

## Miller X 31-5JI: Bradenhead, Replace Wellhead Valves, & Pressure Test Casing

- 1 Call foreman and/or field coordinator 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 need to bleed off the bradenhead pressure before the rig gets on location.
- 2 Check and report surface casing pressure. If valve is not accessible at ground level, re-plumb so valve is at ground level.
- 3 MIRU slickline. RIH to retrieve production equipment and tag for fill. Note tagged depth in OpenWells. RDMO slickline.
- 4 MIRU WO rig. Kill well as necessary with water and biocide. ND wellhead. NU BOP.
- 5 Unland 2-3/8" tbg and lay down landing joint.
- 6 MIRU EMI services. EMI 2-3/8" tbg while TOO H and tally while standing back. Lay down 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.
- 7 PU 10,000 psi rated from above and below RBP (4.5", 11.6#), retrieving head, and 2-3/8" tubing. Set RBP at +/- 7,800' (collars located at 7,776' and 7,818').
- 8 Release tbg from RBP and circulate all gas out of the hole. Pumping water with biocide, pressure test RBP and production casing to 2,500 psi for 15 minutes (**production casing grade unknown**). If pressure test passes, proceed; otherwise contact engineering.
- 9 Bleed off pressure and stack tubing on RBP so the top joint of tbg is below the BOP.
- 10 ND BOP.
- 11 **\*\*Verify existing tubing head is 5,000 psi rated; if less than 5,000 psi rated change tubing head\*\*** Replace casing valves with 5,000 psi rated casing valves and be sure all wellhead equipment is rated to 5,000 psi.
- 12 NU BOP.
- 13 Sting into tubing string and circulate 2 sx of sand on top of RBP set at +/- 7,800'. TOO H with 2-3/8" tubing.
- 14 ND BOP. Screw 4-1/2" 11.6# pup joint into production casing and un-land 4-1/2" production casing. NU double entry flange. NU BOP.
- 15 PU approx. 158 joints of 1.66" 2.3# J-55 10RD IJ tubing and TIH between the 4-1/2" production casing and open hole to +/- 4,971' (CBL indicates current cement top at 6,850'). Circulate with freshwater and biocide to clean up annulus while TIH.
- 16 MIRU cementing services. Pump 1 bbl freshwater spacer and cement job consisting of 20 bbls of sodium metasilicate, 230 sx (based on 9" hole size and 20% excess) of 15.8ppg neat Class G cement with 1/4# per sx of cello-flake, 0.4% CD-32, 0.4% ASA-301 and 1.15 cuft/sk yield. Attempt to cement from 4,971' to 4,317'.
- 17 Under displace cement in 1.66" 2.3# J-55 10RD IJ tubing to 4,100' using 7.6 bbls of freshwater (estimated TOC at +/- 4,172'). RDMO cementing services.
- 18 TOO H and stand back 1.66" 2.3# J-55 10RD IJ tubing. ND BOP and double entry flange. Use 4-1/2" pup joint to re-land 4-1/2" casing. NU BOP. Shut well in and WOC.
- 19 MIRU wireline services. RIH with CCL-GR-CBL-VDL. Run from +/- 5,050' to top of cement (estimated +/- 4,172'). If the cement is not above 4,317' contact engineer (top of Sussex at 4,517'). RDMO wireline services.
- 20 ND BOP. Screw 4-1/2" 11.6# pup joint into production casing and un-land 4-1/2" production casing. NU double entry flange. NU BOP.

Well needs bradenhead cement job, replace wellhead valves, and pressure test casing

Well is to be worked on in preparation for the upcoming APC THOMASON 35-6 HZ pad

TOC: 6,850'; NB top: 7,170'

Soonest Frac: 2/25/2014

NPV: \$120M; no wellbore integrity issues

Full Circle

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- 21 PU approx. 64 joints of 1.66" 2.3# J-55 10RD IJ tubing and TIH between the 4-1/2" production casing and open hole to +/- 2,000'. Circulate with freshwater and biocide to clean up annulus while TIH.
- 22 MIRU cementing services. Pump 1 bbl freshwater spacer and cement job consisting of 20 bbls of sodium metasilicate, 270 sx (based on 9" hole size and 10% excess) of 14 ppg Type III cement with 1/4# per sx of cello-flake mixed at 1.53 cuft/sk yield. Attempt to cement from 2,000' to 984'.
- 23 Under displace cement in 1.66" 2.3# J-55 10RD IJ tubing to 600' using 1.1 bbl of freshwater (estimated TOC at +/- 656'). RDMO cementing services.
- 24 TOO H and LD 1.66" 2.3# J-55 10RD IJ tubing. ND BOP and double entry flange. Use 4-1/2" pup joint to re-land 4-1/2" casing. NU BOP. Shut well in and WOC.
- 25 MIRU wireline services. RIH with CCL-GR-CBL-VDL. Run from 2,050' to top of cement (estimated +/- 656'). If the cement is not above 984' contact engineer. RDMO wireline services.
- 26 PU RBP retrieving head, 2-3/8" tubing, and TIH to RBP at +/- 7,800'. Circulate sand off of RBP. Latch onto and release RBP.
- 27 TOO H standing back all 2-3/8" tubing and LD RBP.
- 28 If sand fill tagged above 7,912' (bottom J Sand perfs) in step 3, then either bail or reverse circulate to cleanout well to PBMD at 8,000'. Otherwise proceed to next step.
- 29 PU 2-3/8" NC, 2-3/8" XN nipple (be sure nipple is correctly input into OpenWells), and 2-3/8" 4.7# J-55 tbg to surface. Land EOT at +/- 7,855' (1 joint above top J Sand perfs).
- 30 RU rig lubricator. Broach tubing to XN seating nipple. RD rig lubricator. ND BOP.
- 31 Install 7-1/16" x 5,000 psi tubing head adaptor with new 5,000 psi master valve with threaded 2-3/8" connection. Make sure all wellhead valves are rated to 5,000 psi.
- 32 MIRU hydrotesters. Install 2-3/8" pup joint above the master valve. Pressure test the tubing head from below the tubing head through the master valve to 5,000 psi using hydrotester. RDMO hydrotester.
- 33 NU WH. RDMO WO rig. Return well to production team.

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