

Engineer: MICHAEL LEE

Cell: 970-302-4601

PLUG and ABANDONMENT PROCEDURE

ROBERT POWERS X 27-9

Step	Description of Work
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| 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 isolate production equipment, and remove any automation prior to rig MIRU. |
| 2. | MIRU slickline. Pull bumper spring and tag bottom. Record tag depth in OpenWells. Well has a gyro survey from 4/18/2016. |
| 3. | Prepare location for base beam equipped rig. Install perimeter fence as needed. |
| 4. | Check and record bradenhead pressure. If bradenhead valve is not accessible, re-plumb so that valve is above GL. Blow down surface casing pressure. Contact Evans Engineering if there is any bradenhead pressures. Changes in the procedure may be necessary if pressure exists. |
| 5. | MIRU WO rig. Load hole using clean fresh water with biocide to control well. ND WH. NU BOP. Unland tbg using unlanding joint and LD. |
| 6. | TOOH and SB 6900' of 2-3/8" tbg. |
| 7. | MIRU WL. RIH with gauge ring (4-1/2", 11.6#, M-80) down to 7610'. TOOH. |
| 8. | RIH with CIBP (4-1/2", 11.6#, M-80) and set at +/- 7600' to abandon the J-Sand perms. TOOH. RIH to dump 2 sx on CIBP. TOOH. |
| 9. | RIH with CIBP (4-1/2", 11.6#, M-80) and set at +/- 6900' to abandon the Niobrara and Codell perms. TOOH. Load hole with biocide treated fresh water and PT CIBP to 1000 psi for 15 minutes. RD WL. |
| 10. | TIH with 2-3/8" tbg to 6900' while hydrotesting to 3000 psi. When on bottom, circulate all the gas out of the well. |
| 11. | <u>RU cementers. Pump Niobrara Balance Plug:</u> Pump 25 sxs (37.5 cf) Thermal 35 + 0.3% CFR-2 + 0.3% ASM-3 mixed at 15.6 ppg & 1.51 cf/sk. Volume based on 430' inside 4-1/2" production casing. Cement will be from 6900' – 6470'. RD cementers. |
| 12. | Slowly pull out of the cement and PUH to 6270'. Reverse circulate to ensure no cement is left in the tbg. |
| 13. | PUH and LD 2-3/8" tbg until EOT is at 4470'. |
| 14. | <u>RU Cementers. Pump Sussex Balance Plug:</u> 15 sxs (17.5 cf) 0:1:0 'G' + 0.5% CFR-2 + 0.2% FMC + 0.5% LWA mixed at 15.8 ppg & 1.15 cf/sk. Volume is based on 200' inside 4-1/2" production casing. Cement will be from 4470' – 4270'. RD cementers. |
| 15. | Slowly pull out of the cement and PUH to 4070'. Reverse circulate to ensure no cement is left in the tbg. WOC per cement company recommendations. |
| 16. | TIH to tag cement (~4270') and record tag depth in OpenWells. |
| 17. | TOOH and SB 1590' of 2-3/8" tbg. |
| 18. | RU WL. RIH and cut 4-1/2" casing at 1490'. RD WL. |
| 19. | Circulate with fresh water containing biocide to remove any gas. |
| 20. | Un-land casing. ND BOP. ND TH. Install BOP on casing head with 4-1/2" pipe rams. |
| 21. | TOOH and LD 1490' of 4-1/2" casing. Remove 4-1/2" pipe rams and install 2-3/8" pipe rams. |
| 22. | RIH with 2-3/8" tbg to 1590'. |
| 23. | Establish circulation with biocide treated fresh water. Circulate two hole volumes (210 bbls) of biocide treated fresh water. |

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24. Pump 10 bbls (min) SAPP, followed by 20 bbls fresh water spacer.
25. RU Cementers. **Pump Stub Plug:** 270 sxs (356 cf) Type III + 0.3% CFL-3 + 0.3% CFR-2 + 0.25lb/sk Polyflake, mixed at 14.8 ppg and 1.33 cf/sk. Volume is based on 100' in 4-1/2" production casing with no excess, 502' of 8.5" OH from log with 20% excess, and 208' in 8-5/8" surface casing with no excess. The plug will cover 1590' - 780'. RD cementers.
26. Slowly pull out of the cement and PUH to 480'. Circulate using biocide treated fresh water to ensure no cement is left in the tbg. WOC per cement company recommendation.
27. TIH to tag cement and record tag depth in OpenWells. Cement needs to be at or above 938' (50' into the SC shoe). If tag is below 938', call Evans Engineering.
28. RU WL. RIH with 8-5/8" CIBP and set at 80'. RDMO WL and WO rig.
29. 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.
30. Supervisor submit paper copies of all invoices, logs, and reports to Evans Engineering Specialist.
31. Excavation crew to notify One Call to clear excavation area around wellhead and for flow lines.
32. Capping crew will set and secure night cap on 8 5/8" casing head, restrain the casing head, pressure test CIBP to 500 psi with hydrotest pump, then remove night cap and casing head restraints.
33. Excavate hole around surface casing enough to allow welder to cut casing a minimum 5' below ground level.
34. Welder cut casing minimum 5' below ground level.
35. Fill casing to surface using 4500 psi compressive strength cement (NO gravel) if necessary.
36. Spot weld on steel marker plate. Marker should contain Well name, Well number, legal location (1/4 1/4 descriptor) and API number.
37. Obtain GPS location data as per COGCC Rule 215 and send to rscDJVendors@anadarko.com.
38. Properly abandon flow lines per Rule 1103. File electronic Form 42 once abandonment is complete.
39. Back fill hole with fill. Clean location, and level.
40. Submit Form 6 to COGCC ensuring to provide 'As performed' WBD identifying operations completed.