



November 14, 2023

Mr. Andy Verbonitz
Caerus Oil and Gas
143 Diamond Avenue
Parachute, CO 81635

via email

**Subject: Report of Work Completed
 L29 595 6A-32 Flowline Release
 CECMC Release ID: 485140
 CECMC Facility ID: 335607
 Garfield County, Colorado**

Mr. Verbonitz,

Entrada Consulting Group, Inc. (Entrada) was contracted by Caerus Oil and Gas, LLC (Caerus) to conduct field screening and soil sampling associated with the removal of impacted soil resulting from a release from the 6A-32 flow line on the L29 595 pad (Site).

The North Parachute EF L29 595 pad is located in the southwest quarter of the northeast quarter of section 29 of township 5 south and range 95 west of the 6th principal meridian and is identified in the Colorado Energy and Carbon Management Commission (CECMC) database by Facility ID 335607. The 6A-32 flowline release is identified by CECMC Release ID 485140.

PATHWAY TO GROUNDWATER

The Site is located in the East Fork of North Parachute Ranch at an elevation of 5,985 feet above mean sea level (ft-amsl). The nearest surface water feature is the East Fork of Parachute Creek located on the northern margin of the Site (**Figure 1**) at an elevation of approximately 5,950 ft-amsl. The East Fork of Parachute Creek is an intermittent stream that is dry much of the year, with peak flows driven by melting snow in the spring and early summer.

Groundwater monitoring wells are present approximately 0.7 miles down-gradient of the Site at the N30 pad and 0.6 miles up-gradient of the Site, near the G29 pad. Well construction and groundwater elevation information for a selection of the N30 monitoring wells and the up-gradient NPR23MW well are presented in the table below.

Well Name	DWR Permit Number	Construction Date	Distance from Site (mi)	Direction from Site	Well Elevation (ft-amsl)	TD (ft)	Static Depth to Groundwater (ft-bgs)	Groundwater Elevation (ft-amsl)	Elevation Difference from Site Surface (ft)
NPR23MW	327469	2022-02-01	0.6	ENE	6060	75	Dry	< 5985	> 0
East Fork Parachute Creek			0.1	N	5950	0	Intermittent	< 5950	> 35
N30 19MW	291940	2013-04-25	0.7	WSW	5880	45	35	5835	150
N30 22MW	56183	2016-11-17	0.7	WSW	5880	47	39	5833	152

Table A - Well construction and groundwater elevation information for monitoring wells near the L29 595.

The elevation of groundwater at the Site is known to be greater than 35 feet below ground surface (ft-bgs) at the Site, due to the intermittent nature of the East Fork of Parachute Creek. Extrapolating from groundwater monitoring well information, we can infer that the elevation of groundwater at the Site is likely to be approximately 5,910 ft-amsl or less (75 ft-bgs or deeper).

EXCAVATION FIELD SCREENING AND SOIL SAMPLING

An Entrada representative was on site on October 10, 2023, to conduct initial field screening and collect soil samples. All excavation activities were completed prior to arrival. Prior to sampling, the excavation was inspected for evidence of potential environmental impacts (e.g., staining or hydrocarbon odor) and field-screened for volatile organic compounds (VOCs) with a handheld photoionization detector (PID).

The excavation formed a narrow trench along the failed flowline, approximately 100 feet in length from southwest to northeast by approximately 8 feet northwest to southeast, with the base at a depth of approximately 6 ft-bgs.

The excavated material, approximately 180 cubic yards, was staged on the working surface of the pad adjacent to the northwest side of the trench and bermed to contain impacts. Two (2) five-point composite soil samples (20231009-L29 595-(SPOIL1)@1 and 20231009-L29 595-(SPOIL2)@1) were collected from the excavated material.

The base of the excavation was field screened for VOCs at 10-foot intervals along the flowline beginning approximately 20 feet northeast of the point of release (POR) and ending approximately 40 feet southwest of the POR for a total of seven (7) locations. The highest concentration of VOCs recorded was 211.1 parts per million (ppm) at B2, approximately 10 feet northeast of the POR. All other VOC readings from the base were between 0 and 2.0 ppm. No staining was observed at any point, and only minor hydrocarbon odor was noted from soil at B2.

Four (4) soil samples were collected from the base of the excavation:

- 20231009-L29 595-(BASE1)@6 was collected at field screening location B1, approximately 20 feet northeast of the POR, as an analog for the east wall of the excavation, with a VOC reading of 0.2 ppm.
- 20231009-L29 595-(BASE2)@6 was collected at field screening location B2, the point of highest VOC field screening of 211.1 ppm, approximately 10 feet northeast of the POR.
- 20231009-L29 595-(BASE3 FL POR)@6 was collected at field screening location B3, directly beneath the POR, with a VOC reading of 2.0 ppm.

- 20231009-L29 595-(BASE4)@6 was collected at field screening location B4, approximately 10 feet southwest of the POR, as an analog for the west wall of the excavation.

Six (6) locations from the north and south walls of the excavation were field screened for VOCs. These were all at approximately 5 ft-bgs, directly adjacent to base screening locations B1, B3, and B5. VOC readings were all less than 1.0 ppm. Two (2) soil samples were collected, one (1) from each wall of the excavation:

- 20231009-L29 595-(NW1)@5 was collected from the north wall of the excavation at 5 ft-bgs directly adjacent to the POR, with a VOC reading of 0.0 ppm.
- 20231009-L29 595-(SW1)@5 was collected from the south wall of the excavation at 5 ft-bgs directly adjacent to the POR, with a VOC reading of 0.5 ppm.

Groundwater was not observed at any point during field activities. The excavation boundary, field screening, and soil sample locations are shown in **Figure 1**.

All soil samples were collected in 9 oz glass jars, sealed, labeled, and placed into an ice-filled cooler for preservation. Samples were submitted to Pace Analytical in Mt. Juliet, TN and analyzed for the following analyte suite:

- Total Petroleum Hydrocarbons – diesel range organics (TPH-DRO [C10-C28]) and Total Petroleum Hydrocarbons – oil range organics (TPH-ORO [C28-C36]) by U.S. Environmental Protection Agency (EPA) Method 8015M
- TPH – gasoline range organics (TPH-GRO [C6-C10]) by EPA Method 8015D/GRO
- Benzene, Toluene, Ethylbenzene, Xylenes (BTEX), 1,2,4-trimethylbenzene, and 1,3,5-trimethylbenzene by EPA Method 8260B
- Polycyclic aromatic Hydrocarbons (PAHs)(CECMC Table 915-1) by EPA Method 8270C-SIM
- pH by EPA Method 9045D
- Metals (CECMC Table 915-1) by EPA Method 6010B
 - Hexavalent chromium by EPA Method 7199A
 - Hot-water soluble Boron by EPA Method 6010B-NE493, Ch 2
 - Arsenic by EPA Method 6020
- Electrical Conductivity (EC) by EPA Method 9050AMod
- Sodium adsorption ratio (SAR) by USDA Method H60

SOIL ANALYTICAL RESULTS

Analytical results for six (6) excavation soil samples and two (2) spoils pile soil samples are presented in **Table 1** and **Table 2** along with CECMC Table 915-1 Residential Soil Screening Levels (RSSLs) and Soil Suitability for Reclamation standards (SSRSs) for comparison. Results in exceedance of Table 915-1 RSSLs or SSRSs are summarized below:

- Electrical Conductivity (EC) was reported above the SSRS maximum value of 4.0 mmhos/cm in sample 20231009-L29 595-(BASE2)@6 with a value of 4.52 mmhos/cm.
- pH was reported in exceedance of SSRS maximum value of 8.3 in six (6) samples, with values ranging from 8.38 to 8.86.

- Arsenic was reported in exceedance of the RSSL concentration of 0.68 mg/kg in all samples with concentrations ranging from 9.51 mg/kg to 21.1 mg/kg.
- Hexavalent chromium was identified in all samples at concentrations below the laboratory reporting detection limit (RDL) of 1.00 mg/kg. The RSSL for hexavalent chromium is 0.3 mg/kg.

All remaining soil analytical results were below applicable CECMC Table 915-1 standards. Laboratory analysis reports and chain-of-custody documentation are included as **Attachments**.

BACKGROUND SOIL

Numerous background soil samples have been collected from sites within the East Fork drainage of North Parachute Ranch (NPR) (**Figure 2**). Laboratory analysis of these samples has demonstrated that the naturally occurring electrical conductivity (EC), pH, and concentration of arsenic in the soil within the East Fork geographic region are elevated with regard to CECMC Table 915-1 standards. **Table A** below presents a summary of a selection of historical background soil samples within the East Fork of NPR for reference. Complete laboratory analytical results for these samples have also been included in **Table 1** and **Table 2**. Laboratory analysis reports and chain-of-custody documentation for these samples are included as **Attachments**.

PROTECTION OF GROUNDWATER SOIL SCREENING LEVEL CONCENTRATION (mg/Kg)							<4.0 mmhos/cm	6 – 8.3	0.29
RESIDENTIAL SOIL SCREENING LEVEL CONCENTRATION (mg/Kg)									0.69
Location	Facility ID	Approx. Distance from Site (ft)	Lab Report #	Sample Date	Project Area	Sample ID	Electrical Conductivity (EC) (by saturated paste method)	pH (saturated paste method)	Arsenic
N30	335670	3800	T49818	2010-03-24	Background	N30-BACKGROUND-032410	2.55	8.23	29.1
C27A	335824	12350	D14746	2010-06-28	Background	C27A-SE BACK-062810	0.445	9.44	12.7
C28A	335970	6650	D14745	2010-06-28	Background	C28A-BACKGROUND-062810	0.243	9.6	24.2
G29	335573	3380	D14851	2010-06-29	Background	G29-SE BACK-062910	4.81	9.11	20
A28B	335804	10040	L473791	2010-08-12	Background	A28B-N BACK-081210	NT	NT	39
C28	335970	7300	L536189	2011-09-14	Background	C28-BGS-091411	NT	NT	22
G29	335573	3380	L1457192	2022-02-01	Background	20220201-G29-MW01(60-62')	0.204	8.4	20.8

Table A – Arsenic, pH, and EC values from a selection of historical background soil samples from locations within the East Fork of North Parachute Ranch (NPR), east and west of the Site.

CONCLUSIONS AND RECOMMENDATIONS

Based on the information presented in the pathway to groundwater discussion above, Entrada asserts that there is no clear direct pathway to groundwater at the Site, and therefore confirmation soil samples from the excavation should be evaluated against CECMC Table 915-1 RSSLs and SSRs.

Soil analytical results identified subsurface concentrations of arsenic and hexavalent chromium above CECMC Table 915-1 RSSLs in all samples, and pH and EC values above Table 915-1 SSRs in select samples.

The concentrations of hexavalent chromium identified were below the laboratory RDL of 1.00 mg/kg in all samples, which is above the Table 915-1 RSSL of 0.3 mg/kg. These exceedances should be addressed under Table 915 Footnote 9.


In the discussion above, we have established from historical background soil data that the naturally occurring levels for EC, pH, and arsenic found in the soil of the East Fork of North Parachute Ranch are elevate with respect to Table 915-1 RSSLs standards, often in excess of the values reported in the excavation clearance samples (**Table A, Table 2**). These exceedances should be addressed under Table 915 Footnote 1.

Based on field screening and soil sampling activities completed at the site and laboratory analytical data presented herein, Entrada recommends that Caerus pursue closure of Release Number 485140 with the CECMC.

We appreciate the opportunity to assist Caerus Oil and Gas LLC. Please contact us at (970) 270-2986 if you have any questions.

Sincerely,

ENTRADA CONSULTING GROUP



Christopher Mace
Senior Geologist

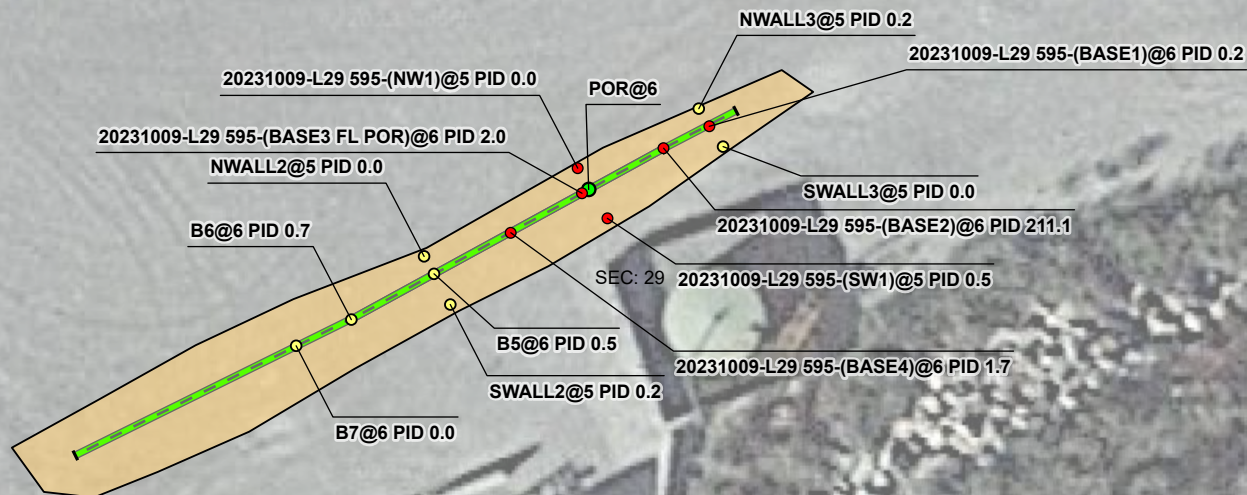


Tim Dobransky
Principal Scientist

Attachments:

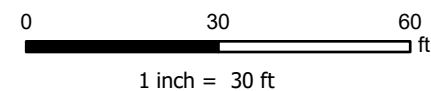
Figure 1 – Release Excavation Diagram
Figure 2 – Historical Background Soil Sample Locations
Table 1 – Soil Analytical Results – Organic
Table 2 – Soil Analytical Results – Inorganic
Photographic Log
Soil Laboratory Analytical Reports
Historical Background Soil Analytical Reports

FIGURES



LEGEND

- Soil Sample Location
- Field Screening Location
- Spill Origin
- Flowline
- Excavation



Project No: 023-109

Map By: NDB

Date: 11/9/2023

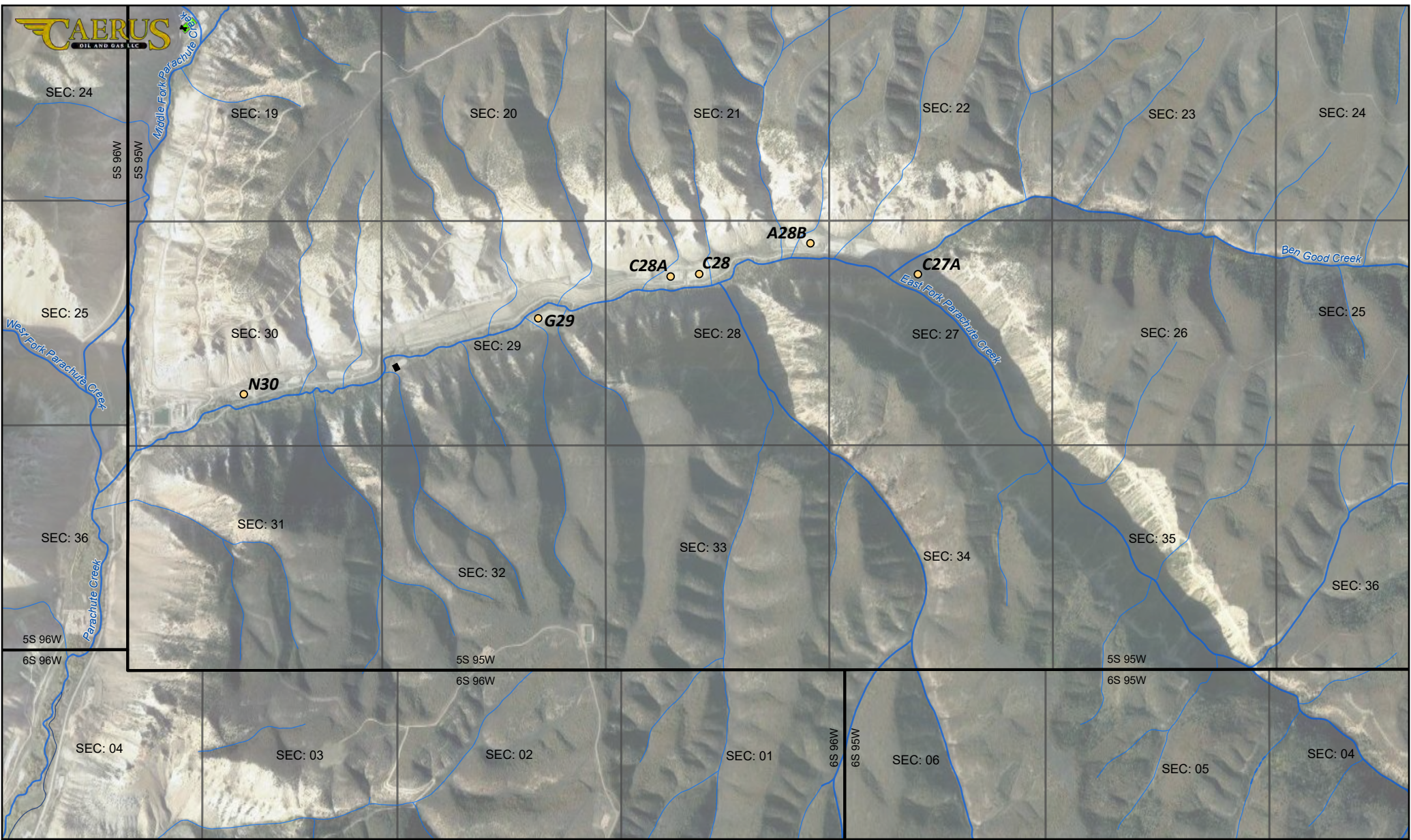
L29 595 (6A-32) Flow Line Release Site Diagram
Caerus Oil and Gas, LLC
NWSW, Section 29, T5S R95W, 6th PM
Garfield County, Colorado



330 Grand Avenue, Unit C
Grand Junction, CO 81501
970-579-1015

Figure

1



<p>Project No: 020-035</p> <p>Map By: NDB</p> <p>Date: 11/9/2023</p>	<p>North Parachute Ranch – East Fork Historical Background Soil Sample Locations</p> <p>Caerus Oil and Gas LLC Sections 27-30, T5S R95W, 6th PM Garfield County, Colorado</p>	<p>ENTRADA CONSULTING GROUP</p> <p>330 Grand Avenue, Unit C Grand Junction, CO 81501 970-579-1015</p>	<p>Figure</p> <p>2</p>
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TABLES

TABLE 1

L29 595
CAERUS OPERATING LLC
GARFIELD COUNTY, COLORADO

L29 595 6A-32 FLOWLINE RELEASE
RESIDENTIAL SOIL SCREENING LEVEL
SOIL ANALYTICAL RESULTS - ORGANIC

PROTECTION OF GROUNDWATER SOIL SCREENING LEVEL CONCENTRATION (mg/Kg)						Contaminants of Concern				Organic Compounds in Soil																					
RESIDENTIAL SOIL SCREENING LEVEL CONCENTRATION (mg/Kg)						500 mg/Kg				0.0025	0.69	0.78	9.9	0.0081	0.0087	0.55	5.8	0.011	0.3	2.9	0.24	9	0.096	5.9	0.54	0.98	0.006	0.019	0.0038	1.3	
Location	Location ID	Lab Report #	Sample Date	Project Area	Sample ID	TPH (total volatile [C ₆ - C ₁₀] and extractable [C ₁₁ - C ₄₀] hydrocarbons)	TPH - GRO [C8 - C10] Low Fraction	TPH - DRO [C10 - C28] High Fraction	TPH - ORO [C28 - C38] Oil Fraction	Benzene	Toluene	Ethylbenzene	Xylenes (sum of o-, m-, and p-isomers = total xylenes)	1,2,4-trimethylbenzene	1,3,5-trimethylbenzene	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-cd)pyrene	1-methylnaphthalene	2-methylnaphthalene	Naphthalene	Pyrene	
L29 595	335607	L1665260	2023-10-09	Excavation	20231009-L29 595-(BASE1)@6	185.57	0.267	64	121	0.00107	0.00768	<0.00250	0.017	<0.00500	0.00765	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	0.024	0.0671	0.0478	<0.00600	
L29 595	335607	L1665260	2023-10-09	Excavation	20231009-L29 595-(BASE2)@6	264.84	4.84	116.0	144	0.00428	0.0285	0.0087	0.162	0.0148	0.355	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	0.0643	0.162	0.152	<0.00600	
L29 595	335607	L1665260	2023-10-09	Excavation	20231009-L29 595-(BASE3 FL POR)@6	141.26	0.256	48.2	92.8	0.00107	0.00528	<0.00250	0.0136	<0.00500	0.0132	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.0200	<0.0200	<0.0200	<0.00600	
L29 595	335607	L1665260	2023-10-09	Excavation	20231009-L29 595-(BASE4)@6	186.72	0.216	74.5	112	<0.00100	<0.00500	<0.00250	0.00765	<0.00500	0.00838	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.0200	<0.0200	<0.0200	<0.00600	
L29 595	335607	L1665260	2023-10-09	Excavation	20231009-L29 595-(NW1)@5	118.58	0.178	33.70	84.70	<0.00100	<0.00500	<0.00250	0.00765	<0.00500	0.00933	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.0200	<0.0200	<0.0200	<0.00600	
L29 595	335607	L1665260	2023-10-09	Excavation	20231009-L29 595-(SW1)@5	134.60	0.20	49.80	84.60	<0.00100	<0.00500	<0.00250	0.00800	<0.00500	0.0411	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.0200	<0.0200	<0.0200	<0.00600	
L29 595	335607	L1665262	2023-10-09	Spoils	20231009-L29 595-(SPOILS1)@1	59.40	0.202	19.1	40.1	<0.00100	<0.00500	<0.00250	<0.00650	<0.00500	<0.00500	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.0200	<0.0200	<0.0200	<0.00600	
L29 595	335607	L1665262	2023-10-09	Spoils	20231009-L29 595-(SPOILS2)@1	35.46	0.161	11	25	<0.00100	<0.00500	<0.00250	<0.00650	<0.00500	<0.00500	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.0200	<0.0200	<0.0200	<0.00600	
G29	335573	L1457192	2022-02-01	Background	20220201-G29-MW01(60-62')	412.75	0.35	99.40	313	<0.00100	<0.00500	<0.00250	<0.00650	<0.00500	<0.00500	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.0200	<0.0200	<0.0200	<0.00600	
A28B	335804	L473791	2010-08-12	Background	A28B-N BACK-081210	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
C27A	335824	D14746	2010-06-28	Background	C27A-SE BACK-062810	65.70	NT	66	NT	ND	ND	ND	ND	NT	NT	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
C28A	335970	D14745	2010-06-28	Background	C28A-BACKGROUND-062810	62.30	ND	62	NT	ND	ND	ND	ND	NT	NT	ND	ND	ND	ND	ND	ND	0.0271	ND	ND	ND	ND	ND	ND	ND	ND	0.0136
C28	335970	L536189	2011-09-14	Background	C28-BGS-091411	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
G29	335573	D14851	2010-06-29	Background	G29-SE BACK-062910	ND	ND	ND	NT	ND	ND	ND	ND	NT	NT	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
N30	335670	T49818	2010-03-24	Background	N30-BACKGROUND-032410	32.55	0.849	32	NT	ND	ND	ND	ND	NT	NT	ND	ND	ND	ND	ND	ND	ND	ND	0.0026	ND	ND	0.0021	0.0061	0.0068	ND	ND

Notes:

mg/kg - milligrams per kilogram

mmhos/cm - millimhos per centimeter

mg/L - milligrams per liter

ND = analyte was not detected, NT = sample was not tested for this analyte

TPH = total petroleum hydrocarbons

*< indicates result is below the laboratory minimum reporting limit (RDL)

BLACK - indicates result is above the applicable Table 915-1 Residential Soil Screening Level

TABLE 2

L29 595
CAERUS OPERATING LLC
GARFIELD COUNTY, COLORADO

L29 595 6A-32 FLOWLINE RELEASE
RESIDENTIAL SOIL SCREENING LEVEL
SOIL ANALYTICAL RESULTS - INORGANIC

PROTECTION OF GROUNDWATER SOIL SCREENING LEVEL CONCENTRATION (mg/Kg)						Soil Suitability for Reclamation				Metals in Soil									
						<4.0 mmhos/cm	<6	6 – 8.3	2 mg/L	0.29	82	0.38	0.00067	46	14	26	0.26	0.8	370
RESIDENTIAL SOIL SCREENING LEVEL CONCENTRATION (mg/Kg)										0.68	15000	71	0.3	3100	400	1500	390	390	23000
Location	Location ID	Lab Report #	Sample Date	Project Area	Sample ID	Electrical Conductivity (EC) (by saturated paste method)	Sodium Adsorption Ratio (SAR) by saturated paste method)	pH (by saturated paste method)	Boron (hot water soluble soil extract)	Arsenic	Barium	Cadmium	Chromium (VI)	Copper	Lead	Nickel	Selenium	Silver	Zinc
L29 595	335607	L1665260	2023-10-09	Excavation	20231009-L29 595-(BASE1)@6	3.48	3.43	7.99	1.21	21.1	926	<1.00	<1.00	19.6	18.8	18.3	<2.50	<0.500	54.7
L29 595	335607	L1665260	2023-10-09	Excavation	20231009-L29 595-(BASE2)@6	4.52	5.91	8.38	1.11	12.2	1290	<1.00	<1.00	26.2	11.1	23.1	<2.50	<0.500	57.8
L29 595	335607	L1665260	2023-10-09	Excavation	20231009-L29 595-(BASE3 FL POR)@6	3.32	4.51	8.85	1.38	13.2	1180	<1.00	<1.00	17.3	13	17.9	<2.50	<0.500	54.8
L29 595	335607	L1665260	2023-10-09	Excavation	20231009-L29 595-(BASE4)@6	3.42	4.08	8.19	1.45	12.4	2300	<1.00	<1.00	19.9	12.6	18.4	<2.50	<0.500	53.7
L29 595	335607	L1665260	2023-10-09	Excavation	20231009-L29 595-(NW1)@5	2.87	5.67	8.42	1.01	15.6	515	<1.00	<1.00	20	13.4	18.5	<2.50	<0.500	56.1
L29 595	335607	L1665260	2023-10-09	Excavation	20231009-L29 595-(SW1)@5	1.73	4.38	8.46	0.868	17.9	975	<1.00	<1.00	19.5	12.8	19.5	<2.50	<0.500	60.5
L29 595	335607	L1665262	2023-10-09	Spoils	20231009-L29 595-(SPOILS1)@1	0.649	4.87	8.86	0.797	10.4	1620	<1.00	<1.00	16.6	11.6	13.8	<2.50	<0.500	45
L29 595	335607	L1665262	2023-10-09	Spoils	20231009-L29 595-(SPOILS2)@1	0.57	4.43	8.8	0.858	9.51	1480	<1.00	<1.00	14.2	10.3	14.2	<2.50	<0.500	46.4
G29	335573	L1457192	2022-02-01	Background	20220201-G29-MW01(60-62')	0.204	1.14	8.4	<0.200	20.8	234	<0.500	<1.00	21.9	14.1	15	<2.00	<1.00	46
A28B	335804	L473791	2010-08-12	Background	A28B-N BACK-081210	NT	NT	NT	NT	39	NT	NT	NT	NT	NT	NT	NT	NT	NT
C27A	335824	D14746	2010-06-28	Background	C27A-SE BACK-062810	0.445	2.96	9.44	NT	12.7	265	BDL	BDL	20.4	12	14	BDL	BDL	45.2
C28A	335970	D14745	2010-06-28	Background	C28A-BACKGROUND-062810	0.243	1.01	9.6	NT	24.2	344	BDL	BDL	32.9	17.7	18.1	BDL	BDL	54.1
C28	335970	L536189	2011-09-14	Background	C28-BGS-091411	NT	NT	NT	NT	22	NT	NT	NT	NT	NT	NT	NT	NT	NT
G29	335573	D14851	2010-06-29	Background	G29-SE BACK-062910	4.81	2.77	9.11	NT	20	297	BDL	BDL	22.4	13	17	BDL	BDL	51.4
N30	335670	T49818	2010-03-24	Background	N30-BACKGROUND-032410	2.55	3.72	8.23	NT	29.1	800	0.52	2	32.5	17.6	19.9	1.7	0.05	67

Notes:

mg/kg - milligrams per kilogram

mmhos/cm - millimhos per centimeter

mg/L - milligrams per liter


ND = analyte was not detected, NT = sample was not tested for this analyte


TPH - total petroleum hydrocarbons

"<" indicates result is below the laboratory minimum reporting limit (RDL)

BLACK - indicates result is above the applicable Table 915-1 Residential Soil Screening Level

PHOTOGRAPHIC LOG

<p>Site: L29 595</p>	<p>Project Name: L29 595 Flowline Release</p>	<p>Project Number: 023-109</p>
<p>Date: 2023-10-09</p> <p>Location: East end of excavation.</p> <p>Description: View looking west.</p>		
<p>Date: 2023-10-09</p> <p>Location: West end of excavation.</p> <p>Description: View looking east.</p>		

<p>Site: L29 595</p>	<p>Project Name: L29 595 Flowline Release</p>	<p>Project Number: 023-109</p>
<p>Date: 2023-10-09</p> <p>Location: L29 flowline excavation</p> <p>Description: View of failed section of pipe.</p>		

SOIL


LABORATORY ANALYTICAL REPORTS

October 19, 2023

Caerus Oil and Gas

Sample Delivery Group: L1665260
Samples Received: 10/11/2023
Project Number:
Description: L29-595 Flowline (6A-32)
Site: L29 595
Report To: Jake J. / Brett M. / Blair R. / Andy V.
143 Diamond Avenue
Parachute, CO 81635

Entire Report Reviewed By:



Chris Ward
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.

Pace Analytical National

12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 www.pacenational.com

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SAMPLE SUMMARY

20231009-L29 595-(BASE1)@6 L1665260-01 Solid

Collected by
C. Mace

Collected date/time
10/09/23 10:00

Received date/time
10/11/23 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG2151262	1	10/18/23 15:31	10/18/23 15:31	DJS	Mt. Juliet, TN
Wet Chemistry by Method 7199	WG2151300	1	10/14/23 09:10	10/18/23 12:56	SET	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG2151622	1	10/15/23 09:58	10/17/23 12:42	ARD	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG2151272	1	10/14/23 08:10	10/14/23 10:04	NTG	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG2151263	1	10/17/23 11:20	10/17/23 21:18	DJS	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2151032	5	10/14/23 06:30	10/17/23 11:35	SJM	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG2150388	1	10/12/23 13:23	10/13/23 05:41	NCD	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG2150412	1	10/12/23 13:23	10/13/23 02:03	DWR	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015M	WG2152430	5	10/17/23 05:05	10/17/23 11:51	KAP	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG2152435	1	10/17/23 16:39	10/18/23 01:26	JCH	Mt. Juliet, TN

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

20231009-L29 595-(BASE2)@6 L1665260-02 Solid

Collected by
C. Mace

Collected date/time
10/09/23 10:10

Received date/time
10/11/23 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG2151262	1	10/18/23 15:39	10/18/23 15:39	DJS	Mt. Juliet, TN
Wet Chemistry by Method 7199	WG2151300	1	10/14/23 09:10	10/18/23 13:02	SET	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG2151629	1	10/15/23 10:23	10/15/23 14:00	BJM	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG2151272	1	10/14/23 08:10	10/14/23 10:04	NTG	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG2151263	1	10/17/23 11:20	10/17/23 21:22	DJS	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2151032	10	10/14/23 06:30	10/17/23 15:26	SJM	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2151032	5	10/14/23 06:30	10/17/23 11:38	SJM	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG2150388	1	10/12/23 13:23	10/13/23 06:05	NCD	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG2150412	1	10/12/23 13:23	10/13/23 02:24	DWR	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015M	WG2152430	5	10/17/23 05:05	10/17/23 12:28	KAP	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG2152435	1	10/17/23 16:39	10/18/23 01:44	JCH	Mt. Juliet, TN

⁷Gl

⁸Al

⁹Sc

20231009-L29 595-(BASE3 FL POR)@6 L1665260-03 Solid

Collected by
C. Mace

Collected date/time
10/09/23 10:20

Received date/time
10/11/23 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG2151262	1	10/18/23 15:42	10/18/23 15:42	DJS	Mt. Juliet, TN
Wet Chemistry by Method 7199	WG2151300	1	10/14/23 09:10	10/18/23 13:07	SET	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG2151629	1	10/15/23 10:23	10/15/23 14:00	BJM	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG2151272	1	10/14/23 08:10	10/14/23 10:04	NTG	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG2151263	1	10/17/23 11:20	10/17/23 21:25	DJS	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2151032	10	10/14/23 06:30	10/17/23 15:29	SJM	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2151032	5	10/14/23 06:30	10/17/23 11:41	SJM	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG2150388	1	10/12/23 13:23	10/13/23 06:30	NCD	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG2150412	1	10/12/23 13:23	10/13/23 02:46	DWR	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015M	WG2152430	1	10/17/23 05:05	10/17/23 11:27	KAP	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG2152435	1	10/17/23 16:39	10/18/23 02:02	JCH	Mt. Juliet, TN

20231009-L29 595-(BASE4)@6 L1665260-04 Solid

Collected by
C. Mace

Collected date/time
10/09/23 10:30

Received date/time
10/11/23 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG2151262	1	10/18/23 15:45	10/18/23 15:45	DJS	Mt. Juliet, TN
Wet Chemistry by Method 7199	WG2151300	1	10/14/23 09:10	10/18/23 13:12	SET	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG2151629	1	10/15/23 10:23	10/15/23 14:00	BJM	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG2151272	1	10/14/23 08:10	10/14/23 10:04	NTG	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG2151263	1	10/17/23 11:20	10/17/23 21:28	DJS	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2151032	20	10/14/23 06:30	10/17/23 15:32	SJM	Mt. Juliet, TN

SAMPLE SUMMARY

20231009-L29 595-(BASE4)@6 L1665260-04 Solid

Collected by
C. Mace

Collected date/time
10/09/23 10:30

Received date/time
10/11/23 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Metals (ICPMS) by Method 6020	WG2151032	5	10/14/23 06:30	10/17/23 11:45	JDG	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG2150388	1	10/12/23 13:23	10/13/23 06:54	NCD	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG2150412	1	10/12/23 13:23	10/13/23 03:07	DWR	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015M	WG2152430	1	10/17/23 05:05	10/17/23 11:27	KAP	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG2152435	1	10/17/23 16:39	10/18/23 02:20	JCH	Mt. Juliet, TN



20231009-L29 595-(NW1)@5 L1665260-05 Solid

Collected by
C. Mace

Collected date/time
10/09/23 11:10

Received date/time
10/11/23 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG2151262	1	10/18/23 15:48	10/18/23 15:48	DJS	Mt. Juliet, TN
Wet Chemistry by Method 7199	WG2151300	1	10/14/23 09:10	10/18/23 13:17	SET	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG2151629	1	10/15/23 10:23	10/15/23 14:00	BJM	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG2151272	1	10/14/23 08:10	10/14/23 10:04	NTG	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG2151263	1	10/17/23 11:20	10/17/23 21:31	DJS	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2151032	5	10/14/23 06:30	10/17/23 11:48	SJM	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG2150394	1	10/12/23 13:23	10/13/23 01:36	AV	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG2150415	1	10/12/23 13:23	10/12/23 21:55	ADM	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015M	WG2152430	1	10/17/23 05:05	10/17/23 11:14	KAP	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG2152435	1	10/17/23 16:39	10/18/23 02:38	JCH	Mt. Juliet, TN



20231009-L29 595-(SW1)@5 L1665260-06 Solid

Collected by
C. Mace

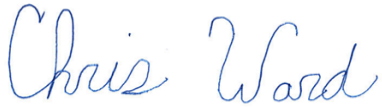
Collected date/time
10/09/23 11:40

Received date/time
10/11/23 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG2151262	1	10/18/23 15:51	10/18/23 15:51	DJS	Mt. Juliet, TN
Wet Chemistry by Method 7199	WG2151300	1	10/14/23 09:10	10/18/23 13:22	SET	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG2151629	1	10/15/23 10:23	10/15/23 14:00	BJM	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG2151275	1	10/14/23 15:00	10/14/23 17:33	NTG	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG2151263	1	10/17/23 11:20	10/17/23 21:34	DJS	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2151032	10	10/14/23 06:30	10/17/23 15:43	SJM	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2151032	5	10/14/23 06:30	10/17/23 11:51	SJM	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG2150394	1	10/12/23 13:23	10/13/23 01:59	AV	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG2150415	1	10/12/23 13:23	10/12/23 22:14	ADM	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015M	WG2152431	1	10/17/23 05:00	10/17/23 09:41	KAP	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG2152435	1	10/17/23 16:39	10/18/23 02:56	JCH	Mt. Juliet, TN

CASE NARRATIVE

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.



Chris Ward
Project Manager

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	3.43		1	10/18/2023 15:31	WG2151262

Wet Chemistry by Method 7199

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Hexavalent Chromium	U		0.255	1.00	1	10/18/2023 12:56	WG2151300

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	7.99	T8	1	10/17/2023 12:42	WG2151622

Sample Narrative:
L1665260-01 WG2151622: 7.99 at 20.6C

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	3480		10.0	1	10/14/2023 10:04	WG2151272

Sample Narrative:
L1665260-01 WG2151272: at 25C

Metals (ICP) by Method 6010B-NE493 Ch 2

Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
Hot Water Sol. Boron	1.21		0.0167	0.200	1	10/17/2023 21:18	WG2151263

Metals (ICPMS) by Method 6020

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	21.1		0.100	1.00	5	10/17/2023 11:35	WG2151032
Barium	926		0.152	2.50	5	10/17/2023 11:35	WG2151032
Cadmium	0.437	B J	0.0855	1.00	5	10/17/2023 11:35	WG2151032
Copper	19.6		0.132	5.00	5	10/17/2023 11:35	WG2151032
Lead	18.8		0.0990	2.00	5	10/17/2023 11:35	WG2151032
Nickel	18.3		0.197	2.50	5	10/17/2023 11:35	WG2151032
Selenium	0.691	B J	0.180	2.50	5	10/17/2023 11:35	WG2151032
Silver	0.112	J	0.0865	0.500	5	10/17/2023 11:35	WG2151032
Zinc	54.7		0.740	25.0	5	10/17/2023 11:35	WG2151032

Volatile Organic Compounds (GC) by Method 8015D/GRO

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	0.267		0.0217	0.100	1	10/13/2023 05:41	WG2150388
(S) a,a,a-Trifluorotoluene(FID)	90.1			77.0-120		10/13/2023 05:41	WG2150388

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	0.00107		0.000467	0.00100	1	10/13/2023 02:03	WG2150412
Toluene	0.00768		0.00130	0.00500	1	10/13/2023 02:03	WG2150412
Ethylbenzene	U		0.000737	0.00250	1	10/13/2023 02:03	WG2150412
Xylenes, Total	0.0170		0.000880	0.00650	1	10/13/2023 02:03	WG2150412
1,2,4-Trimethylbenzene	0.00397	J	0.00158	0.00500	1	10/13/2023 02:03	WG2150412
1,3,5-Trimethylbenzene	0.00765		0.00200	0.00500	1	10/13/2023 02:03	WG2150412
(S) Toluene-d8	99.9			75.0-131		10/13/2023 02:03	WG2150412
(S) 4-Bromofluorobenzene	99.4			67.0-138		10/13/2023 02:03	WG2150412
(S) 1,2-Dichloroethane-d4	102			70.0-130		10/13/2023 02:03	WG2150412

Semi-Volatile Organic Compounds (GC) by Method 8015M

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	64.3		8.05	20.0	5	10/17/2023 11:51	WG2152430
C28-C36 Motor Oil Range	121		1.37	20.0	5	10/17/2023 11:51	WG2152430
(S) o-Terphenyl	55.8			18.0-148		10/17/2023 11:51	WG2152430

Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Acenaphthene	U		0.00209	0.00600	1	10/18/2023 01:26	WG2152435
Anthracene	U		0.00230	0.00600	1	10/18/2023 01:26	WG2152435
Benzo(a)anthracene	U		0.00173	0.00600	1	10/18/2023 01:26	WG2152435
Benzo(b)fluoranthene	U		0.00153	0.00600	1	10/18/2023 01:26	WG2152435
Benzo(k)fluoranthene	U		0.00215	0.00600	1	10/18/2023 01:26	WG2152435
Benzo(a)pyrene	U		0.00179	0.00600	1	10/18/2023 01:26	WG2152435
Chrysene	U		0.00232	0.00600	1	10/18/2023 01:26	WG2152435
Dibenz(a,h)anthracene	U		0.00172	0.00600	1	10/18/2023 01:26	WG2152435
Fluoranthene	U		0.00227	0.00600	1	10/18/2023 01:26	WG2152435
Fluorene	U		0.00205	0.00600	1	10/18/2023 01:26	WG2152435
Indeno(1,2,3-cd)pyrene	U		0.00181	0.00600	1	10/18/2023 01:26	WG2152435
1-Methylnaphthalene	0.0240		0.00449	0.0200	1	10/18/2023 01:26	WG2152435
2-Methylnaphthalene	0.0671		0.00427	0.0200	1	10/18/2023 01:26	WG2152435
Naphthalene	0.0478		0.00408	0.0200	1	10/18/2023 01:26	WG2152435
Pyrene	U		0.00200	0.00600	1	10/18/2023 01:26	WG2152435
(S) p-Terphenyl-d14	75.0			23.0-120		10/18/2023 01:26	WG2152435
(S) Nitrobenzene-d5	154	J1		14.0-149		10/18/2023 01:26	WG2152435
(S) 2-Fluorobiphenyl	90.5			34.0-125		10/18/2023 01:26	WG2152435

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Calculated Results

	Result	Qualifier	Dilution	Analysis date / time	Batch
Analyte	SAR				
Sodium Adsorption Ratio	5.91		1	10/18/2023 15:39	WG2151262

Wet Chemistry by Method 7199

	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Analyte							
Hexavalent Chromium	U		0.255	1.00	1	10/18/2023 13:02	WG2151300

Wet Chemistry by Method 9045D

	Result	Qualifier	Dilution	Analysis date / time	Batch
Analyte	pH				
pH	8.38	T8	1	10/15/2023 14:00	WG2151629

Sample Narrative:
L1665260-02 WG2151629: 8.38 at 20.4C

Wet Chemistry by Method 9050AMod

	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Analyte						
Specific Conductance	4520		10.0	1	10/14/2023 10:04	WG2151272

Sample Narrative:
L1665260-02 WG2151272: at 25C

Metals (ICP) by Method 6010B-NE493 Ch 2

	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
Analyte							
Hot Water Sol. Boron	1.11		0.0167	0.200	1	10/17/2023 21:22	WG2151263

Metals (ICPMS) by Method 6020

	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Analyte							
Arsenic	12.2		0.100	1.00	5	10/17/2023 11:38	WG2151032
Barium	1290		0.304	5.00	10	10/17/2023 15:26	WG2151032
Cadmium	0.431	B J	0.0855	1.00	5	10/17/2023 11:38	WG2151032
Copper	26.2		0.132	5.00	5	10/17/2023 11:38	WG2151032
Lead	11.1		0.0990	2.00	5	10/17/2023 11:38	WG2151032
Nickel	23.1		0.197	2.50	5	10/17/2023 11:38	WG2151032
Selenium	0.517	B J	0.180	2.50	5	10/17/2023 11:38	WG2151032
Silver	U		0.0865	0.500	5	10/17/2023 11:38	WG2151032
Zinc	57.8		0.740	25.0	5	10/17/2023 11:38	WG2151032

Volatile Organic Compounds (GC) by Method 8015D/GRO

	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Analyte							
TPH (GC/FID) Low Fraction	4.84		0.0217	0.100	1	10/13/2023 06:05	WG2150388
(S) a,a,a-Trifluorotoluene(FID)	91.3			77.0-120		10/13/2023 06:05	WG2150388

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	0.00428		0.000467	0.00100	1	10/13/2023 02:24	WG2150412
Toluene	0.0285		0.00130	0.00500	1	10/13/2023 02:24	WG2150412
Ethylbenzene	0.00870		0.000737	0.00250	1	10/13/2023 02:24	WG2150412
Xylenes, Total	0.162		0.000880	0.00650	1	10/13/2023 02:24	WG2150412
1,2,4-Trimethylbenzene	0.0148		0.00158	0.00500	1	10/13/2023 02:24	WG2150412
1,3,5-Trimethylbenzene	0.355		0.00200	0.00500	1	10/13/2023 02:24	WG2150412
(S) Toluene-d8	97.0			75.0-131		10/13/2023 02:24	WG2150412
(S) 4-Bromofluorobenzene	102			67.0-138		10/13/2023 02:24	WG2150412
(S) 1,2-Dichloroethane-d4	102			70.0-130		10/13/2023 02:24	WG2150412

Semi-Volatile Organic Compounds (GC) by Method 8015M

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	116		8.05	20.0	5	10/17/2023 12:28	WG2152430
C28-C36 Motor Oil Range	144		1.37	20.0	5	10/17/2023 12:28	WG2152430
(S) o-Terphenyl	45.6			18.0-148		10/17/2023 12:28	WG2152430

Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Acenaphthene	U		0.00209	0.00600	1	10/18/2023 01:44	WG2152435
Anthracene	U		0.00230	0.00600	1	10/18/2023 01:44	WG2152435
Benzo(a)anthracene	U		0.00173	0.00600	1	10/18/2023 01:44	WG2152435
Benzo(b)fluoranthene	U		0.00153	0.00600	1	10/18/2023 01:44	WG2152435
Benzo(k)fluoranthene	U		0.00215	0.00600	1	10/18/2023 01:44	WG2152435
Benzo(a)pyrene	U		0.00179	0.00600	1	10/18/2023 01:44	WG2152435
Chrysene	U		0.00232	0.00600	1	10/18/2023 01:44	WG2152435
Dibenz(a,h)anthracene	U		0.00172	0.00600	1	10/18/2023 01:44	WG2152435
Fluoranthene	U		0.00227	0.00600	1	10/18/2023 01:44	WG2152435
Fluorene	0.00350	J	0.00205	0.00600	1	10/18/2023 01:44	WG2152435
Indeno(1,2,3-cd)pyrene	U		0.00181	0.00600	1	10/18/2023 01:44	WG2152435
1-Methylnaphthalene	0.0643		0.00449	0.0200	1	10/18/2023 01:44	WG2152435
2-Methylnaphthalene	0.162		0.00427	0.0200	1	10/18/2023 01:44	WG2152435
Naphthalene	0.152		0.00408	0.0200	1	10/18/2023 01:44	WG2152435
Pyrene	U		0.00200	0.00600	1	10/18/2023 01:44	WG2152435
(S) p-Terphenyl-d14	64.6			23.0-120		10/18/2023 01:44	WG2152435
(S) Nitrobenzene-d5	150	J1		14.0-149		10/18/2023 01:44	WG2152435
(S) 2-Fluorobiphenyl	77.1			34.0-125		10/18/2023 01:44	WG2152435

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	4.51		1	10/18/2023 15:42	WG2151262

1
Cp

2
Tc

Wet Chemistry by Method 7199

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Hexavalent Chromium	U		0.255	1.00	1	10/18/2023 13:07	WG2151300

3
Ss

4
Cn

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	8.85	T8	1	10/15/2023 14:00	WG2151629

5
Sr

6
Qc

Sample Narrative:

L1665260-03 WG2151629: 8.85 at 20.3C

7
Gl

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	3320		10.0	1	10/14/2023 10:04	WG2151272

8
Al

9
Sc

Sample Narrative:

L1665260-03 WG2151272: at 25C

Metals (ICP) by Method 6010B-NE493 Ch 2

Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
Hot Water Sol. Boron	1.38		0.0167	0.200	1	10/17/2023 21:25	WG2151263

Metals (ICPMS) by Method 6020

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	13.2		0.100	1.00	5	10/17/2023 11:41	WG2151032
Barium	1180		0.304	5.00	10	10/17/2023 15:29	WG2151032
Cadmium	0.360	B J	0.0855	1.00	5	10/17/2023 11:41	WG2151032
Copper	17.3		0.132	5.00	5	10/17/2023 11:41	WG2151032
Lead	13.0		0.0990	2.00	5	10/17/2023 11:41	WG2151032
Nickel	17.9		0.197	2.50	5	10/17/2023 11:41	WG2151032
Selenium	0.605	B J	0.180	2.50	5	10/17/2023 11:41	WG2151032
Silver	U		0.0865	0.500	5	10/17/2023 11:41	WG2151032
Zinc	54.8		0.740	25.0	5	10/17/2023 11:41	WG2151032

Volatile Organic Compounds (GC) by Method 8015D/GRO

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	0.256		0.0217	0.100	1	10/13/2023 06:30	WG2150388
(S) a,a,a-Trifluorotoluene(FID)	89.9			77.0-120		10/13/2023 06:30	WG2150388

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	0.00107		0.000467	0.00100	1	10/13/2023 02:46	WG2150412
Toluene	0.00528		0.00130	0.00500	1	10/13/2023 02:46	WG2150412
Ethylbenzene	U		0.000737	0.00250	1	10/13/2023 02:46	WG2150412
Xylenes, Total	0.0136		0.000880	0.00650	1	10/13/2023 02:46	WG2150412
1,2,4-Trimethylbenzene	0.00305	J	0.00158	0.00500	1	10/13/2023 02:46	WG2150412
1,3,5-Trimethylbenzene	0.0132		0.00200	0.00500	1	10/13/2023 02:46	WG2150412
(S) Toluene-d8	100			75.0-131		10/13/2023 02:46	WG2150412
(S) 4-Bromofluorobenzene	101			67.0-138		10/13/2023 02:46	WG2150412
(S) 1,2-Dichloroethane-d4	101			70.0-130		10/13/2023 02:46	WG2150412

Semi-Volatile Organic Compounds (GC) by Method 8015M

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	48.2		1.61	4.00	1	10/17/2023 11:27	WG2152430
C28-C36 Motor Oil Range	92.8		0.274	4.00	1	10/17/2023 11:27	WG2152430
(S) o-Terphenyl	72.2			18.0-148		10/17/2023 11:27	WG2152430

Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Acenaphthene	U		0.00209	0.00600	1	10/18/2023 02:02	WG2152435
Anthracene	U		0.00230	0.00600	1	10/18/2023 02:02	WG2152435
Benzo(a)anthracene	U		0.00173	0.00600	1	10/18/2023 02:02	WG2152435
Benzo(b)fluoranthene	U		0.00153	0.00600	1	10/18/2023 02:02	WG2152435
Benzo(k)fluoranthene	U		0.00215	0.00600	1	10/18/2023 02:02	WG2152435
Benzo(a)pyrene	U		0.00179	0.00600	1	10/18/2023 02:02	WG2152435
Chrysene	U		0.00232	0.00600	1	10/18/2023 02:02	WG2152435
Dibenz(a,h)anthracene	U		0.00172	0.00600	1	10/18/2023 02:02	WG2152435
Fluoranthene	U		0.00227	0.00600	1	10/18/2023 02:02	WG2152435
Fluorene	U		0.00205	0.00600	1	10/18/2023 02:02	WG2152435
Indeno(1,2,3-cd)pyrene	U		0.00181	0.00600	1	10/18/2023 02:02	WG2152435
1-Methylnaphthalene	U		0.00449	0.0200	1	10/18/2023 02:02	WG2152435
2-Methylnaphthalene	0.0122	J	0.00427	0.0200	1	10/18/2023 02:02	WG2152435
Naphthalene	0.00538	J	0.00408	0.0200	1	10/18/2023 02:02	WG2152435
Pyrene	U		0.00200	0.00600	1	10/18/2023 02:02	WG2152435
(S) p-Terphenyl-d14	69.7			23.0-120		10/18/2023 02:02	WG2152435
(S) Nitrobenzene-d5	114			14.0-149		10/18/2023 02:02	WG2152435
(S) 2-Fluorobiphenyl	84.0			34.0-125		10/18/2023 02:02	WG2152435

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Calculated Results

	Result	Qualifier	Dilution	Analysis date / time	Batch
Analyte	SAR				
Sodium Adsorption Ratio	4.08		1	10/18/2023 15:45	WG2151262

Wet Chemistry by Method 7199

	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Analyte							
Hexavalent Chromium	U		0.255	1.00	1	10/18/2023 13:12	WG2151300

Wet Chemistry by Method 9045D

	Result	Qualifier	Dilution	Analysis date / time	Batch
Analyte	pH				
pH	8.19	T8	1	10/15/2023 14:00	WG2151629

Sample Narrative:

L1665260-04 WG2151629: 8.19 at 20.4C

Wet Chemistry by Method 9050AMod

	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Analyte						
Specific Conductance	3420		10.0	1	10/14/2023 10:04	WG2151272

Sample Narrative:

L1665260-04 WG2151272: at 25C

Metals (ICP) by Method 6010B-NE493 Ch 2

	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
Analyte							
Hot Water Sol. Boron	1.45		0.0167	0.200	1	10/17/2023 21:28	WG2151263

Metals (ICPMS) by Method 6020

	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Analyte							
Arsenic	12.4		0.100	1.00	5	10/17/2023 11:45	WG2151032
Barium	2300		0.608	10.0	20	10/17/2023 15:32	WG2151032
Cadmium	0.494	B J	0.0855	1.00	5	10/17/2023 11:45	WG2151032
Copper	19.9		0.132	5.00	5	10/17/2023 11:45	WG2151032
Lead	12.6		0.0990	2.00	5	10/17/2023 11:45	WG2151032
Nickel	18.4		0.197	2.50	5	10/17/2023 11:45	WG2151032
Selenium	0.542	B J	0.180	2.50	5	10/17/2023 11:45	WG2151032
Silver	U		0.0865	0.500	5	10/17/2023 11:45	WG2151032
Zinc	53.7		0.740	25.0	5	10/17/2023 11:45	WG2151032

Volatile Organic Compounds (GC) by Method 8015D/GRO

	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Analyte							
TPH (GC/FID) Low Fraction	0.216		0.0217	0.100	1	10/13/2023 06:54	WG2150388
(S) a,a,a-Trifluorotoluene(FID)	92.2			77.0-120		10/13/2023 06:54	WG2150388

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	0.000625	U	0.000467	0.00100	1	10/13/2023 03:07	WG2150412
Toluene	0.00250	U	0.00130	0.00500	1	10/13/2023 03:07	WG2150412
Ethylbenzene	U		0.000737	0.00250	1	10/13/2023 03:07	WG2150412
Xylenes, Total	0.00765		0.000880	0.00650	1	10/13/2023 03:07	WG2150412
1,2,4-Trimethylbenzene	U		0.00158	0.00500	1	10/13/2023 03:07	WG2150412
1,3,5-Trimethylbenzene	0.00838		0.00200	0.00500	1	10/13/2023 03:07	WG2150412
(S) Toluene-d8	99.9			75.0-131		10/13/2023 03:07	WG2150412
(S) 4-Bromofluorobenzene	95.5			67.0-138		10/13/2023 03:07	WG2150412
(S) 1,2-Dichloroethane-d4	93.0			70.0-130		10/13/2023 03:07	WG2150412

Semi-Volatile Organic Compounds (GC) by Method 8015M

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	74.5		1.61	4.00	1	10/17/2023 11:27	WG2152430
C28-C36 Motor Oil Range	112		0.274	4.00	1	10/17/2023 11:27	WG2152430
(S) o-Terphenyl	50.0			18.0-148		10/17/2023 11:27	WG2152430

Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Acenaphthene	U		0.00209	0.00600	1	10/18/2023 02:20	WG2152435
Anthracene	U		0.00230	0.00600	1	10/18/2023 02:20	WG2152435
Benzo(a)anthracene	U		0.00173	0.00600	1	10/18/2023 02:20	WG2152435
Benzo(b)fluoranthene	U		0.00153	0.00600	1	10/18/2023 02:20	WG2152435
Benzo(k)fluoranthene	U		0.00215	0.00600	1	10/18/2023 02:20	WG2152435
Benzo(a)pyrene	U		0.00179	0.00600	1	10/18/2023 02:20	WG2152435
Chrysene	U		0.00232	0.00600	1	10/18/2023 02:20	WG2152435
Dibenz(a,h)anthracene	U		0.00172	0.00600	1	10/18/2023 02:20	WG2152435
Fluoranthene	U		0.00227	0.00600	1	10/18/2023 02:20	WG2152435
Fluorene	U		0.00205	0.00600	1	10/18/2023 02:20	WG2152435
Indeno(1,2,3-cd)pyrene	U		0.00181	0.00600	1	10/18/2023 02:20	WG2152435
1-Methylnaphthalene	0.00490	U	0.00449	0.0200	1	10/18/2023 02:20	WG2152435
2-Methylnaphthalene	0.0112	U	0.00427	0.0200	1	10/18/2023 02:20	WG2152435
Naphthalene	0.00519	U	0.00408	0.0200	1	10/18/2023 02:20	WG2152435
Pyrene	U		0.00200	0.00600	1	10/18/2023 02:20	WG2152435
(S) p-Terphenyl-d14	73.8			23.0-120		10/18/2023 02:20	WG2152435
(S) Nitrobenzene-d5	116			14.0-149		10/18/2023 02:20	WG2152435
(S) 2-Fluorobiphenyl	88.4			34.0-125		10/18/2023 02:20	WG2152435

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	5.67		1	10/18/2023 15:48	WG2151262

Wet Chemistry by Method 7199

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Hexavalent Chromium	U		0.255	1.00	1	10/18/2023 13:17	WG2151300

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	8.42	T8	1	10/15/2023 14:00	WG2151629

Sample Narrative:

L1665260-05 WG2151629: 8.42 at 20.2C

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	2870		10.0	1	10/14/2023 10:04	WG2151272

Sample Narrative:

L1665260-05 WG2151272: at 25C

Metals (ICP) by Method 6010B-NE493 Ch 2

Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
Hot Water Sol. Boron	1.01		0.0167	0.200	1	10/17/2023 21:31	WG2151263

Metals (ICPMS) by Method 6020

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	15.6		0.100	1.00	5	10/17/2023 11:48	WG2151032
Barium	515		0.152	2.50	5	10/17/2023 11:48	WG2151032
Cadmium	0.449	B J	0.0855	1.00	5	10/17/2023 11:48	WG2151032
Copper	20.0		0.132	5.00	5	10/17/2023 11:48	WG2151032
Lead	13.4		0.0990	2.00	5	10/17/2023 11:48	WG2151032
Nickel	18.5		0.197	2.50	5	10/17/2023 11:48	WG2151032
Selenium	0.596	B J	0.180	2.50	5	10/17/2023 11:48	WG2151032
Silver	U		0.0865	0.500	5	10/17/2023 11:48	WG2151032
Zinc	56.1		0.740	25.0	5	10/17/2023 11:48	WG2151032

Volatile Organic Compounds (GC) by Method 8015D/GRO

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	0.178		0.0217	0.100	1	10/13/2023 01:36	WG2150394
(S) a,a,a-Trifluorotoluene(FID)	81.5			77.0-120		10/13/2023 01:36	WG2150394

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	U		0.000467	0.00100	1	10/12/2023 21:55	WG2150415
Toluene	U		0.00130	0.00500	1	10/12/2023 21:55	WG2150415
Ethylbenzene	U		0.000737	0.00250	1	10/12/2023 21:55	WG2150415
Xylenes, Total	0.00238	<u>J</u>	0.000880	0.00650	1	10/12/2023 21:55	WG2150415
1,2,4-Trimethylbenzene	U		0.00158	0.00500	1	10/12/2023 21:55	WG2150415
1,3,5-Trimethylbenzene	0.00933		0.00200	0.00500	1	10/12/2023 21:55	WG2150415
(S) Toluene-d8	96.9			75.0-131		10/12/2023 21:55	WG2150415
(S) 4-Bromofluorobenzene	93.9			67.0-138		10/12/2023 21:55	WG2150415
(S) 1,2-Dichloroethane-d4	92.3			70.0-130		10/12/2023 21:55	WG2150415

Semi-Volatile Organic Compounds (GC) by Method 8015M

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	33.7		1.61	4.00	1	10/17/2023 11:14	WG2152430
C28-C36 Motor Oil Range	84.7		0.274	4.00	1	10/17/2023 11:14	WG2152430
(S) o-Terphenyl	42.5			18.0-148		10/17/2023 11:14	WG2152430

Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Acenaphthene	U		0.00209	0.00600	1	10/18/2023 02:38	WG2152435
Anthracene	U		0.00230	0.00600	1	10/18/2023 02:38	WG2152435
Benzo(a)anthracene	U		0.00173	0.00600	1	10/18/2023 02:38	WG2152435
Benzo(b)fluoranthene	U		0.00153	0.00600	1	10/18/2023 02:38	WG2152435
Benzo(k)fluoranthene	U		0.00215	0.00600	1	10/18/2023 02:38	WG2152435
Benzo(a)pyrene	U		0.00179	0.00600	1	10/18/2023 02:38	WG2152435
Chrysene	U		0.00232	0.00600	1	10/18/2023 02:38	WG2152435
Dibenz(a,h)anthracene	U		0.00172	0.00600	1	10/18/2023 02:38	WG2152435
Fluoranthene	U		0.00227	0.00600	1	10/18/2023 02:38	WG2152435
Fluorene	U		0.00205	0.00600	1	10/18/2023 02:38	WG2152435
Indeno(1,2,3-cd)pyrene	U		0.00181	0.00600	1	10/18/2023 02:38	WG2152435
1-Methylnaphthalene	U		0.00449	0.0200	1	10/18/2023 02:38	WG2152435
2-Methylnaphthalene	U		0.00427	0.0200	1	10/18/2023 02:38	WG2152435
Naphthalene	U		0.00408	0.0200	1	10/18/2023 02:38	WG2152435
Pyrene	U		0.00200	0.00600	1	10/18/2023 02:38	WG2152435
(S) p-Terphenyl-d14	63.4			23.0-120		10/18/2023 02:38	WG2152435
(S) Nitrobenzene-d5	75.8			14.0-149		10/18/2023 02:38	WG2152435
(S) 2-Fluorobiphenyl	75.4			34.0-125		10/18/2023 02:38	WG2152435

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Calculated Results

	Result	Qualifier	Dilution	Analysis date / time	Batch
Analyte	SAR				
Sodium Adsorption Ratio	4.38		1	10/18/2023 15:51	WG2151262

Wet Chemistry by Method 7199

	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Analyte							
Hexavalent Chromium	U		0.255	1.00	1	10/18/2023 13:22	WG2151300

Wet Chemistry by Method 9045D

	Result	Qualifier	Dilution	Analysis date / time	Batch
Analyte	pH				
pH	8.46	T8	1	10/15/2023 14:00	WG2151629

Sample Narrative:
L1665260-06 WG2151629: 8.46 at 20.3C

Wet Chemistry by Method 9050AMod

	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Analyte						
Specific Conductance	1730		10.0	1	10/14/2023 17:33	WG2151275

Sample Narrative:
L1665260-06 WG2151275: at 25C

Metals (ICP) by Method 6010B-NE493 Ch 2

	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
Analyte							
Hot Water Sol. Boron	0.868		0.0167	0.200	1	10/17/2023 21:34	WG2151263

Metals (ICPMS) by Method 6020

	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Analyte							
Arsenic	17.9		0.100	1.00	5	10/17/2023 11:51	WG2151032
Barium	975		0.304	5.00	10	10/17/2023 15:43	WG2151032
Cadmium	0.438	B J	0.0855	1.00	5	10/17/2023 11:51	WG2151032
Copper	19.5		0.132	5.00	5	10/17/2023 11:51	WG2151032
Lead	12.8		0.0990	2.00	5	10/17/2023 11:51	WG2151032
Nickel	19.5		0.197	2.50	5	10/17/2023 11:51	WG2151032
Selenium	0.565	B J	0.180	2.50	5	10/17/2023 11:51	WG2151032
Silver	U		0.0865	0.500	5	10/17/2023 11:51	WG2151032
Zinc	60.5		0.740	25.0	5	10/17/2023 11:51	WG2151032

Volatile Organic Compounds (GC) by Method 8015D/GRO

	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Analyte							
TPH (GC/FID) Low Fraction	0.195		0.0217	0.100	1	10/13/2023 01:59	WG2150394
(S) a,a,a-Trifluorotoluene(FID)	84.0			77.0-120		10/13/2023 01:59	WG2150394

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	U		0.000467	0.00100	1	10/12/2023 22:14	WG2150415
Toluene	0.00188	<u>L</u>	0.00130	0.00500	1	10/12/2023 22:14	WG2150415
Ethylbenzene	U		0.000737	0.00250	1	10/12/2023 22:14	WG2150415
Xylenes, Total	0.00800		0.000880	0.00650	1	10/12/2023 22:14	WG2150415
1,2,4-Trimethylbenzene	0.00288	<u>L</u>	0.00158	0.00500	1	10/12/2023 22:14	WG2150415
1,3,5-Trimethylbenzene	0.0411		0.00200	0.00500	1	10/12/2023 22:14	WG2150415
(S) Toluene-d8	97.5			75.0-131		10/12/2023 22:14	WG2150415
(S) 4-Bromofluorobenzene	94.4			67.0-138		10/12/2023 22:14	WG2150415
(S) 1,2-Dichloroethane-d4	92.4			70.0-130		10/12/2023 22:14	WG2150415

Semi-Volatile Organic Compounds (GC) by Method 8015M

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	49.8		1.61	4.00	1	10/17/2023 09:41	WG2152431
C28-C36 Motor Oil Range	84.6		0.274	4.00	1	10/17/2023 09:41	WG2152431
(S) o-Terphenyl	45.1			18.0-148		10/17/2023 09:41	WG2152431

Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Acenaphthene	U		0.00209	0.00600	1	10/18/2023 02:56	WG2152435
Anthracene	U		0.00230	0.00600	1	10/18/2023 02:56	WG2152435
Benzo(a)anthracene	U		0.00173	0.00600	1	10/18/2023 02:56	WG2152435
Benzo(b)fluoranthene	U		0.00153	0.00600	1	10/18/2023 02:56	WG2152435
Benzo(k)fluoranthene	U		0.00215	0.00600	1	10/18/2023 02:56	WG2152435
Benzo(a)pyrene	U		0.00179	0.00600	1	10/18/2023 02:56	WG2152435
Chrysene	U		0.00232	0.00600	1	10/18/2023 02:56	WG2152435
Dibenz(a,h)anthracene	U		0.00172	0.00600	1	10/18/2023 02:56	WG2152435
Fluoranthene	U		0.00227	0.00600	1	10/18/2023 02:56	WG2152435
Fluorene	U		0.00205	0.00600	1	10/18/2023 02:56	WG2152435
Indeno(1,2,3-cd)pyrene	U		0.00181	0.00600	1	10/18/2023 02:56	WG2152435
1-Methylnaphthalene	U		0.00449	0.0200	1	10/18/2023 02:56	WG2152435
2-Methylnaphthalene	U		0.00427	0.0200	1	10/18/2023 02:56	WG2152435
Naphthalene	U		0.00408	0.0200	1	10/18/2023 02:56	WG2152435
Pyrene	U		0.00200	0.00600	1	10/18/2023 02:56	WG2152435
(S) p-Terphenyl-d14	73.7			23.0-120		10/18/2023 02:56	WG2152435
(S) Nitrobenzene-d5	87.4			14.0-149		10/18/2023 02:56	WG2152435
(S) 2-Fluorobiphenyl	86.2			34.0-125		10/18/2023 02:56	WG2152435

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Method Blank (MB)

(MB) R3987920-1 10/18/23 11:42

	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	mg/kg		mg/kg	mg/kg
Hexavalent Chromium	U		0.255	1.00

L1665258-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1665258-03 10/18/23 12:30 • (DUP) R3987920-7 10/18/23 12:46

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	mg/kg	mg/kg		%		%
Hexavalent Chromium	U	U	1	0.000		20

L1665264-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1665264-03 10/18/23 13:28 • (DUP) R3987920-8 10/18/23 13:33

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	mg/kg	mg/kg		%		%
Hexavalent Chromium	0.838	1.22	1	37.5	P1	20

Laboratory Control Sample (LCS)

(LCS) R3987920-2 10/18/23 11:49

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	mg/kg	mg/kg	%	%	
Hexavalent Chromium	10.0	10.2	102	80.0-120	

L1665258-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1665258-01 10/18/23 11:59 • (MS) R3987920-3 10/18/23 12:05 • (MSD) R3987920-4 10/18/23 12:10

	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/kg	mg/kg	mg/kg	mg/kg	%	%		%			%	%
Hexavalent Chromium	20.0	U	2.93	4.34	14.7	21.7	1	75.0-125	J6	J3 J6	38.8	20

L1665258-01 Original Sample (OS) • Matrix Spike (MS)

(OS) L1665258-01 10/18/23 11:59 • (MS) R3987920-5 10/18/23 12:15

	Spike Amount	Original Result	MS Result	MS Rec.	Dilution	Rec. Limits	MS Qualifier
Analyte	mg/kg	mg/kg	mg/kg	%		%	
Hexavalent Chromium	641	U	784	122	50	75.0-125	

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

L1665118-07 Original Sample (OS) • Duplicate (DUP)

(OS) L1665118-07 10/17/23 12:42 • (DUP) R3987261-2 10/17/23 12:42

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	su		%		%
pH	7.96	7.94	1	0.252		1

Sample Narrative:
OS: 7.96 at 20.4C
DUP: 7.94 at 20.5C

L1665260-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1665260-01 10/17/23 12:42 • (DUP) R3987261-3 10/17/23 12:42

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	pH	su		%		%
pH	7.99	7.97	1	0.251		1

Sample Narrative:
OS: 7.99 at 20.6C
DUP: 7.97 at 20.6C

Laboratory Control Sample (LCS)

(LCS) R3987261-1 10/17/23 12:42

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	su	su	%	%	
pH	10.0	9.99	99.9	99.0-101	

Sample Narrative:
LCS: 9.99 at 20.6C

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

L1665108-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1665108-03 10/15/23 14:00 • (DUP) R3986385-2 10/15/23 14:00

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	su		%		%
pH	8.61	8.59	1	0.233		1

Sample Narrative:

OS: 8.61 at 21C

DUP: 8.59 at 21C

L1665108-13 Original Sample (OS) • Duplicate (DUP)

(OS) L1665108-13 10/15/23 14:00 • (DUP) R3986385-3 10/15/23 14:00

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	su		%		%
pH	8.49	8.47	1	0.236		1

Sample Narrative:

OS: 8.49 at 20.8C

DUP: 8.47 at 20.8C

Laboratory Control Sample (LCS)

(LCS) R3986385-1 10/15/23 14:00

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	su	su	%	%	
pH	10.0	10.0	100	99.0-101	

Sample Narrative:

LCS: 10 at 20.4C



Method Blank (MB)

(MB) R3986193-1 10/14/23 10:04

Analyte	MB Result umhos/cm	MB Qualifier	MB MDL umhos/cm	MB RDL umhos/cm
Specific Conductance	U		10.0	10.0

Sample Narrative:

BLANK: at 25C

L1665163-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1665163-03 10/14/23 10:04 • (DUP) R3986193-3 10/14/23 10:04

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	443	445	1	0.450		20

Sample Narrative:

OS: at 25C

DUP: at 25C

L1665276-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1665276-01 10/14/23 10:04 • (DUP) R3986193-4 10/14/23 10:04

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	53.1	50.2	1	5.61		20

Sample Narrative:

OS: at 25C

DUP: at 25C

Laboratory Control Sample (LCS)

(LCS) R3986193-2 10/14/23 10:04

Analyte	Spike Amount umhos/cm	LCS Result umhos/cm	LCS Rec. %	Rec. Limits %	LCS Qualifier
Specific Conductance	732	720	98.4	85.0-115	

Sample Narrative:

LCS: at 25C



Method Blank (MB)

(MB) R3986277-1 10/14/23 17:33

Analyte	MB Result umhos/cm	MB Qualifier	MB MDL umhos/cm	MB RDL umhos/cm
Specific Conductance	U		10.0	10.0

Sample Narrative:

BLANK: at 25C

L1665258-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1665258-01 10/14/23 17:33 • (DUP) R3986277-3 10/14/23 17:33

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	819	815	1	0.490		20

Sample Narrative:

OS: at 25C

DUP: at 25C

L1665264-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1665264-01 10/14/23 17:33 • (DUP) R3986277-4 10/14/23 17:33

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	424	423	1	0.236		20

Sample Narrative:

OS: at 25C

DUP: at 25C

Laboratory Control Sample (LCS)

(LCS) R3986277-2 10/14/23 17:33

Analyte	Spike Amount umhos/cm	LCS Result umhos/cm	LCS Rec. %	Rec. Limits %	LCS Qualifier
Specific Conductance	732	722	98.6	85.0-115	

Sample Narrative:

LCS: at 25C



Method Blank (MB)

(MB) R3987524-1 10/17/23 20:41

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Hot Water Sol. Boron	U		0.0167	0.200

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3987524-2 10/17/23 20:43 • (LCSD) R3987524-3 10/17/23 20:46

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Hot Water Sol. Boron	1.00	1.08	1.09	108	109	80.0-120			1.34	20

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

Method Blank (MB)

(MB) R3987190-1 10/17/23 10:43

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Arsenic	0.812	⬇	0.100	1.00
Barium	0.834	⬇	0.152	2.50
Cadmium	0.837	⬇	0.0855	1.00
Copper	0.795	⬇	0.133	5.00
Lead	0.790	⬇	0.0990	2.00
Selenium	0.974	⬇	0.180	2.50
Silver	U		0.0865	0.500
Zinc	1.29	⬇	0.740	25.0

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

Method Blank (MB)

(MB) R3987190-7 10/17/23 15:02

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Nickel	U		0.197	2.50

Laboratory Control Sample (LCS)

(LCS) R3987190-2 10/17/23 10:46

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Arsenic	100	106	106	80.0-120	
Barium	100	102	102	80.0-120	
Cadmium	100	105	105	80.0-120	
Copper	100	97.4	97.4	80.0-120	
Lead	100	100	100	80.0-120	
Selenium	100	119	119	80.0-120	
Silver	20.0	20.9	105	80.0-120	
Zinc	100	100	100	80.0-120	

Laboratory Control Sample (LCS)

(LCS) R3987190-8 10/17/23 15:06

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Nickel	100	93.2	93.2	80.0-120	

L1665389-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1665389-02 10/17/23 10:50 • (MS) R3987190-5 10/17/23 11:00 • (MSD) R3987190-6 10/17/23 11:03

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Arsenic	100	10.0	97.3	103	87.3	93.1	5	75.0-125			5.82	20
Barium	100	138	230	248	91.9	110	5	75.0-125			7.48	20
Cadmium	100	0.397	91.4	96.7	91.0	96.3	5	75.0-125			5.63	20
Copper	100	23.1	103	112	80.3	88.5	5	75.0-125			7.71	20
Lead	100	104	179	202	74.7	98.0	5	75.0-125	J6		12.3	20
Nickel	100	16.3	101	109	85.1	92.7	5	75.0-125			7.26	20
Selenium	100	2.80	109	114	106	111	5	75.0-125	E	E	4.72	20
Silver	20.0	U	18.1	19.3	90.7	96.4	5	75.0-125			6.03	20
Zinc	100	93.0	178	191	85.2	98.3	5	75.0-125			7.07	20

L1665389-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1665389-02 10/17/23 15:09 • (MS) R3987190-11 10/17/23 15:19 • (MSD) R3987190-12 10/17/23 15:22

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Nickel	100	16.4	104	106	87.5	89.6	5	75.0-125			2.07	20

1

Cp

2

Tc

3

Ss

4

Cn

5

Sr

6

Qc

7

Gl

8

Al

9

Sc

Method Blank (MB)

(MB) R3986853-2 10/12/23 22:21

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
TPH (GC/FID) Low Fraction	U		0.0217	0.100
(S) a,a,a-Trifluorotoluene(FID)	93.5			77.0-120

Laboratory Control Sample (LCS)

(LCS) R3986853-1 10/12/23 21:21

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
TPH (GC/FID) Low Fraction	5.50	5.76	105	72.0-127	
(S) a,a,a-Trifluorotoluene(FID)			102	77.0-120	

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

Method Blank (MB)

(MB) R3987895-2 10/13/23 00:37

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
TPH (GC/FID) Low Fraction	U		0.0217	0.100
(S) a,a,a-Trifluorotoluene(FID)	89.9			77.0-120

Laboratory Control Sample (LCS)

(LCS) R3987895-1 10/12/23 23:51

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
TPH (GC/FID) Low Fraction	5.50	5.65	103	72.0-127	
(S) a,a,a-Trifluorotoluene(FID)			93.8	77.0-120	

¹Cp

²Tc

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⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

Method Blank (MB)

(MB) R3987772-3 10/12/23 21:39

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Benzene	U		0.000467	0.00100
Toluene	U		0.00130	0.00500
Ethylbenzene	U		0.000737	0.00250
Xylenes, Total	U		0.000880	0.00650
1,2,4-Trimethylbenzene	U		0.00158	0.00500
1,3,5-Trimethylbenzene	U		0.00200	0.00500
(S) Toluene-d8	101			75.0-131
(S) 4-Bromofluorobenzene	96.1			67.0-138
(S) 1,2-Dichloroethane-d4	97.9			70.0-130

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3987772-1 10/12/23 19:51 • (LCSD) R3987772-2 10/12/23 20:12

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Benzene	0.125	0.121	0.135	96.8	108	70.0-123			10.9	20
Toluene	0.125	0.110	0.129	88.0	103	75.0-121			15.9	20
Ethylbenzene	0.125	0.112	0.127	89.6	102	74.0-126			12.6	20
Xylenes, Total	0.375	0.348	0.391	92.8	104	72.0-127			11.6	20
1,2,4-Trimethylbenzene	0.125	0.113	0.125	90.4	100	70.0-126			10.1	20
1,3,5-Trimethylbenzene	0.125	0.111	0.125	88.8	100	73.0-127			11.9	20
(S) Toluene-d8				95.9	100	75.0-131				
(S) 4-Bromofluorobenzene				96.7	98.4	67.0-138				
(S) 1,2-Dichloroethane-d4				107	111	70.0-130				

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Method Blank (MB)

(MB) R3987233-2 10/12/23 19:38

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Benzene	U		0.000467	0.00100
Toluene	U		0.00130	0.00500
Ethylbenzene	U		0.000737	0.00250
Xylenes, Total	U		0.000880	0.00650
1,2,4-Trimethylbenzene	U		0.00158	0.00500
1,3,5-Trimethylbenzene	U		0.00200	0.00500
(S) Toluene-d8	97.2			75.0-131
(S) 4-Bromofluorobenzene	96.9			67.0-138
(S) 1,2-Dichloroethane-d4	91.9			70.0-130

Laboratory Control Sample (LCS)

(LCS) R3987233-1 10/12/23 18:23

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Benzene	0.125	0.128	102	70.0-123	
Toluene	0.125	0.115	92.0	75.0-121	
Ethylbenzene	0.125	0.102	81.6	74.0-126	
Xylenes, Total	0.375	0.308	82.1	72.0-127	
1,2,4-Trimethylbenzene	0.125	0.115	92.0	70.0-126	
1,3,5-Trimethylbenzene	0.125	0.123	98.4	73.0-127	
(S) Toluene-d8			96.9	75.0-131	
(S) 4-Bromofluorobenzene			96.3	67.0-138	
(S) 1,2-Dichloroethane-d4			95.1	70.0-130	

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Method Blank (MB)

(MB) R3987282-1 10/17/23 10:36

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
C10-C28 Diesel Range	U		1.61	4.00
C28-C36 Motor Oil Range	0.589	J	0.274	4.00
(S) o-Terphenyl	67.1			18.0-148

Laboratory Control Sample (LCS)

(LCS) R3987282-2 10/17/23 10:50

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
C10-C28 Diesel Range	50.0	37.5	75.0	50.0-150	
(S) o-Terphenyl			50.6	18.0-148	

L1665255-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1665255-01 10/17/23 11:51 • (MS) R3987282-3 10/17/23 12:04 • (MSD) R3987282-4 10/17/23 12:16

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
C10-C28 Diesel Range	49.0	62.7	88.3	76.1	52.2	27.6	5	50.0-150		J6	14.8	20
(S) o-Terphenyl					5.38	4.38		18.0-148	J2	J2		

1Cp

2Tc

3Ss

4Cn

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6Qc

7Gl

8Al

9Sc

Method Blank (MB)

(MB) R3987173-1 10/17/23 08:22

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
C10-C28 Diesel Range	U		1.61	4.00
C28-C36 Motor Oil Range	0.769	⬇	0.274	4.00
(S) o-Terphenyl	53.0			18.0-148

Laboratory Control Sample (LCS)

(LCS) R3987173-2 10/17/23 08:35

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
C10-C28 Diesel Range	50.0	39.5	79.0	50.0-150	
(S) o-Terphenyl			68.6	18.0-148	

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Method Blank (MB)

(MB) R3987871-2 10/17/23 22:09

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Acenaphthene	U		0.00209	0.00600
Anthracene	U		0.00230	0.00600
Benzo(a)anthracene	U		0.00173	0.00600
Benzo(b)fluoranthene	U		0.00153	0.00600
Benzo(k)fluoranthene	U		0.00215	0.00600
Benzo(a)pyrene	U		0.00179	0.00600
Chrysene	U		0.00232	0.00600
Dibenz(a,h)anthracene	U		0.00172	0.00600
Fluoranthene	U		0.00227	0.00600
Fluorene	U		0.00205	0.00600
Indeno(1,2,3-cd)pyrene	U		0.00181	0.00600
1-Methylnaphthalene	U		0.00449	0.0200
2-Methylnaphthalene	U		0.00427	0.0200
Naphthalene	U		0.00408	0.0200
Pyrene	U		0.00200	0.00600
(S) p-Terphenyl-d14	82.1			23.0-120
(S) Nitrobenzene-d5	76.5			14.0-149
(S) 2-Fluorobiphenyl	93.0			34.0-125

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Laboratory Control Sample (LCS)

(LCS) R3987871-1 10/17/23 21:51

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Acenaphthene	0.0800	0.0629	78.6	50.0-120	
Anthracene	0.0800	0.0656	82.0	50.0-126	
Benzo(a)anthracene	0.0800	0.0674	84.3	45.0-120	
Benzo(b)fluoranthene	0.0800	0.0616	77.0	42.0-121	
Benzo(k)fluoranthene	0.0800	0.0606	75.8	49.0-125	
Benzo(a)pyrene	0.0800	0.0600	75.0	42.0-120	
Chrysene	0.0800	0.0651	81.4	49.0-122	
Dibenz(a,h)anthracene	0.0800	0.0754	94.3	47.0-125	
Fluoranthene	0.0800	0.0632	79.0	49.0-129	
Fluorene	0.0800	0.0657	82.1	49.0-120	
Indeno(1,2,3-cd)pyrene	0.0800	0.0731	91.4	46.0-125	
1-Methylnaphthalene	0.0800	0.0567	70.9	51.0-121	
2-Methylnaphthalene	0.0800	0.0591	73.9	50.0-120	
Naphthalene	0.0800	0.0526	65.8	50.0-120	
Pyrene	0.0800	0.0634	79.3	43.0-123	

Laboratory Control Sample (LCS)

(LCS) R3987871-1 10/17/23 21:51

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	<u>LCS Qualifier</u>
(S) p-Terphenyl-d14			83.7	23.0-120	
(S) Nitrobenzene-d5			82.0	14.0-149	
(S) 2-Fluorobiphenyl			97.5	34.0-125	

L1665250-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1665250-03 10/17/23 22:44 • (MS) R3987871-3 10/17/23 23:02 • (MSD) R3987871-4 10/17/23 23:20

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	<u>MS Qualifier</u>	<u>MSD Qualifier</u>	RPD %	RPD Limits %
Anthracene	0.0800	U	0.171	0.188	214	235	1	10.0-145	J5	J5	9.47	30
Benzo(a)anthracene	0.0800	U	0.0728	0.0675	91.0	84.4	1	10.0-139			7.56	30
Benzo(b)fluoranthene	0.0800	U	0.0528	0.0504	66.0	63.0	1	10.0-140			4.65	36
Benzo(k)fluoranthene	0.0800	U	0.0538	0.0504	67.3	63.0	1	10.0-137			6.53	31
Benzo(a)pyrene	0.0800	U	0.0591	0.0545	73.9	68.1	1	10.0-141			8.10	31
Chrysene	0.0800	0.0135	0.0823	0.0824	86.0	86.1	1	10.0-145			0.121	30
Dibenz(a,h)anthracene	0.0800	U	0.0672	0.0641	84.0	80.1	1	10.0-132			4.72	31
Fluoranthene	0.0800	0.0378	0.0945	0.0902	70.9	65.5	1	10.0-153			4.66	33
Indeno(1,2,3-cd)pyrene	0.0800	U	0.0653	0.0629	81.6	78.6	1	10.0-137			3.74	32
1-Methylnaphthalene	0.0800	4.01	2.41	3.83	0.000	0.000	1	10.0-142	V	J3 V	45.5	28
2-Methylnaphthalene	0.0800	12.4	7.38	11.7	0.000	0.000	1	10.0-137	E V	E J3 V	45.3	28
Naphthalene	0.0800	4.28	2.49	3.88	0.000	0.000	1	10.0-135	V	J3 V	43.6	27
Pyrene	0.0800	0.0287	0.0832	0.0829	68.1	67.8	1	10.0-148			0.361	35
(S) p-Terphenyl-d14					70.9	72.3		23.0-120				
(S) Nitrobenzene-d5					0.000	0.000		14.0-149	J2	J2		
(S) 2-Fluorobiphenyl					36.7	36.1		34.0-125				

Sample Narrative:
OS: Surrogate failure due to matrix interference

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

GLOSSARY OF TERMS

Guide to Reading and Understanding Your Laboratory Report

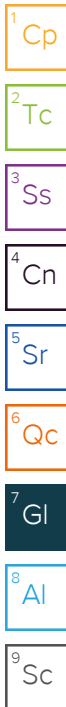
The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDL	Method Detection Limit.
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state "ND" (Not Detected) or "BDL" (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
B	The same analyte is found in the associated blank.
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL).
J	The identification of the analyte is acceptable; the reported value is an estimate.
J1	Surrogate recovery limits have been exceeded; values are outside upper control limits.
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.
J5	The sample matrix interfered with the ability to make any accurate determination; spike value is high.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
P1	RPD value not applicable for sample concentrations less than 5 times the reporting limit.
T8	Sample(s) received past/too close to holding time expiration.
V	The sample concentration is too high to evaluate accurate spike recoveries.



ACCREDITATIONS & LOCATIONS

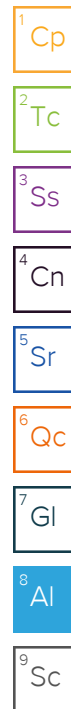
Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey--NELAP	TN002
California	2932	New Mexico ¹	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina ¹	DW21704
Georgia	NELAP	North Carolina ³	41
Georgia ¹	923	North Dakota	R-140
Idaho	TN00003	Ohio--VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LA000356
Kentucky ^{1 6}	KY90010	South Carolina	84004002
Kentucky ²	16	South Dakota	n/a
Louisiana	AI30792	Tennessee ^{1 4}	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas ⁵	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
A2LA -- ISO 17025	1461.01	AIHA-LAP, LLC EMLAP	100789
A2LA -- ISO 17025 ⁵	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA--Crypto	TN00003		

¹ Drinking Water ² Underground Storage Tanks ³ Aquatic Toxicity ⁴ Chemical/Microbiological ⁵ Mold ⁶ Wastewater n/a Accreditation not applicable

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace Analytical.



[illegible]

Caerus Oil and Gas

Sample Delivery Group: L1665262
Samples Received: 10/11/2023
Project Number:
Description: L29-595 Flowline (6A-32)
Site: L29 595
Report To: Jake J. / Brett M. / Blair R. / Andy V.
143 Diamond Avenue
Parachute, CO 81635

Entire Report Reviewed By:



Chris Ward
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.

Pace Analytical National12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 www.pacenational.com

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SAMPLE SUMMARY

20231009-L29 595-(SPOIL1)@1 L1665262-01 Solid

Collected by
C. Mace

Collected date/time
10/09/23 12:10

Received date/time
10/11/23 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG2151260	1	10/20/23 10:56	10/20/23 10:56	JTM	Mt. Juliet, TN
Wet Chemistry by Method 7199	WG2150781	1	10/13/23 09:56	10/18/23 10:39	SET	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG2151293	1	10/14/23 10:40	10/14/23 15:15	NTG	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG2150878	1	10/13/23 15:40	10/13/23 18:00	NTG	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG2151261	1	10/17/23 10:29	10/18/23 10:20	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2150428	5	10/13/23 00:44	10/17/23 13:10	JPD	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG2150394	1	10/12/23 14:41	10/13/23 02:22	AV	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG2150415	1	10/12/23 14:41	10/12/23 22:33	ADM	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015M	WG2152431	1	10/17/23 05:00	10/17/23 09:54	KAP	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG2152435	1	10/17/23 16:39	10/18/23 03:14	JCH	Mt. Juliet, TN

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

20231009-L29 595-(SPOIL2)@1 L1665262-02 Solid

Collected by
C. Mace

Collected date/time
10/09/23 12:20

Received date/time
10/11/23 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG2151262	1	10/18/23 15:54	10/18/23 15:54	DJS	Mt. Juliet, TN
Wet Chemistry by Method 7199	WG2150781	1	10/13/23 09:56	10/18/23 10:45	SET	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG2151293	1	10/14/23 10:40	10/14/23 15:15	NTG	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG2150878	1	10/13/23 15:40	10/13/23 18:00	NTG	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG2151263	1	10/17/23 11:20	10/17/23 21:37	DJS	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2150428	5	10/13/23 00:44	10/17/23 14:40	JPD	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG2150394	1	10/12/23 14:41	10/13/23 02:45	AV	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG2150415	1	10/12/23 14:41	10/12/23 22:52	ADM	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015M	WG2152431	1	10/17/23 05:00	10/17/23 09:15	KAP	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG2152435	1	10/17/23 16:39	10/18/23 03:31	JCH	Mt. Juliet, TN

⁷Gl

⁸Al

⁹Sc

CASE NARRATIVE

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.



Chris Ward
Project Manager

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc

Calculated Results

	Result	Qualifier	Dilution	Analysis date / time	Batch
Analyte	SAR				
Sodium Adsorption Ratio	4.87		1	10/20/2023 10:56	WG2151260

Wet Chemistry by Method 7199

	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Analyte							
Hexavalent Chromium	U		0.255	1.00	1	10/18/2023 10:39	WG2150781

Wet Chemistry by Method 9045D

	Result	Qualifier	Dilution	Analysis date / time	Batch
Analyte	pH				
pH	8.86	T8	1	10/14/2023 15:15	WG2151293

Sample Narrative:

L1665262-01 WG2151293: 8.86 at 20.1C

Wet Chemistry by Method 9050AMod

	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Analyte						
Specific Conductance	649		10.0	1	10/13/2023 18:00	WG2150878

Sample Narrative:

L1665262-01 WG2150878: at 25C

Metals (ICP) by Method 6010B-NE493 Ch 2

	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
Analyte							
Hot Water Sol. Boron	0.797		0.0167	0.200	1	10/18/2023 10:20	WG2151261

Metals (ICPMS) by Method 6020

	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Analyte							
Arsenic	10.4		0.100	1.00	5	10/17/2023 13:10	WG2150428
Barium	1620		0.152	2.50	5	10/17/2023 13:10	WG2150428
Cadmium	0.462	J	0.0855	1.00	5	10/17/2023 13:10	WG2150428
Copper	16.6		0.132	5.00	5	10/17/2023 13:10	WG2150428
Lead	11.6		0.0990	2.00	5	10/17/2023 13:10	WG2150428
Nickel	13.8		0.197	2.50	5	10/17/2023 13:10	WG2150428
Selenium	0.477	J	0.180	2.50	5	10/17/2023 13:10	WG2150428
Silver	U		0.0865	0.500	5	10/17/2023 13:10	WG2150428
Zinc	45.0		0.740	25.0	5	10/17/2023 13:10	WG2150428

Volatile Organic Compounds (GC) by Method 8015D/GRO

	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Analyte							
TPH (GC/FID) Low Fraction	0.202		0.0217	0.100	1	10/13/2023 02:22	WG2150394
(S) a,a,a-Trifluorotoluene(FID)	83.9			77.0-120		10/13/2023 02:22	WG2150394

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	0.000495	U	0.000467	0.00100	1	10/12/2023 22:33	WG2150415
Toluene	U		0.00130	0.00500	1	10/12/2023 22:33	WG2150415
Ethylbenzene	U		0.000737	0.00250	1	10/12/2023 22:33	WG2150415
Xylenes, Total	0.00101	U	0.000880	0.00650	1	10/12/2023 22:33	WG2150415
1,2,4-Trimethylbenzene	U		0.00158	0.00500	1	10/12/2023 22:33	WG2150415
1,3,5-Trimethylbenzene	U		0.00200	0.00500	1	10/12/2023 22:33	WG2150415
(S) Toluene-d8	99.4			75.0-131		10/12/2023 22:33	WG2150415
(S) 4-Bromofluorobenzene	96.3			67.0-138		10/12/2023 22:33	WG2150415
(S) 1,2-Dichloroethane-d4	91.5			70.0-130		10/12/2023 22:33	WG2150415

Semi-Volatile Organic Compounds (GC) by Method 8015M

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	19.1		1.61	4.00	1	10/17/2023 09:54	WG2152431
C28-C36 Motor Oil Range	40.1		0.274	4.00	1	10/17/2023 09:54	WG2152431
(S) o-Terphenyl	39.2			18.0-148		10/17/2023 09:54	WG2152431

Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Acenaphthene	U		0.00209	0.00600	1	10/18/2023 03:14	WG2152435
Anthracene	U		0.00230	0.00600	1	10/18/2023 03:14	WG2152435
Benzo(a)anthracene	U		0.00173	0.00600	1	10/18/2023 03:14	WG2152435
Benzo(b)fluoranthene	U		0.00153	0.00600	1	10/18/2023 03:14	WG2152435
Benzo(k)fluoranthene	U		0.00215	0.00600	1	10/18/2023 03:14	WG2152435
Benzo(a)pyrene	U		0.00179	0.00600	1	10/18/2023 03:14	WG2152435
Chrysene	U		0.00232	0.00600	1	10/18/2023 03:14	WG2152435
Dibenz(a,h)anthracene	U		0.00172	0.00600	1	10/18/2023 03:14	WG2152435
Fluoranthene	U		0.00227	0.00600	1	10/18/2023 03:14	WG2152435
Fluorene	U		0.00205	0.00600	1	10/18/2023 03:14	WG2152435
Indeno(1,2,3-cd)pyrene	U		0.00181	0.00600	1	10/18/2023 03:14	WG2152435
1-Methylnaphthalene	U		0.00449	0.0200	1	10/18/2023 03:14	WG2152435
2-Methylnaphthalene	0.00832	U	0.00427	0.0200	1	10/18/2023 03:14	WG2152435
Naphthalene	U		0.00408	0.0200	1	10/18/2023 03:14	WG2152435
Pyrene	U		0.00200	0.00600	1	10/18/2023 03:14	WG2152435
(S) p-Terphenyl-d14	63.4			23.0-120		10/18/2023 03:14	WG2152435
(S) Nitrobenzene-d5	71.8			14.0-149		10/18/2023 03:14	WG2152435
(S) 2-Fluorobiphenyl	79.3			34.0-125		10/18/2023 03:14	WG2152435

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	4.43		1	10/18/2023 15:54	WG2151262

1
Cp

2
Tc

Wet Chemistry by Method 7199

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Hexavalent Chromium	U		0.255	1.00	1	10/18/2023 10:45	WG2150781

3
Ss

4
Cn

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	8.80	T8	1	10/14/2023 15:15	WG2151293

5
Sr

6
Qc

Sample Narrative:

L1665262-02 WG2151293: 8.8 at 20.1C

7
Gl

8
Al

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	570		10.0	1	10/13/2023 18:00	WG2150878

9
Sc

Sample Narrative:

L1665262-02 WG2150878: at 25C

Metals (ICP) by Method 6010B-NE493 Ch 2

Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
Hot Water Sol. Boron	0.858		0.0167	0.200	1	10/17/2023 21:37	WG2151263

Metals (ICPMS) by Method 6020

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	9.51		0.100	1.00	5	10/17/2023 14:40	WG2150428
Barium	1480		0.152	2.50	5	10/17/2023 14:40	WG2150428
Cadmium	0.389	J	0.0855	1.00	5	10/17/2023 14:40	WG2150428
Copper	14.2		0.132	5.00	5	10/17/2023 14:40	WG2150428
Lead	10.3		0.0990	2.00	5	10/17/2023 14:40	WG2150428
Nickel	14.2		0.197	2.50	5	10/17/2023 14:40	WG2150428
Selenium	0.407	J	0.180	2.50	5	10/17/2023 14:40	WG2150428
Silver	U		0.0865	0.500	5	10/17/2023 14:40	WG2150428
Zinc	46.4		0.740	25.0	5	10/17/2023 14:40	WG2150428

Volatile Organic Compounds (GC) by Method 8015D/GRO

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	0.161		0.0217	0.100	1	10/13/2023 02:45	WG2150394
(S) a,a,a-Trifluorotoluene(FID)	84.4			77.0-120		10/13/2023 02:45	WG2150394

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	U		0.000467	0.00100	1	10/12/2023 22:52	WG2150415
Toluene	U		0.00130	0.00500	1	10/12/2023 22:52	WG2150415
Ethylbenzene	U		0.000737	0.00250	1	10/12/2023 22:52	WG2150415
Xylenes, Total	U		0.000880	0.00650	1	10/12/2023 22:52	WG2150415
1,2,4-Trimethylbenzene	U		0.00158	0.00500	1	10/12/2023 22:52	WG2150415
1,3,5-Trimethylbenzene	U		0.00200	0.00500	1	10/12/2023 22:52	WG2150415
(S) Toluene-d8	98.3			75.0-131		10/12/2023 22:52	WG2150415
(S) 4-Bromofluorobenzene	97.3			67.0-138		10/12/2023 22:52	WG2150415
(S) 1,2-Dichloroethane-d4	93.9			70.0-130		10/12/2023 22:52	WG2150415

Semi-Volatile Organic Compounds (GC) by Method 8015M

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	10.8		1.61	4.00	1	10/17/2023 09:15	WG2152431
C28-C36 Motor Oil Range	24.5		0.274	4.00	1	10/17/2023 09:15	WG2152431
(S) o-Terphenyl	39.8			18.0-148		10/17/2023 09:15	WG2152431

Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Acenaphthene	U		0.00209	0.00600	1	10/18/2023 03:31	WG2152435
Anthracene	U		0.00230	0.00600	1	10/18/2023 03:31	WG2152435
Benzo(a)anthracene	U		0.00173	0.00600	1	10/18/2023 03:31	WG2152435
Benzo(b)fluoranthene	U		0.00153	0.00600	1	10/18/2023 03:31	WG2152435
Benzo(k)fluoranthene	U		0.00215	0.00600	1	10/18/2023 03:31	WG2152435
Benzo(a)pyrene	U		0.00179	0.00600	1	10/18/2023 03:31	WG2152435
Chrysene	U		0.00232	0.00600	1	10/18/2023 03:31	WG2152435
Dibenz(a,h)anthracene	U		0.00172	0.00600	1	10/18/2023 03:31	WG2152435
Fluoranthene	U		0.00227	0.00600	1	10/18/2023 03:31	WG2152435
Fluorene	U		0.00205	0.00600	1	10/18/2023 03:31	WG2152435
Indeno(1,2,3-cd)pyrene	U		0.00181	0.00600	1	10/18/2023 03:31	WG2152435
1-Methylnaphthalene	U		0.00449	0.0200	1	10/18/2023 03:31	WG2152435
2-Methylnaphthalene	0.00490	U	0.00427	0.0200	1	10/18/2023 03:31	WG2152435
Naphthalene	0.00508	U	0.00408	0.0200	1	10/18/2023 03:31	WG2152435
Pyrene	U		0.00200	0.00600	1	10/18/2023 03:31	WG2152435
(S) p-Terphenyl-d14	66.1			23.0-120		10/18/2023 03:31	WG2152435
(S) Nitrobenzene-d5	76.5			14.0-149		10/18/2023 03:31	WG2152435
(S) 2-Fluorobiphenyl	81.9			34.0-125		10/18/2023 03:31	WG2152435

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Method Blank (MB)

(MB) R3987766-1 10/18/23 08:12

	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	mg/kg		mg/kg	mg/kg
Hexavalent Chromium	U		0.255	1.00

L1665055-05 Original Sample (OS) • Duplicate (DUP)

(OS) L1665055-05 10/18/23 09:16 • (DUP) R3987766-7 10/18/23 09:22

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	mg/kg	mg/kg		%		%
Hexavalent Chromium	U	U	1	0.000		20

L1665057-04 Original Sample (OS) • Duplicate (DUP)

(OS) L1665057-04 10/18/23 09:53 • (DUP) R3987766-8 10/18/23 09:58

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	mg/kg	mg/kg		%		%
Hexavalent Chromium	0.315	0.287	1	9.02	⬇	20

Laboratory Control Sample (LCS)

(LCS) R3987766-2 10/18/23 08:19

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	mg/kg	mg/kg	%	%	
Hexavalent Chromium	10.0	9.67	96.7	80.0-120	

L1665055-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1665055-03 10/18/23 08:35 • (MS) R3987766-3 10/18/23 08:40 • (MSD) R3987766-4 10/18/23 08:45

	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/kg	mg/kg	mg/kg	mg/kg	%	%		%			%	%
Hexavalent Chromium	20.0	U	18.3	18.2	91.4	90.8	1	75.0-125			0.562	20

L1665055-03 Original Sample (OS) • Matrix Spike (MS)

(OS) L1665055-03 10/18/23 08:35 • (MS) R3987766-9 10/18/23 08:50

	Spike Amount	Original Result	MS Result	MS Rec.	Dilution	Rec. Limits	MS Qualifier
Analyte	mg/kg	mg/kg	mg/kg	%		%	
Hexavalent Chromium	643	U	14.9	2.32	1	75.0-125	J6

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

L1665055-07 Original Sample (OS) • Duplicate (DUP)

(OS) L1665055-07 10/14/23 15:15 • (DUP) R3986252-2 10/14/23 15:15

	Original Result	DUP Result	Dilution	DUP RPD	<u>DUP Qualifier</u>	DUP RPD Limits
Analyte	pH	su		%		%
pH	9.08	9.04	1	0.442		1

Sample Narrative:

OS: 9.08 at 20.4C

DUP: 9.04 at 20.2C

L1665255-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1665255-01 10/14/23 15:15 • (DUP) R3986252-3 10/14/23 15:15

	Original Result	DUP Result	Dilution	DUP RPD	<u>DUP Qualifier</u>	DUP RPD Limits
Analyte	pH	su		%		%
pH	8.38	8.33	1	0.598		1

Sample Narrative:

OS: 8.38 at 20.1C

DUP: 8.33 at 20.3C

Laboratory Control Sample (LCS)

(LCS) R3986252-1 10/14/23 15:15

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	<u>LCS Qualifier</u>
Analyte	su	su	%	%	
pH	10.0	9.99	99.9	99.0-101	

Sample Narrative:

LCS: 9.99 at 20.8C

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

Method Blank (MB)

(MB) R3986137-1 10/13/23 18:00

Analyte	MB Result umhos/cm	MB Qualifier	MB MDL umhos/cm	MB RDL umhos/cm
Specific Conductance	U		10.0	10.0

Sample Narrative:

BLANK: at 25C

L1665057-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1665057-01 10/13/23 18:00 • (DUP) R3986137-3 10/13/23 18:00

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	286	285	1	0.456		20

Sample Narrative:

OS: at 25C

DUP: at 25C

L1665257-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1665257-01 10/13/23 18:00 • (DUP) R3986137-4 10/13/23 18:00

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	272	266	1	1.93		20

Sample Narrative:

OS: at 25C

DUP: at 25C

Laboratory Control Sample (LCS)

(LCS) R3986137-2 10/13/23 18:00

Analyte	Spike Amount umhos/cm	LCS Result umhos/cm	LCS Rec. %	Rec. Limits %	LCS Qualifier
Specific Conductance	732	726	99.2	85.0-115	

Sample Narrative:

LCS: at 25C

1

Cp

2

Tc

3

Ss

4

Cn

5

Sr

6

Qc

7

Gl

8

Al

9

Sc

Method Blank (MB)

(MB) R3987797-1 10/18/23 09:57

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Hot Water Sol. Boron	U		0.0167	0.200

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3987797-2 10/18/23 10:00 • (LCSD) R3987797-3 10/18/23 10:03

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Hot Water Sol. Boron	1.00	1.04	1.04	104	104	80.0-120			0.149	20

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Method Blank (MB)

(MB) R3987524-1 10/17/23 20:41

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Hot Water Sol. Boron	U		0.0167	0.200

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3987524-2 10/17/23 20:43 • (LCSD) R3987524-3 10/17/23 20:46

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Hot Water Sol. Boron	1.00	1.08	1.09	108	109	80.0-120			1.34	20

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

Method Blank (MB)

(MB) R3987221-1 10/17/23 13:04

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Arsenic	U		0.100	1.00
Barium	U		0.152	2.50
Cadmium	U		0.0855	1.00
Copper	U		0.133	5.00
Lead	U		0.0990	2.00
Nickel	U		0.197	2.50
Selenium	U		0.180	2.50
Silver	U		0.0865	0.500
Zinc	U		0.740	25.0

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

Laboratory Control Sample (LCS)

(LCS) R3987221-2 10/17/23 13:07

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Arsenic	100	99.5	99.5	80.0-120	
Barium	100	93.9	93.9	80.0-120	
Cadmium	100	97.4	97.4	80.0-120	
Copper	100	88.3	88.3	80.0-120	
Lead	100	92.6	92.6	80.0-120	
Nickel	100	98.8	98.8	80.0-120	
Selenium	100	99.7	99.7	80.0-120	
Silver	20.0	19.5	97.3	80.0-120	
Zinc	100	94.5	94.5	80.0-120	

⁷Gl

⁸Al

⁹Sc

L1665262-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1665262-01 10/17/23 13:10 • (MS) R3987221-5 10/17/23 13:20 • (MSD) R3987221-6 10/17/23 13:24

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Arsenic	100	10.4	94.6	97.2	84.2	86.8	5	75.0-125			2.75	20
Barium	100	1620	1860	1320	237	0.000	5	75.0-125	V	J3 V	33.9	20
Cadmium	100	0.462	86.4	88.3	85.9	87.9	5	75.0-125			2.21	20
Copper	100	16.6	89.0	91.3	72.3	74.7	5	75.0-125	J6	J6	2.60	20
Lead	100	11.6	92.7	95.3	81.1	83.7	5	75.0-125			2.75	20
Nickel	100	13.8	95.3	94.3	81.4	80.5	5	75.0-125			1.02	20
Selenium	100	0.477	87.6	86.6	87.1	86.1	5	75.0-125			1.13	20
Silver	20.0	U	16.8	17.5	84.0	87.6	5	75.0-125			4.27	20
Zinc	100	45.0	125	128	80.0	82.7	5	75.0-125			2.11	20

Method Blank (MB)

(MB) R3987895-2 10/13/23 00:37

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
TPH (GC/FID) Low Fraction	U		0.0217	0.100
(S) a,a,a-Trifluorotoluene(FID)	89.9			77.0-120

Laboratory Control Sample (LCS)

(LCS) R3987895-1 10/12/23 23:51

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
TPH (GC/FID) Low Fraction	5.50	5.65	103	72.0-127	
(S) a,a,a-Trifluorotoluene(FID)			93.8	77.0-120	

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

Method Blank (MB)

(MB) R3987233-2 10/12/23 19:38

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Benzene	U		0.000467	0.00100
Toluene	U		0.00130	0.00500
Ethylbenzene	U		0.000737	0.00250
Xylenes, Total	U		0.000880	0.00650
1,2,4-Trimethylbenzene	U		0.00158	0.00500
1,3,5-Trimethylbenzene	U		0.00200	0.00500
(S) Toluene-d8	97.2			75.0-131
(S) 4-Bromofluorobenzene	96.9			67.0-138
(S) 1,2-Dichloroethane-d4	91.9			70.0-130

Laboratory Control Sample (LCS)

(LCS) R3987233-1 10/12/23 18:23

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Benzene	0.125	0.128	102	70.0-123	
Toluene	0.125	0.115	92.0	75.0-121	
Ethylbenzene	0.125	0.102	81.6	74.0-126	
Xylenes, Total	0.375	0.308	82.1	72.0-127	
1,2,4-Trimethylbenzene	0.125	0.115	92.0	70.0-126	
1,3,5-Trimethylbenzene	0.125	0.123	98.4	73.0-127	
(S) Toluene-d8			96.9	75.0-131	
(S) 4-Bromofluorobenzene			96.3	67.0-138	
(S) 1,2-Dichloroethane-d4			95.1	70.0-130	

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Method Blank (MB)

(MB) R3987173-1 10/17/23 08:22

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
C10-C28 Diesel Range	U		1.61	4.00
C28-C36 Motor Oil Range	0.769	⬇	0.274	4.00
(S) o-Terphenyl	53.0			18.0-148

Laboratory Control Sample (LCS)

(LCS) R3987173-2 10/17/23 08:35

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
C10-C28 Diesel Range	50.0	39.5	79.0	50.0-150	
(S) o-Terphenyl			68.6	18.0-148	

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

Method Blank (MB)

(MB) R3987871-2 10/17/23 22:09

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Acenaphthene	U		0.00209	0.00600
Anthracene	U		0.00230	0.00600
Benzo(a)anthracene	U		0.00173	0.00600
Benzo(b)fluoranthene	U		0.00153	0.00600
Benzo(k)fluoranthene	U		0.00215	0.00600
Benzo(a)pyrene	U		0.00179	0.00600
Chrysene	U		0.00232	0.00600
Dibenz(a,h)anthracene	U		0.00172	0.00600
Fluoranthene	U		0.00227	0.00600
Fluorene	U		0.00205	0.00600
Indeno(1,2,3-cd)pyrene	U		0.00181	0.00600
1-Methylnaphthalene	U		0.00449	0.0200
2-Methylnaphthalene	U		0.00427	0.0200
Naphthalene	U		0.00408	0.0200
Pyrene	U		0.00200	0.00600
(S) p-Terphenyl-d14	82.1			23.0-120
(S) Nitrobenzene-d5	76.5			14.0-149
(S) 2-Fluorobiphenyl	93.0			34.0-125

1
Cp

2
Tc

3
Ss

4
Cn

5
Sr

6
Qc

7
Gl

8
Al

9
Sc

Laboratory Control Sample (LCS)

(LCS) R3987871-1 10/17/23 21:51

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Acenaphthene	0.0800	0.0629	78.6	50.0-120	
Anthracene	0.0800	0.0656	82.0	50.0-126	
Benzo(a)anthracene	0.0800	0.0674	84.3	45.0-120	
Benzo(b)fluoranthene	0.0800	0.0616	77.0	42.0-121	
Benzo(k)fluoranthene	0.0800	0.0606	75.8	49.0-125	
Benzo(a)pyrene	0.0800	0.0600	75.0	42.0-120	
Chrysene	0.0800	0.0651	81.4	49.0-122	
Dibenz(a,h)anthracene	0.0800	0.0754	94.3	47.0-125	
Fluoranthene	0.0800	0.0632	79.0	49.0-129	
Fluorene	0.0800	0.0657	82.1	49.0-120	
Indeno(1,2,3-cd)pyrene	0.0800	0.0731	91.4	46.0-125	
1-Methylnaphthalene	0.0800	0.0567	70.9	51.0-121	
2-Methylnaphthalene	0.0800	0.0591	73.9	50.0-120	
Naphthalene	0.0800	0.0526	65.8	50.0-120	
Pyrene	0.0800	0.0634	79.3	43.0-123	

Laboratory Control Sample (LCS)

(LCS) R3987871-1 10/17/23 21:51

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	<u>LCS Qualifier</u>
(S) p-Terphenyl-d14			83.7	23.0-120	
(S) Nitrobenzene-d5			82.0	14.0-149	
(S) 2-Fluorobiphenyl			97.5	34.0-125	

L1665250-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1665250-03 10/17/23 22:44 • (MS) R3987871-3 10/17/23 23:02 • (MSD) R3987871-4 10/17/23 23:20

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	<u>MS Qualifier</u>	<u>MSD Qualifier</u>	RPD %	RPD Limits %
Anthracene	0.0800	U	0.171	0.188	214	235	1	10.0-145	J5	J5	9.47	30
Benzo(a)anthracene	0.0800	U	0.0728	0.0675	91.0	84.4	1	10.0-139			7.56	30
Benzo(b)fluoranthene	0.0800	U	0.0528	0.0504	66.0	63.0	1	10.0-140			4.65	36
Benzo(k)fluoranthene	0.0800	U	0.0538	0.0504	67.3	63.0	1	10.0-137			6.53	31
Benzo(a)pyrene	0.0800	U	0.0591	0.0545	73.9	68.1	1	10.0-141			8.10	31
Chrysene	0.0800	0.0135	0.0823	0.0824	86.0	86.1	1	10.0-145			0.121	30
Dibenz(a,h)anthracene	0.0800	U	0.0672	0.0641	84.0	80.1	1	10.0-132			4.72	31
Fluoranthene	0.0800	0.0378	0.0945	0.0902	70.9	65.5	1	10.0-153			4.66	33
Indeno(1,2,3-cd)pyrene	0.0800	U	0.0653	0.0629	81.6	78.6	1	10.0-137			3.74	32
1-Methylnaphthalene	0.0800	4.01	2.41	3.83	0.000	0.000	1	10.0-142	V	J3 V	45.5	28
2-Methylnaphthalene	0.0800	12.4	7.38	11.7	0.000	0.000	1	10.0-137	E V	E J3 V	45.3	28
Naphthalene	0.0800	4.28	2.49	3.88	0.000	0.000	1	10.0-135	V	J3 V	43.6	27
Pyrene	0.0800	0.0287	0.0832	0.0829	68.1	67.8	1	10.0-148			0.361	35
(S) p-Terphenyl-d14					70.9	72.3		23.0-120				
(S) Nitrobenzene-d5					0.000	0.000		14.0-149	J2	J2		
(S) 2-Fluorobiphenyl					36.7	36.1		34.0-125				

Sample Narrative:
OS: Surrogate failure due to matrix interference

Cp

Tc

Ss

Cn

Sr

Qc

Gl

Al

Sc

GLOSSARY OF TERMS

Guide to Reading and Understanding Your Laboratory Report

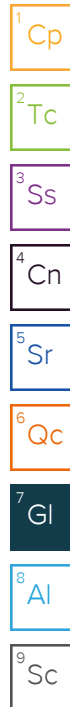
The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDL	Method Detection Limit.
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state "ND" (Not Detected) or "BDL" (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL).
J	The identification of the analyte is acceptable; the reported value is an estimate.
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.
J5	The sample matrix interfered with the ability to make any accurate determination; spike value is high.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
T8	Sample(s) received past/too close to holding time expiration.
V	The sample concentration is too high to evaluate accurate spike recoveries.



ACCREDITATIONS & LOCATIONS

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey--NELAP	TN002
California	2932	New Mexico ¹	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina ¹	DW21704
Georgia	NELAP	North Carolina ³	41
Georgia ¹	923	North Dakota	R-140
Idaho	TN00003	Ohio--VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LA000356
Kentucky ^{1 6}	KY90010	South Carolina	84004002
Kentucky ²	16	South Dakota	n/a
Louisiana	AI30792	Tennessee ^{1 4}	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas ⁵	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
A2LA -- ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA -- ISO 17025 ⁵	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA--Crypto	TN00003		

¹ Drinking Water ² Underground Storage Tanks ³ Aquatic Toxicity ⁴ Chemical/Microbiological ⁵ Mold ⁶ Wastewater n/a Accreditation not applicable

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace Analytical.



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HISTORICAL BACKGROUND SOIL LABORATORY ANALYTICAL REPORTS



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Mt. Juliet, TN 37122
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Tax I.D. 62-0814289

Est. 1970

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

Report Summary

Wednesday August 18, 2010

Report Number: L473791

Samples Received: 08/13/10

Client Project: A28B CUTTINGS

Description: A28B Cuttings Management

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:

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

August 18, 2010

Date Received : August 13, 2010
Description : A28B Cuttings Management
Sample ID : A28B-NW BACK-081210
Collected By : Blair Rollins
Collection Date : 08/12/10 11:20

ESC Sample # : L473791-01

Site ID :

Project # : A28B CUTTINGS

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Arsenic	12.	1.0	mg/kg	6010B	08/16/10	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

The reported analytical results relate only to the sample submitted.

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Reported: 08/17/10 10:16 Revised: 08/18/10 15:20



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REPORT OF ANALYSIS

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

August 18, 2010

Date Received : August 13, 2010
Description : A28B Cuttings Management

Sample ID : A28B- N BACK-081210

Collected By : Blair Rollins
Collection Date : 08/12/10 11:30

ESC Sample # : L473791-02

Site ID :

Project # : A28B CUTTINGS

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Arsenic	39.	5.0	mg/kg	6010B	08/16/10	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: 08/17/10 10:16 Revised: 08/18/10 15:20



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REPORT OF ANALYSIS

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

August 18, 2010

Date Received : August 13, 2010
Description : A28B Cuttings Management
Sample ID : A28B- NE BACK-081210
Collected By : Blair Rollins
Collection Date : 08/12/10 11:45

ESC Sample # : L473791-03

Site ID :

Project # : A28B CUTTINGS

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Arsenic	16.	5.0	mg/kg	6010B	08/16/10	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: 08/17/10 10:16 Revised: 08/18/10 15:20

Attachment A
List of Analytes with QC Qualifiers

Sample Number	Work Group	Sample Type	Analyte	Run ID	Qualifier
L473791-02	WG493583	SAMP	Arsenic	R1333308	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

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

Quality Assurance Report
Level II

L473791

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Tax I.D. 62-0814289

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August 18, 2010

Analyte	Result	Laboratory Blank		Limit	Batch	Date Analyzed
		Units	% Rec			
Arsenic	< 1	mg/kg			WG493583	08/16/10 11:14

Analyte	Units	Duplicate		RPD	Limit	Ref Samp	Batch
		Result	Duplicate				
Arsenic	mg/kg	28.0	39.0	31.5*	20	L473791-02	WG493583

Analyte	Units	Laboratory Control Sample		% Rec	Limit	Batch
		Known Val	Result			
Arsenic	mg/kg	192	181.	94.3	78.6-120.8	WG493583

Analyte	Units	Matrix Spike		% Rec	Limit	Ref Samp	Batch
		MS Res	Ref Res				
Arsenic	mg/kg	80.7	39.0	10	83.4	75-125	L473791-02

Analyte	Units	Matrix Spike Duplicate		Limit	RPD	Limit	Ref Samp	Batch
		MSD	Ref					
Arsenic	mg/kg	99.6	80.7	121.	75-125	21.0*	20	L473791-02

Batch number /Run number / Sample number cross reference

WG493583: R1333308: L473791-01 02 03

* * Calculations are performed prior to rounding of reported values .
 * Performance of this Analyte is outside of established criteria.
 For additional information, please see Attachment A 'List of Analytes with QC Qualifiers.'



YOUR LAB OF CHOICE

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

Parachute, CO 81635

Quality Assurance Report
Level II

L473791

12065 Lebanon Rd.
Mt. Juliet, TN 37122
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Tax I.D. 62-0814289

Est. 1970

August 18, 2010

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.



07/14/10

Technical Report for

EnCana

C27A Pit Closure

Accutest Job Number: D14746

Sampling Date: 06/28/10

Report to:

EnCana

christopher.hines@encana.com

ATTN: Chris Hines

Total number of pages in report: 99



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.

Jesse L. Smith
Laboratory Director

Client Service contact: Amanda Kissell 303-425-6021

Certifications: CO, ID, NE, NM, ND (R-027) (PW) UT (NELAP CO00049)

This report shall not be reproduced, except in its entirety, without the written approval of Accutest Laboratories.
Test results relate only to samples analyzed.

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Sample Summary

EnCana

Job No: D14746

C27A Pit Closure

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
D14746-1	06/28/10	11:00 BR	06/29/10	SO	Soil	C27A-PIT BOTTOM-062810
D14746-1A	06/28/10	11:00 BR	06/29/10	SO	Soil	C27A-PIT BOTTOM-062810
D14746-2	06/28/10	11:30 BR	06/29/10	SO	Soil	C27A-STs-062810
D14746-2A	06/28/10	11:30 BR	06/29/10	SO	Soil	C27A-STs-062810
D14746-3	06/28/10	10:20 BR	06/29/10	SO	Soil	C27A-NE BACK-062810
D14746-4	06/28/10	10:45 BR	06/29/10	SO	Soil	C72A-SE BACK-062810
D14746-4A	06/28/10	10:45 BR	06/29/10	SO	Soil	C72A-SE BACK-062810

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

CASE NARRATIVE / CONFORMANCE SUMMARY

Client: EnCana

Job No D14746

Site: C27A Pit Closure

Report Dat 7/14/2010 2:29:30 PM

On 06/29/2010, 4 sample(s), 0 Trip Blank(s) and 0 Field Blank(s) were received at Accutest Mountain States (AMS) at a temperature of 20 °C. The samples were intact and properly preserved, unless noted below. An AMS Job Number of D14746 was assigned to the project. The lab sample IDs, client sample IDs, and dates of sample collection are detailed in the report's Results Summary.

Specified quality control criteria were achieved for this job except as noted below. For more information, please refer to the analytical results and QC summary pages.

Volatiles by GCMS By Method SW846 8260B

Matrix SO

Batch ID: V3V283

- All samples were analyzed within the recommended method holding time.
- Samples D14850-1MS and D14850-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

Matrix SO

Batch ID: V3V284

- All samples were analyzed within the recommended method holding time.
- Samples D14746-2MS and D14746-2MSD 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: OP2096

- All samples were extracted and analyzed within the recommended method holding time.
- Samples D14744-1MS and D14744-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.
- The RPDs for MSD for several are outside control limits for sample OP2096-MSD. High RPD due to possible sample nonhomogeneity.
- D14746-4: Dilution required due to matrix interference.

Extractables by GC By Method SW846 8015B M

Matrix SO

Batch ID: C:OP2341

- The data for SW846 8015B M meets quality control requirements.
- D14746-1: Analysis performed at Accutest Laboratories, San Jose, CA.

Matrix SO

Batch ID: C:OP2345

- The data for SW846 8015B M meets quality control requirements.
- D14746-2: Reporting Limit increased due to high moisture in the sample. 5grams prepared instead of the standard 10grams. Analysis performed at Accutest Laboratories, San Jose, CA.
- D14746-4: Analysis performed at Accutest Laboratories, San Jose, CA.

Metals By Method SW846 6010B

Matrix AQ

Batch ID: MP2240

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Samples D14745-1AMS and D14745-1AMSD were used as the QC samples for metals.

Matrix AQ

Batch ID: MP2252

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Samples D14444-1MS and D14444-1MSD were used as the QC samples for metals.
- The matrix spike (MS) recovery(s) for Sodium are outside control limits. Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.

Matrix SO

Batch ID: MP2228

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Matrix Spike Duplicate Recovery(s) for Barium are outside control limits. Probable cause due to matrix interference.
- RPD(s) for Serial Dilution for Selenium, Silver, Barium, Chromium, Copper, Lead, Nickel, Zinc are outside control limits for sample MP2228-SD1. Percent difference acceptable due to low initial sample concentration (< 50 times IDL).

Metals By Method SW846 6020

Matrix SO

Batch ID: MP2229

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- RPD(s) for Serial Dilution for Arsenic are outside control limits for sample MP2229-SD1. Percent difference acceptable due to low initial sample concentration (< 50 times IDL).

Metals By Method SW846 7471A

Matrix SO

Batch ID: MP2235

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Matrix Spike and Matrix Spike Duplicate Recovery(s) for Mercury are outside control limits. Probable cause due to matrix interference.

Wet Chemistry By Method ASTM E1498-76M

Matrix SO

Batch ID: M:GN32313

- The data for ASTM E1498-76M meets quality control requirements.
- The following samples were run outside of holding time for method ASTM E1498-76M: D14746-1, D14746-2, D14746-4.
- Redox Potential Vs H2: Analysis performed at Accutest Laboratories, Marlborough, MA.

Wet Chemistry By Method LADNR29B

Matrix SO

Batch ID: R3067

- The data for LADNR29B meets quality control requirements.
- Sodium Adsorption Ratio: Calculated as: $(\text{Na meq/L}) / \sqrt{[(\text{Ca meq/L}) + (\text{Mg meq/L})/2]}$

Wet Chemistry By Method SM19 2540B M

Matrix SO	Batch ID: GN5140
------------------	-------------------------

- The data for SM19 2540B M meets quality control requirements.

Wet Chemistry By Method SW846 3060/7196A M

Matrix SO	Batch ID: R3104
------------------	------------------------

- The data for SW846 3060/7196A M meets quality control requirements.
- Chromium, Trivalent: Calculated as: (Chromium) - (Chromium, Hexavalent)

Wet Chemistry By Method SW846 3060A/7196A

Matrix SO	Batch ID: M:GP11780
------------------	----------------------------

- The data for SW846 3060A/7196A meets quality control requirements.
- Chromium, Hexavalent: Analysis performed at Accutest Laboratories, Marlborough, MA.

Wet Chemistry By Method SW846 9045C

Matrix SO	Batch ID: GN5124
------------------	-------------------------

- The following samples were run outside of holding time for method SW846 9045C: D14746-1, D14746-2, D14746-4.

AMS certifies that data reported for samples received, listed on the associated custody chain or analytical task order, were produced to specifications meeting AMS's Quality System precision, accuracy and completeness objectives except as noted.

Estimated non-standard method measurement uncertainty data is available on request, based on quality control bias and implicit for standard methods. Acceptable uncertainty requires tested parameter quality control data to meet method criteria.

AMS is not responsible for data quality assumptions if partial reports are used and recommends that this report be used in its entirety. This report is authorized by AMS indicated via signature on the report cover.

SAMPLE DELIVERY GROUP CASE NARRATIVE

Client: Accutest Mountain States

Job No D14746

Site: ENCACOP: C27A Pit Closure

Report Date 7/7/2010 4:28:39 PM

3 Sample(s), 0 Trip Blank(s) and 0 Field Blank(s) were collected on 06/28/2010 and were received at Accutest on 06/29/2010 properly preserved and intact, unless noted below. These Samples received an Accutest job number of D14746. 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.

Extractables by GC By Method SW846 8015B M

Matrix SO

Batch ID: OP2341

- 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.

Matrix SO

Batch ID: OP2345

- 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) D14746-4MS, D14746-4MSD were used as the QC samples indicated.
- RPD for MSD for TPH (C10-C28) is outside control limits for sample OP2345-MSD1.
- D14746-2: Reporting Limit increased due to high moisture in the sample. 5 grams prepared instead of the standard 10 grams.

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

SAMPLE DELIVERY GROUP CASE NARRATIVE

Client: Accutest Mountain States

Job No D14746

Site: ENCACOP: C27A Pit Closure

Report Date 7/7/2010 4:02:53 PM

3 Sample(s) were collected on 06/28/2010 and were received at Accutest on 06/29/2010 properly preserved, at 3.7 Deg. C and intact. These Samples received an Accutest job number of D14746. 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.

Wet Chemistry By Method ASTM E1498-76M

Matrix SO

Batch ID: GN32313

- Sample(s) D14702-1DUP were used as the QC samples for Redox Potential Vs H2.

Wet Chemistry By Method SW846 3060A/7196A

Matrix SO

Batch ID: GP11780

- All samples were distilled 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) D14817-3DUP, D14817-3MS were used as the QC samples for Chromium, Hexavalent.

The Accutest Laboratories of New England certifies that all analysis were performed within method specification. It is further recommended that this report to be used in its entirety. The Accutest Laboratories of NE, Laboratory Director or assignee as verified by the signature on the cover page has authorized the release of this report(D14746).



Sample Results

Report of Analysis

Report of Analysis

Client Sample ID:	C27A-NE BACK-062810		
Lab Sample ID:	D14746-3	Date Sampled:	06/28/10
Matrix:	SO - Soil	Date Received:	06/29/10
		Percent Solids:	87.4
Project:	C27A Pit Closure		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	26.0	0.33	mg/kg	5	07/01/10	07/02/10 SH	SW846 6020 ¹	SW846 3050B ²

(1) Instrument QC Batch: MA793
(2) Prep QC Batch: MP2229

RL = Reporting Limit

Report of Analysis

Client Sample ID:	C72A-SE BACK-062810	Date Sampled:	06/28/10
Lab Sample ID:	D14746-4	Date Received:	06/29/10
Matrix:	SO - Soil	Percent Solids:	90.5
Method:	SW846 8260B		
Project:	C27A Pit Closure		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3V05586.D	1	07/04/10	DC	n/a	n/a	V3V283
Run #2							

	Initial Weight
Run #1	1.00 g
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	5.5	1.7	ug/kg	
108-88-3	Toluene	ND	11	5.5	ug/kg	
100-41-4	Ethylbenzene	ND	11	2.2	ug/kg	
	m,p-Xylene	ND	22	3.9	ug/kg	
95-47-6	o-Xylene	ND	11	3.9	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
2037-26-5	Toluene-D8	88%		70-130%
460-00-4	4-Bromofluorobenzene	83%		70-130%
17060-07-0	1,2-Dichloroethane-D4	92%		70-130%

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:	C72A-SE BACK-062810	
Lab Sample ID:	D14746-4	Date Sampled: 06/28/10
Matrix:	SO - Soil	Date Received: 06/29/10
Method:	SW846 8270C BY SIM SW846 3540C	Percent Solids: 90.5
Project:	C27A Pit Closure	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	3G01273.D	5	07/02/10	TMB	06/30/10	OP2096	E3G32
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	5.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	180	170	ug/kg	
208-96-8	Acenaphthylene	ND	920	190	ug/kg	
120-12-7	Anthracene	ND	180	120	ug/kg	
56-55-3	Benzo(a)anthracene	ND	180	180	ug/kg	
50-32-8	Benzo(a)pyrene	ND	180	120	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	180	130	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	180	110	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	180	120	ug/kg	
218-01-9	Chrysene	ND	180	92	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	180	140	ug/kg	
206-44-0	Fluoranthene	ND	180	110	ug/kg	
86-73-7	Fluorene	ND	180	180	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	180	120	ug/kg	
90-12-0	1-Methylnaphthalene	ND	180	160	ug/kg	
91-57-6	2-Methylnaphthalene	ND	920	280	ug/kg	
91-20-3	Naphthalene	ND	920	200	ug/kg	
85-01-8	Phenanthrene	ND	180	150	ug/kg	
129-00-0	Pyrene	ND	180	120	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	90%		10-193%
321-60-8	2-Fluorobiphenyl	101%		20-138%
1718-51-0	Terphenyl-d14	103%		17-174%

(a) Dilution required due to matrix interference.

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:	C72A-SE BACK-062810	
Lab Sample ID:	D14746-4	Date Sampled: 06/28/10
Matrix:	SO - Soil	Date Received: 06/29/10
Method:	SW846 8015B M SW846 3545A	Percent Solids: 90.5
Project:	C27A Pit Closure	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	GG15630.D	5	07/03/10	ANC	07/02/10	C:OP2345	C:GGG470
Run #2							

	Initial Weight	Final Volume
Run #1	10.0 g	1.0 ml
Run #2		

TPH Extractable

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (C10-C28)	65.7	55	28	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
630-01-3	Hexacosane	64%		45-140%

(a) Analysis performed at Accutest Laboratories, San Jose, CA.

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: C72A-SE BACK-062810**Lab Sample ID:** D14746-4**Matrix:** SO - Soil**Project:** C27A Pit Closure**Date Sampled:** 06/28/10**Date Received:** 06/29/10**Percent Solids:** 90.5**Metals Analysis**

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	12.7	0.35	mg/kg	5	07/01/10	07/02/10 SH	SW846 6020 ³	SW846 3050B ⁶
Barium	265	0.88	mg/kg	1	07/01/10	07/01/10 JM	SW846 6010B ¹	SW846 3050B ⁵
Cadmium	< 0.88	0.88	mg/kg	1	07/01/10	07/01/10 JM	SW846 6010B ¹	SW846 3050B ⁵
Chromium	22.4	0.88	mg/kg	1	07/01/10	07/01/10 JM	SW846 6010B ¹	SW846 3050B ⁵
Copper	20.4	0.44	mg/kg	1	07/01/10	07/01/10 JM	SW846 6010B ¹	SW846 3050B ⁵
Lead	12.0	4.4	mg/kg	1	07/01/10	07/01/10 JM	SW846 6010B ¹	SW846 3050B ⁵
Mercury	< 0.11	0.11	mg/kg	1	07/01/10	07/01/10 RN	SW846 7471A ²	SW846 7471A ⁷
Nickel	14.0	2.7	mg/kg	1	07/01/10	07/01/10 JM	SW846 6010B ¹	SW846 3050B ⁵
Selenium	< 4.4	4.4	mg/kg	1	07/01/10	07/01/10 JM	SW846 6010B ¹	SW846 3050B ⁵
Silver	< 2.7	2.7	mg/kg	1	07/01/10	07/01/10 JM	SW846 6010B ¹	SW846 3050B ⁵
Zinc	45.2	2.7	mg/kg	1	07/01/10	07/02/10 SH	SW846 6010B ⁴	SW846 3050B ⁵

(1) Instrument QC Batch: MA791

(2) Instrument QC Batch: MA792

(3) Instrument QC Batch: MA793

(4) Instrument QC Batch: MA798

(5) Prep QC Batch: MP2228

(6) Prep QC Batch: MP2229

(7) Prep QC Batch: MP2235

RL = Reporting Limit

Report of Analysis

Client Sample ID: C72A-SE BACK-062810**Lab Sample ID:** D14746-4**Matrix:** SO - Soil**Project:** C27A Pit Closure**Date Sampled:** 06/28/10**Date Received:** 06/29/10**Percent Solids:** 90.5**General Chemistry**

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent ^a	< 2.2	2.2	mg/kg	1	07/07/10 12:04	AMA	SW846 3060A/7196A
Chromium, Trivalent ^b	22.4	3.1	mg/kg	1	07/07/10 12:04	AMA	SW846 3060/7196A M
Redox Potential Vs H2 ^a	375		mv	1	07/02/10	AMA	ASTM E1498-76M
Solids, Percent	90.5		%	1	06/30/10	JD	SM19 2540B M
Specific Conductivity	445	1.0	umhos/cm	1	07/06/10	JD	DEPT.OF AG, BOOK N9
pH	9.44		su	1	06/30/10 08:15	JK	SW846 9045C

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

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

RL = Reporting Limit

Report of Analysis

Client Sample ID:	C72A-SE BACK-062810	Date Sampled:	06/28/10
Lab Sample ID:	D14746-4A	Date Received:	06/29/10
Matrix:	SO - Soil	Percent Solids:	90.5
Project:	C27A Pit Closure		

SAR Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Calcium	11.3	2.0	mg/l	1	07/06/10	07/06/10 SH	SW846 6010B ¹	EPA 200.7 ²
Magnesium	12.8	1.0	mg/l	1	07/06/10	07/06/10 SH	SW846 6010B ¹	EPA 200.7 ²
Sodium	61.2	2.0	mg/l	1	07/06/10	07/06/10 SH	SW846 6010B ¹	EPA 200.7 ²

(1) Instrument QC Batch: MA800
(2) Prep QC Batch: MP2252

RL = Reporting Limit

Report of Analysis

Client Sample ID:	C72A-SE BACK-062810	
Lab Sample ID:	D14746-4A	Date Sampled: 06/28/10
Matrix:	SO - Soil	Date Received: 06/29/10
		Percent Solids: 90.5
Project:	C27A Pit Closure	

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sodium Adsorption Ratio ^a	2.96		ratio	1	07/06/10 18:07	SH	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

Includes the following where applicable:

- Chain of Custody



D14746

4.1

Page 1 of 2

CONTAMINANT OF CONCERN	CONCENTRATIONS IN SOIL	ANALYTICAL METHOD (SW846)
Organic Compounds in Soil		
TPH (total volatile and extractable petroleum hydrocarbons)	500 mg/kg	8015
Benzene	0.17 mg/kg ^a	8260B
Toluene	85 mg/kg ^a	8260B
Ethylbenzene	100 mg/kg ^a	8260B
Xylenes (total)	175 mg/kg ^a	8260B
Aceanaphthene	1,000 mg/kg ^a	8270C
Anthracene	1,000 mg/kg ^a	8270C
Benzo(a)anthracene	0.22 mg/kg ^a	8270C
Benzo(b)fluoranthene	0.22 mg/kg ^a	8270C
Benzo(k)fluoranthene	0.22 mg/kg ^a	8270C
Benzo(a)pyrene	2.2 mg/kg ^a	8270C
Chrysene	0.022 mg/kg ^a	8270C
Dibenz(a,h)anthracene	22 mg/kg ^a	8270C
Fluoranthene	0.022 mg/kg ^a	8270C
Fluorene	1,000 mg/kg ^a	8270C
Indeno(1,2,3-c)pyrene	0.22 mg/kg ^a	8270C
Naphthalene	23 mg/kg ^a	8270C
Pyrene	1,000 mg/kg ^a	8270C
Inorganics in Soils		
Electrical Conductivity (EC)	≤ 44 mhos/cm or 2x background	9050
Sodium Adsorption Ratio (SAR)	<12 ^a	LAQNR29B
pH	6-9	9046C
Metals in Soils		
Arsenic	0.39 mg/kg ^a	6010B
Barium	15,000 mg/kg ^a	6010B
Cadmium	70 mg/kg ^{a,b}	6010B
Chromium (III)	120,000 mg/kg ^a	6010B
Chromium (VI)	23 mg/kg ^{a,b}	6010B
Copper	3,100 mg/kg ^a	6010B
Lead (inorganic)	400 mg/kg ^a	6010B
Mercury	23 mg/kg ^a	6010B
Nickel (soluble salts)	1,600 mg/kg ^{a,b}	6010B
Selenium	390 mg/kg ^a	6010B
Silver	390 mg/kg ^a	6010B
Zinc	23,000 mg/kg ^{a,b}	6010B
Liquid Hydrocarbons in Soils and Ground Water		
Liquid hydrocarbons including condensate and oil	Below detection level	Visual
<p>OSGC recommends that the latest version of EPA SW 846 analytical methods be used where possible and that analyses of samples be performed in a laboratory that uses EPA approved methods.</p>		

1 Consideration shall be given to background levels in native soils and ground water.
2
3 Concentrations taken from COPHE-HMMWD Table 1 Colorado Soil Evaluation Values (December 2007).
4 Concentrations taken from COPHE-HMMWD Regulation 41 - The Basic Standards for Ground Water.
5
6 The number in the range is a maximum contaminant level, based on the WQCC's established methodology for human
7 health-based standards. This standard number is 900-232 at a maximum contaminant level (MCL), established under the Federal Safe Drinking
8 Water Act which has been 900-22 as of April 1, 2009 900-232.
9
10 The WQCC determined to be an acceptable level for this chemical in public water supplies, taking treatability and laboratory detection limits into account. The
11 WQCC intends that control requirements for this chemical be implemented to attain a level of water quality that is at least equal to the first
12 number in the range except as follows: (1) where ground water quality exceeds the first number in the range, the water quality must be maintained
13 at or below the second number in the range; and (2) where the date of discovery or subsequent migration of such contaminants cleanup levels for the
14 contaminant plume shall be no more restrictive than the second number in the range or the ground water quality resulting from such release, whichever
15 is most protective of these standards. (3) otherwise the WQCC has adopted alternative, site-specific standards for the chemical, the site-specific standards shall apply
16 instead of these standards.
17
18 5. Analysis by USDA Agricultural Handbook 60 method (208) with soluble cations determined by method (2). Method (208) = estimation
19 of exchangeable sodium percentage and exchangeable potassium percentage from soluble cations. Method (2) = saturated paste method (note: each
20 sample shall be a minimum of 500 grams). If soils are saturated, USDA Agricultural Handbook 60 with soluble cations determined by
21 method (5A) saturation extraction method.
22
23 6. The lower values for these inorganic constituents is taken from the COPHE-HMMWD Table 1 Colorado Soil Evaluation Values (December 2007).
24 The reason for these values are high. It is possible that site-specific geochemical conditions may exist that could allow the water to
25 migrate into ground water at levels exceeding ground water standards even though the concentrations are below the table values. Therefore, when
26 these constituents are present as contaminants, a secondary evaluation of the leachability must be performed to ensure ground water protection.



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Tax I.D. 62-0814289

Est. 1970

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

Report Summary

Monday September 19, 2011

Report Number: L536189

Samples Received: 09/15/11

Client Project:

Description: C28-Cuttings Pit Excavation

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

Entire Report Reviewed By:

Jayred Willis , ESC Representative

Laboratory Certification Numbers

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

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

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

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REPORT OF ANALYSIS

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

September 19, 2011

Date Received : September 15, 2011
Description : C28-Cuttings Pit Excavation
Sample ID : C28-BGS-091411
Collected By : Brennen Graff
Collection Date : 09/14/11 08:58

ESC Sample # : L536189-01

Site ID : C28

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Arsenic	22.	1.0	mg/kg	6010B	09/17/11	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

The reported analytical results relate only to the sample submitted.

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.

Reported: 09/19/11 14:00 Printed: 09/19/11 14:01

Summary of Remarks For Samples Printed
09/19/11 at 14:01:10

TSR Signing Reports: 358
R5 - Desired TAT

Sample: L536189-01 Account: ENCANACO Received: 09/15/11 09:00 Due Date: 09/22/11 00:00 RPT Date: 09/19/11 14:00



YOUR LAB OF CHOICE

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

Parachute, CO 81635

Quality Assurance Report
Level II

L536189

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Est. 1970

September 19, 2011

Analyte	Result	Laboratory Blank		Limit	Batch	Date Analyzed			
		Units	% Rec						
Arsenic	< 1	mg/kg			WG555480	09/17/11 13:02			
Analyte	Units	Duplicate		RPD	Limit	Ref Samp	Batch		
		Result	Duplicate						
Arsenic	mg/kg	6.60	6.76	3.16	20	L536064-09	WG555480		
Analyte	Units	Laboratory Control Sample		% Rec	Limit	Batch			
		Known Val	Result						
Arsenic	mg/kg	92.6	90.0	97.2	82.9-117	WG555480			
Analyte	Units	Matrix Spike		% Rec	Limit	Ref Samp	Batch		
		MS Res	Ref Res						
Arsenic	mg/kg	60.2	6.76	50	107.	75-125	L536064-09	WG555480	
Analyte	Units	Matrix Spike Duplicate		Limit	RPD	Limit	Ref Samp	Batch	
		MSD	Ref						
Arsenic	mg/kg	50.7	60.2	87.9	75-125	17.1	20	L536064-09	WG555480

Batch number /Run number / Sample number cross reference

WG555480: R1863193: L536189-01

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

* Performance of this Analyte is outside of established criteria.

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



YOUR LAB OF CHOICE

EnCana Oil & Gas Inc. - CO
Chris Hines / Jake Harris
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Parachute, CO 81635

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September 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.



IT'S ALL IN THE CHEMISTRY

07/09/10

Technical Report for

EnCana

C28A Background

Accutest Job Number: D14745

Sampling Date: 06/28/10

Report to:

EnCana

christopher.hines@encana.com

ATTN: Chris Hines

Total number of pages in report: **75**



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.

Jesse L. Smith
Laboratory Director

Client Service contact: Amanda Kissell 303-425-6021

Certifications: CO, ID, NE, NM, ND (R-027) (PW) UT (NELAP CO00049)

This report shall not be reproduced, except in its entirety, without the written approval of Accutest Laboratories.
Test results relate only to samples analyzed.

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Sample Summary

EnCana

Job No: D14745

C28A Background

Sample Number	Collected		Received	Matrix		Client Sample ID
	Date	Time By		Code	Type	
D14745-1	06/28/10	13:10	06/29/10	SO	Soil	C28A-BACKGROUND-062810
D14745-1A	06/28/10	13:10	06/29/10	SO	Soil	C28A-BACKGROUND-062810

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

CASE NARRATIVE / CONFORMANCE SUMMARY

Client: EnCana

Job No D14745

Site: C28A Background

Report Dat 7/9/2010 2:26:54 PM

On 06/29/2010, 1 sample(s), 0 Trip Blank(s) and 0 Field Blank(s) was received at Accutest Mountain States (AMS) at a temperature of 20 °C. The sample was intact and properly preserved, unless noted below. An AMS Job Number of D14745 was assigned to the project. The lab sample ID, client sample ID, and date of sample collection are detailed in the report's Results Summary.

Specified quality control criteria were achieved for this job except as noted below. For more information, please refer to the analytical results and QC summary pages.

Volatiles by GCMS By Method SW846 8260B

Matrix SO

Batch ID: V3V283

- All samples were analyzed within the recommended method holding time.
- Sample(s) D14850-1MS, D14850-1MSD 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: OP2096

- All samples were extracted and analyzed within the recommended method holding time.
- Sample(s) D14744-1MS, D14744-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.
- RPD(s) for MSD for several analytes are outside control limits for sample OP2096-MSD. High RPD due to possible sample nonhomogeneity.

Volatiles by GC By Method SW846 8015B

Matrix SO

Batch ID: GGB306

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D14670-1MS, D14670-1MSD were used as the QC samples indicated.
- Matrix Spike and Matrix Spike Duplicate Recovery(s) for TPH-GRO (C6-C10) are outside control limits. The blank spike recovery of TPH-GRO (C6-C10) is within the QC limits.

Extractables by GC By Method SW846 8015B M

Matrix SO

Batch ID: C:OP2341

- The data for SW846 8015B M meets quality control requirements.
- D14745-1: Analysis performed at Accutest Laboratories, San Jose, CA.

Metals By Method SW846 6010B

Matrix AQ

Batch ID: MP2240

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D14745-1AMS, D14745-1AMSD were used as the QC samples for metals.

Matrix SO

Batch ID: MP2228

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D14510-1MS, D14510-1MSD, D14510-1SDL were used as the QC samples for metals.
- Matrix Spike Duplicate Recovery(s) for Barium are outside control limits. The blank spike recovery of Barium is within the QC limits.
- RPD(s) for Serial Dilution for Selenium, Silver, Barium, Chromium, Copper, Lead, Nickel, Zinc are outside control limits for sample MP2228-SD1. Percent difference acceptable due to low initial sample concentration (< 50 times IDL).

Metals By Method SW846 6020

Matrix SO

Batch ID: MP2229

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D14510-1MS, D14510-1MSD, D14510-1SDL were used as the QC samples for metals.
- RPD(s) for Serial Dilution for Arsenic are outside control limits for sample MP2229-SD1. Percent difference acceptable due to low initial sample concentration (< 50 times IDL).

Metals By Method SW846 7471A

Matrix SO

Batch ID: MP2235

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D14510-1MSD, D14510-1MS were used as the QC samples for metals.
- Matrix Spike and Matrix Spike Duplicate Recovery(s) for Mercury are outside control limits. The blank spike (BS) recovery of Mercury is within the QC limits.

Wet Chemistry By Method ASTM E1498-76M

Matrix SO

Batch ID: M:GN32313

- The data for ASTM E1498-76M meets quality control requirements.
- The following sample was run outside of holding time for method ASTM E1498-76M: D14745-1.
- D14745-1 for Redox Potential Vs H2: Analysis performed at Accutest Laboratories, Marlborough, MA.

Wet Chemistry By Method LADNR29B

Matrix SO

Batch ID: R3061

- The data for LADNR29B meets quality control requirements.
- D14745-1A for Sodium Adsorption Ratio: Calculated as: $(\text{Na meq/L}) / \sqrt{[(\text{Ca meq/L}) + (\text{Mg meq/L})/2]}$

Wet Chemistry By Method SM19 2540B M

Matrix SO

Batch ID: GN5140

- The data for SM19 2540B M meets quality control requirements.

Wet Chemistry By Method SW846 3060/7196A M

Matrix SO

Batch ID: R3103

- The data for SW846 3060/7196A M meets quality control requirements.
- D14745-1 for Chromium, Trivalent: Calculated as: (Chromium) - (Chromium, Hexavalent)

Wet Chemistry By Method SW846 3060A/7196A

Matrix SO

Batch ID: M:GP11780

- The data for SW846 3060A/7196A meets quality control requirements.
- D14745-1 for Chromium, Hexavalent: Analysis performed at Accutest Laboratories, Marlborough, MA.

Wet Chemistry By Method SW846 9045C

Matrix SO

Batch ID: GN5124

- The following sample was run outside of holding time for method SW846 9045C: D14745-1.

AMS certifies that data reported for samples received, listed on the associated custody chain or analytical task order, were produced to specifications meeting AMS's Quality System precision, accuracy and completeness objectives except as noted.

Estimated non-standard method measurement uncertainty data is available on request, based on quality control bias and implicit for standard methods. Acceptable uncertainty requires tested parameter quality control data to meet method criteria.

AMS is not responsible for data quality assumptions if partial reports are used and recommends that this report be used in its entirety. This report is authorized by AMS indicated via signature on the report cover.

SAMPLE DELIVERY GROUP CASE NARRATIVE

Client: Accutest Mountain States**Job No** D14745**Site:** ENCACOP: C28A Background**Report Date** 7/7/2010 4:20:52 PM

1 Sample(s), 0 Trip Blank(s) and 0 Field Blank(s) were collected on 06/28/2010 and were received at Accutest on 06/29/2010 properly preserved and intact, unless noted below. These Samples received an Accutest job number of D14745. 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.

Extractables by GC By Method SW846 8015B M

Matrix SO**Batch ID:** OP2341

- 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.

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

SAMPLE DELIVERY GROUP CASE NARRATIVE

Client: Accutest Mountain States**Job No** D14745**Site:** ENCACOP: C28A Background**Report Date** 7/7/2010 4:01:42 PM

1 Sample(s) were collected on 06/28/2010 and were received at Accutest on 06/29/2010 properly preserved, at 3.7 Deg. C and intact. These Samples received an Accutest job number of D14745. 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.

Wet Chemistry By Method ASTM E1498-76M

Matrix SO**Batch ID:** GN32313

- Sample(s) D14702-1DUP were used as the QC samples for Redox Potential Vs H2.

Wet Chemistry By Method SW846 3060A/7196A

Matrix SO**Batch ID:** GP11780

- All samples were distilled 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) D14817-3DUP, D14817-3MS were used as the QC samples for Chromium, Hexavalent.

The Accutest Laboratories of New England certifies that all analysis were performed within method specification. It is further recommended that this report to be used in its entirety. The Accutest Laboratories of NE, Laboratory Director or assignee as verified by the signature on the cover page has authorized the release of this report(D14745).



Sample Results

Report of Analysis

Report of Analysis

Client Sample ID: C28A-BACKGROUND-062810**Lab Sample ID:** D14745-1**Date Sampled:** 06/28/10**Matrix:** SO - Soil**Date Received:** 06/29/10**Method:** SW846 8260B**Percent Solids:** 96.1**Project:** C28A Background

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3V05584.D	1	07/04/10	DC	n/a	n/a	V3V283
Run #2							

Initial Weight

Run #1 1.00 g

Run #2

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	5.2	1.6	ug/kg	
108-88-3	Toluene	ND	10	5.2	ug/kg	
100-41-4	Ethylbenzene	ND	10	2.1	ug/kg	
	m,p-Xylene	ND	21	3.6	ug/kg	
95-47-6	o-Xylene	ND	10	3.6	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
2037-26-5	Toluene-D8	92%		70-130%
460-00-4	4-Bromofluorobenzene	78%		70-130%
17060-07-0	1,2-Dichloroethane-D4	89%		70-130%

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:	C28A-BACKGROUND-062810	
Lab Sample ID:	D14745-1	Date Sampled: 06/28/10
Matrix:	SO - Soil	Date Received: 06/29/10
Method:	SW846 8270C BY SIM SW846 3540C	Percent Solids: 96.1
Project:	C28A Background	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3G01270.D	2	07/01/10	TMB	06/30/10	OP2096	E3G32
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	14	13	ug/kg	
208-96-8	Acenaphthylene	ND	69	14	ug/kg	
120-12-7	Anthracene	ND	14	8.9	ug/kg	
56-55-3	Benzo(a)anthracene	ND	14	14	ug/kg	
50-32-8	Benzo(a)pyrene	ND	14	8.7	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	14	10	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	14	8.7	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	14	8.7	ug/kg	
218-01-9	Chrysene	27.1	14	6.9	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	14	10	ug/kg	
206-44-0	Fluoranthene	ND	14	8.5	ug/kg	
86-73-7	Fluorene	ND	14	14	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	14	9.1	ug/kg	
90-12-0	1-Methylnaphthalene	ND	14	12	ug/kg	
91-57-6	2-Methylnaphthalene	ND	69	21	ug/kg	
91-20-3	Naphthalene	ND	69	15	ug/kg	
85-01-8	Phenanthrene	ND	14	11	ug/kg	
129-00-0	Pyrene	13.6	14	9.4	ug/kg	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	62%		10-193%
321-60-8	2-Fluorobiphenyl	67%		20-138%
1718-51-0	Terphenyl-d14	88%		17-174%

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:	C28A-BACKGROUND-062810			
Lab Sample ID:	D14745-1	Date Sampled:	06/28/10	
Matrix:	SO - Soil	Date Received:	06/29/10	
Method:	SW846 8015B	Percent Solids:	96.1	
Project:	C28A Background			

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GB5644.D	1	07/07/10	DG	n/a	n/a	GGB306
Run #2							

	Initial Weight
Run #1	1.0 g
Run #2	

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	1.0	1.0	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
120-82-1	1,2,4-Trichlorobenzene	122%		60-140%		

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:	C28A-BACKGROUND-062810			Date Sampled:	06/28/10
Lab Sample ID:	D14745-1			Date Received:	06/29/10
Matrix:	SO - Soil			Percent Solids:	96.1
Method:	SW846 8015B M SW846 3545A				
Project:	C28A Background				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	GG15642.D	1	07/03/10	ANC	07/01/10	C:OP2341	C:GGG470
Run #2							

	Initial Weight	Final Volume
Run #1	10.0 g	1.0 ml
Run #2		

TPH Extractable

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (C10-C28)	62.3	10	5.2	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
630-01-3	Hexacosane	89%		45-140%

(a) Analysis performed at Accutest Laboratories, San Jose, CA.

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: C28A-BACKGROUND-062810**Lab Sample ID:** D14745-1**Matrix:** SO - Soil**Project:** C28A Background**Date Sampled:** 06/28/10**Date Received:** 06/29/10**Percent Solids:** 96.1**Metals Analysis**

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	24.2	0.34	mg/kg	5	07/01/10	07/01/10 SH	SW846 6020 ³	SW846 3050B ⁶
Barium	344	0.85	mg/kg	1	07/01/10	07/01/10 JM	SW846 6010B ¹	SW846 3050B ⁵
Cadmium	< 0.85	0.85	mg/kg	1	07/01/10	07/01/10 JM	SW846 6010B ¹	SW846 3050B ⁵
Chromium	24.9	0.85	mg/kg	1	07/01/10	07/01/10 JM	SW846 6010B ¹	SW846 3050B ⁵
Copper	32.9	0.43	mg/kg	1	07/01/10	07/01/10 JM	SW846 6010B ¹	SW846 3050B ⁵
Lead	17.7	4.3	mg/kg	1	07/01/10	07/01/10 JM	SW846 6010B ¹	SW846 3050B ⁵
Mercury	< 0.098	0.098	mg/kg	1	07/01/10	07/01/10 RN	SW846 7471A ²	SW846 7471A ⁷
Nickel	18.1	2.6	mg/kg	1	07/01/10	07/01/10 JM	SW846 6010B ¹	SW846 3050B ⁵
Selenium	< 4.3	4.3	mg/kg	1	07/01/10	07/01/10 JM	SW846 6010B ¹	SW846 3050B ⁵
Silver	< 2.6	2.6	mg/kg	1	07/01/10	07/01/10 JM	SW846 6010B ¹	SW846 3050B ⁵
Zinc	54.1	2.6	mg/kg	1	07/01/10	07/02/10 SH	SW846 6010B ⁴	SW846 3050B ⁵

(1) Instrument QC Batch: MA791

(2) Instrument QC Batch: MA792

(3) Instrument QC Batch: MA793

(4) Instrument QC Batch: MA798

(5) Prep QC Batch: MP2228

(6) Prep QC Batch: MP2229

(7) Prep QC Batch: MP2235

RL = Reporting Limit

Report of Analysis

Client Sample ID: C28A-BACKGROUND-062810**Lab Sample ID:** D14745-1**Date Sampled:** 06/28/10**Matrix:** SO - Soil**Date Received:** 06/29/10**Percent Solids:** 96.1**Project:** C28A Background

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent ^a	< 2.1	2.1	mg/kg	1	07/07/10 12:04	AMA	SW846 3060A/7196A
Chromium, Trivalent ^b	24.6	3.0	mg/kg	1	07/07/10 12:04	AMA	SW846 3060/7196A M
Redox Potential Vs H2 ^a	339		mv	1	07/02/10	AMA	ASTM E1498-76M
Solids, Percent	96.1		%	1	06/30/10	JD	SM19 2540B M
Specific Conductivity	243	1.0	umhos/cm	1	07/06/10	JD	DEPT.OF AG, BOOK N9
pH	9.60		su	1	06/30/10 08:15	JK	SW846 9045C

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

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

RL = Reporting Limit

Report of Analysis

Client Sample ID:	C28A-BACKGROUND-062810		
Lab Sample ID:	D14745-1A	Date Sampled:	06/28/10
Matrix:	SO - Soil	Date Received:	06/29/10
		Percent Solids:	96.1
Project:	C28A Background		

SAR Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Calcium	21.1	2.0	mg/l	1	07/02/10	07/02/10 SH	SW846 6010B ¹	EPA 200.7 ²
Magnesium	6.97	1.0	mg/l	1	07/02/10	07/02/10 SH	SW846 6010B ¹	EPA 200.7 ²
Sodium	20.9	2.0	mg/l	1	07/02/10	07/02/10 SH	SW846 6010B ¹	EPA 200.7 ²

(1) Instrument QC Batch: MA798
(2) Prep QC Batch: MP2240

RL = Reporting Limit

Report of Analysis

Client Sample ID:	C28A-BACKGROUND-062810		
Lab Sample ID:	D14745-1A	Date Sampled:	06/28/10
Matrix:	SO - Soil	Date Received:	06/29/10
		Percent Solids:	96.1
Project:	C28A Background		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sodium Adsorption Ratio ^a	1.01		ratio	1	07/02/10 23:12	SH	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

Includes the following where applicable:

- Chain of Custody

CHAIN OF CUSTODY

D14745

10165 Harwin, Suite 150 - Houston, TX 77036 - 713-271-4700 fax: 713-271-4770

Laboratories

10165 Harwin, Suite 150 - Houston, TX 77036 - 713-271-4700 fax: 713-271-4770

FED-EX Tracking #

Bottle Order Control #

Accutest Quote #

Accutest Job #

Client / Reporting Information

Project Information

Requested Analyses

Matrix Codes

Company Name

EnCana Oil & Gas (USA) Inc.

Project Name / No.

C28A Background

Project Contact

E-Mail

Bill to

Invoice Attn.

Chris Hines

christopher.hines@encana.com

Address

Address

2717 County Road 215, Suite 100

City

State

Zip

City

State

Zip

Parachute, CO 81635

Phone No.

970.285.2653

Fax No.

Phone No.

Fax No.

Samplers' Name

Client Purchase Order #

Accutest
Sample #

Field ID / Point of Collection

Collection

Number of preserved bottles

Date

Time

Matrix

of
bottles

NC

NC03

NC04

NC05

NC06

NC07

NC08

NC09

NC10

NC11

NC12

NC13

NC14

NC15

NC16

NC17

NC18

NC19

NC20

NC21

NC22

NC23

NC24

NC25

NC26

NC27

NC28

NC29

NC30

LAB USE ONLY

Please see attached list

01

Turnaround Time (Business days)

Data Deliverable Information

Comments / Remarks

☒ 14 Day STANDARD

☐ 5 Day RUSH

☐ 4 Day RUSH

☐ 3 Day EMERGENCY

☐ 2 Day EMERGENCY

☐ 1 Day EMERGENCY

☐ Other

Approved By: / Date:

☐ Commercial "A"

☐ State Forms

☐ Commercial "B"

☒ EDD Format

☐ Reduced Tier 1

☐ Other

☐ Full Data Package

Commercial "A" = Results Only

Commercial "B" = Results & Standard QC

Client Needs Units In:

Real time analytical data available via Lablink

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION, INCLUDING COURIER DELIVERY

Relinquished by Sampler:

Date Time:

Received By:

Relinquished By:

Date Time:

Received By:

1 Relinquished by:

Date Time:

Received By:

Relinquished By:

Date Time:

Received By:

3 Relinquished by:

Date Time:

Received By:

Relinquished By:

Date Time:

Received By:

5 Relinquished by:

D14745: Chain of Custody

Page 1 of 2

Constituents of Concern: Allowable Concentrations and Analytical Methods (COGCC Table 910-1)

CONTAMINANT OF CONCERN	CONCENTRATIONS ¹		ANALYTICAL METHOD (SW606)
	Compounds in Soil		
Organic			
TPH (total volatile and extractable petroleum hydrocarbons)	500 mg/kg	8015	
Benzene	0.17 mg/kg ²	8260B	
Toluene	85 mg/kg ²	8260B	
Ethylbenzene	100 mg/kg ²	8260B	
Xylenes (total)	175 mg/kg ²	8260B	
Acenaphthene	1,000 mg/kg ²	8270C	
Anthracene	1,000 mg/kg ²	8270C	
Benzo(A)anthracene	0.22 mg/kg ²	8270C	
Benzo(B)fluoranthene	0.22 mg/kg ²	8270C	
Benzo(K)fluoranthene	2.2 mg/kg ²	8270C	
Benzo(A)pyrene	0.022 mg/kg ²	8270C	
Chrysene	22 mg/kg ²	8270C	
Dibenz(A,H)anthracene	0.022 mg/kg ²	8270C	
Fluoranthene	1,000 mg/kg ²	8270C	
Fluorene	1,000 mg/kg ²	8270C	
Indeno(1,2,3-C)Dipyrrene	0.22 mg/kg ²	8270C	
Naphthalene	23 mg/kg ²	8270C	
Pyrene	1,000 mg/kg ²	8270C	
Inorganics in Soils			
Electrical Conductivity (EC)	<4 mmhos/cm or 2x background	9050	
Sodium Adsorption Ratio (SAR)	<12 ²	LADNR298	
pH	6-9	9045C	
Metals in Soils			
Arsenic	0.39 mg/kg ²	6010B	
Barium	15,000 mg/kg ²	6010B	
Cadmium	70 mg/kg ^{2,3}	6010B	
Chromium (III)	120,000 mg/kg ²	6010B	
Chromium (VI)	23 mg/kg ^{2,3}	6010B	
Copper	3,100 mg/kg ²	6010B	
Lead (inorganic)	400 mg/kg ²	6010B	
Mercury	23 mg/kg ²	6010B	
Nickel (soluble salts)	1,800 mg/kg ^{2,3}	6010B	
Selenium	390 mg/kg ^{2,3}	6010B	
Silver	390 mg/kg ²	6010B	
Zinc	23,000 mg/kg ^{2,3}	6010B	
Liquid Hydrocarbons in Soils and Ground Water			
Liquid hydrocarbons including condensate and oil	Below detection level	Visual	

COGCC recommends that the latest version of EPA SW 846 analytical methods be used where possible and that analyses of samples be performed by laboratories that maintain state or national accreditation programs.

- 1 Consideration shall be given to background levels in native soils and ground water.
- 2 Concentrations taken from CDPHE-HHWMD Table 1 Colorado Soil Evaluation Values (December 2007).
- 3 Concentrations taken from CDPHE-HHWMD Table 1 Colorado Soil Evaluation Values (December 2007).
- 4 For this range of standards, the first number in the range is a maximum contaminant level (MCL), established under the Federal Safe Drinking Water Act which has been 900-22 As of April 1, 2009 900-23 As of April 1, 2009.
- 5 The second number in the range is a health-based value, based on the WQCC's established methodology for human health-based standards. The second number in the range is a maximum contaminant level (MCL), established under the Federal Safe Drinking Water Act which has been 900-22 As of April 1, 2009 900-23 As of April 1, 2009.
- 6 The table value for these inorganic constituents is taken from the CDPHE-HHWMD Table 1 Colorado Soil Evaluation Values (December 2007). However, because these values are high, it is possible that site-specific geochemical conditions could allow these constituents to migrate into ground water at levels exceeding ground water standards even though the concentrations are below background levels. When these constituents are present as contaminants, a secondary evaluation of their leachability must be performed to ensure ground water protection.



GC/MS Volatiles

5

QC Data Summaries

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: D14745
Account: ENCACOP EnCana
Project: C28A Background

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V3V283-MB1	3V05570.D	1	07/03/10	DC	n/a	n/a	V3V283

The QC reported here applies to the following samples:

Method: SW846 8260B

D14745-1

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	5.0	1.5	ug/kg	
100-41-4	Ethylbenzene	ND	10	2.0	ug/kg	
108-88-3	Toluene	ND	10	5.0	ug/kg	
	m,p-Xylene	ND	20	3.5	ug/kg	
95-47-6	o-Xylene	ND	10	3.5	ug/kg	

CAS No.	Surrogate Recoveries	Limits
2037-26-5	Toluene-D8	88% 70-130%
460-00-4	4-Bromofluorobenzene	81% 70-130%
17060-07-0	1,2-Dichloroethane-D4	84% 70-130%

Blank Spike Summary

Job Number: D14745
Account: ENCACOP EnCana
Project: C28A Background

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V3V283-BS1	3V05571.D	1	07/03/10	DC	n/a	n/a	V3V283

The QC reported here applies to the following samples:

Method: SW846 8260B

D14745-1

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
71-43-2	Benzene	50	48.2	96	68-130
100-41-4	Ethylbenzene	50	53.8	108	70-130
108-88-3	Toluene	50	53.5	107	70-130
	m,p-Xylene	50	45.9	92	53-130
95-47-6	o-Xylene	50	47.8	96	61-130

CAS No.	Surrogate Recoveries	BSP	Limits
2037-26-5	Toluene-D8	89%	70-130%
460-00-4	4-Bromofluorobenzene	88%	70-130%
17060-07-0	1,2-Dichloroethane-D4	85%	70-130%

Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

Job Number: D14745
Account: ENCACOP EnCana
Project: C28A Background

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D14850-1MS	3V05573.D	1	07/03/10	DC	n/a	n/a	V3V283
D14850-1MSD	3V05574.D	1	07/03/10	DC	n/a	n/a	V3V283
D14850-1	3V05572.D	1	07/03/10	DC	n/a	n/a	V3V283

The QC reported here applies to the following samples:

Method: SW846 8260B

D14745-1

CAS No.	Compound	D14850-1 ug/kg	Q	Spike ug/kg	MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	ND		290	273	94	282	97	3	55-140/30
100-41-4	Ethylbenzene	ND		290	294	101	303	104	3	56-139/30
108-88-3	Toluene	ND		290	302	104	318	110	5	57-144/30
	m,p-Xylene	ND		290	254	88	255	88	0	47-130/30
95-47-6	o-Xylene	ND		290	263	91	266	92	1	51-130/30

CAS No.	Surrogate Recoveries	MS	MSD	D14850-1	Limits
2037-26-5	Toluene-D8	90%	91%	92%	70-130%
460-00-4	4-Bromofluorobenzene	84%	85%	80%	70-130%
17060-07-0	1,2-Dichloroethane-D4	88%	84%	89%	70-130%



GC/MS Semi-volatiles

QC Data Summaries

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: D14745
Account: ENCACOP EnCana
Project: C28A Background

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP2096-MB	3G01265.D	1	07/01/10	TMB	06/30/10	OP2096	E3G32

The QC reported here applies to the following samples:

Method: SW846 8270C BY SIM

D14745-1

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	6.7	6.2	ug/kg	
208-96-8	Acenaphthylene	ND	33	6.9	ug/kg	
120-12-7	Anthracene	ND	6.7	4.3	ug/kg	
56-55-3	Benzo(a)anthracene	ND	6.7	6.5	ug/kg	
50-32-8	Benzo(a)pyrene	ND	6.7	4.2	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	6.7	4.8	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	6.7	4.2	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	6.7	4.2	ug/kg	
218-01-9	Chrysene	ND	6.7	3.3	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	6.7	4.9	ug/kg	
206-44-0	Fluoranthene	ND	6.7	4.1	ug/kg	
86-73-7	Fluorene	ND	6.7	6.5	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	6.7	4.4	ug/kg	
90-12-0	1-Methylnaphthalene	ND	6.7	5.9	ug/kg	
91-57-6	2-Methylnaphthalene	ND	33	10	ug/kg	
91-20-3	Naphthalene	ND	33	7.4	ug/kg	
85-01-8	Phenanthrene	ND	6.7	5.3	ug/kg	
129-00-0	Pyrene	ND	6.7	4.5	ug/kg	

CAS No.	Surrogate Recoveries	Limits
4165-60-0	Nitrobenzene-d5	72% 10-193%
321-60-8	2-Fluorobiphenyl	70% 20-138%
1718-51-0	Terphenyl-d14	88% 17-174%

Blank Spike Summary

Page 1 of 1

Job Number: D14745
Account: ENCACOP EnCana
Project: C28A Background

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP2096-BS	3G01266.D	1	07/01/10	TMB	06/30/10	OP2096	E3G32

The QC reported here applies to the following samples:

Method: SW846 8270C BY SIM

D14745-1

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
83-32-9	Acenaphthene	83.3	58.7	70	40-136
208-96-8	Acenaphthylene	83.3	57.2	69	42-139
120-12-7	Anthracene	83.3	60.1	72	40-141
56-55-3	Benzo(a)anthracene	83.3	65.5	79	38-143
50-32-8	Benzo(a)pyrene	83.3	60.6	73	39-145
205-99-2	Benzo(b)fluoranthene	83.3	60.0	72	38-151
191-24-2	Benzo(g,h,i)perylene	83.3	60.9	73	35-136
207-08-9	Benzo(k)fluoranthene	83.3	59.1	71	38-147
218-01-9	Chrysene	83.3	61.2	73	39-137
53-70-3	Dibenzo(a,h)anthracene	83.3	61.4	74	35-139
206-44-0	Fluoranthene	83.3	63.4	76	34-132
86-73-7	Fluorene	83.3	59.0	71	41-136
193-39-5	Indeno(1,2,3-cd)pyrene	83.3	54.1	65	31-144
90-12-0	1-Methylnaphthalene	83.3	61.3	74	36-130
91-57-6	2-Methylnaphthalene	83.3	61.4	74	40-131
91-20-3	Naphthalene	83.3	58.8	71	36-130
85-01-8	Phenanthrene	83.3	60.1	72	40-135
129-00-0	Pyrene	83.3	59.1	71	29-157

CAS No.	Surrogate Recoveries	BSP	Limits
4165-60-0	Nitrobenzene-d5	76%	10-193%
321-60-8	2-Fluorobiphenyl	71%	20-138%
1718-51-0	Terphenyl-d14	73%	17-174%

Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

Job Number: D14745
Account: ENCACOP EnCana
Project: C28A Background

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP2096-MS	3G01268.D	2	07/01/10	TMB	06/30/10	OP2096	E3G32
OP2096-MSD	3G01269.D	2	07/01/10	TMB	06/30/10	OP2096	E3G32
D14744-1 ^a	3G01267.D	2	07/01/10	TMB	06/30/10	OP2096	E3G32

The QC reported here applies to the following samples:

Method: SW846 8270C BY SIM

D14745-1

CAS No.	Compound	D14744-1 ug/kg	Q	Spike ug/kg	MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
83-32-9	Acenaphthene	ND		91.8	48.5	53	66.1	72	31* ^b	20-151/30
208-96-8	Acenaphthylene	ND		91.8	49.9	54	67.7	74	30	23-156/30
120-12-7	Anthracene	ND		91.8	48.2	52	68.0	74	34* ^b	25-149/30
56-55-3	Benzo(a)anthracene	ND		91.8	57.5	63	78.9	86	31* ^b	22-157/30
50-32-8	Benzo(a)pyrene	ND		91.8	55.1	60	73.3	80	28	23-153/30
205-99-2	Benzo(b)fluoranthene	ND		91.8	57.0	62	75.9	83	28	22-161/30
191-24-2	Benzo(g,h,i)perylene	ND		91.8	53.6	58	73.6	80	31* ^b	20-158/30
207-08-9	Benzo(k)fluoranthene	ND		91.8	46.3	50	64.3	70	33* ^b	17-161/30
218-01-9	Chrysene	ND		91.8	47.1	51	65.8	72	33* ^b	16-159/30
53-70-3	Dibenzo(a,h)anthracene	ND		91.8	59.6	65	78.8	86	28	21-154/30
206-44-0	Fluoranthene	ND		91.8	56.3	61	81.8	89	37* ^b	16-140/30
86-73-7	Fluorene	ND		91.8	50.5	55	69.5	76	32* ^b	15-153/30
193-39-5	Indeno(1,2,3-cd)pyrene	ND		91.8	62.7	68	85.3	93	31* ^b	21-159/30
90-12-0	1-Methylnaphthalene	ND		91.8	50.0	54	67.5	73	30	10-148/30
91-57-6	2-Methylnaphthalene	ND		91.8	52.4	57	67.1	73	25	10-181/30
91-20-3	Naphthalene	ND		91.8	49.7	54	59.1	64	17	10-176/30
85-01-8	Phenanthrene	ND		91.8	48.0	52	67.7	74	34* ^b	22-152/30
129-00-0	Pyrene	ND		91.8	51.3	56	72.9	79	35* ^b	10-200/30

CAS No.	Surrogate Recoveries	MS	MSD	D14744-1	Limits
4165-60-0	Nitrobenzene-d5	56%	66%	64%	10-193%
321-60-8	2-Fluorobiphenyl	54%	73%	67%	20-138%
1718-51-0	Terphenyl-d14	55%	76%	71%	17-174%

(a) Dilution required due to matrix interference.

(b) High RPD due to possible sample nonhomogeneity.



GC Volatiles

QC Data Summaries

Includes the following where applicable:

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

Method Blank Summary

Job Number: D14745
Account: ENCACOP EnCana
Project: C28A Background

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GGB306-MB	GB5626.D	1	07/07/10	DG	n/a	n/a	GGB306

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

D14745-1

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	1.0	1.0	mg/kg	

CAS No.	Surrogate Recoveries	Limits
120-82-1	1,2,4-Trichlorobenzene	116% 60-140%

7.1.1
7

Blank Spike Summary

Job Number: D14745
Account: ENCACOP EnCana
Project: C28A Background

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GGB306-BS	GB5627.D	1	07/07/10	DG	n/a	n/a	GGB306

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

D14745-1

CAS No.	Compound	Spike mg/kg	BSP mg/kg	BSP %	Limits
	TPH-GRO (C6-C10)	11	9.76	89	70-130

CAS No.	Surrogate Recoveries	BSP	Limits
120-82-1	1,2,4-Trichlorobenzene	137%	60-140%

7.2.1
7

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D14745
Account: ENCACOP EnCana
Project: C28A Background

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D14670-1MS	GB5629.D	1	07/07/10	DG	n/a	n/a	GGB306
D14670-1MSD	GB5630.D	1	07/07/10	DG	n/a	n/a	GGB306
D14670-1	GB5628.D	1	07/07/10	DG	n/a	n/a	GGB306

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

D14745-1

CAS No.	Compound	D14670-1 mg/kg	Q	Spike mg/kg	MS mg/kg	MS %	MSD mg/kg	MSD %	RPD	Limits Rec/RPD
	TPH-GRO (C6-C10)	4.57		19.1	11.6	37* a	14.9	54* a	4	62-130/30

CAS No.	Surrogate Recoveries	MS	MSD	D14670-1	Limits
120-82-1	1,2,4-Trichlorobenzene	104%	104%	99%	60-140%

(a) Outside control limits due to matrix interference.



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: D14745
Account: ENCACOP - EnCana
Project: C28A Background

QC Batch ID: MP2228
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date: 07/01/10

Metal	RL	IDL	MDL	MB raw	final
Aluminum	10	.7	2		
Antimony	3.0	.17	.5		
Arsenic	2.5	.28	.72		
Barium	1.0	.014	.05	0.090	<1.0
Beryllium	1.0	.14	.21		
Boron	5.0	.35	.91		
Cadmium	1.0	.022	.12	0.050	<1.0
Calcium	40	1.7	2.7		
Chromium	1.0	.027	.18	0.090	<1.0
Cobalt	0.50	.048	.058		
Copper	0.50	.16	.38	-0.040	<0.50
Iron	7.0	.77	.91		
Lead	5.0	.13	.24	-0.10	<5.0
Lithium	0.20	.076	.09		
Magnesium	20	.58	.93		
Manganese	0.50	.021	.028		
Molybdenum	1.0	.041	.16		
Nickel	3.0	.038	.075	0.0	<3.0
Phosphorus	10	1.5	3.5		
Potassium	200	38	130		
Selenium	5.0	.28	.54	-0.020	<5.0
Silicon	5.0	1.2	.68		
Silver	3.0	.098	.068	-0.10	<3.0
Sodium	40	23	6.3		
Strontium	5.0	.0091	.02		
Thallium	1.0	.31	.21		
Tin	5.0	1.4	.56		
Titanium	1.0	.0098	.041		
Uranium	5.0	.22	.53		
Vanadium	1.0	.027	.034		
Zinc	3.0	.076	.49	0.10	<3.0

Associated samples MP2228: D14745-1

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D14745
Account: ENCACOP - EnCana
Project: C28A Background

QC Batch ID: MP2228
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date:

Metal

(anr) Analyte not requested

8.1.1

8

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D14745
Account: ENCACOP - EnCana
Project: C28A Background

QC Batch ID: MP2228
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date: 07/01/10

Metal	D14510-1 Original MS		SpikeLot MPICPALL % Rec		QC Limits
Aluminum					
Antimony					
Arsenic	anr				
Barium	139	276	166	82.8	75-125
Beryllium					
Boron	anr				
Cadmium	0.35	34.0	41.4	81.3	75-125
Calcium					
Chromium	18.4	54.4	41.4	87.0	75-125
Cobalt					
Copper	47.5	83.2	41.4	86.3	75-125
Iron					
Lead	15.5	83.4	82.8	82.0	75-125
Lithium					
Magnesium					
Manganese					
Molybdenum					
Nickel	22.2	57.2	41.4	84.6	75-125
Phosphorus					
Potassium					
Selenium	3.1	69.5	82.8	80.2	75-125
Silicon					
Silver	0.33	14.8	16.6	87.4	75-125
Sodium					
Strontium					
Thallium					
Tin					
Titanium					
Uranium					
Vanadium					
Zinc	99.1	133	41.4	81.9	75-125

Associated samples MP2228: D14745-1

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D14745
Account: ENCACOP - EnCana
Project: C28A Background

QC Batch ID: MP2228
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date:

Metal

(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

8.1.2

8

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D14745
Account: ENCACOP - EnCana
Project: C28A Background

QC Batch ID: MP2228
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date: 07/01/10

Metal	D14510-1 Original	MSD	Spikelot MPICPAL	% Rec	MSD RPD	QC Limit
Aluminum						
Antimony						
Arsenic	anr					
Barium	139	254	166	69.5N(a)	8.3	20
Beryllium						
Boron	anr					
Cadmium	0.35	33.5	41.4	80.1	1.5	20
Calcium						
Chromium	18.4	54.1	41.4	86.3	0.6	20
Cobalt						
Copper	47.5	82.9	41.4	85.6	0.4	20
Iron						
Lead	15.5	81.8	82.8	80.1	1.9	20
Lithium						
Magnesium						
Manganese						
Molybdenum						
Nickel	22.2	55.4	41.4	80.2	3.2	20
Phosphorus						
Potassium						
Selenium	3.1	67.8	82.8	78.2	2.5	20
Silicon						
Silver	0.33	14.6	16.6	86.2	1.4	20
Sodium						
Strontium						
Thallium						
Tin						
Titanium						
Uranium						
Vanadium						
Zinc	99.1	133	41.4	81.9	0.0	20

Associated samples MP2228: D14745-1

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D14745
Account: ENCACOP - EnCana
Project: C28A Background

QC Batch ID: MP2228
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date:

Metal

- (N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested
(a) Spike recovery indicates possible matrix interference and/or sample nonhomogeneity.

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D14745
Account: ENCACOP - EnCana
Project: C28A Background

QC Batch ID: MP2228
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date: 07/01/10

Metal	BSP Result	Spikelot MPICPALL	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic	anr			
Barium	197	200	98.5	80-120
Beryllium				
Boron	anr			
Cadmium	46.7	50	93.4	80-120
Calcium				
Chromium	50.8	50	101.6	80-120
Cobalt				
Copper	49.5	50	99.0	80-120
Iron				
Lead	96.7	100	96.7	80-120
Lithium				
Magnesium				
Manganese				
Molybdenum				
Nickel	48.8	50	97.6	80-120
Phosphorus				
Potassium				
Selenium	93.3	100	93.3	80-120
Silicon				
Silver	19.4	20	97.0	80-120
Sodium				
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc	47.1	50	94.2	80-120

Associated samples MP2228: D14745-1

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D14745
Account: ENCACOP - EnCana
Project: C28A Background

QC Batch ID: MP2228
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date:

Metal

(anr) Analyte not requested

8.1.3

8

SERIAL DILUTION RESULTS SUMMARY

Login Number: D14745
Account: ENCACOP - EnCana
Project: C28A Background

QC Batch ID: MP2228
Matrix Type: SOLID

Methods: SW846 6010B
Units: ug/l

Prep Date: 07/01/10

Metal	D14510-1 Original	SDL 1:5	%DIF	QC Limits
Aluminum				
Antimony				
Arsenic	anr			
Barium	1680	2010	19.7*(a)	0-10
Beryllium				
Boron	anr			
Cadmium	4.20	4.50	7.1	0-10
Calcium				
Chromium	222	267	20.3*(a)	0-10
Cobalt				
Copper	574	634	10.4*(a)	0-10
Iron				
Lead	187	224	19.5*(a)	0-10
Lithium				
Magnesium				
Manganese				
Molybdenum				
Nickel	269	332	23.5*(a)	0-10
Phosphorus				
Potassium				
Selenium	37.9	60.5	59.6 (b)	0-10
Silicon				
Silver	4.00	5.00	25.0 (b)	0-10
Sodium				
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc	1200	1530	27.7*(a)	0-10

Associated samples MP2228: D14745-1

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits

SERIAL DILUTION RESULTS SUMMARY

Login Number: D14745
Account: ENCACOP - EnCana
Project: C28A Background

QC Batch ID: MP2228
Matrix Type: SOLID

Methods: SW846 6010B
Units: ug/l

Prep Date:

Metal

- (anr) Analyte not requested
(a) Serial dilution indicates possible matrix interference.
(b) Percent difference acceptable due to low initial sample concentration (< 50 times IDL).

8.1.4

8

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D14745
Account: ENCACOP - EnCana
Project: C28A Background

QC Batch ID: MP2229
Matrix Type: SOLID

Methods: SW846 6020
Units: mg/kg

Prep Date: 07/01/10

Metal	RL	IDL	MDL	MB raw	final
Aluminum	25	.14	.89		
Antimony	0.20	.001	.045		
Arsenic	0.40	.049	.26	0.041	<0.40
Barium	1.0	.0035	.17		
Beryllium	0.10	.0075	.014		
Boron	20	.97	2		
Cadmium	0.050	.023	.048		
Calcium	200	1.8	6.1		
Chromium	1.0	.021	.23		
Cobalt	0.10	.0033	.088		
Copper	1.0	.011	.14		
Iron	20	.81	6.1		
Lead	0.25	.0012	.18		
Magnesium	50	.067	1.3		
Manganese	0.50	.007	.089		
Molybdenum	0.50	.0044	.2		
Nickel	1.0	.0029	.074		
Phosphorus	30	1.8	5.6		
Potassium	100	2	9.1		
Selenium	0.20	.075	.14		
Silver	0.050	.0008	.029		
Sodium	250	.8	1.8		
Strontium	10	.004	.047		
Thallium	0.10	.015	.071		
Tin	5.0	.006	.17		
Titanium	1.0	.035	.071		
Uranium	0.25	.00038	.12		
Vanadium	2.0	.052	.99		
Zinc	5.0	.039	.53		

Associated samples MP2229: D14745-1

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: D14745
Account: ENCACOP - EnCana
Project: C28A Background

QC Batch ID: MP2229
Matrix Type: SOLID

Methods: SW846 6020
Units: mg/kg

Prep Date: 07/01/10

Metal	D14510-1 Original MS		SpikeLot MPICPALL % Rec		QC Limits
Aluminum					
Antimony					
Arsenic	1.7	73.1	82.8	86.3	60-119
Barium					
Beryllium					
Boron					
Cadmium					
Calcium					
Chromium					
Cobalt					
Copper					
Iron					
Lead					
Magnesium					
Manganese					
Molybdenum					
Nickel					
Phosphorus					
Potassium					
Selenium					
Silver					
Sodium					
Strontium					
Thallium					
Tin					
Titanium					
Uranium					
Vanadium					
Zinc					

Associated samples MP2229: D14745-1

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

8.2.2
8

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D14745
Account: ENCACOP - EnCana
Project: C28A Background

QC Batch ID: MP2229
Matrix Type: SOLID

Methods: SW846 6020
Units: mg/kg

Prep Date: 07/01/10

Metal	D14510-1 Original	MSD	Spikelot MPICPAL	% Rec	MSD RPD	QC Limit
Aluminum						
Antimony						
Arsenic	1.7	75.5	82.8	89.2	3.2	20
Barium						
Beryllium						
Boron						
Cadmium						
Calcium						
Chromium						
Cobalt						
Copper						
Iron						
Lead						
Magnesium						
Manganese						
Molybdenum						
Nickel						
Phosphorus						
Potassium						
Selenium						
Silver						
Sodium						
Strontium						
Thallium						
Tin						
Titanium						
Uranium						
Vanadium						
Zinc						

Associated samples MP2229: D14745-1

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

Login Number: D14745
Account: ENCACOP - EnCana
Project: C28A Background

Prep Date: 07/01/10

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

SERIAL DILUTION RESULTS SUMMARY

Login Number: D14745
Account: ENCACOP - EnCana
Project: C28A Background

QC Batch ID: MP2229
Matrix Type: SOLID

Methods: SW846 6020
Units: ug/l

Prep Date: 07/01/10

Metal	D14510-1			QC	
	Original	SDL 5:25	%DIF	Limits	
Aluminum					
Antimony					
Arsenic	20.7	24.6	18.8 (a)	0-10	
Barium					
Beryllium					
Boron					
Cadmium					
Calcium					
Chromium					
Cobalt					
Copper					
Iron					
Lead					
Magnesium					
Manganese					
Molybdenum					
Nickel					
Phosphorus					
Potassium					
Selenium					
Silver					
Sodium					
Strontium					
Thallium					
Tin					
Titanium					
Uranium					
Vanadium					
Zinc					

Associated samples MP2229: D14745-1

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: D14745
Account: ENCACOP - EnCana
Project: C28A Background

QC Batch ID: MP2235
Matrix Type: SOLID

Methods: SW846 7471A
Units: mg/kg

Prep Date: 07/01/10

Metal	RL	IDL	MDL	MB	
				raw	final
Mercury	0.10	.0011	.0012	0.00027	<0.10

Associated samples MP2235: D14745-1

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: D14745
Account: ENCACOP - EnCana
Project: C28A Background

QC Batch ID: MP2235
Matrix Type: SOLID

Methods: SW846 7471A
Units: mg/kg

Prep Date: 07/01/10

Metal	D14510-1		Spikelot		QC	
	Original	MS	HGWSR1	% Rec	Limits	
Mercury	0.035	0.39	0.409	79.5N(a)	85-115	

Associated samples MP2235: D14745-1

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 recovery indicates possible matrix interference.

8.3.2

8

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D14745
Account: ENCACOP - EnCana
Project: C28A Background

QC Batch ID: MP2235
Matrix Type: SOLID

Methods: SW846 7471A
Units: mg/kg

Prep Date: 07/01/10

Metal	D14510-1 Original MSD	Spikelot HGWSR1	% Rec	MSD RPD	QC Limit
Mercury	0.035	0.38	0.401	78.5N(a) 2.6	20

Associated samples MP2235: D14745-1

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 recovery indicates possible matrix interference.

8.3.2

8

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D14745
Account: ENCACOP - EnCana
Project: C28A Background

QC Batch ID: MP2235
Matrix Type: SOLID

Methods: SW846 7471A
Units: mg/kg

Prep Date: 07/01/10

Metal	BSP Result	Spikelot HGWSR1	% Rec	QC Limits
Mercury	0.35	0.4	87.5	80-120

Associated samples MP2235: D14745-1

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

8.3.3
8

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D14745
Account: ENCACOP - EnCana
Project: C28A Background

QC Batch ID: MP2240
Matrix Type: AQUEOUS

Methods: SW846 6010B
Units: ug/l

Prep Date: 07/02/10

Metal	RL	IDL	MDL	MB raw	final
Aluminum	500	35	250		
Antimony	150	8.5	65		
Arsenic	130	14	33		
Barium	50	.7	12		
Beryllium	50	7	22		
Boron	250	18	93		
Cadmium	50	1.1	6		
Calcium	2000	85	46	432	<2000
Chromium	50	1.4	8		
Cobalt	25	2.4	1.5		
Copper	25	8	14		
Iron	350	39	50		
Lead	250	6.5	16		
Lithium	10	3.8	8		
Magnesium	1000	29	62	206	<1000
Manganese	25	1.1	3.5		
Molybdenum	50	2.1	6		
Nickel	150	1.9	3		
Phosphorus	500	75	270		
Potassium	5000	1900	2700		
Selenium	250	14	36		
Silicon	250	60	100		
Silver	150	4.9	1.5		
Sodium	2000	1200	110	-470	<2000
Strontium	25	.46	17		
Thallium	50	16	11		
Tin	250	70	22		
Titanium	50	.49	3.5		
Uranium	250	11	20		
Vanadium	50	1.4	1.5		
Zinc	150	3.8	8.5		

Associated samples MP2240: D14745-1A

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D14745
Account: ENCACOP - EnCana
Project: C28A Background

QC Batch ID: MP2240
Matrix Type: AQUEOUS

Methods: SW846 6010B
Units: ug/l

Prep Date:

Metal

(anr) Analyte not requested

8.4.1

8

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D14745
Account: ENCACOP - EnCana
Project: C28A Background

QC Batch ID: MP2240
Matrix Type: AQUEOUS

Methods: SW846 6010B
Units: ug/l

Prep Date: 07/02/10

Metal	D14745-1A Original MS		Spikelot MPICPALL % Rec		QC Limits
Aluminum					
Antimony					
Arsenic					
Barium					
Beryllium					
Boron					
Cadmium					
Calcium	21100	152000	125000	104.7	75-125
Chromium					
Cobalt					
Copper					
Iron					
Lead					
Lithium					
Magnesium	6970	132000	125000	100.0	75-125
Manganese					
Molybdenum					
Nickel					
Phosphorus					
Potassium					
Selenium					
Silicon					
Silver					
Sodium	20900	148000	125000	101.7	75-125
Strontium					
Thallium					
Tin					
Titanium					
Uranium					
Vanadium					
Zinc					

Associated samples MP2240: D14745-1A

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits

8.4.2
8

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D14745
Account: ENCACOP - EnCana
Project: C28A Background

QC Batch ID: MP2240
Matrix Type: AQUEOUS

Methods: SW846 6010B
Units: ug/l

Prep Date:

Metal

(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

8.4.2

8

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D14745
Account: ENCACOP - EnCana
Project: C28A Background

QC Batch ID: MP2240
Matrix Type: AQUEOUS

Methods: SW846 6010B
Units: ug/l

Prep Date: 07/02/10

Metal	D14745-1A Original MSD	Spikelot MPICPAL % Rec	MSD RPD	QC Limit
Aluminum				
Antimony				
Arsenic				
Barium				
Beryllium				
Boron				
Cadmium				
Calcium	21100	151000	125000	103.9
Chromium				
Cobalt				
Copper				
Iron				
Lead				
Lithium				
Magnesium	6970	131000	125000	99.2
Manganese				
Molybdenum				
Nickel				
Phosphorus				
Potassium				
Selenium				
Silicon				
Silver				
Sodium	20900	148000	125000	101.7
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc				

Associated samples MP2240: D14745-1A

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits

8.4.2
8

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D14745
Account: ENCACOP - EnCana
Project: C28A Background

QC Batch ID: MP2240
Matrix Type: AQUEOUS

Methods: SW846 6010B
Units: ug/l

Prep Date:

Metal

(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

8.4.2

8

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D14745
Account: ENCACOP - EnCana
Project: C28A Background

QC Batch ID: MP2240
Matrix Type: AQUEOUS

Methods: SW846 6010B
Units: ug/l

Prep Date: 07/02/10

Metal	BSP Result	Spikelot MPICPALL	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic				
Barium				
Beryllium				
Boron				
Cadmium				
Calcium	134000	125000	107.2	80-120
Chromium				
Cobalt				
Copper				
Iron				
Lead				
Lithium				
Magnesium	118000	125000	94.4	80-120
Manganese				
Molybdenum				
Nickel				
Phosphorus				
Potassium				
Selenium				
Silicon				
Silver				
Sodium	120000	125000	96.0	80-120
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc				

Associated samples MP2240: D14745-1A

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits

8.4.3
8

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D14745
Account: ENCACOP - EnCana
Project: C28A Background

QC Batch ID: MP2240
Matrix Type: AQUEOUS

Methods: SW846 6010B
Units: ug/l

Prep Date:

Metal

(anr) Analyte not requested



General Chemistry

QC Data Summaries

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: D14745
Account: ENCACOP - EnCana
Project: C28A Background

Analyte	Batch ID	RL	MB Result	Units	Spike Amount	BSP Result	BSP %Recov	QC Limits
Specific Conductivity	GP2292/GN5202			umhos/cm	9970	9970	93.3	90-110%
pH	GN5124			su	8.00	8.03	100.4	99.3-100.7%
pH	GN5124			su	8.00	8.03	100.4	99.3-100.7%

Associated Samples:
Batch GN5124: D14745-1
Batch GP2292: D14745-1
(*) Outside of QC limits



Misc. Forms

Custody Documents and Other Forms

(Accutest Northern California, Inc.)

Includes the following where applicable:

- Chain of Custody

Accutest Mountain States Laboratory (AMS) **Subcontractor Order**

Date/Time: 6/30/10 9:30 AM
Accutest Job No. D14745
Client Project:
CSR: Amanda Kissell

Sub Lab: Accutest - Northern California
Address: 2105 Lundy Ave.
 San José CA 95131
Contact: Sample Management
Phone: (408) 588-0200

Sample #:	Analyses
D14745 - 1	B8015DRO
0	
0	
0	
0	
0	
0	
Turn Around 3 - 5 Business Day Rush	

Sample Managment receipt: _____ **Date:** _____
 (Print form and sign/date. Submit this form to Login Dept. with the SUB COC.)

e/sop_new/subform



GC Semi-volatiles

QC Data Summaries

(Accutest Northern California, Inc.)

Includes the following where applicable:

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

Method Blank Summary

Job Number: D14745
Account: ALMS Accutest Mountain States
Project: ENCACOP: C28A Background

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP2341-MB	GG15559.D	1	07/02/10	JH	07/01/10	OP2341	GGG469

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

D14745-1

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (C10-C28)	ND	10	5.0	mg/kg	

CAS No.	Surrogate Recoveries	Limits
630-01-3	Hexacosane	83% 45-140%

11.1.1
11

Blank Spike/Blank Spike Duplicate Summary

Job Number: D14745
Account: ALMS Accutest Mountain States
Project: ENCACOP: C28A Background

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP2341-BS	GG15560.D	1	07/02/10	JH	07/01/10	OP2341	GGG469
OP2341-BSD	GG15561.D	1	07/02/10	JH	07/01/10	OP2341	GGG469

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

D14745-1

CAS No.	Compound	Spike mg/kg	BSP mg/kg	BSP %	BSD mg/kg	BSD %	RPD	Limits Rec/RPD
	TPH (C10-C28)	100	70.4	70	79.4	79	12	45-140/30

CAS No.	Surrogate Recoveries	BSP	BSD	Limits
630-01-3	Hexacosane	88%	91%	45-140%

11.2.1
11



Misc. Forms

Custody Documents and Other Forms

(Accutest Labs of New England, Inc.)

Includes the following where applicable:

- Chain of Custody



CHAIN

CHAIN OF CUSTODY

4036 Youngfield St., Wheat Ridge, CO 80033
303-425-6021 FAX: 303-425-6854

Accutest Job #: D14745

Accutest Quote #:

AMS P.O. #:

Project No.:

Client Information			Subcontract Laboratory Information										Analytical Information						
Name Accutest Mountain States (AMS)			Name Accutest - New England																
Address 4036 Youngfield St.			Address 495 Technology Center West, BLDG O																
City Wheat Ridge,	State CO	Zip 80033	City Marlborough	State MA	Zip 01752														
Send Report to: Tiffany Pham			Contact: Sample Management																
Any questions contact: Amanda Kissell																			
Phone/Fax #: (303) 425-6021; (303) 425-6854			Phone: (508) 481-6200																
Field ID / Point of Collection			Collection		Matrix	# of bottles	HCL	NaOH	HNO3	H2SO4	None	Xcra	eh	Comments					
D14745 -1			Date 6/28/10	Time 1:10 PM	Soil	1						X	X						
-																			
-																			
-																			
-																			
-																			
-																			
-																			
-																			
Turnaround Information			Data Deliverable Information										Comments / Remarks						
<input checked="" type="checkbox"/> 3 - 5 Business Day Rush <input type="checkbox"/> Other _____ (Days)			Approved By: _____		<input type="checkbox"/> Commercial "A"		<input type="checkbox"/> PDF		Please use Colorado regulations and RLs. 148										
					<input type="checkbox"/> Commercial "B"		<input type="checkbox"/> Compact Disk Deliverable												
					<input type="checkbox"/> Commercial "BN"		<input type="checkbox"/> Electronic Delivery: _____												
10 Day Turnaround Hardcopy, RUSH is FAX Data unless previously approved.					<input type="checkbox"/> Reduced Tier 1		<input type="checkbox"/> State Forms												
					<input type="checkbox"/> Full Tier 1		<input type="checkbox"/> Other (Specify) _____												
Sample Custody must be documented below each time samples change possession, including courier delivery.															For Subcontract Laboratory Use Only				
Relinquished by:		Date & Time:		Received By:		Date & Time:		Seal #:		Headspace:		Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/>							
1		6/30/10		1 FedEx		1													
Relinquished by:		Date & Time:		Received By:		Date & Time:		Preserved where applicable:											
2		7/1/10 10:10		2 [Signature]		2		<input type="checkbox"/>											
Relinquished by:		Date & Time:		Received By:		Date & Time:		Temperature °C		On Ice									
3				3		3		37		<input checked="" type="checkbox"/>									

D14745: Chain of Custody

Page 1 of 2

Accutest Labs of New England, Inc.



Accutest Laboratories Sample Receipt Summary

Accutest Job Number: D14745

Client: AMS

Immediate Client Services Action Required: No

Date / Time Received: 7/1/2010 10:10:00 AM

No. Coolers: 1

Client Service Action Required at Login: No

Project: N/A

Airbill #'s: N/A

Cooler Security

Y or N

Y or N

- | | | | | | |
|---------------------------|-------------------------------------|--------------------------|-----------------------|-------------------------------------|--------------------------|
| 1. Custody Seals Present: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 3. COC Present: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Custody Seals Intact: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 4. Smpl Dates/Time OK | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

Cooler Temperature

Y or N

- | | | |
|------------------------------|-------------------------------------|--------------------------|
| 1. Temp criteria achieved: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Cooler temp verification: | Infrared gun | |
| 3. Cooler media: | Ice (bag) | |

Quality Control Preservation

Y or N

N/A

- | | | | |
|---------------------------------|-------------------------------------|--------------------------|-------------------------------------|
| 1. Trip Blank present / cooler: | <input type="checkbox"/> | <input type="checkbox"/> | |
| 2. Trip Blank listed on COC: | <input type="checkbox"/> | <input type="checkbox"/> | |
| 3. Samples preserved properly: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | |
| 4. VOCs headspace free: | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

Sample Integrity - Documentation

Y or N

- | | | |
|--|-------------------------------------|--------------------------|
| 1. Sample labels present on bottles: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Container labeling complete: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Sample container label / COC agree: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

Sample Integrity - Condition

Y or N

- | | | |
|----------------------------------|-------------------------------------|--------------------------|
| 1. Sample recvd within HT: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. All containers accounted for: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Condition of sample: | Intact | |

Sample Integrity - Instructions

Y or N N/A

- | | | | |
|---|-------------------------------------|-------------------------------------|-------------------------------------|
| 1. Analysis requested is clear: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | |
| 2. Bottles received for unspecified tests | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |
| 3. Sufficient volume rec'd for analysis: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | |
| 4. Compositing instructions clear: | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 5. Filtering instructions clear: | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

Comments

Accutest Laboratories
V:508.481.6200

495 Technology Center West, Bldg One
F: 508.481.7753

Marlborough, MA
www.accutest.com

D14745: Chain of Custody

Page 2 of 2



General Chemistry

QC Data Summaries

(Accutest Labs of New England, Inc.)

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: D14745
Account: ALMS - Accutest Mountain States
Project: ENCACOP: C28A Background

Analyte	Batch ID	RL	MB Result	Units	Spike Amount	BSP Result	BSP %Recov	QC Limits
Chromium, Hexavalent	GP11780/GN32325	2.0	0.0	mg/kg	40	36.9	92.3	80-120%
Chromium, Hexavalent	GP11780/GN32325			mg/kg	844	818	96.9	80-120%

Associated Samples:
Batch GP11780: D14745-1
(*) Outside of QC limits

DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D14745
Account: ALMS - Accutest Mountain States
Project: ENCACOP: C28A Background

Analyte	Batch ID	QC Sample	Units	Original Result	DUP Result	RPD	QC Limits
Chromium, Hexavalent	GP11780/GN32325	D14817-3	mg/kg	0.0	0.0	0.0	0-20%
Redox Potential Vs H2	GN32313	D14702-1	mv	321	310	3.5	0-20%

Associated Samples:
Batch GN32313: D14745-1
Batch GP11780: D14745-1
(*) Outside of QC limits

MATRIX SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D14745
Account: ALMS - Accutest Mountain States
Project: ENCACOP: C28A Background

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MS Result	%Rec	QC Limits
Chromium, Hexavalent	GP11780/GN32325	D14817-3	mg/kg	0.0	45.5	39.1	86.0	75-125%
Chromium, Hexavalent	GP11780/GN32325	D14817-3	mg/kg	0.0	988	1020	103.3	75-125%

Associated Samples:
Batch GP11780: D14745-1
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits



IT'S ALL IN THE CHEMISTRY

07/12/10

Technical Report for

EnCana

G29 Pit Closure

Accutest Job Number: D14851

Sampling Date: 06/29/10

Report to:

EnCana
2717 CR 215 Suite 100
Parachute, CO 81635
christopher.hines@encana.com

ATTN: Chris Hines

Total number of pages in report: **95**



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.

Jesse L. Smith
Laboratory Director

Client Service contact: Amanda Kissell 303-425-6021

Certifications: CO, ID, NE, NM, ND (R-027) (PW) UT (NELAP CO00049)

This report shall not be reproduced, except in its entirety, without the written approval of Accutest Laboratories.
Test results relate only to samples analyzed.

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Sample Summary

EnCana

Job No: D14851

G29 Pit CLosure

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
D14851-1	06/29/10	12:15 BR	07/01/10	SO	Soil	G29-SE BACK-062910
D14851-1A	06/29/10	12:15 BR	07/01/10	SO	Soil	G29-SE BACK-062910
D14851-2	06/29/10	12:05 BR	07/01/10	SO	Soil	G29-SW BACK-062910
D14851-3	06/29/10	12:40 BR	07/01/10	SO	Soil	G29-PIT BOTTOM-062910
D14851-3A	06/29/10	12:40 BR	07/01/10	SO	Soil	G29-PIT BOTTOM-062910
D14851-4	06/29/10	13:10 BR	07/01/10	SO	Soil	G29-CUTTINGS-062910
D14851-4A	06/29/10	13:10 BR	07/01/10	SO	Soil	G29-CUTTINGS-062910

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

CASE NARRATIVE / CONFORMANCE SUMMARY

Client: EnCana

Job No D14851

Site: G29 Pit CLOsure

Report Dat 7/10/2010 10:25:37 AM

On 07/01/2010, 4 sample(s), 0 Trip Blank(s) and 0 Field Blank(s) were received at Accutest Mountain States (AMS) at a temperature of 4.3 °C. The samples were intact and properly preserved, unless noted below. An AMS Job Number of D14851 was assigned to the project. The lab sample IDs, client sample IDs, and dates of sample collection are detailed in the report's Results Summary.

Specified quality control criteria were achieved for this job except as noted below. For more information, please refer to the analytical results and QC summary pages.

Volatiles by GCMS By Method SW846 8260B

Matrix SO

Batch ID: V3V283

- All samples were analyzed within the recommended method holding time.
- Sample(s) D14850-1MS, D14850-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

Matrix SO

Batch ID: V3V284

- All samples were analyzed within the recommended method holding time.
- Sample(s) D14746-2MS, D14746-2MSD 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: OP2111

- All samples were extracted within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- Sample(s) D14817-3MS, D14817-3MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.
- D14851-3: Dilution required due to matrix interference.
- D14851-3 for 2-Fluorobiphenyl: Outside control limits due to dilution.
- D14851-3 for Terphenyl-d14: Outside control limits due to dilution.

Volatiles by GC By Method SW846 8015B

Matrix SO

Batch ID: GGA445

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D14907-2MS, D14907-2MSD were used as the QC samples indicated.

Matrix SO

Batch ID: GGB307

- All samples were analyzed within the recommended method holding time.
- Sample(s) D14851-3MS, D14851-3MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.
- Matrix Spike and Matrix Spike Duplicate Recovery(s) for TPH-GRO (C6-C10) are outside control limits. Probable cause due to matrix interference.
- Sample(s) D14851-3, D14851-3MS have surrogates outside control limits. Probable cause due to matrix interference.

Saturday, July 10, 2010

Page 1 of 3

Extractables by GC By Method SW846-8015B

Matrix SO

Batch ID: OP2112

- All samples were extracted within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- Sample(s) D14764-1MS, D14764-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

Metals By Method SW846 6010B

Matrix AQ

Batch ID: MP2263

- 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) D14849-2AMS, D14849-2AMSD were used as the QC samples for metals.

Matrix SO

Batch ID: MP2238

- 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) D14850-1MS, D14850-1MSD, D14850-1SDL were used as the QC samples for metals.
- 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 Serial Dilution for Cadmium, Selenium, Barium, Chromium, Lead, Nickel, Zinc are outside control limits for sample MP2238-SD1. Percent difference acceptable due to low initial sample concentration (< 50 times IDL).

Metals By Method SW846 6020

Matrix SO

Batch ID: MP2239

- 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) D14850-1MS, D14850-1MSD, D14850-1SDL were used as the QC samples for metals.
- RPD(s) for Serial Dilution for Arsenic are outside control limits for sample MP2239-SD1. Probable cause due to sample homogeneity.

Metals By Method SW846 7471A

Matrix SO

Batch ID: MP2250

- 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) D14851-1MS, D14851-1MSD were used as the QC samples for metals.

Wet Chemistry By Method ASTM E1498-76M

Matrix SO

Batch ID: M:GN32327

- The data for ASTM E1498-76M meets quality control requirements.
- The following samples were run outside of holding time for method ASTM E1498-76M: D14851-1, D14851-3, D14851-4.
- Redox Potential Vs H2: Analysis performed at Accutest Laboratories, Marlborough, MA.

Wet Chemistry By Method LADNR29B

Matrix SO	Batch ID: R3126
------------------	------------------------

- The data for LADNR29B meets quality control requirements.
- Sodium Adsorption Ratio: Calculated as: $(\text{Na meq/L}) / \sqrt{[(\text{Ca meq/L}) + (\text{Mg meq/L})/2]}$

Wet Chemistry By Method SM19 2540B M

Matrix SO	Batch ID: GN5174
------------------	-------------------------

- The data for SM19 2540B M meets quality control requirements.

Wet Chemistry By Method SW846 3060/7196A M

Matrix SO	Batch ID: R3112
------------------	------------------------

- The data for SW846 3060/7196A M meets quality control requirements.
- Chromium, Trivalent: Calculated as: (Chromium) - (Chromium, Hexavalent)

Wet Chemistry By Method SW846 3060A/7196A

Matrix SO	Batch ID: M:GP11780
------------------	----------------------------

- The data for SW846 3060A/7196A meets quality control requirements.
- Chromium, Hexavalent: Analysis performed at Accutest Laboratories, Marlborough, MA.

Wet Chemistry By Method SW846 9045C

Matrix SO	Batch ID: GN5177
------------------	-------------------------

- The following samples were run outside of holding time for method SW846 9045C: D14851-1, D14851-3, D14851-4.

AMS certifies that data reported for samples received, listed on the associated custody chain or analytical task order, were produced to specifications meeting AMS's Quality System precision, accuracy and completeness objectives except as noted.

Estimated non-standard method measurement uncertainty data is available on request, based on quality control bias and implicit for standard methods. Acceptable uncertainty requires tested parameter quality control data to meet method criteria.

AMS is not responsible for data quality assumptions if partial reports are used and recommends that this report be used in its entirety. This report is authorized by AMS indicated via signature on the report cover.

SAMPLE DELIVERY GROUP CASE NARRATIVE

Client: Accutest Mountain States

Job No D14851

Site: ENCACOP: G29 Pit CLOsure

Report Date 7/7/2010 4:40:56 PM

3 Sample(s) were collected on 06/29/2010 and were received at Accutest on 07/01/2010 properly preserved, at 3.7 Deg. C and intact. These Samples received an Accutest job number of D14851. 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.

Wet Chemistry By Method ASTM E1498-76M

Matrix SO

Batch ID: GN32327

- Sample(s) D14852-2DUP were used as the QC samples for Redox Potential Vs H2.

Wet Chemistry By Method SW846 3060A/7196A

Matrix SO

Batch ID: GP11780

- All samples were distilled 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) D14817-3DUP, D14817-3MS were used as the QC samples for Chromium, Hexavalent.

The Accutest Laboratories of New England certifies that all analysis were performed within method specification. It is further recommended that this report to be used in its entirety. The Accutest Laboratories of NE, Laboratory Director or assignee as verified by the signature on the cover page has authorized the release of this report(D14851).



Sample Results

Report of Analysis

Report of Analysis

Client Sample ID: G29-SE BACK-062910
Lab Sample ID: D14851-1
Matrix: SO - Soil
Method: SW846 8260B
Project: G29 Pit CLosure

Date Sampled: 06/29/10
Date Received: 07/01/10
Percent Solids: 89.0

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3V05588.D	1	07/04/10	DC	n/a	n/a	V3V283
Run #2							

	Initial Weight
Run #1	1.00 g
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	5.6	1.7	ug/kg	
108-88-3	Toluene	ND	11	5.6	ug/kg	
100-41-4	Ethylbenzene	ND	11	2.2	ug/kg	
	m,p-Xylene	ND	22	3.9	ug/kg	
95-47-6	o-Xylene	ND	11	3.9	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
2037-26-5	Toluene-D8	90%		70-130%
460-00-4	4-Bromofluorobenzene	82%		70-130%
17060-07-0	1,2-Dichloroethane-D4	91%		70-130%

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:	G29-SE BACK-062910		
Lab Sample ID:	D14851-1	Date Sampled:	06/29/10
Matrix:	SO - Soil	Date Received:	07/01/10
Method:	SW846 8270C BY SIM SW846 3540C	Percent Solids:	89.0
Project:	G29 Pit CLosure		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3G01297.D	5	07/07/10	TMB	07/02/10	OP2111	E3G33
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	37	35	ug/kg	
208-96-8	Acenaphthylene	ND	190	38	ug/kg	
120-12-7	Anthracene	ND	37	24	ug/kg	
56-55-3	Benzo(a)anthracene	ND	37	37	ug/kg	
50-32-8	Benzo(a)pyrene	ND	37	24	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	37	27	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	37	23	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	37	24	ug/kg	
218-01-9	Chrysene	ND	37	19	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	37	28	ug/kg	
206-44-0	Fluoranthene	ND	37	23	ug/kg	
86-73-7	Fluorene	ND	37	37	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	37	24	ug/kg	
90-12-0	1-Methylnaphthalene	ND	37	33	ug/kg	
91-57-6	2-Methylnaphthalene	ND	190	57	ug/kg	
91-20-3	Naphthalene	ND	190	41	ug/kg	
85-01-8	Phenanthrene	ND	37	30	ug/kg	
129-00-0	Pyrene	ND	37	25	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	32%		10-193%
321-60-8	2-Fluorobiphenyl	32%		20-138%
1718-51-0	Terphenyl-d14	45%		17-174%

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: G29-SE BACK-062910
Lab Sample ID: D14851-1
Matrix: SO - Soil
Method: SW846 8015B
Project: G29 Pit CLosure

Date Sampled: 06/29/10
Date Received: 07/01/10
Percent Solids: 89.0

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GA7524.D	1	07/07/10	DG	n/a	n/a	GGA445
Run #2							

	Initial Weight
Run #1	1.0 g
Run #2	

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	1.1	1.1	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
120-82-1	1,2,4-Trichlorobenzene	106%		60-140%		

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:	G29-SE BACK-062910			Date Sampled:	06/29/10					
Lab Sample ID:	D14851-1			Date Received:	07/01/10					
Matrix:	SO - Soil			Percent Solids:	89.0					
Method:	SW846-8015B SW846 3550B									
Project:	G29 Pit CLosure									

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FD2496.D	1	07/05/10	CP	07/02/10	OP2112	GFD132
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	Units	Q
	TPH-DRO (C10-C28)	26.6	15	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits	
84-15-1	o-Terphenyl	93%		63-130%	

ND = Not detected
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: G29-SE BACK-062910**Lab Sample ID:** D14851-1**Matrix:** SO - Soil**Project:** G29 Pit CLosure**Date Sampled:** 06/29/10**Date Received:** 07/01/10**Percent Solids:** 89.0**Metals Analysis**

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	20.0	0.37	mg/kg	5	07/02/10	07/02/10 SH	SW846 6020 ¹	SW846 3050B ⁵
Barium	297	0.93	mg/kg	1	07/02/10	07/02/10 SH	SW846 6010B ²	SW846 3050B ⁴
Cadmium	< 0.93	0.93	mg/kg	1	07/02/10	07/02/10 SH	SW846 6010B ²	SW846 3050B ⁴
Chromium	21.6	0.93	mg/kg	1	07/02/10	07/02/10 SH	SW846 6010B ²	SW846 3050B ⁴
Copper	22.4	0.46	mg/kg	1	07/02/10	07/02/10 SH	SW846 6010B ²	SW846 3050B ⁴
Lead	13.0	4.6	mg/kg	1	07/02/10	07/02/10 SH	SW846 6010B ²	SW846 3050B ⁴
Mercury	< 0.11	0.11	mg/kg	1	07/06/10	07/06/10 RN	SW846 7471A ³	SW846 7471A ⁶
Nickel	17.0	2.8	mg/kg	1	07/02/10	07/02/10 SH	SW846 6010B ²	SW846 3050B ⁴
Selenium	< 4.6	4.6	mg/kg	1	07/02/10	07/02/10 SH	SW846 6010B ²	SW846 3050B ⁴
Silver	< 2.8	2.8	mg/kg	1	07/02/10	07/02/10 SH	SW846 6010B ²	SW846 3050B ⁴
Zinc	51.4	2.8	mg/kg	1	07/02/10	07/02/10 SH	SW846 6010B ²	SW846 3050B ⁴

(1) Instrument QC Batch: MA795

(2) Instrument QC Batch: MA798

(3) Instrument QC Batch: MA799

(4) Prep QC Batch: MP2238

(5) Prep QC Batch: MP2239

(6) Prep QC Batch: MP2250

RL = Reporting Limit

Report of Analysis

Client Sample ID: G29-SE BACK-062910**Lab Sample ID:** D14851-1**Matrix:** SO - Soil**Project:** G29 Pit CLosure**Date Sampled:** 06/29/10**Date Received:** 07/01/10**Percent Solids:** 89.0**General Chemistry**

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent ^a	< 2.2	2.2	mg/kg	1	07/07/10 12:07	AMA	SW846 3060A/7196A
Chromium, Trivalent ^b	21.6	3.1	mg/kg	1	07/07/10 12:07	AMA	SW846 3060/7196A M
Redox Potential Vs H2 ^a	402		mv	1	07/06/10	AMA	ASTM E1498-76M
Solids, Percent	89		%	1	07/02/10	JD	SM19 2540B M
Specific Conductivity	4810	1.0	umhos/cm	1	07/07/10	JD	DEPT.OF AG, BOOK N9
pH	9.11		su	1	07/02/10 10:15	CJ	SW846 9045C

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

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

RL = Reporting Limit

Report of Analysis

Client Sample ID:	G29-SE BACK-062910	Date Sampled:	06/29/10
Lab Sample ID:	D14851-1A	Date Received:	07/01/10
Matrix:	SO - Soil	Percent Solids:	89.0
Project:	G29 Pit CLosure		

SAR Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Calcium	219	2.0	mg/l	1	07/07/10	07/08/10 SH	SW846 6010B ¹	EPA 200.7 ²
Magnesium	435	1.0	mg/l	1	07/07/10	07/08/10 SH	SW846 6010B ¹	EPA 200.7 ²
Sodium	307	2.0	mg/l	1	07/07/10	07/08/10 SH	SW846 6010B ¹	EPA 200.7 ²

(1) Instrument QC Batch: MA806
(2) Prep QC Batch: MP2263

RL = Reporting Limit

Report of Analysis

Client Sample ID:	G29-SE BACK-062910		
Lab Sample ID:	D14851-1A	Date Sampled:	06/29/10
Matrix:	SO - Soil	Date Received:	07/01/10
		Percent Solids:	89.0
Project:	G29 Pit CLOsure		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sodium Adsorption Ratio ^a	2.77		ratio	1	07/08/10 02:06	SH	LADNR29B

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

RL = Reporting Limit

Report of Analysis

Client Sample ID:	G29-SW BACK-062910	Date Sampled:	06/29/10
Lab Sample ID:	D14851-2	Date Received:	07/01/10
Matrix:	SO - Soil	Percent Solids:	80.9
Project:	G29 Pit CLosure		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	17.4	0.39	mg/kg	5	07/02/10	07/04/10 SH	SW846 6020 ¹	SW846 3050B ²

(1) Instrument QC Batch: MA797
(2) Prep QC Batch: MP2239

RL = Reporting Limit



Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody

10165 Harwin, Suite 150 - Houston, TX 77036 - 713-271-4700 fax: 713-271-4770

[illegible]

D14851: Chain of Custody

Page 1 of 2

Constituents of Concern: Allowable Concentrations and Analytical Methods (COGCC Table 910-1)

CONTAMINANT OF CONCERN	CONCENTRATIONS	ANALYTICAL METHOD (SW646)
<i>Organic Compounds in Soil</i>		
TPH (total volatile and extractable petroleum hydrocarbons)	500 mg/kg	8015
Benzene	0.17 mg/kg ²	8260B
Toluene	85 mg/kg ²	8260B
Ethylbenzene	100 mg/kg ²	8260B
Xylenes (total)	175 mg/kg ²	8260B
Acenaphthene	1,000 mg/kg ²	8270C
Anthracene	1,000 mg/kg ²	8270C
Benzo(A)anthracene	0.22 mg/kg ²	8270C
Benzo(B)fluoranthene	0.22 mg/kg ²	8270C
Benzo(K)fluoranthene	2.2 mg/kg ²	8270C
Benzo(A)pyrene	0.022 mg/kg ²	8270C
Chrysene	22 mg/kg ²	8270C
Dibenz(A,H)anthracene	0.022 mg/kg ²	8270C
Fluoranthene	1,000 mg/kg ²	8270C
Fluorene	1,000 mg/kg ²	8270C
Indeno(1,2,3-CD)pyrene	0.22 mg/kg ²	8270C
Naphthalene	23 mg/kg ²	8270C
Pyrene	1,000 mg/kg ²	8270C
<i>Inorganics in Soils</i>		
Electrical Conductivity (EC)	<4 mmhos/cm or 2x background	9050
Sodium Adsorption Ratio (SAR)	<12 ²	LAQN298
pH	6-9	9045C
<i>Metals in Soils</i>		
Arsenic	0.38 mg/kg ³	8010B
Barium	15,000 mg/kg ³	8010B
Cadmium	70 mg/kg ^{3,5}	8010B
Chromium (III)	120,000 mg/kg ³	8010B
Chromium (VI)	23 mg/kg ^{3,5}	8010B
Copper	3,100 mg/kg ³	8010B
Lead (inorganic)	400 mg/kg ³	8010B
Mercury	23 mg/kg ³	8010B
Nickel (soluble salts)	1,600 mg/kg ^{3,5}	8010B
Selenium	390 mg/kg ^{3,5}	8010B
Silver	390 mg/kg ³	8010B
Zinc	23,000 mg/kg ^{3,5}	8010B
<i>Liquid Hydrocarbons in Soils and Ground Water</i>		
Liquid hydrocarbons including condensate and oil	Below detection level	Visual

COGCC recommends that the latest version of EPA SW 846 analytical methods be used where possible and that analyses of samples be performed by accredited laboratories in the state or national accreditation programs.

1 Consideration shall be given to background levels in native soils and ground water.
 2 Concentrations taken from CDPHE-HMWM Table 1 (Colorado Soil Evaluation Values) (December 2007).
 3 Concentrations taken from CDPHE-WQCC Regulation 41 - The Basic Standards for Ground Water.
 4 For this range of standards, the first number in this range is a strictly health-based value, based on the WQCC's established methodology for human health-based standards. The second number in this range is a strictly health-based value, based on the WQCC's established methodology for human health-based standards. The third number in this range is a strictly health-based value, based on the WQCC's established methodology for human health-based standards.
 5 Analysis by USDA Agricultural Handbook 60, method (2B) with soluble cations determined by method (2). Method (2B) = estimation of exchangeable sodium percentage and exchangeable potassium percentage on methods cations. Method (2) = saturated paste method (note: each analysis requires a unique sample of at least 500 grams). If soils are saturated, USDA Agricultural Handbook 60 with soluble cations determined by method (3A) saturation extraction method.
 6 The table value for these inorganic constituents is taken from the CDPHE-HMWM Table 1 Colorado Soil Evaluation Values (December 2007). Because these values are high, it is possible that site-specific geochemical conditions may exist that could allow these constituents to migrate into ground water standards even though the concentrations are below the table values. Therefore, when these constituents are present as contaminants, a secondary evaluation of their leachability must be performed to ensure ground water protection.



04/08/10

Technical Report for

ENCANA

N30 Background Sample

Accutest Job Number: T49818

Sampling Date: 03/24/10

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: T49818

N30 Background Sample

Sample Number	Collected			Received	Matrix		Client Sample ID
	Date	Time	By		Code	Type	
T49818-1	03/24/10	09:15	AS	03/25/10	SO	Soil	N30-BACKGROUND-032410
T49818-1A	03/24/10	09:15	AS	03/25/10	SO	Soil	N30-BACKGROUND-032410

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

SAMPLE DELIVERY GROUP CASE NARRATIVE

Client: ENCANA

Job No T49818

Site: N30 Background Sample

Report Date 4/8/2010 9:28:01 AM

1 Sample(s), 0 Trip Blank(s) and 0 Field Blank(s) were collected on 03/24/2010 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 T49818. 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.
- T49818-1: Internal standards are not within the advisory limits due to a matrix interference. Confirmed by associated ms/msd.

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: MP11448

- 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) T49551-1DUP, T49551-1MS, T49551-1MSD, T49551-1SDL, T49551-1DUP were used as the QC samples for metals.
- Matrix Spike Recovery(s) for Arsenic, Selenium, Zinc are outside control limits. Probable cause due to matrix interference.
- Matrix Spike Duplicate Recovery(s) for Arsenic, Selenium 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 Cadmium are outside control limits for sample MP11448-D1. RPD acceptable due to low duplicate and sample concentrations.
- RPD(s) for Serial Dilution for Cadmium, Selenium, Barium, Chromium, Lead, Nickel, Zinc are outside control limits for sample MP11448-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

- T49818-1A 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:** R22216

- T49818-1 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

Client Sample ID:	N30-BACKGROUND-032410		
Lab Sample ID:	T49818-1	Date Sampled:	03/24/10
Matrix:	SO - Soil	Date Received:	03/25/10
Method:	SW846 8260B	Percent Solids:	87.5
Project:	N30 Background Sample		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	Y0038999.D	1	03/31/10	JL	n/a	n/a	VY2467
Run #2							

	Initial Weight	Final Volume
Run #1	5.33 g	5.0 ml
Run #2		

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	0.0054	0.00075	mg/kg	
108-88-3	Toluene	ND	0.0054	0.0010	mg/kg	
100-41-4	Ethylbenzene	ND	0.0054	0.00097	mg/kg	
1330-20-7	Xylene (total)	ND	0.016	0.0022	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	102%		70-121%
2037-26-5	Toluene-D8	110%		76-132%
460-00-4	4-Bromofluorobenzene	114%		73-165%
17060-07-0	1,2-Dichloroethane-D4	78%		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

Client Sample ID: N30-BACKGROUND-032410**Lab Sample ID:** T49818-1**Date Sampled:** 03/24/10**Matrix:** SO - Soil**Date Received:** 03/25/10**Method:** SW846 8270C BY SIM SW846 3550B**Percent Solids:** 87.5**Project:** N30 Background Sample

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	H37794.D	1	04/02/10	SC	03/26/10	OP14399	EH2022
Run #2							

	Initial Weight	Final Volume
Run #1	30.3 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	0.0076	0.0013	mg/kg	
208-96-8	Acenaphthylene	ND	0.0076	0.0026	mg/kg	
120-12-7	Anthracene	ND	0.0076	0.0014	mg/kg	
56-55-3	Benzo(a)anthracene	ND	0.0076	0.0012	mg/kg	
50-32-8	Benzo(a)pyrene	ND	0.0076	0.0040	mg/kg	
205-99-2	Benzo(b)fluoranthene	ND	0.0076	0.0040	mg/kg	
191-24-2	Benzo(g,h,i)perylene	ND	0.0076	0.0076	mg/kg	
207-08-9	Benzo(k)fluoranthene	ND	0.0076	0.0049	mg/kg	
218-01-9	Chrysene	ND	0.0076	0.0019	mg/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	0.0076	0.0073	mg/kg	
206-44-0	Fluoranthene	0.0026	0.0076	0.0017	mg/kg	J
86-73-7	Fluorene	ND	0.0076	0.0027	mg/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.0076	0.0057	mg/kg	
90-12-0	1-Methylnaphthalene	0.0021	0.0076	0.0014	mg/kg	J
91-57-6	2-Methylnaphthalene	0.0061	0.0076	0.0013	mg/kg	J
91-20-3	Naphthalene	0.0068	0.0076	0.0012	mg/kg	J
85-01-8	Phenanthrene	ND	0.0076	0.0011	mg/kg	
129-00-0	Pyrene	ND	0.0076	0.0026	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	29%		10-127%
321-60-8	2-Fluorobiphenyl	29%		11-133%
1718-51-0	Terphenyl-d14	71%		15-187%

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

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: N30-BACKGROUND-032410

Lab Sample ID: T49818-1

Matrix: SO - Soil

Date Sampled: 03/24/10

Date Received: 03/25/10

Percent Solids: 87.5

Project: N30 Background Sample

Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed By	Method	Prep Method	
Arsenic	29.1	0.62	0.12	mg/kg	1	03/31/10	04/01/10	NS	SW846 6010B ²	SW846 3050B ³
Barium	800	12	0.037	mg/kg	1	03/31/10	04/01/10	NS	SW846 6010B ²	SW846 3050B ³
Cadmium	0.52	0.31	0.062	mg/kg	1	03/31/10	04/01/10	NS	SW846 6010B ²	SW846 3050B ³
Chromium	25.9	0.62	0.044	mg/kg	1	03/31/10	04/01/10	NS	SW846 6010B ²	SW846 3050B ³
Copper	32.5	1.6	0.081	mg/kg	1	03/31/10	04/01/10	NS	SW846 6010B ²	SW846 3050B ³
Lead	17.6	0.62	0.25	mg/kg	1	03/31/10	04/01/10	NS	SW846 6010B ²	SW846 3050B ³
Mercury	0.018	0.018	0.00073	mg/kg	1	04/01/10	04/01/10	TW	SW846 7471A ¹	SW846 7471A ⁴
Nickel	19.9	2.5	0.081	mg/kg	1	03/31/10	04/01/10	NS	SW846 6010B ²	SW846 3050B ³
Selenium	1.7	0.62	0.15	mg/kg	1	03/31/10	04/01/10	NS	SW846 6010B ²	SW846 3050B ³
Silver	0.050 U	0.62	0.050	mg/kg	1	03/31/10	04/01/10	NS	SW846 6010B ²	SW846 3050B ³
Zinc	67.0	1.2	0.25	mg/kg	1	03/31/10	04/01/10	NS	SW846 6010B ²	SW846 3050B ³

(1) Instrument QC Batch: MA4639

(2) Instrument QC Batch: MA4640

(3) Prep QC Batch: MP11448

(4) Prep QC Batch: MP11453

RL = Reporting Limit

MDL = Method Detection Limit

U = Indicates a result < MDL

B = Indicates a result > = MDL but < RL

Report of Analysis

Client Sample ID:	N30-BACKGROUND-032410	Date Sampled:	03/24/10
Lab Sample ID:	T49818-1	Date Received:	03/25/10
Matrix:	SO - Soil	Percent Solids:	87.5
Project:	N30 Background 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 ^a	23.9	2.6	1.0	mg/kg	1	04/07/10 12:00	KD	SW846 6010/7196A M
Solids, Percent	87.5			%	1	03/31/10	MR	SM 2540 G
Specific Conductivity	2550	1.0		umhos/cm	1	04/06/10 13:00	KD	EPA 120.1
pH	8.23			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

Client Sample ID:	N30-BACKGROUND-032410	Date Sampled:	03/24/10
Lab Sample ID:	T49818-1A	Date Received:	03/25/10
Matrix:	SO - Soil	Percent Solids:	87.5
Project:	N30 Background Sample		

SAR Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed By	Method	Prep Method
Calcium	1860	25	0.18	mg/l	5	03/31/10	04/03/10 NS	SW846 6010B ¹	LADNR 29B ²
Magnesium	713	25	0.039	mg/l	5	03/31/10	04/03/10 NS	SW846 6010B ¹	LADNR 29B ²
Sodium	745	25	0.67	mg/l	5	03/31/10	04/03/10 NS	SW846 6010B ¹	LADNR 29B ²

(1) Instrument QC Batch: MA4643
(2) 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

Client Sample ID:	N30-BACKGROUND-032410		
Lab Sample ID:	T49818-1A	Date Sampled:	03/24/10
Matrix:	SO - Soil	Date Received:	03/25/10
		Percent Solids:	87.5
Project:	N30 Background Sample		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sodium Adsorption Ratio ^a	3.72		ratio	1	04/03/10 15:07	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

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

FED-EX Tracking #		Bottle Order Control #	
Accutest Quote #		Accutest Job # T49818	
Client / Reporting Information		Project Information	
Company Name Encana Oil & Gas (USA) Inc Street Address 2717 Cr 215 Suite 100 City State Zip Parachute Co. 81635 Project Contact Chris Hines christopher.hines@encana.com Phone # Fax # 970.285.2653 Sampler(s) Name(s) Aaron Stacy		Project Name N30 Background Sample Billing Information (if different from Report to) Company Name Street Address City State Zip Attention:	
Requested Analyses		Matrix Codes	
DW - Drinking Water GW - Ground Water WW - Water SW - Surface Water SO - Soil SL - Sludge SED - Sediment OI - Oil LIQ - Other Liquid AIR - Air SOL - Other Solid WP - Wipe FB - Field Blank EB - Equipment Blank RB - Rinse Blank TB - Trip Blank		LAB USE ONLY	
Turnaround Time (Business days) <input checked="" type="checkbox"/> Standard <input type="checkbox"/> 5 Day RUSH <input type="checkbox"/> 4 Day RUSH <input type="checkbox"/> 3 Day RUSH <input type="checkbox"/> 2 Day RUSH <input type="checkbox"/> 1 Day EMERGENCY Emergency & Rush T/A data available VIA Lablink			
Approved By (Accutest PM): / Date: _____ Commercial "A" (Level 1) <input type="checkbox"/> Commercial "B" (Level 2) <input type="checkbox"/> FULT1 (Level 3+4) <input type="checkbox"/> REDT1 (Level 3+4) <input type="checkbox"/> Commercial "C" Commercial "A" = Results Only Commercial "B" = Results + QC Summary Commercial "C" = Results + QC & Surrogate Summary			
Data Deliverable Information <input type="checkbox"/> TRRP <input checked="" type="checkbox"/> EDD Format <input type="checkbox"/> Other _____			
Comments / Special Instructions			
Sample Custody must be documented below each time samples change possession, including courier delivery.			
Relinquished by Sampler: 1 <i>[Signature]</i> Relinquished by Sampler: 3 <i>[Signature]</i> Relinquished by: 5	Date Time: 03/24/10 1730 Date Time: Date Time:	Received By: 1 Received By: 3 Received By: 5	Relinquished By: 2 FED EX Relinquished By: 4 Custody Seal # <input type="checkbox"/> Intact <input type="checkbox"/> Not Intact Preserved where applicable <input type="checkbox"/> On Ice Cooler Temp: 4.0°C

T49818: Chain of Custody

Page 1 of 3

SAMPLE INSPECTION FORM

Accutest Job Number: T49818 Client: ENCANA Date/Time Received: 3/25/10 0930
 # of Coolers Received: 1 Thermometer #: R-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 recvd 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: [Signature] 3/25/10

INFORMATION AND SAMPLE LABELING VERIFIED BY: EC 3-2570

CORRECTIVE ACTIONS

Client Representative Notified: _____ Date: _____

By Accutest Representative: _____ Via: Phone Email

Client Instructions: _____

T49818: Chain of Custody

Page 2 of 3

JOB #: 749818 DATE/TIME RECEIVED: 3/25/10 0930
CLIENT: ENCANA INITIALS: IS

[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 (Solis) VR: Volatile Fridge M: Metals SUB: Subcontract EF: Encore Freezer

T49818: Chain of Custody
Page 3 of 3



GC/MS Volatiles

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QC Data Summaries

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: T49818
Account: ENCACOP ENCANA
Project: N30 Background 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

T49818-1

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: T49818
Account: ENCACOP ENCANA
Project: N30 Background 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

T49818-1

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: T49818
Account: ENCACOP ENCANA
Project: N30 Background 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

T49818-1

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

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: T49818
Account: ENCACOP ENCANA
Project: N30 Background 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

T49818-1

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: T49818
Account: ENCACOP ENCANA
Project: N30 Background 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

T49818-1

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: T49818
Account: ENCACOP ENCANA
Project: N30 Background 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 ^a	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

T49818-1

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

Includes the following where applicable:

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

Method Blank Summary

Job Number: T49818
Account: ENCACOP ENCANA
Project: N30 Background 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

T49818-1

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%

7.1.1
7

Blank Spike Summary

Job Number: T49818
Account: ENCACOP ENCANA
Project: N30 Background 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

T49818-1

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: T49818
Account: ENCACOP ENCANA
Project: N30 Background 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

T49818-1

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

Includes the following where applicable:

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

Method Blank Summary

Job Number: T49818
Account: ENCACOP ENCANA
Project: N30 Background 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

T49818-1

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: T49818
Account: ENCACOP ENCANA
Project: N30 Background 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

T49818-1

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: T49818
Account: ENCACOP ENCANA
Project: N30 Background 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

T49818-1

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: T49818
Account: ENCACOP - ENCANA
Project: N30 Background 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: T49818-1A

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: T49818
Account: ENCACOP - ENCANA
Project: N30 Background 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: T49818-1A

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: T49818
Account: ENCACOP - ENCANA
Project: N30 Background 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: T49818-1A

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: T49818
Account: ENCACOP - ENCANA
Project: N30 Background Sample

QC Batch ID: MP11448
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date: 03/31/10

Metal	RL	IDL	MDL	MB raw	final
Aluminum	10	.82	2.2		
Antimony	0.50	.11	.14		
Arsenic	0.50	.089	.1	-0.032	<0.50
Barium	10	.007	.03	0.0020	<10
Beryllium	0.25	.0055	.01		
Boron	5.0	.054	.11		
Cadmium	0.25	.013	.05	0.0020	<0.25
Calcium	250	.27	.86		
Chromium	0.50	.055	.035	0.017	<0.50
Cobalt	2.5	.025	.09		
Copper	1.3	.029	.065	0.014	<1.3
Iron	5.0	.65	1.1		
Lead	0.50	.079	.2	-0.037	<0.50
Magnesium	250	.34	.58		
Manganese	0.75	.01	.035		
Molybdenum	0.50	.048	.075		
Nickel	2.0	.048	.065	-0.011	<2.0
Potassium	250	2.7	16		
Selenium	0.50	.16	.12	0.0065	<0.50
Silver	0.50	.043	.04	0.0035	<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	-0.031	<1.0

Associated samples MP11448: T49818-1

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: T49818
Account: ENCACOP - ENCANA
Project: N30 Background Sample

QC Batch ID: MP11448
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date:

03/31/10

03/31/10

	T49551-1			QC	T49551-1		Spikelot		QC
Metal	Original	DUP	RPD	Limits	Original	MS	MPTW4	% Rec	Limits
Aluminum									
Antimony									
Arsenic	5.5	5.7	3.6	0-20	5.5	27.6	28.6	77.2N	80-120
Barium	313	261	18.1	0-20	313	311	28.6	-7.0 (b)	80-120
Beryllium									
Boron									
Cadmium	0.16	0.12	28.6 (a)	0-20	0.16	23.8	28.6	82.6	80-120
Calcium									
Chromium	13.9	14.9	6.9	0-20	13.9	39.8	28.6	90.5	80-120
Cobalt									
Copper	32.2	35.2	8.9	0-20	32.2	64.2	28.6	111.8	80-120
Iron									
Lead	17.1	16.1	6.0	0-20	17.1	40.1	28.6	80.4	80-120
Magnesium									
Manganese									
Molybdenum									
Nickel	13.3	14.9	11.3	0-20	13.3	38.5	28.6	88.1	80-120
Potassium	anr								
Selenium	0.78	0.67	15.2	0-20	0.78	22.8	28.6	77.0N	80-120
Silver	0.0	0.0	NC	0-20	0.0	25.8	28.6	90.2	80-120
Sodium									
Strontium									
Thallium									
Tin									
Titanium									
Vanadium									
Zinc	77.5	84.7	8.9	0-20	77.5	99.6	28.6	77.2N	80-120

Associated samples MP11448: T49818-1

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) RPD acceptable due to low duplicate and sample concentrations.

(b) 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: T49818
Account: ENCACOP - ENCANA
Project: N30 Background Sample

QC Batch ID: MP11448
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date: 03/31/10

Metal	T49551-1 Original	MSD	Spikelot MPTW4	% Rec	MSD RPD	QC Limit
Aluminum						
Antimony						
Arsenic	5.5	28.8	29.6	78.7N	4.3	20
Barium	313	289	29.6	-81.1(a)	7.3	20
Beryllium						
Boron						
Cadmium	0.16	24.9	29.6	83.6	4.5	20
Calcium						
Chromium	13.9	38.9	29.6	84.4	2.3	20
Cobalt						
Copper	32.2	62.1	29.6	101.0	3.3	20
Iron						
Lead	17.1	40.8	29.6	80.1	1.7	20
Magnesium						
Manganese						
Molybdenum						
Nickel	13.3	39.0	29.6	86.8	1.3	20
Potassium	anr					
Selenium	0.78	23.3	29.6	76.1N	2.2	20
Silver	0.0	26.8	29.6	90.5	3.8	20
Sodium						
Strontium						
Thallium						
Tin						
Titanium						
Vanadium						
Zinc	77.5	108	29.6	103.0	8.1	20

Associated samples MP11448: T49818-1

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: T49818
 Account: ENCACOP - ENCANA
 Project: N30 Background Sample

QC Batch ID: MP11448
 Matrix Type: SOLID

Methods: SW846 6010B
 Units: mg/kg

Prep Date: 03/31/10

Metal	LCS Result	Spikelot MPLCD054	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic	139	158	88.0	82-118
Barium	324	348	93.1	81-119
Beryllium				
Boron				
Cadmium	167	187	89.3	82-118
Calcium				
Chromium	82.7	89.5	92.4	79-121
Cobalt				
Copper	123	129	95.3	84-117
Iron				
Lead	148	172	86.0	79-120
Magnesium				
Manganese				
Molybdenum				
Nickel	90.2	99	91.1	81-119
Potassium	anr			
Selenium	131	148	88.5	78-121
Silver	59.8	66	90.6	66-134
Sodium				
Strontium				
Thallium				
Tin				
Titanium				
Vanadium				
Zinc	345	394	87.6	80-119

Associated samples MP11448: T49818-1

Results < IDL are shown as zero for calculation purposes

(*) Outside of QC limits

(anr) Analyte not requested

SERIAL DILUTION RESULTS SUMMARY

Login Number: T49818
Account: ENCACOP - ENCANA
Project: N30 Background Sample

QC Batch ID: MP11448
Matrix Type: SOLID

Methods: SW846 6010B
Units: ug/l

Prep Date: 03/31/10

Metal	T49551-1 Original	SDL 1:5	%DIF	QC Limits
Aluminum				
Antimony				
Arsenic	83.4	90.5	8.6	0-10
Barium	4730	5470	15.6*(a)	0-10
Beryllium				
Boron				
Cadmium	2.44	0.00	100.0(b)	0-10
Calcium				
Chromium	210	253	20.7*(a)	0-10
Cobalt				
Copper	487	529	8.5	0-10
Iron				
Lead	258	310	20.1*(a)	0-10
Magnesium				
Manganese				
Molybdenum				
Nickel	202	244	21.0*(a)	0-10
Potassium	anr			
Selenium	11.8	0.00	100.0(b)	0-10
Silver	0.00	0.00	NC	0-10
Sodium				
Strontium				
Thallium				
Tin				
Titanium				
Vanadium				
Zinc	1170	1440	23.3*(a)	0-10

Associated samples MP11448: T49818-1

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).

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: T49818
Account: ENCACOP - ENCANA
Project: N30 Background 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

Associated samples MP11453: T49818-1

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: T49818
Account: ENCACOP - ENCANA
Project: N30 Background 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		RPD	QC Limits	T50046-1		Spikelot HGTXWS1	% Rec	QC Limits
	Original	DUP			Original	MS			
Mercury	0.14	0.16	13.3	0-20	0.14	0.70	0.322	173.9N	75-125

Associated samples MP11453: T49818-1

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: T49818
 Account: ENCACOP - ENCANA
 Project: N30 Background 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	
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Associated samples MP11453: T49818-1

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: T49818
 Account: ENCACOP - ENCANA
 Project: N30 Background 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
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Mercury	7.8	7.34	106.3	72-128
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Associated samples MP11453: T49818-1

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



General Chemistry

QC Data Summaries

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: T49818
Account: ENCACOP - ENCANA
Project: N30 Background 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: T49818-1
Batch GN21871: T49818-1
(*) Outside of QC limits

DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: T49818
Account: ENCACOP - ENCANA
Project: N30 Background 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: T49818-1

Batch GN21781: T49818-1

Batch GN21869: T49818-1

Batch GN21871: T49818-1

(*) Outside of QC limits

MATRIX SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: T49818
Account: ENCACOP - ENCANA
Project: N30 Background 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: T49818-1

(*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

Caerus Oil and Gas

Sample Delivery Group: L1457192
Samples Received: 02/02/2022
Project Number: 020-035
Description: G29

Report To: Brett Middleton
143 Diamond Avenue
Parachute, CO 81635

Entire Report Reviewed By:



Chris Ward
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.

Pace Analytical National12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 www.pacenational.com

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SAMPLE SUMMARY

20220201-G29-MW1(60-62) L1457192-01 Solid

Collected by
Reed Rollins

Collected date/time
02/01/22 09:45

Received date/time
02/02/22 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1813859	1	02/08/22 20:36	02/08/22 20:36	RDS	Mt. Juliet, TN
Wet Chemistry by Method 7199	WG1812320	1	02/03/22 04:20	02/07/22 19:57	JER	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1812791	1	02/04/22 09:00	02/04/22 11:00	GI	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1813552	1	02/07/22 01:49	02/07/22 06:39	ARD	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1812573	1	02/07/22 08:49	02/07/22 13:36	ZSA	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG1813862	1	02/07/22 19:49	02/08/22 20:25	CCE	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1812574	5	02/07/22 08:53	02/08/22 14:24	JPD	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1812241	1	02/02/22 16:25	02/03/22 07:07	DWR	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1812798	1	02/02/22 16:25	02/03/22 19:04	ADM	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1813263	1	02/02/22 16:25	02/04/22 21:45	JAH	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015M	WG1813670	1	02/07/22 05:46	02/08/22 03:18	JAS	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015M	WG1813670	5	02/07/22 05:46	02/08/22 11:07	JAS	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1814062	1	02/08/22 04:14	02/08/22 16:01	AMG	Mt. Juliet, TN

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

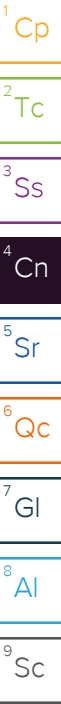
⁹Sc

CASE NARRATIVE

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.



Chris Ward
Project Manager



Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	1.14		1	02/08/2022 20:36	WG1813859

Wet Chemistry by Method 7199

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Hexavalent Chromium	ND		1.00	1	02/07/2022 19:57	WG1812320

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	8.40	T8	1	02/04/2022 11:00	WG1812791

Sample Narrative:

L1457192-01 WG1812791: 8.4 at 19.8C

Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Specific Conductance	204		10.0	1	02/07/2022 06:39	WG1813552

Sample Narrative:

L1457192-01 WG1813552: at 25C

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Barium	234		0.500	1	02/07/2022 13:36	WG1812573
Cadmium	ND		0.500	1	02/07/2022 13:36	WG1812573
Copper	21.9		2.00	1	02/07/2022 13:36	WG1812573
Lead	14.1		0.500	1	02/07/2022 13:36	WG1812573
Nickel	15.0		2.00	1	02/07/2022 13:36	WG1812573
Selenium	ND		2.00	1	02/07/2022 13:36	WG1812573
Silver	ND		1.00	1	02/07/2022 13:36	WG1812573
Zinc	46.0		5.00	1	02/07/2022 13:36	WG1812573

Metals (ICP) by Method 6010B-NE493 Ch 2

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Hot Water Sol. Boron	ND		0.200	1	02/08/2022 20:25	WG1813862

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Arsenic	20.8		1.00	5	02/08/2022 14:24	WG1812574

Volatile Organic Compounds (GC) by Method 8015D/GRO

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	0.353		0.100	1	02/03/2022 07:07	WG1812241
(S) a,a,a-Trifluorotoluene(FID)	99.9		77.0-120		02/03/2022 07:07	WG1812241



Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00100	1	02/03/2022 19:04	WG1812798
Toluene	ND		0.00500	1	02/03/2022 19:04	WG1812798
Ethylbenzene	ND		0.00250	1	02/03/2022 19:04	WG1812798
Xylenes, Total	ND		0.00650	1	02/03/2022 19:04	WG1812798
1,2,4-Trimethylbenzene	ND		0.00500	1	02/04/2022 21:45	WG1813263
1,3,5-Trimethylbenzene	ND		0.00500	1	02/04/2022 21:45	WG1813263
(S) Toluene-d8	104		75.0-131		02/03/2022 19:04	WG1812798
(S) Toluene-d8	93.1		75.0-131		02/04/2022 21:45	WG1813263
(S) 4-Bromofluorobenzene	101		67.0-138		02/03/2022 19:04	WG1812798
(S) 4-Bromofluorobenzene	101		67.0-138		02/04/2022 21:45	WG1813263
(S) 1,2-Dichloroethane-d4	110		70.0-130		02/03/2022 19:04	WG1812798
(S) 1,2-Dichloroethane-d4	122		70.0-130		02/04/2022 21:45	WG1813263

Semi-Volatile Organic Compounds (GC) by Method 8015M

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	99.4		4.00	1	02/08/2022 03:18	WG1813670
C28-C36 Motor Oil Range	313		20.0	5	02/08/2022 11:07	WG1813670
(S) o-Terphenyl	90.4		18.0-148		02/08/2022 03:18	WG1813670
(S) o-Terphenyl	73.5		18.0-148		02/08/2022 11:07	WG1813670

Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Acenaphthene	ND		0.00600	1	02/08/2022 16:01	WG1814062
Anthracene	ND		0.00600	1	02/08/2022 16:01	WG1814062
Benzo(a)anthracene	ND		0.00600	1	02/08/2022 16:01	WG1814062
Benzo(b)fluoranthene	ND		0.00600	1	02/08/2022 16:01	WG1814062
Benzo(k)fluoranthene	ND		0.00600	1	02/08/2022 16:01	WG1814062
Benzo(a)pyrene	ND		0.00600	1	02/08/2022 16:01	WG1814062
Chrysene	ND		0.00600	1	02/08/2022 16:01	WG1814062
Dibenz(a,h)anthracene	ND		0.00600	1	02/08/2022 16:01	WG1814062
Fluoranthene	ND		0.00600	1	02/08/2022 16:01	WG1814062
Fluorene	ND		0.00600	1	02/08/2022 16:01	WG1814062
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	02/08/2022 16:01	WG1814062
1-Methylnaphthalene	ND		0.0200	1	02/08/2022 16:01	WG1814062
2-Methylnaphthalene	ND		0.0200	1	02/08/2022 16:01	WG1814062
Naphthalene	ND		0.0200	1	02/08/2022 16:01	WG1814062
Pyrene	ND		0.00600	1	02/08/2022 16:01	WG1814062
(S) p-Terphenyl-d14	80.0		23.0-120		02/08/2022 16:01	WG1814062
(S) Nitrobenzene-d5	74.7		14.0-149		02/08/2022 16:01	WG1814062
(S) 2-Fluorobiphenyl	77.3		34.0-125		02/08/2022 16:01	WG1814062

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Method Blank (MB)

(MB) R3757912-1 02/07/22 18:09

	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	mg/kg		mg/kg	mg/kg
Hexavalent Chromium	U		0.255	1.00

L1457187-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1457187-01 02/07/22 18:22 • (DUP) R3757912-3 02/07/22 18:27

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	mg/kg	mg/kg		%		%
Hexavalent Chromium	ND	ND	1	0.000		20

L1457230-05 Original Sample (OS) • Duplicate (DUP)

(OS) L1457230-05 02/07/22 20:23 • (DUP) R3757912-8 02/07/22 20:29

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	mg/kg	mg/kg		%		%
Hexavalent Chromium	ND	ND	1	7.12		20

Laboratory Control Sample (LCS)

(LCS) R3757912-2 02/07/22 18:16

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	mg/kg	mg/kg	%	%	
Hexavalent Chromium	10.0	10.5	105	80.0-120	

L1457187-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1457187-04 02/07/22 18:42 • (MS) R3757912-4 02/07/22 18:48 • (MSD) R3757912-5 02/07/22 18:53

	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/kg	mg/kg	mg/kg	mg/kg	%	%		%			%	%
Hexavalent Chromium	20.0	ND	21.4	19.2	107	96.0	1	75.0-125			10.8	20

L1457187-04 Original Sample (OS) • Matrix Spike (MS)

(OS) L1457187-04 02/07/22 18:42 • (MS) R3757912-6 02/07/22 18:58

	Spike Amount	Original Result	MS Result	MS Rec.	Dilution	Rec. Limits	MS Qualifier
Analyte	mg/kg	mg/kg	mg/kg	%		%	
Hexavalent Chromium	680	ND	706	104	50	75.0-125	

Cp

Tc

Ss

Cn

Sr

Qc

Gl

Al

Sc

L1457028-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1457028-01 02/04/22 11:00 • (DUP) R3756852-2 02/04/22 11:00

	Original Result	DUP Result	Dilution	DUP RPD	<u>DUP Qualifier</u>	DUP RPD Limits
Analyte	su	su		%		%
pH	7.69	7.64	1	0.652		1

Sample Narrative:

OS: 7.69 at 17.3C

DUP: 7.64 at 17.2C

Laboratory Control Sample (LCS)

(LCS) R3756852-1 02/04/22 11:00

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	<u>LCS Qualifier</u>
Analyte	su	su	%	%	
pH	10.0	10.0	100	99.0-101	

Sample Narrative:

LCS: 10.02 at 16.3C

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

Method Blank (MB)

(MB) R3757477-1 02/07/22 06:39

Analyte	MB Result umhos/cm	MB Qualifier	MB MDL umhos/cm	MB RDL umhos/cm
Specific Conductance	U		10.0	10.0

Sample Narrative:

BLANK: at 25C

L1457187-05 Original Sample (OS) • Duplicate (DUP)

(OS) L1457187-05 02/07/22 06:39 • (DUP) R3757477-3 02/07/22 06:39

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	10400	10100	1	2.73		20

Sample Narrative:

OS: at 25C

DUP: at 25C

L1457790-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1457790-01 02/07/22 06:39 • (DUP) R3757477-4 02/07/22 06:39

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	9320	9210	1	1.19		20

Sample Narrative:

OS: at 25C

DUP: at 25C

Laboratory Control Sample (LCS)

(LCS) R3757477-2 02/07/22 06:39

Analyte	Spike Amount umhos/cm	LCS Result umhos/cm	LCS Rec. %	Rec. Limits %	LCS Qualifier
Specific Conductance	268	267	99.8	85.0-115	

Sample Narrative:

LCS: at 25C

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Method Blank (MB)

(MB) R3757691-1 02/07/22 12:58

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Barium	U		0.0852	0.500
Cadmium	U		0.0471	0.500
Copper	U		0.400	2.00
Lead	U		0.208	0.500
Nickel	U		0.132	2.00
Selenium	U		0.764	2.00
Silver	U		0.127	1.00
Zinc	U		0.832	5.00

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

Laboratory Control Sample (LCS)

(LCS) R3757691-2 02/07/22 13:01

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Barium	100	93.4	93.4	80.0-120	
Cadmium	100	94.6	94.6	80.0-120	
Copper	100	96.0	96.0	80.0-120	
Lead	100	90.8	90.8	80.0-120	
Nickel	100	92.0	92.0	80.0-120	
Selenium	100	95.9	95.9	80.0-120	
Silver	20.0	17.3	86.5	80.0-120	
Zinc	100	88.3	88.3	80.0-120	

L1457187-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1457187-02 02/07/22 13:04 • (MS) R3757691-5 02/07/22 13:13 • (MSD) R3757691-6 02/07/22 13:15

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Barium	100	142	249	238	108	96.3	1	75.0-125			4.64	20
Cadmium	100	ND	94.2	90.0	93.8	89.7	1	75.0-125			4.50	20
Copper	100	12.7	106	99.7	93.4	87.0	1	75.0-125			6.29	20
Lead	100	7.82	97.6	91.9	89.7	84.1	1	75.0-125			5.92	20
Nickel	100	13.6	105	97.6	91.0	84.0	1	75.0-125			6.89	20
Selenium	100	ND	92.9	89.2	92.9	89.2	1	75.0-125			4.00	20
Silver	20.0	ND	17.2	16.3	85.9	81.3	1	75.0-125			5.47	20
Zinc	100	43.7	125	118	81.0	74.1	1	75.0-125		J6	5.72	20

Method Blank (MB)

(MB) R3758229-1 02/08/22 20:02

Analyte	MB Result mg/l	<u>MB Qualifier</u>	MB MDL mg/l	MB RDL mg/l
Hot Water Sol. Boron	U		0.0167	0.200

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3758229-2 02/08/22 20:05 • (LCSD) R3758229-3 02/08/22 20:08

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	<u>LCS Qualifier</u>	<u>LCSD Qualifier</u>	RPD %	RPD Limits %
Hot Water Sol. Boron	1.00	0.954	0.979	95.4	97.9	80.0-120			2.54	20

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

Method Blank (MB)

(MB) R3758052-1 02/08/22 13:40

	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	mg/kg		mg/kg	mg/kg
Arsenic	U		0.100	1.00

Laboratory Control Sample (LCS)

(LCS) R3758052-2 02/08/22 13:43

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	mg/kg	mg/kg	%	%	
Arsenic	100	104	104	80.0-120	

L1457187-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1457187-02 02/08/22 13:47 • (MS) R3758052-5 02/08/22 13:57 • (MSD) R3758052-6 02/08/22 14:00

	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/kg	mg/kg	mg/kg	mg/kg	%	%		%			%	%
Arsenic	100	8.63	115	119	106	110	5	75.0-125			3.74	20

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

Method Blank (MB)

(MB) R3756490-2 02/02/22 23:44

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
TPH (GC/FID) Low Fraction	U		0.0217	0.100
(S) a,a,a-Trifluorotoluene(FID)	109			77.0-120

Laboratory Control Sample (LCS)

(LCS) R3756490-1 02/02/22 23:01

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
TPH (GC/FID) Low Fraction	5.50	5.01	91.1	72.0-127	
(S) a,a,a-Trifluorotoluene(FID)			98.5	77.0-120	

L1456858-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1456858-01 02/03/22 01:43 • (MS) R3756490-3 02/03/22 08:33 • (MSD) R3756490-4 02/03/22 08:55

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
TPH (GC/FID) Low Fraction	5.50	ND	2.46	2.13	44.7	38.7	1	10.0-151			14.4	28
(S) a,a,a-Trifluorotoluene(FID)					100	100		77.0-120				

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Method Blank (MB)

(MB) R3757121-2 02/03/22 11:03

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Benzene	U		0.000467	0.00100
Ethylbenzene	U		0.000737	0.00250
Toluene	U		0.00130	0.00500
Xylenes, Total	U		0.000880	0.00650
(S) Toluene-d8	103			75.0-131
(S) 4-Bromofluorobenzene	99.2			67.0-138
(S) 1,2-Dichloroethane-d4	114			70.0-130

Laboratory Control Sample (LCS)

(LCS) R3757121-1 02/03/22 10:06

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Benzene	0.125	0.117	93.6	70.0-123	
Ethylbenzene	0.125	0.118	94.4	74.0-126	
Toluene	0.125	0.121	96.8	75.0-121	
Xylenes, Total	0.375	0.346	92.3	72.0-127	
(S) Toluene-d8			101	75.0-131	
(S) 4-Bromofluorobenzene			97.7	67.0-138	
(S) 1,2-Dichloroethane-d4			126	70.0-130	

L1457192-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1457192-01 02/03/22 19:04 • (MS) R3757121-3 02/03/22 21:17 • (MSD) R3757121-4 02/03/22 21:36

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Benzene	0.125	ND	0.0977	0.117	78.2	93.6	1	10.0-149			18.0	37
Ethylbenzene	0.125	ND	0.119	0.129	95.2	103	1	10.0-160			8.06	38
Toluene	0.125	ND	0.106	0.129	84.8	103	1	10.0-156			19.6	38
Xylenes, Total	0.375	ND	0.329	0.375	86.8	99.0	1	10.0-160			13.1	38
(S) Toluene-d8					102	101		75.0-131				
(S) 4-Bromofluorobenzene					99.8	100		67.0-138				
(S) 1,2-Dichloroethane-d4					113	118		70.0-130				

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Method Blank (MB)

(MB) R3757391-2 02/04/22 12:28

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
1,2,4-Trimethylbenzene	U		0.00158	0.00500
1,3,5-Trimethylbenzene	U		0.00200	0.00500
(S) Toluene-d8	94.3			75.0-131
(S) 4-Bromofluorobenzene	101			67.0-138
(S) 1,2-Dichloroethane-d4	122			70.0-130

Laboratory Control Sample (LCS)

(LCS) R3757391-1 02/04/22 11:30

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
1,2,4-Trimethylbenzene	0.125	0.118	94.4	70.0-126	
1,3,5-Trimethylbenzene	0.125	0.114	91.2	73.0-127	
(S) Toluene-d8			95.7	75.0-131	
(S) 4-Bromofluorobenzene			101	67.0-138	
(S) 1,2-Dichloroethane-d4			118	70.0-130	

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

Method Blank (MB)

(MB) R3757797-1 02/07/22 16:17

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
C10-C28 Diesel Range	U		1.61	4.00
C28-C36 Motor Oil Range	0.900	⬇	0.274	4.00
(S) o-Terphenyl	70.4			18.0-148

Laboratory Control Sample (LCS)

(LCS) R3757797-2 02/07/22 16:30

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
C10-C28 Diesel Range	50.0	46.1	92.2	50.0-150	
(S) o-Terphenyl			105	18.0-148	

L1457790-11 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1457790-11 02/08/22 00:17 • (MS) R3757797-3 02/08/22 00:30 • (MSD) R3757797-4 02/08/22 00:43

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
C10-C28 Diesel Range	49.4	ND	42.6	40.7	86.2	83.4	1	50.0-150			4.56	20
(S) o-Terphenyl					97.4	92.5		18.0-148				

1
Cp

2
Tc

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Ss

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Cn

5
Sr

6
Qc

7
Gl

8
Al

9
Sc

Method Blank (MB)

(MB) R3758300-2 02/08/22 10:05

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Anthracene	U		0.00230	0.00600
Acenaphthene	U		0.00209	0.00600
Benzo(a)anthracene	U		0.00173	0.00600
Benzo(a)pyrene	U		0.00179	0.00600
Benzo(b)fluoranthene	U		0.00153	0.00600
Benzo(k)fluoranthene	U		0.00215	0.00600
Chrysene	U		0.00232	0.00600
Dibenz(a,h)anthracene	U		0.00172	0.00600
Fluoranthene	U		0.00227	0.00600
Fluorene	U		0.00205	0.00600
Indeno(1,2,3-cd)pyrene	U		0.00181	0.00600
Naphthalene	U		0.00408	0.0200
Pyrene	U		0.00200	0.00600
1-Methylnaphthalene	U		0.00449	0.0200
2-Methylnaphthalene	U		0.00427	0.0200
(S) Nitrobenzene-d5	77.9			14.0-149
(S) 2-Fluorobiphenyl	74.9			34.0-125
(S) p-Terphenyl-d14	76.6			23.0-120

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

Laboratory Control Sample (LCS)

(LCS) R3758300-1 02/08/22 09:47

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Anthracene	0.0800	0.0569	71.1	50.0-126	
Acenaphthene	0.0800	0.0565	70.6	50.0-120	
Benzo(a)anthracene	0.0800	0.0599	74.9	45.0-120	
Benzo(a)pyrene	0.0800	0.0474	59.3	42.0-120	
Benzo(b)fluoranthene	0.0800	0.0530	66.3	42.0-121	
Benzo(k)fluoranthene	0.0800	0.0535	66.9	49.0-125	
Chrysene	0.0800	0.0574	71.8	49.0-122	
Dibenz(a,h)anthracene	0.0800	0.0560	70.0	47.0-125	
Fluoranthene	0.0800	0.0592	74.0	49.0-129	
Fluorene	0.0800	0.0565	70.6	49.0-120	
Indeno(1,2,3-cd)pyrene	0.0800	0.0590	73.8	46.0-125	
Naphthalene	0.0800	0.0554	69.3	50.0-120	
Pyrene	0.0800	0.0559	69.9	43.0-123	
1-Methylnaphthalene	0.0800	0.0558	69.8	51.0-121	
2-Methylnaphthalene	0.0800	0.0582	72.8	50.0-120	

Laboratory Control Sample (LCS)

(LCS) R3758300-1 02/08/22 09:47

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	<u>LCS Qualifier</u>
(S) Nitrobenzene-d5			81.5	14.0-149	
(S) 2-Fluorobiphenyl			77.1	34.0-125	
(S) p-Terphenyl-d14			77.9	23.0-120	

L1457187-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1457187-01 02/08/22 10:23 • (MS) R3758300-3 02/08/22 10:40 • (MSD) R3758300-4 02/08/22 10:58

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	<u>MS Qualifier</u>	<u>MSD Qualifier</u>	RPD %	RPD Limits %
Anthracene	0.0800	ND	0.0528	0.0547	66.0	68.4	1	10.0-145			3.53	30
Acenaphthene	0.0800	ND	0.0506	0.0530	63.3	66.3	1	14.0-127			4.63	27
Benzo(a)anthracene	0.0800	ND	0.0540	0.0573	67.5	71.6	1	10.0-139			5.93	30
Benzo(a)pyrene	0.0800	ND	0.0552	0.0578	69.0	72.3	1	10.0-141			4.60	31
Benzo(b)fluoranthene	0.0800	ND	0.0460	0.0480	57.5	60.0	1	10.0-140			4.26	36
Benzo(k)fluoranthene	0.0800	ND	0.0473	0.0490	59.1	61.3	1	10.0-137			3.53	31
Chrysene	0.0800	ND	0.0518	0.0550	64.8	68.8	1	10.0-145			5.99	30
Dibenz(a,h)anthracene	0.0800	ND	0.0494	0.0509	61.8	63.6	1	10.0-132			2.99	31
Fluoranthene	0.0800	ND	0.0525	0.0549	65.6	68.6	1	10.0-153			4.47	33
Fluorene	0.0800	ND	0.0507	0.0535	63.4	66.9	1	11.0-130			5.37	29
Indeno(1,2,3-cd)pyrene	0.0800	ND	0.0520	0.0537	65.0	67.1	1	10.0-137			3.22	32
Naphthalene	0.0800	ND	0.0527	0.0539	65.9	67.4	1	10.0-135			2.25	27
Pyrene	0.0800	ND	0.0488	0.0520	61.0	65.0	1	10.0-148			6.35	35
1-Methylnaphthalene	0.0800	ND	0.0514	0.0533	64.3	66.6	1	10.0-142			3.63	28
2-Methylnaphthalene	0.0800	ND	0.0539	0.0555	67.4	69.4	1	10.0-137			2.93	28
(S) Nitrobenzene-d5					69.7	77.1		14.0-149				
(S) 2-Fluorobiphenyl					62.4	70.4		34.0-125				
(S) p-Terphenyl-d14					59.2	66.4		23.0-120				

Cp

Tc

Ss

Cn

Sr

Qc

Gl

Al

Sc

GLOSSARY OF TERMS

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

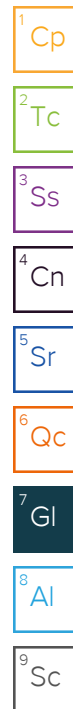
Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDL	Method Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state "ND" (Not Detected) or "BDL" (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier Description

J	The identification of the analyte is acceptable; the reported value is an estimate.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
T8	Sample(s) received past/too close to holding time expiration.



ACCREDITATIONS & LOCATIONS

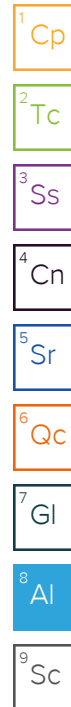
Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey--NELAP	TN002
California	2932	New Mexico ¹	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina ¹	DW21704
Georgia	NELAP	North Carolina ³	41
Georgia ¹	923	North Dakota	R-140
Idaho	TN00003	Ohio--VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LA000356
Kentucky ^{1 6}	KY90010	South Carolina	84004002
Kentucky ²	16	South Dakota	n/a
Louisiana	AI30792	Tennessee ^{1 4}	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas ⁵	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
A2LA -- ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA -- ISO 17025 ⁵	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA--Crypto	TN00003		

¹ Drinking Water ² Underground Storage Tanks ³ Aquatic Toxicity ⁴ Chemical/Microbiological ⁵ Mold ⁶ Wastewater n/a Accreditation not applicable

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace Analytical.



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