

PLUG AND ABANDONMENT PROCEDURE

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STRONG P 21-2

- | 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 the 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. |
| 3 | Check and report surface casing pressure. If surface casing is not accessible at ground level, re-plumb so valve is at ground level. The last Form 17 test on 7/16/2014 recorded Bradenhead pressure of 33 psi, blown down to 1 psi and 5 gallons of water was produced. Blow down the Bradenhead and re-check pressure the next day. Repeat until pressure stays at 0 psi. Contact Evans Engineering if pressure does not blow down to 0 and stay at 0. |
| 4 | Prepare location for base beam equipped rig. Install perimeter fence as needed. |
| 5 | MIRU, kill well as necessary using clean fresh water with biocide. ND WH. NU BOP. Unseat landing jt. |
| 6 | TOOH and stand back 1.66" NUE tbg: 218 jts total + 2-10' pup jts landed @ 7058' KB. |
| 7 | MIRU WL. RIH w/ gauge ring for 2 7/8" 8.7# tbg to 7050'. RIH 2 7/8" CIBP and set at 7010' to abandon Codell perms. Pressure test plug and csg to 3000 psi for 15 minutes. |
| 8 | RIH 1.66" tbg open-ended to CIBP @ 7010'. Hydro-test tbg to 3000 psi. |
| 9 | RU cementers and equalize a balanced plug above CIBP from 7010' to 6200' as follows: 15 sx "Thermal 35" + 0.5% CFR-2 + 0.25% FMC, mixed at 15.6 ppg and 1.51 cuft/sk. (23 cuft of slurry). |
| 10 | Pull and LD tbg to ~5000' and reverse circulate clean w/fresh water treated with biocide. |
| 11 | TOOH and LD 1.66" tbg. |
| 12 | RU WL, RIH w/ chemical cutter or jet cutter and cut 2 7/8" casing at 4660'. Circulate bottoms up and continue circulating to remove any gas from wellbore. RD WL. |
| 13 | ND BOP and wellhead. Install BOP on surface 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. NOTE: If 2 7/8" csg did not pass PT in step #7, TOOH and hydro-test in to 3000 psi before proceeding to step 14. Establish circulation down 2 7/8" csg taking returns on surface csg. Get bottoms up to remove gas from wellbore. |
| 14 | RU Cementers. Pump 5 bbl water w/ biocide, 20 bbl Sodium Metasilicate, and another 5 bbl spacer immediately preceding cement. Note: If unable to circulate, consult Evans Engineering. |
| 15 | Pump a balanced cement plug from 4660' to 3900': 440 sx class "G" w/0.25 lb/sk Polyflake 0.5% CFR-2, 0.2% FMC, 0.5% LWA mixed at 15.8 ppg and 1.15 cf/sk. (506 cuft of slurry). Cement volume based on 760' coverage in 10 1/2" open hole with 20% excess. |
| 16 | TOH to 2000' and circulate to clear 2 7/8" and wellbore. WOC per cementing company recommendation. |
| 17 | TIH and tag top of plug @ 3900'. Lay down 2 7/8" to place EOT at 950'. |

- 18 Establish circulation with biocide-treated water and get bottoms up to remove gas from well bore.
- 19 RU cementers. Pump 10 bbl SAPP (Sodium Acid Pyrophosphate) followed by 20 bbl (min) fresh water spacer immediately preceding cement.
- 20 Pump a balanced plug 950'-187': 420 sx (559 cuft.) Type III cement w/ 0.25 pps Polyflake, 0.3% CFR-2, 0.3% CFL-3 and 0.5% CaCl₂ mixed at 14.8 ppg and 1.33 cf/sk. Design to fill 563' in 10 1/2" OH + 40% excess and 200' in 8 5/8" surface casing.
- 21 TOOH and LD 2 7/8" tbg. WOC per cementing company recommendation. Tag plug; TOC should be 287' or higher. If not, Consult Evans Engineering before proceeding.
- 22 MIRU WL. RIH 8 5/8", 24# CIBP to 80' and set. RDMO WL and WO rig.
- 23 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.
- 24 Supervisor submit paper copies of all invoices, logs, and reports to Evans Engineering Specialist.
- 25 Excavation crew to notify One Call to clear excavation area around wellhead and for flowlines.
- 26 Capping crew will set and secure night cap on 8 5/8" casing head, restrain the casing head, pressure test CIBP to 500 psi with hydrotest pump, then remove night cap and casing head restraints.
- 27 Excavate hole around surface casing enough to allow welder to cut 8 5/8" casing minimum 5' below ground level.
- 28 Welder cut 8 5/8" casing minimum 5' below ground level.
- 29 Fill casing to surface using 4500 psi compressive strength cement, (NO gravel).
- 30 Spot weld on steel marker plate. Marker should contain Well name, Well number, legal location (1/4 1/4 descriptor) and API number.
- 31 Obtain GPS location data as per COGCC Rule 215 and send to rscDJVendors@anadarko.com.
- 32 Properly abandon flowlines per Rule 1103. File electronic Form 42 once abandonment complete.
- 33 Back fill hole with fill. Clean location, level.
- 34 Submit Form 6 to COGCC ensuring to provide 'As performed' WBD identifying operations completed.