

Engineer: ELIZABETH HUNT

Cell: 808-594-3092

PLUG and ABANDONMENT PROCEDURE

NORGREN 14-10J7

Step	Description of Work
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| 1. | 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 Automation Removal Group at least 24 hr prior to rig move. Request they catch and remove the plunger, isolate production equipment and remove any automation prior to MIRU. |
| 2. | MIRU Slickline. Pull bumper spring and tag bottom. Record tag depth in Open Wells. Well has gyro from 11/08/2014. RDMO slickline. |
| 3. | Prepare location for base beam equipped rig. Install perimeter fence as needed. Order a minimum of 25 joints additional 2-1/16", 3.25#, J-55 tbg. |
| 4. | 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. Contact the on-call engineer if pressure does not blow down to 0 and stay at 0. |
| 5. | MIRU WO rig. Kill as necessary using clean fresh water with biocide. ND WH. NU BOP. Unland tbg and release packer set at 7205'. |
| 6. | TOOH and SB all 2-1/16" tbg. LD packer. |
| 7. | PU 3-1/2", 7.7# RBP retrieving head and RIH with 2-1/16" tbg. Circulate sand off of RBP, latch and release RBP at +/- 7319'. |
| 8. | TOOH and SB all 2-1/16" tbg. LD RBP and retrieving head. |
| 9. | PU bit and scraper for 3-1/2", 7.7# csg and RIH to 7330' (just above 2-3/8" liner top @ 7332'). TOOH, SB 7150' 2-1/16" tbg and LD bit and scraper. |
| 10. | MIRU WL. RIH with 3-1/2" (7.7#) CIBP and set at +/- 7320' to abandon the J-Sand perfs. TOOH. RIH to dump 2 sx cement on CIBP. POOH. |
| 11. | RIH with 3-1/2" (7.7#) CIBP and set at +/- 7150' to abandon the NB formation/CD perfs. POOH. RDMO WL. |
| 12. | MIRU hydrotesters. RIH with 2-1/16" tbg OE to 7150' while hydrotesting in to 3000psi. RDMO hydrotesters. Load hole with biocide treated fresh water and circulate all gas out of the hole. |
| 13. | Pressure test CIBP to 2000 psi for 15 minutes. (3-1/2" csg will be used as a work string later). If PT fails, contact the on-call engineer. |
| 14. | <u>MIRU cementers</u> . Pump Niobrara Balance Plug: Pump 20 sxs (31 cf), assuming 15.8 ppg & 1.55 cf/sk. The plug will cover 7150ft-6580ft. Volume based on 570' above the CIBP inside the 3.5" production casing w/ no excess. RD cementers. |
| 15. | Slowly pull out of the cement and PUH to 6000'. Reverse circulate tubing clean to ensure no cement is left in the tubing. TOOH and LD all 2-1/16" tbg. |
| 16. | MIRU WL. RIH and cut 3-1/2 (7.7#) casing at 4360'. POOH. RDMO WL. |
| 17. | Circulate with fresh water containing biocide to remove any gas. |
| 18. | ND BOP. ND TH. Un-land casing using a casing spear, not a lifting sub. Max pull shall be 100,000#. If unable to unland, contact Engineering. |
| 19. | Install BOP on casing head with 3-1/2" pipe rams. |
| 20. | Raise 3-1/2" csg to floor. |
| 21. | Establish circulation to surface with biocide treated fresh water. |

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22. RU cementers. Pump Sussex Squeeze: Pump 10 bbls pre-flush, followed by 5 bbls fresh water followed by 120 sx (181 cf) with 0.25 lb/sk polyflake, assuming 15.8 ppg & 1.51 cf/sk. Volume based on 410' in the open hole assuming 6-1/4" drill bit size with 60% excess. RD cementers.
23. Slowly pull out of the cement and PUH to 3500'. Reverse circulate to ensure no cement is left in the csg.
24. WOC per cement company recommendations. Tag cement as needed.
25. TOOH while LD 3-1/2" csg to 1000'.
26. Establish circulation with biocide treated water.
27. RU Cementers. Pump 10 bbls pre-flush, followed by 5 bbls fresh water spacer. Pump Stub Plug: 170 sxs (255 cf) w/ 0.25 lb/sk Polyflake, assuming 15.8 ppg and 1.16 cf/sk. Volume is based on 576' of OH assuming 6-1/4" bit size with 60% excess, and 200' in 7" surface casing with no excess. The plug is designed to cover from 1000' to 224'. RDMO cementers.
28. Slowly pull out of the cement and PUH to 100'. Reverse circulate tubing clean to ensure no cement is left in the casing.
29. MIRU WL. Tag cement as needed. RIH with 7", 20# CIBP and set at +/- 80. RDMO WL and WO rig.
30. Instruct cementing and wireline contractors to e-mail copies of all job logs/job summaries to rscDJVendors@anadarko.com within 24 hrs of completion of the job.
31. Supervisor submit paper copies of all invoices, logs, and reports to Platteville Engineering Specialist.
32. Excavation crew to notify One Call to clear excavation area around wellhead and for flowlines.
33. Capping crew will set and secure night cap on 7" casing head, restrain the casing head, pressure test CIBP to 500 psi with hydrotest pump, then remove night cap and casing head restraints.
34. Excavate hole around surface casing enough to allow welder to cut casing minimum 5' below ground level.
35. Welder cut casing minimum 5' below ground level.
36. Fill casing to surface using 4500 psi compressive strength cement, (NO gravel).
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. Obtain GPS location data as per COGCC Rule 215 and send to rscDJVendors@anadarko.com.
39. Properly abandon flowlines per Rule 1103. File electronic Form 42 once abandonment complete.
40. Back fill hole with fill. Clean location, level.
41. Submit Form 6 to COGCC ensuring to provide 'As performed' WBD identifying operations completed.