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PLUG and ABANDONMENT PROCEDURE

MCREYNOLDS 9-6

Description

1. Provide 48 hour notice to COGCC prior to rig up per request on approved Form 6 (e.g. call field coordinator, submit Form 42, etc.). Notify Automation Removal Group at least 24 hours prior to rig move. Request they catch and remove plunger, isolate production equipment, and remove any automation prior to rig MIRU.
2. MIRU Slickline. Pull production equipment and tag bottom. Record tag depth in Open Wells. Gyro was run on 09/19/14. RDMO Slickline.
3. Prepare location for base beam equipped rig. Install perimeter fence as needed.
4. Verify COAs before RU.
5. Upon RU, check and record bradenhead pressure. If bradenhead valve is not accessible, re-plumb so that valve is above GL. Blow down bradenhead and re-check pressure the next day. Repeat until pressure stays at 0 psi.
6. MIRU WO rig. Kill well as necessary using biocide treated fresh water. Verify BOP and wellhead rating, inspect for appropriate API standards, pressure test BOP according to VWP BOP testing guidelines. ND WH. NU BOP. Unland tbg using unlanding joint and LD.
7. TOOH and SB 7760' 2-3/8" tbg. LD any remainder.
8. PU and TIH with (4-1/2", 11.6#) Bit and Scraper on 2-3/8" tbg to 7760'. TOOH and SB 7010' of 2-3/8" tbg. LD Bit and Scraper and remaining tbg.
9. MIRU WL. PU and RIH with (4-1/2", 11.6#) CIBP and set at +/- 7750' (collars at 7475' & 7518'). POOH. RIH and dump 2 sx cement on CIBP. POOH.
10. PU and RIH with (4-1/2", 11.6#) CIBP and set at +/- 7010' (collars at 7000' & 7043'). POOH.
11. Run CCL/GR/CBL/VDL log from +/-6960' to surface to confirm squeeze location. Run entire at 500 psi on casing. Current CBL squeeze location is 4100'-4250'.
12. Forward logs to engineering and in addition to the normal handling of logs/job summaries, email copies of all cement job logs/job summaries and invoices to rscDJVendors@anadarko.com within 24 hours of job completion. Note that squeeze hole locations and cement volumes may vary depending on CBL results. May also run packer to test injection first.
13. TIH with 2-3/8" tbg to 7010'.
14. Load hole with biocide treated fresh water and circulate all gas out of well. PT CIBP to 1000 psi for 15 minutes.
15. MIRU Cementers. Pump Niobrara Balance Plug: Pump 25 sx (6.9 bbl or 39 cf), assuming 15.8 ppg & 1.53 cf/sk. Volume based on 400' inside 4-1/2", 11.6# production casing with no excess. Cement will be from 7010'-6610'. Collect wet and dry samples of cement to be left on rig. RD Cementers.
16. Pull out of cement at a rate of 1 jt/min. TOOH, SB 4160' 2-3/8" tbg. LD remaining tbg.
17. MIRU WL. PU and RIH with two 3-1/8" perf guns with 3 spf, min 0.5" EHD, 120° phasing. Shoot 2' of squeeze holes at 4250' and 4' of squeeze holes at 4100'. RDMO WL.
18. PU and TIH with (4-1/2", 11.6#) CICR on 2-3/8" tbg. Set CICR at 4160'.

19. Establish circulation to surface for a minimum 4 hours with biocide treated fresh water, and pump 100 bbls to clean up hole. Max pump pressure is psi with fresh water at 2 bpm. If unable to circulate at that pressure, contact engineer.
20. RU Cementers. Pump 10 bbls (min) of pre-flush, followed by 5 bbls fresh water spacer. Pump Sussex Squeeze: 45 sx (14.4 bbl or 81 cf) TXI cement with 0.25 lb/sk polyflake, assuming 12 ppg & 1.79 cf/sk. Max pump pressure is to be psi at 2 bpm with a full column of cement. Underdisplace by 3 bbls. Volume is based on 90' below the CICR inside 4-1/2", 11.6# production casing with no excess, 150' in the 4-1/2", 11.6# annulus assuming 7.88" bit size with 60% excess and 190' on top of the CICR to cover top perms. Collect wet and dry samples of cement to be left on rig. RD Cementers.
21. Pull out of cement at a rate of 1 jt/min. TOOH to 3470'. Reverse circulate to ensure no cement is left in the tbg.
22. TOOH and SB 2550' of 2-3/8" tbg. LD stinger, and remaining tbg.
23. RIH and jet cut 4-1/2", 11.6# casing at 2500'. RDMO WL.
24. Attempt to establish circulation and circulate (100 bbl) with fresh water containing biocide to remove any gas.
25. ND BOP. ND TH. Un-land casing using a casing spear, not a lifting sub. Rig max pull shall be 100,000#. Max pull over string weight shall be 50,000#. If unable to unland, contact Engineering.
26. Install BOP on casing head with 4-1/2", 11.6# pipe rams.
27. TOOH and LD all 4-1/2", 11.6# casing. Remove 4-1/2", 11.6# pipe rams and install 2-3/8" pipe rams.
28. TIH with mule shoe and 2-3/8" tubing to 2550'.
29. Establish circulation to surface with biocide treated fresh water and pump at least two hole-volumes (465 bbl) to circulate all gas out of the well. Contact engineering if evidence of gas migration persists.
30. RU Cementers. Pump 10 bbls (min) of pre-flush, followed by 5 bbls fresh water spacer. Pump balanced plug: 25 sx (6.9 bbl or 38.8 cf) Class G cement with 0.25 lb/sk Polyflake, assuming 14 ppg & 1.55 cf/sk. Volume is based on 50' in 4-1/2", 11.6# casing with 0% excess and 50' in 7.88" bit size open hole with 100% excess factor. The plug is designed to cover 2550'-2450'. Collect wet and dry samples of cement to be left on rig. RDMO Cementers. Notify engineering if circulation is ever lost during job.
31. Pull out of cement at a rate of 1 jt/min. TOOH to 1950'. Reverse circulate using biocide treated fresh water to ensure the tubing is clean. WOC. Contact engineer if evidence of gas migration persists.
32. TOOH to 1020'. LD remaining 2-3/8" tbg.
33. If surface casing pressure was at 0 psi prior to pumping the stub plug, then you can proceed to pump the surface casing plug in the same job. If surface casing pressure remained, WOC, tag TOC, and verify surface casing pressure before continuing.
34. TIH with mule shoe and 2-3/8" tubing to 1020'.
35. RU Cementers. Pump 10 bbls (min) of pre-flush, followed by 5 bbls fresh water spacer. Pump Stub Plug: 135 sx (37.3 bbl or 210 cf) Class G cement with 0.25 lb/sk Polyflake, assuming 14 ppg & 1.55 cf/sk. Volume is based on 203' in 7.88" bit size open hole with 100% excess factor. 202' in the 8-5/8", 24# surface casing with no excess. The plug is designed to cover 1020'-615'. Collect wet and dry samples of cement to be left on rig. RDMO Cementers. Notify engineering if circulation is ever lost during job.
36. Pull out of cement at a rate of 1 jt/min. TOOH to 410'. Reverse circulate using biocide treated fresh water to ensure the tubing is clean. TOOH, SB 720' 2-3/8" tbg. WOC.
37. TIH with mule shoe on 2-3/8" tbg and tag cement to verify appropriate coverage above the surface casing shoe. Pressure test casing to 500 psi and hold for 15 minutes. TOOH to 150', LD 2-3/8" tbg.

38. MIRU Cementers. Pump Surface Plug: Pump 50 sx (10.5 bbl or 58 cf) Class G cement, assuming 15.8 ppg & 1.15 cf/sk. Volume based on 150' inside 8-5/8", 24# surface casing with no excess. Cement will be from 150' to surface. Verify and document cement to surface. Collect wet and dry samples of cement to be left on rig. RDMO Cementers.
39. Pull out of cement at a rate of 1 jt/min. TOO, LD all 2-3/8" tbg. Tag cement as needed to verify cement to surface. RDMO WO rig.
40. Instruct cementing and wireline contractors to e-mail copies of all job logs/job summaries to rscDJVendors@anadarko.com within 24 hours of completion of the job.
41. Supervisor submit paper copies of all invoices, logs, and reports to VWP Engineering Specialist.
42. Excavation crew to notify One Call to clear excavation area around wellhead and for flow lines.
43. Capping crew will set and secure night cap on 8-5/8", 24# casing head, restrain the casing head, pressure test CIBP to 500 psi with hydrotest pump, then remove night cap and casing head restraints.
44. Excavate hole around surface casing enough to allow welder to cut casing a minimum 5' below ground level.
45. Welder cut casing minimum 5' below ground level.
46. Fill casing to surface using 4500 psi compressive strength cement (NO gravel).
47. Spot weld on steel marker plate. Marker should contain Well name, Well number, legal location (1/4 1/4 descriptor) and API number.
48. Obtain GPS location data as per COGCC Rule 215 and send to rscDJVendors@anadarko.com.
49. Properly abandon flow lines per Rule 1103. File electronic Form 42 once abandonment is complete.
50. Back fill hole with fill. Clean location, and level.
51. Submit Form 6 to COGCC ensuring to provide 'As performed' WBD identifying operations completed.