

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 |

Cementing Job Summary

Created: Monday, July 28, 2014

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 |

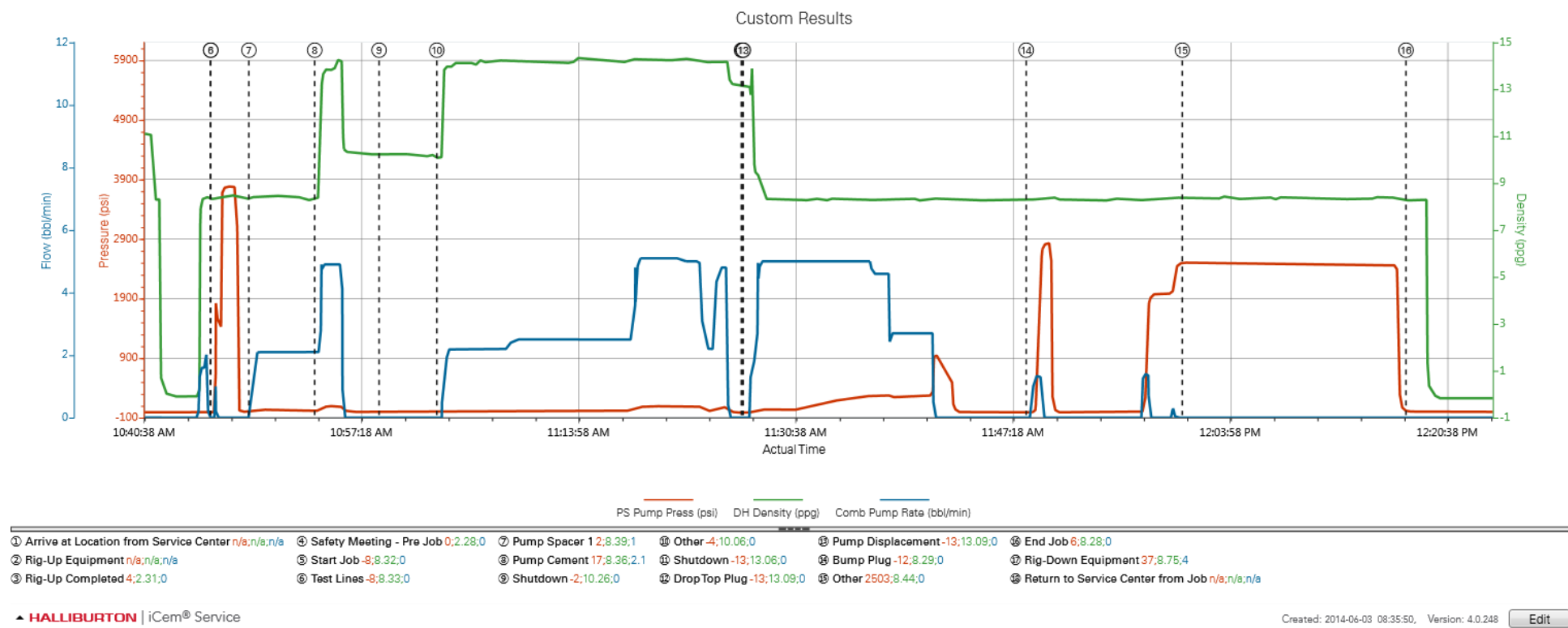
Submitted Respectfully by: _____

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



3.0 Appendix
