

Introduction

Encana Oil & Gas (USA) Inc. (Encana) is submitting this Form 4 Sundry Notice to request final closure status for the earthen pit associated with the Thunder Com B 7502 (COGCC facility #315466, COGCC remediation #5300). A third party consultant conducted the site investigation, characterization and sampling of the pit. All samples were collected in accordance with Encana's Environmental Compliance Group's Sampling Procedures. The analytical results for the respective soil samples were within the COGCC Table 910-1 standards and are provided in Table 1 and Attachment A of this submittal. The text below provides the details of the site investigation. For a visual description of the site please refer to Figures 1 and 2 – Site Maps.

Site Investigation

August 9, 2011 –A track hoe was utilized to excavate the historic pit area. Soil was characterized and delineated utilizing a photoionization detector (PID) field unit by a third party consultant. There were indicators of hydrocarbon impacted soil (e.g. soil staining, elevated field screen readings). A grab sample from the soil with the highest PID readings (1652 ppm) was submitted for analysis to an analytical laboratory. Five (5) background samples were also collected up gradient from the pit from approximately six (6) inches beneath the grounds surface for analysis with regards to arsenic. The excavation was fenced and the excavated soil was stockpiled onsite until the analytical laboratory report confirmed the soil was within the COGCC Table 910-1 standards. The soil was backfilled and compacted into the excavation.

Conclusion

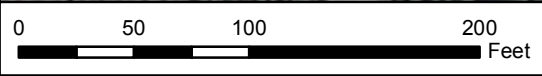
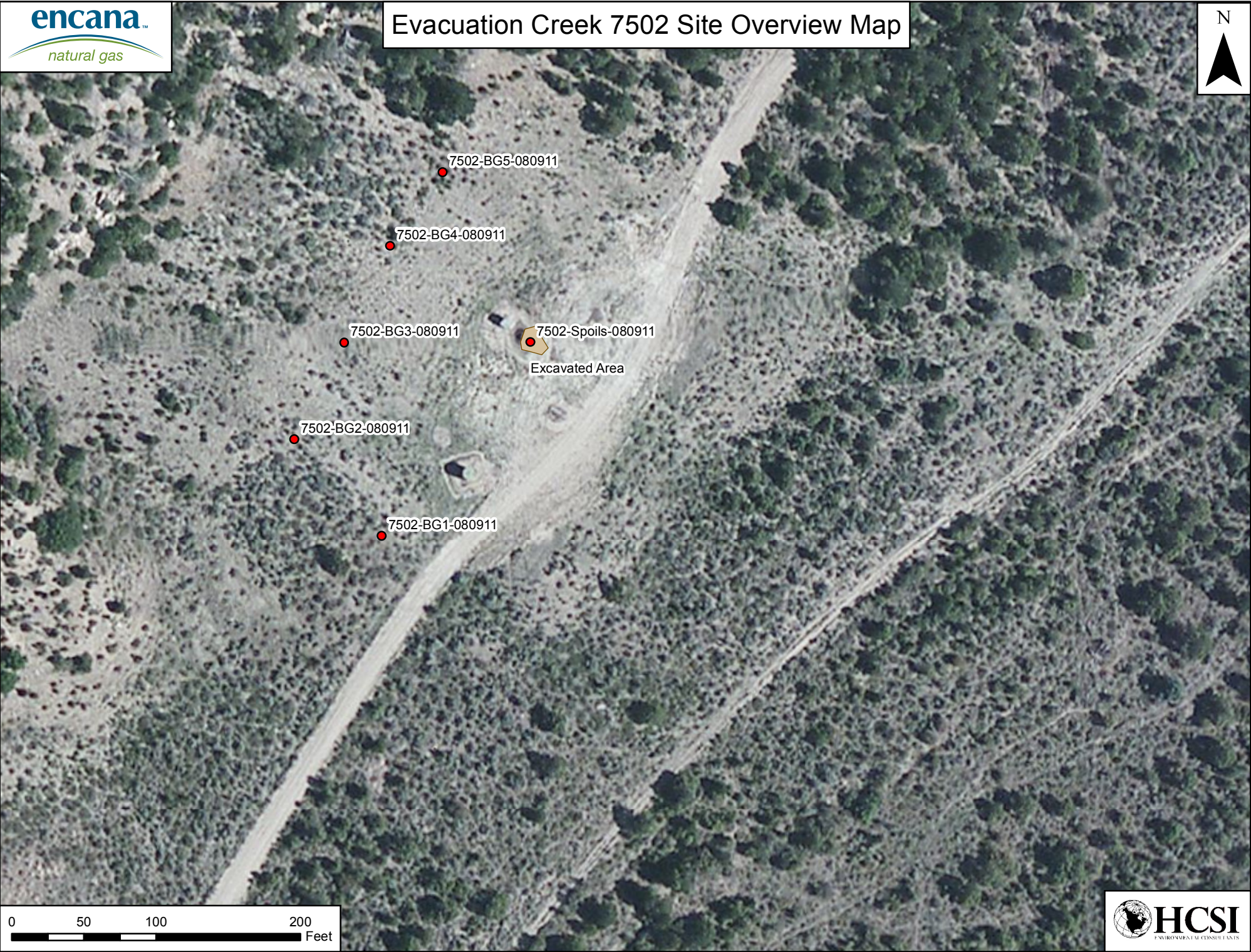
Based on the site investigation and analytical results, the pit associated with the Thunder Com B 7502 is in compliance with the standards specified within COGCC Table 910-1. Encana respectfully requests that final closure be granted for the respective pit, COGCC remediation #5300.

Analytical Review

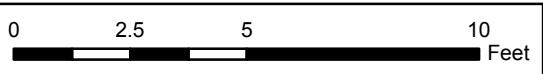
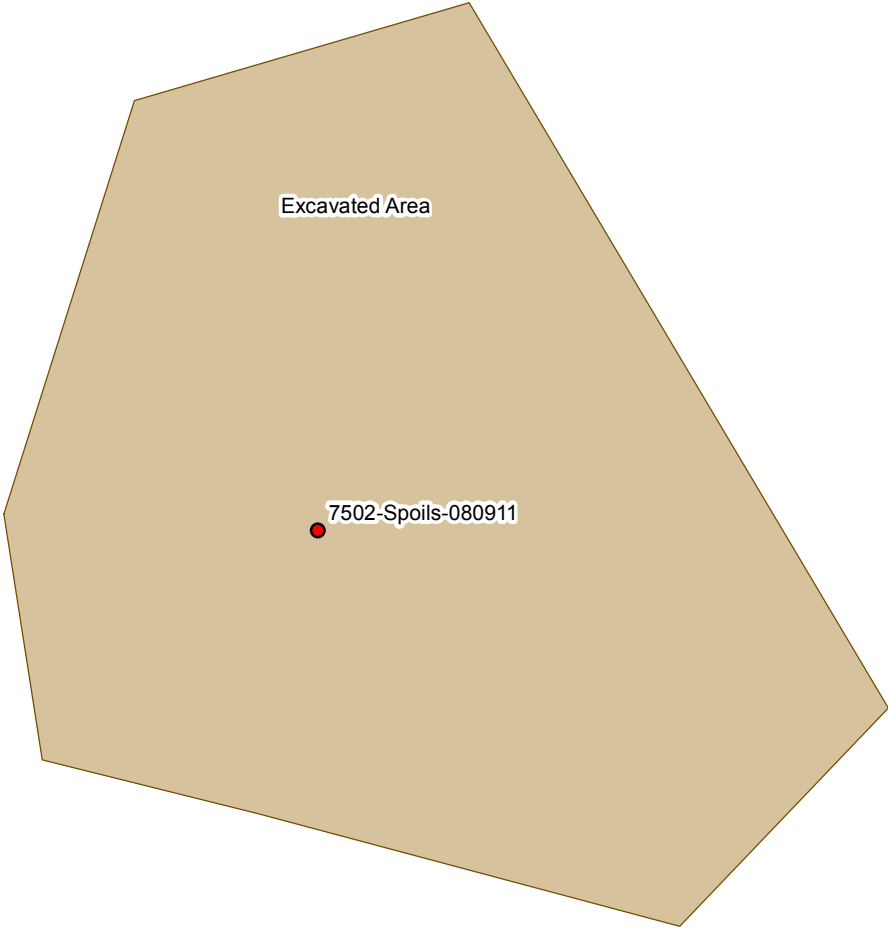
Sample results indicate that the soil within the earthen pit footprint on Encana's Thunder Com B 7502 well pad have exceedances of COGCC Table 910-1 allowable concentrations for arsenic (5.7 ppm). Though the arsenic concentration in the soil is above the allowable concentration

identified in Table 910-1, the concentration is within the range of arsenic background values (4.8-7.0 ppm) in this area. Based on these results and footnote 1 to COGCC Table 910-1, Encana requests that the COGCC consider the higher range of background arsenic value(s) as the allowable concentration for this constituent. Please see Attachment A for the respective laboratory analytical results.

Evacuation Creek 7502 Site Overview Map



Evacuation Creek 7502 Sample Location Map



						Analytes (BDL = Below Detection Limit; NA = Not Applicable; NS = Not Sampled)																								
						Organics in Soil (mg/Kg)																								
						Allowable Concentration -->		500	NA	NA	0.17	85	100	175	1000	1000	0.22	0.22	2.2	0.022	22	0.022	1000	1000	0.22	23	1000	see below	<12	(6-9)
Location Number ID	COC ID	Date:	Lab	Sampler:	Sample Matrix	Matrix Notes	TPH	TPH-GRO (G6-C10) Low Fraction	TPH-DRO (C10-C28) High Fraction	Benzene	Toluene	EthylBenzene	Xylenes - total	Acenaphthene	Anthracene	Benzo(A)anthracene	Benzo(B)fluoranthene	Benzo(K)fluoranthene	Benzo(A)pyrene	Chrysene	Dibenzo(A,H)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Pyrene	EC (<4 mmhos/cm or 2x background)	SAR (calculation)	pH	
7502	7502-BG1-080911	8/9/2011	ESC	KHR	Soil	Background 1	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	
7502	7502-BG2-080911	8/9/2011	ESC	KHR	Soil	Background 2	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	
7502	7502-BG3-080911	8/9/2011	ESC	KHR	Soil	Background 3	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	
7502	7502-BG4-080911	8/9/2011	ESC	KHR	Soil	Background 4	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	
7502	7502-BG5-080911	8/9/2011	ESC	KHR	Soil	Background 5	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	
7502	7502-SPOILS-080911	8/9/2011	ESC	KHR	Soil	Spoils	50	23	27	0.016	0.041	0.07	0.64	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.044	BDL	0.57	0.73	7.5	

Metals in Soil (mg/kg [ppm])														
0.39	15000	15000	2 (mg/L)	NA	70	120000	23	3100	400	23	1600	390	390	23000
Arsenic	Barium - LDNR True Total Barium	Barium - EPA Total Barium	Boron - Hot Water Soluble	Boron - EPA Total Boron	Cadmium	Chromium (III)	Chromium (VI)	Copper	Lead	Mercury	Nickel	Selenium	Silver	Zinc
4.8	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
7	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
5.3	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
5.6	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
5.1	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
5.7	NS	120	NS	NS	1.2	18	BDL	13	14	BDL	15	BDL	BDL	66



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Kate Ramsay
HRL Compliance Solutions- CO
744 Horizon Ct., Suite 140
Grand Junction, CO 81506

Report Summary

Tuesday August 23, 2011

Report Number: L531296

Samples Received: 08/16/11

Client Project:

Description: Pit Closure Project

The analytical results in this report are based upon information supplied by you, the client, and are for your exclusive use. If you have any questions regarding this data package, please do not hesitate to call.

Entire Report Reviewed By:

Jayred Willis , ESC Representative

Laboratory Certification Numbers

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - I-2327, CT - PH-0197, FL - E87487
GA - 923, IN - C-TN-01, KY - 90010, KYUST - 0016, NC - ENV375/DW21704, ND - R-140
NJ - TN002, NJ NELAP - TN002, SC - 84004, TN - 2006, VA - 00109, WV - 233
AZ - 0612, MN - 047-999-395, NY - 11742, WI - 998093910, NV - TN000032008A,
TX - T104704245, OK-9915

Accreditation is only applicable to the test methods specified on each scope of accreditation held by ESC Lab Sciences.

Note: The use of the preparatory EPA Method 3511 is not approved or endorsed by the CA ELAP.

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REPORT OF ANALYSIS

Kate Ramsay
HRL Compliance Solutions- CO
744 Horizon Ct., Suite 140
Grand Junction, CO 81506

August 23, 2011

Date Received : August 16, 2011
Description : Pit Closure Project

Sample ID : 7502-SPOILS-080911

Collected By : Kate Ramsay
Collection Date : 08/09/11 12:00

ESC Sample # : L531296-01

Site ID : EC 7502

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Chromium, Hexavalent	BDL	2.0	mg/kg	3060A/7196A	08/19/11	1
Chromium, Trivalent	18.	2.0	mg/kg	Calc.	08/17/11	1
ORP	100		mV	2580	08/19/11	1
pH	7.5		su	9045D	08/17/11	1
Sodium Adsorption Ratio	0.73			Calc.	08/19/11	1
Specific Conductance	570		umhos/cm	9050AMod	08/18/11	1
Mercury	BDL	0.020	mg/kg	7471	08/18/11	1
Arsenic	5.7	1.0	mg/kg	6010B	08/17/11	1
Barium	120	0.25	mg/kg	6010B	08/17/11	1
Cadmium	1.2	0.25	mg/kg	6010B	08/17/11	1
Chromium	18.	0.50	mg/kg	6010B	08/17/11	1
Copper	13.	1.0	mg/kg	6010B	08/17/11	1
Lead	14.	0.25	mg/kg	6010B	08/17/11	1
Nickel	15.	1.0	mg/kg	6010B	08/17/11	1
Selenium	BDL	1.0	mg/kg	6010B	08/17/11	1
Silver	BDL	0.50	mg/kg	6010B	08/17/11	1
Zinc	66.	1.5	mg/kg	6010B	08/17/11	1
Benzene	0.016	0.0025	mg/kg	8021/8015	08/17/11	5
Toluene	0.041	0.025	mg/kg	8021/8015	08/17/11	5
Ethylbenzene	0.070	0.0025	mg/kg	8021/8015	08/17/11	5
Total Xylene	0.64	0.0075	mg/kg	8021/8015	08/17/11	5
TPH (GC/FID) Low Fraction	23.	0.50	mg/kg	GRO	08/17/11	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	92.6		% Rec.	8021/8015	08/17/11	5
a,a,a-Trifluorotoluene(PID)	108.		% Rec.	8021/8015	08/17/11	5
TPH (GC/FID) High Fraction	27.	4.0	mg/kg	3546/DRO	08/19/11	1
Surrogate recovery(%)						
o-Terphenyl	65.6		% Rec.	3546/DRO	08/19/11	1
Polynuclear Aromatic Hydrocarbons						
Anthracene	BDL	0.0060	mg/kg	8270C-SIM	08/21/11	1
Acenaphthene	BDL	0.0060	mg/kg	8270C-SIM	08/21/11	1
Acenaphthylene	BDL	0.0060	mg/kg	8270C-SIM	08/21/11	1
Benzo(a)anthracene	BDL	0.0060	mg/kg	8270C-SIM	08/21/11	1
Benzo(a)pyrene	BDL	0.0060	mg/kg	8270C-SIM	08/21/11	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
L531296-01 (PH) - 7.5@21.9c



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August 23, 2011

Date Received : August 16, 2011
Description : Pit Closure Project

Sample ID : 7502-SPOILS-080911

Collected By : Kate Ramsay
Collection Date : 08/09/11 12:00

ESC Sample # : L531296-01

Site ID : EC 7502

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzo(b)fluoranthene	BDL	0.0060	mg/kg	8270C-SIM	08/21/11	1
Benzo(g,h,i)perylene	BDL	0.0060	mg/kg	8270C-SIM	08/21/11	1
Benzo(k)fluoranthene	BDL	0.0060	mg/kg	8270C-SIM	08/21/11	1
Chrysene	BDL	0.0060	mg/kg	8270C-SIM	08/21/11	1
Dibenz(a,h)anthracene	BDL	0.0060	mg/kg	8270C-SIM	08/21/11	1
Fluoranthene	BDL	0.0060	mg/kg	8270C-SIM	08/21/11	1
Fluorene	BDL	0.0060	mg/kg	8270C-SIM	08/21/11	1
Indeno(1,2,3-cd)pyrene	BDL	0.0060	mg/kg	8270C-SIM	08/21/11	1
Naphthalene	0.044	0.0060	mg/kg	8270C-SIM	08/21/11	1
Phenanthrene	BDL	0.0060	mg/kg	8270C-SIM	08/21/11	1
Pyrene	BDL	0.0060	mg/kg	8270C-SIM	08/21/11	1
1-Methylnaphthalene	0.021	0.0060	mg/kg	8270C-SIM	08/21/11	1
2-Methylnaphthalene	0.035	0.0060	mg/kg	8270C-SIM	08/21/11	1
2-Chloronaphthalene	BDL	0.0060	mg/kg	8270C-SIM	08/21/11	1
Surrogate Recovery						
Nitrobenzene-d5	82.6		% Rec.	8270C-SIM	08/21/11	1
2-Fluorobiphenyl	65.3		% Rec.	8270C-SIM	08/21/11	1
p-Terphenyl-d14	48.0		% Rec.	8270C-SIM	08/21/11	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

The reported analytical results relate only to the sample submitted.

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Reported: 08/22/11 14:11 Revised: 08/23/11 08:14
L531296-01 (PH) - 7.5@21.9c



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REPORT OF ANALYSIS

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August 23, 2011

Date Received : August 16, 2011
Description : Pit Closure Project

Sample ID : 7502-BG1-080911

Collected By : Kate Ramsay
Collection Date : 08/09/11 11:00

ESC Sample # : L531296-02

Site ID : EC 7502

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Arsenic	4.8	1.0	mg/kg	6010B	08/18/11	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

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Reported: 08/22/11 14:11 Revised: 08/23/11 08:14



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August 23, 2011

Date Received : August 16, 2011
Description : Pit Closure Project

Sample ID : 7502-BG2-080911

Collected By : Kate Ramsay
Collection Date : 08/09/11 11:10

ESC Sample # : L531296-03

Site ID : EC 7502

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Arsenic	7.0	1.0	mg/kg	6010B	08/18/11	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

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Reported: 08/22/11 14:11 Revised: 08/23/11 08:14



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August 23, 2011

Date Received : August 16, 2011
Description : Pit Closure Project

Sample ID : 7502-BG3-080911

Collected By : Kate Ramsay
Collection Date : 08/09/11 11:20

ESC Sample # : L531296-04

Site ID : EC 7502

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Arsenic	5.3	1.0	mg/kg	6010B	08/18/11	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

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Reported: 08/22/11 14:11 Revised: 08/23/11 08:14



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REPORT OF ANALYSIS

Kate Ramsay
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August 23, 2011

Date Received : August 16, 2011
Description : Pit Closure Project

Sample ID : 7502-BG4-080911

Collected By : Kate Ramsay
Collection Date : 08/09/11 11:30

ESC Sample # : L531296-05

Site ID : EC 7502

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Arsenic	5.6	1.0	mg/kg	6010B	08/18/11	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

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Reported: 08/22/11 14:11 Revised: 08/23/11 08:14



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August 23, 2011

Date Received : August 16, 2011
Description : Pit Closure Project

Sample ID : 7502-BG5-080911

Collected By : Kate Ramsay
Collection Date : 08/09/11 11:40

ESC Sample # : L531296-06

Site ID : EC 7502

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Arsenic	5.1	1.0	mg/kg	6010B	08/18/11	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

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Reported: 08/22/11 14:11 Revised: 08/23/11 08:14

Summary of Remarks For Samples Printed
08/23/11 at 08:14:40

TSR Signing Reports: 358
R5 - Desired TAT

Accounting - pending credit application. TSR - pending info release authorization.

Sample: L531296-01 Account: HRLCSCO Received: 08/16/11 09:00 Due Date: 08/23/11 00:00 RPT Date: 08/22/11 14:11

Sample: L531296-02 Account: HRLCSCO Received: 08/16/11 09:00 Due Date: 08/23/11 00:00 RPT Date: 08/22/11 14:11

Sample: L531296-03 Account: HRLCSCO Received: 08/16/11 09:00 Due Date: 08/23/11 00:00 RPT Date: 08/22/11 14:11

Sample: L531296-04 Account: HRLCSCO Received: 08/16/11 09:00 Due Date: 08/23/11 00:00 RPT Date: 08/22/11 14:11

Sample: L531296-05 Account: HRLCSCO Received: 08/16/11 09:00 Due Date: 08/23/11 00:00 RPT Date: 08/22/11 14:11

Sample: L531296-06 Account: HRLCSCO Received: 08/16/11 09:00 Due Date: 08/23/11 00:00 RPT Date: 08/22/11 14:11



YOUR LAB OF CHOICE

HRL Compliance Solutions- CO
Kate Ramsay
744 Horizon Ct., Suite 140

Grand Junction, CO 81506

Quality Assurance Report
Level II

L531296

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August 23, 2011

Analyte	Result	Laboratory Blank		Limit	Batch	Date Analyzed
		Units	% Rec			
pH	4.60	su			WG550786	08/17/11 13:32
Arsenic	< 1	mg/kg			WG550737	08/17/11 14:31
Barium	< .25	mg/kg			WG550737	08/17/11 14:31
Cadmium	< .25	mg/kg			WG550737	08/17/11 14:31
Chromium	< .5	mg/kg			WG550737	08/17/11 14:31
Copper	< 1	mg/kg			WG550737	08/17/11 14:31
Lead	< .25	mg/kg			WG550737	08/17/11 14:31
Nickel	< 1	mg/kg			WG550737	08/17/11 14:31
Selenium	< 1	mg/kg			WG550737	08/17/11 14:31
Silver	< .5	mg/kg			WG550737	08/17/11 14:31
Zinc	< 1.5	mg/kg			WG550737	08/17/11 14:31
Mercury	< .02	mg/kg			WG550884	08/18/11 02:08
Arsenic	< 1	mg/kg			WG550738	08/17/11 23:07
Benzene	< .0005	mg/kg			WG550830	08/17/11 13:52
Ethylbenzene	< .0005	mg/kg			WG550830	08/17/11 13:52
Toluene	< .005	mg/kg			WG550830	08/17/11 13:52
TPH (GC/FID) Low Fraction	< .1	mg/kg			WG550830	08/17/11 13:52
Total Xylene	< .0015	mg/kg			WG550830	08/17/11 13:52
a,a,a-Trifluorotoluene(FID)		% Rec.	102.4	59-128	WG550830	08/17/11 13:52
a,a,a-Trifluorotoluene(PID)		% Rec.	109.5	54-144	WG550830	08/17/11 13:52
Specific Conductance	0.810	umhos/cm			WG551021	08/18/11 13:38
Chromium,Hexavalent	< 2	mg/kg			WG550789	08/19/11 11:53
TPH (GC/FID) High Fraction	< 4	ppm			WG551163	08/19/11 09:22
o-Terphenyl		% Rec.	84.66	50-150	WG551163	08/19/11 09:22
1-Methylnaphthalene	< .006	mg/kg			WG550965	08/19/11 14:43
2-Chloronaphthalene	< .006	mg/kg			WG550965	08/19/11 14:43
2-Methylnaphthalene	< .006	mg/kg			WG550965	08/19/11 14:43
Acenaphthene	< .006	mg/kg			WG550965	08/19/11 14:43
Acenaphthylene	< .006	mg/kg			WG550965	08/19/11 14:43
Anthracene	< .006	mg/kg			WG550965	08/19/11 14:43
Benzo(a)anthracene	< .006	mg/kg			WG550965	08/19/11 14:43
Benzo(a)pyrene	< .006	mg/kg			WG550965	08/19/11 14:43
Benzo(b)fluoranthene	< .006	mg/kg			WG550965	08/19/11 14:43
Benzo(g,h,i)perylene	< .006	mg/kg			WG550965	08/19/11 14:43
Benzo(k)fluoranthene	< .006	mg/kg			WG550965	08/19/11 14:43
Chrysene	< .006	mg/kg			WG550965	08/19/11 14:43
Dibenz(a,h)anthracene	< .006	mg/kg			WG550965	08/19/11 14:43
Fluoranthene	< .006	mg/kg			WG550965	08/19/11 14:43
Fluorene	< .006	mg/kg			WG550965	08/19/11 14:43
Indeno(1,2,3-cd)pyrene	< .006	mg/kg			WG550965	08/19/11 14:43
Naphthalene	< .006	mg/kg			WG550965	08/19/11 14:43
Phenanthrene	< .006	mg/kg			WG550965	08/19/11 14:43
Pyrene	< .006	mg/kg			WG550965	08/19/11 14:43

* Performance of this Analyte is outside of established criteria.

For additional information, please see Attachment A 'List of Analytes with QC Qualifiers.'



YOUR LAB OF CHOICE

HRL Compliance Solutions- CO
Kate Ramsay
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Quality Assurance Report
Level II

L531296

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Tax I.D. 62-0814289

Est. 1970

August 23, 2011

Analyte	Units	Result	Duplicate		RPD	Limit	Ref Samp	Batch
			Duplicate					
2-Fluorobiphenyl		% Rec.	87.13			34-129	08/19/11	14:43
Nitrobenzene-d5		% Rec.	79.38			14-141	08/19/11	14:43
p-Terphenyl-d14		% Rec.	92.68			25-139	08/19/11	14:43

Analyte	Units	Result	Duplicate		RPD	Limit	Ref Samp	Batch
			Duplicate					
pH	su	7.60	7.60		0	1	L531042-97	WG550786
pH	su	7.80	8.00		2.53*	1	L531318-106	WG550786
Arsenic	mg/kg	6.00	6.00		0.501	20	L531273-03	WG550737
Barium	mg/kg	95.0	98.2		3.73	20	L531273-03	WG550737
Cadmium	mg/kg	0.720	0.720		0	20	L531273-03	WG550737
Chromium	mg/kg	16.0	14.0		12.7	20	L531273-03	WG550737
Copper	mg/kg	6.80	6.60		2.69	20	L531273-03	WG550737
Lead	mg/kg	12.0	13.0		8.00	20	L531273-03	WG550737
Nickel	mg/kg	7.50	7.00		7.03	20	L531273-03	WG550737
Silver	mg/kg	0	0		0	20	L531273-03	WG550737
Zinc	mg/kg	28.0	27.0		3.28	20	L531273-03	WG550737
Selenium	mg/kg	0	0		0	20	L531273-03	WG550737
Mercury	mg/kg	0	0		0	20	L531301-03	WG550884
Arsenic	mg/kg	3.30	3.90		15.8	20	L531273-04	WG550738
Specific Conductance	umhos/cm	2400	2300		5.50	20	L531042-96	WG551021
Specific Conductance	umhos/cm	85.0	86.0		1.41	20	L531516-01	WG551021
Chromium, Hexavalent	mg/kg	0	0		0	20	L531127-01	WG550789
Chromium, Hexavalent	mg/kg	0.0220	0.880		190.*	20	L531516-01	WG550789
ORP	mV	100.	100.		0.995	20	L531296-01	WG551033
ORP	mV	97.0	98.0		1.03	20	L531812-04	WG551033

Analyte	Units	Laboratory Control Sample		% Rec	Limit	Batch
		Known Val	Result			
pH	su	9.04	8.90	98.5	98-101	WG550786
Arsenic	mg/kg	192	196.	102.	78.6-120.8	WG550737
Barium	mg/kg	420	430.	102.	78.8-121.4	WG550737
Cadmium	mg/kg	70.1	70.1	100.	78.5-121.5	WG550737
Chromium	mg/kg	168	178.	106.	80.4-120.2	WG550737
Copper	mg/kg	122	128.	105.	81.6-119.7	WG550737
Lead	mg/kg	113	114.	101.	77.3-122.1	WG550737
Nickel	mg/kg	74.1	75.7	102.	78.8-121.2	WG550737
Selenium	mg/kg	176	179.	102.	75.6-125.0	WG550737
Silver	mg/kg	115	120.	104.	66-133.9	WG550737
Zinc	mg/kg	437	454.	104.	78.5-121.7	WG550737
Mercury	mg/kg	3.77	3.09	82.0	71.6-128	WG550884

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Analyte	Units	Laboratory Control Known Val	Sample Result	% Rec	Limit	Batch
Arsenic	mg/kg	192	202.	105.	78.6-120.8	WG550738
TPH (GC/FID) Low Fraction	mg/kg	5.5	4.97	90.3	67-135	WG550830
a,a,a-Trifluorotoluene(FID)				111.0	59-128	WG550830
Benzene	mg/kg	.05	0.0492	98.3	76-113	WG550830
Ethylbenzene	mg/kg	.05	0.0530	106.	78-115	WG550830
Toluene	mg/kg	.05	0.0492	98.4	76-114	WG550830
Total Xylene	mg/kg	.15	0.161	107.	81-118	WG550830
a,a,a-Trifluorotoluene(PID)				109.4	54-144	WG550830
Specific Conductance	umhos/cm	427	430.	101.	85-115	WG551021
Chromium,Hexavalent	mg/kg	132	120.	90.9	50-150	WG550789
TPH (GC/FID) High Fraction	ppm	60	49.9	83.2	50-150	WG551163
o-Terphenyl				75.49	50-150	WG551163
1-Methylnaphthalene	mg/kg	.033	0.0294	89.0	48-113	WG550965
2-Chloronaphthalene	mg/kg	.033	0.0290	88.0	51-114	WG550965
2-Methylnaphthalene	mg/kg	.033	0.0281	85.1	44-109	WG550965
Acenaphthene	mg/kg	.033	0.0272	82.4	52-108	WG550965
Acenaphthylene	mg/kg	.033	0.0276	83.5	51-110	WG550965
Anthracene	mg/kg	.033	0.0295	89.3	58-120	WG550965
Benzo(a)anthracene	mg/kg	.033	0.0262	79.3	54-110	WG550965
Benzo(a)pyrene	mg/kg	.033	0.0304	92.0	56-118	WG550965
Benzo(b)fluoranthene	mg/kg	.033	0.0302	91.4	55-114	WG550965
Benzo(g,h,i)perylene	mg/kg	.033	0.0295	89.5	48-130	WG550965
Benzo(k)fluoranthene	mg/kg	.033	0.0312	94.6	55-122	WG550965
Chrysene	mg/kg	.033	0.0291	88.2	57-118	WG550965
Dibenz(a,h)anthracene	mg/kg	.033	0.0308	93.2	53-122	WG550965
Fluoranthene	mg/kg	.033	0.0301	91.2	58-118	WG550965
Fluorene	mg/kg	.033	0.0289	87.6	54-109	WG550965
Indeno(1,2,3-cd)pyrene	mg/kg	.033	0.0297	90.0	51-125	WG550965
Naphthalene	mg/kg	.033	0.0285	86.3	45-105	WG550965
Phenanthrene	mg/kg	.033	0.0274	82.9	53-114	WG550965
Pyrene	mg/kg	.033	0.0276	83.7	53-121	WG550965
2-Fluorobiphenyl				88.85	34-129	WG550965
Nitrobenzene-d5				81.18	14-141	WG550965
p-Terphenyl-d14				87.60	25-139	WG550965
ORP	mV	229	220.	96.1	95.6-104.37	WG551033

Analyte	Units	Laboratory Control Result	Sample Duplicate Ref	%Rec	Limit	RPD	Limit	Batch
pH	su	8.90	8.90	98.0	98-101	0	20	WG550786
TPH (GC/FID) Low Fraction	mg/kg	5.17	4.97	94.0	67-135	4.05	20	WG550830
a,a,a-Trifluorotoluene(FID)				112.6	59-128			WG550830
Benzene	mg/kg	0.0474	0.0492	95.0	76-113	3.61	20	WG550830
Ethylbenzene	mg/kg	0.0518	0.0530	104.	78-115	2.24	20	WG550830
Toluene	mg/kg	0.0482	0.0492	96.0	76-114	2.07	20	WG550830

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Analyte	Units	Laboratory Control		Sample Duplicate		Limit	RPD	Limit	Batch
		Result	Ref	%Rec					
Total Xylene	mg/kg	0.156	0.161	104.		81-118	2.79	20	WG550830
a,a,a-Trifluorotoluene(PID)				108.8		54-144			WG550830
Specific Conductance	umhos/	430.	430.	101.		85-115	0	20	WG551021
Chromium,Hexavalent	mg/kg	98.6	120.	75.0		50-150	19.6	20	WG550789
TPH (GC/FID) High Fraction	ppm	52.2	49.9	87.0		50-150	4.51	25	WG551163
o-Terphenyl				77.45		50-150			WG551163
1-Methylnaphthalene	mg/kg	0.0312	0.0294	94.0		48-113	5.91	24	WG550965
2-Chloronaphthalene	mg/kg	0.0305	0.0290	92.0		51-114	5.01	24	WG550965
2-Methylnaphthalene	mg/kg	0.0291	0.0281	88.0		44-109	3.42	24	WG550965
Acenaphthene	mg/kg	0.0286	0.0272	87.0		52-108	4.98	22	WG550965
Acenaphthylene	mg/kg	0.0297	0.0276	90.0		51-110	7.44	21	WG550965
Anthracene	mg/kg	0.0302	0.0295	92.0		58-120	2.60	20	WG550965
Benzo(a)anthracene	mg/kg	0.0277	0.0262	84.0		54-110	5.68	22	WG550965
Benzo(a)pyrene	mg/kg	0.0317	0.0304	96.0		56-118	4.31	21	WG550965
Benzo(b)fluoranthene	mg/kg	0.0334	0.0302	101.		55-114	10.2	20	WG550965
Benzo(g,h,i)perylene	mg/kg	0.0288	0.0295	87.0		48-130	2.50	20	WG550965
Benzo(k)fluoranthene	mg/kg	0.0308	0.0312	93.0		55-122	1.53	25	WG550965
Chrysene	mg/kg	0.0296	0.0291	90.0		57-118	1.71	20	WG550965
Dibenz(a,h)anthracene	mg/kg	0.0306	0.0308	93.0		53-122	0.616	20	WG550965
Fluoranthene	mg/kg	0.0312	0.0301	95.0		58-118	3.71	20	WG550965
Fluorene	mg/kg	0.0302	0.0289	92.0		54-109	4.43	20	WG550965
Indeno(1,2,3-cd)pyrene	mg/kg	0.0296	0.0297	90.0		51-125	0.334	21	WG550965
Naphthalene	mg/kg	0.0296	0.0285	90.0		45-105	3.77	24	WG550965
Phenanthrene	mg/kg	0.0297	0.0274	90.0		53-114	8.06	20	WG550965
Pyrene	mg/kg	0.0286	0.0276	87.0		53-121	3.51	20	WG550965
2-Fluorobiphenyl				92.16		34-129			WG550965
Nitrobenzene-d5				85.34		14-141			WG550965
p-Terphenyl-d14				88.10		25-139			WG550965
ORP	mV	220.	220.	96.0		95.6-104.37	0	20	WG551033

Analyte	Units	Matrix Spike		TV	% Rec	Limit	Ref Samp	Batch
		MS Res	Ref Res					
Arsenic	mg/kg	51.3	6.00	50	90.6	75-125	L531273-03	WG550737
Barium	mg/kg	143.	98.2	50	89.6	75-125	L531273-03	WG550737
Cadmium	mg/kg	49.4	0.720	50	97.4	75-125	L531273-03	WG550737
Chromium	mg/kg	66.8	14.0	50	106.	75-125	L531273-03	WG550737
Copper	mg/kg	57.3	6.60	50	101.	75-125	L531273-03	WG550737
Lead	mg/kg	59.0	13.0	50	92.0	75-125	L531273-03	WG550737
Nickel	mg/kg	57.4	7.00	50	101.	75-125	L531273-03	WG550737
Silver	mg/kg	49.0	0	50	98.0	75-125	L531273-03	WG550737
Zinc	mg/kg	78.5	27.0	50	103.	75-125	L531273-03	WG550737
Selenium	mg/kg	42.3	0	10	84.6	75-125	L531273-03	WG550737

Mercury	mg/kg	0.270	0	.25	108.	70-130	L531301-03	WG550884
Arsenic	mg/kg	52.8	3.90	50	97.8	75-125	L531273-04	WG550738

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Analyte	Units	MS Res	Matrix Spike		% Rec	Limit	Ref Samp	Batch
			Ref Res	TV				
Benzene	mg/kg	0.231	0	.05	92.5	32-137	L531252-02	WG550830
Ethylbenzene	mg/kg	0.220	0	.05	87.9	10-150	L531252-02	WG550830
Toluene	mg/kg	0.203	0	.05	81.1	20-142	L531252-02	WG550830
Total Xylene	mg/kg	0.695	0	.15	92.6	16-141	L531252-02	WG550830
a,a,a-Trifluorotoluene(PID)					107.5	54-144		WG550830
TPH (GC/FID) Low Fraction	mg/kg	22.5	0.129	5.5	81.4	55-109	L531252-02	WG550830
a,a,a-Trifluorotoluene(FID)					106.6	59-128		WG550830
Chromium,Hexavalent	mg/kg	7.24	0	20	36.2*	50-150	L531127-01	WG550789
TPH (GC/FID) High Fraction	ppm	1660	1400	60	429.*	50-150	L531436-07	WG551163
o-Terphenyl					85.84	50-150		WG551163
1-Methylnaphthalene	mg/kg	0.0282	0	.033	85.3	25-155	L531516-01	WG550965
2-Chloronaphthalene	mg/kg	0.0266	0	.033	80.7	31-153	L531516-01	WG550965
2-Methylnaphthalene	mg/kg	0.0261	0	.033	79.0	22-172	L531516-01	WG550965
Acenaphthene	mg/kg	0.0258	0	.033	78.3	43-133	L531516-01	WG550965
Acenaphthylene	mg/kg	0.0250	0	.033	75.9	42-146	L531516-01	WG550965
Anthracene	mg/kg	0.0272	0	.033	82.5	38-153	L531516-01	WG550965
Benzo(a)anthracene	mg/kg	0.0232	0	.033	70.2	31-142	L531516-01	WG550965
Benzo(a)pyrene	mg/kg	0.0269	0	.033	81.5	26-152	L531516-01	WG550965
Benzo(b)fluoranthene	mg/kg	0.0261	0	.033	79.0	10-188	L531516-01	WG550965
Benzo(g,h,i)perylene	mg/kg	0.0258	0	.033	78.3	10-176	L531516-01	WG550965
Benzo(k)fluoranthene	mg/kg	0.0302	0	.033	91.6	22-163	L531516-01	WG550965
Chrysene	mg/kg	0.0274	0	.033	83.0	26-146	L531516-01	WG550965
Dibenz(a,h)anthracene	mg/kg	0.0260	0	.033	78.9	10-160	L531516-01	WG550965
Fluoranthene	mg/kg	0.0286	0	.033	86.7	23-160	L531516-01	WG550965
Fluorene	mg/kg	0.0273	0	.033	82.8	44-143	L531516-01	WG550965
Indeno(1,2,3-cd)pyrene	mg/kg	0.0256	0	.033	77.7	10-157	L531516-01	WG550965
Naphthalene	mg/kg	0.0265	0	.033	80.3	22-156	L531516-01	WG550965
Phenanthrene	mg/kg	0.0261	0	.033	79.1	23-164	L531516-01	WG550965
Pyrene	mg/kg	0.0251	0	.033	76.1	12-170	L531516-01	WG550965
2-Fluorobiphenyl					83.55	34-129		WG550965
Nitrobenzene-d5					76.78	14-141		WG550965
p-Terphenyl-d14					79.60	25-139		WG550965

Analyte	Units	MSD	Matrix Spike Duplicate		Limit	RPD	Limit	Ref Samp	Batch
			Ref	%Rec					
Arsenic	mg/kg	53.1	51.3	94.2	75-125	3.45	20	L531273-03	WG550737
Barium	mg/kg	140.	143.	83.6	75-125	2.12	20	L531273-03	WG550737
Cadmium	mg/kg	47.7	49.4	94.0	75-125	3.50	20	L531273-03	WG550737
Chromium	mg/kg	69.5	66.8	111.	75-125	3.96	20	L531273-03	WG550737
Copper	mg/kg	55.8	57.3	98.4	75-125	2.65	20	L531273-03	WG550737
Lead	mg/kg	61.6	59.0	97.2	75-125	4.31	20	L531273-03	WG550737
Nickel	mg/kg	58.0	57.4	102.	75-125	1.04	20	L531273-03	WG550737
Silver	mg/kg	48.2	49.0	96.4	75-125	1.65	20	L531273-03	WG550737
Zinc	mg/kg	75.7	78.5	97.4	75-125	3.63	20	L531273-03	WG550737
Selenium	mg/kg	47.7	42.3	95.4	75-125	12.0	20	L531273-03	WG550737
Mercury	mg/kg	0.255	0.270	102.	70-130	5.71	20	L531301-03	WG550884

Arsenic	mg/kg	51.2	52.8	94.6	75-125	3.08	20	L531273-04	WG550738
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Analyte	Units	MSD	Matrix Spike Duplicate		Limit	RPD	Limit	Ref	Samp	Batch
			Ref	%Rec						
Benzene	mg/kg	0.238	0.231	95.2	32-137	2.89	39	L531252-02		WG550830
Ethylbenzene	mg/kg	0.232	0.220	92.6	10-150	5.24	44	L531252-02		WG550830
Toluene	mg/kg	0.215	0.203	85.8	20-142	5.68	42	L531252-02		WG550830
Total Xylene	mg/kg	0.722	0.695	96.2	16-141	3.85	46	L531252-02		WG550830
a,a,a-Trifluorotoluene(PID)				107.9	54-144					WG550830
TPH (GC/FID) Low Fraction	mg/kg	20.6	22.5	74.3	55-109	9.03	20	L531252-02		WG550830
a,a,a-Trifluorotoluene(FID)				105.9	59-128					WG550830
Chromium,Hexavalent	mg/kg	2.56	7.24	12.8*	50-150	95.5*	20	L531127-01		WG550789
TPH (GC/FID) High Fraction	ppm	1610	1660	34.3*	50-150	3.14	25	L531436-07		WG551163
o-Terphenyl				112.2	50-150					WG551163
1-Methylnaphthalene	mg/kg	0.0253	0.0282	76.6	25-155	10.8	27	L531516-01		WG550965
2-Chloronaphthalene	mg/kg	0.0236	0.0266	71.7	31-153	11.9	22	L531516-01		WG550965
2-Methylnaphthalene	mg/kg	0.0225	0.0261	68.2	22-172	14.6	29	L531516-01		WG550965
Acenaphthene	mg/kg	0.0230	0.0258	69.7	43-133	11.7	26	L531516-01		WG550965
Acenaphthylene	mg/kg	0.0226	0.0250	68.4	42-146	10.3	22	L531516-01		WG550965
Anthracene	mg/kg	0.0243	0.0272	73.7	38-153	11.3	27	L531516-01		WG550965
Benzo(a)anthracene	mg/kg	0.0211	0.0232	64.0	31-142	9.24	31	L531516-01		WG550965
Benzo(a)pyrene	mg/kg	0.0241	0.0269	73.0	26-152	11.0	32	L531516-01		WG550965
Benzo(b)fluoranthene	mg/kg	0.0235	0.0261	71.2	10-188	10.4	33	L531516-01		WG550965
Benzo(g,h,i)perylene	mg/kg	0.0230	0.0258	69.8	10-176	11.5	30	L531516-01		WG550965
Benzo(k)fluoranthene	mg/kg	0.0267	0.0302	81.0	22-163	12.3	29	L531516-01		WG550965
Chrysene	mg/kg	0.0246	0.0274	74.4	26-146	10.9	30	L531516-01		WG550965
Dibenz(a,h)anthracene	mg/kg	0.0232	0.0260	70.2	10-160	11.7	39	L531516-01		WG550965
Fluoranthene	mg/kg	0.0253	0.0286	76.7	23-160	12.2	22	L531516-01		WG550965
Fluorene	mg/kg	0.0235	0.0273	71.2	44-143	15.1	23	L531516-01		WG550965
Indeno(1,2,3-cd)pyrene	mg/kg	0.0227	0.0256	68.9	10-157	12.0	40	L531516-01		WG550965
Naphthalene	mg/kg	0.0223	0.0265	67.5	22-156	17.3	27	L531516-01		WG550965
Phenanthrene	mg/kg	0.0239	0.0261	72.4	23-164	8.84	25	L531516-01		WG550965
Pyrene	mg/kg	0.0227	0.0251	68.8	12-170	10.1	24	L531516-01		WG550965
2-Fluorobiphenyl				67.65	34-129					WG550965
Nitrobenzene-d5				66.05	14-141					WG550965
p-Terphenyl-d14				67.32	25-139					WG550965

Batch number /Run number / Sample number cross reference

WG550786: R1817450: L531296-01
WG550737: R1817591: L531296-01
WG550884: R1818151: L531296-01
WG550738: R1818474: L531296-02 03 04 05 06
WG550830: R1818630: L531296-01
WG551021: R1819054: L531296-01
WG550965: R1819351: L531296-01
WG550841: R1820410: L531296-01
WG550789: R1820490: L531296-01
WG551163: R1820631: L531296-01
WG551033: R1821010: L531296-01

* * Calculations are performed prior to rounding of reported values.

* Performance of this Analyte is outside of established criteria.

For additional information, please see Attachment A 'List of Analytes with QC Qualifiers.'



YOUR LAB OF CHOICE

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Est. 1970

August 23, 2011

The data package includes a summary of the analytic results of the quality control samples required by the SW-846 or CWA methods. The quality control samples include a method blank, a laboratory control sample, and the matrix spike/matrix spike duplicate analysis. If a target parameter is outside the method limits, every sample that is effected is flagged with the appropriate qualifier in Appendix B of the analytic report.

Method Blank - an aliquot of reagent water carried through the entire analytic process. The method blank results indicate if any possible contamination exposure during the sample handling, digestion or extraction process, and analysis. Concentrations of target analytes above the reporting limit in the method blank are qualified with the "B" qualifier.

Laboratory Control Sample - is a sample of known concentration that is carried through the digestion/extraction and analysis process. The percent recovery, expressed as a percentage of the theoretical concentration, has statistical control limits indicating that the analytic process is "in control". If a target analyte is outside the control limits for the laboratory control sample or any other control sample, the parameter is flagged with a "J4" qualifier for all effected samples.

Matrix Spike and Matrix Spike Duplicate - is two aliquots of an environmental sample that is spiked with known concentrations of target analytes. The percent recovery of the target analytes also has statistical control limits. If any recoveries that are outside the method control limits, the sample that was selected for matrix spike/matrix spike duplicate analysis is flagged with either a "J5" or a "J6". The relative percent difference (%RPD) between the matrix spike and the matrix spike duplicate recoveries is all calculated. If the RPD is above the method limit, the effected samples are flagged with a "J3" qualifier.