

QUICKSILVER RESOURCES INC-EBUSINESS  
DO NOT MAIL-801 CHERRY ST  
FORT WORTH, Texas

K-Diamond Federal 21-21

**DHS 6**

## **Post Job Summary**

# **Cement Surface Casing**

Prepared for: Ryan Hord  
Date Prepared: July 31, 2011  
Version: 1

Service Supervisor: ASHBY, ANDREW

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
Open Hole Section	Surface Open Hole		12.250		0.00	1,200.00			100.00	0.00
Casing	Surface Casing	9.63	8.921	36.00	0.00	1,200.00				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	SUPER FLUSH 101	10.00	0.00	20.0 bbl	20.0 bbl
1	2	Cement Slurry	VariCem V1	12.30		200.0 sacks	200.0 sacks
1	3	Cement Slurry	VariCem V1	13.50		195.0 sacks	195.0 sacks
1	4	Spacer	Water Based Mud	8.40	0.00	90.0 bbl	90.0 bbl
1	5	Cement Slurry	HalCem Top Out	15.80		24.0 sacks	24.0 sacks

# HALLIBURTON

## Fluids Pumped

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**Stage/Plug # 1    Fluid 1:**    SUPER FLUSH 101  
SUPER FLUSH 101 - SBM (12199)

Fluid Density: 10.00 lbm/gal  
Fluid Volume: 20.00 bbl  
Pump Rate: 0.00 bbl/min

**Stage/Plug # 1    Fluid 2:**    VariCem V1  
VARICEM (TM) CEMENT  
0.125 lbm    Poly-E-Flake

Fluid Weight: 12.30 lbm/gal  
Slurry Yield: 2.24 ft<sup>3</sup>/sack  
Total Mixing Fluid: 12.95 Gal  
Surface Volume: 200.0 sacks  
Sacks: 200.0 sacks  
Calculated Fill: 700.00 ft  
Calculated Top of Fluid: 0.00 ft  
Estimated Top of Fluid:

**Stage/Plug # 1    Fluid 3:**    VariCem V1  
VARICEM (TM) CEMENT  
0.125 lbm    Poly-E-Flake

Fluid Weight: 13.50 lbm/gal  
Slurry Yield: 1.72 ft<sup>3</sup>/sack  
Total Mixing Fluid: 9.07 Gal  
Surface Volume: 195.0 sacks  
Sacks: 195.0 sacks  
Calculated Fill: 500.00 ft  
Calculated Top of Fluid: 700.00 ft  
Estimated Top of Fluid:

**Stage/Plug # 1    Fluid 4:**    Water Based Mud  
DUMMY MUD / FLUSH / SPACER SBC MATERIAL

Fluid Density: 8.40 lbm/gal  
Fluid Volume: 90.00 bbl  
Pump Rate: 0.00 bbl/min

**Stage/Plug # 1    Fluid 5:**    HalCem Top Out  
HALCEM (TM) SYSTEM  
2 %    Calcium Chloride

Fluid Weight: 15.80 lbm/gal  
Slurry Yield: 1.20 ft<sup>3</sup>/sack  
Total Mixing Fluid: 5.26 Gal  
Surface Volume: 24.0 sacks  
Sacks: 24.0 sacks  
Estimated Top of Fluid:

# HALLIBURTON

## Job Summary

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### Job Information

<b>Job Start Date</b>	7/7/2011 8:00:00 AM
<b>Job MD</b>	1,217.0 ft
<b>Job TVD</b>	1,217.0 ft
<b>Height of Plug Container/Swage Above Rig Floor</b>	5.0 ft
<b>Surface Temperature at Time of Job</b>	80 degF
<b>Mud Type</b>	LSND
<b>Actual Mud Density</b>	9 lbm/gal
<b>Pipe Movement During Hole Circulation</b>	Reciprocated
<b>Pipe Movement During Cementing</b>	None
<b>Calculated Displacement</b>	89.68 bbl
<b>Job Displaced by (rig/halco)</b>	Cement Unit HP Pumps
<b>Length of Rat Hole</b>	1.00 ft

### Cementing Equipment

<b>Number of Centralizers Used</b>	12
<b>Pipe Centralization</b>	Through Entire Cement Column
<b>Did Float Equipment Hold?</b>	Yes
<b>Brand of Plug set used?</b>	Halliburton
<b>Did Plugs Bump?</b>	Unknown
<b>Did Stage Cementing Tool Open Properly?</b>	Unknown

# HALLIBURTON

## Service Supervisor Reports

### Job Log

Date/Time	Char t #	Activity Code	Pump Rate	Cum Vol	Pump	Pressure (psig)	Comments
07/06/2011 16:30		Call Out					Crew Called out for Job. Requested on location @ 21:00. Plug Container# D0776,C
07/06/2011 18:00		Pre-Convoy Safety Meeting					Met w/crew to discuss safety and hazards of travel to location
07/06/2011 18:15		Depart from Service Center or Other Site					Entered into Journey Management.
07/06/2011 21:00		Arrive At Loc					Ended Journey Management. Still Logging, haven't started casing.
07/06/2011 21:30		Assessment Of Location Safety Meeting					Met w/crew to discuss hazards of site, location of materials and safety precautions.
07/07/2011 05:00		Other					Spot Equipment - Casing crew finished & off location.
07/07/2011 05:30		Pre-Rig Up Safety Meeting					Met w/crew to discuss the best way to rig up, safety and hazards involved.
07/07/2011 05:45		Rig-Up Equipment					Rig up Ground & Standpipe
07/07/2011 07:00		Pre-Job Safety Meeting					Met w/Rig Crew, Co. Rep, and our crew to discuss job procedres, contingencies, and safety measures.

# HALLIBURTON

Date/Time	Chart #	Activity Code	Pump Rate	Cum Vol	Pump	Pressure (psig)	Comments
07/07/2011 07:15		Rig-Up Equipment					Rig-up the rig floor.
07/07/2011 07:41		Other	2	3		45.0	Fill Lines with fresh water for pressure test - Leak on the manifold - tighten & pump additional 1 bbl.
07/07/2011 07:47		Test Lines				5365.0	Pressure test iron to 5000 psi - psi started falling immediately, checked for leaks - no leaks - pressured up to 5365 psi & lost 70 psi in 4 min.
07/07/2011 07:59		Pump Water	1.7	5		45.0	Fresh Water Spacer
07/07/2011 07:59		Pump Spacer	3.2	20		81.0	SuperFlush 101 Spacer
07/07/2011 08:06		Pump Water	3	10		60.0	Fresh Water Spacer
07/07/2011 08:10		Pump Lead Cement	5.2	79.8		183.0	200 sks VariCem V1 Lead @ 12.3 lbm/gal, 2.24 cuft/sk, 12.95 gal/sk - (bbl counter read 68.9 bbls)
07/07/2011 08:23		Pump Tail Cement	5	59.7		140.0	195 sks VariCem V1 Tail @ 13.5 lbm/gal, 1.72 cuft/sk, 9.07 gal/sk - (bbls counter read 53 bbls)
07/07/2011 08:35		Shutdown					Shutdown / Drop Top Plug (Co. Rep Witnessed)
07/07/2011 08:43		Pump Displacement	4	90.5		31.0	Displacement = 90 bbls Mud
07/07/2011 08:47		Other	5.5			129.0	Increase Rate to 5.5 bpm

# HALLIBURTON

Date/Time	Char t #	Activity Code	Pump Rate	Cum Vol	Pump	Pressure (psig)	Comments
07/07/2011 08:53		Pump Water	5.5			207.0	Had trouble w/getting mud - Co. Rep. said to swap to water to finish displacement.
07/07/2011 08:59		Slow Rate	3			318.0	Slow displacement rate to 3 bpm to bump plug.
07/07/2011 09:03		Bump Plug	3			769.0	Bump plug after 88 barrels displacement gone. Over pressure to 1000 psi per Co. Rep.
07/07/2011 09:12		Check Floats				878.0	Held for 8 min, bled off pressure - 1/2 bbl back.
07/07/2011 11:12		Other					Mix Calcium Chloride into mix water and mix up 5 bbls of cement
07/07/2011 11:21		Pump Water	1	2		33.0	Pump Water Spacer to clear tubing.
07/07/2011 11:23		Pump Cap Cement	1	2.5		36.0	24 sks of G-Neat Cement w/ 2% CaCl @ 15.8 lbm/gal, 1.20 cuft/sk, 5.26 gal/sk
07/07/2011 11:25		Shutdown					Pump until we see good cement to surface - Co. Rep. shutdown @ 2.5 bbls gone.
07/07/2011 11:30		End Job					Job Complete
07/07/2011 11:35		Post-Job Safety Meeting (Pre Rig-Down)					Met w/crew to discuss rigging down safely.
07/07/2011 11:45		Rig-Down Equipment					Rig everything down.
07/07/2011 14:15		Pre-Convoy Safety Meeting					Met w/crew to discuss fit-for-duty, safety and hazards of travel back.

# HALLIBURTON

Date/Time	Chart #	Activity Code	Pump Rate	Cum Vol	Pump		Pressure (psig)		Comments
07/07/2011 14:30		Depart Location for Service Center or Other Site							Entered into Journey Management.
07/07/2011 14:30		Other							Thanks for using Halliburton!!!

**The Road to Excellence Starts with Safety**

<b>Sold To #:</b> 346707	<b>Ship To #:</b> 2864112	<b>Quote #:</b>	<b>Sales Order #:</b> 8297231
<b>Customer:</b> QUICKSILVER RESOURCES INC-EBUSINESS		<b>Customer Rep:</b> Hord, Ryan	
<b>Well Name:</b> K-Diamond Federal		<b>Well #:</b> 21-21	<b>API/UWI #:</b>
<b>Field:</b>	<b>City (SAP):</b> CRAIG	<b>County/Parish:</b>	<b>State:</b> Colorado
<b>Legal Description:</b> Section 21 Township 6N Range 92W			
<b>Contractor:</b> DHS		<b>Rig/Platform Name/Num:</b> 6	
<b>Job Purpose:</b> Cement Surface Casing			
<b>Well Type:</b> Exploratory / Wildcat		<b>Job Type:</b> Cement Surface Casing	
<b>Sales Person:</b> SCOTT, KYLE		<b>Srvc Supervisor:</b> ASHBY, ANDREW	<b>MBU ID Emp #:</b> 450544

**Job Personnel**

HES Emp Name	Exp Hrs	Emp #	HES Emp Name	Exp Hrs	Emp #	HES Emp Name	Exp Hrs	Emp #
ASHBY, ANDREW A		450544	BONE, JEFFERSON Eldon		491216	FUCHS, ANDREW Peter		489821
GAMBLES, BRAYDEN Kade		469413						

**Equipment**

HES Unit #	Distance-1 way						
10616259	80 mile	10991613	80 mile	11019277	80 mile	11071474	80 mile
11127525	80 mile	11189139	80 mile	11526494	80 mile		

**Job Hours**

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

**Job**

**Job Times**

Formation Name	Top	Bottom	Called Out	Date	Time	Time Zone
<b>Form Type</b>		BHST	<b>On Location</b>	06 - Jul - 2011	21:00	MST
<b>Job depth MD</b>	1217. ft	<b>Job Depth TVD</b>	<b>Job Started</b>	07 - Jul - 2011	08:00	MST
<b>Water Depth</b>		<b>Wk Ht Above Floor</b>	<b>Job Completed</b>	07 - Jul - 2011	11:30	MST
<b>Perforation Depth (MD)</b>	<b>From</b>	<b>To</b>	<b>Departed Loc</b>	07 - Jul - 2011	14:30	MST

**Well Data**

Description	New / Used	Max pressure psig	Size in	ID in	Weight lbf/ft	Thread	Grade	Top MD ft	Bottom MD ft	Top TVD ft	Bottom TVD ft
Surface Open Hole				12.25				.	1200.		
Surface Casing	Unknown		9.625	8.921	36.		J-55	.	1200.		

**Sales/Rental/3<sup>rd</sup> Party (HES)**

Description	Qty	Qty uom	Depth	Supplier
PLUG,CMTG, TOP, 9 5/8, HWE, 8.16 MIN/9.06 MA	1	EA		

**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	%
Treatment Fld		Conc		Inhibitor		Conc		Sand Type		Size		Qty	

### Fluid Data

#### Stage/Plug #: 1

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	SUPER FLUSH 101	SUPER FLUSH 101 - SBM (12199)	20.00	bbl	10.	.0	.0	.0	
2	VariCem V1	VARICEM (TM) CEMENT (452009)	200.0	sacks	12.3	2.24	12.95		12.95
		0.125 lbm POLY-E-FLAKE (101216940)							
		12.954 Gal FRESH WATER							
3	VariCem V1	VARICEM (TM) CEMENT (452009)	195.0	sacks	13.5	1.72	9.07		9.07
		0.125 lbm POLY-E-FLAKE (101216940)							
		9.065 Gal FRESH WATER							
4	Water Based Mud		90.00	bbl	8.4	.0	.0	.0	
5	HalCem Top Out	HALCEM (TM) SYSTEM (452986)	24.0	sacks	15.8	1.2	5.26		5.26
		2 % CALCIUM CHLORIDE - HI TEST PELLET (100005053)							
		5.26 Gal FRESH WATER							

Calculated Values	Pressures	Volumes
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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

#### Rates

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

<p>The Information Stated Herein Is Correct</p>	<p><b>Customer Representative Signature</b></p>
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# HALLIBURTON

## Lab Data

# HALLIBURTON

Cementing Rockies, Vernal

LAB RESULTS - Lead

### Job Information

Request/Slurry	159997/1	Rig Name	DHS DRILLING #6	Date	06/JUL/2011
Submitted By	Craig Dube	Job Type	Surface Casing	Bulk Plant	Vernal
Customer	Quicksilver Resources Inc.	Location	Moffat	Well	K-Diamond Federal 21-21

### Well Information

Casing/Liner Size	9 5/8"	Depth MD	1200 ft	BHST	96 F
Hole Size	12 1/4"	Depth TVD	0 ft	BHCT	82 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	
		VariCem				Slurry Density	12.30 PPG
						Slurry Yield	2.23 ft3/sk
0.125	lb/sk	Pol-E-Flake	Bulk	Jul 06, 2011		Water Requirement	12.91 GPS

Water Source	Fresh Water
Water Chloride	N/A ppm

### Operation Test Results Request ID 159997/1

#### Thickening Time, Request Test ID:1603768, 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)
82	800	14	5	02:03	02:18	02:28	02:40

# HALLIBURTON

## HALLIBURTON Cementing Rockies, Vernal

### LAB RESULTS - Tail

#### Job Information

<b>Request/Slurry</b>	159998/1	<b>Rig Name</b>	DHS DRILLING #6	<b>Date</b>	06/JUL/2011
<b>Submitted By</b>	Craig Dube	<b>Job Type</b>	Surface Casing	<b>Bulk Plant</b>	Vernal
<b>Customer</b>	Quicksilver Resources Inc.	<b>Location</b>	Moffat	<b>Well</b>	K-Diamond Federal 21-21

#### Well Information

<b>Casing/Liner Size</b>	9 5/8"	<b>Depth MD</b>	1200 ft	<b>BHST</b>	99 F
<b>Hole Size</b>	12 1/4"	<b>Depth TVD</b>	1200 ft	<b>BHCT</b>	82 F

#### Drilling Fluid Information

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

<u>Conc</u>	<u>UOM</u>	<u>Cement/Additive</u>	<u>Sample Type</u>	<u>Sample Date</u>	<u>Lot No.</u>	<u>Cement Properties</u>	
		VariCem				Slurry Density	13.50 PPG
						Slurry Yield	1.73 ft <sup>3</sup> /sk
9.20	gal/sack	Fresh Water	Lab	May 29, 2011		Water Requirement	9.2 GPS

Water Source	Fresh Water
Water Chloride	N/A ppm

#### Operation Test Results Request ID 159998/1

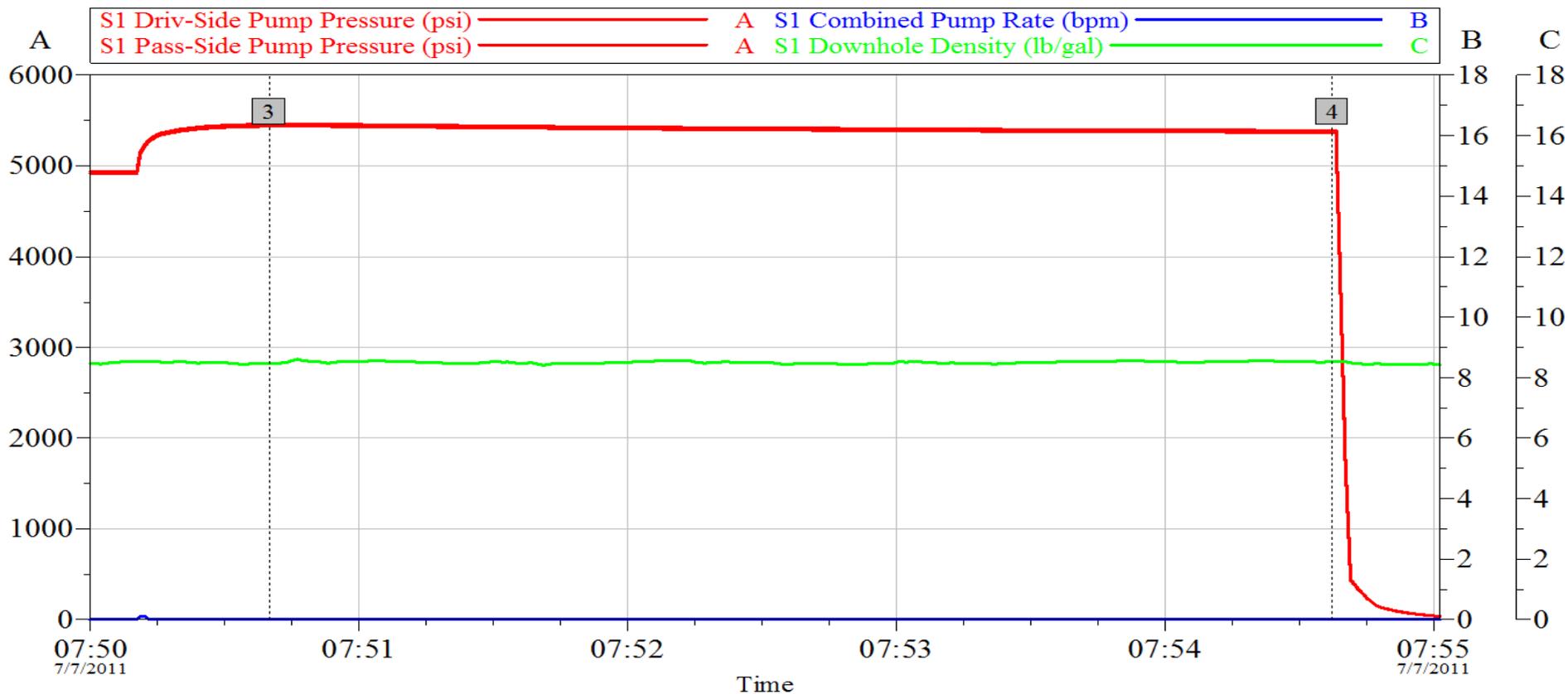
#### Thickening Time, Request Test ID:1603717, Historical Data

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)
82	800	14	12	01:34	01:54	02:04	02:34

# HALLIBURTON

## Data Acquisition

### QuickSilver Resources - R.Diamond Federal# 21-21 9.625" Surface - Pressure Test

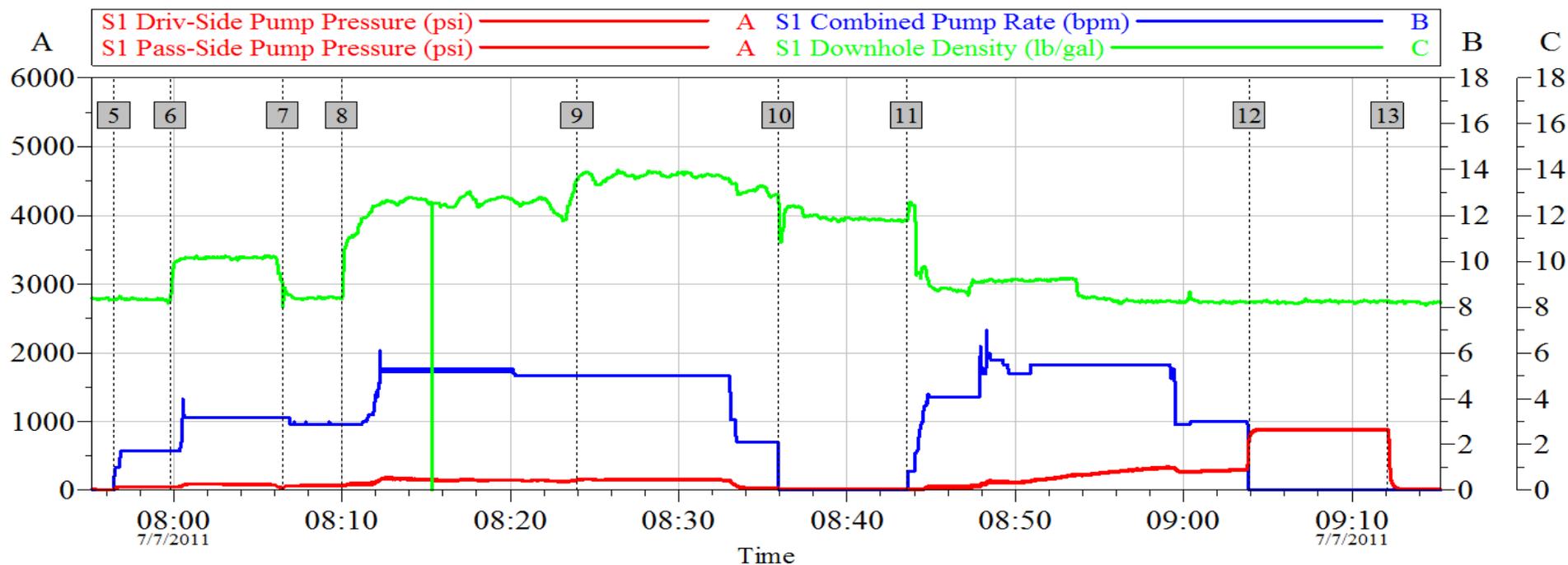


Global Event Log									
Intersection		PSI	RATE	Intersection		PSI	RATE		
<b>3</b>	Start Pressure Test	07:50:40	5435	0.000	<b>4</b>	End Pressure Tesst	07:54:37	5365	0.000

Customer:	QuickSilver Resources	Job Date:	07-Jul-2011	Sales Order #:	8297231
Well Description:	R.Diamond Federal# 21-21	UWI:			

OptiCem v6.4.9  
07-Jul-11 12:31

## QuickSilver Resources - R.Diamond Federal# 21-21 9.625" Surface

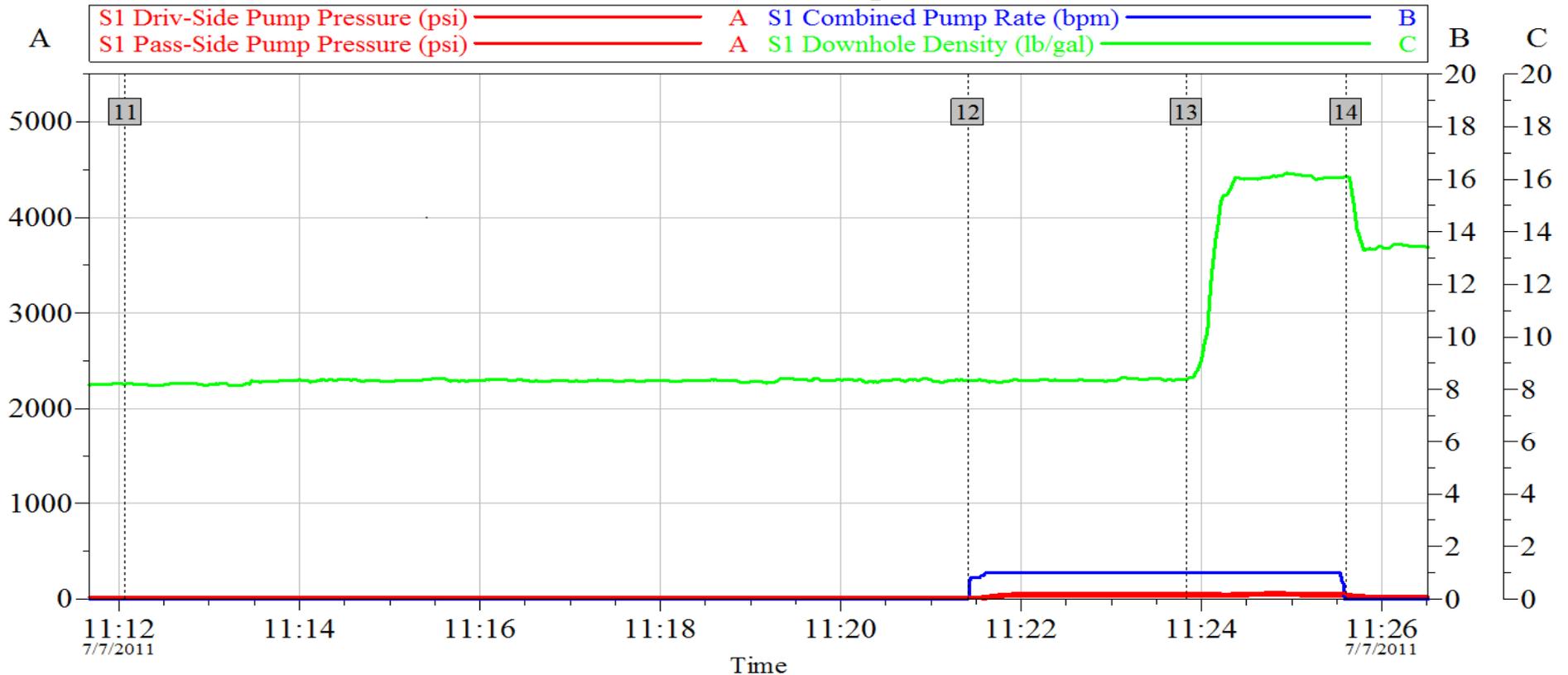


Global Event Log						
Intersection			PSI	RATE	Intersection	
5	Pump Water	07:56:28	18.29	0.459	6	Pump SuperFlush
7	Pump Water	08:06:30	29.01	3.200	8	Pump Lead Cement
9	Pump Tail Cement	08:23:59	140.0	5.000	10	Shutdown / Drop Plug
11	Pump Displacement	08:43:33	-4.000	0.000	12	Bump Plug
13	Check Floats	09:12:07	878.0	0.000		

Customer: QuickSilver Resources	Job Date: 07-Jul-2011	Sales Order #: 8297231
Well Description: R.Diamond Federal# 21-21	UWI:	

OptiCem v6.4.9  
07-Jul-11 13:27

## QuickSilver Resources - R.Diamond Federal# 21-21 9.625" Surface - Top Out



Global Event Log							
Intersection		PSI	RATE	Intersection			
11	Mix CaCl Water / Cement	11:12:04	-4.000 0.000	12	Pump Water	11:21:25	-5.000 0.024
13	Pump Cap Cement	11:23:50	33.00 1.000	14	Shutdown	11:25:36	24.29 0.000

Customer: QuickSilver Resources	Job Date: 07-Jul-2011	Sales Order #: 8297231
Well Description: R.Diamond Federal# 21-21	UWI:	

OptiCem v6.4.9  
07-Jul-11 12:24