

PLUG and ABANDONMENT PROCEDURE

HSR-FULENWIDER 10-21

| 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 7970' 2-3/8" tbgs, LD remaining. |
| 7. | PU and RIH with (4-1/2", 11.6#) Bit and Scraper on 2-3/8" tbgs to 7970'. TOOH and SB 7960' 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 +/- 7960' to abandon the J Sand perfs. RDMO Hydrotester. |
| 9. | Hydraulically set CIBP at +/- 7960'. 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. J Sand Balance Plug:</u> Pump 65 sxs (101 cf) 15.8 ppg & 1.55 cf/sk. Volume based on 1140' inside 4-1/2" production casing. Cement will be from 7960' – 6820'. RD Cementers. |
| 11. | Slowly pull out of the cement and PUH to 6300'. Reverse circulate tubing clean to ensure no cement is left in the tubing. |
| 12. | TOOH and SB 4740' 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 5120' and 4' of squeeze holes at 4710'. POOH. RDMO WL. |
| 14. | PU and RIH with (4-1/2", 11.6#) CIBP on 2-3/8" tbgs. Set CIBP at 4740'. |
| 15. | Establish circulation to surface with biocide treated fresh water, and pump 200 bbls to clean up hole. |
| 16. | <u>RU Cementers. Pump Sussex Squeeze:</u> Pump 10 bbls sodium silicate and 5 bbls fresh water followed by 205 sx (242 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 7.88" bit size with 60% excess and 193' on top of the CIBP to cover top perfs. 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 2190' 2-3/8" tbgs, LD remaining tbgs and CIBP stinger. |
| 19. | MIRU WL. RIH and jet cut 4-1/2" casing at 2090'. 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" tubing to 2190'.
25. Establish circulation with biocide treated fresh water and pump one hole volume (155 bbls).
26. RU Cementers. **Pump Stub Plug:** Pump 10 bbls (min) SAPP, followed by 5 bbls fresh water spacer. Pump 310 sxs (360 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, 509' in 7.88" bit size with 60% excess factor, and 200' in 8-5/8" surface casing with no excess. The plug will cover 2190' – 1381'. RDMO Cementers.
27. Slowly pull out of the cement and PUH to 880'. Reverse circulate using biocide treated fresh water to ensure the tubing is clean.
28. WOC per cement company recommendation. TIH and tag cement. Cement top needs to be at or above 1531' (50' above the surface casing shoe at 1581'). Call Engineering if tag is lower than 1531'. TOOH.
29. MIRU WL. 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.