		
CR04-1		13:30		3							X		
CR05-10cm	11/8/13	8:25	Sed	8	X	X	X			X	X		
CR05-2.5		8:45		8							X		
CR05-3.5		9:00		2							X		
CR04-2.5		9:40		8							X		

Comments/Special Instructions	Relinquished by (Signature)	Received by (Signature)	Relinquished by (Signature)	Received by (Signature)
	Printed Name: Madi Novak	Printed Name: Jennifer Millsap	Printed Name	Printed Name
	Company: MFA	Company: ARI	Company	Company
	Date & Time: 11/8/13 2:00 pm	Date & Time: 11/8/13 1830	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.

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: XN164	Turn-around Requested: standard
ARI Client Company: Maul Foster + Alongi	Phone: 9715442139
Client Contact: Mike Murray	
Client Project Name: DHS GHHSA	
Client Project #: 0863.01.01	Samplers: MRM/MN

Page: 2 of 2	
Date: 11/8/13	Ice Present? Y
No. of Coolers: 3	Cooler Temps: 3.2, 0.4, 5.2

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

Sample ID	Date	Time	Matrix	No Containers	Analysis Requested: Dioxin/Furan	Bulk benzyl butyl phthalate, pentachlorophenol	Mercury	SMS comp. w/ Marine Criteria	TOC	Conventionals	Archive	Salinity for grain size	Notes/Comments
CR04-5	11/8/13	10:00	Sed	4							X		Archive all remaining sample volume ↓
CR01-10cm	↓	11.15	↓	5	X			X	X		X	X	
CR02-10cm		11:30		5	X			X	X		X	X	
CR03-10cm		12:00		5	X			X	X		X	X	

Conventionals = TOC, TVS, total solids, NH_4, TS, pore water sulfides, % fines

Comments/Special Instructions	Relinquished by (Signature)	Received by (Signature)	Relinquished by (Signature)	Received by (Signature)
	Printed Name: Madi Novak	Printed Name: Jennifer Millsap	Printed Name:	Printed Name:
	Company: MFA	Company: ARI	Company:	Company:
	Date & Time: 11/8/13 2 pm	Date & Time: 11/8/13 1830	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.

XN164 : 11SNA

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: XN64	Turn-around Requested: Standard
ARI Client Company: Maul Foster & Alongi	Phone: 971 544 2139
Client Contact: Mike Murray	
Client Project Name: GHHSA	
Client Project #: 0863.01.01	Samplers: MRM/MN
Page: 1 of 2	
Date: 11/8/13	Ice Present? Y
No. of Coolers: 3	Cooler Temps: 3.2, 0.4, 5.2

Sample ID	Date	Time	Matrix	No. Containers	Dioxin/Furans	Butyl-Benzyl-Phthalate, Pentachlorophenol	Mercury	SMS compounds with marked criteria	TOC	Conventionals (TOC, TVS, Total NH4, TS, PWS, %fines)	Archive	Salinity in pore water	Notes/Comments
CR06-10cm	11/7/13	12:00	Sed.	8	X	X	X	phenol		X	X		"Conventionals" include: TOC, TVS, total solids, NH4, TS, pore water sulfides, %fines
CR06-1		12:15		4	X			X	tphg, tplhc		X		Archive all remaining sample volume
CR06-2.5		12:30		8	X			X	tphg, tplhc		X		
CR06-4		12:45		8							X		
CR04-10cm		13:00		8	X	X	X	phenol		X	X		
CR04-1		13:30		3							X		
CR05-10cm	11/8/13	8:25	Sed	8	X	X	X	phenol		X	X		
CR05-2.5		8:45		8							X		
CR05-3.5		9:00		2							X		
CR04-2.5		9:40		8							X		

Comments/Special Instructions	Relinquished by: (Signature)	Received by: (Signature)	Relinquished by: (Signature)	Received by: (Signature)
	Printed Name: Madi Novak	Printed Name: Jennifer Millsap	Printed Name:	Printed Name
	Company: MFA	Company: ARI	Company	Company
	Date & Time: 11/8/13 2:00 pm	Date & Time: 11/8/13 1830	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.

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: XN64	Turn-around Requested: standard	Page: 2 of 2	
ARI Client Company: Maul Foster + Alongi	Phone: 9715442139	Date: 11/8/13	Ice Present? Y
Client Contact: Mike Murray		No. of Coolers: 3	Cooler Temps: 3.2, 0.4, 5.2
Client Project Name: EHS GHHSN			
Client Project #: 0863.01.01	Samplers: MRM/MN		

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

Sample ID	Date	Time	Matrix	No Containers	Dioxin/Furan	Butylbenzyl Phthalate, Pentachlorophenol	Mercury	SMS Conventionals 33/Marine Criteria	TOC	Conventionals	Archive	Sulfides, % Fines	Notes/Comments
CR04-5	11/8/13	10:00	Sed	4		phenol				X (NO3)	X		Archive all remaining sample volume
CR01-10cm		11:15		5	X			X	X		X	X	
CR02-10cm		11:30		5	X			X	X		X	X	
CR03-10cm	↓	12:00	↓	5	X			X	X		X	X	↓

Analysis Requested

Conventionals = TOC, TVS, total solids, NH4, TS, pore water sulfides, % fines

Comments/Special Instructions	Relinquished by (Signature)	Received by (Signature)	Relinquished by: (Signature)	Received by (Signature)
	Printed Name: Madi Novak	Printed Name: Jennifer Millsap	Printed Name	Printed Name:
	Company: MFA	Company: ARI	Company:	Company:
	Date & Time: 11/8/13 2 pm	Date & Time: 11/8/13 1830	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 Maul Foster & Alongi Project Name GHH3A

COC No(s): _____ (NA) Delivered by Fed-Ex UPS Courier Hand Delivered Other: MC Delivery

Assigned ARI Job No: XN64 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

Temperature of Cooler(s) (°C) (recommended 2 0-6.0 °C for chemistry) 3.2 0.4 5.2

Time: 1830

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

Cooler Accepted by: JM Date 11/8/13 Time 1830

Complete custody forms and attach all shipping documents

Log-In Phase:

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

Was Sample Split by ARI: (NA) YES Date/Time: _____ Equipment _____ Split by: _____

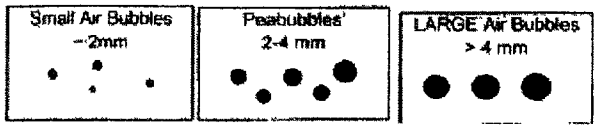
Samples Logged by: JM Date. 11/12/13 Time 1240

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

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

Additional Notes, Discrepancies, & Resolutions:

By _____ Date. _____



Small → "sm" (< 2 mm)
Peabubbles → "pb" (2 to < 4 mm)
Large → "lg" (4 to < 6 mm)
Headspace → "hs" (> 6 mm)

XNGU : 00007

Subject: RE: GHHSA
From: "Mike Murray" <mmurray@maulfoster.com>
Date: 11/11/2013 3:40 PM
To: "Mark Harris" <markh@arilabs.com>
CC: <mnovak@maulfoster.com>

Hi Mark, you are correct on all statements. The SMS marine chemicals we want analyzed are in Table 2 of the attached (should be the same table we circulated in August). Table 3 includes a summary of the methods we discussed.

Please let us know if you have any questions.
Thanks,
MRM

MICHAEL R. MURRAY RG | MAUL FOSTER & ALONGI, INC.

d. 503 501 5226 | p. 971 544 2139 | c. 503 310 0435 | f. 971 544 2140 |
www.maulfoster.com
2001 NW 19th Avenue, Suite 200, Portland, OR 97209

-----Original Message-----
From: Mark Harris [mailto:markh@arilabs.com]
Sent: Monday, November 11, 2013 8:42 AM
To: Mike Murray
Subject: GHHSA

Mike:

I just have a few items to clarify on these samples:

1) For those samples that request 'butylbenzylphthalate and PCP' only, we are to only do those two compounds, not the full SMS SVOC list, correct?

2) Is the request for 'SMS compounds' the full list of compounds in the table you sent in August?

3) Is '% fines' the same as grain size?

I think that's all we need. We'll get them logged and started as soon as possible.

Mark H.

--

Mark Harris
Project Manager
Analytical Resources, Inc.

206/695-6210
markh@arilabs.com

How was your customer experience?
Please take our 5 minute online customer survey <https://www.surveymonkey.com/s/WPDBVJK>.

Attachments

T-SAP.xlsx 24.8 KB

Subject: RE: GHHSA
From: "Madi Novak" <mnovak@maulfoster.com>
Date: 11/12/2013 12:55 PM
To: "Mark Harris" <markh@arilabs.com>
CC: "Mike Murray" <mmurray@maulfoster.com>

Thanks Mark,

1) just plain phenol
2) that is fine
3) that works

MADI NOVAK | MAUL FOSTER & ALONGI, INC.

direct. 503 501 5212 | main. 971 544 2139 | cell. 971 227 1060 |www.maulfoster.com
2001 NW 19th Avenue, Suite 200, Portland, OR 97209

-----Original Message-----
From: Mark Harris [mailto:markh@arilabs.com]
Sent: Tuesday, November 12, 2013 12:53 PM
To: Madi Novak
Subject: Re: GHHSA

Madi:

Okay, there are a couple of questions:

1) Is 'phenol' just plain phenol (by 8270), or PCP?

2) For CR04-5, we didn't receive large jars for porewater extraction. We received 4-8oz, 1-4oz and 1-2oz. We can us the 8oz but it won't leave much leftover.

3) For CR06-2.5, we didn't receive "VOA" jars. We can use the 4oz conventionals jar here and then give it to the conventionals lab if that works for you.

Mark H.

On 11/12/2013 12:28 PM, Madi Novak wrote:
> Thanks! Note the 06 sample appears to be pretty impacted. . .
>
> MADI NOVAK | MAUL FOSTER & ALONGI, INC.
>
> direct. 503 501 5212 | main. 971 544 2139 | cell. 971 227 1060
> |www.maulfoster.com
> 2001 NW 19th Avenue, Suite 200, Portland, OR 97209

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-----Original Message-----
From: Mark Harris [mailto:markh@arilabs.com]
Sent: Tuesday, November 12, 2013 12:22 PM
To: Madi Novak
Cc: Mike Murray
Subject: Re: GHHSA

Madi:

Got it. We'll get these tests added.

Mark H.

On 11/12/2013 12:20 PM, Madi Novak wrote:

Hi Mark,

I'd like to add analyses beyond what is already noted on the COC as follows:

CR04-10cm analyze for phenol
CR05-10cm analyze for phenol
CR06-10cm analyze for phenol
CR04-5 please analyze for conventionals (toc, tvs, total solids, ammonia, total sulfides, pore water sulfides) and phenol.
CR06-2.5 please analyze for SMS constituents, dioxins/furans, NWTPH-Gx and NWTPH-Dx

Please let me know if you have any questions.

Thank you,

MADI NOVAK | MAUL FOSTER & ALONGI, INC.

direct. 503 501 5212 | main. 971 544 2139 | cell. 971 227 1060
|www.maulfoster.com
2001 NW 19th Avenue, Suite 200, Portland, OR 97209 Please consider the environment before printing this email.

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

From: Mark Harris [mailto:markh@arilabs.com]
Sent: Tuesday, November 12, 2013 6:25 AM
To: Mike Murray
Cc: Madi Novak
Subject: Re: GHHSA

We'll get them logged this morning.

On 11/11/2013 3:40 PM, Mike Murray wrote:
> Hi Mark, you are correct on all statements. The SMS marine chemicals we want analyzed are in Table 2 of the attached (should be the same table we circulated in August). Table 3 includes a summary of the methods we discussed.
>
> Please let us know if you have any questions.
> Thanks,
> MRM
>
> MICHAEL R. MURRAY RG | MAUL FOSTER & ALONGI, INC.
>
> d. 503 501 5226 | p. 971 544 2139 | c. 503 310 0435 | f. 971 544 2140
> | www.maulfoster.com
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>
> -----Original Message-----
> From: Mark Harris [mailto:markh@arilabs.com]
> Sent: Monday, November 11, 2013 8:42 AM
> To: Mike Murray
> Subject: GHHSA
>
> Mike:
>
> I just have a few items to clarify on these samples:
>
> 1) For those samples that request 'butylbenzylphthalate and PCP' only, we are to only do those two compounds, not the full SMS SVOC list, correct?
>
> 2) Is the request for 'SMS compounds' the full list of compounds in the table you sent in August?
>
> 3) Is '% fines' the same as grain size?
>
> I think that's all we need. We'll get them logged and started as soon as

possible.

Mark H.

--

Mark Harris
Project Manager
Analytical Resources, Inc.
206/695-6210
markh@arilabs.com

How was your customer experience?
Please take our 5 minute online customer survey <https://www.surveymonkey.com/s/WPDBVJK>.

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Client: Maul Foster & Alongi	**ARI Job No.:** XN64
Client Project: GHHSA	**Client Project No.:** 0863.01.01

Case Narrative

1. Seven samples were submitted for testing and preparation on November 12, 2013 and were in good condition.
2. The samples were submitted for pore water extraction by the United States Army Corp of Engineers draft interim guidelines. Four samples to be submitted for sulfide analysis would not yield the required pore water volume. The three pore water samples to be submitted for salinity analysis did yield sufficient volume for analysis. All centrifuge bottles were decontaminated, pre-rinsed with hexane and allowed to dry completely. All spoons were decontaminated, pre-rinsed with dichloromethane and allowed to air dry completely. All samples were centrifuged in a pre-cooled centrifuge (4°C) at 3,000 x g for 30 minutes, decanted and then placed in another pre-cooled centrifuge (4°C) and spun at 7,000-x g for 30 minutes. The samples were decanted into small HDPE sample bottles with no preservation.
3. Four samples were submitted for grain size analysis according to Puget Sound Estuary Protocol (PSEP) methodology. The samples were originally split under the required volume required in PSEP. The samples were resplit, and the original bench sheets are included in the raw data. 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. The samples contained woody or other organic matter which may have broken down during the sieving process, affecting grain size analysis. The samples displayed an oil-like sheen and left an oil-like residue on the equipment after processing.
4. The data is reported in summary tables and plots.
5. There were no other noted anomalies in the samples or methods on this project.

Released by: _____ Date: 11/25/13
Geotechnical Laboratory Manager

Reviewed by: _____ Date: November 25, 2013
Lead Technician

Sample ID Cross Reference Report

ANALYTICAL RESOURCES INCORPORATED

ARI Job No: XN64
Client: Maul Foster & Alongi
Project Event: 0863.01.01
Project Name: GHHSA

	Sample ID	ARI Lab ID	ARI LIMS ID	Matrix	Sample Date/Time	VTSR
1.	CR06-10cm	XN64A	13-24853	Sediment	11/07/13 12:00	11/08/13 18:30
2.	CR04-10cm	XN64B	13-24854	Sediment	11/07/13 13:00	11/08/13 18:30
3.	CR05-10cm	XN64C	13-24855	Sediment	11/08/13 08:25	11/08/13 18:30
4.	CR06-2.5	XN64D	13-24856	Sediment	11/07/13 12:30	11/08/13 18:30
5.	CR04-5	XN64E	13-24857	Sediment	11/08/13 10:00	11/08/13 18:30
6.	CR01-10cm	XN64F	13-24858	Sediment	11/08/13 11:15	11/08/13 18:30
7.	CR02-10cm	XN64G	13-24859	Sediment	11/08/13 11:30	11/08/13 18:30
8.	CR03-10cm	XN64H	13-24860	Sediment	11/08/13 11:30	11/08/13 18:30
9.	CR06-1	XN64I	13-24861	Sediment	11/07/13 12:15	11/08/13 18:30
10.	CR06-4	XN64J	13-24862	Sediment	11/07/13 12:30	11/08/13 18:30
11.	CR04-1	XN64K	13-24863	Sediment	11/07/13 13:30	11/08/13 18:30
12.	CR05-2.5	XN64L	13-24864	Sediment	11/08/13 08:45	11/08/13 18:30
13.	CR05-3.5	XN64M	13-24865	Sediment	11/08/13 09:00	11/08/13 18:30
14.	CR04-2.5	XN64N	13-24866	Sediment	11/08/13 09:40	11/08/13 18:30

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Data Reporting Qualifiers

Effective 2/14/2011

Inorganic Data

U — Indicates that the target analyte was not detected at the reported concentration

* — Duplicate RPD is not within established control limits

B — Reported value is less than the CRDL but ≥ the Reporting Limit

N — Matrix Spike recovery not within established control limits

NA — Not Applicable, analyte not spiked

H — The natural concentration of the spiked element is so much greater than the concentration spiked that an accurate determination of spike recovery is not possible

L — Analyte concentration is ≤5 times the Reporting Limit and the replicate control limit defaults to ±1 RL instead of the normal 20% RPD

Organic Data

U — Indicates that the target analyte was not detected at the reported concentration

* — Flagged value is not within established control limits

B — Analyte detected in an associated Method Blank at a concentration greater than one-half of ARI's Reporting Limit or 5% of the regulatory limit or 5% of the analyte concentration in the sample.

J — Estimated concentration when the value is less than ARI's established reporting limits

D — The spiked compound was not detected due to sample extract dilution

E — Estimated concentration calculated for an analyte response above the valid instrument calibration range. A dilution is required to obtain an accurate quantification of the analyte.

Q — Indicates a detected analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20%RSD, <20%Drift or minimum RRF).

S Indicates an analyte response that has saturated the detector. The calculated concentration is not valid; a dilution is required to obtain valid quantification of the analyte

NA The flagged analyte was not analyzed for

NR Spiked compound recovery is not reported due to chromatographic interference

NS The flagged analyte was not spiked into the sample

M Estimated value for an analyte detected and confirmed by an analyst but with low spectral match parameters. This flag is used only for GC-MS analyses

M2 The sample contains PCB congeners that do not match any standard Aroclor pattern. The PCBs are identified and quantified as the Aroclor whose pattern most closely matches that of the sample. The reported value is an estimate.

N The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification"

Y The analyte is not detected at or above the reported concentration. The reporting limit is raised due to chromatographic interference. The Y flag is equivalent to the U flag with a raised reporting limit.

EMPC Estimated Maximum Possible Concentration (EMPC) defined in EPA Statement of Work DLM02.2 as a value "calculated for 2,3,7,8-substituted isomers for which the quantitation and /or confirmation ion(s) has signal to noise in excess of 2.5, but does not meet identification criteria" **(Dioxin/Furan analysis only)**

C The analyte was positively identified on only one of two chromatographic columns. Chromatographic interference prevented a positive identification on the second column

P The analyte was detected on both chromatographic columns but the quantified values differ by ≥40% RPD with no obvious chromatographic interference

X Analyte signal includes interference from polychlorinated diphenyl ethers. **(Dioxin/Furan analysis only)**

Z Analyte signal includes interference from the sample matrix or perfluorokerosene ions. **(Dioxin/Furan analysis only)**

Geotechnical Data

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

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
TPHG by Method NWTPHG
Matrix: Sediment

QC Report No: XN64-Maul Foster & Alongi
Project: GHHSA
Event: 0863.01.01

Data Release Authorized:
Reported: 11/14/13

ARI ID	Client ID	Analysis Date	Basis	Range	Result
MB-111313	Method Blank	11/13/13	Dry	Gasoline	< 5.0 U
13-24856		PID1		HC ID	---
				Trifluorotoluene	93.3%
				Bromobenzene	89.6%
XN64D	CR06-2.5	11/13/13	Dry	Gasoline	< 54 U
13-24856		PID1		HC ID	---
				Trifluorotoluene	26.8%
				Bromobenzene	21.6%

Gasoline values reported in mg/kg (ppm)

Quantitation on total peaks in the gasoline range from Toluene to Naphthalene.

GAS: Indicates the presence of gasoline or weathered gasoline.
GRO: Positive result that does not match an identifiable gasoline pattern.

Results corrected for soil moisture content per Section 11.10.5 of EPA Method 8000C.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
TPHG by Method NWTPHG
Page 1 of 1

Sample ID: LCS-111313
LAB CONTROL SAMPLE

Lab Sample ID: LCS-111313
LIMS ID: 13-24856
Matrix: Sediment
Data Release Authorized:
Reported: 11/14/13

QC Report No: XN64-Maul Foster & Alongi
Project: GHHSA
Event: 0863.01.01
Date Sampled: NA
Date Received: NA

Date Analyzed LCS: 11/13/13 11:16
LCSD: 11/13/13 11:46
Instrument/Analyst LCS: PID1/PKC
LCSD: PID1/PKC

Purge Volume: 5.0 mL

Sample Amount LCS: 100 mg-dry-wt
LCSD: 100 mg-dry-wt

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Gasoline Range Hydrocarbons	121	125	96.8%	121	125	96.8%	0.0%

Reported in mg/kg (ppm)

RPD calculated using sample concentrations per SW846.

TPHG Surrogate Recovery

	LCS	LCSD
Trifluorotoluene	107%	113%
Bromobenzene	93.3%	99.7%

ANALYTICAL RESOURCES INCORPORATED

TPHG SOIL SURROGATE RECOVERY SUMMARY

ARI Job: XN64
Matrix: Sediment

QC Report No: XN64-Maul Foster & Alongi
Project: GHHSA
Event: 0863.01.01

Client ID	BFB	TFT	BBZ	TOT OUT
MB-111313	NA	93.3%	89.6%	0
LCS-111313	NA	107%	93.3%	0
LCSD-111313	NA	113%	99.7%	0
CR06-2.5	NA	26.8%*	21.6%*	2

	LCS/MB LIMITS	QC LIMITS
(TFT) = Trifluorotoluene	(80-120)	(65-128)
(BBZ) = Bromobenzene	(80-120)	(52-149)

Log Number Range: 13-24856 to 13-24856

FORM II TPHG

XN64 : 00021

Data File: /chem3/pid1.i/20131113-1.b/1113a008.d

Date : 13-NOV-2013 15:59

Client ID: CR06-2.5

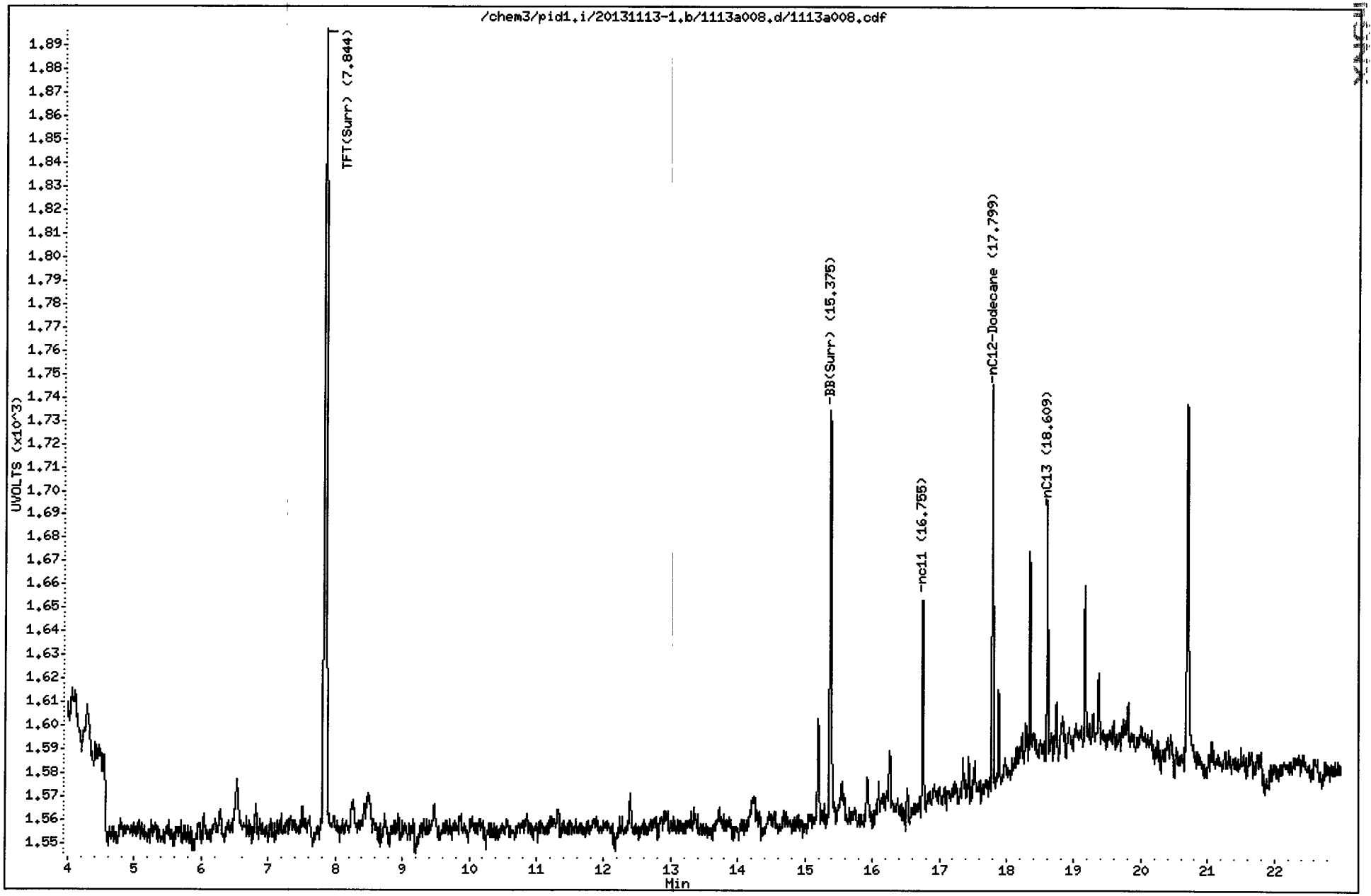
Sample Info: XN64D

Column phase: RTX 502-2 FID

Instrument: pid1.i

Operator: PC

Column diameter: 0.18



Data File: /chem3/pid1.i/20131113-1.b/1113a004.d

Date : 13-NOV-2013 11:16

Client ID:

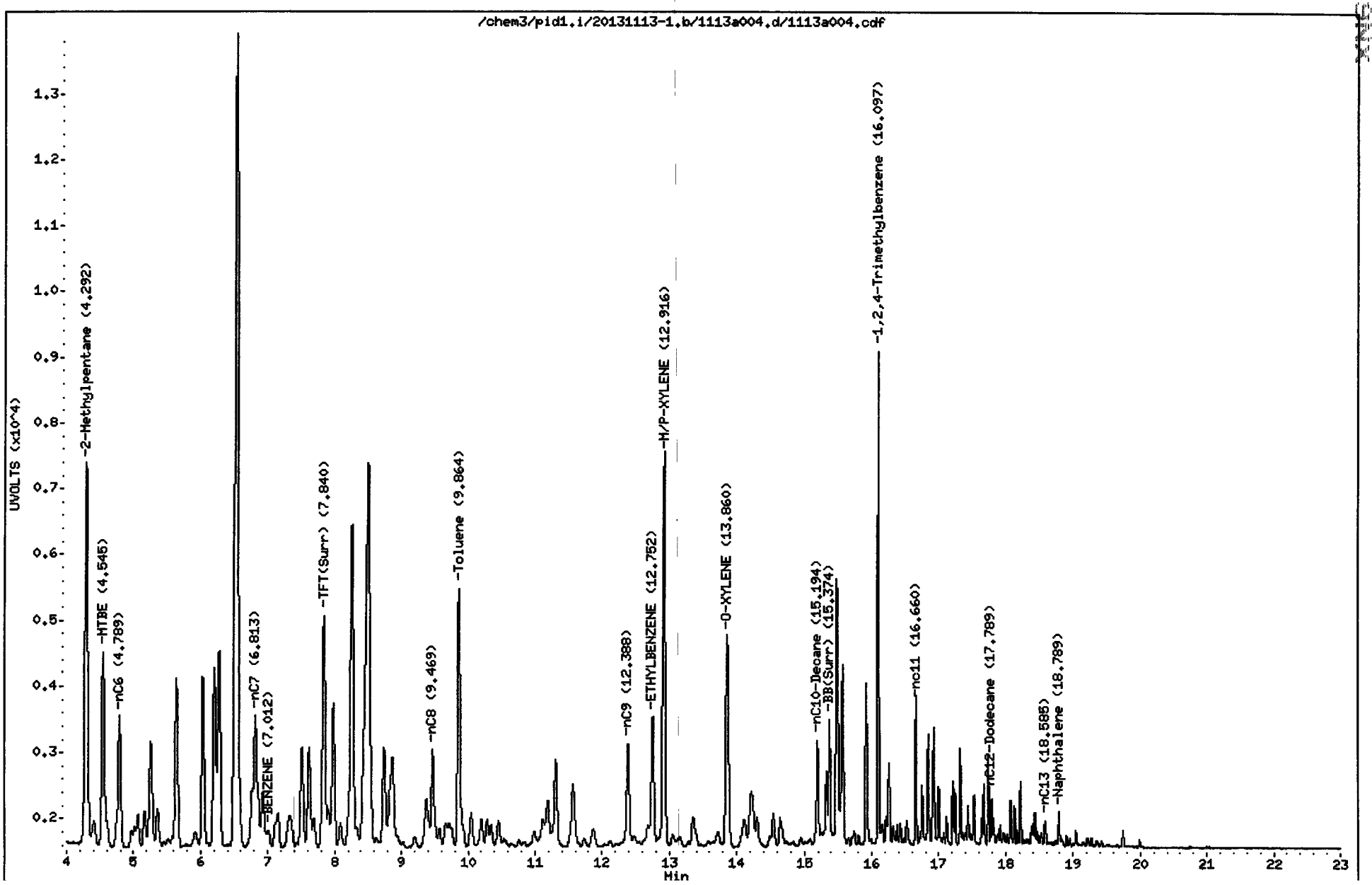
Sample Info: LCS1113

Instrument: pid1.i

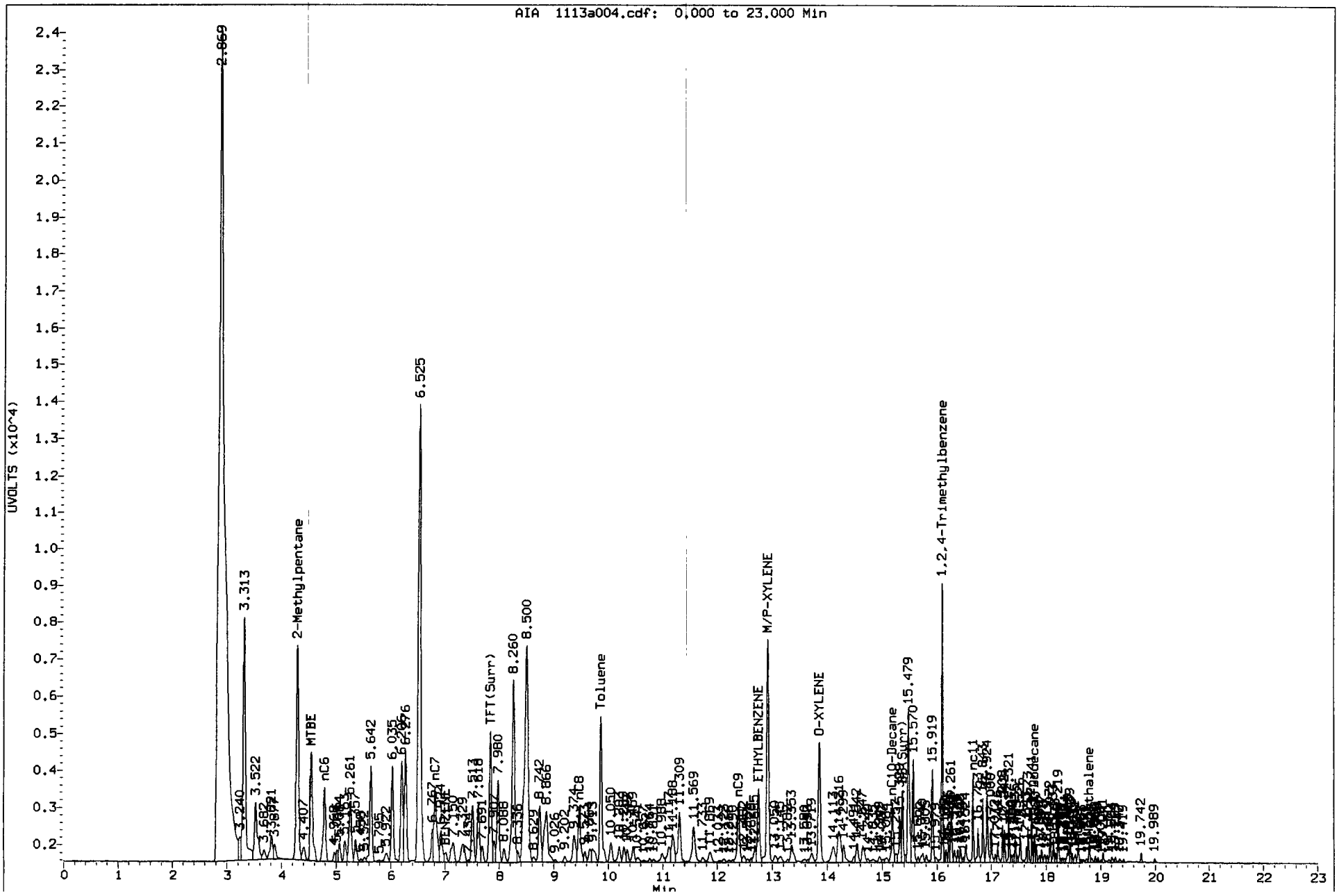
Operator: PC

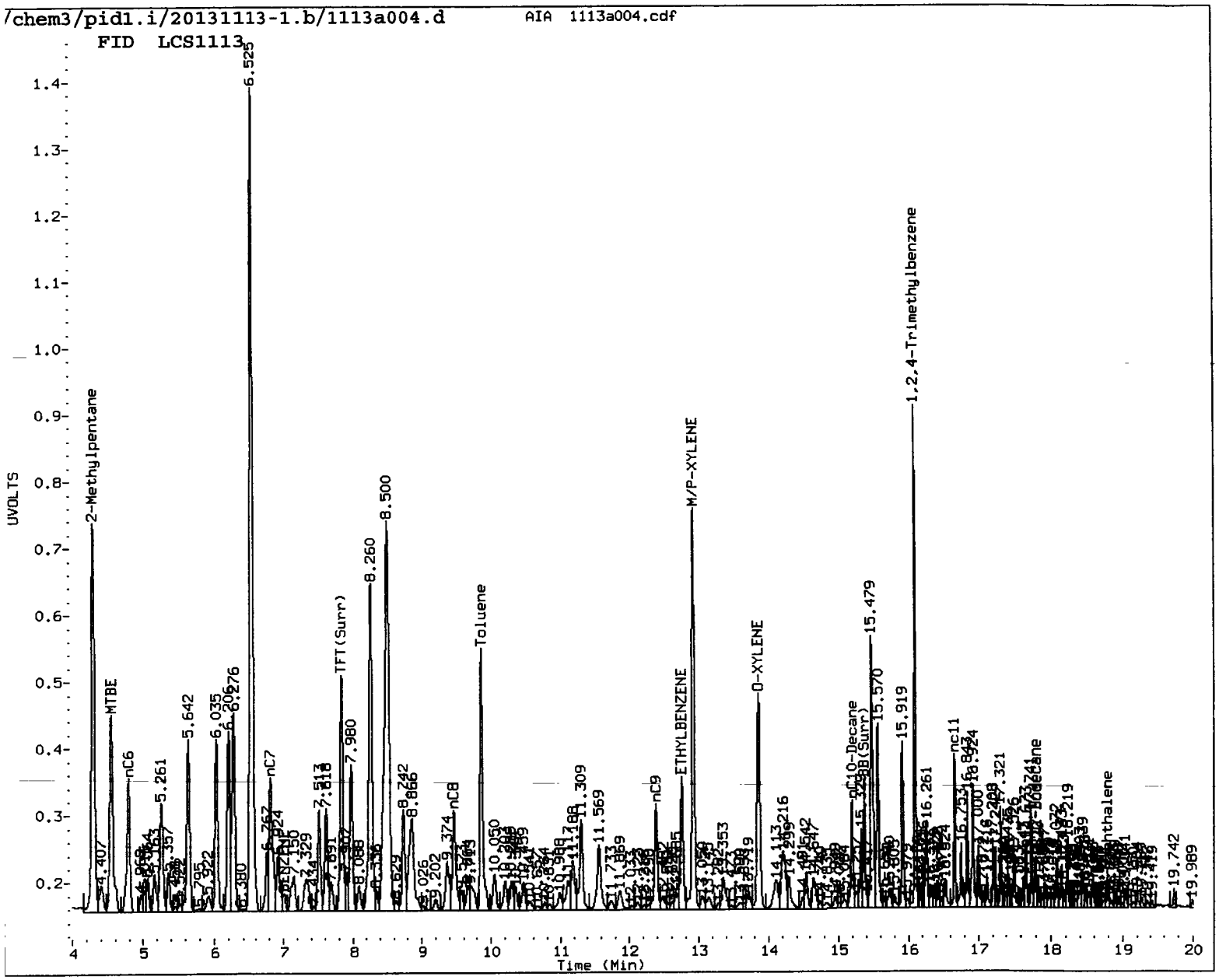
Column phase: RTX 502-2 FID

Column diameter: 0.18



Data File: /chem3/pid1.i/20131113-1.b/1113a004.d/1113a004.cdf
Injection Date: 13-NOV-2013 11:16
Instrument: pid1.i
Client Sample ID:





MANUAL INTEGRATION

1. Baseline correction
2. Poor chromatography
3. Peak not found
4. Totals calculation

5. Other _____

Analyst: _____ Date: 4/14/13

Data File: /chem3/pid1.i/20131113-1.b/1113a005.d

Date : 13-NOV-2013 11:46

Client ID:

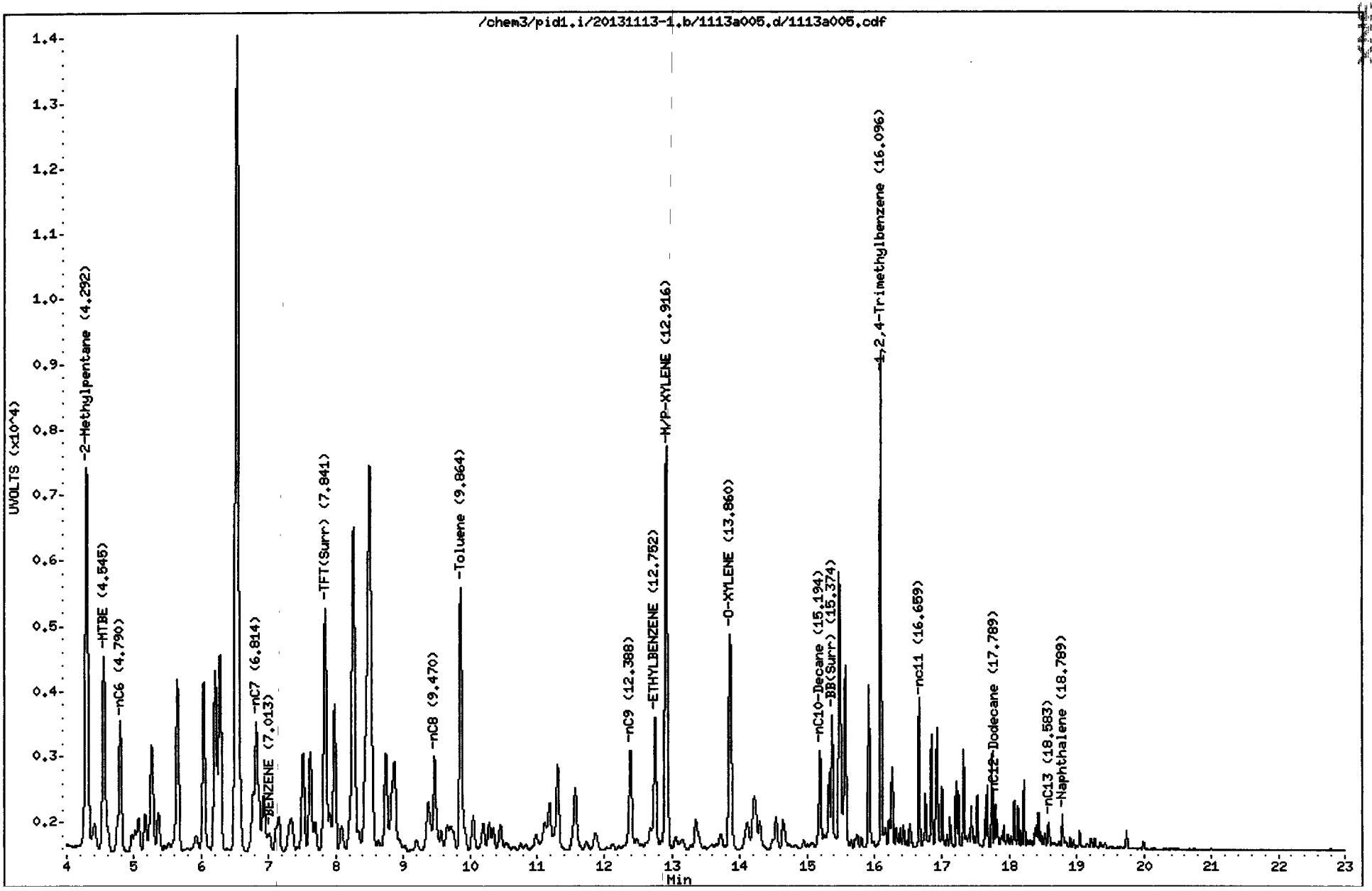
Sample Info: LCSD1113

Column phase: RTX 502-2 FID

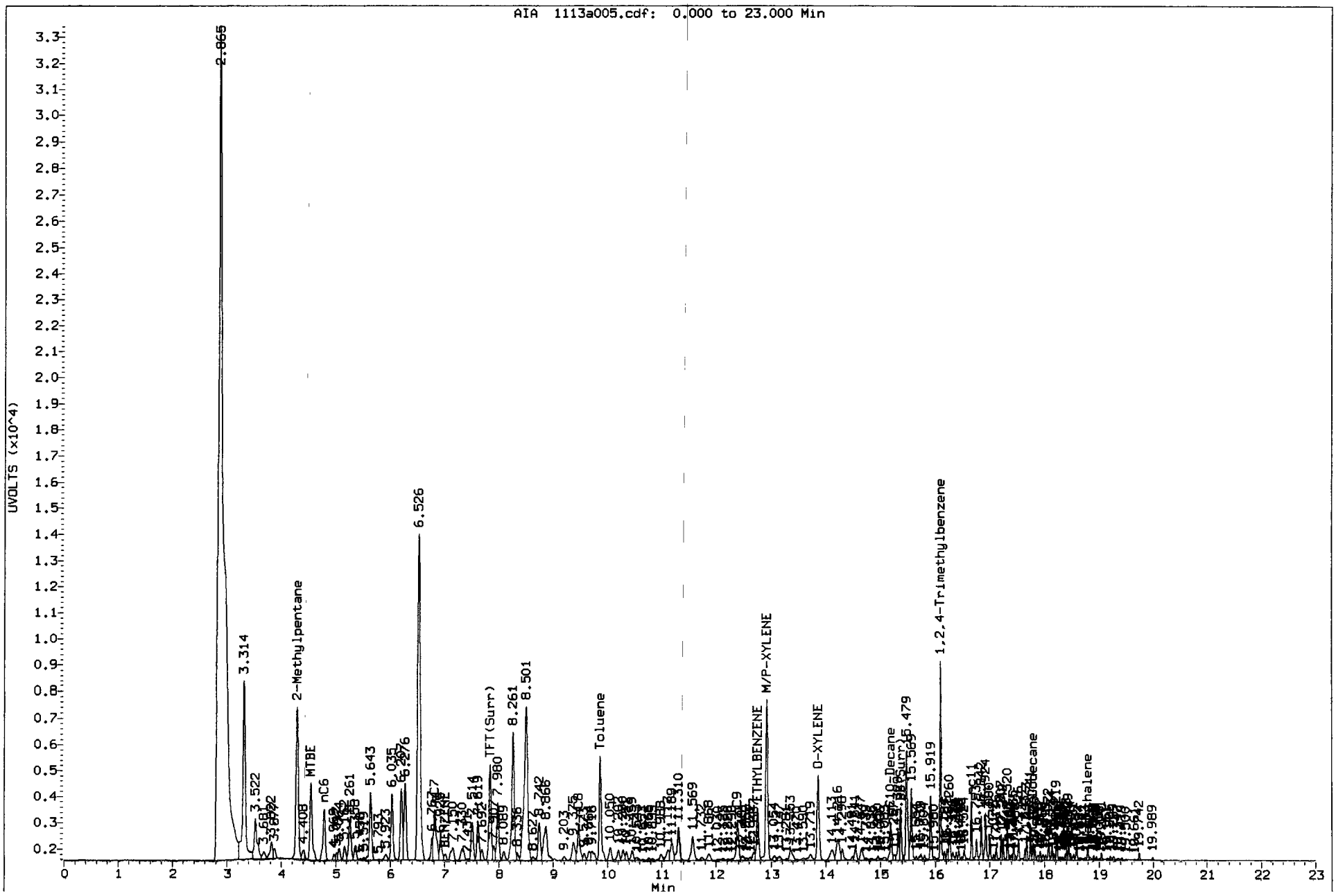
Instrument: pid1.i

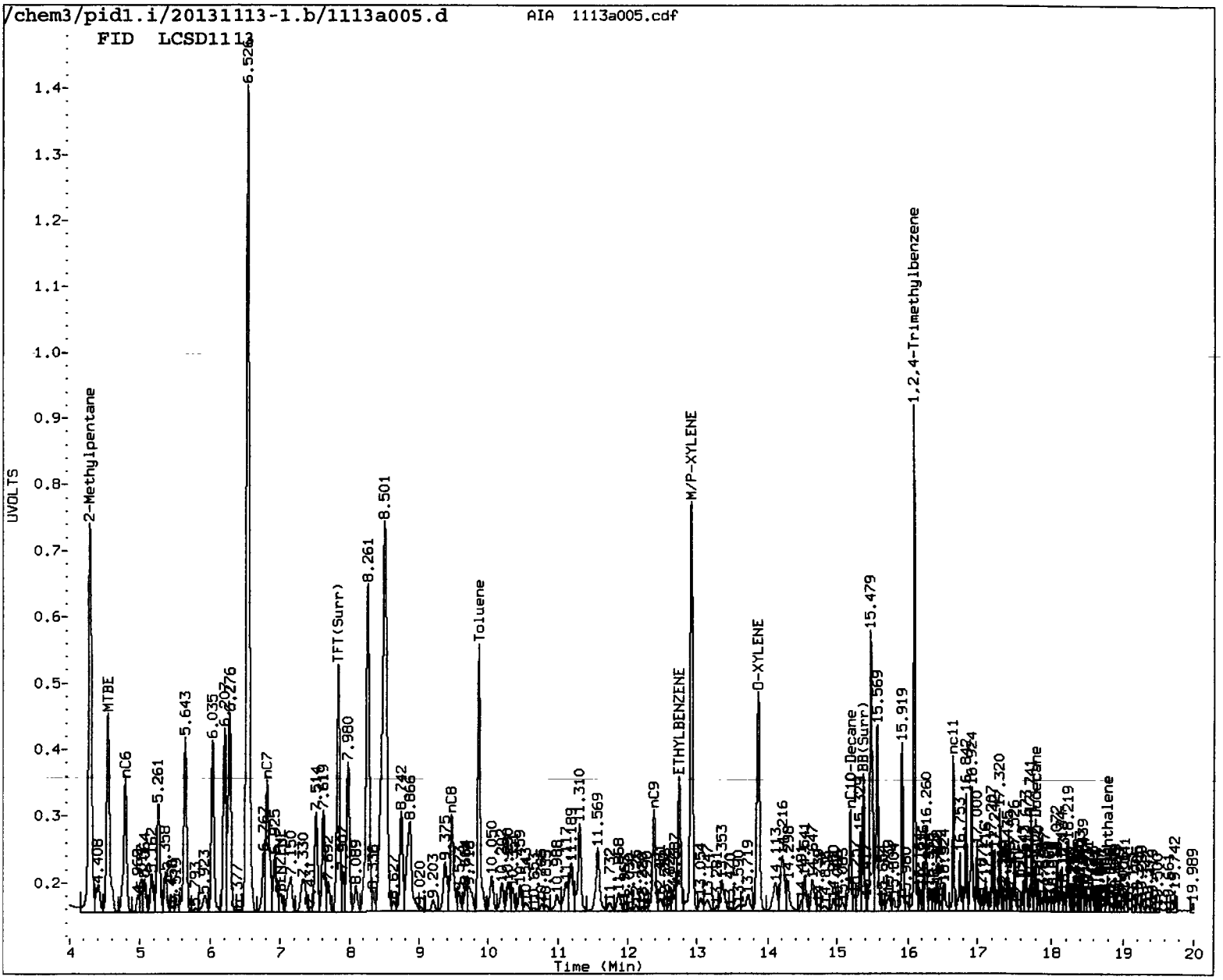
Operator: PC

Column diameter: 0.18



Data File: /chem3/pid1.i/20131113-1.b/1113a005.d/1113a005.cdf
Injection Date: 13-NOV-2013 11:46
Instrument: pid1.i
Client Sample ID:





MANUAL INTEGRATION

1. Baseline correction
2. Poor chromatography
3. Peak not found
4. Totals calculation

5. Other _____

Analyst: KC Date: 11/14/13

Data File: /chem3/pid1.i/20131113-1.b/1113a007.d

Date : 13-NOV-2013 12:57

Client ID:

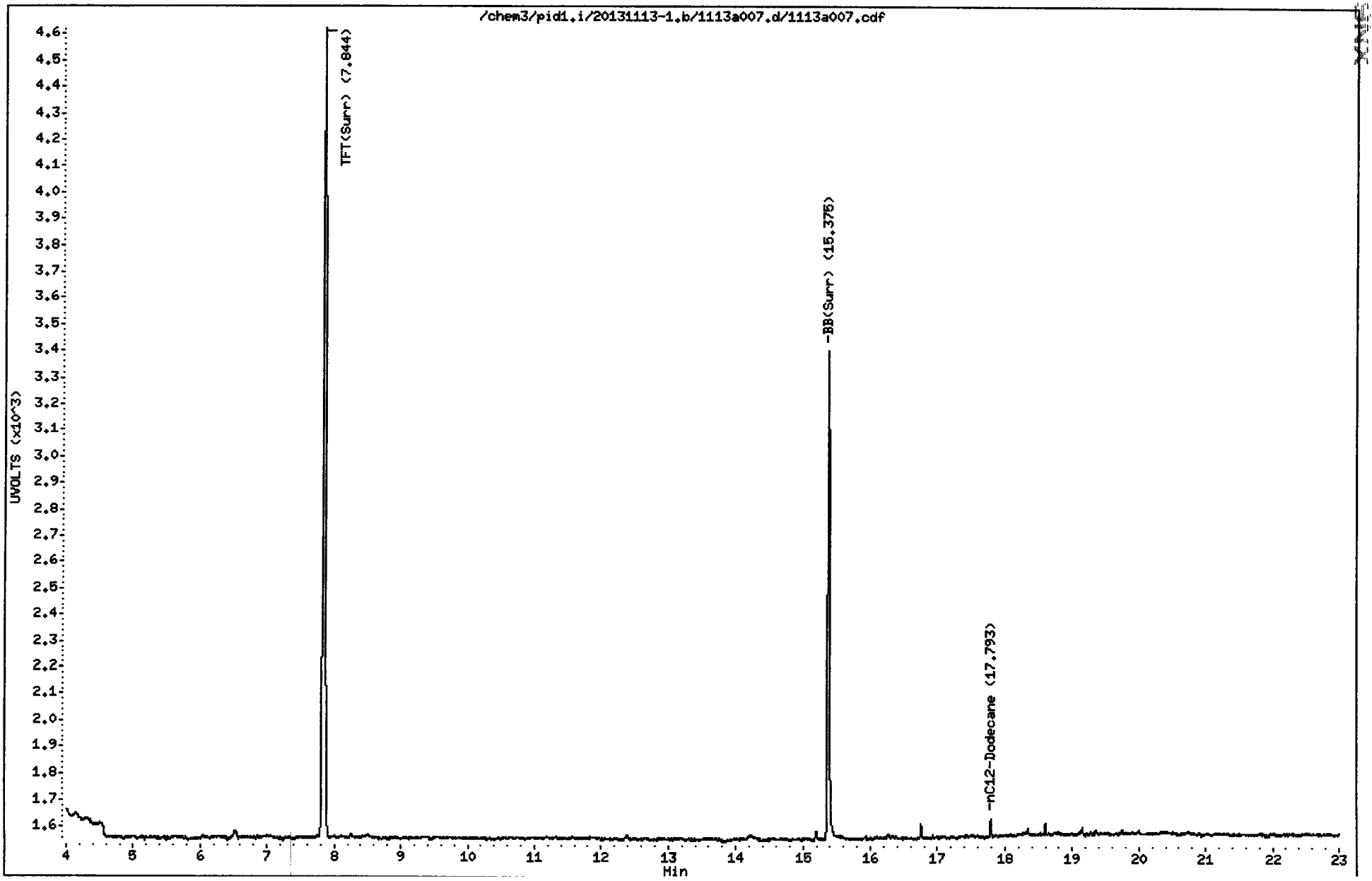
Sample Info: MB1113A

Column phase: RTX 502-2 FID

Instrument: pid1.i

Operator: PC

Column diameter: 0.18



ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Extraction Method: SW3546
Page 1 of 1

Sample ID: MB-111513
METHOD BLANK

Lab Sample ID: MB-111513
LIMS ID: 13-24856
Matrix: Sediment
Data Release Authorized:
Reported: 11/21/13

QC Report No: XN64-Maul Foster & Alongi
Project: GHHSA
0863.01.01
Date Sampled: NA
Date Received: NA

Date Extracted: 11/15/13
Date Analyzed: 11/20/13 14:58
Instrument/Analyst: NT10/YZ
GPC Cleanup: Yes

Sample Amount: 10.00 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Percent Moisture: NA

CAS Number	Analyte	RL	Result
108-95-2	Phenol	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	100	< 100 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	50	< 50 U
218-01-9	Chrysene	20	< 20 U
117-84-0	Di-n-Octyl phthalate	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
TOTBFA	Total Benzofluoranthenes	40	< 40 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	64.6%	2-Fluorobiphenyl	64.0%
d14-p-Terphenyl	79.8%	d4-1,2-Dichlorobenzene	66.4%
d5-Phenol	56.9%	2-Fluorophenol	60.8%
2,4,6-Tribromophenol	61.5%	d4-2-Chlorophenol	64.1%

FORM I

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS **Sample ID: CR06-2.5**
Extraction Method: SW3546 **SAMPLE**

Lab Sample ID: XN64D
LIMS ID: 13-24856
Matrix: Sediment
Data Release Authorized: MW
Reported: 11/21/13

QC Report No: XN64-Maul Foster & Alongi
Project: GHHSA
0863.01.01
Date Sampled: 11/07/13
Date Received: 11/08/13

Date Extracted: 11/15/13
Date Analyzed: 11/20/13 16:09
Instrument/Analyst: NT10/YZ
GPC Cleanup: Yes

Sample Amount: 0.71 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Percent Moisture: 77.0%

CAS Number	Analyte	RL	Result
108-95-2	**Phenol**	**280**	**240 J**
106-46-7	1,4-Dichlorobenzene	280	< 280 U
100-51-6	Benzyl Alcohol	280	< 280 U
95-50-1	1,2-Dichlorobenzene	280	< 280 U
95-48-7	2-Methylphenol	280	< 280 U
106-44-5	**4-Methylphenol**	**280**	**420**
105-67-9	2,4-Dimethylphenol	1,400	< 1,400 U
65-85-0	**Benzoic Acid**	**2,800**	**860 J**
120-82-1	1,2,4-Trichlorobenzene	280	< 280 U
91-20-3	**Naphthalene**	**280**	**1,800**
87-68-3	Hexachlorobutadiene	280	< 280 U
91-57-6	**2-Methylnaphthalene**	**280**	**780**
131-11-3	Dimethylphthalate	280	< 280 U
208-96-8	**Acenaphthylene**	**280**	**520**
83-32-9	**Acenaphthene**	**280**	**490**
132-64-9	**Dibenzofuran**	**280**	**490**
84-66-2	**Diethylphthalate**	**280**	**270 J**
86-73-7	**Fluorene**	**280**	**650**
86-30-6	N-Nitrosodiphenylamine	280	< 280 U
118-74-1	Hexachlorobenzene	280	< 280 U
87-86-5	Pentachlorophenol	1,400	< 1,400 U
85-01-8	**Phenanthrene**	**280**	**3,600**
120-12-7	**Anthracene**	**280**	**750**
84-74-2	Di-n-Butylphthalate	280	< 280 U
206-44-0	**Fluoranthene**	**280**	**3,200**
129-00-0	**Pyrene**	**280**	**3,600**
85-68-7	Butylbenzylphthalate	280	< 280 U
56-55-3	**Benzo(a)anthracene**	**280**	**1,300**
117-81-7	**bis(2-Ethylhexyl)phthalate**	**700**	**1,900**
218-01-9	**Chrysene**	**280**	**1,600**
117-84-0	Di-n-Octyl phthalate	280	< 280 U
50-32-8	**Benzo(a)pyrene**	**280**	**1,200**
193-39-5	**Indeno(1,2,3-cd)pyrene**	**280**	**490**
53-70-3	Dibenz(a,h)anthracene	280	< 280 U
191-24-2	**Benzo(g,h,i)perylene**	**280**	**590**
TOTBFA	**Total Benzofluoranthenes**	**560**	**2,000**

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	63.6%	2-Fluorobiphenyl	70.0%
d14-p-Terphenyl	76.4%	d4-1,2-Dichlorobenzene	63.0%
d5-Phenol	55.6%	2-Fluorophenol	59.9%
2,4,6-Tribromophenol	72.9%	d4-2-Chlorophenol	61.9%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS **Sample ID: CR01-10cm**
Extraction Method: SW3546 **SAMPLE**

Lab Sample ID: XN64F
LIMS ID: 13-24858
Matrix: Sediment
Data Release Authorized: MW
Reported: 11/21/13

QC Report No: XN64-Maul Foster & Alongi
Project: GHHSA
0863.01.01
Date Sampled: 11/08/13
Date Received: 11/08/13

Date Extracted: 11/15/13
Date Analyzed: 11/20/13 16:45
Instrument/Analyst: NT10/YZ
GPC Cleanup: Yes

Sample Amount: 10.30 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Percent Moisture: 51.2%

CAS Number	Analyte	RL	Result
108-95-2	**Phenol**	**19**	**24**
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**	**30**
105-67-9	2,4-Dimethylphenol	97	< 97 U
65-85-0	Benzoic Acid	190	< 190 U
120-82-1	1,2,4-Trichlorobenzene	19	< 19 U
91-20-3	**Naphthalene**	**19**	**25**
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**	**14 J**
132-64-9	**Dibenzofuran**	**19**	**12 J**
84-66-2	**Diethylphthalate**	**19**	**56**
86-73-7	**Fluorene**	**19**	**14 J**
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**	**47**
120-12-7	**Anthracene**	**19**	**14 J**
84-74-2	Di-n-Butylphthalate	19	< 19 U
206-44-0	**Fluoranthene**	**19**	**100**
129-00-0	**Pyrene**	**19**	**110**
85-68-7	Butylbenzylphthalate	19	< 19 U
56-55-3	**Benzo(a)anthracene**	**19**	**28**
117-81-7	**bis(2-Ethylhexyl)phthalate**	**48**	**29 J**
218-01-9	**Chrysene**	**19**	**35**
117-84-0	Di-n-Octyl phthalate	19	< 19 U
50-32-8	**Benzo(a)pyrene**	**19**	**21**
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**	**14 J**
TOTBFA	**Total Benzofluoranthenes**	**39**	**52**

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	58.0%	2-Fluorobiphenyl	66.4%
d14-p-Terphenyl	71.6%	d4-1,2-Dichlorobenzene	57.6%
d5-Phenol	57.1%	2-Fluorophenol	57.2%
2,4,6-Tribromophenol	72.1%	d4-2-Chlorophenol	59.1%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS **Sample ID: CR02-10cm**
Extraction Method: SW3546 **SAMPLE**

Lab Sample ID: XN64G
LIMS ID: 13-24859
Matrix: Sediment
Data Release Authorized: MW
Reported: 11/21/13

QC Report No: XN64-Maul Foster & Alongi
Project: GHHSA
0863.01.01
Date Sampled: 11/08/13
Date Received: 11/08/13

Date Extracted: 11/15/13
Date Analyzed: 11/20/13 17:20
Instrument/Analyst: NT10/YZ
GPC Cleanup: Yes

Sample Amount: 10.20 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Percent Moisture: 46.9%

CAS Number	Analyte	RL	Result	
108-95-2	**Phenol**	**20**	**94**	
106-46-7	**1,4-Dichlorobenzene**	**20**	**19**	**J**
100-51-6	**Benzyl Alcohol**	**20**	**31**	
95-50-1	1,2-Dichlorobenzene	20	< 20	U
95-48-7	2-Methylphenol	20	< 20	U
106-44-5	**4-Methylphenol**	**20**	**730**	
105-67-9	2,4-Dimethylphenol	98	< 98	U
65-85-0	**Benzoic Acid**	**200**	**240**	
120-82-1	1,2,4-Trichlorobenzene	20	< 20	U
91-20-3	**Naphthalene**	**20**	**280**	
87-68-3	Hexachlorobutadiene	20	< 20	U
91-57-6	**2-Methylnaphthalene**	**20**	**28**	
131-11-3	Dimethylphthalate	20	< 20	U
208-96-8	**Acenaphthylene**	**20**	**68**	
83-32-9	**Acenaphthene**	**20**	**20**	
132-64-9	**Dibenzofuran**	**20**	**20**	
84-66-2	**Diethylphthalate**	**20**	**20**	
86-73-7	**Fluorene**	**20**	**15**	**J**
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**	**89**	
120-12-7	**Anthracene**	**20**	**16**	**J**
84-74-2	Di-n-Butylphthalate	20	< 20	U
206-44-0	**Fluoranthene**	**20**	**63**	
129-00-0	**Pyrene**	**20**	**61**	
85-68-7	Butylbenzylphthalate	20	< 20	U
56-55-3	**Benzo(a)anthracene**	**20**	**11**	**J**
117-81-7	bis(2-Ethylhexyl)phthalate	49	< 49	U
218-01-9	**Chrysene**	**20**	**17**	**J**
117-84-0	Di-n-Octyl phthalate	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**	**15**	**J**
TOTBFA	**Total Benzofluoranthenes**	**39**	**22**	**J**

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	52.6%	2-Fluorobiphenyl	60.0%
d14-p-Terphenyl	64.8%	d4-1,2-Dichlorobenzene	51.6%
d5-Phenol	55.3%	2-Fluorophenol	53.7%
2,4,6-Tribromophenol	66.5%	d4-2-Chlorophenol	56.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Extraction Method: SW3546
Page 1 of 1

Sample ID: CR03-10cm
SAMPLE

Lab Sample ID: XN64H
LIMS ID: 13-24860
Matrix: Sediment
Data Release Authorized: MW
Reported: 11/21/13

QC Report No: XN64-Maul Foster & Alongi
Project: GHHSA
0863.01.01
Date Sampled: 11/08/13
Date Received: 11/08/13

Date Extracted: 11/15/13
Date Analyzed: 11/20/13 17:55
Instrument/Analyst: NT10/YZ
GPC Cleanup: Yes

Sample Amount: 10.41 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Percent Moisture: 61.6%

CAS Number	Analyte	RL	Result
108-95-2	**Phenol**	**19**	**43**
106-46-7	1,4-Dichlorobenzene	19	< 19 U
100-51-6	**Benzyl Alcohol**	**19**	**36**
95-50-1	1,2-Dichlorobenzene	19	< 19 U
95-48-7	2-Methylphenol	19	< 19 U
106-44-5	**4-Methylphenol**	**19**	**60**
105-67-9	2,4-Dimethylphenol	96	< 96 U
65-85-0	**Benzoic Acid**	**190**	**180 J**
120-82-1	1,2,4-Trichlorobenzene	19	< 19 U
91-20-3	**Naphthalene**	**19**	**23**
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**	**36**
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	96	< 96 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**	**25**
129-00-0	**Pyrene**	**19**	**21**
85-68-7	Butylbenzylphthalate	19	< 19 U
56-55-3	Benzo(a)anthracene	19	< 19 U
117-81-7	bis(2-Ethylhexyl)phthalate	48	< 48 U
218-01-9	Chrysene	19	< 19 U
117-84-0	Di-n-Octyl phthalate	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
TOTBFA	**Total Benzofluoranthenes**	**38**	**13 J**

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	60.8%	2-Fluorobiphenyl	66.8%
d14-p-Terphenyl	72.6%	d4-1,2-Dichlorobenzene	56.2%
d5-Phenol	61.5%	2-Fluorophenol	56.9%
2,4,6-Tribromophenol	72.1%	d4-2-Chlorophenol	60.7%

ANALYTICAL RESOURCES INCORPORATED

SW8270 SEMIVOLATILES SOIL/SEDIMENT SURROGATE RECOVERY SUMMARY

Matrix: Sediment

QC Report No: XN64-Maul Foster & Alongi
Project: GHHSA
0863.01.01

Client ID	NBZ	FBP	TPH	DCB	PHL	2FP	TBP	2CP	TOT OUT
MB-111513	64.6%	64.0%	79.8%	66.4%	56.9%	60.8%	61.5%	64.1%	0
LCS-111513	67.0%	66.8%	79.0%	63.4%	63.9%	64.1%	71.5%	64.3%	0
CR06-2.5	63.6%	70.0%	76.4%	63.0%	55.6%	59.9%	72.9%	61.9%	0
CR01-10cm	58.0%	66.4%	71.6%	57.6%	57.1%	57.2%	72.1%	59.1%	0
CR02-10cm	52.6%	60.0%	64.8%	51.6%	55.3%	53.7%	66.5%	56.0%	0
CR03-10cm	60.8%	66.8%	72.6%	56.2%	61.5%	56.9%	72.1%	60.7%	0

	LCS/MB LIMITS	QC LIMITS
(NBZ) = d5-Nitrobenzene	(33-120)	(30-120)
(FBP) = 2-Fluorobiphenyl	(35-120)	(35-120)
(TPH) = d14-p-Terphenyl	(42-124)	(37-120)
(DCB) = d4-1,2-Dichlorobenzene	(37-120)	(32-120)
(PHL) = d5-Phenol	(32-120)	(29-120)
(2FP) = 2-Fluorophenol	(32-120)	(27-120)
(TBP) = 2,4,6-Tribromophenol	(23-133)	(24-134)
(2CP) = d4-2-Chlorophenol	(36-120)	(31-120)

Prep Method: SW3546
Log Number Range: 13-24856 to 13-24860

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270 GC/MS

Sample ID: LCS-111513
LAB CONTROL

Lab Sample ID: LCS-111513
LIMS ID: 13-24856
Matrix: Sediment
Data Release Authorized:
Reported: 11/21/13

QC Report No: XN64-Maul Foster & Alongi
Project: GHHSA
0863.01.01
Date Sampled: 11/07/13
Date Received: 11/08/13

Date Extracted: 11/15/13
Date Analyzed: 11/20/13 15:34
Instrument/Analyst: NT10/YZ
GPC Cleanup: Yes

Sample Amount: 10.00 g
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Percent Moisture: NA

Analyte	Lab Control	Spike Added	Recovery
Phenol	324	500	64.8%
1,4-Dichlorobenzene	345	500	69.0%
Benzyl Alcohol	312	500	62.4%
1,2-Dichlorobenzene	348	500	69.6%
2-Methylphenol	282	500	56.4%
4-Methylphenol	583	1000	58.3%
2,4-Dimethylphenol	908	1500	60.5%
Benzoic Acid	1810	2750	65.8%
1,2,4-Trichlorobenzene	347	500	69.4%
Naphthalene	329	500	65.8%
Hexachlorobutadiene	362	500	72.4%
2-Methylnaphthalene	360	500	72.0%
Dimethylphthalate	404	500	80.8%
Acenaphthylene	387	500	77.4%
Acenaphthene	350	500	70.0%
Dibenzofuran	376	500	75.2%
Diethylphthalate	412	500	82.4%
Fluorene	359	500	71.8%
N-Nitrosodiphenylamine	406	500	81.2%
Hexachlorobenzene	407	500	81.4%
Pentachlorophenol	1110	1500	74.0%
Phenanthrene	404	500	80.8%
Anthracene	383	500	76.6%
Di-n-Butylphthalate	470	500	94.0%
Fluoranthene	406	500	81.2%
Pyrene	410	500	82.0%
Butylbenzylphthalate	484	500	96.8%
Benzo(a)anthracene	393	500	78.6%
bis(2-Ethylhexyl)phthalate	466	500	93.2%
Chrysene	384	500	76.8%
Di-n-Octyl phthalate	427	500	85.4%
Benzo(a)pyrene	399	500	79.8%
Indeno(1,2,3-cd)pyrene	373	500	74.6%
Dibenz(a,h)anthracene	264	500	52.8%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270 GC/MS **Sample ID: LCS-111513**
 LAB CONTROL

Lab Sample ID: LCS-111513 QC Report No: XN64-Maul Foster & Alongi
LIMS ID: 13-24856 Project: GHHSA
Matrix: Sediment 0863.01.01
Date Analyzed: 11/20/13 15:34

Analyte	Lab Control	Spike Added	Recovery
Benzo(g,h,i)perylene	324	500	64.8%
Total Benzofluoranthenes	801	1000	80.1%

Semivolatile Surrogate Recovery	
d5-Nitrobenzene	67.0%
2-Fluorobiphenyl	66.8%
d14-p-Terphenyl	79.0%
d4-1,2-Dichlorobenzene	63.4%
d5-Phenol	63.9%
2-Fluorophenol	64.1%
2,4,6-Tribromophenol	71.5%
d4-2-Chlorophenol	64.3%

Reported in µg/kg (ppb)

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by Selected Ion Monitoring GC/MS **Sample ID: MB-111513**
Extraction Method: SW3546 **METHOD BLANK**

Lab Sample ID: MB-111513
LIMS ID: 13-24856
Matrix: Sediment
Data Release Authorized:
Reported: 11/22/13

QC Report No: XN64-Maul Foster & Alongi
Project: GHHSA
Event: 0863.01.01
Date Sampled: NA
Date Received: NA

Date Extracted: 11/15/13
Date Analyzed: 11/20/13 14:58
Instrument/Analyst: NT10/YZ
GPC Cleanup: Yes
Silica Gel Cleanup: No
Alumina Cleanup: No

Sample Amount: 10.00 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Percent Moisture: NA

CAS Number	Analyte	LOQ	Result
53-70-3	Dibenz(a,h)anthracene	5.0	< 5.0 U
106-46-7	1,4-Dichlorobenzene	5.0	< 5.0 U
120-82-1	1,2,4-Trichlorobenzene	5.0	< 5.0 U
118-74-1	Hexachlorobenzene	5.0	< 5.0 U
87-68-3	Hexachlorobutadiene	5.0	< 5.0 U
131-11-3	Dimethylphthalate	5.0	< 5.0 U
85-68-7	Butylbenzylphthalate	5.0	< 5.0 U
95-48-7	2-Methylphenol	5.0	< 5.0 U
105-67-9	2,4-Dimethylphenol	25	< 25 U
86-30-6	N-Nitrosodiphenylamine	5.0	< 5.0 U
100-51-6	Benzyl Alcohol	20	< 20 U
87-86-5	Pentachlorophenol	20	< 20 U
95-50-1	1,2-Dichlorobenzene	5.0	< 5.0 U
541-73-1	1,3-Dichlorobenzene	5.0	< 5.0 U

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

2-Fluorophenol	58.0%
d14-p-Terphenyl	76.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by Selected Ion Monitoring GC/MS **Sample ID: CR06-2.5**
Extraction Method: SW3546 **SAMPLE**

Lab Sample ID: XN64D
LIMS ID: 13-24856
Matrix: Sediment
Data Release Authorized:
Reported: 11/22/13

QC Report No: XN64-Maul Foster & Alongi
Project: GHHSA
Event: 0863.01.01
Date Sampled: 11/07/13
Date Received: 11/08/13

Date Extracted: 11/15/13
Date Analyzed: 11/20/13 16:09
Instrument/Analyst: NT10/YZ
GPC Cleanup: Yes
Silica Gel Cleanup: No
Alumina Cleanup: No

Sample Amount: 0.71 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Percent Moisture: 77.0%

CAS Number	Analyte	LOQ	Result
53-70-3	**Dibenz(a,h)anthracene**	**70**	**150**
106-46-7	1,4-Dichlorobenzene	70	< 70 U
120-82-1	1,2,4-Trichlorobenzene	70	< 70 U
118-74-1	Hexachlorobenzene	70	< 70 U
87-68-3	Hexachlorobutadiene	70	< 70 U
131-11-3	Dimethylphthalate	70	< 70 U
85-68-7	Butylbenzylphthalate	70	< 70 U
95-48-7	**2-Methylphenol**	**70**	**45 J**
105-67-9	2,4-Dimethylphenol	350	< 350 U
86-30-6	N-Nitrosodiphenylamine	70	< 70 U
100-51-6	Benzyl Alcohol	280	< 280 U
87-86-5	**Pentachlorophenol**	**280**	**240 J**
95-50-1	1,2-Dichlorobenzene	70	< 70 U
541-73-1	1,3-Dichlorobenzene	70	< 70 U

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

2-Fluorophenol	57.2%
d14-p-Terphenyl	76.6%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by Selected Ion Monitoring GC/MS **Sample ID: CR01-10cm**
Extraction Method: SW3546 **SAMPLE**

Lab Sample ID: XN64F
LIMS ID: 13-24858
Matrix: Sediment
Data Release Authorized: MW
Reported: 11/22/13

QC Report No: XN64-Maul Foster & Alongi
Project: GHHSA
Event: 0863.01.01
Date Sampled: 11/08/13
Date Received: 11/08/13

Date Extracted: 11/15/13
Date Analyzed: 11/20/13 16:45
Instrument/Analyst: NT10/YZ
GPC Cleanup: Yes
Silica Gel Cleanup: No
Alumina Cleanup: No

Sample Amount: 10.30 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Percent Moisture: 51.2%

CAS Number	Analyte	LOQ	Result
53-70-3	**Dibenz(a,h)anthracene**	**4.8**	**3.0 J**
106-46-7	1,4-Dichlorobenzene	4.8	< 4.8 U
120-82-1	1,2,4-Trichlorobenzene	4.8	< 4.8 U
118-74-1	Hexachlorobenzene	4.8	< 4.8 U
87-68-3	Hexachlorobutadiene	4.8	< 4.8 U
131-11-3	Dimethylphthalate	4.8	< 4.8 U
85-68-7	Butylbenzylphthalate	4.8	< 4.8 U
95-48-7	2-Methylphenol	4.8	< 4.8 U
105-67-9	2,4-Dimethylphenol	24	< 24 U
86-30-6	N-Nitrosodiphenylamine	4.8	< 4.8 U
100-51-6	**Benzyl Alcohol**	**19**	**15 J**
87-86-5	Pentachlorophenol	19	< 19 U
95-50-1	1,2-Dichlorobenzene	4.8	< 4.8 U
541-73-1	1,3-Dichlorobenzene	4.8	< 4.8 U

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

2-Fluorophenol	55.2%
d14-p-Terphenyl	70.4%

XN64I : 0863.01

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by Selected Ion Monitoring GC/MS **Sample ID: CR02-10cm**
Extraction Method: SW3546 **SAMPLE**

Lab Sample ID: XN64G
LIMS ID: 13-24859
Matrix: Sediment
Data Release Authorized: MW
Reported: 11/22/13

QC Report No: XN64-Maul Foster & Alongi
Project: GHHSA
Event: 0863.01.01
Date Sampled: 11/08/13
Date Received: 11/08/13

Date Extracted: 11/15/13
Date Analyzed: 11/20/13 17:20
Instrument/Analyst: NT10/YZ
GPC Cleanup: Yes
Silica Gel Cleanup: No
Alumina Cleanup: No

Sample Amount: 10.20 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Percent Moisture: 46.9%

CAS Number	Analyte	LOQ	Result
53-70-3	Dibenz(a,h)anthracene	4.9	< 4.9 U
106-46-7	**1,4-Dichlorobenzene**	**4.9**	**16**
120-82-1	1,2,4-Trichlorobenzene	4.9	< 4.9 U
118-74-1	Hexachlorobenzene	4.9	< 4.9 U
87-68-3	Hexachlorobutadiene	4.9	< 4.9 U
131-11-3	**Dimethylphthalate**	**4.9**	**3.1 J**
85-68-7	Butylbenzylphthalate	4.9	< 4.9 U
95-48-7	2-Methylphenol	4.9	< 4.9 U
105-67-9	2,4-Dimethylphenol	24	< 24 U
86-30-6	N-Nitrosodiphenylamine	4.9	< 4.9 U
100-51-6	**Benzyl Alcohol**	**20**	**43 Q**
87-86-5	Pentachlorophenol	20	< 20 U
95-50-1	1,2-Dichlorobenzene	4.9	< 4.9 U
541-73-1	1,3-Dichlorobenzene	4.9	< 4.9 U

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

2-Fluorophenol	52.9%
d14-p-Terphenyl	61.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by Selected Ion Monitoring GC/MS **Sample ID: CR03-10cm**
Extraction Method: SW3546 **SAMPLE**

Lab Sample ID: XN64H
LIMS ID: 13-24860
Matrix: Sediment
Data Release Authorized: MW
Reported: 11/22/13

QC Report No: XN64-Maul Foster & Alongi
Project: GHHSA
Event: 0863.01.01
Date Sampled: 11/08/13
Date Received: 11/08/13

Date Extracted: 11/15/13
Date Analyzed: 11/20/13 17:55
Instrument/Analyst: NT10/YZ
GPC Cleanup: Yes
Silica Gel Cleanup: No
Alumina Cleanup: No

Sample Amount: 10.41 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Percent Moisture: 61.6%

CAS Number	Analyte	LOQ	Result
53-70-3	Dibenz(a,h)anthracene	4.8	< 4.8 U
106-46-7	1,4-Dichlorobenzene	4.8	< 4.8 U
120-82-1	1,2,4-Trichlorobenzene	4.8	< 4.8 U
118-74-1	Hexachlorobenzene	4.8	< 4.8 U
87-68-3	Hexachlorobutadiene	4.8	< 4.8 U
131-11-3	**Dimethylphthalate**	**4.8**	**2.5 J**
85-68-7	Butylbenzylphthalate	4.8	< 4.8 U
95-48-7	**2-Methylphenol**	**4.8**	**3.3 J**
105-67-9	2,4-Dimethylphenol	24	< 24 U
86-30-6	N-Nitrosodiphenylamine	4.8	< 4.8 U
100-51-6	**Benzyl Alcohol**	**19**	**43 Q**
87-86-5	Pentachlorophenol	19	< 19 U
95-50-1	1,2-Dichlorobenzene	4.8	< 4.8 U
541-73-1	1,3-Dichlorobenzene	4.8	< 4.8 U

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

2-Fluorophenol	56.5%
d14-p-Terphenyl	67.8%

XN64H : 08012

ANALYTICAL RESOURCES INCORPORATED

SIM SW8270 SURROGATE RECOVERY SUMMARY

Matrix: Sediment

QC Report No: XN64-Maul Foster & Alongi
Project: GHHSA
0863.01.01

Client ID	FPH	TER	TOT OUT
MB-111513	58.0%	76.0%	0
LCS-111513	62.8%	74.8%	0
CR06-2.5	57.2%	76.6%	0
CR01-10cm	55.2%	70.4%	0
CR02-10cm	52.9%	61.2%	0
CR03-10cm	56.5%	67.8%	0

	LCS/MB LIMITS	QC LIMITS
(FPH) = 2-Fluorophenol	(32-120)	(27-120)
(TER) = d14-p-Terphenyl	(42-124)	(37-120)

Prep Method: SW3546
Log Number Range: 13-24856 to 13-24860

XN64I : 080413

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by Selected Ion Monitoring GC/MS **Sample ID: LCS-111513**
Page 1 of 1 **LAB CONTROL SAMPLE**

Lab Sample ID: LCS-111513
LIMS ID: 13-24856
Matrix: Sediment
Data Release Authorized:
Reported: 11/22/13

QC Report No: XN64-Maul Foster & Alongi
Project: GHHSA
Event: 0863.01.01
Date Sampled: NA
Date Received: NA

Date Extracted: 11/15/13
Date Analyzed LCS: 11/20/13 15:34
Instrument/Analyst LCS: NT10/YZ

Sample Amount LCS: 10.00 g-dry-wt
Final Extract Volume LCS: 1.0 mL
Dilution Factor LCS: 1.00

Analyte	LCS		Spike Added	Recovery
Dibenz(a,h)anthracene	268		500	53.6%
1,4-Dichlorobenzene	323		500	64.6%
1,2,4-Trichlorobenzene	337		500	67.4%
Hexachlorobenzene	389		500	77.8%
Hexachlorobutadiene	345		500	69.0%
Dimethylphthalate	395		500	79.0%
Butylbenzylphthalate	497	Q	500	99.4%
2-Methylphenol	287		500	57.4%
2,4-Dimethylphenol	898		1500	59.9%
N-Nitrosodiphenylamine	405		500	81.0%
Benzyl Alcohol	369	Q	500	73.8%
Pentachlorophenol	1140	E	1500	76.0%
1,2-Dichlorobenzene	335		500	67.0%
1,3-Dichlorobenzene	325		500	65.0%

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

2-Fluorophenol	62.8%
d14-p-Terphenyl	74.8%

Analytical Resources, Inc.

CONTINUING CALIBRATION COMPOUNDS

Instrument ID: nt10.i Injection Date: 20-NOV-2013 13:25
Lab File ID: cc1120.d Init. Cal. Date(s): 18-NOV-2013 18-NOV-2013
Analysis Type: Init. Cal. Times: 12:57 17:06
Lab Sample ID: CC1120 Quant Type: ISTD
Method: /chem1/nt10.i/20131120.b/SIM.b/SIMABN2.m

COMPOUND	RRF / AMOUNT	RF1	MIN RRF	%D / %DRIFT	MAX %D / %DRIFT	CURVE TYPE	
$ 1 2-Fluorophenol	1.38322	1.30899	0.010	-5.36686	20.00000	Averaged	
3 Phenol	1.61320	1.38756	0.010	-13.98709	20.00000	Averaged	
7 1,3-Dichlorobenzene	1.56138	1.49622	0.010	-4.17358	20.00000	Averaged	
9 1,4-Dichlorobenzene	1.52875	1.43658	0.010	-6.02923	20.00000	Averaged	
11 Benzyl alcohol	0.77619	0.54595	0.010	-29.66251	20.00000	Averaged	<-
12 1,2-Dichlorobenzene	1.44302	1.37869	0.010	-4.45818	20.00000	Averaged	
13 2-Methylphenol	1.29978	1.15552	0.010	-11.09903	20.00000	Averaged	
15 4-Methylphenol	1.35246	1.11087	0.010	-17.86342	20.00000	Averaged	
16 N-Nitroso-di-n-propylamine	0.61576	0.60800	0.050	-1.26034	20.00000	Averaged	
22 2,4-Dimethylphenol	0.38359	0.36366	0.010	-5.19602	20.00000	Averaged	
26 1,2,4-Trichlorobenzene	0.40429	0.38951	0.010	-3.65675	20.00000	Averaged	
30 Hexachlorobutadiene	0.23352	0.22840	0.010	-2.19038	20.00000	Averaged	
39 Dimethylphthalate	1.32454	1.33403	0.010	0.71718	20.00000	Averaged	
50 Diethylphthalate	1.47908	1.50022	0.010	1.42921	20.00000	Averaged	
54 N-Nitrosodiphenylamine	0.49786	0.50051	0.010	0.53071	20.00000	Averaged	
57 Hexachlorobenzene	0.32846	0.32612	0.010	-0.71223	20.00000	Averaged	
58 Pentachlorophenol	0.22846	0.22091	0.005	-3.30315	20.00000	Averaged	
$ 66 Terphenyl-d14	0.50821	0.49737	0.010	-2.13243	20.00000	Averaged	
67 Butylbenzylphthalate	0.38795	0.46893	0.010	20.87418	20.00000	Averaged	<-
79 Dibenzo(a,h)anthracene	1.10683	1.13862	0.010	2.87234	20.00000	Averaged	
90 N-Nitrosodimethylamine	0.56255	0.61737	0.010	9.74446	20.00000	Averaged	

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS **Sample ID: CR06-10cm**
Extraction Method: SW3546 **SAMPLE**

Lab Sample ID: XN64A
LIMS ID: 13-24853
Matrix: Sediment
Data Release Authorized:
Reported: 12/02/13

QC Report No: XN64-Maul Foster & Alongi
Project: GHHSA
0863.01.01
Date Sampled: 11/07/13
Date Received: 11/08/13

Date Extracted: 11/27/13
Date Analyzed: 11/30/13 16:35
Instrument/Analyst: NT10/YZ
GPC Cleanup: Yes

Sample Amount: 0.65 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Percent Moisture: 78.7%

CAS Number	Analyte	RL	Result
108-95-2	**Phenol**	**310**	**370**
87-86-5	Pentachlorophenol	1,500	< 1,500 U
85-68-7	Butylbenzylphthalate	310	< 310 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	64.0%	2-Fluorobiphenyl	65.2%
d14-p-Terphenyl	67.2%	d4-1,2-Dichlorobenzene	60.2%
d5-Phenol	62.0%	2-Fluorophenol	58.1%
2,4,6-Tribromophenol	61.1%	d4-2-Chlorophenol	62.1%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS **Sample ID: CR04-10cm**
Extraction Method: SW3546 **SAMPLE**

Lab Sample ID: XN64B
LIMS ID: 13-24854
Matrix: Sediment
Data Release Authorized:
Reported: 12/02/13

QC Report No: XN64-Maul Foster & Alongi
Project: GHHSA
0863.01.01
Date Sampled: 11/07/13
Date Received: 11/08/13

Date Extracted: 11/27/13
Date Analyzed: 11/30/13 17:10
Instrument/Analyst: NT10/YZ
GPC Cleanup: Yes

Sample Amount: 3.44 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Percent Moisture: 71.5%

CAS Number	Analyte	RL	Result
108-95-2	**Phenol**	**58**	**290**
87-86-5	Pentachlorophenol	290	< 290 U
85-68-7	Butylbenzylphthalate	58	< 58 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	66.0%	2-Fluorobiphenyl	71.4%
d14-p-Terphenyl	61.8%	d4-1,2-Dichlorobenzene	51.0%
d5-Phenol	56.9%	2-Fluorophenol	50.8%
2,4,6-Tribromophenol	69.1%	d4-2-Chlorophenol	56.4%

XN64B : 0863A17

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS **Sample ID: CR05-10cm**
Extraction Method: SW3546 **SAMPLE**

Lab Sample ID: XN64C
LIMS ID: 13-24855
Matrix: Sediment
Data Release Authorized:
Reported: 12/02/13

QC Report No: XN64-Maul Foster & Alongi
Project: GHHSA
0863.01.01
Date Sampled: 11/08/13
Date Received: 11/08/13

Date Extracted: 11/27/13
Date Analyzed: 11/30/13 17:46
Instrument/Analyst: NT10/YZ
GPC Cleanup: Yes

Sample Amount: 3.38 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Percent Moisture: 74.1%

CAS Number	Analyte	RL	Result
108-95-2	**Phenol**	**59**	**570**
87-86-5	Pentachlorophenol	300	< 300 U
85-68-7	Butylbenzylphthalate	59	< 59 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	71.4%	2-Fluorobiphenyl	65.6%
d14-p-Terphenyl	64.0%	d4-1,2-Dichlorobenzene	55.2%
d5-Phenol	62.0%	2-Fluorophenol	54.9%
2,4,6-Tribromophenol	64.8%	d4-2-Chlorophenol	60.8%

XN64C : 0604L8

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS **Sample ID: CR04-5**
Extraction Method: SW3546 **SAMPLE**

Lab Sample ID: XN64E
LIMS ID: 13-24857
Matrix: Sediment
Data Release Authorized:
Reported: 12/02/13

QC Report No: XN64-Maul Foster & Alongi
Project: GHHSA
0863.01.01
Date Sampled: 11/08/13
Date Received: 11/08/13

Date Extracted: 11/27/13
Date Analyzed: 11/30/13 18:21
Instrument/Analyst: NT10/YZ
GPC Cleanup: Yes

Sample Amount: 4.15 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Percent Moisture: 80.3%

CAS Number	Analyte	RL	Result
108-95-2	**Phenol**	**48**	**980**

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Phenol	62.3%
2-Fluorophenol	50.8%
2,4,6-Tribromophenol	60.5%
d4-2-Chlorophenol	55.5%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS **Sample ID: MB-112713**
Extraction Method: SW3546 **METHOD BLANK**

Lab Sample ID: MB-112713
LIMS ID: 13-24853
Matrix: Sediment
Data Release Authorized:
Reported: 12/02/13

QC Report No: XN64-Maul Foster & Alongi
Project: GHHSA
0863.01.01
Date Sampled: NA
Date Received: NA

Date Extracted: 11/27/13
Date Analyzed: 11/30/13 15:25
Instrument/Analyst: NT10/YZ
GPC Cleanup: Yes

Sample Amount: 10.00 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Percent Moisture: NA

CAS Number	Analyte	RL	Result
108-95-2	Phenol	20	< 20 U
87-86-5	Pentachlorophenol	100	< 100 U
85-68-7	Butylbenzylphthalate	20	< 20 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	61.0%	2-Fluorobiphenyl	59.4%
d14-p-Terphenyl	71.2%	d4-1,2-Dichlorobenzene	62.0%
d5-Phenol	62.7%	2-Fluorophenol	60.1%
2,4,6-Tribromophenol	55.5%	d4-2-Chlorophenol	64.0%

ANALYTICAL RESOURCES INCORPORATED

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

Sample ID: LCS-112713
LAB CONTROL

Lab Sample ID: LCS-112713
LIMS ID: 13-24853
Matrix: Sediment
Data Release Authorized:
Reported: 12/02/13

QC Report No: XN64-Maul Foster & Alongi
Project: GHHSA
0863.01.01
Date Sampled: 11/07/13
Date Received: 11/08/13

Date Extracted: 11/27/13
Date Analyzed: 11/30/13 16:00
Instrument/Analyst: NT10/YZ
GPC Cleanup: Yes

Sample Amount: 10.00 g
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Percent Moisture: NA

Analyte	Lab Control	Spike Added	Recovery
Phenol	322	500	64.4%
Pentachlorophenol	726 Q	1500	48.4%
Butylbenzylphthalate	470	500	94.0%

Semivolatile Surrogate Recovery

d5-Nitrobenzene	59.4%
2-Fluorobiphenyl	58.8%
d14-p-Terphenyl	72.2%
d4-1,2-Dichlorobenzene	54.4%
d5-Phenol	61.5%
2-Fluorophenol	58.0%
2,4,6-Tribromophenol	62.8%
d4-2-Chlorophenol	59.5%

Reported in µg/kg (ppb)

ANALYTICAL RESOURCES INCORPORATED

SW8270 SEMIVOLATILES SOIL/SEDIMENT SURROGATE RECOVERY SUMMARY

Matrix: Sediment

QC Report No: XN64-Maul Foster & Alongi
Project: GHHSA
0863.01.01

Client ID	NBZ	FBP	TPH	DCB	PHL	2FP	TBP	2CP	TOT OUT
MB-112713	61.0%	59.4%	71.2%	62.0%	62.7%	60.1%	55.5%	64.0%	0
LCS-112713	59.4%	58.8%	72.2%	54.4%	61.5%	58.0%	62.8%	59.5%	0
CR06-10cm	64.0%	65.2%	67.2%	60.2%	62.0%	58.1%	61.1%	62.1%	0
CR04-10cm	66.0%	71.4%	61.8%	51.0%	56.9%	50.8%	69.1%	56.4%	0
CR05-10cm	71.4%	65.6%	64.0%	55.2%	62.0%	54.9%	64.8%	60.8%	0

	LCS/MB LIMITS	QC LIMITS
(NBZ) = d5-Nitrobenzene	(33-120)	(30-120)
(FBP) = 2-Fluorobiphenyl	(35-120)	(35-120)
(TPH) = d14-p-Terphenyl	(42-124)	(37-120)
(DCB) = d4-1,2-Dichlorobenzene	(37-120)	(32-120)
(PHL) = d5-Phenol	(32-120)	(29-120)
(2FP) = 2-Fluorophenol	(32-120)	(27-120)
(TBP) = 2,4,6-Tribromophenol	(23-133)	(24-134)
(2CP) = d4-2-Chlorophenol	(36-120)	(31-120)

Prep Method: SW3546
Log Number Range: 13-24853 to 13-24855

FORM-II SW8270

XN64 : 00052

ANALYTICAL RESOURCES INCORPORATED

SW8270 SEMIVOLATILES SOIL/SEDIMENT SURROGATE RECOVERY SUMMARY

Matrix: Sediment

QC Report No: XN64-Maul Foster & Alongi
Project: GHHSA
0863.01.01

Client ID	PHL	2FP	TBP	2CP	TOT OUT
CR04-5	62.3%	50.8%	60.5%	55.5%	0

	LCS/MB LIMITS	QC LIMITS
(PHL) = d5-Phenol	(32-120)	(29-120)
(2FP) = 2-Fluorophenol	(32-120)	(27-120)
(TBP) = 2,4,6-Tribromophenol	(23-133)	(24-134)
(2CP) = d4-2-Chlorophenol	(36-120)	(31-120)

Prep Method: SW3546
Log Number Range: 13-24857 to 13-24857

Analytical Resources, Inc.

CONTINUING CALIBRATION COMPOUNDS

Instrument ID: nt10.i Injection Date: 30-NOV-2013 14:15
Lab File ID: cc1130.d Init. Cal. Date(s): 18-NOV-2013 18-NOV-2013
Analysis Type: Init. Cal. Times: 12:57 17:06
Lab Sample ID: ABN 5 Quant Type: ISTD
Method: /chem1/nt10.i/20131130.b/ABN.m

COMPOUND	RRF / AMOUNT	RF5	CCAL RRF5	MIN RRF	%D / %DRIFT	MAX %D / %DRIFT	CURVE TYPE	
$ 1 2-Fluorophenol	1.33752	1.34316	1.34316	0.010	0.42122	20.00000	Averaged	
$ 2 Phenol-d5	1.67903	1.76680	1.76680	0.010	5.22762	20.00000	Averaged	
3 Phenol	1.64980	1.69868	1.69868	0.100	2.96273	20.00000	Averaged	
$ 5 2-Chlorophenol-d4	1.46461	1.46737	1.46737	0.010	0.18817	20.00000	Averaged	
4 Bis(2-Chloroethyl)ether	1.13893	1.18807	1.18807	0.700	4.31473	20.00000	Averaged	
6 2-Chlorophenol	1.46555	1.50423	1.50423	0.800	2.63963	20.00000	Averaged	
7 1,3-Dichlorobenzene	1.50753	1.45671	1.45671	0.010	-3.37073	20.00000	Averaged	
9 1,4-Dichlorobenzene	1.45615	1.42731	1.42731	0.010	-1.98057	20.00000	Averaged	
$ 10 1,2-Dichlorobenzene-d4	1.05860	1.03186	1.03186	0.010	-2.52571	20.00000	Averaged	
12 1,2-Dichlorobenzene	1.40987	1.36328	1.36328	0.010	-3.30494	20.00000	Averaged	
11 Benzyl alcohol	0.75201	0.68021	0.68021	0.010	-9.54771	20.00000	Averaged	
14 2,2'-oxybis(1-Chloropropane	0.43859	0.42280	0.42280	0.010	-3.60025	20.00000	Averaged	
13 2-Methylphenol	1.30286	1.31369	1.31369	0.700	0.83087	20.00000	Averaged	
17 Hexachloroethane	0.56357	0.54992	0.54992	0.300	-2.42211	20.00000	Averaged	
16 N-Nitroso-di-n-propylamine	0.66921	0.73985	0.73985	0.500	10.55710	20.00000	Averaged	
15 4-Methylphenol	1.35046	1.37131	1.37131	0.600	1.54365	20.00000	Averaged	
$ 18 Nitrobenzene-d5	0.37070	0.37690	0.37690	0.010	1.66998	20.00000	Averaged	
19 Nitrobenzene	0.31004	0.32068	0.32068	0.200	3.43116	20.00000	Averaged	
20 Isophorone	0.55731	0.58888	0.58888	0.300	5.66490	20.00000	Averaged	
21 2-Nitrophenol	0.24272	0.24399	0.24399	0.100	0.52330	20.00000	Averaged	
22 2,4-Dimethylphenol	0.38529	0.37385	0.37385	0.200	-2.96952	20.00000	Averaged	
23 Bis(2-Chloroethoxy)methane	0.35632	0.37333	0.37333	0.050	4.77269	20.00000	Averaged	
24 Benzoic acid	0.30601	0.26338	0.26338	0.010	-13.93292	20.00000	Averaged	
25 2,4-Dichlorophenol	0.36046	0.41793	0.41793	0.100	15.94310	20.00000	Averaged	
26 1,2,4-Trichlorobenzene	0.38026	0.35588	0.35588	0.010	-6.41096	20.00000	Averaged	
28 Naphthalene	1.04402	1.01224	1.01224	0.100	-3.04360	20.00000	Averaged	
29 4-Chloroaniline	0.40752	0.43494	0.43494	0.010	6.73065	20.00000	Averaged	
30 Hexachlorobutadiene	0.23172	0.21277	0.21277	0.010	-8.17927	20.00000	Averaged	
31 4-Chloro-3-methylphenol	0.32584	0.34666	0.34666	0.200	6.39045	20.00000	Averaged	
32 2-Methylnaphthalene	0.73051	0.73095	0.73095	0.300	0.05998	20.00000	Averaged	
33 Hexachlorocyclopentadiene	0.50700	0.29528	0.29528	0.001	-41.75949	20.00000	Averaged	<-
34 2,4,6-Trichlorophenol	0.48707	0.47548	0.47548	0.200	-2.37996	20.00000	Averaged	
35 2,4,5-Trichlorophenol	0.50939	0.50924	0.50924	0.200	-0.02896	20.00000	Averaged	
$ 36 2-Fluorobiphenyl	1.55155	1.51018	1.51018	0.010	-2.66625	20.00000	Averaged	
37 2-Chloronaphthalene	1.16558	1.13475	1.13475	0.700	-2.64502	20.00000	Averaged	

Analytical Resources, Inc.

CONTINUING CALIBRATION COMPOUNDS

Instrument ID: nt10.i
Lab File ID: cc1130.d
Analysis Type:
Lab Sample ID: ABN 5
Method: /chem1/nt10.i/20131130.b/ABN.m

Injection Date: 30-NOV-2013 14:15
Init. Cal. Date(s): 18-NOV-2013 18-NOV-2013
Init. Cal. Times: 12:57 17:06
Quant Type: ISTD

COMPOUND	RRF / AMOUNT	RF5	CCAL RRF5	MIN RRF	%D / %DRIFT	MAX %D / %DRIFT	CURVE TYPE	
38 2-Nitroaniline	0.23475	0.24809	0.24809	0.010	5.68109	20.00000	Averaged	
39 Dimethylphthalate	1.27144	1.23018	1.23018	0.010	-3.24557	20.00000	Averaged	
40 Acenaphthylene	1.93144	1.70905	1.70905	0.900	-11.51387	20.00000	Averaged	
41 2,6-Dinitrotoluene	0.29938	0.30586	0.30586	0.100	2.16402	20.00000	Averaged	
43 3-Nitroaniline	0.26355	0.27431	0.27431	0.010	4.08108	20.00000	Averaged	
44 Acenaphthene	1.10793	1.08908	1.08908	0.100	-1.70133	20.00000	Averaged	
45 2,4-Dinitrophenol	16.88949	20.00000	0.23757	0.030	-15.55253	20.00000	Quadratic	
46 Dibenzofuran	1.61373	1.57411	1.57411	0.800	-2.45529	20.00000	Averaged	
47 4-Nitrophenol	0.15330	0.14702	0.14702	0.010	-4.09852	20.00000	Averaged	
48 2,4-Dinitrotoluene	0.39663	0.40616	0.40616	0.200	2.40385	20.00000	Averaged	
50 Diethylphthalate	1.21570	1.17752	1.17752	0.010	-3.14028	20.00000	Averaged	
49 Fluorene	1.39934	1.36129	1.36129	0.100	-2.71971	20.00000	Averaged	
51 4-Chlorophenyl-phenylether	0.72393	0.68927	0.68927	0.100	-4.78774	20.00000	Averaged	
52 4-Nitroaniline	0.25521	0.28063	0.28063	0.010	9.96049	20.00000	Averaged	
53 4,6-Dinitro-2-methylphenol	0.19322	0.22219	0.22219	0.001	14.99232	20.00000	Averaged	
54 N-Nitrosodiphenylamine	0.49888	0.48789	0.48789	0.010	-2.20376	20.00000	Averaged	
$ 55 2,4,6-Tribromophenol	0.32583	0.30139	0.30139	0.010	-7.50140	20.00000	Averaged	
56 4-Bromophenyl-phenylether	0.27481	0.26681	0.26681	0.100	-2.91384	20.00000	Averaged	
57 Hexachlorobenzene	0.30461	0.28307	0.28307	0.100	-7.06893	20.00000	Averaged	
58 Pentachlorophenol	0.24013	0.15990	0.15990	0.010	-33.41037	20.00000	Averaged	<-
60 Phenanthrene	1.07912	1.04348	1.04348	0.700	-3.30326	20.00000	Averaged	
61 Anthracene	1.13273	1.13095	1.13095	0.700	-0.15729	20.00000	Averaged	
62 Carbazole	0.80682	0.78067	0.78067	0.010	-3.24134	20.00000	Averaged	
63 Di-n-butylphthalate	1.13123	1.22086	1.22086	0.010	7.92264	20.00000	Averaged	
64 Fluoranthene	1.38260	1.37203	1.37203	0.600	-0.76422	20.00000	Averaged	
65 Pyrene	1.28185	1.36007	1.36007	0.600	6.10263	20.00000	Averaged	
$ 66 Terphenyl-d14	0.78868	0.79464	0.79464	0.010	0.75639	20.00000	Averaged	
67 Butylbenzylphthalate	0.41048	0.46207	0.46207	0.010	12.56816	20.00000	Averaged	
68 Benzo(a)anthracene	1.24366	1.21618	1.21618	0.700	-2.20941	20.00000	Averaged	
70 3,3'-Dichlorobenzidine	0.55098	0.51627	0.51627	0.010	-6.30086	20.00000	Averaged	
71 Chrysene	1.10420	1.08574	1.08574	0.700	-1.67179	20.00000	Averaged	
72 bis(2-Ethylhexyl)phthalate	0.48960	0.49585	0.49585	0.010	1.27708	20.00000	Averaged	
73 Di-n-octylphthalate	1.00124	0.93208	0.93208	0.010	-6.90672	20.00000	Averaged	
74 Benzo(b)fluoranthene	1.18784	1.14841	1.14841	0.700	-3.31942	20.00000	Averaged	
75 Benzo(k)fluoranthene	1.19134	1.20474	1.20474	0.700	1.12484	20.00000	Averaged	

Analytical Resources, Inc.

CONTINUING CALIBRATION COMPOUNDS

Instrument ID: nt10.i Injection Date: 30-NOV-2013 14:15
Lab File ID: cc1130.d Init. Cal. Date(s): 18-NOV-2013 18-NOV-2013
Analysis Type: Init. Cal. Times: 12:57 17:06
Lab Sample ID: ABN 5 Quant Type: ISTD
Method: /chem1/nt10.i/20131130.b/ABN.m

COMPOUND	RRF / AMOUNT	RF5	CCAL RRF5	MIN RRF	%D / %DRIFT	MAX %D / %DRIFT	CURVE TYPE	
76 Benzo(a)pyrene	1.04130	1.02577	1.02577	0.700	-1.49136	20.00000	Averaged	
78 Indeno(1,2,3-cd)pyrene	1.31830	1.22128	1.22128	0.500	-7.35969	20.00000	Averaged	
79 Dibenzo(a,h)anthracene	1.03965	0.92626	0.92626	0.400	-10.90674	20.00000	Averaged	
80 Benzo(g,h,i)perylene	1.13505	1.05475	1.05475	0.500	-7.07445	20.00000	Averaged	
90 N-Nitrosodimethylamine	0.59522	0.70862	0.70862	0.010	19.05172	20.00000	Averaged	
91 Aniline	3.20010	3.08583	3.08583	0.010	-3.57071	20.00000	Averaged	
93 Benzidine	0.26426	0.11931	0.11931	0.010	-54.85056	20.00000	Averaged	<-
103 Pyridine	0.58020	0.52374	0.52374	0.010	-9.73196	20.00000	Averaged	
105 1-methylnaphthalene	0.66247	0.67212	0.67212	0.010	1.45537	20.00000	Averaged	
111 Azobenzene (1,2-DP-Hydrazin	0.92896	0.88274	0.88274	0.010	-4.97580	20.00000	Averaged	
187 Total Benzofluoranthenes	1.17065	1.14890	1.14890	0.010	-1.85796	20.00000	Averaged	
99 Perylene	1.00589	0.97543	0.97543	0.010	-3.02855	20.00000	Averaged	
98 Retene	0.00018	0.00031	0.00031	0.010	77.41910	20.00000	Averaged	<-
120 2,3,4,6-Tetrachlorophenol	0.41983	0.37849	0.37849	0.010	-9.84831	20.00000	Averaged	

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Dioxins/Furans by EPA 1613B **Sample ID: MB-111813**
Page 1 of 1

Lab Sample ID: MB-111813
LIMS ID: 13-24853
Matrix: Sediment
Data Release Authorized: MW
Reported: 11/26/13

QC Report No: XN64-Maul Foster & Alongi
Project: GHHSA
0863.01.01
Date Sampled: NA
Date Received: NA

Date Extracted: 11/18/13
Date Analyzed: 11/23/13 08:06
Instrument/Analyst: AS1/PK
Acid Cleanup: Yes
Silica-Carbon Cleanup: No

Sample Amount: 10.0 g-dry-wt
Final Extract Volume: 20 uL
Dilution Factor: 1.00
Silica-Florisil Cleanup: Yes

Analyte	Ion Ratio	Ratio Limits	EDL	RL	Result	
2,3,7,8-TCDF		0.65-0.89	0.0360	1.00	< 0.0360	U
2,3,7,8-TCDD	0.26	0.65-0.89		1.00	0.136	JEMPC
1,2,3,7,8-PeCDF	0.83	1.32-1.78		1.00	0.0300	JEMPC
2,3,4,7,8-PeCDF		1.32-1.78	0.0320	1.00	< 0.0320	U
1,2,3,7,8-PeCDD	1.47	1.32-1.78		1.00	0.0940	J
1,2,3,4,7,8-HxCDF		1.05-1.43	0.0300	1.00	< 0.0300	U
1,2,3,6,7,8-HxCDF		1.05-1.43	0.0300	1.00	< 0.0300	U
2,3,4,6,7,8-HxCDF		1.05-1.43	0.0320	1.00	< 0.0320	U
1,2,3,7,8,9-HxCDF		1.05-1.43	0.0380	1.00	< 0.0380	U
1,2,3,4,7,8-HxCDD	1.08	1.05-1.43		1.00	0.162	J
1,2,3,6,7,8-HxCDD	0.74	1.05-1.43		1.00	0.148	JEMPC
1,2,3,7,8,9-HxCDD	1.50	1.05-1.43		1.00	0.214	JEMPC
1,2,3,4,6,7,8-HpCDF		0.88-1.20	0.0280	1.00	< 0.0280	U
1,2,3,4,7,8,9-HpCDF		0.88-1.20	0.0420	1.00	< 0.0420	U
1,2,3,4,6,7,8-HpCDD	1.06	0.88-1.20		1.00	3.93	
OCDF		0.76-1.02	0.0640	2.00	< 0.0640	U
OCDD	0.87	0.76-1.02		2.00	21.7	

Homologue Group	EDL	RL	Result	
Total TCDF	0.0360	1.00	< 0.0360	U
Total TCDD		1.00	0.243	EMPC
Total PeCDF		2.00	0.0575	EMPC
Total PeCDD		1.00	1.08	EMPC
Total HxCDF	0.0380	2.00	< 0.0380	U
Total HxCDD		2.00	3.93	EMPC
Total HpCDF	0.0420	2.00	< 0.0420	U
Total HpCDD		2.00	11.4	

Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, Including EMPC): 0.33

Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, Including EMPC): 0.34

Reported in pg/g

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Dioxins/Furans by EPA 1613B **Sample ID: MB-111813**

Lab Sample ID: MB-111813
LIMS ID: 13-24853
Matrix: Sediment
Data Release Authorized: MW
Reported: 11/26/13

QC Report No: XN64-Maul Foster & Alongi
Project: GHHSA
0863.01.01
Date Sampled: NA
Date Received: NA

Date Extracted: 11/18/13
Date Analyzed: 11/23/13 08:06
Instrument/Analyst: AS1/PK

Sample Amount: 10.0 g-dry-wt
Final Extract Volume: 20 uL
Dilution Factor: 1.00

Analyte	Ion Ratio	Ratio Limits	Result	Limits	Exceedance
13C-2,3,7,8-TCDF	0.78	0.65-0.89	101	24-169	
13C-2,3,7,8-TCDD	0.79	0.65-0.89	103	25-164	
13C-1,2,3,7,8-PeCDF	1.56	1.32-1.78	131	24-185	
13C-2,3,4,7,8-PeCDF	1.57	1.32-1.78	129	21-178	
13C-1,2,3,7,8-PeCDD	1.57	1.32-1.78	135	25-181	
13C-1,2,3,4,7,8-HxCDF	0.51	0.43-0.59	100	26-152	
13C-1,2,3,6,7,8-HxCDF	0.52	0.43-0.59	94.6	26-123	
13C-2,3,4,6,7,8-HxCDF	0.52	0.43-0.59	98.0	28-136	
13C-1,2,3,7,8,9-HxCDF	0.52	0.43-0.59	98.4	29-147	
13C-1,2,3,4,7,8-HxCDD	1.27	1.05-1.43	106	32-141	
13C-1,2,3,6,7,8-HxCDD	1.24	1.05-1.43	96.5	28-130	
13C-1,2,3,4,6,7,8-HpCDF	0.45	0.37-0.51	89.2	28-143	
13C-1,2,3,4,7,8,9-HpCDF	0.44	0.37-0.51	100	26-138	
13C-1,2,3,4,6,7,8-HpCDD	1.06	0.88-1.20	105	23-140	
13C-OCDD	0.89	0.76-1.02	92.0	17-157	
37Cl4-2,3,7,8-TCDD			104	35-197	

Reported in Percent Recovery

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Dioxins/Furans by EPA 1613B **Sample ID: OPR-111813**

Lab Sample ID: OPR-111813
LIMS ID: 13-24853
Matrix: Sediment
Data Release Authorized: MW
Reported: 11/26/13

QC Report No: XN64-Maul Foster & Alongi
Project: GHHSA
0863.01.01
Date Sampled: NA
Date Received: NA

Date Extracted: 11/18/13
Date Analyzed: 11/22/13 12:52
Instrument/Analyst: AS1/PK
Acid Cleanup: Yes
Silica-Carbon Cleanup: No

Sample Amount: 10.0 g-dry-wt
Final Extract Volume: 20 uL
Dilution Factor: 1.00
Silica-Florisil Cleanup: Yes

Analyte	Ion Ratio	Ratio Limits	RL	Result
2,3,7,8-TCDF	0.71	0.65-0.89	1.00	21.7
2,3,7,8-TCDD	0.78	0.65-0.89	1.00	22.0
1,2,3,7,8-PeCDF	1.44	1.32-1.78	1.00	110
2,3,4,7,8-PeCDF	1.47	1.32-1.78	1.00	107
1,2,3,7,8-PeCDD	1.55	1.32-1.78	1.00	110
1,2,3,4,7,8-HxCDF	1.16	1.05-1.43	1.00	109
1,2,3,6,7,8-HxCDF	1.20	1.05-1.43	1.00	126
2,3,4,6,7,8-HxCDF	1.17	1.05-1.43	1.00	112
1,2,3,7,8,9-HxCDF	1.14	1.05-1.43	1.00	108
1,2,3,4,7,8-HxCDD	1.26	1.05-1.43	1.00	107
1,2,3,6,7,8-HxCDD	1.25	1.05-1.43	1.00	119
1,2,3,7,8,9-HxCDD	1.24	1.05-1.43	1.00	112
1,2,3,4,6,7,8-HpCDF	0.96	0.88-1.20	1.00	119
1,2,3,4,7,8,9-HpCDF	0.95	0.88-1.20	1.00	109
1,2,3,4,6,7,8-HpCDD	1.02	0.88-1.20	1.00	110
OCDF	0.87	0.76-1.02	2.00	219
OCDD	0.91	0.76-1.02	2.00	228

Homologue Group	EDL	RL	Result	
Total TCDF		1.00	22.8	EMPC
Total TCDD		1.00	22.9	EMPC
Total PeCDF		2.00	223	EMPC
Total PeCDD		1.00	111	EMPC
Total HxCDF		2.00	456	EMPC
Total HxCDD		2.00	340	EMPC
Total HpCDF		2.00	228	
Total HpCDD		2.00	114	

Reported in pg/g

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Dioxins/Furans by EPA 1613B **Sample ID: OPR-111813**

Lab Sample ID: OPR-111813
LIMS ID: 13-24853
Matrix: Sediment
Data Release Authorized: MW
Reported: 11/26/13

QC Report No: XN64-Maul Foster & Alongi
Project: GHHSA
0863.01.01
Date Sampled: NA
Date Received: NA

Date Extracted: 11/18/13
Date Analyzed: 11/22/13 12:52
Instrument/Analyst: AS1/PK

Sample Amount: 10.0 g-dry-wt
Final Extract Volume: 20 uL
Dilution Factor: 1.00

Analyte	Ion Ratio	Ratio Limits	Result	Limits	Exceedance
13C-2,3,7,8-TCDF	0.78	0.65-0.89	108	22-152	
13C-2,3,7,8-TCDD	0.79	0.65-0.89	102	20-175	
13C-1,2,3,7,8-PeCDF	1.62	1.32-1.78	118	21-192	
13C-2,3,4,7,8-PeCDF	1.58	1.32-1.78	109	13-328	
13C-1,2,3,7,8-PeCDD	1.58	1.32-1.78	113	21-227	
13C-1,2,3,4,7,8-HxCDF	0.52	0.43-0.59	111	19-202	
13C-1,2,3,6,7,8-HxCDF	0.52	0.43-0.59	97.3	21-159	
13C-2,3,4,6,7,8-HxCDF	0.52	0.43-0.59	106	22-176	
13C-1,2,3,7,8,9-HxCDF	0.50	0.43-0.59	105	17-205	
13C-1,2,3,4,7,8-HxCDD	1.25	1.05-1.43	113	21-193	
13C-1,2,3,6,7,8-HxCDD	1.23	1.05-1.43	101	25-163	
13C-1,2,3,4,6,7,8-HpCDF	0.45	0.37-0.51	96.4	21-158	
13C-1,2,3,4,7,8,9-HpCDF	0.44	0.37-0.51	103	20-186	
13C-1,2,3,4,6,7,8-HpCDD	1.08	0.88-1.20	107	26-166	
13C-OCDD	0.89	0.76-1.02	92.4	13-198	
37Cl4-2,3,7,8-TCDD			101	31-191	

Reported in Percent Recovery

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Dioxins/Furans by EPA 1613B **Sample ID: OPR-111813**

Lab Sample ID: OPR-111813
LIMS ID: 13-24853
Matrix: Sediment
Data Release Authorized: MW
Reported: 11/26/13

QC Report No: XN64-Maul Foster & Alongi
Project: GHHSA
0863.01.01
Date Sampled: NA
Date Received: NA

Date Extracted: 11/18/13
Date Analyzed: 11/22/13 12:52
Instrument/Analyst: AS1/PK

Sample Amount: 10.0 g-dry-wt
Final Extract Volume: 20 uL
Dilution Factor: 1.00

Analyte	OPR	Spiked	Recovery	Limits
2,3,7,8-TCDF	21.7	20.0	108	75-158
2,3,7,8-TCDD	22.0	20.0	110	67-158
1,2,3,7,8-PeCDF	110	100	110	80-134
2,3,4,7,8-PeCDF	107	100	107	68-160
1,2,3,7,8-PeCDD	110	100	110	70-142
1,2,3,4,7,8-HxCDF	109	100	109	72-134
1,2,3,6,7,8-HxCDF	126	100	126	84-130
2,3,4,6,7,8-HxCDF	112	100	112	70-156
1,2,3,7,8,9-HxCDF	108	100	108	78-130
1,2,3,4,7,8-HxCDD	107	100	107	70-164
1,2,3,6,7,8-HxCDD	119	100	119	76-134
1,2,3,7,8,9-HxCDD	112	100	112	64-162
1,2,3,4,6,7,8-HpCDF	119	100	119	82-132
1,2,3,4,7,8,9-HpCDF	109	100	109	78-138
1,2,3,4,6,7,8-HpCDD	110	100	110	70-140
OCDF	219	200	110	63-170
OCDD	228	200	114	78-144

Reported in pg/g

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Dioxins/Furans by EPA 1613B **Sample ID: CR06-10cm**

Lab Sample ID: XN64A
LIMS ID: 13-24853
Matrix: Sediment
Data Release Authorized: MW
Reported: 11/26/13

QC Report No: XN64-Maul Foster & Alongi
Project: GHHSA
0863.01.01
Date Sampled: 11/07/13
Date Received: 11/08/13

Date Extracted: 11/18/13
Date Analyzed: 11/22/13 23:04
Instrument/Analyst: AS1/PK
Acid Cleanup: Yes
Silica-Carbon Cleanup: No

Sample Amount: 10.0 g-dry-wt
Final Extract Volume: 20 uL
Dilution Factor: 1.00
Silica-Florisil Cleanup: Yes

Analyte	Ion Ratio	Ratio Limits	EDL	RL	Result	
2,3,7,8-TCDF	0.66	0.65-0.89		1.00	4.87	
2,3,7,8-TCDD	0.69	0.65-0.89		1.00	2.09	
1,2,3,7,8-PeCDF	1.44	1.32-1.78		1.00	3.28	
2,3,4,7,8-PeCDF	1.58	1.32-1.78		1.00	5.96	
1,2,3,7,8-PeCDD	1.52	1.32-1.78		1.00	9.35	
1,2,3,4,7,8-HxCDF	1.15	1.05-1.43		1.00	18.1	
1,2,3,6,7,8-HxCDF	1.14	1.05-1.43		1.00	8.90	
2,3,4,6,7,8-HxCDF	1.15	1.05-1.43		1.00	16.9	
1,2,3,7,8,9-HxCDF	1.19	1.05-1.43		1.00	4.79	
1,2,3,4,7,8-HxCDD	1.19	1.05-1.43		1.00	12.7	
1,2,3,6,7,8-HxCDD	1.23	1.05-1.43		1.00	63.8	
1,2,3,7,8,9-HxCDD	1.22	1.05-1.43		1.00	16.5	
1,2,3,4,6,7,8-HpCDF	0.97	0.88-1.20		1.00	258	
1,2,3,4,7,8,9-HpCDF	0.94	0.88-1.20		1.00	13.2	
1,2,3,4,6,7,8-HpCDD	1.03	0.88-1.20		1.00	1,080	
OCDF	0.86	0.76-1.02		2.00	680	
OCDD	0.89	0.76-1.02		2.00	7,830	E

Homologue Group	EDL	RL	Result	
Total TCDF		1.00	82.8	EMPC
Total TCDD		1.00	42.6	EMPC
Total PeCDF		2.00	203	EMPC
Total PeCDD		1.00	88.7	
Total HxCDF		2.00	463	EMPC
Total HxCDD		2.00	742	EMPC
Total HpCDF		2.00	950	
Total HpCDD		2.00	2,480	

Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, Including EMPC): 44.0

Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, Including EMPC): 44.0

Reported in pg/g

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Dioxins/Furans by EPA 1613B **Sample ID: CR06-10cm**

Lab Sample ID: XN64A
LIMS ID: 13-24853
Matrix: Sediment
Data Release Authorized: MW
Reported: 11/26/13

QC Report No: XN64-Maul Foster & Alongi
Project: GHHSA
0863.01.01
Date Sampled: 11/07/13
Date Received: 11/08/13

Date Extracted: 11/18/13
Date Analyzed: 11/22/13 23:04
Instrument/Analyst: AS1/PK

Sample Amount: 10.0 g-dry-wt
Final Extract Volume: 20 uL
Dilution Factor: 1.00

Analyte	Ion Ratio	Ratio Limits	Result	Limits	Exceedance
13C-2,3,7,8-TCDF	0.78	0.65-0.89	53.0	24-169	
13C-2,3,7,8-TCDD	0.78	0.65-0.89	64.4	25-164	
13C-1,2,3,7,8-PeCDF	1.58	1.32-1.78	71.8	24-185	
13C-2,3,4,7,8-PeCDF	1.57	1.32-1.78	72.1	21-178	
13C-1,2,3,7,8-PeCDD	1.56	1.32-1.78	77.0	25-181	
13C-1,2,3,4,7,8-HxCDF	0.52	0.43-0.59	63.0	26-152	
13C-1,2,3,6,7,8-HxCDF	0.52	0.43-0.59	58.2	26-123	
13C-2,3,4,6,7,8-HxCDF	0.52	0.43-0.59	61.3	28-136	
13C-1,2,3,7,8,9-HxCDF	0.52	0.43-0.59	62.8	29-147	
13C-1,2,3,4,7,8-HxCDD	1.26	1.05-1.43	66.8	32-141	
13C-1,2,3,6,7,8-HxCDD	1.24	1.05-1.43	60.8	28-130	
13C-1,2,3,4,6,7,8-HpCDF	0.43	0.37-0.51	54.2	28-143	
13C-1,2,3,4,7,8,9-HpCDF	0.45	0.37-0.51	67.9	26-138	
13C-1,2,3,4,6,7,8-HpCDD	1.04	0.88-1.20	65.5	23-140	
13C-OCDD	0.89	0.76-1.02	53.1	17-157	
37Cl4-2,3,7,8-TCDD			85.7	35-197	

Reported in Percent Recovery

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Dioxins/Furans by EPA 1613B **Sample ID: CR04-10cm**

Lab Sample ID: XN64B
LIMS ID: 13-24854
Matrix: Sediment
Data Release Authorized: MW
Reported: 11/26/13

QC Report No: XN64-Maul Foster & Alongi
Project: GHHSA
0863.01.01
Date Sampled: 11/07/13
Date Received: 11/08/13

Date Extracted: 11/18/13
Date Analyzed: 11/23/13 00:01
Instrument/Analyst: AS1/PK
Acid Cleanup: Yes
Silica-Carbon Cleanup: No

Sample Amount: 10.0 g-dry-wt
Final Extract Volume: 20 uL
Dilution Factor: 1.00
Silica-Florisil Cleanup: Yes

Analyte	Ion Ratio	Ratio Limits	EDL	RL	Result	
2,3,7,8-TCDF	0.68	0.65-0.89		0.999	3.53	
2,3,7,8-TCDD	0.62	0.65-0.89		0.999	1.14	BEMPC
1,2,3,7,8-PeCDF	1.34	1.32-1.78		0.999	2.06	
2,3,4,7,8-PeCDF	1.44	1.32-1.78		0.999	3.43	
1,2,3,7,8-PeCDD	1.57	1.32-1.78		0.999	4.34	
1,2,3,4,7,8-HxCDF	1.21	1.05-1.43		0.999	7.26	
1,2,3,6,7,8-HxCDF	1.22	1.05-1.43		0.999	3.38	
2,3,4,6,7,8-HxCDF	1.16	1.05-1.43		0.999	5.09	
1,2,3,7,8,9-HxCDF	1.21	1.05-1.43		0.999	2.45	
1,2,3,4,7,8-HxCDD	1.23	1.05-1.43		0.999	4.26	
1,2,3,6,7,8-HxCDD	1.26	1.05-1.43		0.999	54.5	
1,2,3,7,8,9-HxCDD	1.26	1.05-1.43		0.999	10.2	
1,2,3,4,6,7,8-HpCDF	0.98	0.88-1.20		0.999	165	
1,2,3,4,7,8,9-HpCDF	0.89	0.88-1.20		0.999	7.55	EMPC
1,2,3,4,6,7,8-HpCDD	1.03	0.88-1.20		0.999	817	
OCDF	0.85	0.76-1.02		2.00	476	
OCDD	0.89	0.76-1.02		2.00	5,340	E

Homologue Group	EDL	RL	Result	
Total TCDF		0.999	27.9	EMPC
Total TCDD		0.999	17.5	EMPC
Total PeCDF		2.00	101	EMPC
Total PeCDD		0.999	68.7	EMPC
Total HxCDF		2.00	301	EMPC
Total HxCDD		2.00	350	EMPC
Total HpCDF		2.00	678	EMPC
Total HpCDD		2.00	1,530	

Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, Including EMPC): 27.3

Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, Including EMPC): 27.3

Reported in pg/g

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Dioxins/Furans by EPA 1613B **Sample ID: CR04-10cm**

Lab Sample ID: XN64B
LIMS ID: 13-24854
Matrix: Sediment
Data Release Authorized: MW
Reported: 11/26/13

QC Report No: XN64-Maul Foster & Alongi
Project: GHHSA
0863.01.01
Date Sampled: 11/07/13
Date Received: 11/08/13

Date Extracted: 11/18/13
Date Analyzed: 11/23/13 00:01
Instrument/Analyst: AS1/PK

Sample Amount: 10.0 g-dry-wt
Final Extract Volume: 20 uL
Dilution Factor: 1.00

Analyte	Ion Ratio	Ratio Limits	Result	Limits	Exceedance
13C-2,3,7,8-TCDF	0.78	0.65-0.89	50.7	24-169	
13C-2,3,7,8-TCDD	0.78	0.65-0.89	75.7	25-164	
13C-1,2,3,7,8-PeCDF	1.58	1.32-1.78	88.0	24-185	
13C-2,3,4,7,8-PeCDF	1.57	1.32-1.78	87.7	21-178	
13C-1,2,3,7,8-PeCDD	1.57	1.32-1.78	93.0	25-181	
13C-1,2,3,4,7,8-HxCDF	0.52	0.43-0.59	79.0	26-152	
13C-1,2,3,6,7,8-HxCDF	0.52	0.43-0.59	71.2	26-123	
13C-2,3,4,6,7,8-HxCDF	0.53	0.43-0.59	76.7	28-136	
13C-1,2,3,7,8,9-HxCDF	0.52	0.43-0.59	80.5	29-147	
13C-1,2,3,4,7,8-HxCDD	1.25	1.05-1.43	78.1	32-141	
13C-1,2,3,6,7,8-HxCDD	1.22	1.05-1.43	75.4	28-130	
13C-1,2,3,4,6,7,8-HpCDF	0.44	0.37-0.51	66.9	28-143	
13C-1,2,3,4,7,8,9-HpCDF	0.45	0.37-0.51	84.1	26-138	
13C-1,2,3,4,6,7,8-HpCDD	1.04	0.88-1.20	80.2	23-140	
13C-OCDD	0.89	0.76-1.02	64.9	17-157	
37Cl4-2,3,7,8-TCDD			84.3	35-197	

Reported in Percent Recovery

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Dioxins/Furans by EPA 1613B **Sample ID: CR05-10cm**

Lab Sample ID: XN64C
LIMS ID: 13-24855
Matrix: Sediment
Data Release Authorized: MW
Reported: 11/26/13

QC Report No: XN64-Maul Foster & Alongi
Project: GHHSA
0863.01.01
Date Sampled: 11/08/13
Date Received: 11/08/13

Date Extracted: 11/18/13
Date Analyzed: 11/23/13 00:55
Instrument/Analyst: AS1/PK
Acid Cleanup: Yes
Silica-Carbon Cleanup: No

Sample Amount: 10.0 g-dry-wt
Final Extract Volume: 20 uL
Dilution Factor: 1.00
Silica-Florisil Cleanup: Yes

Analyte	Ion Ratio	Ratio Limits	EDL	RL	Result	
2,3,7,8-TCDF	0.77	0.65-0.89		0.999	6.30	
2,3,7,8-TCDD	0.73	0.65-0.89		0.999	3.00	
1,2,3,7,8-PeCDF	1.49	1.32-1.78		0.999	4.73	
2,3,4,7,8-PeCDF	1.52	1.32-1.78		0.999	5.82	
1,2,3,7,8-PeCDD	1.60	1.32-1.78		0.999	13.9	
1,2,3,4,7,8-HxCDF	1.12	1.05-1.43		0.999	15.3	
1,2,3,6,7,8-HxCDF	1.17	1.05-1.43		0.999	10.9	
2,3,4,6,7,8-HxCDF	1.18	1.05-1.43		0.999	11.1	
1,2,3,7,8,9-HxCDF	1.11	1.05-1.43		0.999	6.11	
1,2,3,4,7,8-HxCDD	1.26	1.05-1.43		0.999	11.2	
1,2,3,6,7,8-HxCDD	1.24	1.05-1.43		0.999	136	
1,2,3,7,8,9-HxCDD	1.25	1.05-1.43		0.999	29.9	
1,2,3,4,6,7,8-HpCDF	0.98	0.88-1.20		0.999	437	
1,2,3,4,7,8,9-HpCDF	1.05	0.88-1.20		0.999	19.8	
1,2,3,4,6,7,8-HpCDD	1.03	0.88-1.20		0.999	1,820	
OCDF	0.86	0.76-1.02		2.00	863	
OCDD	0.89	0.76-1.02		2.00	10,300	E

Homologue Group	EDL	RL	Result	
Total TCDF		0.999	78.1	EMPC
Total TCDD		0.999	73.6	EMPC
Total PeCDF		2.00	281	EMPC
Total PeCDD		0.999	334	EMPC
Total HxCDF		2.00	853	
Total HxCDD		2.00	1,010	EMPC
Total HpCDF		2.00	1,560	
Total HpCDD		2.00	3,750	

Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, Including EMPC): 67.6

Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, Including EMPC): 67.6

Reported in pg/g

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Dioxins/Furans by EPA 1613B **Sample ID: CR05-10cm**

Lab Sample ID: XN64C
LIMS ID: 13-24855
Matrix: Sediment
Data Release Authorized: MW
Reported: 11/26/13

QC Report No: XN64-Maul Foster & Alongi
Project: GHHSA
0863.01.01
Date Sampled: 11/08/13
Date Received: 11/08/13

Date Extracted: 11/18/13
Date Analyzed: 11/23/13 00:55
Instrument/Analyst: AS1/PK

Sample Amount: 10.0 g-dry-wt
Final Extract Volume: 20 uL
Dilution Factor: 1.00

Analyte	Ion Ratio	Ratio Limits	Result	Limits	Exceedance
13C-2,3,7,8-TCDF	0.78	0.65-0.89	67.0	24-169	
13C-2,3,7,8-TCDD	0.78	0.65-0.89	86.8	25-164	
13C-1,2,3,7,8-PeCDF	1.58	1.32-1.78	102	24-185	
13C-2,3,4,7,8-PeCDF	1.57	1.32-1.78	97.1	21-178	
13C-1,2,3,7,8-PeCDD	1.56	1.32-1.78	104	25-181	
13C-1,2,3,4,7,8-HxCDF	0.51	0.43-0.59	88.7	26-152	
13C-1,2,3,6,7,8-HxCDF	0.52	0.43-0.59	78.9	26-123	
13C-2,3,4,6,7,8-HxCDF	0.52	0.43-0.59	83.3	28-136	
13C-1,2,3,7,8,9-HxCDF	0.52	0.43-0.59	80.4	29-147	
13C-1,2,3,4,7,8-HxCDD	1.24	1.05-1.43	88.0	32-141	
13C-1,2,3,6,7,8-HxCDD	1.25	1.05-1.43	81.4	28-130	
13C-1,2,3,4,6,7,8-HpCDF	0.44	0.37-0.51	69.6	28-143	
13C-1,2,3,4,7,8,9-HpCDF	0.44	0.37-0.51	86.7	26-138	
13C-1,2,3,4,6,7,8-HpCDD	1.06	0.88-1.20	82.4	23-140	
13C-OCDD	0.89	0.76-1.02	66.5	17-157	
37Cl4-2,3,7,8-TCDD			86.6	35-197	

Reported in Percent Recovery

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Dioxins/Furans by EPA 1613B **Sample ID: CR06-2.5**

Lab Sample ID: XN64D
LIMS ID: 13-24856
Matrix: Sediment
Data Release Authorized: MW
Reported: 11/26/13

QC Report No: XN64-Maul Foster & Alongi
Project: GHHSA
0863.01.01
Date Sampled: 11/07/13
Date Received: 11/08/13

Date Extracted: 11/18/13
Date Analyzed: 11/23/13 01:49
Instrument/Analyst: AS1/PK
Acid Cleanup: Yes
Silica-Carbon Cleanup: No

Sample Amount: 10.0 g-dry-wt
Final Extract Volume: 20 uL
Dilution Factor: 1.00
Silica-Florisil Cleanup: Yes

Analyte	Ion Ratio	Ratio Limits	EDL	RL	Result	
2,3,7,8-TCDF	0.75	0.65-0.89		0.999	4.95	
2,3,7,8-TCDD	0.72	0.65-0.89		0.999	2.11	
1,2,3,7,8-PeCDF	1.42	1.32-1.78		0.999	3.24	
2,3,4,7,8-PeCDF	1.52	1.32-1.78		0.999	5.87	
1,2,3,7,8-PeCDD	1.45	1.32-1.78		0.999	8.27	
1,2,3,4,7,8-HxCDF	1.16	1.05-1.43		0.999	21.7	
1,2,3,6,7,8-HxCDF	1.18	1.05-1.43		0.999	8.35	
2,3,4,6,7,8-HxCDF	1.18	1.05-1.43		0.999	16.3	
1,2,3,7,8,9-HxCDF	1.15	1.05-1.43		0.999	4.66	
1,2,3,4,7,8-HxCDD	1.21	1.05-1.43		0.999	8.21	
1,2,3,6,7,8-HxCDD	1.25	1.05-1.43		0.999	72.8	
1,2,3,7,8,9-HxCDD	1.28	1.05-1.43		0.999	15.4	
1,2,3,4,6,7,8-HpCDF	0.99	0.88-1.20		0.999	276	
1,2,3,4,7,8,9-HpCDF	0.98	0.88-1.20		0.999	15.5	
1,2,3,4,6,7,8-HpCDD	1.04	0.88-1.20		0.999	1,090	
OCDF	0.87	0.76-1.02		2.00	652	
OCDD	0.88	0.76-1.02		2.00	6,810	E

Homologue Group	EDL	RL	Result	
Total TCDF		0.999	62.3	EMPC
Total TCDD		0.999	28.7	
Total PeCDF		2.00	147	EMPC
Total PeCDD		0.999	67.0	EMPC
Total HxCDF		2.00	518	EMPC
Total HxCDD		2.00	783	EMPC
Total HpCDF		2.00	1,120	EMPC
Total HpCDD		2.00	2,050	

Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, Including EMPC): 43.5

Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, Including EMPC): 43.5

Reported in pg/g

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Dioxins/Furans by EPA 1613B **Sample ID: CR06-2.5**

Lab Sample ID: XN64D
LIMS ID: 13-24856
Matrix: Sediment
Data Release Authorized: MW
Reported: 11/26/13

QC Report No: XN64-Maul Foster & Alongi
Project: GHHSA
0863.01.01
Date Sampled: 11/07/13
Date Received: 11/08/13

Date Extracted: 11/18/13
Date Analyzed: 11/23/13 01:49
Instrument/Analyst: AS1/PK

Sample Amount: 10.0 g-dry-wt
Final Extract Volume: 20 uL
Dilution Factor: 1.00

Analyte	Ion Ratio	Ratio Limits	Result	Limits	Exceedance
13C-2,3,7,8-TCDF	0.78	0.65-0.89	52.4	24-169	
13C-2,3,7,8-TCDD	0.80	0.65-0.89	65.4	25-164	
13C-1,2,3,7,8-PeCDF	1.57	1.32-1.78	76.0	24-185	
13C-2,3,4,7,8-PeCDF	1.56	1.32-1.78	76.5	21-178	
13C-1,2,3,7,8-PeCDD	1.57	1.32-1.78	80.6	25-181	
13C-1,2,3,4,7,8-HxCDF	0.52	0.43-0.59	66.0	26-152	
13C-1,2,3,6,7,8-HxCDF	0.52	0.43-0.59	60.5	26-123	
13C-2,3,4,6,7,8-HxCDF	0.52	0.43-0.59	64.1	28-136	
13C-1,2,3,7,8,9-HxCDF	0.52	0.43-0.59	67.0	29-147	
13C-1,2,3,4,7,8-HxCDD	1.29	1.05-1.43	69.2	32-141	
13C-1,2,3,6,7,8-HxCDD	1.24	1.05-1.43	64.1	28-130	
13C-1,2,3,4,6,7,8-HpCDF	0.44	0.37-0.51	63.3	28-143	
13C-1,2,3,4,7,8,9-HpCDF	0.44	0.37-0.51	83.3	26-138	
13C-1,2,3,4,6,7,8-HpCDD	1.06	0.88-1.20	77.5	23-140	
13C-OCDD	0.89	0.76-1.02	70.3	17-157	
37Cl4-2,3,7,8-TCDD			84.5	35-197	

Reported in Percent Recovery

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Dioxins/Furans by EPA 1613B **Sample ID: CR01-10cm**

Lab Sample ID: XN64F
LIMS ID: 13-24858
Matrix: Sediment
Data Release Authorized: MW
Reported: 11/26/13

QC Report No: XN64-Maul Foster & Alongi
Project: GHHSA
0863.01.01
Date Sampled: 11/08/13
Date Received: 11/08/13

Date Extracted: 11/18/13
Date Analyzed: 11/23/13 02:43
Instrument/Analyst: AS1/PK
Acid Cleanup: Yes
Silica-Carbon Cleanup: No

Sample Amount: 10.0 g-dry-wt
Final Extract Volume: 20 uL
Dilution Factor: 1.00
Silica-Florisil Cleanup: Yes

Analyte	Ion Ratio	Ratio Limits	EDL	RL	Result	
2,3,7,8-TCDF	0.70	0.65-0.89		0.995	1.96	
2,3,7,8-TCDD	0.70	0.65-0.89		0.995	2.62	
1,2,3,7,8-PeCDF	1.48	1.32-1.78		0.995	0.683	J
2,3,4,7,8-PeCDF	1.74	1.32-1.78		0.995	0.814	J
1,2,3,7,8-PeCDD	1.60	1.32-1.78		0.995	3.93	
1,2,3,4,7,8-HxCDF	1.21	1.05-1.43		0.995	2.77	
1,2,3,6,7,8-HxCDF	1.17	1.05-1.43		0.995	1.19	
2,3,4,6,7,8-HxCDF	1.11	1.05-1.43		0.995	1.80	
1,2,3,7,8,9-HxCDF	1.05	1.05-1.43		0.995	0.778	JEMPC
1,2,3,4,7,8-HxCDD	1.18	1.05-1.43		0.995	1.76	
1,2,3,6,7,8-HxCDD	1.24	1.05-1.43		0.995	9.98	
1,2,3,7,8,9-HxCDD	1.28	1.05-1.43		0.995	11.1	
1,2,3,4,6,7,8-HpCDF	0.98	0.88-1.20		0.995	31.9	
1,2,3,4,7,8,9-HpCDF	1.00	0.88-1.20		0.995	1.59	
1,2,3,4,6,7,8-HpCDD	1.03	0.88-1.20		0.995	211	
OCDF	0.86	0.76-1.02		1.99	51.0	
OCDD	0.89	0.76-1.02		1.99	1,690	

Homologue Group	EDL	RL	Result	
Total TCDF		0.995	12.4	EMPC
Total TCDD		0.995	17.4	EMPC
Total PeCDF		1.99	18.0	EMPC
Total PeCDD		0.995	25.8	
Total HxCDF		1.99	52.5	EMPC
Total HxCDD		1.99	97.0	
Total HpCDF		1.99	87.1	EMPC
Total HpCDD		1.99	485	

Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, Including EMPC): 12.9

Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, Including EMPC): 12.9

Reported in pg/g

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Dioxins/Furans by EPA 1613B **Sample ID: CR01-10cm**

Lab Sample ID: XN64F
LIMS ID: 13-24858
Matrix: Sediment
Data Release Authorized: MW
Reported: 11/26/13

QC Report No: XN64-Maul Foster & Alongi
Project: GHHSA
0863.01.01
Date Sampled: 11/08/13
Date Received: 11/08/13

Date Extracted: 11/18/13
Date Analyzed: 11/23/13 02:43
Instrument/Analyst: AS1/PK

Sample Amount: 10.0 g-dry-wt
Final Extract Volume: 20 uL
Dilution Factor: 1.00

Analyte	Ion Ratio	Ratio Limits	Result	Limits	Exceedance
13C-2,3,7,8-TCDF	0.78	0.65-0.89	73.1	24-169	
13C-2,3,7,8-TCDD	0.79	0.65-0.89	84.6	25-164	
13C-1,2,3,7,8-PeCDF	1.58	1.32-1.78	115	24-185	
13C-2,3,4,7,8-PeCDF	1.57	1.32-1.78	115	21-178	
13C-1,2,3,7,8-PeCDD	1.59	1.32-1.78	119	25-181	
13C-1,2,3,4,7,8-HxCDF	0.51	0.43-0.59	89.7	26-152	
13C-1,2,3,6,7,8-HxCDF	0.52	0.43-0.59	82.2	26-123	
13C-2,3,4,6,7,8-HxCDF	0.52	0.43-0.59	87.7	28-136	
13C-1,2,3,7,8,9-HxCDF	0.52	0.43-0.59	87.9	29-147	
13C-1,2,3,4,7,8-HxCDD	1.26	1.05-1.43	90.8	32-141	
13C-1,2,3,6,7,8-HxCDD	1.25	1.05-1.43	84.5	28-130	
13C-1,2,3,4,6,7,8-HpCDF	0.45	0.37-0.51	79.5	28-143	
13C-1,2,3,4,7,8,9-HpCDF	0.45	0.37-0.51	98.3	26-138	
13C-1,2,3,4,6,7,8-HpCDD	1.05	0.88-1.20	93.8	23-140	
13C-OCDD	0.89	0.76-1.02	90.0	17-157	
37Cl4-2,3,7,8-TCDD			85.0	35-197	

Reported in Percent Recovery

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Dioxins/Furans by EPA 1613B **Sample ID: CR02-10cm**

Lab Sample ID: XN64G
LIMS ID: 13-24859
Matrix: Sediment
Data Release Authorized: MW
Reported: 11/26/13

QC Report No: XN64-Maul Foster & Alongi
Project: GHHSA
0863.01.01
Date Sampled: 11/08/13
Date Received: 11/08/13

Date Extracted: 11/18/13
Date Analyzed: 11/23/13 03:37
Instrument/Analyst: AS1/PK
Acid Cleanup: Yes
Silica-Carbon Cleanup: No

Sample Amount: 10.0 g-dry-wt
Final Extract Volume: 20 uL
Dilution Factor: 1.00
Silica-Florisil Cleanup: Yes

Analyte	Ion Ratio	Ratio Limits	EDL	RL	Result	
2,3,7,8-TCDF	0.71	0.65-0.89		0.998	2.18	
2,3,7,8-TCDD	0.75	0.65-0.89		0.998	2.89	
1,2,3,7,8-PeCDF	1.33	1.32-1.78		0.998	0.804	J
2,3,4,7,8-PeCDF	1.63	1.32-1.78		0.998	1.13	
1,2,3,7,8-PeCDD	1.50	1.32-1.78		0.998	4.53	
1,2,3,4,7,8-HxCDF	1.11	1.05-1.43		0.998	4.60	
1,2,3,6,7,8-HxCDF	1.20	1.05-1.43		0.998	3.22	
2,3,4,6,7,8-HxCDF	1.17	1.05-1.43		0.998	5.58	
1,2,3,7,8,9-HxCDF	1.14	1.05-1.43		0.998	0.886	J
1,2,3,4,7,8-HxCDD	1.18	1.05-1.43		0.998	1.96	
1,2,3,6,7,8-HxCDD	1.24	1.05-1.43		0.998	10.4	
1,2,3,7,8,9-HxCDD	1.23	1.05-1.43		0.998	12.4	
1,2,3,4,6,7,8-HpCDF	0.98	0.88-1.20		0.998	113	
1,2,3,4,7,8,9-HpCDF	0.97	0.88-1.20		0.998	4.94	
1,2,3,4,6,7,8-HpCDD	1.04	0.88-1.20		0.998	201	
OCDF	0.85	0.76-1.02		2.00	211	
OCDD	0.89	0.76-1.02		2.00	1,550	

Homologue Group	EDL	RL	Result	
Total TCDF		0.998	33.0	EMPC
Total TCDD		0.998	28.1	EMPC
Total PeCDF		2.00	47.6	EMPC
Total PeCDD		0.998	34.9	
Total HxCDF		2.00	125	
Total HxCDD		2.00	114	
Total HpCDF		2.00	310	
Total HpCDD		2.00	433	

Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, Including EMPC): 15.6

Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, Including EMPC): 15.6

Reported in pg/g

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Dioxins/Furans by EPA 1613B **Sample ID: CR02-10cm**

Lab Sample ID: XN64G
LIMS ID: 13-24859
Matrix: Sediment
Data Release Authorized:
Reported: 11/26/13

QC Report No: XN64-Maul Foster & Alongi
Project: GHHSA
0863.01.01
Date Sampled: 11/08/13
Date Received: 11/08/13

Date Extracted: 11/18/13
Date Analyzed: 11/23/13 03:37
Instrument/Analyst: AS1/PK

Sample Amount: 10.0 g-dry-wt
Final Extract Volume: 20 uL
Dilution Factor: 1.00

Analyte	Ion Ratio	Ratio Limits	Result	Limits	Exceedance
13C-2,3,7,8-TCDF	0.78	0.65-0.89	94.6	24-169	
13C-2,3,7,8-TCDD	0.77	0.65-0.89	92.5	25-164	
13C-1,2,3,7,8-PeCDF	1.58	1.32-1.78	119	24-185	
13C-2,3,4,7,8-PeCDF	1.56	1.32-1.78	120	21-178	
13C-1,2,3,7,8-PeCDD	1.58	1.32-1.78	125	25-181	
13C-1,2,3,4,7,8-HxCDF	0.52	0.43-0.59	87.6	26-152	
13C-1,2,3,6,7,8-HxCDF	0.52	0.43-0.59	81.5	26-123	
13C-2,3,4,6,7,8-HxCDF	0.52	0.43-0.59	89.2	28-136	
13C-1,2,3,7,8,9-HxCDF	0.52	0.43-0.59	91.3	29-147	
13C-1,2,3,4,7,8-HxCDD	1.26	1.05-1.43	93.6	32-141	
13C-1,2,3,6,7,8-HxCDD	1.25	1.05-1.43	85.4	28-130	
13C-1,2,3,4,6,7,8-HpCDF	0.45	0.37-0.51	86.1	28-143	
13C-1,2,3,4,7,8,9-HpCDF	0.45	0.37-0.51	105	26-138	
13C-1,2,3,4,6,7,8-HpCDD	1.05	0.88-1.20	103	23-140	
13C-OCDD	0.89	0.76-1.02	101	17-157	
37Cl4-2,3,7,8-TCDD			92.5	35-197	

Reported in Percent Recovery

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Dioxins/Furans by EPA 1613B **Sample ID: CR03-10cm**

Lab Sample ID: XN64H
LIMS ID: 13-24860
Matrix: Sediment
Data Release Authorized: MW
Reported: 11/26/13

QC Report No: XN64-Maul Foster & Alongi
Project: GHHSA
0863.01.01
Date Sampled: 11/08/13
Date Received: 11/08/13

Date Extracted: 11/18/13
Date Analyzed: 11/23/13 04:31
Instrument/Analyst: AS1/PK
Acid Cleanup: Yes
Silica-Carbon Cleanup: No

Sample Amount: 10.1 g-dry-wt
Final Extract Volume: 20 uL
Dilution Factor: 1.00
Silica-Florisil Cleanup: Yes

Analyte	Ion Ratio	Ratio Limits	EDL	RL	Result	
2,3,7,8-TCDF	0.77	0.65-0.89		0.993	1.34	
2,3,7,8-TCDD	0.73	0.65-0.89		0.993	3.56	
1,2,3,7,8-PeCDF	1.55	1.32-1.78		0.993	0.508	J
2,3,4,7,8-PeCDF	1.70	1.32-1.78		0.993	0.594	J
1,2,3,7,8-PeCDD	1.61	1.32-1.78		0.993	5.08	
1,2,3,4,7,8-HxCDF	1.18	1.05-1.43		0.993	1.02	
1,2,3,6,7,8-HxCDF	1.13	1.05-1.43		0.993	0.862	J
2,3,4,6,7,8-HxCDF	1.25	1.05-1.43		0.993	0.785	J
1,2,3,7,8,9-HxCDF	1.36	1.05-1.43		0.993	0.268	J
1,2,3,4,7,8-HxCDD	1.28	1.05-1.43		0.993	1.42	B
1,2,3,6,7,8-HxCDD	1.27	1.05-1.43		0.993	4.81	
1,2,3,7,8,9-HxCDD	1.23	1.05-1.43		0.993	12.9	
1,2,3,4,6,7,8-HpCDF	0.96	0.88-1.20		0.993	24.7	
1,2,3,4,7,8,9-HpCDF	0.92	0.88-1.20		0.993	0.894	J
1,2,3,4,6,7,8-HpCDD	1.03	0.88-1.20		0.993	66.1	
OCDF	0.86	0.76-1.02		1.99	36.4	
OCDD	0.89	0.76-1.02		1.99	489	

Homologue Group	EDL	RL	Result	
Total TCDF		0.993	16.7	EMPC
Total TCDD		0.993	24.7	EMPC
Total PeCDF		1.99	13.2	EMPC
Total PeCDD		0.993	30.6	
Total HxCDF		1.99	24.4	EMPC
Total HxCDD		1.99	80.8	EMPC
Total HpCDF		1.99	55.9	
Total HpCDD		1.99	167	

Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, Including EMPC): 12.2

Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, Including EMPC): 12.2

Reported in pg/g

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Dioxins/Furans by EPA 1613B **Sample ID: CR03-10cm**

Lab Sample ID: XN64H
LIMS ID: 13-24860
Matrix: Sediment
Data Release Authorized:
Reported: 11/26/13

QC Report No: XN64-Maul Foster & Alongi
Project: GHHSA
0863.01.01
Date Sampled: 11/08/13
Date Received: 11/08/13

Date Extracted: 11/18/13
Date Analyzed: 11/23/13 04:31
Instrument/Analyst: AS1/PK

Sample Amount: 10.1 g-dry-wt
Final Extract Volume: 20 uL
Dilution Factor: 1.00

Analyte	Ion Ratio	Ratio Limits	Result	Limits	Exceedance
13C-2,3,7,8-TCDF	0.78	0.65-0.89	83.5	24-169	
13C-2,3,7,8-TCDD	0.78	0.65-0.89	90.3	25-164	
13C-1,2,3,7,8-PeCDF	1.57	1.32-1.78	113	24-185	
13C-2,3,4,7,8-PeCDF	1.57	1.32-1.78	116	21-178	
13C-1,2,3,7,8-PeCDD	1.58	1.32-1.78	118	25-181	
13C-1,2,3,4,7,8-HxCDF	0.52	0.43-0.59	90.1	26-152	
13C-1,2,3,6,7,8-HxCDF	0.52	0.43-0.59	82.5	26-123	
13C-2,3,4,6,7,8-HxCDF	0.52	0.43-0.59	87.4	28-136	
13C-1,2,3,7,8,9-HxCDF	0.52	0.43-0.59	89.6	29-147	
13C-1,2,3,4,7,8-HxCDD	1.25	1.05-1.43	91.8	32-141	
13C-1,2,3,6,7,8-HxCDD	1.24	1.05-1.43	83.1	28-130	
13C-1,2,3,4,6,7,8-HpCDF	0.44	0.37-0.51	82.9	28-143	
13C-1,2,3,4,7,8,9-HpCDF	0.45	0.37-0.51	101	26-138	
13C-1,2,3,4,6,7,8-HpCDD	1.06	0.88-1.20	96.1	23-140	
13C-OCDD	0.90	0.76-1.02	94.1	17-157	
37Cl4-2,3,7,8-TCDD			91.2	35-197	

Reported in Percent Recovery

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA PCB by GC/ECD **Sample ID: MB-111513**
Extraction Method: SW3546 **METHOD BLANK**

Lab Sample ID: MB-111513
LIMS ID: 13-24856
Matrix: Sediment
Data Release Authorized: MW
Reported: 11/22/13

QC Report No: XN64-Maul Foster & Alongi
Project: GHHSA
0863.01.01
Date Sampled: NA
Date Received: NA

Date Extracted: 11/15/13
Date Analyzed: 11/21/13 17:41
Instrument/Analyst: ECD5/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 5.00 g
Final Extract Volume: 5.00 mL
Dilution Factor: 1.00
Silica Gel: Yes

Percent Moisture: NA

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	20	< 20 U
53469-21-9	Aroclor 1242	20	< 20 U
12672-29-6	Aroclor 1248	20	< 20 U
11097-69-1	Aroclor 1254	20	< 20 U
11096-82-5	Aroclor 1260	20	< 20 U
11104-28-2	Aroclor 1221	20	< 20 U
11141-16-5	Aroclor 1232	20	< 20 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	77.2%
Tetrachlorometaxylene	64.8%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA PCB by GC/ECD **Sample ID: CR06-2.5**
Extraction Method: SW3546 **SAMPLE**

Lab Sample ID: XN64D
LIMS ID: 13-24856
Matrix: Sediment
Data Release Authorized: MW
Reported: 11/22/13

QC Report No: XN64-Maul Foster & Alongi
Project: GHHSA
0863.01.01
Date Sampled: 11/07/13
Date Received: 11/08/13

Date Extracted: 11/15/13
Date Analyzed: 11/21/13 18:42
Instrument/Analyst: ECD5/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 5.06 g-dry-wt
Final Extract Volume: 5.00 mL
Dilution Factor: 1.00
Silica Gel: Yes

Percent Moisture: 77.0%

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	20	< 20 U
53469-21-9	Aroclor 1242	20	< 20 U
12672-29-6	Aroclor 1248	99	< 99 Y
11097-69-1	Aroclor 1254	200	< 200 Y
11096-82-5	**Aroclor 1260**	**20**	**690**
11104-28-2	Aroclor 1221	20	< 20 U
11141-16-5	Aroclor 1232	20	< 20 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery	
Decachlorobiphenyl	92.2%
Tetrachlorometaxylene	60.5%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA PCB by GC/ECD **Sample ID: CR01-10cm**
Extraction Method: SW3546 **SAMPLE**

Lab Sample ID: XN64F
LIMS ID: 13-24858
Matrix: Sediment
Data Release Authorized: MW
Reported: 11/22/13

QC Report No: XN64-Maul Foster & Alongi
Project: GHHSA
0863.01.01
Date Sampled: 11/08/13
Date Received: 11/08/13

Date Extracted: 11/15/13
Date Analyzed: 11/21/13 19:02
Instrument/Analyst: ECD5/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 5.39 g-dry-wt
Final Extract Volume: 5.00 mL
Dilution Factor: 1.00
Silica Gel: Yes

Percent Moisture: 51.2%

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	18	< 18 U
53469-21-9	Aroclor 1242	18	< 18 U
12672-29-6	Aroclor 1248	18	< 18 U
11097-69-1	Aroclor 1254	18	< 18 U
11096-82-5	Aroclor 1260	18	< 18 U
11104-28-2	Aroclor 1221	18	< 18 U
11141-16-5	Aroclor 1232	23	< 23 Y

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	57.0%
Tetrachlorometaxylene	55.5%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA PCB by GC/ECD
Extraction Method: SW3546
Page 1 of 1

Sample ID: CR02-10cm
SAMPLE

Lab Sample ID: XN64G
LIMS ID: 13-24859
Matrix: Sediment
Data Release Authorized: MW
Reported: 11/22/13

QC Report No: XN64-Maul Foster & Alongi
Project: GHHSA
0863.01.01
Date Sampled: 11/08/13
Date Received: 11/08/13

Date Extracted: 11/15/13
Date Analyzed: 11/21/13 19:22
Instrument/Analyst: ECD5/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 5.32 g-dry-wt
Final Extract Volume: 5.00 mL
Dilution Factor: 1.00
Silica Gel: Yes

Percent Moisture: 46.9%

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	19	< 19 U
53469-21-9	Aroclor 1242	19	< 19 U
12672-29-6	Aroclor 1248	19	< 19 U
11097-69-1	**Aroclor 1254**	**19**	**12 J**
11096-82-5	Aroclor 1260	19	< 19 U
11104-28-2	Aroclor 1221	19	< 19 U
11141-16-5	Aroclor 1232	38	< 38 Y

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	60.0%
Tetrachlorometaxylene	59.5%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA PCB by GC/ECD **Sample ID: CR03-10cm**
Extraction Method: SW3546 **SAMPLE**
Page 1 of 1

Lab Sample ID: XN64H
LIMS ID: 13-24860
Matrix: Sediment
Data Release Authorized:
Reported: 11/22/13

QC Report No: XN64-Maul Foster & Alongi
Project: GHHSA
0863.01.01
Date Sampled: 11/08/13
Date Received: 11/08/13

Date Extracted: 11/15/13
Date Analyzed: 11/21/13 19:42
Instrument/Analyst: ECD5/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 5.38 g-dry-wt
Final Extract Volume: 5.00 mL
Dilution Factor: 1.00
Silica Gel: Yes

Percent Moisture: 61.6%

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	19	< 19 U
53469-21-9	Aroclor 1242	19	< 19 U
12672-29-6	Aroclor 1248	19	< 19 U
11097-69-1	Aroclor 1254	19	< 19 U
11096-82-5	Aroclor 1260	19	< 19 U
11104-28-2	Aroclor 1221	19	< 19 U
11141-16-5	Aroclor 1232	46	< 46 Y

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	68.8%
Tetrachlorometaxylene	67.2%

ANALYTICAL RESOURCES INCORPORATED

SW8082/PCB SOIL/SOLID/SEDIMENT SURROGATE RECOVERY SUMMARY

Matrix: Sediment

QC Report No: XN64-Maul Foster & Alongi
Project: GHHSA
0863.01.01

Client ID	DCBP % REC	DCBP LCL-UCL	TCMX % REC	TCMX LCL-UCL	TOT OUT
MB-111513	77.2%	61-114	64.8%	52-117	0
LCS-111513	77.2%	61-114	64.5%	52-117	0
CR06-2.5	92.2%	54-115	60.5%	57-109	0
CR01-10cm	57.0%	54-115	55.5%*	57-109	1
CR02-10cm	60.0%	54-115	59.5%	57-109	0
CR03-10cm	68.8%	54-115	67.2%	57-109	0

Microwave (MARS) Control Limits PCBSMM
Prep Method: SW3546
Log Number Range: 13-24856 to 13-24860

ANALYTICAL RESOURCES INCORPORATED

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

Sample ID: LCS-111513
LAB CONTROL

Lab Sample ID: LCS-111513
LIMS ID: 13-24856
Matrix: Sediment
Data Release Authorized: MW
Reported: 11/22/13

QC Report No: XN64-Maul Foster & Alongi
Project: GHHSA
0863.01.01
Date Sampled: NA
Date Received: NA

Date Extracted: 11/15/13
Date Analyzed: 11/21/13 18:01
Instrument/Analyst: ECD5/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 5.00 g-dry-wt
Final Extract Volume: 5.00 mL
Dilution Factor: 1.00
Silica Gel: Yes

Percent Moisture: NA

Analyte	Lab Control	Spike Added	Recovery
Aroclor 1016	345	500	69.0%
Aroclor 1260	369	500	73.8%

PCB Surrogate Recovery

Decachlorobiphenyl	77.2%
Tetrachlorometaxylene	64.5%

Results reported in µg/kg (ppb)

ORGANICS ANALYSIS DATA SHEET
TOTAL DIESEL RANGE HYDROCARBONS

NWTPHD by GC/FID
Extraction Method: SW3546

QC Report No: XN64-Maul Foster & Alongi
Project: GHHSA
0863.01.01

Matrix: Sediment

Date Received: 11/08/13

Data Release Authorized:
Reported: 11/19/13

ARI ID	Sample ID	Extraction Date	Analysis Date	EFV DL	Range/Surrogate	LOQ	Result
MB-111413	Method Blank	11/14/13	11/15/13	10.0	Diesel Range	50	< 50 U
13-24856	HC ID: ---		FID9	1.0	Motor Oil Range	100	< 100 U
					o-Terphenyl		77.0%
XN64D	CR06-2.5	11/14/13	11/15/13	10.0	**Diesel Range**	**220**	**18,000 E**
13-24856	HC ID: **DIESEL/MOTOR OIL**		FID9	1.0	**Motor Oil Range**	**430**	**61,000 E**
					o-Terphenyl		66.6%
XN64D DL	CR06-2.5	11/14/13	11/18/13	10.0	**Diesel Range**	**2,200**	**20,000**
13-24856	HC ID: **DIESEL/MOTOR OIL**		FID9	10	**Motor Oil Range**	**4,300**	**60,000**
					o-Terphenyl		63.3%

Reported in mg/kg (ppm)

EFV-Effective Final Volume in mL.
DL-Dilution of extract prior to analysis.
LOQ-Limit of Quantitation

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

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
NWTPHD by GC/FID
Page 1 of 1

Sample ID: LCS-111413
LAB CONTROL

Lab Sample ID: LCS-111413
LIMS ID: 13-24856
Matrix: Sediment
Data Release Authorized:
Reported: 11/19/13

QC Report No: XN64-Maul Foster & Alongi
Project: GHHSA
0863.01.01
Date Sampled: NA
Date Received: NA

Date Extracted: 11/14/13
Date Analyzed: 11/15/13 13:34
Instrument/Analyst: FID9/JLW

Sample Amount: 10.0 g-dry-wt
Final Extract Volume: 10 mL
Dilution Factor: 1.00

Range	Lab Control	Spike Added	Recovery
Diesel	1,240	1,500	82.7%

TPHD Surrogate Recovery

o-Terphenyl	77.1%

Results reported in mg/kg

XN64 : 000811

ANALYTICAL RESOURCES INCORPORATED

TOTAL DIESEL RANGE HYDROCARBONS-EXTRACTION REPORT

Matrix: Sediment
Date Received: 11/08/13

ARI Job: XN64
Project: GHHSA
0863.01.01

ARI ID	Client ID	Client Amt	Final Vol	Basis	Prep Date
13-24856-111413MB1	Method Blank	10.0 g	10.0 mL	-	11/14/13
13-24856-111413LCS1	Lab Control	10.0 g	10.0 mL	-	11/14/13
13-24856-XN64D	CR06-2.5	2.31 g	10.0 mL	D	11/14/13

Basis: D=Dry Weight W=As Received

ANALYTICAL RESOURCES INCORPORATED

TPHD SURROGATE RECOVERY SUMMARY

Matrix: Sediment

QC Report No: XN64-Maul Foster & Alongi
Project: GHHSA
0863.01.01

Client ID	OTER	TOT OUT
111413MBS	77.0%	0
111413LCS	77.1%	0
CR06-2.5	66.6%	0
CR06-2.5 DL	63.3%	0

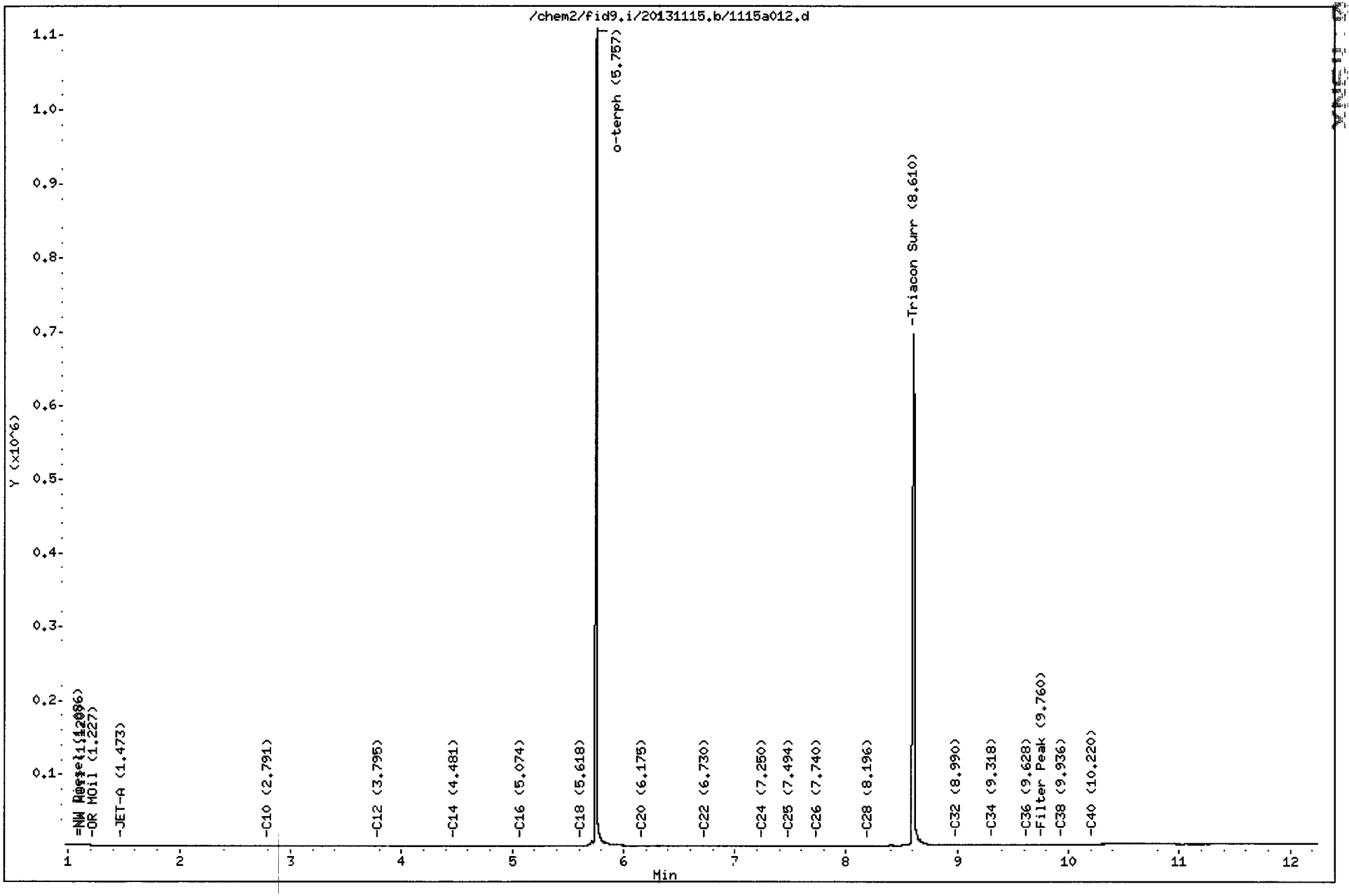
	LCS/MB LIMITS	QC LIMITS
(OTER) = o-Terphenyl	(50-150)	(50-150)

Prep Method: DL
Log Number Range: 13-24856 to 13-24856

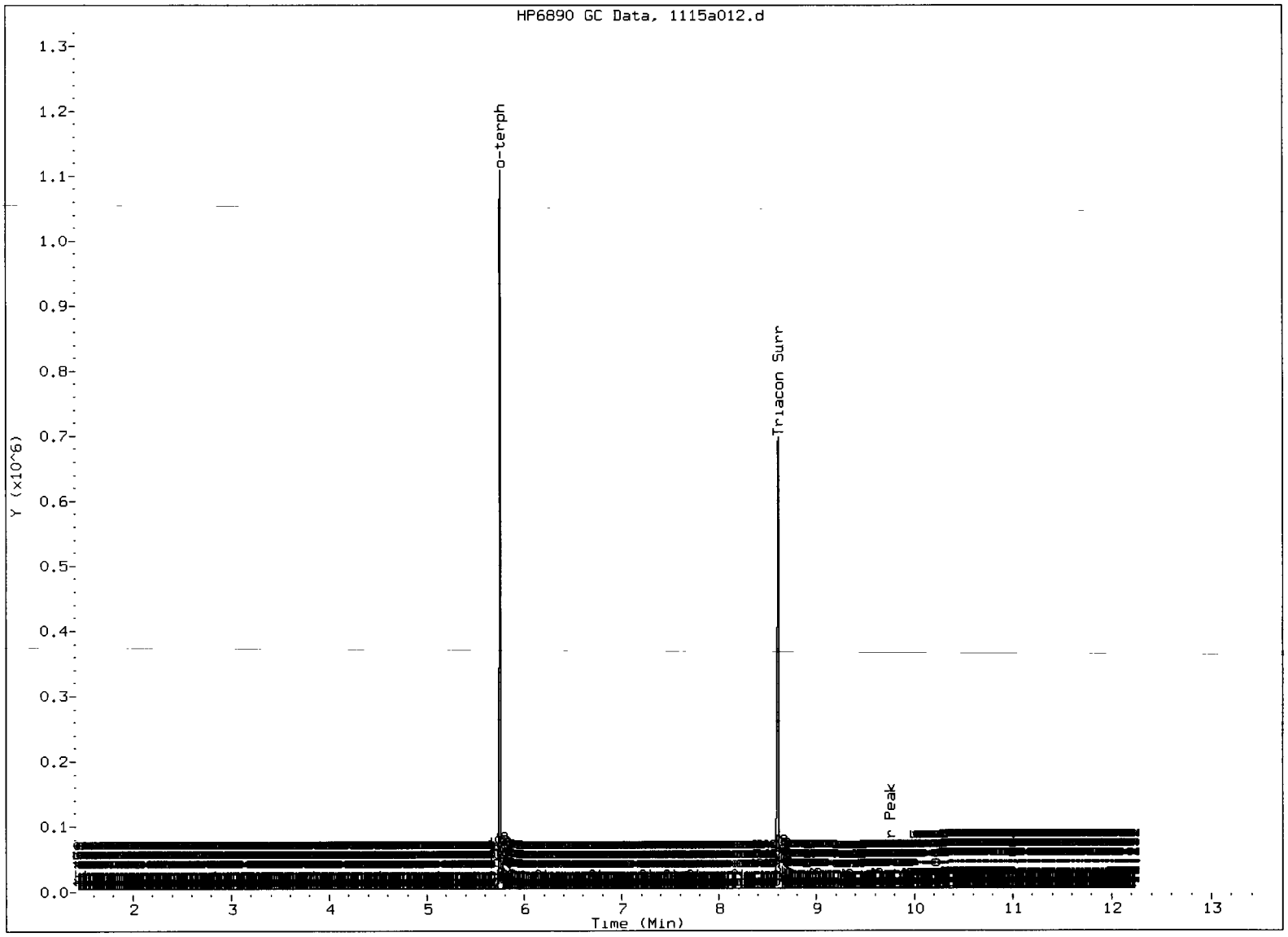
Data File: /chem2/fid9.i/20131115.b/1115a012.d
Date : 15-NOV-2013 13:13
Client ID: XN64MBS1
Sample Info: XN64MBS1

Instrument: fid9.i
Operator: JW
Column diameter: 0.25

Column phase: RTX-1



FID:9A-2C/RTX-1 XN64MBS1 FID:9A SIGNAL



MANUAL INTEGRATION

1. Baseline correction
2. Poor chromatography
3. Peak not found
4. Totals calculation
5. Surrogate Skimmed

Analyst: _____ Date: 11/19/17

Data File: /chem2/fid9.i/20131115.b/1115a013.d

Date : 15-NOV-2013 13:34

Client ID: XN64LCSS1

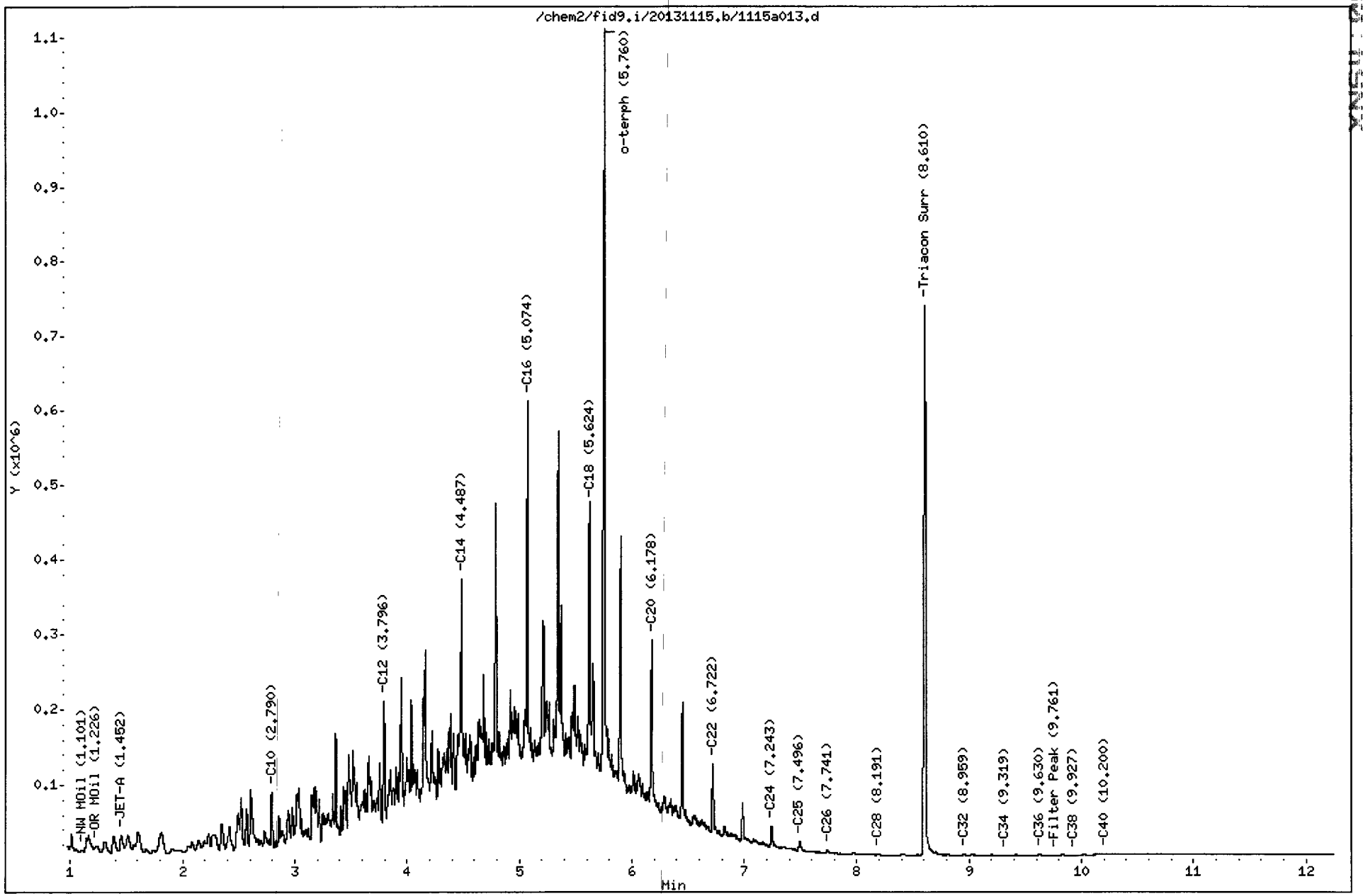
Sample Info: XN64LCSS1

Column phase: RTX-1

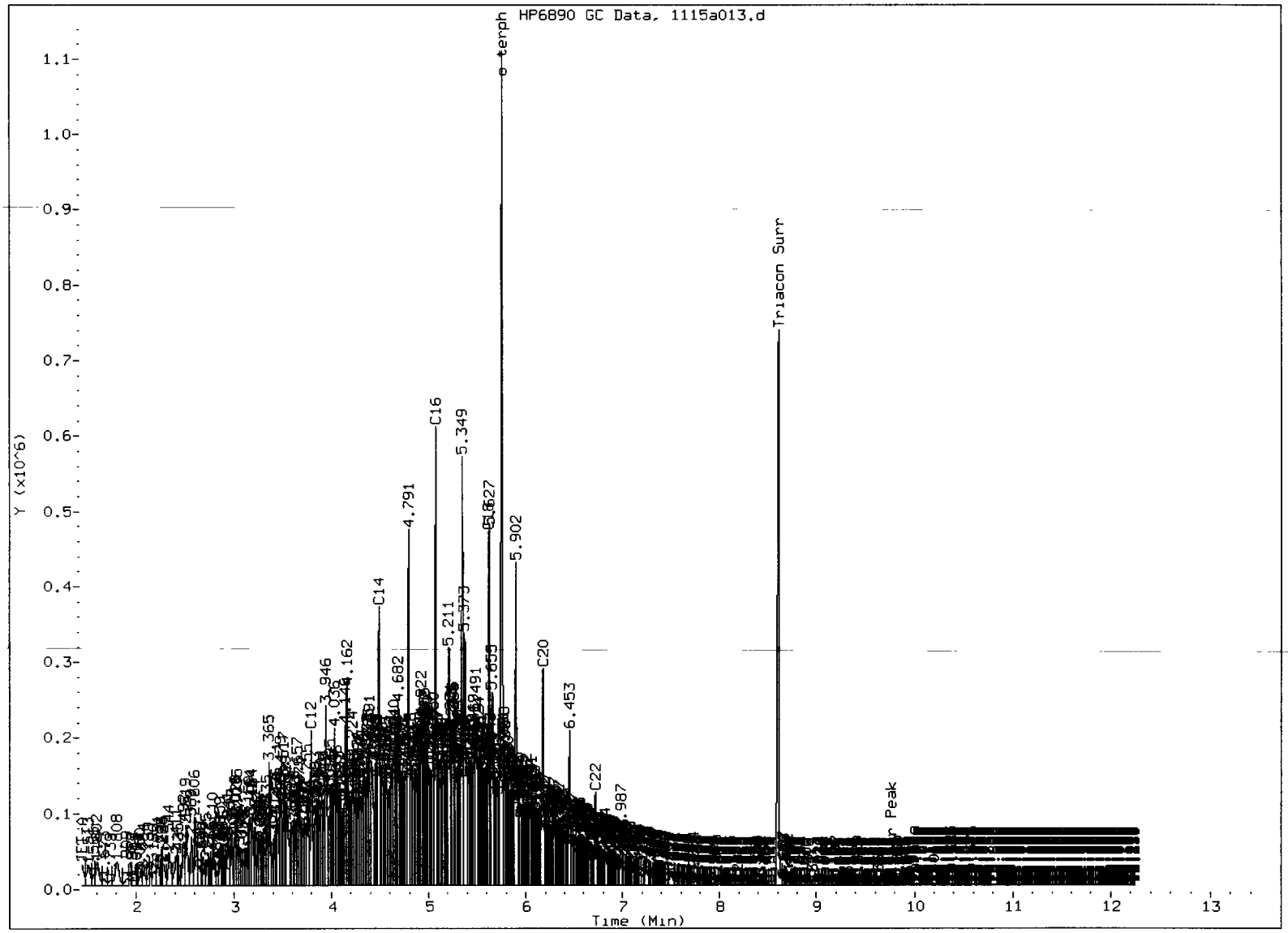
Instrument: fid9.i

Operator: JW

Column diameter: 0.25



FID:9A-2C/RTX-1 XN64LCSS1 FID:9A SIGNAL



MANUAL INTEGRATION

1. Baseline correction
2. Poor chromatography
3. Peak not found
4. Totals calculation
5. Surrogate Skimmed

(5)

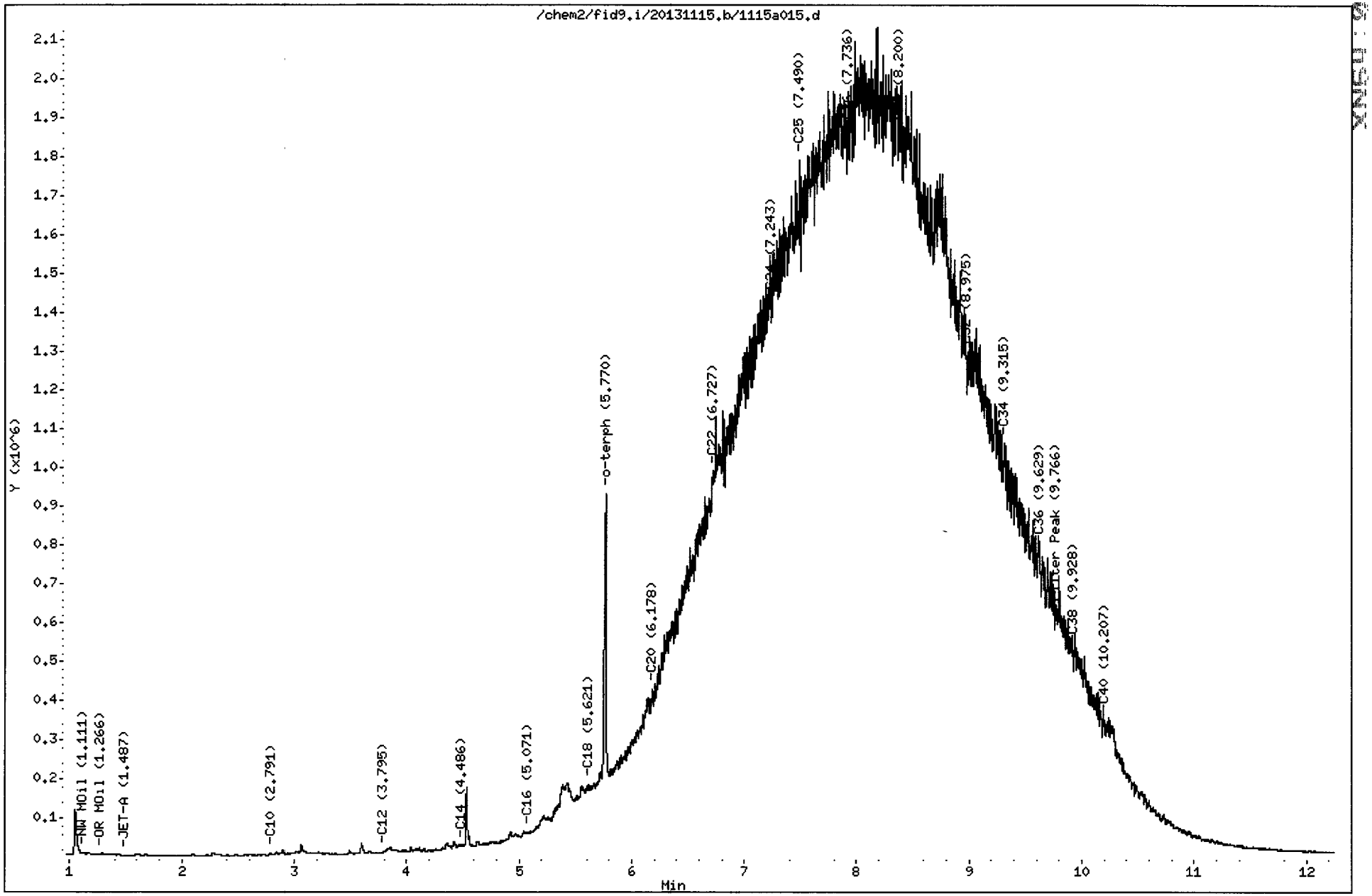
Analyst: JW Date: 11/19/12

XNGU : 00000

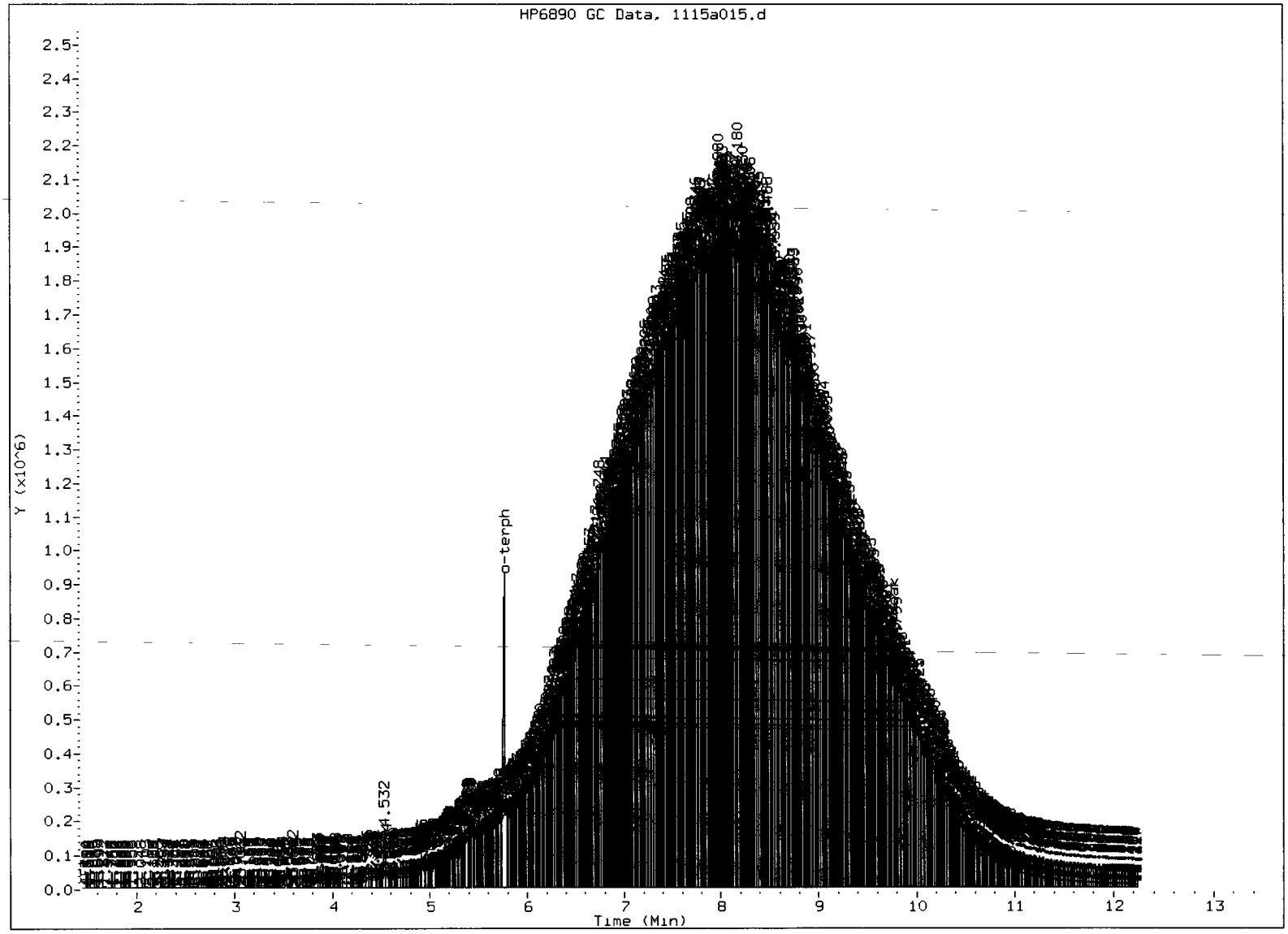
Data File: /chem2/fid9.i/20131115.b/1115a015.d
Date : 15-NOV-2013 14:16
Client ID: CR06-2.5
Sample Info: XN64D

Instrument: fid9.i
Operator: JW
Column diameter: 0.25

Column phase: RTX-1



FID:9A-2C/RTX-1 XN64D FID:9A SIGNAL



MANUAL INTEGRATION

1. Baseline correction
2. Poor chromatography
3. Peak not found
4. Totals calculation
5. Surrogate Skimmed

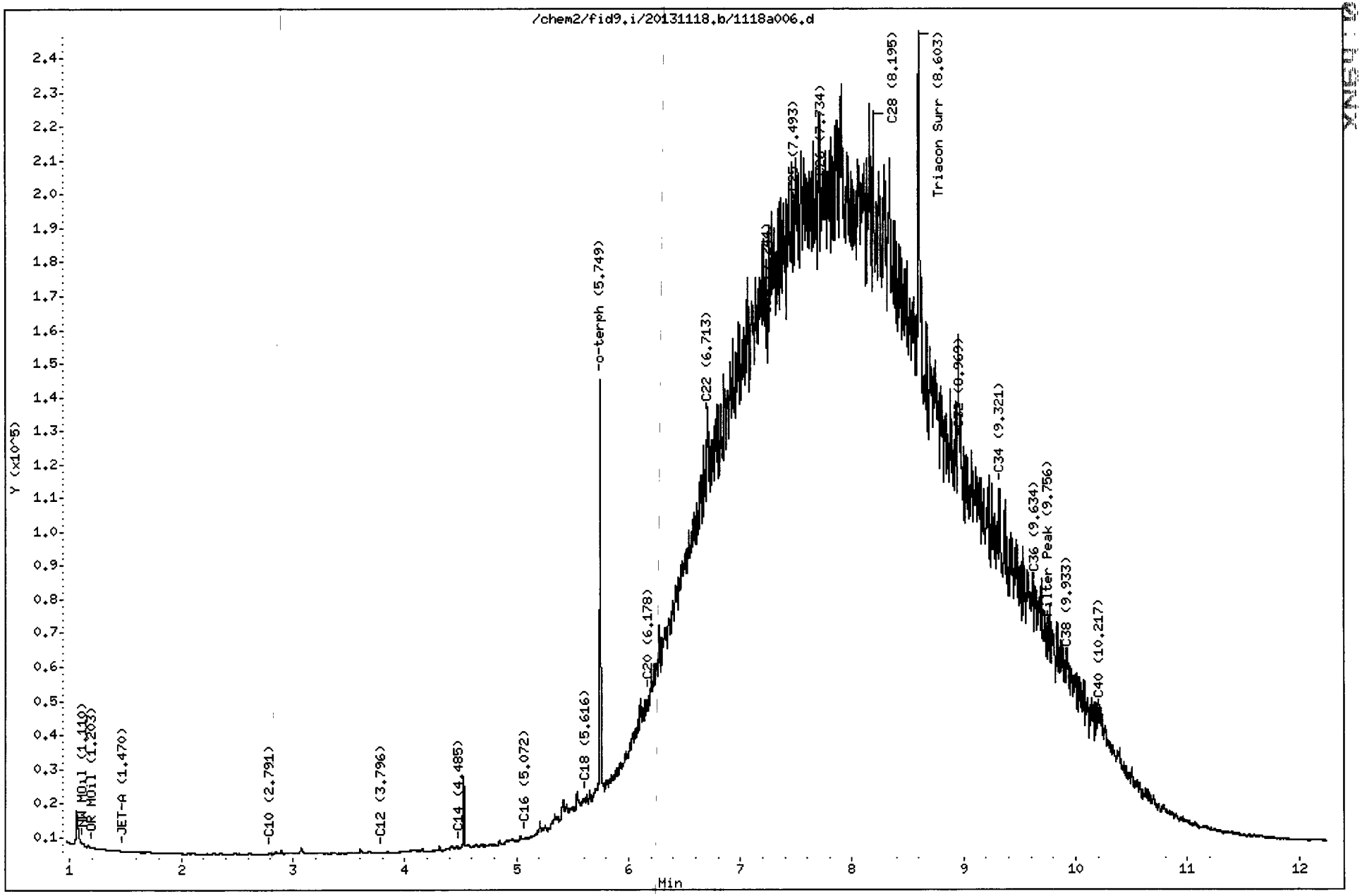
Analyst: JW Date: 11/19/15

Data File: /chem2/fid9.i/20131118.b/1118a006.d
Date : 18-NOV-2013 12:29
Client ID: CR06-2.5
Sample Info: XN64D,10

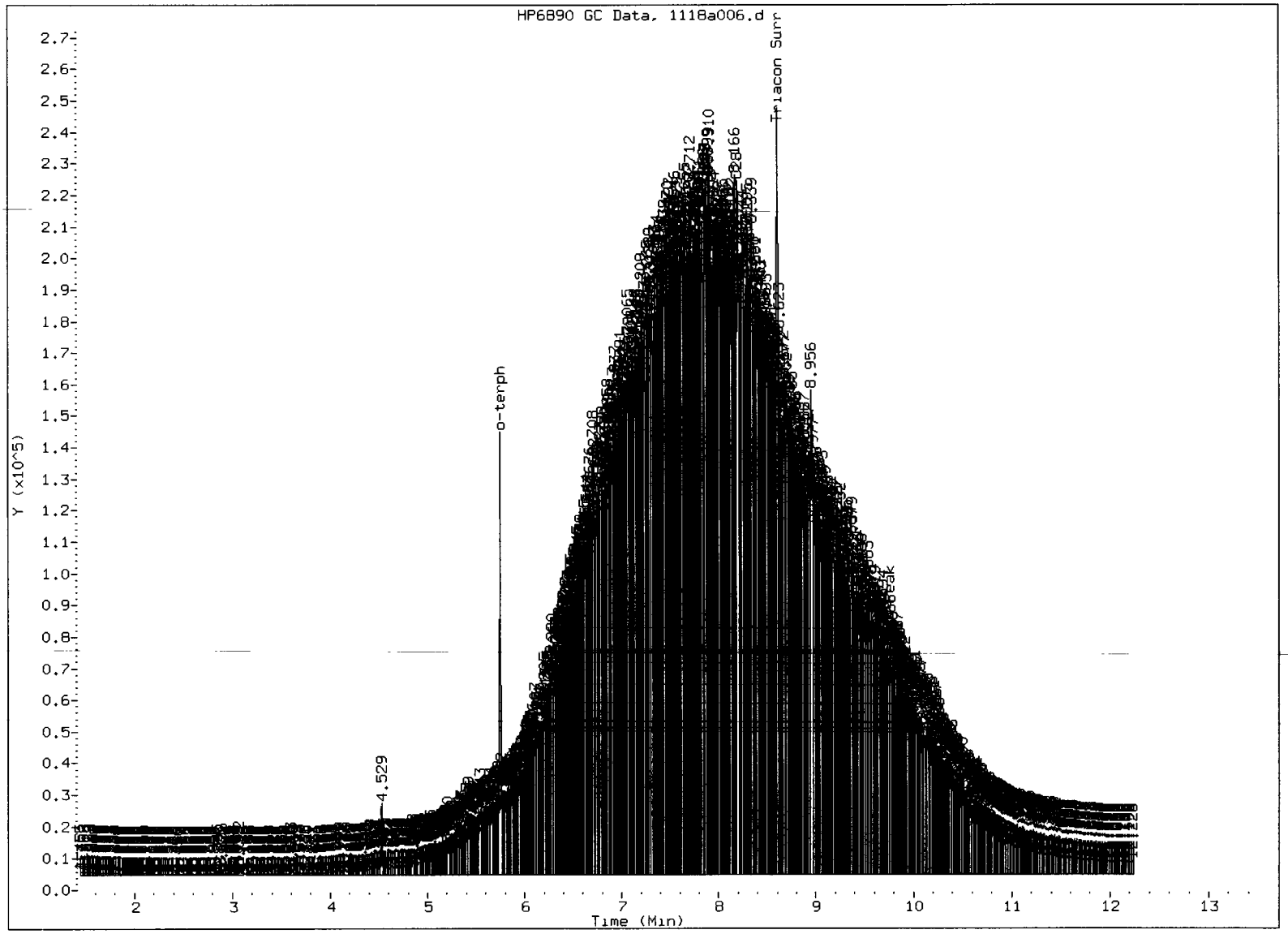
Column phase: RTX-1

Instrument: fid9.i

Operator: JW
Column diameter: 0.25



FID:9A-2C/RTX-1 XN64D FID:9A SIGNAL



MANUAL INTEGRATION

1. Baseline correction
2. Poor chromatography
3. Peak not found
4. Totals calculation
5. Surrogate Skimmed

Analyst: JU Date: 11/19/12

SAMPLE RESULTS-CONVENTIONALS
XN64-Maul Foster & Alongi

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 11/26/13

Project: GHHSA
Event: 0863.01.01
Date Sampled: 11/07/13
Date Received: 11/08/13

Client ID: CR06-10cm
ARI ID: 13-24853 XN64A

Analyte	Date	Method	Units	RL	Sample
Total Solids	11/13/13 111313#1	SM2540G	Percent	0.01	21.40
Preserved Total Solids	11/13/13 111313#1	SM2540G	Percent	0.01	19.81
Total Volatile Solids	11/13/13 111313#1	SM2540E	Percent	0.01	60.05
N-Ammonia	11/13/13 111313#1	EPA 350.1M	mg-N/kg	0.46	1.37
Sulfide	11/12/13 111213#1	EPA 376.2	mg/kg	50.2	906
Total Organic Carbon	11/26/13 112613#1	Plumb,1981	Percent	0.198	35.6

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
XN64-Maul Foster & Alongi

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 11/26/13

Project: GHHSA
Event: 0863.01.01
Date Sampled: 11/07/13
Date Received: 11/08/13

Client ID: CR04-10cm
ARI ID: 13-24854 XN64B

Analyte	Date	Method	Units	RL	Sample
Total Solids	11/13/13 111313#1	SM2540G	Percent	0.01	20.62
Preserved Total Solids	11/13/13 111313#1	SM2540G	Percent	0.01	22.16
Total Volatile Solids	11/13/13 111313#1	SM2540E	Percent	0.01	59.91
N-Ammonia	11/13/13 111313#1	EPA 350.1M	mg-N/kg	0.47	< 0.47 U
Sulfide	11/14/13 111413#1	EPA 376.2	mg/kg	4.49	6.46
Total Organic Carbon	11/26/13 112613#1	Plumb,1981	Percent	0.196	31.4

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
XN64-Maul Foster & Alongi

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 11/26/13

Project: GHHSA
Event: 0863.01.01
Date Sampled: 11/08/13
Date Received: 11/08/13

Client ID: CR05-10cm
ARI ID: 13-24855 XN64C

Analyte	Date	Method	Units	RL	Sample
Total Solids	11/13/13 111313#1	SM2540G	Percent	0.01	30.32
Preserved Total Solids	11/13/13 111313#1	SM2540G	Percent	0.01	31.81
Total Volatile Solids	11/13/13 111313#1	SM2540E	Percent	0.01	36.49
N-Ammonia	11/13/13 111313#1	EPA 350.1M	mg-N/kg	0.31	7.21
Sulfide	11/12/13 111213#1	EPA 376.2	mg/kg	31.1	320
Total Organic Carbon	11/26/13 112613#1	Plumb,1981	Percent	0.200	13.6

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
XN64-Maul Foster & Alongi

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 11/26/13

Project: GHHSA
Event: 0863.01.01
Date Sampled: 11/07/13
Date Received: 11/08/13

Client ID: CR06-2.5
ARI ID: 13-24856 XN64D

Analyte	Date	Method	Units	RL	Sample
Total Solids	11/13/13 111313#1	SM2540G	Percent	0.01	21.59
Preserved Total Solids	11/13/13 111313#1	SM2540G	Percent	0.01	21.85
Total Volatile Solids	11/13/13 111313#1	SM2540E	Percent	0.01	69.23
N-Ammonia	11/13/13 111313#1	EPA 350.1M	mg-N/kg	0.42	14.0
Sulfide	11/12/13 111213#1	EPA 376.2	mg/kg	225	2,910
Total Organic Carbon	11/26/13 112613#1	Plumb,1981	Percent	0.198	49.5

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
XN64-Maul Foster & Alongi

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 11/26/13

Project: GHHSA
Event: 0863.01.01
Date Sampled: 11/08/13
Date Received: 11/08/13

Client ID: CR04-5
ARI ID: 13-24857 XN64E

Analyte	Date	Method	Units	RL	Sample
Total Solids	11/13/13 111313#1	SM2540G	Percent	0.01	19.98
Preserved Total Solids	11/13/13 111313#1	SM2540G	Percent	0.01	24.44
Total Volatile Solids	11/13/13 111313#1	SM2540E	Percent	0.01	38.20
N-Ammonia	11/13/13 111313#1	EPA 350.1M	mg-N/kg	0.45	15.2
Sulfide	11/12/13 111213#1	EPA 376.2	mg/kg	20.1	179
Total Organic Carbon	11/26/13 112613#1	Plumb,1981	Percent	0.196	16.5

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
XN64-Maul Foster & Alongi

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 11/26/13

Project: GHHSA
Event: 0863.01.01
Date Sampled: 11/08/13
Date Received: 11/08/13

Client ID: CR01-10cm
ARI ID: 13-24858 XN64F

Analyte	Date	Method	Units	RL	Sample
Total Solids	11/13/13 111313#1	SM2540G	Percent	0.01	44.09
Total Organic Carbon	11/26/13 112613#1	Plumb,1981	Percent	0.020	2.06

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
XN64-Maul Foster & Alongi

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 11/26/13

Project: GHHSA
Event: 0863.01.01
Date Sampled: 11/08/13
Date Received: 11/08/13

Client ID: CR02-10cm
ARI ID: 13-24859 XN64G

Analyte	Date	Method	Units	RL	Sample
Total Solids	11/13/13 111313#1	SM2540G	Percent	0.01	51.80
Total Organic Carbon	11/26/13 112613#1	Plumb,1981	Percent	0.020	3.21

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
XN64-Maul Foster & Alongi

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 11/26/13

Project: GHHSA
Event: 0863.01.01
Date Sampled: 11/08/13
Date Received: 11/08/13

Client ID: CR03-10cm
ARI ID: 13-24860 XN64H

Analyte	Date	Method	Units	RL	Sample
Total Solids	11/13/13 111313#1	SM2540G	Percent	0.01	36.40
Total Organic Carbon	11/26/13 112613#1	Plumb,1981	Percent	0.020	2.91

RL Analytical reporting limit
U Undetected at reported detection limit

METHOD BLANK RESULTS-CONVENTIONALS
XN64-Maul Foster & Alongi

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 11/26/13

Project: GHHSA
Event: 0863.01.01
Date Sampled: NA
Date Received: NA

Analyte	Date	Units	Blank	QC ID
Total Solids	11/13/13	Percent	< 0.01 U	ICB
Preserved Total Solids	11/13/13	Percent	< 0.01 U	ICB
Total Volatile Solids	11/13/13	Percent	< 0.01 U	ICB
N-Ammonia	11/13/13	mg-N/kg	< 0.10 U	PREP
Sulfide	11/12/13	mg/kg	0.17	PREP
	11/14/13		< 0.05 U	PREP
Total Organic Carbon	11/26/13	Percent	< 0.020 U	ICB

LAB CONTROL RESULTS-CONVENTIONALS
XN64-Maul Foster & Alongi

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 11/26/13

Project: GHHSA
Event: 0863.01.01
Date Sampled: NA
Date Received: NA

Analyte/Method	QC ID	Date	Units	LCS	Spike Added	Recovery
Sulfide	PREP	11/12/13	mg/kg	6.37	6.79	93.8%
EPA 376.2	PREP	11/14/13		6.20	6.31	98.3%
Total Organic Carbon Plumb,1981	ICVL	11/26/13	Percent	0.098	0.100	98.0%

STANDARD REFERENCE RESULTS-CONVENTIONALS
XN64-Maul Foster & Alongi

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 11/26/13

Project: GHHSA
Event: 0863.01.01
Date Sampled: NA
Date Received: NA

Analyte/SRM ID	Date	Units	SRM	True Value	Recovery
N-Ammonia ERA #040912	11/13/13	mg-N/kg	102	100	102.0%
Total Organic Carbon NIST 1941B	11/26/13	Percent	3.36	2.99	112.4%

REPLICATE RESULTS-CONVENTIONALS
XN64-Maul Foster & Alongi

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 11/26/13

Project: GHHSA
Event: 0863.01.01
Date Sampled: 11/07/13
Date Received: 11/08/13

Analyte	Date	Units	Sample	Replicate(s)	RPD/RSD
ARI ID: XN64A Client ID: CR06-10cm					
Total Solids	11/13/13	Percent	21.40	22.11 21.57	1.7%
Preserved Total Solids	11/13/13	Percent	19.81	21.39	7.7%
Total Volatile Solids	11/13/13	Percent	60.05	59.01 59.81	0.9%
Total Organic Carbon	11/26/13	Percent	35.6	33.7 31.3	6.4%
ARI ID: XN64B Client ID: CR04-10cm					
Sulfide	11/14/13	mg/kg	6.46	0.67	162.4%

MS/MSD RESULTS-CONVENTIONALS
XN64-Maul Foster & Alongi

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 11/26/13

Project: GHHSA
Event: 0863.01.01
Date Sampled: 11/07/13
Date Received: 11/08/13

Analyte	Date	Units	Sample	Spike	Spike Added	Recovery
ARI ID: XN64A Client ID: CR06-10cm						
Total Organic Carbon	11/26/13	Percent	35.6	64.5	45.5	63.4%
ARI ID: XN64B Client ID: CR04-10cm						
Sulfide	11/14/13	mg/kg	6.46	525	566	91.6%

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: CR06-10cm
SAMPLE

Lab Sample ID: XN64A
LIMS ID: 13-24853
Matrix: Sediment
Data Release Authorized:
Reported: 11/20/13

QC Report No: XN64-Maul Foster & Alongi
Project: GHHSA
0863.01.01
Date Sampled: 11/07/13
Date Received: 11/08/13

Percent Total Solids: 23.3%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	LOQ	mg/kg-dry	Q
CLP	11/14/13	7471A	11/18/13	**7439-97-6**	**Mercury**	0.08	**0.55**	

U-Analyte undetected at given LOQ
LOQ-Limit of Quantitation

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: CR04-10cm
SAMPLE

Lab Sample ID: XN64B
LIMS ID: 13-24854
Matrix: Sediment
Data Release Authorized:
Reported: 11/20/13

QC Report No: XN64-Maul Foster & Alongi
Project: GHHSA
0863.01.01
Date Sampled: 11/07/13
Date Received: 11/08/13

Percent Total Solids: 20.7%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	LOQ	mg/kg-dry	Q
CLP	11/14/13	7471A	11/18/13	**7439-97-6**	**Mercury**	0.1	**6.2**	

U-Analyte undetected at given LOQ
LOQ-Limit of Quantitation

XN64H : 022409

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: CR05-10cm
SAMPLE

Lab Sample ID: XN64C
LIMS ID: 13-24855
Matrix: Sediment
Data Release Authorized:
Reported: 11/20/13

QC Report No: XN64-Maul Foster & Alongi
Project: GHHSA
0863.01.01
Date Sampled: 11/08/13
Date Received: 11/08/13

Percent Total Solids: 26.9%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	LOQ	mg/kg-dry	Q
CLP	11/14/13	7471A	11/18/13	**7439-97-6**	**Mercury**	0.09	**0.16**	

U-Analyte undetected at given LOQ
LOQ-Limit of Quantitation

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: CR06-2.5
SAMPLE

Lab Sample ID: XN64D
LIMS ID: 13-24856
Matrix: Sediment
Data Release Authorized:
Reported: 11/20/13

QC Report No: XN64-Maul Foster & Alongi
Project: GHHSA
0863.01.01
Date Sampled: 11/07/13
Date Received: 11/08/13

Percent Total Solids: 20.3%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	LOQ	mg/kg-dry	Q
3050B	11/14/13	6010C	11/19/13	7440-38-2	Arsenic	20	20	U
3050B	11/14/13	6010C	11/19/13	7440-43-9	Cadmium	1	1	U
3050B	11/14/13	6010C	11/19/13	**7440-47-3**	**Chromium**	2	**26**	
3050B	11/14/13	6010C	11/19/13	**7440-50-8**	**Copper**	1	**96**	
3050B	11/14/13	6010C	11/19/13	**7439-92-1**	**Lead**	10	**110**	
CLP	11/14/13	7471A	11/18/13	**7439-97-6**	**Mercury**	0.08	**0.53**	
3050B	11/14/13	6010C	11/19/13	7440-22-4	Silver	1	1	U
3050B	11/14/13	6010C	11/19/13	**7440-66-6**	**Zinc**	5	**237**	

U-Analyte undetected at given LOQ
LOQ-Limit of Quantitation

XN64I : 0001 1 1

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: CR06-2.5
DUPLICATE

Lab Sample ID: XN64D
LIMS ID: 13-24856
Matrix: Sediment
Data Release Authorized:
Reported: 11/20/13

QC Report No: XN64-Maul Foster & Alongi
Project: GHHSA
0863.01.01
Date Sampled: 11/07/13
Date Received: 11/08/13

MATRIX DUPLICATE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Duplicate	RPD	Control Limit	Q
Arsenic	6010C	20 U	20 U	0.0%	+/- 20	L
Cadmium	6010C	1 U	1 U	0.0%	+/- 1	L
Chromium	6010C	26	91	111%	+/- 20%	*
Copper	6010C	96	237	84.7%	+/- 20%	*
Lead	6010C	110	120	8.7%	+/- 20%	
Mercury	7471A	0.53	0.41	25.5%	+/- 0.08	L*
Silver	6010C	1 U	1 U	0.0%	+/- 1	L
Zinc	6010C	237	211	11.6%	+/- 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: CR06-2.5
MATRIX SPIKE

Lab Sample ID: XN64D
LIMS ID: 13-24856
Matrix: Sediment
Data Release Authorized:
Reported: 11/20/13

QC Report No: XN64-Maul Foster & Alongi
Project: GHHSA
0863.01.01
Date Sampled: 11/07/13
Date Received: 11/08/13

MATRIX SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample		Spike	Spike Added	% Recovery	Q
Arsenic	6010C	20	U	970	979	99.1%	
Cadmium	6010C	1	U	242	245	98.8%	
Chromium	6010C	26		276	245	102%	
Copper	6010C	96		389	245	120%	
Lead	6010C	110		1,090	979	100%	
Mercury	7471A	0.53		1.66	0.854	132%	N
Silver	6010C	1	U	237	245	96.7%	
Zinc	6010C	237		476	245	97.6%	

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%

XNS4: 80113

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: CR01-10cm
SAMPLE

Lab Sample ID: XN64F
LIMS ID: 13-24858
Matrix: Sediment
Data Release Authorized:
Reported: 11/20/13

QC Report No: XN64-Maul Foster & Alongi
Project: GHHSA
0863.01.01
Date Sampled: 11/08/13
Date Received: 11/08/13

Percent Total Solids: 43.4%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	LOQ	mg/kg-dry	Q
3050B	11/14/13	6010C	11/19/13	7440-38-2	Arsenic	10	10	U
3050B	11/14/13	6010C	11/19/13	**7440-43-9**	**Cadmium**	0.5	**0.5**	
3050B	11/14/13	6010C	11/19/13	**7440-47-3**	**Chromium**	1	**40**	
3050B	11/14/13	6010C	11/19/13	**7440-50-8**	**Copper**	0.5	**58.0**	
3050B	11/14/13	6010C	11/19/13	**7439-92-1**	**Lead**	5	**7**	
CLP	11/14/13	7471A	11/18/13	**7439-97-6**	**Mercury**	0.04	**0.05**	
3050B	11/14/13	6010C	11/19/13	7440-22-4	Silver	0.7	0.7	U
3050B	11/14/13	6010C	11/19/13	**7440-66-6**	**Zinc**	2	**87**	

U-Analyte undetected at given LOQ
LOQ-Limit of Quantitation

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: CR02-10cm
SAMPLE

Lab Sample ID: XN64G
LIMS ID: 13-24859
Matrix: Sediment
Data Release Authorized:
Reported: 11/20/13

QC Report No: XN64-Maul Foster & Alongi
Project: GHHSA
0863.01.01
Date Sampled: 11/08/13
Date Received: 11/08/13

Percent Total Solids: 50.5%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	LOQ	mg/kg-dry	Q
3050B	11/14/13	6010C	11/19/13	7440-38-2	Arsenic	9	9	U
3050B	11/14/13	6010C	11/19/13	**7440-43-9**	**Cadmium**	0.4	**0.4**	
3050B	11/14/13	6010C	11/19/13	**7440-47-3**	**Chromium**	0.9	**38.5**	
3050B	11/14/13	6010C	11/19/13	**7440-50-8**	**Copper**	0.4	**56.3**	
3050B	11/14/13	6010C	11/19/13	**7439-92-1**	**Lead**	4	**9**	
CLP	11/14/13	7471A	11/18/13	**7439-97-6**	**Mercury**	0.04	**0.10**	
3050B	11/14/13	6010C	11/19/13	7440-22-4	Silver	0.6	0.6	U
3050B	11/14/13	6010C	11/19/13	**7440-66-6**	**Zinc**	2	**79**	

U-Analyte undetected at given LOQ
LOQ-Limit of Quantitation

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: CR03-10cm
SAMPLE

Lab Sample ID: XN64H
LIMS ID: 13-24860
Matrix: Sediment
Data Release Authorized:
Reported: 11/20/13

QC Report No: XN64-Maul Foster & Alongi
Project: GHHSA
0863.01.01
Date Sampled: 11/08/13
Date Received: 11/08/13

Percent Total Solids: 35.2%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	LOQ	mg/kg-dry	Q
3050B	11/14/13	6010C	11/19/13	7440-38-2	Arsenic	10	10	U
3050B	11/14/13	6010C	11/19/13	7440-43-9	Cadmium	0.5	0.5	U
3050B	11/14/13	6010C	11/19/13	**7440-47-3**	**Chromium**	1	**48**	
3050B	11/14/13	6010C	11/19/13	**7440-50-8**	**Copper**	0.5	**65.4**	
3050B	11/14/13	6010C	11/19/13	**7439-92-1**	**Lead**	5	**8**	
CLP	11/14/13	7471A	11/18/13	**7439-97-6**	**Mercury**	0.06	**0.09**	
3050B	11/14/13	6010C	11/19/13	7440-22-4	Silver	0.8	0.8	U
3050B	11/14/13	6010C	11/19/13	**7440-66-6**	**Zinc**	3	**91**	

U-Analyte undetected at given LOQ
LOQ-Limit of Quantitation

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS **Sample ID: METHOD BLANK**

Lab Sample ID: XN64MB
LIMS ID: 13-24858
Matrix: Sediment
Data Release Authorized:
Reported: 11/20/13

QC Report No: XN64-Maul Foster & Alongi
Project: GHHSA
0863.01.01
Date Sampled: NA
Date Received: NA

Percent Total Solids: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	LOQ	mg/kg-dry	Q
3050B	11/14/13	6010C	11/19/13	7440-38-2	Arsenic	5	5	U
3050B	11/14/13	6010C	11/19/13	7440-43-9	Cadmium	0.2	0.2	U
3050B	11/14/13	6010C	11/19/13	7440-47-3	Chromium	0.5	0.5	U
3050B	11/14/13	6010C	11/19/13	7440-50-8	Copper	0.2	0.2	U
3050B	11/14/13	6010C	11/19/13	7439-92-1	Lead	2	2	U
CLP	11/14/13	7471A	11/18/13	7439-97-6	Mercury	0.02	0.02	U
3050B	11/14/13	6010C	11/19/13	7440-22-4	Silver	0.3	0.3	U
3050B	11/14/13	6010C	11/19/13	7440-66-6	Zinc	1	1	U

U-Analyte undetected at given LOQ
LOQ-Limit of Quantitation

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS **Sample ID: LAB CONTROL**

Lab Sample ID: XN64LCS
LIMS ID: 13-24858
Matrix: Sediment
Data Release Authorized:
Reported: 11/20/13

QC Report No: XN64-Maul Foster & Alongi
Project: GHHSA
0863.01.01
Date Sampled: NA
Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike Found	Spike Added	% Recovery	Q
Arsenic	6010C	194	200	97.0%	
Cadmium	6010C	48.4	50.0	96.8%	
Chromium	6010C	50.5	50.0	101%	
Copper	6010C	49.2	50.0	98.4%	
Lead	6010C	195	200	97.5%	
Mercury	7471A	0.51	0.50	102%	
Silver	6010C	50.5	50.0	101%	
Zinc	6010C	48	50	96.0%	

Reported in mg/kg-dry

N-Control limit not met
NA-Not Applicable, Analyte Not Spiked
Control Limits: 80-120%

XN64 · QA19

Maul Foster & Alongi
GHHSA
0863.01.01

Apparent Grain Size Distribution Summary
Percent Finer Than Indicated Size

Sample No.	Gravel			Very Coarse Sand	Coarse Sand	Medium Sand	Fine Sand	Very Fine Sand	Silt				Clay	
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
XN50 B	100.0	86.0	69.2	55.5	40.6	22.8	12.5	9.0	8.5	7.5	6.4	5.2	3.5	2.8
	100.0	89.7	71.9	59.5	43.7	25.3	14.7	11.4	9.3	8.1	7.1	5.5	4.3	3.0
	100.0	82.2	66.7	54.2	39.7	22.5	12.4	9.1	8.6	7.6	6.6	5.2	3.8	2.8
CR06-10cm	100.0	87.1	77.3	64.3	48.7	36.7	31.6	29.7	25.5	20.5	15.9	12.2	9.5	7.4
CR04-10cm	100.0	84.3	77.2	63.4	49.2	40.7	37.0	35.6	28.5	22.6	16.4	11.6	8.7	6.1
CR05-10cm	100.0	89.8	79.8	68.4	55.2	44.7	38.8	35.3	27.2	19.4	14.3	9.9	7.8	5.4
CR04-5	100.0	87.8	76.4	63.5	52.8	46.7	43.5	42.1	40.9	30.3	21.3	15.2	10.9	7.2

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.

Maul Foster & Alongi
GHHSA
0863.01.01

Apparent Grain Size Distribution Summary
Percent Retained in Each Size Fraction

Sample No.	Gravel	Very Coarse Sand	Coarse Sand	Medium Sand	Fine Sand	Very Fine Sand	Coarse Silt	Medium Silt	Fine Silt	Very Fine Silt	Clay			Total Fines
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)
XN50 B	30.8	13.7	14.9	17.8	10.4	3.4	0.5	1.0	1.0	1.3	1.7	0.6	2.8	9.0
	28.1	12.4	15.8	18.4	10.6	3.4	2.1	1.2	1.0	1.6	1.3	1.3	3.0	11.4
	33.3	12.5	14.5	17.2	10.1	3.3	0.5	1.1	1.0	1.4	1.4	1.0	2.8	9.1
CR06-10cm	22.7	13.0	15.7	11.9	5.1	2.0	4.1	5.1	4.5	3.7	2.7	2.1	7.4	29.7
CR04-10cm	22.8	13.8	14.2	8.5	3.7	1.4	7.2	5.9	6.2	4.8	2.9	2.6	6.1	35.6
CR05-10cm	20.2	11.4	13.2	10.5	6.0	3.5	8.1	7.7	5.1	4.5	2.1	2.4	5.4	35.3
CR04-5	23.6	13.0	10.7	6.1	3.2	1.4	1.3	10.6	8.9	6.1	4.3	3.7	7.2	42.1

Notes to the Testing:

1. Organic matter was not removed prior to testing, thus the reported values are the "apparent" grain size distribution. See narrative for discussion of the testing.

QA SUMMARY

Client:	Maul Foster & Alongi	Client Project:	GHHSA
ARI Trip. Sample ID:	XN50 B	Client Project No.:	0863 01 01
		Batch No.:	XN64-1

Relative Standard Deviation, By Phi Size

Sample ID	-3	-2	-1	0	1	2	3	4	5	6	7	8	9	10
XN50 B	100.0	86.0	69 2	55.5	40.6	22.8	12.5	9.0	8 5	7.5	6 4	5.2	3.5	2.8
	100.0	89.7	71.9	59.5	43.7	25.3	14 7	11.4	9.3	8.1	7.1	5.5	4.3	3.0
	100.0	82.2	66.7	54.2	39 7	22 5	12.4	9.1	8.6	7 6	6 6	5.2	3.8	2.8
AVE	100.0	86.0	69 3	56.4	41.3	23 5	13.2	9.8	8.8	7.7	6 7	5.3	3.8	2.9
STDEV	0.0	3.8	2.6	2 8	2 1	1.6	1.3	1.3	0.4	0.3	0 3	0.2	0.4	0.1
%RSD	0 0	4.4	3.8	4.9	5.1	6.6	10 0	13.5	4.6	4.4	4.9	3.6	10 3	3.5

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)
XN50 B	11/8/2013	11/12/2013	11/14/2013	99.0		6.6
	11/8/2013	11/12/2013	11/14/2013	100.8		8.5
	11/8/2013	11/12/2013	11/14/2013	99 0		6.6
CR06-10cm	11/7/2013	11/15/2013	11/22/2013	100.1		12.4
CR04-10cm	11/7/2013	11/15/2013	11/22/2013	96.0		13.7
CR05-10cm	11/8/2013	11/15/2013	11/22/2013	101.6		13 0
CR04-5	11/8/2013	11/15/2013	11/22/2013	97.4		14.0

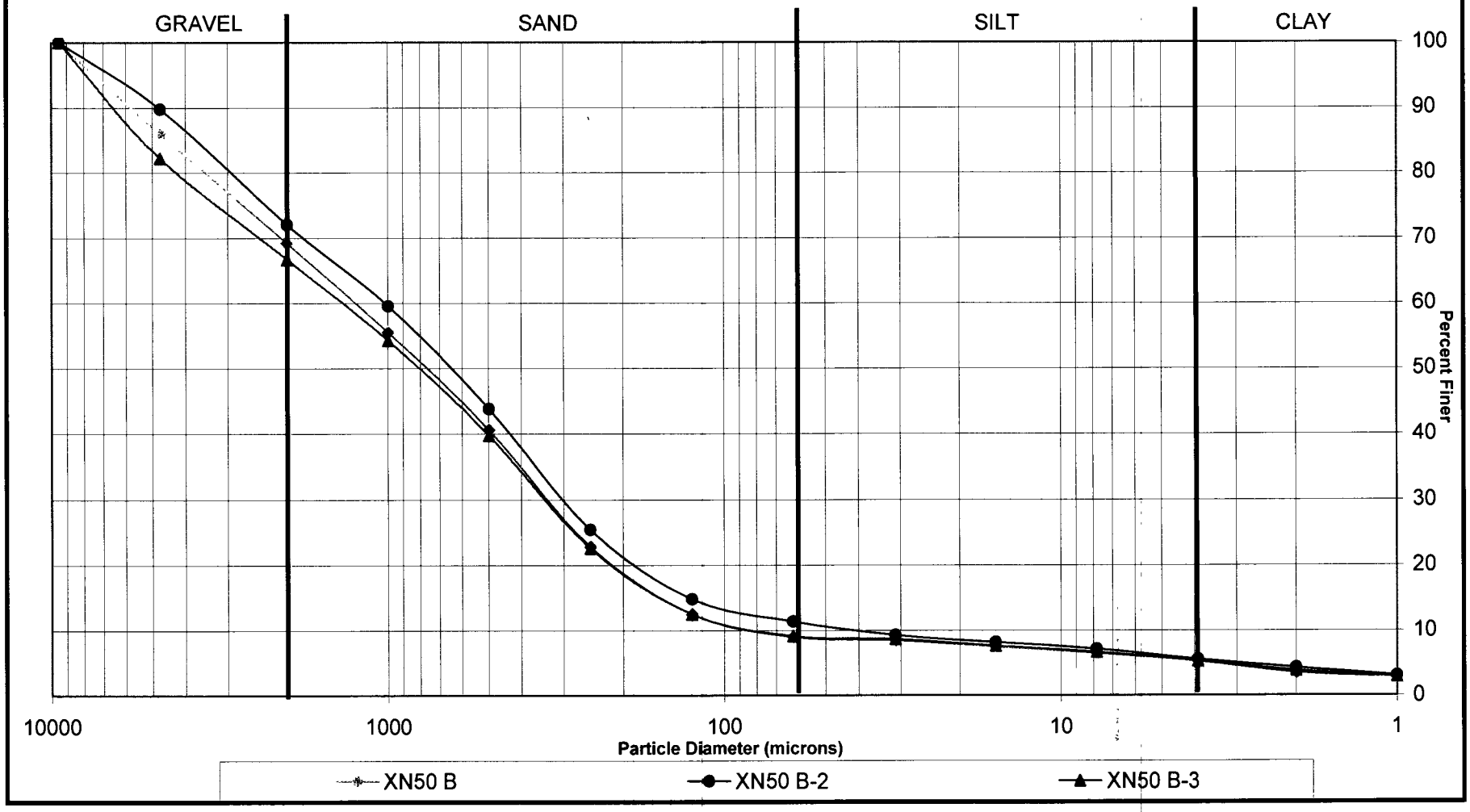
* ARI Internal QA limits = 95-105%

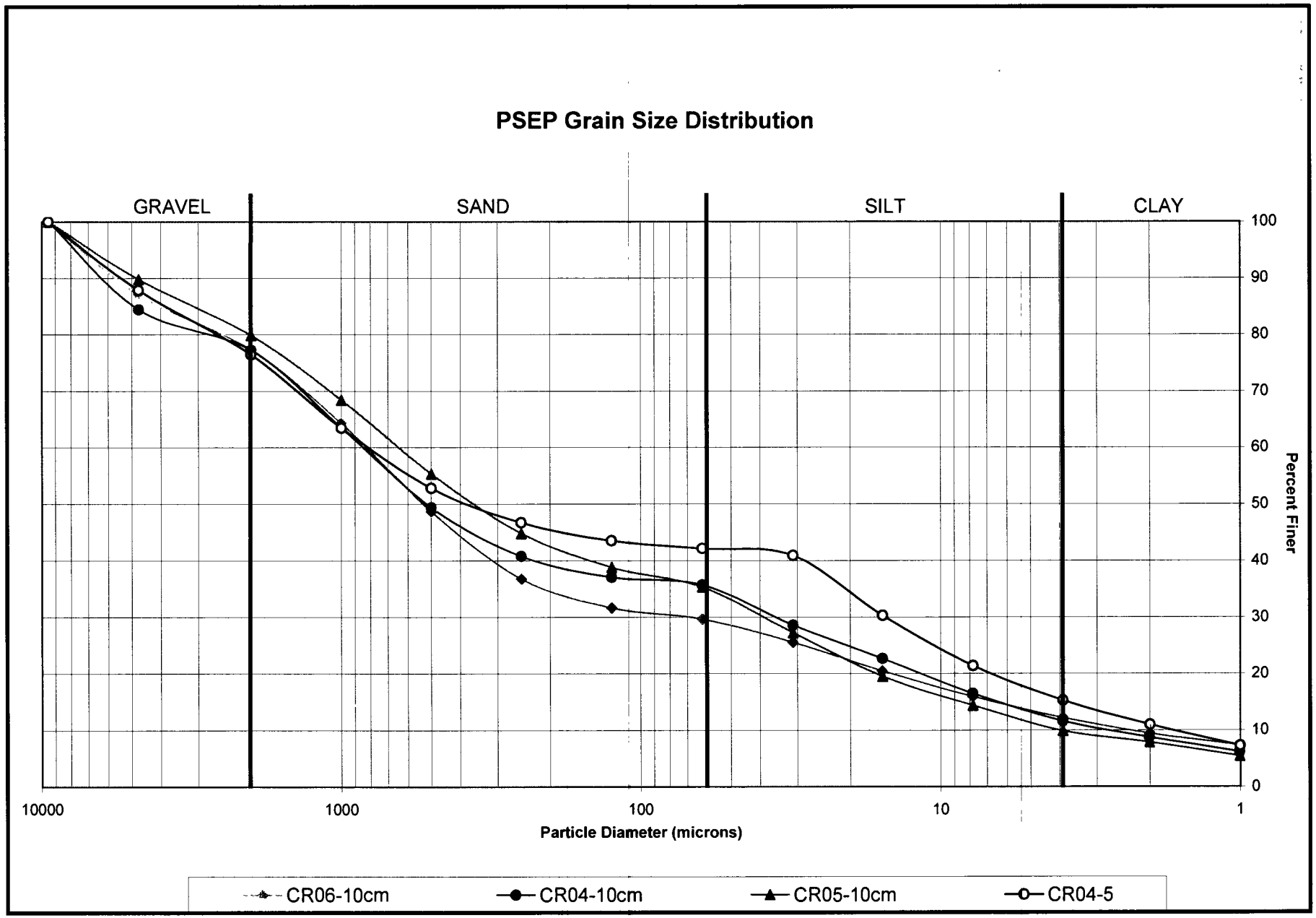
Notes to the Testing:

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.

PSEP Grain Size Distribution

Triplicate Sample Plot




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)
CR06-10cm
CR04-10cm
CR05-10cm
CR04-5

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: X000	Turn-around Requested:
ARI Client Company: Maul Foster & Alongi	Phone:
Client Contact: Murray, Mike	
Client Project Name: GHHSA	
Client Project #: 0463.01.01	Samplers: ML

Page: 1	of 1
Date: 11/14/13	Ice Present? NO
No. of Coolers: NA	Cooler Temps: NA

Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested: Salinity								Notes/Comments
CR01-10cm	11/14/13	11:~~45~~ 55 mL	H_2O	1	✓								
CR02-10cm	11/14/13	11:25	H_2O	1	✓								
CR0~~2~~3-10cm	11/14/13	11:25	H_2O	1	✓								

Comments/Special Instructions	Relinquished by	Received by:	Relinquished by	Received by:
	(Signature) MaxLitwin	(Signature) [signature]	(Signature)	(Signature)
	Printed Name: Max Litwin	Printed Name: Jennifer Millsap	Printed Name:	Printed Name
	Company: ARI	Company: ARI	Company:	Company:
	Date & Time: 11/14/13	Date & Time: 11/14/13 1145	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.

Sample ID Cross Reference Report

ANALYTICAL RESOURCES INCORPORATED

ARI Job No: XO00
Client: Maul Foster & Alongi
Project Event: 0863.01.01
Project Name: GHHSA

	Sample ID	ARI Lab ID	ARI LIMS ID	Matrix	Sample Date/Time	VTSR
1.	CR01-10CM	XO00A	13-25167	Pore Water	11/14/13 11:25	11/14/13 11:45
2.	CR02-10CM	XO00B	13-25168	Pore Water	11/14/13 11:25	11/14/13 11:45
3.	CR03-10CM	XO00C	13-25169	Pore Water	11/14/13 11:25	11/14/13 11:45

SAMPLE RESULTS-CONVENTIONALS
XO00-Maul Foster & Alongi

ANALYTICAL RESOURCES INCORPORATED

Matrix: Pore Water
Data Release Authorized:
Reported: 11/15/13

Project: GHHSA
Event: 0863.01.01
Date Sampled: 11/14/13
Date Received: 11/14/13

Client ID: CR01-10cm
ARI ID: 13-25167 XO00A

Analyte	Date Batch	Method	Units	RL	Sample
Conductivity	11/15/13 111513#1	EPA 120.1	umhos/cm	1.00	18,700
Salinity	11/15/13 111513#1	SM 2520.B	ppt	0.10	11.0

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
XO00-Maul Foster & Alongi

ANALYTICAL RESOURCES INCORPORATED

Matrix: Pore Water
Data Release Authorized:
Reported: 11/15/13

Project: GHHSA
Event: 0863.01.01
Date Sampled: 11/14/13
Date Received: 11/14/13

Client ID: CR02-10cm
ARI ID: 13-25168 XO00B

Analyte	Date Batch	Method	Units	RL	Sample
Conductivity	11/15/13 111513#1	EPA 120.1	umhos/cm	1.00	12,200
Salinity	11/15/13 111513#1	SM 2520.B	ppt	0.10	6.90

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
XO00-Maul Foster & Alongi

ANALYTICAL RESOURCES INCORPORATED

Matrix: Pore Water
Data Release Authorized:
Reported: 11/15/13

Project: GHHSA
Event: 0863.01.01
Date Sampled: 11/14/13
Date Received: 11/14/13

Client ID: CR03-10cm
ARI ID: 13-25169 XO00C

Analyte	Date Batch	Method	Units	RL	Sample
Conductivity	11/15/13 111513#1	EPA 120.1	umhos/cm	1.00	17,500
Salinity	11/15/13 111513#1	SM 2520.B	ppt	0.10	10.2

RL Analytical reporting limit
U Undetected at reported detection limit

METHOD BLANK RESULTS-CONVENTIONALS
XO00-Maul Foster & Alongi

ANALYTICAL RESOURCES INCORPORATED

Matrix: Pore Water
Data Release Authorized:
Reported: 11/15/13

Project: GHHSA
Event: 0863.01.01
Date Sampled: NA
Date Received: NA

Analyte	Method	Date	Units	Blank	ID
Conductivity	EPA 120.1	11/15/13	umhos/cm	< 1.00 U	
Salinity	SM 2520.B	11/15/13	ppt	< 0.10 U	

LAB CONTROL RESULTS-CONVENTIONALS
XO00-Maul Foster & Alongi

ANALYTICAL RESOURCES INCORPORATED

Matrix: Pore Water
Data Release Authorized:
Reported: 11/15/13

Project: GHHSA
Event: 0863.01.01
Date Sampled: NA
Date Received: NA

Analyte/Method	QC ID	Date	Units	LCS	Spike Added	Recovery
Salinity SM 2520.B	ICVL	11/15/13	ppt	46,700	47,600	98.1%

STANDARD REFERENCE RESULTS-CONVENTIONALS
XO00-Maul Foster & Alongi

ANALYTICAL RESOURCES INCORPORATED

Matrix: Pore Water
Data Release Authorized:
Reported: 11/15/13

Project: GHHSA
Event: 0863.01.01
Date Sampled: NA
Date Received: NA

Analyte/SRM ID	Method	Date	Units	SRM	True Value	Recovery
Conductivity Ricca #4110724	EPA 120.1	11/15/13	umhos/cm	974	1,000	97.4%

REPLICATE RESULTS-CONVENTIONALS
XO00-Maul Foster & Alongi

ANALYTICAL RESOURCES INCORPORATED

Matrix: Pore Water
Data Release Authorized:
Reported: 11/15/13

Project: GHHSA
Event: 0863.01.01
Date Sampled: 11/14/13
Date Received: 11/14/13

Analyte	Method	Date	Units	Sample	Replicate(s)	RPD/RSD
ARI ID: XO00A	**Client ID: CR01-10cm**					
Conductivity	EPA 120.1	11/15/13	umhos/cm	18,700	18,700	0.0%
Salinity	SM 2520.B	11/15/13	ppt	11.0	11.0	0.0%

Analytical Resources, Incorporated
Analytical Chemists and Consultants

23 December 2013

Mike Murray
Maul, Foster and Alongi, Inc
2001 NW 19th Avenue
Suite 200
Portland, OR 97209

RE: Project: GHHSA
ARI Job No.: XQ70

Dear Mike:

Please find enclosed copies of the original chain of custody records and the final results for the samples from the project referenced above. These samples were originally accepted on November 8, 2013. These samples were analyzed for SVOCs, dioxins/furans, PCBs, NWTPH-Dx and total mercury as requested on 12/6/13.

The percent differences (%Ds) for several compounds were high for the CCALs that bracketed the SVOA and SIM-SVOA analyses of these samples. All positive results have been flagged with a "Q" qualifier to denote the high %Ds.

All samples were initially analyzed for SVOAs and SIM-SVOAs on 12/16/13. The areas for the internal standards were not within control limits following the analyses of these samples. All samples were diluted and re-analyzed on 12/19/13. The re-analyses proceeded without incident of note. The results for the re-analyses only have been submitted.

The remaining analyses proceeded without incident of note.

An electronic copy of this report and all associated raw data will be kept on file at ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,

ANALYTICAL RESOURCES, INC.

Mark D. Harris
Project Manager
206/695-6210
markh@arilabs.com

cc: file XQ70

Enclosures

MDH/mdh

4611 South 134th Place, Suite 100 • Tukwila WA 98168 • **206-695-6200** • **206-695-6201** fax

Subject: RE: XN64-GHHSA
From: "Mike Murray" <mmurray@maulfoster.com>
Date: 12/6/2013 11:22 AM
To: "Mark Harris" <markh@arilabs.com>
CC: "Madi Novak" <mnovak@maulfoster.com>, "Mary Benzinger" <mbenzinger@maulfoster.com>

Hi Mark, we finished our initial evaluation and would like to run some follow-up analysis.

Since we are up against the hold time for mercury, the mercury analysis would have to happen pretty soon.

We would like to run archived samples: CR04-2.5 and CR05-2.5 for dioxin/furans and mercury.

We would like to run archived samples: CR04-10cm, CR04-2.5, CR05-10cm, and CR05-2.5 for SVOCs, PCBs and TPH-Dx.

Standard TAT is fine.

Lastly could you provide us with a cost for this follow-up analysis for our budget?

Let me know if you have any questions.

Thanks and have a nice weekend.
Mike

MICHAEL R. MURRAY RG | MAUL FOSTER & ALONGI, INC.

d. 503 501 5226 | p. 971 544 2139 | c. 503 310 0435 | f. 971 544 2140 |
www.maulfoster.com
2001 NW 19th Avenue, Suite 200, Portland, OR 97209

-----Original Message-----
From: Mark Harris [mailto:markh@arilabs.com]
Sent: Tuesday, December 03, 2013 8:32 AM
To: Mary Benzinger
Cc: Madi Novak; Mike Murray
Subject: Re: XN64-GHHSA

Mary:

No problem. It's in 2 parts due to the size of the file.

This is one of two and the EDD for XN64.

Mark H.

On 12/2/2013 5:30 PM, Mary Benzinger wrote:

Hi Mark,
Thanks for the final EDD and cover letter.
Since there are so many parts to this report, and I don't want to miss anything, could you send these as a single report?
Thank you!

Mary Benzinger | MAUL FOSTER & ALONGI, INC.

d. 503 501 5247 | p. 503 501 5214| c. 503 319 7132|
www.maulfoster.com
2001 NW 19th Avenue, Suite 200, Portland, OR 97209

-----Original Message-----
From: Mark Harris [mailto:markh@arilabs.com]
Sent: Monday, December 02, 2013 2:08 PM
To: Madi Novak; Mike Murray; Mary Benzinger
Subject: XN64-GHHSA

All:

Attached are the final EDD for the bulk of the sediment samples (XO00 was for the porewaters and that one was complete and final.) and a copy of the narrative. No data have change so I omitted the actual sample reports. If you'd like those re-sent and an 'intact'/complete report, let me know. The hard copy will mail tomorrow.

Let me know if you have any questions.

Mark H.

--

Mark Harris
Project Manager
Analytical Resources, Inc.
206/695-6210
markh@arilabs.com

Inc. (ARI) The information contained herein is intended solely for the use of the individual(s) named above. If you are not the intended recipient, any copying, distribution, disclosure, or use of the text and/or attached document(s) is strictly prohibited.

If you have received this correspondence in error, please notify sender immediately. Thank you.

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: XN64	Turn-around Requested: Standard	Page: 1 of 2	
ARI Client Company: Maul Foster & Alongi	Phone: 9715442139	Date: 11/8/13	Ice Present? Y
Client Contact: Mike Murray		No. of Coolers: 3	Cooler Temps: 3.2, 0.4, 5.2
Client Project Name: GHHSA			
Client Project #: 0863.01.01	Samplers: MRM/MN		

Analysis Requested

Sample ID	Date	Time	Matrix	No Containers	Dioxin/Furan	Butyl-Benzyl-Phthalate, Perka Chlorophenol	Mercury	SMS compounds with marine criteria	TOC	Conventionals TOC, TVS, Total NH4, TS, PWS, % solids	Archive	Salinity in pore water	Notes/Comments
CR06-10cm	11/7/13	12:00	Sed.	8	X	X	X			X	X		"Conventionals" include: TOC, TVS, total solids, NH4, TS, pore water sulfides, % fines
CR06-1		12:15		4							X		Archive all remaining sample volume
CR06-2.5		12:30		8							X		
CR06-4		12:45		8							X		
CR04-10cm		13:00		8	X	X	X			X	X		
CR04-1		13:30		3							X		
CR05-10cm	11/8/13	8.25	Sed	8	X	X	X			X	X		
CR05-2.5		8.45		8							X		
CR05-3.5		9:00		2							X		
CR04-2.5		9:40		8							X		

Comments/Special Instructions	Relinquished by (Signature)	Received by (Signature)	Relinquished by (Signature)	Received by (Signature)
	Printed Name: Mad. Novak	Printed Name: Jennifer Millsap	Printed Name	Printed Name
	Company: MFA	Company: ARI	Company	Company
	Date & Time: 11/8/13 2:00 pm	Date & Time: 11/8/13 1830	Date & Time	Date & Time

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: XN64	Turn-around Requested: standard	Page: 2 of 2	
ARI Client Company: Maul Foster + Alongi	Phone: 9715442139	Date: 11/8/13	Ice Present? Y
Client Contact: Mike Murray		No. of Coolers: 3	Cooler Temps: 3.2, 0.4, 5.2
Client Project Name: 6115 GHHSA			
Client Project #: 0863.01.01	Samplers: MRM/MN		

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

Sample ID	Date	Time	Matrix	No Containers	Analysis Requested: Dioxins/Furans	Butylbenzyl, Phthalates, Pentachlorophenol	Mercury	SVOCs compounded w/ Modified Criteria	TOC	Conventionals	Archive	Salinity & Particle Size	Notes/Comments
CR04-5	11/8/13	10:00	Sed	4							X		Archive all remaining sample volume ↓
CR01-10cm	↓	11.15	↓	5	X			X	X		X	X	
CR02-10cm		11:30		5	X			X	X		X	X	
CR03-10cm		12:00		5	X			X	X		X	X	

Conventionals = TOC, TVS, total solids, NH_4, TS, pore water sulfides, % fines

Comments/Special Instructions	Relinquished by (Signature)	Received by (Signature)	Relinquished by (Signature)	Received by (Signature)
	Printed Name: Madi Novak	Printed Name: Jennifer Millsap	Printed Name:	Printed Name:
	Company: MFA	Company: ARI	Company:	Company:
	Date & Time: 11/8/13 2 pm	Date & Time: 11/8/13 1830	Date & Time:	Date & Time:

ENVIRONMENTAL CHEMISTS

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.

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: XN64	Turn-around Requested: Standard	Page: 1 of 2	
ARI Client Company: Maul Foster & Alongi	Phone: 971 544 2139	Date: 11/8/13	Ice Present? Y
Client Contact: Mike Murray		No. of Coolers: 3	Cooler Temps: 3.2, 0.4, 5.2
Client Project Name: GHHSA			
Client Project #: 0963.01.01	Samplers: MRM/MN		

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

Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested: Dioxin/Furan	Benzyl Butyl Phthalate, Pentachlorophenol	Mercury	SMS compounds with marine criteria	TOC	Conventionals (TOC, TVS, Total NH4, TS, PAHs, %fines)	Archive	Salinity in pore water	Notes/Comments
CR06-10cm	11/7/13	12:00	Sed.	8	X	X	X	phenol		X	X		"Conventionals" include: TOC, TVS, total solids, NH4, TS, pore water solids, %fines
CR06-1		12:15		4	X			X	tphg, tplvk		X		Archive all remaining sample volume
CR06-2.5		12:30		8	X			X	tphg, tplvk		X		
CR06-4		12:45		8							X		
CR04-10cm		13:00		8	X	X	X	phenol		X	X		
CR04-1		13:30		3							X		
CR05-10cm	11/8/13	8.25	sed	8	X	X	X	phenol		X	X		
CR05-2.5		8.45		8							X		
CR05-3.5		9:00		2							X		
CR04-2.5		9:40		8							X		

Comments/Special Instructions	Relinquished by: (Signature)	Received by: (Signature)	Relinquished by: (Signature)	Received by: (Signature)
	Printed Name: Madi Novak	Printed Name: Jennifer Millsap	Printed Name:	Printed Name
	Company: MFA	Company: ARI	Company	Company
	Date & Time: 11/8/13 2:00 pm	Date & Time: 11/8/13 1830	Date & Time:	Date & Time:

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: XN64	Turn-around Requested: Standard
ARI Client Company: Maul Foster + Alongi	Phone: 9715442139
Client Contact: Mike Murray	
Client Project Name: FHS GHHSA	
Client Project #: 0863.01.01	Samplers: MRM/MN

Page: 2	of 2
Date: 11/8/13	Ice Present? Y
No. of Coolers: 3	Cooler Temps: 3.2, 0.4, 5.2

Sample ID	Date	Time	Matrix	No Containers	Dioxin/Furan	Butylbenzyl Phthalate, Pentachlorophenol	Mercury	SMS Compounds w/ Marine criteria	TOC	Conventionals	Archive	Salinity & Pore H2O	Notes/Comments: Conventionals = TOC, TVS, total solids, NH3, TS, pore water sulfides, % fines
CR04-5	11/8/13	10:00	Sed	4		phenol				X (NH3)	X		Archive all
CR01-10cm	↓	11.15	↓	5	X			X	X		X	X	remaining
CR02-10cm	↓	11:30	↓	5	X			X	X		X	X	sample
CR03-10cm	↓	12:00	↓	5	X			X	X		X	X	volume ↓

Comments/Special Instructions

Relinquished by	Received by	Relinquished by:	Received by
(Signature) [signature]	(Signature) [signature]	(Signature)	(Signature)
Printed Name: Madi Novak	Printed Name: Jennifer Millsap	Printed Name	Printed Name:
Company: MFA	Company: ARI	Company:	Company:
Date & Time: 11/8/13 2 pm	Date & Time: 11/8/13 1830	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.

00005XN64

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client Maul Foster & Alongi Project Name GHH3A

COC No(s): _____ (NA) Delivered by Fed-Ex UPS (Courier) Hand Delivered Other: MC Delivery

Assigned ARI Job No: XN64 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

Temperature of Cooler(s) (°C) (recommended 2 0-6.0 °C for chemistry) 3.2 0.4 5.2

Time: 1830

If cooler temperature is out of compliance fill out form 00070F Temp Gun ID#: 90877452

Cooler Accepted by: JM Date 11/8/13 Time 1830

Complete custody forms and attach all shipping documents

Log-In Phase:

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

Was Sample Split by ARI: (NA) YES Date/Time: _____ Equipment _____ Split by: _____

Samples Logged by: JM Date. 11/12/13 Time 1240

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

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

Additional Notes, Discrepancies, & Resolutions:

By Date.

Small Air Bubbles ~2mm	Peabubbles 2-4 mm	LARGE Air Bubbles > 4 mm
		

Small → "sm" (< 2 mm)	
Peabubbles → "pb" (2 to < 4 mm)	
Large → "lg" (4 to < 6 mm)	
Headspace → "hs" (> 6 mm)	

XN64 00007

Sample ID Cross Reference Report

ANALYTICAL RESOURCES INCORPORATED

ARI Job No: XQ70
Client: Maul Foster & Alongi
Project Event: 0863.01.01
Project Name: GHHSA

	Sample ID	ARI Lab ID	ARI LIMS ID	Matrix	Sample Date/Time	VTSR
1.	CR04-10cm	XQ70A	13-26908	Sediment	11/07/13 13:00	11/08/13 18:30
2.	CR05-10cm	XQ70B	13-26909	Sediment	11/08/13 08:25	11/08/13 18:30
3.	CR05-2.5	XQ70C	13-26910	Sediment	11/08/13 08:45	11/08/13 18:30
4.	CR04-2.5	XQ70D	13-26911	Sediment	11/08/13 09:40	11/08/13 18:30

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Data Reporting Qualifiers

Effective 2/14/2011

Inorganic Data

U — Indicates that the target analyte was not detected at the reported concentration

* — Duplicate RPD is not within established control limits

B — Reported value is less than the CRDL but ≥ the Reporting Limit

N — Matrix Spike recovery not within established control limits

NA — Not Applicable, analyte not spiked

H — The natural concentration of the spiked element is so much greater than the concentration spiked that an accurate determination of spike recovery is not possible

L — Analyte concentration is ≤5 times the Reporting Limit and the replicate control limit defaults to ±1 RL instead of the normal 20% RPD

Organic Data

U — Indicates that the target analyte was not detected at the reported concentration

* — Flagged value is not within established control limits

B — Analyte detected in an associated Method Blank at a concentration greater than one-half of ARI's Reporting Limit or 5% of the regulatory limit or 5% of the analyte concentration in the sample.

J — Estimated concentration when the value is less than ARI's established reporting limits

D — The spiked compound was not detected due to sample extract dilution

E — Estimated concentration calculated for an analyte response above the valid instrument calibration range. A dilution is required to obtain an accurate quantification of the analyte.

Q — Indicates a detected analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20%RSD, <20%Drift or minimum RRF).

S Indicates an analyte response that has saturated the detector. The calculated concentration is not valid; a dilution is required to obtain valid quantification of the analyte

NA The flagged analyte was not analyzed for

NR Spiked compound recovery is not reported due to chromatographic interference

NS The flagged analyte was not spiked into the sample

M Estimated value for an analyte detected and confirmed by an analyst but with low spectral match parameters. This flag is used only for GC-MS analyses

M2 The sample contains PCB congeners that do not match any standard Aroclor pattern. The PCBs are identified and quantified as the Aroclor whose pattern most closely matches that of the sample. The reported value is an estimate.

N The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification"

Y The analyte is not detected at or above the reported concentration. The reporting limit is raised due to chromatographic interference. The Y flag is equivalent to the U flag with a raised reporting limit.

EMPC Estimated Maximum Possible Concentration (EMPC) defined in EPA Statement of Work DLM02.2 as a value "calculated for 2,3,7,8-substituted isomers for which the quantitation and /or confirmation ion(s) has signal to noise in excess of 2.5, but does not meet identification criteria" **(Dioxin/Furan analysis only)**

C The analyte was positively identified on only one of two chromatographic columns. Chromatographic interference prevented a positive identification on the second column

P The analyte was detected on both chromatographic columns but the quantified values differ by ≥40% RPD with no obvious chromatographic interference

X Analyte signal includes interference from polychlorinated diphenyl ethers. **(Dioxin/Furan analysis only)**

Z Analyte signal includes interference from the sample matrix or perfluorokerosene ions. **(Dioxin/Furan analysis only)**

Geotechnical Data

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

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Extraction Method: SW3546
Page 1 of 1

Sample ID: MB-121013
METHOD BLANK

Lab Sample ID: MB-121013
LIMS ID: 13-26908
Matrix: Sediment
Data Release Authorized:
Reported: 12/20/13

QC Report No: XQ70-Maul Foster & Alongi
Project: GHHSA
0863.01.01
Date Sampled: NA
Date Received: NA

Date Extracted: 12/10/13
Date Analyzed: 12/16/13 22:31
Instrument/Analyst: NT14/YZ
GPC Cleanup: Yes

Sample Amount: 10.00 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Percent Moisture: NA

CAS Number	Analyte	RL	Result
108-95-2	Phenol	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	100	< 100 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	50	< 50 U
218-01-9	Chrysene	20	< 20 U
117-84-0	Di-n-Octyl phthalate	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
TOTBFA	Total Benzofluoranthenes	40	< 40 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	73.6%	2-Fluorobiphenyl	68.8%
d14-p-Terphenyl	96.4%	d4-1,2-Dichlorobenzene	67.6%
d5-Phenol	76.1%	2-Fluorophenol	74.8%
2,4,6-Tribromophenol	88.8%	d4-2-Chlorophenol	73.1%

FORM I

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Extraction Method: SW3546
Page 1 of 1

Sample ID: CR04-10cm
SAMPLE

Lab Sample ID: XQ70A
LIMS ID: 13-26908
Matrix: Sediment
Data Release Authorized:
Reported: 12/20/13

QC Report No: XQ70-Maul Foster & Alongi
Project: GHHSA
0863.01.01
Date Sampled: 11/07/13
Date Received: 11/08/13

Date Extracted: 12/10/13
Date Analyzed: 12/19/13 14:35
Instrument/Analyst: NT14/YZ
GPC Cleanup: Yes

Sample Amount: 2.37 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 5.00
Percent Moisture: 80.3%

CAS Number	Analyte	RL	Result
108-95-2	**Phenol**	**420**	**460**
106-46-7	1,4-Dichlorobenzene	420	< 420 U
100-51-6	Benzyl Alcohol	420	< 420 U
95-50-1	1,2-Dichlorobenzene	420	< 420 U
95-48-7	2-Methylphenol	420	< 420 U
106-44-5	4-Methylphenol	420	< 420 U
105-67-9	2,4-Dimethylphenol	2,100	< 2,100 U
65-85-0	**Benzoic Acid**	**4,200**	**1,700 J**
120-82-1	1,2,4-Trichlorobenzene	420	< 420 U
91-20-3	**Naphthalene**	**420**	**420**
87-68-3	Hexachlorobutadiene	420	< 420 U
91-57-6	2-Methylnaphthalene	420	< 420 U
131-11-3	Dimethylphthalate	420	< 420 U
208-96-8	Acenaphthylene	420	< 420 U
83-32-9	Acenaphthene	420	< 420 U
132-64-9	Dibenzofuran	420	< 420 U
84-66-2	Diethylphthalate	420	< 420 U
86-73-7	Fluorene	420	< 420 U
86-30-6	N-Nitrosodiphenylamine	420	< 420 U
118-74-1	Hexachlorobenzene	420	< 420 U
87-86-5	Pentachlorophenol	2,100	< 2,100 U
85-01-8	**Phenanthrene**	**420**	**320 J**
120-12-7	Anthracene	420	< 420 U
84-74-2	Di-n-Butylphthalate	420	< 420 U
206-44-0	**Fluoranthene**	**420**	**590 Q**
129-00-0	**Pyrene**	**420**	**700**
85-68-7	Butylbenzylphthalate	420	< 420 U
56-55-3	**Benzo(a)anthracene**	**420**	**250 J**
117-81-7	bis(2-Ethylhexyl)phthalate	1,000	< 1,000 U
218-01-9	**Chrysene**	**420**	**530**
117-84-0	Di-n-Octyl phthalate	420	< 420 U
50-32-8	**Benzo(a)pyrene**	**420**	**300 JQ**
193-39-5	Indeno(1,2,3-cd)pyrene	420	< 420 U
53-70-3	Dibenz(a,h)anthracene	420	< 420 U
191-24-2	**Benzo(g,h,i)perylene**	**420**	**230 JQ**
TOTBFA	**Total Benzofluoranthenes**	**840**	**550 J**

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	76.0%	2-Fluorobiphenyl	76.0%
d14-p-Terphenyl	94.0%	d4-1,2-Dichlorobenzene	63.0%
d5-Phenol	80.0%	2-Fluorophenol	74.0%
2,4,6-Tribromophenol	101%	d4-2-Chlorophenol	74.7%

FORM I

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Extraction Method: SW3546
Page 1 of 1

Sample ID: CR05-10cm
SAMPLE

Lab Sample ID: XQ70B
LIMS ID: 13-26909
Matrix: Sediment
Data Release Authorized:
Reported: 12/20/13

QC Report No: XQ70-Maul Foster & Alongi
Project: GHHSA
0863.01.01
Date Sampled: 11/08/13
Date Received: 11/08/13

Date Extracted: 12/10/13
Date Analyzed: 12/19/13 15:10
Instrument/Analyst: NT14/YZ
GPC Cleanup: Yes

Sample Amount: 4.31 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 5.00
Percent Moisture: 73.1%

CAS Number	Analyte	RL	Result	
108-95-2	**Phenol**	**230**	**600**	
106-46-7	**1,4-Dichlorobenzene**	**230**	**1,100**	
100-51-6	Benzyl Alcohol	230	< 230	U
95-50-1	1,2-Dichlorobenzene	230	< 230	U
95-48-7	2-Methylphenol	230	< 230	U
106-44-5	**4-Methylphenol**	**230**	**310**	
105-67-9	2,4-Dimethylphenol	1,200	< 1,200	U
65-85-0	**Benzoic Acid**	**2,300**	**950**	**J**
120-82-1	1,2,4-Trichlorobenzene	230	< 230	U
91-20-3	**Naphthalene**	**230**	**720**	
87-68-3	Hexachlorobutadiene	230	< 230	U
91-57-6	**2-Methylnaphthalene**	**230**	**310**	
131-11-3	Dimethylphthalate	230	< 230	U
208-96-8	**Acenaphthylene**	**230**	**170**	**J**
83-32-9	**Acenaphthene**	**230**	**210**	**J**
132-64-9	**Dibenzofuran**	**230**	**310**	
84-66-2	Diethylphthalate	230	< 230	U
86-73-7	**Fluorene**	**230**	**260**	
86-30-6	N-Nitrosodiphenylamine	230	< 230	U
118-74-1	Hexachlorobenzene	230	< 230	U
87-86-5	Pentachlorophenol	1,200	< 1,200	U
85-01-8	**Phenanthrene**	**230**	**700**	
120-12-7	**Anthracene**	**230**	**230**	
84-74-2	Di-n-Butylphthalate	230	< 230	U
206-44-0	**Fluoranthene**	**230**	**1,300**	**Q**
129-00-0	**Pyrene**	**230**	**1,300**	
85-68-7	Butylbenzylphthalate	230	< 230	U
56-55-3	**Benzo(a)anthracene**	**230**	**390**	
117-81-7	**bis(2-Ethylhexyl)phthalate**	**580**	**960**	
218-01-9	**Chrysene**	**230**	**420**	
117-84-0	Di-n-Octyl phthalate	230	< 230	U
50-32-8	**Benzo(a)pyrene**	**230**	**340**	**Q**
193-39-5	**Indeno(1,2,3-cd)pyrene**	**230**	**200**	**JQ**
53-70-3	Dibenz(a,h)anthracene	230	< 230	U
191-24-2	**Benzo(g,h,i)perylene**	**230**	**260**	**Q**
TOTBFA	**Total Benzofluoranthenes**	**460**	**660**	

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	69.0%	2-Fluorobiphenyl	75.0%
d14-p-Terphenyl	92.0%	d4-1,2-Dichlorobenzene	59.0%
d5-Phenol	76.7%	2-Fluorophenol	68.0%
2,4,6-Tribromophenol	92.0%	d4-2-Chlorophenol	72.0%

FORM I

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Extraction Method: SW3546
Page 1 of 1

Sample ID: CR05-2.5
SAMPLE

Lab Sample ID: XQ70C
LIMS ID: 13-26910
Matrix: Sediment
Data Release Authorized:
Reported: 12/20/13

QC Report No: XQ70-Maul Foster & Alongi
Project: GHHSA
0863.01.01
Date Sampled: 11/08/13
Date Received: 11/08/13

Date Extracted: 12/10/13
Date Analyzed: 12/19/13 15:44
Instrument/Analyst: NT14/YZ
GPC Cleanup: Yes

Sample Amount: 2.85 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 5.00
Percent Moisture: 74.2%

CAS Number	Analyte	RL	Result	
108-95-2	**Phenol**	**350**	**530**	
106-46-7	**1,4-Dichlorobenzene**	**350**	**600**	
100-51-6	Benzyl Alcohol	350	< 350	U
95-50-1	1,2-Dichlorobenzene	350	< 350	U
95-48-7	2-Methylphenol	350	< 350	U
106-44-5	**4-Methylphenol**	**350**	**280**	**J**
105-67-9	2,4-Dimethylphenol	1,800	< 1,800	U
65-85-0	Benzoic Acid	3,500	< 3,500	U
120-82-1	1,2,4-Trichlorobenzene	350	< 350	U
91-20-3	**Naphthalene**	**350**	**440**	
87-68-3	Hexachlorobutadiene	350	< 350	U
91-57-6	2-Methylnaphthalene	350	< 350	U
131-11-3	Dimethylphthalate	350	< 350	U
208-96-8	Acenaphthylene	350	< 350	U
83-32-9	**Acenaphthene**	**350**	**390**	
132-64-9	**Dibenzofuran**	**350**	**230**	**J**
84-66-2	Diethylphthalate	350	< 350	U
86-73-7	**Fluorene**	**350**	**230**	**J**
86-30-6	N-Nitrosodiphenylamine	350	< 350	U
118-74-1	Hexachlorobenzene	350	< 350	U
87-86-5	Pentachlorophenol	1,800	< 1,800	U
85-01-8	**Phenanthrene**	**350**	**470**	
120-12-7	**Anthracene**	**350**	**320**	**J**
84-74-2	Di-n-Butylphthalate	350	< 350	U
206-44-0	**Fluoranthene**	**350**	**3,900**	**Q**
129-00-0	**Pyrene**	**350**	**3,100**	
85-68-7	Butylbenzylphthalate	350	< 350	U
56-55-3	**Benzo(a)anthracene**	**350**	**680**	
117-81-7	**bis(2-Ethylhexyl)phthalate**	**880**	**9,400**	
218-01-9	**Chrysene**	**350**	**460**	
117-84-0	Di-n-Octyl phthalate	350	< 350	U
50-32-8	**Benzo(a)pyrene**	**350**	**530**	**Q**
193-39-5	**Indeno(1,2,3-cd)pyrene**	**350**	**190**	**JQ**
53-70-3	Dibenz(a,h)anthracene	350	< 350	U
191-24-2	**Benzo(g,h,i)perylene**	**350**	**300**	**JQ**
TOTBFA	**Total Benzofluoranthenes**	**700**	**810**	

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	71.0%	2-Fluorobiphenyl	72.0%
d14-p-Terphenyl	87.0%	d4-1,2-Dichlorobenzene	58.0%
d5-Phenol	75.3%	2-Fluorophenol	68.0%
2,4,6-Tribromophenol	93.3%	d4-2-Chlorophenol	67.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS **Sample ID: CR04-2.5**
Extraction Method: SW3546 **SAMPLE**

Lab Sample ID: XQ70D
LIMS ID: 13-26911
Matrix: Sediment
Data Release Authorized: MW
Reported: 12/20/13

QC Report No: XQ70-Maul Foster & Alongi
Project: GHHSA
0863.01.01
Date Sampled: 11/08/13
Date Received: 11/08/13

Date Extracted: 12/10/13
Date Analyzed: 12/19/13 16:18
Instrument/Analyst: NT14/YZ
GPC Cleanup: Yes

Sample Amount: 3.10 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 5.00
Percent Moisture: 82.8%

CAS Number	Analyte	RL	Result	
108-95-2	**Phenol**	**320**	**390**	
106-46-7	1,4-Dichlorobenzene	320	< 320	U
100-51-6	Benzyl Alcohol	320	< 320	U
95-50-1	1,2-Dichlorobenzene	320	< 320	U
95-48-7	2-Methylphenol	320	< 320	U
106-44-5	4-Methylphenol	320	< 320	U
105-67-9	2,4-Dimethylphenol	1,600	< 1,600	U
65-85-0	Benzoic Acid	3,200	< 3,200	U
120-82-1	1,2,4-Trichlorobenzene	320	< 320	U
91-20-3	**Naphthalene**	**320**	**340**	
87-68-3	Hexachlorobutadiene	320	< 320	U
91-57-6	2-Methylnaphthalene	320	< 320	U
131-11-3	Dimethylphthalate	320	< 320	U
208-96-8	Acenaphthylene	320	< 320	U
83-32-9	**Acenaphthene**	**320**	**180**	**J**
132-64-9	**Dibenzofuran**	**320**	**210**	**J**
84-66-2	Diethylphthalate	320	< 320	U
86-73-7	**Fluorene**	**320**	**180**	**J**
86-30-6	N-Nitrosodiphenylamine	320	< 320	U
118-74-1	Hexachlorobenzene	320	< 320	U
87-86-5	Pentachlorophenol	1,600	< 1,600	U
85-01-8	**Phenanthrene**	**320**	**370**	
120-12-7	**Anthracene**	**320**	**290**	**J**
84-74-2	Di-n-Butylphthalate	320	< 320	U
206-44-0	**Fluoranthene**	**320**	**2,200**	**Q**
129-00-0	**Pyrene**	**320**	**1,800**	
85-68-7	Butylbenzylphthalate	320	< 320	U
56-55-3	**Benzo(a)anthracene**	**320**	**640**	
117-81-7	**bis(2-Ethylhexyl)phthalate**	**810**	**870**	
218-01-9	**Chrysene**	**320**	**940**	
117-84-0	Di-n-Octyl phthalate	320	< 320	U
50-32-8	**Benzo(a)pyrene**	**320**	**680**	**Q**
193-39-5	**Indeno(1,2,3-cd)pyrene**	**320**	**480**	**Q**
53-70-3	Dibenz(a,h)anthracene	320	< 320	U
191-24-2	**Benzo(g,h,i)perylene**	**320**	**660**	**Q**
TOTBFA	**Total Benzofluoranthenes**	**640**	**1,700**	

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	68.0%	2-Fluorobiphenyl	70.0%
d14-p-Terphenyl	85.0%	d4-1,2-Dichlorobenzene	58.0%
d5-Phenol	76.0%	2-Fluorophenol	67.3%
2,4,6-Tribromophenol	90.7%	d4-2-Chlorophenol	71.3%

ANALYTICAL RESOURCES INCORPORATED

SW8270 SEMIVOLATILES SOIL/SEDIMENT SURROGATE RECOVERY SUMMARY

Matrix: Sediment

QC Report No: XQ70-Maul Foster & Alongi
Project: GHHSA
0863.01.01

Client ID	NBZ	FBP	TPH	DCB	PHL	2FP	TBP	2CP	TOT OUT
MB-121013	73.6%	68.8%	96.4%	67.6%	76.1%	74.8%	88.8%	73.1%	0
LCS-121013	72.8%	69.0%	86.0%	64.4%	76.9%	69.7%	89.1%	69.7%	0
CR04-10cm	76.0%	76.0%	94.0%	63.0%	80.0%	74.0%	101%	74.7%	0
CR05-10cm	69.0%	75.0%	92.0%	59.0%	76.7%	68.0%	92.0%	72.0%	0
CR05-2.5	71.0%	72.0%	87.0%	58.0%	75.3%	68.0%	93.3%	67.3%	0
CR04-2.5	68.0%	70.0%	85.0%	58.0%	76.0%	67.3%	90.7%	71.3%	0

	LCS/MB LIMITS	QC LIMITS
(NBZ) = d5-Nitrobenzene	(33-120)	(30-120)
(FBP) = 2-Fluorobiphenyl	(35-120)	(35-120)
(TPH) = d14-p-Terphenyl	(42-124)	(37-120)
(DCB) = d4-1,2-Dichlorobenzene	(37-120)	(32-120)
(PHL) = d5-Phenol	(32-120)	(29-120)
(2FP) = 2-Fluorophenol	(32-120)	(27-120)
(TBP) = 2,4,6-Tribromophenol	(23-133)	(24-134)
(2CP) = d4-2-Chlorophenol	(36-120)	(31-120)

Prep Method: SW3546
Log Number Range: 13-26908 to 13-26911

FORM-II SW8270

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270 GC/MS

Sample ID: LCS-121013
LAB CONTROL

Lab Sample ID: LCS-121013
LIMS ID: 13-26908
Matrix: Sediment
Data Release Authorized: MW
Reported: 12/20/13

QC Report No: XQ70-Maul Foster & Alongi
Project: GHHSA
0863.01.01
Date Sampled: 11/07/13
Date Received: 11/08/13

Date Extracted: 12/10/13
Date Analyzed: 12/16/13 23:05
Instrument/Analyst: NT14/YZ
GPC Cleanup: Yes

Sample Amount: 10.00 g
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Percent Moisture: NA

Analyte	Lab Control	Spike Added	Recovery
Phenol	409 Q	500	81.8%
1,4-Dichlorobenzene	362	500	72.4%
Benzyl Alcohol	443	500	88.6%
1,2-Dichlorobenzene	359	500	71.8%
2-Methylphenol	347 Q	500	69.4%
4-Methylphenol	704	1000	70.4%
2,4-Dimethylphenol	1030	1500	68.7%
Benzoic Acid	1750	2750	63.6%
1,2,4-Trichlorobenzene	359	500	71.8%
Naphthalene	349	500	69.8%
Hexachlorobutadiene	346	500	69.2%
2-Methylnaphthalene	384	500	76.8%
Dimethylphthalate	440	500	88.0%
Acenaphthylene	371	500	74.2%
Acenaphthene	369	500	73.8%
Dibenzofuran	371	500	74.2%
Diethylphthalate	465	500	93.0%
Fluorene	402	500	80.4%
N-Nitrosodiphenylamine	497	500	99.4%
Hexachlorobenzene	431	500	86.2%
Pentachlorophenol	1260	1500	84.0%
Phenanthrene	418	500	83.6%
Anthracene	420	500	84.0%
Di-n-Butylphthalate	499	500	99.8%
Fluoranthene	487	500	97.4%
Pyrene	451	500	90.2%
Butylbenzylphthalate	538	500	108%
Benzo(a)anthracene	449	500	89.8%
bis(2-Ethylhexyl)phthalate	453	500	90.6%
Chrysene	405	500	81.0%
Di-n-Octyl phthalate	411	500	82.2%
Benzo(a)pyrene	473 Q	500	94.6%
Indeno(1,2,3-cd)pyrene	326	500	65.2%
Dibenz(a,h)anthracene	239	500	47.8%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270 GC/MS

Sample ID: LCS-121013
LAB CONTROL

Lab Sample ID: LCS-121013
LIMS ID: 13-26908
Matrix: Sediment
Date Analyzed: 12/16/13 23:05

QC Report No: XQ70-Maul Foster & Alongi
Project: GHHSA
0863.01.01

Analyte	Lab Control	Spike Added	Recovery
Benzo(g,h,i)perylene	298 Q	500	59.6%
Total Benzofluoranthenes	804	1000	80.4%

Semivolatile Surrogate Recovery

d5-Nitrobenzene	72.8%
2-Fluorobiphenyl	69.0%
d14-p-Terphenyl	86.0%
d4-1,2-Dichlorobenzene	64.4%
d5-Phenol	76.9%
2-Fluorophenol	69.7%
2,4,6-Tribromophenol	89.1%
d4-2-Chlorophenol	69.7%

Reported in µg/kg (ppb)

Analytical Resources, Inc.

CONTINUING CALIBRATION COMPOUNDS

Instrument ID: nt14.i Injection Date: 16-DEC-2013 14:35
Lab File ID: cc1216.d Init. Cal. Date(s): 11-DEC-2013 11-DEC-2013
Analysis Type: Init. Cal. Times: 13:42 18:15
Lab Sample ID: CC1216 Quant Type: ISTD
Method: /chem3/nt14.i/20131216.b/ABN.m

COMPOUND	RRF / AMOUNT	RF5	CCAL RRF5	MIN RRF	%D / %DRIFT	MAX %D / %DRIFT	CURVE TYPE	
$ 1 2-Fluorophenol	1.17428	1.24341	1.24341	0.010	5.88625	20.00000	Averaged	
$ 2 Phenol-d5	1.53259	1.86495	1.86495	0.010	21.68632	20.00000	Averaged	<-
3 Phenol	1.72460	2.28443	2.28443	0.100	32.46149	20.00000	Averaged	<-
$ 5 2-Chlorophenol-d4	1.26113	1.48243	1.48243	0.010	17.54756	20.00000	Averaged	
4 Bis(2-Chloroethyl)ether	1.21185	1.36504	1.36504	0.700	12.64150	20.00000	Averaged	
6 2-Chlorophenol	1.39571	1.58374	1.58374	0.800	13.47235	20.00000	Averaged	
7 1,3-Dichlorobenzene	1.35866	1.39327	1.39327	0.010	2.54760	20.00000	Averaged	
9 1,4-Dichlorobenzene	1.37673	1.47273	1.47273	0.010	6.97294	20.00000	Averaged	
$ 10 1,2-Dichlorobenzene-d4	0.91055	0.92994	0.92994	0.010	2.12977	20.00000	Averaged	
12 1,2-Dichlorobenzene	1.30836	1.39328	1.39328	0.010	6.49053	20.00000	Averaged	
11 Benzyl alcohol	0.71262	0.71605	0.71605	0.010	0.48076	20.00000	Averaged	
14 2,2'-oxybis(1-Chloropropane	0.41510	0.44252	0.44252	0.010	6.60507	20.00000	Averaged	
13 2-Methylphenol	1.28565	1.63760	1.63760	0.700	27.37490	20.00000	Averaged	<-
17 Hexachloroethane	0.50480	0.58400	0.58400	0.300	15.68841	20.00000	Averaged	
16 N-Nitroso-di-n-propylamine	0.82009	0.92258	0.92258	0.500	12.49799	20.00000	Averaged	
15 4-Methylphenol	1.32235	1.52759	1.52759	0.600	15.52060	20.00000	Averaged	
$ 18 Nitrobenzene-d5	0.34376	0.36571	0.36571	0.010	6.38390	20.00000	Averaged	
19 Nitrobenzene	0.31920	0.34108	0.34108	0.200	6.85376	20.00000	Averaged	
20 Isophorone	0.53787	0.62730	0.62730	0.300	16.62654	20.00000	Averaged	
21 2-Nitrophenol	0.17764	0.20043	0.20043	0.100	12.83152	20.00000	Averaged	
22 2,4-Dimethylphenol	0.34055	0.33896	0.33896	0.200	-0.46801	20.00000	Averaged	
23 Bis(2-Chloroethoxy)methane	0.36439	0.39087	0.39087	0.050	7.26782	20.00000	Averaged	
24 Benzoic acid	22.13133	20.00000	0.29393	0.010	10.65666	20.00000	Quadratic	
25 2,4-Dichlorophenol	0.30590	0.29214	0.29214	0.100	-4.49796	20.00000	Averaged	
26 1,2,4-Trichlorobenzene	0.28701	0.28540	0.28540	0.010	-0.56085	20.00000	Averaged	
28 Naphthalene	0.97655	0.91734	0.91734	0.100	-6.06334	20.00000	Averaged	
29 4-Chloroaniline	0.35123	0.35058	0.35058	0.010	-0.18568	20.00000	Averaged	
30 Hexachlorobutadiene	0.15785	0.14396	0.14396	0.010	-8.79813	20.00000	Averaged	
31 4-Chloro-3-methylphenol	0.27785	0.31047	0.31047	0.200	11.74054	20.00000	Averaged	
32 2-Methylnaphthalene	0.60064	0.65374	0.65374	0.300	8.84080	20.00000	Averaged	
33 Hexachlorocyclopentadiene	0.28573	0.28156	0.28156	0.001	-1.46152	20.00000	Averaged	
34 2,4,6-Trichlorophenol	0.33472	0.33706	0.33706	0.200	0.69917	20.00000	Averaged	
35 2,4,5-Trichlorophenol	0.34791	0.37941	0.37941	0.200	9.05304	20.00000	Averaged	
$ 36 2-Fluorobiphenyl	1.17682	1.17950	1.17950	0.010	0.22809	20.00000	Averaged	
37 2-Chloronaphthalene	0.91423	0.95716	0.95716	0.700	4.69518	20.00000	Averaged	

Analytical Resources, Inc.

CONTINUING CALIBRATION COMPOUNDS

Instrument ID: nt14.i Injection Date: 16-DEC-2013 14:35
Lab File ID: cc1216.d Init. Cal. Date(s): 11-DEC-2013 11-DEC-2013
Analysis Type: Init. Cal. Times: 13:42 18:15
Lab Sample ID: CC1216 Quant Type: ISTD
Method: /chem3/nt14.i/20131216.b/ABN.m

COMPOUND	RRF / AMOUNT	RF5	CCAL RRF5	MIN RRF	%D / %DRIFT	MAX %D / %DRIFT	CURVE TYPE	
38 2-Nitroaniline	0.24954	0.32129	0.32129	0.010	28.75471	20.00000	Averaged	<-
39 Dimethylphthalate	1.02784	0.99658	0.99658	0.010	-3.04148	20.00000	Averaged	
40 Acenaphthylene	1.49257	1.50210	1.50210	0.900	0.63883	20.00000	Averaged	
41 2,6-Dinitrotoluene	0.21189	0.22920	0.22920	0.100	8.16670	20.00000	Averaged	
43 3-Nitroaniline	0.24052	0.31026	0.31026	0.010	28.99449	20.00000	Averaged	<-
44 Acenaphthene	0.98795	0.99989	0.99989	0.100	1.20896	20.00000	Averaged	
45 2,4-Dinitrophenol	23.16297	20.00000	0.20780	0.030	15.81487	20.00000	Quadratic	
46 Dibenzofuran	1.35835	1.36137	1.36137	0.800	0.22181	20.00000	Averaged	
47 4-Nitrophenol	12.21840	10.00000	0.18571	0.010	22.18400	20.00000	Quadratic	<-
48 2,4-Dinitrotoluene	0.28642	0.34410	0.34410	0.200	20.13907	20.00000	Averaged	<-
50 Diethylphthalate	1.04034	1.11819	1.11819	0.010	7.48333	20.00000	Averaged	
49 Fluorene	1.11381	1.19567	1.19567	0.100	7.34932	20.00000	Averaged	
51 4-Chlorophenyl-phenylether	0.52797	0.55611	0.55611	0.100	5.33073	20.00000	Averaged	
52 4-Nitroaniline	0.23548	0.30333	0.30333	0.010	28.80928	20.00000	Averaged	<-
53 4,6-Dinitro-2-methylphenol	21.44275	20.00000	0.15670	0.001	7.21377	20.00000	Quadratic	
54 N-Nitrosodiphenylamine	0.45731	0.48842	0.48842	0.010	6.80253	20.00000	Averaged	
$ 55 2,4,6-Tribromophenol	0.14057	0.15699	0.15699	0.010	11.67677	20.00000	Averaged	
56 4-Bromophenyl-phenylether	0.17470	0.17810	0.17810	0.100	1.94559	20.00000	Averaged	
57 Hexachlorobenzene	0.18922	0.19402	0.19402	0.100	2.53893	20.00000	Averaged	
58 Pentachlorophenol	0.13759	0.15143	0.15143	0.010	10.06242	20.00000	Averaged	
60 Phenanthrene	0.98991	1.00125	1.00125	0.700	1.14616	20.00000	Averaged	
61 Anthracene	0.93027	1.00068	1.00068	0.700	7.56870	20.00000	Averaged	
62 Carbazole	0.78633	0.80297	0.80297	0.010	2.11592	20.00000	Averaged	
63 Di-n-butylphthalate	4.97069	5.00000	0.99244	0.010	-0.58611	20.00000	Quadratic	
64 Fluoranthene	0.96832	1.02085	1.02085	0.600	5.42503	20.00000	Averaged	
65 Pyrene	1.05920	1.13312	1.13312	0.600	6.97928	20.00000	Averaged	
$ 66 Terphenyl-d14	0.54772	0.60324	0.60324	0.010	10.13620	20.00000	Averaged	
67 Butylbenzylphthalate	5.99504	5.00000	0.48742	0.010	19.90087	20.00000	Quadratic	
68 Benzo(a)anthracene	0.96296	1.05793	1.05793	0.700	9.86156	20.00000	Averaged	
70 3,3'-Dichlorobenzidine	0.37653	0.50746	0.50746	0.010	34.77172	20.00000	Averaged	<-
71 Chrysene	0.96364	1.00119	1.00119	0.700	3.89666	20.00000	Averaged	
72 bis(2-Ethylhexyl)phthalate	5.09548	5.00000	0.48263	0.010	1.90964	20.00000	Quadratic	
73 Di-n-octylphthalate	0.90626	0.85470	0.85470	0.010	-5.68872	20.00000	Averaged	
74 Benzo(b)fluoranthene	0.95807	1.16281	1.16281	0.700	21.37041	20.00000	Averaged	<-
75 Benzo(k)fluoranthene	1.08338	1.05983	1.05983	0.700	-2.17316	20.00000	Averaged	

Analytical Resources, Inc.

CONTINUING CALIBRATION COMPOUNDS

Instrument ID: nt14.i Injection Date: 19-DEC-2013 13:20
Lab File ID: cc1219.d Init. Cal. Date(s): 11-DEC-2013 11-DEC-2013
Analysis Type: Init. Cal. Times: 13:42 18:15
Lab Sample ID: CC1219 Quant Type: ISTD
Method: /chem3/nt14.i/20131219.b/ABN.m

COMPOUND	RRF / AMOUNT	RF5	CCAL RRF5	MIN RRF	%D / %DRIFT	MAX %D / %DRIFT	CURVE TYPE	
$ 1 2-Fluorophenol	1.17428	1.25110	1.25110	0.010	6.54152	20.00000	Averaged	
$ 2 Phenol-d5	1.53259	1.68197	1.68197	0.010	9.74747	20.00000	Averaged	
3 Phenol	1.72460	2.06212	2.06212	0.100	19.57082	20.00000	Averaged	
$ 5 2-Chlorophenol-d4	1.26113	1.35866	1.35866	0.010	7.73355	20.00000	Averaged	
7 1,3-Dichlorobenzene	1.35866	1.37381	1.37381	0.010	1.11576	20.00000	Averaged	
9 1,4-Dichlorobenzene	1.37673	1.40685	1.40685	0.010	2.18783	20.00000	Averaged	
$ 10 1,2-Dichlorobenzene-d4	0.91055	0.90961	0.90961	0.010	-0.10237	20.00000	Averaged	
12 1,2-Dichlorobenzene	1.30836	1.33676	1.33676	0.010	2.17026	20.00000	Averaged	
11 Benzyl alcohol	0.71262	0.60029	0.60029	0.010	-15.76266	20.00000	Averaged	
13 2-Methylphenol	1.28565	1.38979	1.38979	0.700	8.10015	20.00000	Averaged	
17 Hexachloroethane	0.50480	0.54043	0.54043	0.300	7.05796	20.00000	Averaged	
15 4-Methylphenol	1.32235	1.55612	1.55612	0.600	17.67807	20.00000	Averaged	
$ 18 Nitrobenzene-d5	0.34376	0.43301	0.43301	0.010	25.96305	20.00000	Averaged	<-
22 2,4-Dimethylphenol	0.34055	0.41148	0.41148	0.200	20.82758	20.00000	Averaged	<-
24 Benzoic acid	22.66401	20.00000	0.30132	0.010	13.32003	20.00000	Quadratic	
26 1,2,4-Trichlorobenzene	0.28701	0.28579	0.28579	0.010	-0.42499	20.00000	Averaged	
28 Naphthalene	0.97655	0.99956	0.99956	0.100	2.35549	20.00000	Averaged	
30 Hexachlorobutadiene	0.15785	0.16150	0.16150	0.010	2.31186	20.00000	Averaged	
32 2-Methylnaphthalene	0.60064	0.63776	0.63776	0.300	6.17978	20.00000	Averaged	
$ 36 2-Fluorobiphenyl	1.17682	1.14344	1.14344	0.010	-2.83614	20.00000	Averaged	
39 Dimethylphthalate	1.02784	1.08929	1.08929	0.010	5.97840	20.00000	Averaged	
40 Acenaphthylene	1.49257	1.66949	1.66949	0.900	11.85318	20.00000	Averaged	
44 Acenaphthene	0.98795	1.02363	1.02363	0.100	3.61189	20.00000	Averaged	
46 Dibenzofuran	1.35835	1.35620	1.35620	0.800	-0.15867	20.00000	Averaged	
50 Diethylphthalate	1.04034	1.08344	1.08344	0.010	4.14230	20.00000	Averaged	
49 Fluorene	1.11381	1.13689	1.13689	0.100	2.07158	20.00000	Averaged	
54 N-Nitrosodiphenylamine	0.45731	0.49072	0.49072	0.010	7.30647	20.00000	Averaged	
$ S5 2,4,6-Tribromophenol	0.14057	0.15985	0.15985	0.010	13.71325	20.00000	Averaged	
57 Hexachlorobenzene	0.18922	0.18957	0.18957	0.100	0.18562	20.00000	Averaged	
58 Pentachlorophenol	0.13759	0.14640	0.14640	0.010	6.40405	20.00000	Averaged	
60 Phenanthrene	0.98991	1.01301	1.01301	0.700	2.33394	20.00000	Averaged	
61 Anthracene	0.93027	1.04290	1.04290	0.700	12.10716	20.00000	Averaged	
62 Carbazole	0.78633	0.91010	0.91010	0.010	15.74008	20.00000	Averaged	
63 Di-n-butylphthalate	5.99374	5.00000	1.20308	0.010	19.87484	20.00000	Quadratic	
64 Fluoranthene	0.96832	1.23153	1.23153	0.600	27.18196	20.00000	Averaged	<-

Analytical Resources, Inc.

CONTINUING CALIBRATION COMPOUNDS

Instrument ID: nt14.i Injection Date: 19-DEC-2013 13:20
Lab File ID: cc1219.d Init. Cal. Date(s): 11-DEC-2013 11-DEC-2013
Analysis Type: Init. Cal. Times: 13:42 18:15
Lab Sample ID: CC1219 Quant Type: ISTD
Method: /chem3/nt14.i/20131219.b/ABN.m

COMPOUND	RRF / AMOUNT	RF5	CCAL RRF5	MIN RRF	%D / %DRIFT	MAX %D / %DRIFT	CURVE TYPE	
65 Pyrene	1.05920	1.21808	1.21808	0.600	15.00059	20.00000	Averaged	
$ 66 Terphenyl-d14	0.54772	0.60372	0.60372	0.010	10.22380	20.00000	Averaged	
67 Butylbenzylphthalate	5.93567	5.00000	0.48241	0.010	18.71334	20.00000	Quadratic	
68 Benzo(a)anthracene	0.96296	1.03775	1.03775	0.700	7.76626	20.00000	Averaged	
71 Chrysene	0.96364	0.99857	0.99857	0.700	3.62404	20.00000	Averaged	
72 bis(2-Ethylhexyl)phthalate	5.06179	5.00000	0.47942	0.010	1.23574	20.00000	Quadratic	
73 Di-n-octylphthalate	0.90626	0.84799	0.84799	0.010	-6.42947	20.00000	Averaged	
76 Benzo(a)pyrene	0.75649	0.91728	0.91728	0.700	21.25560	20.00000	Averaged	<-
78 Indeno(1,2,3-cd)pyrene	6.32074	5.00000	1.23958	0.500	26.41483	20.00000	Quadratic	<-
79 Dibenzo(a,h)anthracene	6.52311	5.00000	1.00184	0.400	30.46223	20.00000	Quadratic	<-
80 Benzo(g,h,i)perylene	0.74846	0.97758	0.97758	0.500	30.61294	20.00000	Averaged	<-
105 1-methylnaphthalene	0.55159	0.58695	0.58695	0.010	6.41015	20.00000	Averaged	
187 Total Benzofluoranthenes	0.94535	1.00637	1.00637	0.010	6.45522	20.00000	Averaged	
98 Retene	++++	0.00018	0.00018	0.010	++++	20.00000	Averaged	<-
120 2,3,4,6-Tetrachlorophenol	0.24889	0.28706	0.28706	0.010	15.33455	20.00000	Averaged	

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by Selected Ion Monitoring GC/MS **Sample ID: MB-121013**
Extraction Method: SW3546 **METHOD BLANK**

Lab Sample ID: MB-121013
LIMS ID: 13-26908
Matrix: Sediment
Data Release Authorized:
Reported: 12/20/13

QC Report No: XQ70-Maul Foster & Alongi
Project: GHHSA
Event: 0863.01.01
Date Sampled: NA
Date Received: NA

Date Extracted: 12/10/13
Date Analyzed: 12/16/13 22:31
Instrument/Analyst: NT14/YZ
GPC Cleanup: Yes
Silica Gel Cleanup: No
Alumina Cleanup: No

Sample Amount: 10.00 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Percent Moisture: NA

CAS Number	Analyte	LOQ	Result
53-70-3	Dibenz(a,h)anthracene	5.0	< 5.0 U
106-46-7	1,4-Dichlorobenzene	5.0	< 5.0 U
120-82-1	1,2,4-Trichlorobenzene	5.0	< 5.0 U
118-74-1	Hexachlorobenzene	5.0	< 5.0 U
87-68-3	Hexachlorobutadiene	5.0	< 5.0 U
131-11-3	Dimethylphthalate	5.0	< 5.0 U
85-68-7	Butylbenzylphthalate	5.0	< 5.0 U
95-48-7	2-Methylphenol	5.0	< 5.0 U
105-67-9	2,4-Dimethylphenol	25	< 25 U
86-30-6	N-Nitrosodiphenylamine	5.0	< 5.0 U
100-51-6	Benzyl Alcohol	20	< 20 U
87-86-5	Pentachlorophenol	20	< 20 U
95-50-1	1,2-Dichlorobenzene	5.0	< 5.0 U
541-73-1	1,3-Dichlorobenzene	5.0	< 5.0 U

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

2-Fluorophenol	73.6%
d14-p-Terphenyl	93.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by Selected Ion Monitoring GC/MS **Sample ID: CR04-10cm**
Extraction Method: SW3546 **SAMPLE**

Lab Sample ID: XQ70A
LIMS ID: 13-26908
Matrix: Sediment
Data Release Authorized: TMM
Reported: 12/20/13

QC Report No: XQ70-Maul Foster & Alongi
Project: GHHSA
Event: 0863.01.01
Date Sampled: 11/07/13
Date Received: 11/08/13

Date Extracted: 12/10/13
Date Analyzed: 12/19/13 14:35
Instrument/Analyst: NT14/YZ
GPC Cleanup: Yes
Silica Gel Cleanup: No
Alumina Cleanup: No

Sample Amount: 2.37 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 5.00
Percent Moisture: 80.3%

CAS Number	Analyte	LOQ	Result
53-70-3	**Dibenz(a,h)anthracene**	**100**	**120 Q**
106-46-7	1,4-Dichlorobenzene	100	< 100 U
120-82-1	1,2,4-Trichlorobenzene	100	< 100 U
118-74-1	Hexachlorobenzene	100	< 100 U
87-68-3	Hexachlorobutadiene	100	< 100 U
131-11-3	Dimethylphthalate	100	< 100 U
85-68-7	Butylbenzylphthalate	100	< 100 U
95-48-7	2-Methylphenol	100	< 100 U
105-67-9	2,4-Dimethylphenol	530	< 530 U
86-30-6	N-Nitrosodiphenylamine	100	< 100 U
100-51-6	Benzyl Alcohol	420	< 420 U
87-86-5	**Pentachlorophenol**	**420**	**270 J**
95-50-1	1,2-Dichlorobenzene	100	< 100 U
541-73-1	1,3-Dichlorobenzene	100	< 100 U

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

2-Fluorophenol	72.0%
d14-p-Terphenyl	95.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by Selected Ion Monitoring GC/MS **Sample ID: CR05-10cm**
Extraction Method: SW3546 **SAMPLE**

Lab Sample ID: XQ70B
LIMS ID: 13-26909
Matrix: Sediment
Data Release Authorized: MW
Reported: 12/20/13

QC Report No: XQ70-Maul Foster & Alongi
Project: GHHSA
Event: 0863.01.01
Date Sampled: 11/08/13
Date Received: 11/08/13

Date Extracted: 12/10/13
Date Analyzed: 12/19/13 15:10
Instrument/Analyst: NT14/YZ
GPC Cleanup: Yes
Silica Gel Cleanup: No
Alumina Cleanup: No

Sample Amount: 4.31 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 5.00
Percent Moisture: 73.1%

CAS Number	Analyte	LOQ	Result
53-70-3	**Dibenz(a,h)anthracene**	**58**	**94 Q**
106-46-7	**1,4-Dichlorobenzene**	**58**	**1,000**
120-82-1	**1,2,4-Trichlorobenzene**	**58**	**43 J**
118-74-1	Hexachlorobenzene	58	< 58 U
87-68-3	Hexachlorobutadiene	58	< 58 U
131-11-3	Dimethylphthalate	58	< 58 U
85-68-7	Butylbenzylphthalate	58	< 58 U
95-48-7	**2-Methylphenol**	**58**	**44 J**
105-67-9	2,4-Dimethylphenol	290	< 290 U
86-30-6	N-Nitrosodiphenylamine	58	< 58 U
100-51-6	Benzyl Alcohol	230	< 230 U
87-86-5	Pentachlorophenol	230	< 230 U
95-50-1	1,2-Dichlorobenzene	58	< 58 U
541-73-1	**1,3-Dichlorobenzene**	**58**	**620**

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

2-Fluorophenol	66.0%
d14-p-Terphenyl	96.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by Selected Ion Monitoring GC/MS **Sample ID: CR05-2.5**
Extraction Method: SW3546 **SAMPLE**

Lab Sample ID: XQ70C
LIMS ID: 13-26910
Matrix: Sediment
Data Release Authorized:
Reported: 12/20/13

QC Report No: XQ70-Maul Foster & Alongi
Project: GHHSA
Event: 0863.01.01
Date Sampled: 11/08/13
Date Received: 11/08/13

Date Extracted: 12/10/13
Date Analyzed: 12/19/13 15:44
Instrument/Analyst: NT14/YZ
GPC Cleanup: Yes
Silica Gel Cleanup: No
Alumina Cleanup: No

Sample Amount: 2.85 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 5.00
Percent Moisture: 74.2%

CAS Number	Analyte	LOQ	Result
53-70-3	**Dibenz(a,h)anthracene**	**88**	**190 Q**
106-46-7	**1,4-Dichlorobenzene**	**88**	**540**
120-82-1	**1,2,4-Trichlorobenzene**	**88**	**74 J**
118-74-1	Hexachlorobenzene	88	< 88 U
87-68-3	Hexachlorobutadiene	88	< 88 U
131-11-3	Dimethylphthalate	88	< 88 U
85-68-7	Butylbenzylphthalate	88	< 88 U
95-48-7	2-Methylphenol	88	< 88 U
105-67-9	2,4-Dimethylphenol	440	< 440 U
86-30-6	N-Nitrosodiphenylamine	88	< 88 U
100-51-6	Benzyl Alcohol	350	< 350 U
87-86-5	Pentachlorophenol	350	< 350 U
95-50-1	1,2-Dichlorobenzene	88	< 88 U
541-73-1	**1,3-Dichlorobenzene**	**88**	**280**

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

2-Fluorophenol	66.0%
d14-p-Terphenyl	92.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by Selected Ion Monitoring GC/MS **Sample ID: CR04-2.5**
Extraction Method: SW3546 **SAMPLE**

Lab Sample ID: XQ70D
LIMS ID: 13-26911
Matrix: Sediment
Data Release Authorized: MW
Reported: 12/20/13

QC Report No: XQ70-Maul Foster & Alongi
Project: GHHSA
Event: 0863.01.01
Date Sampled: 11/08/13
Date Received: 11/08/13

Date Extracted: 12/10/13
Date Analyzed: 12/19/13 16:18
Instrument/Analyst: NT14/YZ
GPC Cleanup: Yes
Silica Gel Cleanup: No
Alumina Cleanup: No

Sample Amount: 3.10 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 5.00
Percent Moisture: 82.8%

CAS Number	Analyte	LOQ	Result
53-70-3	**Dibenz(a,h)anthracene**	**81**	**360 Q**
106-46-7	1,4-Dichlorobenzene	81	< 81 U
120-82-1	1,2,4-Trichlorobenzene	81	< 81 U
118-74-1	Hexachlorobenzene	81	< 81 U
87-68-3	Hexachlorobutadiene	81	< 81 U
131-11-3	Dimethylphthalate	81	< 81 U
85-68-7	Butylbenzylphthalate	81	< 81 U
95-48-7	2-Methylphenol	81	< 81 U
105-67-9	2,4-Dimethylphenol	400	< 400 U
86-30-6	N-Nitrosodiphenylamine	81	< 81 U
100-51-6	Benzyl Alcohol	320	< 320 U
87-86-5	**Pentachlorophenol**	**320**	**400**
95-50-1	1,2-Dichlorobenzene	81	< 81 U
541-73-1	1,3-Dichlorobenzene	81	< 81 U

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery	
2-Fluorophenol	66.7%
d14-p-Terphenyl	88.0%

ANALYTICAL RESOURCES INCORPORATED

SIM SW8270 SURROGATE RECOVERY SUMMARY

Matrix: Sediment

QC Report No: XQ70-Maul Foster & Alongi
Project: GHHSA
0863.01.01

Client ID	FPH	TER	TOT OUT
MB-121013	73.6%	93.0%	0
LCS-121013	67.3%	85.0%	0
CR04-10cm	72.0%	95.0%	0
CR05-10cm	66.0%	96.0%	0
CR05-2.5	66.0%	92.0%	0
CR04-2.5	66.7%	88.0%	0

	LCS/MB LIMITS	QC LIMITS
(FPH) = 2-Fluorophenol	(32-120)	(27-120)
(TER) = d14-p-Terphenyl	(42-124)	(37-120)

Prep Method: SW3546
Log Number Range: 13-26908 to 13-26911

FORM-II SIM SW8270

XQ70 : 00091

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by Selected Ion Monitoring GC/MS **Sample ID: LCS-121013**
Page 1 of 1 **LAB CONTROL SAMPLE**

Lab Sample ID: LCS-121013
LIMS ID: 13-26908
Matrix: Sediment
Data Release Authorized:
Reported: 12/20/13

QC Report No: XQ70-Maul Foster & Alongi
Project: GHHSA
Event: 0863.01.01
Date Sampled: NA
Date Received: NA

Date Extracted: 12/10/13
Date Analyzed LCS: 12/16/13 23:05
Instrument/Analyst LCS: NT14/YZ

Sample Amount LCS: 10.00 g-dry-wt
Final Extract Volume LCS: 1.0 mL
Dilution Factor LCS: 1.00

Analyte	LCS	Spike Added	Recovery
Dibenz(a,h)anthracene	277 Q	500	55.4%
1,4-Dichlorobenzene	321	500	64.2%
1,2,4-Trichlorobenzene	324	500	64.8%
Hexachlorobenzene	397	500	79.4%
Hexachlorobutadiene	311	500	62.2%
Dimethylphthalate	431	500	86.2%
Butylbenzylphthalate	497 Q	500	99.4%
2-Methylphenol	351	500	70.2%
2,4-Dimethylphenol	1030	1500	68.7%
N-Nitrosodiphenylamine	539	500	108%
Benzyl Alcohol	472	500	94.4%
Pentachlorophenol	1060	1500	70.7%
1,2-Dichlorobenzene	327	500	65.4%
1,3-Dichlorobenzene	325	500	65.0%

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

2-Fluorophenol	67.3%
d14-p-Terphenyl	85.0%

Analytical Resources, Inc.

CONTINUING CALIBRATION COMPOUNDS

Instrument ID: nt14.i Injection Date: 16-DEC-2013 15:10
Lab File ID: cc1216a.d Init. Cal. Date(s): 11-DEC-2013 11-DEC-2013
Analysis Type: Init. Cal. Times: 13:42 18:15
Lab Sample ID: CC1216A Quant Type: ISTD
Method: /chem3/nt14.i/20131216.b/SIM.b/SIMABN2.m

COMPOUND	RRF / AMOUNT	RF1	CCAL RRF1	MIN RRF	%D / %DRIFT	MAX %D / %DRIFT	CURVE TYPE	
$ 1 2-Fluorophenol	1.15354	1.35715	1.35715	0.010	17.65056	20.00000	Averaged	
3 Phenol	1.64342	2.01076	2.01076	0.010	22.35191	20.00000	Averaged	<-
7 1,3-Dichlorobenzene	1.48921	1.36005	1.36005	0.010	-8.67321	20.00000	Averaged	
9 1,4-Dichlorobenzene	1.53576	1.39881	1.39881	0.010	-8.91741	20.00000	Averaged	
11 Benzyl alcohol	0.73455	0.69021	0.69021	0.010	-6.03607	20.00000	Averaged	
12 1,2-Dichlorobenzene	1.44417	1.35069	1.35069	0.010	-6.47300	20.00000	Averaged	
13 2-Methylphenol	1.16447	1.32247	1.32247	0.010	13.56828	20.00000	Averaged	
15 4-Methylphenol	1.17598	1.42684	1.42684	0.010	21.33128	20.00000	Averaged	<-
16 N-Nitroso-di-n-propylamine	0.67964	0.81381	0.81381	0.050	19.74181	20.00000	Averaged	
22 2,4-Dimethylphenol	0.31095	0.36393	0.36393	0.010	17.03836	20.00000	Averaged	
26 1,2,4-Trichlorobenzene	0.32381	0.31910	0.31910	0.010	-1.45706	20.00000	Averaged	
30 Hexachlorobutadiene	0.18925	0.18577	0.18577	0.010	-1.83458	20.00000	Averaged	
39 Dimethylphthalate	1.08013	1.09660	1.09660	0.010	1.52449	20.00000	Averaged	
50 Diethylphthalate	1.08190	1.20458	1.20458	0.010	11.33938	20.00000	Averaged	
54 N-Nitrosodiphenylamine	0.44728	0.41444	0.41444	0.010	-7.34177	20.00000	Averaged	
57 Hexachlorobenzene	0.23567	0.20797	0.20797	0.010	-11.75525	20.00000	Averaged	
58 Pentachlorophenol	1.96223	2.00000	0.13704	0.005	-1.88854	20.00000	Quadratic	
$ 66 Terphenyl-d14	0.33250	0.37945	0.37945	0.010	14.12095	20.00000	Averaged	
67 Butylbenzylphthalate	1.50861	1.00000	0.44448	0.010	50.86076	20.00000	Quadratic	<-
79 Dibenzo(a,h)anthracene	1.28459	1.00000	0.85513	0.010	28.45890	20.00000	Quadratic	<-
90 N-Nitrosodimethylamine	0.71021	0.74780	0.74780	0.010	5.29331	20.00000	Averaged	

Analytical Resources, Inc.

CONTINUING CALIBRATION COMPOUNDS

Instrument ID: nt14.i Injection Date: 19-DEC-2013 13:54
Lab File ID: cc1219a.d Init. Cal. Date(s): 11-DEC-2013 11-DEC-2013
Analysis Type: Init. Cal. Times: 13:42 18:15
Lab Sample ID: CC1219A Quant Type: ISTD
Method: /chem3/nt14.i/20131219.b/SIM.b/SIMABN2.m

COMPOUND	RRF / AMOUNT	RF1	CCAL RRF1	MIN RRF	%D / %DRIFT	MAX %D / %DRIFT	CURVE TYPE	
$ 1 2-Fluorophenol	1.15354	1.24037	1.24037	0.010	7.52656	20.00000	Averaged	
3 Phenol	1.64342	2.06332	2.06332	0.010	25.55060	20.00000	Averaged	<-
7 1,3-Dichlorobenzene	1.48921	1.38703	1.38703	0.010	-6.86159	20.00000	Averaged	
9 1,4-Dichlorobenzene	1.53576	1.41163	1.41163	0.010	-8.08209	20.00000	Averaged	
11 Benzyl alcohol	0.73455	0.59642	0.59642	0.010	-18.80423	20.00000	Averaged	
12 1,2-Dichlorobenzene	1.44417	1.34299	1.34299	0.010	-7.00601	20.00000	Averaged	
13 2-Methylphenol	1.16447	1.37427	1.37427	0.010	18.01630	20.00000	Averaged	
15 4-Methylphenol	1.17598	1.41000	1.41000	0.010	19.89964	20.00000	Averaged	
16 N-Nitroso-di-n-propylamine	0.67964	0.78820	0.78820	0.050	15.97388	20.00000	Averaged	
22 2,4-Dimethylphenol	0.31095	0.33793	0.33793	0.010	8.67849	20.00000	Averaged	
26 1,2,4-Trichlorobenzene	0.32381	0.29286	0.29286	0.010	-9.55764	20.00000	Averaged	
30 Hexachlorobutadiene	0.18925	0.17622	0.17622	0.010	-6.88463	20.00000	Averaged	
39 Dimethylphthalate	1.08013	1.09935	1.09935	0.010	1.77956	20.00000	Averaged	
50 Diethylphthalate	1.08190	1.18151	1.18151	0.010	9.20739	20.00000	Averaged	
54 N-Nitrosodiphenylamine	0.44728	0.47933	0.47933	0.010	7.16631	20.00000	Averaged	
57 Hexachlorobenzene	0.23567	0.21436	0.21436	0.010	-9.04196	20.00000	Averaged	
58 Pentachlorophenol	1.87741	2.00000	0.13089	0.005	-6.12946	20.00000	Quadratic	
$ 66 Terphenyl-d14	0.33250	0.37094	0.37094	0.010	11.56153	20.00000	Averaged	
67 Butylbenzylphthalate	1.39203	1.00000	0.40762	0.010	39.20322	20.00000	Quadratic	<-
79 Dibenzo(a,h)anthracene	1.42897	1.00000	0.95782	0.010	42.89718	20.00000	Quadratic	<-
90 N-Nitrosodimethylamine	0.71021	0.81237	0.81237	0.010	14.38476	20.00000	Averaged	

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Dioxins/Furans by EPA 1613B **Sample ID: MB-121013**

Lab Sample ID: MB-121013
LIMS ID: 13-26910
Matrix: Sediment
Data Release Authorized:
Reported: 12/17/13

QC Report No: XQ70-Maul Foster & Alongi
Project: GHHSA
0863.01.01
Date Sampled: NA
Date Received: NA

Date Extracted: 12/10/13
Date Analyzed: 12/16/13 20:08
Instrument/Analyst: AS1/PK
Acid Cleanup: Yes
Silica-Carbon Cleanup: No

Sample Amount: 10.0 g-dry-wt
Final Extract Volume: 20 uL
Dilution Factor: 1.00
Silica-Florisil Cleanup: Yes

Analyte	Ion Ratio	Ratio Limits	EDL	RL	Result	
2,3,7,8-TCDF		0.65-0.89	0.0320	1.00	< 0.0320	U
2,3,7,8-TCDD	0.11	0.65-0.89		1.00	0.162	JEMPC
1,2,3,7,8-PeCDF		1.32-1.78	0.0340	1.00	< 0.0340	U
2,3,4,7,8-PeCDF		1.32-1.78	0.0420	1.00	< 0.0420	U
1,2,3,7,8-PeCDD	0.80	1.32-1.78		1.00	0.0460	JEMPC
1,2,3,4,7,8-HxCDF		1.05-1.43	0.0360	1.00	< 0.0360	U
1,2,3,6,7,8-HxCDF		1.05-1.43	0.0320	1.00	< 0.0320	U
2,3,4,6,7,8-HxCDF		1.05-1.43	0.0380	1.00	< 0.0380	U
1,2,3,7,8,9-HxCDF		1.05-1.43	0.0520	1.00	< 0.0520	U
1,2,3,4,7,8-HxCDD	1.93	1.05-1.43		1.00	0.0620	JEMPC
1,2,3,6,7,8-HxCDD		1.05-1.43	0.0740	1.00	< 0.0740	U
1,2,3,7,8,9-HxCDD	1.07	1.05-1.43		1.00	0.104	J
1,2,3,4,6,7,8-HpCDF		0.88-1.20	0.0900	1.00	< 0.0900	U
1,2,3,4,7,8,9-HpCDF		0.88-1.20	0.144	1.00	< 0.144	U
1,2,3,4,6,7,8-HpCDD	1.17	0.88-1.20		1.00	1.44	
OCDF		0.76-1.02	0.0780	2.00	< 0.0780	U
OCDD	0.84	0.76-1.02		2.00	8.80	

Homologue Group	EDL	RL	Result	
Total TCDF	0.0320	1.00	< 0.0320	U
Total TCDD		1.00	0.305	EMPC
Total PeCDF	0.0420	2.00	< 0.0420	U
Total PeCDD		1.00	0.113	EMPC
Total HxCDF	0.0520	2.00	< 0.0520	U
Total HxCDD		2.00	1.48	EMPC
Total HpCDF	0.144	2.00	< 0.144	U
Total HpCDD		2.00	3.95	

Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, Including EMPC): 0.24

Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, Including EMPC): 0.26

Reported in pg/g

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Dioxins/Furans by EPA 1613B **Sample ID: MB-121013**

Lab Sample ID: MB-121013
LIMS ID: 13-26910
Matrix: Sediment
Data Release Authorized: MW
Reported: 12/17/13

QC Report No: XQ70-Maul Foster & Alongi
Project: GHHSA
0863.01.01
Date Sampled: NA
Date Received: NA

Date Extracted: 12/10/13
Date Analyzed: 12/16/13 20:08
Instrument/Analyst: AS1/PK

Sample Amount: 10.0 g-dry-wt
Final Extract Volume: 20 uL
Dilution Factor: 1.00

Analyte	Ion Ratio	Ratio Limits	Result	Limits	Exceedance
13C-2,3,7,8-TCDF	0.77	0.65-0.89	88.8	24-169	
13C-2,3,7,8-TCDD	0.79	0.65-0.89	90.4	25-164	
13C-1,2,3,7,8-PeCDF	1.58	1.32-1.78	97.4	24-185	
13C-2,3,4,7,8-PeCDF	1.58	1.32-1.78	74.6	21-178	
13C-1,2,3,7,8-PeCDD	1.59	1.32-1.78	88.6	25-181	
13C-1,2,3,4,7,8-HxCDF	0.51	0.43-0.59	77.0	26-152	
13C-1,2,3,6,7,8-HxCDF	0.52	0.43-0.59	81.9	26-123	
13C-2,3,4,6,7,8-HxCDF	0.52	0.43-0.59	76.8	28-136	
13C-1,2,3,7,8,9-HxCDF	0.52	0.43-0.59	69.4	29-147	
13C-1,2,3,4,7,8-HxCDD	1.26	1.05-1.43	92.8	32-141	
13C-1,2,3,6,7,8-HxCDD	1.24	1.05-1.43	85.8	28-130	
13C-1,2,3,4,6,7,8-HpCDF	0.45	0.37-0.51	69.0	28-143	
13C-1,2,3,4,7,8,9-HpCDF	0.44	0.37-0.51	71.8	26-138	
13C-1,2,3,4,6,7,8-HpCDD	1.05	0.88-1.20	93.6	23-140	
13C-OCDD	0.88	0.76-1.02	79.3	17-157	
37Cl4-2,3,7,8-TCDD			95.2	35-197	

Reported in Percent Recovery

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Dioxins/Furans by EPA 1613B **Sample ID: OPR-121013**

Lab Sample ID: OPR-121013
LIMS ID: 13-26910
Matrix: Sediment
Data Release Authorized:
Reported: 12/17/13

QC Report No: XQ70-Maul Foster & Alongi
Project: GHHSA
0863.01.01
Date Sampled: NA
Date Received: NA

Date Extracted: 12/10/13
Date Analyzed: 12/16/13 21:01
Instrument/Analyst: AS1/PK
Acid Cleanup: Yes
Silica-Carbon Cleanup: No

Sample Amount: 10.0 g-dry-wt
Final Extract Volume: 20 uL
Dilution Factor: 1.00
Silica-Florisil Cleanup: Yes

Analyte	Ion Ratio	Ratio Limits	RL	Result
2,3,7,8-TCDF	0.67	0.65-0.89	1.00	24.0
2,3,7,8-TCDD	0.77	0.65-0.89	1.00	22.3
1,2,3,7,8-PeCDF	1.44	1.32-1.78	1.00	116
2,3,4,7,8-PeCDF	1.44	1.32-1.78	1.00	112
1,2,3,7,8-PeCDD	1.54	1.32-1.78	1.00	110
1,2,3,4,7,8-HxCDF	1.15	1.05-1.43	1.00	111
1,2,3,6,7,8-HxCDF	1.16	1.05-1.43	1.00	113
2,3,4,6,7,8-HxCDF	1.17	1.05-1.43	1.00	114
1,2,3,7,8,9-HxCDF	1.16	1.05-1.43	1.00	111
1,2,3,4,7,8-HxCDD	1.27	1.05-1.43	1.00	113
1,2,3,6,7,8-HxCDD	1.25	1.05-1.43	1.00	111
1,2,3,7,8,9-HxCDD	1.25	1.05-1.43	1.00	117
1,2,3,4,6,7,8-HpCDF	0.98	0.88-1.20	1.00	155
1,2,3,4,7,8,9-HpCDF	0.98	0.88-1.20	1.00	111
1,2,3,4,6,7,8-HpCDD	1.04	0.88-1.20	1.00	113
OCDF	0.83	0.76-1.02	2.00	179
OCDD	0.90	0.76-1.02	2.00	236

Homologue Group	EDL	RL	Result	
Total TCDF		1.00	29.9	EMPC
Total TCDD		1.00	23.2	EMPC
Total PeCDF		2.00	247	EMPC
Total PeCDD		1.00	112	EMPC
Total HxCDF		2.00	455	EMPC
Total HxCDD		2.00	343	EMPC
Total HpCDF		2.00	267	EMPC
Total HpCDD		2.00	117	

Reported in pg/g

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Dioxins/Furans by EPA 1613B **Sample ID: OPR-121013**

Lab Sample ID: OPR-121013
LIMS ID: 13-26910
Matrix: Sediment
Data Release Authorized: MW
Reported: 12/17/13

QC Report No: XQ70-Maul Foster & Alongi
Project: GHHSA
0863.01.01
Date Sampled: NA
Date Received: NA

Date Extracted: 12/10/13
Date Analyzed: 12/16/13 21:01
Instrument/Analyst: AS1/PK

Sample Amount: 10.0 g-dry-wt
Final Extract Volume: 20 uL
Dilution Factor: 1.00

Analyte	Ion Ratio	Ratio Limits	Result	Limits	Exceedance
13C-2,3,7,8-TCDF	0.78	0.65-0.89	86.7	22-152	
13C-2,3,7,8-TCDD	0.79	0.65-0.89	86.8	20-175	
13C-1,2,3,7,8-PeCDF	1.59	1.32-1.78	98.4	21-192	
13C-2,3,4,7,8-PeCDF	1.57	1.32-1.78	81.7	13-328	
13C-1,2,3,7,8-PeCDD	1.57	1.32-1.78	104	21-227	
13C-1,2,3,4,7,8-HxCDF	0.52	0.43-0.59	75.8	19-202	
13C-1,2,3,6,7,8-HxCDF	0.52	0.43-0.59	82.2	21-159	
13C-2,3,4,6,7,8-HxCDF	0.53	0.43-0.59	76.2	22-176	
13C-1,2,3,7,8,9-HxCDF	0.51	0.43-0.59	71.6	17-205	
13C-1,2,3,4,7,8-HxCDD	1.26	1.05-1.43	93.2	21-193	
13C-1,2,3,6,7,8-HxCDD	1.25	1.05-1.43	85.8	25-163	
13C-1,2,3,4,6,7,8-HpCDF	0.45	0.37-0.51	69.4	21-158	
13C-1,2,3,4,7,8,9-HpCDF	0.45	0.37-0.51	96.4	20-186	
13C-1,2,3,4,6,7,8-HpCDD	1.04	0.88-1.20	94.5	26-166	
13C-OCDD	0.88	0.76-1.02	81.4	13-198	
37Cl4-2,3,7,8-TCDD			90.1	31-191	

Reported in Percent Recovery

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Dioxins/Furans by EPA 1613B **Sample ID: OPR-121013**
Page 1 of 1

Lab Sample ID: OPR-121013
LIMS ID: 13-26910
Matrix: Sediment
Data Release Authorized: MW
Reported: 12/17/13

QC Report No: XQ70-Maul Foster & Alongi
Project: GHHSA
0863.01.01
Date Sampled: NA
Date Received: NA

Date Extracted: 12/10/13
Date Analyzed: 12/16/13 21:01
Instrument/Analyst: AS1/PK

Sample Amount: 10.0 g-dry-wt
Final Extract Volume: 20 uL
Dilution Factor: 1.00

Analyte	OPR	Spiked	Recovery	Limits
2,3,7,8-TCDF	24.0	20.0	120	75-158
2,3,7,8-TCDD	22.3	20.0	112	67-158
1,2,3,7,8-PeCDF	116	100	116	80-134
2,3,4,7,8-PeCDF	112	100	112	68-160
1,2,3,7,8-PeCDD	110	100	110	70-142
1,2,3,4,7,8-HxCDF	111	100	111	72-134
1,2,3,6,7,8-HxCDF	113	100	113	84-130
2,3,4,6,7,8-HxCDF	114	100	114	70-156
1,2,3,7,8,9-HxCDF	111	100	111	78-130
1,2,3,4,7,8-HxCDD	113	100	113	70-164
1,2,3,6,7,8-HxCDD	111	100	111	76-134
1,2,3,7,8,9-HxCDD	117	100	117	64-162
1,2,3,4,6,7,8-HpCDF	155	100	155	82-132
1,2,3,4,7,8,9-HpCDF	111	100	111	78-138
1,2,3,4,6,7,8-HpCDD	113	100	113	70-140
OCDF	179	200	89.5	63-170
OCDD	236	200	118	78-144

Reported in pg/g

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Dioxins/Furans by EPA 1613B **Sample ID: CR05-2.5**

Lab Sample ID: XQ70C
LIMS ID: 13-26910
Matrix: Sediment
Data Release Authorized:
Reported: 12/17/13

QC Report No: XQ70-Maul Foster & Alongi
Project: GHHSA
0863.01.01
Date Sampled: 11/08/13
Date Received: 11/08/13

Date Extracted: 12/10/13
Date Analyzed: 12/16/13 12:49
Instrument/Analyst: AS1/PK
Acid Cleanup: Yes
Silica-Carbon Cleanup: No

Sample Amount: 10.2 g-dry-wt
Final Extract Volume: 20 uL
Dilution Factor: 1.00
Silica-Florisil Cleanup: Yes

Analyte	Ion Ratio	Ratio Limits	EDL	RL	Result		
2,3,7,8-TCDF	0.69	0.65-0.89		0.984	54.3		
2,3,7,8-TCDD	0.77	0.65-0.89		0.984	5.26		
1,2,3,7,8-PeCDF	1.43	1.32-1.78		0.984	41.4		
2,3,4,7,8-PeCDF	1.48	1.32-1.78		0.984	43.5		
1,2,3,7,8-PeCDD	1.53	1.32-1.78		0.984	34.1		
1,2,3,4,7,8-HxCDF	1.19	1.05-1.43		0.984	115		
1,2,3,6,7,8-HxCDF	1.16	1.05-1.43		0.984	51.7		
2,3,4,6,7,8-HxCDF	1.22	1.05-1.43		0.984	69.3		
1,2,3,7,8,9-HxCDF	1.15	1.05-1.43		0.984	62.9		
1,2,3,4,7,8-HxCDD	1.39	1.05-1.43		0.984	24.5		
1,2,3,6,7,8-HxCDD	1.24	1.05-1.43		0.984	1,020		
1,2,3,7,8,9-HxCDD	1.24	1.05-1.43		0.984	98.1		
1,2,3,4,6,7,8-HpCDF	1.00	0.88-1.20		0.984	1,170		
1,2,3,4,7,8,9-HpCDF	0.99	0.88-1.20		0.984	81.3		
1,2,3,4,6,7,8-HpCDD	1.03	0.88-1.20		9.84	12,200		#
OCDF	0.84	0.76-1.02		1.97	3,100		
OCDD	0.89	0.76-1.02		19.7	68,300	E	#

Homologue Group	EDL	RL	Result	
Total TCDF		0.984	558	EMPC
Total TCDD		0.984	180	
Total PeCDF		1.97	2,660	EMPC
Total PeCDD		0.984	862	EMPC
Total HxCDF		1.97	6,030	EMPC
Total HxCDD		1.97	4,840	
Total HpCDF		1.97	5,060	EMPC
Total HpCDD		1.97	21,300	

Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, Including EMPC): 359

Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, Including EMPC): 359

#-Result from diluted secondary analysis.

Reported in pg/g

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Dioxins/Furans by EPA 1613B **Sample ID: CR05-2.5**

Lab Sample ID: XQ70C
LIMS ID: 13-26910
Matrix: Sediment
Data Release Authorized:
Reported: 12/17/13

QC Report No: XQ70-Maul Foster & Alongi
Project: GHHSA
0863.01.01
Date Sampled: 11/08/13
Date Received: 11/08/13

Date Extracted: 12/10/13
Date Analyzed: 12/16/13 12:49
Instrument/Analyst: AS1/PK

Sample Amount: 10.2 g-dry-wt
Final Extract Volume: 20 uL
Dilution Factor: 1.00

Analyte	Ion Ratio	Ratio Limits	Result	Limits	Exceedance
13C-2,3,7,8-TCDF	0.78	0.65-0.89	70.7	24-169	
13C-2,3,7,8-TCDD	0.79	0.65-0.89	79.7	25-164	
13C-1,2,3,7,8-PeCDF	1.58	1.32-1.78	85.6	24-185	
13C-2,3,4,7,8-PeCDF	1.57	1.32-1.78	84.0	21-178	
13C-1,2,3,7,8-PeCDD	1.58	1.32-1.78	89.2	25-181	
13C-1,2,3,4,7,8-HxCDF	0.52	0.43-0.59	84.4	26-152	
13C-1,2,3,6,7,8-HxCDF	0.51	0.43-0.59	75.8	26-123	
13C-2,3,4,6,7,8-HxCDF	0.52	0.43-0.59	80.4	28-136	
13C-1,2,3,7,8,9-HxCDF	0.53	0.43-0.59	88.5	29-147	
13C-1,2,3,4,7,8-HxCDD	1.27	1.05-1.43	87.3	32-141	
13C-1,2,3,6,7,8-HxCDD	1.25	1.05-1.43	78.6	28-130	
13C-1,2,3,4,6,7,8-HpCDF	0.49	0.37-0.51	128	28-143	
13C-1,2,3,4,7,8,9-HpCDF	0.45	0.37-0.51	91.4	26-138	
13C-1,2,3,4,6,7,8-HpCDD	1.05	0.88-1.20	86.9	23-140	
13C-OCDD	0.91	0.76-1.02	80.3	17-157	
37Cl4-2,3,7,8-TCDD			83.8	35-197	

Reported in Percent Recovery

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Dioxins/Furans by EPA 1613B
Page 1 of 1

Sample ID: CR05-2.5
DILUTION

Lab Sample ID: XQ70C
LIMS ID: 13-26910
Matrix: Sediment
Data Release Authorized:
Reported: 12/17/13

QC Report No: XQ70-Maul Foster & Alongi
Project: GHHSA
0863.01.01
Date Sampled: 11/08/13
Date Received: 11/08/13

Date Extracted: 12/10/13
Date Analyzed: 12/17/13 04:24
Instrument/Analyst: AS1/PK

Sample Amount: 10.2 g-dry-wt
Final Extract Volume: 20 uL
Dilution Factor: 10.0

Analyte	Ion Ratio	Ratio Limits	Result	Limits	Exceedance
13C-1,2,3,4,6,7,8-HpCDD	1.09	0.88-1.20	110	23-140	
13C-OCDD	0.90	0.76-1.02	109	17-157	
37Cl4-2,3,7,8-TCDD			94.7	35-197	

Reported in Percent Recovery

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Dioxins/Furans by EPA 1613B **Sample ID: CR04-2.5**
Page 1 of 1

Lab Sample ID: XQ70D
LIMS ID: 13-26911
Matrix: Sediment
Data Release Authorized: MW
Reported: 12/17/13

QC Report No: XQ70-Maul Foster & Alongi
Project: GHHSA
0863.01.01
Date Sampled: 11/08/13
Date Received: 11/08/13

Date Extracted: 12/10/13
Date Analyzed: 12/16/13 13:43
Instrument/Analyst: AS1/PK
Acid Cleanup: Yes
Silica-Carbon Cleanup: No

Sample Amount: 11.9 g-dry-wt
Final Extract Volume: 20 uL
Dilution Factor: 1.00
Silica-Florisil Cleanup: Yes

Analyte	Ion Ratio	Ratio Limits	EDL	RL	Result		
2,3,7,8-TCDF	0.71	0.65-0.89		0.842	16.0		
2,3,7,8-TCDD	0.77	0.65-0.89		0.842	3.97		
1,2,3,7,8-PeCDF	1.50	1.32-1.78		0.842	12.4		
2,3,4,7,8-PeCDF	1.49	1.32-1.78		0.842	15.7		
1,2,3,7,8-PeCDD	1.54	1.32-1.78		0.842	18.8		
1,2,3,4,7,8-HxCDF	1.14	1.05-1.43		0.842	35.9		
1,2,3,6,7,8-HxCDF	1.18	1.05-1.43		0.842	18.9		
2,3,4,6,7,8-HxCDF	1.35	1.05-1.43		0.842	22.2		
1,2,3,7,8,9-HxCDF	1.18	1.05-1.43		0.842	14.6		
1,2,3,4,7,8-HxCDD	1.17	1.05-1.43		0.842	32.5		
1,2,3,6,7,8-HxCDD	1.23	1.05-1.43		0.842	350		
1,2,3,7,8,9-HxCDD	1.24	1.05-1.43		0.842	48.1		
1,2,3,4,6,7,8-HpCDF	0.99	0.88-1.20		0.842	919		
1,2,3,4,7,8,9-HpCDF	0.95	0.88-1.20		0.842	42.8		
1,2,3,4,6,7,8-HpCDD	1.03	0.88-1.20		4.21	4,070		#
OCDF	0.83	0.76-1.02		1.68	1,900		
OCDD	0.89	0.76-1.02		8.42	23,500	E	#

Homologue Group	EDL	RL	Result	
Total TCDF		0.842	119	EMPC
Total TCDD		0.842	32.6	EMPC
Total PeCDF		1.68	658	EMPC
Total PeCDD		0.842	133	EMPC
Total HxCDF		1.68	2,130	
Total HxCDD		1.68	1,540	EMPC
Total HpCDF		1.68	3,910	
Total HpCDD		1.68	7,520	

Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, Including EMPC): 140

Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, Including EMPC): 140

#-Result from diluted secondary analysis.

Reported in pg/g

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Dioxins/Furans by EPA 1613B
Page 1 of 1

Sample ID: CR04-2.5

Lab Sample ID: XQ70D
LIMS ID: 13-26911
Matrix: Sediment
Data Release Authorized: MW
Reported: 12/17/13

QC Report No: XQ70-Maul Foster & Alongi
Project: GHHSA
0863.01.01
Date Sampled: 11/08/13
Date Received: 11/08/13

Date Extracted: 12/10/13
Date Analyzed: 12/16/13 13:43
Instrument/Analyst: AS1/PK

Sample Amount: 11.9 g-dry-wt
Final Extract Volume: 20 uL
Dilution Factor: 1.00

Analyte	Ion Ratio	Ratio Limits	Result	Limits	Exceedance
13C-2,3,7,8-TCDF	0.77	0.65-0.89	36.8	24-169	
13C-2,3,7,8-TCDD	0.77	0.65-0.89	58.6	25-164	
13C-1,2,3,7,8-PeCDF	1.56	1.32-1.78	70.6	24-185	
13C-2,3,4,7,8-PeCDF	1.58	1.32-1.78	65.8	21-178	
13C-1,2,3,7,8-PeCDD	1.56	1.32-1.78	73.3	25-181	
13C-1,2,3,4,7,8-HxCDF	0.52	0.43-0.59	81.8	26-152	
13C-1,2,3,6,7,8-HxCDF	0.53	0.43-0.59	70.8	26-123	
13C-2,3,4,6,7,8-HxCDF	0.52	0.43-0.59	72.1	28-136	
13C-1,2,3,7,8,9-HxCDF	0.51	0.43-0.59	69.7	29-147	
13C-1,2,3,4,7,8-HxCDD	1.26	1.05-1.43	81.4	32-141	
13C-1,2,3,6,7,8-HxCDD	1.24	1.05-1.43	70.7	28-130	
13C-1,2,3,4,6,7,8-HpCDF	0.47	0.37-0.51	52.6	28-143	
13C-1,2,3,4,7,8,9-HpCDF	0.45	0.37-0.51	71.8	26-138	
13C-1,2,3,4,6,7,8-HpCDD	1.06	0.88-1.20	62.1	23-140	
13C-OCDD	0.89	0.76-1.02	61.1	17-157	
37Cl4-2,3,7,8-TCDD			66.3	35-197	

Reported in Percent Recovery

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Dioxins/Furans by EPA 1613B
Page 1 of 1

Sample ID: CR04-2.5
DILUTION

Lab Sample ID: XQ70D
LIMS ID: 13-26911
Matrix: Sediment
Data Release Authorized: MW
Reported: 12/17/13

QC Report No: XQ70-Maul Foster & Alongi
Project: GHHSA
0863.01.01
Date Sampled: 11/08/13
Date Received: 11/08/13

Date Extracted: 12/10/13
Date Analyzed: 12/17/13 05:18
Instrument/Analyst: AS1/PK

Sample Amount: 11.9 g-dry-wt
Final Extract Volume: 20 uL
Dilution Factor: 5.00

Analyte	Ion Ratio	Ratio Limits	Result	Limits	Exceedance
13C-1,2,3,4,6,7,8-HpCDD	1.06	0.88-1.20	74.7	23-140	
13C-OCDD	0.90	0.76-1.02	60.5	17-157	
37Cl4-2,3,7,8-TCDD			60.1	35-197	

Reported in Percent Recovery

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA PCB by GC/ECD
Extraction Method: SW3546

Sample ID: MB-120913
METHOD BLANK

Lab Sample ID: MB-120913
LIMS ID: 13-26908
Matrix: Sediment
Data Release Authorized: MW
Reported: 12/17/13

QC Report No: XQ70-Maul Foster & Alongi
Project: GHHSA
0863.01.01
Date Sampled: NA
Date Received: NA

Date Extracted: 12/09/13
Date Analyzed: 12/14/13 14:14
Instrument/Analyst: ECD5/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 5.00 g
Final Extract Volume: 5.00 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: NA

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	20	< 20 U
53469-21-9	Aroclor 1242	20	< 20 U
12672-29-6	Aroclor 1248	20	< 20 U
11097-69-1	Aroclor 1254	20	< 20 U
11096-82-5	Aroclor 1260	20	< 20 U
11104-28-2	Aroclor 1221	20	< 20 U
11141-16-5	Aroclor 1232	20	< 20 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	88.8%
Tetrachlorometaxylene	98.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA PCB by GC/ECD
Extraction Method: SW3546
Page 1 of 1

Sample ID: CR04-10cm
SAMPLE

Lab Sample ID: XQ70A
LIMS ID: 13-26908
Matrix: Sediment
Data Release Authorized: MW
Reported: 12/17/13

QC Report No: XQ70-Maul Foster & Alongi
Project: GHHSA
0863.01.01
Date Sampled: 11/07/13
Date Received: 11/08/13

Date Extracted: 12/09/13
Date Analyzed: 12/14/13 15:15
Instrument/Analyst: ECD5/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 5.13 g-dry-wt
Final Extract Volume: 5.00 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: 80.3%

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	20	< 20 U
53469-21-9	Aroclor 1242	20	< 20 U
12672-29-6	Aroclor 1248	29	< 29 Y
11097-69-1	Aroclor 1254	97	< 97 Y
11096-82-5	**Aroclor 1260**	**20**	**200**
11104-28-2	Aroclor 1221	20	< 20 U
11141-16-5	Aroclor 1232	20	< 20 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	82.2%
Tetrachlorometaxylene	77.5%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA PCB by GC/ECD
Extraction Method: SW3546
Page 1 of 1

Sample ID: CR05-10cm
SAMPLE

Lab Sample ID: XQ70B
LIMS ID: 13-26909
Matrix: Sediment
Data Release Authorized: MW
Reported: 12/17/13

QC Report No: XQ70-Maul Foster & Alongi
Project: GHHSA
0863.01.01
Date Sampled: 11/08/13
Date Received: 11/08/13

Date Extracted: 12/09/13
Date Analyzed: 12/14/13 15:35
Instrument/Analyst: ECD5/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 5.12 g-dry-wt
Final Extract Volume: 5.00 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: 73.1%

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	20	< 20 U
53469-21-9	Aroclor 1242	20	< 20 U
12672-29-6	Aroclor 1248	29	< 29 Y
11097-69-1	Aroclor 1254	98	< 98 Y
11096-82-5	**Aroclor 1260**	**20**	**180**
11104-28-2	Aroclor 1221	20	< 20 U
11141-16-5	Aroclor 1232	20	< 20 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	75.5%
Tetrachlorometaxylene	77.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA PCB by GC/ECD
Extraction Method: SW3546
Page 1 of 1

Sample ID: CR05-2.5
SAMPLE

Lab Sample ID: XQ70C
LIMS ID: 13-26910
Matrix: Sediment
Data Release Authorized: MW
Reported: 12/17/13

QC Report No: XQ70-Maul Foster & Alongi
Project: GHHSA
0863.01.01
Date Sampled: 11/08/13
Date Received: 11/08/13

Date Extracted: 12/09/13
Date Analyzed: 12/14/13 15:55
Instrument/Analyst: ECD5/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 5.16 g-dry-wt
Final Extract Volume: 5.00 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: 74.2%

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	19	< 19 U
53469-21-9	Aroclor 1242	19	< 19 U
12672-29-6	Aroclor 1248	97	< 97 Y
11097-69-1	**Aroclor 1254**	**19**	**490**
11096-82-5	**Aroclor 1260**	**19**	**670**
11104-28-2	Aroclor 1221	19	< 19 U
11141-16-5	Aroclor 1232	19	< 19 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	62.0%
Tetrachlorometaxylene	91.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA PCB by GC/ECD
Extraction Method: SW3546
Page 1 of 1

Sample ID: CR04-2.5
SAMPLE

Lab Sample ID: XQ70D
LIMS ID: 13-26911
Matrix: Sediment
Data Release Authorized: MW
Reported: 12/17/13

QC Report No: XQ70-Maul Foster & Alongi
Project: GHHSA
0863.01.01
Date Sampled: 11/08/13
Date Received: 11/08/13

Date Extracted: 12/09/13
Date Analyzed: 12/14/13 16:15
Instrument/Analyst: ECD5/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 5.16 g-dry-wt
Final Extract Volume: 5.00 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: 82.8%

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	19	< 19 U
53469-21-9	Aroclor 1242	19	< 19 U
12672-29-6	Aroclor 1248	48	< 48 Y
11097-69-1	**Aroclor 1254**	**19**	**440**
11096-82-5	**Aroclor 1260**	**19**	**730**
11104-28-2	Aroclor 1221	19	< 19 U
11141-16-5	Aroclor 1232	19	< 19 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	95.2%
Tetrachlorometaxylene	87.8%

ANALYTICAL RESOURCES INCORPORATED

SW8082/PCB SOIL/SOLID/SEDIMENT SURROGATE RECOVERY SUMMARY

Matrix: Sediment

QC Report No: XQ70-Maul Foster & Alongi
Project: GHHSA
0863.01.01

Client ID	DCBP % REC	DCBP LCL-UCL	TCMX % REC	TCMX LCL-UCL	TOT OUT
MB-120913	88.8%	61-114	98.0%	52-117	0
LCS-120913	89.0%	61-114	98.8%	52-117	0
CR04-10cm	82.2%	54-115	77.5%	57-109	0
CR05-10cm	75.5%	54-115	77.2%	57-109	0
CR05-2.5	62.0%	54-115	91.2%	57-109	0
CR04-2.5	95.2%	54-115	87.8%	57-109	0

Microwave (MARS) Control Limits PCBSMM
Prep Method: SW3546
Log Number Range: 13-26908 to 13-26911

ANALYTICAL RESOURCES INCORPORATED

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

Sample ID: LCS-120913
LAB CONTROL

Lab Sample ID: LCS-120913
LIMS ID: 13-26908
Matrix: Sediment
Data Release Authorized: MW
Reported: 12/17/13

QC Report No: XQ70-Maul Foster & Alongi
Project: GHHSA
0863.01.01
Date Sampled: NA
Date Received: NA

Date Extracted: 12/09/13
Date Analyzed: 12/14/13 14:34
Instrument/Analyst: ECD5/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 5.00 g-dry-wt
Final Extract Volume: 5.00 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: NA

Analyte	Lab Control	Spike Added	Recovery
Aroclor 1016	470	500	94.0%
Aroclor 1260	412	500	82.4%

PCB Surrogate Recovery

Decachlorobiphenyl	89.0%
Tetrachlorometaxylene	98.8%

Results reported in µg/kg (ppb)

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD by GC/FID
Extraction Method: SW3546
Page 1 of 1

QC Report No: XQ70-Maul Foster & Alongi
Project: GHHSA
0863.01.01

Matrix: Sediment

Date Received: 11/08/13

Data Release Authorized: MW
Reported: 12/16/13

ARI ID	Sample ID	Extraction Date	Analysis Date	EFV DL	Range/Surrogate	LOQ	Result
MB-121013	Method Blank	12/10/13	12/12/13	10.0	Diesel Range	50	< 50 U
13-26908	HC ID: ---		FID3B	1.0	Motor Oil Range	100	< 100 U
					o-Terphenyl		89.8%
XQ70A	CR04-10cm	12/10/13	12/12/13	10.0	**Diesel Range**	**250**	**2,400**
13-26908	HC ID: **DRO/MOTOR OIL**		FID3B	1.0	**Motor Oil Range**	**500**	**7,400**
					o-Terphenyl		76.4%
XQ70B	CR05-10cm	12/10/13	12/12/13	10.0	**Diesel Range**	**180**	**1,200**
13-26909	HC ID: **DRO/MOTOR OIL**		FID3B	1.0	**Motor Oil Range**	**370**	**4,800**
					o-Terphenyl		85.3%
XQ70C	CR05-2.5	12/10/13	12/12/13	10.0	**Diesel Range**	**190**	**3,200**
13-26910	HC ID: **DRO/MOTOR OIL**		FID3B	1.0	**Motor Oil Range**	**390**	**13,000**
					o-Terphenyl		76.2%
XQ70D	CR04-2.5	12/10/13	12/12/13	10.0	**Diesel Range**	**290**	**3,200**
13-26911	HC ID: **DRO/MOTOR OIL**		FID3B	1.0	**Motor Oil Range**	**580**	**10,000**
					o-Terphenyl		74.7%

Reported in mg/kg (ppm)

EFV-Effective Final Volume in mL.
DL-Dilution of extract prior to analysis.
LOQ-Limit of Quantitation

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

ANALYTICAL RESOURCES INCORPORATED

TPHD SURROGATE RECOVERY SUMMARY

Matrix: Sediment

QC Report No: XQ70-Maul Foster & Alongi
Project: GHHSA
0863.01.01

Client ID	OTER	TOT OUT
121013MBS	89.8%	0
121013LCS	83.1%	0
CR04-10cm	76.4%	0
CR05-10cm	85.3%	0
CR05-2.5	76.2%	0
CR04-2.5	74.7%	0

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

Prep Method: SW3546
Log Number Range: 13-26908 to 13-26911

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
NWTPHD by GC/FID
Page 1 of 1

Sample ID: LCS-121013
LAB CONTROL

Lab Sample ID: LCS-121013
LIMS ID: 13-26908
Matrix: Sediment
Data Release Authorized: MW
Reported: 12/16/13

QC Report No: XQ70-Maul Foster & Alongi
Project: GHHSA
0863.01.01
Date Sampled: NA
Date Received: NA

Date Extracted: 12/10/13
Date Analyzed: 12/12/13 13:47
Instrument/Analyst: FID3B/JLW

Sample Amount: 10.0 g-dry-wt
Final Extract Volume: 10 mL
Dilution Factor: 1.00

Range	Lab Control	Spike Added	Recovery
Diesel	1,170	1,500	78.0%

TPHD Surrogate Recovery

o-Terphenyl	83.1%

Results reported in mg/kg

ANALYTICAL RESOURCES INCORPORATED

TOTAL DIESEL RANGE HYDROCARBONS-EXTRACTION REPORT

ARI Job: XQ70
Matrix: Sediment Project: GHHSA
Date Received: 11/08/13 0863.01.01

ARI ID	Client ID	Client Amt	Final Vol	Basis	Prep Date
13-26908-121013MB1	Method Blank	10.0 g	10.0 mL	-	12/10/13
13-26908-121013LCS1	Lab Control	10.0 g	10.0 mL	-	12/10/13
13-26908-XQ70A	CR04-10cm	1.98 g	10.0 mL	D	12/10/13
13-26909-XQ70B	CR05-10cm	2.70 g	10.0 mL	D	12/10/13
13-26910-XQ70C	CR05-2.5	2.59 g	10.0 mL	D	12/10/13
13-26911-XQ70D	CR04-2.5	1.73 g	10.0 mL	D	12/10/13

Basis: D=Dry Weight W=As Received

Data File: /chem3/fid3b.i/20131212.b/1212b011.d

Date : 12-DEC-2013 13:22

Client ID: XQ70MBS1

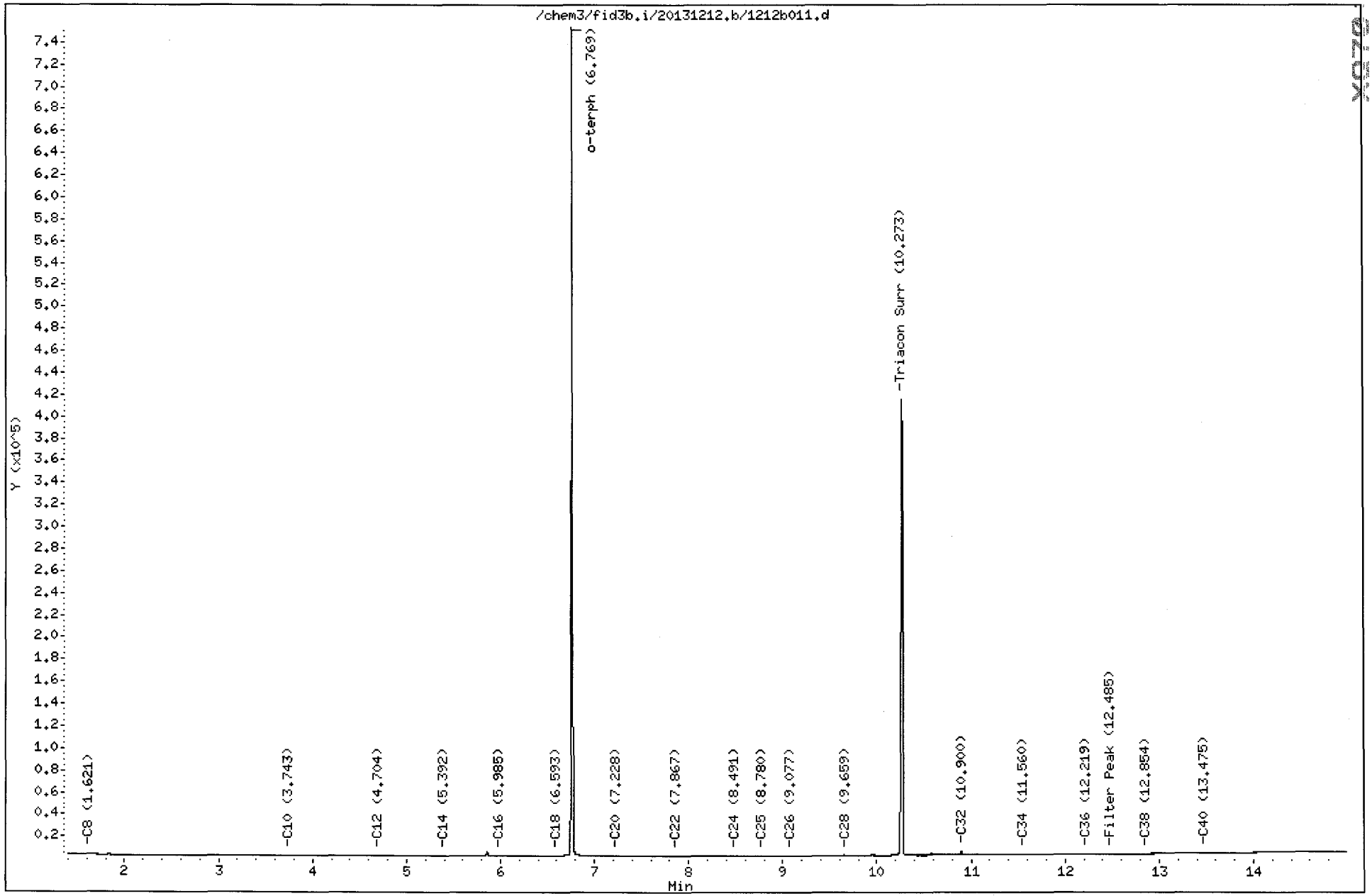
Sample Info: XQ70MBS1

Column phase: RTX-1

Instrument: fid3b.i

Operator: JW

Column diameter: 0.25



Data File: /chem3/fid3b.i/20131212.b/1212b012.d

Date : 12-DEC-2013 13:47

Client ID: XQ70LCSS1

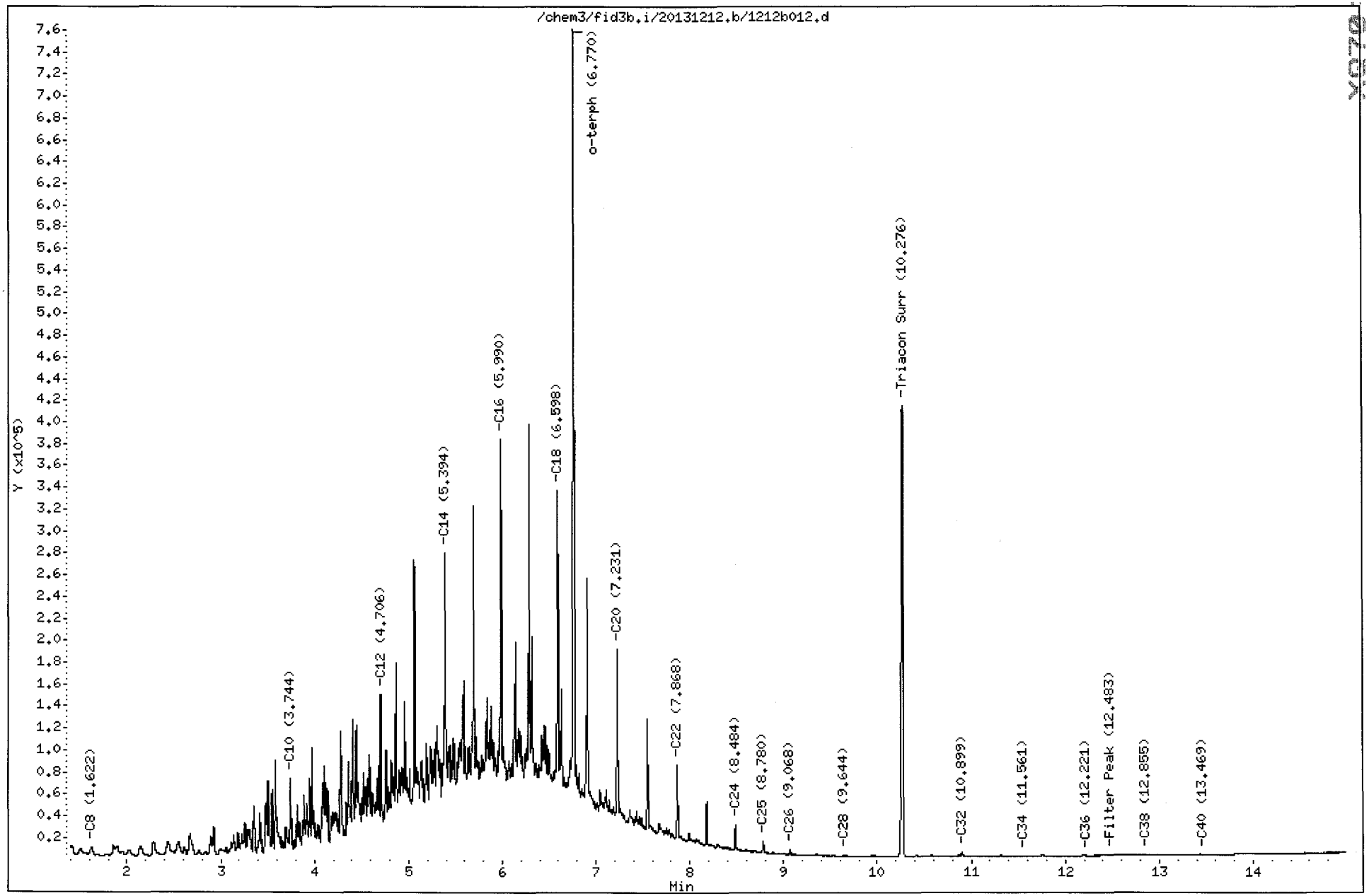
Sample Info: XQ70LCSS1

Column phase: RTX-1

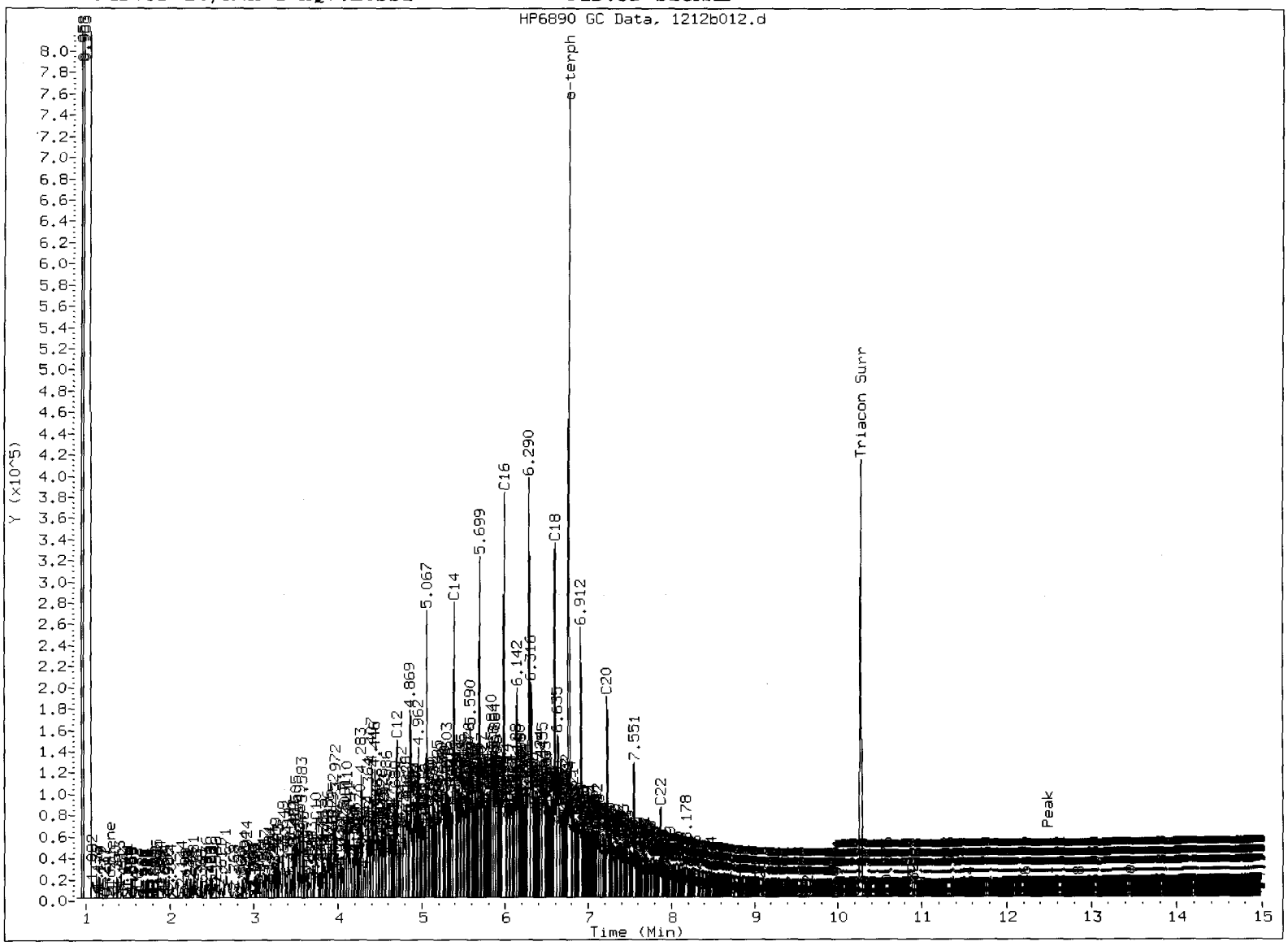
Instrument: fid3b.i

Operator: JW

Column diameter: 0.25



FID:3B-2C/RTX-1 XQ70LCSS1 FID:3B SIGNAL



MANUAL INTEGRATION

1. Baseline correction
3. Peak not found
5. Skimmed surrogate

Analyst: JW Date: 12/17/12

Data File: /chem3/fid3b.i/20131212.b/1212b014.d

Date : 12-DEC-2013 14:37

Client ID: CR04-10cm

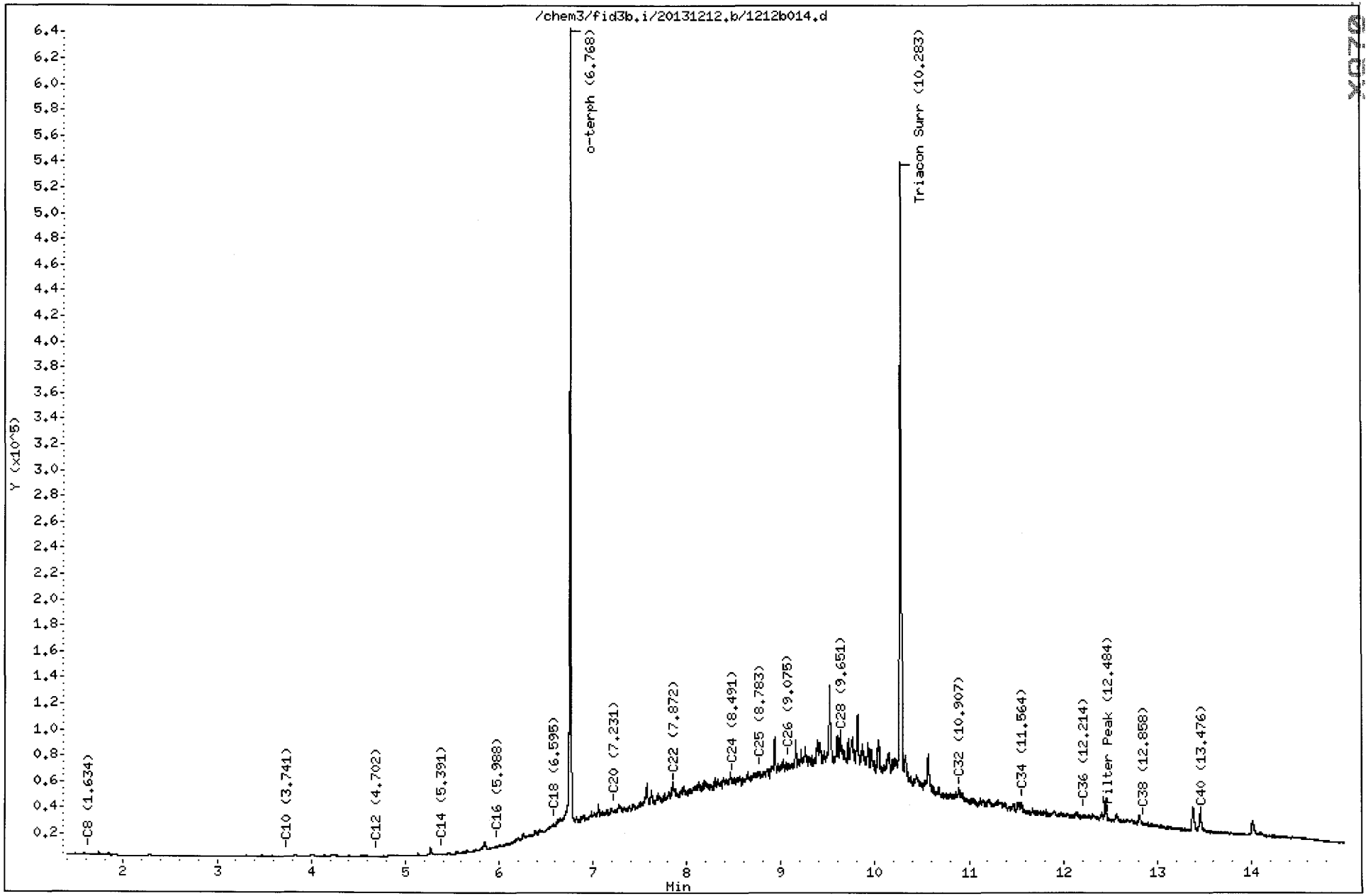
Sample Info: XQ70A

Column phase: RTX-1

Instrument: fid3b.i

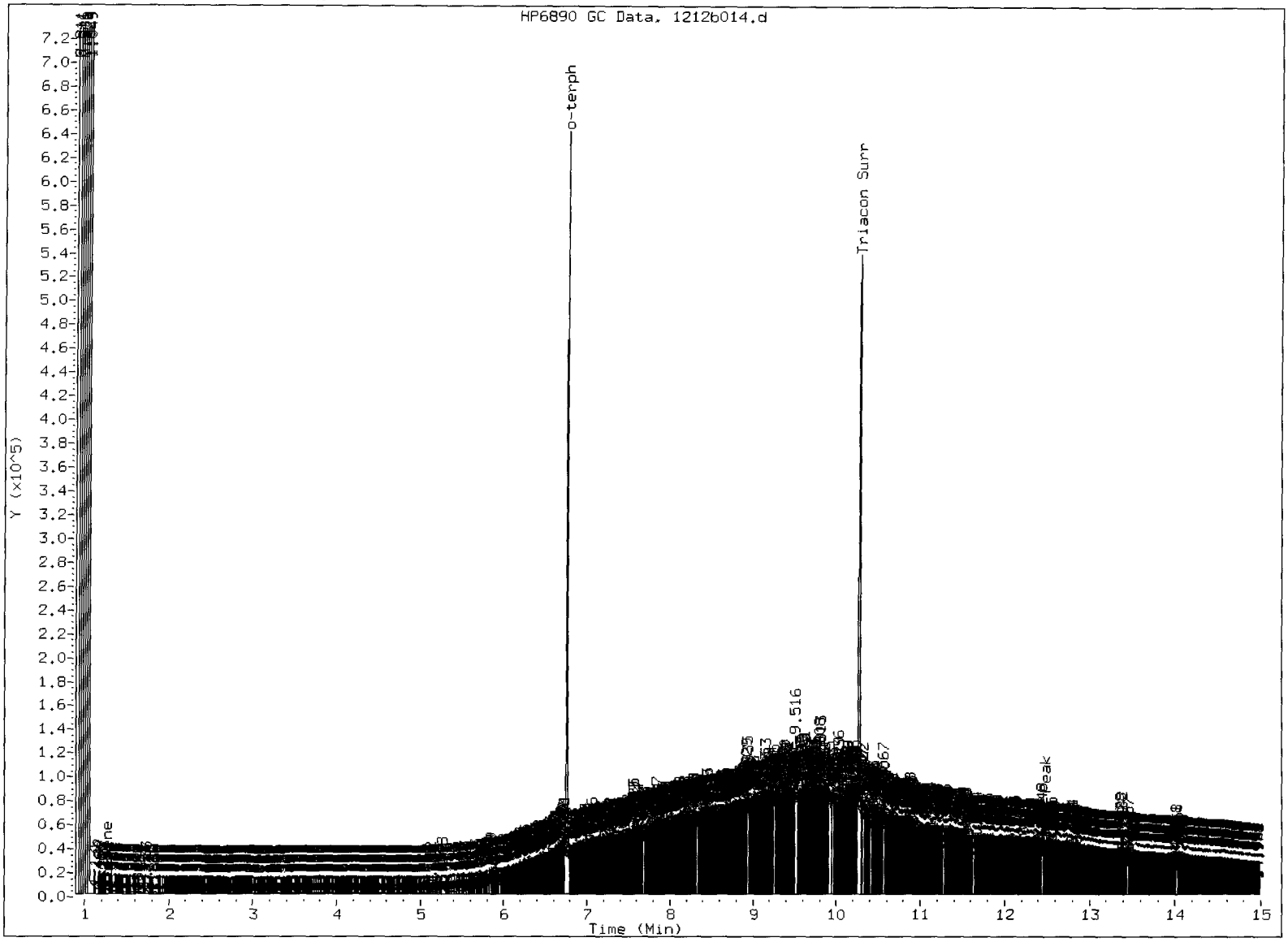
Operator: JW

Column diameter: 0.25



FID:3B-2C/RTX-1 XQ70A

FID:3B SIGNAL



MANUAL INTEGRATION

1. Baseline correction
3. Peak not found
(5) Skimmed surrogate

Analyst: JW Date: 12/0/12

Data File: /chem3/fid3b.i/20131212.b/1212b015.d

Date : 12-DEC-2013 15:02

Client ID: CR05-10cm

Sample Info: XQ70B

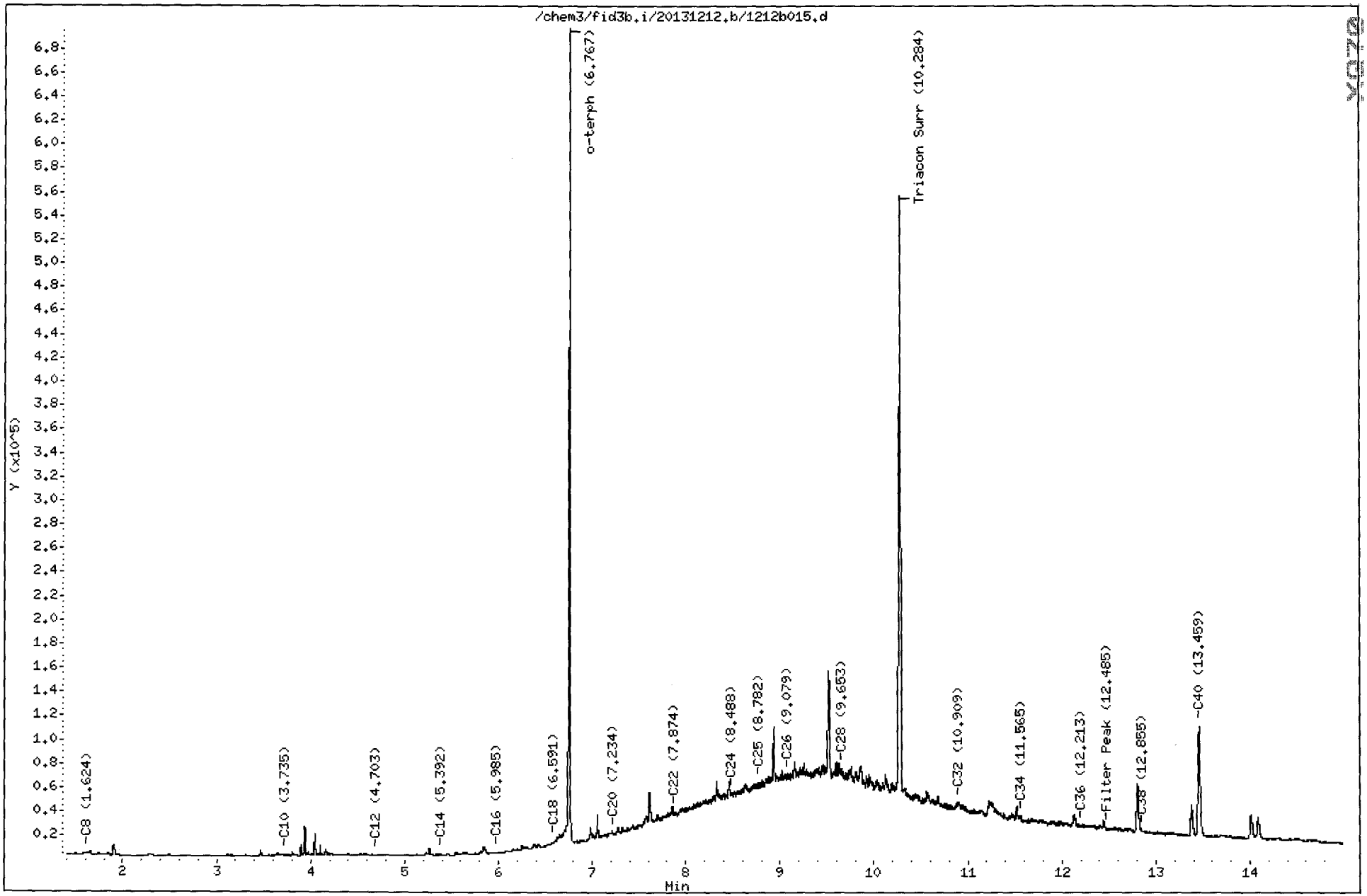
Column phase: RTX-1

Instrument: fid3b.i

Operator: JW

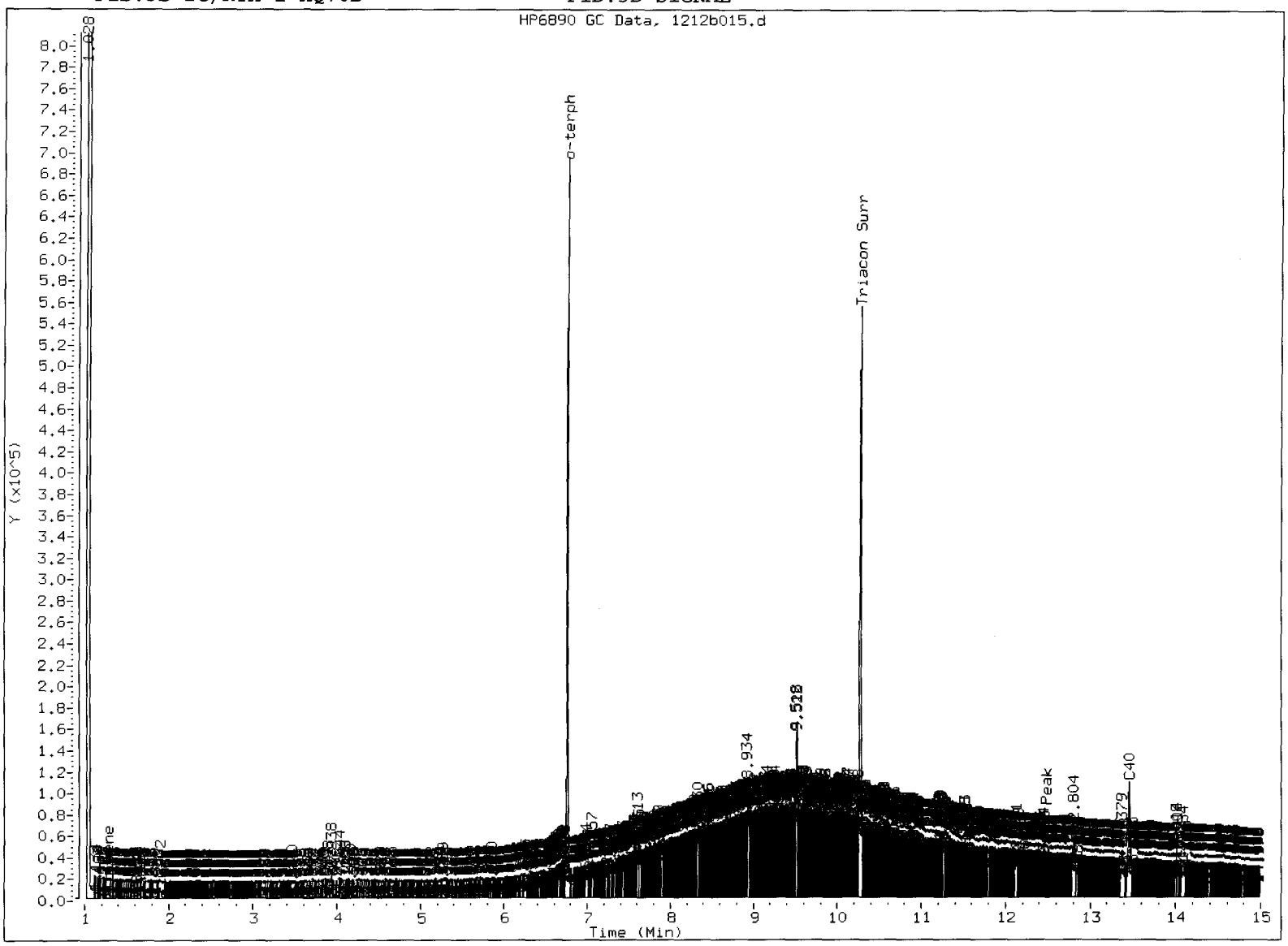
Column diameter: 0.25

XQ70 PAGE2



FID:3B-2C/RTX-1 XQ70B

FID:3B SIGNAL



MANUAL INTEGRATION

1. Baseline correction
3. Peak not found
(5) Skimmed surrogate

Analyst: SU Date: 12/10/10

Data File: /chem3/fid3b.i/20131212.b/1212b016.d

Date : 12-DEC-2013 15:27

Client ID: CR05-2.5

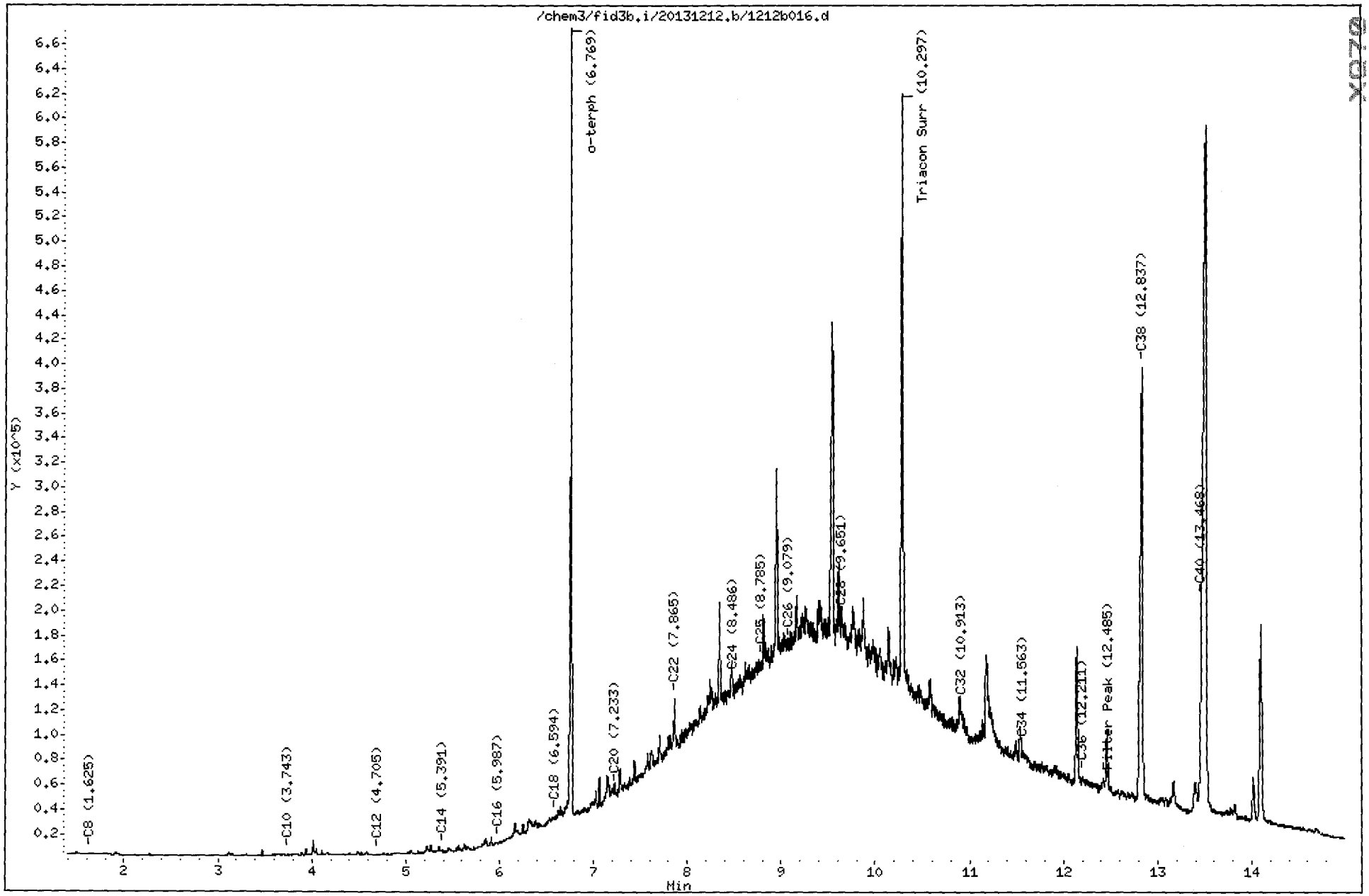
Sample Info: XQ70C

Column phase: RTX-1

Instrument: fid3b.i

Operator: JW

Column diameter: 0.25



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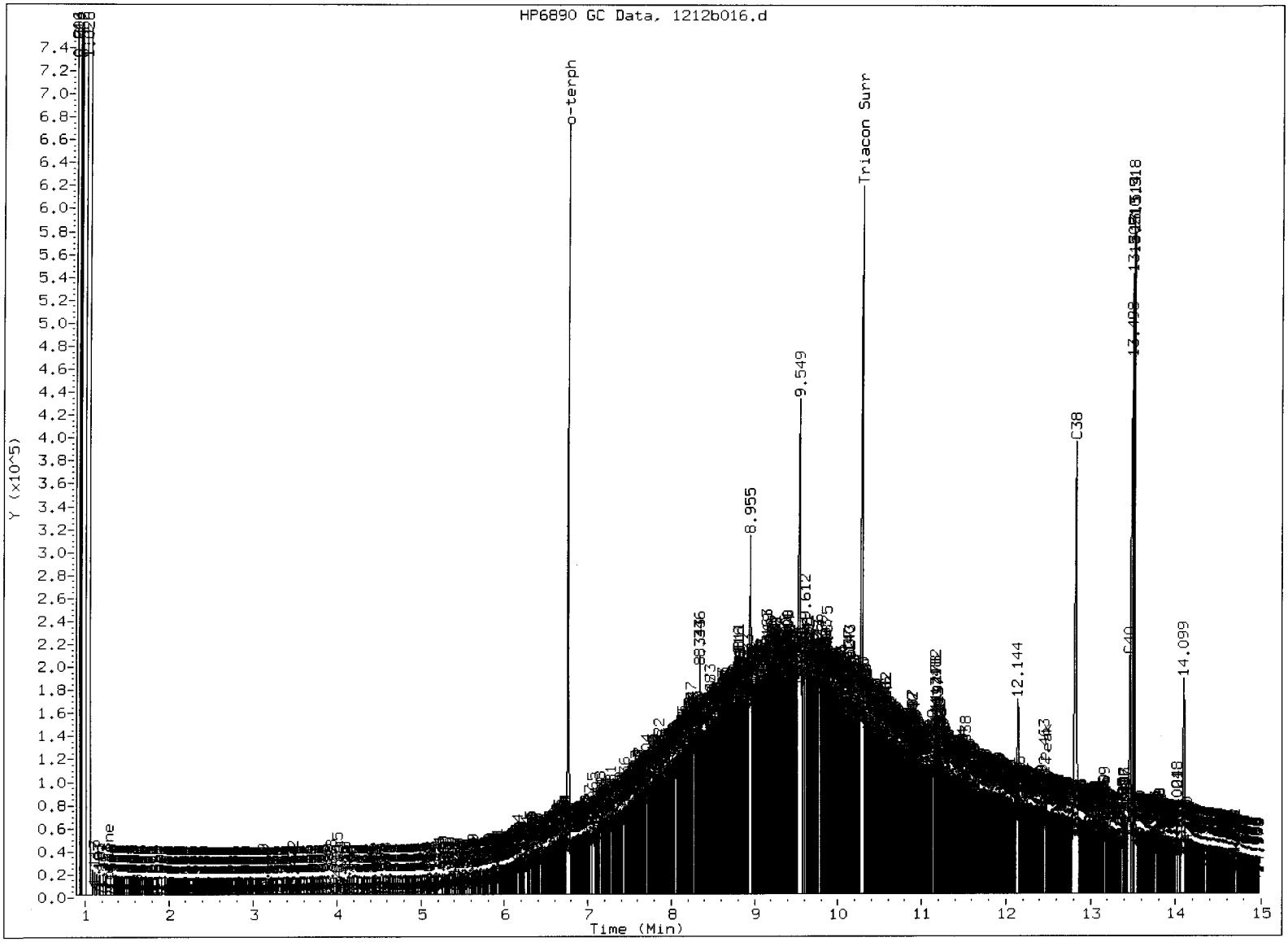
FID:3B SIGNAL



MANUAL INTEGRATION

1. Baseline correction
3. Peak not found
(5) Skimmed surrogate

Analyst: JW Date: 12/13/17

Data File: /chem3/fid3b.i/20131212.b/1212b017.d

Date : 12-DEC-2013 15:52

Client ID: CR04-2.5

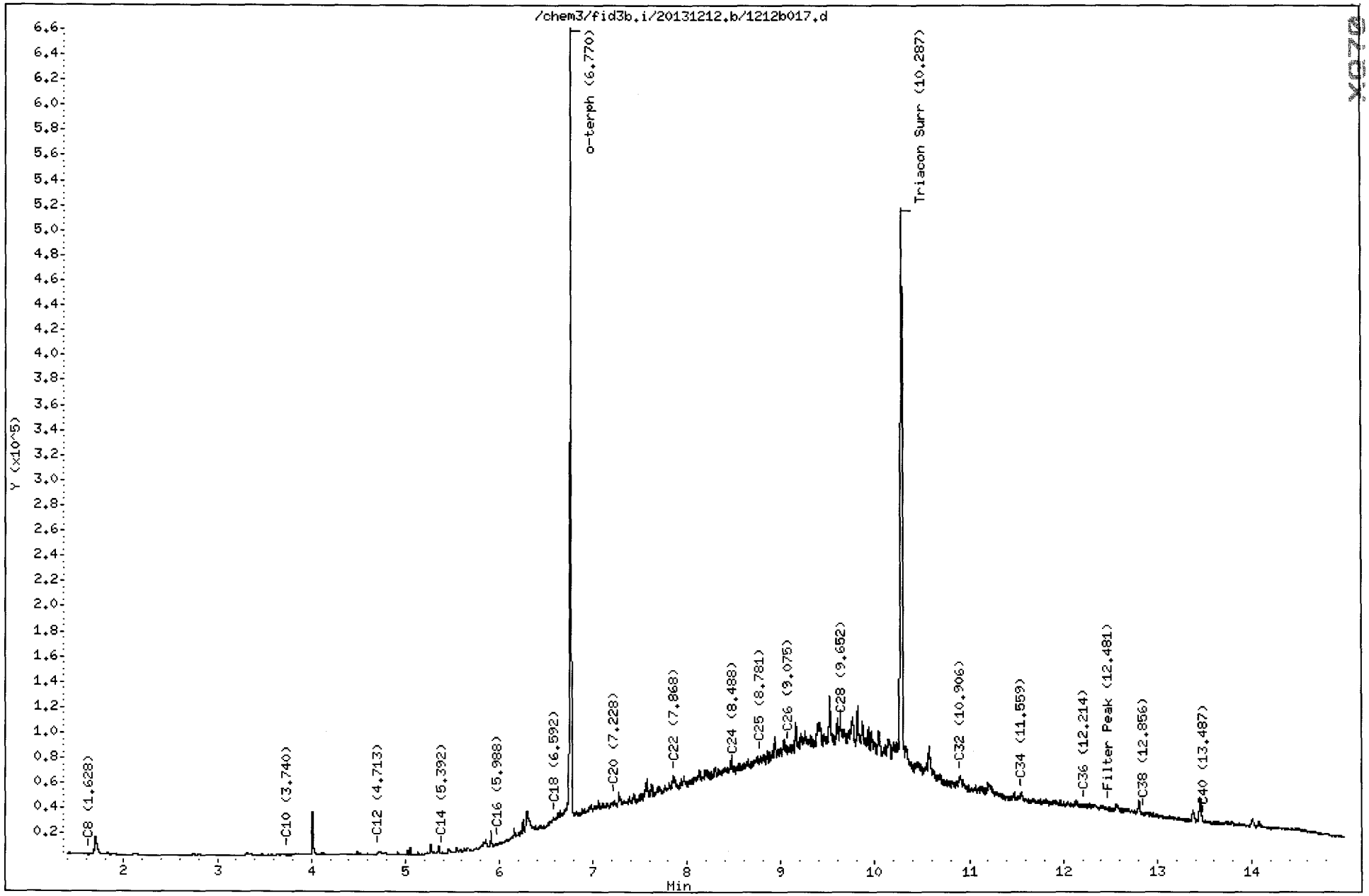
Sample Info: XQ70D

Column phase: RTX-1

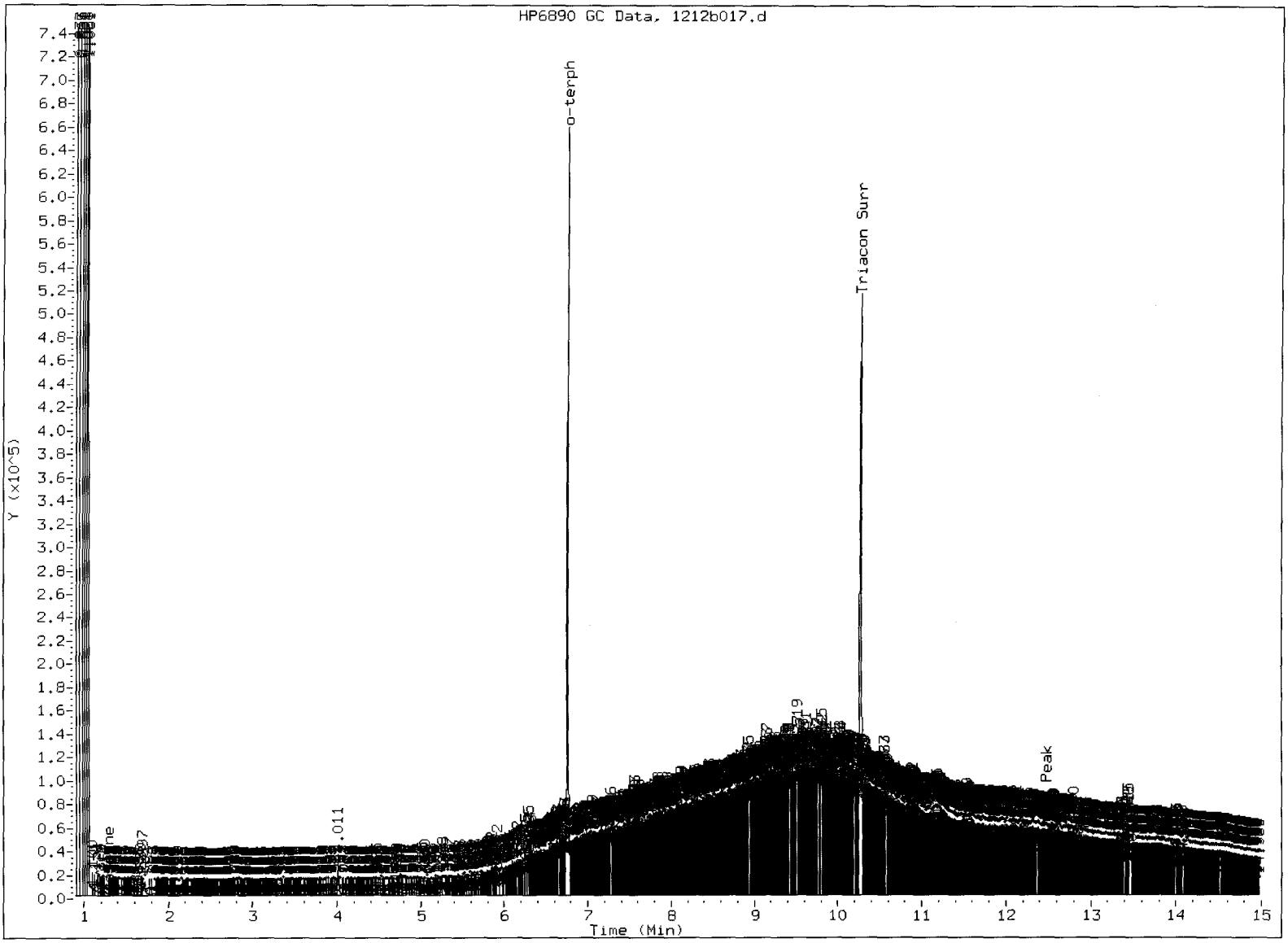
Instrument: fid3b.i

Operator: JW

Column diameter: 0.25



FID:3B-2C/RTX-1 XQ70D FID:3B SIGNAL



MANUAL INTEGRATION

1. Baseline correction
3. Peak not found
(5) Skimmed surrogate

Analyst: SD Date: 12/13/12

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: CR05-2.5
SAMPLE

Lab Sample ID: XQ70C
LIMS ID: 13-26910
Matrix: Sediment
Data Release Authorized:
Reported: 12/13/13

QC Report No: XQ70-Maul Foster & Alongi
Project: GHHSA
0863.01.01
Date Sampled: 11/08/13
Date Received: 11/08/13

Percent Total Solids: 16.0%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	LOQ	mg/kg-dry	Q
CLP	12/10/13	7471A	12/12/13	**7439-97-6**	**Mercury**	0.1	**0.5**	

U-Analyte undetected at given LOQ
LOQ-Limit of Quantitation

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: CR04-2.5
SAMPLE

Lab Sample ID: XQ70D
LIMS ID: 13-26911
Matrix: Sediment
Data Release Authorized:
Reported: 12/13/13

QC Report No: XQ70-Maul Foster & Alongi
Project: GHHSA
0863.01.01
Date Sampled: 11/08/13
Date Received: 11/08/13

Percent Total Solids: 15.5%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	LOQ	mg/kg-dry	Q
CLP	12/10/13	7471A	12/12/13	**7439-97-6**	**Mercury**	0.1	**0.5**	

U-Analyte undetected at given LOQ
LOQ-Limit of Quantitation

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: METHOD BLANK

Lab Sample ID: XQ70MB
LIMS ID: 13-26910
Matrix: Sediment
Data Release Authorized:
Reported: 12/13/13

QC Report No: XQ70-Maul Foster & Alongi
Project: GHHSA
0863.01.01
Date Sampled: NA
Date Received: NA

Percent Total Solids: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	LOQ	mg/kg-dry	Q
CLP	12/10/13	7471A	12/12/13	7439-97-6	Mercury	0.02	0.02	U

U-Analyte undetected at given LOQ
LOQ-Limit of Quantitation

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: LAB CONTROL

Lab Sample ID: XQ70LCS
LIMS ID: 13-26910
Matrix: Sediment
Data Release Authorized:
Reported: 12/13/13

QC Report No: XQ70-Maul Foster & Alongi
Project: GHHSA
0863.01.01
Date Sampled: NA
Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike Found	Spike Added	% Recovery	Q
Mercury	7471A	0.53	0.50	106%	

Reported in mg/kg-dry

N-Control limit not met
NA-Not Applicable, Analyte Not Spiked
Control Limits: 80-120%

APPENDIX C

DATA VALIDATION MEMORANDUM

DATA QUALITY ASSURANCE/QUALITY CONTROL REVIEW

PROJECT NO. 0863.01.03 | NOVEMBER 27, 2013 | GRAYS HARBOR HISTORICAL SEAPORT AUTHORITY

This report reviews the analytical results for sediment samples collected by the Maul Foster & Alongi, Inc. (MFA) project team on the property located at 500 North Custer Street in Aberdeen, Washington. The samples were collected in November 2013.

Analytical Resources, Incorporated (ARI) performed the analyses. ARI report XN64_XO00_GHHSA_rpt, which contains reports XN64 and XO00, and report XQ70_MFA_GHHSA_rpt, which contains XQ70, were reviewed. Three of the sediment samples were processed by ARI to obtain pore water and were reported in XO00. Follow-up analyses were performed on XN64 samples and reported in XQ70. The analyses performed and samples analyzed are listed below. Some analyses may not have been performed on all samples.

Analysis	Reference
Ammonia Nitrogen	USEPA 350.1 Modified
Diesel and Motor Oil	NWTPH-Dx
Dioxins/Furans	USEPA 1613B
Gasoline	NWTPH-G
Grain Size	PSEP 1986
Polychlorinated Biphenyls	USEPA 8082A
Pore Water Conductivity	USEPA 120.1
Pore Water Salinity	SM 2520B
Preserved and Total Solids	SM 2540G
Semivolatile Organic Compounds	USEPA 8270D/8270D SIM
Total Mercury	USEPA 7471A
Total Metals	USEPA 6010C
TOC	Plumb
Total Sulfides	USEPA 376.2
Total Volatile Solids	SM 2540E

NWTPH = Northwest Total Petroleum Hydrocarbons.
Plumb = Procedures for handling and chemical analysis of sediment and water samples (Plumb, 1981).
PSEP = Puget Sound Estuary Protocols.
SIM = selective ion monitoring.
SM = Standard Methods for the Examination of Water and Wastewater.
TOC = total organic carbon.
USEPA = U.S. Environmental Protection Agency.

Samples Analyzed		
SDG XN64	**SDG XO00**	**SDG XQ70**
CR01-10cm	CR01-10cm (pore water)	CR04-10cm
CR02-10cm	CR02-10cm (pore water)	CR05-10cm
CR03-10cm	CR03-10cm (pore water)	CR05-2.5
CR04-10cm	-	CR04-2.5
CR05-10cm	-	-
CR06-10cm	-	-
CR04-5	-	-
CR06-2.5	-	-

SDG = sample delivery group.

DATA QUALIFICATIONS

Analytical results were evaluated according to applicable sections of USEPA procedures (USEPA, 2008, 2010, 2011), appropriate laboratory and method-specific guidelines (ARI, 2013; USEPA, 1986), and the dioxin rules memorandum developed by MFA and approved by the Washington State Department of Ecology (MFA, 2012).

Data validation procedures were modified, as appropriate, to accommodate quality control (QC) requirements for methods not specifically addressed by the functional guidelines (e.g., total volatile solids).

Any result reported as exceeding the calibration range of the instrument was qualified as an estimate and assigned a "J" flag.

USEPA Method 1613B results reported as estimated maximum potential concentrations (EMPCs) were qualified by the reviewer with "U" (non-detect) at the reported EMPC value.

In report XQ70, the USEPA Method 1613B OCDD results for samples CR05-2.5 and CR04-2.5 exceeded the instrument calibration range. National Functional Guidelines for dioxin/furan data review state that laboratories are not required to take action when OCDD exceeds instrument calibration range (USEPA, 2011) The OCDD results were qualified "J" as estimated.

All data are considered acceptable for their intended use, with the appropriate data qualifiers assigned.

HOLDING TIMES, PRESERVATION, AND SAMPLE STORAGE

Holding Times

In report XN64, the USEPA Method 8270D results for phenol, pentachlorophenol, and butylbenzylphthalate from samples CR04-10cm, CR04-5, CR05-10cm, and CR06-10cm were extracted and analyzed 6 six days after the recommended 14-day holding time. All detected results have been qualified "J" as estimated and all non-detect results have been qualified "UJ" as estimated.

In report XQ70, samples CR04-10cm, CR05-10cm, CR05-2.5, and CR04-2.5 were extracted for analysis by NWTPH-Dx, USEPA Method 8082A, and USEPA Method 8270D/8270D SIM after the recommended 14 day holding time. Samples CR05-2.5 and CR04-2.5 were prepared and analyzed for USEPA Method 7471A total mercury after the recommended 28-day holding time. All detected results have been qualified "J" as estimated and all non-detect results have been qualified "UJ" as estimated.

The remaining extractions and analyses were performed within the recommended holding time criteria.

Preservation and Sample Storage

The samples were preserved and stored appropriately.

BLANKS

Method Blanks

Laboratory method blank analyses were performed at the required frequencies. For purposes of data qualification, the method blanks were associated with all samples prepared in the analytical batch.

If an analyte was detected in a sample and in the associated method blank at less than ten times the method blank concentration, the sample result was qualified. USEPA Method 1613B sample results were qualified if sample concentrations were less than five times the associated method blank concentration. Reporting limits were elevated to the concentrations detected in the samples, and results were qualified as not detected "U" at the elevated method reporting limit (MRL).

For USEPA Method 1613B, if an analyte was detected in a sample and in the associated method blank below the reporting limit but above the estimated detection limit (EDL), sample detections below the level found in the method blank were qualified as "U" at the reporting limit.

In report XN64 and XQ70, the USEPA Method 1613B method blanks had detections for some analytes below the MRL and some detections for 1,2,3,4,6,7,8-HpCDD and OCDD above the MRL. All associated sample results were greater than five times the method blank concentrations; thus, no results were qualified.

In report XN64, the USEPA Method 376.2 sulfide method blank prepared on November 12, 2013, had a total sulfide detection of 0.17 milligram per kilogram (mg/kg). All associated sample detections were greater than ten times the method blank detection; thus, no results were qualified.

All remaining laboratory method blanks were non-detect.

Trip Blanks

Trip blanks were not submitted for this sampling event, as volatile organic compounds were not analyzed.

Equipment Rinsate Blanks

Equipment rinsate blanks were not collected for this sampling event. Equipment was decontaminated after each sample was collected, in accordance with the sediment sampling and analysis plan (MFA, 2013).

SURROGATE RECOVERY RESULTS

When appropriate, individual samples were spiked with surrogate compounds to evaluate laboratory performance.

In report XN64, NWTPH-Gx surrogate recoveries for sample CR06-2.5 exceeded the lower percent recovery limits for both trifluorotoluene and bromobenzene. The associated result was qualified by the reviewer as follows:

Sample	Component	Original Result (mg/kg)	Qualified Result (mg/kg)
CR06-2.5	Gasoline	54 U	54 UJ

The reviewer took no action based on minor surrogate outliers or surrogate percent recoveries that were outside acceptance limits because of dilutions necessary to quantify high concentrations of target analytes present in the samples. The laboratory appropriately documented and qualified surrogate outliers. Associated batch quality assurance and QC for samples with surrogate outliers were within acceptance limits.

All remaining surrogate recoveries were within acceptance limits.

LABELED ANALOG STANDARD RECOVERY RESULTS

All USEPA Method 1613B Modified samples were spiked with C13 labeled analog standards to quantify the recovery of individual target compounds. All C13 labeled analog standard recoveries were within acceptance limits.

MATRIX SPIKE/MATRIX SPIKE DUPLICATE RESULTS

Matrix spike/matrix spike duplicate (MS/MSD) results are used to evaluate laboratory precision and accuracy. All MS/MSD samples were extracted and analyzed at the required frequency.

In report XN64, the USEPA Method 7471A MS exceeded the upper percent recovery acceptance limit for total mercury. The exceedance was minor and the laboratory control sample (LCS) had acceptable recovery; thus, no results were qualified.

In report XN64, the case narrative states that the USEPA 376.2 sulfide matrix duplicate exceeded relative percent difference (RPD) acceptance criteria. The matrix duplicate RPD results were not included in the QC report. The remaining batch QC had acceptable recoveries and the laboratory stated that sample heterogeneity likely was the cause of the RPD exceedance. No results were qualified.

In report XN64, the case narrative states that the Method Plumb (1981) MS had low percent recovery for TOC and that a re-prepared MS also had low recovery. The LCS had acceptable recovery, which indicates matrix interference. The following results were qualified "J" as estimated:

Report	Sample	Component	Original Result (%)	Qualified Result (%)
XN64	CR06-10cm	TOC	35.6	35.6 J
XN64	CR04-10cm	TOC	31.4	31.4 J
XN64	CR05-10cm	TOC	13.6	13.6 J
XN64	CR06-2.5	TOC	49.5	49.5 J
XN64	CR04-5	TOC	16.5	16.5 J
XN64	CR01-10cm	TOC	2.06	2.06 J
XN64	CR02-10cm	TOC	3.21	3.21 J
XN64	CR03-10cm	TOC	2.91	2.91 J

All recoveries were within acceptance limits for percent recovery and RPDs.

LABORATORY DUPLICATE RESULTS

Duplicate results are used to evaluate laboratory precision. All duplicate samples were extracted and analyzed at the required frequency. Laboratory duplicate RPDs for USEPA Method 6010C were assessed against the RPD acceptance limit of 35 percent for soil laboratory duplicates, as presented in the National Functional Guidelines for inorganic data review (USEPA, 2010). Minor laboratory duplicate RPD exceedances and exceedances for results near the reporting limit were not qualified by the reviewer.

In report XN64, the USEPA Method 6010C laboratory duplicate exceeded RPD acceptance criteria for total chromium, total copper, and total mercury. The exceedance for total mercury was minor and the associated results were not qualified. The associated batch QC had acceptable recoveries; however, the total chromium and total copper RPD exceedances were significant. The following results were qualified:

Report	Sample	Component	Original Result (mg/kg)	Qualified Result (mg/kg)
XN64	CR06-2.5	Total Chromium	26	26 J
XN64	CR06-2.5	Total Copper	96	96 J
XN64	CR01-10cm	Total Chromium	40	40 J

Report	Sample	Component	Original Result (mg/kg)	Qualified Result (mg/kg)
XN64	CR01-10cm	Total Copper	58	58 J
XN64	CR02-10cm	Total Chromium	38.5	38.5 J
XN64	CR02-10cm	Total Copper	56.3	56.3 J
XN64	CR03-10cm	Total Chromium	48	48 J
XN64	CR03-10cm	Total Copper	65.4	65.4 J

All remaining laboratory duplicate RPDs were within acceptance limits.

LABORATORY CONTROL SAMPLE/LABORATORY CONTROL SAMPLE DUPLICATE RESULTS

An LCS/laboratory control sample duplicate (LCSD) is spiked with target analytes to provide information on laboratory precision and accuracy. The LCS/LCSD samples were extracted and analyzed at the required frequency.

In report XN64, the USEPA Method 8270D SIM LCS exceeded the instrument calibration range for pentachlorophenol. The LCS percent recovery was within acceptance limits, and the associated sample detections were already qualified as estimated because they were below the MRL; thus no results were qualified by the reviewer.

All remaining LCS/LCSD analytes were within acceptance limits for percent recovery and RPD.

FIELD DUPLICATE RESULTS

Field duplicate samples measure both field and laboratory precision. No field duplicate samples were submitted for analysis.

CONTINUING CALIBRATION VERIFICATION RESULTS

Continuing calibration verification (CCV) results are used to demonstrate instrument precision and accuracy through the end of the sample batch.

National Functional Guidelines for low/medium volatile and semivolatile data review (USEPA, 2008) state that results associated with closing CCV percent drift exceedances between 50 percent and -50 percent do not require qualification. However, USEPA Method 8270D states that when CCV percent drift acceptance criteria are met for at least 80 percent of the compounds, non-detects may be reported for compounds that exceed acceptance limits if the laboratory demonstrates that quantitation limit sensitivity can still be achieved. Detected compounds associated with CCV percent drift exceedances may be reported as estimated values.

In report XN64, the USEPA Method 8270D SIM CCV exceeded percent drift criteria for benzyl alcohol and butylbenzylphthalate. In report XQ70, the USEPA Method 8270D and

8270D SIM CCVs also exceeded percent drift criteria for several compounds. Associated sample detections above the MRL were qualified with "J" as estimated. USPEA Method 8270D results associated with report XQ70 were already qualified "J" due to holding time exceedances, as noted above.

Report	Sample	Component	Original Result (µg/kg)	Qualified Result (µg/kg)
XN64	CR02-10cm	Benzyl Alcohol	43 Q	43 J
XN64	CR03-10cm	Benzyl Alcohol	43 Q	43 J

µg/kg = micrograms per kilogram.

Based on available information, all other CCVs were within acceptance limits for percent recovery.

REPORTING LIMITS

ARI used routine reporting limits for non-detect results, except when samples required dilutions because of limited sample or extract volume, high analyte concentrations, and/or matrix interferences.

Detections below the MRL were reported for some analyses: results for USEPA Method 1613B were reported to EDLs, and results for USEPA Methods 8082A, 8270D, and 8270D SIM were reported to method detection limits. Some NWTPH-Gx, USEPA Method 8082A, and USEPA Method 8270D reporting limits were raised because of chromatographic interference or matrix interference. All samples in report XQ70 were diluted 1:5 for USEPA Method 8270D/8270D SIM analyses due to matrix interference.

DATA PACKAGE

The data packages were reviewed for transcription errors, omissions, and anomalies.

In report XN64, the case narrative states that the USEPA Method 7471A MS exceeded the lower acceptance limit for total mercury; however, the MS exceeded the upper acceptance limit.

In report XO00, conductivity was not indicated on the chain of custody but was analyzed for pore water extracts of samples CR01-10cm, CR02-10cm, and CR03-10cm.

All samples submitted for pore water extraction (CR01-10cm, CR02-10cm, CR03-10cm, and CR04-5) produced insufficient volume for USEPA Method 376.2 sulfides analysis. The volume of extracted pore water was sufficient to perform the remaining analyses.

No additional issues were found.

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