

				Organic Compounds in Soil (mg/kg [ppm])																				Inorganics in Soil			Metals in Soil (mg/kg [ppm])											
Allowable Concentration -->				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
Location	Sample Date:	Sample Matrix	Matrix Notes	TPH (total volatile and extractable petroleum hydrocarbons)	TPH-GRO (C6-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
C04	03/23/10	Cuttings	representative sample	150.49	8.49	142	0.432	0.991	0.104	0.643	ND	0.0133	0.124	0.148	0.04	0.0214	0.0994	0.0175	0.118	0.0126	0.031	0.031	0.0778	2.1	5.87	7.91	10.4	1660	0.48	17.6	2	52.2	11.8	0.053	15	0.62	0.061	73
C04	04/14/11	Cuttings	resample for 3/23 exceedences				0.033																															
C04	05/02/12	Cuttings	H17 cuttings pile (composite 1)	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.1	0.72	1.2	0.26	0.35	0.87	0.15	0.72	BDL	0.28	0.17	0.27	2.3	26	8.5	3.6	2900	BDL	13	BDL	20	10	0.029	8.9	BDL	BDL	59
C04	05/02/12	Cuttings	H17 cuttings pile (composite 2)	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.49	0.9	0.19	0.28	0.68	BDL	0.6	BDL	0.27	0.23	0.24				2.9											



04/09/10

## Technical Report for

ENCANA

CO4 Cuttings Sample

Accutest Job Number: T49819

Sampling Date: 03/23/10

### Report to:

EnCana  
2717 Co. Rd. 215  
Parachute, CO 81635  
christopher.hines@encana.com; bradley.kieding@encana.com  
  
ATTN: Chris Hines

Total number of pages in report: 52



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Conference and/or state specific certification programs as applicable.

*Paul K Canevaro*

**Paul Canevaro**  
Laboratory Director

Client Service contact: Sylvia Garza 713-271-4700

Certifications: TX (T104704220-09C-TX) AR (88-0756) FL (E87628) KS (E-10366) LA (85695/04004)  
OK (9103) UT(7132714700)

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Test results relate only to samples analyzed.

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Sample Summary

ENCANA

Job No: T49819

CO4 Cuttings Sample

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
T49819-1	03/23/10	13:15 AS	03/25/10	SO	Soil	CO4-CUTTINGS-032310
T49819-1A	03/23/10	13:15 AS	03/25/10	SO	Soil	CO4-CUTTINGS-032310

Soil samples reported on a dry weight basis unless otherwise indicated on result page.

## SAMPLE DELIVERY GROUP CASE NARRATIVE

**Client:** ENCANA

**Job No** T49819

**Site:** CO4 Cuttings Sample

**Report Date** 4/8/2010 4:11:16 PM

1 Sample(s), 0 Trip Blank(s) and 0 Field Blank(s) were collected on 03/23/2010 and were received at Accutest on 03/25/2010 properly preserved, at 4 Deg. C and intact. These Samples received an Accutest job number of T49819. A listing of the Laboratory Sample ID, Client Sample ID and dates of collection are presented in the Results Summary Section of this report.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

### Volatiles by GCMS By Method SW846 8260B

**Matrix** SO

**Batch ID:** VY2467

- All samples were analyzed within the recommended method holding time.
- Sample(s) T49820-1MS, T49820-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

### Extractables by GCMS By Method SW846 8270C BY SIM

**Matrix** SO

**Batch ID:** OP14399

- All samples were extracted within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- Sample(s) T49818-1MS, T49818-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.
- Matrix Spike Recovery(s) for Benzo(g,h,i)perylene, Pyrene are outside control limits. Probable cause due to matrix interference.
- Matrix Spike Duplicate Recovery(s) for Acenaphthene, Benzo(g,h,i)perylene, Pyrene are outside control limits. Probable cause due to matrix interference.
- T49819-1: Internal standards are not within the advisory limits due to a matrix interference. Confirmed by reanalysis.

### Volatiles by GC By Method SW846 8015

**Matrix** SO

**Batch ID:** GEE2708

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) T49818-1MS, T49818-1MSD were used as the QC samples indicated.

### Extractables by GC By Method SW846 8015 M

**Matrix** SO

**Batch ID:** OP14403

- All samples were extracted within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) T49816-1MS, T49816-1MSD were used as the QC samples indicated.
- Matrix Spike Recovery(s) for TPH (C10-C28) are outside control limits. Probable cause due to matrix interference.
- Matrix Spike Duplicate Recovery(s) for TPH (C10-C28) are outside control limits. Probable cause due to matrix interference.

## Metals By Method SW846 6010B

**Matrix** AQ

**Batch ID:** MP11442

- All samples were digested within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) T49667-1BDUP, T49667-1BSDL were used as the QC samples for metals.
- RPD(s) for Serial Dilution for Magnesium are outside control limits for sample MP11442-SD1. Percent difference acceptable due to low initial sample concentration (< 50 times IDL).

**Matrix** SO

**Batch ID:** MP11458

- All samples were digested within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) T49819-1DUP, T49819-1MS, T49819-1MSD, T49819-1SDL, T49819-1DUP were used as the QC samples for metals.
- Matrix Spike Recovery(s) for Arsenic, Cadmium, Chromium, Copper, Nickel are outside control limits. Probable cause due to matrix interference.
- Matrix Spike Duplicate Recovery(s) for Arsenic, Chromium, Copper, Lead, Nickel, Zinc are outside control limits. Probable cause due to matrix interference.
- Matrix Spike Recovery(s) for Barium are outside control limits. Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.
- RPD(s) for Duplicate for Arsenic, Barium, Cadmium are outside control limits for sample MP11458-D1. High RPD due to possible sample nonhomogeneity.
- RPD(s) for Serial Dilution for Cadmium, Selenium, Arsenic, Barium, Chromium, Lead, Nickel, Zinc are outside control limits for sample MP11458-SD1. Percent difference acceptable due to low initial sample concentration (< 50 times IDL).

## Metals By Method SW846 7471A

**Matrix** SO

**Batch ID:** MP11453

- All samples were digested within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) T50046-1DUP, T50046-1MS, T50046-1MSD were used as the QC samples for metals.
- Matrix Spike Recovery(s) for Mercury are outside control limits. Probable cause due to matrix interference.
- Matrix Spike Duplicate Recovery(s) for Mercury are outside control limits. Probable cause due to matrix interference.

## Wet Chemistry By Method EPA 120.1

**Matrix** AQ

**Batch ID:** GN21871

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) T49551-1DUP were used as the QC samples for Specific Conductivity.

## Wet Chemistry By Method LADNR29B

**Matrix** SO

**Batch ID:** MP11442

- T49819-1A for Sodium Adsorption Ratio: Calculated as:  $(\text{Na meq/L}) / \sqrt{[(\text{Ca meq/L}) + (\text{Mg meq/L})/2]}$

## Wet Chemistry By Method SM 2540 G

**Matrix** SO

**Batch ID:** GN21781

- Sample(s) T49875-1DUP were used as the QC samples for Solids, Percent.

**Wet Chemistry By Method SW846 3060/7196A****Matrix** SO**Batch ID:** GN21869

- All method blanks for this batch meet method specific criteria.
- Sample(s) T49816-1DUP, T49816-1MS were used as the QC samples for Chromium, Hexavalent.

**Wet Chemistry By Method SW846 6010/7196A M****Matrix** SO**Batch ID:** R22217

- T49819-1 for Chromium, Trivalent: Calculated as: (Chromium) - (Chromium, Hexavalent)

**Wet Chemistry By Method SW846 9045C****Matrix** SO**Batch ID:** GN21685

- Sample(s) T49816-1DUP were used as the QC samples for pH.

Accutest Laboratories Gulf Coast (ALGC) certifies that this report meets the project requirements for analytical data produced for the samples as received at ALGC and as stated on the COC. ALGC certifies that the data meets the Data Quality Objectives for precision, accuracy and completeness as specified in the ALGC Quality Manual except as noted above. This report is to be used in its entirety. ALGC is not responsible for any assumptions of data quality if partial data packages are used



## Sample Results

## Report of Analysis



## Report of Analysis

<b>Client Sample ID:</b>	CO4-CUTTINGS-032310		
<b>Lab Sample ID:</b>	T49819-1	<b>Date Sampled:</b>	03/23/10
<b>Matrix:</b>	SO - Soil	<b>Date Received:</b>	03/25/10
<b>Method:</b>	SW846 8260B	<b>Percent Solids:</b>	78.0
<b>Project:</b>	CO4 Cuttings Sample		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	Y0039002.D	1	03/31/10	JL	n/a	n/a	VY2467
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.83 g	5.0 ml	100 ul
Run #2			

## Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	0.432	0.35	0.048	mg/kg	
108-88-3	Toluene	0.991	0.35	0.066	mg/kg	
100-41-4	Ethylbenzene	0.104	0.35	0.062	mg/kg	J
1330-20-7	Xylene (total)	0.643	1.0	0.14	mg/kg	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	100%		70-121%
2037-26-5	Toluene-D8	106%		76-132%
460-00-4	4-Bromofluorobenzene	94%		73-165%
17060-07-0	1,2-Dichloroethane-D4	77%		57-122%

ND = Not detected      MDL - Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b>	CO4-CUTTINGS-032310		
<b>Lab Sample ID:</b>	T49819-1	<b>Date Sampled:</b>	03/23/10
<b>Matrix:</b>	SO - Soil	<b>Date Received:</b>	03/25/10
<b>Method:</b>	SW846 8270C BY SIM SW846 3550B	<b>Percent Solids:</b>	78.0
<b>Project:</b>	CO4 Cuttings Sample		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 <sup>a</sup>	H37731.D	1	03/30/10	SC	03/26/10	OP14399	EH2018
Run #2 <sup>a</sup>	H37755.D	10	03/31/10	SC	03/26/10	OP14399	EH2019

	Initial Weight	Final Volume
Run #1	30.2 g	1.0 ml
Run #2	30.2 g	1.0 ml

## BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	0.0085	0.0014	mg/kg	
208-96-8	Acenaphthylene	ND	0.0085	0.0030	mg/kg	
120-12-7	Anthracene	0.0133	0.0085	0.0016	mg/kg	
56-55-3	Benzo(a)anthracene	0.124	0.0085	0.0014	mg/kg	
50-32-8	Benzo(a)pyrene	0.0214	0.0085	0.0045	mg/kg	
205-99-2	Benzo(b)fluoranthene	0.148	0.0085	0.0045	mg/kg	
191-24-2	Benzo(g,h,i)perylene	0.0494	0.0085	0.0085	mg/kg	
207-08-9	Benzo(k)fluoranthene	0.0418	0.0085	0.0055	mg/kg	
218-01-9	Chrysene	0.0994	0.0085	0.0021	mg/kg	
53-70-3	Dibenzo(a,h)anthracene	0.0175	0.0085	0.0082	mg/kg	
206-44-0	Fluoranthene	0.118	0.0085	0.0019	mg/kg	
86-73-7	Fluorene	0.0126	0.0085	0.0030	mg/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	0.0313	0.0085	0.0064	mg/kg	
90-12-0	1-Methylnaphthalene	0.0309	0.0085	0.0016	mg/kg	
91-57-6	2-Methylnaphthalene	0.0207	0.0085	0.0015	mg/kg	
91-20-3	Naphthalene	0.0311	0.0085	0.0013	mg/kg	
85-01-8	Phenanthrene	0.101	0.0085	0.0012	mg/kg	
129-00-0	Pyrene	0.0778	0.0085	0.0029	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	23%	18%	10-127%
321-60-8	2-Fluorobiphenyl	15%	33%	11-133%
1718-51-0	Terphenyl-d14	50%	37%	15-187%

(a) Internal standards are not within the advisory limits due to a matrix interference. Confirmed by reanalysis.

ND = Not detected MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b>	CO4-CUTTINGS-032310			<b>Date Sampled:</b>	03/23/10					
<b>Lab Sample ID:</b>	T49819-1			<b>Date Received:</b>	03/25/10					
<b>Matrix:</b>	SO - Soil			<b>Percent Solids:</b>	78.0					
<b>Method:</b>	SW846 8015									
<b>Project:</b>	CO4 Cuttings Sample									

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	EE053301.D	1	03/31/10	FI	n/a	n/a	GEE2708
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.83 g	5.0 ml	100 ul
Run #2			

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	8.49	6.9	0.41	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	106%		46-127%
98-08-8	aaa-Trifluorotoluene	106%		44-120%

ND = Not detected      MDL - Method Detection Limit  
RL = Reporting Limit  
E = Indicates value exceeds calibration range

J = Indicates an estimated value  
B = Indicates analyte found in associated method blank  
N = Indicates presumptive evidence of a compound

## Report of Analysis

**Client Sample ID:** CO4-CUTTINGS-032310**Lab Sample ID:** T49819-1**Date Sampled:** 03/23/10**Matrix:** SO - Soil**Date Received:** 03/25/10**Method:** SW846 8015 M SW846 3550B**Percent Solids:** 78.0**Project:** CO4 Cuttings Sample

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	CC218707.D	1	03/30/10	EM	03/27/10	OP14403	GCC1082
Run #2							

	Initial Weight	Final Volume
Run #1	30.4 g	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (C10-C28)	142	11	3.5	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	85%		33-115%

ND = Not detected MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

## Report of Analysis

Client Sample ID: CO4-CUTTINGS-032310

Lab Sample ID: T49819-1

Date Sampled: 03/23/10

Matrix: SO - Soil

Date Received: 03/25/10

Percent Solids: 78.0

Project: CO4 Cuttings Sample

## Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed By	Method	Prep Method	
Arsenic	10.4	0.76	0.15	mg/kg	1	04/01/10	04/03/10	NS	SW846 6010B <sup>2</sup>	SW846 3010A <sup>4</sup>
Barium	1660	15	0.046	mg/kg	1	04/01/10	04/03/10	NS	SW846 6010B <sup>2</sup>	SW846 3010A <sup>4</sup>
Cadmium	0.48	0.38	0.076	mg/kg	1	04/01/10	04/03/10	NS	SW846 6010B <sup>2</sup>	SW846 3010A <sup>4</sup>
Chromium	19.6	0.76	0.053	mg/kg	1	04/01/10	04/03/10	NS	SW846 6010B <sup>2</sup>	SW846 3010A <sup>4</sup>
Copper	52.2	1.9	0.099	mg/kg	1	04/01/10	04/03/10	NS	SW846 6010B <sup>2</sup>	SW846 3010A <sup>4</sup>
Lead	11.8	0.76	0.30	mg/kg	1	04/01/10	04/03/10	NS	SW846 6010B <sup>2</sup>	SW846 3010A <sup>4</sup>
Mercury	0.053	0.019	0.00074	mg/kg	1	04/01/10	04/01/10	TW	SW846 7471A <sup>1</sup>	SW846 7471A <sup>3</sup>
Nickel	15.0	3.0	0.099	mg/kg	1	04/01/10	04/03/10	NS	SW846 6010B <sup>2</sup>	SW846 3010A <sup>4</sup>
Selenium	0.62 B	0.76	0.18	mg/kg	1	04/01/10	04/03/10	NS	SW846 6010B <sup>2</sup>	SW846 3010A <sup>4</sup>
Silver	0.061 U	0.76	0.061	mg/kg	1	04/01/10	04/03/10	NS	SW846 6010B <sup>2</sup>	SW846 3010A <sup>4</sup>
Zinc	73.0	1.5	0.30	mg/kg	1	04/01/10	04/03/10	NS	SW846 6010B <sup>2</sup>	SW846 3010A <sup>4</sup>

(1) Instrument QC Batch: MA4639

(2) Instrument QC Batch: MA4642

(3) Prep QC Batch: MP11453

(4) Prep QC Batch: MP11458

RL = Reporting Limit

MDL = Method Detection Limit

U = Indicates a result &lt; MDL

B = Indicates a result &gt; = MDL but &lt; RL

Report of Analysis

<b>Client Sample ID:</b>	CO4-CUTTINGS-032310	<b>Date Sampled:</b>	03/23/10
<b>Lab Sample ID:</b>	T49819-1	<b>Date Received:</b>	03/25/10
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	78.0
<b>Project:</b>	CO4 Cuttings Sample		

General Chemistry

Analyte	Result	RL	MDL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	2.0	2.0	1.0	mg/kg	1	04/07/10 12:00	KD	SW846 3060/7196A
Chromium, Trivalent <sup>a</sup>	17.6	2.8	1.1	mg/kg	1	04/07/10 12:00	KD	SW846 6010/7196A M
Solids, Percent	78			%	1	03/31/10	MR	SM 2540 G
Specific Conductivity	2100	1.0		umhos/cm	1	04/06/10 13:00	KD	EPA 120.1
pH	7.91			su	1	03/26/10 14:00	CN	SW846 9045C

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit  
MDL = Method Detection Limit

U = Indicates a result < MDL  
B = Indicates a result > = MDL but < RL

Report of Analysis

<b>Client Sample ID:</b>	CO4-CUTTINGS-032310	<b>Date Sampled:</b>	03/23/10
<b>Lab Sample ID:</b>	T49819-1A	<b>Date Received:</b>	03/25/10
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	78.0
<b>Project:</b>	CO4 Cuttings Sample		

SAR Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed By	Method	Prep Method
Calcium	1990	25	0.18	mg/l	5	03/31/10	04/03/10 NS	SW846 6010B <sup>1</sup>	LADNR 29B <sup>3</sup>
Magnesium	260	25	0.039	mg/l	5	03/31/10	04/03/10 NS	SW846 6010B <sup>1</sup>	LADNR 29B <sup>3</sup>
Sodium	1050	130	3.4	mg/l	25	03/31/10	04/08/10 NS	SW846 6010B <sup>2</sup>	LADNR 29B <sup>3</sup>

- (1) Instrument QC Batch: MA4643  
(2) Instrument QC Batch: MA4651  
(3) Prep QC Batch: MP11442

RL = Reporting Limit  
MDL = Method Detection Limit

U = Indicates a result < MDL  
B = Indicates a result > = MDL but < RL

Report of Analysis

<b>Client Sample ID:</b>	CO4-CUTTINGS-032310	<b>Date Sampled:</b>	03/23/10
<b>Lab Sample ID:</b>	T49819-1A	<b>Date Received:</b>	03/25/10
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	78.0
<b>Project:</b>	CO4 Cuttings Sample		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sodium Adsorption Ratio <sup>a</sup>	5.87		ratio	1	04/08/10 14:33	NS	LADNR29B

(a) Calculated as: (Na meq/L) / sqrt [(Ca meq/L)+ (Mg meq/L)/2]

RL = Reporting Limit





## Misc. Forms

### Custody Documents and Other Forms

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Includes the following where applicable:

- Chain of Custody

10165 Harwin Dr, Ste 150 Houston, TX 77036  
TEL: 713-271-4700 FAX: 713-271-4770  
[www.accutest.com](http://www.accutest.com)

[illegible]

## 4.4.1

## T49819: Chain of Custody

Page 1 of 3

# SAMPLE INSPECTION FORM

Accutest Job Number: T49819 Client: ENCANA Date/Time Received: 3/25/10 0930  
 # of Coolers Received: 1 Thermometer #: 1R-1 Temperature Adjustment Factor: +0.4°C  
 Cooler Temps: #1: 4.0°C #2: \_\_\_\_\_ #3: \_\_\_\_\_ #4: \_\_\_\_\_ #5: \_\_\_\_\_ #6: \_\_\_\_\_ #7: \_\_\_\_\_ #8: \_\_\_\_\_  
 Method of Delivery: FEDEX UPS Accutest Courier Greyhound Delivery Other  
 Airbill Numbers: \_\_\_\_\_

## COOLER INFORMATION

- ☐ Custody seal missing or not intact
- ☐ Temperature criteria not met
- ☐ Wet ice received in cooler

## CHAIN OF CUSTODY

- ☐ Chain of Custody not received
- ☐ Sample D/T unclear or missing
- ☐ Analysis unclear or missing
- ☐ COC not properly executed

## SAMPLE INFORMATION

- ☐ Sample containers received broken
- ☐ VOC vials have headspace
- ☐ Sample labels missing or illegible
- ☐ ID on COC does not match label(s)
- ☐ D/T on COC does not match label(s)
- ☐ Sample/Bottles rcvd but no analysis on COC
- ☐ Sample listed on COC, but not received
- ☐ Bottles missing for requested analysis
- ☐ Insufficient volume for analysis
- ☐ Sample received improperly preserved

## TRIP BLANK INFORMATION

- ☐ Trip Blank on COC but not received
- ☐ Trip Blank received but not on COC
- ☐ Trip Blank not intact
- ☐ Received Water Trip Blank
- ☐ Received Soil TB

Number of Encores? \_\_\_\_\_  
 Number of 5035 kits? \_\_\_\_\_  
 Number of lab-filtered metals? \_\_\_\_\_

Summary of Discrepancies:

TECHNICIAN SIGNATURE/DATE: Ja Sth 3/25/10  
 INFORMATION AND SAMPLE LABELING VERIFIED BY: EC 3-25-10

## CORRECTIVE ACTIONS

Client Representative Notified: \_\_\_\_\_ Date: \_\_\_\_\_  
 By Accutest Representative: \_\_\_\_\_ Via: Phone Email  
 Client Instructions: \_\_\_\_\_

## SAMPLE RECEIPT LOG

JOB #: 749819

DATE/TIME RECEIVED: 3/25/10 0930

CLIENT: ENCANA

INITIALS: 1S

[illegible]

PRESERVATIVES: 1: None 2: HCL 3: HNO3 4: H2SO4 5: NAOH 6: DI 7: MeOH 8: Other

LOCATION: 1: Walk-In #1 (Waters) 2: Walk-In #2 (Soils) VR: Volatile Fridge M: Metals SUB: Subcontract EF: Encore Freezer

Rev 8/13/01 ~~even~~

## T49819: Chain of Custody

Page 3 of 3



## GC/MS Volatiles

5

### QC Data Summaries

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Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

## Method Blank Summary

Page 1 of 1

**Job Number:** T49819

**Account:** ENCACOP ENCANA

**Project:** CO4 Cuttings Sample

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VY2467-MB	Y0038996.D	1	03/31/10	JL	n/a	n/a	VY2467

The QC reported here applies to the following samples:

Method: SW846 8260B

T49819-1

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	5.0	0.70	ug/kg	
100-41-4	Ethylbenzene	ND	5.0	0.90	ug/kg	
108-88-3	Toluene	ND	5.0	0.95	ug/kg	
1330-20-7	Xylene (total)	ND	15	2.1	ug/kg	

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	101% 70-121%
2037-26-5	Toluene-D8	105% 76-132%
460-00-4	4-Bromofluorobenzene	91% 73-165%
17060-07-0	1,2-Dichloroethane-D4	79% 57-122%

Blank Spike Summary

Job Number: T49819  
Account: ENCACOP ENCANA  
Project: CO4 Cuttings Sample

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VY2467-BS	Y0038994.D	1	03/31/10	JL	n/a	n/a	VY2467

The QC reported here applies to the following samples:

Method: SW846 8260B

T49819-1

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
71-43-2	Benzene	50	52.3	105	70-114
100-41-4	Ethylbenzene	50	50.2	100	60-119
108-88-3	Toluene	50	50.8	102	68-115
1330-20-7	Xylene (total)	150	151	101	61-115

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	100%	70-121%
2037-26-5	Toluene-D8	108%	76-132%
460-00-4	4-Bromofluorobenzene	98%	73-165%
17060-07-0	1,2-Dichloroethane-D4	77%	57-122%

# Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

**Job Number:** T49819  
**Account:** ENCACOP ENCANA  
**Project:** CO4 Cuttings Sample

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
T49820-1MS	Y0039005.D	1	03/31/10	JL	n/a	n/a	VY2467
T49820-1MSD	Y0039006.D	1	03/31/10	JL	n/a	n/a	VY2467
T49820-1	Y0039003.D	1	03/31/10	JL	n/a	n/a	VY2467

The QC reported here applies to the following samples:

Method: SW846 8260B

T49819-1

CAS No.	Compound	T49820-1 ug/kg	Q	Spike ug/kg	MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	390		3430	3550	92	3570	93	1	70-114/38
100-41-4	Ethylbenzene	84.1	J	3430	3090	88	3110	88	1	60-119/40
108-88-3	Toluene	651		3430	3730	90	3880	94	4	68-115/38
1330-20-7	Xylene (total)	526	J	10300	9760	90	9840	90	1	61-115/39

CAS No.	Surrogate Recoveries	MS	MSD	T49820-1	Limits
1868-53-7	Dibromofluoromethane	97%	96%	99%	70-121%
2037-26-5	Toluene-D8	105%	106%	107%	76-132%
460-00-4	4-Bromofluorobenzene	99%	104%	97%	73-165%
17060-07-0	1,2-Dichloroethane-D4	71%	71%	75%	57-122%





## GC/MS Semi-volatiles

### QC Data Summaries

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Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

## Method Blank Summary

Page 1 of 1

**Job Number:** T49819  
**Account:** ENCACOP ENCANA  
**Project:** CO4 Cuttings Sample

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP14399-MB	H37786.D	1	04/02/10	SC	03/26/10	OP14399	EH2022

The QC reported here applies to the following samples:

Method: SW846 8270C BY SIM

T49819-1

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	6.7	1.1	ug/kg	
208-96-8	Acenaphthylene	ND	6.7	2.3	ug/kg	
120-12-7	Anthracene	ND	6.7	1.3	ug/kg	
56-55-3	Benzo(a)anthracene	ND	6.7	1.1	ug/kg	
50-32-8	Benzo(a)pyrene	ND	6.7	3.6	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	6.7	3.5	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	6.7	6.7	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	6.7	4.3	ug/kg	
218-01-9	Chrysene	ND	6.7	1.6	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	6.7	6.4	ug/kg	
206-44-0	Fluoranthene	ND	6.7	1.5	ug/kg	
86-73-7	Fluorene	ND	6.7	2.4	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	6.7	5.0	ug/kg	
90-12-0	1-Methylnaphthalene	ND	6.7	1.2	ug/kg	
91-57-6	2-Methylnaphthalene	ND	6.7	1.2	ug/kg	
91-20-3	Naphthalene	ND	6.7	1.0	ug/kg	
85-01-8	Phenanthrene	ND	6.7	0.93	ug/kg	
129-00-0	Pyrene	ND	6.7	2.3	ug/kg	

CAS No.	Surrogate Recoveries	Limits
4165-60-0	Nitrobenzene-d5	48% 10-127%
321-60-8	2-Fluorobiphenyl	124% 11-133%
1718-51-0	Terphenyl-d14	53% 15-187%

## Blank Spike Summary

Page 1 of 1

**Job Number:** T49819  
**Account:** ENCACOP ENCANA  
**Project:** CO4 Cuttings Sample

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP14399-BS	H37787.D	1	04/02/10	SC	03/26/10	OP14399	EH2022

The QC reported here applies to the following samples:

Method: SW846 8270C BY SIM

T49819-1

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
83-32-9	Acenaphthene	167	149	89	18-118
208-96-8	Acenaphthylene	167	162	97	35-125
120-12-7	Anthracene	167	132	79	24-116
56-55-3	Benzo(a)anthracene	167	142	85	32-132
50-32-8	Benzo(a)pyrene	167	142	85	36-130
205-99-2	Benzo(b)fluoranthene	167	174	104	35-134
191-24-2	Benzo(g,h,i)perylene	167	147	88	18-149
207-08-9	Benzo(k)fluoranthene	167	170	102	30-131
218-01-9	Chrysene	167	146	88	37-124
53-70-3	Dibenzo(a,h)anthracene	167	133	80	23-150
206-44-0	Fluoranthene	167	173	104	28-118
86-73-7	Fluorene	167	133	80	32-106
193-39-5	Indeno(1,2,3-cd)pyrene	167	129	77	18-150
90-12-0	1-Methylnaphthalene	167	106	64	10-128
91-57-6	2-Methylnaphthalene	167	121	73	28-113
91-20-3	Naphthalene	167	75.5	45	31-106
85-01-8	Phenanthrene	167	115	69	37-112
129-00-0	Pyrene	167	125	75	24-132

CAS No.	Surrogate Recoveries	BSP	Limits
4165-60-0	Nitrobenzene-d5	47%	10-127%
321-60-8	2-Fluorobiphenyl	69%	11-133%
1718-51-0	Terphenyl-d14	46%	15-187%

# Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

**Job Number:** T49819  
**Account:** ENCACOP ENCANA  
**Project:** CO4 Cuttings Sample

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP14399-MS	H37795.D	1	04/02/10	SC	03/26/10	OP14399	EH2022
OP14399-MSD	H37796.D	1	04/02/10	SC	03/26/10	OP14399	EH2022
T49818-1 <sup>a</sup>	H37794.D	1	04/02/10	SC	03/26/10	OP14399	EH2022

The QC reported here applies to the following samples:

Method: SW846 8270C BY SIM

T49819-1

CAS No.	Compound	T49818-1 ug/kg	Q	Spike ug/kg	MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
83-32-9	Acenaphthene	ND		190	191	101	306	162*	46	10-153/80
208-96-8	Acenaphthylene	ND		190	163	86	151	80	8	10-144/71
120-12-7	Anthracene	ND		190	100	53	94.2	50	6	10-176/57
56-55-3	Benzo(a)anthracene	ND		190	146	77	148	78	1	10-174/73
50-32-8	Benzo(a)pyrene	ND		190	150	79	147	78	2	10-182/74
205-99-2	Benzo(b)fluoranthene	ND		190	184	97	177	93	4	10-188/86
191-24-2	Benzo(g,h,i)perylene	ND		190	305	161*	332	175*	8	10-150/62
207-08-9	Benzo(k)fluoranthene	ND		190	153	81	153	81	0	10-170/94
218-01-9	Chrysene	ND		190	143	75	136	72	5	10-165/73
53-70-3	Dibenzo(a,h)anthracene	ND		190	234	123	252	133	7	10-192/74
206-44-0	Fluoranthene	2.6	J	190	140	72	145	75	4	10-141/73
86-73-7	Fluorene	ND		190	171	90	154	81	10	10-164/72
193-39-5	Indeno(1,2,3-cd)pyrene	ND		190	222	117	236	125	6	10-150/73
90-12-0	1-Methylnaphthalene	2.1	J	190	150	78	122	63	21	10-154/82
91-57-6	2-Methylnaphthalene	6.1	J	190	175	89	152	77	14	10-171/75
91-20-3	Naphthalene	6.8	J	190	147	74	100	49	38	10-138/82
85-01-8	Phenanthrene	ND		190	131	69	140	74	7	10-191/77
129-00-0	Pyrene	ND		190	372	196*	393	207*	5	10-150/66

CAS No.	Surrogate Recoveries	MS	MSD	T49818-1	Limits
4165-60-0	Nitrobenzene-d5	49%	42%	29%	10-127%
321-60-8	2-Fluorobiphenyl	30%	51%	29%	11-133%
1718-51-0	Terphenyl-d14	102%	112%	71%	15-187%

(a) Internal standards are not within the advisory limits due to a matrix interference. Confirmed by associated ms/msd.



## GC Volatiles

### QC Data Summaries

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Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: T49819  
Account: ENCACOP ENCANA  
Project: CO4 Cuttings Sample

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GEE2708-MB	EE053284.D	1	03/31/10	FI	n/a	n/a	GEE2708

The QC reported here applies to the following samples: Method: SW846 8015

T49819-1

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	5.0	0.30	mg/kg	

CAS No.	Surrogate Recoveries	Limits
460-00-4	4-Bromofluorobenzene	100%
98-08-8	aaa-Trifluorotoluene	106%

Blank Spike Summary

Job Number: T49819  
Account: ENCACOP ENCANA  
Project: CO4 Cuttings Sample

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GEE2708-BS	EE053280.D	1	03/30/10	FI	n/a	n/a	GEE2708

The QC reported here applies to the following samples: Method: SW846 8015

T49819-1

CAS No.	Compound	Spike mg/kg	BSP mg/kg	BSP %	Limits
	TPH-GRO (C6-C10)	0.4	0.363	91	78-115

CAS No.	Surrogate Recoveries	BSP	Limits
460-00-4	4-Bromofluorobenzene	100%	46-127%
98-08-8	aaa-Trifluorotoluene	103%	44-120%

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: T49819  
Account: ENCACOP ENCANA  
Project: CO4 Cuttings Sample

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
T49818-1MS	EE053305.D	1	03/31/10	FI	n/a	n/a	GEE2708
T49818-1MSD	EE053306.D	1	03/31/10	FI	n/a	n/a	GEE2708
T49818-1	EE053300.D	1	03/31/10	FI	n/a	n/a	GEE2708

The QC reported here applies to the following samples: Method: SW846 8015

T49819-1

CAS No.	Compound	T49818-1 mg/kg	Q	Spike mg/kg	MS mg/kg	MS %	MSD mg/kg	MSD %	RPD	Limits Rec/RPD
	TPH-GRO (C6-C10)	0.849	J	24.8	22.5	87	21.9	85	3	78-115/14

CAS No.	Surrogate Recoveries	MS	MSD	T49818-1	Limits
460-00-4	4-Bromofluorobenzene	109%	110%	104%	46-127%
98-08-8	aaa-Trifluorotoluene	111%	111%	106%	44-120%





## GC Semi-volatiles

### QC Data Summaries

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Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: T49819  
Account: ENCACOP ENCANA  
Project: CO4 Cuttings Sample

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP14403-MB	CC218695.D	1	03/30/10	EM	03/27/10	OP14403	GCC1082

The QC reported here applies to the following samples: Method: SW846 8015 M

T49819-1

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (C10-C28)	ND	8.3	2.7	mg/kg	

CAS No.	Surrogate Recoveries	Limits
84-15-1	o-Terphenyl	110% 33-115%

8.1.1  
8

Blank Spike Summary

Job Number: T49819  
Account: ENCACOP ENCANA  
Project: CO4 Cuttings Sample

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP14403-BS	CC218696.D	1	03/30/10	EM	03/27/10	OP14403	GCC1082

The QC reported here applies to the following samples: Method: SW846 8015 M

T49819-1

CAS No.	Compound	Spike mg/kg	BSP mg/kg	BSP %	Limits
	TPH (C10-C28)	33.1	28.3	85	45-107

CAS No.	Surrogate Recoveries	BSP	Limits
84-15-1	o-Terphenyl	103%	33-115%

8.2.1  
8

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: T49819  
Account: ENCACOP ENCANA  
Project: CO4 Cuttings Sample

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP14403-MS	CC218697.D	1	03/30/10	EM	03/27/10	OP14403	GCC1082
OP14403-MSD	CC218698.D	1	03/30/10	EM	03/27/10	OP14403	GCC1082
T49816-1	CC218699.D	1	03/30/10	EM	03/27/10	OP14403	GCC1082

The QC reported here applies to the following samples: Method: SW846 8015 M

T49819-1

CAS No.	Compound	T49816-1 mg/kg	Q	Spike mg/kg	MS mg/kg	MS %	MSD mg/kg	MSD %	RPD	Limits Rec/RPD
	TPH (C10-C28)	61.8		38.5	72.2	27*	70.7	23*	2	45-107/34

CAS No.	Surrogate Recoveries	MS	MSD	T49816-1	Limits
84-15-1	o-Terphenyl	110%	86%	94%	33-115%

8.3.1  
8



## Metals Analysis

### QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Matrix Spike and Duplicate Summaries
- Blank Spike and Lab Control Sample Summaries
- Serial Dilution Summaries

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: T49819  
Account: ENCACOP - ENCANA  
Project: CO4 Cuttings Sample

QC Batch ID: MP11442  
Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B  
Units: ug/l

Prep Date: 03/31/10

Metal	RL	IDL	MDL	MB raw	final
Aluminum	200	16	17		
Antimony	5.0	2.3	3		
Arsenic	5.0	1.8	2		
Barium	200	.14	2.7		
Beryllium	5.0	.11	.2		
Boron	100	1.1	2.1		
Cadmium	4.0	.25	.3		
Calcium	5000	5.4	35	85.3	<5000
Chromium	10	1.1	1.9		
Cobalt	50	.5	.8		
Copper	25	.58	5.9		
Iron	100	13	13		
Lead	3.0	1.6	1.7		
Magnesium	5000	6.7	7.8	34.1	<5000
Manganese	15	.2	7.6		
Molybdenum	10	.96	1.3		
Nickel	40	.95	3.2		
Potassium	5000	53	53		
Selenium	5.0	3.2	3.2		
Silver	10	.85	.8		
Sodium	5000	130	130	63.9	<5000
Strontium	20	.17	.4		
Thallium	10	3.2	2.6		
Tin	20	1.8	2.9		
Titanium	20	.3	.3		
Vanadium	50	.6	.6		
Zinc	20	.49	4.1		

Associated samples MP11442: T49819-1A

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits  
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: T49819  
Account: ENCACOP - ENCANA  
Project: CO4 Cuttings Sample

QC Batch ID: MP11442  
Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B  
Units: ug/l

Prep Date: 03/31/10

Metal	T49667-1B Original DUP		RPD	QC Limits
Aluminum				
Antimony				
Arsenic				
Barium				
Beryllium				
Boron				
Cadmium				
Calcium	6770	6770	0.0	0-20
Chromium				
Cobalt				
Copper				
Iron				
Lead				
Magnesium	318	338	6.1	0-20
Manganese				
Molybdenum				
Nickel				
Potassium				
Selenium				
Silver				
Sodium	279000	278000	0.4	0-20
Strontium				
Thallium				
Tin				
Titanium				
Vanadium				
Zinc				

Associated samples MP11442: T49819-1A

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits  
(N) Matrix Spike Rec. outside of QC limits  
(anr) Analyte not requested

SERIAL DILUTION RESULTS SUMMARY

Login Number: T49819  
Account: ENCACOP - ENCANA  
Project: CO4 Cuttings Sample

QC Batch ID: MP11442  
Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B  
Units: ug/l

Prep Date: 03/31/10

Metal	T49667-1B			QC	
	Original	SDL 5:25	%DIF	Limits	
Aluminum					
Antimony					
Arsenic					
Barium					
Beryllium					
Boron					
Cadmium					
Calcium	6770	7110	5.0	0-10	
Chromium					
Cobalt					
Copper					
Iron					
Lead					
Magnesium	318	415	30.7 (a)	0-10	
Manganese					
Molybdenum					
Nickel					
Potassium					
Selenium					
Silver					
Sodium	279000	269000	3.5	0-10	
Strontium					
Thallium					
Tin					
Titanium					
Vanadium					
Zinc					

Associated samples MP11442: T49819-1A

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(anr) Analyte not requested

(a) Percent difference acceptable due to low initial sample concentration (< 50 times IDL).



BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: T49819  
Account: ENCACOP - ENCANA  
Project: CO4 Cuttings Sample

QC Batch ID: MP11453  
Matrix Type: SOLID

Methods: SW846 7471A  
Units: mg/kg

Prep Date: 04/01/10

Metal	RL	IDL	MDL	MB raw	final
-------	----	-----	-----	-----------	-------

Mercury	0.017	.0041	.00066	0.0013	<0.017
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Associated samples MP11453: T49819-1

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits  
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: T49819  
 Account: ENCACOP - ENCANA  
 Project: C04 Cuttings Sample

QC Batch ID: MP11453  
 Matrix Type: SOLID

Methods: SW846 7471A  
 Units: mg/kg

Prep Date: 04/01/10 04/01/10

Metal	T50046-1		QC Limits	T50046-1		Spikelot HGTXWS1	% Rec	QC Limits
	Original	DUP		Original	MS			
Mercury	0.14	0.16	13.3	0.14	0.70	0.322	173.9N	75-125

Associated samples MP11453: T49819-1

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (N) Matrix Spike Rec. outside of QC limits  
 (anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: T49819  
Account: ENCACOP - ENCANA  
Project: C04 Cuttings Sample

QC Batch ID: MP11453  
Matrix Type: SOLID

Methods: SW846 7471A  
Units: mg/kg

Prep Date: 04/01/10

Metal	T50046-1 Original	MSD	Spikelot HGTXWS1	% Rec	MSD RPD	QC Limit
-------	----------------------	-----	---------------------	-------	------------	-------------

Mercury	0.14	0.68	0.355	151.9N	2.9	
---------	------	------	-------	--------	-----	--

Associated samples MP11453: T49819-1

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits  
(N) Matrix Spike Rec. outside of QC limits  
(anr) Analyte not requested

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: T49819  
 Account: ENCACOP - ENCANA  
 Project: C04 Cuttings Sample

QC Batch ID: MP11453  
 Matrix Type: SOLID

Methods: SW846 7471A  
 Units: mg/kg

Prep Date: 04/01/10

Metal	LCS Result	Spikelot HGLCD054 % Rec	QC Limits
-------	---------------	----------------------------	--------------

Mercury	7.8	7.34	106.3	72-128
---------	-----	------	-------	--------

Associated samples MP11453: T49819-1

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (anr) Analyte not requested

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: T49819  
Account: ENCACOP - ENCANA  
Project: CO4 Cuttings Sample

QC Batch ID: MP11458  
Matrix Type: SOLID

Methods: SW846 6010B  
Units: mg/kg

Prep Date: 04/01/10

Metal	RL	IDL	MDL	MB raw	final
Aluminum	10	.82	2.2		
Antimony	0.50	.11	.14		
Arsenic	0.50	.089	.1	-0.011	<0.50
Barium	10	.007	.03	0.0065	<10
Beryllium	0.25	.0055	.01		
Boron	5.0	.054	.11		
Cadmium	0.25	.013	.05	0.0	<0.25
Calcium	250	.27	.86		
Chromium	0.50	.055	.035	-0.11	<0.50
Cobalt	2.5	.025	.09		
Copper	1.3	.029	.065	0.0060	<1.3
Iron	5.0	.65	1.1		
Lead	0.50	.079	.2	0.0065	<0.50
Magnesium	250	.34	.58		
Manganese	0.75	.01	.035		
Molybdenum	0.50	.048	.075		
Nickel	2.0	.048	.065	-0.13	<2.0
Potassium	250	2.7	16		
Selenium	0.50	.16	.12	0.047	<0.50
Silver	0.50	.043	.04	-0.0045	<0.50
Sodium	250	6.5	13		
Strontium	1.0	.0085	.025		
Thallium	0.50	.16	.25		
Tin	1.0	.09	.12		
Titanium	1.0	.015	.045		
Vanadium	2.5	.03	.06		
Zinc	1.0	.025	.2	0.0015	<1.0

Associated samples MP11458: T49819-1

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits  
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: T49819  
Account: ENCACOP - ENCANA  
Project: CO4 Cuttings Sample

QC Batch ID: MP11458  
Matrix Type: SOLID

Methods: SW846 6010B  
Units: mg/kg

Prep Date: 04/01/10 04/01/10

	T49819-1			QC	T49819-1		Spikelot		QC
Metal	Original	DUP	RPD	Limits	Original	MS	MPTW4	% Rec	Limits
Aluminum									
Antimony									
Arsenic	10.4	14.8	34.9*(a)	0-20	10.4	31.2	27.5	75.6N	80-120
Barium	1660	1330	22.1*(a)	0-20	1660	1140	27.5	-1890.1c	80-120
Beryllium									
Boron									
Cadmium	0.48	0.39	20.7 (b)	0-20	0.48	22.2	27.5	78.9N	80-120
Calcium									
Chromium	19.6	18.0	8.5	0-20	19.6	40.4	27.5	75.6N	80-120
Cobalt									
Copper	52.2	45.4	13.9	0-20	52.2	73.3	27.5	76.7N	80-120
Iron									
Lead	11.8	12.4	5.0	0-20	11.8	35.1	27.5	84.7	80-120
Magnesium									
Manganese									
Molybdenum									
Nickel	15.0	14.9	0.7	0-20	15.0	34.4	27.5	70.5N	80-120
Potassium									
Selenium	0.62	0.52	17.5	0-20	0.62	25.1	27.5	89.0	80-120
Silver	0.0	0.0	NC	0-20	0.0	25.9	27.5	94.1	80-120
Sodium									
Strontium									
Thallium									
Tin									
Titanium									
Vanadium									
Zinc	73.0	82.1	11.7	0-20	73.0	99.2	27.5	95.2	80-120

Associated samples MP11458: T49819-1

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

(a) High RPD due to possible sample nonhomogeneity.

(b) RPD acceptable due to low duplicate and sample concentrations.

(c) Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: T49819  
Account: ENCACOP - ENCANA  
Project: CO4 Cuttings Sample

QC Batch ID: MP11458  
Matrix Type: SOLID

Methods: SW846 6010B  
Units: mg/kg

Prep Date: 04/01/10

Metal	T49819-1 Original	MSD	SpikeLot MPTW4	% Rec	MSD RPD	QC Limit
Aluminum						
Antimony						
Arsenic	10.4	30.6	26.3	76.7N	1.9	20
Barium	1660	1260	26.3	-1519.4a	10.0	20
Beryllium						
Boron						
Cadmium	0.48	21.8	26.3	81.0	1.8	20
Calcium						
Chromium	19.6	36.8	26.3	65.3N	9.3	20
Cobalt						
Copper	52.2	72.6	26.3	77.5N	1.0	20
Iron						
Lead	11.8	32.4	26.3	78.3N	8.0	20
Magnesium						
Manganese						
Molybdenum						
Nickel	15.0	32.6	26.3	66.9N	5.4	20
Potassium						
Selenium	0.62	23.8	26.3	88.1	5.3	20
Silver	0.0	24.8	26.3	94.2	4.3	20
Sodium						
Strontium						
Thallium						
Tin						
Titanium						
Vanadium						
Zinc	73.0	92.4	26.3	73.7N	7.1	20

Associated samples MP11458: T49819-1

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

(a) Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.

## SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: T49819  
 Account: ENCACOP - ENCANA  
 Project: C04 Cuttings Sample

QC Batch ID: MP11458  
 Matrix Type: SOLID

Methods: SW846 6010B  
 Units: mg/kg

Prep Date: 04/01/10

Metal	LCS Result	Spikelot MPLCD054	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic	150	158	94.9	82-118
Barium	367	348	105.5	81-119
Beryllium				
Boron				
Cadmium	174	187	93.0	82-118
Calcium				
Chromium	86.5	89.5	96.6	79-121
Cobalt				
Copper	142	129	110.1	84-117
Iron				
Lead	157	172	91.3	79-120
Magnesium				
Manganese				
Molybdenum				
Nickel	92.0	99	92.9	81-119
Potassium				
Selenium	141	148	95.3	78-121
Silver	65.9	66	99.8	66-134
Sodium				
Strontium				
Thallium				
Tin				
Titanium				
Vanadium				
Zinc	376	394	95.4	80-119

Associated samples MP11458: T49819-1

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (anr) Analyte not requested



# SERIAL DILUTION RESULTS SUMMARY

Login Number: T49819  
Account: ENCACOP - ENCANA  
Project: CO4 Cuttings Sample

QC Batch ID: MP11458  
Matrix Type: SOLID

Methods: SW846 6010B  
Units: ug/l

Prep Date: 04/01/10

Metal	T49819-1 Original	SDL 1:5	%DIF	QC Limits
Aluminum				
Antimony				
Arsenic	137	151	10.8*(a)	0-10
Barium	21900	27800	26.7*(a)	0-10
Beryllium				
Boron				
Cadmium	6.28	5.23	16.7 (b)	0-10
Calcium				
Chromium	258	287	11.1*(a)	0-10
Cobalt				
Copper	688	722	5.1	0-10
Iron				
Lead	156	179	14.8*(a)	0-10
Magnesium				
Manganese				
Molybdenum				
Nickel	198	221	11.6*(a)	0-10
Potassium				
Selenium	8.16	0.00	100.0(b)	0-10
Silver	0.00	0.00	NC	0-10
Sodium				
Strontium				
Thallium				
Tin				
Titanium				
Vanadium				
Zinc	962	1120	16.1*(a)	0-10

Associated samples MP11458: T49819-1

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(anr) Analyte not requested

(a) Serial dilution indicates possible matrix interference.

(b) Percent difference acceptable due to low initial sample concentration (< 50 times IDL).



## General Chemistry

### QC Data Summaries

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Includes the following where applicable:

- Method Blank and Blank Spike Summaries
- Duplicate Summaries
- Matrix Spike Summaries

METHOD BLANK AND SPIKE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: T49819  
Account: ENCACOP - ENCANA  
Project: CO4 Cuttings Sample

Analyte	Batch ID	RL	MB Result	Units	Spike Amount	BSP Result	BSP %Recov	QC Limits
Chromium, Hexavalent	GN21869	2.0	0.0	mg/kg	40	41.2	102.0	80-120%
Specific Conductivity	GN21871	1.0	<1.0	umhos/cm				

Associated Samples:  
Batch GN21869: T49819-1  
Batch GN21871: T49819-1  
(\*) Outside of QC limits

DUPLICATE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: T49819  
Account: ENCACOP - ENCANA  
Project: CO4 Cuttings Sample

Analyte	Batch ID	QC Sample	Units	Original Result	DUP Result	RPD	QC Limits
Chromium, Hexavalent	GN21869	T49816-1	mg/kg	1.5 B	1.7	11.0	0-20%
Solids, Percent	GN21781	T49875-1	%	64	63.7	0.5	0-5%
Specific Conductivity	GN21871	T49551-1	umhos/cm	467	467	0.0	0-20%
pH	GN21685	T49816-1	su	8.54	8.59	0.6	0-20%

Associated Samples:

Batch GN21685: T49819-1

Batch GN21781: T49819-1

Batch GN21869: T49819-1

Batch GN21871: T49819-1

(\*) Outside of QC limits

MATRIX SPIKE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: T49819  
Account: ENCACOP - ENCANA  
Project: CO4 Cuttings Sample

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MS Result	%Rec	QC Limits
Chromium, Hexavalent	GN21869	T49816-1	mg/kg	1.5 B	40	42.6	102.8	75-125%

Associated Samples:

Batch GN21869: T49819-1

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits



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Est. 1970

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

## Report Summary

Tuesday April 19, 2011

Report Number: L511513

Samples Received: 04/15/11

Client Project: 900133.8887.030

Description: C04

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,  
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# REPORT OF ANALYSIS

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

April 19, 2011

Date Received : April 15, 2011  
Description : CO4

Sample ID : CO4-CUT-041411

Collected By : Bob Stockton  
Collection Date : 04/14/11 11:41

ESC Sample # : L511513-01

Site ID : NPR

Project # : 900133.8887.030

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	0.033	0.0025	mg/kg	8021B	04/16/11	5
Surrogate Recovery(%) a,a,a-Trifluorotoluene(PID)	102.		% Rec.	8021B	04/16/11	5

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: 04/19/11 14:37 Printed: 04/19/11 15:18



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# REPORT OF ANALYSIS

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

April 19, 2011

Date Received : April 15, 2011  
Description : CO4  
Sample ID : CO4-SW BACKGROUND-041411  
Collected By : Bob Stockton  
Collection Date : 04/14/11 11:52

ESC Sample # : L511513-02

Site ID : NPR

Project # : 900133.8887.030

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Arsenic	9.2	5.0	mg/kg	6010B	04/19/11	5

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

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Reported: 04/19/11 14:37 Printed: 04/19/11 15:18





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REPORT OF ANALYSIS

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

April 19, 2011

Date Received : April 15, 2011  
Description : CO4  
Sample ID : CO4-SE BACKGROUND-041411  
Collected By : Bob Stockton  
Collection Date : 04/14/11 12:02

ESC Sample # : L511513-03

Site ID : NPR

Project # : 900133.8887.030

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Arsenic	5.1	5.0	mg/kg	6010B	04/19/11	5

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: 04/19/11 14:37 Printed: 04/19/11 15:18



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REPORT OF ANALYSIS

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

April 19, 2011

Date Received : April 15, 2011  
Description : CO4  
Sample ID : CO4-N BACKGROUND-041411  
Collected By : Bob Stockton  
Collection Date : 04/14/11 12:14

ESC Sample # : L511513-04

Site ID : NPR

Project # : 900133.8887.030

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Arsenic	25.	5.0	mg/kg	6010B	04/19/11	5

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: 04/19/11 14:37 Printed: 04/19/11 15:18



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REPORT OF ANALYSIS

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

April 19, 2011

Date Received : April 15, 2011  
Description : CO4  
Sample ID : CO4-E BACKGROUND-041411  
Collected By : Bob Stockton  
Collection Date : 04/14/11 12:25

ESC Sample # : L511513-05

Site ID : NPR

Project # : 900133.8887.030

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Arsenic	25.	2.0	mg/kg	6010B	04/19/11	2

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: 04/19/11 14:37 Printed: 04/19/11 15:18

Summary of Remarks For Samples Printed  
04/19/11 at 15:18:44

TSR Signing Reports: 358  
R5 - Desired TAT

Log all samples beginning with different sample numbers to separate reports. Ex.- M34 N PIT and M34 S PIT go on one L#, but M34 S PIT and E34 S PIT go on separate L #s. TPH=GRO and DRO ALWAYS

Sample: L511513-01 Account: ENCANACO Received: 04/15/11 09:00 Due Date: 04/22/11 00:00 RPT Date: 04/19/11 14:37  
BTEX is for benzene only.  
Sample: L511513-02 Account: ENCANACO Received: 04/15/11 09:00 Due Date: 04/22/11 00:00 RPT Date: 04/19/11 14:37  
BTEX is for benzene only.  
Sample: L511513-03 Account: ENCANACO Received: 04/15/11 09:00 Due Date: 04/22/11 00:00 RPT Date: 04/19/11 14:37  
BTEX is for benzene only.  
Sample: L511513-04 Account: ENCANACO Received: 04/15/11 09:00 Due Date: 04/22/11 00:00 RPT Date: 04/19/11 14:37  
BTEX is for benzene only.  
Sample: L511513-05 Account: ENCANACO Received: 04/15/11 09:00 Due Date: 04/22/11 00:00 RPT Date: 04/19/11 14:37  
BTEX is for benzene only.



**YOUR LAB OF CHOICE**

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

Quality Assurance Report  
Level II

L511513

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April 19, 2011

Analyte	Result	Laboratory Blank		Limit	Batch	Date Analyzed
		Units	% Rec			
Benzene	< .0005	mg/kg			WG531330	04/15/11 22:15
a,a,a-Trifluorotoluene(PID)		% Rec.	103.5	54-144	WG531330	04/15/11 22:15
Arsenic	< 1	mg/kg			WG531463	04/19/11 08:25

Analyte	Units	Duplicate		RPD	Limit	Ref Samp	Batch
		Result	Duplicate				
Arsenic	mg/kg	3.90	5.10	26.4*	20	L511643-04	WG531463

Analyte	Units	Laboratory Control Sample		% Rec	Limit	Batch
		Known Val	Result			
Benzene	mg/kg	.05	0.0486	97.3	76-113	WG531330
a,a,a-Trifluorotoluene(PID)				102.8	54-144	WG531330
Arsenic	mg/kg	192	180.	93.8	78.6-120.8	WG531463

Analyte	Units	Laboratory Control Sample Duplicate		Limit	RPD	Limit	Batch
		Result	Ref				
Benzene	mg/kg	0.0489	0.0486	98.0	76-113	0.540	WG531330
a,a,a-Trifluorotoluene(PID)				103.5	54-144		WG531330

Analyte	Units	Matrix Spike		% Rec	Limit	Ref Samp	Batch
		MS Res	Ref Res				
Benzene	mg/kg	0.0404	0	.05	80.8	L511564-09	WG531330
a,a,a-Trifluorotoluene(PID)					102.6	54-144	WG531330
Arsenic	mg/kg	46.9	5.10	50	16.7*	L511643-04	WG531463

Analyte	Units	Matrix Spike Duplicate		Limit	RPD	Limit	Ref Samp	Batch
		MSD	Ref					
Benzene	mg/kg	0.0382	0.0404	76.3	32-137	5.76	L511564-09	WG531330
a,a,a-Trifluorotoluene(PID)				102.8	54-144			WG531330
Arsenic	mg/kg	49.7	46.9	17.8*	75-125	5.80	L511643-04	WG531463

Batch number /Run number / Sample number cross reference

WG531330: R1653310: L511513-01  
WG531463: R1656110: L511513-02 03 04 05

\* \* 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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EnCana Oil & Gas Inc. - CO  
Chris Hines  
2717 County Road 215, Suite 100

Parachute, CO 81635

Quality Assurance Report  
Level II

L511513

12065 Lebanon Rd.  
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Tax I.D. 62-0814289

Est. 1970

April 19, 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.

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

## Report Summary

Sunday May 13, 2012

Report Number: L573157

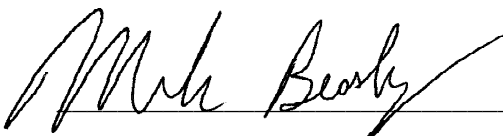
Samples Received: 05/03/12

Client Project:

Description: C04 - H17 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:



Mark W. Beasley , ESC Representative

### Laboratory Certification Numbers

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - 01157CA, CT - PH-0197,  
FL - E87487, GA - 923, IN - C-TN-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

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

May 13, 2012

Date Received : May 03, 2012  
Description : C04 - H17 Cuttings  
Sample ID : C04-H17-CUT1-050212 12IN  
Collected By : CJB  
Collection Date : 05/02/12 10:30

ESC Sample # : L573157-01

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Chromium, Hexavalent	BDL	2.0	mg/kg	3060A/7196A	05/04/12	1
Chromium, Trivalent	13.	2.0	mg/kg	Calc.	05/10/12	1
ORP	180		mV	2580	05/05/12	1
pH	8.5		su	9045D	05/04/12	1
Sodium Adsorption Ratio	26.			Calc.	05/09/12	1
Specific Conductance	2300		umhos/cm	9050AMod	05/04/12	1
Mercury	0.029	0.020	mg/kg	7471	05/04/12	1
Arsenic	3.6	1.0	mg/kg	6010B	05/10/12	1
Barium	2900	0.25	mg/kg	6010B	05/10/12	1
Cadmium	BDL	0.25	mg/kg	6010B	05/10/12	1
Chromium	13.	0.50	mg/kg	6010B	05/10/12	1
Copper	20.	1.0	mg/kg	6010B	05/10/12	1
Lead	10.	0.25	mg/kg	6010B	05/10/12	1
Nickel	8.9	1.0	mg/kg	6010B	05/10/12	1
Selenium	BDL	1.0	mg/kg	6010B	05/10/12	1
Silver	BDL	0.50	mg/kg	6010B	05/10/12	1
Zinc	59.	1.5	mg/kg	6010B	05/10/12	1
Benzene	BDL	0.0025	mg/kg	8021/8015	05/04/12	5
Toluene	BDL	0.025	mg/kg	8021/8015	05/04/12	5
Ethylbenzene	BDL	0.0025	mg/kg	8021/8015	05/04/12	5
Total Xylene	BDL	0.0075	mg/kg	8021/8015	05/04/12	5
TPH (GC/FID) Low Fraction	BDL	0.50	mg/kg	GRO	05/04/12	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	95.1		% Rec.	8021/8015	05/04/12	5
a,a,a-Trifluorotoluene(PID)	103.		% Rec.	8021/8015	05/04/12	5
TPH (GC/FID) High Fraction	BDL	40.	mg/kg	3546/DRO	05/09/12	10
Surrogate recovery(%)						
o-Terphenyl	62.0		% Rec.	3546/DRO	05/09/12	10
Polynuclear Aromatic Hydrocarbons						
Anthracene	0.10	0.060	mg/kg	8270C-SIM	05/09/12	10
Acenaphthene	BDL	0.060	mg/kg	8270C-SIM	05/09/12	10
Acenaphthylene	BDL	0.060	mg/kg	8270C-SIM	05/09/12	10
Benzo(a)anthracene	0.72	0.060	mg/kg	8270C-SIM	05/09/12	10
Benzo(a)pyrene	0.35	0.060	mg/kg	8270C-SIM	05/09/12	10

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

L573157-01 (DRO) - matrix thick/dark, cannot run at lower dilution

L573157-01 (PH) - 8.5@20.1c



REPORT OF ANALYSIS

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

May 13, 2012

Date Received : May 03, 2012  
Description : C04 - H17 Cuttings  
Sample ID : C04-H17-CUT1-050212 12IN  
Collected By : CJB  
Collection Date : 05/02/12 10:30

ESC Sample # : L573157-01

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzo(b)fluoranthene	1.2	0.060	mg/kg	8270C-SIM	05/09/12	10
Benzo(g,h,i)perylene	0.28	0.060	mg/kg	8270C-SIM	05/09/12	10
Benzo(k)fluoranthene	0.26	0.060	mg/kg	8270C-SIM	05/09/12	10
Chrysene	0.87	0.060	mg/kg	8270C-SIM	05/09/12	10
Dibenz(a,h)anthracene	0.15	0.060	mg/kg	8270C-SIM	05/09/12	10
Fluoranthene	0.72	0.060	mg/kg	8270C-SIM	05/09/12	10
Fluorene	BDL	0.060	mg/kg	8270C-SIM	05/09/12	10
Indeno(1,2,3-cd)pyrene	0.28	0.060	mg/kg	8270C-SIM	05/09/12	10
Naphthalene	0.17	0.060	mg/kg	8270C-SIM	05/09/12	10
Phenanthrene	0.56	0.060	mg/kg	8270C-SIM	05/09/12	10
Pyrene	0.27	0.060	mg/kg	8270C-SIM	05/09/12	10
1-Methylnaphthalene	0.16	0.060	mg/kg	8270C-SIM	05/09/12	10
2-Methylnaphthalene	0.27	0.060	mg/kg	8270C-SIM	05/09/12	10
2-Chloronaphthalene	BDL	0.060	mg/kg	8270C-SIM	05/09/12	10
Surrogate Recovery						
Nitrobenzene-d5	54.2		% Rec.	8270C-SIM	05/09/12	10
2-Fluorobiphenyl	71.6		% Rec.	8270C-SIM	05/09/12	10
p-Terphenyl-d14	76.7		% Rec.	8270C-SIM	05/09/12	10

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: 05/13/12 13:26 Printed: 05/13/12 13:26

L573157-01 (DRO) - matrix thick/dark, cannot run at lower dilution

L573157-01 (PH) - 8.5@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

May 13, 2012

Date Received : May 03, 2012  
Description : C04 - H17 Cuttings  
Sample ID : C04-H17-CUT2-050212 12IN  
Collected By : CJB  
Collection Date : 05/02/12 11:04

ESC Sample # : L573157-02

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Arsenic	2.9	1.0	mg/kg	6010B	05/07/12	1
Benzene	BDL	0.0025	mg/kg	8021/8015	05/04/12	5
Toluene	BDL	0.025	mg/kg	8021/8015	05/04/12	5
Ethylbenzene	BDL	0.0025	mg/kg	8021/8015	05/04/12	5
Total Xylene	BDL	0.0075	mg/kg	8021/8015	05/04/12	5
TPH (GC/FID) Low Fraction	BDL	0.50	mg/kg	GRO	05/04/12	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	94.6		% Rec.	8021/8015	05/04/12	5
a,a,a-Trifluorotoluene(PID)	102.		% Rec.	8021/8015	05/04/12	5
TPH (GC/FID) High Fraction	BDL	40.	mg/kg	3546/DRO	05/09/12	10
Surrogate recovery(%)						
o-Terphenyl	73.2		% Rec.	3546/DRO	05/09/12	10
Polynuclear Aromatic Hydrocarbons						
Anthracene	BDL	0.15	mg/kg	8270C-SIM	05/09/12	25
Acenaphthene	BDL	0.15	mg/kg	8270C-SIM	05/09/12	25
Acenaphthylene	BDL	0.15	mg/kg	8270C-SIM	05/09/12	25
Benzo(a)anthracene	0.49	0.15	mg/kg	8270C-SIM	05/09/12	25
Benzo(a)pyrene	0.28	0.15	mg/kg	8270C-SIM	05/09/12	25
Benzo(b)fluoranthene	0.90	0.15	mg/kg	8270C-SIM	05/09/12	25
Benzo(g,h,i)perylene	0.34	0.15	mg/kg	8270C-SIM	05/09/12	25
Benzo(k)fluoranthene	0.19	0.15	mg/kg	8270C-SIM	05/09/12	25
Chrysene	0.68	0.15	mg/kg	8270C-SIM	05/09/12	25
Dibenz(a,h)anthracene	BDL	0.15	mg/kg	8270C-SIM	05/09/12	25
Fluoranthene	0.60	0.15	mg/kg	8270C-SIM	05/09/12	25
Fluorene	BDL	0.15	mg/kg	8270C-SIM	05/09/12	25
Indeno(1,2,3-cd)pyrene	0.27	0.15	mg/kg	8270C-SIM	05/09/12	25
Naphthalene	0.23	0.15	mg/kg	8270C-SIM	05/09/12	25
Phenanthrene	0.57	0.15	mg/kg	8270C-SIM	05/09/12	25
Pyrene	0.24	0.15	mg/kg	8270C-SIM	05/09/12	25
1-Methylnaphthalene	0.25	0.15	mg/kg	8270C-SIM	05/09/12	25
2-Methylnaphthalene	0.37	0.15	mg/kg	8270C-SIM	05/09/12	25
2-Chloronaphthalene	BDL	0.15	mg/kg	8270C-SIM	05/09/12	25
Surrogate Recovery						
Nitrobenzene-d5	59.5		% Rec.	8270C-SIM	05/09/12	25
2-Fluorobiphenyl	64.7		% Rec.	8270C-SIM	05/09/12	25
p-Terphenyl-d14	74.1		% Rec.	8270C-SIM	05/09/12	25

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

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Reported: 05/13/12 13:26 Printed: 05/13/12 13:26

L573157-02 (DRO) - matrix thick/dark, cannot run at lower dilution

Attachment A  
List of Analytes with QC Qualifiers

Sample Number	Work Group	Sample Type	Analyte	Run ID	Qualifier
L573157-01	WG591095	SAMP	Lead	R2167074	B
	WG591041	SAMP	pH	R2157093	T8
	WG590986	SAMP	TPH (GC/FID) High Fraction	R2162673	O
L573157-02	WG590977	SAMP	Nitrobenzene-d5	R2160635	J7
	WG590977	SAMP	2-Fluorobiphenyl	R2160635	J7
	WG590977	SAMP	p-Terphenyl-d14	R2160635	J7
	WG590986	SAMP	TPH (GC/FID) High Fraction	R2162673	O

Attachment B  
Explanation of QC Qualifier Codes

Qualifier	Meaning
B	(EPA) - The indicated compound was found in the associated method blank as well as the laboratory sample.
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.

Summary of Remarks For Samples Printed  
05/13/12 at 13:26:48

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.

Sample: L573157-01 Account: ENCANACO Received: 05/03/12 09:00 Due Date: 05/10/12 00:00 RPT Date: 05/13/12 13:26

Sample: L573157-02 Account: ENCANACO Received: 05/03/12 09:00 Due Date: 05/10/12 00:00 RPT Date: 05/13/12 13:26



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Est. 1970

May 13, 2012

Analyte	Result	Laboratory Blank		Limit	Batch	Date Analyzed
		Units	% Rec			
Chromium, Hexavalent	< 2	mg/kg			WG590368	05/04/12 11:16
Mercury	< .02	mg/kg			WG590979	05/04/12 09:58
pH	4.80	su			WG591041	05/04/12 14:20
Benzene	< .0005	mg/kg			WG591050	05/04/12 17:04
Ethylbenzene	< .0005	mg/kg			WG591050	05/04/12 17:04
Toluene	< .005	mg/kg			WG591050	05/04/12 17:04
TPH (GC/FID) Low Fraction	< .1	mg/kg			WG591050	05/04/12 17:04
Total Xylene	< .0015	mg/kg			WG591050	05/04/12 17:04
a,a,a-Trifluorotoluene(FID)		% Rec.	95.00	59-128	WG591050	05/04/12 17:04
a,a,a-Trifluorotoluene(PID)		% Rec.	103.3	54-144	WG591050	05/04/12 17:04
Specific Conductance	2.35	umhos/cm			WG591031	05/04/12 13:33
Arsenic	< 1	mg/kg			WG591385	05/07/12 12:02
1-Methylnaphthalene	< .006	mg/kg			WG590977	05/08/12 12:07
2-Chloronaphthalene	< .006	mg/kg			WG590977	05/08/12 12:07
2-Methylnaphthalene	< .006	mg/kg			WG590977	05/08/12 12:07
Acenaphthene	< .006	mg/kg			WG590977	05/08/12 12:07
Acenaphthylene	< .006	mg/kg			WG590977	05/08/12 12:07
Anthracene	< .006	mg/kg			WG590977	05/08/12 12:07
Benzo(a)anthracene	< .006	mg/kg			WG590977	05/08/12 12:07
Benzo(a)pyrene	< .006	mg/kg			WG590977	05/08/12 12:07
Benzo(b)fluoranthene	< .006	mg/kg			WG590977	05/08/12 12:07
Benzo(g,h,i)perylene	< .006	mg/kg			WG590977	05/08/12 12:07
Benzo(k)fluoranthene	< .006	mg/kg			WG590977	05/08/12 12:07
Chrysene	< .006	mg/kg			WG590977	05/08/12 12:07
Dibenz(a,h)anthracene	< .006	mg/kg			WG590977	05/08/12 12:07
Fluoranthene	< .006	mg/kg			WG590977	05/08/12 12:07
Fluorene	< .006	mg/kg			WG590977	05/08/12 12:07
Indeno(1,2,3-cd)pyrene	< .006	mg/kg			WG590977	05/08/12 12:07
Naphthalene	< .006	mg/kg			WG590977	05/08/12 12:07
Phenanthrene	< .006	mg/kg			WG590977	05/08/12 12:07
Pyrene	< .006	mg/kg			WG590977	05/08/12 12:07
2-Fluorobiphenyl		% Rec.	73.71	34-129	WG590977	05/08/12 12:07
Nitrobenzene-d5		% Rec.	53.80	14-141	WG590977	05/08/12 12:07
p-Terphenyl-d14		% Rec.	89.60	25-139	WG590977	05/08/12 12:07
TPH (GC/FID) High Fraction	< 4	ppm			WG590986	05/09/12 15:53
o-Terphenyl		% Rec.	77.25	50-150	WG590986	05/09/12 15:53
Arsenic	< 1	mg/kg			WG591095	05/10/12 20:46
Barium	< .25	mg/kg			WG591095	05/10/12 20:46
Cadmium	< .25	mg/kg			WG591095	05/10/12 20:46
Chromium	< .5	mg/kg			WG591095	05/10/12 20:46
Copper	< 1	mg/kg			WG591095	05/10/12 20:46
Lead	< .25	mg/kg			WG591095	05/10/12 20:46
Nickel	< 1	mg/kg			WG591095	05/10/12 20:46

\* 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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May 13, 2012

Analyte	Result	Laboratory Blank		Limit	Batch	Date Analyzed
		Units	% Rec			
Selenium	< 1	mg/kg			WG591095	05/10/12 20:46
Silver	< .5	mg/kg			WG591095	05/10/12 20:46
Zinc	< 1.5	mg/kg			WG591095	05/10/12 20:46

Analyte	Units	Duplicate		RPD	Limit	Ref Samp	Batch
		Result	Duplicate				
Chromium,Hexavalent	mg/kg	0	0	0	20	L572352-02	WG590368
Chromium,Hexavalent	mg/kg	0	0	0	20	L572914-07	WG590368
Mercury	mg/kg	0.0430	0.0460	7.67	20	L573138-04	WG590979
pH	su	8.50	8.50	0.354	1	L573100-01	WG591041
pH	su	8.30	8.30	0.121	1	L573138-04	WG591041
Specific Conductance	umhos/cm	920.	910.	0.548	20	L572969-01	WG591031
Specific Conductance	umhos/cm	970.	980.	1.03	20	L573171-02	WG591031
ORP	mV	200.	190.	6.12	20	L572883-01	WG591212
ORP	mV	180.	180.	1.68	20	L573289-01	WG591212
Arsenic	mg/kg	0	0	0	20	L572768-06	WG591385
Arsenic	mg/kg	4.30	4.20	3.05	20	L573160-01	WG591095
Barium	mg/kg	340.	340.	0.294	20	L573160-01	WG591095
Cadmium	mg/kg	0	0.280	NA	20	L573160-01	WG591095
Chromium	mg/kg	15.0	15.0	2.70	20	L573160-01	WG591095
Copper	mg/kg	15.0	14.0	8.87	20	L573160-01	WG591095
Lead	mg/kg	8.50	7.90	7.55	20	L573160-01	WG591095
Selenium	mg/kg	0	0	0	20	L573160-01	WG591095
Silver	mg/kg	0	0	0	20	L573160-01	WG591095
Nickel	mg/kg	15.0	14.0	5.56	20	L573160-01	WG591095
Zinc	mg/kg	72.0	73.0	1.38	20	L573160-01	WG591095

Analyte	Units	Laboratory Control Sample		% Rec	Limit	Batch
		Known Val	Result			
Chromium,Hexavalent	mg/kg	150	124.	82.7	50-150	WG590368
Mercury	mg/kg	3.77	4.32	115.	71.6-128	WG590979
pH	su	5.7	5.69	99.8	98-101	WG591041
Benzene	mg/kg	.05	0.0552	110.	76-113	WG591050
Ethylbenzene	mg/kg	.05	0.0559	112.	78-115	WG591050
Toluene	mg/kg	.05	0.0552	110.	76-114	WG591050
Total Xylene	mg/kg	.15	0.169	112.	81-118	WG591050
a,a,a-Trifluorotoluene(PID)				103.0	54-144	WG591050
TPH (GC/FID) Low Fraction	mg/kg	5.5	6.78	123.	67-135	WG591050
a,a,a-Trifluorotoluene(FID)				102.3	59-128	WG591050

\* Performance of this Analyte is outside of established criteria.

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Quality Assurance Report  
Level II

Parachute, CO 81635

May 13, 2012

L573157

Analyte	Units	Laboratory Control		Sample	% Rec	Limit	Batch
		Known	Val	Result			
Specific Conductance	umhos/cm	495		492.	99.4	85-115	WG591031
ORP	mV	228		231.	101.	95.6-104.	WG591212
Arsenic	mg/kg	92.6		83.7	90.4	82.9-117	WG591385
1-Methylnaphthalene	mg/kg	.033		0.0199	60.4	48-113	WG590977
2-Chloronaphthalene	mg/kg	.033		0.0195	59.1	51-114	WG590977
2-Methylnaphthalene	mg/kg	.033		0.0180	54.7	44-109	WG590977
Acenaphthene	mg/kg	.033		0.0222	67.3	52-108	WG590977
Acenaphthylene	mg/kg	.033		0.0212	64.1	51-110	WG590977
Anthracene	mg/kg	.033		0.0243	73.5	58-120	WG590977
Benzo(a)anthracene	mg/kg	.033		0.0237	71.8	54-110	WG590977
Benzo(a)pyrene	mg/kg	.033		0.0219	66.3	56-118	WG590977
Benzo(b)fluoranthene	mg/kg	.033		0.0236	71.4	55-114	WG590977
Benzo(g,h,i)perylene	mg/kg	.033		0.0259	78.4	48-130	WG590977
Benzo(k)fluoranthene	mg/kg	.033		0.0219	66.4	55-122	WG590977
Chrysene	mg/kg	.033		0.0237	71.8	57-118	WG590977
Dibenz(a,h)anthracene	mg/kg	.033		0.0256	77.5	53-122	WG590977
Fluoranthene	mg/kg	.033		0.0245	74.2	58-118	WG590977
Fluorene	mg/kg	.033		0.0224	67.9	54-109	WG590977
Indeno(1,2,3-cd)pyrene	mg/kg	.033		0.0253	76.6	51-125	WG590977
Naphthalene	mg/kg	.033		0.0173	52.4	45-105	WG590977
Phenanthrene	mg/kg	.033		0.0235	71.3	53-114	WG590977
Pyrene	mg/kg	.033		0.0230	69.8	53-121	WG590977
2-Fluorobiphenyl					65.25	34-129	WG590977
Nitrobenzene-d5					42.60	14-141	WG590977
p-Terphenyl-d14					81.96	25-139	WG590977
TPH (GC/FID) High Fraction	ppm	60		39.2	65.4	50-150	WG590986
o-Terphenyl					72.17	50-150	WG590986
Arsenic	mg/kg	92.6		86.7	93.6	82.9-117	WG591095
Barium	mg/kg	169		168.	99.4	82.8-117	WG591095
Cadmium	mg/kg	61.8		59.6	96.4	83.3-117	WG591095
Chromium	mg/kg	71.3		67.5	94.7	81.8-118	WG591095
Copper	mg/kg	81.2		79.4	97.8	83.9-116	WG591095
Lead	mg/kg	92.4		90.5	97.9	83.3-117	WG591095
Nickel	mg/kg	59.1		56.1	94.9	83.8-116	WG591095
Selenium	mg/kg	89.5		86.8	97.0	79-121	WG591095
Silver	mg/kg	34.4		33.1	96.2	66.3-134	WG591095
Zinc	mg/kg	141		135.	95.7	80.9-119	WG591095

Analyte	Units	Laboratory Control		Sample Duplicate	Limit	RPD	Limit	Batch
		Result	Ref	%Rec				
Chromium, Hexavalent	mg/kg	118.	124.	79.0	50-150	4.96	20	WG590368
pH	su	5.67	5.69	99.0	98-101	0.352	20	WG591041
Benzene	mg/kg	0.0557	0.0552	111.	76-113	0.800	20	WG591050
Ethylbenzene	mg/kg	0.0560	0.0559	112.	78-115	0.190	20	WG591050

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L573157

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Est. 1970

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Analyte	Units	Laboratory Control Sample Duplicate			Limit	RPD	Limit	Batch
		Result	Ref	%Rec				
Toluene	mg/kg	0.0552	0.0552	110.	76-114	0.0700	20	WG591050
Total Xylene	mg/kg	0.168	0.169	112.	81-118	0.0500	20	WG591050
a,a,a-Trifluorotoluene(PID)				102.9	54-144			WG591050
TPH (GC/FID) Low Fraction	mg/kg	6.89	6.78	125.	67-135	1.49	20	WG591050
a,a,a-Trifluorotoluene(FID)				102.9	59-128			WG591050
Specific Conductance	umhos/	492.	492.	99.0	85-115	0	20	WG591031
ORP	mV	232.	231.	102.	95.6-104.	0.432	20	WG591212
1-Methylnaphthalene	mg/kg	0.0206	0.0199	62.0	48-113	3.50	24	WG590977
2-Chloronaphthalene	mg/kg	0.0202	0.0195	61.0	51-114	3.43	24	WG590977
2-Methylnaphthalene	mg/kg	0.0186	0.0180	56.0	44-109	3.09	24	WG590977
Acenaphthene	mg/kg	0.0237	0.0222	72.0	52-108	6.38	22	WG590977
Acenaphthylene	mg/kg	0.0216	0.0212	66.0	51-110	2.22	21	WG590977
Anthracene	mg/kg	0.0243	0.0243	74.0	58-120	0.239	20	WG590977
Benzo(a)anthracene	mg/kg	0.0243	0.0237	74.0	54-110	2.68	22	WG590977
Benzo(a)pyrene	mg/kg	0.0223	0.0219	67.0	56-118	1.64	21	WG590977
Benzo(b)fluoranthene	mg/kg	0.0231	0.0236	70.0	55-114	2.05	20	WG590977
Benzo(g,h,i)perylene	mg/kg	0.0262	0.0259	80.0	48-130	1.40	20	WG590977
Benzo(k)fluoranthene	mg/kg	0.0238	0.0219	72.0	55-122	8.24	25	WG590977
Chrysene	mg/kg	0.0244	0.0237	74.0	57-118	3.05	20	WG590977
Dibenz(a,h)anthracene	mg/kg	0.0261	0.0256	79.0	53-122	2.02	20	WG590977
Fluoranthene	mg/kg	0.0252	0.0245	76.0	58-118	2.74	20	WG590977
Fluorene	mg/kg	0.0232	0.0224	70.0	54-109	3.53	20	WG590977
Indeno(1,2,3-cd)pyrene	mg/kg	0.0262	0.0253	79.0	51-125	3.37	21	WG590977
Naphthalene	mg/kg	0.0177	0.0173	54.0	45-105	2.10	24	WG590977
Phenanthrene	mg/kg	0.0240	0.0235	72.0	53-114	1.80	20	WG590977
Pyrene	mg/kg	0.0235	0.0230	71.0	53-121	1.97	20	WG590977
2-Fluorobiphenyl				68.94	34-129			WG590977
Nitrobenzene-d5				46.10	14-141			WG590977
p-Terphenyl-d14				87.44	25-139			WG590977
TPH (GC/FID) High Fraction	ppm	42.3	39.2	70.0	50-150	7.57	23	WG590986
o-Terphenyl				77.15	50-150			WG590986

Analyte	Units	Matrix Spike				Limit	Ref Samp	Batch
		MS Res	Ref Res	TV	% Rec			
Chromium,Hexavalent	mg/kg	10.0	0	20	50.0	50-150	L572350-02	WG590368
Mercury	mg/kg	0.304	0.0460	.25	103.	70-130	L573138-04	WG590979
Benzene	mg/kg	0.263	0	.05	105.	32-137	L573157-01	WG591050
Ethylbenzene	mg/kg	0.260	0	.05	104.	10-150	L573157-01	WG591050
Toluene	mg/kg	0.263	0	.05	105.	20-142	L573157-01	WG591050
Total Xylene	mg/kg	0.789	0	.15	105.	16-141	L573157-01	WG591050
a,a,a-Trifluorotoluene(PID)					102.1	54-144		WG591050
TPH (GC/FID) Low Fraction	mg/kg	27.7	0	5.5	101.	55-109	L573157-01	WG591050
a,a,a-Trifluorotoluene(FID)					100.1	59-128		WG591050

Arsenic	mg/kg	46.8	0	50	93.6	75-125	L572768-06	WG591385
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Analyte	Units	MS Res	Matrix Spike		% Rec	Limit	Ref Samp	Batch
			Ref Res	TV				
1-Methylnaphthalene	mg/kg	0.0181	0	.033	54.9	25-155	L573178-08	WG590977
2-Chloronaphthalene	mg/kg	0.0179	0	.033	54.3	31-153	L573178-08	WG590977
2-Methylnaphthalene	mg/kg	0.0174	0	.033	52.8	22-172	L573178-08	WG590977
Acenaphthene	mg/kg	0.0190	0	.033	57.4	43-133	L573178-08	WG590977
Acenaphthylene	mg/kg	0.0185	0	.033	56.0	42-146	L573178-08	WG590977
Anthracene	mg/kg	0.0185	0	.033	56.2	38-153	L573178-08	WG590977
Benzo(a)anthracene	mg/kg	0.0173	0	.033	52.4	31-142	L573178-08	WG590977
Benzo(a)pyrene	mg/kg	0.0162	0	.033	49.2	26-152	L573178-08	WG590977
Benzo(b)fluoranthene	mg/kg	0.0167	0	.033	50.7	10-188	L573178-08	WG590977
Benzo(g,h,i)perylene	mg/kg	0.0179	0	.033	54.2	10-176	L573178-08	WG590977
Benzo(k)fluoranthene	mg/kg	0.0164	0	.033	49.8	22-163	L573178-08	WG590977
Chrysene	mg/kg	0.0168	0	.033	51.0	26-146	L573178-08	WG590977
Dibenz(a,h)anthracene	mg/kg	0.0177	0	.033	53.6	10-160	L573178-08	WG590977
Fluoranthene	mg/kg	0.0188	0	.033	56.8	23-160	L573178-08	WG590977
Fluorene	mg/kg	0.0195	0	.033	59.2	44-143	L573178-08	WG590977
Indeno(1,2,3-cd)pyrene	mg/kg	0.0182	0	.033	55.2	10-157	L573178-08	WG590977
Naphthalene	mg/kg	0.0168	0	.033	50.8	22-156	L573178-08	WG590977
Phenanthrene	mg/kg	0.0189	0	.033	57.3	23-164	L573178-08	WG590977
Pyrene	mg/kg	0.0174	0	.033	52.6	12-170	L573178-08	WG590977
2-Fluorobiphenyl					60.78	34-129		WG590977
Nitrobenzene-d5					48.22	14-141		WG590977
p-Terphenyl-d14					69.14	25-139		WG590977
TPH (GC/FID) High Fraction	ppm	38.2	0	60	63.6	50-150	L573178-03	WG590986
o-Terphenyl					65.97	50-150		WG590986
Arsenic	mg/kg	50.8	4.20	50	93.2	75-125	L573160-01	WG591095
Barium	mg/kg	578.	340.	50	476.*	75-125	L573160-01	WG591095
Cadmium	mg/kg	43.9	0.280	50	87.2	75-125	L573160-01	WG591095
Chromium	mg/kg	59.5	15.0	50	89.0	75-125	L573160-01	WG591095
Copper	mg/kg	63.2	14.0	50	98.4	75-125	L573160-01	WG591095
Lead	mg/kg	52.7	7.90	50	89.6	75-125	L573160-01	WG591095
Selenium	mg/kg	42.0	0	50	84.0	75-125	L573160-01	WG591095
Silver	mg/kg	48.8	0	50	97.6	75-125	L573160-01	WG591095
Nickel	mg/kg	54.8	14.0	25	81.6	75-125	L573160-01	WG591095
Zinc	mg/kg	110.	73.0	25	74.0*	75-125	L573160-01	WG591095

Analyte	Units	MSD	Matrix Spike Duplicate		Limit	RPD	Limit	Ref Samp	Batch
			Ref	%Rec					
Chromium,Hexavalent	mg/kg	10.1	10.0	50.5	50-150	0.995	20	L572350-02	WG590368
Mercury	mg/kg	0.315	0.304	108.	70-130	3.55	20	L573138-04	WG590979
Benzene	mg/kg	0.254	0.263	102.	32-137	3.25	39	L573157-01	WG591050
Ethylbenzene	mg/kg	0.243	0.260	97.4	10-150	6.49	44	L573157-01	WG591050
Toluene	mg/kg	0.247	0.263	98.6	20-142	6.62	42	L573157-01	WG591050
Total Xylene	mg/kg	0.739	0.789	98.6	16-141	6.54	46	L573157-01	WG591050
a,a,a-Trifluorotoluene(PID)				101.7	54-144				WG591050
TPH (GC/FID) Low Fraction	mg/kg	24.9	27.7	90.6	55-109	10.6	20	L573157-01	WG591050
a,a,a-Trifluorotoluene(FID)				99.13	59-128				WG591050

Arsenic mg/kg 47.7 46.8 95.4 75-125 1.90 20 L572768-06 WG591385

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Analyte	Units	MSD	Matrix Spike Duplicate		Limit	RPD	Limit	Ref Samp	Batch
			Ref	%Rec					
1-Methylnaphthalene	mg/kg	0.0167	0.0181	50.5	25-155	8.27	27	L573178-08	WG590977
2-Chloronaphthalene	mg/kg	0.0168	0.0179	50.8	31-153	6.67	22	L573178-08	WG590977
2-Methylnaphthalene	mg/kg	0.0159	0.0174	48.1	22-172	9.36	29	L573178-08	WG590977
Acenaphthene	mg/kg	0.0176	0.0190	53.3	43-133	7.55	26	L573178-08	WG590977
Acenaphthylene	mg/kg	0.0173	0.0185	52.3	42-146	6.79	22	L573178-08	WG590977
Anthracene	mg/kg	0.0175	0.0185	53.1	38-153	5.70	27	L573178-08	WG590977
Benzo(a)anthracene	mg/kg	0.0165	0.0173	49.9	31-142	4.80	31	L573178-08	WG590977
Benzo(a)pyrene	mg/kg	0.0156	0.0162	47.2	26-152	4.20	32	L573178-08	WG590977
Benzo(b)fluoranthene	mg/kg	0.0163	0.0167	49.4	10-188	2.63	33	L573178-08	WG590977
Benzo(g,h,i)perylene	mg/kg	0.0169	0.0179	51.2	10-176	5.77	30	L573178-08	WG590977
Benzo(k)fluoranthene	mg/kg	0.0151	0.0164	45.8	22-163	8.28	29	L573178-08	WG590977
Chrysene	mg/kg	0.0159	0.0168	48.2	26-146	5.52	30	L573178-08	WG590977
Dibenz(a,h)anthracene	mg/kg	0.0164	0.0177	49.6	10-160	7.86	39	L573178-08	WG590977
Fluoranthene	mg/kg	0.0181	0.0188	54.8	23-160	3.61	22	L573178-08	WG590977
Fluorene	mg/kg	0.0185	0.0195	56.0	44-143	5.67	23	L573178-08	WG590977
Indeno(1,2,3-cd)pyrene	mg/kg	0.0171	0.0182	51.7	10-157	6.45	40	L573178-08	WG590977
Naphthalene	mg/kg	0.0153	0.0168	46.5	22-156	8.84	27	L573178-08	WG590977
Phenanthrene	mg/kg	0.0180	0.0189	54.6	23-164	4.87	25	L573178-08	WG590977
Pyrene	mg/kg	0.0163	0.0174	49.5	12-170	6.12	24	L573178-08	WG590977
2-Fluorobiphenyl				54.75	34-129				WG590977
Nitrobenzene-d5				42.08	14-141				WG590977
p-Terphenyl-d14				60.57	25-139				WG590977
TPH (GC/FID) High Fraction	ppm	41.0	38.2	68.4	50-150	7.20	40	L573178-03	WG590986
o-Terphenyl				65.54	50-150				WG590986
Arsenic	mg/kg	50.3	50.8	92.2	75-125	0.989	20	L573160-01	WG591095
Barium	mg/kg	389.	578.	98.0	75-125	39.1*	20	L573160-01	WG591095
Cadmium	mg/kg	42.9	43.9	85.2	75-125	2.30	20	L573160-01	WG591095
Chromium	mg/kg	58.6	59.5	87.2	75-125	1.52	20	L573160-01	WG591095
Copper	mg/kg	62.5	63.2	97.0	75-125	1.11	20	L573160-01	WG591095
Lead	mg/kg	52.0	52.7	88.2	75-125	1.34	20	L573160-01	WG591095
Selenium	mg/kg	41.9	42.0	83.8	75-125	0.238	20	L573160-01	WG591095
Silver	mg/kg	46.0	48.8	92.0	75-125	5.91	20	L573160-01	WG591095
Nickel	mg/kg	59.4	54.8	90.8	75-125	8.06	20	L573160-01	WG591095
Zinc	mg/kg	120.	110.	94.0	75-125	8.70	20	L573160-01	WG591095

Batch number /Run number / Sample number cross reference

WG590368: R2156515: L573157-01  
WG590979: R2156774: L573157-01  
WG591041: R2157093: L573157-01  
WG591050: R2158114: L573157-01 02  
WG591031: R2158195: L573157-01  
WG591212: R2158253: L573157-01  
WG591385: R2159333: L573157-02  
WG590977: R2160635: L573157-01 02  
WG590986: R2162673: L573157-01 02  
WG591386: R2163353: L573157-01  
WG591095: R2167074: L573157-01

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

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Quality Assurance Report  
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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.