



OIL CONS. DIV DIST. 3
MAR 28 2017

Analytical Report

Report Summary

Client: Thompson Engineering

Chain Of Custody Number:

Samples Received: 3/10/2017 1:30:00PM

Job Number: 07173-0001

Work Order: P703009

Project Name/Location: Captain Sawyer #1-S

30.645.31717

Report Reviewed By:

Date: 3/22/17

Walter Hinchman, Laboratory Director

Date: 3/22/17

Tim Cain, Quality Assurance Officer

The results in this report apply to the samples submitted to Envirotech's Analytical Laboratory and were analyzed in accordance with the chain of custody document supplied by you, the client, and as such are for your exclusive use only. The results in this report are based on the sample as received unless otherwise noted. Partial or incomplete reproduction of this report is prohibited, unless approved by Envirotech, Inc. If you have any questions regarding this analytical report, please don't hesitate to contact Envirotech's Laboratory Staff.



Thompson Engineering
7415 E. Main St
Farmington NM, 87402

Project Name: Captain Sawycr #1-S
Project Number: 07173-0001
Project Manager: John Hampton Jr

Reported:
22-Mar-17 14:48

Analytical Report for Samples

Client Sample ID	Lab Sample ID	Matrix	Sampled	Received	Container
Bradenhead	P703009-01A	Aqueous	03/10/17	03/10/17	Poly 500mL
	P703009-01B	Aqueous	03/10/17	03/10/17	Poly 125mL; H2SO4
Tubing Sample	P703009-02A	Aqueous	03/10/17	03/10/17	Poly 500mL
	P703009-02B	Aqueous	03/10/17	03/10/17	Poly 125mL; H2SO4

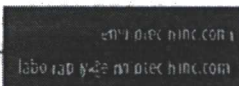
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Project Name: Captain Sawyer #1-S
Project Number: 07173-0001
Project Manager: John Hampton Jr

Reported:
22-Mar-17 14:48

Bradenhead
P703009-01 (Water)

Reporting

Analyte	Result	Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Wet Chem/Gravimetric									
Total Dissolved Solids	15000	10.0	mg/L	1	1711016	03/15/17	03/17/17	SM2540C	
Cation/Anion Analysis									
pH @25°C	11.8		pH Units	1	1710017	03/13/17 14:59	03/13/17 16:04	9040C/4500 H	H2
Electrical Conductivity	15100		umhos/cm	1	1711017	03/15/17	03/16/17	9050A/2510	
Sodium Absorption Ratio	66.6		N/A	1	1711018	03/15/17	03/16/17	[CALC]	
Total Alkalinity as CaCO3	550	10.0	mg/L	1	1711024	03/16/17	03/17/17	Hach Method 8203	
Bicarbonate as CaCO3	110	10.0	mg/L	1	1711024	03/16/17	03/17/17	Hach Method 8203	
Carbonate as CaCO3	440	10.0	mg/L	1	1711024	03/16/17	03/17/17	Hach Method 8203	
Hydroxide as CaCO3	ND	10.0	mg/L	1	1711024	03/16/17	03/17/17	Hach Method 8203	
Fluoride	ND	2.50	mg/L	10	1712002	03/20/17	03/21/17	EPA 300.0	
Chloride	1250	200	mg/L	100	1712002	03/20/17	03/20/17	EPA 300.0	
Nitrite-N	ND	2.50	mg/L	10	1712002	03/20/17 11:23	03/21/17 14:43	EPA 300.0	A-01
Nitrate-N	ND	2.50	mg/L	10	1712002	03/20/17 11:23	03/21/17 14:43	EPA 300.0	A-01
o-Phosphate-P	ND	2.50	mg/L	10	1712002	03/20/17 11:23	03/21/17 14:43	EPA 300.0	A-01
Sulfate	8350	200	mg/L	100	1712002	03/20/17	03/20/17	EPA 300.0	
Iron	ND	0.50	mg/L	1	1711008	03/14/17	03/14/17	EPA 6010C	
Calcium	105	0.50	mg/L	1	1711008	03/14/17	03/14/17	EPA 6010C	
Magnesium	ND	0.20	mg/L	1	1711008	03/14/17	03/14/17	EPA 6010C	
Potassium	22.7	4.95	mg/L	10	1711008	03/14/17	03/15/17	EPA 6010C	A-01a
Sodium	2480	1.98	mg/L	1	1711008	03/14/17	03/14/17	EPA 6010C	

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Thompson Engineering 7415 E. Main St Farmington NM, 87402	Project Name: Captain Sawyer # 8 Project Number: 07173-0001 Project Manager: John Hampton Jr	Reported: 22-Mar-17 14:48
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**Tubing Sample
P703009-02 (Water)**

Reporting									
Analyte	Result	Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes

Wet Chem/Gravimetric

Total Dissolved Solids	20600	10.0	mg/L	1	171016	03/15/17	03/17/17	SM2540C	
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Cation/Anion Analysis

pH @25 °C	6.50		pH Units	1	1710017	03/13/17 14:59	03/13/17 16:04	9040C/4500 H	H2
Electrical Conductivity	31600		umho/cm	1	171017	03/15/17	03/16/17	9050A/2510	
Sodium Absorption Ratio	38.3		NA	1	171018	03/15/17	03/16/17	[CALC]	
Total Alkalinity as CaCO3	290	10.0	mg/L	1	1711024	03/16/17	03/17/17	Hach Method 8203	
Bicarbonate as CaCO3	290	10.0	mg/L	1	1711024	03/16/17	03/17/17	Hach Method 8203	
Carbonate as CaCO3	ND	10.0	mg/L	1	1711024	03/16/17	03/17/17	Hach Method 8203	
Hydroxide as CaCO3	ND	10.0	mg/L	1	1711024	03/16/17	03/17/17	Hach Method 8203	
Fluoride	ND	2.50	mg/L	10	1712002	03/20/17	03/21/17	EPA 300.0	
Chloride	11700	200	mg/L	100	1712002	03/20/17	03/20/17	EPA 300.0	
Nitrite-N	ND	2.50	mg/L	10	1712002	03/20/17 11:23	03/21/17 15:05	EPA 300.0	A-01
Nitrate-N	ND	2.50	mg/L	10	1712002	03/20/17 11:23	03/21/17 15:05	EPA 300.0	A-01
o-Phosphate-P	ND	2.50	mg/L	10	1712002	03/20/17 11:23	03/21/17 15:05	EPA 300.0	A-01
Sulfate	ND	20.0	mg/L	10	1712002	03/20/17	03/21/17	EPA 300.0	
Iron	23.9	0.50	mg/L	1	1711008	03/14/17	03/14/17	EPA 6010C	
Calcium	332	0.50	mg/L	1	1711008	03/14/17	03/14/17	EPA 6010C	
Magnesium	67.2	0.20	mg/L	1	1711008	03/14/17	03/14/17	EPA 6010C	
Potassium	49.0	4.95	mg/L	10	1711008	03/14/17	03/15/17	EPA 6010C	A-01a
Sodium	2930	1.98	mg/L	1	1711008	03/14/17	03/14/17	EPA 6010C	

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Wet Chem/Gravimetric - Quality Control

Envirotech Analytical Laboratory

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1711016 - No Prep Wet Chem										
Blank (1711016-BLK1)										
					Prepared: 15-Mar-17 Analyzed: 17-Mar-17					
Total Dissolved Solids	ND	10.0	mg/L							
LCS (1711016-BS1)										
					Prepared: 15-Mar-17 Analyzed: 17-Mar-17					
Total Dissolved Solids	100	10.0	mg/L	100		100	50-150			
Duplicate (1711016-DUP1)										
					Source: P703012-01 Prepared: 15-Mar-17 Analyzed: 17-Mar-17					
Total Dissolved Solids	532	10.0	mg/L		540			1.49	5	

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Cation/Anion Analysis - Quality Control

Envirotech Analytical Laboratory

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 1710017 - No Prep Wet Chem

LCS (1710017-BS1)

Prepared & Analyzed: 13-Mar-17

pH	7.98		pH Units				98.75-101.25			
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Duplicate (1710017-DUP1)

Source: P703003-01

Prepared & Analyzed: 13-Mar-17

pH	11.0		pH Units		11.1			0.905	20	
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Project Number: 07173-0001
Project Manager: John Hampton Jr

Reported:
22-Mar-17 14:48

Cation/Anion Analysis - Quality Control

Envirotech Analytical Laboratory

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 1711008 - Metal Water Digestion EPA 3015A

Blank (1711008-BLK1)

Prepared: 13-Mar-17 Analyzed: 14-Mar-17

Iron	ND	0.50	mg/L
Calcium	ND	0.50	"
Magnesium	ND	0.20	"
Potassium	ND	0.50	"
Sodium	ND	1.98	"

LCS (1711008-BS1)

Prepared: 13-Mar-17 Analyzed: 14-Mar-17

Iron	98.5	0.50	mg/L	100	98.5	80-120
Calcium	104	0.50	"	100	104	80-120
Magnesium	98.9	0.20	"	100	98.9	80-120
Potassium	1.15	0.50	"	1.00	115	80-120
Sodium	101	1.98	"	100	101	80-120

Matrix Spike (1711008-MS1)

Source: P703004-01RE1

Prepared: 13-Mar-17 Analyzed: 14-Mar-17

Iron	96.9	0.50	mg/L	100	96.9	75-125
Calcium	110	0.50	"	100	110	75-125
Magnesium	97.3	0.20	"	100	97.3	75-125
Potassium	1.55	0.50	"	1.00	155	75-125
Sodium	110	1.98	"	100	110	75-125

SPK1

Matrix Spike Dup (1711008-MSD1)

Source: P703004-01RE1

Prepared: 13-Mar-17 Analyzed: 14-Mar-17

Iron	97.9	0.50	mg/L	100	97.9	75-125	0.971	20
Calcium	110	0.50	"	100	110	75-125	0.100	20
Magnesium	98.2	0.20	"	100	98.2	75-125	0.866	20
Potassium	1.50	0.50	"	1.00	150	75-125	3.46	20
Sodium	110	1.98	"	100	110	75-125	0.529	20

SPK1

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Cation/Anion Analysis - Quality Control

Envirotech Analytical Laboratory

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 1711017 - No Prep Wet Chem

Duplicate (1711017-DUP1)	Source: P703009-01		Prepared: 15-Mar-17 Analyzed: 16-Mar-17							
Electrical Conductivity	15100		umhos/cm		15100			0.265	20	

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Cation/Anion Analysis - Quality Control

Envirotech Analytical Laboratory

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 1711024 - No Prep Wet Chem

Duplicate (1711024-DUP1)	Source: P703009-01			Prepared: 16-Mar-17 Analyzed: 17-Mar-17						
Total Alkalinity as CaCO3	560	10.0	mg/L		550			1.80	30	
Bicarbonate as CaCO3	40.0	10.0	"		110			93.3	30	D1
Carbonate as CaCO3	520	10.0	"		440			16.7	30	
Hydroxide as CaCO3	ND	10.0	"		ND				30	

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Cation/Anion Analysis - Quality Control
Envirotech Analytical Laboratory

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	*REC Limits	RPD	RPD Limit	Notes
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Batch 1712002 - Anion Extraction EPA 300.0

Blank (1712002-BLK1)				Prepared & Analyzed: 20-Mar-17						
Fluoride	ND	0.25	mg/L							
Chloride	ND	2.00	"							
Nitrite-N	ND	0.25	"							
Nitrate-N	ND	0.25	"							
o-Phosphate-P	ND	0.25	"							
Sulfate	ND	2.00	"							

LCS (1712002-BS1)				Prepared & Analyzed: 20-Mar-17						
Fluoride	2.56	0.25	mg/L	2.50		102	90-110			
Chloride	24.8	2.00	"	25.0		99.4	90-110			
Nitrite-N	2.51	0.25	"	2.50		100	90-110			
Nitrate-N	2.55	0.25	"	2.50		102	90-110			
o-Phosphate-P	12.3	0.25	"	12.5		98.4	90-110			
Sulfate	24.1	2.00	"	25.0		96.4	90-110			

Matrix Spike (1712002-MS1)				Source: P703012-01	Prepared: 20-Mar-17	Analyzed: 21-Mar-17				
Fluoride	6.35	0.50	mg/L	5.00	0.51	117	80-120			
Chloride	93.7	4.00	"	50.0	41.1	105	80-120			
Nitrite-N	3.32	0.50	"	5.00	ND	66.5	80-120			SPK1
Nitrate-N	4.85	0.50	"	5.00	ND	97.0	80-120			
o-Phosphate-P	28.3	0.50	"	25.0	1.89	106	80-120			
Sulfate	165	4.00	"	50.0	112	107	80-120			

Matrix Spike Dup (1712002-MSD1)				Source: P703012-01	Prepared: 20-Mar-17	Analyzed: 21-Mar-17				
Fluoride	6.42	0.50	mg/L	5.00	0.51	118	80-120	1.13	20	
Chloride	94.1	4.00	"	50.0	41.1	106	80-120	0.398	20	
Nitrite-N	3.32	0.50	"	5.00	ND	66.3	80-120	0.241	20	SPK1
Nitrate-N	5.03	0.50	"	5.00	ND	101	80-120	3.56	20	
o-Phosphate-P	28.7	0.50	"	25.0	1.89	107	80-120	1.36	20	
Sulfate	166	4.00	"	50.0	112	109	80-120	0.610	20	

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Project Manager: John Hampton Jr

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22-Mar-17 14:48

Notes and Definitions

SPK1 The spike recovery is outside of quality control limits.

H2 Sample was analyzed after regulatory hold-time exceeded for target analyte.

D1 Duplicates or Matrix Spike Duplicates Relative Percent Difference is outside of control limits.

A-01a Samples analyzed numerous times with similar results, with numerous wavelengths, all closing CVs high

A-01 Sample was analyzed using both preserved & unpreserved samples for analysis of Nitrite & Nitrate However the amount of H2SO4 acid overwhelmed the detector. Nitrite & Nitrate were analyzed and reported off the unpreserved container.

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

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