

Summit Scientific

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

March 23, 2017

Blake Ford
Extraction Oil & Gas
570 17th St. Suite 550
Denver, CO 80202
RE: Mickey Spill Response

Enclosed are the results of analyses for samples received by Summit Scientific on 03/17/17 12:25. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Paul Shrewsbury
President



Extraction Oil & Gas
570 17th St. Suite 550
Denver CO, 80202

Project: Mickey Spill Response

Project Number: [none]
Project Manager: Blake Ford

Reported:
03/23/17 09:47

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
Mickey Spill Area	1703150-01	Soil	03/17/17 10:45	03/17/17 12:25

Summit Scientific

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Extraction Oil & Gas
570 17th St. Suite 550
Denver CO, 80202

Project: Mickey Spill Response

Project Number: [none]
Project Manager: Blake Ford

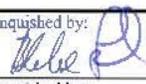
Reported:
03/23/17 09:47

Summit Scientific 1703/50

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Page 1 of 1

Client: Extraction Oil & Gas	Project Manager: Blake Ford
Address: 370 17th Street, Suite 5300	E-Mail: bford@extractionog.com
City/State/Zip: Denver, CO 80202	Project Name: Mickey Spill Response
Phone: 720-481-2362 Fax:	Project Number:
Sampler Name: Blake Ford	

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)	910-1 Suite	BTEX/TPH GRO-828	TPH DRO-8015		
Mickey Spill Area	3/17/2017	1045	3		x			x								
Relinquished by: 	Date/Time: 12:00/03/17/2017	Received by: 	Date/Time: 3-17-17 2017 12:00	Turn Around Time (Check)		Notes: Per Paul 910-1										
Relinquished by: 	Date/Time: 3-17-17 12:55	Received by: 	Date/Time: 3/17/17 12:55	Same Day <input type="checkbox"/>	72 Hours <input checked="" type="checkbox"/>											
Relinquished by:	Date/Time:	Received in Lab by:	Date/Time:	24 Hours <input type="checkbox"/>	Standard <input type="checkbox"/>											
				48 Hours <input type="checkbox"/>												
				Sample Integrity:												
				Temperature Upon Receipt: 7.4												
				Intact: Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>											

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Extraction Oil & Gas
 570 17th St. Suite 550
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Project: Mickey Spill Response

Project Number: [none]
 Project Manager: Blake Ford

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Sample Receipt Checklist

S2 Work Order 1703150

Client Extraction Oil & Gas Client Project ID Mickey Spill ~~Response~~ Response

Shipped Via 4.D. on ice (UPS FedEx, Hand Delivered, Pick-up, etc.) Airbill # _____

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

Cooler ID				
Temp (°C)	<u>7.4</u>			

Thermometer ID: 61857155-K

	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature just above 0°C to ≤ 6°C (1)? NOTE: If samples are delivered the same day of sampling, this requirement is waived provided that there is evidence that cooling has begun.	<input checked="" type="checkbox"/>			
Were all samples received intact (1)?	<input checked="" type="checkbox"/>			
Was adequate sample volume provided (1)?	<input checked="" type="checkbox"/>			
If custody seals are present, are they intact (1)?			<input checked="" type="checkbox"/>	
Are short holding time analytes or samples with HTs due within 48 hours present?			<input checked="" type="checkbox"/>	
Is a chain-of-custody (COC) form present and filled out completely (1)?	<input checked="" type="checkbox"/>			
Does the COC agree with the number and type of sample bottles received (1)?	<input checked="" type="checkbox"/>			
Do the sample IDs on the bottle labels match the COC (1)?	<input checked="" type="checkbox"/>			
Is the COC properly relinquished by the client w/ date and time recorded (1)?	<input checked="" type="checkbox"/>			
For volatiles in water – is there headspace present? If yes, contact client and note in narrative.			<input checked="" type="checkbox"/>	
Are samples preserved that require preservation (excluding cooling) (1)? Note the type of preservative in the Comments column – HCl, H2SO4, NaOH, HNO3, ect.			<input checked="" type="checkbox"/>	
If samples are acid preserved for metals, is the pH < 2 (1)? 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):				

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

Muri P
 Custodian Printed Name

NA 3-17-17
 Signature or Initials of Custodian

12:05
 Date/Time



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Project: Mickey Spill Response

Project Number: [none]
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Mickey Spill Area
1703150-01 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **03/17/17 10:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	4000	50	mg/kg	1	1703200	03/20/17	03/21/17	8015M	

Date Sampled: **03/17/17 10:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: o-Terphenyl</i>		105 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **03/17/17 10:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	1703213	03/20/17	03/21/17	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.0050	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **03/17/17 10:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		108 %	23-173		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		101 %	20-170		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		104 %	21-167		"	"	"	"	

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

Date Sampled: **03/17/17 10:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	837	10.2	mg/kg dry	1	1703229	03/22/17	03/22/17	EPA 6020/Mod. USDA60 6(2, 3A)	
Magnesium	150	5.10	"	"	"	"	"	"	

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Mickey Spill Area
1703150-01 (Soil)

Summit Scientific

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

Analyte	Result	Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium	322	5.10	mg/kg dry	1	1703229	03/22/17	03/22/17	EPA 6020/Mod. USDA60 6(2, 3A)	
Sodium Adsorption Ratio	2.69		units	"	1703259	03/23/17	03/23/17	"	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **03/17/17 10:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	2.01	0.0100	mmhos/cm	1	1703230	03/21/17	03/21/17	SM 2510B	
% Solids	98.0		%	"	1703207	03/20/17	03/20/17	% calculation	
pH	8.32	0.100	pH Units	"	1703231	03/21/17	03/21/17	EPA 9045	

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Project: Mickey Spill Response

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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 1703200 - EPA 3550A

Blank (1703200-BLK1)

Prepared & Analyzed: 03/20/17

C10-C28 (DRO)	ND	50	mg/kg								
<i>Surrogate: o-Terphenyl</i>	12.2		"	12.5		97.3	30-150				

LCS (1703200-BS1)

Prepared: 03/20/17 Analyzed: 03/21/17

C10-C28 (DRO)	618	50	mg/kg	499		124	73-134				
<i>Surrogate: o-Terphenyl</i>	11.9		"	12.5		95.4	30-150				

Matrix Spike (1703200-MS1)

Source: 1703141-01

Prepared: 03/20/17 Analyzed: 03/21/17

C10-C28 (DRO)	495	50	mg/kg	499	29.2	93.3	50-148				
<i>Surrogate: o-Terphenyl</i>	11.3		"	12.5		90.6	30-150				

Matrix Spike Dup (1703200-MSD1)

Source: 1703141-01

Prepared: 03/20/17 Analyzed: 03/21/17

C10-C28 (DRO)	511	50	mg/kg	499	29.2	96.6	50-148	3.22	20		
<i>Surrogate: o-Terphenyl</i>	11.5		"	12.5		92.0	30-150				

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Project: Mickey Spill Response

Project Number: [none]
Project Manager: Blake Ford

Reported:
03/23/17 09:47

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 1703213 - EPA 5030 Soil MS

Blank (1703213-BLK1)

Prepared: 03/20/17 Analyzed: 03/21/17

Benzene	ND	0.0020	mg/kg							
Toluene	ND	0.0050	"							
Ethylbenzene	ND	0.0050	"							
Xylenes (total)	ND	0.0050	"							
Gasoline Range Hydrocarbons	ND	0.50	"							
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0406</i>		<i>"</i>	<i>0.0400</i>		<i>101</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0409</i>		<i>"</i>	<i>0.0400</i>		<i>102</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0422</i>		<i>"</i>	<i>0.0400</i>		<i>106</i>	<i>21-167</i>			

LCS (1703213-BS1)

Prepared: 03/20/17 Analyzed: 03/21/17

Benzene	0.0996	0.0020	mg/kg	0.100		99.6	58-130			
Toluene	0.104	0.0050	"	0.100		104	61-134			
Ethylbenzene	0.116	0.0050	"	0.0992		117	74-139			
m,p-Xylene	0.221	0.010	"	0.200		111	73-137			
o-Xylene	0.108	0.0050	"	0.0980		110	73-141			
Xylenes (total)	0.329	0.0050	"				30-150			
Gasoline Range Hydrocarbons	0.989	0.50	"				30-150			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0398</i>		<i>"</i>	<i>0.0400</i>		<i>99.4</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0420</i>		<i>"</i>	<i>0.0400</i>		<i>105</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0411</i>		<i>"</i>	<i>0.0400</i>		<i>103</i>	<i>21-167</i>			

Matrix Spike (1703213-MS1)

Source: 1703150-01

Prepared: 03/20/17 Analyzed: 03/21/17

Benzene	0.108	0.0020	mg/kg	0.100	ND	108	30-131			
Toluene	0.116	0.0050	"	0.100	ND	116	30-134			
Ethylbenzene	0.123	0.0050	"	0.0992	ND	124	22-153			
m,p-Xylene	0.236	0.010	"	0.200	ND	118	10-159			
o-Xylene	0.115	0.0050	"	0.0980	ND	117	31-151			
Xylenes (total)	0.351	0.0050	"		ND		30-150			
Gasoline Range Hydrocarbons	1.07	0.50	"		ND		30-150			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0433</i>		<i>"</i>	<i>0.0400</i>		<i>108</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0418</i>		<i>"</i>	<i>0.0400</i>		<i>105</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0417</i>		<i>"</i>	<i>0.0400</i>		<i>104</i>	<i>21-167</i>			

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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 1703213 - EPA 5030 Soil MS

Matrix Spike Dup (1703213-MSD1)	Source: 1703150-01			Prepared: 03/20/17	Analyzed: 03/21/17					
Benzene	0.108	0.0020	mg/kg	0.100	ND	108	30-131	0.222	34	
Toluene	0.117	0.0050	"	0.100	ND	117	30-134	0.464	30	
Ethylbenzene	0.128	0.0050	"	0.0992	ND	129	22-153	4.34	24	
m,p-Xylene	0.246	0.010	"	0.200	ND	123	10-159	4.30	68	
o-Xylene	0.121	0.0050	"	0.0980	ND	123	31-151	4.74	38	
Xylenes (total)	0.367	0.0050	"		ND		30-150	4.44	20	
Gasoline Range Hydrocarbons	1.15	0.50	"		ND		30-150	7.34	20	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0430</i>		<i>"</i>	<i>0.0400</i>		<i>108</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0404</i>		<i>"</i>	<i>0.0400</i>		<i>101</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0410</i>		<i>"</i>	<i>0.0400</i>		<i>102</i>	<i>21-167</i>			

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Project: Mickey Spill Response

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

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

Batch 1703229 - General Preparation

Blank (1703229-BLK1)

Prepared & Analyzed: 03/22/17

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

LCS (1703229-BS1)

Prepared & Analyzed: 03/22/17

Calcium	585	10.0	mg/kg wet	500	117	82.9-118				
Magnesium	555	5.00	"	500	111	77.1-123				
Sodium	568	5.00	"	500	114	71-129				

Duplicate (1703229-DUP1)

Source: 1703150-01

Prepared & Analyzed: 03/22/17

Calcium	1090	10.2	mg/kg dry	837			26.6	200		
Magnesium	202	5.10	"	150			29.7	200		
Sodium	323	5.10	"	322			0.459	200		

Matrix Spike (1703229-MS1)

Source: 1703150-01

Prepared & Analyzed: 03/22/17

Calcium	1440	10.2	mg/kg dry	483	837	125	75-125			
Magnesium	731	5.10	"	483	150	120	75-125			
Sodium	868	5.10	"	483	322	113	75-125			

Matrix Spike Dup (1703229-MSD1)

Source: 1703150-01

Prepared & Analyzed: 03/22/17

Calcium	1310	10.2	mg/kg dry	483	837	97.4	75-125	9.68	25	
Magnesium	684	5.10	"	483	150	111	75-125	6.60	25	
Sodium	822	5.10	"	483	322	103	75-125	5.48	25	

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

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

Batch 1703207 - General Preparation

Duplicate (1703207-DUP1)	Source: 1703150-01		Prepared & Analyzed: 03/20/17								
% Solids	98.0		%		98.0				0.00	20	

Batch 1703230 - General Preparation

Blank (1703230-BLK1)									Prepared & Analyzed: 03/21/17		
Specific Conductance (EC)	ND	0.0100	mmhos/cm								

LCS (1703230-BS1)									Prepared & Analyzed: 03/21/17		
Specific Conductance (EC)	0.500	0.0100	mmhos/cm	0.500	100	90-110					

Duplicate (1703230-DUP1)	Source: 1703150-01		Prepared & Analyzed: 03/21/17								
Specific Conductance (EC)	1.97	0.0100	mmhos/cm		2.01				1.76	20	

Batch 1703231 - General Preparation

LCS (1703231-BS1)									Prepared & Analyzed: 03/21/17		
pH	6.00	0.100	pH Units	6.00	100	95-105					

Duplicate (1703231-DUP1)	Source: 1703150-01		Prepared & Analyzed: 03/21/17								
pH	8.28	0.100	pH Units		8.32				0.482	20	

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Project Number: [none]
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Reported:
03/23/17 09:47

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