

HALLIBURTON

iCem[®] Service

ENCANA CORPORATION

For:

Date: Thursday, July 17, 2014

VOGL-MCCOY 2E-5 H-F267

Case 1

Sincerely,

Sebastian Estensoro

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1.1 Executive Summary

Halliburton appreciates the opportunity to perform the cementing services on the **Vogl McCoy 2E-5H-F267** 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

	Date	Time	Time Zone
Called Out	5/26/14	0330	MST
On Location	5/26/14	0725	MST
Job Started	5/26/14	1107	MST
Job Completed	5/26/14	1430	MST
Departed Location	5/26/14	1500	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 #: 3191321		Quote #:		Sales Order #: 0901373625					
Customer: ENCANA OIL & GAS (USA) INC. - EBUS				Customer Rep: CHARLIE							
Well Name: VOGL-MCCOY			Well #: 2E-5 H-F267			API/UWI #: 05-123-37780-00					
Field: WATTENBERG		City (SAP): FIRESTONE		County/Parish: WELD		State: COLORADO					
Legal Description: SE NW-5-2N-67W-2597FNL-2343FWL											
Contractor:				Rig/Platform Name/Num: H&P 278							
Job BOM: 7522											
Well Type: HORIZONTAL OIL											
Sales Person: HALAMERICA\HB50180					Srcv Supervisor: Brandon Nielson						
Job											
Formation Name											
Formation Depth (MD)		Top			Bottom						
Form Type					BHST						
Job depth MD		7655ft			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	8.835	40		N-80	0	868	0	0	
Casing		7	6.276	26		N-80	0	7647	0	0	
Open Hole Section			8.75				868	7655	0	0	
Tools and Accessories											
Type	Size in	Qty	Make	Depth ft	Type	Size in	Qty	Make			
Guide Shoe	7	1		7647	Top Plug	7	1	HES			
Float Shoe	7	1			Bottom Plug	7	1	HES			
Float Collar	7	1			SSR plug set	7	1	HES			
Insert Float	7	1			Plug Container	7	1	HES			
Stage Tool	7	1			Centralizers	7	1	HES			
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 ³ /sack	Mix Fluid Gal	Rate bbl/min	Total Mix Fluid Gal		
1	10 lb/gal Tuned Spacer III	Tuned Spacer III	30	bbl	10	5.86	38	5			
61.01 lbm/bbl			BARITE, BULK (100003681)								
38.32 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 ³ /sack	Mix Fluid Gal	Rate bbl/min	Total Mix Fluid Gal	
2	Tuned Light B1	TUNED LIGHT (TM) SYSTEM	280	sack	10	2.32			8.73	
8.73 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	VariCem B1	VARICEM (TM) CEMENT	316	sack	13	1.95			9.83	
9.83 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	
4	Displacement		294.5	bbl	10.5					
Cement Left In Pipe		Amount	94 ft		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 4000psi**
- 3. Pump Tuned Spacer**
 - a. Density = 10 lb/gal
 - b. Volume = 30 bbl
 - c. Rate = 2 bpm
- 4. Drop Bottom Plug**
- 5. Pump Tuned Light (Lead)**
 - a. Density = 10
 - b. Yield = 2.32
 - c. Water Requirement = 8.73
 - d. Volume = 280sks (115.6 bbls)
 - e. Rate = 4 bpm
- 6. Pump VariCem (Tail)**
 - a. Density = 13
 - b. Yield = 1.95
 - c. Water Requirement = 9.83
 - d. Volume = X316sks (109.7 bbls)
 - e. Rate = 6 bpm
- 7. Drop Top Plug**
- 8. Start Displacement**
- 9. Pump Displacement Mud**
 - a. Density = 10 lb/gal
 - b. Volume = 294.5 bbls
 - c. Rate = 7 bpm
10. Land Plug – Anticipated Final Circulation Pressure 980 psi

Calculated Total Displacement = 294.5 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

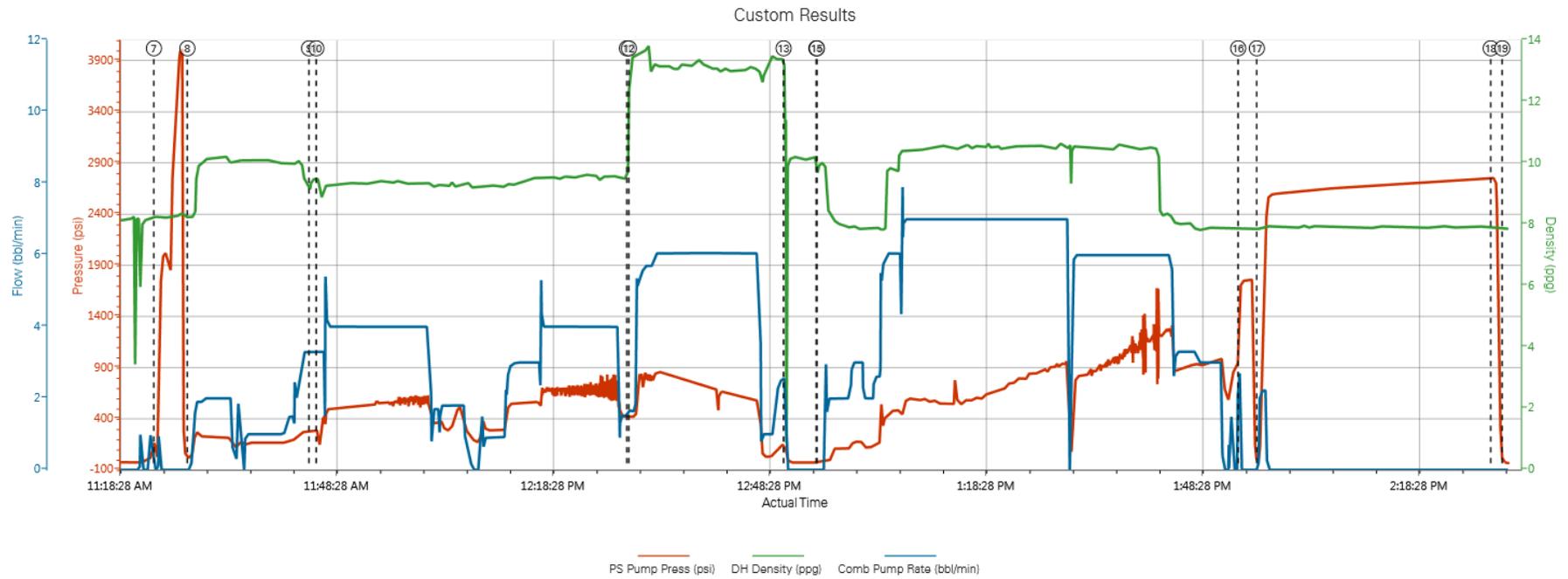
Submitted Respectfully by: _____

1.6 Job Event Log

Type	Seq. No.	Activity	Graph Label	Date	Time	Source	DH Density (ppg)	PS Pump Press (psi)	PS Pump Rate (bbl/min)	Comment
Event	1	Call Out	Call Out	5/26/2014	03:30:00	USER				
Event	2	Arrive At Loc	Arrive At Loc	5/26/2014	07:25:00	USER				RIG HAD 8 JOINTS LEFT UPON ARRIVAL AND WERE HAVING A LITTLE TROUBLE GETTING IT DOWN.
Event	3	Rig-up Lines	Rig-up Lines	5/26/2014	07:45:00	USER				
Event	4	Rig-Up Completed	Rig-Up Completed	5/26/2014	09:00:00	USER				
Event	5	Pre-Job Safety Meeting	Pre-Job Safety Meeting	5/26/2014	10:30:00	USER	8.20	-16.00	0.00	JSA WITH ALL INVOLVED PERSONS.
Event	6	Start Job	Start Job	5/26/2014	11:07:34	COM1	8.24	-23.00	0.00	
Event	7	Test Lines	Test Lines	5/26/2014	11:23:30	COM1	8.27	35.00	0.00	TESTED LINES TO 4000 PSI NO VISIBLE LEAKS.
Event	8	Pump Spacer 1	Pump Spacer 1	5/26/2014	11:28:08	COM1	10.00	28.00	2.00	30 BBL TUNE SPACER MIXED AT 10 PPG WITH FRESH WATER. PUMPED AT 1 BPM AND 165 PSI.
Event	9	Drop Bottom Plug	Drop Bottom Plug	5/26/2014	11:45:00	COM1	10.00	281.00	0.00	PLUG PRE LOADED WITNESSED BY COMPANY REP.
Event	10	Pump Lead Cement	Pump Lead Cement	5/26/2014	11:46:00	COM1	9.50	147.00	4.00	280 SKS OR 115.6 BBL TUNE LIGHT MIXED AT 10 PPG WITH FRESH WATER ON BATCH MIXER. PUMPED AT 4 BPM AND 580 PSI
Event	11	Drop Bottom Plug	Drop Bottom Plug	5/26/2014	12:29:02	COM1	9.50	420.00	0.00	PLUG PRE LOADED WITNESSED BY COMPANY REP
Event	12	Pump Tail Cement	Pump Tail Cement	5/26/2014	12:29:19	COM1	13.00	421.00	6.00	316 SKS OR 109.7 BBL VARICEM MIXED AT 13 PPG WITH FRESH WATER. PUMPED AT 6 BPM AND 786 PSI
Event	13	Shutdown	Shutdown	5/26/2014	12:50:45	COM1	13.00	55.00	0.00	
Event	14	Drop Top Plug	Drop Top Plug	5/26/2014	12:55:17	COM1	13.00	-22.00	0.00	REMOVED CAP AND DROPPED PLUG.
Event	15	Pump Displacement	Pump Displacement	5/26/2014	12:55:22	COM1	10.00	-22.00	7.00	PUMPED 294.5 BBL MUD AT 7 BPM AND 826 PSI. CEMENT RETURNED TO SURFACE 277 BBL INTO LEAVING US WITH 17.5 BBL BACK.
Event	16	Bump Plug	Bump Plug	5/26/2014	13:53:44	COM1	7.88	1708.00	0.00	PLUG BUMPED AT 980 PSI
Event	17	Other	Other	5/26/2014	13:56:19	COM1	7.90	-1.00	1.10	30 MINUTE 2500 PSI CASING TEST
Event	18	Other	Other	5/26/2014	14:28:45	COM1	7.93	2754.00	0.00	RELEASED PRESSURE AT 2754 PSI FLOATS HELD TEST WAS SUCCESSFULL.
Event	19	End Job	End Job	5/26/2014	14:30:20	COM1				WASHED UP INTO A VAC TRUCK AND RIGGED DOWN.

2.0 Custom Graphs

2.1 Custom Graph



- | | | | | | | |
|-----------------------------|------------------------------------|---------------------------------|----------------------------------|------------------------------|-------------------------|-------------------------|
| ① Call Out n/a;n/a;n/a | ④ Rig-Up Completed n/a;n/a;n/a | ⑦ Test Lines 35;8.27;0 | ⑩ Pump Lead Cement 147;9.5;3.3 | ⑬ Shutdown 55;1.45;0 | ⑯ Bump Plug 1708;7.88;0 | ⑲ End Job -28.61;7.87;0 |
| ② Arrive At Loc n/a;n/a;n/a | ⑤ Pre-Job Safety Meeting -16;8.2;0 | ⑧ Pump Spacer 1 28;8.27;0 | ⑫ Drop Bottom Plug 420;12.73;1.7 | ⑭ Drop Top Plug -22;9.88;0 | ⑰ Other -1;7.9;1.1 | |
| ③ Rig-up Lines n/a;n/a;n/a | ⑥ Start Job -23;8.24;0 | ⑨ Drop Bottom Plug 281;9.45;3.3 | ⑪ Pump Tail Cement 421;13.39;1.7 | ⑮ Pump Displacement -22;10;0 | ⑱ Other 2754;7.93;0 | |



3.0 Appendix
