

- 1 Run full length pre-CBL, Niobrara and Fox Hills cement remediation, drill out plugs, run full length post-CBL, replace WH & set production PKR.
- 2 A GYRO survey was run 2/28/2014. Another is not needed.
- 3 The most recent bradenhead report experienced 1 to 0 psi, and no liquids (12/22/2014).
- 4 Notify Automation Removal Group at least 24 hours before rig-up to isolate any production equipment (remove plunger, wellhead automation, etc.). Prepare to move base beam rig onto location. Install fence if needed. Operations needs to bleed off the bradenhead pressure before the rig gets on location.
- 5 Check and report surface casing pressure. If valve is not accessible at ground level, re-plumb so valve is at ground level.
- 6 MIRU slickline. RIH to retrieve production equipment and tag for fill (last cleanout is unknown). Note tagged depth in Open Wells. RDMO slickline.
- 7 MIRU WO rig. Kill well as necessary with biocide treated water. ND wellhead. NU BOP.
- 8 Unland 2-3/8" tbg and lay down 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 PU scraper and RIH to 7980' (through the J Sand perms) for 4-1/2" 11.6 lb/ft casing. TOO H, SB 7900' 2-3/8" tubing, and LD scraper.
- 11 RIH and set RBP (10,000 psi rated, casing 4.5", 11.6#) at +/- 7900' (Collars are unknown, and J-Sand TOP perf is located at 7931').
- 12 Pick up 1 joint above RBP, and circulate all gas out of the hole in preparation for a CBL. Pressure test RBP and production casing to 500 psi for 15 minutes (a DV Tool is located at 769'). If pressure test passes, place 2 sxs of sand on top of the RBP and proceed; otherwise contact engineering. TOO H, SB 6750' 2-3/8" tubing, and LD retrieving head.
- 13 MIRU WL. Run a CBL from 7900' to surface. Forward results to [Tod.Haanes@Anadarko.com](mailto:Tod.Haanes@Anadarko.com) in Evans Engineering.
- 14 *NOTE:* Depending upon what is learned from the CBL, the design may change from here forward.
- 15 PU and RIH with two 1' 3-1/8" perf guns with 3 spf, 0.50" EHD, 120° phasing. Shoot 1' of squeeze holes at 7080' and 6720'. RD WL.
- 16 RU 4-1/2" CICR and RIH on 2-3/8" tubing to set CICR at 6750'.
- 17 RU Cementers. Establish circulation through squeeze holes. Pump Niobrara suicide squeeze: 110 sxs (183 cf) 1:1:3 'Poz G Gel'+20% silica+0.4% CFL-3+0.4% CFR-2+0.1% SMS, mixed at 13.5 ppg & 1.66 cf/sk. Under-displace by 2 bbls and un-sting from CICR spotting a minimum of 100' cement on top of the squeeze holes. The plug will cover 7080' - 6620'. Volume is based on 360' in 9.0" OH from caliper with 20% excess, and 460' in 4-1/2" production casing with no excess. RD cementers.
- 18 Un-sting and slowly pull out of the cement. PUH to 6400' and circulate tubing clean to ensure no cement is left in the tubing. TOO H and SB 820' 2-3/8" tubing.
- 19 RU WL. PU and RIH with two 1' 3-1/8" perf guns with 3 spf, 0.50" EHD, 120° phasing. Shoot 1' of squeeze holes at 1302' and 790'. RD WL.
- 20 RU 4-1/2" CICR and RIH on 2-3/8" tubing to set CICR at 820'.
- 21 RU Cementers. Establish circulation through squeeze holes, and precede cement with 10 bbls SAPP and a 20 bbl water spacer. Pump Fox Hills suicide squeeze: 320 sxs (426 cf) Type III+0.3% CFL-3+0.3% CFR-2+0.25 lb/sk Polyflake, mixed at 14.8 ppg & 1.33 cf/sk. Under-displace by 2 bbls and un-sting from CICR spotting at least 100' cement on top of the squeeze holes. The plug will cover from 1302' to 690'. Volume is based on 512' in 10.75" OH from caliper with 40% excess, and 612' in 4-1/2" production casing with no excess. RD cementers.
- 22 Un-sting and slowly pull out of the cement. PUH to 500' and circulate tubing clean to ensure no cement is left in the tubing. TOO H and SB 2-3/8" tubing.
- 23 ND BOP.
- 24 ND existing tubing head off of 4.5" casing. Install new WHI 5,000 psi flanged tubing head complete with 5,000 psi casing valves and Double-X Heavy nipples. Be sure all wellhead equipment is rated to 5,000 psi.
- 25 NU BOP.

- 26 WOC per cement company recommendation (minimum of 18 hours). PU and RIH with 3-7/8" bit (csg drift dia = 3.875"). TIH to the top plug. Drill down to the CICR located at +/- 820'. Pressure test to 500 psi. If o.k., drill CICR and cement past lower perf located at 1302', and pressure test to 500 psi.
- 27 TIH to the bottom plug. Drill down to the CICR located at +/- 6750'. Pressure test to 500 psi. If o.k., drill CICR and cement past lower perf located at 7080', and pressure test to 500 psi. TOO, SB 2-3/8" tubing, and LD bit.
- 28 RU WL. Run another CBL from +/- 7900' to the surface. Forward results to Tod.Haanes@Anadarko.com in Evans Engineering. RDMO WL.
- 29 TIH with retrieving tool on 2-3/8" tubing to the RBP located at +/- 7900'.
- 30 Circulate sand off RBP. Latch onto and release RBP. TOO, standing back all 2-3/8" tubing and LD RBP.
- 31 MIRU hydrotester. PU 2-3/8" NC, 2-3/8" XN nipple (be sure nipple is correctly input into OpenWells), 2-3/8" 4.7# J-55 tubing, Arrowset AS-1X packer rated to 10,000 psi, and 2-3/8" 4.7# J-55 tbg to surface. Hydrotest tubing to 6,000 psi while TIH. Set the PKR below the new Niobrara TOC (in good cement) between collars. Contact Tod Haanes in Evans Engineering for help in determining the PKR setting location. RDMO hydrotester.
- 32 Land EOT at +/- 7901' (+/- 30' above the top J-Sand perf).
- 33 Load 2-3/8" x 4-1/2" annulus with biocide treated water and pressure test to 500 psi for 15 minutes to be sure packer is set properly.
- 34 RU rig lubricator and broach tubing to the XN nipple with slickline. RD rig lubricator. ND BOP.
- 35 Install 7-1/16" x 5,000 psi flanged tubing head adaptor with 5,000 psi flanged master valve. Make sure all WH valves are rated to 5,000 psi and all nipples are Double-X Heavy.
- 36 Install 2-3/8" pup joint above the master valve. MIRU hydrotester. Pressure test the tubing head from below the tubing head through the master valve to 5,000 psi using hydrotester. RDMO hydrotester.
- 37 RDMO WO rig. Return well to production team.
- 38 END OF SAFETY PREP STEPS. BELOW ARE STEPS FOR UN-PREPPING THE WELL
- 39 When notification is sent to un-prepare the well, MIRU WO rig. Kill well as necessary with biocide treated water. ND wellhead. NU BOP.
- 40 Unland 2-3/8" tbg and LD landing joint.
- 41 Release Arrowset AS-1X packer. TOO, standing back all 2-3/8" tubing and LD packer. Return packer to shop it was purchased from and have the packer redressed.
- 42 MIRU slickline. Tag top of fill, and enter depth in Open Wells. RDMO slickline.
- 43 PU 2-3/8" NC, 2-3/8" XN nipple (be sure nipple is correctly input into Open Wells), and 2-3/8" 4.7# J-55 tbg to surface. If a cleanout is *not* necessary, *proceed to next step*. Otherwise, clean out sand fill as deep as possible (J-Sand perms are located from 7931'-7953').
- 44 Land EOT at +/- 7901' (+/- 30' above the top J-Sand perf).
- 45 RU rig lubricator and broach tubing to the XN nipple with slickline. RD rig lubricator. ND BOP.
- 46 Install 7-1/16" x 5,000 psi tubing head adaptor with 5,000 psi flanged master valve. Make sure all WH valves are rated to 5,000 psi and all nipples are Double-X Heavy.
- 47 Install 2-3/8" pup joint above the master valve. MIRU hydrotester. Pressure test the tubing head from below the tubing head through the master valve to 5,000 psi using hydrotester. RDMO hydrotester. If wellhead does not pressure test, replace wellhead/wellhead valves as necessary with 5,000 psi rated equipment.
- 48 RDMO WO rig. Return well to production team.