



Well Name: Bolack 2
API# 30 - 045 - 23257
Casing Sampled: Bradenhead
Sample Type: Water

Analytical Report

Report Summary

Client: BP America Production Co.

Samples Received: 4/17/2019

Job Number: 03143-0424

Work Order: P904100

Project Name/Location: BH BPS Investigation

NMOC
JUL 11 2019
DISTRICT III

Report Reviewed By:

Date: 4/24/19

Walter Hinchman, Laboratory Director



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Envirotech, Inc. currently holds the appropriate and available Utah TNI certification NM009792018-1 for the data reported.



BP America Production Co.
PO Box 22024
Tulsa OK, 74121-2024

Project Name: BH BPS Investigation
Project Number: 03143-0424
Project Manager: Sabre Beebe

Reported:
04/24/19 15:35

Analytical Report for Samples

Client Sample ID	Lab Sample ID	Matrix	Sampled	Received	Container
Bolack 2 Bradenhead Valve	P904100-01A	Aqueous	04/17/19	04/17/19	Poly 500mL
Bolack 2 Production Water (Sep)	P904100-02A	Aqueous	04/17/19	04/17/19	Poly 500mL

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BP America Production Co.	Project Name:	BH BPS Investigation	Reported: 04/24/19 15:35
PO Box 22024	Project Number:	03143-0424	
Tulsa OK, 74121-2024	Project Manager:	Sabre Beebe	

Bolack 2 Bradenhead Valve
P904100-01 (Water)

Reporting									
Analyte	Result	Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes

Wet Chem/Gravimetric

Total Dissolved Solids	9580	10.0	mg/L	1	1917013	04/22/19	04/24/19	SM2540C	
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Dissolved Metals by 6010

Sodium Absorption Ratio	41.3		N/A	1	1917023	04/24/19	04/24/19	[CALC]	
Calcium	398	1.00	mg/L	1	1916031	04/18/19	04/18/19	EPA 6010C	
Iron	ND	2.00	mg/L	1	1916031	04/18/19	04/18/19	EPA 6010C	
Magnesium	ND	1.00	mg/L	1	1916031	04/18/19	04/18/19	EPA 6010C	
Potassium	9.65	1.00	mg/L	1	1916031	04/18/19	04/22/19	EPA 6010C	
Sodium	2990	20.0	mg/L	10	1916031	04/18/19	04/18/19	EPA 6010C	

Anions by 300.0/9056A

Fluoride	0.917	0.250	mg/L	1	1916027	04/18/19	04/18/19	EPA 300.0/9056A	
Chloride	33.7	2.00	mg/L	1	1916027	04/18/19	04/18/19	EPA 300.0/9056A	
Nitrite-N	ND	0.250	mg/L	1	1916027	04/18/19 08:46	04/18/19 15:01	EPA 300.0/9056A	
Nitrate-N	ND	0.250	mg/L	1	1916027	04/18/19 08:46	04/18/19 15:01	EPA 300.0/9056A	
o-Phosphate-P	ND	0.250	mg/L	1	1916027	04/18/19 08:46	04/18/19 15:01	EPA 300.0/9056A	
Sulfate	6490	40.0	mg/L	20	1916027	04/18/19	04/18/19	EPA 300.0/9056A	

Wet Chemistry

pH @25°C	10.9		pH Units	1	1916034	04/18/19 13:41	04/18/19 16:47	9040C/4500 H+B	H1
Specific Conductance (@ 25 C)	11300	10.0	uS/cm	1	1917006	04/22/19	04/22/19	9050A/2510 B	
Total Alkalinity (as CaCO3 at pH 4.5)	118	10.0	mg/L	1	1917018	04/23/19	04/24/19	SM2320B	

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Well Name: Bolack 2
 API# 30-045-23257
 Casing Sampled: Production
 Sample Type: Water

BP America Production Co. PO Box 22024 Tulsa OK, 74121-2024	Project Name: BH BPS Investigation Project Number: 03143-0424 Project Manager: Sabre Beebe	Reported: 04/24/19 15:35
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Bolack 2 Production Water (Sep)
P904100-02 (Water)

Reporting									
Analyte	Result	Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes

Wet Chem/Gravimetric

Total Dissolved Solids	8980	10.0	mg/L	1	1917013	04/22/19	04/24/19	SM2540C	
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Dissolved Metals by 6010

Sodium Absorption Ratio	126		N/A	1	1917023	04/24/19	04/24/19	[CALC]	
Calcium	47.1	1.00	mg/L	1	1916031	04/18/19	04/18/19	EPA 6010C	
Iron	5.53	2.00	mg/L	1	1916031	04/18/19	04/18/19	EPA 6010C	
Magnesium	8.12	1.00	mg/L	1	1916031	04/18/19	04/18/19	EPA 6010C	
Potassium	42.9	1.00	mg/L	1	1916031	04/18/19	04/22/19	EPA 6010C	
Sodium	3570	20.0	mg/L	10	1916031	04/18/19	04/18/19	EPA 6010C	

Anions by 300.0/9056A

Fluoride	ND	0.250	mg/L	1	1916027	04/18/19	04/18/19	EPA 300.0/9056A	
Chloride	4930	200	mg/L	100	1916027	04/18/19	04/18/19	EPA 300.0/9056A	
Nitrite-N	ND	0.250	mg/L	1	1916027	04/18/19 08:46	04/18/19 16:43	EPA 300.0/9056A	
Nitrate-N	ND	0.250	mg/L	1	1916027	04/18/19 08:46	04/18/19 16:43	EPA 300.0/9056A	
o-Phosphate-P	ND	0.250	mg/L	1	1916027	04/18/19 08:46	04/18/19 16:43	EPA 300.0/9056A	
Sulfate	75.3	10.0	mg/L	5	1916027	04/18/19	04/18/19	EPA 300.0/9056A	

Wet Chemistry

pH @25°C	6.69		pH Units	1	1916034	04/18/19 13:41	04/18/19 16:47	9040C/4500 H+B	H1
Specific Conductance (@ 25 C)	15500	10.0	uS/cm	1	1917006	04/22/19	04/22/19	9050A/2510 B	
Total Alkalinity (as CaCO3 at pH 4.5)	138	10.0	mg/L	1	1917018	04/23/19	04/24/19	SM2320B	

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BP America Production Co.
PO Box 22024
Tulsa OK, 74121-2024

Project Name: BH BPS Investigation
Project Number: 03143-0424
Project Manager: Sabre Beebe

Reported:
04/24/19 15:35

Wet Chem/Gravimetric - 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 1917013 - Wet Chemistry Preparation

Blank (1917013-BLK1)

Prepared: 04/22/19 1 Analyzed: 04/24/19 1

Total Dissolved Solids	ND	10.0	mg/L
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LCS (1917013-BS1)

Prepared: 04/22/19 1 Analyzed: 04/24/19 1

Total Dissolved Solids	87.0	10.0	mg/L	100	87.0	50-150
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Duplicate (1917013-DUP1)

Source: P904078-01

Prepared: 04/22/19 1 Analyzed: 04/24/19 1

Total Dissolved Solids	336	10.0	mg/L	339	0.889	5
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Project Manager: Sabre Beebe

Reported:
04/24/19 15:35

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 1916031 - Metals Water Hotblock Digestion EPA 3010A/200.2

Blank (1916031-BLK1)

Prepared & Analyzed: 04/18/19 1

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

LCS (1916031-BS1)

Prepared & Analyzed: 04/18/19 1

Calcium	50.5	1.00	mg/L	50.0		101	80-120			
Iron	100	2.00	"	100		100	80-120			
Magnesium	52.1	1.00	"	50.0		104	80-120			
Potassium	5.03	1.00	"	5.00		101	80-120			
Sodium	19.0	2.00	"	20.0		95.0	80-120			

Matrix Spike (1916031-MS1)

Source: P904100-01

Prepared & Analyzed: 04/18/19 1

Calcium	450	1.00	mg/L	50.0	398	104	75-125			
Iron	103	2.00	"	100	ND	103	75-125			
Magnesium	50.0	1.00	"	50.0	ND	99.9	75-125			
Potassium	15.6	1.00	"	5.00	9.65	119	75-125			
Sodium	2980	20.0	"	20.0	2990	NR	75-125			SPK2

Matrix Spike Dup (1916031-MSD1)

Source: P904100-01

Prepared & Analyzed: 04/18/19 1

Calcium	448	1.00	mg/L	50.0	398	99.8	75-125	0.423	20	
Iron	102	2.00	"	100	ND	102	75-125	0.779	20	
Magnesium	56.2	1.00	"	50.0	ND	112	75-125	11.8	20	
Potassium	17.2	1.00	"	5.00	9.65	152	75-125	9.99	20	SPK1
Sodium	2990	20.0	"	20.0	2990	NR	75-125	0.235	20	SPK2

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Project Manager: Sabre Beebe

Reported:
04/24/19 15:35

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 1916027 - Anion Extraction EPA 300.0/9056A

Blank (1916027-BLK1)

Prepared: 04/18/19 0 Analyzed: 04/18/19 1

Fluoride	ND	0.250	mg/L
Chloride	ND	2.00	"
Nitrite-N	ND	0.250	"
Nitrate-N	ND	0.250	"
o-Phosphate-P	ND	0.250	"
Sulfate	ND	2.00	"

LCS (1916027-BS1)

Prepared: 04/18/19 0 Analyzed: 04/18/19 1

Fluoride	2.43	0.250	mg/L	2.50		97.0	90-110
Chloride	25.3	2.00	"	25.0		101	90-110
Nitrite-N	2.46	0.250	"	2.50		98.2	90-110
Nitrate-N	2.48	0.250	"	2.50		99.2	90-110
o-Phosphate-P	12.3	0.250	"	12.5		98.6	90-110
Sulfate	24.8	2.00	"	25.0		99.0	90-110

Matrix Spike (1916027-MS1)

Source: P904100-02

Prepared: 04/18/19 0 Analyzed: 04/18/19 1

Fluoride	11.9	1.25	mg/L	12.5	ND	95.4	80-120
Chloride	162	10.0	"	125	4930	NR	80-120
Nitrite-N	12.4	1.25	"	12.5	ND	99.3	80-120
Nitrate-N	12.4	1.25	"	12.5	ND	98.9	80-120
o-Phosphate-P	6.06	1.25	"	62.5	ND	9.70	80-120
Sulfate	6350	10.0	"	125	75.3	NR	80-120

SPK1

Matrix Spike Dup (1916027-MSD1)

Source: P904100-02

Prepared: 04/18/19 0 Analyzed: 04/18/19 1

Fluoride	12.0	1.25	mg/L	12.5	ND	95.6	80-120	0.251	20
Chloride	162	10.0	"	125	4930	NR	80-120		20
Nitrite-N	12.4	1.25	"	12.5	ND	99.2	80-120	0.121	20
Nitrate-N	12.4	1.25	"	12.5	ND	98.9	80-120	0.0404	20
o-Phosphate-P	6.01	1.25	"	62.5	ND	9.61	80-120	0.912	20
Sulfate	6380	10.0	"	125	75.3	NR	80-120	0.485	20

SPK1

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PO Box 22024	Project Number:	03143-0424	
Tulsa OK, 74121-2024	Project Manager:	Sabre Beebe	

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 1916034 - Wet Chemistry Preparation

LCS (1916034-BS1)				Prepared & Analyzed: 04/18/19 1			
pH	7.97	pH Units	8.00	99.8	98.75-101.25		
Duplicate (1916034-DUP1)				Source: P904022-01 Prepared & Analyzed: 04/18/19 1			
pH	8.73	pH Units	8.72	0.115	20		

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PO Box 22024	Project Number:	03143-0424	
Tulsa OK, 74121-2024	Project Manager:	Sabre Beebe	

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 1917006 - Wet Chemistry Preparation

Blank (1917006-BLK1)

Prepared & Analyzed: 04/22/19 1

Specific Conductance (@ 25 C) ND 10.0 uS/cm

LCS (1917006-BS1)

Prepared & Analyzed: 04/22/19 1

Specific Conductance (@ 25 C) 1410 10.0 uS/cm 1410 100 98-102

Duplicate (1917006-DUP1)

Source: P904022-01

Prepared & Analyzed: 04/22/19 1

Specific Conductance (@ 25 C) 199 10.0 uS/cm 204 2.48 20

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Project Manager: Sabre Beebe

Reported:
04/24/19 15:35

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 1917018 - Wet Chemistry Preparation

LCS (1917018-BS1)

Prepared: 04/23/19 | Analyzed: 04/24/19 0

Total Alkalinity (as CaCO ₃ at pH 4.5)	246	10.0	mg/L	250	98.4	70-130
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Duplicate (1917018-DUP1)

Source: P904090-01

Prepared: 04/23/19 | Analyzed: 04/24/19 0

Total Alkalinity (as CaCO ₃ at pH 4.5)	37.0	10.0	mg/L	37.0	0.00	20
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Reported:
04/24/19 15:35

Notes and Definitions

SPK2 The spike recovery was outside of QC acceptance limits for the MS and/or MSD due to native analyte concentration at 4 times or greater than the spike concentration.

SPK1 The spike recovery is outside of quality control limits.

H1 Sample was received after regulatory hold-time exceeded for target analyte.

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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Additional Instructions:

I, (field sampler), attest to the validity and authenticity of this sample. I am aware that tampering with or intentionally mislabelling the sample location, date or time of collection is considered fraud and may be grounds for legal action. Sampled by: Eugenia Lam-Hon

Samples requiring thermal preservation must be received on ice the day they are sampled or receive packed in ice at an avg temp above 0 but less than 6°C on subsequent days.

Relinquished by: (Signature) <i>[Signature]</i>	Date 4-17-19	Time 3:30pm	Received by: (Signature) <i>[Signature]</i>	Date 4-17-19	Time 3:30pm	Lab Use Only Received on ice: Y / <u>(N)</u>
Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time	T1 <u>23.8</u> T2 <u>31.7</u> T3 <u>29.1</u> AVG Temp °C <u>28.2</u>

Sample Matrix: S - Soil, Sd - Solid, Sg - Sludge, A - Aqueous, O - Other

Container Type: g - glass, p - poly/plastic, ag - amber glass, v - VOA

NOTE: Samples are discarded 30 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at the client expense. The report for the analysis of the above samples is applicable only to those samples received by the laboratory with this COC. The liability of the laboratory is limited to the amount paid for on the report.