

# HALLIBURTON

iCem<sup>®</sup> Service

## ENCANA CORPORATION

**For:**

Date: Thursday, July 17, 2014

**VOGL-MCCOY 2E-5 H-F267**

Case 1

Sincerely,

**Sebastian Estenssoro**

## Table of Contents

---

1.1	Executive Summary	3
1.2	Cementing Job Summary	4
1.3	Planned Pumping Schedule	6
1.4	Job Overview	7
1.5	Water Field Test	8
1.6	Job Event Log	9
2.0	Custom Graphs	10
2.1	Custom Graph	10
3.0	Appendix	11

---

## **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**

	<b>Date</b>	<b>Time</b>	<b>Time Zone</b>
<b>Called Out</b>	5/26/14	0330	MST
<b>On Location</b>	5/26/14	0725	MST
<b>Job Started</b>	5/26/14	1107	MST
<b>Job Completed</b>	5/26/14	1430	MST
<b>Departed Location</b>	5/26/14	1500	MST

1.2 Cementing Job Summary

**HALLIBURTON**

**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				Srv Supervisor: Brandon Nielson						
<b>Job</b>										
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						
<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	8.835	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
<b>Tools and Accessories</b>										
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		
<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 ft3/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								

# HALLIBURTON

## Cementing Job Summary

Fluid #	Stage Type	Fluid Name	Qty	Qty UoM	Mixing Density lbm/gal	Yield ft3/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 ft3/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 ft3/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 = 280sk (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 = X316sk (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:** \_\_\_\_\_



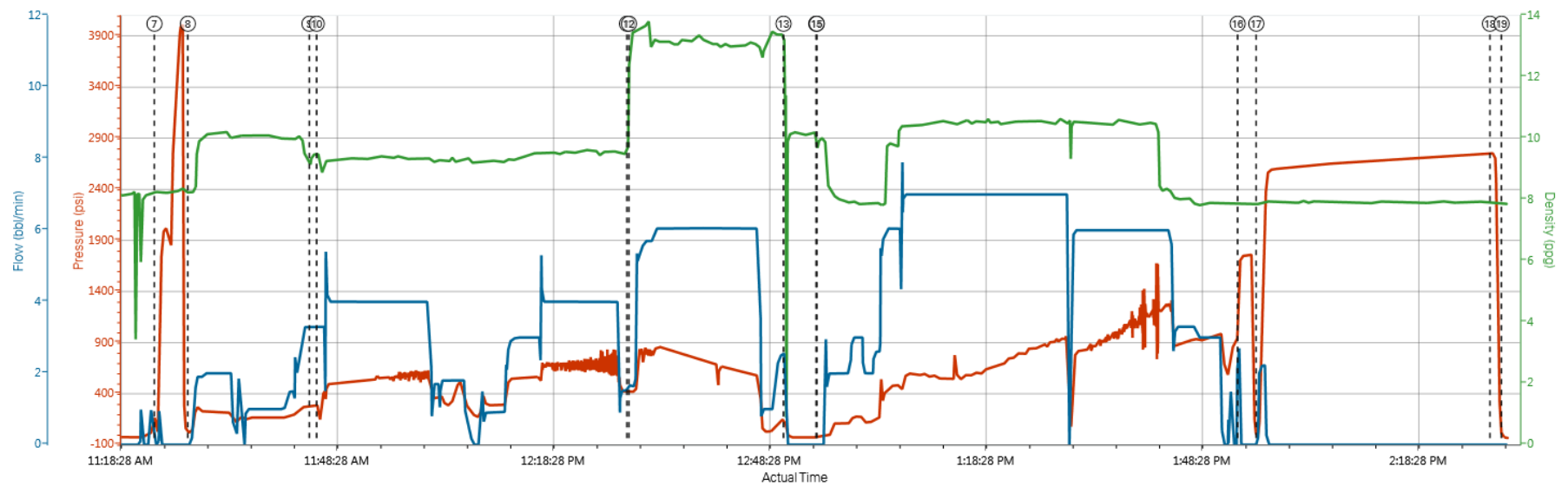
**1.6 Job Event Log**

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 HAVEING A LIITLE 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

Custom Results



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

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    ⑪ 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    ⑫ Pump Tail Cement 421;13.39;1.7    ⑮ Pump Displacement -22;10;0    ⑱ Other 2754;7.93;0

▲ HALLIBURTON | iCem® Service

Created: 2014-05-26 09:05:34, Version: 3.0.121

Edit

### 3.0 Appendix

---