

PLUG and ABANDONMENT PROCEDURE

HSR-NOAH BASS 11-21

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 and VES. Pull bumper spring and tag bottom. Record tag depth in Open Wells. Well needs gyro. Run gyro to 8000', making stops every 100'. RDMO Slickline and VES. |
| 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 tbgs. Kill well as necessary using biocide treated fresh water. ND WH. NU BOP. Unland tbgs using unlanding joint and LD. |
| 6. | TOOH and SB 7980' 2-3/8" tbgs, LD remaining. |
| 7. | PU and TIH with (4-1/2", 11.6#) Bit and Scraper on 2-3/8" tbgs to 7980'. TOOH and SB 7970' 2-3/8" tbgs. LD remaining tbgs and bit and scraper. |
| 8. | MIRU Hydrotester. PU (4-1/2", 11.6#) hydraulically-set CIBP and TIH while hydrotesting to 3000 psi to +/- 7970' to abandon the J Sand perms. RDMO Hydrotester. |
| 9. | Hydraulically set CIBP at +/- 7970'. Release tbgs from CIBP. Load hole with biocide treated fresh water and circulate all gas from well. PT CIBP to 1000 psi for 15 minutes. |
| 10. | <u>MIRU cementers</u> . J Sand Balance Plug: Pump 70 sx (109 cf) 15.8 ppg & 1.55 cf/sk. Volume based on 1160' inside 4-1/2" production casing. Cement will be from 7970' – 6810'. RD Cementers. |
| 11. | Slowly pull out of the cement and PUH to 6300'. Reverse circulate tbgs clean to ensure no cement is left in the tbgs. |
| 12. | TOOH and SB 4670' 2-3/8" tbgs, LD remaining tbgs. |
| 13. | 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 5050' and 4' of squeeze holes at 4640'. POOH. RDMO WL. |
| 14. | PU and TIH with (4-1/2", 11.6#) CIBP on 2-3/8" tbgs. Set CIBP at 4670'. |
| 15. | Establish circulation to surface with biocide treated fresh water, and pump 200 bbls to clean up hole. |
| 16. | <u>RU Cementers</u> . Pump Sussex Squeeze: Pump 10 bbls sodium silicate and 5 bbls fresh water followed by 180 sx (213 cf) 0.25 lb/sk polyflake 15.8 ppg & 1.18 cf/sk. Underdisplace by 3 bbls. Volume is based on 380' below the CIBP inside 4-1/2" production casing with no excess, 410' in the 4-1/2" annulus assuming 8.5" OH from caliper log with 20% excess, and 193' on top of the CIBP to cover top perms. RD Cementers. |
| 17. | Slowly pull out of the cement and PUH to 4000'. Reverse circulate to ensure no cement is left in the tbgs. |
| 18. | TOOH and SB 2170' 2-3/8" tbgs, LD remaining tbgs and CIBP stinger. |
| 19. | MIRU WL. RIH and jet cut 4-1/2" casing at 2070'. POOH and RDMO WL. |
| 20. | Attempt to circulate with biocide treated fresh water to remove any gas. |
| 21. | 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. |
| 22. | Install BOP on casing head with 4-1/2" pipe rams. |
| 23. | TOOH and LD all 4-1/2" casing. Remove 4-1/2" pipe rams and install 2-3/8" pipe rams. |

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24. TIH with 2-3/8" tbg to 2170'.
25. Establish circulation with biocide treated fresh water and pump one hole volume (150 bbls).
26. RU Cementers. Pump Stub Plug: Pump 10 bbls (min) SAPP followed by 5 bbls fresh water spacer. Pump 295 sxs (343 cf) 0.25 lb/sk Polyflake, 15.8 ppg, & 1.16 cf/sk. Volume based on 100' in 4-1/2" production casing with no excess, 482' in 7.88" bit size with 60% excess factor, and 200' in 8-5/8" surface casing with no excess. The plug will cover 2170' – 1388'. RDMO Cementers.
27. Slowly pull out of the cement and PUH to 880'. Reverse circulate using biocide treated fresh water to ensure the tbg is clean. WOC per cement company recommendation.
28. MIRU WL. RIH and tag cement. Cement top needs to be at or above 1538' (50' above the surface casing shoe at 1588'). Call Engineering if tag is lower than 1538'. POOH.
29. PU (8-5/8", 24#) CIBP and RIH to 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 hours 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 flow lines.
33. 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.
34. Excavate hole around surface casing enough to allow welder to cut casing a 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 flow lines per Rule 1103. File electronic Form 42 once abandonment is complete.
40. Back fill hole with fill. Clean location, and level.
41. Submit Form 6 to COGCC ensuring to provide 'As performed' WBD identifying operations completed.