

HALLIBURTON

iCem[®] Service

PDC ENERGY-EBUS

J Clark 7N Production

Sincerely,
Meghan Jacobs

Legal Notice

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1.0 Cementing Job Summary

1.1 Executive Summary

Halliburton appreciates the opportunity to perform the cementing services on the **J Clark 7N** cement **Production** 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.

Approximately 16bbls of MudFlush Spacer returned to surface.

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 [Ft. Lupton]

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Cementing Job Summary

The Road to Excellence Starts with Safety

| Sold To #: 304535 | | Ship To #: 3870497 | | Quote #: | | Sales Order #: 0905029871 | | | | |
|---------------------------------------------------|------------------------|---------------------|------------|-----------------------------------|-----------------------------------------|-----------------------------|---------------|--------------|---------------------|---------------|
| Customer: PDC ENERGY-EBUS | | | | Customer Rep: Chris McMullen | | | | | | |
| Well Name: J CLARK | | | Well #: 7N | | API/UWI #: 05-123-46692-00 | | | | | |
| Field: WATTENBERG | | City (SAP): GREELEY | | County/Parish: WELD | | State: COLORADO | | | | |
| Legal Description: NW NE-14-5N-65W-550FNL-2084FEL | | | | | | | | | | |
| Contractor: ENSIGN DRLG | | | | Rig/Platform Name/Num: ENSIGN 152 | | | | | | |
| Job BOM: 7523 7523 | | | | | | | | | | |
| Well Type: HORIZONTAL OIL | | | | | | | | | | |
| Sales Person: HALAMERICA\HX38199 | | | | | Srv Supervisor: Kendall Broom - H194727 | | | | | |
| Job | | | | | | | | | | |
| Formation Name | | | | | | | | | | |
| Formation Depth (MD) | | Top | | | Bottom | | | | | |
| Form Type | | | | | | | | | | |
| BHST | | | | | | | | | | |
| Job depth MD | | 12245ft | | | 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 | 1677 | | |
| Casing | | 5.5 | 4.778 | 20 | | | 0 | 12238 | | |
| Open Hole Section | | | 8.5 | | | | 1677 | 6881 | | |
| Open Hole Section | | | 8.5 | | | | 6881 | 12271 | | |
| Tools and Accessories | | | | | | | | | | |
| Type | Size in | Qty | Make | Depth ft | | Type | Size in | Qty | Make | |
| Guide Shoe | 5.5 | | | | | Top Plug | 5.5 | | HES | |
| Float Shoe | 5.5 | | | 12245 | | Bottom Plug | 5.5 | | HES | |
| Float Collar | 5.5 | | | | | SSR plug set | 5.5 | | HES | |
| Insert Float | 5.5 | | | | | Plug Container | 5.5 | 1 | HES | |
| Stage Tool | 5.5 | | | | | Centralizers | 5.5 | | HES | |
| 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 | 50 | bbl | 8.4 | | | | | |
| 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 | |

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Cementing Job Summary

| 2 | 11.1 lb/gal Tuned Spacer III | Tuned Spacer III | 100 | bbl | 11.1 | 4.5 | | | |
|-------------------------------------------------------------------------------------------|---------------------------------|-----------------------|---------------|---------------------------|---------------------------|---------------------------------|------------------|---------------------|---------------------------|
| Fluid # | Stage Type | Fluid Name | Qty | Qty UoM | Mixing Density lbm/gal | Yield ft ³ /sack | Mix Fluid Gal | Rate bbl/mi n | Total Mix Fluid Gal |
| 3 | ElastiCem | ELASTICEM (TM) SYSTEM | 815 | sack | 15.6 | 1.18 | | 5 | 5.15 |
| Fluid # | Stage Type | Fluid Name | Qty | Qty UoM | Mixing Density lbm/gal | Yield ft ³ /sack | Mix Fluid Gal | Rate bbl/mi n | Total Mix Fluid Gal |
| 4 | ElastiCem | ELASTICEM (TM) SYSTEM | 787 | sack | 14.4 | 1.7 | | 8 | 7.3 |
| Fluid # | Stage Type | Fluid Name | Qty | Qty UoM | Mixing Density lbm/gal | Yield ft ³ /sack | Mix Fluid Gal | Rate bbl/mi n | Total Mix Fluid Gal |
| 5 | MMCR Displacement | MMCR Displacement | 30 | bbl | 8.34 | | | | |
| Fluid # | Stage Type | Fluid Name | Qty | Qty UoM | Mixing Density lbm/gal | Yield ft ³ /sack | Mix Fluid Gal | Rate bbl/mi n | Total Mix Fluid Gal |
| 6 | Displacement fluid | Water | 240 | bbl | 8.34 | | | | |
| Cement Left In Pipe | | | Amount | Reason | | | | Shoe Joint | |
| Mix Water: | | | pH 7 | Mix Water Chloride: 0 ppm | | Mix Water Temperature: 78 °F °C | | | |
| Plug Bumped? | | | Yes | Floats Held? | | | | Yes | |
| Cement Returns: | | | 0 | | | | | | |
| Comment Bumped plug, burst shoe, pumped a 5 bbl wet shoe, got 1.5 bbbls back on the truck | | | | | | | | | |

2.0 Real-Time Job Summary

2.1 Job Event Log

| Type | Seq. No. | Activity | Graph Label | Date | Time | Source | Comb Pump Rate (bbl/min) | DH Density (ppg) | DS Pump Press (psi) | Comments |
|-------|----------|--------------------------|--------------------------|-----------|----------|--------|-----------------------------|---------------------|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| Event | 1 | Call Out | Call Out | 7/31/2018 | 19:00:00 | USER | | | | Called crew out to be on location at 0200 |
| Event | 2 | Depart Shop for Location | Depart Shop for Location | 7/31/2018 | 22:30:00 | USER | | | | Held a safety meeting before leaving for location |
| Event | 3 | Arrive At Loc | Arrive At Loc | 7/31/2018 | 23:30:00 | USER | | | | Arrive at location and met with the company man |
| Event | 4 | Rig-up Lines | Rig-up Lines | 7/31/2018 | 23:50:00 | USER | | | | Held a hazard hunt before spotting in trucks and rigging up |
| Event | 5 | Safety Meeting | Safety Meeting | 8/1/2018 | 05:30:00 | USER | 0.00 | 8.44 | 29.00 | Held a safety meeting with the rig to discuss the operation and safety |
| Event | 6 | Start Job | Start Job | 8/1/2018 | 06:01:54 | COM5 | 0.00 | 8.47 | -5.00 | Filled lines with 3 bbls water |
| Event | 7 | Test Lines | Test Lines | 8/1/2018 | 06:06:54 | COM5 | 0.00 | 8.47 | -5.00 | Tested lines to 4500 psi with a 500 psi kick out and a 5th gear stall |
| Event | 8 | Pump Spacer 1 | Pump Spacer 1 | 8/1/2018 | 06:17:19 | COM5 | 0.00 | 8.08 | 33.00 | Pumped 50 bbls Mud Flush. Dropped the plug at 40 bbls away. Pumped at 4 bpm and 550 psi. |
| Event | 9 | Pump Spacer 1 | Pump Spacer 1 | 8/1/2018 | 06:34:50 | COM5 | 4.00 | 11.35 | 769.00 | Pumped 100 bbls Tuned Spacer. 11.1#, 4.5 yield, 29.4 gal/sks. |
| Event | 10 | Check Weight | Check Weight | 8/1/2018 | 06:38:07 | COM5 | 5.10 | 11.11 | 808.00 | Verified weight with the pressurized scale. |
| Event | 11 | Pump Lead Cement | Pump Lead Cement | 8/1/2018 | 06:50:43 | COM5 | 8.00 | 15.89 | 1149.00 | Pumped 171.27 bbls Elasticem. 815 sks, 15.6#, 1.18 yield, 5.15 gal/sks. Pumped at 7 bpm and 500-1200 psi. Calculated TOLC is at 2200ft. |
| Event | 12 | Check Weight | Check Weight | 8/1/2018 | 06:55:23 | COM5 | 6.10 | 15.59 | 1062.00 | Verified weight with pressurized scale. |
| Event | 13 | Pump Tail Cement | Pump Tail Cement | 8/1/2018 | 07:15:53 | COM5 | 7.00 | 14.39 | 606.00 | Pumped 238 bbls Elasticem. 787 sks, 14.4#, 1.7 yield, 7.3 gal/sks. Pumped at 7 bpm and 618 psi. Calculated TOTC 6398ft. |
| Event | 14 | Check Weight | Check Weight | 8/1/2018 | 07:17:31 | COM5 | 7.00 | 14.42 | 515.00 | Verified weight with the pressurized scale. |

| | | | | | | | | | | |
|-------|----|-------------------|-------------------|----------|----------|------|------|-------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Event | 15 | Check Weight | Check Weight | 8/1/2018 | 07:46:53 | COM5 | 7.00 | 14.32 | 810.00 | Verified weight with pressurized scales |
| Event | 16 | Shutdown | Shutdown | 8/1/2018 | 07:57:03 | COM5 | 0.00 | 13.75 | -8.00 | Shut down blew lines down with rig air. and washed up cement head and lines. |
| Event | 17 | Drop Top Plug | Drop Top Plug | 8/1/2018 | 08:04:35 | COM5 | 0.00 | 7.56 | -9.00 | Dropped top plug loaded and verified by Weatherford and company man. |
| Event | 18 | Pump Displacement | Pump Displacement | 8/1/2018 | 08:05:06 | COM5 | 0.00 | 7.46 | -13.00 | Pumped 270 bbls displacement. First 30 bb ls had MMCR and Biocide. The balance had Biocide and KCL added on the fly. Got Mud Flush back to surface. Pumped 8 bpm until 200 bbls away. |
| Event | 19 | Shutdown | Shutdown | 8/1/2018 | 08:55:19 | COM5 | 0.00 | 8.34 | 1434.00 | At 254 bbls away the rig took a gas hit, forcing us to shut down. Company man Vaughn Staples and Chris McMullen shut down the operation and made calls for a moc. We then proceeded after being down for 9 min. and the rig controlled the rams. We came on at 1 bpm then to 2 bpm. |
| Event | 20 | Bump Plug | Bump Plug | 8/1/2018 | 09:03:54 | COM5 | 0.00 | 8.38 | 2910.00 | We bumped the plug at 2bpm and 2450 psi. we pressured up the well and burst the shoe at 3795 psi. and pumped a 5 bbl wet shoe. Checked floats and got 1.5 bbls back on the truck. We are leaving the cement head and manifold on the well until the cement sets up. |
| Event | 21 | End Job | End Job | 8/1/2018 | 09:34:51 | COM5 | | | | |
| Event | 22 | Rig Down Lines | Rig Down Lines | 8/1/2018 | 09:40:00 | USER | | | | Held a safety meeting before rigging down the lines |
| Event | 23 | Depart Location | Depart Location | 8/1/2018 | 10:15:00 | USER | | | | Held a safety huddle before leaving location |