

## Paul Schmidt GU B 2 Remedial Cement.docx

- 1 PLEASE NOTE THAT CEMENT/TOOL DEPTHS WILL LIKELY CHANGE BASED ON CBL. PLEASE VERIFY ALL DEPTH WITH EVANS ENGINEERING BEFORE PROCEEDING ON PERFORATING/PUMPING CEMENT.
- 2 Level location for base beam rig.
- 3 Call Foreman or Field Coordinator before rig up to catch plunger, isolate production equipment, and ask if replacement parts/equipment are requested.
- 4 Check and report surface casing pressure. If surface casing is not accessible at ground level, re-plumb so valve is at ground level.
- 5 Spot a minimum of 2 jts 2-3/8", 4.7#, J-55 EUE TBG for replacement.
- 6 MIRU slickline. Fish production equipment as necessary and tag fill. Note tagged depth in OpenWells. RDMO Slickline.
- 7 MIRU WO rig, flat tanks and rig pumps. Kill well, as necessary, with biocide treated fresh water. ND WH. NU BOP.
- 8 Unseat landing joint and lay down.
- 9 MIRU EMI services. TOOH with 2-3/8" TBG. EMI on TOOH. LD joints with wall loss or penetrations > 35%. Replace joints as necessary. \*\*Keep yellow & blue band tubing. Note joint number and depth of tubing leak(s) on PRODUCTION EQUIPMENT FAILURE REPORT IN OPEN WELLS.
- 10 PU casing scraper for 4-1/2", 10.5/11.6# casing and TIH to 7860' KB. Circulate all debris from wellbore with clean water. POOH and stand back tubing and LD scraper.
- 11 MIRU WL. RIH with CCL and CIBP. Set CIBP at 7825'. POOH.
- 12 RIH with CCL and CBL/VDL/GR tool. Correlate depth to Schlumberger Density log dated 5/2/78. Run CBL from just above CIBP to surface. Immediately send CBL to Matt Agee for review to verify cement/perforation plans.
- 13 Pressure test casing/CIBP to 1000 psi for 15 mins. If pressure test passes, proceed.
- 14 ND BOPs, ND existing tubing head. NU new 5000 psi rated wellhead but do not install adapter flange. NU BOPs.
- 15 RIH with CCL and perf guns. Correlate depth to CBL. PUH and shoot squeeze holes as per the following: 6990'-6991', 3 spf, 0.38" EHD. POOH and LD guns.
- 16 PU and TIH retrievable packer for 4-1/2", 10.5/11.6# casing. Set packer at 2600'. Establish injection/circulation before setting CICR. Note rate, pressure, volume pumped. Release packer and TOOH while standing back tubing and laying down packer.
- 17 RIH and set CICR at 6890'. RDMO WL.
- 18 PU stinger and RIH on 2-3/8" tbg. Sting into retainer at 6890'.
- 19 RU cementer. Prepare & pump 100 sks 50/50 Poz 'G' + 20% silica flour + 3% gel + 0.4% fluid-loss additive + 0.1% SMS, mixed at 13.5 ppg and 1.71 cu ft/sk, into squeeze holes at 6990'. Displace cement 1/2 bbl short of CICR. Sting out of CICR, place remaining cement on top of CICR. PUH 1 std and reverse out. Design is for coverage from 6990 to 6590 in 9" hole (partial caliper log), including 20% excess.
- 20 TOOH and stand back tbg. LD stinger. WOC overnight at minimum.
- 21 RIH with CCL and perf guns. Correlate depth to CBL. PUH and shoot squeeze holes as per the following: 5230'-5231', 3 spf, 0.38" EHD. PUH and shoot circulation holes as per the following: 4215'-4216', 3 spf, 0.6" EHD. POOH and LD guns.
- 22 RIH and set CICR at 5100'. RDMO WL.
- 23 PU stinger and RIH on 2-3/8" tbg. Sting into CICR at 5100'.
- 24 Establish circulation down tubing. Note rate, pressure, volume pumped, and returns percent.
- 25 RU cementer. Prepare & pump 460 sks G neat cement + 1/4 #/sk cello flake + 0.4 dispersant + 0.4% anti-settling agent, mixed at 15.8 ppg and 1.15 cu ft/sk, into squeeze holes at 5230'. 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

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- circulation holes at 4215'. Place remaining cement across holes. PUH 3 stands and reverse out. Design is for coverage from 5230 to 4215 in 10.5" hole (caliper log), including 10% excess.
- 26 TOOH and stand back tbg. LD stinger. WOC 24 hrs at minimum.
  - 27 TIH with 3-7/8" bit on 2-3/8" TBG. Drill through cement down to at least 4315'.
  - 28 Pressure test squeeze perforations to 1000 psi for 15 mins. If pressure test passes, proceed.
  - 29 Continue to drill through cement and CICR down past perforations at 5230' to at least 5330'. Pressure test squeeze perforations to 1000 psi for 15 mins. If pressure test passes, proceed.
  - 30 Continue to drill through cement and CICR down past perforations at 6990' to at least 7090'. Pressure test squeeze perforations to 1000 psi for 15 mins. If pressure test passes, proceed.
  - 31 MIRU WL. RIH with CCL and CBL/VDL/GR tool. Correlate depth to CBL. Run CBL from just above CIBP to 4000'. Immediately send CBL to Matt Agee for review to verify cement coverage and proceeding plans.
  - 32 Continue to drill out to PBTD of 7956'.
  - 33 TOOH while standing back tubing and LD bit.
  - 34 MIRU hydrotester.
  - 35 PU & RIH with 2-3/8" NC, 2-3/8" XN profile nipple, 108 joints 2-3/8" TBG, Arrowset AS-1X packer (10k psi rated), and 2-3/8" TBG. Hydrotest tubing to 6000 psi while RIH. Set packer at 4500'. Landed EOT depth should be +/- 7846'.
  - 36 Load backside with biocide treated water and pressure test packer to 1000 psi for 15 min.
  - 37 ND BOP. NU new TBG head adapter. Ensure all valves on TBG head are rated to 5000 psi and ensure TBG head has a new R-46 ring gasket installed.
  - 38 Hydrotest TBG head and master valve to 5000 psi. If pressure test fails, call Evans office for alternate procedures.
  - 39 RDMO hydrotester. RDMO WO rig.
  - 40 Return well to production team.
  - 41 END OF SAFETY PREP STEPS. BELOW ARE STEPS FOR UN-PREPPING THE WELL.
  - 42 When notification is sent to un-prep well, MIRU WO rig.
  - 43 Control well with biocide treated water.
  - 44 ND WH. NU BOP.
  - 45 Release Arrowset AS-1X packer and POOH with 2-3/8" TBG, Arrowset packer, XN profile nipple, and NC while standing back TBG and laying down packer.
  - 46 Return packer to shop were purchased and have redressed.
  - 47 PU & RIH with 2-3/8" NC, 2-3/8" XN profile nipple (ensure nipple is input into OpenWells), and 2-3/8" TBG.
  - 48 Clean out to PBTD at 7956' using biocide treated water. Use a bailer if necessary.
  - 49 PUH and land TBG at 7846', which is approximately 1 joint above the top JS perf.
  - 50 RU rig lubricator. Broach TBG to SN. RD rig lubricator.
  - 51 ND BOP, NU WH.
  - 52 MIRU hydrotesters. Hydrotest TBG head and master valve to 5000 psi. If pressure test fails, call Evans office for alternate procedures. RDMO hydrotesters.
  - 53 RDMO WO rig. Swab well back if needed. Return well to production team.