

# HALLIBURTON

iCem<sup>®</sup> Service

## **BONANZA CREEK ENERGY**

**For:**

Date: Tuesday, January 20, 2015

**State Seventy Holes F-J-4HNB**

Bonanza State Seventy Holes F-J-4HNB Inter

Sincerely,

**Derek Trier**

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## 1.1 Executive Summary

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Halliburton appreciates the opportunity to perform the cementing services on the **State Seventy Holes F-J-4HNB** cement **Intermediate** 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**

	<b>Date</b>	<b>Time</b>	<b>Time Zone</b>
<b>Called Out</b>	1/19/2015	0900	MST
<b>On Location</b>		1410	MST
<b>Job Started</b>		2221	MST
<b>Job Completed</b>	1/20/2015	0030	MST
<b>Departed Location</b>		0140	MST

## 1.2 Cementing Job Summary

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## Cementing Job Summary

*The Road to Excellence Starts with Safety*

Sold To #: 324725	Ship To #: 3463637	Quote #:	Sales Order #: 0902044589							
Customer: BONANZA CREEK ENERGY		Customer Rep: Bonanza Rep								
Well Name: STATE SEVENTY HOLES	Well #: F-J-4 HNB	API/UWI #: 05-123-39210-00								
Field: WATTENBERG	City (SAP): KERSEY	County/Parish: WELD	State: COLORADO							
Legal Description: NE NW-4-4N-62W-310FNL-1385FWL										
Contractor: FRONTIER DRLG		Rig/Platform Name/Num: FRONTIER 04								
Job BOM: 7522										
Well Type: HORIZONTAL OIL										
Sales Person: HALAMERICA\HB21661		Srvc Supervisor: Nathan McBride								
<b>Job</b>										
Formation Name										
Formation Depth (MD)	Top	Bottom								
Form Type	BHST									
Job depth MD	7152ft	Job Depth TVD								
Water Depth	Wk Ht Above Floor									
Perforation Depth (MD)	From	To								
<b>Well Data</b>										
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			0	410		
Casing		7	6.276	26		P-110	0	7152		
Open Hole Section			8.75				410	7152		
<b>Tools and Accessories</b>										
Type	Size in	Qty	Make	Depth ft	Type	Size in	Qty	Make		
Guide Shoe	7				Top Plug	7	1	HES		
Float Shoe	7	1	6529		Bottom Plug	7		HES		
Float Collar	7	1			SSR plug set	7		HES		
Insert Float	7				Plug Container	7		HES		
Stage Tool	7				Centralizers	7		HES		
<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>										
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	Mud Flush III (Powder)	Mud Flush III	24	bbl	8.4			6		
42 gal/bbl			FRESH WATER							

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## Cementing Job Summary

Fluid #	Stage Type	Fluid Name	Qty	Qty UoM	Mixing Density lbm/gal	Yield ft <sup>3</sup> /sack	Mix Fluid Gal	Rate bbl/mi n	Total Mix Fluid Gal
2	Lead Cement	ECONOCEM (TM) SYSTEM	525	sack	12.5	1.89			10.25
10.25 Gal		FRESH WATER							
Fluid #	Stage Type	Fluid Name	Qty	Qty UoM	Mixing Density lbm/gal	Yield ft <sup>3</sup> /sack	Mix Fluid Gal	Rate bbl/mi n	Total Mix Fluid Gal
3	Tail Cement	EXPANDACEM (TM) SYSTEM	220	sack	14.6	1.45			6.06
6.06 Gal		FRESH WATER							
Fluid #	Stage Type	Fluid Name	Qty	Qty UoM	Mixing Density lbm/gal	Yield ft <sup>3</sup> /sack	Mix Fluid Gal	Rate bbl/mi n	Total Mix Fluid Gal
4	Displacement	Displacement	248.1	bbl	8.33				
Cement Left In Pipe		Amount	42 ft	Reason		Shoe Joint			
Comment									

## **1.3 Planned Pumping Schedule**

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- 1. Fill Lines with Water**
  - a. Density = 8.33ppg
  - b. Volume = 2bbl
- 2. Pressure Test Lines to 4110psi**
- 3. Pump Mud Flush Spacer**
  - a. Density = 8.4 lb/gal
  - b. Volume = 24 bbl
  - c. Rate = 5.0 bpm
- 4. Drop Bottom Plug**
- 5. Pump EconoCem (Lead)**
  - a. Density = 12.5 lb/gal
  - b. Yield = 1.89 ft<sup>3</sup>/sk
  - c. Water Requirement = 10.25 gal/sk
  - d. Volume = 525 sks (176.7 bbls)
  - e. Rate = 5.0 bpm
- 6. Pump ExpandaCem (Tail)**
  - a. Density = 14.6 lb/gal
  - b. Yield = 1.45 ft<sup>3</sup>/sk
  - c. Water Requirement = 6.06 gal/sk
  - d. Volume = 220 sks (56.8 bbls)
  - e. Rate = 6.0 bpm
- 7. Drop Top Plug**
- 8. Start Displacement**
- 9. Pump Displacement Water**
  - a. Density = 9.4 lb/gal
  - b. Volume = 248.1 bbls
  - c. Rate = 4.5 bpm
10. Land Plug – Anticipated Final Circulation Pressure 2500 psi

**Calculated Total Displacement = 248.1 bbls**

## 1.4 Job Overview

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		Units	Description
1	Surface temperature at time of job	°F	63
2	Mud type (OBM, WBM, SBM, Water, Brine)	-	WBM
3	Actual mud density	lb/gal	9.2
4	Time circulated before job	HH:MM	
5	Mud volume circulated	Bbls	800
6	Rate at which well was circulated	Bpm	2-6.5
7	Pipe movement during hole circulation	Y/N	N
8	Rig pressure while circulating	Psi	Irratic
9	Time from end mud circulation to start of job	HH:MM	00:15
10	Pipe movement during cementing	Y/N	N
11	Calculated displacement	Bbls	248.1
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	11
16	Units of gas detected while circulating	Units	
17	Was lost circulation experienced at any time ?	Y/N	N

## 1.5 Water Field Test

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Item	Recorded Test Value	Units	Max. Acceptable Limit	Potential Problems in Exceeding Limit
pH	7.5	----	6.0 - 8.0	Chemicals in the water can cause severe retardation
Chlorides	500	ppm	3000 ppm	Can shorten thickening time of cement
Sulfates	200	ppm	1500 ppm	Will greatly decrease the strength of cement
Total Hardness		ppm	500 mg/L	High concentrations will accelerate the set of the cement
Calcium		ppm	500 ppm	High concentrations will accelerate the set of the cement
Total Alkalinity		ppm	1000 ppm	Cement is greatly retarded to the point where it may not set up at all (typically occurs @ pH ≥ 8.3).
Bicarbonates		ppm	1000 ppm	Cement is greatly retarded to the point where it may not set up at all
Potassium		ppm	5000 ppm	High concentrations will shorten the pump time of cement (indicates the presence of chlorides, therefore if Potassium levels are measured as high, so should the chlorides)
Iron	Pass	ppm	300 ppm	High concentrations will accelerate the set of the cement
Temperature	58	°F	50-80 °F	High temps will accelerate; Low temps may risk freezing in cold weather

**Submitted Respectfully by:** \_\_\_\_\_

## 1.6 Job Event Log

Type	Seq. No.	Activity	Graph Label	Date	Time	Source	Comb Pump Rate (bbl/min)	DH Density (ppg)	PS Pump Press (psi)	Comment
Event	1	Arrive at Location from Service Center	Arrive at Location from Service Center	1/19/2015	14:00:00	USER				Requested on Location was 1500 Rig still running casing
Event	2	Assessment Of Location Safety Meeting	Assessment Of Location Safety Meeting	1/19/2015	14:05:00	USER				Hazard Hunt and review location lay out
Event	3	Pre-Rig Up Safety Meeting	Pre-Rig Up Safety Meeting	1/19/2015	14:10:00	USER				Discuss fluid sources and rig up lay out
Event	4	Casing on Bottom	Casing on Bottom	1/19/2015	18:00:00	USER				
Event	5	Circulate Well	Circulate Well	1/19/2015	18:20:00	USER				
Event	6	Pre-Job Safety Meeting	Pre-Job Safety Meeting	1/19/2015	19:15:00	USER	0.00	8.39	-3.00	With customer and rig crew
Event	7	Circulate Well	Circulate Well	1/19/2015	19:49:45	USER	0.00	8.40	-3.00	Continue circulation till stable 6.5bpm is established. Previous Circulation at 200gpm or over caused annular to pressure up.
Event	8	Start Job	Start Job	1/19/2015	22:20:49	COM7	0.00	-0.11	0.00	Circulation still irratic after 6.5bpm
Event	9	Test Lines	Test Lines	1/19/2015	22:23:24	COM7	0.00	8.27	4103.00	4110
Event	10	Pump Spacer 1	Pump Spacer 1	1/19/2015	22:24:57	COM7	0.00	8.07	30.00	24bbls Mud Flush
Event	11	Pump Spacer 2	Pump Spacer 2	1/19/2015	22:30:00	COM7	5.00	8.34	529.00	10 FW
Event	12	Pump Lead Cement	Pump Lead Cement	1/19/2015	22:32:41	COM7	5.50	12.84	708.00	
Event	13	Pump Tail Cement	Pump Tail Cement	1/19/2015	23:01:38	COM7	6.00	13.34	191.00	
Event	14	Drop Plug	Drop Plug	1/19/2015	23:12:39	COM7	1.00	12.37	6.00	
Event	15	Pump Displacement	Pump Displacement	1/19/2015	23:12:46	COM7	1.00	14.05	11.00	20bbls FW 210bbls Mud 18bbls FW
Event	16	Spacer Returns to Surface	Spacer Returns to Surface	1/19/2015	23:58:34	USER	4.40	9.70	2289.00	225bbls Displaced
Event	17	Cement Returns to Surface	Cement Returns to Surface	1/20/2015	00:03:09	USER	3.00	8.92	2048.00	241.8bbls Displaced 6bbls to Surface
Event	18	Bump Plug	Bump Plug	1/20/2015	00:04:56	USER	0.00	8.64	2393.00	248bbls Displaced
Event	19	Check Floats	Check Floats	1/20/2015	00:08:29	USER	0.00	8.67	537.00	Floats Good
Event	20	Comment	Casing Test	1/20/2015	00:11:00	USER	0.00	8.66	2610.00	2500psi for 15 minutes

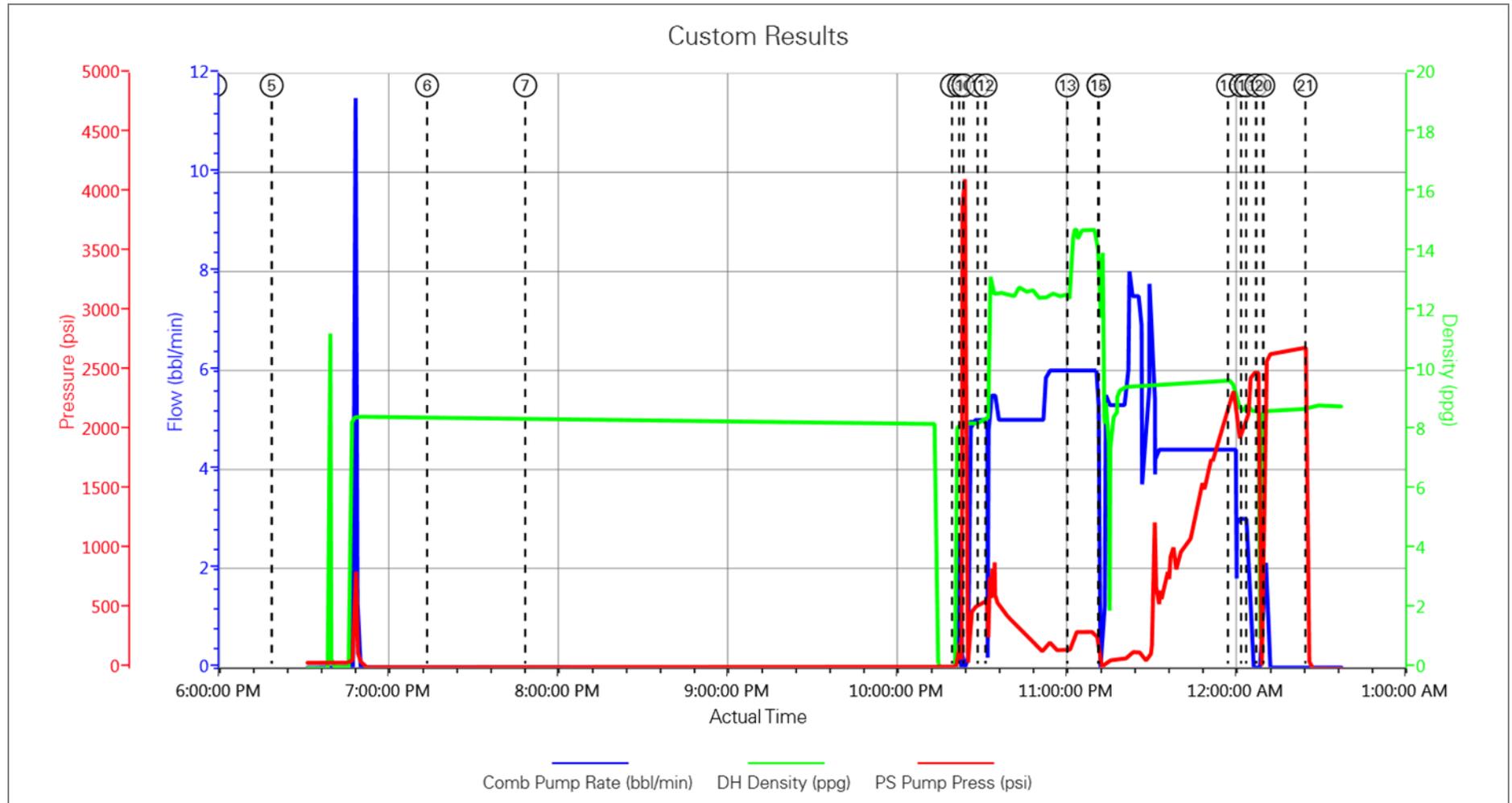
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Event	21	End Job	End Job	1/20/2015	00:25:59	COM7	0.00	8.69	26.00	Thanks McBride and Crew
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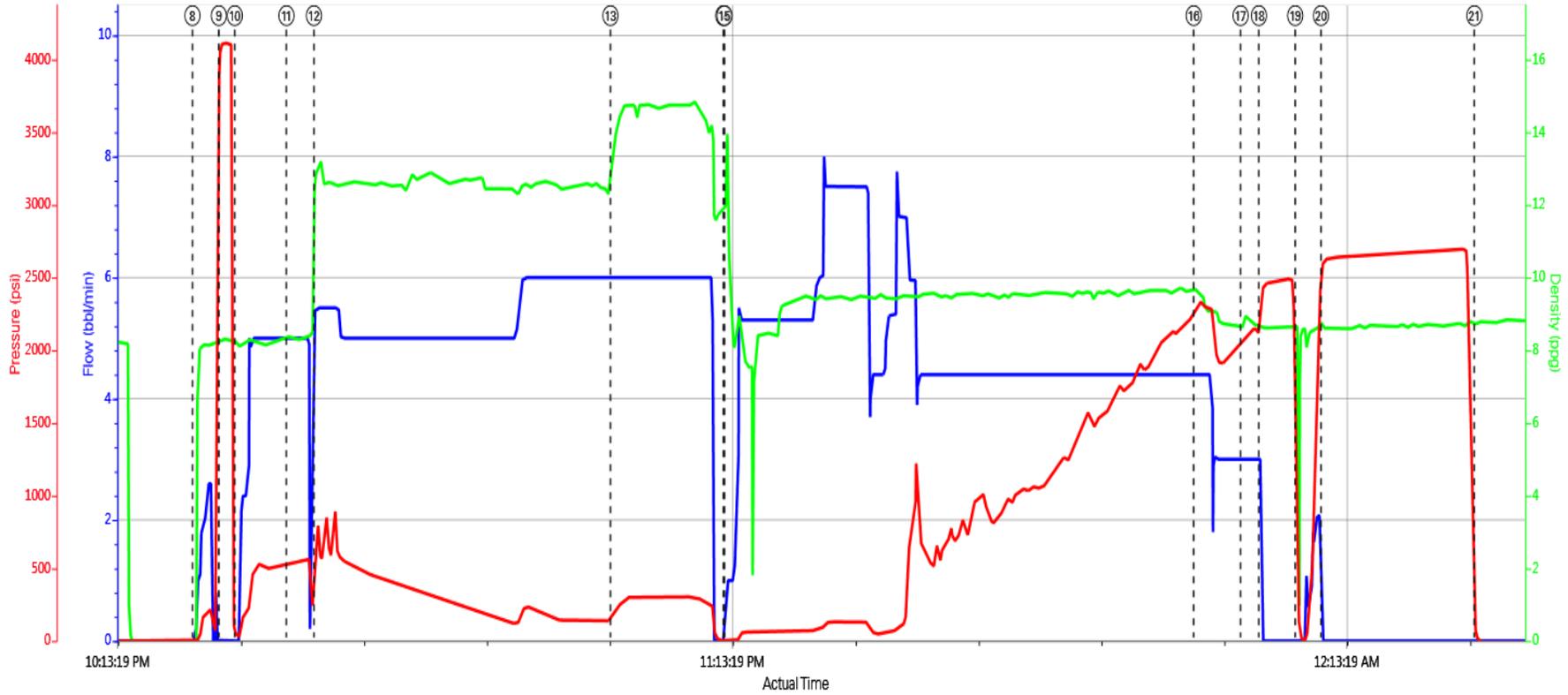
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## 2.0 Custom Graphs

### 2.1 Custom Graph



### Custom Results



Comb Pump Rate (bbl/min)    DH Density (ppg)    PS Pump Press (psi)

- |                                                      |                                    |                           |                                  |                                |                                          |                            |
|------------------------------------------------------|------------------------------------|---------------------------|----------------------------------|--------------------------------|------------------------------------------|----------------------------|
| ① Arrive at Location from Service Center n/a;n/a;n/a | ④ Casing on Bottom n/a;n/a;n/a     | ⑦ Circulate Well 0;8.4;-3 | ⑩ Pump Spacer 1 0;8.07;30        | ⑬ Pump Tail Cement 6;13.34;191 | ⑮ Spacer Returns to Surface 4.4;9.7;2289 | ⑲ Check Floats 0;8.67;537  |
| ② Assessment Of Location Safety Meeting n/a;n/a;n/a  | ⑤ Circulate Well n/a;n/a;n/a       | ⑧ Start Job 0;-0.11;0     | ⑫ Pump Spacer 2 5;8.34;529       | ⑭ Drop Plug 1;12.37;6          | ⑯ Cement Returns to Surface 3;8.92;2048  | 20 Casing Test 0;8.66;2610 |
| ③ Pre-Rig Up Safety Meeting n/a;n/a;n/a              | ⑥ Pre-Job Safety Meeting 0;8.39;-3 | ⑨ Test Lines 0;8.27;4103  | ⑪ Pump Lead Cement 5.5;12.84;708 | ⑰ Pump Displacement 1;14.05;11 | ⑱ Bump Plug 0;8.64;2393                  | 21 End Job 0;8.69;26       |

