

## Lansdown William D B1: Niobrara Remedial Cement

- 1 MIRU WO rig and auxiliary equipment. Check pressures. ND tree and adapter flange, NU BOP. TOO H with 2-3/8" tbg.
- 2 RIH on wireline with CCL and 4-1/2" 10,000 psi rated from above and below CIBP. Set CIBP at +/- 7210' (collars at 7194' and 7224') and POOH. Dump bail 2 sx of sand on top of CIBP and POOH. Pressure test CIBP to 1,000 psi for 15 minutes.
- 3 Rig up one 3" line from the casing head annulus to work tank. Kill well with fresh water. ND BOP. ND existing tubing head off of 4.5" casing and install new WHI 5,000 psi flanged tubing head complete with 5,000 psi casing valves. Be sure all wellhead equipment is rated to 5,000 psi.
- 4 NU lubricator, PU CCL and perf guns. Correlate depth to CBL. PUH and shoot squeeze holes as per the following: 6920'-6921', 3 spf, 0.38" EHD. PUH and shoot circulation holes as per the following 6520'-6521', 3 spf, 0.6" EHD. POOH and LD guns. Referencing the CBL, ensure perforations are not made on a collar.
- 5 PU and TIH retrievable packer for 4-1/2", 10.5/11.6# casing. Set packer at 6800'. Establish injection/circulation before setting CICR. Note rate, pressure, volume pumped. Release packer and TOO H while standing back tubing and laying down packer.
- 6 RIH and set CICR at 6800' (collars at 6780' and 6810'). RDMO wireline.
- 7 PU stinger and RIH on 2-3/8" tbg. Sting into CICR at 6800'.
- 8 NU cement head and RU cement services. Mix and pump ~130 sx (39.6 BBL) 50/50 Poz "G", 20% silica flour, 3% gel, 0.1% SMS, 0.4% FL-52, mixed at 13.5 ppg and 1.71 cu ft/sk, into squeeze holes at 6920'. Displace cement 1.5 bbl short of CICR. Sting out of CICR, place 1/2 bbl of remaining cement on top of CICR. PUH to squeeze circulation holes at 6521'. Place remaining cement across holes. PUH 3 stands and reverse circulate 141 bbl biocide treated water. Design is for coverage from 6920' to 6520' in 10" hole including a 20% excess.
- 9 TOO H and stand back tbg. LD stinger.
- 10 WOC for 48 hours minimum.
- 11 TIH with 3-7/8" bit on 2-3/8" tbg. Drill through cement and CICR down to at least 7000'. Do not drill out CIBP at 7210' until CBL is run.
- 12 Pressure test squeeze perforations to 1000 psi for 15 minutes. If pressure test passes, proceed.
- 13 MIRU wire line and run CCL-GR-CBL-VDL from top of CIBP at 7210' (and 2 sx of sand) to surface. **Call Evans Engineering before moving on to step 19.** Verify new Niobrara cement top as well as that stage tool was set and used from 786' to 400'. If Fox hills coverage is not adequate, contact Evans Engineering for additional procedure to appropriately remediate. In addition to normal handling of logs/job summaries, email copies of all cement job logs/job summaries and invoices to rscDJVendors@anadarko.com within 24 hours of the completion of the job. RDMO wireline.
- 14 TIH with 3-7/8" bit on 2-3/8" tbg. Drill through CIBP down to at least 7250'. TOO H.
- 15 PU 2-3/8" NC, 2-3/8" XN nipple (be sure nipple is correctly input into OpenWells), 20 joints of 2-3/8" tbg, 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 packer at +/- 6,800' (collars located at 6780' and 6810'). Land EOT at +/- 7412' (one joint above bottom Codell perf).
- 16 Load 2-3/8" x 4-1/2" annulus with biocide treated water and pressure test to 1,000 psi for 15 minutes to be sure packer is set properly.
- 17 ND BOP. Install 7-1/16" x 2-1/16" 5,000 psi tubing head adaptor and new flanged 5,000 psi master valve with 2-3/8" EUE companion flange on top. Make sure all wellhead valves are rated to 5,000 psi.
- 18 RU rig lubricator. Broach tubing to seating nipple. RD rig lubricator.
- 19 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.
- 20 RDMO WO rig. Return well to production team.