

PLUG and ABANDONMENT PROCEDURE

WILLIAMS 35-20

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 catch and remove plunger, isolate production equipment, and remove any automation prior to rig MIRU. |
| 2. | MIRU Slickline. Pull bumper spring and tag bottom. Record tag depth in Open Wells. RDMO Slickline. |
| 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 bradenhead and re-check pressure the next day. Repeat until pressure stays at 0 psi. |
| 5. | MIRU WO rig. Spot a min of 25 jts of 2-3/8" 4.7# J-55 EUE tbq. Kill well as necessary using biocide treated fresh water. ND WH. NU BOP. Unland tbq using unlanding joint and LD. |
| 6. | TOOH and SB all 2-3/8" tbq. |
| 7. | MIRU WL. PU and RIH w/ (4-1/2", 11.6#) gauge ring to 7300'. POOH. |
| 8. | PIRIH w/ (4-1/2", 11.6#) CIBP on WL and set at 7250'. POOH. RDMO WL. |
| 9. | TIH with 2-3/8" tbq to 7250'. Load hole with biocide treated water and circulate all gas out of hole. PT csg and CIBP to 1000psi. |
| 10. | <u>MIRU Cementers</u> . Niobrara/Codell Balance Plug: Pump 25 sxs (30 cf, 5.5bbl) 15.8 ppg & 1.53 cf/sk. Volume based on 340' inside 4-1/2" production casing with no excess. Cement will be from 7250 – 6910. RD Cementers. |
| 11. | Slowly pull out of the cement and PUH to 6400. Reverse circulate tbq clean to ensure no cement is left in the tbq. |
| 12. | TOOH and SB 1200' 2-3/8" tbq, LD remaining tbq. |
| 13. | MIRU WL. PIRIH w/ (4-1/2", 11.6#) CIBP on WL and set at 4100'. POOH. |
| 14. | RIH and dump bail 2sxs on top of CIBP at 4100. POOH. |
| 15. | Run CCL-GR-CBL-VDL from 4100' to surface . Forward to Engineering. In addition to normal handling, of logs/job summaries, email copies of all cement job logs/job summaries and invoices to DJVendors@anadarko.com within 24 hrs of the completion of the job. Confirm casing cut depth with engineering based on CBL results and current bradenhead gas pressures. If pressures still an issue, cut may be moved lower in the well if no cement present on backside. |
| 16. | RIH and jet cut 4-1/2" casing at 1100'. RDMO WL. |
| 17. | Attempt to circulate with biocide treated fresh water to remove any gas. |
| 18. | 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. |
| 19. | Install BOP on casing head with 4-1/2" pipe rams. |
| 20. | TOOH and LD all 4-1/2" casing. Remove 4-1/2" pipe rams and install 2-3/8" pipe rams. |
| 21. | TIH with 2-3/8" tbq to 1200'. |
| 22. | Establish circulation with biocide treated fresh water and pump one hole volume (65 bbls). |

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23. RU Cementers. Pump Stub Plug: Pump 10 bbls (min) SAPP and 5 bbls fresh water spacer followed by 80 sx (90 cf, 16 bbl) .25lb/sk polyflake, 14.0 ppg, & 1.15 cf/sk GasBlok cement. Volume is based on 100' in 4-1/2" production casing with no excess and 200' in 7-7/8" bit size OH with 20% excess. The plug will cover 1200 – 900. RDMO Cementers.
24. Slowly pull out of the cement and PUH to 850'. Reverse circulate using biocide treated fresh water to ensure the tbg is clean. WOC per cement company recommendation. Allow time for pressure to buildup.
25. MIRU WL. Record well pressure. RIH and tag cement. Cement top needs to be at or above 1050 (50' above casing cut at 1100). Call Engineering with pressure and tag depth to determine size of next cement plug. POOH. RDMO WL.
26. If well pressure is 0, TIH with 2-3/8" tbg to cement top (for this procedure, toc assumed to be 900').
27. Establish circulation with biocide treated fresh water and pump one hole volume (65 bbls).
28. RU Cementers. Pump Shoe Plug: Pump 10 bbls (min) SAPP and 5 bbls fresh water spacer followed by 140 sx (157 cf, 28 bbl) .25lb/sk polyflake, 14.0 ppg, & 1.15 cf/sk GasBlok cement. Volume is based on 126' in 7-7/8" bit size OH with 100% excess and 200' in 8-5/8" surface casing with no excess. The plug will cover 900 – 574. RDMO Cementers.
29. Slowly pull out of the cement and PUH to 100'. Reverse circulate using biocide treated fresh water to ensure the tbg is clean. WOC per cement company recommendation.
30. MIRU WL. RIH and tag cement. Cement top needs to be at or above 724 (50' above surface casing shoe at 774). Call Engineering if tag depth is deeper than 724. POOH. RDMO WL.
31. Pump pressure test to test casing. Test shall be 500psi for 15mins. If well fails pressure test PU TIH with (8-5/8", 24#) packer and set just above cement top. Re-test casing. If casing still fails test, contact engineering.
32. RIH (8-5/8", 24#) CIBP to 80'. RDMO WL and WO rig.
33. 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.
34. Supervisor submit paper copies of all invoices, logs, and reports to Platteville Engineering Specialist.
35. Excavation crew to notify One Call to clear excavation area around wellhead and for flow lines.
36. 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.
37. Excavate hole around surface casing enough to allow welder to cut casing a minimum 5' below ground level.
38. Welder cut casing minimum 5' below ground level.
39. Fill casing to surface using 4500 psi compressive strength cement (NO gravel).
40. Spot weld on steel marker plate. Marker should contain Well name, Well number, legal location (1/4 1/4 descriptor) and API number.
41. Obtain GPS location data as per COGCC Rule 215 and send to rscDJVendors@anadarko.com.
42. Properly abandon flow lines per Rule 1103. File electronic Form 42 once abandonment is complete.

Engineer: Jacob Roland
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43. Back fill hole with fill. Clean location, and level.
44. Submit Form 6 to COGCC ensuring to provide 'As performed' WBD identifying operations completed.