

PLUG and ABANDONMENT PROCEDURE

NEWBY 23-33

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. | MIR WO rig and spot in empty pipe trailer. Kill well as necessary using biocide treated fresh water. ND WH. NU BOP. Unland tbg using unlanding joint and LD. |
| 6. | TOH and SB 2 3/8" tubing – tally. LD tubing to keep 7049' |
| 7. | MIRU wireline and RIH w/ (4-1/2", 11.6#) CIBP on WL and set at 7049' (Collars around 7025' and 7065'). |
| 8. | <u>MIRU Cementers</u> . Niobrara/Codell Balance Plug: Pump 25 sxs (38.3 cf, 6.9 bbl) 15.8 ppg & 1.53 cf/sk (or 40 sx minimum for SLB). Volume based on 438'+ inside 4-1/2" production casing with no excess. Cement will be from 6611' – 7049'. RD Cementers. |
| 9. | Slowly pull out of the cement and LD tubing. Reverse circulate tbg clean to ensure no cement is left in the tbg. TOH with remaining tubing and SB 2200' of tubing. |
| 10. | MIRU WL. RIH with CIBP on WL and set at 3920' (Collars at 3895' and 3935'). |
| 11. | Dump 2 sxs on top of CIBP. POOH |
| 12. | RIH with 2 - 3-1/8" perf guns with 4 spf, min 0.5" EHD, 90° phasing. Shoot 4' of squeeze holes at 2200'. |
| 13. | Pump down 4.5" casing with BOPs closed and attempt to circulate to surface behind 4.5" casing. Max surface pressure is 600#. If unable to circulate, contact engineer. If circulating pressure is over 500#, call engineer. RDMO WL |
| 14. | PU and TIH with (4-1/2", 11.6#) CICR on 2-3/8" tbg. Set CICR at 2132'. |
| 15. | Establish circulation through retainer with biocide treated fresh water, and pump 90 bbls to clean up hole. If circulating pressure is over 500#, call engineer. |
| 16. | RU Cementers. Pump 10 bbls (min) of pre-flush, followed by 5 bbls fresh water spacer. Pump 14# Fox Hills Gas Blok: 140 sx (28.5 bbl or 161 cf) assuming 14 ppg & 1.15 cf/sk. Slurry could be different yield – confirm yield and volume before pumping. Max pump pressure is 650# with water and 270# with cement. Underdisplace by 1 bbl. Volume is based on 68' below the CICR inside 4-1/2" 11.6# production casing with no excess, 400' in the 4-1/2", 11.6# annulus assuming 7.88" bit size with 60% excess and 68' on top of the CICR. RD Cementers. |
| 17. | Slowly pull out of the cement and TOOH. Reverse circulate to ensure no cement is left in the tbg. |
| 18. | After pumping the squeeze at 2200', SD and WOC at minimum 4 hrs; verify gas migration/pressure on surface casing has been eliminated. If evidence of gas migration or pressure remains, contact engineer. |
| 19. | TOOH and SB 1083' of 2-3/8" tbg. LD stinger, and remaining tbg. |
| 20. | RIH and jet cut 4-1/2" casing at 983'. RDMO WL. |

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21. Attempt to circulate with biocide treated fresh water to remove any gas.
22. 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.
23. Install BOP on casing head with 4-1/2" pipe rams.
24. TOOH and LD all 4-1/2" casing. Remove 4-1/2" pipe rams and install 2-3/8" pipe rams.
25. TIH with 2-3/8" tbg to 1083'.
26. Establish circulation with biocide treated fresh water and pump 70 bbls to clean up hole. Call engineer if any gas is present.
27. **RU Cementers. Pump Conventional 14# Stub Plug without Gas Blok:** Pump 5 bbls fresh water spacer followed by 100 sxs (155 cf, 27.6 bbl), 14 ppg, & 1.55 cf/sk cement. Slurry could be different yield – confirm yield and volume before pumping. Volume is based on 100' in 4-1/2" production casing with no excess, 100' in the 7 7/8" open hole with 100% excess, and 200' in the 8 5/8" casing with no excess. The plug will cover 1083'-683'. RDMO Cementers.
28. Slowly pull out of the cement and TOH to 400'. Reverse circulate using biocide treated fresh water to ensure the tbg is clean. Trip all the way out. WOC at minimum 4 hrs; verify gas migration/pressure on surface casing has been eliminated.
29. MIRU WL. RIH and tag cement. Cement top needs to be at or above 833' (50' above 8 5/8" shoe at 883'). Call Engineering if tag is lower than 833'. POOH.
30. 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.
31. RIH (8-5/8", 24#) CIBP to 80' and set. RDMO WL and WO rig.
32. 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.
33. Supervisor submit paper copies of all invoices, logs, and reports to Platteville Engineering Specialist.
34. Excavation crew to notify One Call to clear excavation area around wellhead and for flow lines.
35. 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.
36. Excavate hole around surface casing enough to allow welder to cut casing a minimum 5' below ground level.
37. Welder cut casing minimum 5' below ground level.
38. Fill casing to surface using 4500 psi compressive strength cement (NO gravel).
39. Spot weld on steel marker plate. Marker should contain Well name, Well number, legal location (1/4 1/4 descriptor) and API number.
40. Obtain GPS location data as per COGCC Rule 215 and send to rscDJVendors@anadarko.com.
41. Properly abandon flow lines per Rule 1103. File electronic Form 42 once abandonment is complete.
42. Back fill hole with fill. Clean location, and level.
43. Submit Form 6 to COGCC ensuring to provide 'As performed' WBD identifying operations completed.