

Engineer: Tod Haanes

Cell: 303-929-2339

PLUG and ABANDONMENT PROCEDURE

McCLAY 12-34A

| Step | Description of Work |
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| 1. | Provide 48 hour 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 hours prior to rig move. Request they catch and remove plunger, isolate production equipment, and remove any automation prior to rig MIRU. |
| 2. | MIRU slickline. Pull bumper spring and tag bottom. Enter tagged depth into Open wells. <i>NOTE: A 2-7/8" CIBP is reported to be in the 2-7/8" Liner at 7960'. Call Evans Engineering if the CIBP is not tagged.</i> RD slickline. |
| 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. The last Form 17 test on 9/25/2015 recorded a Bradenhead pressure of 6 to 1 psi, 2 gallons of water was produced, and buildup to 3 psi occurred in 15 minutes. |
| 5. | <i>Blow-down bradenhead and re-check pressure the next day.</i> Repeat until pressure stays at 0 psi. Contact Evans Engineering if pressure does not report at 0 psi the next day. |
| 6. | MIRU WO rig. Kill well as necessary using clean fresh water with biocide. ND WH. NU BOP. Unseat landing joint, and LD. |
| 7. | TOOH, and SB 7060' of 2-3/8" tubing. |
| 8. | RU WL. PU gauge ring and RIH to 7414' for 4-1/2" 11.6 lb/ft casing (spud date = 3/18/1996). POOH and LD gauge ring. <i>NOTE: A CIBP will be set at 7410', and the 2-7/8" Liner TOP is located at 7414'.</i> |
| 9. | PU a dump bailer that can pass through 2-7/8" 6.5 lb/ft Liner, and spot 1 sx of "G" cement on the <i>existing</i> CIBP located at 7960'. |
| 10. | PU 4-1/2" 11.6 lb/ft CIBP and set at 7410' (the lowest collar is at 7388') to abandon the J-Sand perms. |
| 11. | PU dump bailer and spot 2 sxs of "G" cement on the CIBP at 7410'. |
| 12. | PU another 4-1/2" 11.6 lb/ft CIBP and set at 7060' (collars at 7044' and 7087') to abandon the Nio-Codell perms. RD WL. |
| 13. | RU hydrotesters. TIH with 2-3/8" tubing to 7060' while hydrotesting to 3000 psi. PU 5', circulate gas out of the hole, and pressure test CIBP to 1000 psi for 15 minutes. RD hydrotesters. <i>Monitor bradenhead pressure during test. Contact Evans Engineering if the bradenhead pressure is affected by the casing test.</i> |
| 14. | <u>RU cementers.</u> Pump Niobrara plug: 25 sxs (38 cf) Thermal 35 +0.5% CFR-2+0.25% FMC, mixed at 15.6 ppg & 1.51 cf/sk. The plug will cover 7060' to 6620'. Volume is based on 440' inside 4-1/2" production casing with no excess. RD cementers. |
| 15. | Slowly pull out of the cement and PUH to 6400'. Reverse circulate to ensure no cement is left in the tubing. TOOH and SB 4030' of tubing. |
| 16. | RU WL. PU and RIH with two 3-1/8" perf guns with 3 spf, 0.50" EHD, 120° phasing. Shoot 1' of squeeze holes at 4408' and 2' at 4000'. RD WL. |
| 17. | RU 4-1/2" CICR and RIH on 2-3/8" tubing to set CICR at 4030'. |
| 18. | <u>RU Cementers.</u> Establish circulation through squeeze holes and pump 5 bbls water with biocide, 20 bbls sodium metasilicate, and another 5 bbls spacer immediately preceding cement. Pump Sussex suicide squeeze: 180 sxs (207 cf) 0:1:0 'G'+0.5% CFR-2+0.2% FMC+0.5% LWA+0.25 lb/sk |

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Polyflake, mixed at 15.8 ppg & 1.15 cf/sk. Under-displace by 2 bbls and un-sting from CICR spotting a minimum 100' of cement covering the squeeze holes. The plug will cover 4408' - 3890'. Volume is based on 408' in 9" OH from caliper with 20% excess, and 518' in 4-1/2" production casing with no excess. RD cementers.

19. Slowly pull out of the cement and PUH to 3700'. Circulate tubing clean to ensure no cement is left in the tubing. TOOH and SB 1100' 2-3/8" tubing.
20. RU WL. RIH and cut 4-1/2" casing at 1000'. RD WL.
21. Circulate with fresh water containing biocide to remove any gas.
22. Un-land casing. ND BOP. ND TH. Install BOP on casing head with 4-1/2" pipe rams.
23. TOOH and LD 1000' of 4-1/2" casing. Remove 4-1/2" pipe rams and install 2-3/8" pipe rams.
24. RIH with 2-3/8" tubing to 1100'.
25. Establish circulation with biocide treated fresh water and get bottoms up.
26. RU Cementers. Precede cement with 10 bbl (min) SAPP followed by a 20 bbl fresh water spacer. Pump Stub Plug: 140 sxs (186 cf) Type III+0.3% CFL-3+0.3% CFR-2+0.25 lb/sk Polyflake, mixed at 14.8 ppg & 1.33 cf/sk (100' in 4-1/2" production casing with no excess, 155' in 9" OH from caliper with 40% excess, and 227' in 8-5/8" surface casing with no excess). The plug will cover 1100' - 618'. RD cementers.
27. Slowly PUH to 400'. Reverse circulate to ensure no cement is left in the tubing. PUH to 300' and WOC.
28. WOC per cement company recommendation. Tag cement. Cement top needs to be at or above 745' (100' above the surface casing shoe located at 845'). TOOH.
29. RU WL. RIH 8-5/8" CIBP to 80'. Set and pressure test to 1000 psi for 15 minutes. RDMO WL and WO rig.
30. Instruct cementing and wireline contractors to e-mail copies of all job logs/job summaries to rscDJVendors@anadarko.com within 24 hours of completion of the job.
31. Supervisor submit paper copies of all invoices, logs, and reports to Evans Engineering Specialist.
32. Excavation crew to notify One Call to clear excavation area around wellhead and for flow lines.
33. Excavate hole around surface casing enough to allow welder to cut casing a minimum 5' below ground level.
34. Welder cut casing minimum 5' below ground level.
35. Fill casing to surface using 4500 psi compressive strength cement (NO gravel).
36. Spot weld on steel marker plate. Marker should contain Well name, Well number, legal location (1/4 1/4 descriptor) and API number.
37. Obtain GPS location data as per COGCC Rule 215 and send to rscDJVendors@anadarko.com.
38. Properly abandon flow lines per Rule 1103. File electronic Form 42 once abandonment is complete.
39. Back fill hole with fill. Clean location, and level.
40. Submit Form 6 to COGCC ensuring to provide 'As performed' WBD identifying operations completed.