

## Hanson Glen L GU B 2: Run CBL, Niobrara Cement Coverage, Replace Wellhead, & Set Production Packer

- 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 (last tagged at 7,868' on 6/10/09). 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 CIBP (4.5", 10.5#/11.6#, K-55) and 2-3/8" tubing. Set CIBP at +/- 7,350' (collars located at 7,339' and 7,382').
- 8 Release tbg from CIBP and circulate all gas out of the hole. Pumping water with biocide, pressure test RBP and production casing to 1,000 psi for 15 minutes. If pressure test passes, proceed; otherwise contact engineering.
- 9 Bleed off pressure and TOO H standing back all 2-3/8" tbg. Load hole with biocide treated water.
- 10 MIRU wireline services. PU and RIH with CCL-GR-CBL-VDL. Log from tagged CIBP depth (+/- 7,350') to surface while holding +/- 1,000 psi on casing to verify cement coverage. **Contact engineering after CBL is ran to confirm cement top expected to be below Niobrara top (cement top needs to be at least 6,710'; current cement top should be at +/- 7,200'), verify cement pumped through DV tool at +/- 728', and also to confirm packer setting depth (needs to be high in casing with competent cement behind pipe).**
- 11 **\*\*ALL BELOW STEPS ASSUME TOP OF CEMENT IN WELL AT +/- 7,200' with no additional cement to 4,914' AND CEMENT FROM DV TOOL AT +/- 728' TO +/- 286'\*\*\***
- 12 PU and RIH with 3-1/8" guns and shoot squeeze holes at +/- 7,100' using 3 SPF, 0.38" EHD, 33.65" penetration, 1' net, 3 total shots. Tie into CCL-GR-CBL-VDL log ran in step 10.
- 13 PUH with perf guns and shoot additional squeeze holes at 6,660' using 3 SPF, 0.38" EHD, 33.65" penetration, 1' net, 3 total shots. Tie into CCL-GR-CBL-VDL log ran in step 10. RDMO wireline services.
- 14 PU and TIH with CICR, stinger, and 2-3/8" tbg to set CICR at 6,710'. Sting into CICR.
- 15 MIRU cementing services. Establish injection rate with water and pump 110 sx 50/50 Poz "G" with 20% silica flour, 3% gel, 0.1% sodium metasilicate and 0.4% FL-52 mixed at 13.5 ppg and 1.71 cuft/sx. (cement volumes based on 9" hole with 20% excess). Displace cement past the cement retainer to +/- 7,000' using 30.6 bbl of water (estimated TOC at +/- 5,906' inside 4-1/2" casing).
- 16 Sting out of the CICR and PUH 2 stands so EOT is at +/- 6,585' (just above top squeeze holes at +/- 6,660'). Reverse circulate using approx. 51 bbls water (2 times tubing volume) or until returns are clean. RDMO cementing services.
- 17 TOO H and stand back all 2-3/8" tbg. Allow cement to set up for at least 24 hours.

Well needs CBL ran, remedial Niobrara cement, replace wellhead, and set production packer

Well is to be worked on in preparation for upcoming crop season HZ pads

TOC: 7,200' (need to verify depths of additional existing uphole cement) NB top: 7,110'

Soonest Frac: 4/1/14

NPV: \$155M; squeeze holes at 4,332' & 4,904'

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- 18 PU and TIH with 3-7/8" blade bit and 2-3/8" tbg to cement top estimated at +/- 5,906'. Drill out cement, CIRC and pressure test squeeze holes at 6,660' and 7,100' to 1,000 psi. **\*\*DON'T DRILL OUT CIBP AT 7,350'\*\*** If pressure test fails contact engineering, otherwise proceed to next step.
- 19 TOOH and stand back all 2-3/8" tubing. LD 3-7/8" bit. Load hole with biocide treated water.
- 20 MIRU wireline services. RIH with CCL-GR-CBL-VDL. Log from +/- 7,350' (depth of CIBP) to 100' above TOC (estimated to be +/- 6,660'). If the cement is not above 6,660' contact engineer. RDMO wireline services.
- 21 ND BOP.
- 22 ND existing tubing head off of 4.5" casing and install new WHI 5,000 psi flanged tubing head complete with 5,000 psi rated casing valves.
- 23 NU BOP.
- 24 PU and TIH with 3-7/8" blade bit and 2-3/8" tbg to CIBP at +/- 7,350'. Drill out CIBP and clean well out to PBMD at +/- 7,943'.
- 25 TOOH and stand back all 2-3/8" tubing. LD 3-7/8" bit.
- 26 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 tbg (**exact joints determined once depth of packer is identified from CBL**), Arrowset AS-1X packer rated to 10,000 psi, and 2-3/8" 4.7# J-55 tbg to surface. Set packer at (**depth determined once top of cement is identified from CBL**). Land EOT at +/- 7,830' (1 joint above top J Sand perfs).
- 27 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.
- 28 RU rig lubricator. Broach tubing to seating nipple. RD rig lubricator. ND BOP.
- 29 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.
- 30 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.
- 31 RDMO WO rig. Return well to production team.
- 32 END OF SAFETY PREP STEPS. BELOW ARE STEPS FOR UN-PREPPING THE WELL
- 33 When notification is sent to un-prepare the well, MIRU WO rig. Kill well as necessary with water and biocide. ND wellhead. NU BOP.
- 34 Unland 2-3/8" tbg and lay down landing joint.
- 35 Release Arrowset AS-1X packer and TOOH standing back all 2-3/8" tubing and LD packer. Return packer to shop it was purchased from and have the packer redressed.
- 36 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 +/- 7,830' (1 joint above top J Sand perfs).
- 37 RU rig lubricator. Broach tubing to XN seating nipple. RD rig lubricator. ND BOP. NU WH.
- 38 Install 7-1/16" x 5,000 psi tubing head adaptor and 5,000 psi master valve with threaded 2-3/8" connection. Make sure all wellhead valves are rated to 5,000 psi.

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- 39 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. If wellhead does not pressure test, replace wellhead/ wellhead valves as necessary with 5,000 psi rated equipment.
- 40 NU WH. RDMO WO rig. Return well to production team.

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