

Engineer: Tod Haanes

Cell: 303-929-2339

PLUG and ABANDONMENT PROCEDURE

Erickson Birkle P 25-3 JI

Step	Description of Work
------	---------------------

- | | |
|-----|---|
| 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.). Notify 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. Record tag depth in Open Wells. Run pressure bomb and obtain pressure gradient survey from 7745' to surface (halfway between J Sand perfs) making gradient stops every 1000'. Forward pressure bomb results to Evans Engineering. Note: Do not run the BHP Survey after blowing down or killing the well with fluid. |
| 3. | Tag BH depth and run a VES GYRO survey from EOT to surface, making stops every 100'. Forward GYRO results to Evans Engineering. Enter tagged depth into Open wells. RD slickline. |
| 4. | Prepare location for base beam equipped rig. Install perimeter fence as needed. |
| 5. | 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 9/28/2015 recorded a Bradenhead pressure of 9 to 1 psi, 1 gallon of water was produced, and the buildup in 15 minutes was 3 psi. |
| 6. | Blow-down bradenhead and re-check pressure the next day. Repeat until pressure stays at 0 psi. Contact Evans Engineering if pressure does not report at 0 psi the next day. |
| 7. | MIRU WO rig. Kill well as necessary using clean fresh water with biocide. ND WH. NU BOP. Unseat landing joint, and LD. |
| 8. | TOOH and SB 7010' 2-3/8" tubing. |
| 9. | RU WL. PU gauge ring and RIH to 7700' for 4-1/2" 11.6 lb/ft casing (spud date = 12/11/2002). POOH and LD gauge ring. |
| 10. | With WL, set CIBP at 7670' (collars are located at 7658' and 7702') to abandon the J Sand perfs. Standby WL. |
| 11. | Fill hole with biocide treated water and pressure test CIBP to 1000 psi for 15 minutes. Monitor bradenhead pressure during test. Contact Evans Engineering if the bradenhead pressure is affected by the casing test. |
| 12. | PU dump bailer and spot 2 sxs of "G" cement on the CIBP at 7670'. RD WL. |
| 13. | RU hydrotesters. TIH with 2-3/8" tubing to 7010' while hydrotesting to 3000 psi. RD hydrotesters. |
| 14. | <u>RU cementers.</u> Pump Niobrara balanced 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 7010' to 6570'. 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 tubing clean to ensure no cement is left in the tubing. PUH to 6300' and WOC. |
| 16. | WOC per cement company recommendation. Tag cement. TOC needs to be at or above 6610' (400' above the Niobrara TOP at 7010'). |
| 17. | TOOH and SB 4038' 2-3/8" tubing. |
| 18. | 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 4008'. RD WL. |

Engineer: Tod Haanes

Cell: 303-929-2339

PLUG and ABANDONMENT PROCEDURE

Erickson Birkle P 25-3 JI

19. RU 4-1/2" CICR and RIH on 2-3/8" tubing to set CICR at 4038'.
20. RU Cementers. 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 (208 cf) 0:1:0 'G'+0.5% CFR-2+0.2% FMC+0.5% LWA+0.25 lb/sk Polyflake, mixed at 15.8 ppg & 1.15 cf/sk. Under-displace by 3 bbls and un-sting from CICR spotting at least 100' cement on top of the squeeze holes. The plug will cover 4408' - 3852'. Volume is based on 400' in 9.0" OH from caliper with 20% excess, and 556' in 4-1/2" production casing with no excess. RD cementers.
21. Slowly pull out of the cement and PUH to 3600'. Circulate tubing clean to ensure no cement is left in the tubing. TOO H and SB 1110' 2-3/8" tubing.
22. RU WL. RIH and cut casing at 1010'. RD WL.
23. Circulate with fresh water containing biocide to remove any gas.
24. Un-land casing. ND BOP, and ND TH. Install BOP on casing head with 4-1/2" pipe rams.
25. TOO H and LD 1010' of 4-1/2" casing. Remove 4-1/2" pipe rams and install 2-3/8" pipe rams.
26. RIH with 2-3/8" tubing to 1110'.
27. Establish circulation with fresh water containing biocide and get bottoms up.
28. RU Cementers. Precede cement with 10 bbl (min) SAPP followed by a 20 bbl fresh water spacer. Pump Stub Plug: 285 sxs (379 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, 474' in 9.0" OH from caliper with 40% excess, 216' in 8-5/8" surface casing with no excess). The plug will cover 1110' - 320'. RD cementers.
29. Slowly pull out of the cement and PUH to 200'. Reverse circulate tubing clean using fresh water treated with biocide.
30. WOC per cement company recommendation. Tag cement. Cement top needs to be at or above 436' (100' above the surface casing shoe located at 536'). TOO H.
31. Remove casing head and inspect threads on head and surface casing. Clean and dope casing threads. Re-install casing head.
32. MIRU WL. RIH 8-5/8" CIBP to 80'. Set and pressure test to 1000 psi for 15 minutes. RDMO WL and WO rig.
33. 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.
34. Supervisor submit paper copies of all invoices, logs, and reports to Evans Engineering Specialist.
35. Excavation crew to notify One Call to clear excavation area around wellhead and for flow lines.
36. Excavate hole around surface casing enough to allow welder to cut casing a minimum 5' below ground level.
37. Welder cut casing minimum 5' below ground level.
38. Fill casing to surface using 4500 psi compressive strength cement (NO gravel).
39. Spot weld on steel marker plate. Marker should contain Well name, Well number, legal location (1/4 1/4 descriptor) and API number.
40. Obtain GPS location data as per COGCC Rule 215 and send to rscDJVendors@anadarko.com.
41. Properly abandon flow lines per Rule 1103. File electronic Form 42 once abandonment is complete.
42. Back fill hole with fill. Clean location, and level.

Engineer: Tod Haanes

Cell: 303-929-2339

PLUG and ABANDONMENT PROCEDURE

Erickson Birkle P 25-3 JI

43. Submit Form 6 to COGCC ensuring to provide 'As performed' WBD identifying operations completed.