

PLUG AND ABANDONMENT PROCEDURE

Reynolds 21-24

1. Note: Production Casing = 4 1/2" OD, 11.6#/ft; Production Hole Drilled @ 7 7/8."
2. 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 IOC (970-506-5980) 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.
3. MIRU slickline services. Pull bumper spring and tag bottom. Run pressure bomb and obtain pressure gradient survey from surface to 7400' making gradient stops every 1000'. Forward pressure bomb results to Evans Engineering. RD slick line services. RD slickline.
4. Prepare location for base beam equipped rig.
5. Check and record Bradenhead pressure. If Bradenhead valve is not accessible, re-plumb so that valve is above GL.
6. MIRU, kill as necessary using clean fresh water with biocide and circulate. ND WH. NU BOP. Unseat landing jt, LD.
7. Notify cementers to be on call. Provide volumes listed below:
 - 7.1 Niobrara Balanced Plug: 55 cu ft/ 40 sx "G" w/20% silica flour, 0.4% CD-32, 0.4% ASA-301 and R-3 to achieve 2:30 pump time, mixed at 15.8 ppg and 1.38 cuft/sk yield (580' inside 4-1/2" casing).
 - 7.2 SX Balanced Plug: 33 cu ft/ 30 sx class "G" w/ 0.4% CD-32, 0.4% ASA-301 mixed at 15.8 ppg and 1.15 cf/sx (400' inside 4-1/2" casing, no excess).
 - 7.3 Stub Plug: 598 cu ft/ 450 sx Type III CaCl₂ cement w/0.25 pps cello flake mixed at 14.8 ppg and 1.33 cf/sx (100' inside 4-1/2" csg, 1011' in 8.75" OH + 20% excess, and 209' in 8-5/8" surface casing).
8. TOOH 2-3/8" OD production tubing. Stand back.
9. MIRU WL. RIH gauge ring for 4-1/2", 11.6#/ft casing to 7380'. POOH.
10. RIH CIBP w/ WL. Set at +/- 7300'. POOH. PT CIBP to 1000 psi for 15 minutes. Dump bail 2 sx class "G" cement on CIBP. POOH.
11. RIH 2-3/8" tbg while hydrotesting tbg to 3000 psi to 7300'.
12. RU Cementers. Pump Niobrara Balanced Plug: 55 cu ft/ 40 sx "G" w/20% silica flour, 0.4% CD-32, 0.4% ASA-301 and R-3 15.8 ppg and 1.38 cuft/sk yield (580' inside 4-1/2" Casing, no excess) to place cement from 7300' to 6720'.
13. PUH to 6400'. Circulate 100 bbls water containing biocide to clear tubing. PUH and LD all but 4370' of tbg.
14. RU Cementers. Pump SX Balanced Plug: 33 cu ft/ 30 sx class "G" w/ 0.4% CD-32, 0.4% ASA-301 mixed at 15.8 ppg and 1.15 cf/sx to place cement from 4370' to 3970'.
15. PUH to 3700'. Circulate 60 bbls water containing biocide to clear tubing. WOC 4 hours.
16. Tag TOC at or above 3970' w/ 2-3/8" OD tubing. If plug is tagged deeper than 3970' contact engineering. Then, TOOH and LD all but 1880' of tbg.
17. RU WL. Shoot off casing at or below 1780'. RDMO WL. Circulate water containing biocide to remove any gas.
18. NDBOP, NDTH.
19. Install BOP on casing head with 4-1/2" pipe rams.
20. TOOH with 4-1/2" casing, LD.
21. RIH with 2-3/8" OD tubing to 1880'.
22. RU Cementers. Pump 10 bbl SAPP with a minimum of 20 bbl fresh water spacer. Spot Stub Plug: 598 cu ft/ 450 sx Type III CaCl₂ cement w/0.25 pps cello flake mixed at 14.8 ppg and 1.33 cf/sx from 1880' to 560'.
23. PUH to ~300'. Circulate 20 bbls water containing biocide to clear tubing.

24. TOO. WOC 4 hrs. Tag Cement. Cement top needs to be above 560'; Proceed assuming TOC is above 560'. Otherwise, call production engineer.
25. MIRU WL. RIH 8-5/8" CIBP to 80'. Set, PT to 1000 psi for 15 min. If tests, RDMO WL and WO rig.
26. Instruct cementing and wireline contractors to e-mail copies of all job logs/job summaries and invoices to rscDJVendors@anadarko.com within 24 hrs of the completion of the job.
27. Supervisor submit paper copies of all invoices, logs, and reports to Joleen Kramer.
28. Excavation crew to notify One Call to clear excavation area around wellhead and for flowlines.
29. Excavate hole around surface casing enough to allow welder to cut 8 5/8" casing minimum 5' below ground level.
30. Welder cut 8 5/8" casing minimum 5' below ground level.
31. MIRU ready cement mixer. Use 4500 psi compressive strength cement, (NO gravel) fill stubout.
32. Spot weld on steel marker plate. Marker should contain Well name, Well number, legal location (1/4 1/4 descriptor) and API number.
33. Obtain GPS location data as per COGCC Rule 215 and send to rscDJVendors@anadarko.com.
34. Properly abandon flowlines per Rule 1103.
35. Back fill hole with fill. Clean location, level.
36. Submit Form 6 to COGCC ensuring to provide 'As performed' WBD identifying operations completed. File electronic Form 42 once abandonment complete.