

HALLIBURTON

iCem[®] Service

ENCANA OIL & GAS (USA) INC

For:

Date: Monday, July 28, 2014

1C-28H-H368

ENCANA FREDERIKSEN 1C-28H-H368 SURFACE

Sincerely,

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1.1 Executive Summary

Halliburton appreciates the opportunity to perform the cementing services on the **Frederiksen 1C-28H-H368 cement Surface** 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	6/3/14		MST
On Location	6/3/14	0730	MST
Job Started	6/3/14	1045	MST
Job Completed	6/3/14	1217	MST
Departed Location	6/3/14	1231	MST

1.2 Cementing Job Summary

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Cementing Job Summary

The Road to Excellence Starts with Safety

Sold To #: 340078		Ship To #: 3191784		Quote #:		Sales Order #: 0901401819				
Customer: ENCANA OIL & GAS (USA) INC. - EBUS				Customer Rep: DENNIS ELROD						
Well Name: FREDERIKSEN			Well #: 1C-28H-H368			API/UWI #: 05-123-37668-00				
Field: WATTENBERG		City (SAP): LONGMONT		County/Parish: WELD		State: COLORADO				
Legal Description: SE NE-28-3N-68W-2270FNL-255FEL										
Contractor:				Rig/Platform Name/Num: Ensign 135						
Job BOM: 7521										
Well Type: HORIZONTAL GAS										
Sales Person: HALAMERICA\HX23209				Srvc Supervisor: Joseph Barras						
Job										
Formation Name										
Formation Depth (MD)		Top			Bottom					
Form Type					BHST					
Job depth MD		853ft			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			0	843		843
Fluid Data										
Stage/Plug #: 1										
Fluid #	Stage Type	Fluid Name		Qty	Qty UoM	Mixing Density lbm/gal	Yield ft ³ /sack	Mix Fluid Gal	Rate bbl/min	Total Mix Fluid Gal
1	Mud Flush III (Powder)	Mud Flush III		0	bbl	8.4				
42 gal/bbl		FRESH WATER								
Fluid #	Stage Type	Fluid Name		Qty	Qty UoM	Mixing Density lbm/gal	Yield ft ³ /sack	Mix Fluid Gal	Rate bbl/min	Total Mix Fluid Gal
2	SwiftCem B2	SWIFTCEM (TM) SYSTEM			sack	14.2	1.54		6	7.64
94 lbm		TYPE I / II CEMENT, BULK (101439798)								
7.64 Gal		FRESH WATER								
Fluid #	Stage Type	Fluid Name		Qty	Qty UoM	Mixing Density lbm/gal	Yield ft ³ /sack	Mix Fluid Gal	Rate bbl/min	Total Mix Fluid Gal
3	Displacement	Displacement		0	bbl	9				
Cement Left In Pipe		Amount		Reason			Shoe Joint			
Comment										

1.3 Planned Pumping Schedule

- 1. Fill Lines with Water**
 - a. Density = 8.33ppg
 - b. Volume = 2bbl
- 2. Pressure Test Lines to 3500psi**
- 3. Pump MudFlush Spacer**
 - a. Density = 8.44 lb/gal
 - b. Volume = 10 bbl
 - c. Rate = 2 bpm
- 4. Pump SwiftCem (Lead)**
 - a. Density = 14.2
 - b. Yield = 1.54
 - c. Water Requirement = 7.64
 - d. Volume = 274 sks (75 bbls)
 - e. Rate = 4 bpm
- 5. Drop Top Plug**
- 6. Start Displacement**
- 7. Pump Displacement Water**
 - a. Density = 8.33 lb/gal
 - b. Volume = 61 bbls
 - c. Rate = 4 bpm
- 8. Land Plug – Anticipated Final Circulation Pressure 984 psi**

Calculated Total Displacement = 61 bbls

1.4 Job Overview

		Units	Description
1	Surface temperature at time of job	°F	
2	Mud type (OBM, WBM, SBM, Water, Brine)	-	
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	
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	
11	Calculated displacement	Bbls	
12	Job displaced by	Rig/HES	
13	Annular before job)?	Y/N	
14	Annular flow after job	Y/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	

1.5 Water Field Test

Item	Recorded Test Value	Units	Max. Acceptable Limit	Potential Problems in Exceeding Limit
pH		----	6.0 - 8.0	Chemicals in the water can cause severe retardation
Chlorides		ppm	3000 ppm	Can shorten thickening time of cement
Sulfates		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		ppm	300 ppm	High concentrations will accelerate the set of the cement
Temperature		°F	50-80 °F	High temps will accelerate; Low temps may risk freezing in cold weather

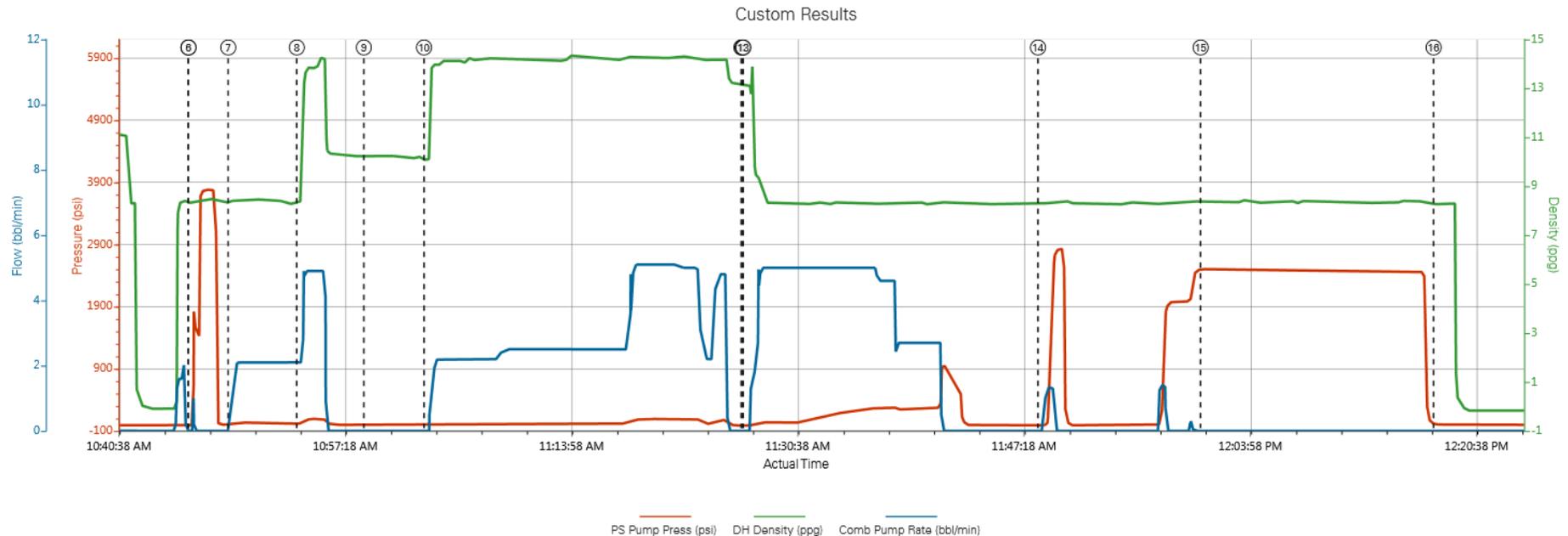
Submitted Respectfully by: _____

1.6 Job Event Log

Type	Seq. No.	Activity	Graph Label	Date	Time	Source	DH Density (ppg)	Comb Pump Rate (bbl/min)	PS Pump Press (psi)	Comment
Event	1	Arrive at Location from Service Center	Arrive at Location from Service Center	6/3/2014	07:30:00	USER				
Event	2	Rig-Up Equipment	Rig-Up Equipment	6/3/2014	08:00:00	USER				
Event	3	Rig-Up Completed	Rig-Up Completed	6/3/2014	09:15:55	USER	2.31	0.00	4.00	
Event	4	Safety Meeting - Pre Job	Safety Meeting - Pre Job	6/3/2014	09:30:00	USER	2.28	0.00	0.00	HES AND RIG CREW
Event	5	Start Job	Start Job	6/3/2014	10:45:54	COM4	8.32	0.00	-8.00	
Event	6	Test Lines	Test Lines	6/3/2014	10:45:55	USER	8.33	0.00	-8.00	TEST TO 3500 PSI NO VISIBLE LEAKS
Event	7	Pump Spacer 1	Pump Spacer 1	6/3/2014	10:48:50	COM4	8.39	2.00	2.00	10 BBL OF MUDFLUSH
Event	8	Pump Cement	Pump Cement	6/3/2014	10:53:53	COM4	14.20	4.00	17.00	75 BBL OF SWIFTCEM @ 14.2 PPG /1.54 YIELD /7.64 GAL/SK
Event	9	Shutdown	Shutdown	6/3/2014	10:58:49	COM4	14.20	0.00	-2.00	DUE TO CELLAR PUMP ISSUE
Event	10	Other	Other	6/3/2014	11:03:16	COM4	14.20	0.00	-4.00	RESUME PUMPING
Event	11	Shutdown	Shutdown	6/3/2014	11:26:38	COM4	14.20	0.00	-13.00	
Event	12	Drop Top Plug	Drop Top Plug	6/3/2014	11:26:43	COM4	14.20	0.00	-13.00	PRELOADED
Event	13	Pump Displacement	Pump Displacement	6/3/2014	11:26:47	COM4	8.33	4.00	-13.00	61 BBL OF WATER WITH CEMENT TO SURFACE @ 40 BBL INTO DISPLACEMENT/21 BBL OF CEMENT TO SURFACE/PLUG LANDED @ 289 PSI
Event	14	Bump Plug	Bump Plug	6/3/2014	11:48:29	COM4	8.29	0.00	-12.00	984 PSI
Event	15	Other	Other	6/3/2014	12:00:28	COM4	8.44	0.00	2503.00	CASING TEST @ 2500 PSI FOR 15 MIN
Event	16	End Job	End Job	6/3/2014	12:17:37	COM4				
Event	17	Rig-Down Equipment	Rig-Down Equipment	6/3/2014	12:31:57	USER	8.75	4.00	37.00	
Event	18	Return to Service Center from Job	Return to Service Center from Job	6/3/2014	13:30:00	USER				

2.0 Attachments

2.1 ENCANA FREDERIKSEN 1C-28H-H368 SURFACE-Custom Results.png



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

- | | | | | | |
|------------------------------------------------------|-------------------------------------|---------------------------|-----------------------------|---------------------------------|-------------------------------------------------|
| ① Arrive at Location from Service Center n/a;n/a;n/a | ④ Safety Meeting - Pre Job 0;2.28;0 | ⑦ Pump Spacer 1 2;8.39;1 | ⑩ Other -4;10.06;0 | ⑬ Pump Displacement -13;13.09;0 | ⑯ End Job 6;8.28;0 |
| ② Rig-Up Equipment n/a;n/a;n/a | ⑤ Start Job -8;8.32;0 | ⑧ Pump Cement 17;8.36;2.1 | ⑪ Shutdown -13;13.06;0 | ⑭ Bump Plug -12;8.29;0 | ⑰ Rig-Down Equipment 37;8.75;4 |
| ③ Rig-Up Completed 4;2.31;0 | ⑥ Test Lines -8;8.33;0 | ⑨ Shutdown -2;10.26;0 | ⑫ Drop Top Plug -13;13.09;0 | ⑮ Other 2503;8.44;0 | ⑱ Return to Service Center from Job n/a;n/a;n/a |

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3.0 Appendix
