

PLUG AND ABANDONMENT PROCEDURE

David Dalton - Production Engineer I

970-339-1015

David.Dalton@anadarko.com

ROSENBROOK DONALD 2A

- | 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. Pull bumper spring and tag bottom. RDMO slickline services. |
| 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 | POOH and stand back 1.66" IJ tbg (245 jts of 1.66" landed at 7918'). |
| 7 | MIRU WL. RIH gauge ring for 2 7/8" 6.5 #/ft casing to 7900'. POOH. Set 2 7/8" CIBP at 7880' to abandon JS perfs. Pressure test CIBP and 2 7/8" casing to 2500 psi for 15 minutes. The following procedure assumes a successful pressure test. |
| 8 | TIH 1.66" tbg to 2500'. Circulate water with biocide to remove gas from wellbore for CBL. TOH and stand back tbg. |
| 9 | Run a CBL from CIBP @ 7880' to surface. Forward results to Evans Engineering for possible changes to procedure. NOTE: If CBL is not conclusive, run again under 1000 PSI. |
| 10 | TIH with 1.66" IJ tbg open-ended to CIBP at 7880', hydro-testing to 3000 PSI. |
| 11 | MIRU Cementers. Place a balanced plug from 7880' to 6720': 25 sx Thermal 35 + 0.5% CFR-2 + 0.25% FMC mixed at 15.6 ppg and 1.51 cuft/ sk (38 cuft of slurry). |
| 12 | LD 1.66" tbg to +/- 6000'. Circulate water treated with biocide to clear tbg. TOH and LD 1.66" tbg string. |
| 13 | MIRU WL. Cut off 2-7/8" liner @ 4900'. Establish circulation with water containing biocide down 2 7/8" liner, taking returns on 4 1/2" casing. Circulate bottoms up to remove any gas from wellbore. RD WL. |
| 14 | ND BOP and 2 7/8" tbg head. Install BOP on casing head with 2 7/8" pipe rams. Install 3000 psi ball valves on both casing head outlets. Install a choke or choke manifold on one outlet. |
| 15 | MIRU Cementers. Circulate bottoms up w/biocide-treated water. Pump 20 bbl sodium metasilicate and a 5 bbl water spacer. |
| 16 | Place a balanced cement plug from 4900'-4100': 70 sx class "G", w/0.25 pps Polyflake + 0.5% CFR-2 + 0.2% FMC + 0.5% LWA mixed at 15.8 ppg and 1.15 cuft/sk (80 cuft of slurry). Cement volume based on 30' in 4" OH plus 770' in 4 1/2" 10.5# casing. |
| 17 | TOH to 3000' and circulate tubing and casing clean. RD cementers. |
| 18 | WOC per cementing company recommendation. Tag cement. TOC should be above 4370'. |

- 19 TOOH standing back 1140' of 2 7/8" tbg. LD remainder.
- 20 RU WL. Cut casing at 1040'. Circulate bottoms up and continue circulating to remove any gas from wellbore. RDMO WL.
- 21 ND BOP and tubing head. Install BOP on surface casing head with 4 1/2" pipe rams. Install 3000 psi ball valves on both casing head outlets. Install a choke or choke manifold on one outlet.
- 22 TOOH and LD 4 1/2" casing. Change pipe rams to 2 7/8". NOTE: 2000 gallons of Angel polymer was pumped through stage tool @ 759'. 4 1/2" casing will be pulled through the Angel.
- 23 TIH with 2 7/8" tubing open-ended to 1140' (100' inside 4 1/2" stub).
- 24 RU cementers. Establish circulation with biocide-treated water. Continue circulating to bring bottoms up and remove gas from wellbore. Pump 10 bbl SAPP (Sodium Acid Pyrophosphate) followed by 20 bbl (min.) fresh water spacer immediately preceding cement.
- 25 Pump balanced Stub Plug from 1140' to 100': 380 sx Type III w/0 .25#/sk Polyflake + 0.5% CaCl₂ + 0.3% CFL-3 + 0.3% CFR-2 mixed at 14.8 ppg and 1.33 cf/sx (505 cuft of slurry). Cement volume based on 100' in 4 1/2" csg, 122' in 8 5/8" csg, and 818' in 8 1/2" OH + 40% excess.
- 26 TOOH. WOC per cementing company recommendation. Tag Cement. TOC should be at or above 122'. If not, consult Evans Engineering.
- 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 Evans Engineering Specialist
- 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.