

Analytes (BDL = Below Detection Limit; ND = Non Detect)

Location	Sample Date:	Sample Matrix	Matrix Notes	Allowable Concentration ->	Organic Compounds in Soil (mg/kg [ppm])																	Inorganics in Soil			Metals in Soil (mg/kg [ppm])														
					500	0.17	85	100	175	1000	1000	0.22	0.22	2.2	0.022	22	0.022	1000	1000	0.22	23	1000	<12	(6-9)	0.39	15000	70	120000	23	3100	400	23	1600	390	390	23000			
					TPH (total volatile and extractable petroleum hydrocarbons)	TPH-GRO (C8-C10) Low Fraction	TPH-DRO (C10-C36) High Fraction	Benzene	Toluene	Ethylbenzene	Xylenes - total	Acenaphthene	Anthracene	Benzo(A)anthracene	Benzo(B)fluoranthene	Benzo(K)fluoranthene	Benzo(A)pyrene	Chrysene	Dibenz(A,H)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-C,D)pyrene	Naphthalene	Pyrene	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
I27W	01/23/13	Cuttings	composite 1		348.9	8.9	340	0.0068	0.034	0.006	0.066	BDL	BDL	0.046	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.007	BDL	1.7	20	8	1.9	7000	0.3	10	BDL	13	5	BDL	4.3	BDL	BDL	30	
I27W	01/23/13	Cuttings	composite 2		1705.9	5.9	1700	0.0064	0.029	0.0048	0.053	BDL	BDL	0.066	BDL	BDL	BDL	0.054	BDL	BDL	0.0097	BDL	0.022	BDL	2.5	19	8.1	1.4											
I27W	01/23/13	Cuttings	composite 2 TPH-DRO re-run		69		69																																
I27W	01/23/13	Cuttings	composite 3		497.8	7.8	490	0.0066	0.032	0.0052	0.057	BDL	BDL	0.068	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.032	BDL	2.8	18	8.1	1.5											



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Est. 1970

Chris Hines / Matt Kasten  
EnCana Oil & Gas Inc. - CO  
143 Diamond Avenue  
Parachute, CO 81635

## Report Summary

Monday February 04, 2013

Report Number: L616977


Samples Received: 01/24/13

Client Project: 127W

Description: 127W 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  
 143 Diamond Avenue  
 Parachute, CO 81635

February 04, 2013

Date Received : January 24, 2013  
 Description : 127W Cuttings  
 Sample ID : 127W-CUT1-012313 12 IN  
 Collected By : Matt Kasten  
 Collection Date : 01/23/13 08:50

ESC Sample # : L616977-01  
 Site ID : 127W  
 Project # : 127W

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Standard Plate Count	780000		col/g	9215B	01/24/13	100000
Chromium,Hexavalent	BDL	10.	mg/kg	3060A/7196A	01/26/13	5
Chromium,Trivalent	10.	10.	mg/kg	Calc.	01/27/13	1
ORP	160		mV	2580 B-2011	01/25/13	1
pH	8.0		su	9045D	01/29/13	1
Sodium Adsorption Ratio	20.			Calc.	01/25/13	1
Specific Conductance	1700		umhos/cm	9050AMod	01/30/13	1
Mercury	BDL	0.020	mg/kg	7471	01/25/13	1
Arsenic	1.9	1.0	mg/kg	6010B	01/27/13	1
Barium	7000	0.50	mg/kg	6010B	01/27/13	2
Cadmium	0.30	0.25	mg/kg	6010B	01/27/13	1
Chromium	10.	0.50	mg/kg	6010B	01/27/13	1
Copper	13.	1.0	mg/kg	6010B	01/27/13	1
Lead	5.0	0.25	mg/kg	6010B	01/27/13	1
Nickel	4.3	1.0	mg/kg	6010B	01/27/13	1
Selenium	BDL	1.0	mg/kg	6010B	01/27/13	1
Silver	BDL	0.50	mg/kg	6010B	01/27/13	1
Zinc	30.	1.5	mg/kg	6010B	01/27/13	1
Benzene	0.0068	0.0025	mg/kg	8021/8015	01/27/13	5
Toluene	0.034	0.025	mg/kg	8021/8015	01/27/13	5
Ethylbenzene	0.0060	0.0025	mg/kg	8021/8015	01/27/13	5
Total Xylene	0.066	0.0075	mg/kg	8021/8015	01/27/13	5
TPH (GC/FID) Low Fraction	8.9	0.50	mg/kg	GRO	01/27/13	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	93.4		% Rec.	8021/8015	01/27/13	5
a,a,a-Trifluorotoluene(PID)	91.4		% Rec.	8021/8015	01/27/13	5
TPH (GC/FID) High Fraction	340	4.0	mg/kg	3546/DRO	01/29/13	1
Surrogate recovery(%)						
o-Terphenyl	51.4		% Rec.	3546/DRO	01/29/13	1
Polynuclear Aromatic Hydrocarbons						
Anthracene	BDL	0.0060	mg/kg	8270C-SIM	01/31/13	1
Acenaphthene	BDL	0.0060	mg/kg	8270C-SIM	01/31/13	1
Acenaphthylene	BDL	0.0060	mg/kg	8270C-SIM	01/31/13	1

BDL - Below Detection Limit  
 Det. Limit - Practical Quantitation Limit(PQL)  
 L616977-01 (PH) - 8.0 @ 21.3c  
 L616977-01 (CR6) - diluted due to sample color interference



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February 04, 2013

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 Description : 127W Cuttings  
 Sample ID : 127W-CUT1-012313 12 IN  
 Collected By : Matt Kasten  
 Collection Date : 01/23/13 08:50

ESC Sample # : L616977-01  
 Site ID : 127W  
 Project # : 127W

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzo(a)anthracene	0.046	0.0060	mg/kg	8270C-SIM	01/31/13	1
Benzo(a)pyrene	BDL	0.0060	mg/kg	8270C-SIM	01/31/13	1
Benzo(b)fluoranthene	BDL	0.0060	mg/kg	8270C-SIM	01/31/13	1
Benzo(g,h,i)perylene	BDL	0.0060	mg/kg	8270C-SIM	01/31/13	1
Benzo(k)fluoranthene	BDL	0.0060	mg/kg	8270C-SIM	01/31/13	1
Chrysene	BDL	0.0060	mg/kg	8270C-SIM	01/31/13	1
Dibenz(a,h)anthracene	BDL	0.0060	mg/kg	8270C-SIM	01/31/13	1
Fluoranthene	BDL	0.0060	mg/kg	8270C-SIM	01/31/13	1
Fluorene	BDL	0.0060	mg/kg	8270C-SIM	01/31/13	1
Indeno(1,2,3-cd)pyrene	BDL	0.0060	mg/kg	8270C-SIM	01/31/13	1
Naphthalene	0.0074	0.0060	mg/kg	8270C-SIM	01/31/13	1
Phenanthrene	BDL	0.0060	mg/kg	8270C-SIM	01/31/13	1
Pyrene	BDL	0.0060	mg/kg	8270C-SIM	01/31/13	1
1-Methylnaphthalene	0.0073	0.0060	mg/kg	8270C-SIM	01/31/13	1
2-Methylnaphthalene	0.012	0.0060	mg/kg	8270C-SIM	01/31/13	1
2-Chloronaphthalene	BDL	0.0060	mg/kg	8270C-SIM	01/31/13	1
Surrogate Recovery						
Nitrobenzene-d5	54.8		% Rec.	8270C-SIM	01/31/13	1
2-Fluorobiphenyl	21.1		% Rec.	8270C-SIM	01/31/13	1
p-Terphenyl-d14	30.9		% Rec.	8270C-SIM	01/31/13	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

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L616977-01 (PH) - 8.0 @ 21.3c

L616977-01 (CR6) - diluted due to sample color interference



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 EnCana Oil & Gas Inc. - CO  
 143 Diamond Avenue  
 Parachute, CO 81635

February 04, 2013

Date Received : January 24, 2013  
 Description : 127W Cuttings  
 Sample ID : 127W-CUT2-012313 12 IN  
 Collected By : Matt Kasten  
 Collection Date : 01/23/13 09:05

ESC Sample # : L616977-02  
 Site ID : 127W  
 Project # : 127W

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Standard Plate Count	20000000		col/g	9215B	01/30/13	10000000
pH	8.1		su	9045D	01/29/13	1
Sodium Adsorption Ratio	19.			Calc.	01/25/13	1
Specific Conductance	2500		umhos/cm	9050AMod	01/30/13	1
Arsenic	1.4	1.0	mg/kg	6010B	01/27/13	1
Benzene	0.0064	0.0025	mg/kg	8021/8015	01/27/13	5
Toluene	0.029	0.025	mg/kg	8021/8015	01/27/13	5
Ethylbenzene	0.0048	0.0025	mg/kg	8021/8015	01/27/13	5
Total Xylene	0.053	0.0075	mg/kg	8021/8015	01/27/13	5
TPH (GC/FID) Low Fraction	5.9	0.50	mg/kg	GRO	01/27/13	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	96.3		% Rec.	8021/8015	01/27/13	5
a,a,a-Trifluorotoluene(PID)	96.3		% Rec.	8021/8015	01/27/13	5
TPH (GC/FID) High Fraction	1700	80.	mg/kg	3546/DRO	01/30/13	20
Surrogate recovery(%)						
o-Terphenyl	0.00		% Rec.	3546/DRO	01/30/13	20
Polynuclear Aromatic Hydrocarbons						
Anthracene	BDL	0.0060	mg/kg	8270C-SIM	01/31/13	1
Acenaphthene	BDL	0.0060	mg/kg	8270C-SIM	01/31/13	1
Acenaphthylene	0.0061	0.0060	mg/kg	8270C-SIM	01/31/13	1
Benzo(a)anthracene	0.066	0.0060	mg/kg	8270C-SIM	01/31/13	1
Benzo(a)pyrene	BDL	0.0060	mg/kg	8270C-SIM	01/31/13	1
Benzo(b)fluoranthene	BDL	0.0060	mg/kg	8270C-SIM	01/31/13	1
Benzo(g,h,i)perylene	BDL	0.0060	mg/kg	8270C-SIM	01/31/13	1
Benzo(k)fluoranthene	BDL	0.0060	mg/kg	8270C-SIM	01/31/13	1
Chrysene	0.054	0.0060	mg/kg	8270C-SIM	01/31/13	1
Dibenz(a,h)anthracene	BDL	0.0060	mg/kg	8270C-SIM	01/31/13	1
Fluoranthene	BDL	0.0060	mg/kg	8270C-SIM	01/31/13	1
Fluorene	0.0097	0.0060	mg/kg	8270C-SIM	01/31/13	1
Indeno(1,2,3-cd)pyrene	BDL	0.0060	mg/kg	8270C-SIM	01/31/13	1
Naphthalene	0.022	0.0060	mg/kg	8270C-SIM	01/31/13	1
Phenanthrene	0.014	0.0060	mg/kg	8270C-SIM	01/31/13	1
Pyrene	BDL	0.0060	mg/kg	8270C-SIM	01/31/13	1
1-Methylnaphthalene	0.019	0.0060	mg/kg	8270C-SIM	01/31/13	1
2-Methylnaphthalene	0.034	0.0060	mg/kg	8270C-SIM	01/31/13	1
2-Chloronaphthalene	BDL	0.0060	mg/kg	8270C-SIM	01/31/13	1
Surrogate Recovery						

BDL - Below Detection Limit  
 Det. Limit - Practical Quantitation Limit(PQL)  
 L616977-02 (PH) - 8.1 @ 21.8c



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REPORT OF ANALYSIS

Chris Hines / Matt Kasten  
 EnCana Oil & Gas Inc. - CO  
 143 Diamond Avenue  
 Parachute, CO 81635

February 04, 2013

Date Received : January 24, 2013  
 Description : 127W Cuttings  
 Sample ID : 127W-CUT2-012313 12 IN  
 Collected By : Matt Kasten  
 Collection Date : 01/23/13 09:05

ESC Sample # : L616977-02  
 Site ID : 127W  
 Project # : 127W

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Nitrobenzene-d5	60.9		% Rec.	8270C-SIM	01/31/13	1
2-Fluorobiphenyl	46.7		% Rec.	8270C-SIM	01/31/13	1
p-Terphenyl-d14	66.4		% Rec.	8270C-SIM	01/31/13	1

BDL - Below Detection Limit  
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 L616977-02 (PH) - 8.1 @ 21.8c



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February 04, 2013

Date Received : January 24, 2013  
 Description : 127W Cuttings  
 Sample ID : 127W-CUT3-012313 12 IN  
 Collected By : Matt Kasten  
 Collection Date : 01/23/13 09:10

ESC Sample # : L616977-03  
 Site ID : 127W  
 Project # : 127W

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Standard Plate Count	9100000		col/g	9215B	01/30/13	10000000
pH	8.1		su	9045D	01/29/13	1
Sodium Adsorption Ratio	18.			Calc.	01/25/13	1
Specific Conductance	2800		umhos/cm	9050AMod	01/30/13	1
Arsenic	1.5	1.0	mg/kg	6010B	01/27/13	1
Benzene	0.0066	0.0025	mg/kg	8021/8015	01/27/13	5
Toluene	0.032	0.025	mg/kg	8021/8015	01/27/13	5
Ethylbenzene	0.0052	0.0025	mg/kg	8021/8015	01/27/13	5
Total Xylene	0.057	0.0075	mg/kg	8021/8015	01/27/13	5
TPH (GC/FID) Low Fraction	7.8	0.50	mg/kg	GRO	01/27/13	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	96.5		% Rec.	8021/8015	01/27/13	5
a,a,a-Trifluorotoluene(PID)	95.2		% Rec.	8021/8015	01/27/13	5
TPH (GC/FID) High Fraction	490	20.	mg/kg	3546/DRO	01/29/13	5
Surrogate recovery(%)						
o-Terphenyl	58.2		% Rec.	3546/DRO	01/29/13	5
Polynuclear Aromatic Hydrocarbons						
Anthracene	BDL	0.030	mg/kg	8270C-SIM	01/31/13	5
Acenaphthene	BDL	0.030	mg/kg	8270C-SIM	01/31/13	5
Acenaphthylene	BDL	0.030	mg/kg	8270C-SIM	01/31/13	5
Benzo(a)anthracene	0.068	0.030	mg/kg	8270C-SIM	01/31/13	5
Benzo(a)pyrene	BDL	0.030	mg/kg	8270C-SIM	01/31/13	5
Benzo(b)fluoranthene	BDL	0.030	mg/kg	8270C-SIM	01/31/13	5
Benzo(g,h,i)perylene	BDL	0.030	mg/kg	8270C-SIM	01/31/13	5
Benzo(k)fluoranthene	BDL	0.030	mg/kg	8270C-SIM	01/31/13	5
Chrysene	BDL	0.030	mg/kg	8270C-SIM	01/31/13	5
Dibenz(a,h)anthracene	BDL	0.030	mg/kg	8270C-SIM	01/31/13	5
Fluoranthene	BDL	0.030	mg/kg	8270C-SIM	01/31/13	5
Fluorene	BDL	0.030	mg/kg	8270C-SIM	01/31/13	5
Indeno(1,2,3-cd)pyrene	BDL	0.030	mg/kg	8270C-SIM	01/31/13	5
Naphthalene	0.032	0.030	mg/kg	8270C-SIM	01/31/13	5
Phenanthrene	BDL	0.030	mg/kg	8270C-SIM	01/31/13	5
Pyrene	BDL	0.030	mg/kg	8270C-SIM	01/31/13	5
1-Methylnaphthalene	BDL	0.030	mg/kg	8270C-SIM	01/31/13	5
2-Methylnaphthalene	0.050	0.030	mg/kg	8270C-SIM	01/31/13	5
2-Chloronaphthalene	BDL	0.030	mg/kg	8270C-SIM	01/31/13	5
Surrogate Recovery						

BDL - Below Detection Limit  
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 L616977-03 (PH) - 8.1 @ 21.1c



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February 04, 2013

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EnCana Oil & Gas Inc. - CO  
143 Diamond Avenue  
Parachute, CO 81635

Date Received : January 24, 2013  
Description : 127W Cuttings  
Sample ID : 127W-CUT3-012313 12 IN  
Collected By : Matt Kasten  
Collection Date : 01/23/13 09:10

ESC Sample # : L616977-03  
Site ID : 127W  
Project # : 127W

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Nitrobenzene-d5	76.7		% Rec.	8270C-SIM	01/31/13	5
2-Fluorobiphenyl	49.6		% Rec.	8270C-SIM	01/31/13	5
p-Terphenyl-d14	109.		% Rec.	8270C-SIM	01/31/13	5

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L616977-03 (PH) - 8.1 @ 21.1c

Attachment A  
List of Analytes with QC Qualifiers

Sample Number	Work Group	Sample Type	Analyte	Run ID	Qualifier
L616977-01	WG633897	SAMP	1-Methyl-naphthalene	R2523958	J3
	WG633897	SAMP	2-Methyl-naphthalene	R2523958	J3
	WG633897	SAMP	2-Fluorobiphenyl	R2523958	J2
	WG635203	SAMP	Standard Plate Count	R2528118	T8
	WG633813	SAMP	Chromium, Hexavalent	R2519338	O
L616977-02	WG633897	SAMP	1-Methyl-naphthalene	R2523958	J3
	WG633897	SAMP	2-Methyl-naphthalene	R2523958	J3
	WG635203	SAMP	Standard Plate Count	R2528118	T8
	WG634426	SAMP	o-Terphenyl	R2522517	J7
L616977-03	WG633897	SAMP	1-Methyl-naphthalene	R2525500	J3
	WG633897	SAMP	2-Methyl-naphthalene	R2525500	J3
	WG635203	SAMP	Standard Plate Count	R2528118	T8

Attachment B  
Explanation of QC Qualifier Codes

Qualifier	Meaning
J2	Surrogate recovery limits have been exceeded; values are outside lower control limits
J3	The associated batch QC was outside the established quality control range for precision.
J7	Surrogate recovery cannot be used for control limit evaluation due to dilution.
O	(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.



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Quality Assurance Report  
Level II

L616977

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

February 04, 2013

Analyte	Result	Laboratory Blank		Limit	Batch	Date Analyzed
		Units	% Rec			
Mercury	< .02	mg/kg			WG633807	01/25/13 11:37
Arsenic	< 1	mg/kg			WG633801	01/27/13 14:28
Barium	< .25	mg/kg			WG633801	01/27/13 14:28
Cadmium	< .25	mg/kg			WG633801	01/27/13 14:28
Chromium	< .5	mg/kg			WG633801	01/27/13 14:28
Copper	< 1	mg/kg			WG633801	01/27/13 14:28
Nickel	< 1	mg/kg			WG633801	01/27/13 14:28
Selenium	< 1	mg/kg			WG633801	01/27/13 14:28
Silver	< .5	mg/kg			WG633801	01/27/13 14:28
Zinc	< 1.5	mg/kg			WG633801	01/27/13 14:28
Lead	< .25	mg/kg			WG633801	01/27/13 17:39
Chromium,Hexavalent	< 2	mg/kg			WG633813	01/26/13 13:59
Benzene	< .0005	mg/kg			WG634012	01/27/13 01:26
Ethylbenzene	< .0005	mg/kg			WG634012	01/27/13 01:26
Toluene	< .005	mg/kg			WG634012	01/27/13 01:26
TPH (GC/FID) Low Fraction	< .1	mg/kg			WG634012	01/27/13 01:26
Total Xylene	< .0015	mg/kg			WG634012	01/27/13 01:26
a,a,a-Trifluorotoluene(FID)		% Rec.	102.0	59-128	WG634012	01/27/13 01:26
a,a,a-Trifluorotoluene(PID)		% Rec.	95.15	54-144	WG634012	01/27/13 01:26
TPH (GC/FID) High Fraction	< 4	mg/kg			WG634426	01/30/13 08:32
o-Terphenyl		% Rec.	61.50	50-150	WG634426	01/30/13 08:32
Specific Conductance	4.25	umhos/cm			WG634110	01/30/13 12:26

Analyte	Units	Duplicate		RPD	Limit	Ref Samp	Batch
		Result	Duplicate				
ORP	mV	0	0	0	20	L616982-01	WG633841
Mercury	mg/kg	0	0.00843	23.5*	20	L616762-11	WG633807
Arsenic	mg/kg	3.50	3.90	10.8	20	L616913-01	WG633801
Barium	mg/kg	170.	190.	11.1	20	L616913-01	WG633801
Cadmium	mg/kg	0	0	0	20	L616913-01	WG633801
Chromium	mg/kg	17.0	17.0	0	20	L616913-01	WG633801
Copper	mg/kg	9.60	9.72	1.24	20	L616913-01	WG633801
Nickel	mg/kg	8.00	8.40	4.88	20	L616913-01	WG633801
Selenium	mg/kg	2.80	2.80	0	20	L616913-01	WG633801
Silver	mg/kg	0	0	0	20	L616913-01	WG633801
Zinc	mg/kg	26.0	28.0	7.41	20	L616913-01	WG633801
Lead	mg/kg	34.0	35.0	2.90	20	L616913-01	WG633801
Chromium,Hexavalent	mg/kg	0	0	0	20	L616637-01	WG633813
Chromium,Hexavalent	mg/kg	0	0	0	20	L616801-24	WG633813
pH	su	13.0	13.0	3.13*	1	L616879-01	WG634292

\* Performance of this Analyte is outside of established criteria.  
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Quality Assurance Report  
Level II

L616977

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Analyte	Units	Duplicate		RPD	Limit	Ref Samp	Batch
		Result	Duplicate				
pH	su	8.50	8.50	0.469	1	L617354-02	WG634292
Specific Conductance	umhos/cm	92.0	84.0	9.63	20	L616668-19	WG634110
Specific Conductance	umhos/cm	980.	1100	11.7	20	L616982-03	WG634110

Analyte	Units	Laboratory Control Sample		% Rec	Limit	Batch
		Known Val	Result			
ORP	mV	228	233.	102.	95.6-104.	WG633841
Mercury	mg/kg	12.4	12.5	101.	71.6-127.7	WG633807
Arsenic	mg/kg	237	230.	97.0	83.1-117	WG633801
Barium	mg/kg	252	245.	97.2	84.1-116	WG633801
Cadmium	mg/kg	191	184.	96.3	83.2-117	WG633801
Chromium	mg/kg	128	123.	96.1	81.3-118	WG633801
Copper	mg/kg	123	124.	101.	83.7-116	WG633801
Nickel	mg/kg	118	114.	96.6	82-118	WG633801
Selenium	mg/kg	110	108.	98.2	78.7-122	WG633801
Silver	mg/kg	47.3	44.3	93.7	66.2-134	WG633801
Zinc	mg/kg	183	175.	95.6	82-118	WG633801
Lead	mg/kg	103	103.	100.	83.1-117	WG633801
Chromium,Hexavalent	mg/kg	261	237.	90.8	80-120	WG633813
Benzene	mg/kg	.05	0.0494	98.7	76-113	WG634012
Ethylbenzene	mg/kg	.05	0.0481	96.2	78-115	WG634012
Toluene	mg/kg	.05	0.0471	94.1	76-114	WG634012
Total Xylene	mg/kg	.15	0.141	94.0	81-118	WG634012
a,a,a-Trifluorotoluene(PID)				101.9	54-144	WG634012
TPH (GC/FID) Low Fraction	mg/kg	5.5	5.16	93.8	67-135	WG634012
a,a,a-Trifluorotoluene(FID)				94.88	59-128	WG634012
pH	su	5.7	5.73	101.	98.25-101.75	WG634292
TPH (GC/FID) High Fraction	mg/kg	60	43.8	73.0	50-150	WG634426
o-Terphenyl				65.40	50-150	WG634426
Specific Conductance	umhos/cm	878	891.	101.	85-115	WG634110

Analyte	Units	Laboratory Control Sample Duplicate			Limit	RPD	Limit	Batch
		Result	Ref	%Rec				
ORP	mV	230.	233.	101.	95.6-104.	1.30	20	WG633841
Chromium,Hexavalent	mg/kg	238.	237.	91.0	80-120	0.421	20	WG633813
Benzene	mg/kg	0.0498	0.0494	100.	76-113	0.920	20	WG634012
Ethylbenzene	mg/kg	0.0497	0.0481	99.0	78-115	3.24	20	WG634012

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Analyte	Units	Laboratory Control Sample Duplicate			Limit	RPD	Limit	Batch
		Result	Ref	%Rec				
Toluene	mg/kg	0.0480	0.0471	96.0	76-114	2.04	20	WG634012
Total Xylene	mg/kg	0.144	0.141	96.0	81-118	2.41	20	WG634012
a,a,a-Trifluorotoluene(PID)				104.7	54-144			WG634012
TPH (GC/FID) Low Fraction	mg/kg	5.13	5.16	93.0	67-135	0.600	20	WG634012
a,a,a-Trifluorotoluene(FID)				95.52	59-128			WG634012
pH	su	5.71	5.73	100.	98.25-101.75	0.350	20	WG634292
TPH (GC/FID) High Fraction	mg/kg	44.5	43.8	74.0	50-150	1.58	20	WG634426
o-Terphenyl				68.20	50-150			WG634426
Specific Conductance	umhos/	892.	891.	102.	85-115	0.112	20	WG634110

Analyte	Units	MS Res	Matrix Spike			Limit	Ref Samp	Batch
			Ref Res	TV	% Rec			
Mercury	mg/kg	0.261	0.00843	.25	101.	80-120	L616762-11	WG633807
Arsenic	mg/kg	39.9	3.90	50	72.0*	75-125	L616913-01	WG633801
Barium	mg/kg	196.	190.	50	12.0*	75-125	L616913-01	WG633801
Cadmium	mg/kg	37.9	0	50	75.8	75-125	L616913-01	WG633801
Chromium	mg/kg	58.4	17.0	50	82.8	75-125	L616913-01	WG633801
Copper	mg/kg	50.2	9.72	50	81.0	75-125	L616913-01	WG633801
Nickel	mg/kg	46.1	8.40	50	75.4	75-125	L616913-01	WG633801
Selenium	mg/kg	35.5	2.80	50	65.4*	75-125	L616913-01	WG633801
Silver	mg/kg	38.0	0	50	76.0	75-125	L616913-01	WG633801
Zinc	mg/kg	65.0	28.0	50	74.0*	75-125	L616913-01	WG633801
Lead	mg/kg	71.0	35.0	50	72.0*	75-125	L616913-01	WG633801
Benzene	mg/kg	0.220	0	.05	88.1	32-137	L617174-01	WG634012
Ethylbenzene	mg/kg	0.212	0.00430	.05	83.2	10-150	L617174-01	WG634012
Toluene	mg/kg	0.213	0	.05	85.2	20-142	L617174-01	WG634012
Total Xylene	mg/kg	0.637	0.0250	.15	81.6	16-141	L617174-01	WG634012
a,a,a-Trifluorotoluene(PID)					98.94	54-144		WG634012
TPH (GC/FID) Low Fraction	mg/kg	22.4	0	5.5	81.6	55-109	L617174-01	WG634012
a,a,a-Trifluorotoluene(FID)					96.54	59-128		WG634012
1-Methylnaphthalene	mg/kg	0.0186	0	.033	56.2	14.2-149	L617005-02	WG633897
2-Chloronaphthalene	mg/kg	0.0194	0	.033	58.8	30.4-130	L617005-02	WG633897
2-Methylnaphthalene	mg/kg	0.0183	0	.033	55.4	19.4-145	L617005-02	WG633897
Acenaphthene	mg/kg	0.0219	0	.033	66.2	30.4-133	L617005-02	WG633897
Acenaphthylene	mg/kg	0.0203	0	.033	61.6	30.5-137	L617005-02	WG633897
Anthracene	mg/kg	0.0260	0	.033	78.8	24.8-145	L617005-02	WG633897
Benzo(a)anthracene	mg/kg	0.0315	0	.033	95.3	17.4-147	L617005-02	WG633897
Benzo(a)pyrene	mg/kg	0.0291	0	.033	88.3	14.5-149	L617005-02	WG633897
Benzo(b)fluoranthene	mg/kg	0.0345	0	.033	105.	17-151	L617005-02	WG633897
Benzo(g,h,i)perylene	mg/kg	0.0266	0	.033	80.5	10-154	L617005-02	WG633897
Benzo(k)fluoranthene	mg/kg	0.0284	0	.033	86.0	14.8-150	L617005-02	WG633897
Chrysene	mg/kg	0.0308	0	.033	93.2	15.7-148	L617005-02	WG633897
Dibenz(a,h)anthracene	mg/kg	0.0239	0	.033	72.5	10-142	L617005-02	WG633897
Fluoranthene	mg/kg	0.0370	0	.033	112.	22.9-153	L617005-02	WG633897
Fluorene	mg/kg	0.0230	0	.033	69.6	28.9-140	L617005-02	WG633897
Indeno(1,2,3-cd)pyrene	mg/kg	0.0274	0	.033	83.0	10-155	L617005-02	WG633897

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Analyte	Units	MS Res	Matrix Spike		% Rec	Limit	Ref Samp	Batch
			Ref Res	TV				
Naphthalene	mg/kg	0.0176	0	.033	53.5	19.5-137	L617005-02	WG633897
Phenanthrene	mg/kg	0.0287	0	.033	86.8	15.6-153	L617005-02	WG633897
Pyrene	mg/kg	0.0365	0	.033	111.	18.4-146	L617005-02	WG633897
2-Fluorobiphenyl					62.90	26.1-136		WG633897
Nitrobenzene-d5					55.10	12.7-142		WG633897
p-Terphenyl-d14					88.50	20.5-158		WG633897

Analyte	Units	MSD	Matrix Spike Duplicate		Limit	RPD	Limit	Ref Samp	Batch
			Ref	%Rec					
Mercury	mg/kg	0.250	0.261	96.5	80-120	4.34	20	L616762-11	WG633807
Arsenic	mg/kg	42.3	39.9	76.8	75-125	5.84	20	L616913-01	WG633801
Barium	mg/kg	224.	196.	68.0*	75-125	13.3	20	L616913-01	WG633801
Cadmium	mg/kg	40.1	37.9	80.2	75-125	5.64	20	L616913-01	WG633801
Chromium	mg/kg	63.0	58.4	92.0	75-125	7.58	20	L616913-01	WG633801
Copper	mg/kg	52.8	50.2	86.2	75-125	5.05	20	L616913-01	WG633801
Nickel	mg/kg	48.7	46.1	80.6	75-125	5.49	20	L616913-01	WG633801
Selenium	mg/kg	38.4	35.5	71.2*	75-125	7.85	20	L616913-01	WG633801
Silver	mg/kg	40.7	38.0	81.4	75-125	6.86	20	L616913-01	WG633801
Zinc	mg/kg	67.1	65.0	78.2	75-125	3.18	20	L616913-01	WG633801
Lead	mg/kg	76.8	71.0	83.6	75-125	7.85	20	L616913-01	WG633801
Benzene	mg/kg	0.238	0.220	95.3	32-137	7.87	39	L617174-01	WG634012
Ethylbenzene	mg/kg	0.238	0.212	93.5	10-150	11.4	44	L617174-01	WG634012
Toluene	mg/kg	0.245	0.213	97.9	20-142	13.8	42	L617174-01	WG634012
Total Xylene	mg/kg	0.713	0.637	91.7	16-141	11.3	46	L617174-01	WG634012
a, a, a-Trifluorotoluene (PID)				104.6	54-144				WG634012
TPH (GC/FID) Low Fraction	mg/kg	12.5	22.4	45.6*	55-109	56.6*	20	L617174-01	WG634012
a, a, a-Trifluorotoluene (FID)				97.78	59-128				WG634012
1-Methylnaphthalene	mg/kg	0.0166	0.0186	50.3	14.2-149	11.1	31.3	L617005-02	WG633897
2-Chloronaphthalene	mg/kg	0.0166	0.0194	50.3	30.4-130	15.5	24.4	L617005-02	WG633897
2-Methylnaphthalene	mg/kg	0.0162	0.0183	49.2	19.4-145	11.9	33.8	L617005-02	WG633897
Acenaphthene	mg/kg	0.0190	0.0219	57.7	30.4-133	13.7	27.6	L617005-02	WG633897
Acenaphthylene	mg/kg	0.0189	0.0203	57.4	30.5-137	7.10	27.3	L617005-02	WG633897
Anthracene	mg/kg	0.0265	0.0260	80.3	24.8-145	1.94	30	L617005-02	WG633897
Benzo(a)anthracene	mg/kg	0.0290	0.0315	87.9	17.4-147	8.14	29.9	L617005-02	WG633897
Benzo(a)pyrene	mg/kg	0.0257	0.0291	77.9	14.5-149	12.5	30.9	L617005-02	WG633897
Benzo(b)fluoranthene	mg/kg	0.0282	0.0345	85.4	17-151	20.2	34.6	L617005-02	WG633897
Benzo(g,h,i)perylene	mg/kg	0.0243	0.0266	73.5	10-154	9.05	35.7	L617005-02	WG633897
Benzo(k)fluoranthene	mg/kg	0.0268	0.0284	81.2	14.8-150	5.65	34.5	L617005-02	WG633897
Chrysene	mg/kg	0.0259	0.0308	78.6	15.7-148	17.0	30.5	L617005-02	WG633897
Dibenz(a,h)anthracene	mg/kg	0.0246	0.0239	74.4	10-142	2.68	34.8	L617005-02	WG633897
Fluoranthene	mg/kg	0.0286	0.0370	86.6	22.9-153	25.8	32.8	L617005-02	WG633897
Fluorene	mg/kg	0.0216	0.0230	65.5	28.9-140	6.01	30	L617005-02	WG633897
Indeno(1,2,3-cd)pyrene	mg/kg	0.0255	0.0274	77.2	10-155	7.31	36.2	L617005-02	WG633897
Naphthalene	mg/kg	0.0153	0.0176	46.4	19.5-137	14.2	33	L617005-02	WG633897
Phenanthrene	mg/kg	0.0250	0.0287	75.7	15.6-153	13.7	32.9	L617005-02	WG633897
Pyrene	mg/kg	0.0291	0.0365	88.1	18.4-146	22.7	33.5	L617005-02	WG633897
2-Fluorobiphenyl				54.20	26.1-136				WG633897
Nitrobenzene-d5				50.90	12.7-142				WG633897
p-Terphenyl-d14				86.50	20.5-158				WG633897

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February 04, 2013

L616977

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Serial Dilution

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Batch number /Run number / Sample number cross reference

WG633841: R2518044: L616977-01  
WG633807: R2518338: L616977-01  
WG633804: R2519163: L616977-01 02 03  
WG633801: R2519197: L616977-01 02 03  
WG633813: R2519338: L616977-01  
WG634012: R2519778: L616977-01 02 03  
WG633885: R2520918: L616977-01 03  
WG634292: R2521181: L616977-01 02 03  
WG634426: R2522517: L616977-02  
WG634110: R2522760: L616977-01 02 03  
WG633897: R2523958 R2525500: L616977-01 02 03  
WG635203: R2528118: L616977-01 02 03

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



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### Report Summary

Friday February 08, 2013

Report Number: L618588


Samples Received: 01/24/13

Client Project: 127W

Description: 127W 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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Est. 1970

REPORT OF ANALYSIS

Chris Hines / Matt Kasten  
 EnCana Oil & Gas Inc. - CO  
 143 Diamond Avenue  
 Parachute, CO 81635

February 08, 2013

Date Received : January 24, 2013  
 Description : 127W Cuttings  
 Sample ID : 127W-CUT2-012313 12 IN  
 Collected By : Matt Kasten  
 Collection Date : 01/23/13 09:05

ESC Sample # : L618588-01  
 Site ID : 127W  
 Project # : 127W

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
TPH (GC/FID) High Fraction	69.	20.	mg/kg	3546/DRO	02/07/13	5
Surrogate recovery(%) o-Terphenyl	86.4		% Rec.	3546/DRO	02/07/13	5

BDL - Below Detection Limit  
 Det. Limit - Practical Quantitation Limit(PQL)  
 Note:  
 The reported analytical results relate only to the sample submitted.  
 This report shall not be reproduced, except in full, without the written approval from ESC.

Reported: 02/08/13 14:03 Printed: 02/08/13 16:34

Attachment A  
List of Analytes with QC Qualifiers

Sample Number	Work Group	Sample Type	Analyte	Run ID	Qualifier
L618588-01	WG635657	SAMP	TPH (GC/FID) High Fraction	R2534058	J3

Attachment B  
Explanation of QC Qualifier Codes

Qualifier	Meaning
J3	The associated batch QC was outside the established quality control range for precision.

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.



**YOUR LAB OF CHOICE**

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Quality Assurance Report  
Level II

L618588

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Analyte	Result	Laboratory Blank		Limit	Batch	Date Analyzed
		Units	% Rec			
TPH (GC/FID) High Fraction	< 4	mg/kg			WG635657	02/07/13 21:47
o-Terphenyl		% Rec.	80.90	50-150	WG635657	02/07/13 21:47

Analyte	Units	Laboratory Control Sample		% Rec	Limit	Batch
		Known Val	Result			
TPH (GC/FID) High Fraction	mg/kg	60	39.9	66.5	50-150	WG635657
o-Terphenyl				63.00	50-150	WG635657

Analyte	Units	Laboratory Control Sample Duplicate			Limit	RPD	Limit	Batch
		Result	Ref	%Rec				
TPH (GC/FID) High Fraction	mg/kg	50.9	39.9	85.0	50-150	24.1*	20	WG635657
o-Terphenyl				82.00	50-150			WG635657

Analyte	Units	MS Res	Matrix Spike		% Rec	Limit	Ref Samp	Batch
			Ref Res	TV				
TPH (GC/FID) High Fraction	mg/kg	144.	100.	60	73.0	50-150	L618255-01	WG635657
o-Terphenyl					163.0*	50-150		WG635657

Analyte	Units	MSD	Matrix Spike Duplicate		Limit	RPD	Limit	Ref Samp	Batch
			Ref	%Rec					
TPH (GC/FID) High Fraction	mg/kg	166.	144.	111.	50-150	14.6	20	L618255-01	WG635657
o-Terphenyl				183.0*	50-150				WG635657

Batch number /Run number / Sample number cross reference

WG635657: R2534058: L618588-01

\* \* 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.'



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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.