

Summit Scientific

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

August 24, 2018

Blake Ford

Extraction Oil&Gas

370 17th Street Suite 5300

Denver, CO 80202

RE: BWSE/GWA_Coyote_Trails

Enclosed are the results of analyses for samples received by Summit Scientific on 08/08/18 16:01. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink, appearing to read 'P. Shrewsbury', with a stylized, flowing script.

Paul Shrewsbury For Ben Shrewsbury

Laboratory Manager



Extraction Oil&Gas
370 17th Street Suite 5300
Denver CO, 80202

Project: BWSE/GWA_Coyote_Trails

Project Number: AFE#17031 Code 961.15

Project Manager: Blake Ford

Reported:
08/24/18 06:50

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BW_Front_Range_Landfill_Surface_Water_SW_SWSE_28	1808099-01	Water	08/08/18 10:57	08/08/18 16:01

Summit Scientific

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741 Corporate Circle, Suite J ♦ Golden, Colorado 80401
303-277-9310 ♦ 303-374-5933

Page 1 of 1

Client: Extraction Oil and Gas (XOG) Report to: Apex Companies, LLC Project Manager: Heather Shideman
Address: 2234 117th Ave, Ste 106 E-Mail: Rochelle.Carlisle@apexcos.com, Heather.Shideman@apexcos.com
City/State/Zip: Greeley, CO 80634 cc: bford@extractionog.com
Phone: (970) 576-3446 Project Name: BWSE/GWA_Coyote_Trails
Sampler Name: Kate Macdonald Project No.: AFE # 17031; Code 961.15 Facility ID

				Preservative				Matrix				Analysis Requested				Special Instructions			
ID	Field ID / Point of Collection	Date Sampled	Time Sampled	# of containers	HCl	HNO3	None	Other (Specify)	Surface Water	Soil	Air-Canister #	Other (Specify)	COGCC 609 minus Isotopes						
1	BW Front Range Landfill Surface Water SW SWSE 28 1N 68W	8/8/18	1057	11	X	X	X		X				X	X	X		Sample Frequency: Q2-Q3 ps		
	Temperature, field:	21.41	°C																
	pH, field:	6.10	s.u.																
	Conductivity, field:	391.6	uS/cm																
	ORP, field:	6.9	mV																
	Dissolved Oxygen, field:	3.11	mg/L																
	Turbidity, field:	58.6	NTU																
Relinquished by:				Date/Time:				Received by:				Date/Time:				Turn Around Time (Check)		Notes:	
[Signature]				8/8/18 1601				[Signature]				8-8-18 1601				Same Day _____ 72 hours			
Relinquished by:				Date/Time:				Received by:				Date/Time:				24 hours <u>X</u>		Standard	
Relinquished by:				Date/Time:				Received by:				Date/Time:				48 hours _____			
Relinquished by:				Date/Time:				Received by:				Date/Time:				Sample Integrity:			
Relinquished by:				Date/Time:				Received by:				Date/Time:				Temperature Upon Receipt: 15.9			
Relinquished by:				Date/Time:				Received by:				Date/Time:				Intact: <u>Yes</u> No			

Sample Receipt Checklist

S2 Work Order 1808099Client: XOGClient Project ID: BWSE/GWA Coyote TrailsShipped Via: Hand

(UPS, FedEx, Hand Delivered, Pick-up, etc.)

Airbill #: _____

Matrix (check all that apply): ☐ Air ☐ Soil/Solid ☒ Water ☐ Other: _____
(Describe)

Temp (°C)	<u>15.9</u>
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Thermometer ID: 61857155-K

	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature at 4°C +/- 2°C ⁽¹⁾ ? NOTE: If samples are delivered the same day of sampling, this requirement is met provided that there is evidence that cooling has begun.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all samples received intact ⁽¹⁾ ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was adequate sample volume provided ⁽¹⁾ ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
If custody seals are present, are they intact ⁽¹⁾ ?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Are samples with holding times due within 48 hours sample due within 48 hours present?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Is a chain-of-custody (COC) form present and filled out completely ⁽¹⁾ ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Does the COC agree with the number and type of sample bottles received ⁽¹⁾ ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Do the sample IDs on the bottle labels match the COC ⁽¹⁾ ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Is the COC properly relinquished by the client w/ date and time recorded ⁽¹⁾ ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
For volatiles in water – is there headspace present? If yes, contact client and note in narrative.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Are samples preserved that require preservation (excluding cooling) ⁽¹⁾ ? Note the type of preservative in the Comments column – HCl, H ₂ SO ₄ , NaOH, HNO ₃ , ect	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	HNO ₃ , HCl
If samples are acid preserved for metals, is the pH ≤ 2 ⁽¹⁾ ? Record the pH in Comments.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	pH 0
If dissolved metals are requested, were samples field filtered?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

Additional Comments (if any):

⁽¹⁾ If NO, then contact the client before proceeding with analysis and note in case narrative.Custodian Printed Name or Initials UPSignature of Custodian ADDate/Time 8.8.2008 1610



Extraction Oil&Gas
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Denver CO, 80202

Project: BWSE/GWA_Coyote_Trails
Project Number: AFE#17031 Code 961.15
Project Manager: Blake Ford

Reported:
08/24/18 06:50

BW_Front_Range_Landfill_Surface_Water_SW_SWSE_28_1N_68W
1808099-01 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **08/08/18 10:57**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0010	mg/L	1	1808182	08/14/18	08/14/18	EPA 8260B	
Toluene	ND	0.0010	"	"	"	"	"	"	
Ethylbenzene	ND	0.0010	"	"	"	"	"	"	
m,p-Xylene	ND	0.0020	"	"	"	"	"	"	
o-Xylene	ND	0.0010	"	"	"	"	"	"	
Xylenes (total)	ND	0.0020	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.050	"	"	"	"	"	"	

Date Sampled: **08/08/18 10:57**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		115 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		100 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		110 %	21-167		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **08/08/18 10:57**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	0.100	mg/L	1	1808171	08/14/18	08/16/18	EPA 8015M	

Date Sampled: **08/08/18 10:57**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		79.7 %	44.8-129		"	"	"	"	

Dissolved Gases by RSK-175 mod

Date Sampled: **08/08/18 10:57**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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BW_Front_Range_Landfill_Surface_Water_SW_SWSE_28_1N_68W
1808099-01 (Water)

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Dissolved Gases by RSK-175 mod

Methane	0.012	0.010	mg/L	1	1808224	08/16/18	08/17/18	RSK-175 mod
Ethane	ND	0.010	"	"	"	"	"	"
Propane	ND	0.010	"	"	"	"	"	"

Date Sampled: **08/08/18 10:57**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: Ethene		103 %	70-130		"	"	"	"	

Dissolved Metals by EPA Method 200.8

Date Sampled: **08/08/18 10:57**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	12.8	0.0500	mg/L	1	1808128	08/10/18	08/10/18	EPA 200.8	
Iron	1.28	0.0100	"	"	"	"	"	"	
Magnesium	6.84	0.0500	"	"	"	"	"	"	
Manganese	0.0217	0.00100	"	"	"	"	"	"	
Potassium	6.97	0.0500	"	"	"	"	"	"	
Sodium	54.8	0.0500	"	"	"	"	"	"	
Barium	0.0574	0.00100	"	"	"	"	"	"	
Boron	0.297	0.0100	"	"	"	"	"	"	
Selenium	0.00202	0.00100	"	"	"	"	"	"	
Strontium	0.315	0.0100	"	"	"	"	"	"	

Anions by EPA Method 300.0

Date Sampled: **08/08/18 10:57**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Bromide	ND	0.200	mg/L	1	1808119	08/09/18	08/09/18	EPA 300.0	
Chloride	11.2	0.100	"	"	"	"	"	"	
Fluoride	0.415	0.200	"	"	"	"	"	"	
Sulfate	87.5	10.0	"	10	"	"	"	"	
Nitrate as N	ND	0.100	"	1	"	"	"	"	
Nitrite as N	ND	0.100	"	"	"	"	"	"	
Nitrate/Nitrite as N	ND	0.200	"	"	"	"	"	"	

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Project: BWSE/GWA_Coyote_Trails
Project Number: AFE#17031 Code 961.15
Project Manager: Blake Ford

Reported:
08/24/18 06:50

BW_Front_Range_Landfill_Surface_Water_SW_SWSE_28_1N_68W
1808099-01 (Water)

Summit Scientific

Anions by EPA Method 300.0

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **08/08/18 10:57**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Total Alkalinity	80.0	10.0	mg/L as CaCO ₃	1	1808187	08/15/18	08/15/18	SM2320-B	
Carbonate	ND	10.0	"	"	"	"	"	"	
Bicarbonate	80.0	10.0	"	"	"	"	"	"	

Conventional Chemistry Parameters by APHA/EPA Methods

Date Sampled: **08/08/18 10:57**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Phosphorus - Total	0.355	0.0500	mg/L	1	1808168	08/14/18	08/15/18	SM4500-P	

Specific Conductance by SM2510B

Date Sampled: **08/08/18 10:57**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	431	1.00	umhos/cm	1	1808178	08/14/18	08/14/18	SM2510B	

Total Dissolved Solids by SM2540C

Date Sampled: **08/08/18 10:57**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Total Dissolved Solids	211	10.0	mg/L	1	1808179	"	08/14/18	SM2450C	

pH by SM4500

Date Sampled: **08/08/18 10:57**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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08/24/18 06:50

BW_Front_Range_Landfill_Surface_Water_SW_SWSE_28_1N_68W
1808099-01 (Water)

Summit Scientific

pH by SM4500

pH	7.81	1	pH Units	1	1808118	08/08/18	08/08/18	SM4500-H+
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Biological Activity Reaction Test

Date Sampled: **08/08/18 10:57**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Iron Related Bacteria	35000	25.0	CFU/ml	1	1808123	08/09/18	08/23/18	BART	
Sulfate Reducing Bacteria	ND	200	"	"	"	"	"	"	
Slime Forming Bacteria	6000	500	"	"	"	"	"	"	

Field Data

Date Sampled: **08/08/18 10:57**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	391.6		uS/cm	1	1808108	08/08/18	08/08/18	Field Method	
Temperature	21.41		°C	"	"	"	"	"	
Oxidation/Reduction Potential	6.9		mv	"	"	"	"	"	
Dissolved Oxygen	3.11		mg/L	"	"	"	"	"	
Turbidity	58.6		NTU	"	"	"	"	"	
pH	6.10		s.u.	"	"	"	"	"	

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Project Manager: Blake Ford

Reported:
08/24/18 06:50

Volatile Organic Compounds by EPA Method 8260B - Quality Control

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Analyte	Reporting			Spike	Source		%REC		RPD	
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

Batch 1808182 - EPA 5030 Water MS

Blank (1808182-BLK1)

Prepared & Analyzed: 08/14/18

Benzene	ND	0.0010	mg/L							
Toluene	ND	0.0010	"							
Ethylbenzene	ND	0.0010	"							
m,p-Xylene	ND	0.0020	"							
o-Xylene	ND	0.0010	"							
Xylenes (total)	ND	0.0020	"							
Gasoline Range Hydrocarbons	ND	0.050	"							
Surrogate: 1,2-Dichloroethane-d4	0.0151		"	0.0132		115	23-173			
Surrogate: Toluene-d8	0.0130		"	0.0133		97.3	20-170			
Surrogate: 4-Bromofluorobenzene	0.0143		"	0.0133		108	21-167			

LCS (1808182-BS1)

Prepared & Analyzed: 08/14/18

Benzene	0.0287	0.0010	mg/L	0.0333		86.0	51-132			
Toluene	0.0287	0.0010	"	0.0333		86.2	51-138			
Ethylbenzene	0.0315	0.0010	"	0.0333		94.5	58-146			
m,p-Xylene	0.0563	0.0020	"	0.0667		84.4	57-144			
o-Xylene	0.0299	0.0010	"	0.0333		89.6	53-146			
Surrogate: 1,2-Dichloroethane-d4	0.0154		"	0.0132		117	23-173			
Surrogate: Toluene-d8	0.0136		"	0.0133		102	20-170			
Surrogate: 4-Bromofluorobenzene	0.0146		"	0.0133		109	21-167			

Matrix Spike (1808182-MS1)

Source: 1808184-02

Prepared & Analyzed: 08/14/18

Benzene	0.0268	0.0010	mg/L	0.0333	ND	80.4	34-141			
Toluene	0.0269	0.0010	"	0.0333	ND	80.6	27-151			
Ethylbenzene	0.0292	0.0010	"	0.0333	ND	87.6	29-160			
m,p-Xylene	0.0524	0.0020	"	0.0667	ND	78.6	20-166			
o-Xylene	0.0284	0.0010	"	0.0333	ND	85.1	33-159			
Surrogate: 1,2-Dichloroethane-d4	0.0160		"	0.0132		121	23-173			
Surrogate: Toluene-d8	0.0136		"	0.0133		102	20-170			
Surrogate: 4-Bromofluorobenzene	0.0141		"	0.0133		105	21-167			

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Project Manager: Blake Ford

Reported:
08/24/18 06:50

Volatile Organic Compounds by EPA Method 8260B - Quality Control
Summit Scientific

Analyte	Reporting			Spike	Source		%REC		RPD	
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

Batch 1808182 - EPA 5030 Water MS

Matrix Spike Dup (1808182-MSD1)		Source: 1808184-02			Prepared & Analyzed: 08/14/18					
Benzene	0.0293	0.0010	mg/L	0.0333	ND	88.0	34-141	9.05	32	
Toluene	0.0293	0.0010	"	0.0333	ND	87.9	27-151	8.62	25	
Ethylbenzene	0.0326	0.0010	"	0.0333	ND	97.8	29-160	11.0	50	
m,p-Xylene	0.0574	0.0020	"	0.0667	ND	86.0	20-166	9.08	36	
o-Xylene	0.0312	0.0010	"	0.0333	ND	93.6	33-159	9.50	26	
Surrogate: 1,2-Dichloroethane-d4	0.0155		"	0.0132		117	23-173			
Surrogate: Toluene-d8	0.0134		"	0.0133		100	20-170			
Surrogate: 4-Bromofluorobenzene	0.0141		"	0.0133		106	21-167			

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08/24/18 06:50

Extractable Petroleum Hydrocarbons by 8015 - Quality Control
Summit Scientific

Analyte	Reporting			Spike	Source		%REC		RPD	
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

Batch 1808171 - EPA 3520B

Blank (1808171-BLK1)

Prepared: 08/14/18 Analyzed: 08/16/18

C10-C28 (DRO)	ND	0.100	mg/L							
Surrogate: o-Terphenyl	0.0216		"	0.0250		86.5	44.8-129			

LCS (1808171-BS1)

Prepared: 08/14/18 Analyzed: 08/16/18

C10-C28 (DRO)	0.827	0.100	mg/L	1.00		82.7	70-130			
Surrogate: o-Terphenyl	0.0207		"	0.0250		82.7	44.8-129			

Matrix Spike (1808171-MS1)

Source: 1808099-01

Prepared: 08/14/18 Analyzed: 08/16/18

C10-C28 (DRO)	0.928	0.100	mg/L	1.00	ND	92.8	10-159			
Surrogate: o-Terphenyl	0.0218		"	0.0250		87.1	44.8-129			

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Reported:
08/24/18 06:50

Dissolved Gases by RSK-175 mod - Quality Control
Summit Scientific

Analyte	Reporting			Spike	Source		%REC		RPD	
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

Batch 1808224 - * DEFAULT PREP *****

Blank (1808224-BLK1)

Prepared: 08/16/18 Analyzed: 08/17/18

Methane	ND	0.010	mg/L							
Ethane	ND	0.010	"							
Propane	ND	0.010	"							
Surrogate: Ethene	0.0405		"	0.0364	111		70-130			

LCS (1808224-BS1)

Prepared: 08/16/18 Analyzed: 08/17/18

Methane	0.042	0.010	mg/L	0.0428	99.1		70-130			
Ethane	0.084	0.010	"	0.0798	105		70-130			
Propane	0.12	0.010	"	0.139	87.2		70-130			
Surrogate: Ethene	0.0842		"	0.0728	116		70-130			

Duplicate (1808224-DUP1)

Source: 1808099-01

Prepared: 08/16/18 Analyzed: 08/17/18

Methane	0.013	0.010	mg/L		0.012			9.37	30	
Ethane	0.0042	0.010	"		0.0016			89.7	30	
Propane	0.0063	0.010	"		0.0029			73.9	30	
Surrogate: Ethene	0.0437		"	0.0364	120		70-130			

Matrix Spike (1808224-MS1)

Source: 1808099-01

Prepared: 08/16/18 Analyzed: 08/17/18

Methane	0.062	0.010	mg/L	0.0428	0.012	116	70-130			
Ethane	0.093	0.010	"	0.0798	0.0016	115	70-130			
Propane	0.14	0.010	"	0.139	0.0029	96.7	70-130			
Surrogate: Ethene	0.0869		"	0.0728	119		70-130			

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08/24/18 06:50

Dissolved Metals by EPA Method 200.8 - Quality Control
Summit Scientific

Analyte	Reporting			Spike	Source		%REC		RPD	
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

Batch 1808128 - EPA 200.8

Blank (1808128-BLK1)

Prepared & Analyzed: 08/10/18

Calcium	ND	0.0500	mg/L
Iron	ND	0.0100	"
Magnesium	ND	0.0500	"
Manganese	ND	0.00100	"
Potassium	ND	0.0500	"
Sodium	ND	0.0500	"
Barium	ND	0.00100	"
Boron	ND	0.0100	"
Selenium	ND	0.00100	"
Strontium	ND	0.0100	"

LCS (1808128-BS1)

Prepared & Analyzed: 08/10/18

Calcium	4.53	0.0500	mg/L	5.00	90.7	80-120
Iron	4.60	0.0100	"	5.00	92.0	80-120
Magnesium	5.05	0.0500	"	5.00	101	80-120
Manganese	0.487	0.00100	"	0.500	97.4	80-120
Potassium	4.67	0.0500	"	5.00	93.4	80-120
Sodium	5.03	0.0500	"	5.00	101	80-120
Barium	0.469	0.00100	"	0.500	93.9	80-120
Boron	2.87	0.0100	"	2.50	115	80-120
Selenium	0.0446	0.00100	"	0.0500	89.3	80-120
Strontium	0.495	0.0100	"			80-120

Duplicate (1808128-DUP1)

Source: 1808099-01

Prepared & Analyzed: 08/10/18

Calcium	12.8	0.0500	mg/L	12.8	0.136	20
Iron	1.26	0.0100	"	1.28	1.90	20
Magnesium	6.94	0.0500	"	6.84	1.45	20
Manganese	0.0241	0.00100	"	0.0217	10.6	20
Potassium	7.21	0.0500	"	6.97	3.48	20
Sodium	56.1	0.0500	"	54.8	2.37	20
Barium	0.0590	0.00100	"	0.0574	2.61	20
Boron	0.273	0.0100	"	0.297	8.68	20
Selenium	0.00194	0.00100	"	0.00202	3.90	20
Strontium	0.314	0.0100	"	0.315	0.389	20

Summit Scientific

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Extraction Oil&Gas
370 17th Street Suite 5300
Denver CO, 80202

Project: BWSE/GWA_Coyote_Trails
Project Number: AFE#17031 Code 961.15
Project Manager: Blake Ford

Reported:
08/24/18 06:50

Dissolved Metals by EPA Method 200.8 - Quality Control
Summit Scientific

Analyte	Reporting			Spike	Source		%REC		RPD	
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

Batch 1808128 - EPA 200.8

Matrix Spike (1808128-MS1)		Source: 1808099-01			Prepared & Analyzed: 08/10/18					
Calcium	17.6	0.0500	mg/L	5.00	12.8	95.7	75-125			
Iron	5.37	0.0100	"	5.00	1.28	81.7	75-125			
Magnesium	11.6	0.0500	"	5.00	6.84	94.6	75-125			
Manganese	0.478	0.00100	"	0.500	0.0217	91.2	75-125			
Potassium	10.9	0.0500	"	5.00	6.97	79.7	75-125			
Sodium	54.6	0.0500	"	5.00	54.8	NR	75-125			QM-02
Barium	0.532	0.00100	"	0.500	0.0574	94.9	75-125			
Boron	2.63	0.0100	"	2.50	0.297	93.2	75-125			
Selenium	0.0487	0.00100	"	0.0500	0.00202	93.3	75-125			
Strontium	0.812	0.0100	"		0.315		75-125			

Matrix Spike Dup (1808128-MSD1)		Source: 1808099-01			Prepared & Analyzed: 08/10/18					
Calcium	16.8	0.0500	mg/L	5.00	12.8	80.6	75-125	4.39	25	
Iron	5.37	0.0100	"	5.00	1.28	81.9	75-125	0.162	25	
Magnesium	11.2	0.0500	"	5.00	6.84	87.4	75-125	3.17	25	
Manganese	0.488	0.00100	"	0.500	0.0217	93.4	75-125	2.26	25	
Potassium	11.2	0.0500	"	5.00	6.97	84.0	75-125	1.97	25	
Sodium	58.0	0.0500	"	5.00	54.8	63.2	75-125	5.93	25	QM-02
Barium	0.532	0.00100	"	0.500	0.0574	94.9	75-125	0.00328	25	
Boron	2.70	0.0100	"	2.50	0.297	96.2	75-125	2.79	25	
Selenium	0.0494	0.00100	"	0.0500	0.00202	94.8	75-125	1.46	25	
Strontium	0.807	0.0100	"		0.315		75-125	0.612	25	

Summit Scientific

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Extraction Oil&Gas
370 17th Street Suite 5300
Denver CO, 80202

Project: BWSE/GWA_Coyote_Trails

Project Number: AFE#17031 Code 961.15

Project Manager: Blake Ford

Reported:
08/24/18 06:50

Anions by EPA Method 300.0 - Quality Control

Summit Scientific

Analyte	Reporting			Spike	Source		%REC		RPD	
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

Batch 1808119 - General Preparation

Blank (1808119-BLK1)

Prepared & Analyzed: 08/09/18

Bromide	ND	0.200	mg/L
Chloride	ND	0.100	"
Fluoride	ND	0.200	"
Sulfate	ND	1.00	"
Nitrate as N	ND	0.100	"
Nitrite as N	ND	0.100	"
Nitrate/Nitrite as N	ND	0.200	"

LCS (1808119-BS1)

Prepared & Analyzed: 08/09/18

Bromide	10.1	0.200	mg/L	10.0	101	90-110
Chloride	2.93	0.100	"	3.00	97.7	90-110
Fluoride	1.81	0.200	"	2.00	90.3	90-110
Sulfate	16.1	1.00	"	15.0	107	90-110
Nitrate as N	2.91	0.100	"	3.00	97.1	90-110
Nitrite as N	2.95	0.100	"	3.00	98.3	90-110

Duplicate (1808119-DUP1)

Source: 1808099-01

Prepared & Analyzed: 08/09/18

Bromide	0.0750	0.200	mg/L	0.0700	6.90	200
Chloride	11.3	0.100	"	11.2	0.650	200
Fluoride	0.424	0.200	"	0.415	2.15	200
Sulfate	87.9	1.00	"	87.5	0.383	200
Nitrate as N	ND	0.100	"	ND		200
Nitrite as N	ND	0.100	"	ND		200
Nitrate/Nitrite as N	ND	0.200	"	ND		200

Matrix Spike (1808119-MS1)

Source: 1808099-01

Prepared & Analyzed: 08/09/18

Bromide	9.91	0.200	mg/L	10.0	0.0700	98.4	80-120
Chloride	14.4	0.100	"	3.00	11.2	108	80-120
Fluoride	2.09	0.200	"	2.00	0.415	83.7	80-120
Sulfate	100	1.00	"	15.0	87.5	86.0	80-120
Nitrate as N	2.51	0.100	"	3.00	ND	83.6	80-120
Nitrite as N	2.74	0.100	"	3.00	ND	91.4	80-120

Summit Scientific

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Extraction Oil&Gas
370 17th Street Suite 5300
Denver CO, 80202

Project: BWSE/GWA_Coyote_Trails
Project Number: AFE#17031 Code 961.15
Project Manager: Blake Ford

Reported:
08/24/18 06:50

Physical Parameters by APHA/ASTM/EPA Methods - Quality Control
Summit Scientific

Analyte	Reporting			Spike	Source		%REC		RPD	
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

Batch 1808187 - General Preparation

Blank (1808187-BLK1)

Prepared & Analyzed: 08/15/18

Total Alkalinity	ND	10.0	mg/L as CaCO3
Carbonate	ND	10.0	"
Bicarbonate	ND	10.0	"

LCS (1808187-BS1)

Prepared & Analyzed: 08/15/18

Total Alkalinity	90.0	10.0	mg/L as CaCO3	100	90.0	80-120
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Duplicate (1808187-DUP1)

Source: 1808099-01

Prepared & Analyzed: 08/15/18

Total Alkalinity	80.0	10.0	mg/L as CaCO3	80.0	0.00	20
Carbonate	ND	10.0	"	ND		20
Bicarbonate	80.0	10.0	"	80.0	0.00	20

Matrix Spike (1808187-MS1)

Source: 1808099-01

Prepared & Analyzed: 08/15/18

Total Alkalinity	190	10.0	mg/L as CaCO3	100	80.0	110	70-130
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Matrix Spike Dup (1808187-MSD1)

Source: 1808099-01

Prepared & Analyzed: 08/15/18

Total Alkalinity	180	10.0	mg/L as CaCO3	100	80.0	100	70-130	5.41	20
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Extraction Oil&Gas
370 17th Street Suite 5300
Denver CO, 80202

Project: BWSE/GWA_Coyote_Trails

Project Number: AFE#17031 Code 961.15

Project Manager: Blake Ford

Reported:
08/24/18 06:50

Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control
Summit Scientific

Analyte	Reporting			Spike	Source		%REC		RPD	
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

Batch 1808168 - General Preparation

Blank (1808168-BLK1)

Prepared: 08/14/18 Analyzed: 08/15/18

Phosphorus - Total ND 0.0500 mg/L

LCS (1808168-BS1)

Prepared: 08/14/18 Analyzed: 08/15/18

Phosphorus - Total 0.929 0.0500 mg/L 1.00 92.9 80-120

Duplicate (1808168-DUP1)

Source: 1808099-01

Prepared: 08/14/18 Analyzed: 08/15/18

Phosphorus - Total 0.349 0.0500 mg/L 0.355 1.70 200

Matrix Spike (1808168-MS1)

Source: 1808099-01

Prepared: 08/14/18 Analyzed: 08/15/18

Phosphorus - Total 1.38 0.0500 mg/L 1.00 0.355 103 70-130

Matrix Spike Dup (1808168-MSD1)

Source: 1808099-01

Prepared: 08/14/18 Analyzed: 08/15/18

Phosphorus - Total 1.39 0.0500 mg/L 1.00 0.355 104 70-130 0.648 20

Summit Scientific

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Extraction Oil&Gas
370 17th Street Suite 5300
Denver CO, 80202

Project: BWSE/GWA_Coyote_Trails

Project Number: AFE#17031 Code 961.15

Project Manager: Blake Ford

Reported:
08/24/18 06:50

Specific Conductance by SM2510B - Quality Control

Summit Scientific

Analyte	Result	Reporting			Spike	Source	%REC		RPD	
		Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

Batch 1808178 - General Preparation

Duplicate (1808178-DUP1)

Source: 1808099-01

Prepared & Analyzed: 08/14/18

Specific Conductance (EC)	431	1.00	umhos/cm	431	0.139	20
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Summit Scientific

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Extraction Oil&Gas
370 17th Street Suite 5300
Denver CO, 80202

Project: BWSE/GWA_Coyote_Trails

Project Number: AFE#17031 Code 961.15

Project Manager: Blake Ford

Reported:
08/24/18 06:50

Total Dissolved Solids by SM2540C - Quality Control

Summit Scientific

Analyte	Result	Reporting			Spike	Source	%REC		RPD		Notes
		Limit	Units	Level	Result	%REC	Limits	RPD	Limit		

Batch 1808179 - General Preparation

Blank (1808179-BLK1)

Prepared & Analyzed: 08/14/18

Total Dissolved Solids ND 10.0 mg/L

Duplicate (1808179-DUP1)

Source: 1808099-01

Prepared & Analyzed: 08/14/18

Total Dissolved Solids 211 10.0 mg/L 211 0.237 200

Summit Scientific

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Extraction Oil&Gas
370 17th Street Suite 5300
Denver CO, 80202

Project: BWSE/GWA_Coyote_Trails

Project Number: AFE#17031 Code 961.15

Project Manager: Blake Ford

Reported:
08/24/18 06:50

pH by SM4500 - Quality Control

Summit Scientific

Analyte	Result	Reporting			Spike	Source	%REC		RPD	
		Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

Batch 1808118 - General Preparation

LCS (1808118-BS1)

Prepared & Analyzed: 08/08/18

pH	9.17	1	pH Units	9.18	99.9	90-110
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Duplicate (1808118-DUP1)

Source: 1808099-01

Prepared & Analyzed: 08/08/18

pH	7.85	1	pH Units	7.81	0.511	20
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Summit Scientific

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Extraction Oil&Gas
370 17th Street Suite 5300
Denver CO, 80202

Project: BWSE/GWA_Coyote_Trails

Project Number: AFE#17031 Code 961.15

Project Manager: Blake Ford

Reported:
08/24/18 06:50

Biological Activity Reaction Test - Quality Control
Summit Scientific

Analyte	Result	Reporting			Spike	Source	%REC		RPD	
		Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

Batch 1808123 - General Preparation

Blank (1808123-BLK1)

Prepared: 08/09/18 Analyzed: 08/23/18

Iron Related Bacteria	ND	25.0	CFU/ml
Sulfate Reducing Bacteria	ND	200	"
Slime Forming Bacteria	ND	500	"

Summit Scientific

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Extraction Oil&Gas
370 17th Street Suite 5300
Denver CO, 80202

Project: BWSE/GWA_Coyote_Trails

Project Number: AFE#17031 Code 961.15

Project Manager: Blake Ford

Reported:
08/24/18 06:50

Notes and Definitions

QM-02	The RPD and/or percent recovery for this QC spike sample cannot be accurately calculated due to the high concentration of analyte inherent in the sample.
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference