

District I  
1625 N. French Dr., Hobbs, NM 88240  
District II  
811 S. First St., Artesia, NM 88210  
District III  
1000 Rio Brazos Road, Aztec, NM 87410  
District IV  
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico  
Energy Minerals and Natural  
Resources Department  
Oil Conservation Division  
1220 South St. Francis Dr.  
Santa Fe, NM 87505

Form C-141  
Revised August 24, 2018  
Submit to appropriate OCD District office

Incident ID	
District RP	
Facility ID	
Application ID	

## Release Notification

See page 5  
(COA) & email

### Responsible Party

Responsible Party: BPX Energy	OGRID: 778	Final Report
Contact Name: Steve Moskal	Contact Telephone: (505) 330-9179	
Contact email: steven.moskal@bpx.com	Incident # (assigned by OCD)	
Contact mailing address: 1199 Main Ave. Suite 101, Durango CO, 81301	NCS1826750131 NMOCD	

### Location of Release Source

DEC 05 2018

Latitude: 36.702446° Longitude: -108.137167°  
(NAD 83 in decimal degrees to 5 decimal places)

DISTRICT III

Site Name: Gallegos Canyon Unit 188E	Site Type: Natural Gas Production Well
Date Release Discovered: November 19, 2018	API#: 30-045-24171

Unit Letter	Section	Township	Range	County
B	30	T29N	R08W	San Juan

Surface Owner:  State  Federal  Tribal  Private (Name: \_\_\_\_\_)

### Nature and Volume of Release

Material(s) Released (Select all that apply and attach calculations or specific justification for the volumes provided below)

<input type="checkbox"/> Crude Oil	Volume Released (bbls)	Volume Recovered (bbls)
<input checked="" type="checkbox"/> Produced Water	Volume Released (bbls): unknown	Volume Recovered (bbls): 0
	Is the concentration of dissolved chloride in the produced water >10,000 mg/l?	<input type="checkbox"/> Yes <input type="checkbox"/> No
<input type="checkbox"/> Condensate	Volume Released (bbls):	Volume Recovered (bbls):
<input type="checkbox"/> Natural Gas	Volume Released (Mcf)	Volume Recovered (Mcf)
<input type="checkbox"/> Other (describe)	Volume/Weight Released (provide units)	Volume/Weight Recovered (provide units)

Cause of Release:

BGT closure sampling indicated no soil impacts, however groundwater was sampled indicating elevated chloride levels. BP further investigated through delineation via drilling using hollow stem auger. The results of the 3 monitor wells samples indicate that chloride levels are natural and occurring at levels exceeding the NMWQCC levels. The groundwater is shallow and not usable as a drinking water source. BP requests no further action.

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Was this a major release as defined by 19.15.29.7(A) NMAC?  <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If YES, for what reason(s) does the responsible party consider this a major release?
If YES, was immediate notice given to the OCD? By whom? To whom? When and by what means (phone, email, etc)?	

### Initial Response

*The responsible party must undertake the following actions immediately unless they could create a safety hazard that would result in injury*

- The source of the release has been stopped.
- The impacted area has been secured to protect human health and the environment.
- Released materials have been contained via the use of berms or dikes, absorbent pads, or other containment devices.
- All free liquids and recoverable materials have been removed and managed appropriately.

If all the actions described above have not been undertaken, explain why:

Per 19.15.29.8 B. (4) NMAC the responsible party may commence remediation immediately after discovery of a release. If remediation has begun, please attach a narrative of actions to date. If remedial efforts have been successfully completed or if the release occurred within a lined containment area (see 19.15.29.11(A)(5)(a) NMAC), please attach all information needed for closure evaluation.

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to OCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Printed Name: \_\_\_\_\_ Title: \_\_\_\_\_

Signature:  \_\_\_\_\_ Date: \_\_\_\_\_

email: \_\_\_\_\_ Telephone: \_\_\_\_\_

**OCD Only**

Received by: \_\_\_\_\_ Date: \_\_\_\_\_

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## Site Assessment/Characterization

*This information must be provided to the appropriate district office no later than 90 days after the release discovery date.*

What is the shallowest depth to groundwater beneath the area affected by the release?	_ 5 _ (ft bgs)
Did this release impact groundwater or surface water?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within 300 feet of a continuously flowing watercourse or any other significant watercourse?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within 200 feet of any lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within 300 feet of an occupied permanent residence, school, hospital, institution, or church?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within 500 horizontal feet of a spring or a private domestic fresh water well used by less than five households for domestic or stock watering purposes?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within 1000 feet of any other fresh water well or spring?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within incorporated municipal boundaries or within a defined municipal fresh water well field?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within 300 feet of a wetland?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Are the lateral extents of the release overlying a subsurface mine?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release overlying an unstable area such as karst geology?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within a 100-year floodplain?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Did the release impact areas <b>not</b> on an exploration, development, production, or storage site?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

Attach a comprehensive report (electronic submittals in .pdf format are preferred) demonstrating the lateral and vertical extents of soil contamination associated with the release have been determined. Refer to 19.15.29.11 NMAC for specifics.

<p><b><u>Characterization Report Checklist:</u> <i>Each of the following items must be included in the report.</i></b></p> <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Scaled site map showing impacted area, surface features, subsurface features, delineation points, and monitoring wells.</li> <li><input checked="" type="checkbox"/> Field data</li> <li><input checked="" type="checkbox"/> Data table of soil contaminant concentration data</li> <li><input checked="" type="checkbox"/> Depth to water determination</li> <li><input checked="" type="checkbox"/> Determination of water sources and significant watercourses within ½-mile of the lateral extents of the release</li> <li><input checked="" type="checkbox"/> Boring or excavation logs</li> <li><input checked="" type="checkbox"/> Photographs including date and GIS information</li> <li><input checked="" type="checkbox"/> Topographic/Aerial maps</li> <li><input checked="" type="checkbox"/> Laboratory data including chain of custody</li> </ul>
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If the site characterization report does not include completed efforts at remediation of the release, the report must include a proposed remediation plan. That plan must include the estimated volume of material to be remediated, the proposed remediation technique, proposed sampling plan and methods, anticipated timelines for beginning and completing the remediation. The closure criteria for a release are contained in Table 1 of 19.15.29.12 NMAC, however, use of the table is modified by site- and release-specific parameters.

State of New Mexico  
Oil Conservation Division

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Printed Name: Steve Moskal Title: Environmental Coordinator

Signature:  Date: December 4, 2018

email: steven.moskal@bpx.com Telephone: (505) 330-9179

**OCD Only**

Received by: \_\_\_\_\_ Date: \_\_\_\_\_

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## Remediation Plan

**Remediation Plan Checklist:** *Each of the following items must be included in the plan.*

- Detailed description of proposed remediation technique
- Scaled sitemap with GPS coordinates showing delineation points
- Estimated volume of material to be remediated
- Closure criteria is to Table 1 specifications subject to 19.15.29.12(C)(4) NMAC
- Proposed schedule for remediation (note if remediation plan timeline is more than 90 days OCD approval is required)

**Deferral Requests Only:** *Each of the following items must be confirmed as part of any request for deferral of remediation.*

- Contamination must be in areas immediately under or around production equipment where remediation could cause a major facility deconstruction.
- Extents of contamination must be fully delineated.
- Contamination does not cause an imminent risk to human health, the environment, or groundwater.

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to OCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Printed Name: \_\_\_\_\_ Title: \_\_\_\_\_

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

email: \_\_\_\_\_ Telephone: \_\_\_\_\_

**OCD Only**

Received by: Vernessa Fields Date: 12/12/2018

- Approved    
 Approved with Attached Conditions of Approval    
 Denied    
 Deferral Approved

Signature: [Signature] Date: 12/12/2018

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## Closure

The responsible party must attach information demonstrating they have complied with all applicable closure requirements and any conditions or directives of the OCD. This demonstration should be in the form of a comprehensive report (electronic submittals in .pdf format are preferred) including a scaled site map, sampling diagrams, relevant field notes, photographs of any excavation prior to backfilling, laboratory data including chain of custody documents of final sampling, and a narrative of the remedial activities. Refer to 19.15.29.12 NMAC.

**Closure Report Attachment Checklist:** Each of the following items must be included in the closure report.

- A scaled site and sampling diagram as described in 19.15.29.11 NMAC
- Photographs of the remediated site prior to backfill or photos of the liner integrity if applicable (Note: appropriate OCD District office must be notified 2 days prior to liner inspection)
- Laboratory analyses of final sampling (Note: appropriate ODC District office must be notified 2 days prior to final sampling)
- Description of remediation activities – **No further action required. Chloride levels naturally exceed NMWQCC standards.**

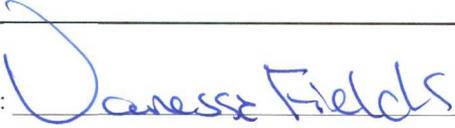
I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to OCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations. The responsible party acknowledges they must substantially restore, reclaim, and re-vegetate the impacted surface area to the conditions that existed prior to the release or their final land use in accordance with 19.15.29.13 NMAC including notification to the OCD when reclamation and re-vegetation are complete.

Printed Name: Steve Moskal Title: Environmental Coordinator

Signature:  Date: December 4, 2018

email: steven.moskal@bpx.com Telephone: (505) 330-9179

**OCD Only**

Received by: 

Date: 12/12/18

Closure approval by the OCD does not relieve the responsible party of liability should their operations have failed to adequately investigate and remediate contamination that poses a threat to groundwater, surface water, human health, or the environment nor does not relieve the responsible party of compliance with any other federal, state, or local laws and/or regulations.

Closure Approved by: \_\_\_\_\_ Date: \_\_\_\_\_

Printed Name: \_\_\_\_\_ Title: \_\_\_\_\_

## Fields, Vanessa, EMNRD

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**From:** Fields, Vanessa, EMNRD  
**Sent:** Wednesday, December 12, 2018 10:26 AM  
**To:** 'Steven Moskal'  
**Cc:** Smith, Cory, EMNRD; Blagg, Jefferey; Nelson Velez (nelsonvelez4519@msn.com) (nelsonvelez4519@msn.com)  
**Subject:** RE: [EXT] Re: GCU 512 - Decrease in Depth to Water (Info. meant for GCU 188E)

Good morning Steve,

Per our conversation this morning. BP will install an monitoring well further most cross and upgradient on the GCU #188E to determine the background level of chlorides.

Please let me know when this well will be installed and sampled.

Thank you,

Vanessa Fields  
Environmental Specialist  
Oil Conservation Division  
Energy, Minerals, & Natural Resources  
1000 Rio Brazos, Aztec, NM 87410  
(505)334-6178 ext 119  
Cell: (505) 419-0463  
[vanessa.fields@state.nm.us](mailto:vanessa.fields@state.nm.us)

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**From:** Nelson Velez <blagg\_njv@yahoo.com>  
**Sent:** Wednesday, November 28, 2018 2:56 PM  
**To:** Fields, Vanessa, EMNRD <Vanessa.Fields@state.nm.us>  
**Cc:** Smith, Cory, EMNRD <Cory.Smith@state.nm.us>; Bayliss, Randolph, EMNRD <Randolph.Bayliss@state.nm.us>; Steven Moskal <steven.moskal@bpx.com>; Blagg, Jefferey <jeffcblagg@aol.com>  
**Subject:** Re: [EXT] Re: GCU 512 - Decrease in Depth to Water (Info. meant for GCU 188E)

The previous email correspondence was meant to address the GCU 188E well site, not the GCU 512. Sorry for the any confusion.

Lastly, BEI's arrival to the site for sampling has been changed to 9 AM tomorrow.

Thank you again.

Nelson J. Velez  
Blagg Engr.  
cell: (505) 320-3489

# BP AMERICA PRODUCTION COMPANY

## GCU 188E – GROUNDWATER QUALITY DATA

API #: 30-045-24171

Legal Description: (Unit Letter B, Sec. 30 -T29N -R12W, NMPM)

### CHRONOLOGICAL EVENT SUMMATION

1. **June 29, 2018:** BP began closure of a 95 barrel below-grade tank (**BGT**) at the site. Groundwater observed directly bgt bottom after removal. Soils and groundwater samples collected after communicating with NMOCD personnel.
2. **July 5, 2018:** Final lab results received. Grab groundwater sample identified as GW @ 4' (95) recorded chloride (680 mg/L) above the New Mexico Water Quality Control Commission (**NMWQCC**) groundwater closure standard (250 mg/L).
3. **September 14, 2018:** BP submitted work plan for future site characterization of chloride impact beneath bgt.
4. **October 16, 2018:** BP installed three (3) groundwater monitor wells. One (1) utilized as up-gradient (MW #1), at source area (MW #2), and at the estimated down gradient direction (MW #3).
5. **November 27, 2018:** All three (3) wells were initially developed using new, dedicated, and disposable bailers. Approximately 10.00 gallons of water and sediments (accumulated during the installation process) were removed from MW #1 and MW #2. Approximately 6.00 gallons of water and sediments (accumulated during the installation process) were removed from MW #1 and MW #2.
6. **November 29, 2018:** All three (3) wells were sampled and relinquished to a laboratory representative that same day. The samples were later analyzed for API Water analyses. The chloride level in monitor well MW #2 (596 mg/L) also exceeded the NMWQCC allowable concentration standard.
7. **December 3, 2018:** BP received final laboratory report from groundwater monitor well sampling event.

**FIELD REPORT:** (circle one):  **BGT CONFIRMATION** /  RELEASE INVESTIGATION /  OTHER:  
PAGE #: **1** of **1**

**SITE INFORMATION:** SITE NAME: **GCU # 188E**  
DATE STARTED: **06/29/18**  
DATE FINISHED: \_\_\_\_\_  
QUAD/UNIT: **B** SEC: **30** TWP: **29N** RNG: **12W** PM: **NM** CNTY: **SJ** ST: **NM**  
1/4 - 1/4 FOOTAGE: **790'N / 1,620'E** **NW/NE** LEASE TYPE: FEDERAL / STATE  **FEE** / INDIAN STRIKE  
LEASE #: **-** PROD. FORMATION: **DK** CONTRACTOR: **BP - J. GONZALES** ENVIRONMENTAL SPECIALIST(S): **NJV**

**REFERENCE POINT:** WELL HEAD (W.H.) GPS COORD.: **36.70266 X 108.13674** GL ELEV.: **5,304'**  
1) **95 BGT (DW/DB)** GPS COORD.: **36.70245 X 108.13715** DISTANCE/BEARING FROM W.H.: **145', S58.5W**  
2) \_\_\_\_\_ GPS COORD.: \_\_\_\_\_ DISTANCE/BEARING FROM W.H.: \_\_\_\_\_  
3) \_\_\_\_\_ GPS COORD.: \_\_\_\_\_ DISTANCE/BEARING FROM W.H.: \_\_\_\_\_  
4) \_\_\_\_\_ GPS COORD.: \_\_\_\_\_ DISTANCE/BEARING FROM W.H.: \_\_\_\_\_

**SAMPLING DATA:** CHAIN OF CUSTODY RECORD(S) # OR LAB USED: **HALL**

SAMPLE ID	SAMPLE DATE	SAMPLE TIME	LAB ANALYSIS	OVM READING (ppm)
1) <b>4PC - TB @ 2'-3' (95)</b>	<b>06/29/18</b>	<b>1110</b>	<b>8015B/8021B/300.0 (CI)</b>	<b>NA</b>
2) <b>GW @ 4.5' (95)</b>	<b>06/29/18</b>	<b>1115</b>	<b>8260B/300.1 (CI)</b>	<b>NA</b>
3) _____	_____	_____	_____	_____
4) _____	_____	_____	_____	_____
5) _____	_____	_____	_____	_____

**SOIL DESCRIPTION:** SOIL TYPE:  **SAND** / SILTY SAND / SILT / SILTY CLAY / CLAY /  **GRAVEL** / OTHER \_\_\_\_\_  
SOIL COLOR: **DARK YELLOWISH ORANGE** PLASTICITY (CLAYS): NON PLASTIC / SLIGHTLY PLASTIC / COHESIVE / MEDIUM PLASTIC / HIGHLY PLASTIC  
COHESION (ALL OTHERS):  **NON COHESIVE** / SLIGHTLY COHESIVE / COHESIVE / HIGHLY COHESIVE DENSITY (COHESIVE CLAYS & SILTS): SOFT / FIRM / STIFF / VERY STIFF / HARD  
CONSISTENCY (NON COHESIVE SOILS):  **LOOSE** /  **FIRM** / DENSE / VERY DENSE HC ODOR DETECTED: YES  **NO** EXPLANATION - \_\_\_\_\_  
MOISTURE: DRY /  **SLIGHTLY MOIST** / MOIST / WET / SATURATED / SUPER SATURATED ANY AREAS DISPLAYING WETNESS:  **YES** / NO EXPLANATION - **GROUNDWATER**  
SAMPLE TYPE: GRAB  **COMPOSITE** # OF PTS. **4**  
DISCOLORATION/STAINING OBSERVED: YES  **NO** EXPLANATION - \_\_\_\_\_

**SITE OBSERVATIONS:** LOST INTEGRITY OF EQUIPMENT: YES  **NO** EXPLANATION - \_\_\_\_\_  
APPARENT EVIDENCE OF A RELEASE OBSERVED AND/OR OCCURRED: YES  **NO** EXPLANATION: \_\_\_\_\_  
EQUIPMENT SET OVER RECLAIMED AREA: YES  **NO** EXPLANATION - \_\_\_\_\_  
OTHER: **NMOC D REP. NOT PRESENT TO WITNESS CONFIRMATION SAMPLING. GAS WELL HAS BEEN PLUGGED & ABANDONED (P&A). WELL PAD SHARED WITH BP'S GCU #395.**  
EXCAVATION DIMENSION ESTIMATION: **NA** ft. X **NA** ft. X **NA** ft. EXCAVATION ESTIMATION (Cubic Yards): **NA**  
DEPTH TO GROUNDWATER: **<50'** NEAREST WATER SOURCE: **<1,000'** NEAREST SURFACE WATER: **>300' / <1,000'** NMOC D TPH CLOSURE STD: **100** ppm

**SITE SKETCH** BGT Located: off  **on** site PLOT PLAN circle: **attached**

OVM CALIB. READ. = **NA** ppm RF=1.00  
OVM CALIB. GAS = **NA** ppm  
TIME: **NA** am/pm DATE: **NA**

**MISCELL. NOTES**  
WO:  
REF #: **P-1000**  
VID: **VHIXONEVB2**  
PJ #:  
Permit date(s): **06/14/10**  
OCD Appr. date(s): **11/01/12**  
Tank ID: **A** OVM = Organic Vapor Meter ppm = parts per million  
**A** BGT Sidewalls Visible: Y /  **(N)**  
BGT Sidewalls Visible: Y / N  
BGT Sidewalls Visible: Y / N  
Magnetic declination: **10° E**

**NOTES:** BGT = BELOW-GRADE TANK; E.D. = EXCAVATION DEPRESSION; B.G. = BELOW GRADE; B = BELOW; T.H. = TEST HOLE; ~ = APPROX.; W.H. = WELL HEAD; T.B. = TANK BOTTOM; PBGTL = PREVIOUS BELOW-GRADE TANK LOCATION; SPD = SAMPLE POINT DESIGNATION; R.W. = RETAINING WALL; NA - NOT APPLICABLE OR NOT AVAILABLE; SW - SINGLE WALL; DW - DOUBLE WALL; SB - SINGLE BOTTOM; DB - DOUBLE BOTTOM.

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: Blagg Engineering

Client Sample ID: 4PC-SW @ 2 '-3' (95)

Project: GCU 188E

Collection Date: 6/29/2018 11:10:00 AM

Lab ID: 1806142-001

Matrix: MEOH (SOIL) Received Date: 6/30/2018 10:15:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 300.0: ANIONS</b>							Analyst: <b>MRA</b>
Chloride	ND	30		mg/Kg	20	7/2/2018 11:31:08 AM	39003
<b>EPA METHOD 8015D MOD: GASOLINE RANGE</b>							Analyst: <b>AG</b>
Gasoline Range Organics (GRO)	ND	3.3		mg/Kg	1	7/2/2018 11:56:23 AM	A52411
Surr: BFB	108	70-130		%Rec	1	7/2/2018 11:56:23 AM	A52411
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>							Analyst: <b>Irm</b>
Diesel Range Organics (DRO)	ND	9.9		mg/Kg	1	7/2/2018 12:42:36 PM	38999
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	7/2/2018 12:42:36 PM	38999
Surr: DNOP	103	70-130		%Rec	1	7/2/2018 12:42:36 PM	38999
<b>EPA METHOD 8260B: VOLATILES SHORT LIST</b>							Analyst: <b>AG</b>
Benzene	ND	0.017		mg/Kg	1	7/2/2018 11:56:23 AM	C52411
Toluene	ND	0.033		mg/Kg	1	7/2/2018 11:56:23 AM	C52411
Ethylbenzene	ND	0.033		mg/Kg	1	7/2/2018 11:56:23 AM	C52411
Xylenes, Total	ND	0.066		mg/Kg	1	7/2/2018 11:56:23 AM	C52411
Surr: 4-Bromofluorobenzene	122	70-130		%Rec	1	7/2/2018 11:56:23 AM	C52411
Surr: Toluene-d8	96.3	70-130		%Rec	1	7/2/2018 11:56:23 AM	C52411

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

<b>Qualifiers:</b>	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

# Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1806142

Date Reported: 7/5/2018

CLIENT: Blagg Engineering

Client Sample ID: GW @ 4.5' (95)

Project: GCU 188E

Collection Date: 6/29/2018 11:15:00 AM

Lab ID: 1806142-002

Matrix: AQUEOUS

Received Date: 6/30/2018 10:15:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 300.0: ANIONS</b>							Analyst: MRA
Chloride	680	50	*	mg/L	100	7/2/2018 1:47:21 PM	R52416
<b>EPA METHOD 8260B: VOLATILES</b>							Analyst: DJF
Benzene	ND	1.0		µg/L	1	7/2/2018 12:01:16 PM	W52404
Toluene	ND	1.0		µg/L	1	7/2/2018 12:01:16 PM	W52404
Ethylbenzene	ND	1.0		µg/L	1	7/2/2018 12:01:16 PM	W52404
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	7/2/2018 12:01:16 PM	W52404
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	7/2/2018 12:01:16 PM	W52404
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	7/2/2018 12:01:16 PM	W52404
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	7/2/2018 12:01:16 PM	W52404
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	7/2/2018 12:01:16 PM	W52404
Naphthalene	ND	2.0		µg/L	1	7/2/2018 12:01:16 PM	W52404
1-Methylnaphthalene	ND	4.0		µg/L	1	7/2/2018 12:01:16 PM	W52404
2-Methylnaphthalene	ND	4.0		µg/L	1	7/2/2018 12:01:16 PM	W52404
Acetone	ND	10		µg/L	1	7/2/2018 12:01:16 PM	W52404
Bromobenzene	ND	1.0		µg/L	1	7/2/2018 12:01:16 PM	W52404
Bromodichloromethane	ND	1.0		µg/L	1	7/2/2018 12:01:16 PM	W52404
Bromoform	ND	1.0		µg/L	1	7/2/2018 12:01:16 PM	W52404
Bromomethane	ND	3.0		µg/L	1	7/2/2018 12:01:16 PM	W52404
2-Butanone	ND	10		µg/L	1	7/2/2018 12:01:16 PM	W52404
Carbon disulfide	ND	10		µg/L	1	7/2/2018 12:01:16 PM	W52404
Carbon Tetrachloride	ND	1.0		µg/L	1	7/2/2018 12:01:16 PM	W52404
Chlorobenzene	ND	1.0		µg/L	1	7/2/2018 12:01:16 PM	W52404
Chloroethane	ND	2.0		µg/L	1	7/2/2018 12:01:16 PM	W52404
Chloroform	ND	1.0		µg/L	1	7/2/2018 12:01:16 PM	W52404
Chloromethane	ND	3.0		µg/L	1	7/2/2018 12:01:16 PM	W52404
2-Chlorotoluene	ND	1.0		µg/L	1	7/2/2018 12:01:16 PM	W52404
4-Chlorotoluene	ND	1.0		µg/L	1	7/2/2018 12:01:16 PM	W52404
cis-1,2-DCE	ND	1.0		µg/L	1	7/2/2018 12:01:16 PM	W52404
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	7/2/2018 12:01:16 PM	W52404
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	7/2/2018 12:01:16 PM	W52404
Dibromochloromethane	ND	1.0		µg/L	1	7/2/2018 12:01:16 PM	W52404
Dibromomethane	ND	1.0		µg/L	1	7/2/2018 12:01:16 PM	W52404
1,2-Dichlorobenzene	ND	1.0		µg/L	1	7/2/2018 12:01:16 PM	W52404
1,3-Dichlorobenzene	ND	1.0		µg/L	1	7/2/2018 12:01:16 PM	W52404
1,4-Dichlorobenzene	ND	1.0		µg/L	1	7/2/2018 12:01:16 PM	W52404
Dichlorodifluoromethane	ND	1.0		µg/L	1	7/2/2018 12:01:16 PM	W52404
1,1-Dichloroethane	ND	1.0		µg/L	1	7/2/2018 12:01:16 PM	W52404
1,1-Dichloroethene	ND	1.0		µg/L	1	7/2/2018 12:01:16 PM	W52404
1,2-Dichloropropane	ND	1.0		µg/L	1	7/2/2018 12:01:16 PM	W52404

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

<b>Qualifiers:</b>	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: Blagg Engineering

Client Sample ID: GW @ 4.5' (95)

Project: GCU 188E

Collection Date: 6/29/2018 11:15:00 AM

Lab ID: 1806142-002

Matrix: AQUEOUS

Received Date: 6/30/2018 10:15:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 8260B: VOLATILES</b>							Analyst: DJF
1,3-Dichloropropane	ND	1.0		µg/L	1	7/2/2018 12:01:16 PM	W52404
2,2-Dichloropropane	ND	2.0		µg/L	1	7/2/2018 12:01:16 PM	W52404
1,1-Dichloropropene	ND	1.0		µg/L	1	7/2/2018 12:01:16 PM	W52404
Hexachlorobutadiene	ND	1.0		µg/L	1	7/2/2018 12:01:16 PM	W52404
2-Hexanone	ND	10		µg/L	1	7/2/2018 12:01:16 PM	W52404
Isopropylbenzene	ND	1.0		µg/L	1	7/2/2018 12:01:16 PM	W52404
4-Isopropyltoluene	ND	1.0		µg/L	1	7/2/2018 12:01:16 PM	W52404
4-Methyl-2-pentanone	ND	10		µg/L	1	7/2/2018 12:01:16 PM	W52404
Methylene Chloride	ND	3.0		µg/L	1	7/2/2018 12:01:16 PM	W52404
n-Butylbenzene	ND	3.0		µg/L	1	7/2/2018 12:01:16 PM	W52404
n-Propylbenzene	ND	1.0		µg/L	1	7/2/2018 12:01:16 PM	W52404
sec-Butylbenzene	ND	1.0		µg/L	1	7/2/2018 12:01:16 PM	W52404
Styrene	ND	1.0		µg/L	1	7/2/2018 12:01:16 PM	W52404
tert-Butylbenzene	ND	1.0		µg/L	1	7/2/2018 12:01:16 PM	W52404
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	7/2/2018 12:01:16 PM	W52404
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	7/2/2018 12:01:16 PM	W52404
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	7/2/2018 12:01:16 PM	W52404
trans-1,2-DCE	ND	1.0		µg/L	1	7/2/2018 12:01:16 PM	W52404
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	7/2/2018 12:01:16 PM	W52404
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	7/2/2018 12:01:16 PM	W52404
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	7/2/2018 12:01:16 PM	W52404
1,1,1-Trichloroethane	ND	1.0		µg/L	1	7/2/2018 12:01:16 PM	W52404
1,1,2-Trichloroethane	ND	1.0		µg/L	1	7/2/2018 12:01:16 PM	W52404
Trichloroethene (TCE)	ND	1.0		µg/L	1	7/2/2018 12:01:16 PM	W52404
Trichlorofluoromethane	ND	1.0		µg/L	1	7/2/2018 12:01:16 PM	W52404
1,2,3-Trichloropropane	ND	2.0		µg/L	1	7/2/2018 12:01:16 PM	W52404
Vinyl chloride	ND	1.0		µg/L	1	7/2/2018 12:01:16 PM	W52404
Xylenes, Total	ND	1.5		µg/L	1	7/2/2018 12:01:16 PM	W52404
Surr: 1,2-Dichloroethane-d4	101	70-130		%Rec	1	7/2/2018 12:01:16 PM	W52404
Surr: 4-Bromofluorobenzene	115	70-130		%Rec	1	7/2/2018 12:01:16 PM	W52404
Surr: Dibromofluoromethane	93.7	70-130		%Rec	1	7/2/2018 12:01:16 PM	W52404
Surr: Toluene-d8	104	70-130		%Rec	1	7/2/2018 12:01:16 PM	W52404

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

<b>Qualifiers:</b>	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

To: Cory Smith, Vanessa Fields (NMOCD)  
From: Steve Moskal (BP)  
Date: 9/14/2018  
Re: Gallegos Canyon Unit 188E – Groundwater Delineation Plan  
API#30-045-24171 (B) S30, T29N, R12W; Lat. 36.70254°, Long. -107.13715°

The Gallegos Canyon Unit (GCU) 188E site is an active natural gas production pad within the San Juan Basin Gas Field in San Juan County, New Mexico. The site is located in San Juan County on private land. Depth to groundwater is anticipated to be ~5' bgs (below ground surface). During a below grade tank (BGT) closure on June 29, 2018, groundwater was encountered at the base of the tank. A grab sample of the groundwater was collected from the open excavation with laboratory results for chloride above the New Mexico water quality standards. All other analyzed contaminants of concern were below lab detection limits. There are no concerns for contaminations other than the elevated chloride. Due to the unconfirmed chloride concentrations and lateral extents, a volume of remediation is unknown.

### **GROUNDWATER DELINEATION PLAN**

BP proposes to advance 3 soil boring to a maximum of 15 feet bgs; one in the center of the recently excavated area and one immediately downgradient and one upgradient of the excavation. The source well will determine if the sample collected from the open excavation during the BGT closure is representative of actual groundwater conditions. The up gradient well will determine background concentrations and the down gradient will determine if the suspected elevated chloride has migrated. The gradient was determined with the assumption that groundwater flows toward the adjacent San Juan River

The borings will be advanced using a minimum 4" (ID) hollow stem auger or other recommended tooling adequate to accommodate 2" PVC groundwater monitoring wells. In each boring, 2-inch PVC well screen will be placed in the lower 10 foot portion, likely from 15' bgs to 5' bgs. Each soil boring will be completed with a blank (solid pipe) riser to the surface for completion as an aboveground monument. The base of the PVC is preferred to have a cone bottom or slip cap. Sand pack will be added to the boring annulus to 1' above the screened interval. Hydrated bentonite or slurry will be placed in the remainder of the boring to 1' bgs where cement will be used to seal the surface and final surface completion. The well protectors will be lockable. The wells will be permitted through the New Mexico Office of the State Engineer Aztec Office by BP's consultant.

During advancement of the well borings, soil samples will be collected for confirmation. A soil sample will be collected every 5' or more frequent if possible. Three soil samples, will be collected from each boring, one from near the surface, one at the field determined groundwater interface, and one below the groundwater interface and all will be submitted for laboratory analysis, following handling and chain of custody protocols, for analysis 6010 or 300.0 chlorides. Field screening will not easily allow detection of chlorides and therefore will not be used.

Once the well installation is complete and allowed to sit for a minimum of 24 hours, the wells will be monitored for water. If no water is present, the wells will then be rechecked in approximately 2 weeks. If water is present, the wells will be developed via a bailing and purging with a new, disposable bailer used in each well. The wells will be purged for a minimum of 3 well volumes and where field screening for temperature, conductivity and pH become stable for a minimum of three

consecutive readings (within 10%). The purged water will be contained and disposed of in the nearby below grade tank.

The wells will then be allowed to sit for approximately 24 hours then purged of approximately three well volumes prior to sampling for General Water Chemistry via API General Chemistry methods (including pH, TDS, cations/anions), all following sample handling and chain of custody protocols.

Once lab results are obtained, BP will determine whether or not further delineation is required and will communicate with the NMOCD on a continued plan of action. Follow up reporting or delineation will be performed within 60 days of the groundwater lab analysis results.

Steve Moskal

A handwritten signature in blue ink, appearing to read "Steve Moskal", enclosed in a light blue oval.

Environmental Coordinator

# BP AMERICA PRODUCTION COMPANY

## GROUNDWATER FIELD DATA & LAB RESULTS

GCU # 512  
UNIT J, SEC. 26, T29N, R12W

REVISED DATE: December 3, 2018  
Submitted by Blagg Engineering, Inc.

SAMPLE DATE	SAMPLE ID	DEPTH TO WATER (ft)	WELL DEPTH (ft)	TDS (mg/L)	CONDUCT. (umhos)	pH	TEMP. (degree F)	BTEX US EPA METHOD 8021B or 8260B			
								BENZENE (ppb)	TOLUENE (ppb)	ETHYL BENZENE (ppb)	TOTAL XYLENES (ppb)
29-Nov-18	MW #1	8.01	18.00	NA	4,300	6.8	15.4	NA	NA	NA	NA
29-Nov-18	MW #2	7.64	17.60	NA	5,400	7.0	14.8	NA	NA	NA	NA
29-Nov-18	MW #3	8.15	17.30	NA	5,800	6.8	14.4	NA	NA	NA	NA

### NMWQCC GROUNDWATER STANDARDS

10	750	750	620
----	-----	-----	-----

	Chloride (mg/L)	BENZENE (ppb)	TOLUENE (ppb)	ETHYL-BENZENE (ppb)	TOTAL XYLENES (ppb)
MW #1	460	NA	NA	NA	NA
GW @ 5' (95)	680	ND	ND	ND	ND
MW #2	596	NA	NA	NA	NA
MW #3	716	NA	NA	NA	NA

### NMWQCC GROUNDWATER STANDARDS

250	10	750	750	620
-----	----	-----	-----	-----

- NOTES:
- 1) ND INDICATES NOT DETECTED AT THE REPORTING LIMITS (less than regulatory standards of at least a magnitude of 10).
  - 2) NMWQCC INDICATES NEW MEXICO WATER QUALITY CONTROL COMMISSION.
  - 3) pH NMWQCC standards range between 6 -9
  - 4) TDS - Total Dissolved Solids
  - 5) ppb - Parts per billion
  - 6) mg/L - Milligrams per liter
  - 7) NA - Not available or not applicable.

# BP - GCU 188E

(B) Section 30, T29N, R12W  
API #: 3004524171

Imagery date: 3/15/2015  
P&A Marker GPS Coord.: 36.702654,-108.136745

MW #1 GPS Coord.: 36.702722,-108.137278  
MW #2 GPS Coord.: 36.702444,-108.137167  
MW #3 GPS Coord.: 36.702417,-108.137250

## FIGURE 1

MW #1

P&A Marker

MW#2

MW #3



100 ft

# FIGURE 2



MW #1  
(93.11)

P & A  
Marker

93.09

93.07

APPARENT  
GROUNDWATER  
FLOW DIRECTION  
~S61.5W

100 bbl  
PROD  
TANK

93.05

MW #3  
(93.04)

MW #2  
(93.08)

FORMER  
95 bbl  
BGT  
LOCATION

Elevation Tops	
GCU 395 WELL FLANGE	(100.00)
MW #1	(101.12)
MW #2	(100.72)
MW #3	(101.19)
MW #1 (93.11)	Groundwater Elevation as of 11/29/18.

MONITOR WELL LOCATIONS ARE ONLY AS ACCURATE AS THE INSTRUMENTS USED IN OBTAINING THE FOOTAGE & BEARING FROM THE WELL HEAD (TAPE MEASURE, LASER RANGE FINDER, & BRUNTON COMPASS). ALL OTHER STRUCTURES DISPLAYED ON THIS MAP ARE SOLELY FOR REFERENCE AND MAY NOT BE TO SCALE.

0 25 50 FT.

BP AMERICA PRODUCTION COMPANY  
GCU #188E  
NW/4 NE/4 SEC. 30, T29N, R12W  
SAN JUAN COUNTY, NEW MEXICO

**BLAGG ENGINEERING, INC.**  
CONSULTING PETROLEUM / RECLAMATION SERVICES  
P.O. BOX 87  
BLOOMFIELD, NEW MEXICO 87413  
PHONE: (505) 632-1199

PROJECT: MW SAMPLING  
DRAFTED: 12/03/18 NJV  
FILENAME: GCU 188E GW MAP.SKF

**GROUNDWATER  
CONTOUR MAP**  
11/18

# BLAGG ENGINEERING, INC.

SJ-4319 POD1

36.702722°N, -108.137278°W  
36°42' 9.8" N, 108°8' 14.2" W

P.O. BOX 87  
BLOOMFIELD, NM 87413

(505) 632-1199

## MW# 1

# BORE / TEST HOLE REPORT

BORING #..... BH - 1  
MW #..... 1  
PAGE #..... 1  
DATE STARTED 10/16/18  
DATE FINISHED 10/16/18  
OPERATOR..... KP  
LOGGED BY..... JCB

CLIENT: BP AMERICA PRODUCTION CO.  
LOCATION NAME: GCU # 188E API # 3004524171 UNIT B, SEC. 30, T29N, R12W  
CONTRACTOR: BLAGG ENGINEERING, INC. / GEOMAT  
EQUIPMENT USED: MOBILE DRILL RIG (CME 55) - HOLLOW STEM AUGER  
BORING LOCATION: APPROX. 158 FEET, N81W FROM WELL HEAD.

DEPTH (FT.)	INTERVAL	LITHOLOGY INTERVAL	MW SCHEMATIC	SAMP TYPE	OVM (ppm)	TIME	FIELD CLASSIFICATION AND REMARKS	
						1300	GROUND SURFACE	
							TOP OF CASING APPROX. 2.20 FT. ABOVE GRADE.	
1		Silty Sand	TOS 5.80 ft.	SS	1.1	1301	DARK YELLOWISH ORANGE SILTY SAND, NON COHESIVE, DRY, FIRM, NO APPARENT HYDROCARBON ODOR DETECTED PHYSICALLY WITHIN CUTTINGS(0.0 - 5.0 FT. BELOW GRADE [B.G.]).	
2								
3								
4								
5								
6		Sand and Gravel	TOS 15.80 ft.	SS	1.7	1318	SAME AS ABOVE EXCEPT SLIGHTLY MOIST (5.0 - 6.0 FT. B.G.). <b>GROUNDWATER ~ 5.81 ft. BELOW GRADE ; MEASURED 11/29/18.</b>	
7								
8								
9		Sand and Gravel	TOS 15.80 ft.	SS	NA	1332	NO RECOVERY, RIVER COBBLES	
10								
11								
12		Sand and Gravel	TOS 15.80 ft.	SS	NA			
13								
14								
15		Sand and Gravel	TOS 15.80 ft.	SS	NA			
16								
17								
18		Sand and Gravel	TOS 15.80 ft.	SS	NA			
19								
20								
TD OF BORE HOLE - 1342								

- NOTES:
- SILTY SAND.
  - SAND AND GRAVEL.
  - TOS** - Top of screen of monitor well.
  - TD** - Total depth/bottom extent of monitor well.
  - SS** - Split spoon sampler used.
  - OVM** - Organic Vapor meter.

Monitor well consist of 2 inch PVC piping - casing from 2.20 ft. above grade to 5.80 ft. below grade, 0.010 slotted screen between 5.80 to 15.80 ft. below grade, sand packed annular to 4.0 ft. below grade, bentonite grout between surface grade to 4.0 ft. below grade, cement grouted rectangular steel well protector enclosing above grade casing and secured with padlock.

# BLAGG ENGINEERING, INC.

SJ-4319 POD2

36.702444°N, -108.137167°W  
36° 42' 8.8" N, 108° 8' 13.8" W

P.O. BOX 87  
BLOOMFIELD, NM 87413  
(505) 632-1199

MW# 2

## BORE / TEST HOLE REPORT

BORING #..... BH - 2  
MW#..... 2  
PAGE #..... 2  
DATE STARTED 10/16/18  
DATE FINISHED 10/16/18  
OPERATOR..... KP  
LOGGED BY..... JCB

CLIENT: BP AMERICA PRODUCTION CO.  
LOCATION NAME: GCU # 188E API # 3004524171 UNIT B, SEC. 30, T29N, R12W  
CONTRACTOR: BLAGG ENGINEERING, INC. / GEOMAT  
EQUIPMENT USED: MOBILE DRILL RIG (CME 55) - HOLLOW STEM AUGER  
BORING LOCATION: APPROX. 145.5 FEET, S58W FROM WELL HEAD.

DEPTH (FT.)	INTERVAL	LITHOLOGY INTERVAL	MW SCHEMATIC	SAMP TYPE	OVM (ppm)	TIME	FIELD CLASSIFICATION AND REMARKS
							GROUND SURFACE
			←			0837	TOP OF CASING APPROX. 2.45 FT. ABOVE GRADE.
1							
2							
3							
4							
5			TOS	SS	2.2	0843	SAME AS ABOVE EXCEPT SLIGHTLY MOIST (4.0 - 6.0 FT. B.G.). <span style="color: blue;">▲</span> <b>GROUNDWATER ~ 5.19 ft. BELOW GRADE ; MEASURED 11/29/18.</b>
6			5.20 ft.				
7							
8							
9							
10				SS	NA	0902	NO RECOVERY, RIVER COBBLES
11							
12							
13							
14							
15			TD				
16			15.20 ft.				
17							
18							
19							
20							
			TD OF BORE HOLE -			0912	

- NOTES:
- SILTY SAND.
  - SAND AND GRAVEL.
  - TOS - Top of screen of monitor well.
  - TD - Total depth/bottom extent of monitor well.
  - SS - Split spoon sampler used.
  - OVM - Organic Vapor meter.

Monitor well consist of 2 inch PVC piping - casing from 2.45 ft. above grade to 5.20 ft. below grade, 0.010 slotted screen between 5.20 to 15.20 ft. below grade, sand packed annular to 4.0 ft. below grade, bentonite grout between surface grade to 4.0 ft. below grade, cement grouted rectangular steel well protector enclosing above grade casing and secured with padlock.

# BLAGG ENGINEERING, INC.

SJ-4319 POD3

36.702417°N, -108.137250°W  
36° 42' 8.7" N, 108° 8' 14.1" W

P.O. BOX 87  
BLOOMFIELD, NM 87413

(505) 632-1199

## MW# 3

# BORE / TEST HOLE REPORT

BORING #..... BH - 3  
MW #..... 3  
PAGE #..... 3  
DATE STARTED 10/16/18  
DATE FINISHED 10/16/18  
OPERATOR..... KP  
LOGGED BY..... JCB

CLIENT: BP AMERICA PRODUCTION CO.  
LOCATION NAME: GCU # 188E API # 3004524171 UNIT B, SEC. 30, T29N, R12W  
CONTRACTOR: BLAGG ENGINEERING, INC. / GEOMAT  
EQUIPMENT USED: MOBILE DRILL RIG (CME 55) - HOLLOW STEM AUGER  
BORING LOCATION: APPROX. 171.5 FEET, S59.5W FROM WELL HEAD.

DEPTH (FT.)	INTERVAL	LITHOLOGY INTERVAL	MW SCHEMATIC	SAMP TYPE	OVM (ppm)	TIME	FIELD CLASSIFICATION AND REMARKS
						1017	GROUND SURFACE
			←			1018	TOP OF CASING APPROX. 2.80 FT. ABOVE GRADE.
1				SS	1.7	1018	DARK YELLOWISH ORANGE SILTY SAND, NON COHESIVE, DRY, FIRM, NO APPARENT HYDROCARBON ODOR DETECTED PHYSICALLY WITHIN CUTTINGS (0.0 - 5.0 FT. BELOW GRADE [B.G.]).
2							
3							
4							
5			TOS 4.50 ft.	SS	1.9	1030	<div style="color: blue; font-weight: bold;"> <span style="font-size: 1.5em;">▼</span> GROUNDWATER ~ 5.35 ft. BELOW GRADE ; MEASURED 11/29/18.                 </div> SAME AS ABOVE EXCEPT COARSE SAND, GRAY (SWAMP ODOR), VERY MOIST @ 5.5 FT. B.G. (5.0 - 6.0 FT. B.G.).
6							
7							
8							
9							
10				SS	NA	1040	NO RECOVERY, RIVER COBBLES
11							SAND AND GRAVEL, NON COHESIVE, SATURATED, LOOSE, NO APPARENT HYDROCARBON ODOR DETECTED PHYSICALLY WITHIN CUTTINGS (6.0 - 16.0 FT. B.G.).
12							
13							
14							
15			TD 14.50 ft.				
16							TD OF BORE HOLE - 1050
17							
18							
19							
20							

- NOTES:
- SILTY SAND.
  - SAND AND GRAVEL.
  - TOS** - Top of screen of monitor well.
  - TD** - Total depth/bottom extent of monitor well.
  - SS** - Split spoon sampler used.
  - OVM** - Organic Vapor meter.

Monitor well consist of 2 inch PVC piping - casing from 2.80 ft. above grade to 4.50 ft. below grade, 0.010 slotted screen between 4.50 to 14.50 ft. below grade, sand packed annular to 4.0 ft. below grade, bentonite grout between surface grade to 4.0 ft. below grade, cement grouted rectangular steel well protector enclosing above grade casing and secured with padlock.

# BLAGG ENGINEERING, INC.

## MONITOR / TEST WELL DEVELOPMENT & / OR SAMPLING DATA

CLIENT : BP AMERICA PROD. CO.

CHAIN-OF-CUSTODY # : N / A

GCU # 188E	API #: 3004524171
UNIT B, SEC. 30, T29N, R12W	

LABORATORY (S) USED : N / A

Date : November 27, 2018  
 Filename : GCU 188E mw log 2018-11-27.xls

DEVELOPER / SAMPLER : N J V  
 PROJECT MANAGER : S. MOSKAL

Sample ID	WELL ELEV. (ft)	WATER ELEV. (ft)	DEPTH TO WATER (ft)	TOTAL DEPTH (ft)	SAMPLING TIME	pH	CONDUCT (umhos)	TEMP. (celcius)	VOLUME PURGED (gal.)
MW #1	-	-	8.03	18.00	-	-	-	-	10.00
MW #2	-	-	7.67	17.60	-	-	-	-	10.00
MW #3	-	-	8.17	17.30	-	-	-	-	6.00

INSTRUMENT CALIBRATIONS = 

-	-
-	-

  
 DATE & TIME = 

-	-
-	-

NOTES : Volume of water purged from well prior to sampling:  $V = \pi \times r^2 \times h \times 7.48 \text{ gal./ft}^3 \times 3 \text{ (wellbores)}$ .  
 (i.e. 2" MW  $r = (1/12) \text{ ft. } h = 1 \text{ ft.}$ ) (i.e. 4" MW  $r = (2/12) \text{ ft. } h = 1 \text{ ft.}$ )

Ideally a minimum of three (3) wellbore volumes:      2.00 " well diameter = 0.49 gal. / ft. of water.

Comments or note well diameter if not standard 2 "

Monitor wells installed: 10/16/2018. Used new disposable bailers to develop (1 each per well). Excellent recovery in MW #1 & MW #2. Good/fair recovery in MW #3. All wells murky brown in appearance, no physical indication of hydrocarbon observed within purged water collection container.

Top of casing: MW #1 ~ 2.20 ft., MW #2 ~ 2.45 ft., MW #3 ~ 2.80 ft. below grade.

on-site	<u>11:00 AM</u>	temp	<u>36 F</u>
off-site	<u>1:30 PM</u>	temp	<u>47 F</u>
sky cond.	<u>Cloudy</u>		
wind speed	<u>0 - 5</u>	direct.	<u>E - W</u>

# BLAGG ENGINEERING, INC.

MONITOR / TEST WELL DEVELOPMENT & / OR SAMPLING DATA

CLIENT : BP AMERICA PROD. CO.

CHAIN-OF-CUSTODY # : N / A

GCU # 188E	API #: 3004524171
UNIT B, SEC. 30, T29N, R12W	

LABORATORY (S) USED : ENVIROTECH INC.

Date : November 29, 2018  
 Filename : GCU 188E mw log 2018-11-29.xls

DEVELOPER / SAMPLER : N J V / J C B  
 PROJECT MANAGER : S. MOSKAL

Sample ID	WELL ELEV. (ft)	WATER ELEV. (ft)	DEPTH TO WATER (ft)	TOTAL DEPTH (ft)	SAMPLING TIME	pH	CONDUCT (umhos)	TEMP. (celcius)	VOLUME PURGED (gal.)
MW #1	-	-	8.01	18.00	0904	6.8	4,300	15.4	5.00
MW #2	-	-	7.64	17.60	0938	7.0	5,400	14.8	5.00
MW #3	-	-	8.15	17.30	0923	6.8	5,800	14.4	4.50

INSTRUMENT CALIBRATIONS =	4.01/7.00/10.00	2,800
DATE & TIME =	11/29/18	0900

NOTES : Volume of water purged from well prior to sampling: V = pi X r<sup>2</sup> X h X 7.48 gal./ft<sup>3</sup> X 3 (wellbores).  
 (i.e. 2" MW r = (1/12) ft. h = 1 ft.) (i.e. 4" MW r = (2/12) ft. h = 1 ft.)

Ideally a minimum of three (3) wellbore volumes: 2.00 " well diameter = 0.49 gal. / ft. of water.

Comments or note well diameter if not standard 2."

Monitor wells installed on 10/16/2018, developed on 11/27/2018. Used new, dedicated, disposable bailers per well.  
 Excellent recovery in all monitor wells. All wells murky brown in appearance, no physical indication of hydrocarbon observed within purged water collection container. Samples collected from all 3 wells and analyzed for API Water, but primarily targeting chloride during this initial event.

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Top of casing: MW #1 ~ 2.20 ft., MW #2 ~ 2.45 ft., MW #3 ~ 2.80 ft. below grade.

on-site	<u>8:45 AM</u>	temp	<u>35 F</u>
off-site	<u>9:30 AM</u>	temp	<u>40 F</u>
sky cond.	<u>Cloudy</u>		
wind speed	<u>0 - 10</u>	direct.	<u>E</u>

BP America Production Co. PO Box 22024 Tulsa OK, 74121-2024	Project Name: Gallegos Canyon Unit 188E Project Number: 03143-0424 Project Manager: Steve Moskal	<b>Reported:</b> 12/03/18 16:45
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**MW #1**  
**P811084-01 (Water)**

Reporting									
Analyte	Result	Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes

**Anions by 300.0/9056A**

Chloride	460	4.00	mg/L	2	1848024	11/29/18	11/30/18	EPA 300.0/9056A	
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BP America Production Co. PO Box 22024 Tulsa OK, 74121-2024	Project Name: Gallegos Canyon Unit 188E Project Number: 03143-0424 Project Manager: Steve Moskal	<b>Reported:</b> 12/03/18 16:44
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**MW #2**  
**P811083-01 (Water)**

Reporting									
Analyte	Result	Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes

**Anions by 300.0/9056A**

Chloride	<b>596</b>	10.0	mg/L	5	1848024	11/29/18	11/29/18	EPA 300.0/9056A	
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BP America Production Co. PO Box 22024 Tulsa OK, 74121-2024	Project Name: Gallegos Canyon Unit 188E Project Number: 03143-0424 Project Manager: Steve Moskal	<b>Reported:</b> 12/03/18 16:45
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**MW #3**  
**P811084-02 (Water)**

Reporting									
Analyte	Result	Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes

**Anions by 300.0/9056A**

Chloride	<b>716</b>	4.00	mg/L	2	1848024	11/29/18	11/30/18	EPA 300.0/9056A	
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Client: **BPX / Blagg Engr.**  
 Project: **Gallegos Canyon Unit 188E**  
 Sampler: **Jeff Blagg - Blagg Engr.**  
 Phone: **(505) 320-1183**  
 Email(s): **jeffcblagg@aol.com, blagg\_njv@yahoo.com, StevenMoskal@bpx.com**  
 Project Manager: **Steve Moskal - BPX**

RUSH?  
 1d  
 3d

Lab Use Only		Analysis and Method				lab Only	
Lab WO#		GRO/DRO by 8015	BTEX by 8021	TPH by 418.1	Chloride by 300.0	Lab Number	Correct Cont/Prsrv (s) Y/N
Job Number							

Sample ID	Sample Date	Sample Time	Matrix	Containers QTY - Vol/TYPE/Preservative	GRO/DRO by 8015	BTEX by 8021	TPH by 418.1	Chloride by 300.0	Lab Number	Correct Cont/Prsrv (s) Y/N
MW #1	11/29/18	0904	water	1				X X	1	
MW #3	11/29/18	0923	water	1				X X	2	

Page 1 of 1

ARI WATER  
 (SEE ATTACHED LIST)

Relinquished by: (Signature) <i>Jeff Blagg</i>	Date 11/29/2018	Time 09:59	Received by: (Signature) <i>Jessica A. N...</i>	Date 11/29/18	Time 09:59	Lab Use Only
Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time	**Received on Ice <input checked="" type="checkbox"/> Y / N
						T1 _____ T2 _____ T3 _____
						AVG Temp °C <u>4</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

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

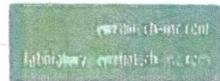
Sample(s) dropped off after hours to a secure drop off area. Chain of Custody Notes/Billing info: **Report chloride only.** BPX PO: 4300994095

Page 7 of 7



5416 US Highway 66, Farmington, NM 87401  
 Three Springs - 65 Maricao Street, Suite 115, Durango CO 81301

Ph: (505) 632-0615 Fax: (505) 637-1861  
 Ph: (970) 250-0615 Fax: (970) 267-1820



## Analytical Report

### Report Summary

Client: BP America Production Co.

Chain Of Custody Number:

Samples Received: 11/29/2018 9:59:00AM

Job Number: 03143-0424

Work Order: P811083

Project Name/Location: Gallegos Canyon Unit  
188E

Report Reviewed By:



Date: 12/3/18

Walter Hinchman, Laboratory Director



Date: 12/3/18

Tim Cain, Project Manager



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

BP America Production Co.	Project Name:	Gallegos Canyon Unit 188E	<b>Reported:</b> 12/03/18 16:44
PO Box 22024	Project Number:	03143-0424	
Tulsa OK, 74121-2024	Project Manager:	Steve Moskal	

### Analytical Report for Samples

Client Sample ID	Lab Sample ID	Matrix	Sampled	Received	Container
MW #2	P811083-01A	Water	11/29/18	11/29/18	Poly 500mL

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BP America Production Co. PO Box 22024 Tulsa OK, 74121-2024	Project Name: Gallegos Canyon Unit 188E Project Number: 03143-0424 Project Manager: Steve Moskal	<b>Reported:</b> 12/03/18 16:44
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**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 1848024 - Anion Extraction EPA 300.0/9056A**

<b>Blank (1848024-BLK1)</b>				Prepared & Analyzed: 11/29/18 1						
Chloride	ND	2.00	mg/L							
<b>LCS (1848024-BS1)</b>				Prepared & Analyzed: 11/29/18 1						
Chloride	25.7	2.00	mg/L	25.0		103	90-110			
<b>Matrix Spike (1848024-MS1)</b>				Source: P811083-01		Prepared & Analyzed: 11/29/18 1				
Chloride	722	10.0	mg/L	125	596	101	80-120			
<b>Matrix Spike Dup (1848024-MSD1)</b>				Source: P811083-01		Prepared & Analyzed: 11/29/18 1				
Chloride	725	10.0	mg/L	125	596	104	80-120	0.495	20	

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

Project Name: Gallegos Canyon Unit 188E  
Project Number: 03143-0424  
Project Manager: Steve Moskal

**Reported:**  
12/03/18 16:44

### Notes and Definitions

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.

Partial or incomplete reproduction of this report is prohibited, unless approved by Envirotech, Inc.

## Analytical Report

### Report Summary

Client: BP America Production Co.

Chain Of Custody Number:

Samples Received: 11/29/2018 9:59:00AM

Job Number: 03143-0424

Work Order: P811084

Project Name/Location: Gallegos Canyon Unit  
188E

Report Reviewed By:



Date: 12/3/18

Walter Hinchman, Laboratory Director



Date: 12/3/18

Tim Cain, Project Manager



Envirotech Inc. certifies the test results meet all requirements of TNi unless footnoted otherwise.  
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BP America Production Co. PO Box 22024 Tulsa OK, 74121-2024	Project Name: Gallegos Canyon Unit 188E Project Number: 03143-0424 Project Manager: Steve Moskal	<b>Reported:</b> 12/03/18 16:45
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### Analytical Report for Samples

Client Sample ID	Lab Sample ID	Matrix	Sampled	Received	Container
MW #1	P811084-01A	Water	11/29/18	11/29/18	Poly 500mL
MW #3	P811084-02A	Water	11/29/18	11/29/18	Poly 500mL

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BP America Production Co. PO Box 22024 Tulsa OK, 74121-2024	Project Name: Gallegos Canyon Unit 188E Project Number: 03143-0424 Project Manager: Steve Moskal	<b>Reported:</b> 12/03/18 16:45
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**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 1848024 - Anion Extraction EPA 300.0/9056A**

<b>Blank (1848024-BLK1)</b>		Prepared & Analyzed: 11/29/18 1								
Chloride	ND	2.00	mg/L							
<b>LCS (1848024-BS1)</b>		Prepared & Analyzed: 11/29/18 1								
Chloride	25.7	2.00	mg/L	25.0		103	90-110			
<b>Matrix Spike (1848024-MS1)</b>		<b>Source: P811083-01</b>		Prepared & Analyzed: 11/29/18 1						
Chloride	722	10.0	mg/L	125	596	101	80-120			
<b>Matrix Spike Dup (1848024-MSD1)</b>		<b>Source: P811083-01</b>		Prepared & Analyzed: 11/29/18 1						
Chloride	725	10.0	mg/L	125	596	104	80-120	0.495	20	

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

Project Name: Gallegos Canyon Unit 188E  
Project Number: 03143-0424  
Project Manager: Steve Moskal

**Reported:**  
12/03/18 16:45

### Notes and Definitions

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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