

**HALLIBURTON**

**CHEVRON - MID-CONTINENT EBIZ  
11111 S WILCREST DR - DO NOT MAIL  
HOUSTON, Texas**

Emerald 93X

H&P 304

## **Post Job Summary**

# **Cement Production Casing**

Prepared for: Bryce Schroeder  
Date Prepared: June 23, 2011  
Version: 1

Service Supervisor: PAUU, SEMISI

Submitted by: Joshua Anglin

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## Wellbore Geometry

Job Tubulars					MD		TVD		Excess %	Shoe Joint Length ft
Type	Description	Size in	ID in	Wt lbm/ft	Top ft	Bottom ft	Top ft	Bottom ft		
Casing	Surface Casing	9.63	8.921	36.00	0.00	2,000.00				40.00
Open Hole Section	8-3/4" Hole		8.750		2,000.00	6,900.00			50.00	
Casing	Production Casing	7.00	6.366	23.00	0.00	6,900.00				40.00

## 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	0.00	30.0 bbl	30.0 bbl
1	2	Cement Slurry	Tuned Light	11.00		440.0 sacks	440.0 sacks
1	3	Cement Slurry	Tuned Light	11.70		350.0 sacks	350.0 sacks
1	4	Spacer	Brine Displacement	10.00	0.00		350.0 sacks

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## Fluids Pumped

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<b>Stage/Plug # 1</b>	<b>Fluid 1:</b>	Tuned Spacer III	88.7 lbm/bbl	Barite
TUNED SPACER III - SBM (483826)				Fluid Density: 10.50 lbm/gal
0 lbm/bbl	Fe-2			Fluid Volume: 30.00 bbl
0 gal/bbl	Musol(R) A			Pump Rate: 0.00 bbl/min
0 gal/bbl	Pen-5M			
0 gal/bbl	Dual Spacer Surfactant B			

<b>Stage/Plug # 1</b>	<b>Fluid 2:</b>	Tuned Light		
TUNED LIGHT (TM) SYSTEM				Fluid Weight: 11.00 lbm/gal
0 lbm	CFR-3			Slurry Yield: 2.20 ft3/sack
0.25 lbm	Poly-E-Flake			Total Mixing Fluid: 9.48 Gal
				Surface Volume: 440.0 sacks
				Sacks: 440.0 sacks
				Calculated Fill: 4,750.00 ft
				Calculated Top of Fluid: 0.00 ft
				Estimated Top of Fluid:

<b>Stage/Plug # 1</b>	<b>Fluid 3:</b>	Tuned Light		
TUNED LIGHT (TM) SYSTEM				Fluid Weight: 11.70 lbm/gal
0.4 lbm	HR-800			Slurry Yield: 1.72 ft3/sack
0.3 lbm	D-AIR 3000			Total Mixing Fluid: 5.92 Gal
0.25 lbm	Poly-E-Flake			Surface Volume: 350.0 sacks
				Sacks: 350.0 sacks
				Calculated Fill: 2,150.00 ft
				Calculated Top of Fluid: 4,750.00 ft
				Estimated Top of Fluid:

<b>Stage/Plug # 1</b>	<b>Fluid 4:</b>	Brine Displacement		
DUMMY MUD / FLUSH / SPACER SBC MATERIAL				Fluid Density: 10.00 lbm/gal
				Pump Rate: 0.00 bbl/min

# HALLIBURTON

## Job Summary

### Job Information

Job Start Date	5/27/2011 10:00:00 PM
Job MD	6,900.0 ft
Job TVD	6,428.0 ft
Height of Plug Container/Swage Above Rig Floor	6.0 ft
Surface Temperature at Time of Job	80 degF
Mud Type	Water Based Mud
Actual Mud Density	9 lbm/gal
Time Circulated before job	2.00 hour(s)
Rate at Which Well was Circulated	5.000 bbl/min
Pipe Movement During Hole Circulation	None
Time From End Mud Circ. to Job Start	15.00 minute
Pipe Movement During Cementing	None
Calculated Displacement	270.06 bbl
Job Displaced by (rig/halco)	Cement Unit HP Pumps
Annular flow Before Job? (Water/Gas)	No
Annular flow After Job? (Water/Gas)	No
Length of Rat Hole	42.00 ft

### Cementing Equipment

Number of Centralizers Used	14
Pipe Centralization	Through Production Intervals
Brand of Float Equipment Used	HALLIBURTON
Did Float Equipment Hold?	Yes
Plug set used?	Yes
Brand of Plug set used?	HALLIBURTON
Did Plugs Bump?	Yes
Did Stage Cementing Tool Open Properly?	Unknown



# HALLIBURTON

## Service Supervisor Reports

### Job Log

Date/Time	Chart #	Activity Code	Pump Rate	Cum Vol	Pump	Pressure (psig)	Comments
05/27/2011 13:00		Call Out					
05/27/2011 14:25		Pre-Convoy Safety Meeting					
05/27/2011 16:30		Arrive at Location from Service Center					
05/27/2011 16:45		Pre-Rig Up Safety Meeting					
05/27/2011 17:00		Rig-Up Equipment					
05/27/2011 18:00		Rig-Up Completed					
05/27/2011 21:30		Pre-Job Safety Meeting					
05/27/2011 22:00		Test Lines	2			5000.0	Started high pressure test, brought lines up to 5000 psi. held for 5 min with no leaks
05/27/2011 22:05		Pump Spacer	4	30			Pumped 28bbl tuned spacer at avg of 4bpm
05/27/2011 22:12		Pump Lead Cement	6	172.4		300.0	Pumped Lead Cement @ 6 bpm, 2.2ft3/sk Water rer 9.48gps
05/27/2011 22:41		Pump Tail Cement	5	107.2		280.0	Pumped Tail Cement @ 5 bpm, 1.72ft3/sk Water rer 5.93gps
05/27/2011 23:02		Clean Lines					Wash Lines to the Pit
05/27/2011 23:10		Drop Top Plug					7" HWE top plug dropped by Mike Still
05/27/2011 23:12		Pump Displacement	6	245.5		169.0	Started our 10#/gal brine displacement
05/27/2011 23:37		Slow Rate	5	249.5		466.0	Slow rate to 5bpm 160 bbl gone
05/27/2011 23:41		Slow Rate	4	249.5		530.0	Slow rate to 4bpm 170 bbl gone
05/27/2011 23:43		Slow Rate	3	249.5		650.0	Slow rate to 3bpm 180 bbl gone

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Date/Time	Chart #	Activity Code	Pump Rate	Cum Vol	Pump		Pressure (psig)	Comments
05/28/2011 00:00		Slow Rate	2	249.5			1060. 0	Slow rate to bump plug to 2 bpm 230 bbl gone Spacer back to surface
05/28/2011 00:09		Bump Plug	2	249.5			1300. 0	Bumped Plug at 1300 psi, pressured over to 2300 psi as per company man's request
05/28/2011 00:11		Check Floats						Checked floats back to truck. Floats held with 1.5 bbls back to the truck
05/28/2011 00:15		Post-Job Safety Meeting (Pre Rig-Down)						
05/28/2011 00:30		Rig-Down Equipment						
05/28/2011 01:30		Rig-Down Completed						
05/28/2011 01:45		Pre-Convoy Safety Meeting						
05/28/2011 02:00		Depart Location for Service Center or Other Site						Job chart created by Semisi Pauu

### The Road to Excellence Starts with Safety

<b>Sold To #:</b> 338668	<b>Ship To #:</b> 2853126	<b>Quote #:</b>	<b>Sales Order #:</b> 8188290
<b>Customer:</b> CHEVRON - MID-CONTINENT EBIZ		<b>Customer Rep:</b> Kavander, Chad	
<b>Well Name:</b> Emerald		<b>Well #:</b> 93X	<b>API/UWI #:</b>
<b>Field:</b> RANGELY	<b>City (SAP):</b> RANGELY	<b>County/Parish:</b> Rio Blanco	<b>State:</b> Colorado
<b>Contractor:</b> H&P		<b>Rig/Platform Name/Num:</b> H&P 304	
<b>Job Purpose:</b> Cement Production Casing			
<b>Well Type:</b> Development Well		<b>Job Type:</b> Cement Production Casing	
<b>Sales Person:</b> GROFF, THEODORE		<b>Srvc Supervisor:</b> PAUU, SEMISI	<b>MBU ID Emp #:</b> 445202

### Job Personnel

HES Emp Name	Exp Hrs	Emp #	HES Emp Name	Exp Hrs	Emp #	HES Emp Name	Exp Hrs	Emp #
BROWN, PAUL		491062	DUBE, CRAIG		476241	FUCHS, ERIC James		471203
HUNTER, SAMUEL David		479669	PAUU, SEMISI Tu'a		445202	SAGE, JAMES Edwin		470468
STILL, MICHEAL Wayne		258213						

### Equipment

HES Unit #	Distance-1 way	HES Unit #	Distance-1 way	HES Unit #	Distance-1 way	HES Unit #	Distance-1 way
10261036	45 mile	10616259	45 mile	10897881	45 mile	11071474	45 mile
11307422	45 mile						

### Job Hours

Date	On Location Hours	Operating Hours	Date	On Location Hours	Operating Hours	Date	On Location Hours	Operating Hours

**TOTAL** Total is the sum of each column separately

### Job

### Job Times

Formation Name	Formation Depth (MD)	Top	Bottom	Form Type	Job depth MD	Job Depth TVD	Water Depth	Perforation Depth (MD)	From	To	Called Out	Date	Time	Time Zone
				BHST	6900. ft	6428. ft						27 - May - 2011	13:00	CST
											On Location	27 - May - 2011	16:30	CST
											Job Started	27 - May - 2011	22:00	CST
											Job Completed	28 - May - 2011	00:15	CST
											Departed Loc	28 - May - 2011	02:00	CST

### 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
8-3/4" Hole				8.75				2000.	6900.		
Production Casing	New		7.	6.366	23.		K-55		6900.		
Surface Casing	New		9.625	8.921	36.		H-40		2000.		

### 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			

### Miscellaneous Materials

Gelling Agt	Conc	Surfactant	Conc	Acid Type	Qty	Conc	%
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Summit  
Version:

Thursday, June 23, 2011 13:56:00



**HALLIBURTON****Cementing Job Summary**

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 ft <sup>3</sup> /sk	Mix Fluid Gal/sk	Rate bbl/min	Total Mix Fluid Gal/sk
1	Tuned Spacer III	TUNED SPACER III - SBM (483826)	30.00	bbl	10.5	.0	.0	.0	
	37.58 gal/bbl	FRESH WATER							
2	Tuned Light	TUNED LIGHT (TM) SYSTEM (452984)	440.0	sacks	11.	2.2	9.48		9.48
	9.48 Gal	FRESH WATER							
3	Tuned Light	TUNED LIGHT (TM) SYSTEM (452984)	350.0	sacks	11.7	1.72	5.92		5.92
	5.92 Gal	FRESH WATER							
4	Brine Displacement			bbl	10.	.0	.0	.0	
<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	40 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 Sign ature					

Summit  
Version:

Thursday, June 23, 2011 13:56:00



# HALLIBURTON

## Lab Data

# HALLIBURTON

Cementing Rockies, Vernal

LAB RESULTS - Lead

### Job Information

Request/Slurry	149802/1	Rig Name	H&P 304	Date	20/MAY/2011
Submitted By	Craig Dube	Job Type	Production Casing	Bulk Plant	Vernal
Customer	Chevron	Location	Rio Blanco	Well	Emerald 93X

### Well Information

Casing/Liner Size	7"	Depth MD	6900 ft	BHST	163 F
Hole Size	8 3/4"	Depth TVD	6900 ft	BHCT	111 F

### Drilling Fluid Information

Mud Company	Type	Density	PV/YP
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### Cement Information - Lead Design

Conc	UOM	Cement/Additive	Sample Type	Sample Date	Lot No.	Cement Properties		
		Tuned Light				Slurry Density	11.00	PPG
						Slurry Yield	2.2	ft3/sk
						Water Requirement	9.48	GPS

Water Source	Fresh Water
Water Chloride	N/A ppm

### Operation Test Results Request ID 149802/1

#### UCA Comp. Strength, Request Test ID:1505554, 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)	End Time (hrs)
151	3,000	02:04	04:14	1,830	2,021	2,114	2,151	72

#### Thickening Time, Request Test ID:1505553, Historical Data

Temp (°F)	Pressure (psi)	Reached in (min)	Start BC	30 Bc (hh:mm)	50 Bc (hh:mm)	70 Bc (hh:mm)	100 Bc (hh:mm)
111	4,130	37	36	00:00	02:53	04:33	05:30

#### Marsh Funnel, Request Test ID:1505975, Historical Data

Volume [ml]	Time [Sec]	Foam Quality
136	120	0

# HALLIBURTON

## Free Water, Request Test ID:1505973, Historical Data

Test Temp (°F)	% FW 45 Inc	Conditioning time
111	0	20

## API Rheology, Request Test ID:1505974, Historical Data

Temp (°F)	600	300	200	100	60	30	6	3	Cond Time (min)	PV/YP
80	282	202	150	97	73	52	33	25	20	173.4 / 34.4

# HALLIBURTON

## Cementing Rockies, Vernal

## LAB RESULTS - Tail

### Job Information

Request/Slurry	150007/2	Rig Name	H&P 304	Date	21/MAY/2011
Submitted By	Craig Dube	Job Type	Production Casing	Bulk Plant	Vernal
Customer	Chevron	Location	Rio Blanco	Well	Emerald 93X

### Well Information

Casing/Liner Size	7"	Depth MD	6900 ft	BHST	163 F
Hole Size	8 3/4"	Depth TVD	6900 ft	BHCT	111 F

### Drilling Fluid Information

Mud Company	Type	Density	PV/YP
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### Cement Information - Tail Design

Conc	UOM	Cement/Additive	Sample Type	Sample Date	Lot No.	Cement Properties	
						Slurry Density	11.70 PPG
						Slurry Yield	1.72 ft3/sk
71.28	%	> Mountain G	Bulk	May 21, 2011		Water Requirement	5.93 GPS
5.93	gal/sack	Fresh Water	Lab	Jul 07, 2010	07/07/2010		
						Water Source	Fresh Water
						Water Chloride	N/A ppm

### Operation Test Results Request ID 150007/2

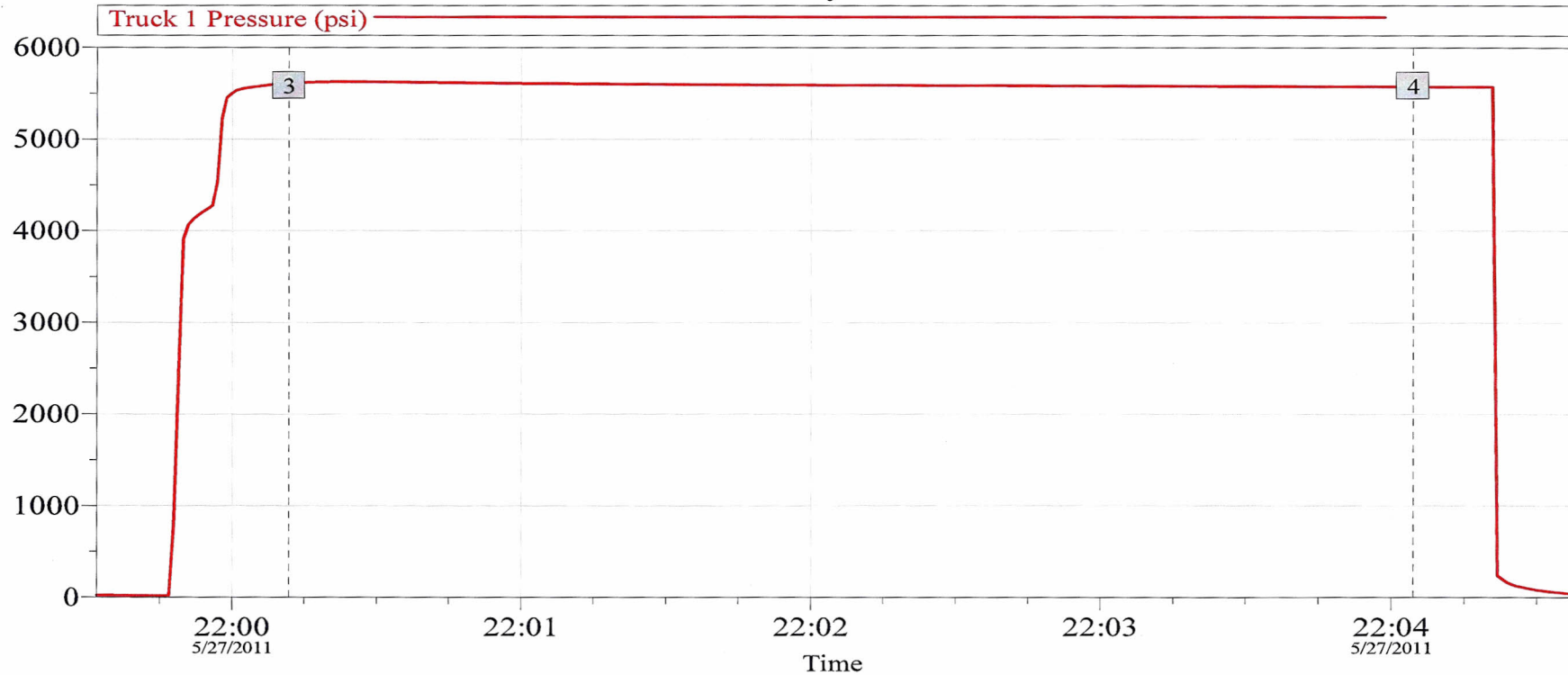
## Thickening Time, Request Test ID:1507826, Historical Data

Temp (°F)	Pressure (psi)	Reached in (min)	Start BC	30 Bc (hh:mm)	50 Bc (hh:mm)	70 Bc (hh:mm)	100 Bc (hh:mm)
111	4,130	37	26	02:40	02:42	02:42	02:46

# HALLIBURTON

## Data Acquisition

### Chevron Emerald 93X 7" Production Cement Job Pressure Test 27 May 2011



#### Global Event Log

Intersection	TIP	Intersection	TIP
3 Start High Pressure Test 22:00:12	5612	4 End High Pressure Test 22:04:04	5577

Customer: CHEVRON ENERGY TECHNOLOGY CO  
Well Description: Emerald 93X

Job Date: 27-May-2011  
UWI: 05-103-11858

Sales Order #: 8188290  
Rig: H&P 304

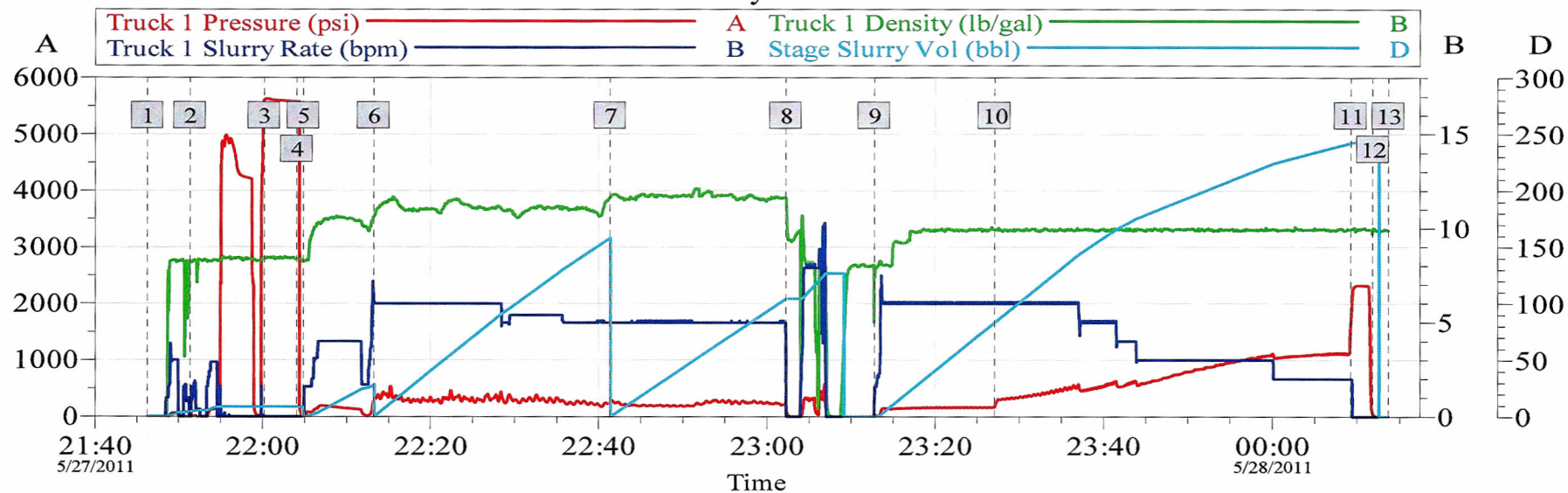
OptiCem v6.4.10  
27-May-11 22:09



## Chevron Emerald 93X 7" Production Cement Job

### Job Chart

27 May 2011



### Global Event Log

1 Starting Job	5/27/2011 21:46:16	2 Test Lines	5/27/2011 21:51:21
3 Start High Pressure Test	5/27/2011 22:00:12	4 End High Pressure Test	5/27/2011 22:04:04
5 Pump Spacer	5/27/2011 22:04:51	6 Pump Lead Cement	5/27/2011 22:13:13
7 Pump Tail Cement	5/27/2011 22:41:21	8 Clean Lines	5/27/2011 23:02:12
9 Drop Plug	5/27/2011 23:12:44	10 Catch Pressure	5/27/2011 23:27:02
11 Bump Plug	5/28/2011 00:09:12	12 Check Floats	5/28/2011 00:11:49
13 Ending Job	5/28/2011 00:13:39		

Customer: CHEVRON ENERGY TECHNOLOGY CO  
Well Description: Emerald 93X

Job Date: 27-May-2011  
UWI: 05-103-11858

Sales Order #: 8188290  
Rig: H&P 304

OptiCem v6.4.10  
28-May-11 00:15