From: Jesse Gagliano
Sent: Sun Apr 18 20:58:10 2010
To: Anthony Cupit; Brett W Cocales (Brett.Cocales@bp.com); Christopher Haire; Danny Mooney; Don Vidrine; Earl Lee; Horizon Forman; Horizon Perf Engineers; Jason Fleming; John Guide; Mike Stidham; Murry Sepulvado; Ronald Sepulvado; Vincent Tabler; Morel, Brian P; Hafle, Mark E; Walz, Gregory S
Cc: Paul Anderson; Nathaniel Chaisson; Quang Nguyen
Subject: Updated Info for Prod Casing job
Importance: Normal
Attachments: Macondo_MC 252_ 9 78 X 7 Prod Casing_v6_CustomerCopy.pdf; 9.875 X 7 Prod Casing Design Report - 6 Cent.pdf; Location Blend 9 GPHS SCR-100L BC18-73909.2.pdf; image001.jpg

Attached it the revised information for the upcoming 9 7/8" X 7" Prod Casing job. The compressive strength is not completed yet, it currently has 34 hours. The chart of the progress is below. Let me know if you have any questions. Thanks!!

Jesse Gagliano
Halliburton Energy Services
Account Representative - Cementing
Office - 281-366-6106
Cell - 281-635-4798
Fax - 713-583-9700
E-mail - jesse.gagliano@halliburton.com

EXHIBIT # 717
WIT:

HALLIBURTON

Cementing Gulf of Mexico, Broussard

LAB RESULTS - Primary

Job Information

Request/Slurry	73909/2	**Rig Name**	TRANSOCEAN HORIZON	**Date**	April 12th 2010
Submitted By	Jesse Gagliano	**Job Type**	9 7/8" X 7" Prod Casing	**Bulk Plant**	Fourchon-C-Port I, La, USA
Customer	BP	**Location**	Mississippi Cny	**Well**	Mississippi Canyon 252 OCS-G-32306 Macondo #1

Well Information

Casing/Liner Size	7"	**Depth MD**	18360 ft	**BHST**	210 F
Hole Size	9 7/8"	**Depth TVD**	18360 ft	**BHCT**	135 F

Drilling Fluid Information

Mud Company	MI	**Type**	SOBM	**Density**	14,1 PPG	**PV/YP**	

Cement Information - Primary Design

Conc	UOM	Cement/Additive	Sample Type	Sample Date	Lot No.
100.00	% BWOC	Lafarge Class H	Rig	Apr 05, 2010	Tank # 8
0.07	% BWOC	EZ-FLO	Rig	Apr 05, 2010	
0.25	% BWOC	D-Air 3000	Rig	Apr 05, 2010	
1.88	lb/sk	KCl (Potassium Chloride) Salt	Rig	Apr 05, 2010	
20.00	% BWOC	SSA-1 (Silica Flour) - PB	Rig	Apr 05, 2010	
15.00	% BWOC	SSA-2 (100 Mesh) - PB	Rig	Apr 05, 2010	
0.20	% BWOC	SA-541	Rig	Apr 05, 2010	
0.11	gps	ZoneSealant 2000	Lab	Mar 15, 2009	
0.09	gps	SCR-100L	Lab	Oct 22, 2009	6264
4.93	gps	Fresh Water	Lab	Apr 12, 2010	FRESH WATER

Cement Properties

Slurry Density	16.741	PPG
Slurry Yield	1.37	FT3
Water Requirement	4.93	GPS
Total Mix Fluid	5.02	GPS
Foam Density	14.496	PPG
Foam Quality	12.98	%
Water Source	Fresh Water	
Water Chloride	N/A	ppm

Operation Test Results Request ID 73909/2

Thickening Time, Request Test ID:812338

Temp (°F)	Pressure (psi)	Reached in (min)	Start BC	30 Bc (hh:mm)	40 Bc (hh:mm)	50 Bc (hh:mm)	70 Bc (hh:mm)
135	14,458	83	14	07:25	07:34	07:36	07:37

Mud Balance Density, Request Test ID:811529

Density (ppg)

16.7

from part 1

Mixability (0 - 5) - 0 is not mixable, Request Test ID:811524

Mixability rating (0 - 5)

4

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Operation Test Results Request ID 73909/1

Non API Rheology, Request Test ID:806075

Test temp (°F)	600	300	200	100	60	30	20	10	6	3
80	180	84	56	28	26	8	6	4	2	2

Non API Rheology, Request Test ID:806076

Test temp (°F)	600	300	200	100	60	30	20	10	6	3
135	130	56	40	20	12	8	6	4	4	2

FYSA Viscosity Profile & Gel Strength, Request Test ID:806074

Test Temp (°F)

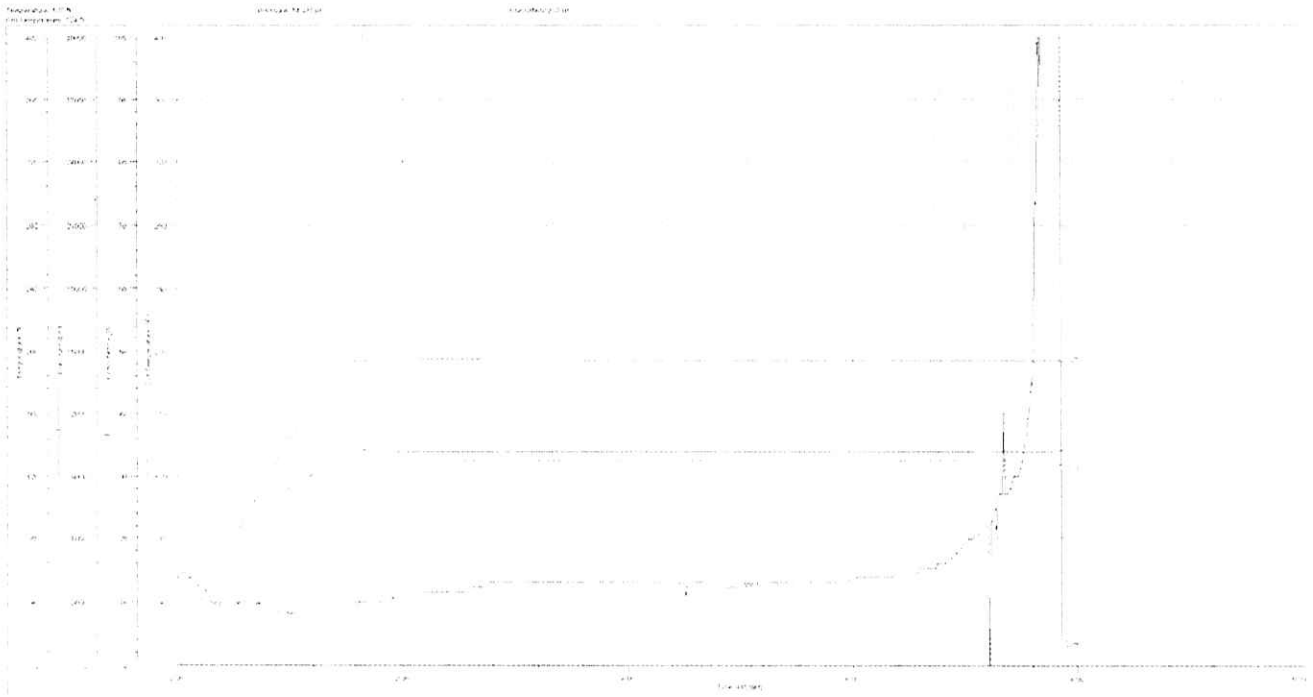
80

600=14, 300=7, 200=5, 100=3, 60=1, 30=1, 6=1, 3=1.... 6D=1, 3D=1

Crush Compressive Strength, Request Test ID:806069

Curing Temp (°F)	Time 1 (hrs)	Strength 1	Time 2 (hrs)	Strength 2	Time 3 (hrs)	Strength 3	Foam quality
180	12	0	24	0	48	1,590	0

Condition for 1.5 hrs, Foamed to 14.5 ppg



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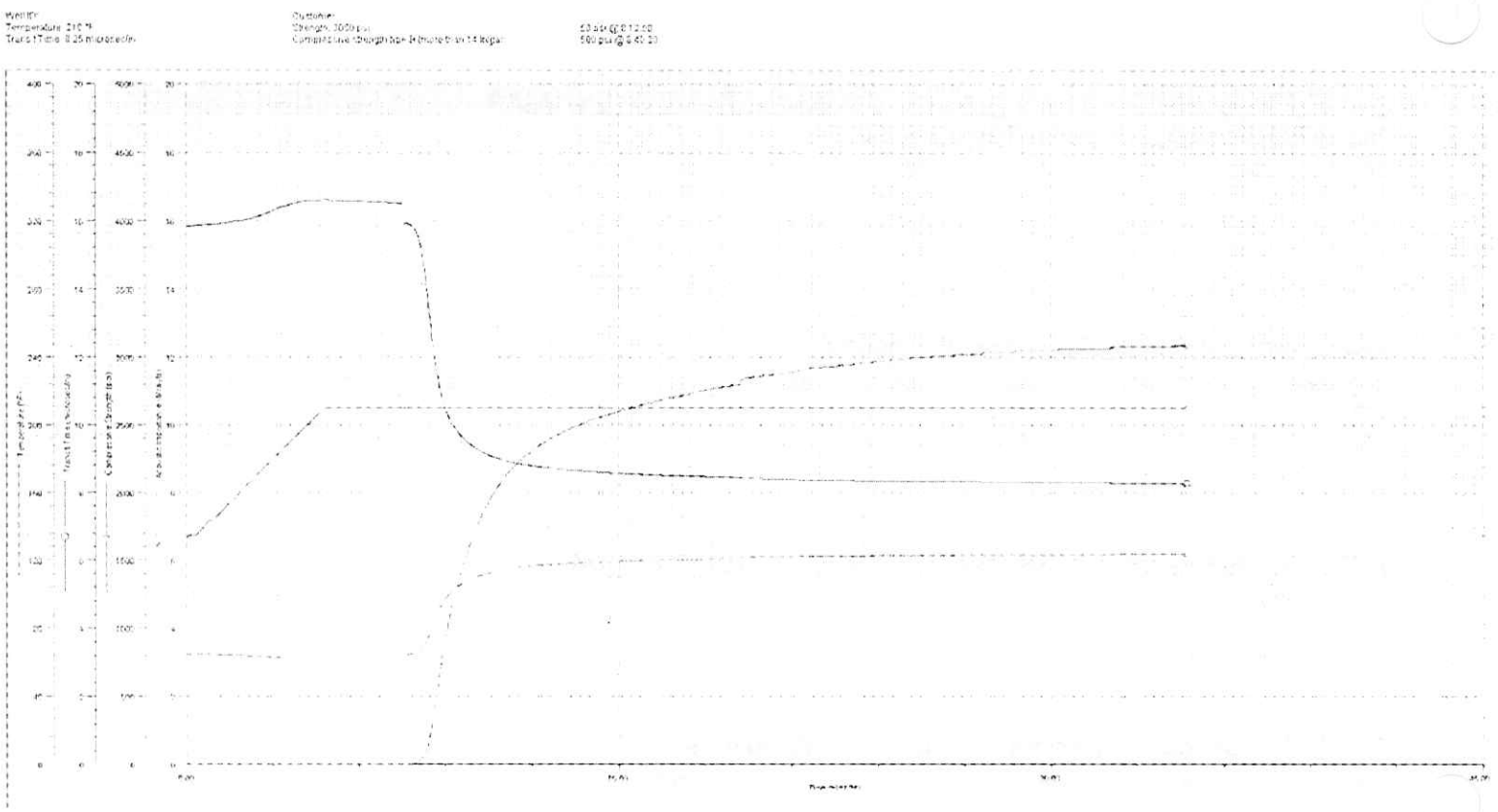

HAL_0125469

BP AMERICA PRODUCTION COMPANY
PO Box 22024
Tulsa, OK 74121-2024

Macondo #1

9 7/8" X 7" Production Casing Design Report

For: Brian Morel
Date: April 18, 2010

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HALLIBURTON

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1.0 DESIGN

1.1 Customer Information

Customer	BP AMERICA PRODUCTION COMPANY
Sales Order	
Job Configuration	N2 Foamed Cement
Well Name	Macondo
Well Number	#1
Start Time	Thursday, April 15, 2010
County	
State	Louisiana
UWI/API	
Country	United States of America
H2S Present	Unknown
CO2 Present	Unknown
Customer Representative	Brian Morel
Service Representative	Jesse Gagliano
Design Name	Macondo Prospect MC 252 #1 - 9.875 X 7 - with 7 bbls Base Oil
Comment	
Injection Path	Casing

1.2 Parameters

Fracture Zone Measured Depth	18305.0	ft
Fracture Zone Gradient	0.779	psi/ft
Fracture Zone Density	15.00	lb/gal
Fracture Zone Pressure	14255	psi
Reservoir Measured Depth	18200.0	ft
Reservoir Pore Pressure	13197	psi
Reservoir Zone Gradient	0.726	psi/ft
Reservoir Zone Density	13.97	lb/gal
Back Pressure	0	psi
Height - Mud Line to Mean Sea Level	4992.0	ft
Height - Mean Sea Level to Rotary Kelly Bushing	75.0	ft
Sea Water Density	8.54	lb/gal
Returns To Surface		
Simulator Volume Increment	5.00	bbl
Surface Iron Displacement	0.41	bbl
Shoe Track Length	189.0	ft
Additional Pressure to Seat Plug	500	psi
Eccentricity Enhanced Calculations	No	
Erodibility Enhanced Calculations	Yes	
Mud Erodibility Measured Depth	17168.0	ft
Mud Erodibility Number	20.69	
Mud Required Shear Stress	29.00	lbf/(100*ft²)
Use Coupling Information	No	

1.3 Wellbore Orientation

Measured Depth	True Vertical Depth	Deviation	Build Angle	Azimuth
ft	ft	°	°/(100*ft)	°
0.0	0.0	0.0		0.0
5067.0	5067.0	0.0	0.00	0.0
5526.0	5525.9	2.0	0.43	101.4
5621.0	5620.9	1.6	-0.33	97.2
5719.0	5718.8	1.3	-0.32	96.8
5815.0	5814.8	1.1	-0.22	91.4
5908.0	5907.8	0.9	-0.20	93.4
6004.0	6003.8	0.9	-0.08	92.6
6099.0	6098.8	0.7	-0.15	89.3
6195.0	6194.8	0.6	-0.11	86.6
6304.0	6303.8	0.5	-0.11	83.3
6401.0	6400.8	0.1	-0.41	82.2
6495.0	6494.8	0.0	-0.06	119.7
6590.0	6589.8	0.0	0.00	211.6
6685.0	6684.8	0.0	0.00	318.1
6780.0	6779.8	0.1	0.06	42.6
6873.0	6872.8	0.1	0.01	268.0
6971.0	6970.8	0.1	0.02	300.4
7057.0	7056.8	0.0	-0.10	100.6
7159.0	7158.8	0.0	0.01	240.7
7254.0	7253.8	0.0	-0.01	220.7
7350.0	7349.8	0.0	0.01	273.7
7443.0	7442.8	0.1	0.02	135.0
7538.0	7537.8	0.1	0.00	171.6
7633.0	7632.8	0.0	-0.02	333.4
7727.0	7726.8	0.0	-0.04	359.8
7821.0	7820.8	0.0	0.03	335.2
7921.0	7920.8	0.1	0.09	181.0
8000.0	7999.8	1.1	1.19	20.0
8096.0	8095.7	0.9	-0.13	17.0
8192.0	8191.7	0.0	-0.95	16.1
8289.0	8288.7	0.2	0.21	225.8
8382.0	8381.7	0.1	-0.18	34.1
8477.0	8476.7	0.1	0.00	324.5
8573.0	8572.7	0.1	0.03	9.4
8667.0	8666.7	0.1	0.00	46.6
8762.0	8761.7	0.1	-0.03	86.7
8854.0	8853.7	0.1	0.03	9.4
8917.0	8916.7	0.1	-0.05	46.6
9187.0	9186.6	2.5	0.89	106.3
9327.0	9326.6	0.4	-1.45	96.0
9463.0	9462.6	0.4	-0.04	90.8
9603.0	9602.6	0.5	0.05	125.7
9736.0	9735.6	0.4	-0.05	154.0
9874.0	9873.6	0.4	0.01	141.0
10004.0	10003.6	0.3	-0.11	157.9
10150.0	10149.6	0.4	0.08	162.3
10285.0	10284.6	0.4	0.06	184.5

Measured Depth	True Vertical Depth	Deviation	Build Angle	Azimuth
ft	ft	°	°/(100*ft)	°
10424.0	10423.6	0.5	0.02	182.7
10563.0	10562.6	0.5	0.00	210.6
10701.0	10700.6	0.5	0.00	205.5
10839.0	10838.6	0.5	0.00	208.5
10977.0	10976.6	0.6	0.07	204.1
11114.0	11113.5	0.7	0.08	205.5
11252.0	11251.5	0.6	-0.04	216.2
11390.0	11389.5	0.5	-0.08	220.5
11528.0	11527.5	0.5	-0.04	191.9
11665.0	11664.5	0.4	-0.05	185.2
11796.0	11795.5	3.1	2.11	267.9
11934.0	11933.0	5.6	1.79	264.1
12070.0	12067.9	9.1	2.58	264.3
12209.0	12205.0	9.9	0.58	262.3
12347.0	12341.0	9.2	-0.52	262.5
12484.0	12476.4	8.6	-0.44	263.4
12622.0	12613.1	7.3	-0.99	261.1
12760.0	12750.1	6.0	-0.91	261.6
12896.0	12885.6	4.3	-1.22	262.0
13034.0	13023.4	1.3	-2.20	264.7
13112.0	13101.4	0.7	-0.79	257.8
13172.0	13161.4	0.6	-0.08	261.4
13310.0	13299.4	0.9	0.20	272.4
13448.0	13437.4	0.6	-0.18	276.6
13585.0	13574.4	0.6	-0.01	274.8
13721.0	13710.3	0.7	0.04	267.5
13859.0	13848.3	0.7	0.01	273.8
13998.0	13987.3	0.8	0.08	265.3
14133.0	14122.3	0.6	-0.18	274.2
14273.0	14262.3	0.8	0.17	262.4
14549.0	14538.3	0.5	-0.12	291.1
14684.0	14673.3	0.3	-0.12	268.7
14816.0	14805.3	0.7	0.27	235.4
14950.0	14939.3	0.7	0.03	230.4
15081.0	15070.3	0.6	-0.05	241.4
15264.0	15253.3	0.7	0.02	214.5
15406.0	15395.2	0.7	0.05	228.4
15540.0	15529.2	0.7	-0.04	223.8
15673.0	15662.2	0.6	-0.09	242.8
15805.0	15794.2	0.6	0.02	234.9
15939.0	15928.2	0.8	0.12	246.9
16072.0	16061.2	0.9	0.09	240.6
16204.0	16193.2	0.7	-0.13	235.1
16333.0	16322.2	0.7	-0.02	229.1
16470.0	16459.2	0.8	0.07	235.1
16604.0	16593.1	0.9	0.07	222.2
16729.0	16718.1	0.8	-0.07	224.2
16870.0	16859.1	0.8	0.02	233.9
17004.0	16993.1	0.7	-0.10	206.2

Measured Depth	True Vertical Depth	Deviation	Build Angle	Azimuth
ft	ft	°	°/(100*ft)	°
17136.0	17125.1	0.9	0.19	219.9
17318.0	17307.1	0.6	-0.15	175.5
17455.0	17444.1	0.4	-0.20	187.9
17592.0	17581.1	0.3	-0.04	157.7
17728.0	17717.1	0.4	0.05	70.5
17867.0	17856.1	0.4	0.00	32.2
18003.0	17992.1	0.6	0.18	19.3
18138.0	18127.1	0.7	0.09	35.9
18305.0	18294.0	0.4	-0.22	38.2

1.4 Surface Lines

Equipment	Length	Elev. Change	OD	ID	Friction Factor	Num In Parallel
	ft	ft	in	in		
2" 15,000 psi Discharge Iron	120.0	45.0	2.620	1.870	1.00	1

1.5 Wellbore Geometry

MD	Hole Ex.	Hole Dia.	Casing OD	Casing ID	Casing Weight
ft	%	in	in	in	lb/ft
5067.0	0.00	19.500	6.625	5.291	40.000
5069.0	0.00	14.920	14.300	8.625	62.800
11185.0	0.00	14.920	9.875	8.598	62.800
12485.0	0.00	12.375	9.875	8.598	62.800
12800.0	0.00	12.375	7.000	6.143	32.000
14803.0	0.00	10.711	7.000	6.143	32.000
17168.0	0.00	8.625	7.000	6.143	32.000
17284.5	0.00	9.700	7.000	6.143	32.000
17352.0	0.00	10.139	7.000	6.143	32.000
17579.5	0.00	10.176	7.000	6.143	32.000
17619.5	0.00	10.555	7.000	6.143	32.000
17639.0	0.00	10.660	7.000	6.143	32.000
17680.5	0.00	10.901	7.000	6.143	32.000
17686.0	0.00	11.578	7.000	6.143	32.000
17719.5	0.00	10.601	7.000	6.143	32.000
17774.0	0.00	10.417	7.000	6.143	32.000
17787.0	0.00	11.140	7.000	6.143	32.000
17803.5	0.00	11.180	7.000	6.143	32.000
17810.5	0.00	10.167	7.000	6.143	32.000
17829.5	0.00	11.469	7.000	6.143	32.000
17848.5	0.00	11.474	7.000	6.143	32.000
17864.0	0.00	10.642	7.000	6.143	32.000
17890.5	0.00	10.740	7.000	6.143	32.000
17910.5	0.00	10.601	7.000	6.143	32.000
17935.0	0.00	10.688	7.000	6.143	32.000
18061.0	0.00	10.550	7.000	6.143	32.000
18105.0	0.00	9.502	7.000	6.143	32.000
18107.5	0.00	11.215	7.000	6.143	32.000
18191.5	0.00	8.755	7.000	6.143	32.000
18305.0	0.00	8.998	7.000	6.143	32.000

1.6 Pumping Schedule

No.	Description	Density	Rate	Volume	Duration
		lb/gal	bpm	bbl	min
1	Macondo 9 7/8" X 7" Prod Casing - 14.17 ppg	14.17	1.00	0.00	0.00
2	6.7 ppg Base Oil Macondo	6.50	4.00	7.00	1.75
3	Macondo 9 7/8" X 7" Prod Casing - 14.3 ppg TS III	14.30	4.00	72.00	18.00
4	Macondo Foamed Slurry - 16.74 ppg	16.74	2.00	5.26	2.63
5-1	Macondo Foamed Slurry - 16.74 ppg	16.74	2.00	15.48	7.74
5-2	Macondo Foamed Slurry - 16.74 ppg	16.74	2.00	23.50	11.75
5-3	Macondo Foamed Slurry - 16.74 ppg	16.74	2.00	0.29	0.14
5-4	Macondo Foamed Slurry - 16.74 ppg	16.74	2.00	6.93	3.46
	Top Plug				
6	Macondo 9 7/8" X 7" Prod Casing - 14.3 ppg TS III	14.30	4.00	20.00	5.00
7	Macondo 9 7/8" X 7" Prod Casing - 14.17 ppg	14.17	4.00	856.93	214.23
	Total			1007.39	264.71

1.7 Fluid Rheology - Generalized Herschel Bulkley

Fluid	Temp.	Foam Density	m	n	Tau0	MuInf	Speed	Dial
	°F	lb/gal			lbf/(100*ft²)	cp	rpm	
Macondo 9 7/8" X 7" Prod Casing - 14.17 ppg	40		1.00	0.87	7.38	99.14	600	187.00
							300	106.00
							200	76.00
							100	45.00
							6	10.00
							3	9.00
	100		0.57	0.57	5.25	33.85	600	97.00
							300	57.00
							200	41.00
							100	27.00
							6	8.00
							3	7.00
	150		1.00	0.89	7.22	25.87	600	62.00
							300	37.00
							200	27.00
							100	18.00
							6	8.00
							3	7.00
6.7 ppg Base Oil Macondo	75		1.00	1.00	1.56	3.02	600	8.00
							300	4.00
							200	3.00
							100	2.00
							6	2.00
							3	2.00
	120		1.00	1.00	0.66	2.30	600	5.00
							300	3.00
							200	2.00
							100	1.00
							6	1.00
							3	1.00
	150		1.00	1.00	0.66	2.30	600	4.00
							300	2.00
							200	2.00
							100	1.00
							6	2.00
							3	2.00
Macondo Foamed Slurry - 16.74 ppg (Class H)	80		1.00	1.00	0.56	87.92	600	180.00
							300	84.00
							200	56.00
							100	28.00

Fluid	Temp.	Foam Density	m	n	Tau0	MuInf	Speed	Dial
	°F	lb/gal			lbf/(100*ft²)	cp	rpm	
							60	26.00
							30	8.00
							20	6.00
							10	4.00
							6	2.00
							3	2.00
	135		1.00	1.00	0.85	62.11	600	130.00
							300	56.00
							200	40.00
							100	20.00
							60	12.00
							30	8.00
							20	6.00
							10	4.00
							6	4.00
							3	4.00
	80	14.50	1.00	1.00	1.30	77.18	600	14.00
							300	7.00
							200	5.00
							100	3.00
							60	1.00
							30	1.00
							6	1.00
							3	1.00

1.8 Fluid Rheology - Bingham Plastic

Fluid	Temp.	PV	YP	Speed	Dial
	°F	cp	lbf/(100*ft²)	rpm	
Macondo 9 7/8" X 7" Prod Casing - 14.3 ppg TS III	80	51.98	30.00		

1.9 Temperature Input

Entered BHCT Method

Surface	80	°F
Outlet	120	°F
BHCT	135	°F
BHST		°F

1.10 Temperature Profile, Temperature Profile 1

Measured Depth	Casing Circulating Temperature	Annulus Circulating Temperature
ft	°F	°F
0.0	80	120
18305.0	135	135

1.11 Fracture Gradient/Pore Pressure Profile

Measured Depth	True Vertical Depth	Pore Pressure	Reservoir Gradient	Reservoir Density	Fracture Gradient	Fracture Density	Fracture Pressure
ft	ft	psi	psi/ft	lb/gal	psi/ft	lb/gal	psi
17163.0	17152.1	12304	0.717	13.81	0.754	14.51	12928
17700.0	17689.1	12873	0.728	14.01			
18200.0	18189.1				0.754	14.51	13709
18305.0	18294.0	13265	0.725	13.96	0.779	15.00	14255

1.12 Critical Velocity - Fracture Zone

Stage Description	Critical Rate	Critical Velocity	GHB Effective Reynold's Number
	bpm	ft/s	
Macondo 9 7/8" X 7" Prod Casing - 14.17 ppg	9.89	5.31	3561.21
6.7 ppg Base Oil Macondo	3.01	1.62	3852.90
Macondo 9 7/8" X 7" Prod Casing - 14.3 ppg TS III	18.70	10.04	3563.65
Macondo Foamed Slurry - 16.74 ppg	11.55	6.20	3046.64
Macondo Foamed Slurry - 16.74 ppg	11.55	6.20	3046.64
Macondo 9 7/8" X 7" Prod Casing - 14.3 ppg TS III	18.70	10.04	3563.65
Macondo 9 7/8" X 7" Prod Casing - 14.17 ppg	9.89	5.31	3561.21

Based on annular segment at fracture zone MD of 18305.0 ft.

1.13 Critical Velocity - Reservoir Zone

Stage Description	Critical Rate	Critical Velocity	GHB Effective Reynold's Number
	bpm	ft/s	
Macondo 9 7/8" X 7" Prod Casing - 14.17 ppg	9.89	5.31	3561.00
6.7 ppg Base Oil Macondo	3.01	1.62	3852.89
Macondo 9 7/8" X 7" Prod Casing - 14.3 ppg TS III	18.70	10.04	3563.65
Macondo Foamed Slurry - 16.74 ppg	11.56	6.20	3046.36
Macondo Foamed Slurry - 16.74 ppg	11.56	6.20	3046.36
Macondo 9 7/8" X 7" Prod Casing - 14.3 ppg TS III	18.70	10.04	3563.65
Macondo 9 7/8" X 7" Prod Casing - 14.17 ppg	9.89	5.31	3561.00

Based on annular segment at reservoir zone MD of 18200.0 ft.

2.0 TUNED SPACER

2.1 Tuned Spacer Parameters, 3. Macondo 9 7/8" X 7" Prod Casing - 14.3 ppg TS III, Bingham Plastic

Density	14.30	lb/gal
Calculated YP	30.00	lbf/(100*ft²)
Calculated PV	51.98	cp
Temperature	190	°F
Use Job Design	Yes	
Zone of Interest		
Measured Depth	18300.0	ft
Displacement Efficiency	100.00	
Hole Dia.	8.998	in
Standoff	80.73	%
Pipe OD	7.000	in
Rate	4.00	bpm
Mud		
Erodibility Number	20.69	
Required Shear Stress	29.00	lbf/(100*ft²)
Density	14.17	lb/gal
PV	23.83	cp
YP	6.27	lbf/(100*ft²)
Laboratory Volume	600.00	cm³
This Tuned Spacer was designed to meet the above conditions. Check pipe OD, hole dia., standoff, rate, erodibility number, density, PV, and YP for any differences in the final job design and simulation.		
Simulated Downhole Rate	3.99	bpm
Simulated Downhole MD	18305.0	ft

2.2 Tuned Spacer Parameters, 6. Macondo 9 7/8" X 7" Prod Casing - 14.3 ppg TS III, Bingham Plastic

Density	14.30	lb/gal
Calculated YP	30.00	lbf/(100*ft²)
Calculated PV	51.98	cp
Temperature	190	°F
Use Job Design	Yes	
Zone of Interest		
Measured Depth	18300.0	ft
Displacement Efficiency	100.00	
Hole Dia.	8.998	in
Standoff	80.73	%
Pipe OD	7.000	in
Rate	4.00	bpm
Mud		
Erodibility Number	20.69	
Required Shear Stress	29.00	lbf/(100*ft²)
Density	14.17	lb/gal
PV	23.83	cp
YP	6.27	lbf/(100*ft²)
Laboratory Volume	600.00	cm³
This Tuned Spacer was designed to meet the above conditions. Check pipe OD, hole dia., standoff, rate, erodibility number, density, PV, and YP for any differences in the final job design and simulation.		
Simulated Downhole Rate		bpm
Simulated Downhole MD	18305.0	ft

3.0 FOAM

3.1 Foam Design Parameters

Constant or Stages Gas Flow Calculation Method

Foaming Agents in Mix Water (volume based)		
Surfactant	1.50	%
Stabilizer	0.00	%
Fracture Zone		
Measured Depth	18305.0	ft
Fracture Pressure	14255	psi
Fracture Gradient	0.779	psi/ft
Fracture Density	15.00	lb/gal
Calculated Hydrostatic Pressure	13485	psi
Calculated Hydrostatic Pressure Gradient	0.737	psi/ft
Calculated Hydrostatic Density	14.19	lb/gal
Reservoir Zone		
Measured Depth	18200.0	ft
Pore Pressure	13197	psi
Reservoir Gradient	0.726	psi/ft
Reservoir Density	13.97	lb/gal
Calculated Hydrostatic Pressure	13405	psi
Calculated Hydrostatic Pressure Gradient	0.737	psi/ft
Calculated Hydrostatic Density	14.19	lb/gal

3.2 Foam Pumping Schedule for Liquids

Stg	Start Time	Pump Rate	Base Slurry Vol.	Cum. Base Slurry Vol.	Cem. Mix Water Vol.	Cum. Cem. Mix Water Vol.	Foam Agents Rate	Foam Agents Vol.	Foaming Agents Cum. Job Volume
	min	bpm	bbl	bbl	bbl	bbl	gpm	gal	gal
1	0.00	1.00	0.00	0.00	0.00	0.00		0.0	0.0
2	0.00	4.00	7.00	7.00	0.00	0.00	0.0	0.0	0.0
3	1.75	4.00	72.00	72.00	0.00	0.00	0.0	0.0	0.0
4	19.75	2.00	5.26	5.26	2.54	2.54	0.0	0.0	0.0
5-1	22.38	2.00	15.48	15.48	7.46	7.46	0.6	4.7	4.7
5-2	30.12	2.00	23.50	38.98	11.33	18.79	0.6	7.1	11.8
5-3	41.87	2.00	0.29	39.27	0.14	18.93	0.0	0.0	11.8
5-4	42.02	2.00	6.93	46.20	3.34	22.27	0.0	0.0	11.8
6	45.48	4.00	20.00	20.00	0.00	0.00	0.0	0.0	11.8
7	50.48	4.00	856.93	856.93	0.00	0.00	0.0	0.0	11.8

3.3 Foam Pumping Schedule for Gas

Stg	Start Time	Pump Rate	Starting Gas Conc.	Starting Gas Rate	Cum. Job Gas Vol.	Exp. Factor
	min	bpm	scf/bbl	scfm	Mscf	
1	0.00	1.00	0.000	0	0.0	1.00
2	0.00	4.00	0.000	0	0.0	1.00
3	1.75	4.00	0.000	0	0.0	1.00
4	19.75	2.00	0.000	0	0.0	1.00
5-1	22.38	2.00	583.381	1167	9.0	1.23
5-2	30.12	2.00	583.381	1167	22.7	1.22
5-3	41.87	2.00	0.000	0	22.7	1.00
5-4	42.02	2.00	0.000	0	22.7	1.00
6	45.48	4.00	0.000	0	22.7	1.00
7	50.48	4.00	0.000	0	22.7	1.00

3.4 Foam Slurry Data

No.	Description	Base Slurry Vol.	Foam Slurry Vol.	Bulk Cem.	Water Req.	Yield
		bbl	bbl	sk94	gal/sk94	ft³/sk94
1	Macondo 9 7/8" X 7" Prod Casing - 14.17 ppg	0.00	0.00			
2	6.7 ppg Base Oil Macondo	7.00	7.00			
3	Macondo 9 7/8" X 7" Prod Casing - 14.3 ppg TS III	72.00	72.00			
4	Macondo Foamed Slurry - 16.74 ppg	5.26	5.26	22	4.940	1.3700
5-1	Macondo Foamed Slurry - 16.74 ppg	15.48	18.98	63	4.940	1.3700
5-2		23.50	28.77	96	4.940	1.3700
5-3		0.29	0.29	1	4.940	1.3700
5-4		6.93	6.93	28	4.940	1.3700
6	Macondo 9 7/8" X 7" Prod Casing - 14.3 ppg TS III	20.00	20.00			
7	Macondo 9 7/8" X 7" Prod Casing - 14.17 ppg	856.93	856.93			

4.0 CENTRALIZERS

4.1 Centralizer Parameters

Calculated Standoff/Spacing Profile		
Use Average Joint Lengths	No	
Torque and Drag Calculations	No	
Fluid Profile As Top of Plug Lands		
Maximum Distance between Centralizers	183.0	ft
Minimum Distance between Centralizers	20.0	ft
Calculate Standoff Above	Yes	

4.2 Centralizer Specifications

Part Number	Type*	COD	Hole Dia.	Nom. Dia.	Min. Dia.	Start Force	Run Force	Rest. Force	Bows
		in	in	in	in	lbf	lbf	lbf	
8.5	BS	7.000	8.500	8.622	7.625	1094	774	1191	4

*BS - Bow Spring, R(S) - Rigid Solid, R(PB) - Rigid Positive Bar

4.3 Constant Spacing/Standoff Centralizer Intervals

Top MD	Bottom MD	Cent. A	Required Standoff	Spacing
ft	ft		%	ft
18035.0	18305.0	8.5		45.0

4.4 Centralizer Placement

Centralizer Number	Measured Depth	Deviation	Azimuth	Restoring Force	Tension	Centralizer
	ft	°	°	lbf	lbf	
1	18305.0	0.4	38.2	4	0	8.5
2	18260.0	0.5	37.5	12	1071	8.5
3	18215.0	0.6	36.7	17	2343	8.5
4	18170.0	0.7	36.1	20	3614	8.5
5	18125.0	0.7	34.5	17	4885	8.5
6	18080.0	0.7	29.4	12	6157	8.5
7	18035.0	0.6	23.7	2456	7263	8.5

5.0 SIMULATION

5.1 Volume and Pressure Results

Annulus fluid is heavier than casing fluid by 38 psi. Apply appropriate back pressure on casing if floating equipment does not hold properly.

5.2 Volume and Rate Calculations

Time	Surface Stage In	Surface Stage Out	Liquid Volume In	Total Volume Out	Liquid Rate In	Total Rate Out
min			bbl	bbl	bpm	bpm
0.02	1	1	0.07	0.07	4.00	4.00
3.75	3	1	15.00	15.00	4.00	4.00
16.25	3	1	65.00	65.00	4.00	4.00
22.38	4	1	84.26	84.26	2.00	2.00
32.75	5	1	105.00	129.60	2.00	3.40
42.75	5	1	125.00	162.60	2.00	2.33
47.87	6	1	140.00	172.39	4.00	2.61
57.87	7	1	180.00	203.39	4.00	3.34
70.37	7	1	230.00	248.00	4.00	3.74
82.87	7	1	280.00	296.09	4.00	3.90
95.37	7	1	330.00	344.99	4.00	3.92
107.87	7	1	380.00	394.09	4.00	3.94
120.37	7	1	430.00	443.35	4.00	3.95
132.87	7	1	480.00	492.74	4.00	3.95
145.37	7	1	530.00	542.22	4.00	3.96
157.87	7	1	580.00	591.77	4.00	3.97
170.37	7	1	630.00	641.38	4.00	3.97
182.87	7	1	680.00	691.01	4.00	3.97
195.37	7	1	730.00	740.70	4.00	3.98
207.87	7	1	780.00	790.39	4.00	3.97
220.37	7	1	830.00	839.96	4.00	3.97
232.87	7	1	880.00	889.65	4.00	4.01
245.37	7	1	930.00	939.30	4.00	3.97
257.87	7	1	980.00	988.99	4.00	3.99
264.83	7	1	1007.80	1016.95	0.00	2.74

5.3 Horsepower, Pressure, Freefall

Time	Liquid Volume In	Pump Output	Surface Pressure In	Surface Pressure Out	ECD @ TD	ECD @ Frac Zone	Free Fall Height
min	bbl	hp	psi	psi	lb/gal	lb/gal	ft
0.02	0.07	48.4	479	0	14.47	14.47	0.0
3.75	15.00	58.6	583	0	14.45	14.45	0.0
16.25	65.00	60.5	602	0	14.45	14.45	0.0
22.38	84.26	23.2	459	0	14.38	14.38	0.0
32.75	105.00	62.2	1255	0	14.43	14.43	0.0
42.75	125.00	59.1	1190	0	14.39	14.39	0.0
47.87	140.00	108.6	1093	0	14.40	14.40	0.0
57.87	180.00	87.5	878	0	14.43	14.43	0.0
70.37	230.00	67.2	671	0	14.44	14.44	0.0
82.87	280.00	56.7	564	0	14.45	14.45	0.0
95.37	330.00	55.3	550	0	14.45	14.45	0.0
107.87	380.00	54.4	541	0	14.45	14.45	0.0
120.37	430.00	53.8	534	0	14.45	14.45	0.0
132.87	480.00	53.1	528	0	14.45	14.45	0.0
145.37	530.00	52.6	522	0	14.45	14.45	0.0
157.87	580.00	52.1	517	0	14.45	14.45	0.0
170.37	630.00	51.7	513	0	14.45	14.45	0.0
182.87	680.00	55.1	547	0	14.45	14.45	0.0
195.37	730.00	55.7	554	0	14.45	14.45	0.0
207.87	780.00	55.4	551	0	14.45	14.45	0.0
220.37	830.00	54.0	536	0	14.45	14.45	0.0
232.87	880.00	40.1	394	0	14.37	14.37	0.0
245.37	930.00	48.8	484	0	14.50	14.50	0.0
257.87	980.00	77.1	772	0	14.80	14.80	0.0
264.83	1007.80	0.0	1433	0	14.69	14.69	0.0

5.4 Gas Flow Potential

Gas Flow Potential	10.29	
at Reservoir Zone Measured Depth	18200.0	ft

Based on analysis of the above outlined well conditions, this well is considered to have a SEVERE gas flow problem. Wells in this category fall into flow condition 3.

5.5 Pressure to Break Circulation - Hydrostatic Pressures

Total Depth	13466	psi
Fracture Zone	13466	psi

5.6 Pressure to Break Circulation

Gel Strength	Surface Pressure	Total Depth Additional Pressure	Fracture Zone Additional Pressure
lbf/(100*ft²)	psi	psi	psi
25.00	644	408	408
50.00	1288	816	816
75.00	1932	1224	1224
100.00	2576	1632	1632
200.00	5153	3264	3264

5.7 Final Position of Stages

Stage Description	Annular Length	Casing Length	Annular Top MD	Casing Top MD
	ft	ft	ft	ft
Macondo 9 7/8" X 7" Prod Casing - 14.17 ppg	14075.5		0.0	
6.7 ppg Base Oil Macondo	109.6		14075.5	
Macondo 9 7/8" X 7" Prod Casing - 14.3 ppg TS III	1954.4		14185.2	
Macondo Foamed Slurry - 16.74 ppg	213.3		16139.6	
Macondo Foamed Slurry - 16.74 ppg	1952.1	189.0	16352.9	18116.0
Macondo 9 7/8" X 7" Prod Casing - 14.3 ppg TS III		545.6		17570.4
Macondo 9 7/8" X 7" Prod Casing - 14.17 ppg		17570.4		0.0

5.8 Final Annular Fluid Density

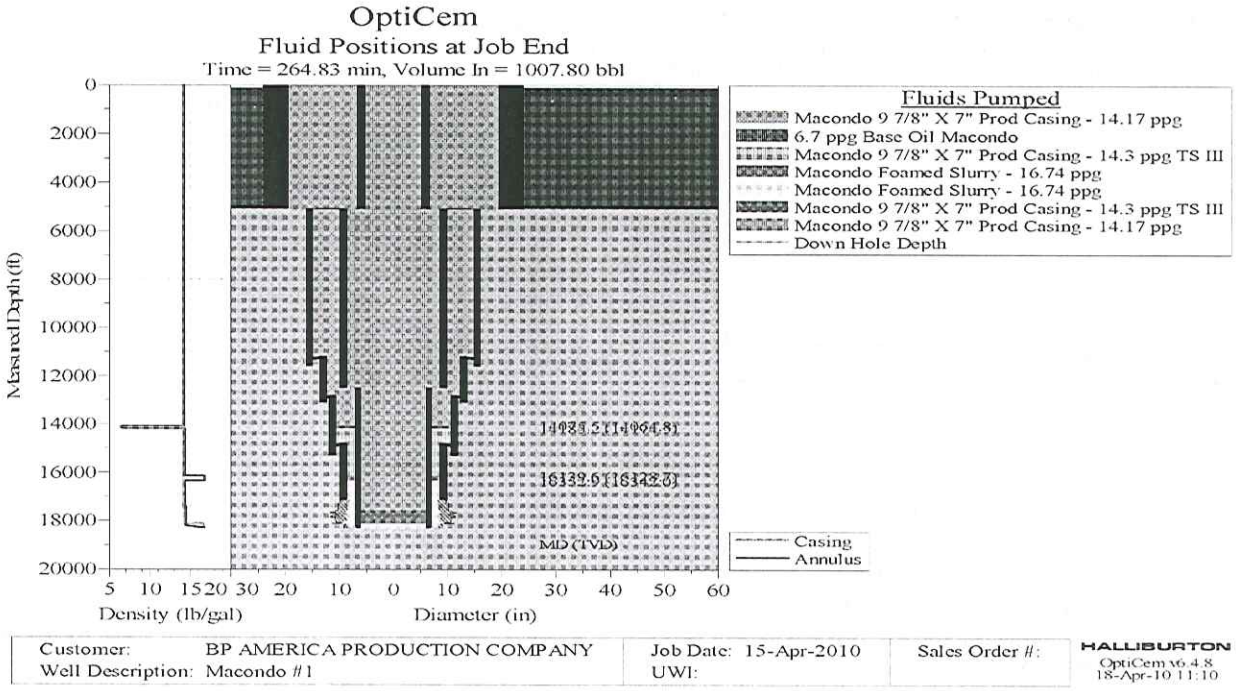
Measured Depth	Density	Quality	Hydrostatic Gradient
ft	lb/gal	%	lb/gal
-0.0	14.17	0.00	14.17
101.8	14.17	0.00	14.17
212.9	14.17	0.00	14.17
324.0	14.17	0.00	14.17
435.1	14.17	0.00	14.17
546.3	14.17	0.00	14.17
657.4	14.17	0.00	14.17
768.5	14.17	0.00	14.17
879.6	14.17	0.00	14.17
990.7	14.17	0.00	14.17
1101.8	14.17	0.00	14.17
1212.9	14.17	0.00	14.17
1324.1	14.17	0.00	14.17
1435.2	14.17	0.00	14.17
1546.3	14.17	0.00	14.17
1657.4	14.17	0.00	14.17
1768.5	14.17	0.00	14.17
1879.6	14.17	0.00	14.17
1990.8	14.17	0.00	14.17
2101.9	14.17	0.00	14.17
2213.0	14.17	0.00	14.17
2324.1	14.17	0.00	14.17
2435.2	14.17	0.00	14.17
2546.3	14.17	0.00	14.17
2657.4	14.17	0.00	14.17
2768.6	14.17	0.00	14.17
2879.7	14.17	0.00	14.17
2990.8	14.17	0.00	14.17
3101.9	14.17	0.00	14.17
3213.0	14.17	0.00	14.17
3324.1	14.17	0.00	14.17
3435.3	14.17	0.00	14.17
3546.4	14.17	0.00	14.17
3657.5	14.17	0.00	14.17
3768.6	14.17	0.00	14.17
3879.7	14.17	0.00	14.17
3990.8	14.17	0.00	14.17
4101.9	14.17	0.00	14.17
4213.1	14.17	0.00	14.17
4324.2	14.17	0.00	14.17
4435.3	14.17	0.00	14.17
4546.4	14.17	0.00	14.17
4657.5	14.17	0.00	14.17
4768.6	14.17	0.00	14.17
4879.8	14.17	0.00	14.17
4990.9	14.17	0.00	14.17
5069.0	14.17	0.00	14.17
5250.4	14.17	0.00	14.17
5381.2	14.17	0.00	14.17

Measured Depth	Density	Quality	Hydrostatic Gradient
ft	lb/gal	%	lb/gal
5617.6	14.17	0.00	14.17
5796.8	14.17	0.00	14.17
5976.1	14.17	0.00	14.17
6159.9	14.17	0.00	14.17
6339.2	14.17	0.00	14.17
6518.5	14.17	0.00	14.17
6697.7	14.17	0.00	14.17
6877.0	14.17	0.00	14.17
7057.0	14.17	0.00	14.17
7254.0	14.17	0.00	14.17
7443.0	14.17	0.00	14.17
7633.0	14.17	0.00	14.17
7821.0	14.17	0.00	14.17
8000.0	14.17	0.00	14.17
8191.6	14.17	0.00	14.17
8370.9	14.17	0.00	14.17
8550.2	14.17	0.00	14.17
8729.4	14.17	0.00	14.17
8908.7	14.17	0.00	14.17
9088.0	14.17	0.00	14.17
9327.0	14.17	0.00	14.17
9506.3	14.17	0.00	14.17
9736.0	14.17	0.00	14.17
9924.6	14.17	0.00	14.17
10150.0	14.17	0.00	14.17
10342.9	14.17	0.00	14.17
10563.0	14.17	0.00	14.17
10761.2	14.17	0.00	14.17
10977.0	14.17	0.00	14.17
11179.4	14.17	0.00	14.17
11441.3	14.17	0.00	14.17
11796.0	14.17	0.00	14.17
12113.2	14.17	0.00	14.17
12484.0	14.17	0.00	14.17
12645.3	14.17	0.00	14.17
12896.0	14.17	0.00	14.17
13123.5	14.17	0.00	14.17
13448.0	14.17	0.00	14.17
13721.0	14.17	0.00	14.17
13998.0	14.17	0.00	14.17
14123.2	6.50	0.00	14.14
14185.9	14.30	0.00	14.11
14396.0	14.30	0.00	14.11
14684.0	14.30	0.00	14.12
14950.0	14.30	0.00	14.12
15371.1	14.30	0.00	14.13
15776.5	14.30	0.00	14.13
16141.4	16.74	0.00	14.13
16263.0	16.74	0.00	14.15
16356.4	14.29	19.50	14.17

Measured Depth	Density	Quality	Hydrostatic Gradient
ft	lb/gal	%	lb/gal
16729.0	14.32	19.30	14.17
17109.3	14.36	19.10	14.17
17168.0	14.36	19.07	14.18
17469.9	14.39	18.90	14.18
17680.5	14.41	18.80	14.18
17774.0	14.42	18.75	14.18
17848.5	14.42	18.72	14.18
17932.5	14.43	18.69	14.18
18043.5	14.44	18.64	14.19
18107.5	14.44	18.61	14.19
18296.8	16.74	0.00	14.19
18304.5	16.74	0.00	14.19

6.0 ATTACHMENTS

6.1 Fluid Positions (graph)



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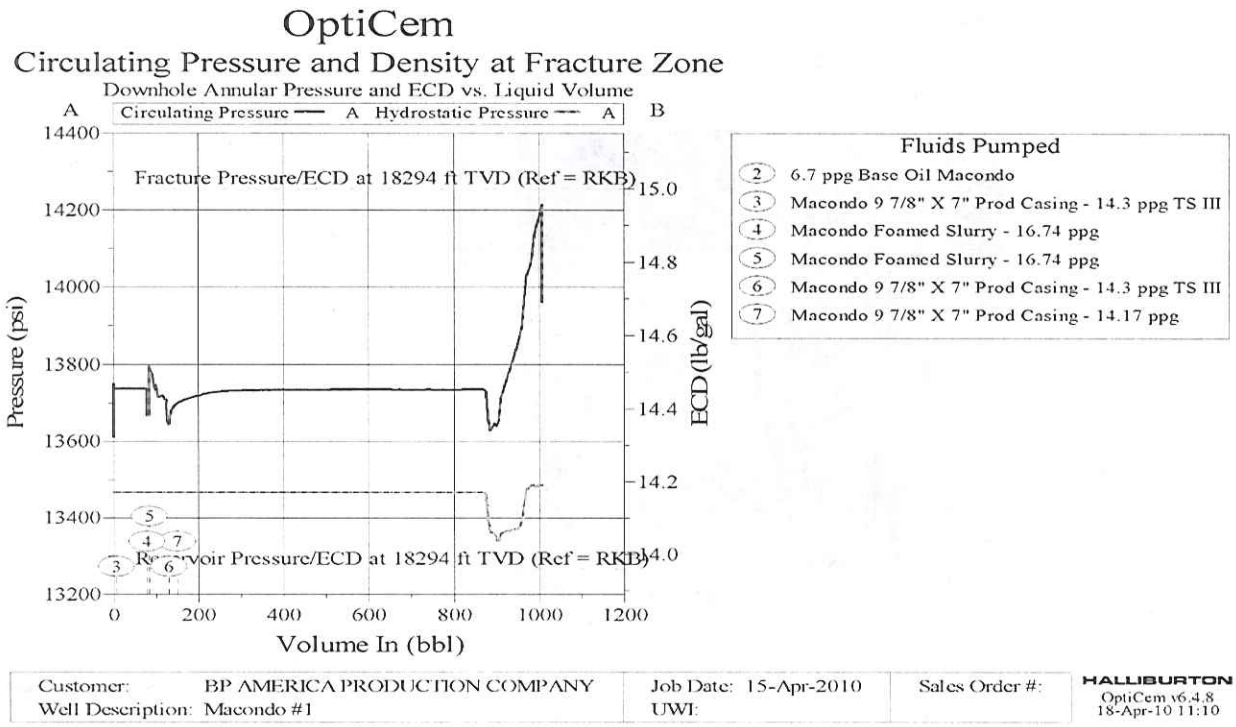
6.2 Circ Pressure & Density - Frac Zone (graph)



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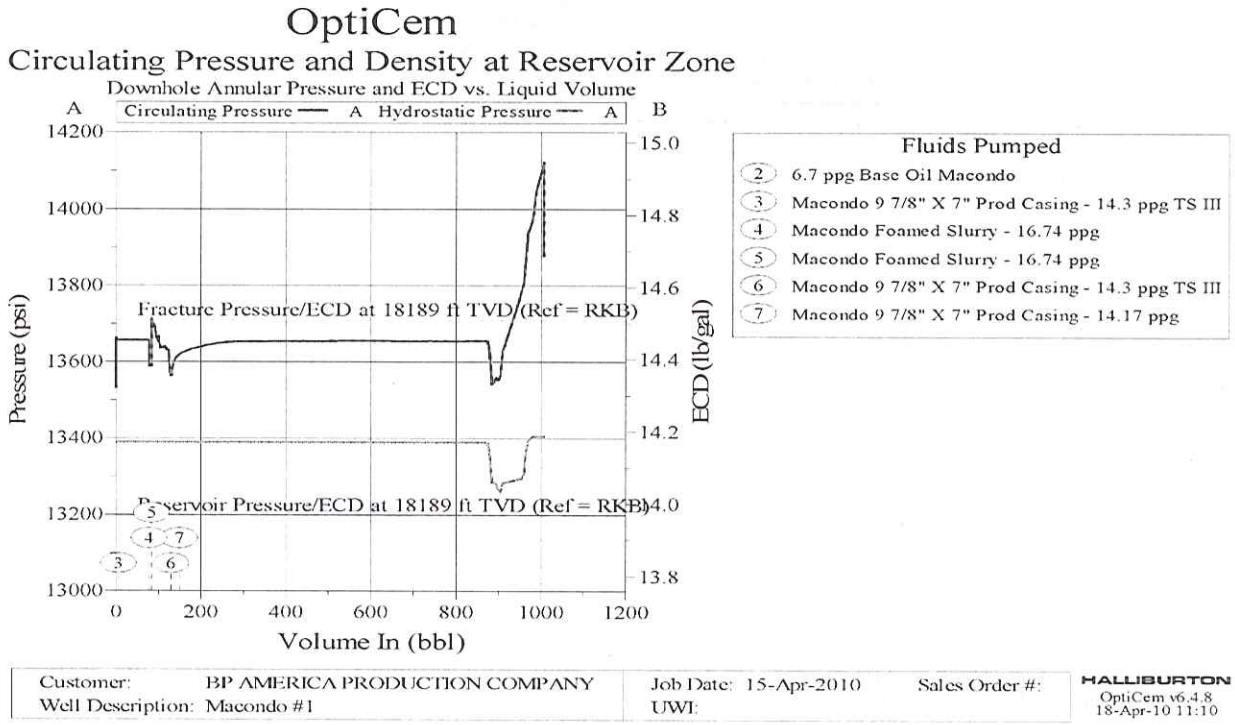
6.3 Circ Pressure & Density - Res Zone (graph)



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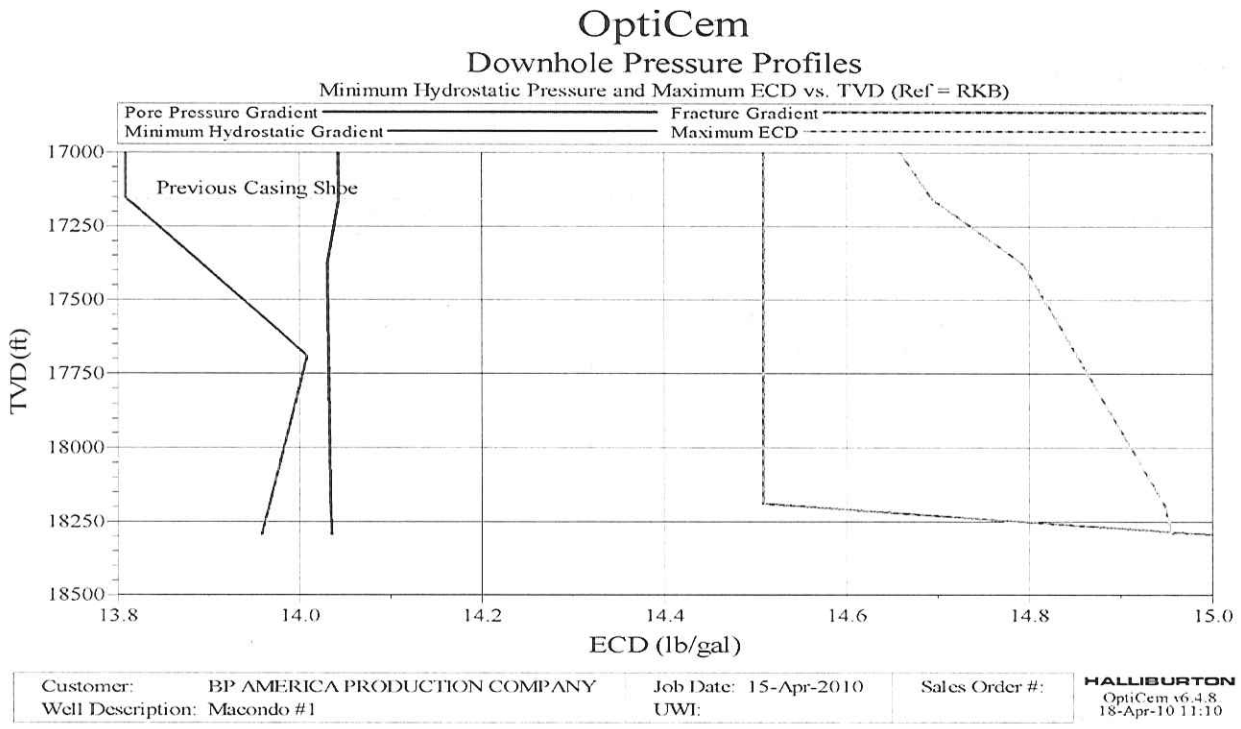
HAL_0125458

HAL_0125434

6.4 Downhole Pressure Profiles (graph)



Created: April 18, 2010 at 11:25 AM
OptiCem v6.4.8 (OC v6.4.8)

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6.5 MC252#1_BP01_Svy_Rec_NO_4_10_10.txt (text)

```
#VERS.                 1.20:   Halliburton Ascii file
#WRAP.                   NO:   One line per depth step
~Well Information Block
#MNEM.UNIT       Data Type    Information
#---------     -----------    --------------------------
 STRT.F             5067.0000: START DEPTH
 STOP.F            18360.0000: STOP DEPTH
 STEP.F                0.0000: STEP DEPTH
 NULL.              -999.2500: NULL VALUE
 WN   .            WELL NAME:  OCS-G 32306 001 ST00BP01
 CN   .        CUSTOMER NAME:  BP Exploration and Production
 RIG  .            RIG NAME:  Deepwater Horizon
 FN   .          FIELD NAME:  Mississippi Canyon Blk. 252
 CNTY.         COUNTY NAME:
 STAT.          STATE NAME:  Louisiana
 CTRY.        COUNTRY NAME:  U.S.A/Offshore LA
 SRVC.         CONTRACTOR:
 LEAS.          LEASE NAME:  Macondo Prospect
 DCON.      DIRECTNL CONTR:  Sperry
 SECT.            SECTION:
 TOWN.          TOWNSHIP:
 RANG.             RANGE:
 SON  .         JOB NUMBER:  LA-MM-0007026939
 APIN.            API S/N:  608174116900
 DOE  .         DOE NUMBER:
 LUNO.        UNIT NUMBER:  82418
 COLG.        COMPANY LOGO:
 CULG.       CUSTOMER LOGO:
 REGN.            REGION:  Central
 DIST.          DISTRICT:  Broussard, LA
 JOBN.    JOB TICKET NUMB:  7026939
 MWDS.          MWD SHOP:  South
 Plat.          PLATFORM:
 Pad  .             PAD:
 Slot.            SLOT:
 Bloc.            BLOCK:  252
 Sub  .       SUB BLOCK:
 SPUD.        SPUD DATE:  16:14:56 06-Oct-09
 GCDE.     GEO COORD DESC:
 GPMT.    GEO PROJ METHOD:
 GREF.      GEO REFERENCE:
 GGSY.       GEO GRID SYS:
 LLGR.           LLGROUP:
 CCDE.    CART COORD DESC:
 CPJM.    CART PROJ METHD:
 CREF.     CART REFERENCE:
 CGSY.      CART GRID SYS:
 XYGR.           XYGROUP:
 MDS  .   MAG DATA SOURCE:  Operator Entered
 MMDL.     MAGNETIC MODEL:
 Mag  .      MAG DATA DATE:
 DFWT.      DIST FWL TEXT:
 DFST.      DIST FSL TEXT:
```

```
 PDAT.          PERMANENT DATUM:  Mean Sea Level
 LMF .            LOG MEAS FROM:  Drill Floor
 DMF .          DRILL MEAS FROM:  Drill Floor
 RC  .               START TIME:  16:14:56 06-Oct-09
 ETIM.                 END TIME:  10:59:12 12-Apr-10
 DMOD.           DRILL MOD DESC:  Drill Model
 SVYD.              SURVEY DESC:  Survey
 ILTD.          INTERP LTH DESC:  Lithology
 FTOP.           FORM TOPS DESC:  Formation Tops
 RCST.$/da             RIG COST:  0.000000
 AGAP.ft               AIR GAP:   75.000000
 CMER.deg       CENTRL MERIDIAN:  0.000000
 VSNS.ft           VERT SEC N/S:  0.000000
 VSEW.ft           VERT SEC E/W:  0.000000
 LATI.deg              LATITUDE:  28.738138
 LONG.deg             LONGITUDE:  -88.365944
 EKB .ft                KB ELEV:  0.000000
 EDF .ft                DF ELEV:  75.000000
 TVDS.ft         TVDSS CORRECTN:  75.000000
 EGL .ft                GL ELEV:  0.000000
 WDMS.ft                WD ELEV:  4992.000000
 WHNS.ft          WELL HEAD N/S:  0.000000
 WHEW.ft          WELL HEAD E/W:  0.000000
 UTMX.m                   UTM X:  366612.937500
 UTMY.m                   UTM Y:  3179557.750000
 DFWL.ft           DISTANCE FWL:  0.000000
 DFSL.ft           DISTANCE FSL:  0.000000
 EPD .ft              ELEVATION:  0.000000
 APD .ft         DEPTH ABOVE PD:  75.000000
 STRD.ft            START DEPTH:  5067.000000
 EDEP.ft              END DEPTH:  18260.000000
 VSDR.deg       VERT SEC DIRECT:  256.640015
 MFLD.nT         MAGNETIC FIELD:  47321.000000
 MDIP.deg           MAGNETIC DIP:  58.613998
 GVFD.g           GRAVITY FIELD:  1.000000
 MDEC.deg         MAGNETIC DECL:  -0.945000
 GRDC.deg       GRID CORRECTION:  -0.656900
 AZTC.deg        AZM TOTAL CORR:  -0.288100
 WTYP.                WELL TYPE:  0
 VSC .             VS TO CLOSURE:  0
 MAGU.          MAGUTM CHECKSUM:  1710684
 NREF.          NORTH REFERENCE:  2
 HPTY.            HOLE POS TYPE:  0
#------- ~OTHER INFORMATION SECTION -----------------
#-START CURVE INFORMATION XML-
#<xml version = "1" missingfloat = "-999.2500" missinginteger = "-999"
missingascii = "" >
#        <curve name = "Depth" wellname = "" run = "" record = "" description
= "" unit = "ft" unittype = "Depth" format = "F" size = "8" specialbits = ""
decimalplaces = "3" optionliststring = "false" > </curve>
#        <curve name = "Inclination" wellname = "MC252 BP01" run =
"Descriptor_run" record = "Survey" description = "Descriptor_data" unit =
"deg" unittype = "Hole angle" format = "F" size = "4" specialbits = "C"
decimalplaces = "2" optionliststring = "false" > </curve>
#        <curve name = "Azimuth" wellname = "MC252 BP01" run =
"Descriptor_run" record = "Survey" description = "Descriptor_data" unit =
```

```
"deg" unittype = "Hole angle" format = "F" size = "4" specialbits = "C"
decimalplaces = "2" optionliststring = "false" > </curve>
#        <curve name = "TVD" wellname = "MC252 BP01" run = "Descriptor_run"
record = "Survey" description = "Descriptor_data" unit = "ft" unittype =
"Depth" format = "F" size = "4" specialbits = "C" decimalplaces = "2"
optionliststring = "false" > </curve>
#        <curve name = "N/S Departure" wellname = "MC252 BP01" run =
"Descriptor_run" record = "Survey" description = "Descriptor_data" unit =
"ft" unittype = "Depth" format = "F" size = "4" specialbits = "C"
decimalplaces = "2" optionliststring = "false" > </curve>
#        <curve name = "E/W Departure" wellname = "MC252 BP01" run =
"Descriptor_run" record = "Survey" description = "Descriptor_data" unit =
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decimalplaces = "2" optionliststring = "false" > </curve>
#        <curve name = "Vertical Sec" wellname = "MC252 BP01" run =
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"ft" unittype = "Depth" format = "F" size = "4" specialbits = "C"
decimalplaces = "2" optionliststring = "false" > </curve>
#        <curve name = "DogLeg Severity" wellname = "MC252 BP01" run =
"Descriptor_run" record = "Survey" description = "Descriptor_data" unit =
"&#176;/100&apos;" unittype = "Dogleg severity" format = "F" size = "4"
specialbits = "C" decimalplaces = "4" optionliststring = "false" > </curve>
#</xml>
#-END CURVE INFORMATION XML-
#
#------- CURVES MNEMONICS -----------------
#       DEPT            Inclinatio          Azimuth              TVD
Latitude          Departure          VerticalSe          DogLeg
#------- CURVES UNITS ---------------------
#        ft                deg                deg                  ft
ft                ft                ft               °/100'
         5067.0000              0.00              0.00           5067.00
0.00              0.00              0.00              0.00
         5526.0000              1.96            101.40           5525.91
-1.55              7.70             -7.13              0.43
         5621.0000              1.65             97.18           5620.86
-2.04             10.64             -9.88              0.35
         5719.0000              1.34             96.79           5718.83
-2.36             13.18            -12.28              0.32
         5815.0000              1.13             91.44           5814.81
-2.51             15.24            -14.25              0.25
         5908.0000              0.94             93.43           5907.79
-2.58             16.92            -15.87              0.21
         6004.0000              0.86             92.56           6003.78
-2.66             18.43            -17.31              0.08
         6099.0000              0.72             89.32           6098.77
-2.68             19.74            -18.58              0.15
         6195.0000              0.61             86.62           6194.76
-2.65             20.85            -19.67              0.12
         6304.0000              0.49             83.25           6303.76
-2.56             21.89            -20.71              0.11
         6401.0000              0.09             82.22           6400.76
-2.50             22.38            -21.20              0.41
         6495.0000              0.03            119.73           6494.76
-2.50             22.47            -21.29              0.07
```

	6590.0000	0.03	211.60		6589.76
-2.54	22.48	-21.29	0.05		
	6685.0000	0.03	318.07		6684.76
-2.54	22.45	-21.26	0.05		
	6780.0000	0.09	42.64		6779.76
-2.46	22.49	-21.31	0.10		
	6873.0000	0.10	268.01		6872.76
-2.41	22.45	-21.29	0.19		
	6971.0000	0.12	300.37		6970.76
-2.36	22.28	-21.13	0.07		
	7057.0000	0.03	100.60		7056.76
-2.32	22.23	-21.09	0.17		
	7159.0000	0.04	240.74		7158.76
-2.35	22.22	-21.08	0.06		
	7254.0000	0.03	220.74		7253.76
-2.38	22.18	-21.03	0.02		
	7350.0000	0.04	273.74		7349.76
-2.40	22.13	-20.97	0.03		
	7443.0000	0.06	135.02		7442.76
-2.43	22.13	-20.97	0.10		
	7538.0000	0.06	171.62		7537.76
-2.51	22.17	-20.99	0.04		
	7633.0000	0.04	333.42		7632.76
-2.53	22.16	-20.98	0.10		
	7727.0000	0.00	359.77		7726.76
-2.50	22.15	-20.97	0.04		
	7821.0000	0.03	335.23		7820.76
-2.48	22.14	-20.96	0.03		
	7921.0000	0.12	180.97		7920.76
-2.56	22.12	-20.93	0.15		
	8000.0000	1.06	19.95		7999.75
-1.96	22.37	-21.31	1.49		
	8096.0000	0.94	17.01		8095.74
-0.37	22.91	-22.20	0.14		
	8192.0000	0.03	16.08		8191.73
0.41	23.14	-22.61	0.95		
	8289.0000	0.23	225.81		8288.73
0.29	23.01	-22.46	0.26		
	8382.0000	0.06	34.14		8381.73
0.20	22.90	-22.33	0.31		
	8477.0000	0.06	324.47		8476.73
0.29	22.90	-22.35	0.07		
	8573.0000	0.09	9.44		8572.73
0.40	22.89	-22.36	0.07		
	8667.0000	0.09	46.61		8666.73
0.53	22.95	-22.45	0.06		
	8762.0000	0.06	86.68		8761.73
0.58	23.06	-22.57	0.06		
	8854.0000	0.09	9.44		8853.73
0.65	23.12	-22.64	0.10		
	8917.0000	0.06	46.61		8916.73
0.73	23.15	-22.69	0.09		
	9187.0000	2.47	106.30		9186.65
-0.81	28.84	-27.87	0.90		
	9327.0000	0.44	96.00		9326.60
-1.71	32.27	-31.00	1.46		

9463.0000	0.38	90.85	9462.59	
-1.78	33.24	-31.93	0.05	
9603.0000	0.45	125.67	9602.59	
-2.10	34.15	-32.74	0.18	
9736.0000	0.38	153.99	9735.59	
-2.80	34.76	-33.18	0.16	
9874.0000	0.39	141.03	9873.58	
-3.58	35.26	-33.48	0.06	
10004.0000	0.25	157.87	10003.58	
-4.19	35.65	-33.71	0.13	
10150.0000	0.36	162.34	10149.58	
-4.92	35.91	-33.80	0.08	
10285.0000	0.44	184.50	10284.58	
-5.84	35.99	-33.67	0.13	
10424.0000	0.47	182.69	10423.57	
-6.94	35.92	-33.35	0.02	
10563.0000	0.47	210.58	10562.57	
-8.00	35.61	-32.80	0.16	
10701.0000	0.47	205.53	10700.56	
-9.00	35.08	-32.05	0.03	
10839.0000	0.47	208.48	10838.56	
-10.01	34.56	-31.31	0.02	
10977.0000	0.56	204.08	10976.55	
-11.12	34.02	-30.53	0.07	
11114.0000	0.67	205.50	11113.54	
-12.46	33.40	-29.62	0.08	
11252.0000	0.61	216.24	11251.54	
-13.78	32.62	-28.55	0.10	
11390.0000	0.50	220.53	11389.53	
-14.83	31.79	-27.51	0.09	
11528.0000	0.45	191.93	11527.52	
-15.81	31.29	-26.79	0.17	
11665.0000	0.38	185.19	11664.52	
-16.79	31.14	-26.41	0.06	
11796.0000	3.15	267.85	11795.45	
-17.36	27.50	-22.75	2.38	
11934.0000	5.62	264.12	11933.04	
-18.20	16.99	-12.33	1.80	
12070.0000	9.13	264.29	12067.89	
-19.95	-0.38	4.98	2.58	
12209.0000	9.94	262.27	12204.97	
-22.67	-23.24	27.85	0.63	
12347.0000	9.22	262.55	12341.04	
-25.70	-46.01	50.70	0.52	
12484.0000	8.62	263.43	12476.39	
-28.30	-67.09	71.81	0.45	
12622.0000	7.25	261.10	12613.06	
-30.83	-85.96	90.76	1.02	
12760.0000	5.99	261.62	12750.14	
-33.23	-101.69	106.62	0.91	
12896.0000	4.33	261.99	12885.58	
-34.98	-113.80	118.80	1.22	
13034.0000	1.29	264.67	13023.40	
-35.85	-120.51	125.53	2.21	
13112.0000	0.67	257.80	13101.39	
-36.03	-121.83	126.86	0.81	

	13172.0000	0.62	261.38		13161.39
-36.15	-122.49	127.53		0.11	
	13310.0000	0.89	272.39		13299.38
-36.21	-124.30	129.30		0.22	
	13448.0000	0.64	276.61		13437.36
-36.08	-126.14	131.06		0.18	
	13585.0000	0.62	274.81		13574.35
-35.93	-127.64	132.49		0.02	
	13721.0000	0.68	267.45		13710.35
-35.90	-129.19	133.99		0.08	
	13859.0000	0.69	273.76		13848.34
-35.89	-130.84	135.59		0.06	
	13998.0000	0.80	265.26		13987.32
-35.91	-132.65	137.35		0.11	
	14133.0000	0.56	274.17		14122.31
-35.94	-134.25	138.92		0.20	
	14273.0000	0.80	262.37		14262.30
-36.02	-135.90	140.55		0.20	
	14549.0000	0.47	291.13		14538.29
-35.87	-138.88	143.41		0.16	
	14684.0000	0.31	268.69		14673.28
-35.68	-139.76	144.22		0.16	
	14816.0000	0.66	235.39		14805.28
-36.12	-140.74	145.28		0.33	
	14950.0000	0.70	230.44		14939.27
-37.08	-142.00	146.73		0.06	
	15081.0000	0.64	241.45		15070.26
-37.94	-143.27	148.16		0.11	
	15264.0000	0.67	214.46		15253.25
-39.31	-144.78	149.95		0.17	
	15406.0000	0.74	228.41		15395.24
-40.61	-145.94	151.37		0.13	
	15540.0000	0.69	223.80		15529.23
-41.77	-147.14	152.81		0.06	
	15673.0000	0.57	242.79		15662.22
-42.65	-148.28	154.13		0.18	
	15805.0000	0.59	234.90		15794.21
-43.33	-149.42	155.39		0.06	
	15939.0000	0.75	246.89		15928.21
-44.07	-150.78	156.89		0.16	
	16072.0000	0.87	240.57		16061.19
-44.91	-152.47	158.72		0.11	
	16204.0000	0.70	235.12		16193.18
-45.87	-154.01	160.44		0.14	
	16333.0000	0.68	229.09		16322.17
-46.82	-155.23	161.85		0.06	
	16470.0000	0.78	235.12		16459.16
-47.88	-156.61	163.44		0.09	
	16604.0000	0.87	222.16		16593.14
-49.16	-158.05	165.13		0.16	
	16729.0000	0.78	224.22		16718.13
-50.48	-159.28	166.63		0.08	
	16870.0000	0.81	233.89		16859.12
-51.76	-160.76	168.36		0.10	
	17004.0000	0.67	206.18		16993.11
-53.01	-161.87	169.74		0.28	

	17136.0000	0.92	219.94		17125.09
-54.51	-162.88	171.07		0.24	
	17318.0000	0.64	175.50		17307.08
-56.65	-163.74	172.40		0.35	
	17455.0000	0.36	187.90		17444.07
-57.84	-163.74	172.67		0.22	
	17592.0000	0.31	157.69		17581.07
-58.62	-163.65	172.77		0.13	
	17728.0000	0.38	70.52		17717.07
-58.82	-163.09	172.27		0.35	
	17867.0000	0.38	32.17		17856.07
-58.28	-162.42	171.49		0.18	
	18003.0000	0.62	19.34		17992.06
-57.21	-161.94	170.77		0.20	
	18138.0000	0.74	35.87		18127.05
-55.81	-161.18	169.72		0.17	
	18348.0000	0.38	38.20		18337.04
-54.16	-159.96	168.15		0.18	
	18360.0000	0.38	38.20		18349.04
-54.10	-159.91	168.08		0.04	

HALLIBURTON

Bp America Prod Co-sorac/gom Ebiz
PO Box 22024 - Do Not Mail
Tulsa, Oklahoma 74121-2024

Macondo 1
MISSISSIPPI CANYON Blk: 252

United States of America

9 7/8" X 7" Production Casing

Prepared for: Brian Morel

April 18, 2010
Version: 6

Submitted by:
Jesse Gagliano
Halliburton
10200 Bellaire Blvd
Houston, Texas 77072-5299

HALLIBURTON

Halliburton appreciates the opportunity to present this proposal and looks forward to being of service to you.

Foreword

Enclosed is our recommended procedure for cementing the casing strings in the referenced well. The information in this proposal includes well data, calculations, materials requirements, and cost estimates. This proposal is based on information from our field personnel and previous cementing services in the area.

Halliburton Energy Services recognizes the importance of meeting society's needs for health, safety, and protection of the environment. It is our intention to proactively work with employees, customers, the public, governments, and others to use natural resources in an environmentally sound manner while protecting the health, safety, and environmental processes while supplying high quality products and services to our customers.

We appreciate the opportunity to present this proposal for your consideration and we look forward to being of service to you. Our Services for your well will be coordinated through the Service Center listed below. If you require any additional information or additional designs, please feel free to contact myself or our field representative listed below.

Prepared and Submitted by:

Jesse Gagliano
Technical Advisor

SERVICE CENTER:	Lafayette, La
SERVICE COORDINATOR:	Danny Mooney
OPER. ENGINEER:	Yarigsa Aviles
PHONE NUMBER:	1-800-444-7830

Job Information — 9 7/8" X 7" Production Casing

Well Name: Macondo	Well #: 1
Riser	0 - 5067 ft (MD)
Outer Diameter	24.000 in
Inner Diameter	19.500 in
16" Casing	5067 - 11585 ft (MD)
Outer Diameter	16.000 in
Inner Diameter	14.920 in
Linear Weight	97 lbm/ft
13 5/8" Liner	11185 - 13100 ft (MD)
Outer Diameter	13.625 in
Inner Diameter	12.375 in
Linear Weight	88.20 lbm/ft
11 7/8" Liner	12816 - 15113 ft (MD)
Outer Diameter	11.875 in
Inner Diameter	10.711 in
Linear Weight	71.80 lbm/ft
9 7/8" Liner	14803 - 17163 ft (MD)
Outer Diameter	9.875 in
Inner Diameter	8.625 in
Linear Weight	62.80 lbm/ft
10 1/2" Average Hole Size	17163 - 18130 ft (MD)
Inner Diameter	10.500 in
Job Excess	0 %
8.88" Average Hole Size	18130 - 18304 ft (MD)
Inner Diameter	8.880 in
Job Excess	0 %
6 5/8" Drill Pipe	0 - 5067 ft (MD)
Outer Diameter	6.625 in
Inner Diameter	5.291 in
Linear Weight	40.01 lbm/ft
9 7/8" Casing	5067 - 12485 ft (MD)
Outer Diameter	9.875 in
Inner Diameter	8.598 in
Linear Weight	62.80 lbm/ft
7" Production Casing	12485 - 18304 ft (MD)
Outer Diameter	7.000 in
Inner Diameter	6.143 in
Linear Weight	32 lbm/ft

Water Depth	4992 feet
Air Gap	75 feet
Mud Type	Synthetic
Mud Weight	14 lbm/gal
BHST	210 degF
BHCT	210 degF

Mud: (110.00 ft fill)

110.00 ft * 0.3585 ft^3/ft * 0 %	= 39.43 ft^3
Total Mud	= 39.30 ft^3
	= 7.00 bbl

Spacer:

88.00 ft * 0.3585 ft^3/ft * 0 %	= 31.55 ft^3
310.00 ft * 0.1385 ft^3/ft * 0 %	= 42.93 ft^3
2050.00 ft * 0.1385 ft^3/ft * 0 %	= 283.89 ft^3
137.00 ft * 0.3341 ft^3/ft * 0 %	= 45.77 ft^3
Total Spacer	= 404.25 ft^3
	= 72.00 bbl

Cement : (100.00 ft fill)

100.00 ft * 0.3341 ft^3/ft * 0 %	= 33.41 ft^3
Total Lead Cement	= 33.41 ft^3
	= 5.95 bbl
Sacks of Cement	= 24 sks

Cement : (904.00 ft fill)

730.00 ft * 0.3341 ft^3/ft * 0 %	= 243.87 ft^3
174.00 ft * 0.1628 ft^3/ft * 0 %	= 28.33 ft^3
Foamed Tail Cement	= 272.20 ft^3
	= 48.48 bbl

Shoe Joint Volume: (189.00 ft fill)

189.00 ft * 0.2058 ft^3/ft	= 38.90 ft^3
	= 6.93 bbl
Tail plus shoe joint	= 311.10 ft^3
	= 55.41 bbl
Total Tail	= 191 sks

Total Pipe Capacity:

5067.00 ft * 0.1527 ft^3/ft	= 773.67 ft^3
7418.00 ft * 0.4032 ft^3/ft	= 2990.95 ft^3
5819.00 ft * 0.2058 ft^3/ft	= 1197.67 ft^3
	= 883.82 bbl

Displacement Volume to Shoe Joint:

Capacity of Pipe - Shoe Joint	= 883.82 bbl - 6.93 bbl
	= 876.89 bbl

Fluid Instructions
Fluid 1: Mud
Base Oil

Fluid Density:	6.70 lbm/gal
Volume Behind:	7 bbl

Fluid 2: Water Based Spacer
TUNED SPACER III

		Fluid Density:	14.30 lbm/gal
0.6 gal/bbl	Dual Spacer Surfactant A (Additive Material)	Fluid Volume:	72 bbl
0.6 gal/bbl	Dual Spacer Surfactant B (Additive Material)		
0.6 gal/bbl	SEM-8 (Additive Material)		
1 lbm/bbl	**WellLife 734 (Additive Material)**		

Fluid 3: Lead Cement – **Un-foamed**
Premium Cement

	Fluid Weight	16.74 lbm/gal
94 lbm/sk Premium Cement (Cement)	Slurry Yield:	1.37 ft^3/sk
0.07 % Halliburton EZ-FLO (Bulk Flow Enhancer)	Total Mixing Fluid:	5.04 Gal/sk
0.25 % D-AIR 3000 (Defoamer)	Top of Fluid:	17300 ft
1.88 lbm/sk KCL (Additive Material)	Calculated Fill:	100 ft
20 % SSA-1 (Additive Material)	Volume:	5.95 bbl
15 % Common White-100 Mesh, SSA-2	Calculated Sacks:	24.37 sks
0.2 lbm/sk SA-541 (Additive Material)	Proposed Sacks:	30 sks
0.11 Gal/sk Zonesealant 2000 (Foamer)		
0.09 Gal/sk SCR-100L (Retarder)		

1 lbm/bbl WellLife 734 (Additive Material) – added by hand to down hole side

Fluid 4: Foamed Tail Cement – **Foamed to average density of 14.5 ppg**
Premium Cement

	Fluid Weight	16.74 lbm/gal
94 lbm/sk Premium Cement (Cement)	Slurry Yield:	1.37 ft^3/sk
0.07 % Halliburton EZ-FLO (Bulk Flow Enhancer)	Total Mixing Fluid:	5.04 Gal/sk
0.25 % D-AIR 3000 (Defoamer)	Top of Fluid:	17400 ft
1.88 lbm/sk KCL (Additive Material)	Calculated Fill:	904 ft
20 % SSA-1 (Additive Material)	Volume:	55.41 bbl
15 % Common White-100 Mesh, SSA-2	Calculated Sacks:	191.44 sks
0.2 lbm/sk SA-541 (Additive Material)	Proposed Sacks:	200 sks
0.11 Gal/sk Zonesealant 2000 (Foamer)		
0.09 Gal/sk SCR-100L (Retarder)		

1 lbm/bbl WellLife 734 (Additive Material) – added by hand to down hole side

Fluid 5: Water Based Spacer

TUNED SPACER III

		Fluid Density:	14.30 lbm/gal
0.6 gal/bbl	Dual Spacer Surfactant A (Additive Material)	Fluid Volume:	20 bbl
0.6 gal/bbl	Dual Spacer Surfactant B (Additive Material)		
0.6 gal/bbl	SEM-8 (Additive Material)		

Fluid 6: Mud

Mud

Fluid Density:	14 lbm/gal
Fluid Volume	856.89 bbl

Detailed Pumping Schedule

Fluid #	Fluid Type	Fluid Name	Surface Density lbm/gal	Estimated Avg Rate bbl/min	Downhole Volume
1	Mud	Base Oil	6.7	4.0	7 bbl
2	Spacer	TUNED SPACER III	14.3	4.0	72 bbl
3	Cement	Cap Cement	16.7	2.0	30 sks
4	Cement	Foamed Tail	16.7	2.0	200 sks
5	Spacer	TUNED SPACER III	14.3	4.0	20 bbl
6	Mud	Mud	14.0	4.0	856.89 bbl

Foam Output Parameter Summary:

Fluid #	Fluid Name	Un-foamed Liquid Volume	Beginning Density lbm/gal	Ending Density lbm/gal	Beginning Rate scf/bbl	Ending Rate scf/bbl
Stage 1						
4	Foamed Tail	39.82bbl	14.5	14.5	521.1	521.1

Foam Design Specifications:

Foam Calculation Method: Constant Gas Flow
Backpressure: 14.70 psig
Bottom Hole Circulating Temp: 210 degF
Mud Outlet Temperature: 150 degF

Calculated Gas = 20748.4 scf
Additional Gas = 50000 scf
Total Gas = 70748.4 scf

Hold Safety Meeting with all personnel to discuss foam cementing operations and possible hazards.

1. ONCE LANDED OUT WITH 9.875" x 7"CASING RIG UP HALLIBURTON AND NITROGEN LINES TO CEMENT STAND.
2. WITH RIG PUMPS, PUMP AND CIRCULATE 111 BBLS @ 1 BPM. NEXT, CIRCULATE 150 BBLS @ 4 BPM AS PER CO.MAN.
3. WHILE CIRCULATING, NITROGEN UNIT SHOULD BE COOLED DOWN, AND NITROGEN LINES WILL BE TESTED TO 5000 PSI.
4. ONCE CIRCULATING IS COMPLETE, CLOSE TOP TIW AND PUT 500 PSI ON TOP DRIVE. MAKE SURE THAT BOTTOM TIW VALVE IS OPEN.
5. WITH HALLIBURTON UNIT PUMP 7 BBLS OF 6.7 PPG BASE OIL @ 4 BPM.
6. WITH HALLIBURTON UNIT PUMP 10 BBLS OF 14.3 PPG TUNED SPACER @ 4 BPM.
7. CLOSE THE 2" LO-TORC VALVE ON THE CEMENT STAND. MAKE SURE RIG FLOOR IS CLEAR OF ALL PERSONAL. TEST CEMENT LINES TO 5000 PSI.

8. ONCE ALL TEST ARE COMPLETE MAKE SURE PRESSURE HAS BEEN RELEASED AND OPEN THE 2" LO-TORC VALVE.
9. PUMP 62 BBLS OF 14.3 PPG TUNED SPACER AT 4 BPM.
10. SHUT DOWN, WASH OUT MEASURING TANKS ON CEMENT UNIT, AND WEIGH UP CEMENT.
11. MIX AND PUMP 4 BBLS OF UNFOAMED LEAD CEMENT AT 16.74 PPG. PUMP RATE OF 2 BPM.
12. DROP DART TO RELEASE BOTTOM PLUG.
13. MIX AND PUMP 4 BBLS OF UNFOAMED LEAD CEMENT AT 16.74 PPG. PUMP RATE OF 4 BPM.
14. BRING NITROGEN ONLINE
15. MIX AND PUMP 39 BBLS OF FOAMED TAIL CEMENT AT 14.5 PPG AFTER FOAMING. PUMP RATE OF 2 BPM. (FOAM VOLUME OF 48 BBLS).
16. BRING NITROGEN OFF LINE
17. MIX AND PUMP 4 BBLS OF UNFOAMED SHOE CEMENT AT 16.74 PPG. PUMP RATE OF 2 BPM.
18. PUMP 3 BBLS OF 14.3 PPG TUNED SPACER @ 2 BPM.
19. DROP DART TO RELEASE TOP PLUG.
20. PUMP 17 BBLS OF 14.3 PPG TUNED SPACER AT 4 BPM.
21. WITH HALLIBURTON PUMPS DISPLACE CEMENT WITH 130 BBLS OF 14.0 PPG MUD @ 4 BPM.
22. REZERO, AND PUMP 727 BBLS OF 14.0 PPG MUD WITH RIG PUMPS @ 4 BPM. IF PLUG DOES NOT BUMP, PUMP NO MORE THAN AN ADDITIONAL 17 BBLS FOR A TOTAL OF 744 BBLS WITH RIG PUMPS.
23. BUMP PLUG AND PRESSURE UP TO 500 PSI ABOVE CIRCULATING PRESSURE. CHECK FLOATS AND BLEED BACK NO MORE THAN 6 BBLS. IF 6 BBLS ARE BLED BACK TO THE UNIT, PUMP AN ADDITIONAL 6 BLS OF 14.0 PPG MUD AND HOLD PRESSURE. TIME TO BE DECIDED BY BP COMPANY REPS AND ENGINEERS.
24. SET SEAL ASSEMBLY AND RELEASE RUNNING TOOL FROM HANGER.
25. PULL 2 STDS AND DROP DRILL PIPE NERF BALL. PUMP 1 ½ DRILL PIPE VOLUME (+/- 207 BBLS).
26. POOH.

SAP Quote # 0

Mtrl Nbr	Description	Qtv	U/M	Unit Price	Net Amt
7523	CMT PRODUCTION CASING BOM	1	JOB		0.00
	Spacer Material				
483826	TUNED SPACER III	92	BBL	122.28	11,249.76
100003664	DUAL SPACER SURFACTANT A	56	GAL	91.32	5,113.92
100003665	DUAL SPACER SURF. B	56	GAL	42.88	2,401.28
101235090	SEM-8	56	GAL	47.45	2,657.20
101492086	WELLLIFE¿ 734	118	LB	4.10	483.80
	Cement Material				
100003687	PREMIUM CEMENT	230	SK	14.72	3,385.60
101002314	EZ-FLO	16	LB	10.57	169.12
101007446	D-AIR 3000	55	LB	4.31	237.05
100001585	KCL POTASSIUM CHLORIDE	433	LB	0.55	238.15
100003691	SAND-200 MESH SILICA FLOUR SSA-1	4324	LB	0.24	1,037.76
100003676	SAND-COMMON WHITE-100 MESH, SSA-2	33	SK	24.28	801.24
100009911	SA-541 SUSPENDING AID -	46	LB	13.20	607.20
101207218	ZONESEALANT 2000	26	GAL	77.25	2,008.50
100012238	SCR-100 L	21	GAL	76.65	1,609.65
	Personnel				
130443	ZONESEAL CERTIFIED SPECIALIST H/DAY/MO TOTAL NUMBER HR/DAY/WEEK/MTH/YEAR/JOB/RUN	1 96	H	145.24	13,943.04
576784	CMT. Offshore Engineer, per hr HOURS	1 96	EA	134.32	12,894.72
	Equipment				
583768	CMT.Foam Cmt Base Rate(3-day)-SORAC	1	EA	24,295.68	24,295.68
583769	CMT.Addl Day Foam Cmt Day Rate-SORAC	5	DAY	3,100.45	15,502.25
	Total	**USD**			**98,635.92**

SAP Quote # 0

Mtrl Nbr	Description	Qty	U/M	Unit Price	Net Amt
342210	N2 BOM-Foam Cementing w/o CT	1	JOB		0.00
13459	Nitrogen Charge	70748	SCF	6.60	4,669.37
	Personnel				
576758	CMT, Equipment Optr, per hr HOURS	2 96	EA	46.62	8,951.04
	Equipment				
583772	CMT,N2 Base Rate(3day)Foam Cmt Job-SORAC	1	EA	31,745.54	31,745.54
583773	CMT,Addl N2 Day Rate Foam Cmt Job-SORAC	5	DAY	8,056.40	40,282.00
583837	CMT,Addl 100ft N2 Iron, ZI Foamed-SORAC	8	DAY	300.00	2,400.00
	Total	**USD**			**88,047.95**

Conditions

NOTE

The cost in this analysis is good for the materials and/or services outlined within and shall be valid for 30 days from the date of this proposal. In order to meet your needs under this proposal with a high quality of service and responsive timing, Halliburton will be allocating limited resources and committing valuable equipment and materials to your area of operations. Accordingly, the discounts reflected in this proposal are available only for materials and services awarded on a first-call basis. Alternate pricing may apply in the event that Halliburton is awarded work on any basis other than as a first-call provider.

The unit prices stated in the proposal are based on our current published prices. The projected equipment, personnel, and material needs are only estimates based on information about the work presently available to us. At the time the work is actually performed, conditions then existing may require an increase or decrease in the equipment, personnel, and/or material needs. Charges will be based upon unit prices in effect at the time the work is performed and the amount of equipment, personnel, and/or material actually utilized in the work. Taxes, if any, are not included. Applicable taxes, if any, will be added to the actual invoice.

It is understood and agreed between the parties that with the exception of the subject discounts, all services performed and equipment and materials sold are provided subject to Halliburton's General Terms and Conditions contained in our current price list, (which include LIMITATION OF LIABILITY and WARRANTY provisions), and pursuant to the applicable Halliburton Work Order Contract (whether or not executed by you), unless a Master Service and/or Sales Contract applicable to the services, equipment, or materials supplied exists between your company and Halliburton, in which case the negotiated Master Contract shall govern the relationship between the parties. A copy of the latest version of our General Terms and Conditions is available from your Halliburton representative or at: http://www.halliburton.com/terms for your convenient review, and we would appreciate receiving any questions you may have about them. Should your company be interested in negotiating a Master Contract with Halliburton, our Law Department would be pleased to work with you to finalize a mutually agreeable contract. In this connection, it is also understood and agreed that Customer will continue to execute Halliburton usual field work orders and/or tickets customarily required by Halliburton in connection with the furnishing of said services, equipment, and materials.
Any terms and conditions contained in purchase orders or other documents issued by the customer shall be of no effect except to confirm the type and quantity of services, equipment, and materials to be supplied to the customer.
If customer does not have an approved open account with Halliburton or a mutually executed written contract with Halliburton, which dictates payment terms different than those set forth in this clause, all sums due are payable in cash at the time of performance of services or delivery of equipment, products, or materials. If customer has an approved open account, invoices are payable on the twentieth day after date of invoice.

Customer agrees to pay interest on any unpaid balance from the date payable until paid at the highest lawful contract rate applicable, but never to exceed 18% per annum. In the event Halliburton employs an attorney for collection of any account, customer agrees to pay attorney fees of 20% of the unpaid account, plus all collection and court costs.