

PLUG AND ABANDONMENT PROCEDURE

JOHNSTON 22-24

- | Step | Description of Work |
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| 1 | Provide 48 hr notice to COGCC prior to rig up per request on approved Form 6 (e.g. call field coordinator, submit Form 42, etc.). Call automation removal group at least 24 hr prior to rig move. Request they catch and remove plunger, isolate production equipment and remove any automation prior to rig MIRU. |
| 2 | MIRU slickline services and pressure bomb services. Pull bumper spring and tag bottom. Run pressure bomb and obtain pressure gradient survey from surface to 8291' (halfway between J sand perfs) making gradient stops every 1000'. Forward pressure bomb results to Evans Engineering. RDMO pressure bomb services. MIRU VES and gyro survey from EOT (landed @ 8264') to surface with stops every 100'. Forward gyro survey data and invoices to Sabrina Frantz. RDMO slickline and VES. |
| 3 | Prepare location for base beam equipped rig. Install perimeter fence as needed. |
| 4 | Check and record Bradenhead pressure. If Bradenhead valve is not accessible, re-plumb so that valve is above GL. |
| 5 | MIRU, kill as necessary using clean fresh water with biocide. ND WH. NU BOP. Unseat landing jt, LD. |
| 6 | TOOH and SB 2 3/8" production tubing (262 jts landed @ 8264'). Note: Expected holes in tubing. Spot tubing trailer with ~140 joints of 2 3/8" workstring, although the amount of bad tubing is unknown. |
| 7 | MIRU WL. RIH with junk basket and gauge ring for 5 1/2" 17#/ft casing to 8250'. POOH. Set CIBP at 8230' (collars @ 8199' & 8245') to abandon J sand perfs. RD WL. |
| 8 | MIRU hydrotester. Hydrotest 2 3/8" tubing down to 8230'. Expected holes in tubing. Tag CIBP and pick up 5'. Pressure test CIBP to 1000 psi. |
| 9 | RU Cementers. Pump Niobrara/J sand Balanced Plug: 135 sx (187 cuft) "G" w/ 20% silica flour, 0.4% CD-32, 0.4% ASA-301 and R-3 to achieve 2:30 pump time, mixed at 15.8 ppg and 1.38 cuft/sx. The plug will cover 8230' to 6800'. Volume based on 1430' inside 5 1/2" production casing with no excess. Note: squeeze holes at 7900' and 6900'. |
| 10 | PUH to 6600' and circulate tubing clean to ensure no cement is left in the tubing. |
| 11 | PUH to 5300', LD remainder. |
| 12 | RU Cementers. Pump Balanced Plug: 80 sx (92 cuft) Class "G" cement with 0.4% CD-32, 0.4% ASA-301 mixed at 15.8 ppg and 1.15 cuft/sx. The plug will cover 5510' - 4800', covering the DV tool at 5222'. |
| 13 | PUH to 4700' and circulate tubing clean to ensure no cement is left in the tubing. P&SB 4430', LD remainder. |
| 14 | MIRU WL. Tag cement at 4800'. PU and RIH with 2-1' 3-3/8" perf guns with 3 spf, 0.73" EHD, 120° phasing. Shoot 1' of squeeze holes at 4660' and 4400'. RD WL. |
| 15 | PU 5 1/2" CICR and RIH on 2 3/8" tubing to set CICR at 4430'. Establish circulation with fresh water treated with biocide. |
| 16 | RU Cementers. Pump 20 bbl sodium metasilicate and a 5 bbl water spacer to establish injection and circulation. Pump Sussex Suicide: 120 sx (138 cuft) Class "G" cement with 0.25 pps cello flake, 0.4% CD-32, 0.4% ASA-301 mixed at 15.8 ppg and 1.15 cuft/sx. Underdisplace by 3 bbls and unstring from CICR spotting at least 100' cement on top of squeeze holes. The plug will cover 4660' - 4400'. Volume based on 260' in 9" OH from caliper with 20% excess, 360' in 5 1/2" production casing with no excess. RDMO cementers. |
| 17 | PUH to 4200' and circulate to ensure no cement left in the tubing. |
| 18 | P & SB 1600' of tubing, LD remainder. |

- 19 RU WL. RIH and cut casing at 1500'. RDMO WL.
- 20 Circulate with fresh water containing biocide to remove any gas.
- 21 Unland casing. NDBOP, NDTH. Install BOP on casing head with 5 1/2" pipe rams.
- 22 POOH with 1500' of 5 1/2" casing, LD. Remove 5 1/2" pipe rams and install 2 3/8" pipe rams.
- 23 RIH with 2 3/8" tubing to 1600'.
- 24 MIRU Cementers. Precede cement with 10 bbl (min) SAPP followed by a 20 bbl fresh water spacer. Pump Stub Plug: 230 sx (306 cuft) Type III w/ cello flake and CaCl₂ as deemed necessary, mixed at 14.8 ppg and 1.33 cuft/sx (100' in 5 1/2" production casing with no excess, 348' in 9" OH from caliper with 40% excess, 202' in 8 5/8" surface csg with no excess). The plug will cover 1600' - 950'. RD cementers.
- 25 Pull up to 200' and circulate tubing clean using fresh water treated with biocide. TOO. H.
- 26 WOC per cement company recommendation. Tag cement. Cement top needs to be above 952'.
- 27 MIRU WL. RIH 8 5/8" CIBP to 80'. Set and pressure test to 1000 psi for 15 minutes. RDMO WL and WO rig.
- 28 Instruct cementing and wireline contractors to e-mail copies of all job logs/job summaries to rscDJVendors@anadarko.com within 24 hrs of completion of the job.
- 29 Supervisor submit paper copies of all invoices, logs, and reports to Joleen Kramer.
- 30 Excavation crew to notify One Call to clear excavation area around wellhead and for flowlines.
- 31 Excavate hole around surface casing enough to allow welder to cut casing minimum 5' below ground level.
- 32 Welder cut casing minimum 5' below ground level.
- 33 Fill casing to surface using 4500 psi compressive strength cement, (NO gravel).
- 34 Spot weld on steel marker plate. Marker should contain Well name, Well number, legal location (1/4 1/4 descriptor) and API number.
- 35 Obtain GPS location data as per COGCC Rule 215 and send to rscDJVendors@anadarko.com.
- 36 Properly abandon flowlines per Rule 1103. File electronic Form 42 once abandonment complete.
- 37 Back fill hole with fill. Clean location, level.
- 38 Submit Form 6 to COGCC ensuring to provide 'As performed' WBD identifying operations completed.

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