

## PLUG AND ABANDONMENT PROCEDURE

### HSR-B/R C 1-29

1. Note: Production Casing = 2-7/8" OD, 6.5#/ft, J-55; 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. RD slickline services.
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.
6. MIRU, kill well 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 Plug: 34 cu ft/25 sx class G w/ 20% silica flour, 0.4% CD-32, 0.4% ASA-301 and R-3 mixed at 15.8 ppg and 1.38 cuft/sk (1060' inside 2-7/8" Casing, no excess)
  - 7.2 SX Wiper Plug: 287 cu ft/250 sx class "G" w/0.25 pps cello flake, 0.4% CD-32, 0.4% ASA-301 mixed at 15.8 ppg and 1.15 cf/sx (400' in 10.5" OH + 20% excess and 400' inside 2-7/8" casing, no excess).
  - 7.3 Stub Plug: 359 cu ft/270 sx Type III CaCl<sub>2</sub> cement w/0.25 pps cello flake mixed at 14.8 ppg and 1.33 cf/sx (328' in 10.5" OH + 40% excess, and 200' in 8 5/8" surface casing).
8. TOOH 1.66" OD production tubing.
9. MIRU WL. RIH gauge ring for 2-7/8" 6.5#/ft casing to 6900'. POOH.
10. RIH CIBP w/ WL. Set at +/- 6860'. Pressure test CIBP to 2500 psi.
11. Run CBL from 6860' to surface to verify that there is no Sussex and surface cement. Send results to Tyler.Davis@anadarko.com and Brent.Marchant@anadarko.com. Note: It is important to get a good quality CBL. It may be necessary to circulate from just above CIBP to surface in order to get gas out of the hole.
12. RIH to 6860' with 1.66" OD tbg hydrotesting to 3000 psi.
13. RU Cementers. Pump Niobrara Plug: 34 cu ft/25 sx class G w/ 20% silica flour, 0.4% CD-32, 0.4% ASA-301 and R-3 mixed at 15.8 ppg and 1.38 cuft/sk to place cement in 2-7/8" production casing from 6860' to 5800'.
14. PUH to 5800'. Circulate 40 bbls water containing biocide to clear tubing. Then, TOOH.
15. MIRU WL. PU 1-11/16" perf gun with 6 spf, 0.37 EHD. Shoot 1' of squeeze holes at 4230'. RDMO WL.
16. Establish circulation down 2-7/8" and out 8-5/8" surface casing. RU Cementers. Pump: 287 cu ft/250 sx class "G" w/0.25 pps cello flake, 0.4% CD-32, 0.4% ASA-301 mixed at 15.8 ppg and 1.15 cf/sx to squeeze cement into annulus and place in casing from 4230' to 3830' (10.5" OH + 20% excess). Follow w/wiper plug and displace to 3830'.

17. WOC 4 hrs. RUWL, RIH w/sinker bars and tag TOC. POOH. Notify engineering if tag depth is deeper than 3830'.
18. Shoot off casing at or below 920'. RDMO WL. PUH 5' and circulate water containing biocide to remove any gas.
19. NDBOP, NDTH.
20. Install BOP on casing head with 2-7/8" pipe rams.
21. If PT passed from step 9, plan on using 2-7/8" as a WS and LD 1.66" tbg. If PT failed, pull 2-7/8" casing and hydrotest 2-7/8" back in hole.
22. RU Cementers. Pump 10 bbl SAPP with a minimum of 20 bbl fresh water spacer. Pump Stub Plug: 359 cu ft/ 270 sx Type III CaCl<sub>2</sub> cement w/0.25 pps cello flake mixed at 14.8 ppg and 1.33 cf/sx from 920' to 390' (10.5" OH + 40% excess).
23. PUH to ~200' with 2-7/8" casing. Circulate 15 bbls water containing biocide to clear cement.
24. TOOH 2-7/8" csg. WOC 4 hrs.
25. RIH w/ 2-7/8" csg and tag Cement. Cement top needs to be above 390'; Proceed assuming TOC is above 390'. Otherwise, call production engineer.
26. MIRU WL. RIH 8 5/8" CIBP to 80'. Set, PT to 1000 psi for 15 min. If tests, RDMO WL and WO rig.
27. 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.
28. Supervisor 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 8 5/8" casing minimum 5' below ground level.
31. Welder cut 8 5/8" casing minimum 5' below ground level.
32. MIRU ready cement mixer. Use 4500 psi compressive strength cement, (NO gravel) fill stubout.
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. Properly abandon flowlines per Rule 1103.
35. Obtain GPS location data as per COGCC Rule 215 and send to rscDJVendors@anadarko.com.
36. Back fill hole with fill. Clean location, level.
37. Submit Form 6 to COGCC ensuring to provide 'As performed' WBD identifying operations completed. File electronic Form 42 once abandonment complete.