

Engineer: Jade Patterson

Cell: 509-307-7514

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## PLUG AND ABANDONMENT PROCEDURE

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### Steps

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 IOC (970-506-5980) 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 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. NDWH. NUBOP. Unseat landing jt, LD.
6. Notify cementers to be on call. Provide volumes listed below:
  - 6.1 Niobrara plug: 20 sx (28 cu-ft) "G" w/silica flour, 0.4% CD-32, 0.4 ASA-301 and R-3 to achieve 2:30 pump time. Mix at 15.8 ppg and 1.38 cu-ft/sk. Cement volume based on 320' in 4 1/2" casing, no excess.
  - 6.2 Sussex plug: 50 sx (58 cu-ft) "G" w/0.4% CD-32, 0.4% ASA-301, mixed at 15.8 ppg and 1.15 cu-ft/sk. Cement volume based on 650' in 4 1/2" casing with no excess.
  - 6.3 Stub plug: 520 sx (692 cu-ft) Type III w/cello flake and CaCl<sub>2</sub> as necessary, mixed at 14.8 ppg and 1.33 cu-ft/sk. Cement volume based on 100' in 4 1/2" casing, 473' in a 14" OH with 20% excess, and 207' in 8 5/8" casing. Caliper on file.
7. TOOH 233 joints of 2 3/8" tubing landed at 7361'. Stand back.
8. MIRU WL. RIH gauge ring for 4 1/2" 11.6# casing to 7140'. POOH.
9. PU 4 1/2" 11.6# CIBP and RIH w/WL. Set at +/-7060' to abandon Niobrara and Codell perms. PT to 1000 psi.
10. RIH with 2 3/8" production tubing to +/- 7060'. Hydrotest tubing to 3000 psi while RIH.
11. RU cementers. Pump Niobrara plug: 20 sx (28 cu-ft) "G" w/silica flour, 0.4% CD-32, 0.4 ASA-301 and R-3 to achieve 2:30 pump time. Mix at 15.8 ppg and 1.38 cu-ft/sk. Plug to cover 7060'-6740'.
12. POOH 11 to ~6400'. Circulate with water containing biocide to displace cement and clear tubing.
13. POOH to 4850', LD remainder of tubing.
14. Pump Sussex plug: 50 sx (58 cu-ft) "G" w/0.4% CD-32, 0.4% ASA-301, mixed at 15.8 ppg and 1.15 cu-ft/sk. Plug to cover 4850'-4200'.
15. POOH to ~3900'. Circulate with water containing biocide to displace cement and clear tubing. RD cementers. WOC per cement company recommendations.

16. RIH with 2 3/8" tubing. Tag top of plug at 4200' or shallower. If not, consult Evans Engineering.
17. P&SB ~1370', LD remaining tubing.
18. RU WL. Shoot off 4 1/2" casing at or below 1270'. RD WL. Circulate casing with water containing biocide to remove any gas.
19. NDBOP, NDTH.
20. Install BOP on casing head with 4 1/2" pipe rams.
21. TOOH 4 1/2" casing, LD.
22. RIH with 2 3/8" tubing into casing stub to 1370' inside 4 1/2" casing.
23. RU cementers. Precede cement with 10 bbl SAPP and a minimum 20 bbl fresh water spacer. Pump stub plug: 520 sx (692 cu-ft) Type III w/ cello flake and CaCl<sub>2</sub> as necessary, mixed at 14.8 ppg and 1.33 cu-ft/sk. Plug to cover 1370'-1270' in 4 1/2" casing, 1270'-797' in 14" OH with 20% excess, and 797'-590' in 8 5/8" casing. Caliper on file.
24. POOH to 300' and circulate with water and biocide to displace cement and clear tubing.
25. WOC per cement company recommendation. Tag cement at 590' or shallower. If not, consult with Evans Engineering.
26. RU WL. RIH 8 5/8" 24# CIBP to 80'. Set and pressure test to 1000 psi for 15 minutes. If tests, RDMO WL and WO rig.
27. Instruct cementing and wireline contractors to email copies of all job logs/jobs summaries to [rscDJVendors@anadarko.com](mailto:rscDJVendors@anadarko.com) within 24 hours of completion of the job.
28. Supervisor is to submit paper copies of all invoices, logs, and reports to Joleen Kramer.
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](mailto: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.