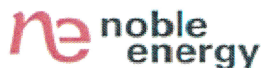


1625 Broadway
Suite 2200.
Denver, CO 80202

Tel: 303.228.4000
Fax: 303.228.4286
www.nobleenergyinc.com



February 16, 2016

Marilyn J. Lutz
6309 W 5 St.
Greeley, CO 80634

RE: Water Well Sampling Results – Domestic Water Well (Receipt # 9059973)

Dear Ms. Lutz:

The Colorado Oil and Gas Conservation Commission (COGCC) observed methane in a monitoring well and requested that operators sample nearby water wells. You granted permission for Noble Energy, Inc. (Noble) to sample your domestic water well on January 15, 2016. On January 19, 2016, Noble collected groundwater samples from your well and submitted them to ALS Environmental (ALS) in Fort Collins, Colorado for laboratory analysis.

The laboratory analytical results for your water are provided in Attachment 1. The results indicate that methane was not detected. The January 29, 2016 ALS report containing all laboratory analyses for your water well are provided in Attachment 2.

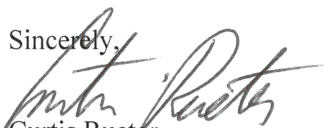
Basic information concerning the groundwater that is supplied to you from your private water well is provided as a reference guide (How Well Do You Know Your Water Well booklet). This booklet also includes information on drinking water standards and methane as related to private water wells. Additional resources concerning water well matters, water quality considerations or oil and gas activities in your vicinity can be found by contacting the appropriate regulatory agency:

Colorado Division of Water Resources, Groundwater Information Desk
(303) 866-3587
<http://www.water.state.co.us>

Colorado Department of Public Health and Environment, Water Quality Control Division
(303) 692-3500
<http://www.cdphe.state.co.us>

Colorado Oil and Gas Conservation Commission
(303) 894-2100
<http://cogcc.state.co.us>

If you have any questions or concerns regarding the sampling results for the water well on your property, please feel free to contact me at (303) 228-4000.

Sincerely,

Curtis Rueter
Project Manager

CC: Rick Allison, COGCC
Attachments

ATTACHMENT 1

LABORATORY ANALYTICAL SUMMARY

Well Permit: 0008422 Receipt: 9059973 Location: NWNW Section 25 Township 6N Range 65W

Sample Date: 1/19/16

Field Water Quality Parameter Summary

Sample ID	pH	Temp (°C)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Turbidity (NTU)	Latitude (North)	Longitude (West)
Permit 0008422	8.74	4.93	0.107	11.00	NM	40.463224	-104.619568

Laboratory Analytical Summary

	Concentration	DWS
Dissolved Gases		
Methane (mg/L)	U	NA
Ethane (mg/L)	U	NA
Propane (mg/L)	U	NA
Volatile Organic Compounds (VOCs)		
Benzene (mg/L)	U	0.005
Toluene (mg/L)	U	1
Ethylbenzene (mg/L)	U	0.68
Total Xylenes (mg/L)	U	10
Gasoline Range Organics (mg/L)	U	NA
Diesel Range Organics (mg/L)	U	NA
Biological Activity and Reaction Test (BART)		
Iron Reducing Bacteria (CFU/ml)	U	NA
Slime Forming Bacteria (CFU/ml)	U	NA
Sulfate Reducing Bacteria (CFU/ml)	U	NA
General Chemistry		
Alkalinity, Bicarbonate as CaCO ₃ (mg/L)	39	NA
Alkalinity, Carbonate (mg/L)	U	NA
Alkalinity, Total as CaCO ₃ (mg/L)	39	NA
Bromide (mg/L)	U	NA
Chloride (mg/L)	5.8	250
Fluoride (mg/L)	0.53	4
Nitrogen, Nitrate (mg/L)	U	10
Nitrogen, Nitrite (mg/L)	U	1
Total Phosphorus (mg/L)	U	NA
Total Dissolved Solids (mg/L)	54	500
Specific Conductivity (umhos/cm)	104.2	NA
Sulfate (mg/L)	3.9	250
pH Adjusted to 25 deg. Celsius	7.91	6.5 - 8.5
Dissolved Metals		
Barium (mg/L)	0.021	2
Boron (mg/L)	U	NA
Calcium (mg/L)	10	NA
Iron (mg/L)	U	0.3
Magnesium (mg/L)	1.9	NA
Manganese (mg/L)	U	NA
Potassium (mg/L)	U	NA
Selenium (mg/L)	U	0.05
Sodium (mg/L)	7.8	NA
Strontium (mg/L)	0.047	NA

Notes:

U = analysis performed but not detected

CFU/ml= colony forming units per milliliter

mg/L = milligrams per liter

umhos/cm = micromhos per centimeter

mS/cm = milli Siemens per centimeter

DWS = Drinking Water Standard

NM = Not Measured

NA = Not Applicable

BOLD - Reported concentration above Colorado drinking water standard

ATTACHMENT 2
LABORATORY ANALYTICAL REPORTS

Friday, January 29, 2016

Nikki Graber
Olsson Associates
5285 McWhinney Blvd, Suite 160
Loveland, CO 80538

Re: ALS Workorder: 1601220
Project Name: Sand Creek
Project Number: 016-0111

Dear Ms. Graber:

Three water samples were received from Olsson Associates, on 1/20/2016. The samples were scheduled for the following analyses:

BART

Dissolved Gasses

GC/MS Volatiles

Inorganics

Metals

Total Extractable Petroleum Hydrocarbons (Diesel)

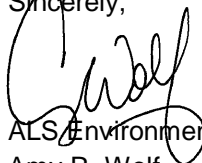
Total Volatile Petroleum Hydrocarbons (Gasoline)

The results for these analyses are contained in the enclosed reports.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Thank you for your confidence in ALS Environmental. Should you have any questions, please call.

Sincerely,



ALS Environmental
Amy R. Wolf
Project Manager

ALS Environmental – Fort Collins is accredited by the following accreditation bodies for various testing scopes in accordance with requirements of each accreditation body. All testing is performed under the laboratory management system, which is maintained to meet these requirement and regulations. Please contact the laboratory or accreditation body for the current scope testing parameters.

ALS Environmental – Fort Collins	
Accreditation Body	License or Certification Number
Alaska (AK)	UST-086
Alaska (AK)	CO01099
Arizona (AZ)	AZ0742
California (CA)	06251CA
Colorado (CO)	CO01099
Connecticut (CT)	PH-0232
Florida (FL)	E87914
Idaho (ID)	CO01099
Kansas (KS)	E-10381
Kentucky (KY)	90137
L-A-B (DoD ELAP/ISO 170250)	L2257
Louisiana (LA)	05057
Maryland (MD)	285
Missouri (MO)	175
Nebraska(NE)	NE-OS-24-13
Nevada (NV)	CO000782008A
New York (NY)	12036
North Dakota (ND)	R-057
Oklahoma (OK)	1301
Pennsylvania (PA)	68-03116
Tennessee (TN)	2976
Texas (TX)	T104704241
Utah (UT)	CO01099
Washington (WA)	C1280



1601220

GC/MS Volatiles:

The samples were analyzed using GC/MS following the current revision of SOP 525 based on SW-846 Method 8260C.

All acceptance criteria were met.

Dissolved Gasses:

The sample was prepared and analyzed according to method RSK-175 procedures and the current revision of SOP 449.

The sample had a pH > 2 at the time of analysis.

All acceptance criteria were met.

GRO:

The sample was analyzed following the current revision of SOP 425 generally based on SW-846 Methods 8000C and 8015D. TVPH is a multicomponent mixture and is quantitated by summing the entire carbon range, rather than individual peaks. The carbon range integrated in this test extends from C6 to C10.

All acceptance criteria were met.

DRO:

The sample was analyzed following the current revision of SOP 406 generally based on SW-846 Methods 8000C and 8015D. TEPH is a multicomponent mixture and is quantitated by summing the entire carbon range, rather than individual peaks. The carbon range integrated in this test extends from C10 to C28.

All acceptance criteria were met.

BART:

The Biological Activity Reaction Test was completed with the Iron-Related Bacteria, Sulfate-Reducing Bacteria, and Slime-Forming Bacteria kit manufactured by Hach Company. The analysis was performed following the manufacturer provided instructions. If the target analyte is not detected (absent), then the sample will be reported with "ND" in the result field. If the target analyte is detected (present), then the sample will be reported with the estimated colony forming units/mL (cfu/mL) as provided by the manufacturer based on the day reaction was observed.

**Metals:**

The sample was analyzed following Methods for the Determination of Metals in Environmental Samples – Supplement 1 procedures. Analysis by ICPMS followed method 200.8 and the current revision of SOP 827.

The sample was to be analyzed for dissolved metals. The sample was filtered through a 0.45 micron filter and preserved with nitric acid to a pH less than 2 prior to analysis.

All acceptance criteria were met.

Inorganics:

The sample was analyzed following MCAWW, EMSL, and Standard Method procedures for the current revisions of the following SOPs and methods:

<u>Analyte</u>	<u>Method</u>	<u>SOP #</u>
Alkalinity	SM2320B	1106
Bicarbonate	SM2320B	1106
Carbonate	SM2320B	1106
pH	SM4500-H ⁺ B	1126
Total phosphorus	365.2	1119
Specific conductance	SM2510B	1128
TDS	SM2540C	1101
Bromide	300.0 Revision 2.1	1113
Chloride	300.0 Revision 2.1	1113
Fluoride	300.0 Revision 2.1	1113
Nitrate as N	300.0 Revision 2.1	1113
Nitrite as N	300.0 Revision 2.1	1113
Total Nitrates	300.0 Revision 2.1	1113
Sulfate	300.0 Revision 2.1	1113

All acceptance criteria were met.

ALS Environmental -- FC

Sample Number(s) Cross-Reference Table

OrderNum: 1601220

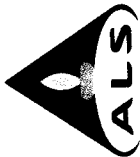
Client Name: Olsson Associates

Client Project Name: Sand Creek

Client Project Number: 016-0111

Client PO Number:

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
Permit 0008422	1601220-1		WATER	19-Jan-16	16:02
Permit 0008422-D	1601220-2		WATER	19-Jan-16	16:02
Trip Blank	1601220-3		WATER	19-Jan-16	



ALS Laboratory Group

225 Commerce Drive, Fort Collins, Colorado 80524
TF: (800) 443-1511 PH: (970) 490-1511 FX: (970) 490-1522

Chain-of-Custody

0.42

Form 202r8

PROJECT NAME Sand Creek		SAMPLER Nikki Graber		DATE 9/1/2015		PAGE 1 of 1		WORKORDER # 1601220	
PROJECT NO. 016-0111		SITE ID		7 business day		DISPOSAL		By Lab	
COMPANY NAME Olsson Associates		EDD FORMAT COGCC EDD		TURNAROUND		BTEX (8260)			
SEND REPORT TO ngrab@olssonassociate.com		PURCHASE ORDER		Ca, Mg, K, Na(200.7/200.8 Dissolved)		DRO (8015)			
ADDRESS 300 East 16th Street		BILL TO COMPANY Olsson Associates		TDS (SM2540C)		GRO (8015)			
CITY / STATE / ZIP Greeley, CO 80631		INVOICE ATTN TO Michelle Moore		Alkalinity, Bicarbonate, Carbonate (SM2320)		Bromide, Chloride, Fluoride, Sulfate(EPA 300.0)			
PHONE 928-240-1043		ADDRESS 300 E 16th St, Unit 309		Methane, Ethane, Propane (RSK 175)		Hold- Methane Ethane Propane (RSK 175)			
FAX 970-635-3709		CITY / STATE / ZIP Greeley, CO 80631		Pres.					
E-MAIL ngrab@olssonassociate.com		PHONE 970-461-7733		# Bottles					
		FAX 970-635-3709		Sample Time					
		E-MAIL nmoore@olssonassociates.com		Sample Date					
Lab ID		Matrix		QC					
① Permit 0008422		GW		1/19		1602 17		Ice	
② Permit 0008422-D		GW				1602 3		Ice	
③ Trip Blank						2		Ice	

*Time Zone (Circle): EST CST MST PST Matrix: O = oil S = soil NS = non-soil solid W = water L = liquid E = extract F = filter

For metals or anions, please detail analytes below.

Comments: 48hr flush on methane Hold ISO flask until methane results return Lab filter 200.7	QC PACKAGE (check below)	
	<input checked="" type="checkbox"/> LEVEL II (Standard QC)	
	<input type="checkbox"/> LEVEL III (Std QC + forms)	
	<input type="checkbox"/> LEVEL IV (Std QC + forms + raw data)	
Preservative Key: 1-HCl 2-HNO3 3-H2SO4 4-NaOH 5-NaHSO4 7-Other 8-4 degrees C 9-5035		

RELINQUISHED BY	SIGNATURE	PRINTED NAME	DATE	TIME
RECEIVED BY	<i>[Signature]</i>	Dillon Flynn	1/20	0830
RELINQUISHED BY	<i>[Signature]</i>	Sgt Melly	1-20-11	0830
RECEIVED BY				
RELINQUISHED BY				
RECEIVED BY				



ALS Environmental - Fort Collins
CONDITION OF SAMPLE UPON RECEIPT FORM

Client: Olsson Workorder No: 1601220
Project Manager: ARW Initials: SDR Date: 1-20-16

1. Does this project require any special handling in addition to standard ALS procedures?	YES	<u>NO</u>
2. Are custody seals on shipping containers intact?	<u>NONE</u>	YES NO
3. Are Custody seals on sample containers intact?	<u>NONE</u>	YES NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?	<u>YES</u>	YES NO
5. Are the COC and bottle labels complete and legible?	<u>YES</u>	YES NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)	YES	<u>NO</u>
7. Were airbills / shipping documents present and/or removable?	<u>DROP OFF</u>	YES NO
8. Are all aqueous samples requiring preservation preserved correctly? (excluding volatiles)	N/A	<u>YES</u> NO
9. Are all aqueous non-preserved samples pH 4-9?	N/A	<u>YES</u> NO
10. Is there sufficient sample for the requested analyses?	<u>YES</u>	YES NO
11. Were all samples placed in the proper containers for the requested analyses?	<u>YES</u>	YES NO
12. Are all samples within holding times for the requested analyses?	<u>YES</u>	YES NO
13. Were all sample containers received intact? (not broken or leaking, etc.)	<u>YES</u>	YES NO
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: ____ < green pea ____ > green pea	N/A	<u>YES</u> NO
15. Do any water samples contain sediment? Amount Amount of sediment: ____ dusting ____ moderate ____ heavy	N/A	YES <u>NO</u>
16. Were the samples shipped on ice?	<u>YES</u>	YES NO
17. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: <u>#2</u> #4 RAD ONLY	<u>YES</u>	YES NO
Cooler #: <u>1</u>		
Temperature (°C): <u>0.4</u>		
No. of custody seals on cooler: <u>1</u>		
External µR/hr reading: <u>N/A</u>		
Background µR/hr reading: <u>11</u>		
Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? YES / NO / <u>NA</u> (If no, see Form 008.)		

Additional Information: PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

6) 120ml Strike bottle sent with the other samples. (Sample 1)
No BART test is indicated in the COC.

If applicable, was the client contacted? YES / NO / NA Contact: _____ Date/Time: _____

Project Manager Signature / Date: [Signature] 1-20-16

Client: Olsson Associates
Project: 016-0111 Sand Creek
Sample ID: Permit 0008422
Legal Location:
Collection Date: 1/19/2016 16:02

Date: 29-Jan-16
Work Order: 1601220
Lab ID: 1601220-1
Matrix: WATER
Percent Moisture:

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Alkalinity as Calcium Carbonate		SM2320B			Prep Date: 1/25/2016	PrepBy: TLB
BICARBONATE AS CaCO3	39		5	MG/L	1	1/25/2016
CARBONATE AS CaCO3	ND		5	MG/L	1	1/25/2016
TOTAL ALKALINITY AS CaCO3	39		5	MG/L	1	1/25/2016
Biological Activity Reaction Test		BART			Prep Date: 1/21/2016	PrepBy: CDR
IRON RELATED BACTERIA	ND		1	cfu/ml	1	1/29/2016
SLIME FORMING BACTERIA	ND		1	cfu/ml	1	1/29/2016
SULFATE REDUCING BACTERIA	ND		1	cfu/ml	1	1/29/2016
Diesel Range Organics		SW8015M			Prep Date: 1/25/2016	PrepBy: ACK
Diesel Range Organics	ND		0.63	MG/L	1	1/27/2016 18:12
Surr: O-TERPHENYL	114		63-126	%REC	1	1/27/2016 18:12
Dissolved Gasses		RSK175			Prep Date: 1/21/2016	PrepBy: DMS
METHANE	ND		1	UG/L	1	1/21/2016 19:03
ETHANE	ND		2	UG/L	1	1/21/2016 19:03
PROPANE	ND		1	UG/L	1	1/21/2016 19:03
Gasoline Range Organics		SW8015			Prep Date: 1/27/2016	PrepBy: TWK
GASOLINE RANGE ORGANICS	ND		0.05	MG/L	1	1/27/2016 14:27
Surr: 2,3,4-TRIFLUOROTOLUENE	97		74-129	%REC	1	1/27/2016 14:27
GC/MS Volatiles		SW8260_25			Prep Date: 1/20/2016	PrepBy: JXK
BENZENE	ND		1	UG/L	1	1/20/2016 22:15
TOLUENE	ND		1	UG/L	1	1/20/2016 22:15
ETHYLBENZENE	ND		1	UG/L	1	1/20/2016 22:15
M+P-XYLENE	ND		1	UG/L	1	1/20/2016 22:15
O-XYLENE	ND		1	UG/L	1	1/20/2016 22:15
TOTAL XYLENES	ND		1	UG/L	1	1/20/2016 22:15
Surr: 4-BROMOFLUOROBENZENE	100		85-115	%REC	1	1/20/2016 22:15
Surr: DIBROMOFLUOROMETHANE	102		84-118	%REC	1	1/20/2016 22:15
Surr: TOLUENE-D8	100		85-115	%REC	1	1/20/2016 22:15
Ion Chromatography		EPA300.0			Prep Date: 1/20/2016	PrepBy: JFN
BROMIDE	ND		0.2	MG/L	1	1/20/2016 17:27
CHLORIDE	5.8		0.2	MG/L	1	1/20/2016 17:27
FLUORIDE	0.53		0.1	MG/L	1	1/20/2016 17:27
NITRATE/NITRITE AS N	ND		0.1	MG/L	1	1/20/2016 17:27
NITRATE AS N	ND		0.2	MG/L	1	1/20/2016 17:27
NITRITE AS N	ND		0.1	MG/L	1	1/20/2016 17:27
SULFATE	3.9		1	MG/L	1	1/20/2016 17:27
Dissolved Metals by 200.8		EPA200.8			Prep Date: 1/22/2016	PrepBy: CDR
BARIUM	0.021		0.001	MG/L	10	1/26/2016 18:59
BORON	ND		0.05	MG/L	10	1/26/2016 18:59
CALCIUM	10		1	MG/L	10	1/26/2016 18:59
IRON	ND		0.1	MG/L	10	1/26/2016 18:59
MAGNESIUM	1.9		0.1	MG/L	10	1/26/2016 18:59
MANGANESE	ND		0.002	MG/L	10	1/26/2016 18:59
POTASSIUM	ND		1	MG/L	10	1/26/2016 18:59

Client: Olsson Associates

Date: 29-Jan-16

Project: 016-0111 Sand Creek

Work Order: 1601220

Sample ID: Permit 0008422

Lab ID: 1601220-1

Legal Location:

Matrix: WATER

Collection Date: 1/19/2016 16:02

Percent Moisture:

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
SELENIUM	ND		0.001	MG/L	10	1/26/2016 18:59
SODIUM	7.8		1	MG/L	10	1/26/2016 18:59
STRONTIUM	0.047		0.001	MG/L	10	1/26/2016 18:59
pH		SM4500-H			Prep Date: 1/21/2016	PrepBy: SDW
PH	7.91		0.1	pH	1	1/21/2016
Specific Conductance in Water		SM2510B			Prep Date: 1/21/2016	PrepBy: SDW
SPECIFIC CONDUCTIVITY	104.2		1	umhos/cm	1	1/21/2016
Total Dissolved Solids		SM2540C			Prep Date: 1/25/2016	PrepBy: TLB
TOTAL DISSOLVED SOLIDS	54		20	MG/L	1	1/26/2016
Total Phosphorus as P		EPA365.2			Prep Date: 1/21/2016	PrepBy: TLB
TOTAL PHOSPHORUS	ND		0.05	MG/L	1	1/21/2016

Client: Olsson Associates
Project: 016-0111 Sand Creek
Sample ID: Trip Blank
Legal Location:
Collection Date: 1/19/2016

Date: 29-Jan-16
Work Order: 1601220
Lab ID: 1601220-3
Matrix: WATER
Percent Moisture:

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
GC/MS Volatiles						
			SW8260_25		Prep Date: 1/20/2016	PrepBy: JXK
BENZENE	ND		1	UG/L	1	1/20/2016 21:54
TOLUENE	ND		1	UG/L	1	1/20/2016 21:54
ETHYLBENZENE	ND		1	UG/L	1	1/20/2016 21:54
M+P-XYLENE	ND		1	UG/L	1	1/20/2016 21:54
O-XYLENE	ND		1	UG/L	1	1/20/2016 21:54
TOTAL XYLENES	ND		1	UG/L	1	1/20/2016 21:54
Surr: 4-BROMOFLUOROBENZENE	101		85-115	%REC	1	1/20/2016 21:54
Surr: DIBROMOFLUOROMETHANE	101		84-118	%REC	1	1/20/2016 21:54
Surr: TOLUENE-D8	98		85-115	%REC	1	1/20/2016 21:54

Client: Olsson Associates

Date: 29-Jan-16

Project: 016-0111 Sand Creek

Work Order: 1601220

Sample ID: Trip Blank

Lab ID: 1601220-3

Legal Location:

Matrix: WATER

Collection Date: 1/19/2016

Percent Moisture:

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
----------	--------	------	--------------	-------	-----------------	---------------

Explanation of Qualifiers**Radiochemistry:**

U or ND - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

* - Aliquot Basis is 'As Received' while the Report Basis is 'Dry Weight'.

- Aliquot Basis is 'Dry Weight' while the Report Basis is 'As Received'.

G - Sample density differs by more than 15% of LCS density.

D - DER is greater than Control Limit

M - Requested MDC not met.

LT - Result is less than requested MDC but greater than achieved MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

NC - Not Calculated for duplicate results less than 5 times MDC

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Inorganics:

B - Result is less than the requested reporting limit but greater than the instrument method detection limit (MDL).

U or ND - Indicates that the compound was analyzed for but not detected.

E - The reported value is estimated because of the presence of interference. An explanatory note may be included in the narrative.

M - Duplicate injection precision was not met.

N - Spiked sample recovery not within control limits. A post spike is analyzed for all ICP analyses when the matrix spike and or spike duplicate fail and the native sample concentration is less than four times the spike added concentration.

Z - Spiked recovery not within control limits. An explanatory note may be included in the narrative.

* - Duplicate analysis (relative percent difference) not within control limits.

S - SAR value is estimated as one or more analytes used in the calculation were not detected above the detection limit.

Organics:

U or ND - Indicates that the compound was analyzed for but not detected.

B - Analyte is detected in the associated method blank as well as in the sample. It indicates probable blank contamination and warns the data user.

E - Analyte concentration exceeds the upper level of the calibration range.

J - Estimated value. The result is less than the reporting limit but greater than the instrument method detection limit (MDL).

A - A tentatively identified compound is a suspected aldol-condensation product.

X - The analyte was diluted below an accurate quantitation level.

* - The spike recovery is equal to or outside the control criteria used.

+ - The relative percent difference (RPD) equals or exceeds the control criteria.

G - A pattern resembling gasoline was detected in this sample.

D - A pattern resembling diesel was detected in this sample.

M - A pattern resembling motor oil was detected in this sample.

C - A pattern resembling crude oil was detected in this sample.

4 - A pattern resembling JP-4 was detected in this sample.

5 - A pattern resembling JP-5 was detected in this sample.

H - Indicates that the fuel pattern was in the heavier end of the retention time window for the analyte of interest.

L - Indicates that the fuel pattern was in the lighter end of the retention time window for the analyte of interest.

Z - This flag indicates that a significant fraction of the reported result did not resemble the patterns of any of the following petroleum hydrocarbon products:

- gasoline
- JP-8
- diesel
- mineral spirits
- motor oil
- Stoddard solvent
- bunker C

ALS Environmental -- FC

Date: 1/29/2016 2:04:

Client: Olsson Associates

QC BATCH REPORT

Work Order: 1601220

Project: 016-0111 Sand Creek

Batch ID: HC160121-99-1

Instrument ID MEE-1

Method: RSK175

LCS	Sample ID: HC160121-99				Units: UG/L		Analysis Date: 1/21/2016 17:22				
Client ID:	Run ID: HC160121-99A				Prep Date: 1/21/2016			DF: 1			
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
METHANE	150	1	142		105	80-120				25	
ETHANE	285	2	267		107	80-120				25	
PROPANE	409	1	391		105	80-120				25	

LCSD	Sample ID: HC160121-99				Units: UG/L		Analysis Date: 1/21/2016 18:11				
Client ID:	Run ID: HC160121-99A				Prep Date: 1/21/2016			DF: 1			
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
METHANE	148	1	142		104	80-120		150	2	25	
ETHANE	282	2	267		106	80-120		285	1	25	
PROPANE	404	1	391		103	80-120		409	1	25	

MB	Sample ID: HC160121-99				Units: UG/L		Analysis Date: 1/21/2016 17:25				
Client ID:	Run ID: HC160121-99A				Prep Date: 1/21/2016			DF: 1			
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
METHANE	ND	1									
ETHANE	ND	2									
PROPANE	ND	1									

The following samples were analyzed in this batch:

1601220-1

Client: Olsson Associates
Work Order: 1601220
Project: 016-0111 Sand Creek

QC BATCH REPORT

Batch ID: **HC160127-6-2** Instrument ID **FUELS-1** Method: **SW8015**

LCS	Sample ID: HC160127-6			Units: MG/L			Analysis Date: 1/27/2016 09:41				
Client ID:		Run ID: HC160127-6A			Prep Date: 1/27/2016			DF: 1			
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
GASOLINE RANGE ORGANICS	0.524	0.05	0.5		105	79-118				20	
Surr: 2,3,4-TRIFLUOROTOLUENE	0.104		0.1		104	74-129					

LCSD		Sample ID: HC160127-6				Units: MG/L		Analysis Date: 1/27/2016 12:38			
Client ID:		Run ID: HC160127-6A				Prep Date: 1/27/2016		DF: 1			
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
GASOLINE RANGE ORGANICS	0.505	0.05	0.5		101	79-118		0.524	4	20	
Surr: 2,3,4-TRIFLUOROTOLUENE	0.101		0.1		101	74-129			3		

MB		Sample ID: HC160127-6				Units: MG/L		Analysis Date: 1/27/2016 10:03				
Client ID:		Run ID: HC160127-6A				Prep Date: 1/27/2016			DF: 1			
Analyte		Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
GASOLINE RANGE ORGANICS		ND	0.05									
Surr: 2,3,4-TRIFLUOROTOLUENE		0.1		0.1		100	74-129					

The following samples were analyzed in this batch:

1601220-1

Client: Olsson Associates
Work Order: 1601220
Project: 016-0111 Sand Creek

QC BATCH REPORT

Batch ID: **EX160125-2-1** Instrument ID **FUELS-1** Method: **SW8015M**

LCS	Sample ID: EX160125-2			Units: MG/L			Analysis Date: 1/27/2016 10:17				
Client ID:		Run ID: HC160127-7			Prep Date: 1/25/2016			DF: 1			
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
Diesel Range Organics	18.3	0.646	17.9		102	36-150				20	
Surr: O-TERPHENYL	0.972		0.897		108	63-126					

LCSD	Sample ID: EX160125-2				Units: MG/L		Analysis Date: 1/27/2016 10:47				
Client ID:	Run ID: HC160127-7				Prep Date: 1/25/2016			DF: 1			
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
Diesel Range Organics	18.1	0.636	17.7		102	36-150		18.3	1	20	
Surr: O-TERPHENYL	0.97		0.884		110	63-126			0		

MB		Sample ID: EX160125-2				Units: MG/L		Analysis Date: 1/27/2016 09:42			
Client ID:		Run ID: HC160127-7				Prep Date: 1/25/2016		DF: 1			
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
Diesel Range Organics	ND	0.67									
Surr: O-TERPHENYL	1.09		0.935		117	63-126					

The following samples were analyzed in this batch:

1601220-1

Client: Olsson Associates
Work Order: 1601220
Project: 016-0111 Sand Creek

QC BATCH REPORT

Batch ID: **IP160122-2-2** Instrument ID **ICPMS2** Method: **EPA200.8**

LCS		Sample ID: FM160122-2			Units: MG/L			Analysis Date: 1/26/2016 18:42			
Client ID:		Run ID: IM160126-12A4			Prep Date: 1/22/2016			DF: 10			
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
BARIUM	0.106	0.001	0.1		106	85-115				20	
BORON	0.996	0.05	1		100	85-115				20	
CALCIUM	9.27	1	10		93	85-115				20	
IRON	4.97	0.1	5		99	85-115				20	
MAGNESIUM	9.83	0.1	10		98	85-115				20	
MANGANESE	0.102	0.002	0.1		102	85-115				20	
POTASSIUM	4.93	1	5		99	85-115				20	
SELENIUM	0.0966	0.001	0.1		97	85-115				20	
SODIUM	9.42	1	10		94	85-115				20	
STRONTIUM	0.0987	0.001	0.1		99	85-115				20	

MB		Sample ID: FP160122-2			Units: MG/L			Analysis Date: 1/26/2016 18:38			
Client ID:		Run ID: IM160126-12A4			Prep Date: 1/22/2016			DF: 10			
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
BARIUM	ND	0.001									
BORON	ND	0.05									
CALCIUM	ND	1									
IRON	ND	0.1									
MAGNESIUM	ND	0.1									
MANGANESE	ND	0.002									
POTASSIUM	ND	1									
SELENIUM	ND	0.001									
SODIUM	ND	1									
STRONTIUM	ND	0.001									

The following samples were analyzed in this batch:

1601220-1

Client: Olsson Associates
 Work Order: 1601220
 Project: 016-0111 Sand Creek

QC BATCH REPORT

Batch ID: VL160120-3-1 Instrument ID HPV1 Method: SW8260_25

LCS		Sample ID: VL160120-3			Units: %REC		Analysis Date: 1/20/2016 11:19				
Client ID:		Run ID: VL160120-3A			Prep Date: 1/20/2016			DF: 1			
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
Surr: 4-BROMOFLUOROBENZENE	24.1		25		96	85-115					
Surr: DIBROMOFLUOROMETHANE	25.7		25		103	84-118					
Surr: TOLUENE-D8	24.6		25		98	85-115					
BENZENE	10.2	1	10		102	83-117				20	
TOLUENE	10	1	10		100	82-113				20	
ETHYLBENZENE	10.1	1	10		101	81-113				20	
M+P-XYLENE	20.6	1	20		103	82-115				20	
O-XYLENE	10.2	1	10		102	81-115				20	

LCSD		Sample ID: VL160120-3				Units: %REC		Analysis Date: 1/20/2016 11:41			
Client ID:		Run ID: VL160120-3A				Prep Date: 1/20/2016			DF: 1		
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
Surr: 4-BROMOFLUOROBENZENE	24.1		25		97	85-115			0		
Surr: DIBROMOFLUOROMETHANE	25.7		25		103	84-118			0		
Surr: TOLUENE-D8	24.8		25		99	85-115			1		
BENZENE	10.2	1	10		102	83-117		10.2	1	20	
TOLUENE	10.3	1	10		103	82-113		10	3	20	
ETHYLBENZENE	10.2	1	10		102	81-113		10.1	1	20	
M+P-XYLENE	20.9	1	20		105	82-115		20.6	2	20	
O-XYLENE	10.4	1	10		104	81-115		10.2	2	20	

MB		Sample ID: VL160120-3				Units: %REC		Analysis Date: 1/20/2016 13:16			
Client ID:		Run ID: VL160120-3A				Prep Date: 1/20/2016		DF: 1			
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
Surr: 4-BROMOFLUOROBENZENE	25.6		25		102	85-115					
Surr: DIBROMOFLUOROMETHANE	25.1		25		100	84-118					
Surr: TOLUENE-D8	24.7		25		99	85-115					
BENZENE	ND	1									
TOLUENE	ND	1									
ETHYLBENZENE	ND	1									
M+P-XYLENE	ND	1									
O-XYLENE	ND	1									
TOTAL XYLENES	ND	1									

The following samples were analyzed in this batch:

1601220-1 1601220-3

Client: Olsson Associates
Work Order: 1601220
Project: 016-0111 Sand Creek

QC BATCH REPORT

Batch ID: **AK160125-1-2** Instrument ID **Balance** Method: **SM2320B**

LCS		Sample ID: AK160125-1			Units: MG/L			Analysis Date: 1/25/2016			
Client ID:		Run ID: AK160125-1A1			Prep Date: 1/25/2016			DF: 1			
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
TOTAL ALKALINITY AS CaCO3	98.8	5	100		99	85-115				15	

MB		Sample ID: AK160125-1			Units: MG/L			Analysis Date: 1/25/2016			
Client ID:		Run ID: AK160125-1A1			Prep Date: 1/25/2016			DF: 1			
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
BICARBONATE AS CaCO3	ND	5									
CARBONATE AS CaCO3	ND	5									
TOTAL ALKALINITY AS CaCO3	ND	5									

The following samples were analyzed in this batch:

1601220-1

Client: Olsson Associates
 Work Order: 1601220
 Project: 016-0111 Sand Creek

QC BATCH REPORT

Batch ID: **ic160120-2-2** Instrument ID **IC-2** Method: **EPA300.0**

LCS	Sample ID: ic160120-2				Units: MG/L		Analysis Date: 1/20/2016 13:25				
Client ID:	Run ID: IC160120-1A2				Prep Date: 1/20/2016			DF: 1			
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
BROMIDE	4.81	0.2	5		96	90-110				15	
CHLORIDE	4.82	0.2	5		96	90-110				15	
FLUORIDE	1.98	0.1	2		99	90-110				15	
NITRATE AS N	4.9	0.2	5		98	90-110				15	
NITRITE AS N	2.1	0.1	2		105	90-110				15	
SULFATE	18.9	1	20		94	90-110				15	

MB	Sample ID: ic160120-2				Units: MG/L		Analysis Date: 1/20/2016 13:10				
Client ID:	Run ID: IC160120-1A2				Prep Date: 1/20/2016			DF: 1			
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
BROMIDE	ND	0.2									
CHLORIDE	ND	0.2									
FLUORIDE	ND	0.1									
NITRATE AS N	ND	0.2									
NITRITE AS N	ND	0.1									
SULFATE	ND	1									

MS		Sample ID: 1601220-1				Units: MG/L		Analysis Date: 1/20/2016 20:44			
Client ID: Permit 0008422			Run ID: IC160120-1A2			Prep Date: 1/20/2016			DF: 1		
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
BROMIDE	4.67	0.2	5	0.2	93	85-115				15	
CHLORIDE	11.3	0.2	5	5.8	110	85-115				15	
FLUORIDE	2.54	0.1	2	0.53	101	85-115				15	
NITRATE AS N	4.84	0.2	5	0.2	97	85-115				15	
NITRITE AS N	1.91	0.1	2	0.1	96	85-115				15	
SULFATE	22.4	1	20	3.9	93	85-115				15	

MSD	Sample ID: 1601220-1				Units: MG/L		Analysis Date: 1/20/2016 20:59				
Client ID: Permit 0008422			Run ID: IC160120-1A2			Prep Date: 1/20/2016			DF: 1		
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
BROMIDE	4.77	0.2	5	0.2	95	85-115		4.67	2	15	
CHLORIDE	11.5	0.2	5	5.8	112	85-115		11.3	1	15	
FLUORIDE	2.59	0.1	2	0.53	103	85-115		2.54	2	15	
NITRATE AS N	4.95	0.2	5	0.2	99	85-115		4.84	2	15	
NITRITE AS N	1.97	0.1	2	0.1	99	85-115		1.91	3	15	
SULFATE	22.8	1	20	3.9	95	85-115		22.4	2	15	

Client: Olsson Associates
Work Order: 1601220
Project: 016-0111 Sand Creek

QC BATCH REPORT

The following samples were analyzed in this batch:

1601220-1

Client: Olsson Associates
Work Order: 1601220
Project: 016-0111 Sand Creek

QC BATCH REPORT

Batch ID: **TD160125-1-1** Instrument ID **Balance** Method: **SM2540C**

LCS	Sample ID: TD160125-1			Units: MG/L			Analysis Date: 1/26/2016				
Client ID:		Run ID: TD160126-1A1			Prep Date: 1/25/2016			DF: 1			
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
TOTAL DISSOLVED SOLIDS	401	20	400		100	85-115				5	

MB		Sample ID: TD160125-1				Units: MG/L		Analysis Date: 1/26/2016			
Client ID:		Run ID: TD160126-1A1				Prep Date: 1/25/2016		DF: 1			
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
TOTAL DISSOLVED SOLIDS		ND	20								

The following samples were analyzed in this batch:

1601220-1

Client: Olsson Associates
Work Order: 1601220
Project: 016-0111 Sand Creek

QC BATCH REPORT

Batch ID: **TP160121-1-1** Instrument ID **Spec** Method: **EPA365.2**

LCS		Sample ID: TP160121-1			Units: MG/L			Analysis Date: 1/21/2016			
Client ID:		Run ID: TP160121-1A1			Prep Date: 1/21/2016			DF: 1			
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
TOTAL PHOSPHORUS	0.524	0.05	0.5		105	80-120				20	

MB		Sample ID: TP160121-1			Units: MG/L			Analysis Date: 1/21/2016			
Client ID:		Run ID: TP160121-1A1			Prep Date: 1/21/2016			DF: 1			
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref	RPD	RPD Limit	Qual
TOTAL PHOSPHORUS	ND	0.05									

The following samples were analyzed in this batch:

1601220-1