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PLUG AND ABANDONMENT PROCEDURE

STATE 16-12L

- | Step | Description of Work |
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| 1 | Note: Production Casing = 4 1/2" OD, 11.6#/ft, M-75; Production Hole Drilled @ 7 7/8"; 2 7/8" Liner top at 7140'. |
| 2 | Provide 48 hr notice to COGCC prior to rig up per request on approved Form 6 (e.g. call field coordinator, submit Form 42, etc.). Call foreman or lead operator at least 24 hr prior to rig move. Request they catch and remove the plunger, isolate production equipment and remove any automation prior to rig showing up. Install perimeter fence as needed. |
| 3 | MIRU slickline services. Pull bumper spring and tag bottom. RDMO slickline services. |
| 4 | Notify IOC when rig mobilizes to location to generate workorder for flowline removal & one call for line locates. |
| 5 | Check and report surface casing pressure. If surface casing is not accessible at ground level, re-plumb so valve is at ground level. |
| 6 | Prepare location for base beam equipped rig. MI ~15 additional 2 3/8 " prod tbg jts. |
| 7 | MIRU, kill as necessary using clean fresh water with biocide and circulate. ND WH. NU BOP. Unseat landing jt, LD. |
| 8 | Notify cementers to be on call. Provide volumes listed below: |
| 8.1 | Niobrara Plug: 25 sx class G w/ 20% silica flour, 0.4% CD-32, 0.4% ASA-301 and R-3 mixed at 15.8 ppg and 1.38 cuft/sk (5.3 bbls) (Inside 2 7/8" Casing, no excess) |
| 8.2 | "SX/SH Suicide: 690 sx class "G" w/0.25 pps cello flake, 0.4% CD-32, 0.4% ASA-301 mixed at 15.8 ppg and 1.15 cf/sx (138 bbls) (12 1/4 "+20% excess)" |
| 8.3 | Stub Plug: 290 sx Type III CaCl ₂ cement w/0.25 pps cello flake mixed at 14.0 ppg and 1.53 cf/sx (76.9 bbls) (100' in 4 1/2" prod casing, 357' in 12 1/4" OH + 20% excess, and 203' in 8 5/8" surface casing) |
| 9 | TOOH 2 3/8 " production tubing. Stand Back. |

- 10 MIRU WL. RIH gauge ring for 2 7/8" 6.5#/ft casing to 7420'.
- 11 RIH CIBP w/ WL. Set at 7420'. PU dump bailer, dump bail 1 sx class 'G' cement on CIBP.
- 12 RIH CIBP w/ WL. Set at 6730'. RDMO Wireline. PT 4 1/2" casing to 1000 psi.
- 13 RIH to 6730' w/ 2 3/8 " tubing while hydrotesting to 3,000 psi.
- 14 "RU Cementers. Pump Niobrara Plug: 25 sx class G w/ 20% silica flour, 0.4% CD-32, 0.4% ASA-301 and R-3 mixed at 15.8 ppg and 1.38 cuft/sk (5.3 bbls) (Inside 2 7/8" Casing, no excess) to place balanced plug between 6730' - 6730'."
- 15 PUH 9 stands. Circulate 90 bbls water containing biocide to clear tubing. P&LD tbg to 4610'.
- 16 RUWL & PU 2 - 1' 3-1/8" perf guns with 3 spf, 0.5" dia 120° phasing. Shoot 1' of squeeze holes at 4610' and 3780'.
- 17 PU CICR. RIH on wireline and set at 3810'. RD WL.
- 18 RIH w/ stinger on 2 3/8 " tubing.
- 19 RU Cementers. Pump 5 bbl water w/ biocide, 20 bbl Sodium Metasilicate, and another 5 bbl spacer immediately preceding cement.
- 20 Pump SX/SH Suicide: 690 sx class "G" w/0.25 pps cello flake, 0.4% CD-32, 0.4% ASA-301 mixed at 15.8 ppg and 1.15 cf/sx (138 bbls) (12 1/4 "+20% excess) to place suicide squeeze between perfs. Underdisplace and sting out of CICR to leave 3 bbls on top of retainer.
- 21 PUH 5 stands. Circulate 50 bbls water containing biocide to clear tubing.
- 22 RU WL. Shoot off casing at or below 860'. RDMO WL. Circulate a full circulation with water containing biocide to remove any gas.
- 23 NDBOP, NDTH.
- 24 Install BOP on casing head with 4 1/2" pipe rams.
- 25 TOOH with 4 1/2" casing, LD.
- 26 RIH with 2 3/8 " tubing to 960'.
- 27 RU Cementers. Spot Stub Plug: 290 sx Type III CaCl₂ cement w/0.25 pps cello flake mixed at 14.0 ppg and 1.53 cf/sx (76.9 bbls) (100' in 4 1/2" prod casing, 357' in 12 1/4" OH + 20% excess, and 203' in 8 5/8" surface casing).
- 28 Circulate 5 bbls water containing biocide to clear tubing.

- 29 TOOH. WOC 4 hrs. Tag Cement. Cement top needs to be above 403'; Proceed if TOC is above 403'. Otherwise, call production engineer.
- 30 MIRU WL. RIH 8 5/8" CIBP to 80'. Set CIBP, and PT to 1000 psi for 15 min. If tests, RDMO WL and WO rig.
- 31 Instruct cementing and wireline contractors to e-mail copies of all job logs/job summaries and invoices to rscDJVendors@anadarko.com within 24 hrs of the completion of the job.
- 32 Supervisor submit paper copies of all invoices, logs, and reports to Joleen Kramer.
- 33 Excavation crew to notify One Call to clear excavation area around wellhead and for flowlines.
- 34 Excavate hole around surface casing enough to allow welder to cut 8 5/8" casing minimum 5' below ground level.
- 35 Welder cut 8 5/8" casing minimum 5' below ground level.
- 36 MIRU ready cement mixer. Use 4500 psi compressive strength cement, (NO gravel) fill stubout.
- 37 "Spot weld on steel marker plate. Marker should contain Well name, Well number, legal location (1/4 1/4 descriptor) and API number."
- 38 Properly abandon flowlines per Rule 1103.
- 39 Back fill hole with fill. Clean location, level.
- 40 Submit Form 6 to COGCC ensuring to provide 'As performed' WBD identifying operations completed. File electronic Form 42 once abandonment complete.