February 3, 2014

Ms. Leslee Conner
Port of Tacoma
P.O. Box 1837
Tacoma, WA 98401

Re: Port of Tacoma/ Parcel 88
Final and Cumulative Groundwater Compliance Monitoring Report
17652-00

Dear Ms. Conner:

We are pleased to report the favorable results of the fourth and final groundwater compliance monitoring round at the Port of Tacoma's Parcel 88 property (Site) at 1621 Marine View Drive (Figure 1). This report presents the results for Round 4 samples (collected on December 9, 2013) from the two compliance monitoring wells (Figure 2). This report also summarizes the results from the previous three monitoring rounds.

Work was completed in accordance with the Compliance Monitoring Work Plan (Hart Crowser 2013) and the Agreed Order No. DE 9745 between the Port of Tacoma and the Washington State Department of Ecology (Ecology). A description of the Site and the cleanup level values for the Site are outlined in the Cleanup Action Plan (CAP) issued by Ecology (2013).

As described in the CAP, the groundwater compliance monitoring was intended to confirm that the Port's cleanup of the site has resulted in the reduction of contaminants in groundwater to below cleanup levels. To do this, the CAP required that MW-201 and -202 be sampled periodically until contaminant concentrations remained below cleanup levels for four consecutive rounds. As described below, this most recent round represents the fourth consecutive round during which groundwater cleanup levels were met and, thus, fulfills the groundwater monitoring requirement of the CAP.

Analytical Results

The groundwater samples collected at Parcel 88 on December 9, 2013, met all the cleanup level values outlined in the CAP. The CAP established numeric cleanup levels for metals and narrative criteria for petroleum hydrocarbons (i.e., "absence of sheen" on the water surface). This monitoring

1700 Westlake Avenue North, Suite 200
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Tel 206.324.9530

event marked the fourth consecutive quarter in which the groundwater samples collected at the Site met all applicable cleanup values.

The analytical results for all four quarters are summarized in Table 1, and this data has been successfully loaded into Ecology's Environmental Information Management (EIM) database.

Data Quality Review

We found all analytical data for Round 4 to be usable without qualification. The data were reviewed for adherence to method guidance and the laboratory's control limits for holding times, method blanks, and blank spike recoveries as described in the Compliance Monitoring Work Plan (Hart Crowser 2013). Attachment 1 contains the data generated by the lab, Analytical Resources, Inc., and Hart Crowser's data validation report for Round 4.

The complete laboratory data reports for Rounds 1 through 3 were presented previously in Hart Crowser (2013b), (2013c), and (2013d), respectively, and are included here on CD-ROM (Attachment 2).

Closing

We trust this report meets your requirements for documenting compliance monitoring. Please contact us with any questions or if you require additional information.

Sincerely,

HART CROWSER, INC.

MARK DAGEL, LHG
Senior Associate Water Resource Specialist

SUZANNE FAUBL, MS
Environmental Scientist

CC: James DeMay, Washington State Department of Ecology

Attachments:
Table 1 - Results of Round Three Groundwater Compliance Monitoring
Figure 1 - Vicinity Map

Attachment 1 – Round 4 Validation Report and Laboratory Analytical Report
Attachment 2 – Rounds 1 through 3 Laboratory Analytical Reports (on CD-ROM)

References

Ecology 2013. Cleanup Action Plan, Port of Tacoma/Parcel 88, Pierce County, Washington, 1621 Marine View Drive, Tacoma, Washington 98422, May 22, 2013, Issued by Washington State Department of Ecology, Toxics Cleanup Program.

Hart Crowser 2013a. Compliance Monitoring Work Plan, Port of Tacoma Parcel 88. Prepared for Port of Tacoma. May 30, 2013.

Hart Crowser, 2013b. Remedial Investigation/Feasibility Study, Port of Tacoma Parcel 88, 1621 Marine View Drive, Tacoma, Washington. Prepared for Port of Tacoma. February 15, 2013.

Hart Crowser, 2013c. Parcel 88, Results of Round Two Groundwater Compliance Monitoring. Letter Report Prepared for Port of Tacoma. July 9, 2013.

Hart Crowser, 2013d. Parcel 88, Results of Round Three Groundwater Compliance Monitoring. Letter Report Prepared for Port of Tacoma. September 27, 2013.

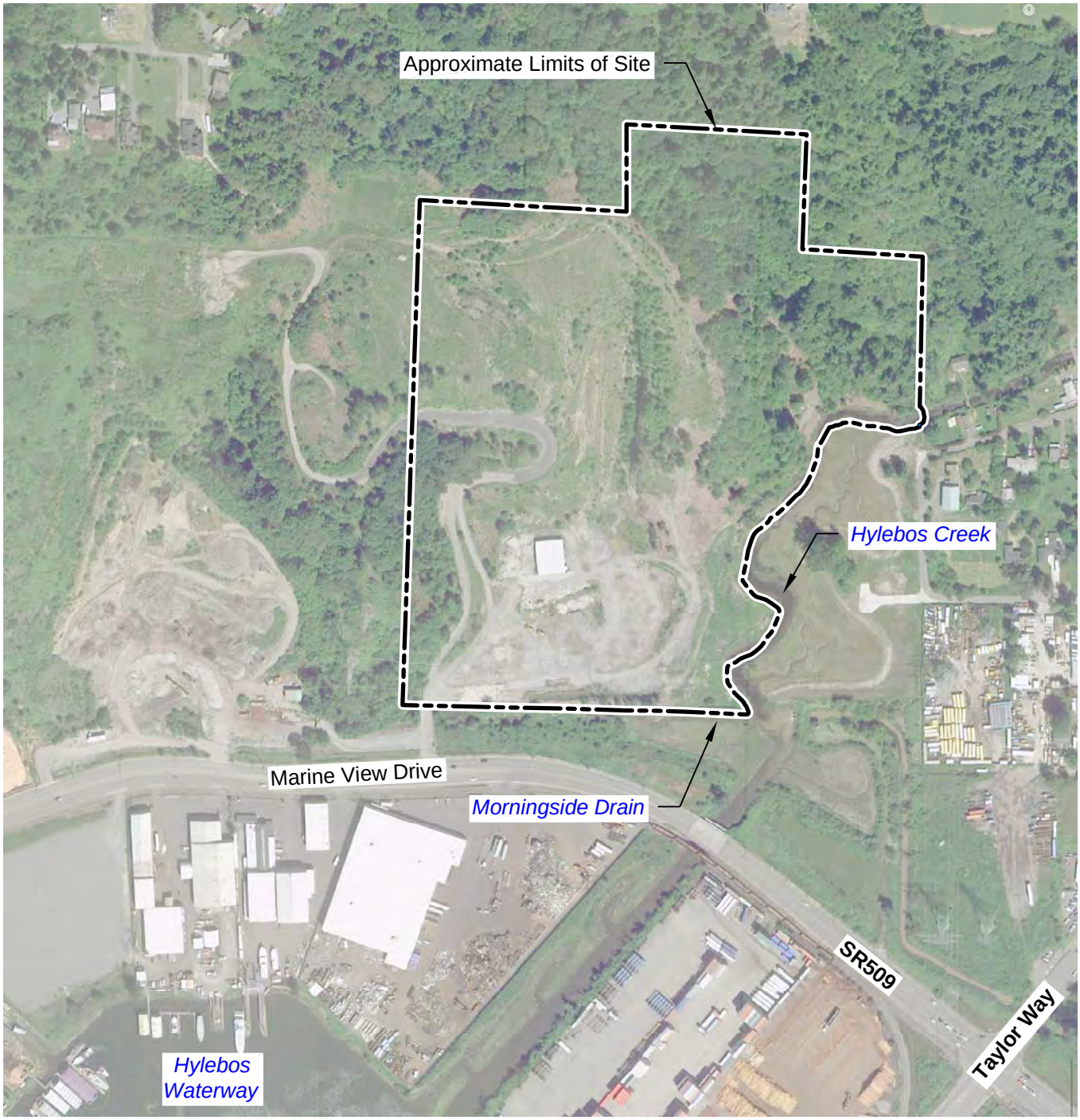
Table 1 - Results of Groundwater Compliance Monitoring

			MW-201 1st Round 9/7/2012*		MW-202 1st Round 9/7/2012		MW-201 2nd Round 6/13/2013		MW-202 2nd Round 6/13/2013		MW-201 3rd Round 9/9/2013		MW-202 3rd Round 9/9/2013		MW-201 4th Round 12/9/2013		MW-202 4th Round 12/9/2013	
Petroleum Hydrocarbons	**Cleanup Level (from CAP)**	**Unit**																
Diesel Range Organics	No Sheen	ug/L[a]	100	U	100	U	100	U	100	U	100	U	100	U	100	U	100	U
Motor Oil Range Organics	No Sheen	ug/L[a]	200	U	200	U	200	U	200	U	200	U	200	U	200	U	200	U
Metals																		
Arsenic, dissolved	36	ug/L	0.9		17.6		2.3		12.7		1.3		14.3		1.4		8.3	
Copper, dissolved	2.4	ug/L	0.5	U	0.5	U	1		0.5	U	0.5	U	0.5	U	0.9		0.5	U
Lead, dissolved	8.1	ug/L	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U
Mercury, total	0.025	ug/L[b]	0.01	U	0.01	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U
Zinc, dissolved	81	ug/L	4	U	4	U	4		4	U	4	U	4	U	4	U	5	

Notes:

µg/L – micrograms per liter
U – undetected at the laboratory's reported detection limit
a - lab reported results in milligrams per liter (mg/L); values in this table have been converted to µg/L for comparison with cleanup level values
b - lab reported results in nanograms per liter (ng/L); values in this table here has been converted to µg/L for comparison with cleanup level values

* The 1st Round results reported for petroleum hydrocarbons and total mercury are for samples collected on 9/7/2012. The results for dissolved metals are for samples collected on 10/12/2012.



Source: **Base map prepared from Google Earth Pro, 2010.**

N

0 400 800

Scale in Feet

Port of Tacoma Parcel 88, Compliance Monitoring
Tacoma, Washington

Vicinity Map

17652-00 1/14

HARTCROWSER

Figure

1

EAL 01/22/14 1765200-CMP-001.dwg

MW-201 Compliance Monitoring Well Location and Number

MW-202

MW-201

Tidal Channel

Unpaved Roadway

Creek

Hylebos

Tidal Channel

Tidal Channel

BPA Access Road

Morningside Drain

N

0 100 200

Scale in Feet

Notes:

1. Vertical datum is MLLW.

Port of Tacoma Parcel 88, Compliance Monitoring
Tacoma, Washington

Compliance Monitoring Wells

17652-00 1/14

HARTCROWSER

Figure **2**

EAL 01/22/14 1765200-CMP-002.dwg

ATTACHMENT 1
HART CROWSER VALIDATION REPORT AND LABORATORY ANALYTICAL REPORT

DATA VALIDATION REPORT

Port of Tacoma / Parcel 88 Round Four Compliance Monitoring

The summary data quality review for two groundwater samples collected on December 9, 2013, is complete. The samples were analyzed by Analytical Resources, Inc., (ARI) laboratory in Tukwila, Washington, for:

- Dissolved metals (arsenic, copper, lead, and zinc) by EPA Method 200.8;
- Total mercury by EPA Method 7470A; and
- TPH by NWTPH-Dx (extended) with silica gel cleanup.

These analyses were performed in general accordance with the method specified in EPA's *Methods for Chemical Analysis of Water and Wastes*, March 1983, and *EPA 200.8, Determination of Trace Elements in Waters and Wastes by Inductively-Coupled Plasma-Mass Spectrometry, Revision 5.4*, May 1994. The laboratory provided a summary report containing the sample results and associated QA/QC data. The following samples are associated with ARI job numbers XQ79 and XQ80:

Sample ID	**ARI Lab IDs**
MW-201	XQ79A/ XQ80A
MW-202	XQ79B/ XQ80B

The data were reviewed for adherence to method guidance and ARI control limits for holding times, method blanks, and blank spike recoveries (laboratory control samples). Data were qualified based on the definition and use of qualifying flags outlined in the EPA document *USEPA Contract Laboratory Program (CLP) National Functional Guidelines for Inorganic Data Review*, January 2010.

Upon arrival at ARI the samples were inspected by the sample receiver, who compared the information on the sample jar labels to the chain-of-custody (COC) and measured the temperature of the cooler. All bottles arrived in good condition, there were no discrepancies on the COC, and the temperature of the cooler was within the EPA-recommended limits.

All analytical data from ARI jobs XQ79 and XQ80 is usable without qualification.

Analytical Resources, Incorporated
Analytical Chemists and Consultants

December 18, 2013

Mark Dagel
Hart Crowser, Inc.
1700 Westlake Avenue N. Suite 200
Seattle, WA 98109-3256

RE: Client Project: Parcel 88
ARI Job Nos.: XQ79 & XQ80

Dear Mark;

Please find enclosed the original Chain-of-Custody record (COC), sample receipt documentation, and the final data for samples from the project referenced above. Analytical Resources, Inc. (ARI) received two water samples on December 9, 2013. The samples were received in good condition with a cooler temperature of 2.6°C. For further details regarding sample receipt, please refer to the enclosed Cooer Receipt Form.

The samples were analyzed for NWTPH-Dx, dissolved metals, and total mercury, as requested on the COC.

There were no anomalies associated with the analyses of these samples.

A copy of this report and all associated raw data will be kept on file at ARI. Should you have any questions regarding these results, please feel free to contact me at your convenience.

Sincerely,

ANALYTICAL RESOURCES, INC.

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

cc: eFile XQ79_XQ80

Enclosures

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

Sample Custody Record

Samples Shipped to: ARI

HARTCROWSER XQ79

Hart Crowser, Inc.
1700 Westlake Avenue North, Suite 200
Seattle, Washington 98109-6212
Office: 206.324.9530 • Fax 206.328.5581

JOB 17652-00 LAB NUMBER XQ79 & XQ80

PROJECT NAME PARCEL 88

HART CROWSER CONTACT MARK DAGEL

SAMPLED BY: SMF

REQUESTED ANALYSIS: * Dissolved metals; Total Hg; ** TPH-Dx

LAB NO.	SAMPLE ID	DESCRIPTION	DATE	TIME	MATRIX	* Dissolved metals	Total Hg	** TPH-Dx	NO. OF CONTAINERS	OBSERVATIONS/COMMENTS/ COMPOSITING INSTRUCTIONS
	MW-201		12.9.13	1445	H_2O	X	X	X	4	Dissolved metals sample
	MW-202		12.9.13	1320	H_2O	X	X	X	4	was filtered in field.

RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE: Suzanne Faubl (signature)	12/9/13	SIGNATURE: (signature)	12-9-13
PRINT NAME: Suzanne Faubl	TIME	PRINT NAME: Taylor Streeter	TIME
COMPANY: Hart Crowser	1600	COMPANY: ARI	1600
RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE		SIGNATURE	
PRINT NAME	TIME	PRINT NAME	TIME
COMPANY		COMPANY	

SPECIAL SHIPMENT HANDLING OR STORAGE REQUIREMENTS:

* By EPA 200.8 (As, Cu, Pb, Zn) Filtered in field

** Use silica gel cleanup

COOLER NO.: STORAGE LOCATION:

See Lab Work Order No. ______ for Other Contract Requirements

8 TOTAL NUMBER OF CONTAINERS

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

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

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

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Hart Crowser Project Name: Parcel 88

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

Assigned ARI Job No. XQ79 XQ80 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): 2.6

Time: 1600

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

Cooler Accepted by: TS Date: 12-9-13 Time: 1600

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: _____

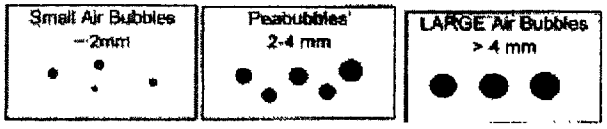
Samples Logged by: TS Date: 12-9-13 Time: 1605

***** 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)

XQ79 : 00003

Sample ID Cross Reference Report

ANALYTICAL RESOURCES INCORPORATED

ARI Job No: XQ79
Client: Hart Crowser, Inc
Project Event: 17652-00
Project Name: Parcel 88

	Sample ID	ARI Lab ID	ARI LIMS ID	Matrix	Sample Date/Time	VTSR
1.	MW-201	XQ79A	13-26966	Water	12/09/13 14:45	12/09/13 16:00
2.	MW-202	XQ79B	13-26967	Water	12/09/13 13:20	12/09/13 16:00

Sample ID Cross Reference Report

ANALYTICAL RESOURCES INCORPORATED

ARI Job No: XQ80
Client: Hart Crowser, Inc
Project Event: 17652-00
Project Name: Parcel 88

	Sample ID	ARI Lab ID	ARI LIMS ID	Matrix	Sample Date/Time	VTSR
1.	MW-201	XQ80A	13-26968	Water	12/09/13 14:45	12/09/13 16:00
2.	MW-202	XQ80B	13-26969	Water	12/09/13 13:20	12/09/13 16:00

PRESERVATION VERIFICATION 12/09/13
Page 1 of 1

ANALYTICAL RESOURCES INCORPORATED

ARI Job No: **XQ79**

Inquiry Number: NONE
Analysis Requested: 12/10/13
Contact: Dagel, Mark
Client: Hart Crowser, Inc
Logged by: TS
Sample Set Used: Yes-481
Validatable Package: No
Deliverables:

PC: Kelly
VTSR: 12/09/13

Project #: 17652-00
Project: Parcel 88
Sample Site:
SDG No:
Analytical Protocol: In-house

LOGNUM ARI ID	CLIENT ID	CN >12	WAD >12	NH3 <2	COD <2	FOG <2	MET <2	PHEN <2	PHOS <2	TKN <2	NO23 <2	TOC <2	S2 >9	TPHD <2	Fe2+ <2	DMET FLT	DOC FLT	PARAMETER	ADJUSTED TO	LOT NUMBER	AMOUNT ADDED	DATE/BY
13-26966 **XQ79A**	MW-201						DIS Pass									Y						
13-26967 **XQ79B**	MW-202						DIS Pass									Y						

XQ79::SDG

Checked By TJ Date 12-9-13

PRESERVATION VERIFICATION 12/09/13
Page 1 of 1

ANALYTICAL RESOURCES INCORPORATED

ARI Job No: **XQ80**

Inquiry Number: NONE
Analysis Requested: 12/10/13
Contact: Dagel, Mark
Client: Hart Crowser, Inc
Logged by: TS
Sample Set Used: Yes-481
Validatable Package: No
Deliverables:

PC: Kelly
VTSR: 12/09/13

Project #: 17652-00
Project: Parcel 88
Sample Site:
SDG No:
Analytical Protocol: In-house

LOGNUM ARI ID	CLIENT ID	CN >12	WAD >12	NH3 <2	COD <2	FOG <2	MET <2	PHEN <2	PHOS <2	TKN <2	NO23 <2	TOC <2	S2 >9	TPHD <2	Fe2+ <2	DMET FLT	DOC FLT	PARAMETER	ADJUSTED TO	LOT NUMBER	AMOUNT ADDED	DATE/BY
13-26968 **XQ80A**	MW-201						TOT Pass															
13-26969 **XQ80B**	MW-202						TOT Pass															

XQ80 09-DEC-13

Checked By TS Date 12-9-13

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD by GC/FID-Silica and Acid Cleaned
Extraction Method:

QC Report No: XQ79-Hart Crowser, Inc
Project: Parcel 88
17652-00

Matrix: Water
Data Release Authorized: MW
Reported: 12/18/13

ARI ID	Sample ID	Extraction Date	Analysis Date	EFV DF	Range/Surrogate	RL	Result
MB-121013	Method Blank	12/10/13	12/17/13	1.00	Diesel Range	0.10	< 0.10 U
13-26966	HC ID: ---		FID3B	1.0	Motor Oil Range	0.20	< 0.20 U
					o-Terphenyl		81.3%
XQ79A	MW-201	12/10/13	12/17/13	1.00	Diesel Range	0.10	< 0.10 U
13-26966	HC ID: ---		FID3B	1.0	Motor Oil Range	0.20	< 0.20 U
					o-Terphenyl		88.1%
XQ79B	MW-202	12/10/13	12/17/13	1.00	Diesel Range	0.10	< 0.10 U
13-26967	HC ID: ---		FID3B	1.0	Motor Oil Range	0.20	< 0.20 U
					o-Terphenyl		78.0%

Reported in mg/L (ppm)

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

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 indicate results of organics or additional hydrocarbons in ranges are not identifiable.

ANALYTICAL RESOURCES INCORPORATED

CLEANED TPHD SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: XQ79-Hart Crowser, Inc
Project: Parcel 88
17652-00

Client ID	OTER	TOT OUT
MB-121013	81.3%	0
LCS-121013	87.4%	0
MW-201	88.1%	0
MW-202	78.0%	0

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

Prep Method: SW3510C
Log Number Range: 13-26966 to 13-26967

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
NWTPHD by GC/FID-Silica and Acid Cleaned **Sample ID: LCS-121013**
Page 1 of 1 **LAB CONTROL**

Lab Sample ID: LCS-121013 QC Report No: XQ79-Hart Crowser, Inc
LIMS ID: 13-26966 Project: Parcel 88
Matrix: Water 17652-00
Data Release Authorized: Date Sampled: 12/09/13
Reported: 12/18/13 Date Received: 12/09/13

Date Extracted: 12/10/13 Sample Amount: 500 mL
Date Analyzed: 12/17/13 16:20 Final Extract Volume: 1.0 mL
Instrument/Analyst: FID/JLW Dilution Factor: 1.00

Range	Lab Control	Spike Added	Recovery
Diesel	2.32	3.00	77.3%

TPHD Surrogate Recovery

o-Terphenyl	87.4%

Results reported in mg/L

ANALYTICAL RESOURCES INCORPORATED

TOTAL DIESEL RANGE HYDROCARBONS-EXTRACTION REPORT

ARI Job: XQ79
Matrix: Water Project: Parcel 88
Date Received: 12/09/13 17652-00

ARI ID	Client ID	Samp Amt	Final Vol	Prep Date
13-26966-121013MB1	Method Blank	500 mL	1.00 mL	12/10/13
13-26966-121013LCS1	Lab Control	500 mL	1.00 mL	12/10/13
13-26966-XQ79A	MW-201	500 mL	1.00 mL	12/10/13
13-26967-XQ79B	MW-202	500 mL	1.00 mL	12/10/13

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS
Page 1 of 1

Sample ID: MW-201
SAMPLE

Lab Sample ID: XQ79A
LIMS ID: 13-26966
Matrix: Water
Data Release Authorized:
Reported: 12/16/13

QC Report No: XQ79-Hart Crowser, Inc
Project: Parcel 88
17652-00
Date Sampled: 12/09/13
Date Received: 12/09/13

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	µg/L	Q
200.8	12/11/13	200.8	12/13/13	**7440-38-2**	**Arsenic**	0.2	**1.4**	
200.8	12/11/13	200.8	12/13/13	**7440-50-8**	**Copper**	0.5	**0.9**	
200.8	12/11/13	200.8	12/13/13	7439-92-1	Lead	0.1	0.1	U
200.8	12/11/13	200.8	12/13/13	7440-66-6	Zinc	4	4	U

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS
Page 1 of 1

Sample ID: MW-201
DUPLICATE

Lab Sample ID: XQ79A
LIMS ID: 13-26966
Matrix: Water
Data Release Authorized:
Reported: 12/16/13

QC Report No: XQ79-Hart Crowser, Inc
Project: Parcel 88
17652-00
Date Sampled: 12/09/13
Date Received: 12/09/13

MATRIX DUPLICATE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Duplicate	RPD	Control Limit	Q
Arsenic	200.8	1.4	1.4	0.0%	+/- 20%	
Copper	200.8	0.9	0.7	25.0%	+/- 0.5	L
Lead	200.8	0.1 U	0.1 U	0.0%	+/- 0.1	L
Zinc	200.8	4 U	4 U	0.0%	+/- 4	L

Reported in µg/L

*-Control Limit Not Met
L-RPD Invalid, Limit = Detection Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS

Sample ID: MW-201
MATRIX SPIKE

Lab Sample ID: XQ79A
LIMS ID: 13-26966
Matrix: Water
Data Release Authorized:
Reported: 12/16/13

QC Report No: XQ79-Hart Crowser, Inc
Project: Parcel 88
17652-00
Date Sampled: 12/09/13
Date Received: 12/09/13

MATRIX SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Spike	Spike Added	% Recovery	Q
Arsenic	200.8	1.4	24.6	25.0	92.8%	
Copper	200.8	0.9	23.9	25.0	92.0%	
Lead	200.8	0.1 U	19.2	25.0	76.8%	
Zinc	200.8	4 U	67	80.0	83.8%	

Reported in µg/L

N-Control Limit Not Met
H-% Recovery Not Applicable, Sample Concentration Too High
NA-Not Applicable, Analyte Not Spiked

Percent Recovery Limits: 75-125%

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS
Page 1 of 1

Sample ID: MW-202
SAMPLE

Lab Sample ID: XQ79B
LIMS ID: 13-26967
Matrix: Water
Data Release Authorized:
Reported: 12/16/13

QC Report No: XQ79-Hart Crowser, Inc
Project: Parcel 88
17652-00
Date Sampled: 12/09/13
Date Received: 12/09/13

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	µg/L	Q
200.8	12/11/13	200.8	12/13/13	**7440-38-2**	**Arsenic**	0.2	**8.3**	
200.8	12/11/13	200.8	12/13/13	7440-50-8	Copper	0.5	0.5	U
200.8	12/11/13	200.8	12/13/13	7439-92-1	Lead	0.1	0.1	U
200.8	12/11/13	200.8	12/13/13	**7440-66-6**	**Zinc**	4	**5**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

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

Lab Sample ID: XQ79MB
LIMS ID: 13-26967
Matrix: Water
Data Release Authorized:
Reported: 12/16/13

QC Report No: XQ79-Hart Crowser, Inc
Project: Parcel 88
17652-00
Date Sampled: NA
Date Received: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	µg/L	Q
200.8	12/11/13	200.8	12/13/13	7440-38-2	Arsenic	0.2	0.2	U
200.8	12/11/13	200.8	12/13/13	7440-50-8	Copper	0.5	0.5	U
200.8	12/11/13	200.8	12/13/13	7439-92-1	Lead	0.1	0.1	U
200.8	12/11/13	200.8	12/13/13	7440-66-6	Zinc	4	4	U

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS

Sample ID: LAB CONTROL

Lab Sample ID: XQ79LCS
LIMS ID: 13-26967
Matrix: Water
Data Release Authorized:
Reported: 12/16/13

QC Report No: XQ79-Hart Crowser, Inc
Project: Parcel 88
17652-00
Date Sampled: NA
Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike Found	Spike Added	% Recovery	Q
Arsenic	200.8	25.2	25.0	101%	
Copper	200.8	26.2	25.0	105%	
Lead	200.8	23.2	25.0	92.8%	
Zinc	200.8	79	80	98.8%	

Reported in µg/L

N-Control limit not met
Control Limits: 80-120%

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
Total Mercury by Method SW7470A

Data Release Authorized:
Reported: 12/18/13
Date Received: 12/09/13
Page 1 of 1

QC Report No: XQ80-Hart Crowser, Inc
Project: Parcel 88
17652-00

Client/ ARI ID	Date Sampled	Matrix	Prep Date Anal Date	RL	Result
MW-201	12/09/13	Water	12/18/13	20.0	20.0 U
XQ80A 13-26968			12/18/13		
MW-202	12/09/13	Water	12/18/13	20.0	20.0 U
XQ80B 13-26969			12/18/13		
MB-121813	NA	Water	12/18/13	20.0	20.0 U
Method Blank			12/18/13		

Reported in ng/L

RL-Analytical reporting limit
U-Undetected at reported detection limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: MW-201
DUPLICATE

Lab Sample ID: XQ80A
LIMS ID: 13-26968
Matrix: Water
Data Release Authorized:
Reported: 12/18/13

QC Report No: XQ80-Hart Crowser, Inc
Project: Parcel 88
17652-00
Date Sampled: 12/09/13
Date Received: 12/09/13

MATRIX DUPLICATE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Duplicate	RPD	Control Limit	Q
Mercury	7470A	20.0 U	20.0 U	0.0%	+/- 20.0	L

Reported in ng/L

*-Control Limit Not Met
L-RPD Invalid, Limit = Detection Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS **Sample ID: MW-201**
Page 1 of 1 **MATRIX SPIKE**

Lab Sample ID: XQ80A
LIMS ID: 13-26968
Matrix: Water
Data Release Authorized:
Reported: 12/18/13

QC Report No: XQ80-Hart Crowser, Inc
Project: Parcel 88
17652-00
Date Sampled: 12/09/13
Date Received: 12/09/13

MATRIX SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Spike	Spike Added	% Recovery	Q
Mercury	7470A	20.0 U	98.1	100	98.1%	

Reported in ng/L

N-Control Limit Not Met
H-% Recovery Not Applicable, Sample Concentration Too High
NA-Not Applicable, Analyte Not Spiked

Percent Recovery Limits: 75-125%

ANALYTICAL RESOURCES INCORPORATED

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

Lab Sample ID: XQ80LCS
LIMS ID: 13-26969
Matrix: Water
Data Release Authorized:
Reported: 12/18/13

QC Report No: XQ80-Hart Crowser, Inc
Project: Parcel 88
17652-00
Date Sampled: NA
Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike Found	Spike Added	% Recovery	Q
Mercury	7470A	198	200	99.0%	

Reported in ng/L

N-Control limit not met
Control Limits: 80-120%

ATTACHMENT 2
ROUNDS 1 THROUGH 3
LABORATORY ANALYTICAL REPORTS
(ON CD-ROM)

Analytical Resources, Incorporated
Analytical Chemists and Consultants

September 24, 2012

Mark Dagel
Hart Crowser, Inc.
1700 Westlake Avenue N. Suite 200
Seattle, WA 98109-3256

RE: Client Project: Parcel 88
ARI Job No.: VI65 and VK17

Dear Mark;

Please find enclosed the original Chain-of-Custody (COC) records, sample receipt documentation, and the final data for samples from the project referenced above. Analytical Resources, Inc. (ARI) received two water samples on September 7, 2012. The samples were received in good condition with a cooler temperature of 5.9 °C.

The samples were analyzed for NWTPH-Dx, dissolved metals and total mercury as requested on the COC.

There were no anomalies associated with the analyses of these samples.

A copy of this report and all associated raw data will be kept on file at ARI. Should you have any questions regarding these results, please feel free to contact me at your convenience.

Sincerely,

ANALYTICAL RESOURCES, INC.

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

cc: eFile VI65, VK17

KFB/kb

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

Sample Custody Record

V165

Samples Shipped to: ARI

HARTCROWSER

Hart Crowser, Inc.
1700 Westlake Avenue North, Suite 200
Seattle, Washington 98109-6212
Office: 206.324.9530 • Fax 206.328.5581

JOB 17652-00 LAB NUMBER

PROJECT NAME PARCEL 88

HART CROWSER CONTACT MARK DAGEL

SAMPLED BY: PRC and SMF

LAB NO.	SAMPLE ID	DESCRIPTION	DATE	TIME	MATRIX	#DISSOLVED METALS	TOTAL Hg	TPH**	NO. OF CONTAINERS	OBSERVATIONS/COMMENTS/ COMPOSITING INSTRUCTIONS
	MW201		9/7/12	11:45A	H_2O	✓	✓	✓	4	
	MW202		9/7/12	12:45P	H_2O	✓	✓	✓	4	

REQUESTED ANALYSIS

RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE	9/7/12	SIGNATURE	
PRINT NAME Phil Casdel	TIME	PRINT NAME	TIME
COMPANY HC	1555	COMPANY	
RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE Jennifer Millsap	9/7/12	SIGNATURE	
PRINT NAME AKT	TIME	PRINT NAME	TIME
COMPANY	1555	COMPANY	

SPECIAL SHIPMENT HANDLING OR STORAGE REQUIREMENTS:

* As, Cd, Cr, Cu, Pb and Zn

** Diesel and heavy oil.

COOLER NO.: STORAGE LOCATION:

See Lab Work Order No. for Other Contract Requirements

TOTAL NUMBER OF CONTAINERS

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

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

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

9/7/12

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Hart Crowser

Project Name: Parcel 88

COC No(s): _____ (NA)

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

Assigned ARI Job No: V165

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) 5.9		

If cooler temperature is out of compliance fill out form 00070F

Temp Gun ID#: 90877957

Cooler Accepted by: JM Date: 9/7/12 Time: 1555

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: _____

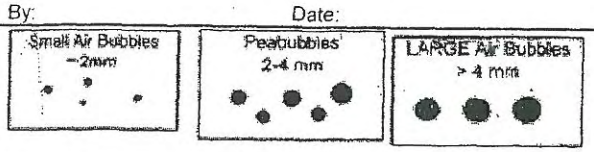
Samples Logged by: JM Date: 9/7/12 Time: 1608

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

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

Additional Notes, Discrepancies, & Resolutions:

By: Date:



Small → "sm"
Peabubbles → "pb"
Large → "lg"
Headspace → "hs"

V165 : 66663 KN 9/24/12

V165 : 66663

PRESERVATION VERIFICATION 09/07/12
Page 1 of 1

ANALYTICAL RESOURCES INCORPORATED

ARI Job No: **VI65**

Inquiry Number: NONE
Analysis Requested: 09/10/12
Contact: Dagel, Mark
Client: Hart Crowser, Inc
Logged by: JM
Sample Set Used: Yes-481
Validatable Package: No
Deliverables:

PC: Kelly
VTSR: 09/07/12

Project #: 17652-00
Project: PARCEL 88
Sample Site:
SDG No:
Analytical Protocol: In-house

LOGNUM ARI ID	CLIENT ID	CN >12	WAD >12	NH3 <2	COD <2	FOG <2	MET <2	PHEN <2	PHOS <2	TKN <2	NO23 <2	TOC <2	S2 >9	AK102 <2	Fe2+ <2	DMET FLT	DOC FLT	PARAMETER	ADJUSTED TO	LOT NUMBER	AMOUNT ADDED	DATE/BY
12-17097 **VI65A**	MW201						TOT pass											NB 09-7-12 pt				
12-17098 **VI65B**	MW202						TOT pass															
12-17099 **VI65C**	MW201						DIS Sai									N		pH	<2	MP2342	2.0mL	NB 09-07-12
12-17100 **VI65D**	MW202						DIS Sai									N		pH	<2	MP2342	2.0mL	NB 09-07-12

Samples C & D filtered & preserved in lab.
-NB 09-07-12

Checked By JM Date 9/7/12

Sample ID Cross Reference Report

ANALYTICAL RESOURCES INCORPORATED

ARI Job No: VI65
Client: Hart Crowser, Inc
Project Event: 17652-00
Project Name: PARCEL 88

	Sample ID	ARI Lab ID	ARI LIMS ID	Matrix	Sample Date/Time	VTSR
1.	MW201	VI65A	12-17097	Water	09/07/12 11:45	09/07/12 15:55
2.	MW202	VI65B	12-17098	Water	09/07/12 12:45	09/07/12 15:55
3.	MW201	VI65C	12-17099	Water	09/07/12 11:45	09/07/12 15:55
4.	MW202	VI65D	12-17100	Water	09/07/12 12:45	09/07/12 15:55

VI65:00005

~~VI65:00005~~ AV
9/24/12

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
TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD by GC/FID-Silica and Acid Cleaned
Extraction Method:
Page 1 of 1

QC Report No: VK17-Hart Crowser, Inc
Project: PARCEL 88
17652-00

Matrix: Water
Data Release Authorized: MW
Reported: 09/24/12

ARI ID	Sample ID	Extraction Date	Analysis Date	EFV DL	Range/Surrogate	RL	Result
MB-091112	Method Blank	09/11/12	09/21/12	1.00	Diesel Range	0.10	< 0.10 U
12-17955	HC ID: ---		FID3B	1.0	Motor Oil Range	0.20	< 0.20 U
					o-Terphenyl		83.7%
VK17A	MW201	09/11/12	09/21/12	1.00	Diesel Range	0.10	< 0.10 U
12-17955	HC ID: ---		FID3B	1.0	Motor Oil Range	0.20	< 0.20 U
					o-Terphenyl		82.5%
VK17B	MW202	09/11/12	09/21/12	1.00	Diesel Range	0.10	< 0.10 U
12-17956	HC ID: ---		FID3B	1.0	Motor Oil Range	0.20	< 0.20 U
					o-Terphenyl		80.3%

Reported in mg/L (ppm)

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

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 indicate results of organics or additional hydrocarbons in ranges are not identifiable.

ANALYTICAL RESOURCES INCORPORATED

CLEANED TPHD SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: VK17-Hart Crowser, Inc
Project: PARCEL 88
17652-00

Client ID	OTER	TOT OUT
MB-091112	83.7%	0
LCS-091112	89.3%	0
MW201	82.5%	0
MW202	80.3%	0

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

Prep Method: SW3510C
Log Number Range: 12-17955 to 12-17956

FORM-II TPHD

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
NWTPHD by GC/FID-Silica and Acid Cleaned **Sample ID: LCS-091112**
Page 1 of 1 **LAB CONTROL**

Lab Sample ID: LCS-091112
LIMS ID: 12-17955
Matrix: Water
Data Release Authorized: MW
Reported: 09/24/12

QC Report No: VK17-Hart Crowser, Inc
Project: PARCEL 88
17652-00
Date Sampled: 09/07/12
Date Received: 09/07/12

Date Extracted: 09/11/12
Date Analyzed: 09/21/12 12:13
Instrument/Analyst: FID/VTS

Sample Amount: 500 mL
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00

Range	Lab Control	Spike Added	Recovery
Diesel	2.25	3.00	75.0%

TPHD Surrogate Recovery

o-Terphenyl	89.3%

Results reported in mg/L

ANALYTICAL RESOURCES INCORPORATED

TOTAL DIESEL RANGE HYDROCARBONS-EXTRACTION REPORT

ARI Job: VK17
Matrix: Water — Project: PARCEL 88
Date Received: 09/07/12 — 17652-00

ARI ID	Client ID	Samp Amt	Final Vol	Prep Date
12-17955-091112MB1	Method Blank	500 mL	1.00 mL	09/11/12
12-17955-091112LCS1	Lab Control	500 mL	1.00 mL	09/11/12
12-17955-VK17A	MW201	500 mL	1.00 mL	09/11/12
12-17956-VK17B	MW202	500 mL	1.00 mL	09/11/12

Analytical Resources Inc.
TPH Quantitation Report

Data file: /chem3/fid3b.i/20120921.b/0921b006.d
Method: /chem3/fid3b.i/20120921.b/ftphfid3b.m
Instrument: fid3b.i
Operator: AR
Report Date: 09/21/2012
Macro: FID:3B091712

ARI ID: VK17MBW1
Client ID:
Injection: 21-SEP-2012 11:54
Dilution Factor: 1

FID:3B RESULTS

Compound	RT	Shift	Height	Area	Method	Range	Total Area	Conc
Toluene	1.013	-0.010	22365	20826	WATPHG	(Tol-C12)	508909	25.28
C8	1.233	-0.005	9209	18182	WATPHD	(C12-C24)	166764	13.00
C10	2.886	-0.003	1622	421	WATPHM	(C24-C38)	156087	18.46
C12	3.731	-0.002	1537	728	AK102	(C10-C25)	263337	16.84
C14	4.330	-0.002	721	445	AK103	(C25-C36)	139011	16.55
C16	4.850	0.002	1002	138	OR.DIES	(C10-C28)	273373	15.29
C18	5.299	-0.002	958	531				
C20	5.699	0.004	1346	861				
C22	6.048	-0.002	639	471				
C24	6.375	0.002	367	260				
C25	6.532	0.006	1394	2240				
C26	6.665	-0.006	104	55				
C28	6.949	0.000	1145	344	FUEL OIL	(C10-C24)	262109	17.98
C32	7.457	0.004	2165	2551				
C34	7.685	0.001	771	450				
Filter Peak	7.944	0.003	1342	609				
C36	7.919	0.017	1986	1452	BUNKERC	(C10-C38)	418196	85.26
o-terph	5.391	0.001	985741	630631	JET-A	(C10-C18)	213064	14.80
Triacon Surr	7.216	0.001	1029563	651049				

Range Times: NW Diesel(3.783 - 6.423) NW Gas(0.973 - 3.783) NW M.Oil(6.423 - 8.165) AK102(2.840 - 6.476) AK103(6.476 - 7.952) Jet A(2.840 - 5.351)

Surrogate	Area	Amount	%Rec
o-Terphenyl	630631	37.7	83.7
Triacontane	651049	44.7	99.4

Analyte	RF	Curve Date
o-Terph Surr	16747.9	13-SEP-2012
Triacon Surr	14552.1	13-SEP-2012
Gas	20131.4	14-SEP-2012
Diesel	12832.6	13-SEP-2012
Motor Oil	8456.6	13-SEP-2012
AK102	15633.9	13-SEP-2012
AK103	8399.4	11-AUG-2012
JetA	14399.0	16-FEB-2012
OR Diesel	17876.0	
Bunker C	4904.8	14-SEP-2012
Fuel Oil	14574.0	16-JUN-2012

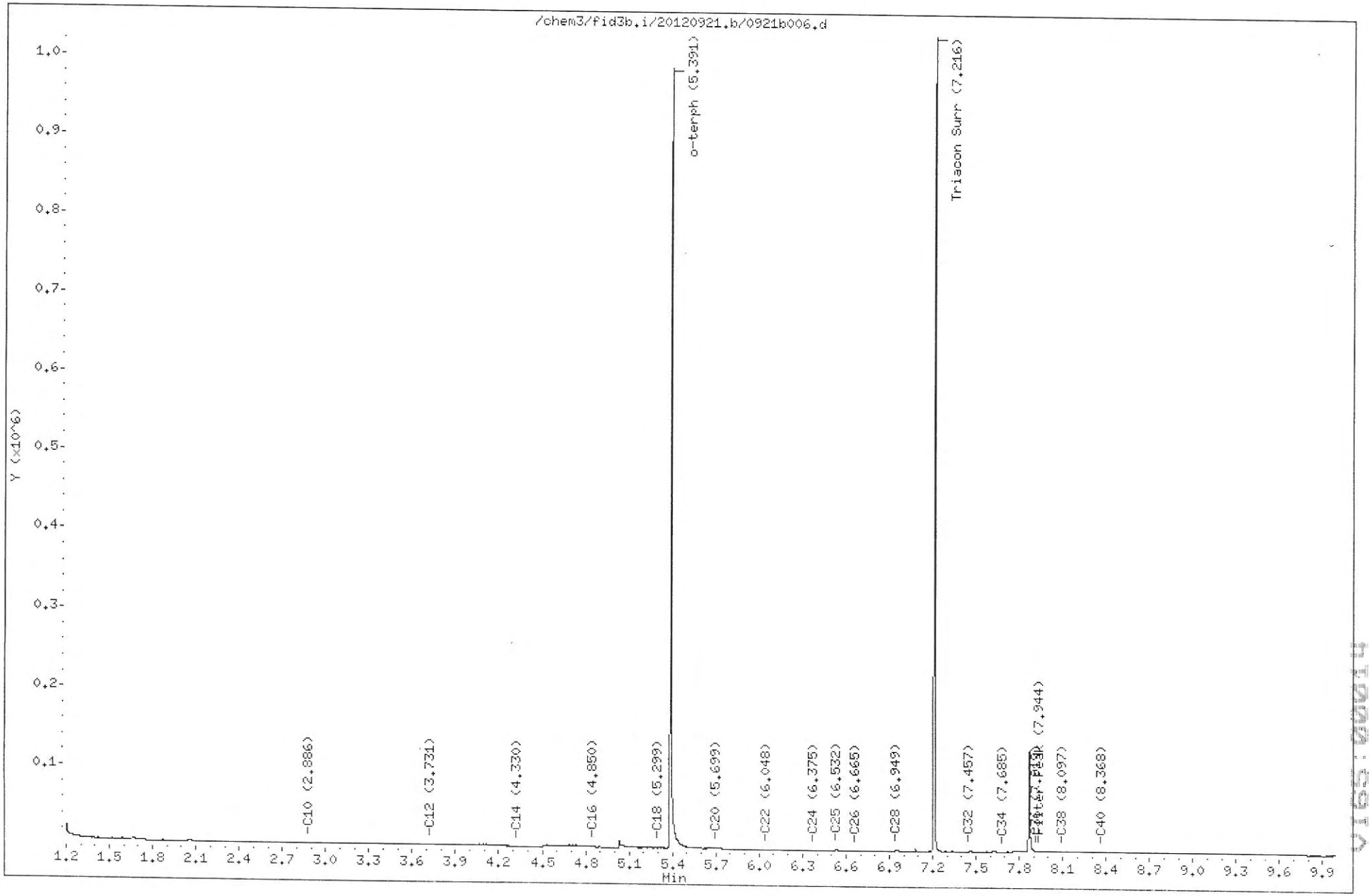
LB
9-21-12

Data File: /chem3/fid3b.i/20120921.b/0921b006.d
Date : 21-SEP-2012 11:54
Client ID:
Sample Info: VK17MBW1

Column phase: RTX-1

Instrument: fid3b.i

Operator: AR
Column diameter: 0.25



Analytical Resources Inc.
TPH Quantitation Report

Data file: /chem3/fid3b.i/20120921.b/0921b007.d
Method: /chem3/fid3b.i/20120921.b/ftphfid3b.m
Instrument: fid3b.i
Operator: AR
Report Date: 09/21/2012
Macro: FID:3B091712

ARI ID: VK17LCSW1
Client ID:
Injection: 21-SEP-2012 12:13
Dilution Factor: 1

FID:3B RESULTS

Compound	RT	Shift	Height	Area	Method	Range	Total Area	Conc
Toluene	1.013	-0.010	22057	20454	WATPHG	(Tol-C12)	3796126	188.57
C8	1.231	-0.007	9299	7617	WATPHD	(C12-C24)	14418930	1123.62
C10	2.895	0.006	81010	71403	WATPHM	(C24-C38)	253348	29.96
C12	3.734	0.002	167908	140053	AK102	(C10-C25)	16921219	1082.34 M
C14	4.334	0.001	311501	304472	AK103	(C25-C36)	214307	25.51
C16	4.851	0.004	488316	390028	OR.DIES	(C10-C28)	17017459	951.97 M
C18	5.305	0.004	446903	352496				
C20	5.698	0.003	312514	274800				
C22	6.050	0.001	161437	131740				
C24	6.373	0.000	41793	45294				
C25	6.526	0.000	18317	20393				
C26	6.674	0.003	6763	7638				
C28	6.952	0.003	1993	1435	FUEL OIL	(C10-C24)	16894213	1159.20
C32	7.456	0.003	1661	530				
C34	7.677	-0.007	515	282				
Filter Peak	7.946	0.005	820	227				
C36	7.918	0.016	1400	1840	BUNKERC	(C10-C38)	17147562	3496.08
o-terph	5.394	0.004	1078922	672946	JET-A	(C10-C18)	12841296	891.82
Triacon Surr	7.215	0.000	1060439	673710				

Range Times: NW Diesel(3.783 - 6.423) NW Gas(0.973 - 3.783) NW M.Oil(6.423 - 8.165)
AK102(2.840 - 6.476) AK103(6.476 - 7.952) Jet A(2.840 - 5.351)

Surrogate	Area	Amount	%Rec
o-Terphenyl	672946	40.2	89.3
Triacontane	673710	46.3	102.9

Analyte	RF	Curve Date
o-Terph Surr	16747.9	13-SEP-2012
Triacon Surr	14552.1	13-SEP-2012
Gas	20131.4	14-SEP-2012
Diesel	12832.6	13-SEP-2012
Motor Oil	8456.6	13-SEP-2012
AK102	15633.9	13-SEP-2012
AK103	8399.4	11-AUG-2012
JetA	14399.0	16-FEB-2012
OR Diesel	17876.0	
Bunker C	4904.8	14-SEP-2012
Fuel Oil	14574.0	16-JUN-2012

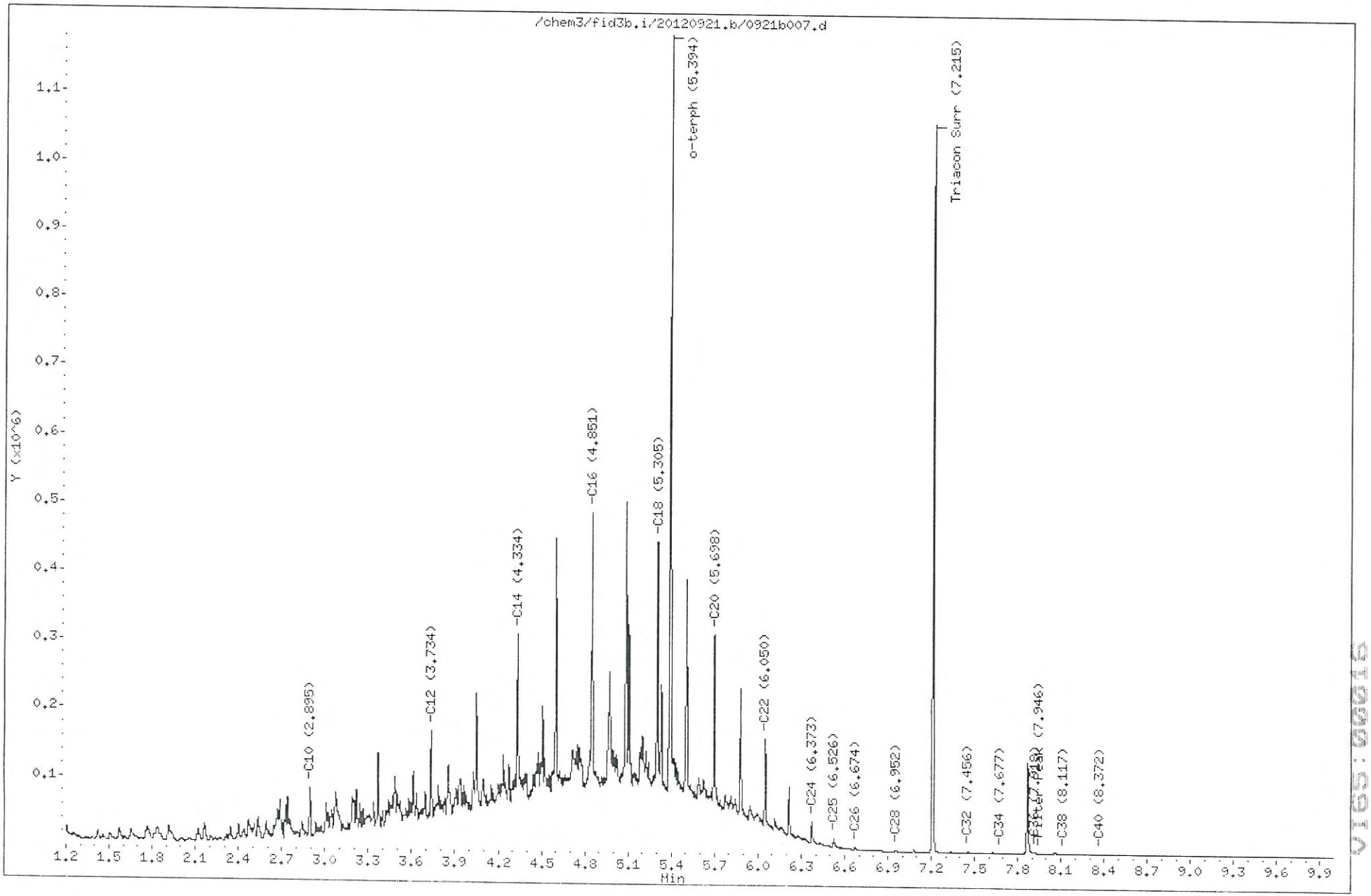
Data File: /chem3/fid3b.i/20120921.b/0921b007.d
Date : 21-SEP-2012 12:13
Client ID:
Sample Info: VK17LCSW1

Column phase: RTX-1

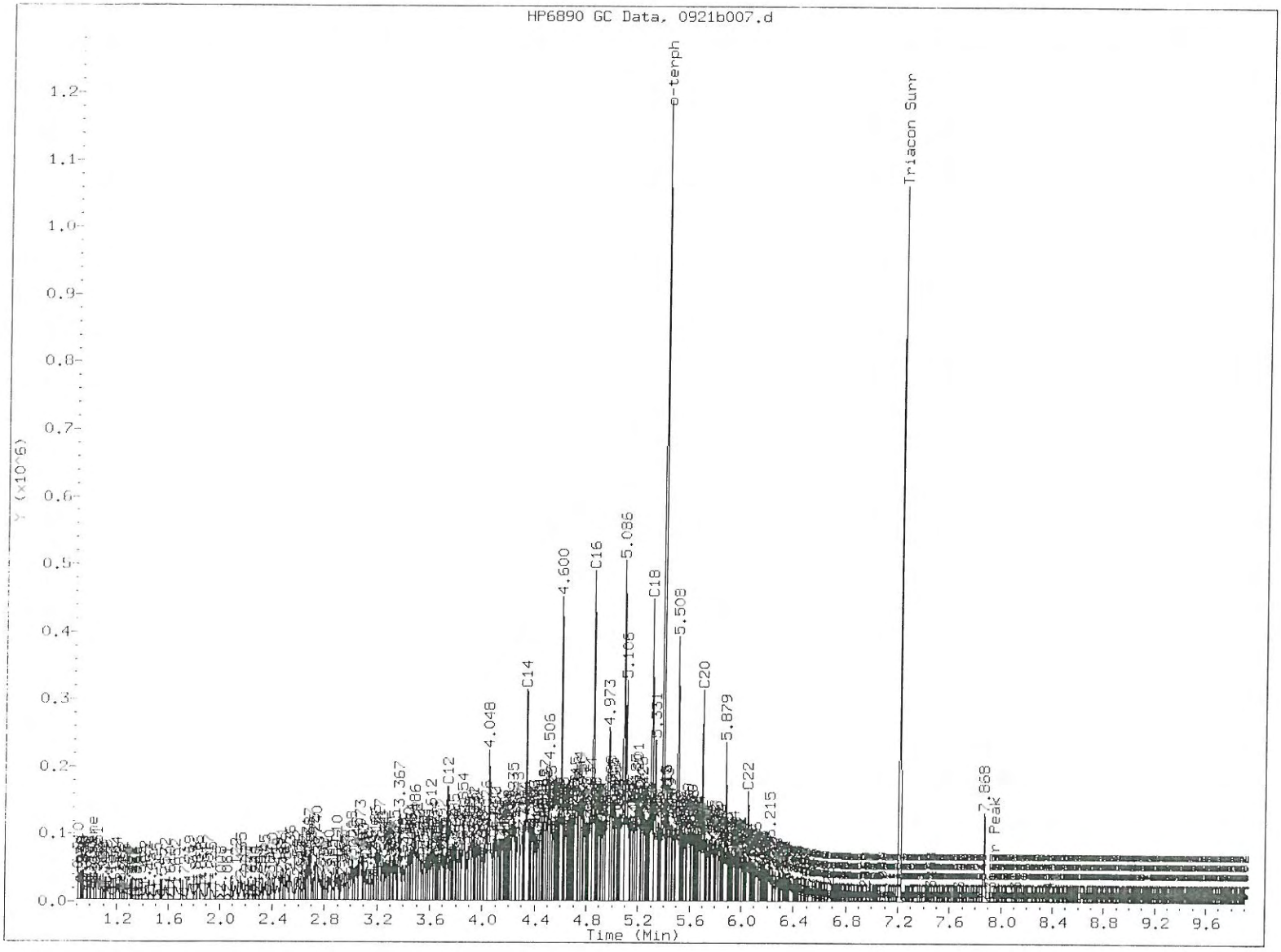
VB 9.21.12

Instrument: fid3b.i

Operator: AR
Column diameter: 0.25



FID:3B-2C/RTX-1 VK17LCSW1 FID:3B SIGNAL



MANUAL INTEGRATION

1. Baseline correction
3. Peak not found
5. Skimmed surrogate

Analyst: VD Date: 9-21-12

Analytical Resources Inc.
TPH Quantitation Report

Data file: /chem3/fid3b.i/20120921.b/0921b009.d
Method: /chem3/fid3b.i/20120921.b/ftphfid3b.m
Instrument: fid3b.i
Operator: AR
Report Date: 09/21/2012
Macro: FID:3B091712

ARI ID: VK17A
Client ID:
Injection: 21-SEP-2012 12:51
Dilution Factor: 1

FID:3B RESULTS

Compound	RT	Shift	Height	Area	Method	Range	Total Area	Conc
Toluene	1.027	0.004	11709	10684	WATPHG	(Tol-C12)	261502	12.99
C8	1.236	-0.002	5262	9238	WATPHD	(C12-C24)	178473	13.91
C10	2.881	-0.009	687	161	WATPHM	(C24-C38)	194073	22.95
C12	3.723	-0.010	1716	2565	AK102	(C10-C25)	262149	16.77
C14	4.336	0.003	422	263	AK103	(C25-C36)	178512	21.25
C16	4.851	0.003	1335	210	OR.DIES	(C10-C28)	280928	15.72
C18	5.302	0.001	1234	482				
C20	5.689	-0.006	2193	1684				
C22	6.047	-0.003	1282	1186				
C24	6.376	0.003	595	448				
C25	6.530	0.004	1724	1449				
C26	6.672	0.001	199	29				
C28	6.942	-0.007	5623	6357	FUEL OIL	(C10-C24)	260107	17.85
C32	7.456	0.003	1896	2091				
C34	7.678	-0.006	1632	1702				
Filter Peak	7.949	0.007	1011	294				
C36	7.918	0.015	1622	1241	BUNKERC	(C10-C38)	454180	92.60
o-terph	5.391	0.001	1011330	622024	JET-A	(C10-C18)	213293	14.81
Triacon Surr	7.215	0.000	924160	639506				

Range Times: NW Diesel(3.783 - 6.423) NW Gas(0.973 - 3.783) NW M.Oil(6.423 - 8.165)
AK102(2.840 - 6.476) AK103(6.476 - 7.952) Jet A(2.840 - 5.351)

Surrogate	Area	Amount	%Rec
o-Terphenyl	622024	37.1	82.5
Triacontane	639506	43.9	97.7

Analyte	RF	Curve Date
o-Terph Surr	16747.9	13-SEP-2012
Triacon Surr	14552.1	13-SEP-2012
Gas	20131.4	14-SEP-2012
Diesel	12832.6	13-SEP-2012
Motor Oil	8456.6	13-SEP-2012
AK102	15633.9	13-SEP-2012
AK103	8399.4	11-AUG-2012
JetA	14399.0	16-FEB-2012
OR Diesel	17876.0	
Bunker C	4904.8	14-SEP-2012
Fuel Oil	14574.0	16-JUN-2012

9-21-12

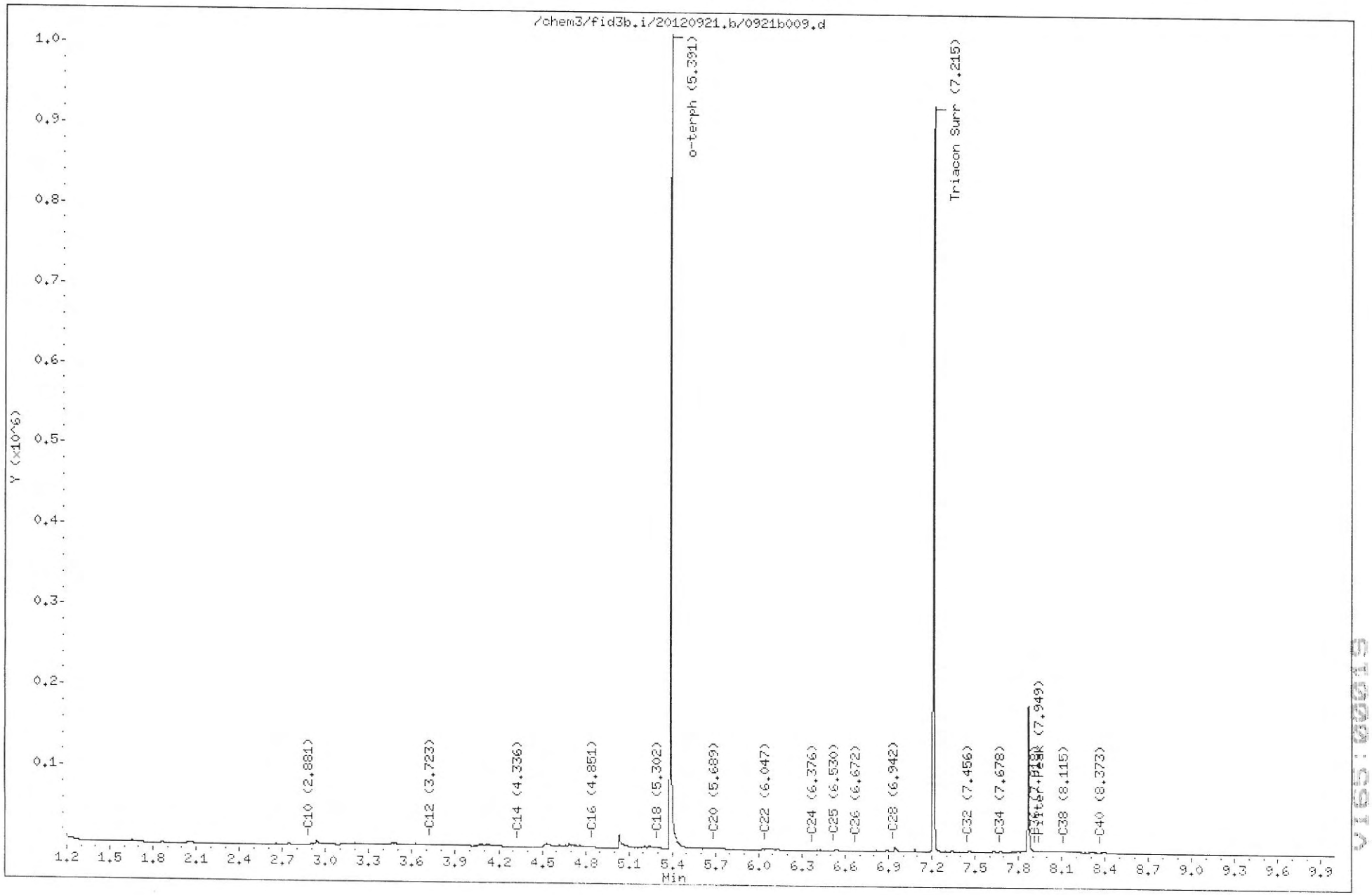
VI65:00018

Data File: /chem3/fid3b.i/20120921.b/0921b009.d
Date : 21-SEP-2012 12:51
Client ID:
Sample Info: VK17A

Column phase: RTX-1

Instrument: fid3b.i

Operator: AR
Column diameter: 0.25



Analytical Resources Inc.
TPH Quantitation Report

Data file: /chem3/fid3b.i/20120921.b/0921b010.d
Method: /chem3/fid3b.i/20120921.b/ftphfid3b.m
Instrument: fid3b.i
Operator: AR
Report Date: 09/21/2012
Macro: FID:3B091712

ARI ID: VK17B
Client ID:
Injection: 21-SEP-2012 13:10
Dilution Factor: 1

FID:3B RESULTS

Compound	RT	Shift	Height	Area	Method	Range	Total Area	Conc
Toluene	1.014	-0.010	22048	19921	WATPHG	(Tol-C12)	499161	24.80
C8	1.233	-0.005	9107	16890	WATPHD	(C12-C24)	178168	13.88
C10	2.892	0.002	1713	863	WATPHM	(C24-C38)	156758	18.54
C12	3.731	-0.002	1663	1074	AK102	(C10-C25)	281475	18.00
C14	4.332	-0.001	832	243	AK103	(C25-C36)	145238	17.29
C16	4.852	0.004	1161	207	OR.DIES	(C10-C28)	290215	16.23
C18	5.301	0.001	1035	585				
C20	5.693	-0.002	1595	1575				
C22	6.047	-0.003	879	564				
C24	6.376	0.003	462	250				
C25	6.535	0.008	1178	1025				
C26	6.669	-0.002	67	7				
C28	6.954	0.005	853	709	FUEL OIL	(C10-C24)	279869	19.20
C32	7.458	0.005	1694	1317				
C34	7.683	-0.001	419	354				
Filter Peak	7.946	0.004	861	170				
C36	7.915	0.012	1504	267	BUNKERC	(C10-C38)	436627	89.02
o-terph	5.391	0.001	973027	605048	JET-A	(C10-C18)	241190	16.75
Triacon Surr	7.215	0.000	940154	623902				

Range Times: NW Diesel(3.783 - 6.423) NW Gas(0.973 - 3.783) NW M.Oil(6.423 - 8.165)
AK102(2.840 - 6.476) AK103(6.476 - 7.952) Jet A(2.840 - 5.351)

Surrogate	Area	Amount	%Rec
o-Terphenyl	605048	36.1	80.3
Triacontane	623902	42.9	95.3

Analyte	RF	Curve Date
o-Terph Surr	16747.9	13-SEP-2012
Triacon Surr	14552.1	13-SEP-2012
Gas	20131.4	14-SEP-2012
Diesel	12832.6	13-SEP-2012
Motor Oil	8456.6	13-SEP-2012
AK102	15633.9	13-SEP-2012
AK103	8399.4	11-AUG-2012
JetA	14399.0	16-FEB-2012
OR Diesel	17876.0	
Bunker C	4904.8	14-SEP-2012
Fuel Oil	14574.0	16-JUN-2012

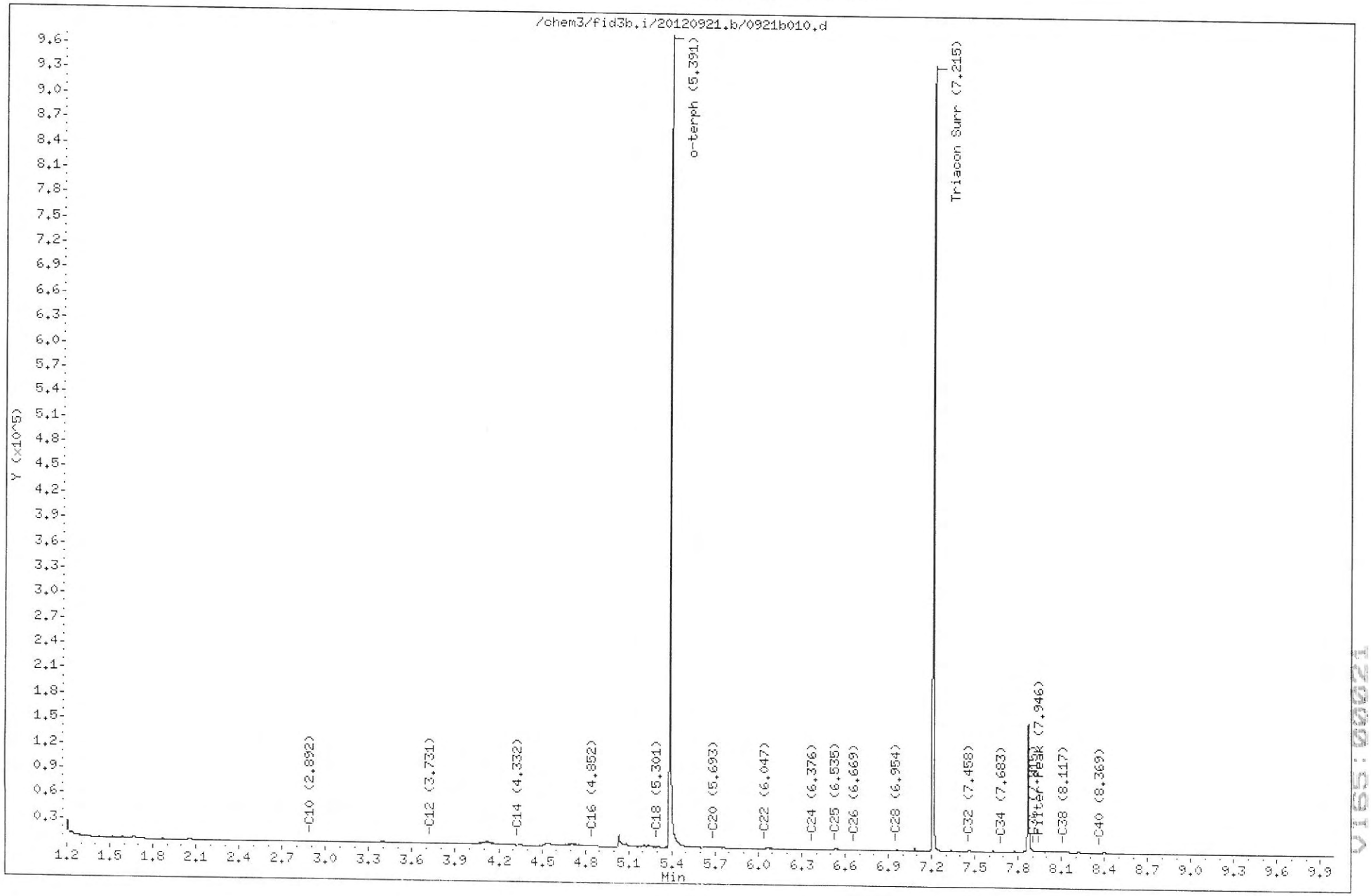
VK17
9.21.12

Data File: /chem3/fid3b.i/20120921.b/0921b010.d
Date : 21-SEP-2012 13:10
Client ID:
Sample Info: VK17B

Column phase: RTX-1

Instrument: fid3b.i

Operator: AR
Column diameter: 0.25



Analytical Resources, Incorporated
Analytical Chemists and Consultants

October 17, 2012

Mark Dagel
Hart Crowser, Inc.
1700 Westlake Avenue N. Suite 200
Seattle, WA 98109-3256

RE: Client Project: Parcel 88
ARI Job No.: VN00

Dear Mark;

Please find enclosed the original Chain-of-Custody (COC) record, sample receipt documentation, and the final data for samples from the project referenced above. Analytical Resources, Inc. (ARI) received two water samples on October 12, 2012. The samples were received in good condition with a cooler temperature of 2.8 °C.

The samples were analyzed for dissolved metals as requested on the COC.

The percent differences (%Ds) for chromium were slightly high for the CCALs that bracketed the analyses of these samples. Due to the expedited TAT for these samples, no corrective actions were taken.

There were no further anomalies associated with the analyses of these samples.

A copy of this report and all associated raw data will be kept on file at ARI. Should you have any questions regarding these results, please feel free to contact me at your convenience.

Sincerely,

ANALYTICAL RESOURCES, INC.

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

cc: eFile VN00

KFB/kb

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

Sample Custody Record

Samples Shipped to: AAT

HARTCROWSER

Hart Crowser, Inc.
1700 Westlake Avenue North, Suite 200
Seattle, Washington 98109-6212
Office: 206.324.9530 • **Fax** 206.328.5581

JOB 17652-00 LAB NUMBER

PROJECT NAME Parcel 88

HART CROWSER CONTACT M. Dagel

SAMPLED BY: PRC

LAB NO.	SAMPLE ID	DESCRIPTION	DATE	TIME	MATRIX	Dissolved Metals*	NO. OF CONTAINERS	OBSERVATIONS/COMMENTS/ COMPOSITING INSTRUCTIONS
								VNOO
	MW-201		10/12/12	0835	H_2O	X	1	Field filtered
	MW-202		10/12/12	0905	H_2O	X	1	Field filtered

RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE	10/12/12	SIGNATURE	10/12/12
PRINT NAME Phil Crandell	TIME	PRINT NAME A. Volgaardsen	TIME
COMPANY HC	1030	COMPANY AKI	1030
RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE	TIME	SIGNATURE	TIME
PRINT NAME		PRINT NAME	
COMPANY		COMPANY	

SPECIAL SHIPMENT HANDLING OR STORAGE REQUIREMENTS:
*As, Cd, Cr, Cu, Pb and Zn by EPA 200.8

TOTAL NUMBER OF CONTAINERS

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

COOLER NO.: STORAGE LOCATION:

See Lab Work Order No. for Other Contract Requirements

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

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

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Hart Crowser Project Name: Parcel 88

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

Assigned ARI Job No: VN00 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) 2.8		

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

Cooler Accepted by: AV Date: 10/12/12 Time: 1630

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:

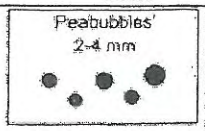
Samples Logged by: TS Date: 10-12-12 Time: 1134

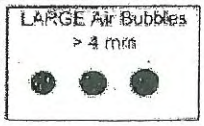
*** Notify Project Manager of discrepancies or concerns ***

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

Additional Notes, Discrepancies, & Resolutions:

By: Date:





Small → "sm"
Peabubbles → "pb"
Large → "lg"
Headspace → "hs"

VN00 : 00003

Sample ID Cross Reference Report

ANALYTICAL RESOURCES INCORPORATED

ARI Job No: VN00
Client: Hart Crowser, Inc
Project Event: 17652-00
Project Name: Parcel 88

	Sample ID	ARI Lab ID	ARI LIMS ID	Matrix	Sample Date/Time	VTSR
1.	MW-201	VN00A	12-19804	Water	10/12/12 08:35	10/12/12 10:30
2.	MW-202	VN00B	12-19805	Water	10/12/12 09:05	10/12/12 10:30

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

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS
Page 1 of 1

Sample ID: MW-201
SAMPLE

Lab Sample ID: VN00A
LIMS ID: 12-19804
Matrix: Water
Data Release Authorized:
Reported: 10/17/12

QC Report No: VN00-Hart Crowser, Inc
Project: Parcel 88
17652-00
Date Sampled: 10/12/12
Date Received: 10/12/12

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	µg/L	Q
200.8	10/15/12	200.8	10/16/12	**7440-38-2**	**Arsenic**	0.5	**0.9**	
200.8	10/15/12	200.8	10/15/12	7440-43-9	Cadmium	0.1	0.1	U
200.8	10/15/12	200.8	10/16/12	**7440-47-3**	**Chromium**	1	**5**	J
200.8	10/15/12	200.8	10/15/12	**7440-50-8**	**Copper**	0.5	**0.5**	
200.8	10/15/12	200.8	10/15/12	7439-92-1	Lead	0.1	0.1	U
200.8	10/15/12	200.8	10/15/12	7440-66-6	Zinc	4	4	U

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS
Page 1 of 1

Sample ID: MW-201
DUPLICATE

Lab Sample ID: VN00A
LIMS ID: 12-19804
Matrix: Water
Data Release Authorized:
Reported: 10/17/12

QC Report No: VN00-Hart Crowser, Inc
Project: Parcel 88
17652-00
Date Sampled: 10/12/12
Date Received: 10/12/12

MATRIX DUPLICATE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Duplicate	RPD	Control Limit	Q
Arsenic	200.8	0.9	1.0	10.5%	+/- 0.5	L
Cadmium	200.8	0.1 U	0.1 U	0.0%	+/- 0.1	L
Chromium	200.8	5	5	0.0%	+/- 1	L
Copper	200.8	0.5	0.5 U	0.0%	+/- 0.5	L
Lead	200.8	0.1 U	0.1 U	0.0%	+/- 0.1	L
Zinc	200.8	4 U	4 U	0.0%	+/- 4	L

Reported in µg/L

*-Control Limit Not Met
L-RPD Invalid, Limit = Detection Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS
Page 1 of 1

Sample ID: MW-201
MATRIX SPIKE

Lab Sample ID: VN00A
LIMS ID: 12-19804
Matrix: Water
Data Release Authorized:
Reported: 10/17/12

QC Report No: VN00-Hart Crowser, Inc
Project: Parcel 88
17652-00
Date Sampled: 10/12/12
Date Received: 10/12/12

MATRIX SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Spike	Spike Added	% Recovery	Q
Arsenic	200.8	0.9	28.0	25.0	108%	
Cadmium	200.8	0.1 U	23.6	25.0	94.4%	
Chromium	200.8	5	29	25	96.0%	
Copper	200.8	0.5	24.0	25.0	94.0%	
Lead	200.8	0.1 U	26.2	25.0	105%	
Zinc	200.8	4 U	73	80	91.2%	

Reported in µg/L

N-Control Limit Not Met
H-% Recovery Not Applicable, Sample Concentration Too High
NA-Not Applicable, Analyte Not Spiked

Percent Recovery Limits: 75-125%

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS
Page 1 of 1

Sample ID: MW-202
SAMPLE

Lab Sample ID: VN00B
LIMS ID: 12-19805
Matrix: Water
Data Release Authorized:
Reported: 10/17/12

QC Report No: VN00-Hart Crowser, Inc
Project: Parcel 88
17652-00
Date Sampled: 10/12/12
Date Received: 10/12/12

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	µg/L	Q
200.8	10/15/12	200.8	10/15/12	**7440-38-2**	**Arsenic**	0.2	**17.6**	
200.8	10/15/12	200.8	10/15/12	7440-43-9	Cadmium	0.1	0.1	U
200.8	10/15/12	200.8	10/16/12	7440-47-3	Chromium	1	1	U
200.8	10/15/12	200.8	10/15/12	7440-50-8	Copper	0.5	0.5	U
200.8	10/15/12	200.8	10/15/12	7439-92-1	Lead	0.1	0.1	U
200.8	10/15/12	200.8	10/15/12	7440-66-6	Zinc	4	4	U

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS

Sample ID: METHOD BLANK

Lab Sample ID: VN00MB
LIMS ID: 12-19805
Matrix: Water
Data Release Authorized:
Reported: 10/17/12

QC Report No: VN00-Hart Crowser, Inc
Project: Parcel 88
17652-00
Date Sampled: NA
Date Received: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	µg/L	Q
200.8	10/15/12	200.8	10/15/12	7440-38-2	Arsenic	0.2	0.2	U
200.8	10/15/12	200.8	10/15/12	7440-43-9	Cadmium	0.1	0.1	U
200.8	10/15/12	200.8	10/15/12	7440-47-3	Chromium	0.5	0.5	U
200.8	10/15/12	200.8	10/15/12	7440-50-8	Copper	0.5	0.5	U
200.8	10/15/12	200.8	10/15/12	7439-92-1	Lead	0.1	0.1	U
200.8	10/15/12	200.8	10/15/12	7440-66-6	Zinc	4	4	U

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS
Page 1 of 1

Sample ID: LAB CONTROL

Lab Sample ID: VN00LCS
LIMS ID: 12-19805
Matrix: Water
Data Release Authorized:
Reported: 10/17/12

QC Report No: VN00-Hart Crowser, Inc
Project: Parcel 88
17652-00
Date Sampled: NA
Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike Found	Spike Added	% Recovery	Q
Arsenic	200.8	25.8	25.0	103%	
Cadmium	200.8	24.1	25.0	96.4%	
Chromium	200.8	24.2	25.0	96.8%	
Copper	200.8	26.8	25.0	107%	
Lead	200.8	26.7	25.0	107%	
Zinc	200.8	83	80	104%	

Reported in µg/L

N-Control limit not met
Control Limits: 80-120%

Analytical Resources, Incorporated
Analytical Chemists and Consultants

June 26, 2013

Mark Dagel
Hart Crowser, Inc.
1700 Westlake Avenue N. Suite 200
Seattle, WA 98109-3256

RE: Client Project: Parcel 88
ARI Job No.: WV08 and WU21

Dear Mark;

Please find enclosed the original Chain-of-Custody (COC) records, sample receipt documentation, and the final data for samples from the project referenced above. Analytical Resources, Inc. (ARI) received two water samples on June 14, 2013. The samples were received in good condition with a cooler temperature of 6.0 °C.

The samples were analyzed for NWTPH-Dx, dissolved metals and total mercury as requested on the COC.

There were no anomalies associated with the analyses of these samples.

A copy of this report and all associated raw data will be kept on file at ARI. Should you have any questions regarding these results, please feel free to contact me at your convenience.

Sincerely,

ANALYTICAL RESOURCES, INC.

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

cc: eFile WV08 and WU21

KFB/kb

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

Sample Custody Record

Samples Shipped to: _____

HARTCROWSER

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

JOB _____ LAB NUMBER _____

PROJECT NAME PARCEL 88

HART CROWSER CONTACT MARK PAGEL

SAMPLED BY:

LAB NO.	SAMPLE ID	DESCRIPTION	DATE	TIME	MATRIX	Dissolved metals (As, Cu, Pb, Zn)*	Tot Hg	TPH-Dx w/silica gel cleanup**	NO. OF CONTAINERS	OBSERVATIONS/COMMENTS/ COMPOSITING INSTRUCTIONS
	MW-201		6/14/13	1115	H_2O	X	X	X	3	1 field-filtered
	MW-202		6/14/13	1300	H_2O	X	X	X	3	1 field-filtered

RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE: Suzanne Favel	6/14/13	SIGNATURE	6/14/13
PRINT NAME: SUZANNE FAVEL	TIME	PRINT NAME: A. Volgardsen	TIME
COMPANY: HART CROWSER	1418	COMPANY	1418
RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE	TIME	SIGNATURE	TIME
PRINT NAME		PRINT NAME	
COMPANY		COMPANY	

SPECIAL SHIPMENT HANDLING OR STORAGE REQUIREMENTS:

* By EPA 200.8. Samples were field filtered. See work plan for detection limits.

** Use silica gel cleanup on TPH-Dx.

COOLER NO.: STORAGE LOCATION:

See Lab Work Order No. _____ for Other Contract Requirements

TOTAL NUMBER OF CONTAINERS

SAMPLE RECEIPT INFORMATION

CUSTODY SEALS: ☐YES ☐NO ☐N/A

GOOD CONDITION ☐YES ☐NO

TEMPERATURE _____

SHIPMENT METHOD: ☐HAND ☐COURIER ☐OVERNIGHT

TURNAROUND TIME:

☐ 24 HOURS ☐ 1 WEEK

☐ 48 HOURS ☒ STANDARD

☐ 72 HOURS OTHER _____

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

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Hart Crowser | Project Name: Parcel 88

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

Assigned ARI Job No: WU21 | 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)	6.0	

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

Cooler Accepted by: AV | Date: 6/14/13 | Time: 1418

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: _____

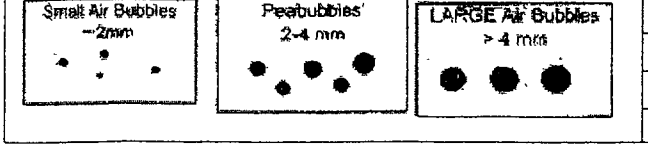
Samples Logged by: JM | Date: 6/14/13 | Time: 1627

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

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

Additional Notes, Discrepancies, & Resolutions:

By: Date:



Small → "sm"	
Peabubbles → "pb"	
Large → "lg"	
Headspace → "hs"	

Sample ID Cross Reference Report

ANALYTICAL RESOURCES INCORPORATED

ARI Job No: WU21
Client: Hart Crowser, Inc
Project Event: N/A
Project Name: Parcel 88

	Sample ID	ARI Lab ID	ARI LIMS ID	Matrix	Sample Date/Time	VTSR
1.	MW-201	WU21A	13-12871	Water	06/14/13 11:15	06/14/13 14:18
2.	MW-202	WU21B	13-12872	Water	06/14/13 13:00	06/14/13 14:18

Sample ID Cross Reference Report

ANALYTICAL RESOURCES INCORPORATED

ARI Job No: WV08
Client: Hart Crowser, Inc
Project Event: N/A
Project Name: Parcel 88

	Sample ID	ARI Lab ID	ARI LIMS ID	Matrix	Sample Date/Time	VTSR
1.	MW-201	WV08A	13-13337	Water	06/14/13 11:15	06/14/13 14:18
2.	MW-202	WV08B	13-13338	Water	06/14/13 13:00	06/14/13 14:18

PRESERVATION VERIFICATION 06/14/13
Page 1 of 1

ANALYTICAL RESOURCES INCORPORATED

ARI Job No: **WU21**

Inquiry Number: NONE
Analysis Requested: 06/14/13
Contact: Dagel, Mark
Client: Hart Crowser, Inc
Logged by: JM
Sample Set Used: Yes-481
Validatable Package: No
Deliverables:

PC: Kelly
VTSR: 06/14/13

Project #:
Project: Parcel 88
Sample Site:
SDG No:
Analytical Protocol: In-house

LOGNUM ARI ID	CLIENT ID	CN >12	WAD >12	NH3 <2	COD <2	FOG <2	MET <2	PHEN <2	PHOS <2	TKN <2	NO23 <2	TOC <2	S2 >9	TPHD <2	Fe2+ <2	DMET FLT	DOC FLT	PARAMETER	ADJUSTED TO	LOT NUMBER	AMOUNT ADDED	DATE/BY
13-12871 **WU21A**	MW-201						TOT															
13-12872 **WU21B**	MW-202						TOT															

Checked By JM Date 6/14/13

PRESERVATION VERIFICATION 06/21/13
Page 1 of 1

ANALYTICAL RESOURCES INCORPORATED

ARI Job No: **WV08**

Inquiry Number: NONE
Analysis Requested: 06/21/13
Contact: Dagel, Mark
Client: Hart Crowser, Inc
Logged by: JM
Sample Set Used: Yes-481
Validatable Package: No
Deliverables:

PC: Kelly
VTSR: 06/14/13

Project #:
Project: Parcel 88
Sample Site:
SDG No:
Analytical Protocol: In-house

LOGNUM ARI ID	CLIENT ID	CN >12	WAD >12	NH3 <2	COD <2	FOG <2	MET <2	PHEN <2	PHOS <2	TKN <2	NO23 <2	TOC <2	S2 >9	TPHD <2	Fe2+ <2	DMET FLT	DOC FLT	PARAMETER	ADJUSTED TO	LOT NUMBER	AMOUNT ADDED	DATE/BY
13-13337 **WV08A**	MW-201						TOT Pair												<2	MP2452	4mL	6-24-13 DM
13-13338 **WV08B**	MW-202						TOT Fail												↓	↓	↓	↓

Checked By JM Date 6/21/13

ORGANICS ANALYSIS DATA SHEET
TOTAL DIESEL RANGE HYDROCARBONS

NWTPHD by GC/FID-Silica and Acid Cleaned
Extraction Method:
Page 1 of 1

QC Report No: WU21-Hart Crowser, Inc
Project: Parcel 88

Matrix: Water
Data Release Authorized:
Reported: 06/19/13

ARI ID	Sample ID	Extraction Date	Analysis Date	EFV DF	Range/Surrogate	RL	Result
MB-061713	Method Blank	06/17/13	06/19/13	1.00	Diesel Range	0.10	< 0.10 U
13-12871	HC ID: ---		FID4A	1.0	Motor Oil Range	0.20	< 0.20 U
					o-Terphenyl		84.0%
WU21A	MW-201	06/17/13	06/19/13	1.00	Diesel Range	0.10	< 0.10 U
13-12871	HC ID: ---		FID4A	1.0	Motor Oil Range	0.20	< 0.20 U
					o-Terphenyl		80.6%
WU21B	MW-202	06/17/13	06/19/13	1.00	Diesel Range	0.10	< 0.10 U
13-12872	HC ID: ---		FID4A	1.0	Motor Oil Range	0.20	< 0.20 U
					o-Terphenyl		85.6%

Reported in mg/L (ppm)

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

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 indicate results of organics or additional hydrocarbons in ranges are not identifiable.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
NWTPHD by GC/FID-Silica and Acid Cleaned **Sample ID: LCS-061713**
Page 1 of 1 **LAB CONTROL**

Lab Sample ID: LCS-061713 QC Report No: WU21-Hart Crowser, Inc
LIMS ID: 13-12871 Project: Parcel 88
Matrix: Water
Data Release Authorized:
Reported: 06/19/13 Date Sampled: 06/14/13
Date Received: 06/14/13

Date Extracted: 06/17/13 Sample Amount: 500 mL
Date Analyzed: 06/19/13 11:29 Final Extract Volume: 1.0 mL
Instrument/Analyst: FID/JLW Dilution Factor: 1.00

Range	Lab Control	Spike Added	Recovery
Diesel	2.25	3.00	75.0%

TPHD Surrogate Recovery

o-Terphenyl	75.0%

Results reported in mg/L

FORM III

ANALYTICAL RESOURCES INCORPORATED

CLEANED TPHD SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: WU21-Hart Crowser, Inc
Project: Parcel 88

Client ID	OTER	TOT OUT
MB-061713	84.0%	0
LCS-061713	75.0%	0
MW-201	80.6%	0
MW-202	85.6%	0

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

Prep Method: SW3510C
Log Number Range: 13-12871 to 13-12872

FORM-II TPHD

ANALYTICAL RESOURCES INCORPORATED

TOTAL DIESEL RANGE HYDROCARBONS-EXTRACTION REPORT

ARI Job: WU21
Matrix: Water Project: Parcel 88
Date Received: 06/14/13

ARI ID	Client ID	Samp Amt	Final Vol	Prep Date
13-12871-061713MB1	Method Blank	500 mL	1.00 mL	06/17/13
13-12871-061713LCS1	Lab Control	500 mL	1.00 mL	06/17/13
13-12871-WU21A	MW-201	500 mL	1.00 mL	06/17/13
13-12872-WU21B	MW-202	500 mL	1.00 mL	06/17/13

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS
Page 1 of 1

Sample ID: MW-201
SAMPLE

Lab Sample ID: WU21A
LIMS ID: 13-12871
Matrix: Water
Data Release Authorized:
Reported: 06/21/13

QC Report No: WU21-Hart Crowser, Inc
Project: Parcel 88

Date Sampled: 06/14/13
Date Received: 06/14/13

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	µg/L	Q
200.8	06/17/13	200.8	06/19/13	**7440-38-2**	**Arsenic**	0.2	**2.3**	
200.8	06/17/13	200.8	06/19/13	**7440-50-8**	**Copper**	0.5	**1.0**	
200.8	06/17/13	200.8	06/19/13	7439-92-1	Lead	0.1	0.1	U
200.8	06/17/13	200.8	06/19/13	**7440-66-6**	**Zinc**	4	**4**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS
Page 1 of 1

Sample ID: MW-202
SAMPLE

Lab Sample ID: WU21B
LIMS ID: 13-12872
Matrix: Water
Data Release Authorized:
Reported: 06/21/13

QC Report No: WU21-Hart Crowser, Inc
Project: Parcel 88

Date Sampled: 06/14/13
Date Received: 06/14/13

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	µg/L	Q
200.8	06/17/13	200.8	06/19/13	**7440-38-2**	**Arsenic**	0.2	**12.7**	
200.8	06/17/13	200.8	06/19/13	7440-50-8	Copper	0.5	0.5	U
200.8	06/17/13	200.8	06/19/13	7439-92-1	Lead	0.1	0.1	U
200.8	06/17/13	200.8	06/19/13	7440-66-6	Zinc	4	4	U

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

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

Lab Sample ID: WU21MB
LIMS ID: 13-12871
Matrix: Water
Data Release Authorized:
Reported: 06/21/13

QC Report No: WU21-Hart Crowser, Inc
Project: Parcel 88

Date Sampled: NA
Date Received: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	µg/L	Q
200.8	06/17/13	200.8	06/19/13	7440-38-2	Arsenic	0.2	0.2	U
200.8	06/17/13	200.8	06/19/13	7440-50-8	Copper	0.5	0.5	U
200.8	06/17/13	200.8	06/19/13	7439-92-1	Lead	0.1	0.1	U
200.8	06/17/13	200.8	06/19/13	7440-66-6	Zinc	4	4	U

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

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

Lab Sample ID: WU21LCS
LIMS ID: 13-12871
Matrix: Water
Data Release Authorized:
Reported: 06/21/13

QC Report No: WU21-Hart Crowser, Inc
Project: Parcel 88

Date Sampled: NA
Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike Found	Spike Added	% Recovery	Q
Arsenic	200.8	27.9	25.0	112%	
Copper	200.8	25.9	25.0	104%	
Lead	200.8	28.2	25.0	113%	
Zinc	200.8	83	80	104%	

Reported in µg/L

N-Control limit not met
Control Limits: 80-120%

INORGANICS ANALYSIS DATA SHEET
Total Mercury by Method SW7470A

ANALYTICAL RESOURCES INCORPORATED

Data Release Authorized:
Reported: 06/25/13
Date Received: 06/14/13
Page 1 of 1

QC Report No: WV08-Hart Crowser, Inc
Project: Parcel 88

Client/ ARI ID	Date Sampled	Matrix	Prep Date Anal Date	RL	Result
MW-201 WV08A 13-13337	06/14/13	Water	06/24/13 06/25/13	20.0	20.0 U
MW-202 WV08B 13-13338	06/14/13	Water	06/24/13 06/25/13	20.0	20.0 U
MB-062413 Method Blank	NA	Water	06/24/13 06/25/13	20.0	20.0 U

Reported in ng/L

RL-Analytical reporting limit
U-Undetected at reported detection limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: MW-201
DUPLICATE

Lab Sample ID: WV08A
LIMS ID: 13-13337
Matrix: Water
Data Release Authorized:
Reported: 06/25/13

QC Report No: WV08-Hart Crowser, Inc
Project: Parcel 88

Date Sampled: 06/14/13
Date Received: 06/14/13

MATRIX DUPLICATE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Duplicate	RPD	Control Limit	Q
Mercury	7470A	20.0 U	20.0 U	0.0%	+/- 20.0	L

Reported in ng/L

*-Control Limit Not Met
L-RPD Invalid, Limit = Detection Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: MW-201
MATRIX SPIKE

Lab Sample ID: WV08A
LIMS ID: 13-13337
Matrix: Water
Data Release Authorized:
Reported: 06/25/13

QC Report No: WV08-Hart Crowser, Inc
Project: Parcel 88

Date Sampled: 06/14/13
Date Received: 06/14/13

MATRIX SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Spike	Spike Added	% Recovery	Q
Mercury	7470A	20.0 U	105	100	105%	

Reported in ng/L

N-Control Limit Not Met
H-% Recovery Not Applicable, Sample Concentration Too High
NA-Not Applicable, Analyte Not Spiked

Percent Recovery Limits: 75-125%

ANALYTICAL RESOURCES INCORPORATED

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

Lab Sample ID: WV08LCS
LIMS ID: 13-13338
Matrix: Water
Data Release Authorized:
Reported: 06/25/13

QC Report No: WV08-Hart Crowser, Inc
Project: Parcel 88

Date Sampled: NA
Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike Found	Spike Added	% Recovery	Q
Mercury	7470A	225	200	112%	

Reported in ng/L

N-Control limit not met
Control Limits: 80-120%

Analytical Resources, Incorporated
Analytical Chemists and Consultants

September 20, 2013

Mark Dagel
Hart Crowser, Inc.
1700 Westlake Avenue N. Suite 200
Seattle, WA 98109-3256

RE: Client Project: Parcel 88
ARI Job Nos.: XE26 & XE27

Dear Mark;

Please find enclosed the original Chain-of-Custody record (COC), sample receipt documentation, and the final data for samples from the project referenced above. Analytical Resources, Inc. (ARI) received two water samples on September 9, 2013. The samples were received in good condition with a cooler temperature of 3.9°C. For further details regarding sample receipt, please refer to the enclosed Cooer Receipt Form.

The samples were analyzed for NWTPH-Dx, dissolved metals, and total mercury, as requested on the COC.

There were no anomalies associated with the analyses of these samples.

A copy of this report and all associated raw data will be kept on file at ARI. Should you have any questions regarding these results, please feel free to contact me at your convenience.

Sincerely,

ANALYTICAL RESOURCES, INC.

Cheronne Oreiro
Project Manager
-For-
Kelly Bottem
Client Services Manager
kellyb@arilabs.com
206/695-6211

cc: eFile XE26_XE27

Enclosures

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

Sample Custody Record

XE24

Samples Shipped to: ARI

*(As, Cu, Pb)

HARTCROWSER

Hart Crowser, Inc.
1700 Westlake Avenue North, Suite 200
Seattle, Washington 98109-6212
Office: 206.324.9530 • Fax 206.328.5581

JOB 17652-00 LAB NUMBER

PROJECT NAME PARCEL 88

HART CROWSER CONTACT MARK PAGEL

SAMPLED BY:

LAB NO.	SAMPLE ID	DESCRIPTION	DATE	TIME	MATRIX	REQUESTED ANALYSIS: Dissolved Metals*	Total Hg	TPH-Dx**	NO. OF CONTAINERS	OBSERVATIONS/COMMENTS/ COMPOSITING INSTRUCTIONS
	MW-201		9/9/13	1100	H_2O	X	X	X	4	1 poly is filtered
	MW-202		9/9/13	1245	H_2O	X	X	X	4	1 poly is filtered

RELINQUISHED BY	DATE	RECEIVED BY	DATE
Suzanne Fanbl	9/9/2013		9-9-13
SIGNATURE		SIGNATURE Tonya Strauss	
SUZANNE FANBL	TIME		TIME
PRINT NAME		PRINT NAME ARI	
HART CROWSER	1355	COMPANY	1355
COMPANY		9.	
RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE	TIME	SIGNATURE	TIME
PRINT NAME		PRINT NAME	
COMPANY		COMPANY	

SPECIAL SHIPMENT HANDLING OR STORAGE REQUIREMENTS:

* By EPA 200.8. Samples were field filtered. See work plan for detection limits.

** use silica gel cleanup

COOLER NO.: STORAGE LOCATION:

See Lab Work Order No. for Other Contract Requirements

8 TOTAL NUMBER OF CONTAINERS

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

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

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

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Hart Crowser Project Name: Parcel 88

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

Assigned ARI Job No: XE26 / XE27 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): 3.7

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

Cooler Accepted by: TB Date: 9-9-13 Time: 1355

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler? YES (NO)

What kind of packing material was used? Bubble Wrap (Wet Ice) Gel Packs Baggies Foam Block Paper Other: _____

Was sufficient ice used (if appropriate)? NA (YES) NO

Were all bottles sealed in individual plastic bags? (YES) NO

Did all bottles arrive in good condition (unbroken)? (YES) NO

Were all bottle labels complete and legible? (YES) NO

Did the number of containers listed on COC match with the number of containers received? (YES) NO

Did all bottle labels and tags agree with custody papers? (YES) NO

Were all bottles used correct for the requested analyses? (YES) NO

Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs) NA (YES) NO

Were all VOC vials free of air bubbles? (NA) YES NO

Was sufficient amount of sample sent in each bottle? (YES) NO

Date VOC Trip Blank was made at ARI: (NA) _____

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

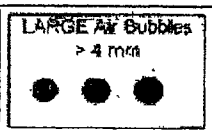
Samples Logged by: AV Date: 9/9/13 Time: 1410

***** 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:



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Peabubbles → "pb"
Large → "lg"
Headspace → "hs"

PRESERVATION VERIFICATION 09/09/13
Page 1 of 1

ANALYTICAL RESOURCES INCORPORATED

ARI Job No: **XE26**

Inquiry Number: NONE
Analysis Requested: 09/09/13
Contact: Dagel, Mark
Client: Hart Crowser, Inc
Logged by: AV
Sample Set Used: Yes-481
Validatable Package: No
Deliverables:

PC: Kelly
VTSR: 09/09/13

Project #: 17652-00
Project: Parcel 88
Sample Site:
SDG No:
Analytical Protocol: In-house

LOGNUM ARI ID	CLIENT ID	CN >12	WAD >12	NH3 <2	COD <2	FOG <2	MET <2	PHEN <2	PHOS <2	TKN <2	NO23 <2	TOC <2	S2 >9	TPHD <2	Fe2+ <2	DMET FLT	DOC FLT	PARAMETER	ADJUSTED TO	LOT NUMBER	AMOUNT ADDED	DATE/BY
13-18925 **XE26A**	MW-201						DIS pass									Y						
13-18926 **XE26B**	MW-202						DIS pass									Y						

XE26:09091

Checked By AV Date 9/9/13

Sample ID Cross Reference Report

ANALYTICAL RESOURCES INCORPORATED

ARI Job No: XE26
Client: Hart Crowser, Inc
Project Event: 17652-00
Project Name: Parcel 88

	Sample ID	ARI Lab ID	ARI LIMS ID	Matrix	Sample Date/Time	VTSR
1.	MW-201	XE26A	13-18925	Water	09/09/13 11:00	09/09/13 13:55
2.	MW-202	XE26B	13-18926	Water	09/09/13 12:45	09/09/13 13:55

PRESERVATION VERIFICATION 09/09/13
Page 1 of 1

ANALYTICAL RESOURCES INCORPORATED

ARI Job No: **XE27**

Inquiry Number: NONE
Analysis Requested: 09/09/13
Contact: Dagel, Mark
Client: Hart Crowser, Inc
Logged by: AV
Sample Set Used: Yes-481
Validatable Package: No
Deliverables:

PC: Kelly
VTSR: 09/09/13

Project #: 17652-00
Project: Parcel 88
Sample Site:
SDG No:
Analytical Protocol: In-house

LOGNUM ARI ID	CLIENT ID	CN >12	WAD >12	NH3 <2	COD <2	FOG <2	MET <2	PHEN <2	PHOS <2	TKN <2	NO23 <2	TOC <2	S2 >9	TPHD <2	Fe2+ <2	DMET FLT	DOC FLT	PARAMETER	ADJUSTED TO	LOT NUMBER	AMOUNT ADDED	DATE/BY
13-18927 **XE27A**	MW-201						TOT pass															
13-18928 **XE27B**	MW-202						TOT pass															

XE27:9999

Checked By AV Date 9/9/13

Sample ID Cross Reference Report

ANALYTICAL RESOURCES INCORPORATED

ARI Job No: XE27
Client: Hart Crowser, Inc
Project Event: 17652-00
Project Name: Parcel 88

	Sample ID	ARI Lab ID	ARI LIMS ID	Matrix	Sample Date/Time	VTSR
1.	MW-201	XE27A	13-18927	Water	09/09/13 11:00	09/09/13 13:55
2.	MW-202	XE27B	13-18928	Water	09/09/13 12:45	09/09/13 13:55

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD by GC/FID-Silica and Acid Cleaned
Extraction Method:
Page 1 of 1

QC Report No: XE26-Hart Crowser, Inc
Project: Parcel 88
17652-00

Matrix: Water
Data Release Authorized:
Reported: 09/20/13

ARI ID	Sample ID	Extraction Date	Analysis Date	EFV DF	Range/Surrogate	RL	Result
MB-091313	Method Blank	09/13/13	09/17/13	1.00	Diesel Range	0.10	< 0.10 U
13-18925	HC ID: ---		FID3B	1.0	Motor Oil Range	0.20	< 0.20 U
					o-Terphenyl		95.4%
XE26A	MW-201	09/13/13	09/17/13	1.00	Diesel Range	0.10	< 0.10 U
13-18925	HC ID: ---		FID3B	1.0	Motor Oil Range	0.20	< 0.20 U
					o-Terphenyl		91.1%
XE26B	MW-202	09/13/13	09/17/13	1.00	Diesel Range	0.10	< 0.10 U
13-18926	HC ID: ---		FID3B	1.0	Motor Oil Range	0.20	< 0.20 U
					o-Terphenyl		90.0%

Reported in mg/L (ppm)

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

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 indicate results of organics or additional hydrocarbons in ranges are not identifiable.

ANALYTICAL RESOURCES INCORPORATED

CLEANED TPHD SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: XE26-Hart Crowser, Inc
Project: Parcel 88
17652-00

Client ID	OTER	TOT OUT
MB-091313	95.4%	0
LCS-091313	89.2%	0
MW-201	91.1%	0
MW-202	90.0%	0

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

Prep Method: SW3510C
Log Number Range: 13-18925 to 13-18926

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
NWTPHD by GC/FID-Silica and Acid Cleaned **Sample ID: LCS-091313**
Page 1 of 1 **LAB CONTROL**

Lab Sample ID: LCS-091313
LIMS ID: 13-18925
Matrix: Water
Data Release Authorized: MW
Reported: 09/20/13

QC Report No: XE26-Hart Crowser, Inc
Project: Parcel 88
17652-00
Date Sampled: 09/09/13
Date Received: 09/09/13

Date Extracted: 09/13/13
Date Analyzed: 09/17/13 13:24
Instrument/Analyst: FID/JLW

Sample Amount: 500 mL
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00

Range	Lab Control	Spike Added	Recovery
Diesel	2.39	3.00	79.7%

TPHD Surrogate Recovery

o-Terphenyl	89.2%

Results reported in mg/L

ANALYTICAL RESOURCES INCORPORATED

TOTAL DIESEL RANGE HYDROCARBONS-EXTRACTION REPORT

Matrix: Water
Date Received: 09/09/13

ARI Job: XE26
Project: Parcel 88
17652-00

ARI ID	Client ID	Samp Amt	Final Vol	Prep Date
13-18925-091313MB1	Method Blank	500 mL	1.00 mL	09/13/13
13-18925-091313LCS1	Lab Control	500 mL	1.00 mL	09/13/13
13-18925-XE26A	MW-201	500 mL	1.00 mL	09/13/13
13-18926-XE26B	MW-202	500 mL	1.00 mL	09/13/13

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS
Page 1 of 1

Sample ID: MW-201
SAMPLE

Lab Sample ID: XE26A
LIMS ID: 13-18925
Matrix: Water
Data Release Authorized:
Reported: 09/17/13

QC Report No: XE26-Hart Crowser, Inc
Project: Parcel 88
17652-00
Date Sampled: 09/09/13
Date Received: 09/09/13

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	µg/L	Q
200.8	09/11/13	200.8	09/12/13	**7440-38-2**	**Arsenic**	0.2	**1.3**	
200.8	09/11/13	200.8	09/12/13	7440-50-8	Copper	0.5	0.5	U
200.8	09/11/13	200.8	09/12/13	7439-92-1	Lead	0.1	0.1	U
200.8	09/11/13	200.8	09/12/13	7440-66-6	Zinc	4	4	U

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
DISSOLVED METALS
Page 1 of 1

Sample ID: MW-202
SAMPLE

Lab Sample ID: XE26B
LIMS ID: 13-18926
Matrix: Water
Data Release Authorized:
Reported: 09/17/13

QC Report No: XE26-Hart Crowser, Inc
Project: Parcel 88
17652-00
Date Sampled: 09/09/13
Date Received: 09/09/13

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	µg/L	Q
200.8	09/11/13	200.8	09/12/13	**7440-38-2**	**Arsenic**	0.2	**14.3**	
200.8	09/11/13	200.8	09/12/13	7440-50-8	Copper	0.5	0.5	U
200.8	09/11/13	200.8	09/12/13	7439-92-1	Lead	0.1	0.1	U
200.8	09/11/13	200.8	09/12/13	7440-66-6	Zinc	4	4	U

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

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

Lab Sample ID: XE26LCS
LIMS ID: 13-18925
Matrix: Water
Data Release Authorized:
Reported: 09/17/13

QC Report No: XE26-Hart Crowser, Inc
Project: Parcel 88
17652-00
Date Sampled: NA
Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike Found	Spike Added	% Recovery	Q
Arsenic	200.8	23.2	25.0	92.8%	
Copper	200.8	27.7	25.0	111%	
Lead	200.8	29.3	25.0	117%	
Zinc	200.8	81	80	101%	

Reported in µg/L

N-Control limit not met
Control Limits: 80-120%

ANALYTICAL RESOURCES INCORPORATED

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

Lab Sample ID: XE26MB
LIMS ID: 13-18925
Matrix: Water
Data Release Authorized:
Reported: 09/17/13

QC Report No: XE26-Hart Crowser, Inc
Project: Parcel 88
17652-00
Date Sampled: NA
Date Received: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	µg/L	Q
200.8	09/11/13	200.8	09/12/13	7440-38-2	Arsenic	0.2	0.2	U
200.8	09/11/13	200.8	09/12/13	7440-50-8	Copper	0.5	0.5	U
200.8	09/11/13	200.8	09/12/13	7439-92-1	Lead	0.1	0.1	U
200.8	09/11/13	200.8	09/12/13	7440-66-6	Zinc	4	4	U

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
Total Mercury by Method SW7470A

Data Release Authorized:
Reported: 09/12/13
Date Received: 09/09/13
Page 1 of 1

QC Report No: XE27-Hart Crowser, Inc
Project: Parcel 88
17652-00

Client/ ARI ID	Date Sampled	Matrix	Prep Date Anal Date	RL	Result
MW-201 XE27A 13-18927	09/09/13	Water	09/10/13 09/11/13	20.0	20.0 U
MW-202 XE27B 13-18928	09/09/13	Water	09/10/13 09/11/13	20.0	20.0 U
MB-091013 Method Blank	NA	Water	09/10/13 09/11/13	20.0	20.0 U

Reported in ng/L

RL-Analytical reporting limit
U-Undetected at reported detection limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: LAB CONTROL

Lab Sample ID: XE27LCS
LIMS ID: 13-18927
Matrix: Water
Data Release Authorized:
Reported: 09/12/13

QC Report No: XE27-Hart Crowser, Inc
Project: Parcel 88
17652-00
Date Sampled: NA
Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike Found	Spike Added	% Recovery	Q
Mercury	7470A	195	200	97.5%	

Reported in ng/L

N-Control limit not met
Control Limits: 80-120%