

# HALLIBURTON

iCem<sup>®</sup> Service

## HALLIBURTON ENERGY INSTITUTE

**For: David Weisgerber**

Date: Monday, August 25, 2014

**Grizzly 3-32H Production**

Case 1

Sincerely,

**Bryce Muir**

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## 1.1 Executive Summary

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Halliburton appreciates the opportunity to perform the cementing services on the **Grizzly 3-32H** cement **Production** casing job. A pre-job safety meeting was held before the job where details of the job were discussed, potential safety hazards were reviewed, and environmental compliance procedures were outlined.

Halliburton maintains a continuous quality improvement process and appreciates any comments or suggestions that you may have. Halliburton again thanks you for the opportunity to perform service work on this well. We hope to be your solutions provider for future projects.

Respectfully,

Halliburton [Brighton]

**Job Times**

	Date	Time	Time Zone
Called Out	8/13/14	1430	MST
On Location	8/13/14	2300	
Job Started	8/14/14	0854	
Job Completed	8/14/14	1259	
Departed Location	8/14/14	1500	

## 1.2 Cementing Job Summary

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## Cementing Job Summary

The Road to Excellence Starts with Safety

Sold To #: 370324	Ship To #: 3286202	Quote #:	Sales Order #: 0901521561							
Customer: EE3 LLC - EBUS	Customer Rep: DAVID WEISGERBER									
Well Name: GRIZZLY	Well #: 3-32 H	API/UWI #: 05-057-06523-00								
Field: WILDCAT	City (SAP): WALDEN	County/Parish: JACKSON	State: COLORADO							
Legal Description: NE NW-32-8N-80W-709FNL-2404FWL										
Contractor:	Rig/Platform Name/Num: Ensign 152									
Job BOM: 7523										
Well Type: HORIZONTAL OIL										
Sales Person: HALAMERICA\HB47901	Srv Supervisor: Bryce Muir									
Job										
Formation Name										
Formation Depth (MD)	Top	Bottom								
Form Type	BHST									
Job depth MD	12468ft	Job Depth TVD								
Water Depth		Wk Ht Above Floor								
Perforation Depth (MD)	From	To								
Well Data										
Description	New / Used	Size in	ID in	Weight lbm/ft	Thread	Grade	Top MD ft	Bottom MD ft	Top TVD ft	Bottom TVD ft
Casing		9.625	8.921	36		J-55	0	1428		0
Casing		5.5	4.67	23		P-110	0	12468	0	0
Casing		5.5	4.67	23		P-110	0	12468		0
Open Hole Section			8.75				1428	12498	0	0
Tools and Accessories										
Type	Size in	Qty	Make	Depth ft	Type	Size in	Qty	Make		
Guide Shoe	5.5	1		12468	Top Plug	5.5	1	WF		
Float Shoe	5.5	1			Bottom Plug	5.5	1	WF		
Float Collar	5.5				SSR plug set	5.5		HES		
Insert Float	5.5				Plug Container	5.5	1	HES		
Stage Tool	5.5				Centralizers	5.5	62	WF		
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 ft <sup>3</sup> /sack	Mix Fluid Gal	Rate bbl/min	Total Mix Fluid Gal	
1	CLEANSRACE R III	CLEANSRACER III	35	bbl	10.8	3.38	20.68			
20.68 gal/bbl		FRESH WATER								

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

Fluid #	Stage Type	Fluid Name	Qty	Qty UoM	Mixing Density lbm/gal	Yield ft3/sack	Mix Fluid Gal	Rate bbl/mi n	Total Mix Fluid Gal
2	ExtendaCem	EXTENDACEM (TM) SYSTEM	700	sack	11.3	2.41		5	13.87
13.87 Gal		FRESH WATER							
Fluid #	Stage Type	Fluid Name	Qty	Qty UoM	Mixing Density lbm/gal	Yield ft3/sack	Mix Fluid Gal	Rate bbl/mi n	Total Mix Fluid Gal
3	ExpandaCem	EXPANDACEM (TM) SYSTEM	1200	sack	13.8	1.68		5	7.75
7.75 Gal		FRESH WATER							
Fluid #	Stage Type	Fluid Name	Qty	Qty UoM	Mixing Density lbm/gal	Yield ft3/sack	Mix Fluid Gal	Rate bbl/mi n	Total Mix Fluid Gal
4	Water	Water	262	bbl	8.33				
42 gal/bbl		FRESH WATER							
Cement Left in Pipe		Amount	ft	Reason				Shoe Joint	
Comment: WE GOT CLEAN SPACER TO SURFACE AFTER 220 BBLs OF DISPLACEMENT PUMPED. SO WE GOT ALL OF OUR CLEAN SPACER TO THE PIT. WE GOT 3 BBLs OF CEMENT TO SURFACE. FLOATS DIDN'T HOLD, SO WE SHUT THE WELL IN. APPROX TIME TO WAIT IS 5 HOURS BEFORE REMOVING THE PLUG CONTAINER.									

### **1.3 Planned Pumping Schedule**

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- 1. Fill Lines with Water**
  - a. Density = 8.33 lb/gal
  - b. Volume = 5 bbl
- 2. Pressure Test Lines to 5000 psi**
- 3. Pump CleanSpacer III**
  - a. Density = 10.5 lb/gal
  - b. Volume = 35 bbl
  - c. Rate = 3.0 bpm
- 4. Drop Bottom Plug**
- 5. Pump ExtendaCem (Lead)**
  - a. Density = 11.3 lb/gal
  - b. Yield = 2.41 ft<sup>3</sup>/sk
  - c. Water Requirement = 13.87 gal/sk
  - d. Volume = 700 sks (300 bbls)
  - e. Rate = 6.0 bpm
- 6. Pump ExpandaCem (Tail)**
  - a. Density = 13.8 lb/gal
  - b. Yield = 1.68 ft<sup>3</sup>/sk
  - c. Water Requirement = 7.67 gal/sk
  - d. Volume = 1200 sks (359 bbls)
  - e. Rate = 5.0 bpm
- 7. Drop Top Plug**
- 8. Start Displacement**
- 9. Pump Displacement Water**
  - a. Density = 8.33 lb/gal
  - b. Volume = 262 bbls
  - c. Rate = 6.0 bpm
- 10. Land Plug – Anticipated Final Circulation Pressure 2280 psi**

**Calculated Total Displacement = 262 bbls**

**1.4 Job Overview**

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		Units	Description
1	Surface temperature at time of job	°F	
2	Mud type (OBM, WBM, SBM, Water, Brine)	-	WBM
3	Actual mud density	lb/gal	
4	Time circulated before job	HH:MM	
5	Mud volume circulated	Bbls	
6	Rate at which well was circulated	Bpm	
7	Pipe movement during hole circulation	Y/N	N
8	Rig pressure while circulating	Psi	
9	Time from end mud circulation to start of job	HH:MM	
10	Pipe movement during cementing	Y/N	N
11	Calculated displacement	Bbls	
12	Job displaced by	Rig/HES	HES
13	Annular before job)?	Y/N	N
14	Annular flow after job	Y/N	N
15	Length of rat hole	Ft	
16	Units of gas detected while circulating	Units	
17	Was lost circulation experienced at any time ?	Y/N	N

**1.5 Job Event Log**

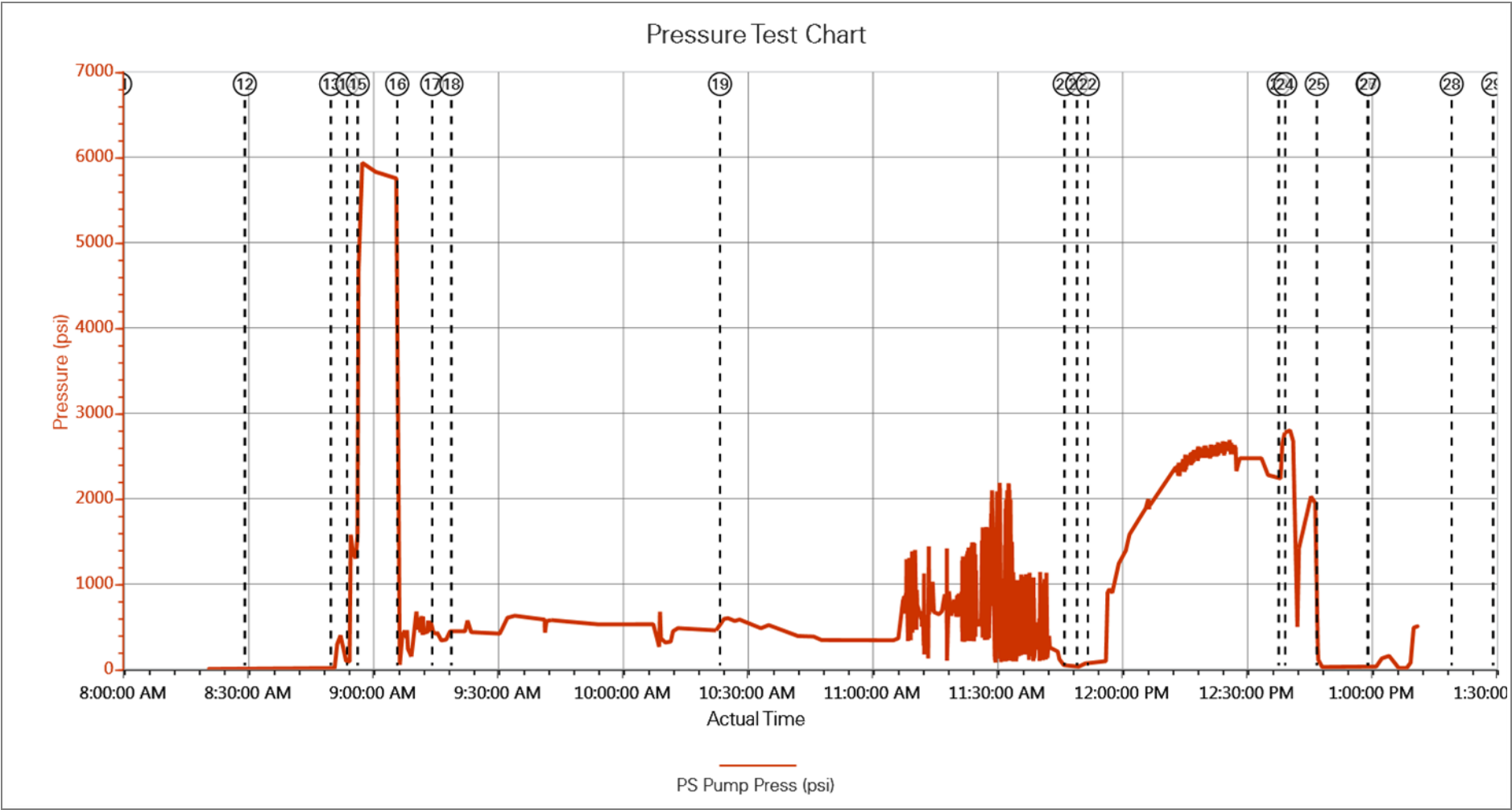
Type	Seq. No.	Activity	Graph Label	Date	Time	Source	Pass-Side Pump Pressure (psi)	Downhole Density (ppg)	Combined Pump Rate (bbl/min)	Comment
Event	1	Call Out	Call Out	8/13/2014	14:30:00	USER				CREW CALLED OUT FOR SCHEDULED JOB.
Event	2	Other	Other	8/13/2014	15:30:00	USER				LOAD TRUCK WITH EQUIPMENT. FIX BATCH MIXER AND RED TIGER. COMPLETE GATE CHECKS.
Event	3	Pre-Convoy Safety Meeting	Pre-Convoy Safety Meeting	8/13/2014	17:15:00	USER				DISCUSS HAZARDS ASSOCIATED WITH DRIVING TRUCKS. DISCUSS ROUTE OF TRAVEL AND CONVOY ORDER.
Event	4	Depart from Service Center or Other Site	Depart from Service Center or Other Site	8/13/2014	17:30:00	USER				
Event	5	Arrive at Location from Service Center	Arrive at Location from Service Center	8/13/2014	23:00:00	USER				
Event	6	Other	Other	8/13/2014	23:05:00	USER				RIG RUNNING CASING. COMPANY MAN STATED THAT IF THEY MAINTAIN THE SPEED THAT THEY WERE FORCED TO GO IT COULD TAKE UP TO 8 MORE HOURS. AS PER COMPANY MAN WE HELD OFF RIGGING UP.
Event	7	Assessment Of Location Safety Meeting	Assessment Of Location Safety Meeting	8/14/2014	03:45:00	USER				COMPANY MAN WOKE ME UP STATING THAT THEY GOT ON BOTTOM AROUND 03:30 AND WERE GOING TO CIRCULATE FOR 4 HOURS. ASSESS LOCATION IDENTIFY POTENTIAL HAZARDS AND THE BEST WAY TO SPOT PUMPING EQUIPMENT.
Event	8	Other	Other	8/14/2014	03:50:00	USER				SPOT PUMPING EQUIPMENT.
Event	9	Pre-Rig Up Safety Meeting	Pre-Rig Up Safety Meeting	8/14/2014	04:00:00	USER				DISCUSS HAZARDS ASSOCIATED WITH RIGGING UP AND PACKING IRON ON LOCATION.
Event	10	Rig-Up Equipment	Rig-Up Equipment	8/14/2014	04:15:00	USER				
Event	11	Rig-Up Equipment	Rig-Up Equipment	8/14/2014	08:00:00	USER				RIG UP PLUG CONTAINER SO THE RIG COULD CIRCULATE THROUGH IT WHILE WE FINISHED UP LOOSE ENDS.

Event	12	Pre-Job Safety Meeting	Pre-Job Safety Meeting	8/14/2014	08:30:00	USER	6.00	8.31	0.00	DISCUSS HSE SAFETY AND JOB PROCEDURES WITH THE RIG CREW AND COMPANY MAN. EXPLAIN THE IMPORTANCE OF SAFETY AND WORKING SAFELY TOGETHER.
Event	13	Other	Other	8/14/2014	08:50:41	COM5	11.00	8.06	2.00	SWAP LINES FROM RIG LINES TO HALLIBURTON HARD LINES. PUMP 5 BBLS FRESH WATER TO FILL LINES.
Event	14	Test Lines	Test Lines	8/14/2014	08:54:35	COM5	1496.00	8.29	0.00	CONDUCT A LOW PRESSURE TEST TO 500 PSI TO TEST RED TIGER KICKOUTS.
Event	15	Test Lines	Test Lines	8/14/2014	08:57:07	COM5	5940.00	8.39	0.00	CONDUCT A HIGH PRESSURE TEST TO 5000 PSI TO TEST PUMPS AND LINES.
Event	16	Pump Spacer 1	Pump Spacer 1	8/14/2014	09:06:36	COM5	59.00	8.26	1.50	PUMP 35 BBLS OF CLEAN SPACER @ 10.8 #/GAL 3.38 CUFT/SK 20.68 GAL/SK. GREAT CIRCULATION.
Event	17	Drop Bottom Plug	Drop Bottom Plug	8/14/2014	09:15:00	USER	415.00	10.84	3.00	DROP 5.5" BOTTOM PLUG ON THE FLY.
Event	18	Pump Lead Cement	Pump Lead Cement	8/14/2014	09:19:37	COM5	425.00	10.98	3.10	PUMP 300 BBLS OF LEAD CEMENT. 700 SACKS @ 11.3 #/GAL 2.41 CUFT/SK 13.87 GAL/SK
Event	19	Pump Tail Cement	Pump Tail Cement	8/14/2014	10:24:10	COM5	607.00	13.67	5.00	PUMP 359 BBLS OF TAIL CEMENT. 1200 SACKS @ 13.8 #/GAL 1.68 CUFT/SK 7.75 GAL/SK. AS PER COMPANY MAN HE WANTED US TO PUMP BEHIND THE TAIL CEMENT 10 BBLS OF SUGAR WATER AND LEAVE A WET SHOE PRIOR TO DROPPING THE TOP PLUG.
Event	20	Shutdown	Shutdown	8/14/2014	11:47:00	USER	54.00	7.90	4.70	
Event	21	Drop Top Plug	Drop Top Plug	8/14/2014	11:50:00	USER	81.00	8.21	4.90	DROP 5.5" TOP PLUG. PLUG DROPPED BY BRYCE MUIR AND WITNESSED BY THE DRILLER.
Event	22	Pump Displacement	Pump Displacement	8/14/2014	11:52:34	COM5	29.00	4.87	0.00	PUMP 262 BBLS OF FRESH WATER DISPLACEMENT. AFTER PUMPING 220 BBLS OF DISPLACEMENT WE GOT CLEAN SPACER TO SURFACE. WE GOT ALL OF OUR CLEAN SPACER TO SURFACE AND AROUND 3 BBLS OF CEMENT TO SURFACE.

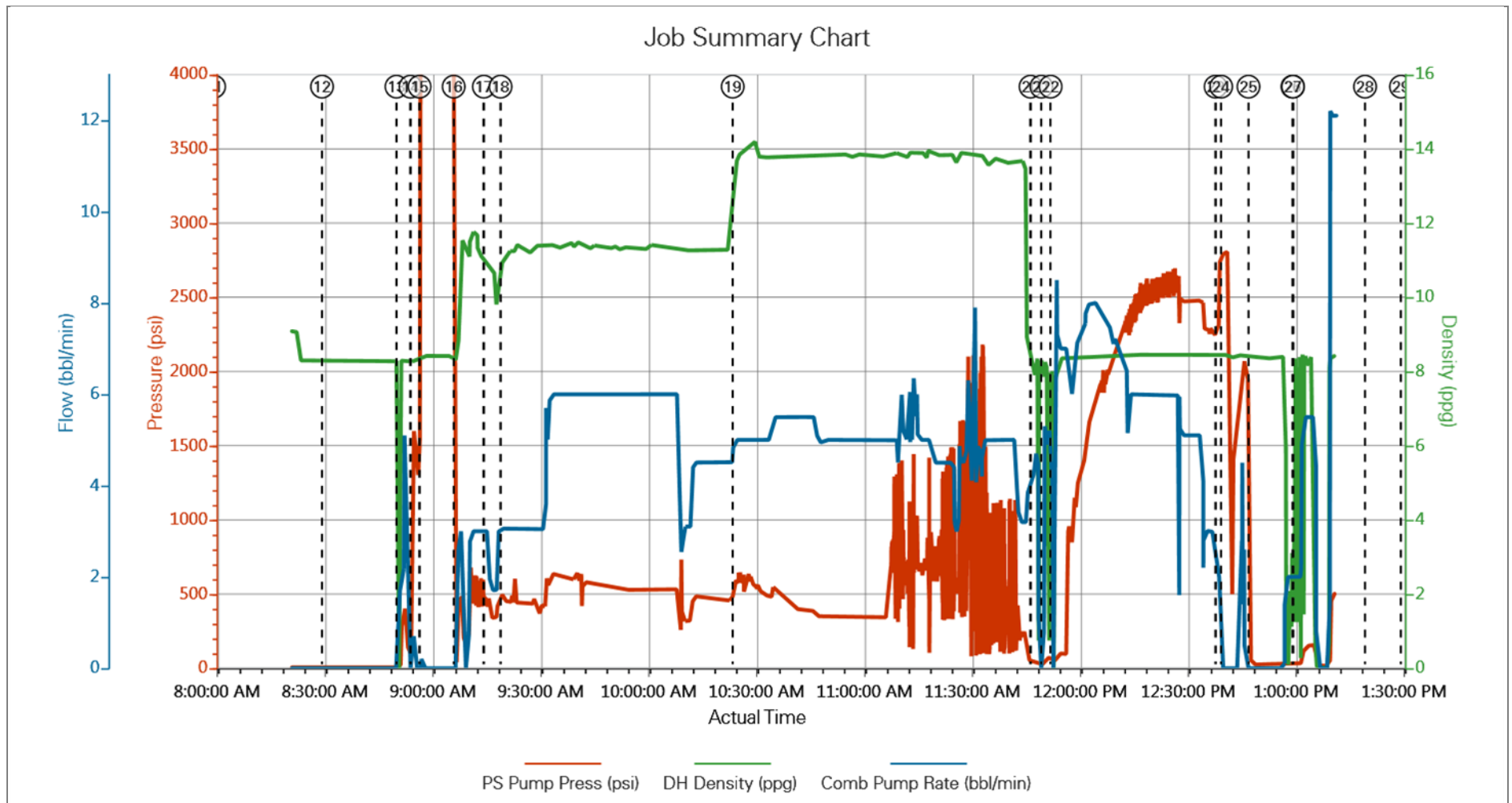
Event	23	Bump Plug	Bump Plug	8/14/2014	12:38:26	COM5	2713.00	8.43	0.00	LANDED PLUG AT 2280 PSI AND PRESSURED UO 500 PSI OVER FINAL CIRCULATING PRESSURE TO 2880 PSI.
Event	24	Check Floats	Check Floats	8/14/2014	12:40:00	USER	2798.00	8.45	0.00	CHECK FLOATS. FLOATS DIDN'T HOLD. WE PUMPED 3 BBLS OF WHAT WE GOT BACK, BACK INTO THE WELL. SHUT WELL IN WITH AROUND 2000 PSI ON THE WELL.
Event	25	Shut In Well	Shut In Well	8/14/2014	12:47:35	COM5	26.00	8.31	0.00	
Event	26	End Job	End Job	8/14/2014	12:59:48	COM5	31.00	1.87	2.00	
Event	27	Other	Other	8/14/2014	13:00:00	USER	29.00	1.25	2.00	WASH UP RED TIGER.
Event	28	Pre-Rig Down Safety Meeting	Pre-Rig Down Safety Meeting	8/14/2014	13:20:00	USER				DISCUSS HAZARDS ASSOCIATED WITH RIGGING DOWN AND PACKING IRON ON LOCATION. DISCUSS FATIGUE AND TO TAKE EXTRA TIME AND NOT RUSH.
Event	29	Rig-Down Equipment	Rig-Down Equipment	8/14/2014	13:30:00	USER				
Event	30	Pre-Convoy Safety Meeting	Pre-Convoy Safety Meeting	8/14/2014	14:45:00	USER				DISCUSS HAZARDS ASSOCIATED WITH DRIVING TRUCKS BACK TO THE SERVICE CENTER. DISCUSS DRIVER FATIGUE AND WHAT TO DO IF TOO TIRED TO DRIVE. NO ONE DRIVES TIRED.
Event	31	Depart Location for Service Center or Other Site	Depart Location for Service Center or Other Site	8/14/2014	15:00:00	USER				THANK YOU FOR USING HALLIBURTON ENERGY SERVICES. STAY SAFE OUT HERE!

2.0 Custom Graphs

2.1 Custom Graph



2.2 Custom Graph



### 3.0 Appendix

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