

Analytical Report

Report Summary

Client: Tacitus, LLC

Chain Of Custody Number:

Samples Received: 5/25/2018 3:15:00PM

Job Number: 18051-0001

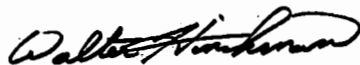
Work Order: P805044

Project Name/Location: Navajo Tribal U #12

API# 30-045-20580

BRADENHEAD WATER SAMPLER

Report Reviewed By:



Date: 6/5/18

Walter Hinchman, Laboratory Director



Date: 6/5/18

Tim Cain, Project Manager

RMOCB
JUN 11 2018
DISTRICT III



Envirotech Inc. certifies the test results meet all requirements of TNI unless footnoted otherwise.
Statement of Data Authenticity: Envirotech, Inc. attests the data reported has not been altered in any way.
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Tacitus, LLC	Project Name:	Navajo Tribal U #12	Reported: 05-Jun-18 14:48
STE. 1770, 700 6th Ave S.W.	Project Number:	18051-0001	
Calgary, Alberta CANADA, T2P0T8	Project Manager:	Vern Andrews	

Analytical Report for Samples

Client Sample ID	Lab Sample ID	Matrix	Sampled	Received	Container
Braden Head Intermediate	P805044-01A	Aqueous	05/25/18	05/25/18	Poly, 1000mL
	P805044-01B	Aqueous	05/25/18	05/25/18	VOA Vial, 40mL, H2SO4

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Tacitus, LLC STE. 1770, 700 6th Ave S.W. Calgary, Alberta CANADA, T2P0T8	Project Name: Navajo Tribal U #12 Project Number: 18051-0001 Project Manager: Vern Andrews	Reported: 05-Jun-18 14:48
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**Braden Head Intermediate
P805044-01 (Water)**

Reporting									
Analyte	Result	Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes

Wet Chem/Gravimetric

Total Dissolved Solids	9650	10.0	mg/L	1	1822017	06/01/18	06/05/18	SM2540C	
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Dissolved Metals by 6010

Calcium	12.7	10.0	mg/L	10	1823001	06/04/18	06/04/18	EPA 6010C	
Iron	ND	20.0	mg/L	10	1823001	06/04/18	06/04/18	EPA 6010C	
Magnesium	ND	2.00	mg/L	10	1823001	06/04/18	06/04/18	EPA 6010C	
Potassium	ND	20.0	mg/L	20	1823001	06/04/18	06/04/18	EPA 6010C	
Sodium	2040	40.0	mg/L	20	1823001	06/04/18	06/04/18	EPA 6010C	
Sodium Absorption Ratio	158		N/A	1	1823007	06/05/18	06/05/18	[CALC]	

Anions by 300.0/9056A

Fluoride	5.67	2.50	mg/L	10	1822003	05/29/18	05/30/18	EPA 300.0/9056A	
Chloride	165	20.0	mg/L	10	1822003	05/29/18	05/30/18	EPA 300.0/9056A	
Nitrite-N	ND	2.50	mg/L	10	1822003	05/29/18 10:18	05/30/18 12:08	EPA 300.0/9056A	A-01
Nitrate-N	ND	2.50	mg/L	10	1822003	05/29/18 10:18	05/30/18 12:08	EPA 300.0/9056A	A-01
o-Phosphate-P	ND	2.50	mg/L	10	1822003	05/29/18 10:18	05/30/18 10:57	EPA 300.0/9056A	H2
Sulfate	30.5	20.0	mg/L	10	1822003	05/29/18	05/30/18	EPA 300.0/9056A	

Wet Chemistry

pH @25°C	10.1		pH Units	1	1822012	05/30/18 10:39	05/30/18 12:33	9040C/4500 H+B	H1
Specific Conductance (@ 25 C)	5890	10.0	uS/cm	1	1823002	06/04/18	06/04/18	9050A/2510 B	
Total Alkalinity (as CaCO3 at pH 4.5)	3510	10.0	mg/L	1	1823006	06/05/18	06/05/18	SM2320B	
Bicarbonate Alkalinity (as CaCO3)	1370		mg/L	1	1823006	06/05/18	06/05/18	SM2320B	
Hydroxide Alkalinity (as CaCO3)	0.00		mg/L	1	1823006	06/05/18	06/05/18	SM2320B	
Carbonate Alkalinity (as CaCO3)	2150		mg/L	1	1823006	06/05/18	06/05/18	SM2320B	

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Calgary, Alberta CANADA, T2P0T8	Project Manager:	Vern Andrews	

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 1822017 - Wet Chemistry Preparation										
Blank (1822017-BLK1)				Prepared: 01-Jun-18 Analyzed: 05-Jun-18						
Total Dissolved Solids	ND	10.0	mg/L							
LCS (1822017-BS1)				Prepared: 01-Jun-18 Analyzed: 05-Jun-18						
Total Dissolved Solids	98.0	10.0	mg/L	100		98.0	50-150			
Duplicate (1822017-DUP1)				Source: P805044-01 Prepared: 01-Jun-18 Analyzed: 05-Jun-18						
Total Dissolved Solids	9730	10.0	mg/L		9650			0.852	5	

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Calgary, Alberta CANADA, T2P0T8	Project Manager:	Vern Andrews	

Dissolved Metals by 6010 - 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 1823001 - Metals Water Hotblock Digestion EPA 3010A/200.2

Blank (1823001-BLK1)

Prepared & Analyzed: 04-Jun-18

Calcium	ND	1.00	mg/L
Iron	ND	2.00	"
Magnesium	ND	0.20	"
Potassium	ND	1.00	"
Sodium	ND	2.00	"

LCS (1823001-BS1)

Prepared & Analyzed: 04-Jun-18

Calcium	49.9	1.00	mg/L	50.0	99.9	80-120
Iron	50.2	2.00	"	50.0	100	80-120
Magnesium	51.3	0.20	"	50.0	103	80-120
Potassium	4.91	1.00	"	5.00	98.3	80-120
Sodium	50.0	2.00	"	50.0	100	80-120

Matrix Spike (1823001-MS1)

Source: P805044-01

Prepared & Analyzed: 04-Jun-18

Calcium	518	10.0	mg/L	500	12.7	101	75-125
Iron	522	20.0	"	500	ND	104	75-125
Magnesium	511	2.00	"	500	ND	102	75-125
Potassium	57.0	20.0	"	50.0	ND	114	75-125
Sodium	2480	40.0	"	500	2040	88.4	75-125

Matrix Spike Dup (1823001-MSD1)

Source: P805044-01

Prepared & Analyzed: 04-Jun-18

Calcium	559	10.0	mg/L	500	12.7	109	75-125	7.59	20
Iron	561	20.0	"	500	ND	112	75-125	7.29	20
Magnesium	547	2.00	"	500	ND	109	75-125	6.64	20
Potassium	61.0	20.0	"	50.0	ND	122	75-125	6.85	20
Sodium	2590	40.0	"	500	2040	110	75-125	4.26	20

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Calgary, Alberta CANADA, T2P0T8	Project Manager:	Vern Andrews	

Anions by 300.0/9056A - 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 1822003 - Anion Extraction EPA 300.0/9056A

Blank (1822003-BLK1)

Prepared: 29-May-18 Analyzed: 30-May-18

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 (1822003-BS1)

Prepared: 29-May-18 Analyzed: 30-May-18

Fluoride	2.65	0.25	mg/L	2.50	106	90-110
Chloride	25.5	2.00	"	25.0	102	90-110
Nitrite-N	2.45	0.25	"	2.50	98.0	90-110
Nitrate-N	2.65	0.25	"	2.50	106	90-110
o-Phosphate-P	12.9	0.25	"	12.5	103	90-110
Sulfate	25.8	2.00	"	25.0	103	90-110

Matrix Spike (1822003-MS1)

Source: P805044-01

Prepared: 29-May-18 Analyzed: 30-May-18

Fluoride	33.0	2.50	mg/L	25.0	5.67	109	80-120
Chloride	425	20.0	"	250	165	104	80-120
Nitrite-N	25.0	2.50	"	25.0	ND	99.9	80-120
Nitrate-N	26.6	2.50	"	25.0	ND	106	80-120
o-Phosphate-P	131	2.50	"	125	ND	104	80-120
Sulfate	282	20.0	"	250	30.5	100	80-120

Matrix Spike Dup (1822003-MSD1)

Source: P805044-01

Prepared: 29-May-18 Analyzed: 30-May-18

Fluoride	33.3	2.50	mg/L	25.0	5.67	111	80-120	1.03	20
Chloride	427	20.0	"	250	165	105	80-120	0.627	20
Nitrite-N	25.2	2.50	"	25.0	ND	101	80-120	0.678	20
Nitrate-N	26.8	2.50	"	25.0	ND	107	80-120	0.973	20
o-Phosphate-P	132	2.50	"	125	ND	105	80-120	0.801	20
Sulfate	283	20.0	"	250	30.5	101	80-120	0.584	20

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STE. 1770, 700 6th Ave S.W.	Project Number:	18051-0001	Reported:
Calgary, Alberta CANADA, T2P0T8	Project Manager:	Vern Andrews	05-Jun-18 14:48

Wet Chemistry - 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 1822012 - Wet Chemistry Preparation

LCS (1822012-BS1)				Prepared & Analyzed: 30-May-18						
pH	7.99		pH Units	8.00		99.9	98.75-101.25			
Duplicate (1822012-DUP1)				Source: P805045-01		Prepared & Analyzed: 30-May-18				
pH	8.78		pH Units		8.77			0.114	20	

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Wet Chemistry - 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 1823002 - Wet Chemistry Preparation

Blank (1823002-BLK1)		Prepared & Analyzed: 04-Jun-18								
Specific Conductance (@ 25 C)	ND	10.0	uS/cm							
LCS (1823002-BS1)		Prepared & Analyzed: 04-Jun-18								
Specific Conductance (@ 25 C)	1440	10.0	uS/cm	1410		102	98-102			
Duplicate (1823002-DUP1)		Source: P805050-01		Prepared & Analyzed: 04-Jun-18						
Specific Conductance (@ 25 C)	1350	10.0	uS/cm		1600			16.8	20	

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Calgary, Alberta CANADA, T2P0T8	Project Manager:	Vern Andrews	

Wet Chemistry - 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 1823006 - Wet Chemistry Preparation

LCS (1823006-BS1)

Prepared & Analyzed: 05-Jun-18

Total Alkalinity (as CaCO ₃ at pH 4.5)	240	10.0	mg/L	250	96.0	70-130
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Duplicate (1823006-DUP1)

Source: P805044-01

Prepared & Analyzed: 05-Jun-18

Total Alkalinity (as CaCO ₃ at pH 4.5)	3510	10.0	mg/L	3510	0.00	20
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Notes and Definitions

H2	Sample was analyzed after regulatory hold-time exceeded for target analyte.
H1	Sample was received after regulatory hold-time exceeded for target analyte.
A-01	Sample analyzed from a preserved container.
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
RPD	Relative Percent Difference
**	Methods marked with ** are non-accredited methods.

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Analytical Laboratory



H&M Precision Products
Water Analysis Report

30-045-20580

PRODUCTION WATER SAMPLE.

Company: RL Bayless
Location: Navajo Tribal U12
Field: 0
Sample Date: May 2, 2018

API#
County & State: (blank)

Navajo Tribal U12

Sampled At: WH
pH: 6.48
Sample Temperature: 70 °C
Manganese: 4.5 mg/L
BaSO4 Scale Possible: YES

Total Dissolved Solids @ 180°C: 85710.56 mg/L
Specific Gravity: 1.0585
Ionic Strength: 1.495
CaCO3 Scaling Tendency @ 104°F: -433

Units for scaling tenders of scale produced per 1000 lbs of water.

Cations

Sodium: 32468.3 mg/L
Calcium: 603 mg/L
Magnesium: 253.26 mg/L
Iron: 20 mg/L
Barium: 6 mg/L
Total: 33350.56 mg/L

Anions

Sulfate: 100 mg/L
Chloride: 52000 mg/L
Bicarbonate: 260 mg/L
Total: 52360 mg/L

Residuals

Chemical Residuals: na PPM.
Amine Residuals: NA PPM.

Bacteria Culture Results

Cultures are incubated for 21 days—results may be from a previous sample.

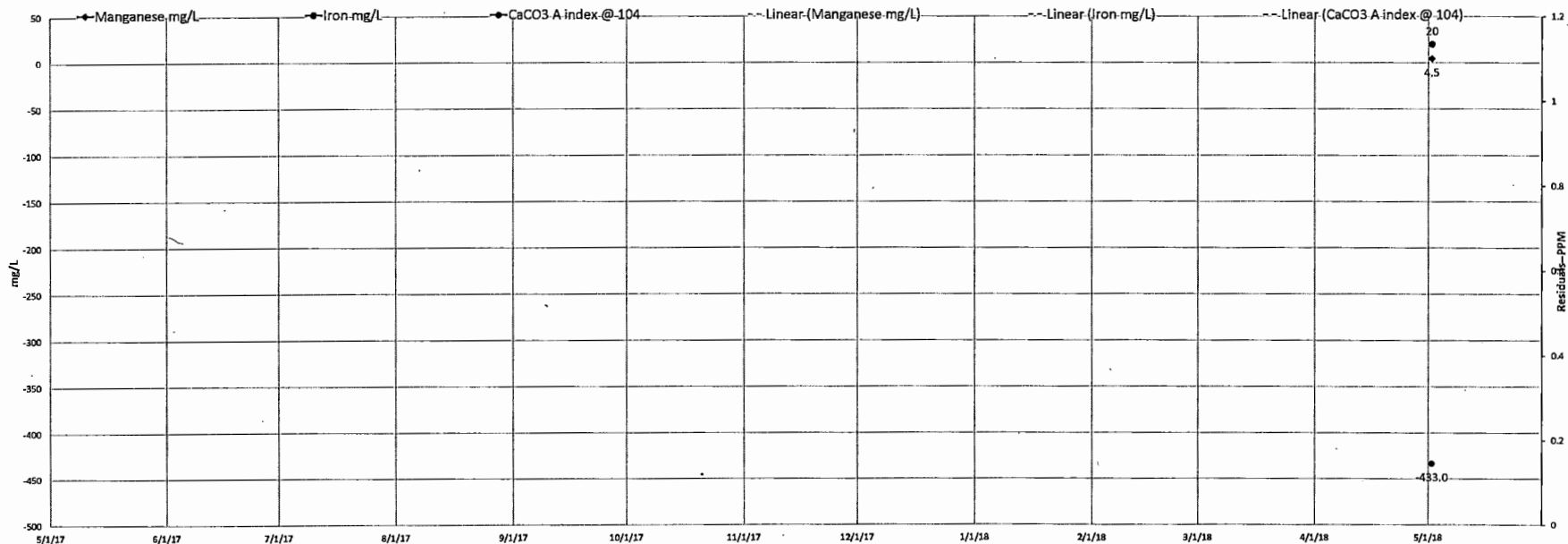
Last Injection Date: na
Acid Producing Bacteria Culture Bottles Positive: na bottles
Sulfate Producing Bacteria Culture Bottles Positive: na bottles

Current Treatments

Not Currently Treating (blank) (blank)

Well Snap Shot

	Sampled At	Manganese mg/L	Iron mg/L	Scaling Tendency @ 104°F	Driver
May 2, 2018	WH	4.5	20	-433.00	JC
January 0, 1900	0	0	0	0.00	0
January 0, 1900	0	0	0	0.00	0
January 0, 1900	0	0	0	0.00	0



Sample Date