



August 3, 2018

Blake Ford
Environmental Coordinator
8 North
370 17th Street, Suite 5300
Denver, Colorado 80202

Subject: **Work Completion Report**– Produced Water Vessel Remedial Investigation
 WANEKA-61S69W 1SE1W ("Waneka Tank Battery")
 COGCC Location ID: 321308
 39.995909, -105.064514
 SE1W 1 S69W
 Unincorporated Boulder County, Colorado

Dear Mr. Ford:

Apex Companies LLC (Apex) has prepared this work completion report to document remedial investigation activities conducted in support of the vault closure at the Waneka Tank Battery Facility IDs: 435833 and 435834 in unincorporated Boulder County, Colorado. The remedial investigation included field screening, soil sampling, and groundwater sampling to support closure and removal of a partially-buried produced water vessel. These efforts were completed under an approved Form 27 (Site Investigation and Remediation Workplan), and remediation project number 11448, assigned by the Colorado Oil and Gas Conservation Commission (COGCC).

Remedial Investigation

On July 18, 2018, an Apex Field Coordinator arrived onsite to support excavation efforts to remove a partially-buried produced water vessel. Field visual observations were recorded, along with photographic documentation of the excavation site and surrounding areas. A Photoionization Detector (PID) was successfully field calibrated and utilized to field-screen four sidewall samples and one composite sample (collected from the onsite stockpile) for potential soil impacts. Groundwater was encountered at four feet below ground surface, therefore, no base sample was collected from within the excavation. Final dimensions of the excavation were approximately 12 feet (12') by 21', with an approximate depth of four feet, where groundwater was encountered. On July 19, 2018, an Apex Field Coordinator returned to the site to collect one groundwater sample (GW01@1.5). No sheen or odor was detected.

Four sidewall samples (W01@2', N01@2', E01@2', and S01@2'), one composite sample collected from the onsite stockpile (C01), and one groundwater sample (GW01@1.5) were submitted for analysis at a NELAP (National Environmental Laboratory Accreditation Program) accredited laboratory for the approved constituents of concern.

An Apex Field Coordinator also submitted a sample of the exposed historic flowline pipe wrapping for asbestos testing. The results of the asbestos testing demonstrated that the flowline pipe wrap was non-asbestos containing material.

In addition to investigation efforts at the site of the excavation, the Apex Field Coordinator completed a visual assessment of the site. The assessment included looking for soil staining, salt accumulation, stressed vegetation, or other signs of soil impacts at the surface or near any recently disturbed soils. The visual assessment of the site yielded no known areas of concern.

Results

All laboratory results were within the allowable limits for the COGCC Table 910-1 constituents of concern (TPH and/or BTEX). Two samples (N01@2' and W01@2') were analyzed, and within the allowable limits, for inorganic constituents of concern including Electrical Conductivity (EC), Sodium Adsorption Ratio (SAR), and pH. Therefore, the remaining soil samples were not analyzed for inorganic constituents. No other indications of soil or groundwater impacts were noted during the remedial investigation. See attached topographic map, site diagram, laboratory result summary table, and laboratory report for an illustration of the sample collection points and findings.

Conclusions

Based on field observations and laboratory results, there is no evidence of any recent or historic release of produced water associated with the operation of the removed partially-buried produced water vessel. No further site investigation is recommended at this time.

If you have any questions about this report, onsite activities, or anything else related to this effort, please don't hesitate to contact me at 720-501-5065.

Sincerely,
Apex Companies, LLC

Maggie Graham

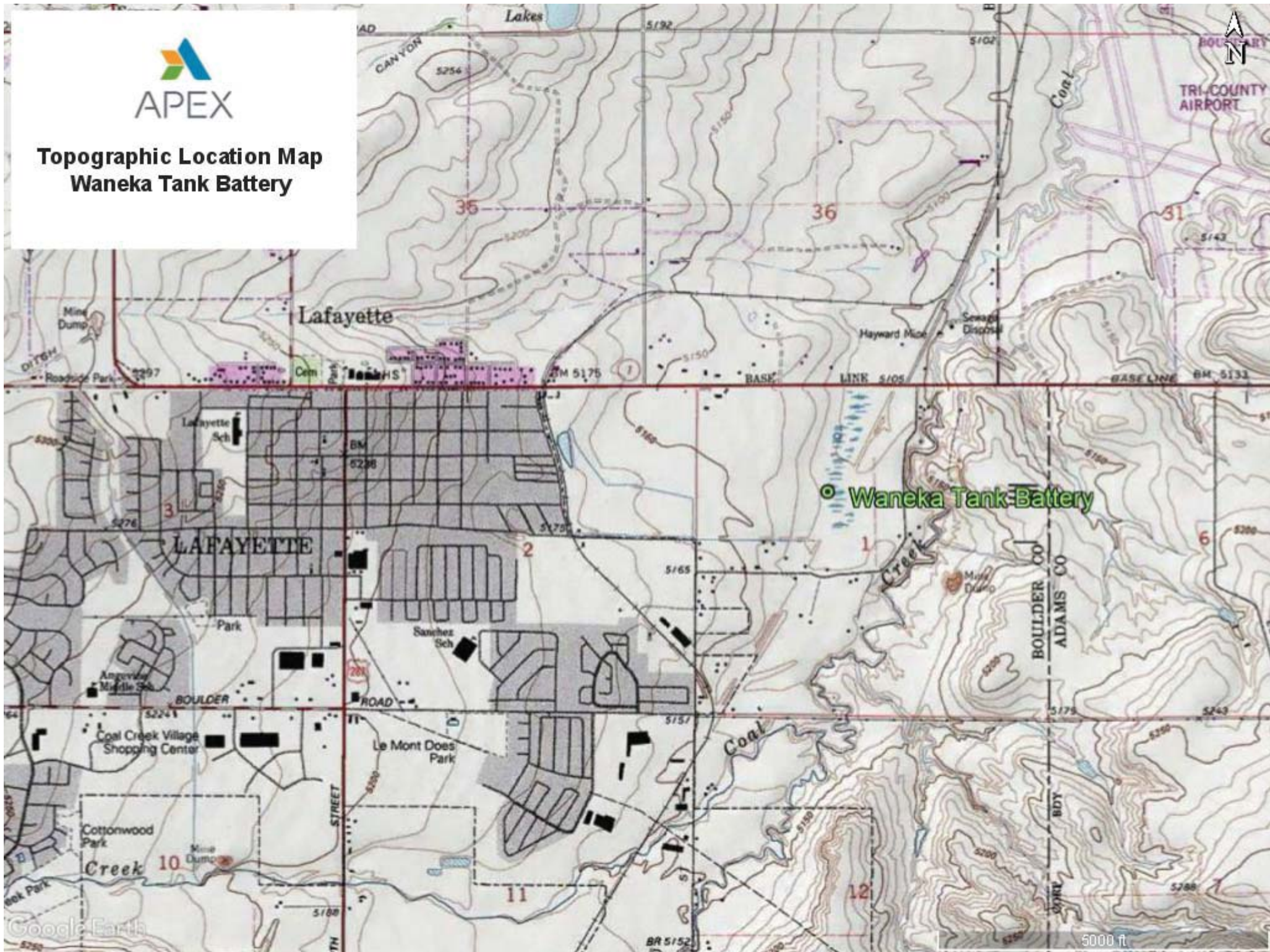
Maggie Graham
Senior Project Manager

Attachments:

1. Topographic Location Map
2. Site Diagram
3. Laboratory Results Summary Table – Soil
4. Laboratory Results Summary Table – Groundwater
5. Laboratory Reports



Topographic Location Map Waneka Tank Battery





8North, LLC
Waneka Tank Battery
COGCC Location ID: 321308
Site Diagram

Legal Description: SENW, Sec 1, T1S R69W
County: Boulder
Land Use: Cropland
Topography: Not Available
Run-Off Risk: Low
Soil Type: Loveland soils
Receiving Waters: Unnamed trib

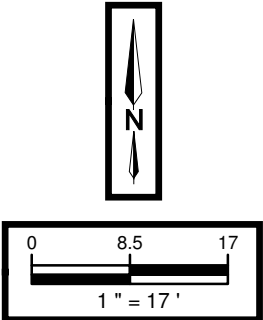


- Soil Sample (7/18/2018)
- Soil Sample (7/19/2018)
- Groundwater Sample (7/19/2018)
- Excavation Extent (7/18/2018)
- Former Crude Oil Tank
- Former Sump
- Former Secondary Containment

Sample ID	Latitude NAD83	Longitude NAD83
GW01@1.5'	39.995915	-105.064502
E01@2'	39.995920	-105.064482
N01@2'	39.995941	-105.064511
W01@2'	39.995918	-105.064522
S01@2'	39.995891	-105.064494
C01	39.995674	-105.064668

GROUNDWATER SAMPLE RESULTS					
		Organic Compounds (mg/L)			
CDPHE Groundwater Protection Values (GPV) (mg/L)		0.005	1	0.7	10
Sample Date:	Sampling ID/ Point	Benzene	Toluene	Ethylbenzene	Xylenes - total
7/19/18	GW01@1.5	0.0036	0.0015	0.0017	0.018

SOIL SAMPLE RESULTS								
COGCC Allow able Concentration -->		Organic Compounds (mg/kg [ppm])						
Sample Date:	Matrix Notes (Sample Point - Depth)	500	0.17	85	100	175		
		TPH (total volatile and extractable petroleum hydrocarbons) (TPH-GRO + TPH-DRO)	Benzene	Toluene	Ethylbenzene	Xylenes - total		
		7/18/18	E01@2'	1.3	0.065	<0.0050	<0.0050	<0.010
		7/18/18	N01@2'	4.1	<0.0020	<0.0050	<0.0050	<0.010
		7/18/18	S01@2'	100	0.11	0.029	0.0092	0.053
		7/18/18	W01@2'	139	0.023	<0.0050	0.084	0.19
7/19/18	C01	240	0.17	0.35	0.12	1.6		



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. For consistency in data representation and adherence to spatial data correction results, illustrated data is not corrected to fit with the aerial imagery or other collected data points.



Laboratory Results Summary Table - Soil

			Organic Compounds (mg/kg)					(mmhos/cm)	Units	(pH Units)
COGCC Allowable Concentration (Soil) -->			500	0.17	85	100	175	4	12	(6-9)
Location	Sample Date	Sample ID	TPH (total volatile and extractable petroleum hydrocarbons) (TPH-GRO + TPH-DRO)	Benzene	Toluene	Ethylbenzene	Xylenes - total	EC (<4 mmhos/cm or 2x background)	SAR (calculation)	pH
Waneka Tank Battery	7/18/18	N01@2'	4.1	<0.0020	<0.0050	<0.0050	<0.010	1.03	0.669	7.55
Waneka Tank Battery	7/18/18	W01@2'	139	0.023	<0.0050	0.084	0.19	0.701	0.646	7.94
Waneka Tank Battery	7/18/18	E01@2'	1.3	0.065	<0.0050	<0.0050	<0.010			
Waneka Tank Battery	7/18/18	S01@2'	100	0.11	0.029	0.0092	0.053			
Waneka Tank Battery	7/19/18	C01	240	0.17	0.35	0.12	1.6			



Laboratory Results Summary Table - Groundwater

COGCC Concentration Levels (mg/L)			Organic Compounds (mg/L)			
Location	Sample Date	Sample ID	0.005	1	0.7	10
			Benzene	Toluene	Ethylbenzene	Xylenes - total
Waneka Tank Battery	7/19/18	GW01@1.5	0.0036	0.0015	0.0017	0.018

Summit Scientific

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

July 19, 2018

Maggie Graham
Extraction Oil&Gas
370 17th Street Suite 5300
Denver, CO 80202
RE: Waneka 4-1

Enclosed are the results of analyses for samples received by Summit Scientific on 07/18/18 15:21. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Paul Shrewsbury For Ben Shrewsbury
Laboratory Manager



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

Project: Waneka 4-1

Project Number: 8.0183.01/8.0183.02-6000-930.88
Project Manager: Maggie Graham

Reported:
07/19/18 11:27

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
N01@2'	1807219-01	Soil	07/18/18 12:55	07/18/18 15:21
W01@2'	1807219-02	Soil	07/18/18 13:00	07/18/18 15:21
E01@2'	1807219-03	Soil	07/18/18 13:10	07/18/18 15:21
S01@2'	1807219-04	Soil	07/18/18 13:15	07/18/18 15:21

Summit Scientific

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Summit Scientific

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

Page 1 of 1

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

Project Manager: Maggie Graham 720-501-5065; 907-538-7699c

E-Mail: DenverRemediation@ApexCos.onmicrosoft.com

Project Name: Wameka

Project Number: 80183.01 / 8.0183.02 - 6000 - 930.88

Sample Description				Date Sampled	Time Sampled	Number of Containers	Preservative				Matrix				Analyze For:										Special Instructions				
							HCl	HNO ₃	None	Other (Specify)	Groundwater	Soil	Air - Canister Serial #	Other (Specify)	TPH	BTEX	PH	EC	SAR										
NO1 @ 2'				7/18/18	1255	1			X			X				X	X	X	X	X									
W01 @ 2'				↓	1300	↓			↓			↓				X	X	X	X	X									
E01 @ 2'				↓	1310	↓			↓			↓				X	X												
S01 @ 2'				↓	1315	↓																							

1807219

Sample Receipt Checklist

S2 Work Order: _____

Client: Ape Companies Client Project ID: WanekaShipped Via: Hand
(UPS, FedEx, Hand Delivered, Pick-up, etc.)

Airbill #: _____

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

Temp (°C)

5.5

Thermometer ID: 61857155-K

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

LP
Custodian Printed Name or Initials

[Signature]
Signature or Initials of Custodian

7.18.18 1612
Date/Time



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

Project: Waneka 4-1
Project Number: 8.0183.01/8.0183.02-6000-930.88
Project Manager: Maggie Graham

Reported:
07/19/18 11:27

N01@2'
1807219-01 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: 07/18/18 12:55									
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	1807215	07/18/18	07/19/18	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	4.1	0.50	"	"	"	"	"	"	

Date Sampled: 07/18/18 12:55									
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		104 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		109 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		93.3 %	21-167		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: 07/18/18 12:55									
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1807216	07/18/18	07/18/18	EPA 8015M	

Date Sampled: 07/18/18 12:55									
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		114 %	30-150		"	"	"	"	

Soluble Nutrients by EPA 6020/USDA60 6(2, 3A) - Dry Weight Basis

Date Sampled: 07/18/18 12:55									
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	6210	14.3	mg/kg dry	1	1807214	07/18/18	07/19/18	EPA 6020B	
Magnesium	989	7.17	"	"	"	"	"	"	

Summit Scientific

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370 17th Street Suite 5300
Denver CO, 80202

Project: Waneka 4-1
Project Number: 8.0183.01/8.0183.02-6000-930.88
Project Manager: Maggie Graham

Reported:
07/19/18 11:27

N01@2'
1807219-01 (Soil)

Summit Scientific

Soluble Nutrients by EPA 6020/USDA60 6(2, 3A) - Dry Weight Basis

Sodium	215	7.17 mg/kg dry	1	1807214	07/18/18	07/19/18	EPA 6020B
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Calculated Analysis

Date Sampled: **07/18/18 12:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	0.669	0.100	units	1	1807225	07/19/18	07/19/18	Calculation	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **07/18/18 12:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	69.7		%	1	1807206	07/18/18	07/19/18	Calculation	
pH	7.55		pH Units	"	1807208	07/18/18	07/18/18	EPA 9045D	

Specific Conductance by EPA Method 120.1

Date Sampled: **07/18/18 12:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	1.03	0.0100	mmhos/cm	1	1807209	"	07/18/18	EPA 120.1	

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370 17th Street Suite 5300
Denver CO, 80202

Project: Waneka 4-1
Project Number: 8.0183.01/8.0183.02-6000-930.88
Project Manager: Maggie Graham

Reported:
07/19/18 11:27

W01@2'
1807219-02 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: 07/18/18 13:00									
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	0.023	0.0020	mg/kg	1	1807215	07/18/18	07/18/18	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	0.084	0.0050	"	"	"	"	"	"	
Xylenes (total)	0.19	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	19	0.50	"	"	"	"	"	"	

Date Sampled: 07/18/18 13:00									
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		104 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		99.7 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		141 %	21-167		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: 07/18/18 13:00									
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	120	50	mg/kg	1	1807216	07/18/18	07/18/18	EPA 8015M	

Date Sampled: 07/18/18 13:00									
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		119 %	30-150		"	"	"	"	

Soluble Nutrients by EPA 6020/USDA60 6(2, 3A) - Dry Weight Basis

Date Sampled: 07/18/18 13:00									
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	1490	11.3	mg/kg dry	1	1807214	07/18/18	07/19/18	EPA 6020B	
Magnesium	554	5.65	"	"	"	"	"	"	
Sodium	115	5.65	"	"	"	"	"	"	

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370 17th Street Suite 5300
Denver CO, 80202

Project: Waneka 4-1
Project Number: 8.0183.01/8.0183.02-6000-930.88
Project Manager: Maggie Graham

Reported:
07/19/18 11:27

W01@2'
1807219-02 (Soil)

Summit Scientific

Soluble Nutrients by EPA 6020/USDA60 6(2, 3A) - Dry Weight Basis

Calculated Analysis

Date Sampled: **07/18/18 13:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	0.646	0.100	units	1	1807225	07/19/18	07/19/18	Calculation	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **07/18/18 13:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	88.5		%	1	1807206	07/18/18	07/19/18	Calculation	
pH	7.94		pH Units	"	1807208	07/18/18	07/18/18	EPA 9045D	

Specific Conductance by EPA Method 120.1

Date Sampled: **07/18/18 13:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	0.701	0.0100	mmhos/cm	1	1807209	"	07/18/18	EPA 120.1	

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370 17th Street Suite 5300
Denver CO, 80202

Project: Waneka 4-1
Project Number: 8.0183.01/8.0183.02-6000-930.88
Project Manager: Maggie Graham

Reported:
07/19/18 11:27

E01@2'
1807219-03 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **07/18/18 13:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	0.065	0.0020	mg/kg	1	1807215	07/18/18	07/18/18	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	1.3	0.50	"	"	"	"	"	"	

Date Sampled: **07/18/18 13:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		107 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		104 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		127 %	21-167		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **07/18/18 13:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1807216	07/18/18	07/18/18	EPA 8015M	

Date Sampled: **07/18/18 13:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		114 %	30-150		"	"	"	"	

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Extraction Oil&Gas
370 17th Street Suite 5300
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Project: Waneka 4-1
Project Number: 8.0183.01/8.0183.02-6000-930.88
Project Manager: Maggie Graham

Reported:
07/19/18 11:27

S01@2'
1807219-04 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **07/18/18 13:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	0.11	0.0020	mg/kg	1	1807215	07/18/18	07/19/18	EPA 8260B	
Toluene	0.029	0.0050	"	"	"	"	"	"	
Ethylbenzene	0.0092	0.0050	"	"	"	"	"	"	
Xylenes (total)	0.053	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	34	0.50	"	"	"	"	"	"	

Date Sampled: **07/18/18 13:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		109 %	23-173		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		99.9 %	20-170		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		122 %	21-167		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **07/18/18 13:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	66	50	mg/kg	1	1807216	07/18/18	07/18/18	EPA 8015M	

Date Sampled: **07/18/18 13:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: o-Terphenyl</i>		112 %	30-150		"	"	"	"	

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Project: Waneka 4-1

Project Number: 8.0183.01/8.0183.02-6000-930.88
Project Manager: Maggie Graham

Reported:
07/19/18 11:27

Volatile Organic Compounds by EPA Method 8260B - Quality Control

Summit Scientific

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

Batch 1807215 - EPA 5030 Soil MS

Blank (1807215-BLK1)

Prepared: 07/18/18 Analyzed: 07/19/18

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	0.0386		"	0.0396	97.5	23-173
Surrogate: Toluene-d8	0.0401		"	0.0400	100	20-170
Surrogate: 4-Bromofluorobenzene	0.0402		"	0.0400	101	21-167

LCS (1807215-BS1)

Prepared: 07/18/18 Analyzed: 07/19/18

Benzene	0.0856	0.0020	mg/kg	0.100	85.6	70-130
Toluene	0.0892	0.0050	"	0.100	89.2	70-130
Ethylbenzene	0.0900	0.0050	"	0.100	90.0	70-130
m,p-Xylene	0.165	0.010	"	0.200	82.7	70-130
o-Xylene	0.0796	0.0050	"	0.100	79.6	70-130

Surrogate: 1,2-Dichloroethane-d4	0.0374		"	0.0396	94.3	23-173
Surrogate: Toluene-d8	0.0432		"	0.0400	108	20-170
Surrogate: 4-Bromofluorobenzene	0.0389		"	0.0400	97.2	21-167

Matrix Spike (1807215-MS1)

Source: 1807210-01

Prepared: 07/18/18 Analyzed: 07/19/18

Benzene	0.0976	0.0020	mg/kg	0.100	ND	97.6	70-130
Toluene	0.102	0.0050	"	0.100	ND	102	70-130
Ethylbenzene	0.107	0.0050	"	0.100	ND	107	70-130
m,p-Xylene	0.196	0.010	"	0.200	ND	97.8	70-130
o-Xylene	0.0950	0.0050	"	0.100	ND	95.0	70-130

Surrogate: 1,2-Dichloroethane-d4	0.0415		"	0.0396	105	23-173
Surrogate: Toluene-d8	0.0421		"	0.0400	105	20-170
Surrogate: 4-Bromofluorobenzene	0.0401		"	0.0400	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.



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

Project: Waneka 4-1
Project Number: 8.0183.01/8.0183.02-6000-930.88
Project Manager: Maggie Graham

Reported:
07/19/18 11:27

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

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

Batch 1807215 - EPA 5030 Soil MS

Matrix Spike Dup (1807215-MSD1)	Source: 1807210-01			Prepared: 07/18/18 Analyzed: 07/19/18						
Benzene	0.0984	0.0020	mg/kg	0.100	ND	98.4	70-130	0.796	30	
Toluene	0.103	0.0050	"	0.100	ND	103	70-130	1.28	30	
Ethylbenzene	0.113	0.0050	"	0.100	ND	113	70-130	5.79	30	
m,p-Xylene	0.209	0.010	"	0.200	ND	104	70-130	6.46	30	
o-Xylene	0.0997	0.0050	"	0.100	ND	99.7	70-130	4.90	30	
Surrogate: 1,2-Dichloroethane-d4	0.0430		"	0.0396		109	23-173			
Surrogate: Toluene-d8	0.0411		"	0.0400		103	20-170			
Surrogate: 4-Bromofluorobenzene	0.0391		"	0.0400		97.6	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: Waneka 4-1
Project Number: 8.0183.01/8.0183.02-6000-930.88
Project Manager: Maggie Graham

Reported:
07/19/18 11:27

Extractable Petroleum Hydrocarbons by 8015 - Quality Control
Summit Scientific

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

Batch 1807216 - EPA 3580A

Blank (1807216-BLK1)

Prepared: 07/18/18 Analyzed: 07/19/18

C10-C28 (DRO) ND 50 mg/kg

LCS (1807216-BS1)

Prepared: 07/18/18 Analyzed: 07/19/18

C10-C28 (DRO) 503 50 mg/kg 70-130

Matrix Spike (1807216-MS1)

Source: 1807210-01

Prepared: 07/18/18 Analyzed: 07/19/18

C10-C28 (DRO) 507 50 mg/kg 30.7 70-130

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: Waneka 4-1
Project Number: 8.0183.01/8.0183.02-6000-930.88
Project Manager: Maggie Graham

Reported:
07/19/18 11:27

Soluble Nutrients by EPA 6020/USDA60 6(2, 3A) - Dry Weight Basis - Quality Control
Summit Scientific

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

Batch 1807214 - General Preparation

Blank (1807214-BLK1)

Prepared: 07/18/18 Analyzed: 07/19/18

Calcium	ND	10.0	mg/kg wet
Magnesium	ND	5.00	"
Sodium	ND	5.00	"

LCS (1807214-BS1)

Prepared: 07/18/18 Analyzed: 07/19/18

Calcium	519	10.0	mg/kg wet	500	104	70-130
Magnesium	534	5.00	"	500	107	70-130
Sodium	550	5.00	"	500	110	70-130

Duplicate (1807214-DUP1)

Source: 1807210-04

Prepared: 07/18/18 Analyzed: 07/19/18

Calcium	1780	12.4	mg/kg dry	1980	10.7	20
Magnesium	575	6.22	"	585	1.67	20
Sodium	462	6.22	"	517	11.2	20

Matrix Spike (1807214-MS1)

Source: 1807210-04

Prepared: 07/18/18 Analyzed: 07/19/18

Calcium	2430	12.4	mg/kg dry	622	1980	73.2	70-130
Magnesium	1130	6.22	"	622	585	87.3	70-130
Sodium	1090	6.22	"	622	517	92.4	70-130

Matrix Spike Dup (1807214-MSD1)

Source: 1807210-04

Prepared: 07/18/18 Analyzed: 07/19/18

Calcium	2460	12.4	mg/kg dry	622	1980	77.1	70-130	0.994	25
Magnesium	1160	6.22	"	622	585	92.0	70-130	2.57	25
Sodium	1120	6.22	"	622	517	97.5	70-130	2.86	25

Summit Scientific

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

Project: Waneka 4-1

Project Number: 8.0183.01/8.0183.02-6000-930.88
Project Manager: Maggie Graham

Reported:
07/19/18 11:27

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

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

Batch 1807206 - General Preparation

Duplicate (1807206-DUP1) **Source: 1807185-01** Prepared: 07/18/18 Analyzed: 07/19/18

% Solids	95.5		%		95.1			0.339	20	
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Batch 1807208 - General Preparation

LCS (1807208-BS1) Prepared & Analyzed: 07/18/18

pH	9.2		pH Units	9.18	99.7	95-105				
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Duplicate (1807208-DUP1) **Source: 1807197-01** Prepared & Analyzed: 07/18/18

pH	8.4		pH Units		8.3			0.601	20	
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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.



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

Project: Waneka 4-1

Project Number: 8.0183.01/8.0183.02-6000-930.88
Project Manager: Maggie Graham

Reported:
07/19/18 11:27

Specific Conductance by EPA Method 120.1 - Quality Control
Summit Scientific

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

Batch 1807209 - General Preparation

LCS (1807209-BS1)

Prepared & Analyzed: 07/18/18

Specific Conductance (EC)	0.738	0.0100	mmhos/cm	0.750	98.3	90-110
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Duplicate (1807209-DUP1)

Source: 1807197-01

Prepared & Analyzed: 07/18/18

Specific Conductance (EC)	0.534	0.0100	mmhos/cm	0.540	1.12	20
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Summit Scientific

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

Project: Waneka 4-1

Project Number: 8.0183.01/8.0183.02-6000-930.88
Project Manager: Maggie Graham

Reported:
07/19/18 11:27

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

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

July 19, 2018

Blake Ford
Extraction Oil&Gas
370 17th Street Suite 5300
Denver, CO 80202
RE: Waneka 4-1

Enclosed are the results of analyses for samples received by Summit Scientific on 07/19/18 10:35. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

DRAFT REPORT
DATA SUBJECT TO CHANGE



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

Project: Waneka 4-1

Project Number: 8.0183.01/8.0183.02-6000-930.88
Project Manager: Blake Ford

Reported:
07/19/18 12:02

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
GW01@1.5	1807250-01	Water	07/19/18 09:31	07/19/18 10:35

DRAFT REPORT

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

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

1807250

Page 1 of 1

Client:	Extraction Oil & Gas	
Address:	370 17th Street, Suite 5300	
City/State/Zip:	Denver, CO 80202	
Phone:	720-481-2362	Fax:
Sampler Name:	Brian Gibson	

Project Manager:	Blake Ford
E-Mail:	bford@extractionog.com; bgibson@extractionog.com
Project Name:	Waneka 4-1
Project Number:	

[illegible]

Sample Receipt Checklist

S2 Work Order 1807250

Client: XOG Client Project ID: Waneka

Shipped Via: H.D. on ice Airbill #: _____
(UPS, FedEx, Hand Delivered, Pick-up, etc.)

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


Temp (°C)	<u>0.0</u>
-----------	------------

Thermometer ID: 61857155-K

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

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

Muri
Custodian Printed Name or Initials

 7-19-18
Signature of Custodian

10:40
Date/Time



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

Project: Waneka 4-1
Project Number: 8.0183.01/8.0183.02-6000-930.88
Project Manager: Blake Ford

Reported:
07/19/18 12:02

GW01@1.5
1807250-01 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **07/19/18 09:31**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	3.6	1.0	ug/l	1	1807232	07/19/18	07/19/18	EPA 8260B	
Toluene	1.5	1.0	"	"	"	"	"	"	
Ethylbenzene	1.7	1.0	"	"	"	"	"	"	
Xylenes (total)	18	2.0	"	"	"	"	"	"	

Date Sampled: **07/19/18 09:31**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		92.0 %	23-173		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		103 %	20-170		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		108 %	21-167		"	"	"	"	

DRAFT REPORT

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: Waneka 4-1

Project Number: 8.0183.01/8.0183.02-6000-930.88
Project Manager: Blake Ford

Reported:
07/19/18 12:02

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

DRAFT REPORT

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: Waneka 4-1

Project Number: 8.0183.01/8.0183.02-6000-930.88
Project Manager: Blake Ford

Reported:
07/19/18 12:02

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

DRAFT REPORT

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

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

July 20, 2018

Maggie Graham
Extraction Oil&Gas
370 17th Street Suite 5300
Denver, CO 80202
RE: Waneka Tank Battery

Enclosed are the results of analyses for samples received by Summit Scientific on 07/19/18 16:30. 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', is written over a light gray rectangular background.

Paul Shrewsbury For Ben Shrewsbury
Laboratory Manager



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

Project: Waneka Tank Battery
Project Number: 8.0183.01/8.0183.02-6000-930.88
Project Manager: Maggie Graham

Reported:
07/20/18 06:12

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
C01	1807256-01	Soil	07/18/18 13:25	07/19/18 16:30

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

Page 1 of 1

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

Project Manager: Maggie Graham 720-501-5065; 907-538-7699c

E-Mail: DenverRemediation@ApexCos.onmicrosoft.com

Project Name: Wanaka Tank Battery

Project Number: 8.0183.01 / 8.0183.02 - 6000 - 930.88

[illegible]

1807256

Sample Receipt Checklist

S2 Work Order: _____

Client: Aper Companies LLC Client Project ID: Wanaka Tank BatteryShipped Via: Hand
(UPS, FedEx, Hand Delivered, Pick-up, etc.)

Airbill #: _____

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

Temp (°C)	4.2
-----------	-----

Thermometer ID: 61857155-K

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

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


 Custodian Printed Name or Initials


 Signature or Initials of Custodian

 7.19.18 1634
 Date/Time



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

Project: Waneka Tank Battery
Project Number: 8.0183.01/8.0183.02-6000-930.88
Project Manager: Maggie Graham

Reported:
07/20/18 06:12

C01
1807256-01 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **07/18/18 13:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	0.17	0.0020	mg/kg	1	1807237	07/19/18	07/19/18	EPA 8260B	
Toluene	0.35	0.0050	"	"	"	"	"	"	
Ethylbenzene	0.12	0.0050	"	"	"	"	"	"	
Xylenes (total)	1.6	0.10	"	10	"	"	"	"	
Gasoline Range Hydrocarbons	240	5.0	"	"	"	"	"	"	

Date Sampled: **07/18/18 13:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		131 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		91.6 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		173 %	21-167		"	"	"	"	S-02

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **07/18/18 13:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1807238	07/19/18	07/19/18	EPA 8015M	

Date Sampled: **07/18/18 13:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		108 %	30-150		"	"	"	"	

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: Waneka Tank Battery
Project Number: 8.0183.01/8.0183.02-6000-930.88
Project Manager: Maggie Graham

Reported:
07/20/18 06:12

Volatile Organic Compounds by EPA Method 8260B - Quality Control

Summit Scientific

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

Batch 1807237 - EPA 5030 Soil MS

Blank (1807237-BLK1)

Prepared & Analyzed: 07/19/18

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	0.0412		"	0.0396	104	23-173
Surrogate: Toluene-d8	0.0410		"	0.0400	102	20-170
Surrogate: 4-Bromofluorobenzene	0.0419		"	0.0400	105	21-167

LCS (1807237-BS1)

Prepared & Analyzed: 07/19/18

Benzene	0.182	0.0020	mg/kg	0.200	90.8	70-130
Toluene	0.173	0.0050	"	0.200	86.5	70-130
Ethylbenzene	0.175	0.0050	"	0.200	87.6	70-130
m,p-Xylene	0.312	0.010	"	0.400	78.1	70-130
o-Xylene	0.159	0.0050	"	0.200	79.6	70-130

Surrogate: 1,2-Dichloroethane-d4	0.0415		"	0.0396	105	23-173
Surrogate: Toluene-d8	0.0423		"	0.0400	106	20-170
Surrogate: 4-Bromofluorobenzene	0.0422		"	0.0400	106	21-167

Matrix Spike (1807237-MS1)

Source: 1807251-01

Prepared & Analyzed: 07/19/18

Benzene	0.158	0.0020	mg/kg	0.200	ND	79.2	70-130
Toluene	0.145	0.0050	"	0.200	ND	72.5	70-130
Ethylbenzene	0.152	0.0050	"	0.200	ND	75.9	70-130
m,p-Xylene	0.264	0.010	"	0.400	ND	65.9	60-130
o-Xylene	0.136	0.0050	"	0.200	ND	67.9	60-130

Surrogate: 1,2-Dichloroethane-d4	0.0400		"	0.0396	101	23-173
Surrogate: Toluene-d8	0.0414		"	0.0400	103	20-170
Surrogate: 4-Bromofluorobenzene	0.0415		"	0.0400	104	21-167

Summit Scientific

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

Project: Waneka Tank Battery
Project Number: 8.0183.01/8.0183.02-6000-930.88
Project Manager: Maggie Graham

Reported:
07/20/18 06:12

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

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

Batch 1807237 - EPA 5030 Soil MS

Matrix Spike Dup (1807237-MSD1)	Source: 1807251-01			Prepared & Analyzed: 07/19/18						
Benzene	0.165	0.0020	mg/kg	0.200	ND	82.6	70-130	4.25	30	
Toluene	0.153	0.0050	"	0.200	ND	76.4	70-130	5.24	30	
Ethylbenzene	0.158	0.0050	"	0.200	ND	79.1	70-130	4.10	30	
m,p-Xylene	0.276	0.010	"	0.400	ND	69.0	60-130	4.63	30	
o-Xylene	0.143	0.0050	"	0.200	ND	71.4	60-130	5.08	30	
Surrogate: 1,2-Dichloroethane-d4	0.0402		"	0.0396		102	23-173			
Surrogate: Toluene-d8	0.0421		"	0.0400		105	20-170			
Surrogate: 4-Bromofluorobenzene	0.0431		"	0.0400		108	21-167			

Summit Scientific

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Project: Waneka Tank Battery
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Project Manager: Maggie Graham

Reported:
07/20/18 06:12

Extractable Petroleum Hydrocarbons by 8015 - Quality Control
Summit Scientific

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

Batch 1807238 - EPA 3550A

Blank (1807238-BLK1)

Prepared: 07/19/18 Analyzed: 07/20/18

C10-C28 (DRO) ND 50 mg/kg

LCS (1807238-BS1)

Prepared: 07/19/18 Analyzed: 07/20/18

C10-C28 (DRO) 548 50 mg/kg 70-130

Matrix Spike (1807238-MS1)

Source: 1807255-01

Prepared: 07/19/18 Analyzed: 07/20/18

C10-C28 (DRO) 508 50 mg/kg 19.6 70-130

Matrix Spike Dup (1807238-MSD1)

Source: 1807255-01

Prepared: 07/19/18 Analyzed: 07/20/18

C10-C28 (DRO) 502 50 mg/kg 19.6 70-130 1.02 20

Summit Scientific

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

Project: Waneka Tank Battery
Project Number: 8.0183.01/8.0183.02-6000-930.88
Project Manager: Maggie Graham

Reported:
07/20/18 06:12

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.
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