

PLUG AND ABANDONMENT PROCEDURE

Nicole Schaly – Production Engineer I
970-506-5913 – Office 419-908-8781 – Cell
Nicole.schaly@anadarko.com

WEBER L 4-6

- | Step | Description of Work |
|------|---|
| 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 | Tubing possibly parted at 3000', no slickline operations planned prior to fishing tubing. Deliver additional 1.66" tubing to replace |
| 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. Form 17 on 3/4/2015 reported 13 psi on the surface casing that blew down to 1 psi after 30 minute blow down. |
| 5 | MIRU, kill as necessary using clean fresh water with biocide. ND WH. NU BOP. Unseat landing jt, LD. |
| 6 | TOOH and SB 1.66" production tubing (229 jts landed @ 7277'). NOTE: Tubing is possibly parted at ~3000'. Plan to pull as much tubing as possible, then fish remainder of the string. |
| 7 | PU casing scraper for 2 7/8" 8.7 #/ft casing and RIH to 7270'. TOOH and LD scraper, SB tbg. |
| 8 | MIRU WL. Run gyro from 3000' to 7300' with stops every 100'. Tie into previous gyro ran by Vaughn on 11/14/2014. |
| 9 | PU 2 7/8" CIBP for 8.7 #/ft casing and RIH on wireline to 7260'. Set CIBP at 7260'. RD WL. |
| 10 | Pressure test CIBP and production casing to 2500 psi for 15 minutes. If pressure test passes, continue; otherwise, contact engineering for revised procedure steps prior to spotting stub plug in step 23. |
| 11 | MIRU hydrotester. Hydrotest 1.66" tubing to 3000 psi down to 7260'. Tag CIBP and pick up 5'. |
| 12 | MIRU cementers. Pump Niobrara Balanced Plug: 20 sx (27.6 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 7260' to 6270'. Volume based on 990' inside 2 7/8" production casing with no excess. RD cementers. |
| 13 | PUH to 6000' and circulate tubing clean to ensure no cement is left in the tubing. |
| 14 | TOOH and LD all 1.66" tubing. |
| 15 | MIRU WL. PU and RIH with 2' of 1-11/16" perf gun with 3 spf, 0.37" EHD, 120° phasing. Shoot 2' of squeeze holes at 4560'. RD WL. |
| 16 | Establish injection by pumping greater than 1 bpm without exceeding a 3000 psi pump pressure. If injection not established, contact Evans Engineering. |
| 17 | MIRU cementers on the 2 7/8" casing. Precede cement with 5 bbl water, 20 bbl sodium metasilicate, and a 5 bbl water spacer. Pump Sussex squeeze: 455 sx (523 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 (560' in 12" OH from caliper with 20% excess, 560' in 2 7/8" casing with no excess). The plug will cover 4560'-4000'. Drop wiper plug and displace to 4000' using 20 bbls water. RDMO cementers. |
| 18 | WOC per cement company recommendation. |

- 19 MIRU WL. RIH and tag wiper plug/cement at 4000' or shallower. If tag is deeper than 4000', contact Evans Engineering.
- 20 Cut casing at 1120'. RDMO WL.
- 21 Circulate with fresh water containing biocide to remove any gas.
- 22 NDBOP, NDTH. Install BOP on casing head with 2 7/8" pipe rams. If casing PT to 2500 psi passed in step 10, proceed; otherwise, TOO and hydrotest back in the hole.
- 23 MIRU Cementers. Establish circulation and pump 10 bbl (min) SAPP followed by a 20 bbl fresh water spacer. Pump stub plug: 635 sx (845 cuft) Type III w/ cello flake and CaCl₂ as deemed necessary, mixed at 14.8 ppg and 1.33 cuft/sx (703' in 12" OH with 40% excess, 112' in 8 5/8" csg with no excess). The plug will cover 1115'-300'. RD cementers.
- 24 Pull up to 100' and circulate tubing clean using fresh water treated with biocide. TOO.
- 25 WOC per cement company recommendation. Tag cement. Cement top needs to be above 312'.
- 26 MIRU WL. RIH 8 5/8" CIBP to 80'. Set and pressure test to 1000 psi for 15 minutes. RDMO WL and WO rig.
- 27 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.
- 28 Supervisor submit paper copies of all invoices, logs, and reports to Evans Engineering Specialist.
- 29 Excavation crew to notify One Call to clear excavation area around wellhead and for flowlines.
- 30 Excavate hole around surface casing enough to allow welder to cut casing minimum 5' below ground level.
- 31 Welder cut casing minimum 5' below ground level.
- 32 Fill casing to surface using 4500 psi compressive strength cement, (NO gravel).
- 33 Spot weld on steel marker plate. Marker should contain Well name, Well number, legal location (1/4 1/4 descriptor) and API number.
- 34 Obtain GPS location data as per COGCC Rule 215 and send to rscDJVendors@anadarko.com.
- 35 Properly abandon flowlines per Rule 1103. File electronic Form 42 once abandonment complete.
- 36 Back fill hole with fill. Clean location, level.
- 37 Submit Form 6 to COGCC ensuring to provide 'As performed' WBD identifying operations completed.