



Laboratory Results Summary Table

				Analytes (BDL = Below Detection Limit; ND = Non Detect)																																		
Allowable Concentration -->				Organic Compounds in Soil (mg/kg [ppm])																	Inorganics in Soil			Metals in Soil (mg/kg [ppm])														
Location	Sample Date:	Sample Matrix	Matrix Notes	500	TPH-GRO (C6-C10) Low Fraction	TPH-DRO (C10-C36) High Fraction	0.17	85	100	175	1000	1000	0.22	0.22	2.2	0.022	22	0.022	1000	1000	0.22	23	1000	EC (<4 mmhos/cm or 2x background)	SAR (calculation)	pH	Arsenic	Barium - EPA Total Barium	Cadmium	Chromium (III)	Chromium (VI)	Copper	Lead (inorganic)	Mercury	Nickel (soluble salts)	Selenium	Silver	Zinc
				TPH (total volatile and extractable petroleum hydrocarbons)			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-C,D)pyrene	Naphthalene	Pyrene															
PC28	10/05/12	Cuttings	composite 1	39	BDL	39	BDL	BDL	BDL	BDL	BDL	0.0067	BDL	BDL	BDL	BDL	0.013	BDL	BDL	0.023	BDL	0.081	BDL	2.3	23	8.9	BDL	3800	0.82	11	BDL	16	6.6	0.022	10	BDL	BDL	42
PC28	10/05/12	Cuttings	composite 1	52	BDL	52	BDL	BDL	BDL	BDL	BDL	0.007	BDL	BDL	BDL	BDL	0.017	BDL	0.007	0.025	BDL	0.089	0.011	2.4	25	8.7	5.3											
PC28	10/05/12	Cuttings	composite 1	66	BDL	66	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.14	BDL	2.2	28	8.6	5.4											



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Est. 1970

Chris Hines / Matt Kasten
EnCana Oil & Gas Inc. - CO
2717 County Road 215, Suite 100
Parachute, CO 81635

Report Summary

Monday October 15, 2012

Report Number: L599509


Samples Received: 10/06/12

Client Project: PC 28

Description: PC 28 Cuttings

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:


Jared Willis , ESC Representative

Laboratory Certification Numbers

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - 01157CA, CT - PH-0197,
FL - E87487, GA - 923, IN - C-IN-01, KY - 90010, KYUST - 0016,
NC - ENV375/DW21704/BIO041, ND - R-140, NJ - TN002, NJ NELAP - TN002,
SC - 84004, TN - 2006, VA - 460132, WV - 233, AZ - 0612,
MN - 047-999-395, NY - 11742, WI - 998093910, NV - TN000032011-1,
TX - T104704245-11-3, OK - 9915, PA - 68-02979, IA Lab #364

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

Chris Hines / Matt Kasten
EnCana Oil & Gas Inc. - CO
2717 County Road 215, Suite 100
Parachute, CO 81635

October 15, 2012

Date Received : October 06, 2012
Description : PC 28 Cuttings

Sample ID : PC 28-CUT1-100512 14 FT

Collected By : Matt Kasten
Collection Date : 10/05/12 08:50

ESC Sample # : L599509-01

Site ID : PC 28

Project # : PC 28

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Chromium, Hexavalent	BDL	10.	mg/kg	3060A/7196A	10/10/12	5
Chromium, Trivalent	11.	2.0	mg/kg	Calc.	10/11/12	1
ORP	210		mV	2580	10/10/12	1
pH	8.9		su	9045D	10/09/12	1
Sodium Adsorption Ratio	23.			Calc.	10/09/12	1
Specific Conductance	2300		umhos/cm	9050AMod	10/11/12	1
Mercury	0.022	0.020	mg/kg	7471	10/11/12	1
Arsenic	BDL	1.0	mg/kg	6010B	10/11/12	1
Barium	3800	0.25	mg/kg	6010B	10/11/12	1
Cadmium	0.82	0.25	mg/kg	6010B	10/11/12	1
Chromium	11.	0.50	mg/kg	6010B	10/11/12	1
Copper	16.	1.0	mg/kg	6010B	10/11/12	1
Lead	6.6	0.25	mg/kg	6010B	10/11/12	1
Nickel	10.	1.0	mg/kg	6010B	10/11/12	1
Selenium	BDL	1.0	mg/kg	6010B	10/11/12	1
Silver	BDL	0.50	mg/kg	6010B	10/11/12	1
Zinc	42.	1.5	mg/kg	6010B	10/11/12	1
Benzene	BDL	0.0025	mg/kg	8021/8015	10/07/12	5
Toluene	BDL	0.025	mg/kg	8021/8015	10/07/12	5
Ethylbenzene	BDL	0.0025	mg/kg	8021/8015	10/07/12	5
Total Xylene	BDL	0.0075	mg/kg	8021/8015	10/07/12	5
TPH (GC/FID) Low Fraction	BDL	0.50	mg/kg	GRO	10/07/12	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	100.		% Rec.	8021/8015	10/07/12	5
a,a,a-Trifluorotoluene(PID)	105.		% Rec.	8021/8015	10/07/12	5
TPH (GC/FID) High Fraction	39.	4.0	mg/kg	3546/DRO	10/12/12	1
Surrogate recovery(%)						
o-Terphenyl	71.4		% Rec.	3546/DRO	10/12/12	1
Polynuclear Aromatic Hydrocarbons						
Anthracene	0.0067	0.0060	mg/kg	8270C-SIM	10/11/12	1
Acenaphthene	BDL	0.0060	mg/kg	8270C-SIM	10/11/12	1
Acenaphthylene	BDL	0.0060	mg/kg	8270C-SIM	10/11/12	1
Benzo(a)anthracene	BDL	0.0060	mg/kg	8270C-SIM	10/11/12	1
Benzo(a)pyrene	BDL	0.0060	mg/kg	8270C-SIM	10/11/12	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
L599509-01 (PH) - 8.9@18.3c
L599509-01 (CR6) - diluted due to sample color interference



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October 15, 2012

Date Received : October 06, 2012
Description : PC 28 Cuttings
Sample ID : PC 28-CUT1-100512 14 FT
Collected By : Matt Kasten
Collection Date : 10/05/12 08:50

ESC Sample # : L599509-01

Site ID : PC 28

Project # : PC 28

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzo(b)fluoranthene	BDL	0.0060	mg/kg	8270C-SIM	10/11/12	1
Benzo(g,h,i)perylene	BDL	0.0060	mg/kg	8270C-SIM	10/11/12	1
Benzo(k)fluoranthene	BDL	0.0060	mg/kg	8270C-SIM	10/11/12	1
Chrysene	0.013	0.0060	mg/kg	8270C-SIM	10/11/12	1
Dibenz(a,h)anthracene	BDL	0.0060	mg/kg	8270C-SIM	10/11/12	1
Fluoranthene	BDL	0.0060	mg/kg	8270C-SIM	10/11/12	1
Fluorene	0.023	0.0060	mg/kg	8270C-SIM	10/11/12	1
Indeno(1,2,3-cd)pyrene	BDL	0.0060	mg/kg	8270C-SIM	10/11/12	1
Naphthalene	0.081	0.0060	mg/kg	8270C-SIM	10/11/12	1
Phenanthrene	0.057	0.0060	mg/kg	8270C-SIM	10/11/12	1
Pyrene	BDL	0.0060	mg/kg	8270C-SIM	10/11/12	1
1-Methylnaphthalene	0.056	0.0060	mg/kg	8270C-SIM	10/11/12	1
2-Methylnaphthalene	0.20	0.0060	mg/kg	8270C-SIM	10/11/12	1
2-Chloronaphthalene	BDL	0.0060	mg/kg	8270C-SIM	10/11/12	1
Surrogate Recovery						
Nitrobenzene-d5	89.7		% Rec.	8270C-SIM	10/11/12	1
2-Fluorobiphenyl	59.0		% Rec.	8270C-SIM	10/11/12	1
p-Terphenyl-d14	46.5		% Rec.	8270C-SIM	10/11/12	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

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Reported: 10/15/12 11:26 Printed: 10/15/12 11:26

L599509-01 (PH) - 8.9@18.3c

L599509-01 (CR6) - diluted due to sample color interference



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EnCana Oil & Gas Inc. - CO
2717 County Road 215, Suite 100
Parachute, CO 81635

October 15, 2012

Date Received : October 06, 2012
Description : PC 28 Cuttings
Sample ID : PC 28-CUT2-100512 14 FT
Collected By : Matt Kasten
Collection Date : 10/05/12 09:00

ESC Sample # : L599509-02

Site ID : PC 28

Project # : PC 28

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
pH	8.7		su	9045D	10/09/12	1
Sodium Adsorption Ratio	25.			Calc.	10/09/12	1
Specific Conductance	2400		umhos/cm	9050AMod	10/11/12	1
Arsenic	5.3	1.0	mg/kg	6010B	10/14/12	1
Benzene	BDL	0.0025	mg/kg	8021/8015	10/07/12	5
Toluene	BDL	0.025	mg/kg	8021/8015	10/07/12	5
Ethylbenzene	BDL	0.0025	mg/kg	8021/8015	10/07/12	5
Total Xylene	BDL	0.0075	mg/kg	8021/8015	10/07/12	5
TPH (GC/FID) Low Fraction	BDL	0.50	mg/kg	GRO	10/07/12	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	100.		% Rec.	8021/8015	10/07/12	5
a,a,a-Trifluorotoluene(PID)	105.		% Rec.	8021/8015	10/07/12	5
TPH (GC/FID) High Fraction	52.	4.0	mg/kg	3546/DRO	10/12/12	1
Surrogate recovery(%)						
o-Terphenyl	60.5		% Rec.	3546/DRO	10/12/12	1
Polynuclear Aromatic Hydrocarbons						
Anthracene	0.0070	0.0060	mg/kg	8270C-SIM	10/11/12	1
Acenaphthene	BDL	0.0060	mg/kg	8270C-SIM	10/11/12	1
Acenaphthylene	0.023	0.0060	mg/kg	8270C-SIM	10/11/12	1
Benzo(a)anthracene	BDL	0.0060	mg/kg	8270C-SIM	10/11/12	1
Benzo(a)pyrene	BDL	0.0060	mg/kg	8270C-SIM	10/11/12	1
Benzo(b)fluoranthene	BDL	0.0060	mg/kg	8270C-SIM	10/11/12	1
Benzo(g,h,i)perylene	BDL	0.0060	mg/kg	8270C-SIM	10/11/12	1
Benzo(k)fluoranthene	BDL	0.0060	mg/kg	8270C-SIM	10/11/12	1
Chrysene	0.017	0.0060	mg/kg	8270C-SIM	10/11/12	1
Dibenz(a,h)anthracene	BDL	0.0060	mg/kg	8270C-SIM	10/11/12	1
Fluoranthene	0.0070	0.0060	mg/kg	8270C-SIM	10/11/12	1
Fluorene	0.025	0.0060	mg/kg	8270C-SIM	10/11/12	1
Indeno(1,2,3-cd)pyrene	BDL	0.0060	mg/kg	8270C-SIM	10/11/12	1
Naphthalene	0.089	0.0060	mg/kg	8270C-SIM	10/11/12	1
Phenanthrene	0.061	0.0060	mg/kg	8270C-SIM	10/11/12	1
Pyrene	0.011	0.0060	mg/kg	8270C-SIM	10/11/12	1
1-Methylnaphthalene	0.066	0.0060	mg/kg	8270C-SIM	10/11/12	1
2-Methylnaphthalene	0.22	0.0060	mg/kg	8270C-SIM	10/11/12	1
2-Chloronaphthalene	BDL	0.0060	mg/kg	8270C-SIM	10/11/12	1
Surrogate Recovery						
Nitrobenzene-d5	89.9		% Rec.	8270C-SIM	10/11/12	1
2-Fluorobiphenyl	50.4		% Rec.	8270C-SIM	10/11/12	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
L599509-02 (PH) - 8.7@20.1c



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REPORT OF ANALYSIS

Chris Hines / Matt Kasten
EnCana Oil & Gas Inc. - CO
2717 County Road 215, Suite 100
Parachute, CO 81635

October 15, 2012

Date Received : October 06, 2012
Description : PC 28 Cuttings
Sample ID : PC 28-CUT2-100512 14 FT
Collected By : Matt Kasten
Collection Date : 10/05/12 09:00

ESC Sample # : L599509-02

Site ID : PC 28
Project # : PC 28

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
p-Terphenyl-d14	45.3		% Rec.	8270C-SIM	10/11/12	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
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L599509-02 (PH) - 8.7@20.1c



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October 15, 2012

Date Received : October 06, 2012
Description : PC 28 Cuttings
Sample ID : PC 28-CUT3-100512 14 FT
Collected By : Matt Kasten
Collection Date : 10/05/12 09:15

ESC Sample # : L599509-03

Site ID : PC 28

Project # : PC 28

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
pH	8.6		su	9045D	10/09/12	1
Sodium Adsorption Ratio	28.			Calc.	10/09/12	1
Specific Conductance	2200		umhos/cm	9050AMod	10/11/12	1
Arsenic	5.4	1.0	mg/kg	6010B	10/14/12	1
Benzene	BDL	0.0025	mg/kg	8021/8015	10/07/12	5
Toluene	BDL	0.025	mg/kg	8021/8015	10/07/12	5
Ethylbenzene	BDL	0.0025	mg/kg	8021/8015	10/07/12	5
Total Xylene	BDL	0.0075	mg/kg	8021/8015	10/07/12	5
TPH (GC/FID) Low Fraction	BDL	0.50	mg/kg	GRO	10/07/12	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	99.6		% Rec.	8021/8015	10/07/12	5
a,a,a-Trifluorotoluene(PID)	104.		% Rec.	8021/8015	10/07/12	5
TPH (GC/FID) High Fraction	66.	4.0	mg/kg	3546/DRO	10/12/12	1
Surrogate recovery(%)						
o-Terphenyl	55.8		% Rec.	3546/DRO	10/12/12	1
Polynuclear Aromatic Hydrocarbons						
Anthracene	BDL	0.060	mg/kg	8270C-SIM	10/11/12	10
Acenaphthene	BDL	0.060	mg/kg	8270C-SIM	10/11/12	10
Acenaphthylene	BDL	0.060	mg/kg	8270C-SIM	10/11/12	10
Benzo(a)anthracene	BDL	0.060	mg/kg	8270C-SIM	10/11/12	10
Benzo(a)pyrene	BDL	0.060	mg/kg	8270C-SIM	10/11/12	10
Benzo(b)fluoranthene	BDL	0.060	mg/kg	8270C-SIM	10/11/12	10
Benzo(g,h,i)perylene	BDL	0.060	mg/kg	8270C-SIM	10/11/12	10
Benzo(k)fluoranthene	BDL	0.060	mg/kg	8270C-SIM	10/11/12	10
Chrysene	BDL	0.060	mg/kg	8270C-SIM	10/11/12	10
Dibenz(a,h)anthracene	BDL	0.060	mg/kg	8270C-SIM	10/11/12	10
Fluoranthene	BDL	0.060	mg/kg	8270C-SIM	10/11/12	10
Fluorene	BDL	0.060	mg/kg	8270C-SIM	10/11/12	10
Indeno(1,2,3-cd)pyrene	BDL	0.060	mg/kg	8270C-SIM	10/11/12	10
Naphthalene	0.14	0.060	mg/kg	8270C-SIM	10/11/12	10
Phenanthrene	0.086	0.060	mg/kg	8270C-SIM	10/11/12	10
Pyrene	BDL	0.060	mg/kg	8270C-SIM	10/11/12	10
1-Methylnaphthalene	0.10	0.060	mg/kg	8270C-SIM	10/11/12	10
2-Methylnaphthalene	0.35	0.060	mg/kg	8270C-SIM	10/11/12	10
2-Chloronaphthalene	BDL	0.060	mg/kg	8270C-SIM	10/11/12	10
Surrogate Recovery						
Nitrobenzene-d5	114.		% Rec.	8270C-SIM	10/11/12	10
2-Fluorobiphenyl	62.0		% Rec.	8270C-SIM	10/11/12	10

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
L599509-03 (PH) - 8.6@19.3c



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REPORT OF ANALYSIS

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EnCana Oil & Gas Inc. - CO
2717 County Road 215, Suite 100
Parachute, CO 81635

October 15, 2012

Date Received : October 06, 2012
Description : PC 28 Cuttings
Sample ID : PC 28-CUT3-100512 14 FT
Collected By : Matt Kasten
Collection Date : 10/05/12 09:15

ESC Sample # : L599509-03

Site ID : PC 28
Project # : PC 28

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
p-Terphenyl-d14	45.2		% Rec.	8270C-SIM	10/11/12	10

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
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Reported: 10/15/12 11:26 Printed: 10/15/12 11:26
L599509-03 (PH) - 8.6@19.3c

Attachment A
List of Analytes with QC Qualifiers

Sample Number	Work Group	Sample Type	Analyte	Run ID	Qualifier
L599509-01	WG616892	SAMP	pH	R2382157	T8
	WG616649	SAMP	Chromium, Hexavalent	R2383077	O
L599509-02	WG616892	SAMP	pH	R2382157	T8
L599509-03	WG616892	SAMP	pH	R2382157	T8

Attachment B
Explanation of QC Qualifier Codes

Qualifier	Meaning
0	(ESC) Sample diluted due to matrix interferences that impaired the ability to make an accurate analytical determination. The detection limit is elevated in order to reflect the necessary dilution.
T8	(ESC) - Additional method/sample information: Sample(s) received past/too close to holding time expiration.

Qualifier Report Information

ESC utilizes sample and result qualifiers as set forth by the EPA Contract Laboratory Program and as required by most certifying bodies including NELAC. In addition to the EPA qualifiers adopted by ESC, we have implemented ESC qualifiers to provide more information pertaining to our analytical results. Each qualifier is designated in the qualifier explanation as either EPA or ESC. Data qualifiers are intended to provide the ESC client with more detailed information concerning the potential bias of reported data. Because of the wide range of constituents and variety of matrices incorporated by most EPA methods, it is common for some compounds to fall outside of established ranges. These exceptions are evaluated and all reported data is valid and useable "unless qualified as 'R' (Rejected)."

Definitions

- Accuracy - The relationship of the observed value of a known sample to the true value of a known sample. Represented by percent recovery and relevant to samples such as: control samples, matrix spike recoveries, surrogate recoveries, etc.
- Precision - The agreement between a set of samples or between duplicate samples. Relates to how close together the results are and is represented by Relative Percent Difference.
- Surrogate - Organic compounds that are similar in chemical composition, extraction, and chromatography to analytes of interest. The surrogates are used to determine the probable response of the group of analytes that are chemically related to the surrogate compound. Surrogates are added to the sample and carried through all stages of preparation and analyses.
- TIC - Tentatively Identified Compound: Compounds detected in samples that are not target compounds, internal standards, system monitoring compounds, or surrogates.

Summary of Remarks For Samples Printed
10/15/12 at 11:26:42

TSR Signing Reports: 358
R5 - Desired TAT

Try not to report benzene as BDL above a 250x dilution. ONLY log soil samples under this account. Waters get logged under ENCRCO. Log all PAHs as PAHSIM.

Sample: L599509-01 Account: ENCANACO Received: 10/06/12 09:00 Due Date: 10/12/12 00:00 RPT Date: 10/15/12 11:26

Sample: L599509-02 Account: ENCANACO Received: 10/06/12 09:00 Due Date: 10/12/12 00:00 RPT Date: 10/15/12 11:26

Sample: L599509-03 Account: ENCANACO Received: 10/06/12 09:00 Due Date: 10/12/12 00:00 RPT Date: 10/15/12 11:26



YOUR LAB OF CHOICE

EnCana Oil & Gas Inc. - CO
Chris Hines / Matt Kasten
2717 County Road 215, Suite 100

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Quality Assurance Report
Level II

L599509

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October 15, 2012

Analyte	Result	Laboratory Blank		Limit	Batch	Date Analyzed
		Units	% Rec			
Benzene	< .0005	mg/kg			WG616659	10/07/12 00:40
Ethylbenzene	< .0005	mg/kg			WG616659	10/07/12 00:40
Toluene	< .005	mg/kg			WG616659	10/07/12 00:40
TPH (GC/FID) Low Fraction	< .1	mg/kg			WG616659	10/07/12 00:40
Total Xylene	< .0015	mg/kg			WG616659	10/07/12 00:40
a,a,a-Trifluorotoluene(FID)		% Rec.	101.0	59-128	WG616659	10/07/12 00:40
a,a,a-Trifluorotoluene(PID)		% Rec.	106.0	54-144	WG616659	10/07/12 00:40
Chromium,Hexavalent	< 2	mg/kg			WG616649	10/10/12 08:10
1-Methylnaphthalene	< .006	mg/kg			WG616688	10/10/12 16:35
2-Chloronaphthalene	< .006	mg/kg			WG616688	10/10/12 16:35
2-Methylnaphthalene	< .006	mg/kg			WG616688	10/10/12 16:35
Acenaphthene	< .006	mg/kg			WG616688	10/10/12 16:35
Acenaphthylene	< .006	mg/kg			WG616688	10/10/12 16:35
Anthracene	< .006	mg/kg			WG616688	10/10/12 16:35
Benzo(a)anthracene	< .006	mg/kg			WG616688	10/10/12 16:35
Benzo(a)pyrene	< .006	mg/kg			WG616688	10/10/12 16:35
Benzo(b)fluoranthene	< .006	mg/kg			WG616688	10/10/12 16:35
Benzo(g,h,i)perylene	< .006	mg/kg			WG616688	10/10/12 16:35
Benzo(k)fluoranthene	< .006	mg/kg			WG616688	10/10/12 16:35
Chrysene	< .006	mg/kg			WG616688	10/10/12 16:35
Dibenz(a,h)anthracene	< .006	mg/kg			WG616688	10/10/12 16:35
Fluoranthene	< .006	mg/kg			WG616688	10/10/12 16:35
Fluorene	< .006	mg/kg			WG616688	10/10/12 16:35
Indeno(1,2,3-cd)pyrene	< .006	mg/kg			WG616688	10/10/12 16:35
Naphthalene	< .006	mg/kg			WG616688	10/10/12 16:35
Phenanthrene	< .006	mg/kg			WG616688	10/10/12 16:35
Pyrene	< .006	mg/kg			WG616688	10/10/12 16:35
2-Fluorobiphenyl		% Rec.	85.64	34-129	WG616688	10/10/12 16:35
Nitrobenzene-d5		% Rec.	74.78	14-141	WG616688	10/10/12 16:35
p-Terphenyl-d14		% Rec.	92.39	25-139	WG616688	10/10/12 16:35
Mercury	< .02	mg/kg			WG616841	10/11/12 10:23
Specific Conductance	1.08	umhos/cm			WG617086	10/11/12 14:15
Arsenic	< 1	mg/kg			WG616852	10/11/12 02:54
Barium	< .25	mg/kg			WG616852	10/11/12 02:54
Cadmium	< .25	mg/kg			WG616852	10/11/12 02:54
Chromium	< .5	mg/kg			WG616852	10/11/12 02:54
Copper	< 1	mg/kg			WG616852	10/11/12 02:54
Nickel	< 1	mg/kg			WG616852	10/11/12 02:54
Selenium	< 1	mg/kg			WG616852	10/11/12 02:54
Silver	< .5	mg/kg			WG616852	10/11/12 02:54
Zinc	< 1.5	mg/kg			WG616852	10/11/12 02:54
Lead	< .25	mg/kg			WG616852	10/11/12 09:10
TPH (GC/FID) High Fraction	< 4	ppm			WG617143	10/12/12 15:49
o-Terphenyl		% Rec.	79.88	50-150	WG617143	10/12/12 15:49
Arsenic	< 1	mg/kg			WG616925	10/14/12 07:44

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Est. 1970

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Analyte	Units	Duplicate		RPD	Limit	Ref Samp	Batch
		Result	Duplicate				
pH	su	6.20	6.20	0.485	1	L598628-01	WG616892
pH	su	12.0	12.0	2.47*	1	L599305-01	WG616892
Chromium,Hexavalent	mg/kg	0	0	0	20	L599509-01	WG616649
Chromium,Hexavalent	mg/kg	0	0	0	20	L599126-02	WG616649
ORP	mV	290.	270.	6.45	20	L599251-01	WG616876
ORP	mV	200.	210.	2.90	20	L599509-01	WG616876
Mercury	mg/kg	0	0.0220	NA	20	L599467-21	WG616841
Specific Conductance	umhos/cm	2300	2600	10.5	20	L598837-33	WG617086
Specific Conductance	umhos/cm	2200	2200	2.25	20	L599509-03	WG617086
Arsenic	mg/kg	0	2.04	NA	20	L599467-12	WG616852
Barium	mg/kg	40.0	40.0	0.747	20	L599467-12	WG616852
Cadmium	mg/kg	1.10	0.709	45.8*	20	L599467-12	WG616852
Chromium	mg/kg	5.00	4.48	11.0	20	L599467-12	WG616852
Copper	mg/kg	3.70	3.99	8.36	20	L599467-12	WG616852
Nickel	mg/kg	2.30	2.52	10.0	20	L599467-12	WG616852
Selenium	mg/kg	0	0	0	20	L599467-12	WG616852
Silver	mg/kg	0	0	0	20	L599467-12	WG616852
Zinc	mg/kg	19.0	17.7	6.03	20	L599467-12	WG616852
Lead	mg/kg	13.0	0	NA	20	L599467-12	WG616852
Arsenic	mg/kg	20.0	11.9	50.8*	20	L599513-01	WG616925

Analyte	Units	Laboratory Control Sample		% Rec	Limit	Batch
		Known Val	Result			
Benzene	mg/kg	.05	0.0432	86.5	76-113	WG616659
Ethylbenzene	mg/kg	.05	0.0543	109.	78-115	WG616659
Toluene	mg/kg	.05	0.0492	98.3	76-114	WG616659
Total Xylene	mg/kg	.15	0.162	108.	81-118	WG616659
a,a,a-Trifluorotoluene(PID)				104.8	54-144	WG616659
TPH (GC/FID) Low Fraction	mg/kg	5.5	5.76	105.	67-135	WG616659
a,a,a-Trifluorotoluene(FID)				98.63	59-128	WG616659
pH	su	6.03	6.03	100.	98-101	WG616892
Chromium,Hexavalent	mg/kg	150	139.	92.7	80-120	WG616649
ORP	mV	228	226.	99.1	95.6-104.	WG616876
1-Methylnaphthalene	mg/kg	.033	0.0267	80.9	48-113	WG616688
2-Chloronaphthalene	mg/kg	.033	0.0278	84.1	51-114	WG616688
2-Methylnaphthalene	mg/kg	.033	0.0263	79.7	44-109	WG616688
Acenaphthene	mg/kg	.033	0.0275	83.5	52-108	WG616688
Acenaphthylene	mg/kg	.033	0.0273	82.6	51-110	WG616688

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Analyte	Units	Laboratory Control Sample		% Rec	Limit	Batch
		Known Val	Result			
Anthracene	mg/kg	.033	0.0311	94.1	58-120	WG616688
Benzo(a)anthracene	mg/kg	.033	0.0277	83.8	54-110	WG616688
Benzo(a)pyrene	mg/kg	.033	0.0308	93.5	56-118	WG616688
Benzo(b)fluoranthene	mg/kg	.033	0.0295	89.4	55-114	WG616688
Benzo(g,h,i)perylene	mg/kg	.033	0.0369	112.	48-130	WG616688
Benzo(k)fluoranthene	mg/kg	.033	0.0286	86.6	55-122	WG616688
Chrysene	mg/kg	.033	0.0310	94.0	57-118	WG616688
Dibenz(a,h)anthracene	mg/kg	.033	0.0346	105.	53-122	WG616688
Fluoranthene	mg/kg	.033	0.0298	90.2	58-118	WG616688
Fluorene	mg/kg	.033	0.0276	83.5	54-109	WG616688
Indeno(1,2,3-cd)pyrene	mg/kg	.033	0.0342	104.	51-125	WG616688
Naphthalene	mg/kg	.033	0.0248	75.2	45-105	WG616688
Phenanthrene	mg/kg	.033	0.0294	89.1	53-114	WG616688
Pyrene	mg/kg	.033	0.0317	96.0	53-121	WG616688
2-Fluorobiphenyl				83.79	34-129	WG616688
Nitrobenzene-d5				70.74	14-141	WG616688
p-Terphenyl-d14				91.17	25-139	WG616688
Mercury	mg/kg	12.4	9.97	80.4	71.6-128	WG616841
Specific Conductance	umhos/cm	1050	1090	104.	85-115	WG617086
Arsenic	mg/kg	237	232.	97.9	83.1-117	WG616852
Barium	mg/kg	252	245.	97.2	84.1-116	WG616852
Cadmium	mg/kg	191	182.	95.3	83.2-117	WG616852
Chromium	mg/kg	128	122.	95.3	81.3-118	WG616852
Copper	mg/kg	123	116.	94.3	83.7-116	WG616852
Nickel	mg/kg	118	115.	97.5	82-118	WG616852
Selenium	mg/kg	110	108.	98.2	78.7-122	WG616852
Silver	mg/kg	47.3	44.1	93.2	66.2-134	WG616852
Zinc	mg/kg	183	177.	96.7	82-118	WG616852
Lead	mg/kg	103	97.9	95.0	83.1-117	WG616852
TPH (GC/FID) High Fraction	ppm	60	50.5	84.2	50-150	WG617143
o-Terphenyl				75.54	50-150	WG617143
Arsenic	mg/kg	237	235.	99.2	83.1-117	WG616925

Analyte	Units	Laboratory Control Sample Duplicate			Limit	RPD	Limit	Batch
		Result	Ref	%Rec				
Benzene	mg/kg	0.0424	0.0432	85.0	76-113	1.91	20	WG616659
Ethylbenzene	mg/kg	0.0533	0.0543	106.	78-115	1.89	20	WG616659
Toluene	mg/kg	0.0480	0.0492	96.0	76-114	2.34	20	WG616659
Total Xylene	mg/kg	0.158	0.162	106.	81-118	2.03	20	WG616659
a,a,a-Trifluorotoluene(PID)				104.6	54-144			WG616659
TPH (GC/FID) Low Fraction	mg/kg	5.69	5.76	104.	67-135	1.18	20	WG616659
a,a,a-Trifluorotoluene(FID)				98.66	59-128			WG616659
pH	su	6.04	6.03	100.	98-101	0.166	20	WG616892
Chromium,Hexavalent	mg/kg	140.	139.	93.0	80-120	0.717	20	WG616649

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Analyte	Units	Laboratory Control Sample Duplicate			Limit	RPD	Limit	Batch
		Result	Ref	%Rec				
ORP	mV	226.	226.	99.0	95.6-104.	0	20	WG616876
1-Methylnaphthalene	mg/kg	0.0258	0.0267	78.0	48-113	3.44	24	WG616688
2-Chloronaphthalene	mg/kg	0.0257	0.0278	78.0	51-114	7.85	24	WG616688
2-Methylnaphthalene	mg/kg	0.0257	0.0263	78.0	44-109	2.35	24	WG616688
Acenaphthene	mg/kg	0.0264	0.0275	80.0	52-108	4.37	22	WG616688
Acenaphthylene	mg/kg	0.0265	0.0273	80.0	51-110	2.66	21	WG616688
Anthracene	mg/kg	0.0296	0.0311	90.0	58-120	4.68	20	WG616688
Benzo(a)anthracene	mg/kg	0.0274	0.0277	83.0	54-110	0.923	22	WG616688
Benzo(a)pyrene	mg/kg	0.0306	0.0308	92.0	56-118	0.948	21	WG616688
Benzo(b)fluoranthene	mg/kg	0.0298	0.0295	90.0	55-114	1.08	20	WG616688
Benzo(g,h,i)perylene	mg/kg	0.0387	0.0369	117.	48-130	4.59	20	WG616688
Benzo(k)fluoranthene	mg/kg	0.0294	0.0286	89.0	55-122	2.98	25	WG616688
Chrysene	mg/kg	0.0302	0.0310	91.0	57-118	2.69	20	WG616688
Dibenz(a,h)anthracene	mg/kg	0.0364	0.0346	110.	53-122	4.83	20	WG616688
Fluoranthene	mg/kg	0.0294	0.0298	89.0	58-118	1.19	20	WG616688
Fluorene	mg/kg	0.0278	0.0276	84.0	54-109	1.02	20	WG616688
Indeno(1,2,3-cd)pyrene	mg/kg	0.0356	0.0342	108.	51-125	3.97	21	WG616688
Naphthalene	mg/kg	0.0246	0.0248	74.0	45-105	0.898	24	WG616688
Phenanthrene	mg/kg	0.0286	0.0294	87.0	53-114	2.64	20	WG616688
Pyrene	mg/kg	0.0299	0.0317	91.0	53-121	5.71	20	WG616688
2-Fluorobiphenyl				80.62	34-129			WG616688
Nitrobenzene-d5				69.72	14-141			WG616688
p-Terphenyl-d14				89.06	25-139			WG616688
Specific Conductance	umhos/	1060	1090	101.	85-115	2.79	20	WG617086
TPH (GC/FID) High Fraction	ppm	51.8	50.5	86.0	50-150	2.56	25	WG617143
o-Terphenyl				77.72	50-150			WG617143

Analyte	Units	Matrix Spike			% Rec	Limit	Ref Samp	Batch
		MS Res	Ref Res	TV				
Benzene	mg/kg	0.189	0	.05	75.6	32-137	L599545-01	WG616659
Ethylbenzene	mg/kg	0.236	0	.05	94.4	10-150	L599545-01	WG616659
Toluene	mg/kg	0.220	0	.05	87.9	20-142	L599545-01	WG616659
Total Xylene	mg/kg	0.707	0	.15	94.3	16-141	L599545-01	WG616659
a,a,a-Trifluorotoluene(PID)					102.6	54-144		WG616659
TPH (GC/FID) Low Fraction	mg/kg	22.3	0	5.5	81.1	55-109	L599545-01	WG616659
a,a,a-Trifluorotoluene(FID)					96.86	59-128		WG616659
Chromium,Hexavalent	mg/kg	4.64	0	20	23.2*	75-125	L599128-02	WG616649
Mercury	mg/kg	0.269	0.0220	.25	98.8	80-120	L599467-21	WG616841
Arsenic	mg/kg	42.4	2.04	50	80.7	75-125	L599467-12	WG616852
Barium	mg/kg	88.2	40.0	50	96.4	75-125	L599467-12	WG616852
Cadmium	mg/kg	54.1	0.709	50	107.	75-125	L599467-12	WG616852
Chromium	mg/kg	65.4	4.48	50	122.	75-125	L599467-12	WG616852
Copper	mg/kg	56.0	3.99	50	104.	75-125	L599467-12	WG616852
Nickel	mg/kg	54.6	2.52	50	104.	75-125	L599467-12	WG616852
Selenium	mg/kg	47.0	0	50	94.0	75-125	L599467-12	WG616852
Silver	mg/kg	47.6	0	50	95.2	75-125	L599467-12	WG616852

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Analyte	Units	MS Res	Matrix Spike		% Rec	Limit	Ref Samp	Batch
			Ref Res	TV				
Zinc	mg/kg	85.0	17.7	50	135.*	75-125	L599467-12	WG616852
Lead	mg/kg	73.0	0	50	146.*	75-125	L599467-12	WG616852
1-Methylnaphthalene	mg/kg	0.0388	0.00731	.033	95.3	25-155	L599521-13	WG616688
2-Chloronaphthalene	mg/kg	0.0230	0	.033	69.8	31-153	L599521-13	WG616688
2-Methylnaphthalene	mg/kg	0.0431	0.00776	.033	107.	22-172	L599521-13	WG616688
Acenaphthene	mg/kg	0.0238	0	.033	72.0	43-133	L599521-13	WG616688
Acenaphthylene	mg/kg	0.0283	0.00840	.033	60.4	42-146	L599521-13	WG616688
Anthracene	mg/kg	0.0246	0	.033	74.6	38-153	L599521-13	WG616688
Benzo(a)anthracene	mg/kg	0.0247	0.0230	.033	5.26*	31-142	L599521-13	WG616688
Benzo(a)pyrene	mg/kg	0.0273	0.0370	.033	0*	26-152	L599521-13	WG616688
Benzo(b)fluoranthene	mg/kg	0.0352	0.0610	.033	0*	10-188	L599521-13	WG616688
Benzo(g,h,i)perylene	mg/kg	0.0195	0.0280	.033	0*	10-176	L599521-13	WG616688
Benzo(k)fluoranthene	mg/kg	0.0190	0.0150	.033	12.1*	22-163	L599521-13	WG616688
Chrysene	mg/kg	0.0267	0.0370	.033	0*	26-146	L599521-13	WG616688
Dibenz(a,h)anthracene	mg/kg	0.0123	0.00600	.033	19.2	10-160	L599521-13	WG616688
Fluoranthene	mg/kg	0.0450	0.0950	.033	0*	23-160	L599521-13	WG616688
Fluorene	mg/kg	0.0240	0	.033	72.8	44-143	L599521-13	WG616688
Indeno(1,2,3-cd)pyrene	mg/kg	0.0180	0.0240	.033	0*	10-157	L599521-13	WG616688
Naphthalene	mg/kg	0.0354	0.00760	.033	84.4	22-156	L599521-13	WG616688
Phenanthrene	mg/kg	0.0444	0.0680	.033	0*	23-164	L599521-13	WG616688
Pyrene	mg/kg	0.0402	0.0760	.033	0*	12-170	L599521-13	WG616688
2-Fluorobiphenyl					71.89	34-129		WG616688
Nitrobenzene-d5					66.02	14-141		WG616688
p-Terphenyl-d14					43.87	25-139		WG616688
TPH (GC/FID) High Fraction	ppm	55.5	0	60	92.5	50-150	L599543-02	WG617143
o-Terphenyl					84.63	50-150		WG617143
Arsenic	mg/kg	58.9	11.9	50	94.0	75-125	L599513-01	WG616925

Analyte	Units	MSD	Matrix Spike Duplicate		Limit	RPD	Limit	Ref Samp	Batch
			Ref	%Rec					
Benzene	mg/kg	0.201	0.189	80.2	32-137	5.93	39	L599545-01	WG616659
Ethylbenzene	mg/kg	0.238	0.236	95.1	10-150	0.820	44	L599545-01	WG616659
Toluene	mg/kg	0.226	0.220	90.4	20-142	2.74	42	L599545-01	WG616659
Total Xylene	mg/kg	0.711	0.707	94.7	16-141	0.470	46	L599545-01	WG616659
a,a,a-Trifluorotoluene(PID)				103.4	54-144				WG616659
TPH (GC/FID) Low Fraction	mg/kg	20.2	22.3	73.3	55-109	10.1	20	L599545-01	WG616659
a,a,a-Trifluorotoluene(FID)				90.28	59-128				WG616659
Chromium, Hexavalent	mg/kg	4.08	4.64	20.4*	75-125	12.8	20	L599128-02	WG616649
Mercury	mg/kg	0.260	0.269	95.2	80-120	3.40	20	L599467-21	WG616841
Arsenic	mg/kg	46.1	42.4	88.1	75-125	8.36	20	L599467-12	WG616852
Barium	mg/kg	97.6	88.2	115.	75-125	10.1	20	L599467-12	WG616852
Cadmium	mg/kg	54.6	54.1	108.	75-125	0.920	20	L599467-12	WG616852
Chromium	mg/kg	59.1	65.4	109.	75-125	10.1	20	L599467-12	WG616852
Copper	mg/kg	55.9	56.0	104.	75-125	0.179	20	L599467-12	WG616852
Nickel	mg/kg	52.5	54.6	100.	75-125	3.92	20	L599467-12	WG616852
Selenium	mg/kg	48.1	47.0	96.2	75-125	2.31	20	L599467-12	WG616852

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Quality Assurance Report
Level II

L599509

12065 Lebanon Rd.
Mt. Juliet, TN 37122
(615) 758-5858
1-800-767-5859
Fax (615) 758-5859

Tax I.D. 62-0814289

Est. 1970

October 15, 2012

Analyte	Units	MSD	Matrix Spike Duplicate		Limit	RPD	Limit	Ref Samp	Batch
			Ref	%Rec					
Silver	mg/kg	50.5	47.6	101.	75-125	5.91	20	L599467-12	WG616852
Zinc	mg/kg	76.0	85.0	117.	75-125	11.2	20	L599467-12	WG616852
Lead	mg/kg	66.2	73.0	132.*	75-125	9.77	20	L599467-12	WG616852
1-Methylnaphthalene	mg/kg	0.0317	0.0388	73.8	25-155	20.1	27	L599521-13	WG616688
2-Chloronaphthalene	mg/kg	0.0248	0.0230	75.0	31-153	7.23	22	L599521-13	WG616688
2-Methylnaphthalene	mg/kg	0.0326	0.0431	75.3	22-172	27.8	29	L599521-13	WG616688
Acenaphthene	mg/kg	0.0246	0.0238	74.6	43-133	3.55	26	L599521-13	WG616688
Acenaphthylene	mg/kg	0.0309	0.0283	68.2	42-146	8.72	22	L599521-13	WG616688
Anthracene	mg/kg	0.0265	0.0246	80.2	38-153	7.22	27	L599521-13	WG616688
Benzo(a)anthracene	mg/kg	0.0360	0.0247	39.3	31-142	37.0*	31	L599521-13	WG616688
Benzo(a)pyrene	mg/kg	0.0843	0.0273	143.	26-152	102.*	32	L599521-13	WG616688
Benzo(b)fluoranthene	mg/kg	0.0792	0.0352	55.2	10-188	77.0*	33	L599521-13	WG616688
Benzo(g,h,i)perylene	mg/kg	0.135	0.0195	323.*	10-176	150.*	30	L599521-13	WG616688
Benzo(k)fluoranthene	mg/kg	0.0240	0.0190	27.2	22-163	23.3	29	L599521-13	WG616688
Chrysene	mg/kg	0.0535	0.0267	49.9	26-146	66.9*	30	L599521-13	WG616688
Dibenz(a,h)anthracene	mg/kg	0.0213	0.0123	46.4	10-160	53.5*	39	L599521-13	WG616688
Fluoranthene	mg/kg	0.0773	0.0450	0*	23-160	52.9*	22	L599521-13	WG616688
Fluorene	mg/kg	0.0253	0.0240	76.8	44-143	5.26	23	L599521-13	WG616688
Indeno(1,2,3-cd)pyrene	mg/kg	0.0372	0.0180	40.1	10-157	69.8*	40	L599521-13	WG616688
Naphthalene	mg/kg	0.0314	0.0354	72.0	22-156	12.2	27	L599521-13	WG616688
Phenanthrene	mg/kg	0.0682	0.0444	0.706*	23-164	42.4*	25	L599521-13	WG616688
Pyrene	mg/kg	0.0750	0.0402	0*	12-170	60.3*	24	L599521-13	WG616688
2-Fluorobiphenyl				73.36	34-129				WG616688
Nitrobenzene-d5				71.36	14-141				WG616688
p-Terphenyl-d14				51.55	25-139				WG616688
TPH (GC/FID) High Fraction	ppm	47.9	55.5	79.8	50-150	14.7	25	L599543-02	WG617143
o-Terphenyl				74.55	50-150				WG617143
Arsenic	mg/kg	58.5	58.9	93.2	75-125	0.681	20	L599513-01	WG616925

Batch number /Run number / Sample number cross reference

WG616659: R2380024: L599509-01 02 03
WG616715: R2381217: L599509-01 02 03
WG616892: R2382157: L599509-01 02 03
WG616649: R2383077: L599509-01
WG616876: R2384137: L599509-01
WG616688: R2385357: L599509-01 02 03
WG616841: R2385597: L599509-01
WG617086: R2386497: L599509-01 02 03
WG616852: R2386580: L599509-01
WG617143: R2389517: L599509-01 02 03
WG616925: R2389717: L599509-02 03

* * 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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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.