

Job Details & Summary

Geometry

| Type | Function | OD (in) | ID (in) | Weight (lb/ft) | Thread | Top (ft) | Bottom (ft) | Excess (%) |
|-----------|----------|---------|---------|----------------|--------|----------|-------------|------------|
| Casing | Outer | 9.625 | 8.921 | 36 | n/a | 0 | 1546 | 0 |
| Open Hole | Outer | n/a | 8.5 | n/a | n/a | 1546 | 6700 | 20 |
| Casing | Inner | 5.5 | 4.778 | 20 | n/a | 0 | 16497 | 0 |
| Open Hole | Outer | n/a | 8.5 | n/a | n/a | 6700 | 16507 | 15 |

Equipment / People

| Unit Type | Unit | Power Unit | Employee #1 | Employee #2 | Mileage |
|--------------------|--------|------------|------------------|------------------|---------|
| Field Bin | 604 | | | | 138 |
| Plug Container | 150509 | | | | 138 |
| Bulk Trailer | 502 | 204 | Bueghly, Steve | Saldivar, Jesus | 138 |
| Cement Pump | 102 | 202 | Hyde, Zack | Chaparro, Hector | 138 |
| Field Bin | 602 | | | | 138 |
| Light Duty Pickups | 3 | | Fuentes, Orlando | Hyde, Tyson | 138 |
| Swage | 150529 | | | | 138 |

Timing

| Event | Date/Time |
|-----------------|------------------|
| Call Out | 12/13/2016 09:00 |
| Depart Facility | 12/13/2016 12:00 |
| On Location | 12/13/2016 13:30 |
| Rig Up Iron | 12/13/2016 14:00 |
| Job Started | 12/14/2016 08:30 |
| Job Completed | 12/14/2016 13:30 |
| Rig Down Iron | 12/14/2016 14:00 |
| Depart Location | 12/14/2016 15:00 |

General Job Information

| Metrics | Value |
|-------------------------|-------------|
| Well Fluid Density | 10.3 lb/gal |
| Well Fluid Type | WBM |
| Rig Circulation Vol | 1453 bbls |
| Rig Circulation Time | 3 hours |
| Calculated Displacement | 365.8 bbls |
| Actual Displacement | 361 bbls |
| Total Spacer to Surface | 100 bbls |
| Total CMT to Surface | 71 bbls |
| Well Topped Out | No |

Well Fluid Details

| Metrics | Value |
|-------------------|-------|
| Plastic Viscosity | 13 |
| Yield Point | 8 |
| 10 sec. SGS | 3 |
| 10 min. SGS | 6 |
| 30 min. SGS | 10 |
| Filtrate | 3.6 |

Job Details

| Metrics | Value |
|--------------------------------|-------------|
| Flare Prior to Job | Yes |
| Flare During Job | No |
| Flare at End of Job | No |
| Well Full Prior to Job | Yes |
| Well Fluid Density Into Well | 10.3 lb/gal |
| Well Fluid Density Out of Well | 10.3 lb/gal |

Job Details (cont.)

| Metrics | Value |
|---------|--------|
| BHCT | 220 °F |
| BHST | 220 °F |

Circulation

| |
|------------------------------|
| Lost Circulation Experienced |
| No |



Job Execution Information

| Job | Fluid | Product | Function | Density (lb/gal) | Yield (ft ³ /sk) | Water Rq. (gal/sk) | Water Rq. (gal/bbl) | Volume (sks) | Volume (bbl) | Top (ft) |
|-----|-------|--------------------------------------|-------------------|------------------|-----------------------------|--------------------|---------------------|--------------|--------------|----------|
| 1 | 1 | Water | Flush | 8.33 | | | 42.00 | | 60.00 | 0 |
| 1 | 2 | CD Spacer | Spacer | 11.00 | | | 33.76 | | 40.00 | 0 |
| 1 | 3 | ALTCem P100-X2 | Lead | 12.50 | 2.07 | 11.76 | | 890.00 | 327.40 | 0 |
| 1 | 4 | ALTCem P50-X1 | Tail | 13.50 | 1.47 | 7.35 | | 1970.00 | 517.22 | 3856 |
| 1 | 5 | MMCR Water | Displacement | 8.33 | | | 41.90 | | 5.00 | 16384 |
| 1 | 6 | Water w/ Clay Protection and Biocide | DisplacementFinal | 8.33 | | | 41.91 | | 365.80 | 0 |

Job Fluid Details

| Job | Fluid | Type | Fluid | Product | Function | Conc. | Uom |
|-----|-------|-------------------|--------------------------------------|---------|-----------------------|--------|---------|
| 1 | 2 | Spacer | CD Spacer | ASR-20 | StrengthRetrogression | 179.30 | lb/bbl |
| 1 | 2 | Spacer | CD Spacer | AR-31 | Retarder | 0.64 | lb/bbl |
| 1 | 2 | Spacer | CD Spacer | AVS-10 | Viscosifier | 0.80 | lb/bbl |
| 1 | 3 | Lead | ALTCem P100-X2 | AC3-10 | Cement | 100.00 | % |
| 1 | 3 | Lead | ALTCem P100-X2 | ABX-30 | BondEnhancer | 0.40 | %BWOB |
| 1 | 3 | Lead | ALTCem P100-X2 | ADF-20 | Defoamer | 0.03 | gal/sk |
| 1 | 3 | Lead | ALTCem P100-X2 | AFL-10 | FluidLoss | 0.30 | %BWOB |
| 1 | 3 | Lead | ALTCem P100-X2 | AR-31 | Retarder | 0.15 | %BWOB |
| 1 | 3 | Lead | ALTCem P100-X2 | AVS-20 | Viscosifier | 0.10 | %BWOB |
| 1 | 4 | Tail | ALTCem P50-X1 | ACG-10 | Cement | 50.00 | % |
| 1 | 4 | Tail | ALTCem P50-X1 | AFA-10 | Extender | 50.00 | % |
| 1 | 4 | Tail | ALTCem P50-X1 | ADF-20 | Defoamer | 0.03 | gal/sk |
| 1 | 4 | Tail | ALTCem P50-X1 | AFL-50 | FluidLoss | 0.20 | %BWOB |
| 1 | 4 | Tail | ALTCem P50-X1 | AR-10 | Retarder | 0.80 | %BWOB |
| 1 | 4 | Tail | ALTCem P50-X1 | AR-31 | Retarder | 0.05 | %BWOB |
| 1 | 4 | Tail | ALTCem P50-X1 | AVS-10 | Viscosifier | 0.10 | %BWOB |
| 1 | 4 | Tail | ALTCem P50-X1 | AVS-50 | Viscosifier | 2.00 | %BWOB |
| 1 | 5 | Displacement | MMCR Water | AR-61 | Retarder | 0.10 | gal/bbl |
| 1 | 6 | DisplacementFinal | Water w/ Clay Protection and Biocide | ASF-50 | ClayProtection | 0.08 | gal/bbl |
| 1 | 6 | DisplacementFinal | Water w/ Clay Protection and Biocide | Biocide | Other | 0.01 | gal/bbl |



Job Logs

| Line | # | Event | Date (MM/DD/YY) | Time (HH:MM) | Density (lb/gal) | Pump Rate (bpm) | Pump Volume (bbls) | Pipe Pressure (psi) | Annular Pressure (psi) | Comment |
|------|---|--------------------|--------------------|-----------------|---------------------|-----------------------|--------------------------|---------------------------|------------------------------|--|
| 1 | | Call Out | 12/13/2016 | 0:900 | | | | | | ALTCem Crew Gets Called Out |
| 2 | | Depart Facility | 12/13/2016 | | | | | | | ALTCem Crew Departs Facility - Cheyenne Wy |
| 3 | | Arrive On Location | 12/13/2016 | | | | | | | ALTCem Crew Arrives On Location - Got Number From Co Man TD- 16507' , TVD- 7392' , TC- 16497' , FC- 19' (5.5 " 20# P-110 Casing) (8.5 " O.H) Well Fluid 10.3 PPG |
| 4 | | Pre Rig Up Meeting | 12/13/2016 | | | | | | | ALTCem Crew Had A Pre Rig Up Meeting |
| 5 | | Rig Up | 12/14/2016 | | | | | | | ALTCem Crew Rigs Up Pump And Iron |
| 6 | | Waiting | 12/15/2016 | | | | | | | Waiting On Rig To Run Casing |
| 7 | | Other | 12/13/2016 | | | | | | | Rig Is Having Problems Getting Casing To Bottom Company Man Decides To Release Crew |
| 8 | | Leave Location | 12/13/2016 | 21:30 | | | | | | ALTCem Crew Leaves Location |
| 9 | | Casing On Bottom | 12/14/2016 | 04:30 | | | | | | Rig Landed Casing On Bottom |
| 10 | | Call Out | 12/14/2016 | 05:00 | | | | | | ALTCem Crew Gets Called Out |
| 11 | | Arrive On Location | 12/14/2016 | 06:30 | | | | | | ALTCem Crew Arrives On Location |
| 12 | | Safety Meeting | 12/14/2016 | 08:30 | | | | | | ALTCem Crew Had Safety Meeting With Rig Hands And Company Man Went Over Job Procedure |
| 13 | | Pressure Test | 12/14/2016 | 08:51 | | | | 6500 | | Pressure Test Pumps and Lines To 6500 PSI |
| 14 | | Pump Spacer | 12/14/2016 | 09:03 | 8.33 | 5 | 60 | 807 | | Pumped 60 BBL Of Water Spacer At 5 BPM W/807 PSI |
| 15 | | Pump CD Spacer | 12/14/2016 | 09:09 | 11 | 6 | 40 | 995 | | Pumped 40 BBL Of CD Spacer At 11 PPG At 6 BPM W/995 PSI |
| 16 | | Pump Lead Cement | 12/14/2016 | 09:19 | 12.5 | 6 | 328 | 921 | | Pumped 328 BBL Of Lead Cement (890 SKS 12.5 PPG 2.07 Yld 11.76 Yld) At 6 BPM W/921 PSI |
| 17 | | Pump Tail Cement | 12/14/2016 | 10:16 | 13.5 | 6 | 515.75 | 274 | | Pumped 515 BBL Of Tail Cement (1970 SKS 13.5 PPG 1.47 Yld 7.35 G/Sk) At 6 BPM W/274 Psi |
| 18 | | Shut Down | 12/14/2016 | 11:45 | | | | | | Shut Down Pumping Cement |
| 19 | | Clean Pumps | 12/14/2016 | 11:46 | | | | | | Wash Pumps And Lines To Pit |
| 20 | | Drop Plug | 12/14/2016 | 11:50 | | | | | | Tool Hand And ALTCem Crew Drops Bottom Plug |
| 21 | | Pump MMCR | 12/14/2016 | 11:51 | 8.33 | 2.5 | 5 | 300 | | Pumped 5 BBL Of Water W/ 2 Gal AR-61 |
| 22 | | Shut Down | 12/14/2016 | 11:55 | | | | | | Shut Down Pumping |
| 23 | | Drop Plug | 12/14/2016 | 11:56 | | | | | | Tool Hand And ALTCem Crew Drops Top Plug |
| 24 | | Start Displacement | 12/14/2016 | 11:56 | 8.33 | 8 | 0 | 460 | | Start Pumping Water Displacement W/ ASF-50 & Biocide At 8 BPM W/460 PSI |
| 25 | | Spacer To Surface | 12/14/2016 | 12:29 | 8.33 | 8 | 256 | 2651 | | At 256 BBL Away Into Displacement Got CD Spacer To Surface |
| 26 | | Cement To Surface | 12/14/2016 | 12:35 | 8.33 | 8 | 290 | 2829 | | At 290 BBL Away Into Displacement Got Cement To Surface |
| 27 | | Slow Rate | 12/14/2016 | 12:42 | 8.33 | 2 | 345 | 1779 | | At 345 BBL Away Slow Down Rate To 2 BPM W/1779 PSI |
| 28 | | Ruptured Disc | 12/14/2016 | 12:47 | 8.33 | 2 | 356 | 2780 | | At 356 BBL Away Into Displacement Ruptured Disc On Bottom Plug At 2780 Psi At 2 BPM Pressure Dropped Back To 1820 Psi |
| 29 | | Land Plug | 12/14/2016 | 12:50 | 8.33 | 2 | 361 | 1898 | | Land Plug At 361 BBL Away Final Circ Pressure Was 1898 PSI |
| 30 | | Bumped Plug | 12/14/2016 | 12:50 | 8.33 | 2 | 361 | 2784 | | Bumped Plug To 2784 PSI |
| 31 | | Check Floats | 12/14/2016 | 12:55 | | | | | | Check Floats Got 4 BBL Back And Still Flowing Slow Back To Pump |



Thornton H-29-30HC API# 05-123-43589
Cement Post Job Report

| | | | | | | | | | |
|----|----------------------|------------|-------|--|--|--|------|--|--|
| 32 | Pressure Up Plug | 12/14/2016 | 13:01 | | | | 2991 | | Company Man Decides To Bump Plug Again To 2991 Psi And Hold For 5 Min |
| 33 | Check Floats | 12/14/2016 | 13:06 | | | | | | Check Floats Got 3.5 BBL Back And Still Was Flowing Back To Pump Slowly |
| 34 | Pressure Up Plug | 12/14/2016 | 13:23 | | | | 2000 | | Pressure Up Plug To 2000 PSI And Customer Decides To Shut In Well At Cement Head |
| 35 | Pre Rig Down Meeting | 12/14/2016 | 13:30 | | | | | | ALTCem Crew Had A Pre Rig Down Meeting |
| 36 | Rig Down | 12/14/2016 | 14:00 | | | | | | ALTCem Crew Rigs Down Pump Nad Iron |
| 37 | Depart Location | 12/14/2016 | 15:00 | | | | | | ALTCem Crew Departs Location |
| 38 | Other | 12/14/2016 | | | | | | | Got 71 BBL Of Cement Back To Surface |
| 39 | Other | 12/14/2016 | | | | | | | Got 100 BBL Of Spacer Back To Surface |

Water Analysis

| Metrics | Value | Recommended |
|------------------|------------------|-------------|
| Water Source | Upright Rig Tank | |
| Temperature | 65 °F | 50-80 °F |
| pH Level | 5 | 5.5-8.5 |
| Chlorides | 1 mg/L | 0-3000 mg/L |
| Total Alkalinity | 0 | 0-1000 |
| Total Hardness | >70 mg/L | 0-500 mg/L |
| Carbonates | 4 mg/L | 0-100 mg/L |
| Sulfates | <200 mg/L | 0-1500 mg/L |
| Potassium | 0 mg/L | 0-3000 mg/L |
| Iron | 0 mg/L | 0-300 mg/L |

Pump Diagrams

