

Summit Scientific

4653 Table Mountain Drive, Golden, Colorado 80403

303.277.9310

May 05, 2020

Heather Shideman

Extraction Oil&Gas

370 17th Street Suite 5300

Denver, CO 80202

RE: BWSE/GWA_United_Pad

Work Order # 2004355

Enclosed are the results of analyses for samples received by Summit Scientific on 04/27/20 13:55. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink, reading "Muri Premier", on a light blue background.

Muri Premier For Paul Shrewsbury

President



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

Project: BWSE/GWA_United_Pad

Project Number: ALLOC-733, 962, 32

Project Manager: Heather Shideman

Reported:
05/05/20 09:47

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BW_Avery_99967	2004355-01	Water	04/27/20 10:06	04/27/20 13:55

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303-277-9310 ♦ 303-374-5933

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_United_Pad		
Sampler Name:	Jeff Griggs	Project No.:	ALLOC-733, 962, 32	Facility ID	760087

www.s2scientific.com

Sample Receipt Checklist

S2 Work Order 2004355

Client: Apex/XOG

Client Project ID: BWSE/GWA-United-Pad

Shipped Via: H.D./P.U./FedEx/UPS/USPS/Other Airbill #: _____

☒ ☐ ☐ ☐ ☐

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

Temp (°C)	6.7
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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"/>	On Ice
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 checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	pH, anions
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, H2SO4, NaOH, HNO3, ect	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	H2SO4 HNO3 NaOH+Zn
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"/>	
If dissolved metals are requested, were samples field filtered?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Additional Comments (if any):

⁽¹⁾ If NO, then contact the client before proceeding with analysis and note in case narrative.

MP

Custodian Printed Name or Initials

Muri Premer

Signature of Custodian

4/27/20

Date/Time



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BW_Avery_99967
NESE_9_1S_68W
2004355-01 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **04/27/20 10:06**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	0.0010	mg/L	1	2004338	04/28/20	04/29/20	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: **04/27/20 10:06**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		73.0 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		98.9 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		92.7 %	21-167		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **04/27/20 10:06**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
C10-C28 (DRO)	ND	0.100	mg/L	1	2005016	05/01/20	05/02/20	EPA 8015M	

Date Sampled: **04/27/20 10:06**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: o-Terphenyl		82.6 %	44.8-129		"	"	"	"	

Dissolved Gases by RSK-175

Date Sampled: **04/27/20 10:06**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							

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BW_Avery_99967
NESE_9_1S_68W

2004355-01 (Water)

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Dissolved Gases by RSK-175

Methane	ND	0.010	mg/L	1	2005017	05/01/20	05/01/20	RSK-175 mod
Ethane	ND	0.010	"	"	"	"	"	"
Propane	ND	0.010	"	"	"	"	"	"

Date Sampled: **04/27/20 10:06**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: Ethene		105 %	70-130		"	"	"	"	

Total Metals by EPA Method 200.8

Date Sampled: **04/27/20 10:06**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Uranium	0.0217	0.000500	mg/L	1	2004378	04/30/20	05/01/20	EPA 200.8	
Arsenic	ND	0.0006000	"	"	"	"	"	"	
Chromium	ND	0.00100	"	"	"	"	"	"	
Copper	0.100	0.00100	"	"	"	"	"	"	
Lead	0.00144	0.000500	"	"	"	"	"	"	

Dissolved Metals by EPA Method 200.8

Date Sampled: **04/27/20 10:06**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	86.1	0.0500	mg/L	1	2004376	04/30/20	04/30/20	EPA 200.8	
Iron	0.0453	0.0100	"	"	"	"	"	"	
Magnesium	51.1	0.0500	"	"	"	"	"	"	
Manganese	0.0295	0.00100	"	"	"	"	"	"	
Potassium	3.44	0.0500	"	"	"	"	"	"	
Sodium	198	0.0500	"	"	"	"	"	"	
Barium	0.0160	0.00100	"	"	"	"	"	"	
Boron	0.436	0.0100	"	"	"	"	"	"	
Selenium	0.00204	0.00100	"	"	"	"	"	"	
Strontium	1.59	0.0100	"	"	"	"	"	"	

Total Mercury by EPA 245.1

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NESE_9_1S_68W

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Total Mercury by EPA 245.1

Date Sampled: **04/27/20 10:06**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Mercury	ND	0.000200	mg/L	1	2004382	04/30/20	05/01/20	EPA 245.1	

Anions by EPA Method 300.0

Date Sampled: **04/27/20 10:06**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Bromide	0.359	0.200	mg/L	1	2004341	04/28/20	04/28/20	EPA 300.0	
Chloride	41.8	5.00	"	50	"	"	"	"	
Fluoride	4.32	0.200	"	1	"	"	"	"	
Sulfate	436	15.0	"	50	"	"	"	"	
Nitrate as N	1.25	0.100	"	1	"	"	"	"	
Nitrite as N	ND	0.100	"	"	"	"	"	"	
Nitrate/Nitrite as N	1.25	0.200	"	"	"	"	"	"	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **04/27/20 10:06**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Total Alkalinity	440	10.0	mg/L as CaCO3	1	2004371	04/30/20	05/04/20	SM2320-B	
Carbonate	ND	10.0	"	"	"	"	"	"	
Bicarbonate	440	10.0	"	"	"	"	"	"	

Conventional Chemistry Parameters by APHA/EPA Methods

Date Sampled: **04/27/20 10:06**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Phosphorus - Total	ND	0.0500	mg/L	1	2005015	05/01/20	05/04/20	SM4500-P-E	
Sulfide as H2S	ND	0.200	"	"	2005027	05/04/20	05/04/20	SM4500 S2 F	

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NESE_9_1S_68W

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Specific Conductance by SM2510B

Date Sampled: **04/27/20 10:06**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Specific Conductance (EC)	1760	1.00	umhos/cm	1	2004351	04/29/20	04/29/20	SM2510B	

Total Dissolved Solids by SM2540C

Date Sampled: **04/27/20 10:06**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Total Dissolved Solids	866	10.0	mg/L	1	2004352	04/29/20	04/29/20	SM2540C	

pH by SM4500

Date Sampled: **04/27/20 10:06**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
pH	7.57	1.00	pH Units	1	2005008	04/27/20	05/01/20	SM4500-H+ B	

Biological Activity Reaction Test

Date Sampled: **04/27/20 10:06**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Iron Related Bacteria	9000	25.0	CFU/ml	1	2004340	04/28/20	05/04/20	BART	
Sulfate Reducing Bacteria	1400	200	"	"	"	"	"	"	
Slime Forming Bacteria	67000	500	"	"	"	"	"	"	

Field Data

Date Sampled: **04/27/20 10:06**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Specific Conductance (EC)	1429		uS/cm	1	2004333	04/27/20	04/27/20	Field Method	
Temperature	10.8		Degrees C	"	"	"	"	"	
Turbidity	2.82		NTU	"	"	"	"	"	
Oxidation/Reduction Potential	83.4		mv	"	"	"	"	"	

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05/05/20 09:47

BW_Avery_99967

NESE_9_1S_68W

2004355-01 (Water)

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Field Data

Dissolved Oxygen	0.93	mg/L	1	2004333	04/27/20	04/27/20	Field Method
pH	7.58	SU	"	"	"	"	"

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Reported:
05/05/20 09:47

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 2004338 - EPA 5030 Water MS

Blank (2004338-BLK1)

Prepared & Analyzed: 04/28/20

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	0.0103		"	0.0133		77.6	23-173			
Surrogate: Toluene-d8	0.0138		"	0.0133		103	20-170			
Surrogate: 4-Bromofluorobenzene	0.0129		"	0.0133		96.5	21-167			

LCS (2004338-BS1)

Prepared & Analyzed: 04/28/20

Benzene	0.0246	0.0010	mg/L	0.0333		73.7	51-132			
Toluene	0.0245	0.0010	"	0.0333		73.6	51-138			
Ethylbenzene	0.0301	0.0010	"	0.0333		90.3	58-146			
m,p-Xylene	0.0572	0.0020	"	0.0667		85.8	57-144			
o-Xylene	0.0294	0.0010	"	0.0333		88.2	53-146			
Surrogate: 1,2-Dichloroethane-d4	0.00964		"	0.0133		72.3	23-173			
Surrogate: Toluene-d8	0.0132		"	0.0133		98.9	20-170			
Surrogate: 4-Bromofluorobenzene	0.0127		"	0.0133		95.3	21-167			

Matrix Spike (2004338-MS1)

Source: 2004354-01

Prepared & Analyzed: 04/28/20

Benzene	0.0256	0.0010	mg/L	0.0333	0.00130	72.9	34-141			
Toluene	0.0244	0.0010	"	0.0333	ND	73.1	27-151			
Ethylbenzene	0.0324	0.0010	"	0.0333	0.00139	93.2	29-160			
m,p-Xylene	0.0632	0.0020	"	0.0667	0.00518	87.1	20-166			
o-Xylene	0.0329	0.0010	"	0.0333	0.00183	93.2	33-159			
Surrogate: 1,2-Dichloroethane-d4	0.00899		"	0.0133		67.4	23-173			
Surrogate: Toluene-d8	0.0126		"	0.0133		94.9	20-170			
Surrogate: 4-Bromofluorobenzene	0.0126		"	0.0133		94.4	21-167			

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Project: BWSE/GWA_United_Pad
Project Number: ALLOC-733, 962, 32
Project Manager: Heather Shideman

Reported:
05/05/20 09:47

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 2004338 - EPA 5030 Water MS

Matrix Spike Dup (2004338-MSD1)	Source: 2004354-01			Prepared & Analyzed: 04/28/20						
Benzene	0.0250	0.0010	mg/L	0.0333	0.00130	71.2	34-141	2.29	32	
Toluene	0.0247	0.0010	"	0.0333	ND	74.1	27-151	1.39	25	
Ethylbenzene	0.0291	0.0010	"	0.0333	0.00139	83.0	29-160	11.0	50	
m,p-Xylene	0.0556	0.0020	"	0.0667	0.00518	75.6	20-166	12.9	36	
o-Xylene	0.0296	0.0010	"	0.0333	0.00183	83.3	33-159	10.5	26	
Surrogate: 1,2-Dichloroethane-d4	0.0123		"	0.0133		92.5	23-173			
Surrogate: Toluene-d8	0.0130		"	0.0133		97.8	20-170			
Surrogate: 4-Bromofluorobenzene	0.0130		"	0.0133		97.4	21-167			

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Extractable Petroleum Hydrocarbons by 8015 - Quality Control
Summit Scientific

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

Batch 2005016 - EPA 3520B

Blank (2005016-BLK1)

Prepared: 05/01/20 Analyzed: 05/02/20

C10-C28 (DRO) ND 0.100 mg/L

Surrogate: o-Terphenyl 0.0208 " 0.0250 83.4 44.8-129

LCS (2005016-BS1)

Prepared: 05/01/20 Analyzed: 05/02/20

C10-C28 (DRO) 0.791 0.100 mg/L 1.00 79.1 70-130

Surrogate: o-Terphenyl 0.0220 " 0.0250 88.0 44.8-129

LCS Dup (2005016-BSD1)

Prepared: 05/01/20 Analyzed: 05/02/20

C10-C28 (DRO) 0.824 0.100 mg/L 1.00 82.4 70-130 4.12 200

Surrogate: o-Terphenyl 0.0196 " 0.0250 78.3 44.8-129

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Project: BWSE/GWA_United_Pad
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Reported:
05/05/20 09:47

Dissolved Gases by RSK-175 - Quality Control
Summit Scientific

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

Batch 2005017 - GC

Blank (2005017-BLK1)

Prepared & Analyzed: 05/01/20

Methane	ND	0.010	mg/L							
Ethane	ND	0.010	"							
Propane	ND	0.010	"							
Surrogate: Ethene	0.0365		"	0.0364		100	70-130			

LCS (2005017-BS1)

Prepared & Analyzed: 05/01/20

Methane	0.031	0.010	mg/L	0.0428		71.6	70-130			
Ethane	0.085	0.010	"	0.0798		107	70-130			
Propane	0.13	0.010	"	0.139		91.2	70-130			
Surrogate: Ethene	0.0836		"	0.0728		115	70-130			

Duplicate (2005017-DUP1)

Source: 2004355-01

Prepared & Analyzed: 05/01/20

Methane	ND	0.010	mg/L		ND				30	
Ethane	ND	0.010	"		ND				30	
Propane	ND	0.010	"		ND				30	
Surrogate: Ethene	0.0310		"	0.0364		85.2	70-130			

Matrix Spike (2005017-MS1)

Source: 2004355-01

Prepared & Analyzed: 05/01/20

Methane	0.030	0.010	mg/L	0.0428	ND	70.4	70-130			
Ethane	0.085	0.010	"	0.0798	ND	106	70-130			
Propane	0.12	0.010	"	0.139	ND	90.0	70-130			
Surrogate: Ethene	0.0791		"	0.0728		109	70-130			

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Total 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 2004378 - EPA 200.8

Blank (2004378-BLK1)

Prepared: 04/30/20 Analyzed: 05/01/20

Uranium	ND	0.000500	mg/L
Arsenic	ND	0.0006000	"
Chromium	ND	0.00100	"
Copper	ND	0.00100	"
Lead	ND	0.000500	"

LCS (2004378-BS1)

Prepared: 04/30/20 Analyzed: 05/01/20

Uranium	0.227	0.000500	mg/L	0.250	90.9	85-115
Arsenic	0.4844	0.0006000	"	0.500	96.9	85-115
Chromium	0.459	0.00100	"	0.500	91.8	85-115
Copper	0.453	0.00100	"	0.500	90.6	85-115
Lead	0.230	0.000500	"	0.250	92.1	85-115

Duplicate (2004378-DUP1)

Source: 2004355-01

Prepared: 04/30/20 Analyzed: 05/01/20

Uranium	0.0213	0.000500	mg/L	0.0217	1.87	20
Arsenic	ND	0.0006000	"	0.0005806		20
Chromium	0.000322	0.00100	"	0.000306	5.11	20
Copper	0.0978	0.00100	"	0.100	2.27	20
Lead	0.00143	0.000500	"	0.00144	0.452	20

Matrix Spike (2004378-MS1)

Source: 2004355-01

Prepared: 04/30/20 Analyzed: 05/01/20

Uranium	0.253	0.000500	mg/L	0.250	0.0217	92.7	70-130
Arsenic	0.4848	0.0006000	"	0.500	0.0005806	96.9	70-130
Chromium	0.462	0.00100	"	0.500	0.000306	92.3	70-130
Copper	0.554	0.00100	"	0.500	0.100	90.7	70-130
Lead	0.218	0.000500	"	0.250	0.00144	86.5	70-130

Matrix Spike Dup (2004378-MSD1)

Source: 2004355-01

Prepared: 04/30/20 Analyzed: 05/01/20

Uranium	0.237	0.000500	mg/L	0.250	0.0217	85.9	70-130	6.87	25
Arsenic	0.4557	0.0006000	"	0.500	0.0005806	91.0	70-130	6.18	25
Chromium	0.432	0.00100	"	0.500	0.000306	86.4	70-130	6.61	25
Copper	0.517	0.00100	"	0.500	0.100	83.3	70-130	6.90	25
Lead	0.203	0.000500	"	0.250	0.00144	80.7	70-130	6.97	25

Summit Scientific

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

Project: BWSE/GWA_United_Pad
Project Number: ALLOC-733, 962, 32
Project Manager: Heather Shideman

Reported:
05/05/20 09:47

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 2004376 - EPA 200.8

Blank (2004376-BLK1)

Prepared & Analyzed: 04/30/20

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 (2004376-BS1)

Prepared & Analyzed: 04/30/20

Calcium	5.51	0.0500	mg/L	5.00	110	85-115
Iron	4.96	0.0100	"	5.00	99.1	85-115
Magnesium	5.59	0.0500	"	5.00	112	85-115
Manganese	0.550	0.00100	"	0.500	110	85-115
Potassium	5.27	0.0500	"	5.00	105	85-115
Sodium	4.99	0.0500	"	5.00	99.7	85-115
Barium	0.518	0.00100	"	0.500	104	85-115
Boron	2.61	0.0100	"	2.50	105	85-115
Selenium	0.0535	0.00100	"	0.0500	107	85-115
Strontium	0.550	0.0100	"	0.500	110	85-115

Duplicate (2004376-DUP1)

Source: 2004349-01

Prepared & Analyzed: 04/30/20

Calcium	112	0.0500	mg/L	113	0.518	20
Iron	0.0472	0.0100	"	0.0484	2.41	20
Magnesium	20.8	0.0500	"	21.3	2.10	20
Manganese	1.73	0.00100	"	1.75	1.29	20
Potassium	8.10	0.0500	"	8.38	3.34	20
Sodium	71.6	0.0500	"	73.5	2.64	20
Barium	0.137	0.00100	"	0.137	0.361	20
Boron	0.0248	0.0100	"	0.0293	16.6	20
Selenium	ND	0.00100	"	ND		20
Strontium	1.01	0.0100	"	1.00	0.948	20

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

Project: BWSE/GWA_United_Pad
Project Number: ALLOC-733, 962, 32
Project Manager: Heather Shideman

Reported:
05/05/20 09:47

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 2004376 - EPA 200.8

Matrix Spike (2004376-MS1)				Source: 2004349-01		Prepared & Analyzed: 04/30/20				
Calcium	119	0.0500	mg/L	5.00	113	115	70-130			
Iron	5.08	0.0100	"	5.00	0.0484	101	70-130			
Magnesium	26.0	0.0500	"	5.00	21.3	95.5	70-130			
Manganese	2.25	0.00100	"	0.500	1.75	98.6	70-130			
Potassium	13.0	0.0500	"	5.00	8.38	91.5	70-130			
Sodium	77.8	0.0500	"	5.00	73.5	85.4	70-130			
Barium	0.659	0.00100	"	0.500	0.137	104	70-130			
Boron	2.51	0.0100	"	2.50	0.0293	99.4	70-130			
Selenium	0.0504	0.00100	"	0.0500	ND	101	70-130			
Strontium	1.57	0.0100	"	0.500	1.00	112	70-130			

Matrix Spike Dup (2004376-MSD1)				Source: 2004349-01		Prepared & Analyzed: 04/30/20				
Calcium	119	0.0500	mg/L	5.00	113	122	70-130	0.329	25	
Iron	5.02	0.0100	"	5.00	0.0484	99.4	70-130	1.27	25	
Magnesium	26.3	0.0500	"	5.00	21.3	99.7	70-130	0.804	25	
Manganese	2.31	0.00100	"	0.500	1.75	110	70-130	2.62	25	
Potassium	13.2	0.0500	"	5.00	8.38	96.7	70-130	2.01	25	
Sodium	79.7	0.0500	"	5.00	73.5	124	70-130	2.43	25	
Barium	0.648	0.00100	"	0.500	0.137	102	70-130	1.66	25	
Boron	2.50	0.0100	"	2.50	0.0293	98.8	70-130	0.587	25	
Selenium	0.0509	0.00100	"	0.0500	ND	102	70-130	1.11	25	
Strontium	1.59	0.0100	"	0.500	1.00	118	70-130	1.77	25	

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

Project: BWSE/GWA_United_Pad
Project Number: ALLOC-733, 962, 32
Project Manager: Heather Shideman

Reported:
05/05/20 09:47

Total Mercury by EPA 245.1 - Quality Control
Summit Scientific

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

Batch 2004382 - EPA 245.1

Blank (2004382-BLK1)

Prepared: 04/30/20 Analyzed: 05/01/20

Mercury ND 0.000200 mg/L

LCS (2004382-BS1)

Prepared: 04/30/20 Analyzed: 05/01/20

Mercury 0.00260 0.000200 mg/L 0.00250 104 85-115

Duplicate (2004382-DUP1)

Source: 2004355-01

Prepared: 04/30/20 Analyzed: 05/01/20

Mercury ND 0.000200 mg/L ND 20

Matrix Spike (2004382-MS1)

Source: 2004355-01

Prepared: 04/30/20 Analyzed: 05/01/20

Mercury 0.00305 0.000200 mg/L 0.00250 ND 122 70-130

Matrix Spike Dup (2004382-MSD1)

Source: 2004355-01

Prepared: 04/30/20 Analyzed: 05/01/20

Mercury 0.00281 0.000200 mg/L 0.00250 ND 112 70-130 8.19 20

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

Project: BWSE/GWA_United_Pad
Project Number: ALLOC-733, 962, 32
Project Manager: Heather Shideman

Reported:
05/05/20 09:47

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 2004341 - General Preparation

Blank (2004341-BLK1)

Prepared & Analyzed: 04/28/20

Bromide	ND	0.200	mg/L
Chloride	ND	0.100	"
Fluoride	ND	0.200	"
Sulfate	ND	0.300	"
Nitrate as N	ND	0.100	"
Nitrite as N	ND	0.100	"
Nitrate/Nitrite as N	ND	0.200	"

LCS (2004341-BS1)

Prepared & Analyzed: 04/28/20

Bromide	10.8	0.200	mg/L	10.0	108	90-110
Chloride	3.15	0.100	"	3.00	105	90-110
Fluoride	2.14	0.200	"	2.00	107	90-110
Sulfate	16.0	0.300	"	15.0	106	90-110
Nitrate as N	3.16	0.100	"	3.00	105	90-110
Nitrite as N	3.12	0.100	"	3.00	104	90-110

Duplicate (2004341-DUP1)

Source: 2004355-01

Prepared & Analyzed: 04/28/20

Bromide	0.360	0.200	mg/L	0.359	0.278	20	QM-02
Chloride	34.0	0.100	"	41.8	20.8	20	
Fluoride	4.30	0.200	"	4.32	0.556	20	
Sulfate	366	0.300	"	436	17.5	20	
Nitrate as N	1.26	0.100	"	1.25	0.239	20	
Nitrite as N	0.0450	0.100	"	0.0440	2.25	20	
Nitrate/Nitrite as N	ND	0.200	"	1.25		20	

Matrix Spike (2004341-MS1)

Source: 2004355-01

Prepared & Analyzed: 04/28/20

Bromide	10.8	0.200	mg/L	10.0	0.359	104	80-120	QM-02
Chloride	35.6	0.100	"	3.00	41.8	NR	80-120	
Fluoride	6.37	0.200	"	2.00	4.32	102	80-120	
Sulfate	375	0.300	"	15.0	436	NR	80-120	QM-02
Nitrate as N	4.36	0.100	"	3.00	1.25	104	80-120	
Nitrite as N	2.80	0.100	"	3.00	0.0440	91.8	80-120	

Summit Scientific

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

Project: BWSE/GWA_United_Pad
Project Number: ALLOC-733, 962, 32
Project Manager: Heather Shideman

Reported:
05/05/20 09:47

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 2004371 - General Preparation

Blank (2004371-BLK1)

Prepared: 04/30/20 Analyzed: 05/04/20

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

LCS (2004371-BS1)

Prepared: 04/30/20 Analyzed: 05/04/20

Total Alkalinity	110	10.0	mg/L as CaCO3	100		110	80-120			
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Duplicate (2004371-DUP1)

Source: 2004355-01

Prepared: 04/30/20 Analyzed: 05/04/20

Total Alkalinity	440	10.0	mg/L as CaCO3		440			0.00	20	
Carbonate	ND	10.0	"		ND				20	
Bicarbonate	440	10.0	"		440			0.00	20	

Matrix Spike (2004371-MS1)

Source: 2004355-01

Prepared: 04/30/20 Analyzed: 05/04/20

Total Alkalinity	550	10.0	mg/L as CaCO3	100	440	110	70-130			
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Matrix Spike Dup (2004371-MSD1)

Source: 2004355-01

Prepared: 04/30/20 Analyzed: 05/04/20

Total Alkalinity	550	10.0	mg/L as CaCO3	100	440	110	70-130	0.00	20	
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Extraction Oil&Gas
370 17th Street Suite 5300
Denver CO, 80202

Project: BWSE/GWA_United_Pad
Project Number: ALLOC-733, 962, 32
Project Manager: Heather Shideman

Reported:
05/05/20 09:47

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 2005015 - General Preparation

Blank (2005015-BLK1)

Prepared: 05/01/20 Analyzed: 05/04/20

Phosphorus - Total ND 0.0500 mg/L

LCS (2005015-BS1)

Prepared: 05/01/20 Analyzed: 05/04/20

Phosphorus - Total 1.01 0.0500 mg/L 1.00 101 80-120

Duplicate (2005015-DUP1)

Source: 2004355-01

Prepared: 05/01/20 Analyzed: 05/04/20

Phosphorus - Total 0.00800 0.0500 mg/L 0.00700 13.3 20

Matrix Spike (2005015-MS1)

Source: 2004355-01

Prepared: 05/01/20 Analyzed: 05/04/20

Phosphorus - Total 0.974 0.0500 mg/L 1.00 0.00700 96.7 70-130

Matrix Spike Dup (2005015-MSD1)

Source: 2004355-01

Prepared: 05/01/20 Analyzed: 05/04/20

Phosphorus - Total 0.968 0.0500 mg/L 1.00 0.00700 96.1 70-130 0.618 20

Batch 2005027 - General Preparation

Blank (2005027-BLK1)

Prepared & Analyzed: 05/04/20

Sulfide as H2S ND 0.200 mg/L

LCS (2005027-BS1)

Prepared & Analyzed: 05/04/20

Sulfide as H2S 1.02 0.200 mg/L 1.00 102 80-120

Matrix Spike (2005027-MS1)

Source: 2004355-01

Prepared & Analyzed: 05/04/20

Sulfide as H2S 0.950 0.200 mg/L 1.00 ND 95.0 75-125

Matrix Spike Dup (2005027-MSD1)

Source: 2004355-01

Prepared & Analyzed: 05/04/20

Sulfide as H2S 0.930 0.200 mg/L 1.00 ND 93.0 75-125 2.13 20

Summit Scientific

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

Project: BWSE/GWA_United_Pad

Project Number: ALLOC-733, 962, 32

Project Manager: Heather Shideman

Reported:
05/05/20 09:47

Specific Conductance by SM2510B - Quality Control

Summit Scientific

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

Batch 2004351 - General Preparation

Blank (2004351-BLK1)

Prepared & Analyzed: 04/29/20

Specific Conductance (EC) ND 1.00 umhos/cm

Duplicate (2004351-DUP1)

Source: 2004355-01

Prepared & Analyzed: 04/29/20

Specific Conductance (EC) 1760 1.00 umhos/cm 1760 0.0567 20

Summit Scientific

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

Project: BWSE/GWA_United_Pad
Project Number: ALLOC-733, 962, 32
Project Manager: Heather Shideman

Reported:
05/05/20 09:47

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 2004352 - General Preparation

Blank (2004352-BLK1)

Prepared & Analyzed: 04/29/20

Total Dissolved Solids ND 10.0 mg/L

Duplicate (2004352-DUP1)

Source: 2004355-01

Prepared & Analyzed: 04/29/20

Total Dissolved Solids 866 10.0 mg/L 866 0.0231 20

Summit Scientific

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

Project: BWSE/GWA_United_Pad

Project Number: ALLOC-733, 962, 32

Project Manager: Heather Shideman

Reported:
05/05/20 09:47

pH by SM4500 - Quality Control

Summit Scientific

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

Batch 2005008 - General Preparation

LCS (2005008-BS1)

Prepared: 04/27/20 Analyzed: 05/01/20

pH	9.21	1.00	pH Units	9.18	100	90-110
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Duplicate (2005008-DUP1)

Source: 2004352-01

Prepared: 04/27/20 Analyzed: 05/01/20

pH	7.07	1.00	pH Units	7.06	0.142	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_United_Pad
Project Number: ALLOC-733, 962, 32
Project Manager: Heather Shideman

Reported:
05/05/20 09:47

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 2004340 - General Preparation

Blank (2004340-BLK1)

Prepared: 04/28/20 Analyzed: 05/04/20

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_United_Pad

Project Number: ALLOC-733, 962, 32

Project Manager: Heather Shideman

Reported:
05/05/20 09:47

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