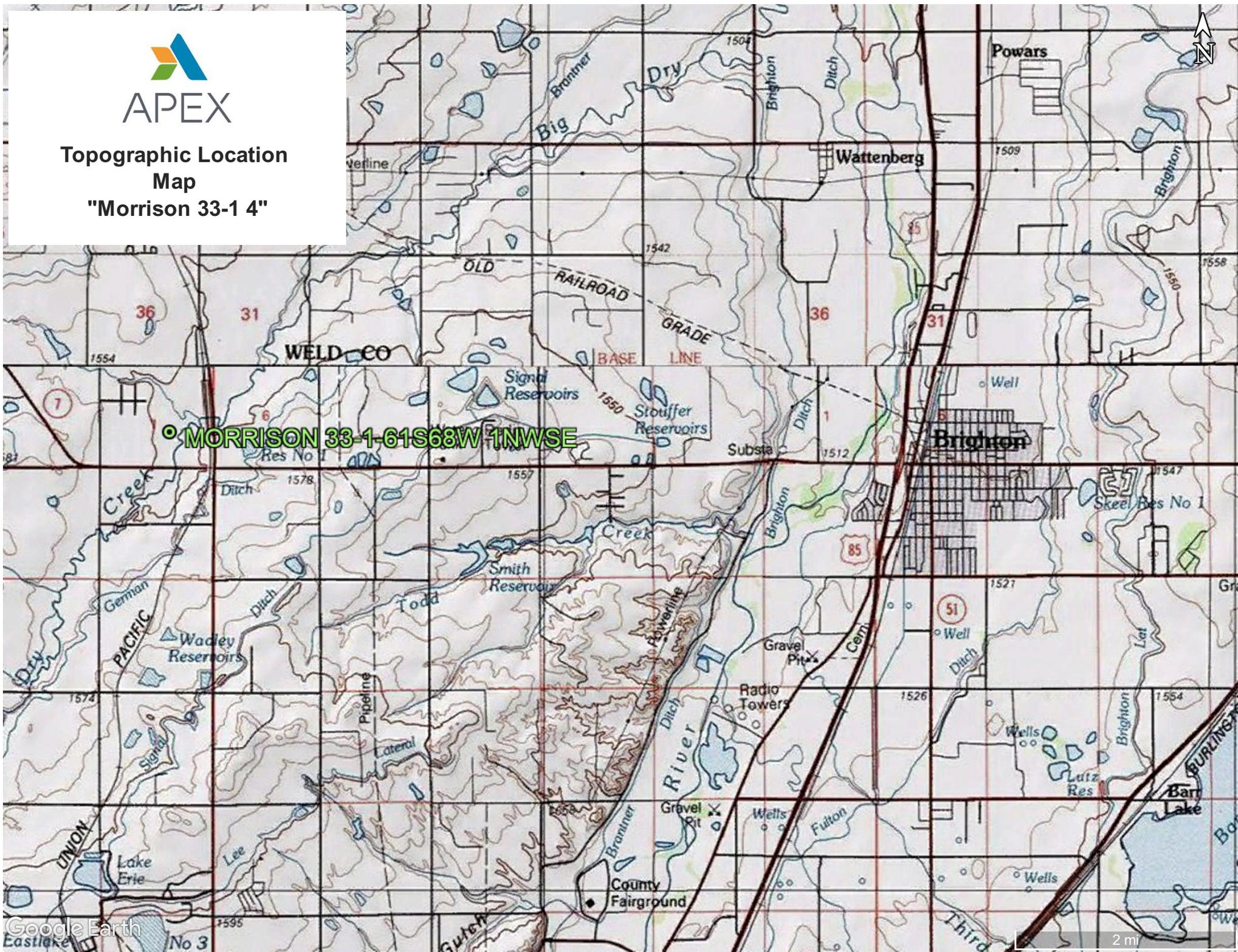




Topographic Location  
Map  
"Morrison 33-1 4"





## Laboratory Results Summary Table - Soil Borings Morrison 33-1 4 East

			Organics (mg/kg)				
COGCC Allowable Concentration (Soil) -->			500	0.17	85	100	175
Location	Sample Date	Sample ID	TPH (total volatile and extractable petroleum hydrocarbons) (TPH-GRO + TPH-DRO)	Benzene	Toluene	Ethylbenzene	Xylenes - total
Morrison 33-1 4	10/25/18	BH2@6	7.9	<0.0020	<0.0050	<0.0050	0.035
Morrison 33-1 4	10/25/18	BH6@8	15	<0.0020	<0.0050	0.021	0.061
Morrison 33-1 4	10/25/18	BH7@7	600	<0.0020	<0.0050	<0.0050	<0.010
Morrison 33-1 4	10/25/18	BH2@14	<50	<0.0020	<0.0050	<0.0050	<0.010
Morrison 33-1 4	10/25/18	BH7@10	<50	<0.0020	<0.0050	<0.0050	<0.010
Morrison 33-1 4	10/25/18	BH6@12	<50	<0.0020	<0.0050	<0.0050	<0.010
Morrison 33-1 4	10/25/18	BH1@16	<50	<0.0020	<0.0050	<0.0050	<0.010
Morrison 33-1 4	10/25/18	BH5@6	<50	<0.0020	<0.0050	<0.0050	<0.010
Morrison 33-1 4	10/25/18	BH5@12	<50	<0.0020	<0.0050	<0.0050	<0.010
Morrison 33-1 4	10/25/18	BH4@8	<50	<0.0020	<0.0050	<0.0050	<0.010
Morrison 33-1 4	10/25/18	BH4@12	<50	<0.0020	<0.0050	<0.0050	<0.010
Morrison 33-1 4	10/25/18	BH8@12	<50	<0.0020	<0.0050	<0.0050	<0.010
Morrison 33-1 4	10/25/18	BH8@10	<50	<0.0020	<0.0050	<0.0050	<0.010
Morrison 33-1 4	10/25/18	BH3@12	<50	<0.0020	<0.0050	<0.0050	<0.010
Morrison 33-1 4	10/25/18	BH3@8	<50	<0.0020	<0.0050	<0.0050	<0.010
Morrison 33-1 4	10/25/18	BH9@8	<50	<0.0020	<0.0050	<0.0050	<0.010
Morrison 33-1 4	10/25/18	BH9@12	<50	<0.0020	<0.0050	<0.0050	<0.010
Morrison 33-1 4	10/25/18	BH1@6	650	0.014	<0.0050	0.50	0.023



## Laboratory Results Summary Table - Groundwater Morrison 33-1 4

			Organic Compounds (µg/L)			
COGCC Allowable Concentration (Water)			5	1,000	700	10,000
Location	Sample Date	Sample ID	Benzene	Toluene	Ethylbenzene	Xylenes - total
Morrison 33-1	10/25/18	BH01	410	<1	280	250
Morrison 33-1	10/25/18	BH02	2.9	<1	<1	17
Morrison 33-1	10/25/18	BH03	<1	<1	<1	<2
Morrison 33-1	10/25/18	BH04	140	<1	130	<2
Morrison 33-1	10/25/18	BH05	<1	<1	1.2	<2
Morrison 33-1	10/25/18	BH06	20	<1	73	200
Morrison 33-1	10/25/18	BH07	<1	<1	<1	<2
Morrison 33-1	10/25/18	BH08	<1	<1	<1	<2
Morrison 33-1	10/25/18	BH09	<1	<1	<1	<2
Morrison 33-1	2/27/19	BH01	26	<1	7.2	<2
Morrison 33-1	2/27/19	BH02	6	<1	3.5	<2
Morrison 33-1	2/27/19	BH04	45	<1	1.5	<2
Morrison 33-1	2/27/19	BH06	1.3	<1	<1	<2
Morrison 33-1	2/27/19	BH08	<1	<1	<1	<2
Morrison 33-1	5/30/19	BH01	17	<1	3.9	<2
Morrison 33-1	5/30/19	BH02	<1	<1	<1	<2
Morrison 33-1	5/30/19	BH03	<1	<1	<1	<2
Morrison 33-1	5/30/19	BH04	450	1.3	64	<2
Morrison 33-1	5/30/19	BH05	<1	<1	<1	<2

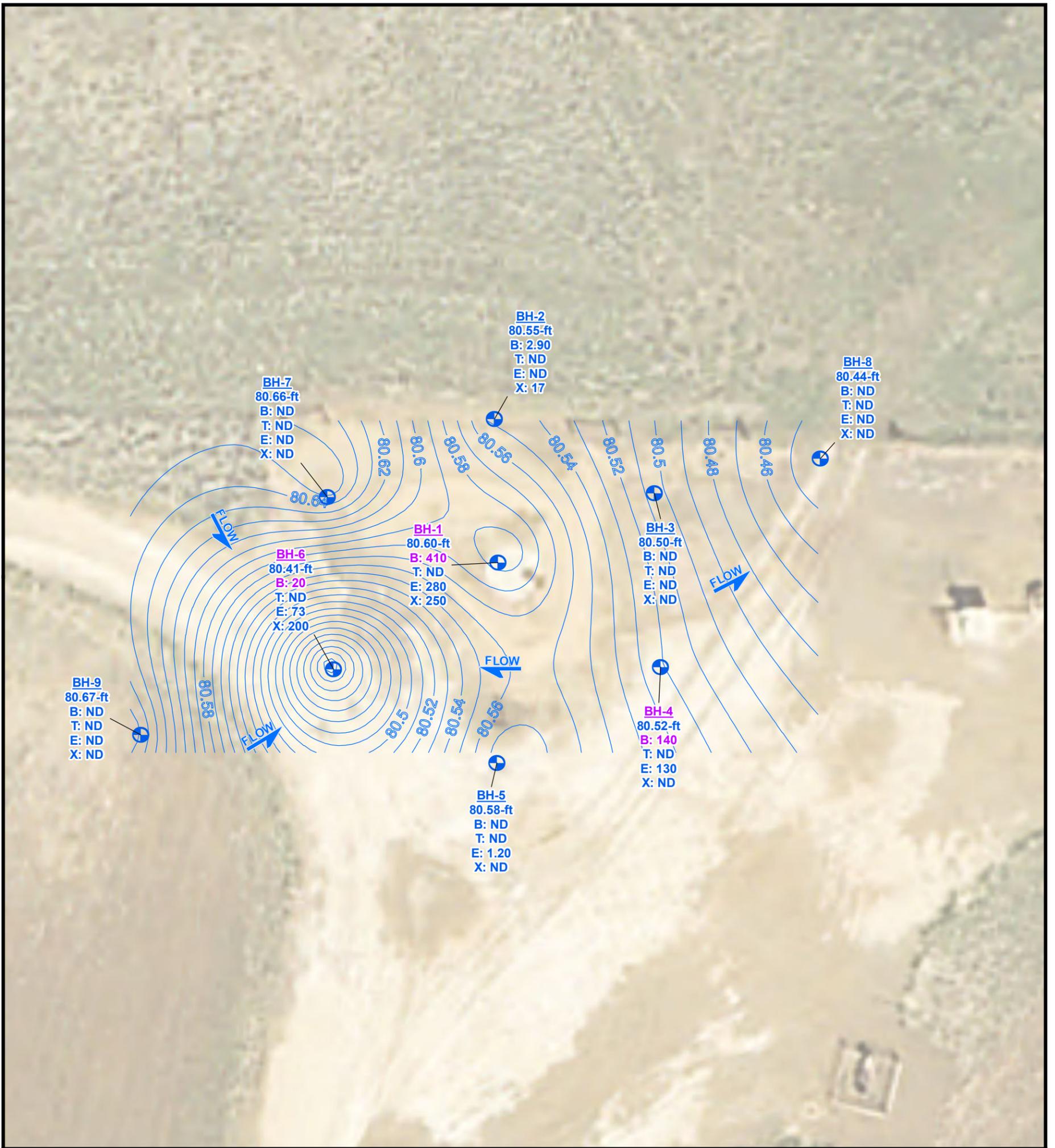
Orange Highlight - Exceedance

Grey Highlight - Below Detection Limit



## Laboratory Results Summary Table - Groundwater Morrison 33-1 4

			Organic Compounds (µg/L)			
COGCC Allowable Concentration (Water)			5	1,000	700	10,000
Location	Sample Date	Sample ID	Benzene	Toluene	Ethylbenzene	Xylenes - total
Morrison 33-1	5/30/19	BH06	<1	<1	<1	<2
Morrison 33-1	5/30/19	BH07	<1	<1	<1	<2
Morrison 33-1	5/30/19	BH08	<1	<1	<1	<2
Morrison 33-1	5/30/19	BH09	<1	<1	<1	<2
Morrison 33-1	9/6/19	BH01	16	<1	<1	<2
Morrison 33-1	9/6/19	BH02	<1	<1	<1	<2
Morrison 33-1	9/6/19	BH03	<1	<1	<1	<2
Morrison 33-1	9/6/19	BH04	7.1	<1	<1	<2
Morrison 33-1	9/6/19	BH06	<1	<1	<1	<2
Morrison 33-1	9/6/19	BH07	<1	<1	<1	<2
Morrison 33-1	9/6/19	BH08	<1	<1	<1	<2
Morrison 33-1	9/6/19	BH09	<1	<1	<1	<2
Morrison 33-1	10/4/19	BH10	<1	<1	<1	<2
Morrison 33-1	10/4/19	BH11	<1	<1	<1	<2



**Extraction Oil & Gas**  
**Morrison 33-1 4 (EAST)**  
**COGCC Location ID: 320318**  
**Temporary Monitoring Well Layout &**  
**GW Elevations for the**  
**10/25/2018 Sampling Event**

Legal Description: NWSE, Sec 1, T1S R68W  
 County: Adams  
 Land Use: Cropland  
 Topography: 0-3% Slopes  
 Run-Off Risk: Low  
 Soil Type: Arvada loam  
 Receiving Waters: Big Dry Creek



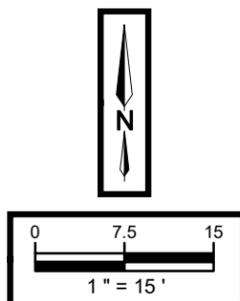
**BH-1**  
80.60-ft

Temp. Monitoring Well Location & Relative GW Elevation

**FLOW**

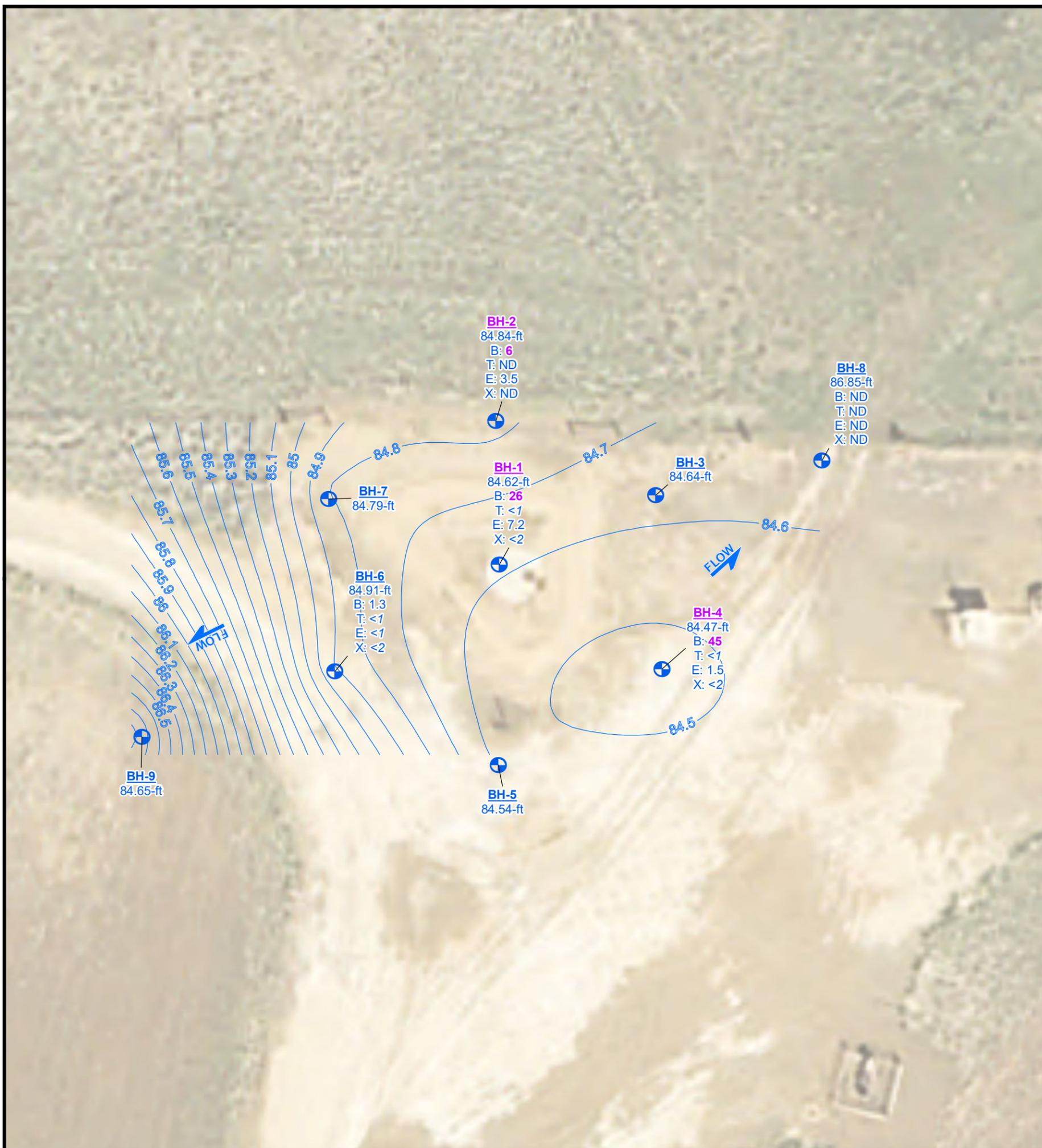
Estimated Groundwater Flow Direction

\* Sample ID in Purple font indicates a regulatory exceedance.



Sample ID	Latitude NAD83	Longitude NAD 83
BH-1	39.991684	-104.947656
BH-2	39.991743	-104.947658
BH-3	39.991713	-104.947574
BH-4	39.991642	-104.947570
BH-5	39.991603	-104.947657
BH-6	39.991641	-104.947743
BH-7	39.991711	-104.947747
BH-8	39.991727	-104.947486
BH-9	39.991614	-104.947845

Spatial data collected for this project was acquired using a GPS with submeter accuracy. Illustration discrepancies may be present in this diagram due to the inherent limitations of data accuracy for both project data and the underlying aerial imagery. To accurately reflect field conditions, illustrated data may have been manually corrected in order to fit with the aerial imagery reference points and other collected data points.



**Extraction Oil & Gas  
Morrison 33-1 4 (EAST)  
COGCC Location ID: 320318  
Temporary Monitoring Well Layout &  
GW Elevations for the  
2/27/2019 Sampling Event**

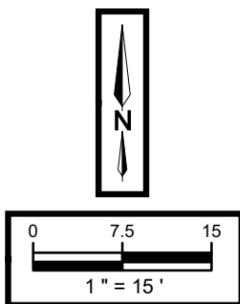
Legal Description: NWSE, Sec 1, T1S R68W  
County: Adams  
Land Use: Cropland  
Topography: 0-3% Slopes  
Run-Off Risk: Low  
Soil Type: Arvada loam  
Receiving Waters: Big Dry Creek



- BH-1** 80.60-ft Temp. Monitoring Well Location & Relative GW Elevation
- Estimated Groundwater Contour
- Estimated Groundwater Flow Direction

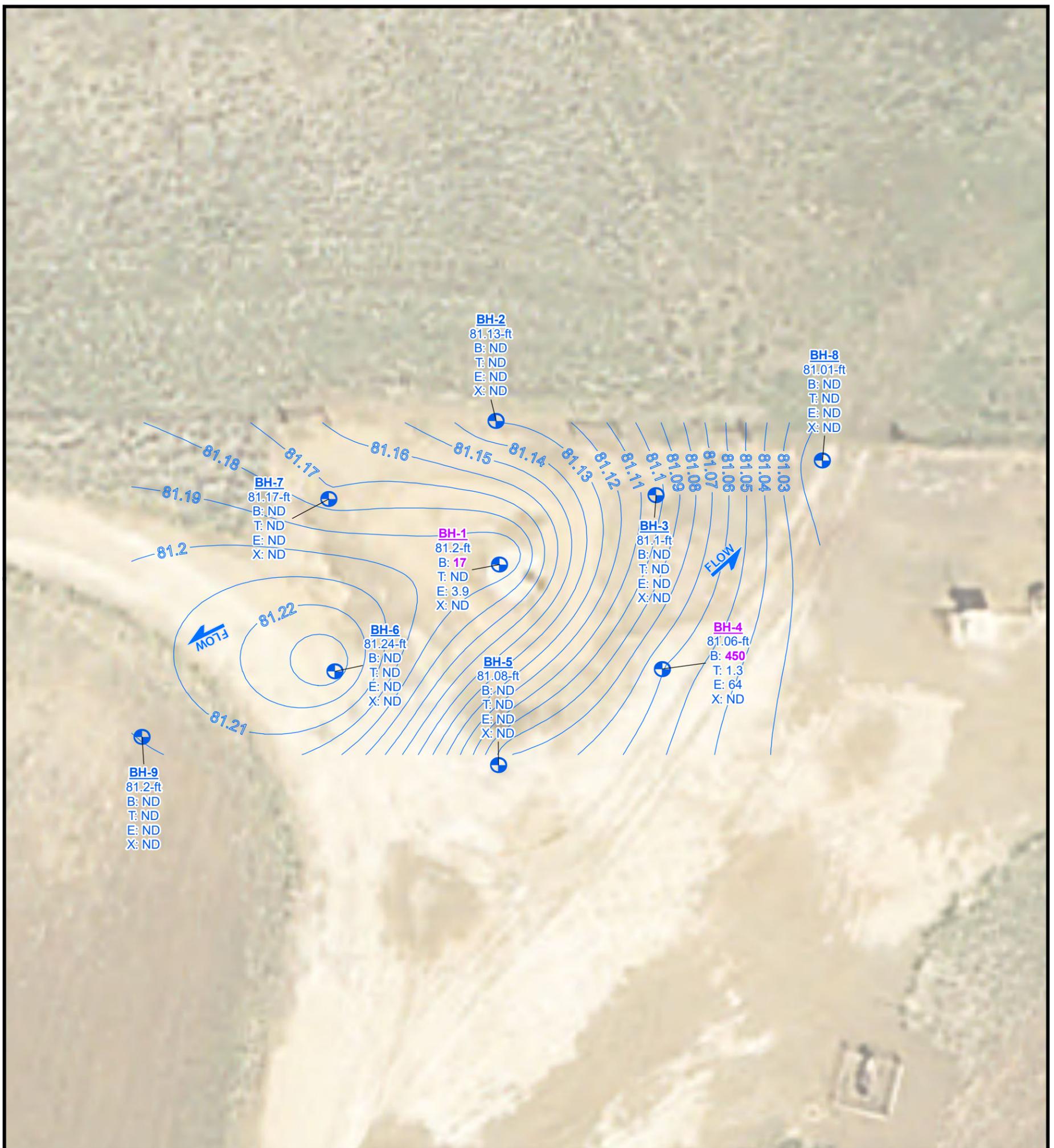
\* Sample ID in Purple font indicates a regulatory exceedance.

\* Organic Compounds in ug/L



Sample ID	Latitude NAD83	Longitude NAD 83
BH-1	39.991684	-104.947656
BH-2	39.991743	-104.947658
BH-3	39.991713	-104.947574
BH-4	39.991642	-104.947570
BH-5	39.991603	-104.947657
BH-6	39.991641	-104.947743
BH-7	39.991711	-104.947747
BH-8	39.991727	-104.947486
BH-9	39.991614	-104.947845

Spatial data collected for this project was acquired using a GPS with submeter accuracy. Illustration discrepancies may be present in this diagram due to the inherent limitations of data accuracy for both project data and the underlying aerial imagery. To accurately reflect field conditions, illustrated data may have been manually corrected in order to fit with the aerial imagery reference points and other collected data points.



**Extraction Oil & Gas**  
**Morrison 33-1 4 (EAST)**  
**COGCC Location ID: 320318**  
**Temporary Monitoring Well Layout &**  
**GW Elevations for the**  
**5/30/2019 Sampling Event**

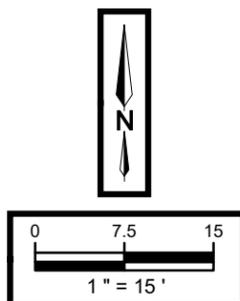
Legal Description: NWSE, Sec 1, T1S R68W  
 County: Adams  
 Land Use: Cropland  
 Topography: 0-3% Slopes  
 Run-Off Risk: Low  
 Soil Type: Arvada loam  
 Receiving Waters: Big Dry Creek



- BH-1 80.60-ft Temp. Monitoring Well Location & Relative GW Elevation
- Estimated Groundwater Contour
- FLOW Estimated Groundwater Flow Direction

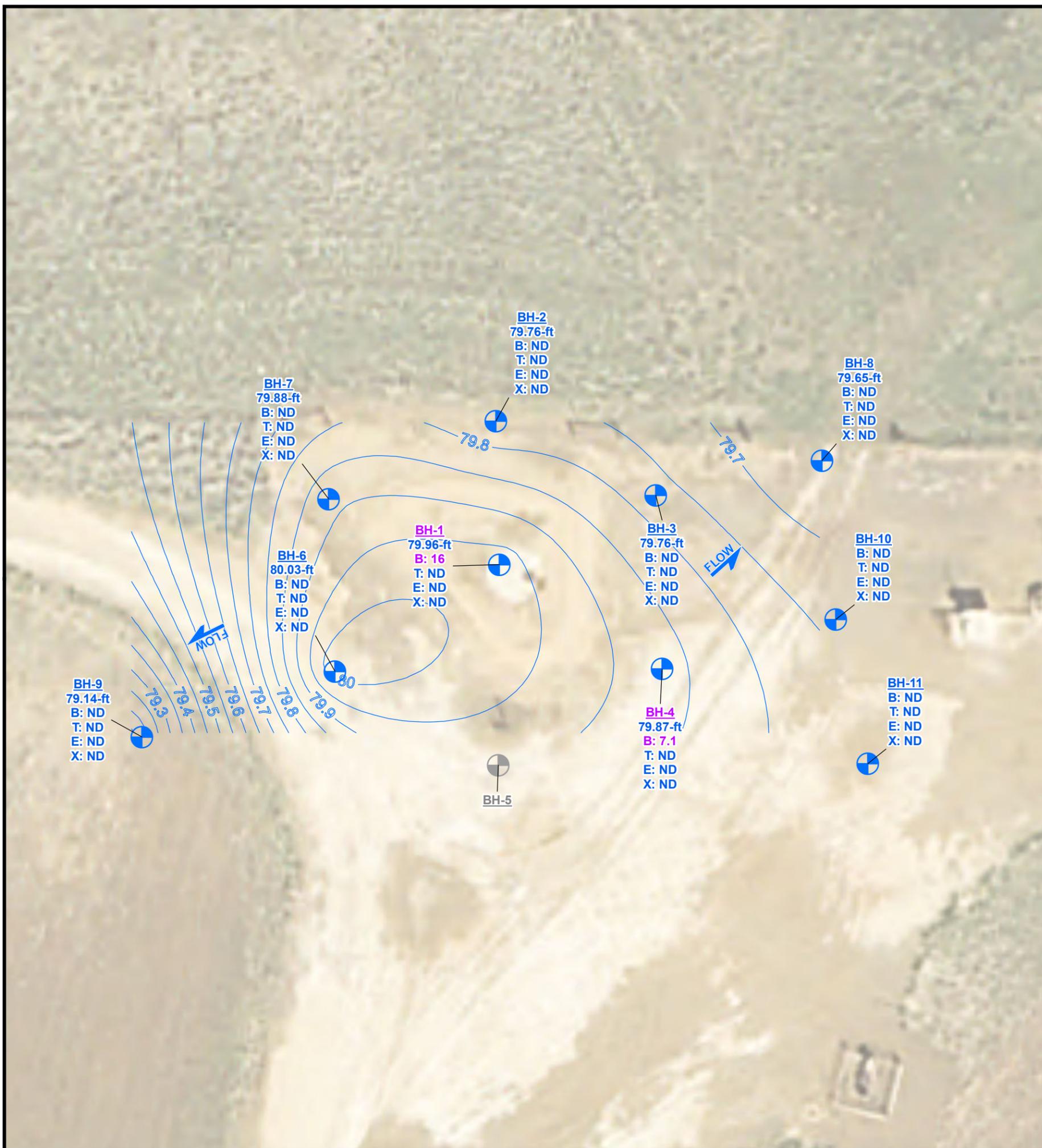
\* Sample ID in Purple font indicates a regulatory exceedance.

\* Organic Compounds in ug/L



Sample ID	Latitude NAD83	Longitude NAD 83
BH-1	39.991684	-104.947656
BH-2	39.991743	-104.947658
BH-3	39.991713	-104.947574
BH-4	39.991642	-104.947570
BH-5	39.991603	-104.947657
BH-6	39.991641	-104.947743
BH-7	39.991711	-104.947747
BH-8	39.991727	-104.947486
BH-9	39.991614	-104.947845

Spatial data collected for this project was acquired using a GPS with submeter accuracy. Illustration discrepancies may be present in this diagram due to the inherent limitations of data accuracy for both project data and the underlying aerial imagery. To accurately reflect field conditions, illustrated data may have been manually corrected in order to fit with the aerial imagery reference points and other collected data points.



**Extraction Oil & Gas**  
**Morrison 33-1 4 (EAST)**  
**COGCC Location ID: 320318**  
**Temporary Monitoring Well layout &**  
**GW Elevations for the 9/6/2019**  
**and 10/4/2019 Sampling Events**

Legal Description: NWSE, Sec 1, T1S R68W  
 County: Adams  
 Land Use: Cropland  
 Topography: 0-3% Slopes  
 Run-Off Risk: Low  
 Soil Type: Arvada loam  
 Receiving Waters: Big Dry Creek



**BH-1**  
80.60-ft

Temp. Monitoring Well Location & Relative GW Elevation; BH-2; BH-3; BH-4; BH-6; BH-7; BH-8; BH-9; BH-10; BH-11

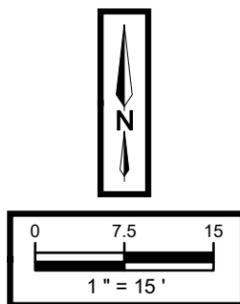
Estimated Groundwater Contour

**FLOW**  
Estimated Groundwater Flow Direction

Temp. Monitoring Well Location - Not Sampled

\* Sample ID in Purple font indicates a regulatory exceedance.

\* Organic Compounds in ug/L  
 ND - Non-Detect



Sample ID	Latitude NAD83	Longitude NAD 83
BH-1	39.991684	-104.947656
BH-2	39.991743	-104.947658
BH-3	39.991713	-104.947574
BH-4	39.991642	-104.947570
BH-5	39.991603	-104.947657
BH-6	39.991641	-104.947743
BH-7	39.991711	-104.947747
BH-8	39.991727	-104.947486
BH-9	39.991614	-104.947845
BH-10	39.991662	-104.947479
BH-11	39.991603	-104.947462

Spatial data collected for this project was acquired using a GPS with submeter accuracy. Illustration discrepancies may be present in this diagram due to the inherent limitations of data accuracy for both project data and the underlying aerial imagery. To accurately reflect field conditions, illustrated data may have been manually corrected in order to fit with the aerial imagery reference points and other collected data points.

**Attachment A**

**Boring Logs**



Boring Location Sketch

## SOIL BORING LOG

 Project Number 744.1304.01 Boring Number BH1 Sheet 1 of 1

 Project Extraction Location Morrison 33-1-61568W 1NWSE

 Drilling Method & Equipment Direct Push VERTODT Drilling Contractor Drill Pro

 Date 10/25/18 Water Level ~6' Start 1100 Finish 1124 Logger S. Maher

Depth Below Surface	Sample			Standard Penetration Test Results 6" 6" 6" 6"	Soil Description USCS Group Symbol, Name, Gradation or Plasticity, Particle Size Distribution, Color, Moisture Content, Relative Density or Consistency, Soil Structure, Mineralogy, Stain or Odor	Symbol of USCS Log	Staining	PID Readings (ppm)	PID Reading Depths (bgs)
	Interval	Depth/Time	Recovery						
0 - 6					hydro vac to 6'			3142 → 6	
6 - 11					<del>6-11' silty sand (black)</del> black poorly sorted sand. vfg - veg, loose, saturated. odor + staining	SP		679.4 → 8 355.9 → 10 27.1 → 12	
11 - 16					11-16' med brown sandy clay. veg - vfg. med dense very plastic.	CLN		24.9 → 14 19.1 → 16	

Total Depth(s) =

16

Soil Sample(s):

2

Rationale

 6 - High PID  
~~10 - clearance~~  
 16 - Bottom

Additional Information:

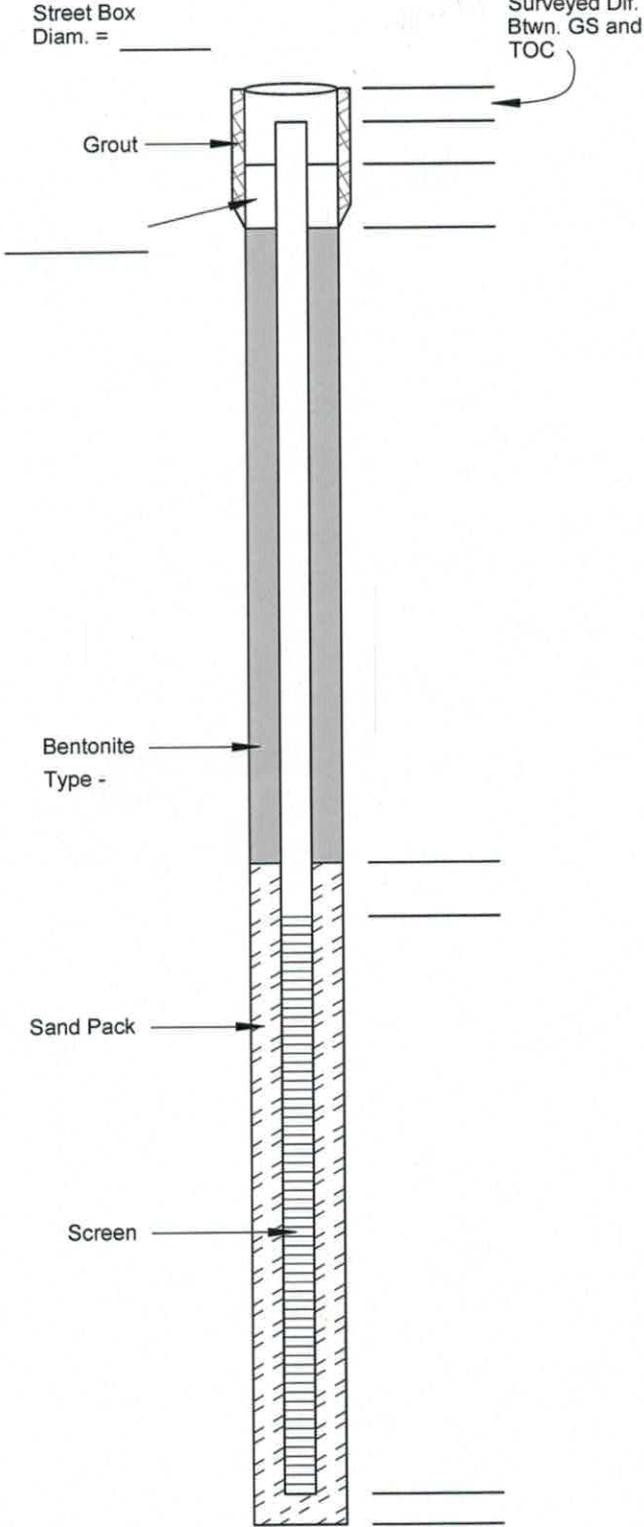


**WELL CONSTRUCTION LOG**

**Well Completion Detail**

Project 744.1804.01-  
 Number 320318

Well Number BTH



**Drilling Summary**

Total Depth of Hole: 10'  
 Hole Diameter: \_\_\_\_\_  
 Drilling Company: Drill Pro  
 Driller: \_\_\_\_\_  
 Rig Type: \_\_\_\_\_  
 Bits: \_\_\_\_\_  
 Geologist: Sage Maher

**Time Log**

	Start		Finish	
	Date	Time	Date	Time
Drilling:	<u>10/25/18</u>	<u>1100</u>	<u>10/25/18</u>	_____
Well Completion:	_____	_____	_____	_____
Grouting:	_____	_____	_____	_____

**Depth to Water (Below TOC)**

Depth: \_\_\_\_\_ Date: 10/25/18 Time: \_\_\_\_\_

**Well Construction Materials**

	Grout	Seals	Filter
Quantity:	_____	_____	_____
Type:	_____	_____	_____
	Screen		
Size:	<u>10'</u>	Config.: <u>SUN 40</u>	
Area/Ft.:	_____	Comp.: <u>PVC</u>	
Inside Diam.:	_____	Outside Diam.:	_____

**Comments**

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

\* Measuring Point is Below Ground Surface (bgs)

Total Depth from TOC = \_\_\_\_\_



Boring Location Sketch

## SOIL BORING LOG

Project Number  
744.1604.01  
~~744.1604.01~~Boring Number  
BH2Sheet  
1 of 1Project ExtractionLocation Morrison 33-1-61568W 1NWSEDrilling Method & Equipment Direct Push UPRDTDrilling Contractor Drill ProDate 10/25/18Water Level n/cStart 1227Finish 1255Logger S. Maher

Depth Below Surface	Sample			Standard Penetration Test Results 6"/6"/6"/6"	Soil Description USCS Group Symbol, Name, Gradation or Plasticity, Particle Size Distribution, Color, Moisture Content, Relative Density or Consistency, Soil Structure, Mineralogy, Stain or Odor	Symbol of USCS Log	Staining	PID Readings (ppm)	PID Reading Depths (bgs)
	Interval	Depth/Time	Recovery						
6					hydrovae to c'			18.2	6
7					6-7' black sandy clay vfg-veg, saturated, med plastic, med dense, staining + odor	CL	Y	7.0	8
10					7-10' light grey poorly sorted sand, loose, saturated, staining + odor	SP	Y	2.2	10
12					* color changes @ 9' to med brown			5.8	12
13					10-12' light grey sandy clay, vfg-veg, very dense, med plastic, staining + odor	CL	Y	0.8	14
14					12-13' poorly sorted sand, med brown, loose, saturated, no odor or stain	SP	N		
					13-14' med brown sandy clay, very dense, med plastic, no odor or staining	CL	N		
					vfg-veg				

Total Depth(s) =

14

Soil Sample(s):

2

Rationale

High PID @ 6'  
Bottom @ 14'

Additional Information:



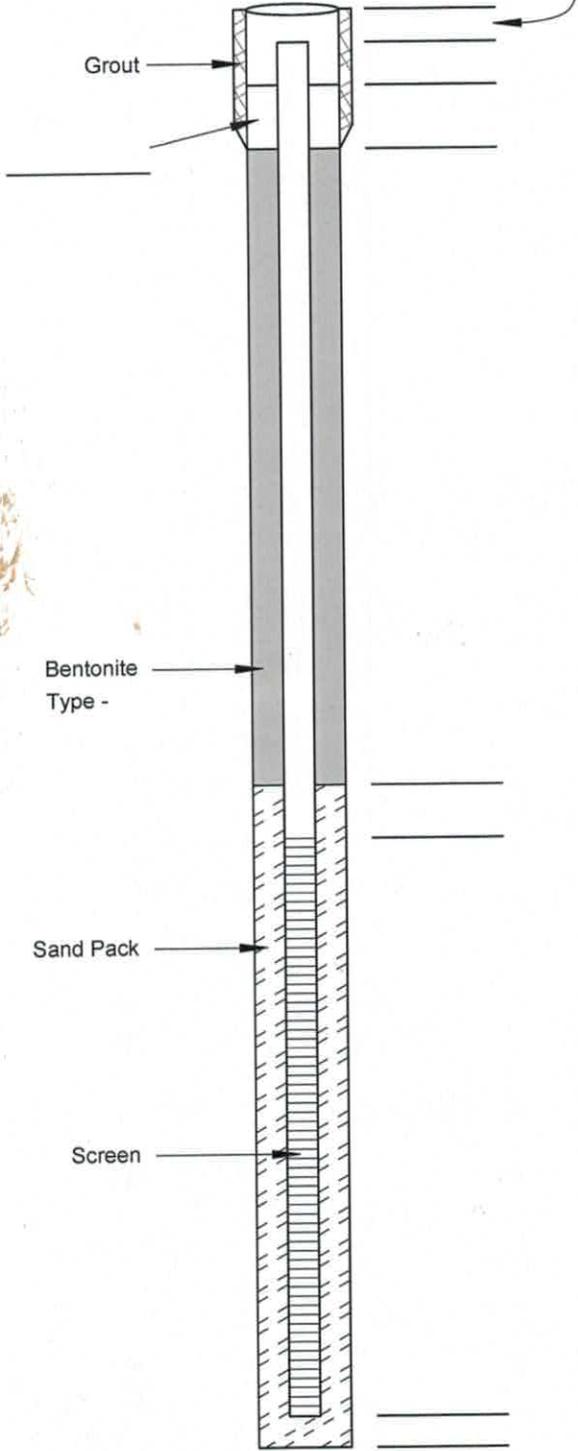
**WELL CONSTRUCTION LOG**

**Well Completion Detail**

Street Box  
Diam. = \_\_\_\_\_

Surveyed Dif.  
Btwn. GS and  
TOC

Grout



Bentonite  
Type - \_\_\_\_\_

Sand Pack

Screen

\* Measuring Point is Below Ground Surface (bgs)

Total Depth from TOC = \_\_\_\_\_

Project 744.1804.01-  
Number 320318

Well  
Number BHZ

**Drilling Summary**

Total Depth of Hole: 14'  
Hole Diameter: \_\_\_\_\_  
Drilling Company: Drill Pro  
Driller: \_\_\_\_\_  
Rig Type: \_\_\_\_\_  
Bits: \_\_\_\_\_  
Geologist: Sage Maher

**Time Log**

	Start		Finish	
	Date	Time	Date	Time
Drilling:	<u>10/25/18</u>	<u>1227</u>	_____	_____
Well Completion:	_____	_____	_____	_____
Grouting:	_____	_____	_____	_____

**Depth to Water (Below TOC)**

Depth: \_\_\_\_\_ Date: 10/25/18 Time: \_\_\_\_\_

**Well Construction Materials**

	Grout	Seals	Filter
Quantity:	_____	_____	_____
Type:	_____	_____	_____
	Screen		
Size:	<u>10'</u>	Config.: <u>3cm 40'</u>	_____
Area/Ft.:	_____	Comp.: <u>PVC</u>	_____
Inside Diam.:	_____	Outside Diam.:	_____

**Comments**

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



Boring Location Sketch

SOIL BORING LOG

Project Number 744.1004.01 Boring Number BH3 Sheet 1 of 1



Project Extraction Location Morrison 33-1-UISUBW INWSE

Drilling Method & Equipment Direct Push 66205 Drilling Contractor Drill Pro

Date 10/25/18 Water Level ~6' Start 1259 Finish 1342 Logger S. Maher

Depth Below Surface	Sample			Standard Penetration Test Results 6" 6" 6" 6"	Soil Description USCS Group Symbol, Name, Gradation or Plasticity, Particle Size Distribution, Color, Moisture Content, Relative Density or Consistency, Soil Structure, Mineralogy, Stain or Odor	Symbol of USCS Log	Staining	PID Readings (ppm)	PID Reading Depths (bgs)
	Interval	Depth/Time	Recovery						
0-6'					hydrovae to 6'				
6-10'					4-10' clayey sand med brown, vfg-veg, <del>very</del> loose, low plasticity w/ lenses of poorly sorted sand (vfg-veg), saturated	SC	N	0.0 - 6 0.0 - 8 0.0 - 10 0.4 - 12	
10-12'					10-12' gravelly sandy clay, grey with orange mottles, med plastic, very dense, no staining or odor, saturated	#4 CL	N		

Total Depth(s) = 12

Soil Sample(s):

Rationale: 8' High PID, 12' Base

Additional Information: 6' sample too saturated

Horizon 33-1-41548W INWSE

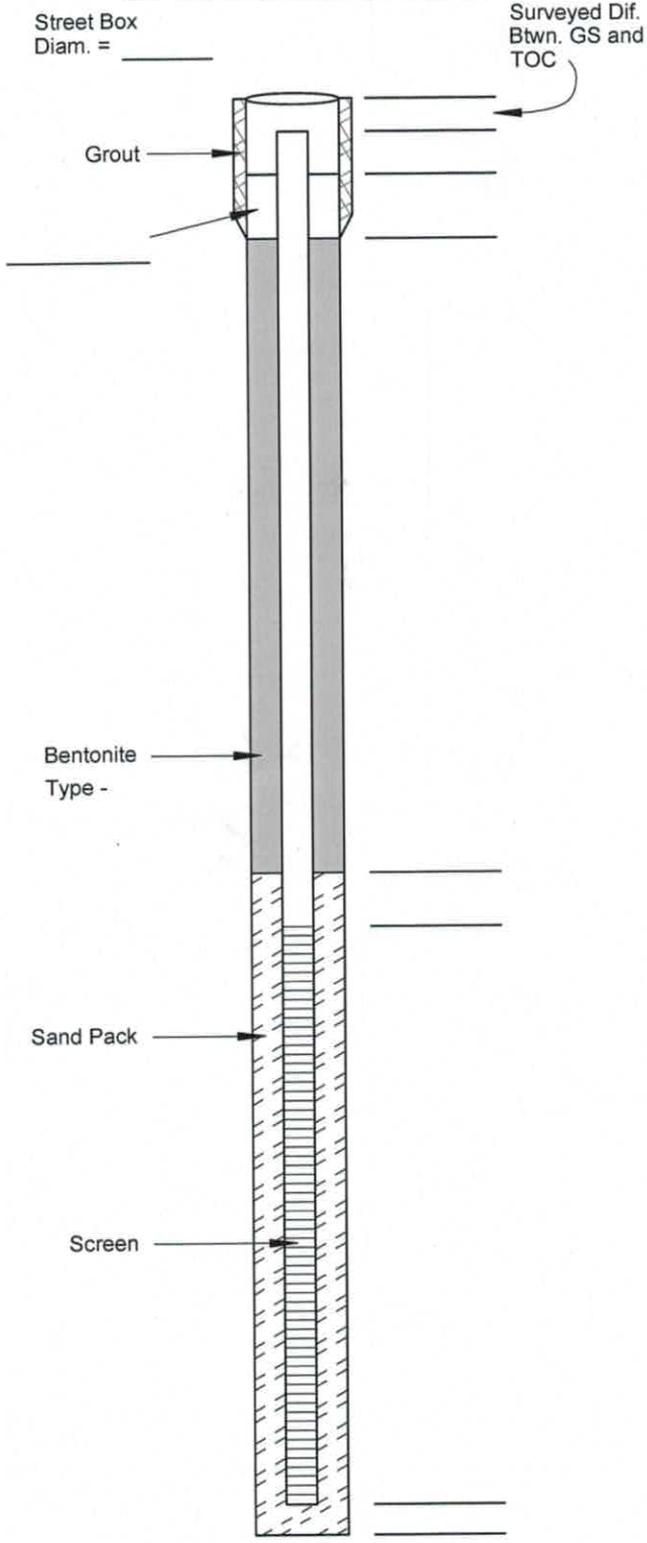


### WELL CONSTRUCTION LOG

Project 744.1804.01-  
Number 3203.8

Well Number BH3

#### Well Completion Detail



#### Drilling Summary

Total Depth of Hole: 12'

Hole Diameter: \_\_\_\_\_

Drilling Company: Drill Pro

Driller: \_\_\_\_\_

Rig Type: \_\_\_\_\_

Bits: \_\_\_\_\_

Geologist: Sage Maher

#### Time Log

	Start		Finish	
	Date	Time	Date	Time
Drilling:	<u>10/25/18</u>	<u>1259</u>	_____	_____
Well Completion:	_____	_____	_____	_____
Grouting:	_____	_____	_____	_____

#### Depth to Water (Below TOC)

Depth: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_

#### Well Construction Materials

	Grout	Seals	Filter
Quantity:	_____	_____	_____
Type:	_____	_____	_____
	Screen		
Size:	<u>10'</u>	Config.: <u>3cm 40</u>	
Area/Ft.:	_____	Comp.: <u>PVC</u>	
Inside Diam.:	_____	Outside Diam.:	_____

#### Comments

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\* Measuring Point is Below Ground Surface (bgs)

Total Depth from TOC = \_\_\_\_\_



Boring Location Sketch

## SOIL BORING LOG

Project Number 744.1804.01 Boring Number BH4 Sheet 1 of 1



Project Extraction Location Manison 33-1-61S108W 1NWSE

Drilling Method & Equipment WZODT Direct Push Drilling Contractor DrillPro

Date 10/25/18 Water Level ~4' Start 1142 Finish 1154 Logger S. Maher

Depth Below Surface	Sample			Standard Penetration Test Results 6" 6" 6" 6"	Soil Description USCS Group Symbol, Name, Gradation or Plasticity, Particle Size Distribution, Color, Moisture Content, Relative Density or Consistency, Soil Structure, Mineralogy, Stain or Odor	Symbol of USCS Log	Staining	PID Readings (ppm)	PID Reading Depths (bgs)
	Interval	Depth/Time	Recovery						
0					hydrovac to 8' due to GW * GW interface < 6'				
8					8-12' poorly sorted sand vfg-vcg, loose, saturated * 8-9' is light grey + 9-12' is med. brown	SP		7.9 - 8 0.0 - 10 0.1 - 12	
12									

Total Depth(s) =

12'

Soil Sample(s):

2

Rationale

High PID @ 8'  
Bottom @ 12'

Additional Information:

Morrison 33-1-01868W INWSE



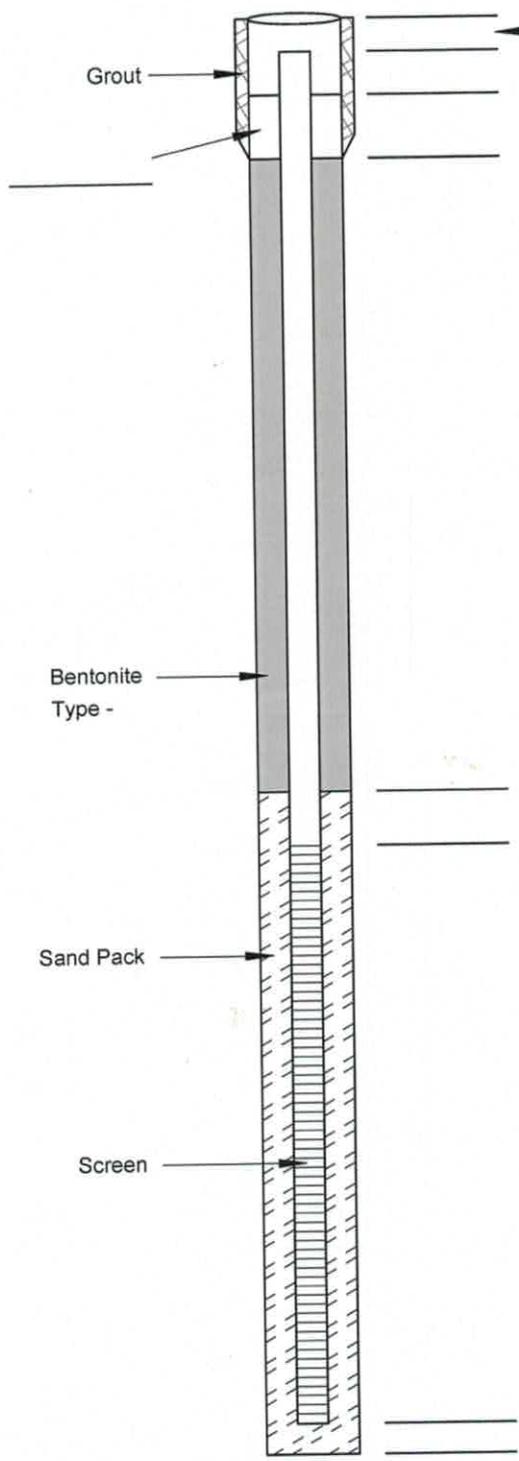
**WELL CONSTRUCTION LOG**

**Well Completion Detail**

Project Number 744-1804-01  
 Well Number 320318      Well Number BH4

Street Box  
Diam. = \_\_\_\_\_

Surveyed Dif.  
Btwn. GS and  
TOC



**Drilling Summary**

Total Depth of Hole: 12'  
 Hole Diameter: \_\_\_\_\_  
 Drilling Company: \_\_\_\_\_  
 Driller: Drill Pro  
 Rig Type: \_\_\_\_\_  
 Bits: \_\_\_\_\_  
 Geologist: Sage Maher

**Time Log**

	Start		Finish	
	Date	Time	Date	Time
Drilling:	<u>10/25/18</u>	<u>1142</u>	_____	_____
Well Completion:	_____	_____	_____	_____
Grouting:	_____	_____	_____	_____

**Depth to Water (Below TOC)**

Depth: \_\_\_\_\_ Date: 10/25/18 Time: \_\_\_\_\_

**Well Construction Materials**

	Grout	Seals	Filter
Quantity:	_____	_____	_____
Type:	_____	_____	_____
	Screen		
Size:	<u>10'</u>	Config.: <u>Sch 40</u>	_____
Area/Ft.:	_____	Comp.: <u>PVC</u>	_____
Inside Diam.:	_____	Outside Diam.:	_____

**Comments**

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

\* Measuring Point is Below Ground Surface (bgs)

Total Depth from TOC = \_\_\_\_\_



MORISON 33-1-6156BW INNSE

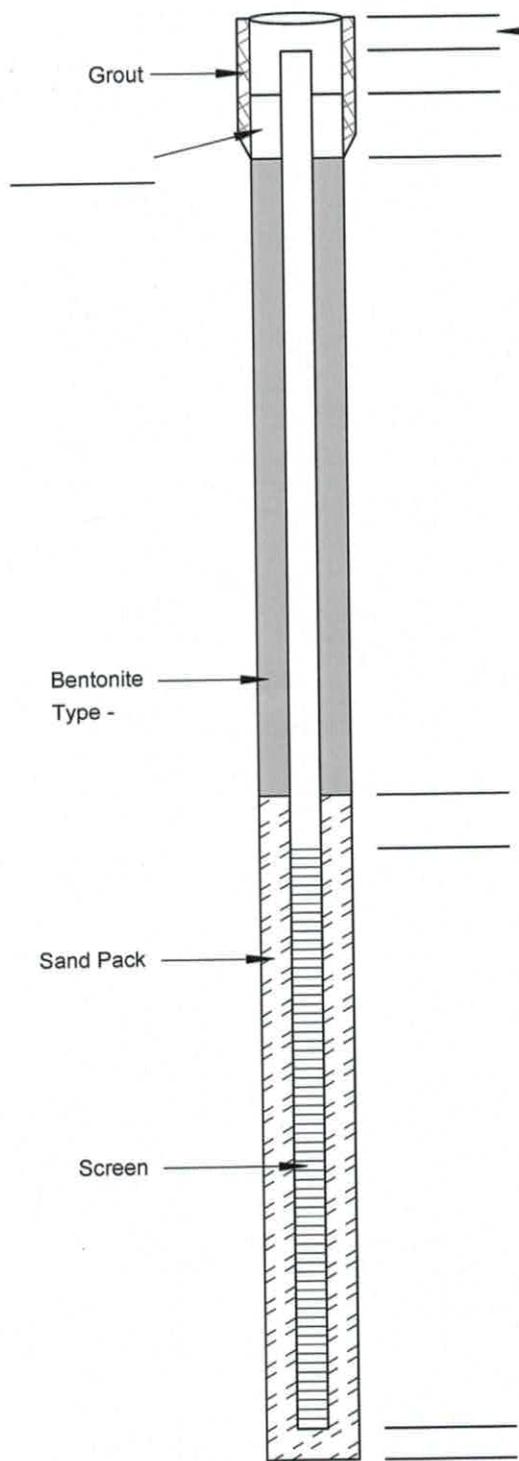


### WELL CONSTRUCTION LOG

#### Well Completion Detail

Street Box  
Diam. = \_\_\_\_\_

Surveyed Dif.  
Btwn. GS and  
TOC



\* Measuring Point is Below Ground Surface (bgs)

Total Depth from TOC = \_\_\_\_\_

Project Number BH5

Well Number 744-1804-10  
Number 320318

#### Drilling Summary

Total Depth of Hole: 12'  
 Hole Diameter: \_\_\_\_\_  
 Drilling Company: DrillPro  
 Driller: \_\_\_\_\_  
 Rig Type: \_\_\_\_\_  
 Bits: \_\_\_\_\_  
 Geologist: Sage Maher

#### Time Log

	Start		Finish	
	Date	Time	Date	Time
Drilling:	<u>10/25/18</u>	<u>1131</u>	_____	_____
Well Completion:	_____	_____	_____	_____
Grouting:	_____	_____	_____	_____

#### Depth to Water (Below TOC)

Depth: \_\_\_\_\_ Date: 10/25/18 Time: \_\_\_\_\_

#### Well Construction Materials

	Grout	Seals	Filter
Quantity:	_____	_____	_____
Type:	_____	_____	_____
	Screen		
Size:	<u>10'</u>	Config.: <u>SCM 40</u>	_____
Area/Ft.:	_____	Comp.: <u>PVC</u>	_____
Inside Diam.:	_____	Outside Diam.:	_____

#### Comments

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_



Boring Location Sketch

**SOIL BORING LOG**
 Project Number 744.1804.01 Boring Number BAG Sheet 1 of 1

 Project Extraction Location MORISON 33-1-61568W 1NWSE

 Drilling Method & Equipment Direct Push UG20DT Drilling Contractor Drill Pro

 Date 10/25/18 Water Level ~6' Start 1050 Finish 1104 Logger S. Maher

Depth Below Surface	Sample			Standard Penetration Test Results 6"/6"/6"/6"	Soil Description USCS Group Symbol, Name, Gradation or Plasticity, Particle Size Distribution, Color, Moisture Content, Relative Density or Consistency, Soil Structure, Mineralogy, Stain or Odor	Symbol of USCS Log	Staining	PID Readings (ppm)	PID Reading Depths (bgs)
	Interval	Depth/Time	Recovery						
					Hydrovac to 8'				
8					8-9' grey clayey sand vfg-vcg. Med. plastic, low density, saturated odor + staining	SC	Y	0.1 @ 6 94.9 @ 8 13.2 @ 10	
9					9-12' med brown poorly sorted sand. vfg-vcg low plastic, low dense, loose, saturated	SP	N	3.0 @ 12 0.3 @ 14	
12									

Total Depth(s) =

14

Soil Sample(s):

1

Rationale

High PID @ 8'  
Bgs @ 12'  
Sw int in hydrovac

Additional Information:



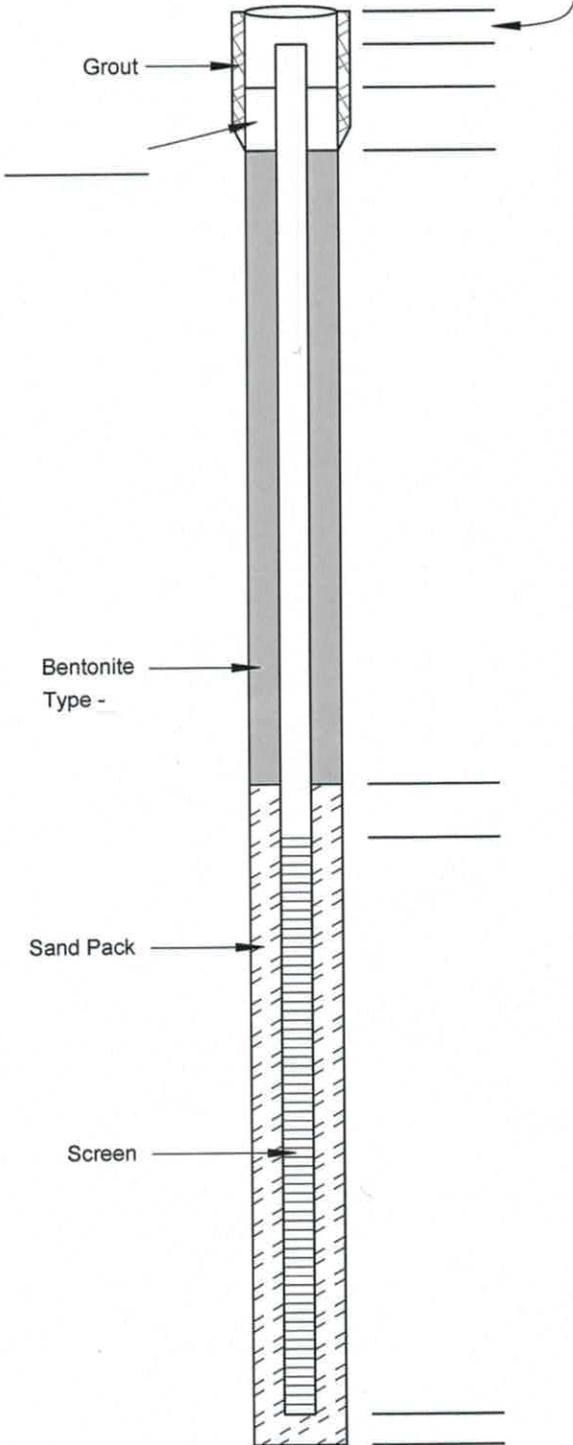
**WELL CONSTRUCTION LOG**

**Well Completion Detail**

Street Box  
Diam. = \_\_\_\_\_

Surveyed Dif.  
Btwn. GS and  
TOC

Grout



\* Measuring Point is Below Ground Surface (bgs)

Total Depth from TOC = \_\_\_\_\_

Project 744.1804.01  
Number 320318

Well  
Number BHLE

**Drilling Summary**

Total Depth of Hole: 14'  
Hole Diameter: \_\_\_\_\_  
Drilling Company: Drill Pro  
Driller: \_\_\_\_\_  
Rig Type: \_\_\_\_\_  
Bits: \_\_\_\_\_  
Geologist: Sage Maher

**Time Log**

	Start		Finish	
	Date	Time	Date	Time
Drilling:	<u>10/25/18</u>	<u>1050</u>	_____	_____
Well Completion:	_____	_____	_____	_____
Grouting:	_____	_____	_____	_____

**Depth to Water (Below TOC)**

Depth: \_\_\_\_\_ Date: 10/25/18 Time: \_\_\_\_\_

**Well Construction Materials**

	Grout	Seals	Filter
Quantity:	_____	_____	_____
Type:	_____	_____	_____
	Screen		
Size:	<u>10'</u>	Config.: <u>Sch 40</u>	
Area/Ft.:	_____	Comp.: <u>PVC</u>	
Inside Diam.:	_____	Outside Diam.:	_____

**Comments**

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



Boring Location Sketch

**SOIL BORING LOG**

Project Number 744.1804.01 Boring Number BH 7 Sheet 1 of 1



Project Extraction Location Morrison 33-1-61508W 1NWSE

Drilling Method & Equipment Direct Push C620DT Drilling Contractor DrillPro

Date 10/25/18 Water Level -6' Start 1015 Finish 1045 Logger R. Finley

Depth Below Surface	Sample			Standard Penetration Test Results 6" 6" 6" 6"	Soil Description USCS Group Symbol, Name, Gradation or Plasticity, Particle Size Distribution, Color, Moisture Content Relative Density or Consistency, Soil Structure, Mineralogy, Stain or Odor	Symbol of USCS Log	Staining	PID Readings (ppm)	PID Reading Depths (bgs)
	Interval	Depth/Time	Recovery						
					Hydrovac to 6'			0.1	4
					*GW interface			3.7	7
8					6-8' m-d bwn clayey sand vfg-vfg. High plastic low dense must to saturated no odor	SC	N	0.0	8
11					8-11' m bwn partly sorted sand vfg-vfg - low plastic, loose saturated	SP	N	1.1	10
13					11-13' - m grey sandy clay vfg - very dense, mid plastic	CL	N	0.8	12
15					13-15' - m bwn partly sorted sand vfg - vfg low plastic, loose	SP	N	0.0	14

Total Depth(s) = 15' Soil Sample(s): 2 Rationale: \*GW interface @ 7'  
High PID @ 10' Additional Information:

Morrison 33-1-61868W NWSE

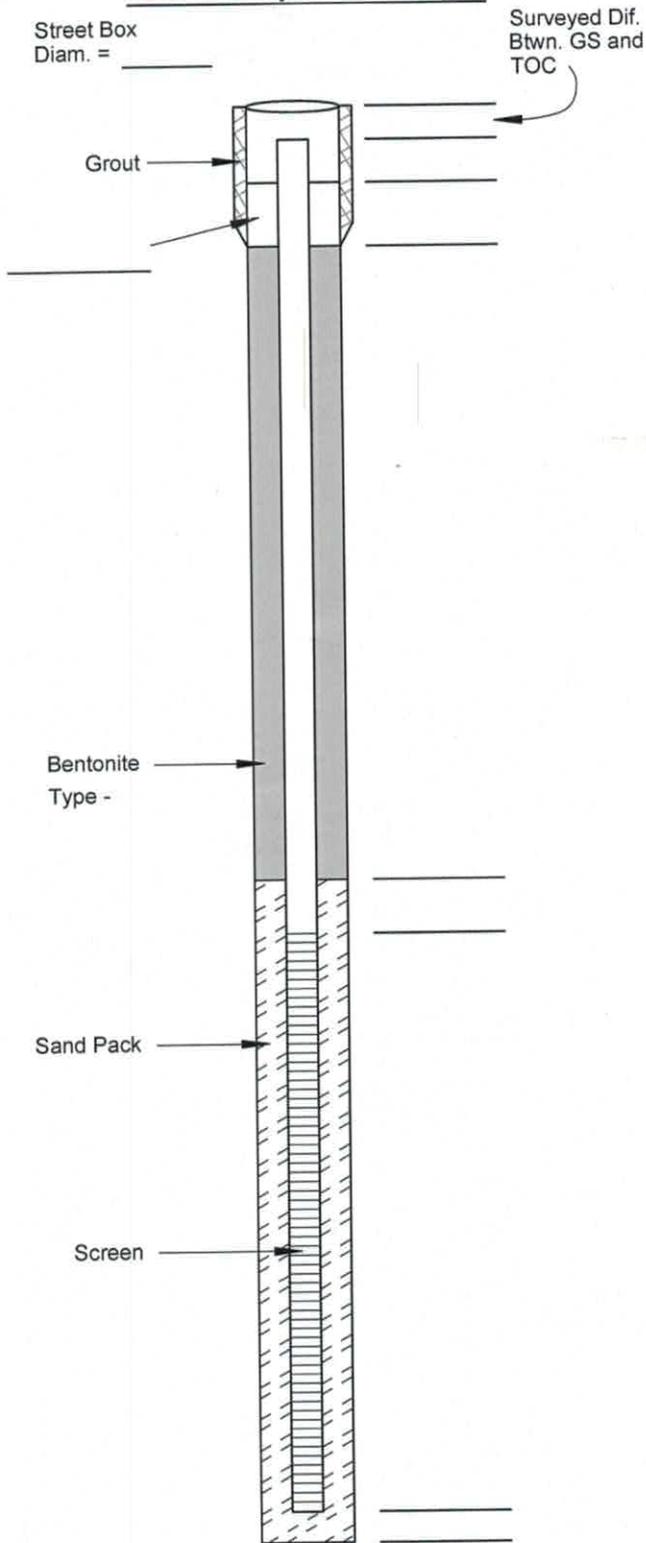


### WELL CONSTRUCTION LOG

Project 744-1804.01  
Number 320318

Well Number BH7

#### Well Completion Detail



\* Measuring Point is Below Ground Surface (bgs)

Total Depth from TOC = \_\_\_\_\_

#### Drilling Summary

Total Depth of Hole: 15'  
 Hole Diameter: \_\_\_\_\_  
 Drilling Company: Drill Pro  
 Driller: [Signature]  
 Rig Type: \_\_\_\_\_  
 Bits: \_\_\_\_\_  
 Geologist: Sage Maher

#### Time Log

	Start		Finish	
	Date	Time	Date	Time
Drilling:	<u>10/25/18</u>	<u>1015</u>	_____	_____
Well Completion:	_____	_____	_____	_____
Grouting:	_____	_____	_____	_____

#### Depth to Water (Below TOC)

Depth: \_\_\_\_\_ Date: 10/25/18 Time: \_\_\_\_\_

#### Well Construction Materials

	Grout	Seals	Filter
Quantity:	_____	_____	_____
Type:	_____	_____	_____
	Screen		
Size:	<u>10'</u>	Config.: <u>Sch 40</u>	
Area/Ft.:	_____	Comp.: <u>PVC</u>	
Inside Diam.:	_____	Outside Diam.:	_____

#### Comments

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_



Boring Location Sketch

**SOIL BORING LOG**
 Project Number 744-1804.01 Boring Number BH08 Sheet 1 of 1
Project Extraction Location Morrison 33-1-01S08W 1NWSEDrilling Method & Equipment Direct Push 4220DT Drilling Contractor DrillProDate 10/25/16 Water Level N/A Start 1205 Finish 1225 Logger S. Maher

Depth Below Surface	Sample			Standard Penetration Test Results 6"/6"/6"/6"	Soil Description USCS Group Symbol, Name, Gradation or Plasticity, Particle Size Distribution, Color, Moisture Content, Relative Density or Consistency, Soil Structure, Mineralogy, Stain or Odor	Symbol of USCS Log	Staining	PID Readings (ppm)	PID Reading Depths (bgs)
	Interval	Depth/Time	Recovery						
					improves to 8'				
8					8-11' med brown poorly sorted sand, vfg-veg, loose, saturated, no odor or staining	SP	N	0.0 — 8	
11					11-12' med brown sandy clay, vfg-veg, very dense, med. plastic, no odor or staining	CL	N	0.1 — 10	
12								0.0 — 12	

Total Depth(s) =

12

Soil Sample(s):

2

Rationale

 High PID @ 10  
 Base @ 12

Additional Information:

Morrison 33-1-41568W 1NWSE



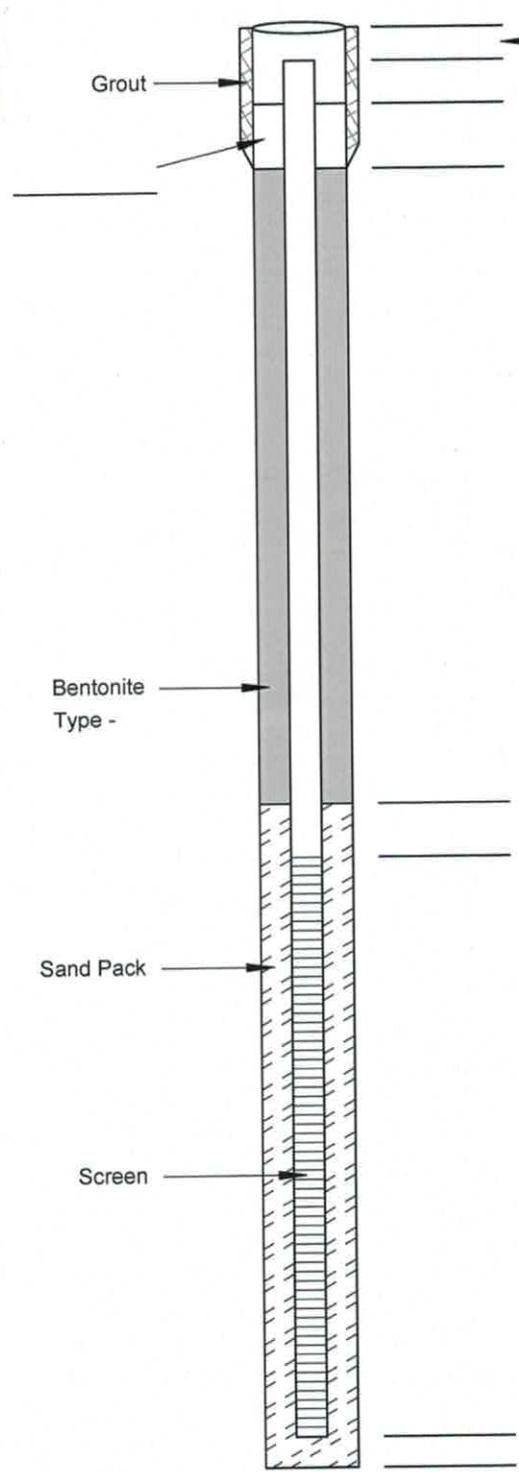
### WELL CONSTRUCTION LOG

#### Well Completion Detail

Street Box  
Diam. = \_\_\_\_\_

Surveyed Dif.  
Btwn. GS and  
TOC

Grout



Bentonite  
Type -

Sand Pack

Screen

\* Measuring Point is Below Ground Surface (bgs)

Total Depth from TOC = \_\_\_\_\_

Project 744.1804.01  
Number 320318

Well  
Number B18

#### Drilling Summary

Total Depth of Hole: 12'  
 Hole Diameter: \_\_\_\_\_  
 Drilling Company: Drill Pro  
 Driller: \_\_\_\_\_  
 Rig Type: \_\_\_\_\_  
 Bits: \_\_\_\_\_  
 Geologist: Sage Maher

#### Time Log

	Start		Finish	
	Date	Time	Date	Time
Drilling:	<u>10/25/18</u>	<u>1205</u>	_____	_____
Well Completion:	_____	_____	_____	_____
Grouting:	_____	_____	_____	_____

#### Depth to Water (Below TOC)

Depth: \_\_\_\_\_ Date: 10/25/18 Time: \_\_\_\_\_

#### Well Construction Materials

	Grout	Seals	Filter
Quantity:	_____	_____	_____
Type:	_____	_____	_____
	Screen		
Size:	<u>10'</u>	Config.: <u>Sch 40</u>	_____
Area/Ft.:	_____	Comp.: <u>PVC</u>	_____
Inside Diam.:	_____	Outside Diam.:	_____

#### Comments

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_



Boring Location Sketch

**SOIL BORING LOG**

Project Number 744.1804.01 Boring Number BH 9 Sheet 1 of 1



Project Extraction Location Morrison 33-1-0150BW INWSE  
 Drilling Method & Equipment Direct Push w/20PT Drilling Contractor Drill Pro  
 Date 10/25/18 Water Level ~0' Start 1352 Finish 1415 Logger J. Maher

Depth Below Surface	Sample			Standard Penetration Test Results 6"/6"/6"/6"	Soil Description USCS Group Symbol, Name, Gradation or Plasticity, Particle Size Distribution, Color, Moisture Content Relative Density or Consistency, Soil Structure, Mineralogy, Stain or Odor	Symbol of USCS Log	Staining	PID Readings (ppm)	PID Reading Depths (bgs)
	Interval	Depth/Time	Recovery						
0					hand augered to 0'				
6					6-8' med brown clayey sand, loose, med plastic (vfg-vcg) saturated	SC	N	0.0	6
8					8-10' poorly sorted sand vfg-vcg (med brown) loose, saturated	SP	N	0.0	8
10					10-12' sandy clay, med brown, very dense, med plastic w/ sand lens (moderately sorted, med. grain), sat.	CL	N	0.0	10
12								0.0	12

Total Depth(s) = 12 Soil Sample(s): 2 Rationale: 8 for clearance, 12 for base Additional Information:

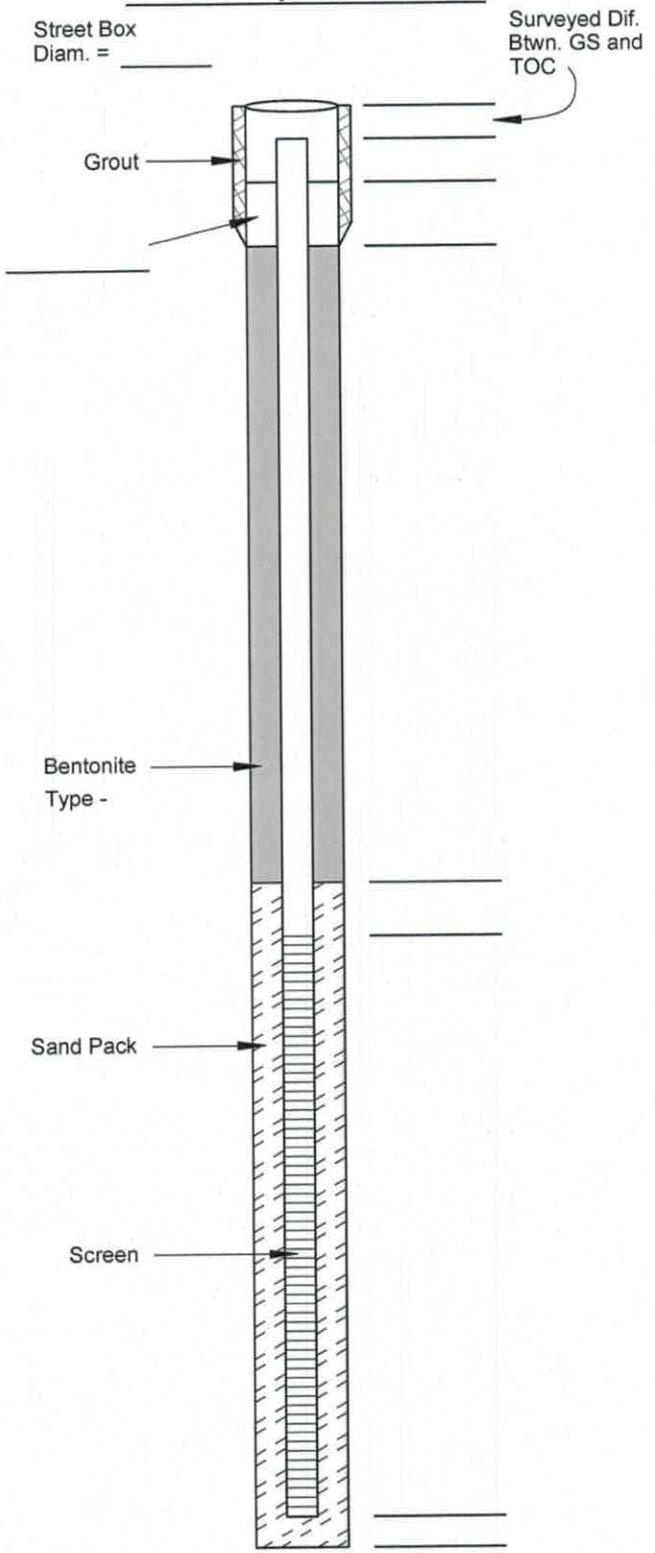
Morrison 33-1-~~US~~08W INWSE



**WELL CONSTRUCTION LOG**

Project 744-1804.01 Well Number BH9  
 Number 320318

**Well Completion Detail**



\* Measuring Point is Below Ground Surface (bgs)

Total Depth from TOC = \_\_\_\_\_

**Drilling Summary**

Total Depth of Hole: 12'  
 Hole Diameter: \_\_\_\_\_  
 Drilling Company: Drill Pro  
 Driller: Tewanle  
 Rig Type: W420DT  
 Bits: Direct Push  
 Geologist: Sage Maher

**Time Log**

	Start		Finish	
	Date	Time	Date	Time
Drilling:	<u>10/25/18</u>	<u>1352</u>	_____	_____
Well Completion:	_____	_____	_____	_____
Grouting:	_____	_____	_____	_____

**Depth to Water (Below TOC)**

Depth: \_\_\_\_\_ Date: 10/25/18 Time: \_\_\_\_\_

**Well Construction Materials**

	Grout	Seals	Filter
Quantity:	_____	_____	_____
Type:	_____	_____	_____
	Screen		
Size:	<u>10 Slot</u>	Config.: <u>Sch 40</u>	_____
Area/Ft.:	<u>10'</u>	Comp.: <u>PVC</u>	_____
Inside Diam.:	_____	Outside Diam.:	_____

**Comments**

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**Attachment B**

**Laboratory Analytical Reports**

# Summit Scientific

---

4653 Table Mountain Drive, Golden, Colorado 80403

303.277.9310

November 02, 2018

Maggie Graham

Extraction Oil&Gas

370 17th Street Suite 5300

Denver, CO 80202

RE: Morrison 33-1

Enclosed are the results of analyses for samples received by Summit Scientific on 10/25/18 18:05. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink, appearing to read 'Paul Shrewsbury', written in a cursive style.

Paul Shrewsbury For Ben Shrewsbury

Laboratory Manager



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

Project: Morrison 33-1

Project Number: 2347-6000-930.88

Project Manager: Maggie Graham

**Reported:**  
11/02/18 07:12

### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BH7@7	1810324-01	Soil	10/25/18 10:45	10/25/18 18:05
BH7@10	1810324-02	Soil	10/25/18 10:48	10/25/18 18:05
BH6@8	1810324-03	Soil	10/25/18 11:02	10/25/18 18:05
BH6@12	1810324-04	Soil	10/25/18 11:04	10/25/18 18:05
BH1@6	1810324-05	Soil	10/25/18 11:28	10/25/18 18:05
BH1@16	1810324-06	Soil	10/25/18 11:35	10/25/18 18:05
BH5@6	1810324-07	Soil	10/25/18 11:49	10/25/18 18:05
BH5@12	1810324-08	Soil	10/25/18 11:51	10/25/18 18:05
BH4@8	1810324-09	Soil	10/25/18 11:59	10/25/18 18:05
BH4@12	1810324-10	Soil	10/25/18 12:01	10/25/18 18:05
BH8@12	1810324-11	Soil	10/25/18 12:22	10/25/18 18:05
BH8@10	1810324-12	Soil	10/25/18 12:23	10/25/18 18:05
BH2@14	1810324-13	Soil	10/25/18 12:49	10/25/18 18:05
BH2@6	1810324-14	Soil	10/25/18 12:54	10/25/18 18:05
BH3@12	1810324-15	Soil	10/25/18 13:44	10/25/18 18:05
BH3@8	1810324-16	Soil	10/25/18 13:46	10/25/18 18:05
BH9@8	1810324-17	Soil	10/25/18 14:18	10/25/18 18:05
BH9@12	1810324-18	Soil	10/25/18 14:20	10/25/18 18:05
BH01	1810324-19	Water	10/25/18 15:08	10/25/18 18:05
BH02	1810324-20	Water	10/25/18 14:31	10/25/18 18:05
BH03	1810324-21	Water	10/25/18 14:51	10/25/18 18:05
BH04	1810324-22	Water	10/25/18 14:57	10/25/18 18:05
BH05	1810324-23	Water	10/25/18 14:48	10/25/18 18:05
BH06	1810324-24	Water	10/25/18 14:38	10/25/18 18:05
BH07	1810324-25	Water	10/25/18 15:01	10/25/18 18:05
BH08	1810324-26	Water	10/25/18 15:03	10/25/18 18:05
BH09	1810324-27	Water	10/25/18 15:15	10/25/18 18:05

Summit Scientific

*The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*



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

Project: Morrison 33-1

Project Number: 2347-6000-930.88

Project Manager: Maggie Graham

**Reported:**  
11/02/18 07:12

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Summit Scientific

*The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*

# Summit Scientific

4653 Table Mountain Drive ♦ Golden, Colorado 80403

303-277-9310 ♦ 303-374-5933 Fax

1810324.1

Page 1 of 3

Client: APEX Companies, LLC

Address: 176 Cole Blvd. Suite 250

City/State/Zip: Lakewood, Colorado 80101

Phone: 720-501-5065 Fax:

Sampler Name: Sage Maher & Ryan Finley

Project Manager: Maggie Graham 720-501-5065

E-Mail: DenverRemediation@ApexCos.onmicrosoft.com

Project Name: Morrison 33-1

Project Number: 2347-6000-930.88

Sample Description	Date Sampled	Time Sampled	Number of Containers	Preservative				Matrix			Analyze For:				Special Instructions
				HCl	HNO <sub>3</sub>	None	Other (Specify)	Groundwater	Soil	Air - Canister Serial #	Other (Specify)	TPH	BTEX		
BH7@7	10/25/18	1045	1			X			X				✓	✓	Call Maggie Graham with questions
BH2@10		1048													
BH6@8		1102													
BH10@12		1104													
BH1@10		1128													
BH7@16		1135													
BH5@6		1149													
BH5@12		1151													
BH4@8		1159													
BH4@12		1201													
Relinquished by: <i>[Signature]</i>		Date/Time: 10/25/18 18:00		Received by: <i>[Signature]</i>		Date/Time: 10/25/18 18:00		Turn Around Time (Check)				Notes			
Same Day <input checked="" type="checkbox"/>		72 Hours <input type="checkbox"/>		24 Hours <input type="checkbox"/>		Standard <input checked="" type="checkbox"/>		48 Hours <input type="checkbox"/>		Circle applicable regulatory agency:					
Relinquished by: <i>[Signature]</i>		Date/Time: 10/25/18		Received by: <i>[Signature]</i>		Date/Time: 10-25-18 18:05		Sample Integrity:				Client Name:			
Temperature Upon Receipt: 12.0		Intact: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		Client Name: X06											

# Summit Scientific

4653 Table Mountain Drive ♦ Golden, Colorado 80403  
303-277-9310 ♦ 303-374-5933 Fax

1810324-2

Page 2 of 3

Client: APEX Companies, LLC  
Address: 176 Cole Blvd. Suite 250  
City/State/Zip: Lakewood, Colorado 80101  
Phone: 720-501-5065 Fax: \_\_\_\_\_  
Sampler Name: Sage Maher & Ryan Finley

Project Manager: Maggie Graham 720-501-5065  
E-Mail: DenverRemediation@ApexCos.onmicrosoft.com  
Project Name: Morrison 33-1  
Project Number: 2347-6000-930.88

Sample Description	Date Sampled	Time Sampled	Number of Containers	Preservative				Matrix			Analyze For:				Special Instructions	
				HCl	HNO <sub>3</sub>	None	Other (Specify)	Groundwater	Soil	Air - Canister Serial #	Other (Specify)	TPH	BTEX	RUSH! (same day)		
BH8@12	10/25/18	1222	1			X			X				✓	X		Call Maggie Graham with questions  Please <u>RUSH</u> *  BH2@14 and BH2@6 (same day)
BH8@10		1223														
BH2@14		1249														
BH2@6		1254												✓		
BH3@12		1344														
BH3@8		1346														
BH9@8		1418														
BH9@12		1420														
Relinquished by: <u>[Signature]</u>		Date/Time: <u>10-25-18 18:00</u>		Received by: <u>[Signature]</u>		Date/Time: <u>10-25-18 18:00</u>		Turn Around Time (Check)				Notes				
								Same Day <input checked="" type="checkbox"/> 72 Hours <input type="checkbox"/> 24 Hours <input type="checkbox"/> Standard <input checked="" type="checkbox"/> 48 Hours <input type="checkbox"/>				Circle applicable regulatory agency: <u>COGCC/CDPHE</u>				
Relinquished by: <u>[Signature]</u>		Date/Time: <u>10/25/18</u>		Received by: <u>[Signature]</u>		Date/Time: <u>10-25-18 18:05</u>		Sample Integrity: Temperature Upon Receipt: <u>12.0</u>				Client Name: <u>XOG</u>				
								Intact: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>								

# Summit Scientific

S<sub>2</sub>

4653 Table Mountain Drive ♦ Golden, Colorado 80403  
303-277-9310

1810324.3

Page 3 of 3

Client: APEX COMPANIES

Project Manager: Maggie Graham

Address: 1710 COLE BLVD.

E-Mail: DenverRemediation@apexcos.onmicrosoft.com

City/State/Zip: LAKEWOOD, CO 80101

Phone: 720-501-5065

Project Name: Morrison 33-1

Sampler Name: RF

Project Number: 2347-6000-930.88

ID	Sample Description	Date Sampled	Time Sampled	# of containers	Preservative				Matrix			Analysis Requested				Special Instructions	
					HCl	HNO3	None	Other	Water	Soil	Air-Canister #	Other	BTEX	SAME DAY			
1	BH01	10/25/18	1508	3	X				X				X				
2	BH02		1437											X			
3	BH03		1451														
4	BH04		1457														
5	BH05		1448														
6	BH06		1438														
7	BH07		1501														
8	BH08		1503														
9	BH09		1515	✓	✓				✓				✓				
10																	

Relinquished by: Ryan July  
Date/Time: 10/25/18 18:05

Received by: [Signature]  
Date/Time: 10-25-18 18:05

Turn Around Time (Check)  
Same Day  72 hours  
24 hours  Standard   
48 hours

Notes:  
XOG

Relinquished by: \_\_\_\_\_  
Date/Time: \_\_\_\_\_

Received by: \_\_\_\_\_  
Date/Time: \_\_\_\_\_

Sample Integrity:  
Temperature Upon Receipt: \_\_\_\_\_  
Samples Intact: Yes No

Relinquished by: \_\_\_\_\_  
Date/Time: \_\_\_\_\_

Received by: \_\_\_\_\_  
Date/Time: \_\_\_\_\_

**Sample Receipt Checklist**

S2 Work Order 1810324

Client: APEX/XOG Client Project ID: MORRISON 33-1

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

Matrix (check all that apply):  Air  Soil/Solid  Water  Other: \_\_\_\_\_  
(Describe)

Temp (°C)	12.0
-----------	------

Thermometer ID: 61857155-K

	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature at 4°C +/- 2°C <sup>(1)</sup> ? NOTE: If samples are delivered the same day of sampling, this requirement is met provided that there is evidence that cooling has begun.	X			
Were all samples received intact <sup>(1)</sup> ?	X			
Was adequate sample volume provided <sup>(1)</sup> ?	X			
If custody seals are present, are they intact <sup>(1)</sup> ?			X	
Are samples with holding times due within 48 hours sample due within 48 hours present?	X			
Is a chain-of-custody (COC) form present and filled out completely <sup>(1)</sup> ?	X			
Does the COC agree with the number and type of sample bottles received <sup>(1)</sup> ?	X			
Do the sample IDs on the bottle labels match the COC <sup>(1)</sup> ?	X			
Is the COC properly relinquished by the client w/ date and time recorded <sup>(1)</sup> ?	X			
For volatiles in water – is there headspace present? If yes, contact client and note in narrative.		X		
Are samples preserved that require preservation (excluding cooling) <sup>(1)</sup> ? Note the type of preservative in the Comments column – HCl, H2SO4, NaOH, HNO3, ect	X			HCL
If samples are acid preserved for metals, is the pH ≤ 2 <sup>(1)</sup> ? Record the pH in Comments.			X	
If dissolved metals are requested, were samples field filtered?			X	
Additional Comments (if any):				

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

Muri  
Custodian Printed Name or Initials

~~PA~~ 10-25-18  
Signature of Custodian

10:10  
Date/Time



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

Project: Morrison 33-1

Project Number: 2347-6000-930.88

Project Manager: Maggie Graham

**Reported:**

11/02/18 07:12

**BH7@7**  
**1810324-01 (Soil)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **10/25/18 10:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	1810394	10/26/18	10/26/18	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **10/25/18 10:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		101 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		98.4 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		101 %	21-167		"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **10/25/18 10:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>C10-C28 (DRO)</b>	<b>600</b>	50	mg/kg	1	1810395	10/26/18	10/27/18	EPA 8015M	

Date Sampled: **10/25/18 10:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		103 %	30-150		"	"	"	"	

Summit Scientific

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

Project: Morrison 33-1

Project Number: 2347-6000-930.88

Project Manager: Maggie Graham

**Reported:**

11/02/18 07:12

**BH7@10**

**1810324-02 (Soil)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **10/25/18 10:48**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	1810394	10/26/18	10/26/18	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **10/25/18 10:48**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		107 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		99.4 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		106 %	21-167		"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **10/25/18 10:48**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1810395	10/26/18	10/27/18	EPA 8015M	

Date Sampled: **10/25/18 10:48**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		101 %	30-150		"	"	"	"	

Summit Scientific

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

Project: Morrison 33-1

Project Number: 2347-6000-930.88

Project Manager: Maggie Graham

**Reported:**

11/02/18 07:12

**BH6@8**

**1810324-03 (Soil)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **10/25/18 11:02**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	1810394	10/26/18	10/29/18	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
<b>Ethylbenzene</b>	<b>0.021</b>	0.0050	"	"	"	"	"	"	
<b>Xylenes (total)</b>	<b>0.061</b>	0.010	"	"	"	"	"	"	
<b>Gasoline Range Hydrocarbons</b>	<b>15</b>	0.50	"	"	"	"	"	"	

Date Sampled: **10/25/18 11:02**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		76.7 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		127 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		140 %	21-167		"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **10/25/18 11:02**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1810395	10/26/18	10/27/18	EPA 8015M	

Date Sampled: **10/25/18 11:02**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		104 %	30-150		"	"	"	"	

Summit Scientific

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

Project: Morrison 33-1

Project Number: 2347-6000-930.88

Project Manager: Maggie Graham

**Reported:**

11/02/18 07:12

**BH6@12**

**1810324-04 (Soil)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **10/25/18 11:04**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	1810394	10/26/18	10/26/18	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **10/25/18 11:04**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		109 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		98.2 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		102 %	21-167		"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **10/25/18 11:04**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1810395	10/26/18	10/27/18	EPA 8015M	

Date Sampled: **10/25/18 11:04**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		101 %	30-150		"	"	"	"	

Summit Scientific

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

Project: Morrison 33-1

Project Number: 2347-6000-930.88

Project Manager: Maggie Graham

**Reported:**

11/02/18 07:12

**BH1@6**  
**1810324-05 (Soil)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **10/25/18 11:28**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Benzene</b>	<b>0.014</b>	0.0020	mg/kg	1	1810394	10/26/18	10/29/18	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
<b>Ethylbenzene</b>	<b>0.50</b>	0.0050	"	"	"	"	"	"	
<b>Xylenes (total)</b>	<b>0.023</b>	0.010	"	"	"	"	"	"	
<b>Gasoline Range Hydrocarbons</b>	<b>220</b>	5.0	"	10	"	"	"	"	

Date Sampled: **10/25/18 11:28**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		93.6 %	23-173	"	"	"	"	"	
Surrogate: Toluene-d8		973 %	20-170	"	"	"	"	"	S-02
Surrogate: 4-Bromofluorobenzene		631 %	21-167	"	"	"	"	"	S-02

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **10/25/18 11:28**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>C10-C28 (DRO)</b>	<b>430</b>	50	mg/kg	1	1810395	10/26/18	10/28/18	EPA 8015M	

Date Sampled: **10/25/18 11:28**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		102 %	30-150	"	"	"	"	"	

Summit Scientific

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

Project: Morrison 33-1

Project Number: 2347-6000-930.88

Project Manager: Maggie Graham

**Reported:**  
11/02/18 07:12

**BH1@16**  
**1810324-06 (Soil)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **10/25/18 11:35**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Benzene	ND	0.0020	mg/kg	1	1810394	10/26/18	10/26/18	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **10/25/18 11:35**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Surrogate: 1,2-Dichloroethane-d4		105 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		98.0 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		110 %	21-167		"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **10/25/18 11:35**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
C10-C28 (DRO)	ND	50	mg/kg	1	1810395	10/26/18	10/28/18	EPA 8015M	

Date Sampled: **10/25/18 11:35**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Surrogate: o-Terphenyl		97.6 %	30-150		"	"	"	"	

Summit Scientific

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

Project: Morrison 33-1

Project Number: 2347-6000-930.88

Project Manager: Maggie Graham

**Reported:**

11/02/18 07:12

**BH5@6**  
**1810324-07 (Soil)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **10/25/18 11:49**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	1810394	10/26/18	10/26/18	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **10/25/18 11:49**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		107 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		99.4 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		99.8 %	21-167		"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **10/25/18 11:49**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1810395	10/26/18	10/28/18	EPA 8015M	

Date Sampled: **10/25/18 11:49**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		103 %	30-150		"	"	"	"	

Summit Scientific

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

Project: Morrison 33-1

Project Number: 2347-6000-930.88

Project Manager: Maggie Graham

**Reported:**  
11/02/18 07:12

**BH5@12**  
**1810324-08 (Soil)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **10/25/18 11:51**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	0.0020		mg/kg	1	1810394	10/26/18	10/26/18	EPA 8260B	
Toluene	ND	0.0050		"	"	"	"	"	"	
Ethylbenzene	ND	0.0050		"	"	"	"	"	"	
Xylenes (total)	ND	0.010		"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50		"	"	"	"	"	"	

Date Sampled: **10/25/18 11:51**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		108 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		98.9 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		103 %		21-167		"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **10/25/18 11:51**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
C10-C28 (DRO)	ND	50		mg/kg	1	1810395	10/26/18	10/28/18	EPA 8015M	

Date Sampled: **10/25/18 11:51**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: o-Terphenyl		107 %		30-150		"	"	"	"	

Summit Scientific

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

Project: Morrison 33-1

Project Number: 2347-6000-930.88

Project Manager: Maggie Graham

**Reported:**  
11/02/18 07:12

**BH4@8**  
**1810324-09 (Soil)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **10/25/18 11:59**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Benzene	ND	0.0020	mg/kg	1	1810394	10/26/18	10/27/18	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **10/25/18 11:59**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Surrogate: 1,2-Dichloroethane-d4		98.2 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		98.3 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		127 %	21-167		"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **10/25/18 11:59**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
C10-C28 (DRO)	ND	50	mg/kg	1	1810395	10/26/18	10/28/18	EPA 8015M	

Date Sampled: **10/25/18 11:59**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Surrogate: o-Terphenyl		102 %	30-150		"	"	"	"	

Summit Scientific

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

Project: Morrison 33-1

Project Number: 2347-6000-930.88

Project Manager: Maggie Graham

**Reported:**

11/02/18 07:12

**BH4@12**  
**1810324-10 (Soil)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **10/25/18 12:01**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	1810394	10/26/18	10/27/18	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **10/25/18 12:01**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		108 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		101 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		103 %	21-167		"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **10/25/18 12:01**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1810395	10/26/18	10/28/18	EPA 8015M	

Date Sampled: **10/25/18 12:01**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		101 %	30-150		"	"	"	"	

Summit Scientific

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

Project: Morrison 33-1

Project Number: 2347-6000-930.88

Project Manager: Maggie Graham

**Reported:**

11/02/18 07:12

**BH8@12**

**1810324-11 (Soil)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **10/25/18 12:22**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	1810394	10/26/18	10/27/18	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **10/25/18 12:22**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		111 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		100 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		105 %	21-167		"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **10/25/18 12:22**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1810395	10/26/18	10/28/18	EPA 8015M	

Date Sampled: **10/25/18 12:22**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		101 %	30-150		"	"	"	"	

Summit Scientific

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

Project: Morrison 33-1

Project Number: 2347-6000-930.88

Project Manager: Maggie Graham

**Reported:**

11/02/18 07:12

**BH8@10**  
**1810324-12 (Soil)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **10/25/18 12:23**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Benzene	ND	0.0020	mg/kg	1	1810394	10/26/18	10/27/18	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **10/25/18 12:23**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Surrogate: 1,2-Dichloroethane-d4		101 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		100 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		101 %	21-167		"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **10/25/18 12:23**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
C10-C28 (DRO)	ND	50	mg/kg	1	1810395	10/26/18	10/28/18	EPA 8015M	

Date Sampled: **10/25/18 12:23**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Surrogate: o-Terphenyl		102 %	30-150		"	"	"	"	

Summit Scientific

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

Project: Morrison 33-1

Project Number: 2347-6000-930.88

Project Manager: Maggie Graham

**Reported:**

11/02/18 07:12

**BH2@14**  
**1810324-13 (Soil)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **10/25/18 12:49**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Benzene	ND	0.0020	mg/kg	1	1810376	10/25/18	10/25/18	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **10/25/18 12:49**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Surrogate: 1,2-Dichloroethane-d4		119 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		101 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		101 %	21-167		"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **10/25/18 12:49**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
C10-C28 (DRO)	ND	50	mg/kg	1	1810377	"	10/25/18	EPA 8015M	

Date Sampled: **10/25/18 12:49**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Surrogate: o-Terphenyl		92.0 %	30-150		"	"	"	"	

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

Project: Morrison 33-1

Project Number: 2347-6000-930.88

Project Manager: Maggie Graham

**Reported:**  
11/02/18 07:12

**BH2@6**  
**1810324-14 (Soil)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **10/25/18 12:54**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	0.0020		mg/kg	1	1810376	10/25/18	10/26/18	EPA 8260B	
Toluene	ND	0.0050		"	"	"	"	"	"	
Ethylbenzene	ND	0.0050		"	"	"	"	"	"	
<b>Xylenes (total)</b>	<b>0.035</b>	0.010		"	"	"	"	"	"	
<b>Gasoline Range Hydrocarbons</b>	<b>7.9</b>	0.50		"	"	"	"	"	"	

Date Sampled: **10/25/18 12:54**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
<i>Surrogate: 1,2-Dichloroethane-d4</i>		108 %		23-173		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		100 %		20-170		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		150 %		21-167		"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **10/25/18 12:54**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
C10-C28 (DRO)	ND	50		mg/kg	1	1810377	"	10/25/18	EPA 8015M	

Date Sampled: **10/25/18 12:54**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
<i>Surrogate: o-Terphenyl</i>		89.4 %		30-150		"	"	"	"	

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

Project: Morrison 33-1

Project Number: 2347-6000-930.88

Project Manager: Maggie Graham

**Reported:**

11/02/18 07:12

**BH3@12**

**1810324-15 (Soil)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **10/25/18 13:44**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	1810394	10/26/18	10/27/18	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **10/25/18 13:44**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		112 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		99.6 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		102 %	21-167		"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **10/25/18 13:44**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1810395	10/26/18	10/28/18	EPA 8015M	

Date Sampled: **10/25/18 13:44**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		101 %	30-150		"	"	"	"	

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

Project: Morrison 33-1

Project Number: 2347-6000-930.88

Project Manager: Maggie Graham

**Reported:**

11/02/18 07:12

**BH3@8**  
**1810324-16 (Soil)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **10/25/18 13:46**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Benzene	ND	0.0020	mg/kg	1	1810394	10/26/18	10/27/18	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **10/25/18 13:46**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Surrogate: 1,2-Dichloroethane-d4		101 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		100 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		105 %	21-167		"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **10/25/18 13:46**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
C10-C28 (DRO)	ND	50	mg/kg	1	1810395	10/26/18	10/28/18	EPA 8015M	

Date Sampled: **10/25/18 13:46**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Surrogate: o-Terphenyl		102 %	30-150		"	"	"	"	

Summit Scientific

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

Project: Morrison 33-1

Project Number: 2347-6000-930.88

Project Manager: Maggie Graham

**Reported:**

11/02/18 07:12

**BH9@8**

**1810324-17 (Soil)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **10/25/18 14:18**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	1810394	10/26/18	10/27/18	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **10/25/18 14:18**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		106 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		99.5 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		101 %	21-167		"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **10/25/18 14:18**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1810395	10/26/18	10/28/18	EPA 8015M	

Date Sampled: **10/25/18 14:18**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		103 %	30-150		"	"	"	"	

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

Project: Morrison 33-1

Project Number: 2347-6000-930.88

Project Manager: Maggie Graham

**Reported:**

11/02/18 07:12

**BH9@12**

**1810324-18 (Soil)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **10/25/18 14:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	1810394	10/26/18	10/27/18	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **10/25/18 14:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		106 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		99.0 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		103 %	21-167		"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **10/25/18 14:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1810395	10/26/18	10/28/18	EPA 8015M	

Date Sampled: **10/25/18 14:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		103 %	30-150		"	"	"	"	

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

Project: Morrison 33-1

Project Number: 2347-6000-930.88

Project Manager: Maggie Graham

**Reported:**

11/02/18 07:12

**BH01**  
**1810324-19 (Water)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **10/25/18 15:08**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
<b>Benzene</b>	<b>410</b>	10		ug/l	10	1810428	10/30/18	10/31/18	EPA 8260B	
Toluene	ND	1.0		"	1	"	"	"	"	
<b>Ethylbenzene</b>	<b>280</b>	1.0		"	"	"	"	"	"	
<b>Xylenes (total)</b>	<b>250</b>	2.0		"	"	"	"	"	"	

Date Sampled: **10/25/18 15:08**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		116 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		98.6 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		140 %		21-167		"	"	"	"	

Summit Scientific

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

Project: Morrison 33-1

Project Number: 2347-6000-930.88

Project Manager: Maggie Graham

**Reported:**

11/02/18 07:12

**BH02**  
**1810324-20 (Water)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **10/25/18 14:31**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
<b>Benzene</b>	<b>2.9</b>	1.0		ug/l	1	1810344	10/25/18	10/25/18	EPA 8260B	
Toluene	ND	1.0		"	"	"	"	"	"	
<b>Ethylbenzene</b>	<b>17</b>	1.0		"	"	"	"	"	"	
Xylenes (total)	ND	2.0		"	"	"	"	"	"	

Date Sampled: **10/25/18 14:31**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		83.9 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		96.4 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		90.6 %		21-167		"	"	"	"	

Summit Scientific

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

Project: Morrison 33-1

Project Number: 2347-6000-930.88

Project Manager: Maggie Graham

**Reported:**

11/02/18 07:12

**BH03**

**1810324-21 (Water)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **10/25/18 14:51**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	1810428	10/30/18	10/31/18	EPA 8260B	
Toluene	ND	1.0		"	"	"	"	"	"	
Ethylbenzene	ND	1.0		"	"	"	"	"	"	
Xylenes (total)	ND	2.0		"	"	"	"	"	"	

Date Sampled: **10/25/18 14:51**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		118 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		98.6 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		115 %		21-167		"	"	"	"	

Summit Scientific

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

Project: Morrison 33-1

Project Number: 2347-6000-930.88

Project Manager: Maggie Graham

**Reported:**  
 11/02/18 07:12

**BH04**  
**1810324-22 (Water)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **10/25/18 14:57**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
<b>Benzene</b>	<b>140</b>	1.0		ug/l	1	1810428	10/30/18	10/31/18	EPA 8260B	
Toluene	ND	1.0		"	"	"	"	"	"	
<b>Ethylbenzene</b>	<b>130</b>	1.0		"	"	"	"	"	"	
Xylenes (total)	ND	2.0		"	"	"	"	"	"	

Date Sampled: **10/25/18 14:57**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		112 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		102 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		139 %		21-167		"	"	"	"	

Summit Scientific

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

Project: Morrison 33-1

Project Number: 2347-6000-930.88

Project Manager: Maggie Graham

**Reported:**

11/02/18 07:12

**BH05**

**1810324-23 (Water)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **10/25/18 14:48**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	1810428	10/30/18	10/31/18	EPA 8260B	
Toluene	ND	1.0		"	"	"	"	"	"	
<b>Ethylbenzene</b>	<b>1.2</b>	1.0		"	"	"	"	"	"	
Xylenes (total)	ND	2.0		"	"	"	"	"	"	

Date Sampled: **10/25/18 14:48**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		109 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		97.9 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		113 %		21-167		"	"	"	"	

Summit Scientific

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 370 17th Street Suite 5300  
 Denver CO, 80202

Project: Morrison 33-1

Project Number: 2347-6000-930.88

Project Manager: Maggie Graham

**Reported:**  
 11/02/18 07:12

**BH06**  
**1810324-24 (Water)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **10/25/18 14:38**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
<b>Benzene</b>	<b>20</b>	1.0		ug/l	1	1810428	10/30/18	10/31/18	EPA 8260B	
Toluene	ND	1.0		"	"	"	"	"	"	
<b>Ethylbenzene</b>	<b>73</b>	1.0		"	"	"	"	"	"	
<b>Xylenes (total)</b>	<b>200</b>	2.0		"	"	"	"	"	"	

Date Sampled: **10/25/18 14:38**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		113 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		97.1 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		121 %		21-167		"	"	"	"	

Summit Scientific

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

Project: Morrison 33-1

Project Number: 2347-6000-930.88

Project Manager: Maggie Graham

**Reported:**

11/02/18 07:12

**BH07**  
**1810324-25 (Water)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **10/25/18 15:01**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	1810428	10/30/18	10/31/18	EPA 8260B	
Toluene	ND	1.0		"	"	"	"	"	"	
Ethylbenzene	ND	1.0		"	"	"	"	"	"	
Xylenes (total)	ND	2.0		"	"	"	"	"	"	

Date Sampled: **10/25/18 15:01**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		103 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		97.0 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		113 %		21-167		"	"	"	"	

Summit Scientific

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Project: Morrison 33-1

Project Number: 2347-6000-930.88

Project Manager: Maggie Graham

**Reported:**

11/02/18 07:12

**BH08**

**1810324-26 (Water)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **10/25/18 15:03**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	1810428	10/30/18	10/31/18	EPA 8260B	
Toluene	ND	1.0		"	"	"	"	"	"	
Ethylbenzene	ND	1.0		"	"	"	"	"	"	
Xylenes (total)	ND	2.0		"	"	"	"	"	"	

Date Sampled: **10/25/18 15:03**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		106 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		99.5 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		110 %		21-167		"	"	"	"	

Summit Scientific

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

Project: Morrison 33-1

Project Number: 2347-6000-930.88

Project Manager: Maggie Graham

**Reported:**

11/02/18 07:12

**BH09**  
**1810324-27 (Water)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **10/25/18 15:15**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	1810428	10/30/18	10/31/18	EPA 8260B	
Toluene	ND	1.0		"	"	"	"	"	"	
Ethylbenzene	ND	1.0		"	"	"	"	"	"	
Xylenes (total)	ND	2.0		"	"	"	"	"	"	

Date Sampled: **10/25/18 15:15**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		109 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		98.4 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		112 %		21-167		"	"	"	"	

Summit Scientific

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

Project: Morrison 33-1

Project Number: 2347-6000-930.88

Project Manager: Maggie Graham

Reported:

11/02/18 07:12

### Volatile Organic Compounds by EPA Method 8260B - Quality Control

#### Summit Scientific

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

#### Batch 1810344 - EPA 5030 Water MS

##### Blank (1810344-BLK1)

Prepared: 10/24/18 Analyzed: 10/26/18

Benzene	ND	1.0	ug/l								
Toluene	ND	1.0	"								
Ethylbenzene	ND	1.0	"								
Xylenes (total)	ND	2.0	"								
Surrogate: 1,2-Dichloroethane-d4	9.74		"	13.2		73.8		23-173			
Surrogate: Toluene-d8	12.7		"	13.3		95.0		20-170			
Surrogate: 4-Bromofluorobenzene	11.7		"	13.3		88.1		21-167			

##### LCS (1810344-BS1)

Prepared: 10/24/18 Analyzed: 10/26/18

Benzene	23.6	1.0	ug/l	33.3		70.7		70-130			
Toluene	26.7	1.0	"	33.3		80.0		70-130			
Ethylbenzene	28.4	1.0	"	33.3		85.3		70-130			
m,p-Xylene	59.1	2.0	"	66.7		88.6		70-130			
o-Xylene	29.4	1.0	"	33.3		88.2		70-130			
Surrogate: 1,2-Dichloroethane-d4	10.0		"	13.2		76.1		23-173			
Surrogate: Toluene-d8	12.7		"	13.3		95.3		20-170			
Surrogate: 4-Bromofluorobenzene	12.1		"	13.3		90.6		21-167			

##### Matrix Spike (1810344-MS1)

Source: 1810291-01

Prepared: 10/24/18 Analyzed: 10/26/18

Benzene	28.1	1.0	ug/l	33.3	ND	84.2		70-130			
Toluene	26.4	1.0	"	33.3	ND	79.3		70-130			
Ethylbenzene	41.0	1.0	"	33.3	ND	123		70-130			
m,p-Xylene	60.4	2.0	"	66.7	ND	90.6		70-130			
o-Xylene	30.2	1.0	"	33.3	ND	90.8		70-130			
Surrogate: 1,2-Dichloroethane-d4	9.98		"	13.2		75.6		23-173			
Surrogate: Toluene-d8	12.2		"	13.3		91.4		20-170			
Surrogate: 4-Bromofluorobenzene	12.0		"	13.3		90.4		21-167			

Summit Scientific

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

Project: Morrison 33-1

Project Number: 2347-6000-930.88

Project Manager: Maggie Graham

Reported:

11/02/18 07:12

### Volatile Organic Compounds by EPA Method 8260B - Quality Control

#### Summit Scientific

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

#### Batch 1810344 - EPA 5030 Water MS

##### Matrix Spike Dup (1810344-MSD1)

Source: 1810291-01

Prepared: 10/24/18 Analyzed: 10/26/18

Benzene	26.8	1.0	ug/l	33.3	ND	80.4	70-130	4.59	30	
Toluene	28.3	1.0	"	33.3	ND	84.9	70-130	6.91	30	
Ethylbenzene	41.0	1.0	"	33.3	ND	123	70-130	0.122	30	
m,p-Xylene	64.0	2.0	"	66.7	ND	96.1	70-130	5.88	30	
o-Xylene	32.9	1.0	"	33.3	ND	98.6	70-130	8.30	30	
Surrogate: 1,2-Dichloroethane-d4	10.1		"	13.2		76.7	23-173			
Surrogate: Toluene-d8	12.3		"	13.3		92.2	20-170			
Surrogate: 4-Bromofluorobenzene	12.1		"	13.3		90.9	21-167			

#### Batch 1810376 - EPA 5030 Soil MS

##### Blank (1810376-BLK1)

Prepared: 10/25/18 Analyzed: 10/26/18

Benzene	ND	0.0020	mg/kg							
Toluene	ND	0.0050	"							
Ethylbenzene	ND	0.0050	"							
Xylenes (total)	ND	0.010	"							
Gasoline Range Hydrocarbons	ND	0.50	"							
Surrogate: 1,2-Dichloroethane-d4	0.0469		"	0.0396		118	23-173			
Surrogate: Toluene-d8	0.0411		"	0.0400		103	20-170			
Surrogate: 4-Bromofluorobenzene	0.0460		"	0.0400		115	21-167			

##### LCS (1810376-BS1)

Prepared: 10/25/18 Analyzed: 10/26/18

Benzene	0.0765	0.0020	mg/kg	0.100		76.5	70-130			
Toluene	0.0837	0.0050	"	0.100		83.7	70-130			
Ethylbenzene	0.0880	0.0050	"	0.100		88.0	70-130			
m,p-Xylene	0.168	0.010	"	0.200		84.2	70-130			
o-Xylene	0.0898	0.0050	"	0.100		89.8	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.0460		"	0.0396		116	23-173			
Surrogate: Toluene-d8	0.0410		"	0.0400		102	20-170			
Surrogate: 4-Bromofluorobenzene	0.0422		"	0.0400		106	21-167			

Summit Scientific

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

Project: Morrison 33-1

Project Number: 2347-6000-930.88

Project Manager: Maggie Graham

**Reported:**  
11/02/18 07:12

### Volatile Organic Compounds by EPA Method 8260B - Quality Control

#### Summit Scientific

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

#### Batch 1810376 - EPA 5030 Soil MS

##### Matrix Spike (1810376-MS1)

Source: 1810321-01

Prepared: 10/25/18 Analyzed: 10/26/18

Benzene	0.0773	0.0020	mg/kg	0.100	ND	77.3	70-130			
Toluene	0.0879	0.0050	"	0.100	ND	87.9	70-130			
Ethylbenzene	0.0904	0.0050	"	0.100	ND	90.4	70-130			
m,p-Xylene	0.176	0.010	"	0.200	ND	88.2	70-130			
o-Xylene	0.0927	0.0050	"	0.100	ND	92.7	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.0492		"	0.0396		124	23-173			
Surrogate: Toluene-d8	0.0419		"	0.0400		105	20-170			
Surrogate: 4-Bromofluorobenzene	0.0450		"	0.0400		113	21-167			

##### Matrix Spike Dup (1810376-MSD1)

Source: 1810321-01

Prepared: 10/25/18 Analyzed: 10/26/18

Benzene	0.0822	0.0020	mg/kg	0.100	ND	82.2	70-130	6.06	30	
Toluene	0.0893	0.0050	"	0.100	ND	89.3	70-130	1.66	30	
Ethylbenzene	0.0887	0.0050	"	0.100	ND	88.7	70-130	1.88	30	
m,p-Xylene	0.174	0.010	"	0.200	ND	87.0	70-130	1.37	30	
o-Xylene	0.0892	0.0050	"	0.100	ND	89.2	70-130	3.89	30	
Surrogate: 1,2-Dichloroethane-d4	0.0490		"	0.0396		124	23-173			
Surrogate: Toluene-d8	0.0430		"	0.0400		107	20-170			
Surrogate: 4-Bromofluorobenzene	0.0436		"	0.0400		109	21-167			

#### Batch 1810394 - EPA 5030 Soil MS

##### Blank (1810394-BLK1)

Prepared & Analyzed: 10/26/18

Benzene	ND	0.0020	mg/kg							
Toluene	ND	0.0050	"							
Ethylbenzene	ND	0.0050	"							
Xylenes (total)	ND	0.010	"							
Gasoline Range Hydrocarbons	ND	0.50	"							
Surrogate: 1,2-Dichloroethane-d4	0.0434		"	0.0400		108	23-173			
Surrogate: Toluene-d8	0.0393		"	0.0400		98.3	20-170			
Surrogate: 4-Bromofluorobenzene	0.0422		"	0.0400		105	21-167			

Summit Scientific

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

Project: Morrison 33-1

Project Number: 2347-6000-930.88

Project Manager: Maggie Graham

Reported:

11/02/18 07:12

**Volatile Organic Compounds by EPA Method 8260B - Quality Control**

**Summit Scientific**

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

**Batch 1810394 - EPA 5030 Soil MS**

**LCS (1810394-BS1)**

Prepared & Analyzed: 10/26/18

Benzene	0.113	0.0020	mg/kg	0.100		113	70-130			
Toluene	0.117	0.0050	"	0.100		117	70-130			
Ethylbenzene	0.124	0.0050	"	0.100		124	70-130			
m,p-Xylene	0.249	0.010	"	0.200		124	70-130			
o-Xylene	0.118	0.0050	"	0.100		118	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.0399		"	0.0400		99.8	23-173			
Surrogate: Toluene-d8	0.0404		"	0.0400		101	20-170			
Surrogate: 4-Bromofluorobenzene	0.0406		"	0.0400		101	21-167			

**Matrix Spike (1810394-MS1)**

Source: 1810324-01

Prepared & Analyzed: 10/26/18

Benzene	0.119	0.0020	mg/kg	0.100	ND	119	70-130			
Toluene	0.125	0.0050	"	0.100	ND	125	70-130			
Ethylbenzene	0.132	0.0050	"	0.100	ND	132	70-135			
m,p-Xylene	0.264	0.010	"	0.200	ND	132	70-135			
o-Xylene	0.127	0.0050	"	0.100	ND	127	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.0425		"	0.0400		106	23-173			
Surrogate: Toluene-d8	0.0405		"	0.0400		101	20-170			
Surrogate: 4-Bromofluorobenzene	0.0406		"	0.0400		101	21-167			

**Matrix Spike Dup (1810394-MSD1)**

Source: 1810324-01

Prepared & Analyzed: 10/26/18

Benzene	0.109	0.0020	mg/kg	0.100	ND	109	70-130	8.20	30	
Toluene	0.114	0.0050	"	0.100	ND	114	70-130	9.41	30	
Ethylbenzene	0.120	0.0050	"	0.100	ND	120	70-130	9.05	30	
m,p-Xylene	0.241	0.010	"	0.200	ND	121	70-130	8.95	30	
o-Xylene	0.116	0.0050	"	0.100	ND	116	70-130	9.30	30	
Surrogate: 1,2-Dichloroethane-d4	0.0421		"	0.0400		105	23-173			
Surrogate: Toluene-d8	0.0400		"	0.0400		100	20-170			
Surrogate: 4-Bromofluorobenzene	0.0408		"	0.0400		102	21-167			

Summit Scientific

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

Project: Morrison 33-1

Project Number: 2347-6000-930.88

Project Manager: Maggie Graham

Reported:

11/02/18 07:12

**Volatile Organic Compounds by EPA Method 8260B - Quality Control**

**Summit Scientific**

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

**Batch 1810428 - EPA 5030 Water MS**

**Blank (1810428-BLK1)**

Prepared: 10/30/18 Analyzed: 10/31/18

Benzene	ND	1.0	ug/l								
Toluene	ND	1.0	"								
Ethylbenzene	ND	1.0	"								
Xylenes (total)	ND	2.0	"								
Surrogate: 1,2-Dichloroethane-d4	12.9		"	13.2		97.7	23-173				
Surrogate: Toluene-d8	13.5		"	13.3		101	20-170				
Surrogate: 4-Bromofluorobenzene	15.9		"	13.3		119	21-167				

**LCS (1810428-BS1)**

Prepared: 10/30/18 Analyzed: 10/31/18

Benzene	26.2	1.0	ug/l	33.3		78.8	70-130				
Toluene	26.9	1.0	"	33.3		80.6	70-130				
Ethylbenzene	28.9	1.0	"	33.3		86.6	70-130				
m,p-Xylene	56.4	2.0	"	66.7		84.6	70-130				
o-Xylene	30.0	1.0	"	33.3		90.1	70-130				
Surrogate: 1,2-Dichloroethane-d4	13.7		"	13.2		104	23-173				
Surrogate: Toluene-d8	13.2		"	13.3		99.2	20-170				
Surrogate: 4-Bromofluorobenzene	14.7		"	13.3		110	21-167				

**Matrix Spike (1810428-MS1)**

Source: 1810324-19

Prepared: 10/30/18 Analyzed: 10/31/18

Benzene	328	1.0	ug/l	33.3	409	NR	70-130				E
Toluene	27.8	1.0	"	33.3	ND	83.3	70-130				
Ethylbenzene	302	1.0	"	33.3	283	57.3	70-130				E
m,p-Xylene	279	2.0	"	66.7	245	50.2	70-130				E
o-Xylene	31.3	1.0	"	33.3	ND	93.9	70-130				
Surrogate: 1,2-Dichloroethane-d4	18.9		"	13.2		143	23-173				
Surrogate: Toluene-d8	13.4		"	13.3		100	20-170				
Surrogate: 4-Bromofluorobenzene	18.0		"	13.3		135	21-167				

Summit Scientific

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

Project: Morrison 33-1

Project Number: 2347-6000-930.88

Project Manager: Maggie Graham

**Reported:**  
11/02/18 07:12

**Volatile Organic Compounds by EPA Method 8260B - Quality Control**

**Summit Scientific**

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

**Batch 1810428 - EPA 5030 Water MS**

<b>Matrix Spike Dup (1810428-MSD1)</b>	<b>Source: 1810324-19</b>			Prepared: 10/30/18 Analyzed: 10/31/18							
Benzene	308	1.0	ug/l	33.3	409	NR	70-130	6.37	30		E
Toluene	28.7	1.0	"	33.3	ND	86.0	70-130	3.19	30		
Ethylbenzene	287	1.0	"	33.3	283	10.3	70-130	5.32	30		E
m,p-Xylene	264	2.0	"	66.7	245	27.3	70-130	5.64	30		E
o-Xylene	31.6	1.0	"	33.3	ND	94.8	70-130	0.954	30		
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>17.0</i>		<i>"</i>	<i>13.2</i>		<i>128</i>	<i>23-173</i>				
<i>Surrogate: Toluene-d8</i>	<i>13.6</i>		<i>"</i>	<i>13.3</i>		<i>102</i>	<i>20-170</i>				
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>17.8</i>		<i>"</i>	<i>13.3</i>		<i>133</i>	<i>21-167</i>				

Summit Scientific

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

Project: Morrison 33-1

Project Number: 2347-6000-930.88

Project Manager: Maggie Graham

**Reported:**

11/02/18 07:12

**Extractable Petroleum Hydrocarbons by 8015 - Quality Control**

**Summit Scientific**

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

**Batch 1810377 - EPA 3550A**

**Blank (1810377-BLK1)**

Prepared: 10/25/18 Analyzed: 10/26/18

C10-C28 (DRO) ND 50 mg/kg

**LCS (1810377-BS1)**

Prepared: 10/25/18 Analyzed: 10/26/18

C10-C28 (DRO) 526 50 mg/kg 500 105 70-130

**Matrix Spike (1810377-MS1)**

**Source: 1810321-01**

Prepared: 10/25/18 Analyzed: 10/26/18

C10-C28 (DRO) 540 50 mg/kg 500 22.7 103 70-130

**Matrix Spike Dup (1810377-MSD1)**

**Source: 1810321-01**

Prepared: 10/25/18 Analyzed: 10/26/18

C10-C28 (DRO) 579 50 mg/kg 500 22.7 111 70-130 6.97 20

**Batch 1810395 - EPA 3550A**

**Blank (1810395-BLK1)**

Prepared: 10/26/18 Analyzed: 10/27/18

C10-C28 (DRO) ND 50 mg/kg

**LCS (1810395-BS1)**

Prepared: 10/26/18 Analyzed: 10/27/18

C10-C28 (DRO) 580 50 mg/kg 500 116 70-130

**Matrix Spike (1810395-MS1)**

**Source: 1810324-02**

Prepared: 10/26/18 Analyzed: 10/27/18

C10-C28 (DRO) 586 50 mg/kg 500 14.9 114 70-130

**Matrix Spike Dup (1810395-MSD1)**

**Source: 1810324-02**

Prepared: 10/26/18 Analyzed: 10/27/18

C10-C28 (DRO) 602 50 mg/kg 500 14.9 117 70-130 2.55 20

Summit Scientific

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

Project: Morrison 33-1

Project Number: 2347-6000-930.88

Project Manager: Maggie Graham

**Reported:**  
11/02/18 07:12

### Notes and Definitions

- S-02 The surrogate recovery for this sample cannot be accurately quantified due to interference from coeluting organic compounds present in the sample extract.
- E The concentration indicated for this analyte is an estimated value above the calibration range of the instrument.
- 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

# Summit Scientific

---

4653 Table Mountain Drive, Golden, Colorado 80403

303.277.9310

March 06, 2019

Maggie Graham

Extraction Oil&Gas

370 17th Street Suite 5300

Denver, CO 80202

RE: Morrison 33-1

Enclosed are the results of analyses for samples received by Summit Scientific on 02/27/19 16:13. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink that reads "Muri Premer". The signature is written in a cursive style with a large initial "M" and a long, sweeping underline.

Muri Premer For Ben Shrewsbury

Laboratory Manager



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

Project: Morrison 33-1

Project Number: 2347-6000-930.88

Project Manager: Maggie Graham

**Reported:**  
03/06/19 09:30

### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BH8	1902268-01	Water	02/27/19 14:00	02/27/19 16:13
BH4	1902268-02	Water	02/27/19 14:45	02/27/19 16:13
BH1	1902268-03	Water	02/27/19 14:26	02/27/19 16:13
BH6	1902268-04	Water	02/27/19 14:15	02/27/19 16:13
BH2	1902268-05	Water	02/27/19 14:30	02/27/19 16:13

Summit Scientific

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# Summit Scientific

4653 Table Mountain Drive ♦ Golden, Colorado 80403  
303-277-9310 ♦ 303-374-5933 Fax

Client: APEX Companies, LLC  
Address: 176 Cole Blvd. Suite 250  
City/State/Zip: Lakewood, Colorado 80101  
Phone: 720-501-5065 Fax:  
Sampler Name: Ryan Finley + Ken Worthington

Project Manager: Maggie Graham 720-501-5065; 907-538-7699c  
E-Mail: DenverRemediation@ApexCos.onmicrosoft.com  
Project Name: Morrison 33-1  
Project Number: 2377-6000-930.88

Sample Description	Date Sampled	Time Sampled	Number of Containers	Preservative				Matrix		Analyze For:							Special Instructions	
				HCl	HNO <sub>3</sub>	None	Other (Specify)	Groundwater	Soil	Air - Canister Serial #	Other (Specify)	BTEX	Nitrate	Sulfate	total phosphorus	Reduced Iron		Reduced Microbiology
BH8	2/27/19	1400	6	X	X		X	X			X	X	X	X	X	X		Call Maggie Graham with questions  NO REDUCED Mn per R.F.
BH4	↓	1445	6	X	X		X				X	X	X	X	X	X		
BH1	↓	1426	6	X	X		X				X	X	X	X	X	X		
BH6	↓	1415	3	X														
BH2	↓	1430	3	X														
Relinquished by: <i>Ryan Finley</i> Date/Time: 2/27/19 1613				Received by: <i>[Signature]</i> Date/Time: 2.27.19 1613				Turn Around Time (Check)				Notes						
Relinquished by:				Received by:				Same Day <input type="checkbox"/> 72 Hours <input type="checkbox"/>				Circle applicable regulatory agency:						
Relinquished by:				Received in Lab by:				24 Hours <input type="checkbox"/> Standard <input checked="" type="checkbox"/>				COGCC/CDPHE						
Relinquished by:				Received in Lab by:				48 Hours <input type="checkbox"/>				Client Name: <i>XOG</i>						
Relinquished by:				Received in Lab by:				Sample Integrity: Temperature Upon Receipt: 7.9										
Relinquished by:				Received in Lab by:				Intact: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>										

**Sample Receipt Checklist**

S2 Work Order 1902268

Client: APEX/COGCC Client Project ID: Morrison 33-1

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

Matrix (check all that apply):  Air  Soil/Solid  Water  Other: \_\_\_\_\_  
(Describe)

Temp (°C)	<u>7.9</u>
-----------	------------

Thermometer ID: 61857155-K

	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature at 4°C +/- 2°C <sup>(1)</sup> ? NOTE: If samples are delivered the same day of sampling, this requirement is met provided that there is evidence that cooling has begun.	/			
Were all samples received intact <sup>(1)</sup> ?	/			
Was adequate sample volume provided <sup>(1)</sup> ?	/			
If custody seals are present, are they intact <sup>(1)</sup> ?			/	
Are samples with holding times due within 48 hours sample due within 48 hours present?			/	
Is a chain-of-custody (COC) form present and filled out completely <sup>(1)</sup> ?	/			
Does the COC agree with the number and type of sample bottles received <sup>(1)</sup> ?	/			
Do the sample IDs on the bottle labels match the COC <sup>(1)</sup> ?	/			
Is the COC properly relinquished by the client w/ date and time recorded <sup>(1)</sup> ?	/			
For volatiles in water – is there headspace present? <b>If yes, contact client and note in narrative.</b>		/		
Are samples preserved that require preservation (excluding cooling) <sup>(1)</sup> ? Note the type of preservative in the Comments column – HCl, H2SO4, NaOH, HNO3, ect	/			HCl, HNO3 heavy
If samples are acid preserved for metals, is the pH ≤ 2 <sup>(1)</sup> ? Record the pH in Comments.		/		pH 5-9 fixed by lab
If dissolved metals are requested, were samples field filtered?			/	

Additional Comments (if any):

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

UP  
Custodian Printed Name or Initials

[Signature]  
Signature of Custodian

2.27.14 1845  
Date/Time



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

Project: Morrison 33-1

Project Number: 2347-6000-930.88

Project Manager: Maggie Graham

**Reported:**  
03/06/19 09:30

**BH8**  
**1902268-01 (Water)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **02/27/19 14:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1902348	02/28/19	03/03/19	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **02/27/19 14:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		92.1 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		97.8 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		98.0 %	21-167		"	"	"	"	

**Total Metals by EPA Method 200.8**

Date Sampled: **02/27/19 14:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Phosphorus</b>	<b>1.94</b>	0.0100	mg/L	1	1902360	02/28/19	02/28/19	EPA 200.8	

**Ferrous Iron**

Date Sampled: **02/27/19 14:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Ferrous Iron</b>	<b>1.680</b>	0.02000	mg/L	1	1903015	02/27/19	02/27/19	SM3500-Fe	

**Anions by EPA Method 300.0**

Date Sampled: **02/27/19 14:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Sulfate</b>	<b>2240</b>	60.0	mg/L	200	1902353	02/28/19	02/28/19	EPA 300.0	
<b>Nitrate as N</b>	<b>2.02</b>	0.0500	"	1	"	"	"	"	

Summit Scientific

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

Project: Morrison 33-1

Project Number: 2347-6000-930.88

Project Manager: Maggie Graham

**Reported:**  
03/06/19 09:30

**BH8**

**1902268-01 (Water)**

**Summit Scientific**

**Anions by EPA Method 300.0**

---

Summit Scientific

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

Project: Morrison 33-1

Project Number: 2347-6000-930.88

Project Manager: Maggie Graham

**Reported:**  
03/06/19 09:30

**BH4**  
**1902268-02 (Water)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **02/27/19 14:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Benzene</b>	<b>45</b>	1.0	ug/l	1	1902348	02/28/19	03/03/19	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
<b>Ethylbenzene</b>	<b>1.5</b>	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **02/27/19 14:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		89.2 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		96.7 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		112 %	21-167		"	"	"	"	

**Total Metals by EPA Method 200.8**

Date Sampled: **02/27/19 14:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Phosphorus</b>	<b>2.33</b>	0.0100	mg/L	1	1902360	02/28/19	02/28/19	EPA 200.8	

**Ferrous Iron**

Date Sampled: **02/27/19 14:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Ferrous Iron</b>	<b>2.360</b>	0.02000	mg/L	1	1903015	02/27/19	02/27/19	SM3500-Fe	

**Anions by EPA Method 300.0**

Date Sampled: **02/27/19 14:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Nitrate as N</b>	<b>0.145</b>	0.0500	mg/L	1	1902353	02/28/19	02/28/19	EPA 300.0	
<b>Sulfate</b>	<b>409</b>	60.0	"	200	"	"	"	"	

Summit Scientific

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

Project: Morrison 33-1

Project Number: 2347-6000-930.88

Project Manager: Maggie Graham

**Reported:**  
 03/06/19 09:30

**BH4**

**1902268-02 (Water)**

**Summit Scientific**

**Anions by EPA Method 300.0**

**Chemical Oxygen Demand by EPA Approved Method Hach 8000**

Date Sampled: **02/27/19 14:45**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
<b>Chemical Oxygen Demand</b>	<b>49.3</b>	3.00		mg/L	1	1903043	03/05/19	03/05/19	Hach 8000	

Summit Scientific

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

Project: Morrison 33-1

Project Number: 2347-6000-930.88

Project Manager: Maggie Graham

**Reported:**  
03/06/19 09:30

**BH1**  
**1902268-03 (Water)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **02/27/19 14:26**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Benzene</b>	<b>26</b>	1.0	ug/l	1	1902348	02/28/19	03/03/19	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
<b>Ethylbenzene</b>	<b>7.2</b>	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **02/27/19 14:26**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		90.4 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		95.5 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		104 %	21-167		"	"	"	"	

**Total Metals by EPA Method 200.8**

Date Sampled: **02/27/19 14:26**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Phosphorus</b>	<b>0.993</b>	0.0100	mg/L	1	1902360	02/28/19	02/28/19	EPA 200.8	

**Ferrous Iron**

Date Sampled: **02/27/19 14:26**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Ferrous Iron</b>	<b>8.100</b>	0.2000	mg/L	10	1903015	02/27/19	02/27/19	SM3500-Fe	

**Anions by EPA Method 300.0**

Date Sampled: **02/27/19 14:26**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Sulfate</b>	<b>1870</b>	60.0	mg/L	200	1902353	02/28/19	02/28/19	EPA 300.0	
<b>Nitrate as N</b>	<b>1.19</b>	0.0500	"	1	"	"	"	"	

Summit Scientific

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

Project: Morrison 33-1

Project Number: 2347-6000-930.88

Project Manager: Maggie Graham

**Reported:**  
 03/06/19 09:30

**BH1**  
**1902268-03 (Water)**

**Summit Scientific**

**Anions by EPA Method 300.0**

**Chemical Oxygen Demand by EPA Approved Method Hach 8000**

Date Sampled: **02/27/19 14:26**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
<b>Chemical Oxygen Demand</b>	<b>41.6</b>	3.00		mg/L	1	1903043	03/05/19	03/05/19	Hach 8000	

Summit Scientific



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

Project: Morrison 33-1

Project Number: 2347-6000-930.88

Project Manager: Maggie Graham

**Reported:**  
03/06/19 09:30

**BH6**  
**1902268-04 (Water)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **02/27/19 14:15**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
<b>Benzene</b>	<b>1.3</b>	1.0		ug/l	1	1902348	02/28/19	03/03/19	EPA 8260B	
Toluene	ND	1.0		"	"	"	"	"	"	
Ethylbenzene	ND	1.0		"	"	"	"	"	"	
Xylenes (total)	ND	2.0		"	"	"	"	"	"	

Date Sampled: **02/27/19 14:15**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		89.9 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		97.4 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		105 %		21-167		"	"	"	"	

Summit Scientific

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

Project: Morrison 33-1

Project Number: 2347-6000-930.88

Project Manager: Maggie Graham

**Reported:**  
03/06/19 09:30

**BH2**  
**1902268-05 (Water)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **02/27/19 14:30**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
<b>Benzene</b>	<b>6.0</b>	1.0		ug/l	1	1902348	02/28/19	03/03/19	EPA 8260B	
Toluene	ND	1.0		"	"	"	"	"	"	
<b>Ethylbenzene</b>	<b>3.5</b>	1.0		"	"	"	"	"	"	
Xylenes (total)	ND	2.0		"	"	"	"	"	"	

Date Sampled: **02/27/19 14:30**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		91.7 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		98.9 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		106 %		21-167		"	"	"	"	

Summit Scientific

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

Project: Morrison 33-1

Project Number: 2347-6000-930.88

Project Manager: Maggie Graham

**Reported:**  
03/06/19 09:30

**Volatile Organic Compounds by EPA Method 8260B - Quality Control**

**Summit Scientific**

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

**Batch 1902348 - EPA 5030 Water MS**

**Blank (1902348-BLK1)**

Prepared: 02/28/19 Analyzed: 03/02/19

Benzene	ND	1.0	ug/l								
Toluene	ND	1.0	"								
Ethylbenzene	ND	1.0	"								
Xylenes (total)	ND	2.0	"								
Surrogate: 1,2-Dichloroethane-d4	11.6		"	13.3		86.7	23-173				
Surrogate: Toluene-d8	12.9		"	13.3		96.7	20-170				
Surrogate: 4-Bromofluorobenzene	13.1		"	13.3		98.5	21-167				

**LCS (1902348-BS1)**

Prepared: 02/28/19 Analyzed: 03/02/19

Benzene	33.0	1.0	ug/l	33.3		99.1	70-130				
Toluene	34.6	1.0	"	33.3		104	70-130				
Ethylbenzene	36.3	1.0	"	33.3		109	70-130				
m,p-Xylene	75.0	2.0	"	66.7		112	70-130				
o-Xylene	34.2	1.0	"	33.3		102	70-130				
Surrogate: 1,2-Dichloroethane-d4	11.7		"	13.3		87.6	23-173				
Surrogate: Toluene-d8	12.9		"	13.3		96.8	20-170				
Surrogate: 4-Bromofluorobenzene	13.0		"	13.3		97.4	21-167				

**Matrix Spike (1902348-MS1)**

Source: 1902253-01

Prepared: 02/28/19 Analyzed: 03/02/19

Benzene	33.4	1.0	ug/l	33.3	ND	100	70-130				
Toluene	35.2	1.0	"	33.3	ND	106	70-130				
Ethylbenzene	35.6	1.0	"	33.3	ND	107	70-130				
m,p-Xylene	73.7	2.0	"	66.7	ND	111	70-130				
o-Xylene	33.7	1.0	"	33.3	ND	101	70-130				
Surrogate: 1,2-Dichloroethane-d4	12.1		"	13.3		90.9	23-173				
Surrogate: Toluene-d8	13.1		"	13.3		98.3	20-170				
Surrogate: 4-Bromofluorobenzene	12.5		"	13.3		94.1	21-167				

Summit Scientific

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

Project: Morrison 33-1

Project Number: 2347-6000-930.88

Project Manager: Maggie Graham

**Reported:**  
03/06/19 09:30

**Volatile Organic Compounds by EPA Method 8260B - Quality Control**

**Summit Scientific**

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

**Batch 1902348 - EPA 5030 Water MS**

**Matrix Spike Dup (1902348-MSD1)**

Source: 1902253-01

Prepared: 02/28/19 Analyzed: 03/02/19

Benzene	32.8	1.0	ug/l	33.3	ND	98.3	70-130	1.84	30	
Toluene	34.2	1.0	"	33.3	ND	103	70-130	2.91	30	
Ethylbenzene	35.7	1.0	"	33.3	ND	107	70-130	0.224	30	
m,p-Xylene	74.2	2.0	"	66.7	ND	111	70-130	0.568	30	
o-Xylene	33.7	1.0	"	33.3	ND	101	70-130	0.119	30	
Surrogate: 1,2-Dichloroethane-d4	12.6		"	13.3		94.6	23-173			
Surrogate: Toluene-d8	12.8		"	13.3		95.8	20-170			
Surrogate: 4-Bromofluorobenzene	12.9		"	13.3		97.0	21-167			

Summit Scientific

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

Project: Morrison 33-1

Project Number: 2347-6000-930.88

Project Manager: Maggie Graham

**Reported:**  
03/06/19 09:30

**Total Metals by EPA Method 200.8 - Quality Control**  
**Summit Scientific**

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

**Batch 1902360 - EPA 200.8**

**Blank (1902360-BLK1)**

Prepared & Analyzed: 02/28/19

Phosphorus ND 0.0100 mg/L

**LCS (1902360-BS1)**

Prepared & Analyzed: 02/28/19

Phosphorus 5.18 0.0100 mg/L 5.00 104 85-115

**Duplicate (1902360-DUP1)**

Source: 1902259-01

Prepared & Analyzed: 02/28/19

Phosphorus ND 0.0100 mg/L ND 20

**Matrix Spike (1902360-MS1)**

Source: 1902259-01

Prepared & Analyzed: 02/28/19

Phosphorus 4.86 0.0100 mg/L 5.00 ND 97.2 70-130

**Matrix Spike Dup (1902360-MSD1)**

Source: 1902259-01

Prepared & Analyzed: 02/28/19

Phosphorus 4.90 0.0100 mg/L 5.00 ND 98.0 70-130 0.821 25

Summit Scientific

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

Project: Morrison 33-1

Project Number: 2347-6000-930.88

Project Manager: Maggie Graham

**Reported:**  
 03/06/19 09:30

**Ferrous Iron - Quality Control**  
**Summit Scientific**

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

**Batch 1903015 - General Preparation**

**Blank (1903015-BLK1)**

Prepared & Analyzed: 02/27/19

Ferrous Iron ND 0.02000 mg/L

**LCS (1903015-BS1)**

Prepared & Analyzed: 02/27/19

Ferrous Iron 2.01 0.02000 mg/L 2.00 100 80-120

**Duplicate (1903015-DUP1)**

Source: 1902268-01

Prepared & Analyzed: 02/27/19

Ferrous Iron 1.70 0.02000 mg/L 1.68 1.18 200

**Matrix Spike (1903015-MS1)**

Source: 1902268-01

Prepared & Analyzed: 02/27/19

Ferrous Iron 3.28 0.02000 mg/L 2.00 1.68 80.0 75-125

**Matrix Spike Dup (1903015-MSD1)**

Source: 1902268-01

Prepared & Analyzed: 02/27/19

Ferrous Iron 3.25 0.02000 mg/L 2.00 1.68 78.5 75-125 0.919 20

Summit Scientific

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

Project: Morrison 33-1

Project Number: 2347-6000-930.88

Project Manager: Maggie Graham

**Reported:**  
03/06/19 09:30

**Anions by EPA Method 300.0 - Quality Control**

**Summit Scientific**

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

**Batch 1902353 - General Preparation**

**Blank (1902353-BLK1)**

Prepared & Analyzed: 02/28/19

Sulfate	ND	0.300	mg/L							
Nitrate as N	ND	0.0500	"							

**LCS (1902353-BS1)**

Prepared & Analyzed: 02/28/19

Nitrate as N	3.22	0.0500	mg/L	3.00	107	90-110				
Sulfate	15.9	0.300	"	15.0	106	90-110				

**Duplicate (1902353-DUP1)**

Source: 1902268-03

Prepared & Analyzed: 02/28/19

Sulfate	ND	0.300	mg/L		1870				20	QM-02
Nitrate as N	1.16	0.0500	"		1.19			1.87	20	

**Matrix Spike (1902353-MS1)**

Source: 1902268-03

Prepared & Analyzed: 02/28/19

Nitrate as N	4.28	0.0500	mg/L	3.00	1.19	103	80-120			
Sulfate	ND	0.300	"	15.0	1870	NR	80-120			QM-02

Summit Scientific

*The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*



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

Project: Morrison 33-1

Project Number: 2347-6000-930.88

Project Manager: Maggie Graham

**Reported:**  
03/06/19 09:30

**Chemical Oxygen Demand by EPA Approved Method Hach 8000 - Quality Control**  
**Summit Scientific**

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

**Batch 1903043 - General Preparation**

**Blank (1903043-BLK1)**

Prepared & Analyzed: 03/05/19

Chemical Oxygen Demand      ND      3.00      mg/L

**LCS (1903043-BS1)**

Prepared & Analyzed: 03/05/19

Chemical Oxygen Demand      99.3      3.00      mg/L      100      99.3      70-130

**Duplicate (1903043-DUP1)**

**Source: 1902268-02**

Prepared & Analyzed: 03/05/19

Chemical Oxygen Demand      49.1      3.00      mg/L      49.3      0.407      20

**Matrix Spike (1903043-MS1)**

**Source: 1902268-02**

Prepared & Analyzed: 03/05/19

Chemical Oxygen Demand      153      3.00      mg/L      100      49.3      104      75-125

**Matrix Spike Dup (1903043-MSD1)**

**Source: 1902268-02**

Prepared & Analyzed: 03/05/19

Chemical Oxygen Demand      150      3.00      mg/L      100      49.3      101      75-125      1.98      20

Summit Scientific

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

Project: Morrison 33-1

Project Number: 2347-6000-930.88

Project Manager: Maggie Graham

**Reported:**  
03/06/19 09:30

### 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

# Summit Scientific

---

4653 Table Mountain Drive, Golden, Colorado 80403

303.277.9310

June 06, 2019

Maggie Graham

Extraction Oil&Gas

370 17th Street Suite 5300

Denver, CO 80202

RE: Morrison 33-1

Work Order # 1905332

Enclosed are the results of analyses for samples received by Summit Scientific on 05/30/19 19:25. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink that reads "Muri Premer". The signature is written in a cursive style with a large initial "M" and a long, sweeping underline.

Muri Premer For Ben Shrewsbury

Laboratory Manager



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

Project: Morrison 33-1

Project Number: 2347-6000-930.88

Project Manager: Maggie Graham

**Reported:**  
06/06/19 10:10

### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BH1	1905332-01	Water	05/30/19 16:30	05/30/19 19:25
BH2	1905332-02	Water	05/30/19 16:55	05/30/19 19:25
BH3	1905332-03	Water	05/30/19 17:55	05/30/19 19:25
BH4	1905332-04	Water	05/30/19 17:30	05/30/19 19:25
BH5	1905332-05	Water	05/30/19 16:10	05/30/19 19:25
BH6	1905332-06	Water	05/30/19 15:15	05/30/19 19:25
BH7	1905332-07	Water	05/30/19 15:45	05/30/19 19:25
BH8	1905332-08	Water	05/30/19 18:15	05/30/19 19:25
BH9	1905332-09	Water	05/30/19 14:45	05/30/19 19:25

Summit Scientific

*The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*



1905332

Sample Receipt Checklist

S2 Work Order \_\_\_\_\_

Client: Apex / XOG Client Project ID: Morrison 33-1

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

Matrix (check all that apply):  Air  Soil/Solid  Water  Other: \_\_\_\_\_  
(Describe)

Temp (°C)	1.5°
-----------	------

Thermometer ID: 61857155-K

	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature at 4°C +/- 2°C <sup>(1)</sup> ? NOTE: If samples are delivered the same day of sampling, this requirement is met provided that there is evidence that cooling has begun.	✓			on ice
Were all samples received intact <sup>(1)</sup> ?	✓			
Was adequate sample volume provided <sup>(1)</sup> ?	✓			
If custody seals are present, are they intact <sup>(1)</sup> ?			✓	
Are samples with holding times due within 48 hours sample due within 48 hours present?			✓	
Is a chain-of-custody (COC) form present and filled out completely <sup>(1)</sup> ?	✓			
Does the COC agree with the number and type of sample bottles received <sup>(1)</sup> ?	✓			
Do the sample IDs on the bottle labels match the COC <sup>(1)</sup> ?	✓			
Is the COC properly relinquished by the client w/ date and time recorded <sup>(1)</sup> ?	✓			
For volatiles in water – is there headspace present? <b>If yes, contact client and note in narrative.</b>		✓		
Are samples preserved that require preservation (excluding cooling) <sup>(1)</sup> ? Note the type of preservative in the Comments column – HCl, H2SO4, NaOH, HNO3, ect	✓			HCl
If samples are acid preserved for metals, is the pH ≤ 2 <sup>(1)</sup> ? Record the pH in Comments.			✓	
If dissolved metals are requested, were samples field filtered?			✓	

Additional Comments (if any):

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

AT  
Custodian Printed Name or Initials

[Signature]  
Signature of Custodian

5-30-19 19:25  
Date/Time



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

Project: Morrison 33-1

Project Number: 2347-6000-930.88

Project Manager: Maggie Graham

**Reported:**  
 06/06/19 10:10

**BH1**  
**1905332-01 (Water)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **05/30/19 16:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Benzene</b>	<b>17</b>	1.0	ug/l	1	1905421	05/31/19	06/01/19	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
<b>Ethylbenzene</b>	<b>3.9</b>	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **05/30/19 16:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		95.1 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		100 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		115 %	21-167		"	"	"	"	

Summit Scientific

*The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*



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

Project: Morrison 33-1

Project Number: 2347-6000-930.88

Project Manager: Maggie Graham

**Reported:**  
06/06/19 10:10

**BH2**

**1905332-02 (Water)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **05/30/19 16:55**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	1905421	05/31/19	06/01/19	EPA 8260B	
Toluene	ND	1.0		"	"	"	"	"	"	
Ethylbenzene	ND	1.0		"	"	"	"	"	"	
Xylenes (total)	ND	2.0		"	"	"	"	"	"	

Date Sampled: **05/30/19 16:55**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		95.0 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		102 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		113 %		21-167		"	"	"	"	

Summit Scientific

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

Project: Morrison 33-1

Project Number: 2347-6000-930.88

Project Manager: Maggie Graham

**Reported:**  
 06/06/19 10:10

**BH3**  
**1905332-03 (Water)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **05/30/19 17:55**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	1905421	05/31/19	06/02/19	EPA 8260B	
Toluene	ND	1.0		"	"	"	"	"	"	
Ethylbenzene	ND	1.0		"	"	"	"	"	"	
Xylenes (total)	ND	2.0		"	"	"	"	"	"	

Date Sampled: **05/30/19 17:55**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		95.3 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		101 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		98.9 %		21-167		"	"	"	"	

Summit Scientific

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

Project: Morrison 33-1

Project Number: 2347-6000-930.88

Project Manager: Maggie Graham

**Reported:**  
 06/06/19 10:10

**BH4**  
**1905332-04 (Water)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **05/30/19 17:30**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
<b>Benzene</b>	<b>450</b>	10		ug/l	10	1905421	05/31/19	06/02/19	EPA 8260B	
<b>Toluene</b>	<b>1.3</b>	1.0		"	1	"	"	"	"	
<b>Ethylbenzene</b>	<b>64</b>	1.0		"	"	"	"	"	"	
Xylenes (total)	ND	2.0		"	"	"	"	"	"	

Date Sampled: **05/30/19 17:30**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		92.3 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		102 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		114 %		21-167		"	"	"	"	

Summit Scientific

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

Project: Morrison 33-1

Project Number: 2347-6000-930.88

Project Manager: Maggie Graham

**Reported:**  
 06/06/19 10:10

**BH5**  
**1905332-05 (Water)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **05/30/19 16:10**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	1905421	05/31/19	06/02/19	EPA 8260B	
Toluene	ND	1.0		"	"	"	"	"	"	
Ethylbenzene	ND	1.0		"	"	"	"	"	"	
Xylenes (total)	ND	2.0		"	"	"	"	"	"	

Date Sampled: **05/30/19 16:10**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		93.6 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		98.9 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		102 %		21-167		"	"	"	"	

Summit Scientific

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

Project: Morrison 33-1

Project Number: 2347-6000-930.88

Project Manager: Maggie Graham

**Reported:**  
 06/06/19 10:10

**BH6**  
**1905332-06 (Water)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **05/30/19 15:15**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	1905421	05/31/19	06/02/19	EPA 8260B	
Toluene	ND	1.0		"	"	"	"	"	"	
Ethylbenzene	ND	1.0		"	"	"	"	"	"	
Xylenes (total)	ND	2.0		"	"	"	"	"	"	

Date Sampled: **05/30/19 15:15**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		94.0 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		99.3 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		104 %		21-167		"	"	"	"	

Summit Scientific

*The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*



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

Project: Morrison 33-1

Project Number: 2347-6000-930.88

Project Manager: Maggie Graham

**Reported:**  
06/06/19 10:10

**BH7**  
**1905332-07 (Water)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **05/30/19 15:45**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	1905421	05/31/19	06/02/19	EPA 8260B	
Toluene	ND	1.0		"	"	"	"	"	"	
Ethylbenzene	ND	1.0		"	"	"	"	"	"	
Xylenes (total)	ND	2.0		"	"	"	"	"	"	

Date Sampled: **05/30/19 15:45**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		92.2 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		99.8 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		99.9 %		21-167		"	"	"	"	

Summit Scientific



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



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

Project: Morrison 33-1

Project Number: 2347-6000-930.88

Project Manager: Maggie Graham

**Reported:**  
06/06/19 10:10

**BH8**

**1905332-08 (Water)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **05/30/19 18:15**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	1905421	05/31/19	06/02/19	EPA 8260B	
Toluene	ND	1.0		"	"	"	"	"	"	
Ethylbenzene	ND	1.0		"	"	"	"	"	"	
Xylenes (total)	ND	2.0		"	"	"	"	"	"	

Date Sampled: **05/30/19 18:15**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		93.8 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		99.2 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		98.8 %		21-167		"	"	"	"	

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



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

Project: Morrison 33-1

Project Number: 2347-6000-930.88

Project Manager: Maggie Graham

**Reported:**  
06/06/19 10:10

**BH9**  
**1905332-09 (Water)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **05/30/19 14:45**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	1905421	05/31/19	06/02/19	EPA 8260B	
Toluene	ND	1.0		"	"	"	"	"	"	
Ethylbenzene	ND	1.0		"	"	"	"	"	"	
Xylenes (total)	ND	2.0		"	"	"	"	"	"	

Date Sampled: **05/30/19 14:45**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		81.9 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		98.9 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		96.6 %		21-167		"	"	"	"	

Summit Scientific

*The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*



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

Project: Morrison 33-1

Project Number: 2347-6000-930.88

Project Manager: Maggie Graham

**Reported:**  
06/06/19 10:10

### Volatile Organic Compounds by EPA Method 8260B - Quality Control

#### Summit Scientific

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

#### Batch 1905421 - EPA 5030 Water MS

##### Blank (1905421-BLK1)

Prepared: 05/31/19 Analyzed: 06/01/19

Benzene	ND	1.0	ug/l							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes (total)	ND	2.0	"							
Surrogate: 1,2-Dichloroethane-d4	11.3		"	13.3		84.8	23-173			
Surrogate: Toluene-d8	13.1		"	13.3		98.5	20-170			
Surrogate: 4-Bromofluorobenzene	13.3		"	13.3		99.8	21-167			

##### LCS (1905421-BS1)

Prepared: 05/31/19 Analyzed: 06/01/19

Benzene	32.7	1.0	ug/l	33.3		98.2	70-130			
Toluene	35.1	1.0	"	33.3		105	70-130			
Ethylbenzene	37.4	1.0	"	33.3		112	70-130			
m,p-Xylene	72.4	2.0	"	66.7		109	70-130			
o-Xylene	34.4	1.0	"	33.3		103	70-130			
Surrogate: 1,2-Dichloroethane-d4	13.0		"	13.3		97.7	23-173			
Surrogate: Toluene-d8	13.8		"	13.3		103	20-170			
Surrogate: 4-Bromofluorobenzene	13.4		"	13.3		100	21-167			

##### Matrix Spike (1905421-MS1)

Source: 1905332-01

Prepared: 05/31/19 Analyzed: 06/01/19

Benzene	58.8	1.0	ug/l	33.3	17.1	125	70-130			
Toluene	35.0	1.0	"	33.3	ND	105	70-130			
Ethylbenzene	44.5	1.0	"	33.3	3.91	122	70-130			
m,p-Xylene	72.0	2.0	"	66.7	ND	108	70-130			
o-Xylene	34.4	1.0	"	33.3	ND	103	70-130			
Surrogate: 1,2-Dichloroethane-d4	13.0		"	13.3		97.4	23-173			
Surrogate: Toluene-d8	13.3		"	13.3		100	20-170			
Surrogate: 4-Bromofluorobenzene	15.0		"	13.3		113	21-167			

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



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

Project: Morrison 33-1

Project Number: 2347-6000-930.88

Project Manager: Maggie Graham

**Reported:**  
06/06/19 10:10

**Volatile Organic Compounds by EPA Method 8260B - Quality Control**

**Summit Scientific**

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

**Batch 1905421 - EPA 5030 Water MS**

**Matrix Spike Dup (1905421-MSD1)**

Source: 1905332-01

Prepared: 05/31/19 Analyzed: 06/01/19

Benzene	55.4	1.0	ug/l	33.3	17.1	115	70-130	5.81	30	
Toluene	35.3	1.0	"	33.3	ND	106	70-130	0.910	30	
Ethylbenzene	44.0	1.0	"	33.3	3.91	120	70-130	1.04	30	
m,p-Xylene	73.4	2.0	"	66.7	ND	110	70-130	1.95	30	
o-Xylene	34.9	1.0	"	33.3	ND	105	70-130	1.56	30	
Surrogate: 1,2-Dichloroethane-d4	13.2		"	13.3		99.0	23-173			
Surrogate: Toluene-d8	13.5		"	13.3		102	20-170			
Surrogate: 4-Bromofluorobenzene	15.2		"	13.3		114	21-167			

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



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

Project: Morrison 33-1

Project Number: 2347-6000-930.88

Project Manager: Maggie Graham

**Reported:**  
06/06/19 10:10

### Notes and Definitions

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

# Summit Scientific

---

4653 Table Mountain Drive, Golden, Colorado 80403

303.277.9310

September 13, 2019

Maggie Graham

Extraction Oil&Gas

370 17th Street Suite 5300

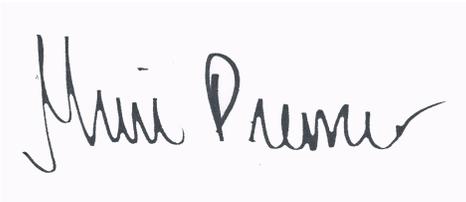
Denver, CO 80202

RE: Morrison 33-1

Work Order # 1909078

Enclosed are the results of analyses for samples received by Summit Scientific on 09/06/19 15:10. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink that reads "Muri Premer". The signature is written in a cursive style with a large initial "M" and a long, sweeping underline.

Muri Premer For Ben Shrewsbury

Laboratory Manager



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

Project: Morrison 33-1

Project Number: 2347-6000-930.88

Project Manager: Maggie Graham

**Reported:**  
09/13/19 11:22

**ANALYTICAL REPORT FOR SAMPLES**

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BH01	1909078-01	Water	09/06/19 12:45	09/06/19 15:10
BH02	1909078-02	Water	09/06/19 12:59	09/06/19 15:10
BH03	1909078-03	Water	09/06/19 13:53	09/06/19 15:10
BH04	1909078-04	Water	09/06/19 13:22	09/06/19 15:10
BH06	1909078-05	Water	09/06/19 12:24	09/06/19 15:10
BH07	1909078-06	Water	09/06/19 12:00	09/06/19 15:10
BH08	1909078-07	Water	09/06/19 14:08	09/06/19 15:10
BH09	1909078-08	Water	09/06/19 11:37	09/06/19 15:10

Summit Scientific

*The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*

1909078

# Summit Scientific

4653 Table Mountain Drive ♦ Golden, Colorado 80403  
303-277-9310 ♦ 303-374-5933 Fax

Page \_\_\_\_\_ of \_\_\_\_\_

Client: APEX Companies, LLC  
Address: 176 Cole Blvd. Suite 250  
City/State/Zip: Lakewood, Colorado 80101  
Phone: 720-501-5065 Fax: \_\_\_\_\_  
Sampler Name: AB

Project Manager: Maggie Graham 720-501-5065  
E-Mail: DenverRemediation@ApexCos.onmicrosoft.com  
Project Name: MORISON 33-1  
Project Number: 2347-6000-930.88

Sample Description	Date Sampled	Time Sampled	Number of Containers	Preservative				Matrix		Analyze For:						Special Instructions			
				HCl	HNO <sub>3</sub>	None	Other (Specify)	Groundwater	Soil	Air - Canister Serial #	Other (Specify)	BTEX							
BH01	9/6/19	1245	3	X				X					X						Call Maggie Graham with questions  No BH05 sample
BH02	↓	1259	↓	↓				↓					↓						
BH03	↓	1353	↓	↓				↓					↓						
BH04	↓	1322	↓	↓				↓					↓						
BH06	↓	1224	↓	↓				↓					↓						
BH07	↓	1206	↓	↓				↓					↓						
BH08	↓	1408	↓	↓				↓					↓						
BH09	↓	1137	↓	↓				↓					↓						

Relinquished by: <u>[Signature]</u>	Date/Time: <u>9/6/19 1420</u>	Received by: <u>[Signature]</u>	Date/Time: <u>9.6.19 1420</u>	Turn Around Time (Check)		Notes
				Same Day <input type="checkbox"/>	72 Hours <input type="checkbox"/>	Circle applicable regulatory agency: <u>COGOC/CDPHE</u>
				24 Hours <input type="checkbox"/>	Standard <input checked="" type="checkbox"/>	
				48 Hours <input type="checkbox"/>		
Relinquished by: <u>[Signature]</u>	Date/Time: <u>9.6.19 1570</u>	Received by: <u>[Signature]</u>	Date/Time: <u>9/6/19 15:10</u>	Sample Integrity:		Client Name: <u>XOG</u>
				Temperature Upon Receipt: <u>12.2</u>	Intact: Yes <input type="checkbox"/> No <input type="checkbox"/>	

**Sample Receipt Checklist**

S2 Work Order 1909078

Client: Apex Client Project ID: Morrison 33-1

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

Matrix (check all that apply):  Air  Soil/Solid  Water  Other: \_\_\_\_\_ (Describe)

Temp (°C) 12.2

Thermometer ID: 61857155-K

	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature at 4°C +/- 2°C <sup>(1)</sup> ? NOTE: If samples are delivered the same day of sampling, this requirement is met provided that there is evidence that cooling has begun.	✓			
Were all samples received intact <sup>(1)</sup> ?	✓			
Was adequate sample volume provided <sup>(1)</sup> ?	✓			
If custody seals are present, are they intact <sup>(1)</sup> ?			✓	
Are samples with holding times due within 48 hours sample due within 48 hours present?		✓		
Is a chain-of-custody (COC) form present and filled out completely <sup>(1)</sup> ?	✓			
Does the COC agree with the number and type of sample bottles received <sup>(1)</sup> ?	✓			
Do the sample IDs on the bottle labels match the COC <sup>(1)</sup> ?	✓			
Is the COC properly relinquished by the client w/ date and time recorded <sup>(1)</sup> ?	✓			
For volatiles in water – is there headspace present? If yes, contact client and note in narrative.		✓		
Are samples preserved that require preservation (excluding cooling) <sup>(1)</sup> ? Note the type of preservative in the Comments column – HCl, H2SO4, NaOH, HNO3, ect	✓			HCl
If samples are acid preserved for metals, is the pH ≤ 2 <sup>(1)</sup> ? Record the pH in Comments.			✓	
If dissolved metals are requested, were samples field filtered?			✓	

Additional Comments (if any):

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

MC  
Custodian Printed Name or Initials

MC  
Signature of Custodian

9/6/19  
Date/Time *myc*  
9/6/19



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

Project: Morrison 33-1

Project Number: 2347-6000-930.88

Project Manager: Maggie Graham

**Reported:**  
 09/13/19 11:22

**BH01**  
**1909078-01 (Water)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **09/06/19 12:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Benzene</b>	<b>16</b>	1.0	ug/l	1	1909111	09/10/19	09/11/19	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **09/06/19 12:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		105 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		92.1 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		124 %	21-167		"	"	"	"	

Summit Scientific

*The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*



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

Project: Morrison 33-1

Project Number: 2347-6000-930.88

Project Manager: Maggie Graham

**Reported:**  
09/13/19 11:22

**BH02**  
**1909078-02 (Water)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **09/06/19 12:59**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	1909111	09/10/19	09/11/19	EPA 8260B	
Toluene	ND	1.0		"	"	"	"	"	"	
Ethylbenzene	ND	1.0		"	"	"	"	"	"	
Xylenes (total)	ND	2.0		"	"	"	"	"	"	

Date Sampled: **09/06/19 12:59**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		107 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		95.3 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		122 %		21-167		"	"	"	"	

Summit Scientific

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

Project: Morrison 33-1

Project Number: 2347-6000-930.88

Project Manager: Maggie Graham

**Reported:**  
09/13/19 11:22

**BH03**  
**1909078-03 (Water)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **09/06/19 13:53**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	1909111	09/10/19	09/11/19	EPA 8260B	
Toluene	ND	1.0		"	"	"	"	"	"	
Ethylbenzene	ND	1.0		"	"	"	"	"	"	
Xylenes (total)	ND	2.0		"	"	"	"	"	"	

Date Sampled: **09/06/19 13:53**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		109 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		94.2 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		107 %		21-167		"	"	"	"	

Summit Scientific



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

Project: Morrison 33-1

Project Number: 2347-6000-930.88

Project Manager: Maggie Graham

**Reported:**  
09/13/19 11:22

**BH04**  
**1909078-04 (Water)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **09/06/19 13:22**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
<b>Benzene</b>	<b>7.1</b>	1.0		ug/l	1	1909111	09/10/19	09/11/19	EPA 8260B	
Toluene	ND	1.0		"	"	"	"	"	"	
Ethylbenzene	ND	1.0		"	"	"	"	"	"	
Xylenes (total)	ND	2.0		"	"	"	"	"	"	

Date Sampled: **09/06/19 13:22**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		104 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		94.4 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		120 %		21-167		"	"	"	"	

Summit Scientific



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

Project: Morrison 33-1

Project Number: 2347-6000-930.88

Project Manager: Maggie Graham

**Reported:**  
09/13/19 11:22

**BH06**  
**1909078-05 (Water)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **09/06/19 12:24**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	1909111	09/10/19	09/11/19	EPA 8260B	
Toluene	ND	1.0		"	"	"	"	"	"	
Ethylbenzene	ND	1.0		"	"	"	"	"	"	
Xylenes (total)	ND	2.0		"	"	"	"	"	"	

Date Sampled: **09/06/19 12:24**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		107 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		92.8 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		109 %		21-167		"	"	"	"	

Summit Scientific

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

Project: Morrison 33-1

Project Number: 2347-6000-930.88

Project Manager: Maggie Graham

**Reported:**  
 09/13/19 11:22

**BH07**  
**1909078-06 (Water)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **09/06/19 12:00**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	1909111	09/10/19	09/11/19	EPA 8260B	
Toluene	ND	1.0		"	"	"	"	"	"	
Ethylbenzene	ND	1.0		"	"	"	"	"	"	
Xylenes (total)	ND	2.0		"	"	"	"	"	"	

Date Sampled: **09/06/19 12:00**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		109 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		92.8 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		99.3 %		21-167		"	"	"	"	

Summit Scientific

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

Project: Morrison 33-1

Project Number: 2347-6000-930.88

Project Manager: Maggie Graham

**Reported:**  
09/13/19 11:22

**BH08**  
**1909078-07 (Water)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **09/06/19 14:08**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	1909111	09/10/19	09/11/19	EPA 8260B	
Toluene	ND	1.0		"	"	"	"	"	"	
Ethylbenzene	ND	1.0		"	"	"	"	"	"	
Xylenes (total)	ND	2.0		"	"	"	"	"	"	

Date Sampled: **09/06/19 14:08**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		109 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		93.8 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		104 %		21-167		"	"	"	"	

Summit Scientific

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

Project: Morrison 33-1

Project Number: 2347-6000-930.88

Project Manager: Maggie Graham

**Reported:**  
09/13/19 11:22

**BH09**  
**1909078-08 (Water)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **09/06/19 11:37**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	1909111	09/10/19	09/11/19	EPA 8260B	
Toluene	ND	1.0		"	"	"	"	"	"	
Ethylbenzene	ND	1.0		"	"	"	"	"	"	
Xylenes (total)	ND	2.0		"	"	"	"	"	"	

Date Sampled: **09/06/19 11:37**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		101 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		94.0 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		104 %		21-167		"	"	"	"	

Summit Scientific

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

Project: Morrison 33-1

Project Number: 2347-6000-930.88

Project Manager: Maggie Graham

**Reported:**  
09/13/19 11:22

### Volatile Organic Compounds by EPA Method 8260B - Quality Control

#### Summit Scientific

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

#### Batch 1909111 - EPA 5030 Water MS

##### Blank (1909111-BLK1)

Prepared: 09/10/19 Analyzed: 09/11/19

Benzene	ND	1.0	ug/l								
Toluene	ND	1.0	"								
Ethylbenzene	ND	1.0	"								
Xylenes (total)	ND	2.0	"								
Surrogate: 1,2-Dichloroethane-d4	14.1		"	13.3		106		23-173			
Surrogate: Toluene-d8	12.8		"	13.3		96.1		20-170			
Surrogate: 4-Bromofluorobenzene	13.4		"	13.3		101		21-167			

##### LCS (1909111-BS1)

Prepared: 09/10/19 Analyzed: 09/11/19

Benzene	31.7	1.0	ug/l	33.3		95.0		51-132			
Toluene	31.9	1.0	"	33.3		95.6		51-138			
Ethylbenzene	31.9	1.0	"	33.3		95.6		58-146			
m,p-Xylene	63.8	2.0	"	66.7		95.7		57-144			
o-Xylene	31.1	1.0	"	33.3		93.4		53-146			
Surrogate: 1,2-Dichloroethane-d4	14.9		"	13.3		112		23-173			
Surrogate: Toluene-d8	12.4		"	13.3		93.2		20-170			
Surrogate: 4-Bromofluorobenzene	13.4		"	13.3		100		21-167			

##### Matrix Spike (1909111-MS1)

Source: 1909078-01

Prepared: 09/10/19 Analyzed: 09/11/19

Benzene	31.9	1.0	ug/l	33.3	15.5	49.1		34-141			
Toluene	31.4	1.0	"	33.3	ND	94.3		27-151			
Ethylbenzene	32.6	1.0	"	33.3	ND	98.0		29-160			
m,p-Xylene	65.1	2.0	"	66.7	ND	97.7		20-166			
o-Xylene	31.2	1.0	"	33.3	ND	93.5		33-159			
Surrogate: 1,2-Dichloroethane-d4	14.2		"	13.3		107		23-173			
Surrogate: Toluene-d8	12.4		"	13.3		93.2		20-170			
Surrogate: 4-Bromofluorobenzene	15.0		"	13.3		112		21-167			

Summit Scientific

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

Project: Morrison 33-1

Project Number: 2347-6000-930.88

Project Manager: Maggie Graham

**Reported:**  
09/13/19 11:22

**Volatile Organic Compounds by EPA Method 8260B - Quality Control**

**Summit Scientific**

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

**Batch 1909111 - EPA 5030 Water MS**

**Matrix Spike Dup (1909111-MSD1)**

Source: 1909078-01

Prepared: 09/10/19 Analyzed: 09/11/19

Benzene	31.8	1.0	ug/l	33.3	15.5	49.0	34-141	0.0942	30	
Toluene	31.5	1.0	"	33.3	ND	94.4	27-151	0.0954	30	
Ethylbenzene	33.5	1.0	"	33.3	ND	100	29-160	2.48	30	
m,p-Xylene	66.6	2.0	"	66.7	ND	99.9	20-166	2.29	30	
o-Xylene	32.3	1.0	"	33.3	ND	96.8	33-159	3.44	30	
Surrogate: 1,2-Dichloroethane-d4	15.5		"	13.3		116	23-173			
Surrogate: Toluene-d8	12.9		"	13.3		96.5	20-170			
Surrogate: 4-Bromofluorobenzene	15.2		"	13.3		114	21-167			

Summit Scientific



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



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

Project: Morrison 33-1  
Project Number: 2347-6000-930.88  
Project Manager: Maggie Graham

**Reported:**  
09/13/19 11:22

### Notes and Definitions

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

# Summit Scientific

---

4653 Table Mountain Drive, Golden, Colorado 80403

303.277.9310

October 09, 2019

Maggie Graham

Extraction Oil&Gas

370 17th Street Suite 5300

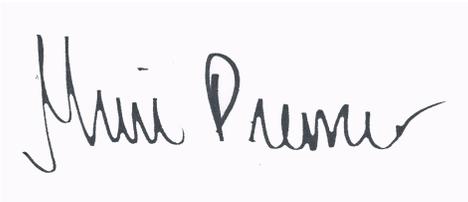
Denver, CO 80202

RE: Morrison 33-1

Work Order # 1910064

Enclosed are the results of analyses for samples received by Summit Scientific on 10/04/19 15:50. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink that reads "Muri Premer". The signature is written in a cursive style with a large initial "M" and a long, sweeping underline.

Muri Premer For Ben Shrewsbury

Laboratory Manager



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

Project: Morrison 33-1

Project Number: 2347-6000-930.88

Project Manager: Maggie Graham

**Reported:**  
10/09/19 17:38

**ANALYTICAL REPORT FOR SAMPLES**

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BH10	1910064-01	Water	10/04/19 13:00	10/04/19 15:50
BH11	1910064-02	Water	10/04/19 12:35	10/04/19 15:50

Summit Scientific

*The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*



**Sample Receipt Checklist**

S2 Work Order 1910064

Client: APEX / XOG Client Project ID: MORRISON 331

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

Matrix (check all that apply): \_\_\_\_\_ Air \_\_\_\_\_ Soil/Solid  Water \_\_\_\_\_ Other: \_\_\_\_\_  
(Describe)

Temp (°C)	<u>12.4</u>
-----------	-------------

Thermometer ID: 61857155-K

	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature at 4°C +/- 2°C <sup>(1)</sup> ? 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"/>			
Were all samples received intact <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Was adequate sample volume provided <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
If custody seals are present, are they intact <sup>(1)</sup> ?			<input checked="" type="checkbox"/>	
Are samples with holding times due within 48 hours sample due within 48 hours present?			<input checked="" type="checkbox"/>	
Is a chain-of-custody (COC) form present and filled out completely <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Does the COC agree with the number and type of sample bottles received <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Do the sample IDs on the bottle labels match the COC <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Is the COC properly relinquished by the client w/ date and time recorded <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
For volatiles in water – is there headspace present? <b>If yes, contact client and note in narrative.</b>		<input checked="" type="checkbox"/>		
Are samples preserved that require preservation (excluding cooling) <sup>(1)</sup> ? Note the type of preservative in the Comments column – HCl, H2SO4, NaOH, HNO3, ect	<input checked="" type="checkbox"/>			
If samples are acid preserved for metals, is the pH ≤ 2 <sup>(1)</sup> ? Record the pH in Comments.	.		<input checked="" type="checkbox"/>	
If dissolved metals are requested, were samples field filtered?			<input checked="" type="checkbox"/>	
Additional Comments (if any):				

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

MP  
Custodian Printed Name or Initials

[Signature]  
Signature of Custodian

10-4-19 15:50  
Date/Time



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

Project: Morrison 33-1

Project Number: 2347-6000-930.88

Project Manager: Maggie Graham

**Reported:**

10/09/19 17:38

**BH10**  
**1910064-01 (Water)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **10/04/19 13:00**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	1910113	10/07/19	10/08/19	EPA 8260B	
Toluene	ND	1.0		"	"	"	"	"	"	
Ethylbenzene	ND	1.0		"	"	"	"	"	"	
Xylenes (total)	ND	2.0		"	"	"	"	"	"	

Date Sampled: **10/04/19 13:00**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		80.5 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		92.0 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		100 %		21-167		"	"	"	"	

Summit Scientific

*The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*



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Project Manager: Maggie Graham

**Reported:**  
 10/09/19 17:38

**BH11**  
**1910064-02 (Water)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **10/04/19 12:35**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	1910113	10/07/19	10/08/19	EPA 8260B	
Toluene	ND	1.0		"	"	"	"	"	"	
Ethylbenzene	ND	1.0		"	"	"	"	"	"	
Xylenes (total)	ND	2.0		"	"	"	"	"	"	

Date Sampled: **10/04/19 12:35**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		79.2 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		90.7 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		99.8 %		21-167		"	"	"	"	

Summit Scientific

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Denver CO, 80202

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Project Manager: Maggie Graham

Reported:

10/09/19 17:38

### Volatile Organic Compounds by EPA Method 8260B - Quality Control

#### Summit Scientific

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

#### Batch 1910113 - EPA 5030 Water MS

##### LCS (1910113-BS1)

Prepared: 10/07/19 Analyzed: 10/08/19

Benzene	28.4	1.0	ug/l	33.3		85.1	51-132			
Toluene	26.6	1.0	"	33.3		79.9	51-138			
Ethylbenzene	29.6	1.0	"	33.3		88.9	58-146			
m,p-Xylene	53.0	2.0	"	66.7		79.6	57-144			
o-Xylene	27.0	1.0	"	33.3		81.2	53-146			
Surrogate: 1,2-Dichloroethane-d4	11.1		"	13.3		83.3	23-173			
Surrogate: Toluene-d8	12.4		"	13.3		92.9	20-170			
Surrogate: 4-Bromofluorobenzene	12.6		"	13.3		94.9	21-167			

##### Matrix Spike (1910113-MS1)

Source: 1910030-01

Prepared: 10/07/19 Analyzed: 10/08/19

Benzene	27.5	1.0	ug/l	33.3	ND	82.4	34-141			
Toluene	30.1	1.0	"	33.3	ND	90.4	27-151			
Ethylbenzene	30.5	1.0	"	33.3	ND	91.4	29-160			
m,p-Xylene	55.6	2.0	"	66.7	ND	83.4	20-166			
o-Xylene	27.8	1.0	"	33.3	ND	83.5	33-159			
Surrogate: 1,2-Dichloroethane-d4	9.51		"	13.3		71.3	23-173			
Surrogate: Toluene-d8	13.3		"	13.3		99.9	20-170			
Surrogate: 4-Bromofluorobenzene	12.5		"	13.3		93.5	21-167			

##### Matrix Spike Dup (1910113-MSD1)

Source: 1910030-01

Prepared: 10/07/19 Analyzed: 10/08/19

Benzene	27.0	1.0	ug/l	33.3	ND	80.9	34-141	1.76	30	
Toluene	32.1	1.0	"	33.3	ND	96.4	27-151	6.43	30	
Ethylbenzene	30.4	1.0	"	33.3	ND	91.2	29-160	0.263	30	
m,p-Xylene	56.2	2.0	"	66.7	ND	84.4	20-166	1.20	30	
o-Xylene	27.8	1.0	"	33.3	ND	83.5	33-159	0.0359	30	
Surrogate: 1,2-Dichloroethane-d4	10.8		"	13.3		81.1	23-173			
Surrogate: Toluene-d8	14.4		"	13.3		108	20-170			
Surrogate: 4-Bromofluorobenzene	12.5		"	13.3		93.5	21-167			

Summit Scientific

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**Reported:**  
10/09/19 17:38

### Notes and Definitions

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