# 3R - 0389

# ANNUAL MONITORING REPORT

# 04/25/2008

P.O. Box 87. Bloomfield. New Mexico 87413

# RECEIVED

### 2008 APR 30 PM 3 32

April 25, 2008

Mr. Glenn von Gonten, Senior Hydrologist New Mexico Oil Conservation Division-NMOCD Environmental Bureau 1220 St. Francis Drive Santa Fe, New Mexico 87505

Re: BP America Production Company Groundwater Monitoring Report GCU # 194, Unit D, Sec. 5, T27N, R12W, NMPM San Juan County, New Mexico

NMOCD Administrative/Environmental Order #: 3RP-389-0

Dear Mr. von Gonten:

BP America Production Company (**BP**) has retained Blagg Engineering, Inc. (**BEI**) to conduct environmental monitoring of groundwater at the GCU # 194.

The last formal correspondence to NMOCD was conducted with a letter dated February 10, 2006. Since then, BP has followed its NMOCD approved groundwater management plan and continues to monitor the site. No permanent closure is requested at this time.

If you have any questions concerning the enclosed documentation, please contact either myself or Jeffrey C. Blagg at (505) 632-1199. Thank you for your cooperation and assistance.

Respectfully submitted: *Blagg Engineering, Inc.* 

Nelson J. Velez Staff Geologist

NJV/njv

Attachment: Groundwater Report (2 copies)

cc: Mr. Brandon Powell, Environmental Specialist, NMOCD District III Office, Aztec, NM Mr. Larry Schlotterback, Environmental Coordinator, BP, Farmington, NM (without lab report) Ms. Shannon Hoover, Senior Geologist, URS Corp., Austin, Texas

GCU 194 04-25-08 CVL.DOC

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RECEIVED

# BP AMERICA PRODUCTION CO! APR 30 PM 3 32

## **GROUNDWATER REMEDIATION REPORT**

# GCU # 194 (D) SECTION 5, T27N, R12W, NMPM SAN JUAN COUNTY, NEW MEXICO

### PREPARED FOR: NEW MEXICO OIL CONSERVATION DIVISION 1220 ST. FRANCIS DRIVE SANTA FE, NEW MEXICO 87504

**APRIL 2008** 

### PREPARED BY: BLAGG ENGINEERING, INC.

Consulting Petroleum / Reclamation Services P.O. Box 87 Bloomfield, New Mexico 87413

# BP AMERICA PRODUCTION COMPANY GCU # 194 - Dehydrator Pit NW/4 NW/4, Sec. 5, T27N, R12W

Monitor Well Installation Date:

7/6/06 (MW #4)

Monitor Well Sampling Dates:

8/3/06, 6/25/07, 9/17/07, 11/14/07

## Site History:

A site dehydrator pit closure was initiated in April 2002. Potential groundwater impacts were identified within the source area from sampling and testing of the exposed groundwater via excavation. A secondary source area was discovered during installation of a groundwater monitor well (MW #3) in December 2002; and thereafter, sampling and testing verified groundwater impacts. During quarterly sampling in March 2004, free phase product was observed within MW #3 and continues to be present. Documentation of this work and subsequent groundwater monitoring data for the site have previously been submitted for New Mexico Oil Conservation Division (NMOCD) review. Further site delineation and limited excavation of the secondary source area was suggested within the report. The reporting herein is for site monitoring for 2006 and 2007.

# Groundwater Investigation and Soil Lithology:

Groundwater monitor well MW #4 was installed in July 2006 to delineate the previously identified secondary source area and to test groundwater quality (Figure 1). The initial boring intended for MW #4 (BH-4), revealed a dark gray to black sand with a strong apparent hydrocarbon odor between 6 ½ to 8 ½ feet below grade. BH-4 was located approximately 60 feet north from monitor well MW #3. BH-4 was grouted and abandoned using % inch bentonite chips. MW #4 was installed 30 feet beyond BH-4 in the down gradient direction where physical characteristics revealed a more apparent non-impacted soil conditions.

Soil lithology at the site consists of primarily sand, non cohesive, firm, and with varying color. Boring logs for BH-4 and MW #4 are included.

# Groundwater Monitor Well Sampling Procedures:

Monitor well MW #4 was developed after installation by hand-bailing, using new disposable bailers. Prior to sample collections, MW #4 was purged approximately three (3) well bore volumes with new disposable bailers. The groundwater samples were collected following US EPA: SW-846 protocol, were placed into laboratory supplied containers with appropriate preservative, and stored in an ice chest for express delivery to an analytical laboratory for testing under strict chain-of-custody procedures. Analytical testing included benzene, toluene, ethylbenzene, and total xylenes (BTEX) by US EPA Method 8021B.

Fluids generated during monitor well development and purging were managed by discarding into the separator tank pit located on the well site. The tank pit contents are then disposed through approved NMOCD operational procedures for removal of produced fluids.

# **Groundwater Quality & Flow Direction Information:**

Since June 2007, monitor well MW #4 has been sampled on a quarterly basis. Fluctuations above and below the New Mexico Water Quality Control Commission (NMWQCC) standards has been recorded. Source area monitor well MW#3 has continued to reveal the presence of free phase product. A historical summary of laboratory analytical BTEX results is included within the table on the following page. Field data sheets, laboratory reports, and laboratory quality assurance/quality control information are also included.

Blagg Engineering, Inc. Consulting Engineers Groundwater elevations have consistently been measured with a gradient towards the north and parallel to the nearby Gallegos Canyon wash (Figure 2 through Figure 4).

## Summary and/or Recommendations:

The well site is located in a very remote area of San Juan County. Quarterly monitoring of MW #3 and sampling of MW #4 is currently being conducted. The presence of free phase product within monitor well MW #3 indicates long term monitoring will be necessary if proactive remediation efforts are not undertaken. Shallow groundwater suggests excavation of the secondary source area might be the most practical solution. Alternative technologies such as air sparging may be suitable for remediation of lower dissolved concentrations of BTEX and/or the secondary source area.

BP AMERICA PROD. CO. GROUNDWATER LAB RESULTS SUBMITTED BY BLAGG ENGINEERING, INC.

GCU	# 1	94 - 5	SEF	PARATO	or Pit
UNIT	D,	SEC.	5,	T27N,	R12W

REVISED DATE: November 30, 2007

FILENAME: (194-4Q07.WK4) NJV

							:	BTEX	EPA METH	OD 8021B (	ppb )
SAMPLE	WELL	D.T.W.	T.D.	TDS	COND.	pН	PRODUCT	Benzene	Toluene	Ethyl	Total
DATE	NAME or No.	(ft)	(ft)	(mg/L)	umhos		(ft)			Benzene	Xylene
23-Dec-02	MW #1	8.04	14.50	-	6,100	7.73	-	ND	ND	ND	ND
23-Dec-02	MW #2	7.84	14.50	-	7,100	7.94	-	6.8	0.5	14	8.0
24-Feb-03		7.72		-	6,900	8.03	-	5.4	ND	9.9	13
29-May-03		7.96			6,100	7.78		5.4	1.0	6.7	11
18-Aug-03		8.58			8,700	7.56		11	ND	17	19
18-Nov-03		8.20			7,900	7.66		2.3	ND	8.4	5.1
22-Mar-04		7.80			6,800	7.59		2.1	ND	5.8	7.6
23-Jun-04		8.43			8,000	7.49		3.5	ND	8.5	5.4
22-Dec-04		7.93			N/A	N/A		ND	ND	1.9	2.7
28-Mar-05		7.67			6,400	7.58		ND	ND	1.5	2.1
23-Dec-02	MW #3	8.69	14.00	-	8,800	7.80	-	180	34	220	2,130
29-May-03		8.81			7,700	7.40		8.6	7.6	8.5	17
18-Aug-03		9.46			9,500	7.25		13	ND	2.1	30
18-Nov-03		8.97			7,900	7.37		1,800	100	1,300	13,000
22-Mar-04							0.01				
23-Jun-04							0.45				
22-Dec-04					<u>.</u>		0.40				
28-Mar-05							0.01				
27-Jul-06							0.04				
25-Jun-07							0.10				
17-Sep-07							0.01				<u>,</u>
14-Nov-07							0.01				
03-Aug-06	MW #4	8.82	17.15		800	7.33		91	ND	130	ND
25-Jun-07		8.60			4,800	7.44		ND	ND	ND	ND
17-Sep-07		8.87			6,500	7.22		ND	ND	ND	ND
14-Nov-07		8.43			7,100	7.57		31	ND	26	ND
		NMW	QCC GF	ROUNDV	VATER S	TAND	ARDS	10	750	750	620

NOTES: 1) RESULTS IN BOLD RED TYPE INDICATE EXCEEDING NMWQCC STANDARDS.

- 2) RESULTS IN BOLD BLUE TYPE INDICATE BELOW NMWQCC STANDARDS AFTER PREVIOUS RESULTS IN BOLD RED TYPE EXCEEDED.
- 3) ND INDICATES NOT DETECTED AT THE REPORTING LIMITS (less than regulatory standards of at least a magnitude of 10).



















MONITOR WELL DEVELOPMENT & / OR SAMPLING DATA

### CLIENT: BP AMERICA PROD. CO.

CHAIN-OF-CUSTODY # : N / A

GCU #194 - SEPARATOR PIT UNIT D, SEC. 5, T27N, R12W

*Date :* August 3, 2006

Filename : 08-03-06.WK4

LABORATORY (S) USED : HALL ENVIRONMENTAL

SAMPLER : N J V

PROJECT MANAGER :

 N	V	

WELL #	WELL ELEV. (ft)	WATER ELEV. (ft)	DEPTH TO WATER (ft)	TOTAL DEPTH (ft)	SAMPLING TIME	рН	CONDUCT (umhos)	TEMP. (celcius)	VOLUME PURGED (gal.)
<u>MW - 1</u>	102.35		-	14.50	-	-	-	-	-
MW - 2	102.47		-	14.50	-	-	-	-	· -
MW - 3	103.43			14.00	-	-	-	-	-
DEPTH	TO PRODU	CT (FT.) =			_	PRODU		SS ( FT. ) =	
MW - 4	102.55	93.73	8.82	17.15	0810	7.33	800	21.6	4.00
			INSTRUME	ENT CALIE	RATIONS =	7.00	2,800		
				DATI	E & TIME =	08/06/06	0755		

NOTES : <u>Volume of water purged from well prior to sampling</u>:  $V = pi X r^2 X h X 7.48 gal./ft3) X 3 (wellbores).$ (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 gallons per foot of water.

Comments or note well diameter if not standard 2 ".

Excellent recovery in MW #4. Collected sample from MW #4 for BTEX analysis only.

Top of casing MW #1 ~ 2.40 ft., MW #2 ~ 2.55 ft., MW #3 ~ 2.40 ft., MW #4 ~ 2.60 ft. above grade

CLIENT:	Blagg Engineering			Clien	t Sample ID:	MW#4	
Lab Order:	0608081			Col	lection Date:	8/3/2006	8:10:00 AM
Project:	GCU #194			Da	te Received:	8/4/2006	
Lab ID:	0608081-01	•		· ·	Matrix:	AQUEO	US
Analyses		Result	PQL	Qual Un	its	DF	Date Analyzed
EPA METHOD	8021B: VOLATILES						Analyst: NSE
Benzene		91	1.0	μg/	-	1	8/7/2006 1:50:28 PM
Toluene		ND	1.0	μg/	-	1	8/7/2006 1:50:28 PM
Ethylbenzene		130	5.0	μg/	_	5	8/7/2006 9:51:37 PM
Xylenes, Total		ND	3.0	μg/	_	1	8/7/2006 1:50:28 PM
Sure: A Brom	ofluorobenzene	104	72.2-125	%R	FC	1	8/7/2006 1:50:28 PM

Date: 08-Aug-06

Qualifiers:

\* Value exceeds Maximum Contaminant Level

E Value above quantitation range

J Analyte detected below quantitation limits

S Spike Recovery outside accepted recovery limits

- $B \qquad \text{Analyte detected in the associated Method Blank}$
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit

<b>HAI</b>	IN-OF		CHAIN-OF-CUSTODY RECORD	Other	QA/QC Package: Std 🔲 Level 4	C Package:	<b>8</b> . ••••••••••••••••••••••••••••••••••••			э́л:	JA 9	ALL E VALY 31 Háv	<b>NVIF SIS L</b> Kins M	HALL ENVIRONMENTAL ANALY SI ANALYSIS LABORATORY 4901 Hawkins NE, Suite D		IAL ORY		
Client: 🔏	2966	HGG ENK.	BP AMERCA	Project Name:	שר ד	7614	7				Alt Ver	uquerq 505.3 w.halle	ue, Nev 45.39. 7vironn	Albuquerque, New Mexico 87109 Tel. 505.345.3975 Fax 505.34 www.hallenvironmental.com	ta 871 x 505. tom	xico 87109 Fax 505.345.4107 91.com	107	
Address:		NCN N	6	Project #:							AN	ANALYSIS		REQUEST	15			
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				Project Manager:										(70				
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Phone #:		632	- 1199	Sampler:	2					<u></u>	(12			.ศาส /				
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Date		Matrix	Sample I.D. No.	Number/Volume	<u> </u>	Preservative	HEAL NO.	BTEX + M	TPH Metho	TPH (Meth	EDC (Meth	NG) 0158	) ;7) enoinA	8081 Pest 82608 (V	<sup>n9</sup> 2) 0728	·		Air Bubble:
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# QA/QC SUMMARY REPORT

Client:Blagg EngiProject:GCU #194	-						V	ork O	order: 0608081
Analyte	Result	Units	PQL	%Rec	LowLimit I	lighLimit	%RPD	RPDL	.imit Qual
Method: SW8021					<u> </u>				
Sample ID: 5ML RB	x	MBLK			Batch ID	: <b>R20190</b>	Analysis Da	ate:	8/7/2006 8:55:16 AM
Benzene	ND	µg/L	1.0						
Toluene	ND	µg/L	1.0						
Ethylbenzene	ND	µg/L	1.0						
Xylenes, Total	ND	µg/L	3.0						
Sample ID: 100NG BTEX LCS		LCS			Batch ID	: R20190	Analysis Da	ate:	8/7/2006 5:21:30 P
Benzene	22.37	µg/L	1.0	112	85	115			
Toluene	22.31	µg/L	1.0	112	85	118			
Ethylbenzene	22.12	µg/L	1.0	111	85	116			
Xylenes, Total	45.47	µg/L	3.0	112	85	119			
Sample ID: 100NG BTEX LCSD	)	LCSD			Batch IC	): <b>R20190</b>	Analysis D	ate:	8/7/2006 5:51:39 Pl
Benzene	22.11	µg/L	1.0	111	85	115	1.17	27	
Toluene	21.63	µg/L	1.0	108	85	118	3.09	19	
Ethylbenzene	21.93	µg/L	1.0	110	85	116	0.863	10	
Xylenes, Total	45.31	µg/L	3.0	111	85	119	0.361	13	

Qualifiers:

J

R

- E Value above quantitation range
  - Analyte detected below quantitation limits
  - RPD outside accepted recovery limits

- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
  - Spike Recovery outside accepted recovery limits
  - 2/3

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Page 1

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	Sample	Receipt						
Client Name BLAGG				te and Time	Received:		8/7	/2006
Work Order Number 0608081	ΛΛ		F	Received by	GLS			
Checklist completed by Signature	hppi_		-7-(	26				
Matrix	Carrier name	Greyhour	<u>id</u>					
Shipping container/cooler in good condition?		Yes 🗹	١	No 🗔	Not Present			
Custody seals intact on shipping container/coole	r?	Yes 🗹	١	No 🗀	Not Present	□ Not	Shipped	
Custody seals intact on sample bottles?		Yes 🗹	1	No 🗌	N/A			
Chain of custody present?		Yes 🗹	1	No 🗌				
Chain of custody signed when relinquished and relinquishe	eceived?	Yes 🗹	١	No 🗆				
Chain of custody agrees with sample labels?		Yes 🗹	1	No 🗆				
Samples in proper container/bottle?		Yes 🗹	1	No 🗔				
Sample containers intact?		Yes 🗹	1	No 🗆				
Sufficient sample volume for indicated test?		Yes 🗹	1	No 🗔				
All samples received within holding time?	· · ·	Yes 🗹	1					
Water - VOA vials have zero headspace?	No VOA vials subm	nitted 🗌	Ye	s 🗹	No 🗌			
Water - pH acceptable upon receipt?		Yes 🗌	. 1	No 🗔	N/A 🗹	l		
Container/Temp Blank temperature?		4°		± 2 Accepta ven sufficient	ble time to cool.			
COMMENTS:					·			
		===				===		===
Client contacted	Date contacted:			Pers	on contacted			
Contacted by:	Regarding							
Comments:								
	<u> </u>		· · · · · · ·					
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Corrective Action							. (1944)	
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MONITOR WELL DEVELOPMENT & / OR SAMPLING DATA

CLIENT: BP AMERICA PROD. CO.

N/A CHAIN-OF-CUSTODY # :

GCU #194 - SEPARATOR PIT UNIT D, SEC. 5, T27N, R12W

Date : June 25, 2007

Filename : 06-25-07.WK4

LABORATORY (S) USED : HALL ENVIRONMENTAL

SAMPLER : NJV V

**PROJECT MANAGER:** 

N J
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WELL #	WELL ELEV. (ft)	WATER ELEV. (ft)	DEPTH TO WATER (ft)	TOTAL DEPTH (ft)	Sampling Time	рН	CONDUCT (umhos)	TEMP. (celcius)	VOLUME PURGED (gal.)
1	102.35	93.82	8.53	14.50	-	-	-	-	-
2	102.47	94.12	8.35	14.50	-		-	-	
3	103.43	94.22 *	9.22	15.00	-	-	-	-	1.50
DEPTH	TO PRODU	CT (FT.) =	9.18			PRODU	CT THICKNES	6S(FT.)=	0.10
4	102.55	93.95	8.60	17.15	0600	7.44	4,800	13.1	4.25
		<u>.</u>	INSTRUME	INT CALIE	BRATIONS =	7.00	2,800		
				DATI	E & TIME =	06/25/07	0550		

NOTES: Volume of water purged from well prior to sampling; V = pi X r2 X h X 7.48 gal./ft3) 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 gallons per foot of water.

Comments or note well diameter if not standard 2 ".

\* INDICATES PRODUCT SPECIFIC GRAVITY ASSUMED TO = 0.65.

Excellent recovery in MW #4. Murky brown in appearance. Collected sample from MW #4 for BTEX analysis only. Purged MW #3 to total depth, then terminated. Very black in appearance with strong physical hydrocarbon presence.

Top of casing MW #1 ~ 2.40 ft., MW #2 ~ 2.55 ft., MW #3 ~ 2.40 ft., MW #4 ~ 2.60 ft. above grade

CLIENT:	Blagg Engineering			Client Sam	ple ID: MW	#4
Lab Order:	0706381			Collectio	n Date: 6/25/	2007 6:00:00 AM
Project:	GCU #194			Date Re	ceived: 6/26/	2007
Lab ID:	0706381-01			ſ	Matrix: AQU	
Analyses		Result	PQL	Qual Units	DF	Date Analyzed
EPA METHOD	8021B: VOLATILES					Analyst: NSE
Benzene		ND	1.0	µg/L	1	7/1/2007 9:27:16 AM
Toluene		ND	1.0	µg/L	1	7/1/2007 9:27:16 AM
Ethylbenzene		ND	1.0	µg/L	1	7/1/2007 9:27:16 AM
Xylenes, Total		ND	2.0	µg/L	1	7/1/2007 9:27:16 AM
Surr: 4-Brom	ofluorobenzene	78.7	70.2-105	%REC	1	7/1/2007 9:27:16 AM

Date: 02-Jul-07

Qualifiers:

\*

- Value exceeds Maximum Contaminant Level
- E Value above quantitation range
- J Analyte detected below quantitation limits
- ND Not Detected at the Reporting Limit
- S Spike recovery outside accepted recovery limits
- Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- MCL Maximum Contaminant Level
- RL Reporting Limit

В

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QA/ GC Package         DA/ GC Package         Std □       Level 4 □         Std □       Level 4 □         Amal Y Sis       Laboratory         Amal Henvironmental.com       Laboratory	Image: Second	HIGCI HIO HIGCI HIO		By: (Signature)
ENER REPORT OF REAL PROPERTY OF THE PROPERTY O	Project #: Project Manager: Sampler: Sample Temperature:	Time     Matrix     Sample I.D. No.     Number/Volume       D600     いれた     ハレーキ     イ     ス-イクハ/		Date:     Time:     Relinquished Br. (Signatural)     Received By. (Signatural)       Date:     ISIS     Received By. (Signatural)     Received By. (Signatural)

# **QA/QC SUMMARY REPORT**

-	g Engineering J #194						Work	<b>Order:</b> 0706381
Analyte	Result	Units	PQL	%Rec	LowLimit H	lighLimit	%RPD RF	DLimit Qual
Method: SW8021								· · · · ·
Sample ID: 5ML REAGE	INT BLA	MBLK			Batch ID:	R24198	Analysis Date:	6/30/2007 6:59:05 PM
Benzene	ND	µg/L	1.0					
Toluene	ND	µg/L	1.0					
Ethylbenzene	ND	µg/L	1.0					
Xylenes, Total	ND	µg/L	2.0					
Sample ID: 100NG BTE	X LCS	LCS			Batch ID:	R24198	Analysis Date:	6/30/2007 11:44:25 PM
Benzene	19.42	µg/L	1.0	97.1	85.9	113		
Toluene	19.80	µg/L	1.0	99.0	86.4	113		
Ethylbenzene	20.03	µg/L	1.0	100	83.5	118		
Xylenes, Total	59.67	µg/L	2.0	99.4	83.4	122		

Qualifiers:

E Value above quantitation range

J Analyte detected below quantitation limits

R RPD outside accepted recovery limits

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

S

Snike recovery outside accepted recovery limits 2/3

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	Sample Re	eceipt Ch	necklist			
Client Name BLAGG			Date and Time	Received:	6/26/	2007
Work Order Number 0706381	$\cap$		Received by	AT		
Checklist completed by Signature	In	(	0/26/0	67		
Matrix	Carrier name <u>G</u>	reyhound				
Shipping container/cooler in good condition?	Y	es 🗹	No 🗔	Not Present		
Custody seals intact on shipping container/cooler?	Y	es 🗹	No 🗋	Not Present	Not Shipped	
Custody seals intact on sample bottles?	Y	es 🗌	No 🗹	N/A		
Chain of custody present?	Y	es 🗹	No 🗌			
Chain of custody signed when relinquished and receive	ed? Y	es 🗹	No 🗌			
Chain of custody agrees with sample labels?	Y	es 🗹	No 🗔			
Samples in proper container/bottle?	Y	es 🗹	No 🗌			
Sample containers intact?	Y	es 🗹	No 🗔			
Sufficient sample volume for indicated test?	Y	'es 🗹	No 🗆			
All samples received within holding time?	Y	'es 🗹	No 🗆			
Water - VOA vials have zero headspace? No	VOA vials submitte	ed 🗋	Yes 🗹	No 🗔		
Water - Preservation labels on bottle and cap match?	Y	'es 🗌	No 🗌	N/A 🗹		
Water - pH acceptable upon receipt?	Y	'es 🗌	No 🗔	N/A 🗹		
Container/Temp Blank temperature?		8°	4° C ± 2 Accepta			
COMMENTS:			If given sufficient	time to cool.		
	· ··· • ···- •·		·			
	·····					
Client contacted Date	contacted:		Pors	on contacted		
	·····			·	· ··· ···	
Contacted by: Rega	arding					
Comments:				· · · · · · · · · · · · · · · · · · ·	·····	
	·····					
			•••••••••••••••••••••••••••••••••••••••			
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Corrective Action	. <u>.</u>		· · · · · · · · · · · · · · · · · · ·	···· · · · · · ·		

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MONITOR WELL DEVELOPMENT & / OR SAMPLING DATA

### CLIENT: BP AMERICA PROD. CO.

### CHAIN-OF-CUSTODY # : N / A

GCU #194 - SEPARATOR PIT

UNIT D, SEC. 5, T27N, R12W

*Date* : September 17, 2007

*Filename* : 09-17-07.WK4

LABORATORY (S) USED : HALL ENVIRONMENTAL

SAMPLER : NJV

NJV

PROJECT MANAGER :

1 110/100/10					-				
WELL	WELL	WATER	DEPTH TO	TOTAL	SAMPLING	рН	CONDUCT	TEMP.	VOLUME
#	ELEV.	ELEV.	WATER	DEPTH	TIME		(umhos)	(celcius)	PURGED
	(ft)	(ft)	(ft)	(ft)					(gal.)
1	102.35	93.49	8.86	14.50	-	- ,	-	-	-
2	102.47	93.82	8.65	14.50	-	-	-	-	-
3	103.43	93.98 *	9.45	15.00	-	-	-	-	1.25
DEPTH	TO PRODU	CT (FT.) =	9.45			PRODU	CT THICKNES	SS ( FT. ) =	0.01
4	102.55	93.68	8.87	17.15	0950	7.22	6,500	21.7	4.00
			INSTRUM	ENT CALIE	BRATIONS =	7.00	2,800		
				DAT	E & TIME =	09/17/07	0945		

NOTES: <u>Volume</u> of water purged from well prior to sampling;  $V = pi X r^2 X h X 7.48 gal./ft3) X 3 (wellbores),$ (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 gallons per foot of water.

Comments or note well diameter if not standard 2 ".

\* INDICATES PRODUCT SPECIFIC GRAVITY ASSUMED TO = 0.65.

Excellent recovery in MW #4. Murky brown in appearance. Collected sample from MW #4 for. BTEX analysis only. Purged MW #3 to total depth, then terminated. Very black in appearance with strong physical hydrocarbon presence.

Top of casing MW #1 ~ 2.40 ft., MW #2 ~ 2.55 ft., MW #3 ~ 2.40 ft., MW #4 ~ 2.60 ft. above grade

Blagg Engineering

0709207

GCU #194

0709207-01

CLIENT:

Project:

Lab ID:

Lab Order:

Date: 27-Sep-07

Client Sample ID: MW#4 Collection Date: 9/17/2007 9:50:00 AM Date Received: 9/18/2007 Matrix: AQUEOUS

Analyses	Result	PQL Qua	al Units	DF	Date Analyzed
EPA METHOD 8021B: VOLATILES					Analyst: NSB
Benzene	ND	1.0	µg/L	1	9/26/2007 9:45:26 PM
Toluene	. ND	1.0	µg/L	1	9/26/2007 9:45:26 PM
Ethylbenzene	ND	1.0	µg/L	1	9/26/2007 9:45:26 PM
Xylenes, Totai	ND	2.0	µg/L	1	9/26/2007 9:45:26 PM
Surr: 4-Bromofluorobenzene	80.8	70.2-105	%REC	1	9/26/2007 9:45:26 PM

Qualifiers:

- Value exceeds Maximum Contaminant Level Value above quantitation range
- E

J Analyte detected below quantitation limits

- ND Not Detected at the Reporting Limit
- S Spike recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- Н Holding times for preparation or analysis exceeded

MCL Maximum Contaminant Level

RI. Reporting Limit

Page 1 of 1

1/3

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lent: $Race Even RPMERCA RPMERCA Project Name: CCU \#194dorss: P.O. BOX B7 Project #:Riped, NMT 87413$ Project $#:Ripet Manager: NVhome #: S2 - 1/99 Sample: NVx #:Data Time Matrix Sample LD. No. Number/Volume Hg0Li HNO3Data Time Matrix Sample LD. No. Number/Volume Hg0Li HNO3 Data Time Matrix Sample LD. No. Number/Volume Hg0Li HNO3$	4901 Hawkins NE, Suite D
P.O. $BOX$ BT     Project #:       BLFD, NM $R$ 74/3     Project Manager: $KV$ Sampler: $VV$ $GZZ$ $-1/9$ Sampler: $VV$ $GZZ$ $-1/9$ Sampler: $VV$ $GZZ$ $-1/9$ Sampler: $VV$ $GZZ$ $-1/9$ Sampler: $VV$ $O95O$ $WATEQ$ $MUUTP4Y$ $Z-4Or/(Y)$ $POFO     MTEQ MUUTP4Y Z-4Or/(X) $	Tall 505.345.
BCP.O., MM. $B74/3$ Project Manager: NU       NOIDE #: $232 - 1/9$ Sampler: NU       N       Date       Time     Matrix       Date     Time       Matrix     Sample: D. No.       Date     Matrix       Date     Time       Matrix     Sample: D. No.       Date     Matrix       Date     Munber/Volume       HgCl <sub>2</sub> HNO <sub>3</sub> C     A-4/0-1       D     A-4/0-1    D     A-4/0-1    D    D    D   A-4/0-1    D    D    D    D   A-4/0-1    D	ANALYSIS REQUEST
Project Manager: $\mathcal{N}$ Dire #: $\mathcal{Z}$ $\mathcal{N}$ x #: $\mathcal{L}$ Sample Temperature: $\mathcal{N}$ Data     Ima     Matrix     Sample Temperature: $\mathcal{J}$ Data     Ima     Matrix     Sample I.D. No.     Number/Multure       Data     Ima     Matrix     Sample I.D. No.     Number/Multure       Data     Ima     Matrix     Sample I.D. No.     Number/Multure       Dita     Matrix     Sample I.D. No.     Number/Multure     Matrix       Dita     Matrix     Sample I.D. No.     No.     Matrix       Dita     Matrix     Sample I.D. No.     No.     Matrix       Dita     Matrix     Sample I.D. No.     Matrix     Matrix       Matrix     Matrix     Sample I.D. No.     Matrix     Matrix       Matrix     Matrix <td></td>	
None #: $\mathcal{S}_{3,2} - 1/9$ Sampler: $\mathcal{N}_{V}$ x #:     Sample Time     Sample Time $\mathcal{N}_{V}$ Dete     Time     Metrix     Sample LO.	0 <sup>4</sup> . S0 <sup>4</sup> ) 850line 0n 90jiesel)
x #: Dete Time Matrix Sample I.D. No. Number/Molume Preservetive Clip HVD3 Clip HVD	) / 6CB.2 / NO <sup>5</sup> ' 6 //) //) //) //) //) //) //) //) //) //
Data     Time     Matrix     Sample I.D. No.     Number/Molume     Preservative       17/b70950     WATER     MUU     A     A     A     A       17/b710950     MUU     A     A     A     A     A       17/b710950     MUU     A     A     A     A     A       17/b710950     MUU     A	+ 381 + 381 r08 by 02 bou 08 bou 08 bou 08 bou v, k al63 cou , k cou , k cou , k al63 cou , k cou , k
$\frac{1}{1} \frac{1}{2} \frac{1}$	Metho Metho
1-16700 WATER MW 744 2-40-1	
5	
PL7/67 / 600 / 1.125 9/11/20 / 1.125 9/11/20 / 1.125 9/11/20 / 1.125 9/11/20 / 1.125 9/11/20 / 1.125 9/11/20 / 1.125 9/11/20 / 1.125 9/11/20 / 1.125 9/11/20 / 1.125 / 11/20 / 12/20 /	25

# **QA/QC SUMMARY REPORT**

Client:BlaggProject:GCU	Engineering #194						Worl	<b>Order:</b> 0709207
Analyte	Result	Units	PQL	%Rec	LowLimit H	ighLimit	%RPD RF	PDLimit Qual
Method: SW8021								
Sample ID: 5ML RB		MBLK			Batch ID:	R25334	Analysis Date:	9/26/2007 10:12:19 AM
Benzene	ND	µg/L	1.0					
Toluene	ND	µg/L	1.0					
Ethylbenzene	ND	µg/L	1.0					
Xylenes, Total	ND	µg/L	2.0					
Sample ID: 100NG BTEX	LCS	LCS			Batch ID:	R25334	Analysis Date:	9/26/2007 9:15:28 PM
Benzene	20.66	µg/L	1.0	103	85.9	113		
Toluene	20.61	µg/L	1.0	103	86.4	113		
Ethylbenzene	20.22	µg/L	1.0	101	83.5	118		
Xylenes, Total	60.06	µg/L	2.0	100	83.4	122		

Qualifiers:

- E Value above quantitation range
- J Analyte detected below quantitation limits
- R RPD outside accepted recovery limits

- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
  - Spike recovery outside accepted recovery limits
    - 2/3

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Hall Environmental Analysis Laboratory,	Inc
Tiali Environmental Analysis Laboratory,	

	Sample	Receipt Ch	nècklist	-	
Client Name BLAGG			Date and Time	Received:	9/18/2007
Work Order Number 0709207	$ \langle 1\rangle\rangle$		Received by	ARS	
Checklist completed by Signature	Util: 9	18 07 <sub>Date</sub>			
Matrix	Carrier name	UPS			
Shipping container/cooler in good condi	ition?	Yes 🗹	No	Not Present	
Custody seals intact on shipping contain	iner/cooler?	Yes 🔽	No	Not Present	Not Shipped
Custody seals intact on sample bottles?	?	Yes	No	N/A	
Chain of custody present?		Yes 🔽	No		
Chain of custody signed when relinquis	shed and received?	Yes 🔽	Noi		
Chain of custody agrees with sample la	abels?	Yes 🔀	No		
Samples in proper container/bottle?		Yes 🔽	No 🗌		
Sample containers intact?		Yes 🔽	No		
Sufficient sample volume for indicated t	test?	Yes 🔽	No		
All samples received within holding time	e?	Yes 🗹	No 🗔		
Water - VOA vials have zero headspac	e? No VOA vials subr	mitted 🗍	Yes 🗹	No	
Water - Preservation labels on bottle ar	nd cap match?	Yes 🛄 '	No I	N/A 🗸	
Water - pH acceptable upon receipt?		Yes	No	N/A	
Container/Temp Blank temperature?		3°	4° C ± 2 Accepta		
COMMENTS:			If given sufficien	t time to cool.	

Client contacted	Date contacted:	Person contacted	
Contacted by:	Regarding		·
Comments:			,
			······································
		· · · ·	
Corrective Action			
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· · · ·		and the second	

### MONITOR WELL DEVELOPMENT & / OR SAMPLING DATA

### CLIENT: BP AMERICA PROD. CO.

N/A CHAIN-OF-CUSTODY # :

GCU #194 - SEPARATOR PIT

UNIT D, SEC. 5, T27N, R12W

*Date :* November 14, 2007

Filename : 11-14-07.WK4

LABORATORY (S) USED : HALL ENVIRONMENTAL

NJV SAMPLER : V PROJECT MANAGER :

NJ

							-		
WELL #	WELL ELEV. (ft)	WATER ELEV. (ft)	DEPTH TO WATER (ft)	TOTAL DEPTH (ft)	SAMPLING TIME	рН	CONDUCT (umhos)	TEMP. (celcius)	VOLUME PURGED (gal.)
1	102.35	93.97	8.38	14.50	-	-	-	-	-
2	102.47	94.29	8.18	14.50	-	_	-	-	-
3	103.43	94.39 *	9.04	15.00	-	-	-	-	2.00
	DEPTH TO PR	ODUCT (FT.) =	9.04	DEPTH TO	WATER (FT.) =	9.05	PRODUCT THIC	KNESS (FT.) ≖	0.01
4	102.55	94.12	8.43	17.15	1010	7.57	7,100	14.5	4.25
			INSTRUM	ENT CALIE	BRATIONS =	7.00	2,800		
				DAT	E & TIME =	11/14/07	1000		

NOTES: Volume of water purged from well prior to sampling; V = pi X r2 X h X 7.48 gal./ft3) 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 gallons per foot of water.

Comments or note well diameter if not standard 2".

\* INDICATES PRODUCT SPECIFIC GRAVITY ASSUMED TO = 0.65.

Excellent recovery in MW #4. Murky brown in appearance. Collected sample from MW #4 for BTEX analysis only. Purged MW #3 to total depth. Very black in appearance with strong physical hydrocarbon presence.

Top of casing MW #1 ~ 2.40 ft., MW #2 ~ 2.55 ft., MW #3 ~ 2.40 ft., MW #4 ~ 2.60 ft. above grade

CLIENT: Lab Order: Project: Lab ID:	Blagg Engineering 0711290 GCU #194 0711290-01		Date Received:			11/14 11/19	11/14/2007 10:10:00 AM		
Analyses		Result	PQL	Qual Units		DF	Date Analyzed		
EPA METHOD	8021B: VOLATILES			· · · · ·			Analyst: NSB		
Benzene		31	1.0	µg/L		1	11/21/2007 11:30:36 PM		
Toluene		ND	1.0	μg/L		1	11/21/2007 11:30:36 PM		
Ethylbenzene		26	1.0	µg/L		1	11/21/2007 11:30:36 PM		
Xylenes, Total		ND	2.0	μg/L		1	11/21/2007 11:30:36 PM		
Surr: 4-Brom	ofluorobenzene	89.9	70.2-105	%REC		1	11/21/2007 11:30:36 PM		

Date: 26-Nov-07

Qualifiers:

\* Value exceeds Maximum Contaminant Level

E Value above quantitation range

J Analyte detected below quantitation limits

ND Not Detected at the Reporting Limit

- S Spike recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank

MCL Maximum Contaminant Level

RL Reporting Limit

H Holding times for preparation or analysis exceeded

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	HALL EN				ANALYSIS			(H)		/ or P/	119M) (NG) ( MB A	8310		+			 							
						4 J) 8 J)			314 bodial 908 bodial		608 H9T				+	 			 		 			
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# **QA/QC SUMMARY REPORT**

Client: Project:	Blagg Engineering GCU #194					Worl	k Order: 0711290
Analyte	Result	Units	PQL	%Rec	LowLimit HighLimi	%RPD RF	PDLimit Qual
Method: EPA	A Method 8021B: Volatiles	- · · · · · · · · · · · · · · · · · · ·					
Sample ID: 5N	IL RB	MBLK			Batch ID: R261	92 Analysis Date:	11/21/2007 9:29:58 AM
Benzene	ND	µg/L	1.0				
Toluene	ND	µg/L	1.0				
Ethylbenzene	ND	µg/L	1.0				
Xylenes, Total	ND	µg/L	2.0				
Sample ID: 10	ONG BTEX LCS	LCS			Batch ID: R261	92 Analysis Date:	11/21/2007 5:22:13 PM
Benzene	20.11	µg/L	1.0	101	85.9 113		
Toluene	20.53	µg/L	1.0	103	86.4 113		
Ethylbenzene	20.99	µg/L	1.0	105	83.5 118		
Xylenes, Total	67.69	µg/L	2.0	113	83.4 122		
Sample ID: 10	ONG BTEX LCSD	LCSD			Batch ID: R261	92 Analysis Date:	11/21/2007 5:52:17 PM
Benzene	20.18	µg/L	1.0	101	85.9 113	0.387	27
Toluene	20.09	µg/L	1.0	100	86.4 113	2.21	19
Ethylbenzene	20.67	µg/L	1.0	103	83.5 118	1.55	10
Xylenes, Total	64.06	µg/L	2.0	107	83.4 122	5.52	13

### Qualifiers:

E Value above quantitation range

J Analyte detected below quantitation limits

R RPD outside accepted recovery limits

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

S Spike recovery outside accepted recovery limits

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	Sample n	receibi		(IISL			
Client Name BLAGG			1	Date Recei	ved:	11/19/2007	
Work Order Number 0711290				Received	by: ARS	K	
Checklist completed by:			19/0. Date	Sample IE 7	) labels checked t	 Initials	
Matrix	Carrier name	<u>UPS</u>					
Shipping container/cooler in good condition?		Yes 🗹		No 🗌	Not Present		
Custody seals intact on shipping container/coole	er?	Yes 🗹		No 🗌	Not Present	Not Shipped	
Custody seals intact on sample bottles?		Yes 🗌		Νο 🔲	N/A		
Chain of custody present?		Yes 🗹		Νο			
Chain of custody signed when relinquished and	received?	Yes 🗹	ļ	No 🗌			
Chain of custody agrees with sample labels?		Yes 🗹		No 🗌			
Samples in proper container/bottle?		Yes 🗹		No 🗌			
Sample containers intact?	. •	Yes 🗹		No 🗌			
Sufficient sample volume for indicated test?		Yes 🗹		No 🗌			
All samples received within holding time?		Yes 🗹		No 🗌			
Water - VOA vials have zero headspace?	No VOA vials submit	tted 🗌	•	Yes 🗹	No 🗔		
Water - Preservation labels on bottle and cap m	atch?	Yes 🗌	}	Νο	N/A 🗹		
Water - pH acceptable upon receipt?		Yes 🗌	}	No 🗌	N/A 🗹		
Container/Temp Blank temperature?		1°		°C Accept			
COMMENTS:			lfg	given suffici	ent time to cool.		
Client contacted	Data apata stadu				area contrated		
	Date contacted:			P	erson contacted	 	
Contacted by:	Regarding				·····	 	
Comments:							
			· · · · · · · · · · · · · · · · · · ·				
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Corrective Action						 	
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### Sample Receipt Checklist