

Engineer: Alex Caravaggio
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BRADENHEAD REMEDIATION (RESIN) PROCEDURE

SEC FOUR 35-4

Step Description of Work

1. Well has directional survey from drilling on 7/21/2009. No GYRO is needed.
2. Notify Automation Removal Group at least 24 hours prior to rig move.
3. Notify Foreman to pull bumper spring and plunger, isolate production equipment, and remove any automation prior to rig MIRU. Install perimeter fence as needed.
4. Operations needs to 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 slickline. RIH to retrieve production equipment and tag for fill. Note tagged depth in Openwells.
6. MIRU beam balanced workover rig. Spot a min of 25 jts of 2-3/8" 4.7# J-55 EUE tbg.
7. Kill well as necessary with biocide treated fresh water. ND wellhead. NU BOP.
8. Unland 2-3/8" tbg and LD landing joint.
9. MIRU EMI services. EMI 2-3/8" tbg while TOO H and tally while standing back. Do not exceed safety tensile load of 57,000 lbs. LD joints that have greater than 35% penetration or wall loss. Replace all joints that fail EMI testing. Document joint numbers and depth of bad tubing and create a Production Equipment Failure report in OpenWells. RDMO EMI services.
10. RU Wireline. PU and RIH with gauge ring (4-1/2", 11.6#) to 7600'. POOH. RDMO WL.
11. PU and TIH with CIBP (4.5", 11.6#) on 2-3/8" tbg and set at +/- 7590' (collars @ 7568' and 7612').
12. Pick up 1 joint above CIBP, and circulate all gas out of hole. Land tubing and MIRU hydrotester. Pumping water with biocide, pressure test against CIBP to 5K for 15 minutes. Unland tubing and TOO H while SB all 2-3/8" tubing. LD setting tool. RDMO hydrotester.
13. MIRU WL. Run Halliburton CAST-M/RMT/ACX/PRT log from 7590' to surface (contact is Joel Walden – 303-502-6786). Expedite interpretation. Send results to engineering. RDMO WL and wait for orders from engineering.
14. MIRU WL. PU and RIH with one 3-1/8" perf gun with 4 spf, and 90° phasing. Shoot 1' of squeeze holes at 1500' (depth and phasing to be confirmed by logging interpretation). POOH. SB WL.
15. Establish injection to ensure micro-annulus was contacted. Maximum pump pressure 1200 psi. Contact engineer to confirm cement design with HAL based on injection rates and pressures. Monitor bradenhead pressure during injection.
16. RU WL. PU and RIH with (4-1/2", 11.6#) CIBP and set at 1530' (~30' below sqz holes; collars @ 1510' and 1555'). Establish injection. If rate differs from Step 15, contact engineer to revise resin design.
17. PU and TIH with 2-3/8" tubing to 1495' (5' above squeeze holes).
18. RU Pump Truck. Place 5 bbls of resin across the perms, displacing with water (volumes to be confirmed with HAL). TOO H to 500' and reverse circulate the tubing clean.

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- TOOH and SB all 2-3/8" tubing. Close blind rams on BOP. Perform hesitation squeeze until less than 5% pressure is bled off over 30 minutes.
19. Install crystal gauge to monitor BH pressure after hesitation squeeze and wait on resin 24 hours.
 20. PU and TIH with 3-7/8" rock bit, appropriate number of 3-1/2" drill collars, and 2-3/8" 4.7# J-55 to surface with appropriate crossovers to top of resin at ~1200'.
 21. RU power swivel. Establish circulation with biocide treated fresh water and time drill resin. If ROP is greater than 1 foot in 2 minutes (1 jt an hour), contact engineering and continue to wait on resin. Otherwise, continue drilling resin and CIBP until you fall free. Contact engineering if at any point torque and/or rate of penetration drop significantly.
 22. Once bit falls free, circulate bottoms up and PT holes to 1000 psi. If successful, proceed. Otherwise, contact engineering.
 23. RD power swivel. TOOH LD all work string, drill collars and drill bit.
 24. MIRU WL. PU and RIH with CCL-GR-CBL-VDL. Run log from 5500' to 1000' and send results to Engineering. Report cement tops in OpenWells. RDMO WL.
 25. TIH with 3-7/8" bit on 2-3/8" tbg and drill out CIBP at 7590'. Chase CIBP to bottom.
 26. MIRU hydrotesters. Hydrotest 2-3/8" tubing to 3000 psi while TIH. Plan to use existing tubing hanger on wellhead to land tbg.
 27. RIH with: 2-3/8" NC, XN, and 253 jts 2-3/8" 4.7# J-55 tbg and land at +/- 7970 (1 jt above top Codell perf).
 28. RU rig lubricator. Broach tubing to seating nipple. RD rig lubricator.
 29. ND BOP. NU 7-1/16" flanged 5,000 psi tubing head adaptor with 2-3/8" studded top, 2-3/8" flanged 5,000 psi master valves, and 2-3/8" pup joint above the master valve. Make sure all wellhead valves are rated to 5,000 psi and all nipples are XXH. Document wellhead components in Openwells wellhead report.
 30. MIRU hydrotester and test top flange assembly to 5,000 psi for 15 minutes.
 31. RDMO workover rig. Return well to production team.