

**EXXONMOBIL CORPORATION**

**HOUSTON, Texas**

PCU 296-5A6

H&P 321

## **Post Job Summary**

### **Cement Production Casing**

Prepared for: George McNary  
Date Prepared: March 31, 2011  
Version: 1

Service Supervisor: MCCONKIE, TRAVIS

Submitted by: Joshua Anglin

**HALLIBURTON**

# HALLIBURTON

## Wellbore Geometry

Job Tubulars					MD		TVD		Excess	Shoe Joint Length
Type	Description	Size in	ID in	Wt lbm/ft	Top ft	Bottom ft	Top ft	Bottom ft	%	ft
Casing	7" Intermediate Casing	7.00	6.276	26.00	0.00	10,578.00	0.00	10,245.00		
Open Hole Section	6 1/8" Production Open Hole		6.125		10578.00	14,000.00	10,245.00	13,665.00	350.00	
Casing	4 1/2" Production Casing	4.50	3.826	15.10	0.00	13,985.00	0.00	13,650.00		89.39

## Pumping Schedule

Stage /Plug #	Fluid #	Fluid Type	Fluid Name	Surface Density lbm/gal	Avg Rate bbl/min	Surface Volume	Downhole Volume
1	1	Spacer	TUNED SPACER III	10.50	6.00	80.0 bbl	80.0 bbl
1	2	Cement Slurry	Lightweight Tail Cement	12.00	6.00	754.0 sacks	754.0 sacks
1	3	Spacer	NaCl Displacement	8.44	6.00	194.0 bbl	194.0 bbl

# HALLIBURTON

## Fluids Pumped

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**Stage/Plug # 1      Fluid 1:**      TUNED SPACER III  
TUNED SPACER III - SBM (483826)  
88.7 lbm/bbl      Barite

Fluid Density:      10.50 lbm/gal  
Fluid Volume:      80.00 bbl  
Pump Rate:      6.00 bbl/min

**Stage/Plug # 1      Fluid 2:**      Lightweight Tail  
Cement  
VARICEM (TM) CEMENT  
0.179 lbm      WG-17  
0.44 lbm      SCR-100  
14.465 lbm      SSA-1

Fluid Weight:      12.00 lbm/gal  
Slurry Yield:      2.44 ft<sup>3</sup>/sack  
Total Mixing Fluid:      11.98 Gal  
Surface Volume:      754.0 sacks  
Sacks:      754.0 sacks  
Calculated Fill:      6,982.00 ft  
Calculated Top of Fluid:      7,608.00 ft  
Estimated Top of Fluid:  
Pump Rate:      6.00 bbl/min

**Stage/Plug # 1      Fluid 3:**      NaCl Displacement  
DUMMY MUD / FLUSH / SPACER SBC MATERIAL  
7.15 lbm/bbl      Salt

Fluid Density:      8.44 lbm/gal  
Fluid Volume:      192.00 bbl  
Pump Rate:      6.00 bbl/min

## Job Summary

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### Job Information

Job Start Date	3/24/2011
Job MD	14000.0 ft
Job TVD	13665.0 ft
Height of Plug Container/Swage Above Rig Floor	4.7 ft
Surface Temperature at Time of Job	55 degF
Mud Type	Water Based Mud
Name of Mud Company	BAROID
Actual Mud Density	10 lbm/gal
Mud loss while running Casing	112.00 bbl
Time Circulated before job	4.00 hour(s)
Mud Volume Circulated	480.00 bbl
Rate at Which Well was Circulated	6.000 bbl/min
Mud loss while Circulating	120.00 bbl
Units of Gas Detected While Circulating	500 API Gas Units
Pipe Movement During Hole Circulation	Reciprocated
Time From End Mud Circ. to Job Start	10.00 minute
Mud loss during Cement Job	120.00 bbl
Pipe Movement During Cementing	Reciprocated
Calculated Displacement	197.47 bbl
Job Displaced by (rig/halco)	Cement Unit HP Pumps
Annular flow Before Job? (Water/Gas)	Yes
Annular flow After Job? (Water/Gas)	Yes
Length of Rat Hole	10.00 ft

### Cementing Equipment

Number of Centralizers Used	131
Pipe Centralization	Through Entire Cement Column
Brand of Float Equipment Used	Weatherford
Did Float Equipment Hold?	Yes
Plug set used?	Yes
Brand of Plug set used?	Weatherford
Did Plugs Bump?	Yes
Calculated Pressure to Bump Plugs	2,200.0 psig

# HALLIBURTON

## Service Supervisor Reports

### Job Log

Date/Time	Activity Code	Pump Rate	Cum Vol	Pressure (psig)	Comments
03/24/2011 02:30	Call Out				
03/24/2011 03:15	Pre-Convoy Safety Meeting				Discuss saftey hazards and way of travel
03/24/2011 03:30	Other				Load Equipment for job
03/24/2011 04:30	Depart Yard Safety Meeting				Discuss saftey hazards and way of travel
03/24/2011 05:00	Crew Leave Yard				
03/24/2011 08:30	Other				Arrive at White river yard pre trip bulk equipment
03/24/2011 09:30	Pre-Convoy Safety Meeting				Discuss saftey hazards and way of travel
03/24/2011 10:30	Arrive At Loc				
03/24/2011 10:35	Assessment Of Location Safety Meeting				Sign in at safety shack get work permit signed assess location for equipment , casing at 10520 ft. rig circulating at intermediate shoe
03/24/2011 10:45	Safety Meeting				Meet with company person, get job info, discuss well conditions, discuss saftey and hazards of job
03/24/2011 11:00	Other				Safety huddle, spot equipment,
03/24/2011 11:30	Safety Meeting - Pre Rig-Up				Discuss safety and hazards of rigging up job bulk, water, iron
03/24/2011 11:40	Rig-Up Equipment				Rig up iron, bulk and water to redzone, test water
03/24/2011 11:45	Other				Rig starts running casing again
03/24/2011 14:00	Safety Meeting				Meet with company person, go over calculations, discuss job procedure, go over max psi, disscuss job contingencies, discuss saftey and hazards of job. Waiting on rig to finish running casing casing at 12000 ft
03/24/2011 17:00	Other				Rig still running casing

# HALLIBURTON

Date/Time	Activity Code	Pump Rate	Cum Vol	Pressure (psig)	Comments
03/25/2011 03:00	Casing on Bottom				
03/25/2011 03:10	Circulate Well				Circulating bottoms up
03/25/2011 03:30	Pre-Rig Up Safety Meeting				discuss safety hazards of rigging up rest of iron to stand pipe
03/25/2011 03:40	Other				Rig up iron to stand pipe
03/25/2011 04:30	Pre-Rig Up Safety Meeting				Safety meeting for rig up floor
03/25/2011 04:50	Load Bottom Plug				
03/25/2011 04:55	Load Top Plug				
03/25/2011 05:10	Rig-Up Equipment				Rig up Cement head, manifold and bells
03/25/2011 05:30	Circulate Well				Rig circulating till we prime up
03/25/2011 06:30	Safety Meeting - Pre Job				Safety meeting with rig crew and company people discuss safety hazards and job procedures
03/25/2011 07:00	Prime Pumps				
03/25/2011 07:30	Start Job				
03/25/2011 07:35	Pump Water				Pump 8 bbls till we get circulation
03/25/2011 08:01	Pressure Test				Low psi test
03/25/2011 08:04	Pressure Test				High Psi test
03/25/2011 08:09	Pump Spacer	5	80		Pump spacer at 10.5 lbs/gal 80bbls total
03/25/2011 08:27	Drop Bottom Plug				
03/25/2011 09:25	Clean Lines				Wash pumps and lines to pit
03/25/2011 09:26	Pump Cement	6	318.9		Pump cement at 12.0 lbs/gal 318.9 bbls pumped total
03/25/2011 09:32	Drop Top Plug				
03/25/2011 09:33	Pump Displacement - Start	6	194		Pump displacement with salt total pumped 192 bbls

# HALLIBURTON

Date/Time	Activity Code	Pump Rate	Cum Vol	Pressure (psig)	Comments
03/25/2011 09:37	Displ Reached Cmmt	6	35	500	35 bbls gone when caught cement
03/25/2011 10:11	Bump Plug	2		1966	
03/25/2011 10:15	Check Floats				Floats held got 2bbls back
03/25/2011 10:24	Bump Plug				Company women wanted to re bump plug
03/25/2011 10:26	Check Floats				Floats held got 2 1/2 bbls back
03/25/2011 10:28	End Job				

### The Road to Excellence Starts with Safety

<b>Sold To #:</b> 331699		<b>Ship To #:</b> 2753382		<b>Quote #:</b>		<b>Sales Order #:</b> 8033910	
<b>Customer:</b> EXXONMOBIL CORPORATION				<b>Customer Rep:</b> CURTIS, CANDACE			
<b>Well Name:</b> PCU			<b>Well #:</b> 296-5A6			<b>API/UWI #:</b> 05-103-1124	
<b>Field:</b>		<b>City (SAP):</b> MEEKER		<b>County/Parish:</b> Rio Blanco		<b>State:</b> Colorado	
<b>Legal Description:</b> Section 5 Township 2S Range 96W							
<b>Contractor:</b> H&P			<b>Rig/Platform Name/Num:</b> H&P321				
<b>Job Purpose:</b> Cement Production Casing							
<b>Well Type:</b> Development Well			<b>Job Type:</b> Cement Production Casing				
<b>Sales Person:</b> MCNARY, GEORGE			<b>Srvc Supervisor:</b> MCCONKIE, TRAVIS			<b>MBU ID Emp #:</b> 471264	

### Job Personnel

HES Emp Name	Exp Hrs	Emp #	HES Emp Name	Exp Hrs	Emp #	HES Emp Name	Exp Hrs	Emp #
ARIZOLA, EDWARD Alan		468545	DE OLIVEIRA, GABRIEL Antonio		466988	DEARING, KEN A		239372
DUBE, MTHOKOZISI		476241	Lawton, Curtis		492181	MCCONKIE, TRAVIS Terry		471264
WOLFGRAMM, SHANE Brandon		479670						

### Equipment

HES Unit #	Distance-1 way	HES Unit #	Distance-1 way	HES Unit #	Distance-1 way	HES Unit #	Distance-1 way
10948689	45 mile	10973575	45 mile	11023106	45 mile	11062230	45 mile
11076824	45 mile	11263211	45 mile	11338211	45 mile	11410666	45 mile

### Job Hours

Date	On Location Hours	Operating Hours	Date	On Location Hours	Operating Hours	Date	On Location Hours	Operating Hours
<b>TOTAL</b>			Total is the sum of each column separately					

### Job

Formation Name								Date	Time	Time Zone
Formation Depth (MD)	Top		Bottom		Called Out	24 - Mar - 2011	02:00	MST		
Form Type		BHST			On Location	24 - Mar - 2011	10:30	MST		
Job depth MD	14000. ft	Job Depth TVD	13665. ft		Job Started	24 - Mar - 2011	00:00	MST		
Water Depth		Wk Ht Above Floor	4.7 ft		Job Completed	24 - Mar - 2011	00:00	MST		
Perforation Depth (MD)	From		To		Departed Loc	25 - Mar - 2011	16:00	MST		

### Well Data

Description	New / Used	Max pressure psig	Size in	ID in	Weight lbm/ft	Thread	Grade	Top MD ft	Bottom MD ft	Top TVD ft	Bottom TVD ft
6 1/8" Production Open Hole				6.125				10578.	14000.	10243.	13650.
4 1/2" Production Casing	New		4.5	3.826	15.1		P-110	.	13985.	.	13650.
7" Intermediate Casing	Unknown		7.	6.276	26.		P-110	.	10578.	.	10245.

### Tools and Accessories

Type	Size	Qty	Make	Depth	Type	Size	Qty	Make	Depth	Type	Size	Qty	Make
Guide Shoe					Packer					Top Plug			
Float Shoe					Bridge Plug					Bottom Plug			
Float Collar					Retainer					SSR plug set			
Insert Float										Plug Container			



Stage Tool										Centralizers			
<b>Miscellaneous Materials</b>													
Gelling Agt		Conc		Surfactant		Conc		Acid Type		Qty		Conc	%
Treatment Fld		Conc		Inhibitor		Conc		Sand Type		Size		Qty	
<b>Fluid Data</b>													
<b>Stage/Plug #: 1</b>													
Fluid #	Stage Type	Fluid Name			Qty	Qty uom	Mixing Density lbm/gal	Yield ft3/sk	Mix Fluid Gal/sk	Rate bbl/min	Total Mix Fluid Gal/sk		
1	TUNED SPACER III	TUNED SPACER III - SBM (483826)			80.00	bbl	10.5	.0	.0	6.0			
	37.58 gal/bbl	FRESH WATER											
	88.7 lbm/bbl	BARITE, 100 LB SK (100003680)											
2	Lightweight Tail Cement	VARICEM (TM) CEMENT (452009)			754.0	sacks	12.	2.44	11.98	6.0	11.98		
	11.98 Gal	FRESH WATER											
	0.179 lbm	WG-17, 50 LB SK (100003623)											
	0.44 lbm	SCR-100 (100003749)											
	14.465 lbm	SAND-SSA-1 - SILICA FLOUR - 200 MESH, BULK (100003691)											
3	NaCl Displacement				194.00	bbl	8.44	.0	.0	6.0			
	7.15 lbm/bbl	SALT, 100 LB BAG (100003652)											
<b>Calculated Values</b>		<b>Pressures</b>			<b>Volumes</b>								
Displacement		Shut In: Instant			Lost Returns			Cement Slurry			Pad		
Top Of Cement		5 Min			Cement Returns			Actual Displacement			Treatment		
Frac Gradient		15 Min			Spacers			Load and Breakdown			Total Job		
<b>Rates</b>													
Circulating		Mixing			Displacement			Avg. Job					
Cement Left In Pipe	Amount	89.39 ft	Reason	Shoe Joint									
Frac Ring # 1 @	ID		Frac ring # 2 @	ID		Frac Ring # 3 @	ID		Frac Ring # 4 @	ID			
The Information Stated Herein Is Correct					Customer Representative Signature								

# HALLIBURTON

## Lab Data

# HALLIBURTON

## Cementing Rockies, Meeker

## LAB RESULTS - Primary

### Job Information

Request/Slurry	134824/3	Rig Name	H&P 321	Date	12/MAR/2011
Submitted By	Isaac Whorl	Job Type	Production Casing	Bulk Plant	Meeker
Customer	ExxonMobil	Location	Rio Blanco	Well	PCU 296-5A6

### Well Information

Casing/Liner Size	4 1/2"	Depth MD	14028 ft	BHST	289 F
Hole Size	6 1/8"	Depth TVD	13696 ft	BHCT	224 F

### Drilling Fluid Information

Mud Company	Type	Density	9.7 PPG	PV/YP
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### Cement Information - Primary Design

Conc	UOM	Cement/Additive	Sample Type	Sample Date	Lot No.	Cement Properties		
		<b>Tuned Light</b>				Slurry Density	12.00	PPG
40	%	> Boral Craig Pozmix	Bulk	Mar 14, 2011	02-26-11	Slurry Yield	2.44	ft3/sk
15	%	> Enhancer 923	Bulk	Mar 14, 2011	01-18-11	Water Requirement	11.98	GPS
5.23	%	> HGS 10000 (PB)	Bulk	Mar 14, 2011	98021229905			
43	%	> Mountain G	Bulk	Mar 14, 2011	02-28-11			
20	%	> Silicalite - Compacted	Bulk	Mar 14, 2011	OG1709132			
100.00	% BWOC	Cement Blend				Water Source	Field (Fresh) Water	
14.147	% BWOC	SSA-1 (Silica Flour) - PB	Bulk	Mar 14, 2011	2010265AC	Water Chloride	N/A	ppm
0.500	% BWOC	Econolite (Powder - PB)	Bulk	Mar 14, 2011	U110210			
0.600	% BWOC	HALAD-344 (PB)	Bulk	Mar 14, 2011	BO321			
0.175	% BWOC	FWCA	Bulk	Mar 14, 2011	YJ2655S6D2			
0.430	% BWOC	SCR-100	Bulk	Mar 14, 2011	L10017			
0.500	% BWOC	D-Air 3000	Bulk	Mar 14, 2011	2010328AC			
11.98	gal/sack	Field (Fresh) Water	Lab	Feb 18, 2011	1-18-11			

### Operation Test Results Request ID 134824/3

#### UCA Comp. Strength, Request Test ID:1367625, Historical Data

End Temp (°F)	Pressure (psi)	50 psi (hh:mm)	500 psi (hh:mm)	12 hr CS (psi)	24 hr CS (psi)	48 hr CS (psi)	End CS (psi)
258	3,000	03:47	08:57	523	587	677	731

#### Thickening Time, Request Test ID:1367622, Historical Data

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)	100 Bc (hh:mm)
224	6,901	40	7	02:37	02:37	02:37	02:42	02:46

#### Mud Balance Density, Request Test ID:1367630, Historical Data

Density (SG)

## Mixability (0 - 5) - 0 is not mixable, Request Test ID:1367629, Historical Data

Mixability rating (0 - 5)

5

## Marsh Funnel, Request Test ID:1367631, Historical Data

Volume [ml]	Time [Sec]	Foam Quality
250	50	0

250 mL's reached in 50 seconds.

## Free Water, Request Test ID:1367627, Historical Data

Test Temp (°F)	% FW 45 Inc	Conditioning time
180	0	30

0 channeling, Trace F.W., 0 settling.

## API Rheology, Request Test ID:1367626, Historical Data

Temp (°F)	600	300	200	100	60	30	6	3	Cond Time (min)	PV/YP
80	157	92	70	45	34	26	14	10	20	79.4 / 16.1

## API Fluid Loss, Request Test ID:1367628, Historical Data

Test Temp (°F)	Test Pressure (psi)	Test Time (min)	Meas. Vol (< 30 min, cc)	Extr. ISO FL (cc/30 min)	Conditioning time (min)
180	1,000	30	27	54	30

27 mL's in 30:00 mins.

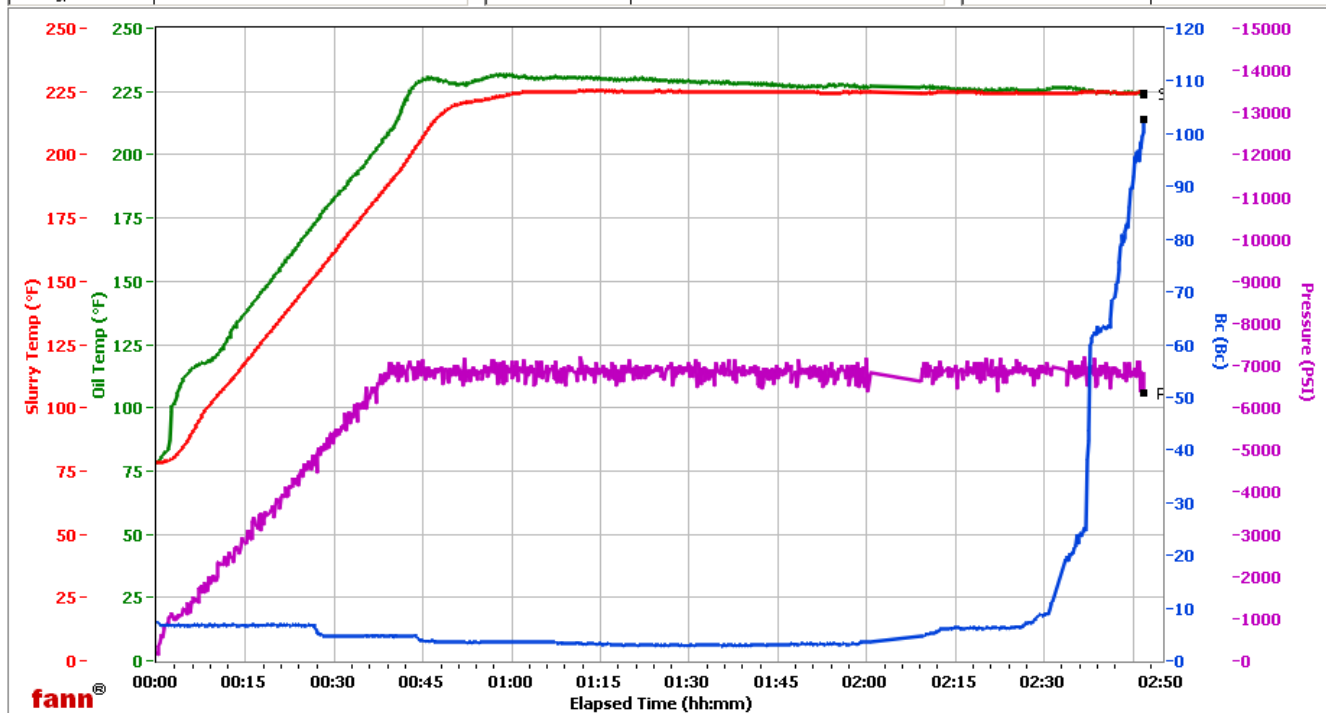
# HALLIBURTON

## WRCR

Fields	Values
Project Name	ExxonMobil 134824-3
Test ID	134824-3
Request ID	HPHT 4
Tested by	ac
Customer	ExxonMobil
Well No	PCU 296-5A6
Rig	H&P 321
Casing/Liner Size	

Fields	Values
Job Type	Prod Prim
Cement Type	G/Poz
Cement Weight	Light Weight
Test Date	01/01/70
Test Time	02:41 AM
Temp. Units	degF
Pressure Units	PSI

Events	Results
30.00 Bc	02h:37m
40.00 Bc	02h:37m
50.00 Bc	02h:37m
70.00 Bc	02h:42m
100.00 Bc	02h:46m
200.00 Bc	NaN
03h:00m	NaN
06h:00m	NaN



Data File O:\HPHT Data Files WRCR\WRCR Consistometer #4\ExxonMobil 134824-3.tdms

Comments 43/30% G/Poz, 0.430% SCR-100, 2.44 Yield, 12.001 Den

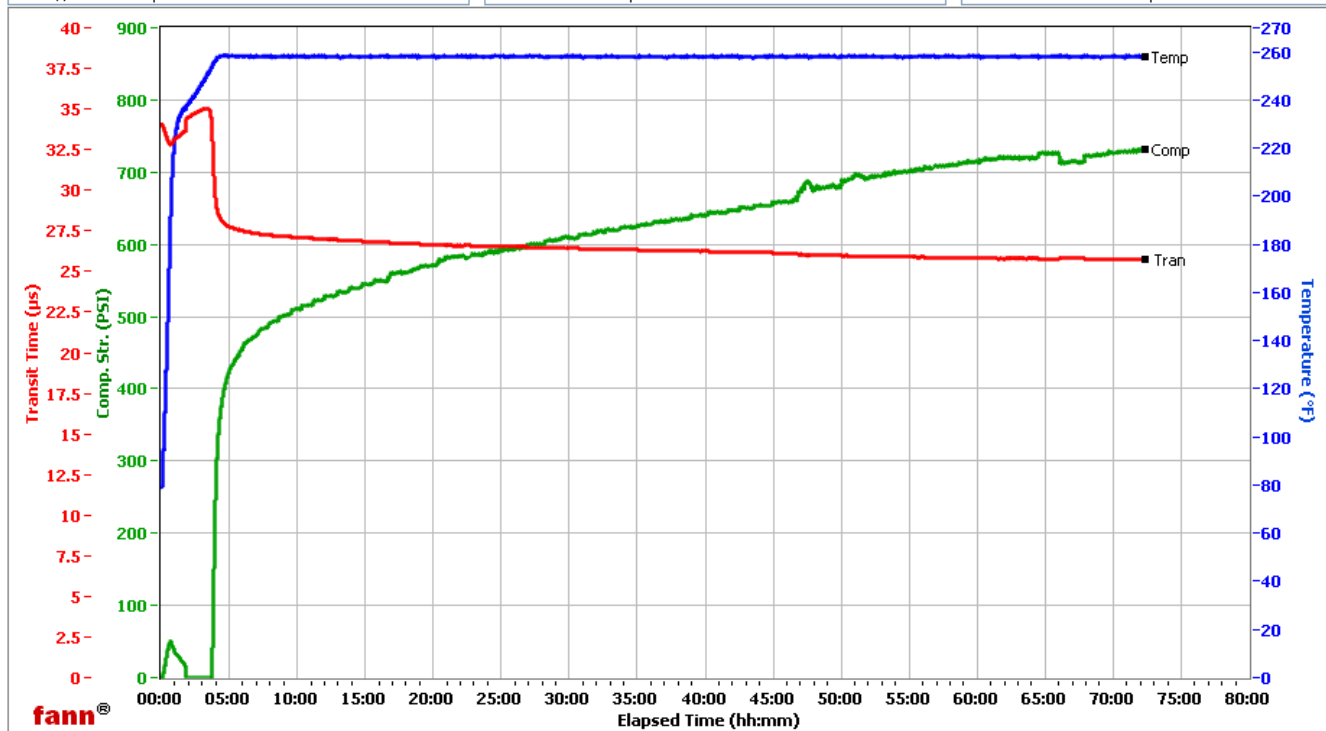
# HALLIBURTON

## WRCR

Fields	Values
Project Name	ExxonMobil 134824-3
Test ID	134824-3
Request ID	UCA 3
Tested by	ac
Customer	ExxonMobil
Well No	PCU 296-5A6
Rig	H&P 321
Casing/Liner Size	
Job Type	Prod Prim

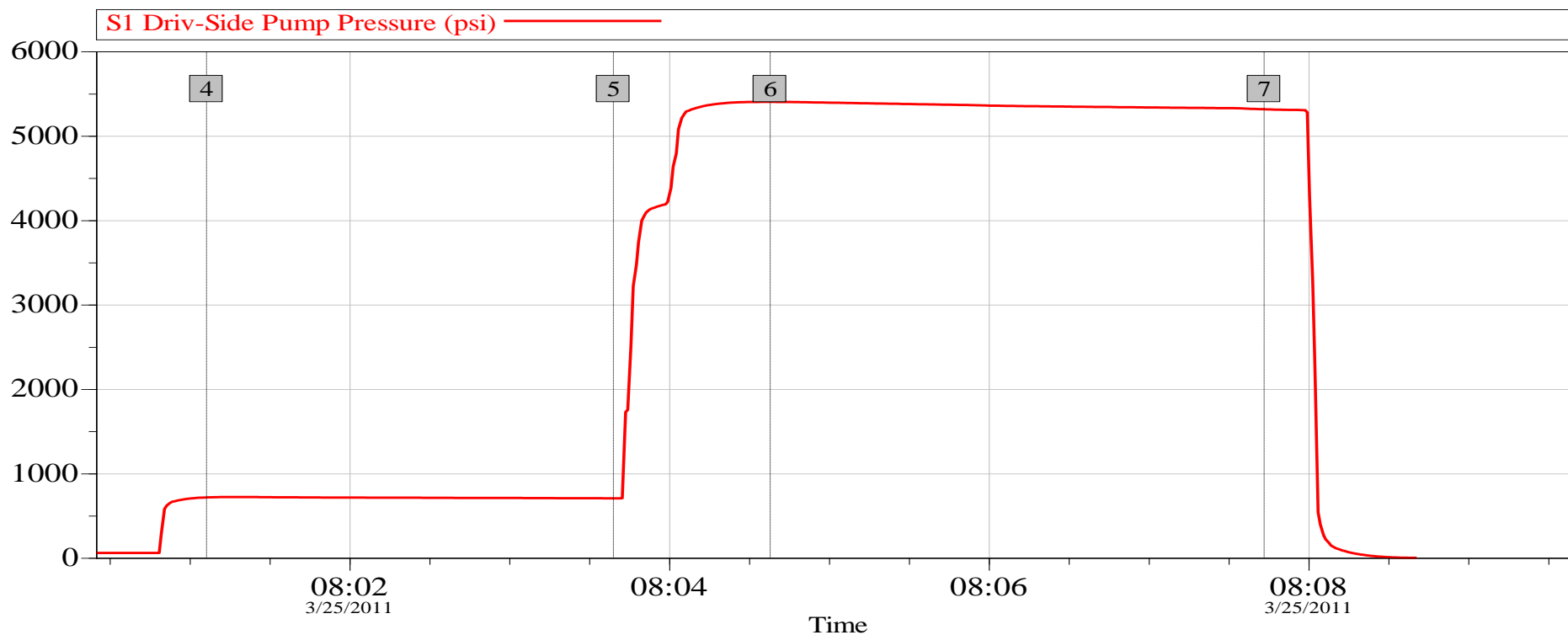
Fields	Values
Cement Type	G/Poz
Cement Weight	Light Weight
Comments	43/40% G/Poz, 0.430 SCR-100, 2.44 Yield,
Test Date	3/15/2011
Test Time	2:55 PM
Temp. Units	degF
Pressure Units	PSI

Events	Results
50.00 PSI	03h:47m
100.00 PSI	03h:50m
500.00 PSI	08h:57m
1000.00 PSI	NaN
06h:00m	456.30
12h:00m	523.45
24h:00m	587.34
48h:00m	676.82
72h:00m	731.30



Data File C:\Documents and Settings\UCA\My Documents\DATA\134824-3.tdms

## XOM PCU 296-5A6 Production Pressure Test 25 March 2011



Global Event Log					
Intersection			SDPP	Intersection	
4	Test Lines	08:01:06	715.9	5	End Low Pressure Test
6	Start High Pressure Test	08:04:38	5402	7	End High Pressure Test

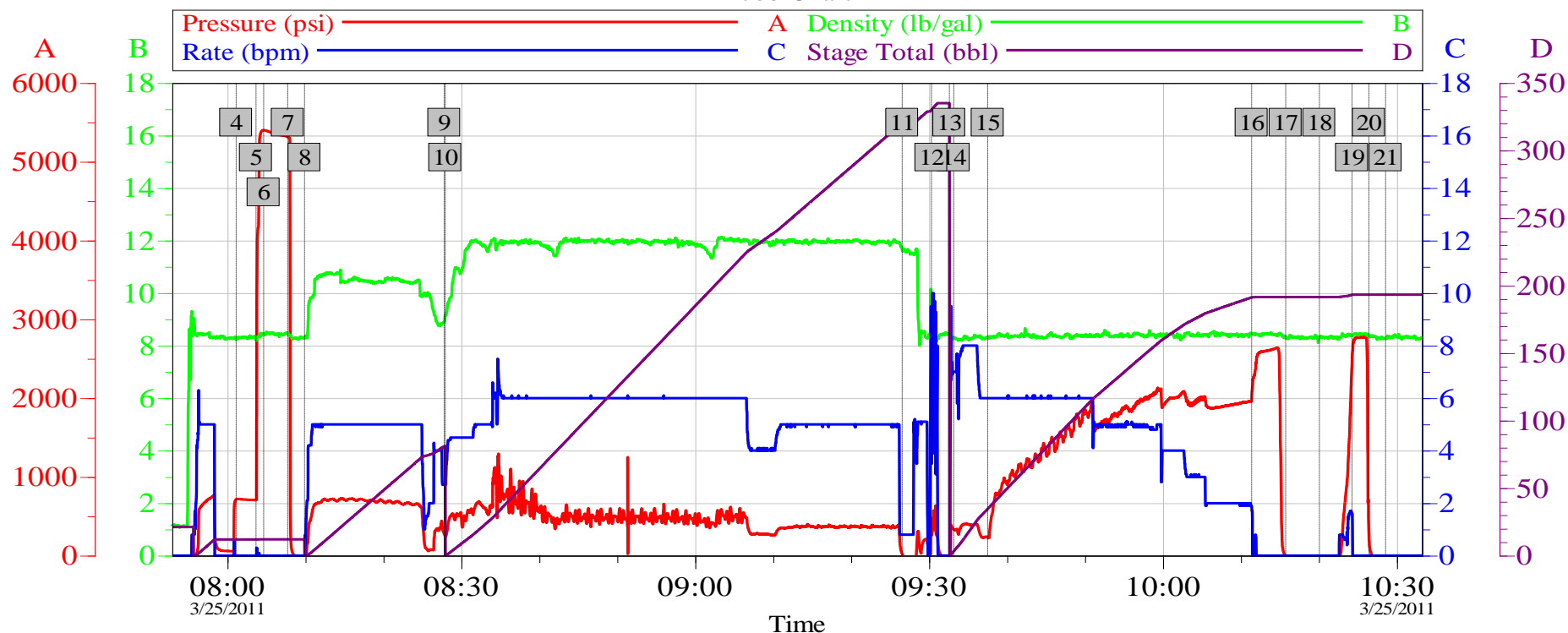
Customer:	Job Date: 24-Mar-2011	Sales Order #: 8033910
Well Description:	UWI:	

OptiCem v6.3.3  
25-Mar-11 08:23

# HALLIBURTON

## XOM PCU 296-5A6 4.5" Production Casing Cement Job

### Job Chart



4	Start Low Pressure Test	08:01:06	5	End Low Pressure Test	08:03:39	6	Start High Pressure Test	08:04:38
7	End High Pressure Test	08:07:43	8	Pump Spacer 1	08:09:53	9	Drop Bottom Plug	08:27:48
10	Pump Cement	08:27:56	11	Wash Up Lines	09:26:33	12	Resuming Job	09:30:17
13	Drop Top Plug	09:32:35	14	Pump Displacement	09:33:10	15	Catch Pressure	09:37:31
16	Bump Plug	10:11:22	17	Check Floats	10:15:44	18	Ending Job	10:20:03
19	Re-Bump Plug	10:24:15	20	Re- Check Floats	10:26:24	21	End Job	10:28:33

Customer:  
Well Description:

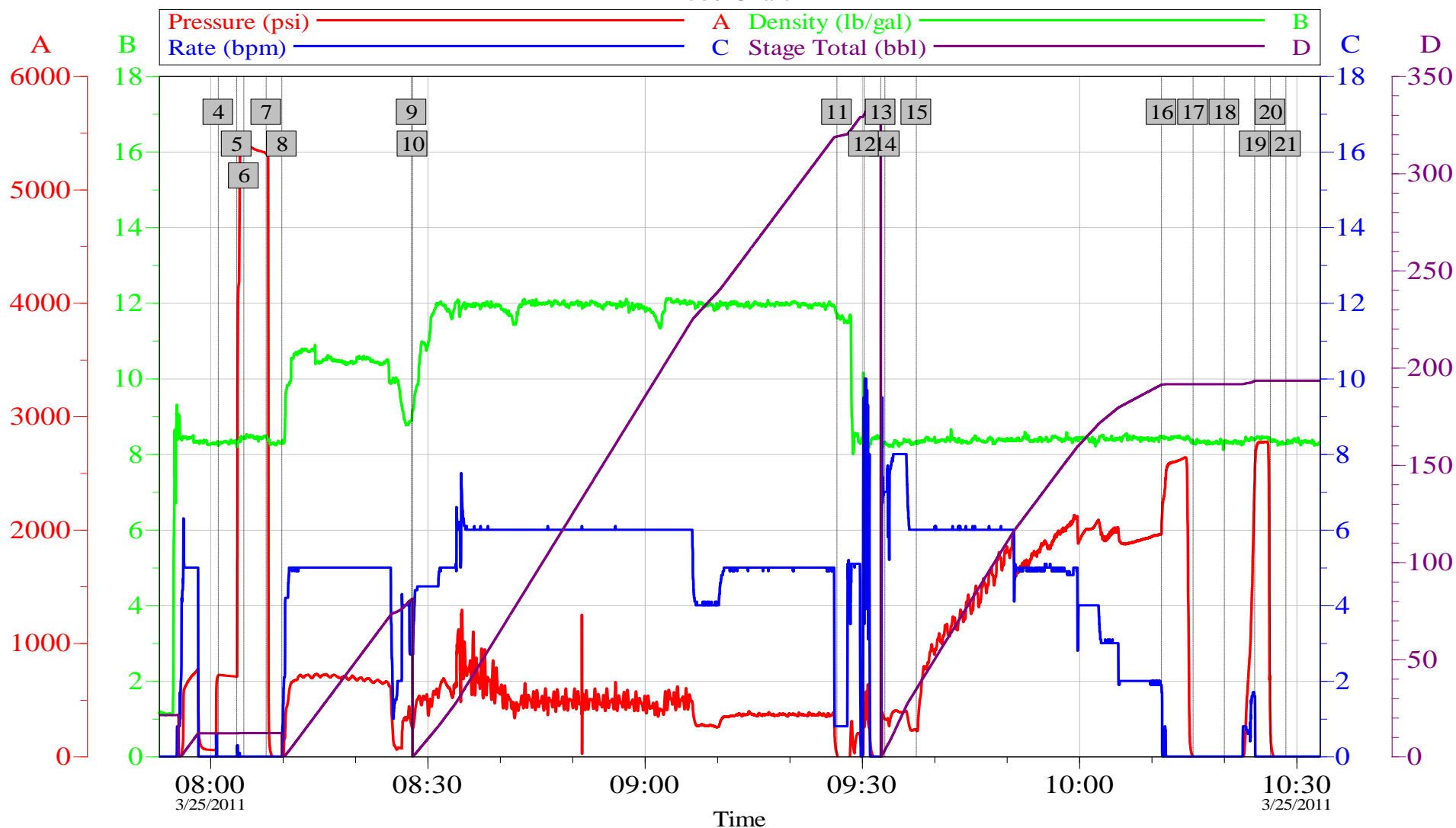
Job Date: 24-Mar-2011  
UWI:

Sales Order #: 8033910

OptiCem v6.4.9  
31-Mar-11 17:30

## XOM PCU 296-5A6 4.5" Production Casing Cement Job

Job Chart



Customer:  
Well Description:

Job Date: 24-Mar-2011  
UWI:

Sales Order #: 8033910

OptiCem v6.4.9  
31-Mar-11 17:30