



Florance 117
30-045-23827
Bradenhead Water Sample

75 Suttle Street
Durango, CO 81303
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17 August 2018

Sabre Beebe
BP America
380 Airport Rd.
Durango, CO 81303
RE: API

Enclosed are the results of analyses for samples received by the laboratory on 08/06/18 16:40.
If you need any further assistance, please feel free to contact me.

Sincerely,

A handwritten signature in blue ink that reads "Jeremy D. Allen".

Jeremy D Allen For Debbie Zufelt
Reports Manager

WMOGD
FEB 13 2019
DISTRICT III

All accredited analytes contained in this report are denoted by an asterisk (*). For a complete list of accredited analytes please do not hesitate to contact us via any of the contact information contained in this report. All of our certifications can be viewed at <http://greenanalytical.com/certifications/>

Green Analytical Laboratories is NELAP accredited through the Texas Commission on Environmental Quality. Accreditation applies to drinking water and non-potable water matrices for trace metals and a variety of inorganic parameters. Green Analytical Laboratories is also accredited through the Colorado Department of Public Health and Environment and EPA region 8 for trace metals, Cyanide, Fluoride, Nitrate, and Nitrite in drinking water.

Our affiliate laboratory, Cardinal Laboratories, is also NELAP accredited through the Texas Commission on Environmental Quality for a variety of organic constituents in drinking water, non-potable water and solid matrices. Cardinal is also accredited for regulated VOCs, TTHM, and HAA-5 in drinking water through the Colorado Department of Public Health and Environment and EPA region 8.



BP America 380 Airport Rd. Durango CO, 81303	Project: API Project Name / Number: Bradenhead Project Manager: Sabre Beebe	Reported: 08/17/18 16:04
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ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
Florance 117	1808061-01	Water	08/06/18 09:12	08/06/18 16:40

Green Analytical Laboratories

Jeremy D Allen For Debbie Zufelt, Reports Manager

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Florance 117

1808061-01 (Water)

Analyte	Result	RL	MDL	Units	Dilution	Analyzed	Method	Notes	Analyst
General Chemistry									
Alkalinity, Bicarbonate as CaCO3*	<10.0	10.0		mg/L	1	08/13/18	2320 B		JDU
Alkalinity, Carbonate as CaCO3*	54.0	10.0		mg/L	1	08/13/18	2320 B		JDU
Alkalinity, Hydroxide as CaCO3*	<10.0	10.0		mg/L	1	08/13/18	2320 B		JDU
Alkalinity, Total as CaCO3*	63.0	10.0		mg/L	1	08/13/18	2320 B		JDU
Chloride*	<250	250	48.2	mg/L	250	08/16/18	EPA300.0		AES
Conductivity*	17900	10.0		uS/cm	1	08/09/18	2510 B		JDU
pH*	9.83			pH Units	1	08/07/18	EPA150.1		JDU
Resistivity	55.9			ohm/cm	1	08/13/18	2510 B		JDU
Total Dissolved Solids*	13000	20.0		mg/L	2	08/13/18	EPA160.1		JDU
Specific Gravity	1.013	0.8000		No Unit	1	08/13/18	Hydrometer		JDU
Sulfate*	9840	250	73.8	mg/L	250	08/16/18	EPA300.0		AES
Total Recoverable Metals by ICP (E200.7)									
Iron*	3.09	2.50	0.871	mg/L	50	08/16/18	EPA200.7		AES
Dissolved Metals by ICP									
Hardness	155	33.1	5.46	mg/L	50	08/16/18	2340 B		AES
Barium*	<1.00	1.00	0.104	mg/L	50	08/16/18	EPA200.7		AES
Calcium*	62.0	5.00	0.642	mg/L	50	08/16/18	EPA200.7		AES
Iron*	<2.50	2.50	1.38	mg/L	50	08/16/18	EPA200.7		AES
Magnesium*	<5.00	5.00	0.938	mg/L	50	08/16/18	EPA200.7		AES
Manganese*	<1.00	1.00	0.134	mg/L	50	08/16/18	EPA200.7		AES
Potassium*	<50.0	50.0	4.78	mg/L	50	08/16/18	EPA200.7		AES
Sodium*	4460	50.0	18.3	mg/L	50	08/16/18	EPA200.7		AES
Strontium*	9.18	5.00	0.144	mg/L	50	08/16/18	EPA200.7		AES
Cation/Anion Balance	-3.21								

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Jeremy D Allen For Debbie Zufelt, Reports Manager

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General Chemistry - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B808077 - General Prep - Wet Chem										
Reference (B808077-SRM1)					Prepared & Analyzed: 08/07/18					
pH	8.72		pH Units	8.91		97.9	97.8-102.2			
Batch B808079 - General Prep - Wet Chem										
Reference (B808079-SRM1)					Prepared & Analyzed: 08/09/18					
Conductivity	486	10.0	uS/cm	491		99.0	90-110.1			
Batch B808089 - General Prep - Wet Chem										
Blank (B808089-BLK1)					Prepared: 08/10/18 Analyzed: 08/13/18					
Total Dissolved Solids	ND	10.0	mg/L							
Reference (B808089-SRM1)					Prepared: 08/10/18 Analyzed: 08/13/18					
Total Dissolved Solids	370	10.0	mg/L	380		97.4	85-115			
Batch B808098 - General Prep - Wet Chem										
Blank (B808098-BLK1)					Prepared & Analyzed: 08/13/18					
Alkalinity, Total as CaCO3	ND	10.0	mg/L							
LCS (B808098-BS1)					Prepared & Analyzed: 08/13/18					
Alkalinity, Total as CaCO3	100	10.0	mg/L	100		100	85-115			
LCS Dup (B808098-BSD1)					Prepared & Analyzed: 08/13/18					
Alkalinity, Total as CaCO3	111	10.0	mg/L	100		111	85-115	10.4	20	
Batch B808143 - General Prep - Wet Chem										
Blank (B808143-BLK1)					Prepared & Analyzed: 08/15/18					
Chloride	ND	1.00	mg/L							
Sulfate	ND	1.00	mg/L							
LCS (B808143-BS1)					Prepared & Analyzed: 08/15/18					
Chloride	22.9	1.00	mg/L	25.0		91.6	90-110			
Sulfate	23.2	1.00	mg/L	25.0		92.9	90-110			
LCS Dup (B808143-BSD1)					Prepared: 08/15/18 Analyzed: 08/16/18					
Chloride	23.8	1.00	mg/L	25.0		95.1	90-110	3.75	20	
Sulfate	24.0	1.00	mg/L	25.0		95.8	90-110	3.16	20	

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BP America 380 Airport Rd. Durango CO, 81303	Project: API Project Name / Number: Bradenhead Project Manager: Sabre Beebe	Reported: 08/17/18 16:04
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Total Recoverable Metals by ICP (E200.7) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B808075 - Total Rec. 200.7/200.8/200.2										
Blank (B808075-BLK1)										
Iron	ND	0.050	mg/L							Prepared: 08/09/18 Analyzed: 08/15/18
LCS (B808075-BS1)										
Iron	4.26	0.050	mg/L	4.00		106	85-115			Prepared: 08/09/18 Analyzed: 08/15/18
LCS Dup (B808075-BSD1)										
Iron	4.36	0.050	mg/L	4.00		109	85-115	2.52	20	

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BP America 380 Airport Rd. Durango CO, 81303	Project: API Project Name / Number: Bradenhead Project Manager: Sabre Beebe	Reported: 08/17/18 16:04
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Dissolved Metals by ICP - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B808081 - Diss. 200.7/200.8

Blank (B808081-BLK1)

Prepared: 08/10/18 Analyzed: 08/16/18

Barium	ND	0.020	mg/L							
Calcium	ND	0.100	mg/L							
Iron	ND	0.050	mg/L							
Magnesium	ND	0.100	mg/L							
Manganese	ND	0.020	mg/L							
Potassium	ND	1.00	mg/L							
Sodium	ND	1.00	mg/L							
Strontium	ND	0.100	mg/L							

LCS (B808081-BS1)

Prepared: 08/10/18 Analyzed: 08/15/18

Barium	2.43	0.020	mg/L	2.50		97.0	85-115			
Calcium	5.02	0.100	mg/L	5.00		100	85-115			
Iron	4.87	0.050	mg/L	5.00		97.4	85-115			
Magnesium	24.7	0.100	mg/L	25.0		98.9	85-115			
Manganese	2.45	0.020	mg/L	2.50		97.9	85-115			
Potassium	10.1	1.00	mg/L	10.0		101	85-115			
Sodium	3.79	1.00	mg/L	4.05		93.7	85-115			
Strontium	4.94	0.100	mg/L	5.00		98.7	85-115			

LCS Dup (B808081-BSD1)

Prepared: 08/10/18 Analyzed: 08/15/18

Barium	2.48	0.020	mg/L	2.50		99.2	85-115	2.17	20	
Calcium	5.06	0.100	mg/L	5.00		101	85-115	0.651	20	
Iron	4.93	0.050	mg/L	5.00		98.6	85-115	1.22	20	
Magnesium	25.1	0.100	mg/L	25.0		100	85-115	1.31	20	
Manganese	2.48	0.020	mg/L	2.50		99.2	85-115	1.27	20	
Potassium	10.2	1.00	mg/L	10.0		102	85-115	0.933	20	
Sodium	3.83	1.00	mg/L	4.05		94.4	85-115	0.789	20	
Strontium	5.02	0.100	mg/L	5.00		100	85-115	1.64	20	

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BP America
380 Airport Rd.
Durango CO, 81303

Project: API
Project Name / Number: Bradenhead
Project Manager: Sabre Beebe

Reported:
08/17/18 16:04

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
*Results reported on as received basis unless designated as dry.
- RPD Relative Percent Difference
- LCS Laboratory Control Sample (Blank Spike)
- RL Report Limit
- MDL Method Detection Limit

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FlORANCE 117
 30-045-23827
 casing sample

2030 Afton Place
 Farmington, NM 87401
 (505) 325-6622

Analysis No: SO180162
 Cust No: 15950-11240

Well/Lease Information

Customer Name: BP - SOUTH BHD PROJECT
 Well Name: FLORANCE #117;CSG
 County/State: SAN JUAN NM
 Location:
 Field:
 Formation: PC
 Cust. Stn. No.: API # 3004523827

NMCGD
 FEB 13 2013
 DISTRICT III

Source: CASING
 Well Flowing: Y
 Pressure: 129 PSIA
 Flow Temp: DEG. F
 Ambient Temp: 78 DEG. F
 Flow Rate: MCF/D
 Sample Method: Purge & Fill
 Sample Date: 08/06/2018
 Sample Time: 9.20 AM
 Sampled By: SCOTT WILLARD
 Sampled by (CO): PESCO

Heat Trace: N
 Remarks:

Analysis

Component:	Mole%:	Unnormalized %:	**GPM:	*BTU:	*SP Gravity:
Nitrogen	0.3824	0.3804	0.0420	0.00	0.0037
CO2	1.4294	1.4218	0.2450	0.00	0.0217
Methane	78.2659	77.8475	13.3150	790.49	0.4335
Ethane	11.0317	10.9728	2.9610	195.23	0.1145
Propane	4.6061	4.5815	1.2730	115.89	0.0701
Iso-Butane	1.0372	1.0317	0.3410	33.73	0.0208
N-Butane	1.2927	1.2858	0.4090	42.17	0.0259
I-Pentane	0.6313	0.6279	0.2320	25.26	0.0157
N-Pentane	0.4204	0.4182	0.1530	16.85	0.0105
Hexane Plus	0.9029	0.8981	0.4040	47.59	0.0299
Total	100.0000	99.4657	19.3750	1267.21	0.7464

* @ 14.730 PSIA DRY & UNCORRECTED FOR COMPRESSIBILITY

**@ 14.730 PSIA & 60 DEG. F.

COMPRESSIBILITY FACTOR (1/Z):	1.0038	CYLINDER #:	7083
BTU/CU.FT IDEAL:	1270.1	CYLINDER PRESSURE:	118 PSIG
BTU/CU.FT (DRY) CORRECTED FOR (1/Z):	1275.0	ANALYSIS DATE:	08/16/2018
BTU/CU.FT (WET) CORRECTED FOR (1/Z):	1252.8	ANALYSIS TIME:	12:15:00 AM
DRY BTU @ 15.025:	1300.5	ANALYSIS RUN BY:	SHYANN ELLEDGE
REAL SPECIFIC GRAVITY:	0.749		

GPM, BTU, and SPG calculations as shown above are based on current GPA constants.

GPA Standard: GPA-2261

GC: Danalyzer Model 500

Last Cal/Verify: 08/23/2018

GC Method: C6+ Gas



BP - SOUTH BHD PROJECT
WELL ANALYSIS COMPARISON

Lease: FLORANCE #117;CSG
Stn. No.: API # 3004523827
Mtr. No.:

CASING
PC

08/23/2018
15950-11240

Smpl Date: 08/06/2018
Test Date: 08/16/2018
Run No: SO180162
Nitrogen: 0.3824
CO2: 1.4294
Methane: 78.2659
Ethane: 11.0317
Propane: 4.6061
I-Butane: 1.0372
N-Butane: 1.2927
I-Pentane: 0.6313
N-Pentane: 0.4204
Hexane+: 0.9029
BTU: 1275.0
GPM: 19.3750
SPG: 0.7490



FLORANCE 117
 30-045-23827
 Tubing SAMPLE

2030 Afton Place
 Farmington, NM 87401
 (505) 325-6622

Analysis No: SO180163
 Cust No: 15950-11245

Well/Lease Information

Customer Name: BP - SOUTH BHD PROJECT
 Well Name: FLORANCE #117; TBG
 County/State: SAN JUAN NM
 Location:
 Field:
 Formation: PC
 Cust. Str. No.: API # 3004523827

Source: TUBING
 Well Flowing: Y
 Pressure: 127 PSIA
 Flow Temp: DEG. F
 Ambient Temp: 78 DEG. F
 Flow Rate: MCF/D
 Sample Method: Purge & Fill
 Sample Date: 08/06/2018
 Sample Time: 9.30 AM
 Sampled By: SCOTT WILLARD
 Sampled by (CO): PESCO

NMCD
 FEB 13 2013
 DISTRICT III

Heat Trace: N
 Remarks:

Analysis

Component:	Mole%:	Unnormalized %:	**GPM:	*BTU:	*SP Gravity:
Nitrogen	0.4117	0.4090	0.0450	0.00	0.0040
CO2	1.4072	1.3979	0.2410	0.00	0.0214
Methane	78.7300	78.2124	13.3940	795.17	0.4361
Ethane	10.8203	10.7492	2.9040	191.49	0.1123
Propane	4.5795	4.5494	1.2660	115.22	0.0697
Iso-Butane	1.0174	1.0107	0.3340	33.08	0.0204
N-Butane	1.2582	1.2499	0.3980	41.05	0.0252
I-Pentane	0.5626	0.5589	0.2060	22.51	0.0140
N-Pentane	0.3787	0.3762	0.1380	15.18	0.0094
Hexane Plus	0.8344	0.8289	0.3730	43.98	0.0276
Total	100.0000	99.3425	19.2990	1257.69	0.7402

* @ 14.730 PSIA DRY & UNCORRECTED FOR COMPRESSIBILITY

**@ 14.730 PSIA & 60 DEG. F.

COMPRESSIBILITY FACTOR (1/Z): 1.0038
 BTU/CU.FT IDEAL: 1260.6
 BTU/CU.FT (DRY) CORRECTED FOR (1/Z): 1265.3
 BTU/CU.FT (WET) CORRECTED FOR (1/Z): 1243.3
 DRY BTU @ 15.025: 1290.6
 REAL SPECIFIC GRAVITY: 0.7427

CYLINDER #: 7045
 CYLINDER PRESSURE: 113 PSIG
 ANALYSIS DATE: 08/16/2018
 ANALYSIS TIME: 12:29:29 AM
 ANALYSIS RUN BY: SHYANN ELLEDGE

GPM, BTU, and SPG calculations as shown above are based on current GPA constants.

GPA Standard: GPA-2261

GC: Danalyzer Model 500

Last Cal/Verify: 08/23/2018

GC Method: C6+ Gas



BP - SOUTH BHD PROJECT
WELL ANALYSIS COMPARISON

Lease: FLORANCE #117; TBG
Stn. No.: API # 3004523827
Mtr. No.:

TUBING
PC

08/23/2018
15950-11245

Smpl Date: 08/06/2018
Test Date: 08/16/2018
Run No: SO180163
Nitrogen: 0.4117
CO2: 1.4072
Methane: 78.7300
Ethane: 10.8203
Propane: 4.5795
I-Butane: 1.0174
N-Butane: 1.2582
I-Pentane: 0.5626
N-Pentane: 0.3787
Hexane+: 0.8344
BTU: 1265.3
GPM: 19.2990
SPG: 0.7427