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## **PLUG AND ABANDONMENT PROCEDURE**

**UIV LAND 5-20, API 05-123-21825**

### **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 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 services and pressure bomb services. Pull bumper spring, tag bottom, and run pressure bomb survey and obtain pressure gradient survey from surface to 6953' making gradient stops every 1000'. Forward pressure bomb results to Sabrina Frantz. RDMO pressure bomb services. MIRU VES and run gyro survey from 7232' to surface with stops every 100'. Forward gyro survey data and invoices to Sabrina Frantz. RDMO slickline services and VES.
3. Prepare location for base beam equipped rig. Install perimeter fence as needed.
4. MIRU, kill as necessary using clean fresh water with biocide. NDWH, NUBOP. Unseat landing jt, LD.
5. Check and record Bradenhead pressure. If Bradenhead valve is not accessible, re-plumb so that valve is above GL.
6. Notify cementers to be on call. Provide volumes listed below:
  - 6.1 Niobrara plug: **25 sx** (35 cu-ft) "G" w/20% 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 350' in 4 ½" casing.
  - 6.2 Sussex suicide: **100 sx** (115 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 420' in 4 ½" casing and 260' in an 8" open hole with 20% excess. Caliper on file.
  - 6.3 Foxhills plug: **180 sx** (239 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 ½" casing, 350' in an 8" open hole with 20% excess and 200' in 8 5/8" casing. Caliper on file.
7. TOOH 228 joints of 2 3/8" tubing landed at 7080'. Stand back 6730' of tubing, LD remainder.
8. MIRU WL. PU 4 ½" 11.6# gauge ring and RIH to 6760'. POOH.
9. PU 4 ½" 11.6# CIBP, RIH and set at +/- 6730' to abandon Codell/Niobrara perfs. RD WL.
10. Hydrotest tubing to 3000 psi while RIH. Tag CIBP and PUH just above. Circulate with water containing biocide to remove all excess gas. PT CIBP to 1000 psi.
11. RU cementers. Pump Niobrara plug: **25 sx** (35 cu-ft) "G" w/20% 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 from 6730' to 6380'.
12. PUH to ~6000'. Circulate with water containing biocide to displace cement and clear tubing.
13. TOOH. Stand back 3680', LD remainder.

14. RU WL. PU 3 1/8" perf gun with 3 spf, 120 degree phasing, and 0.59" EHD. Shoot 1' of squeeze perfs at 3910' and 3650'. RD WL.
15. PU 4 1/2" 11.6# CIRC, RIH and set at +/- 3680'. Establish circulation with water containing biocide.
16. RU cementers. Precede cement with 5 bbls of water w/biocide, 20 bbls sodium metasilicate, and another 5 bbls water w/biocide spacer.
17. Pump Sussex suicide: 100 sx (115 cu-ft) "G" w/0.4% CD-32, 0.4% ASA-301, mixed at 15.8 ppg and 1.15 cu-ft/sk to place cement between perfs from 3910' to 3650'. Under displace and sting out of CIRC to leave 3 bbls on top of retainer. RD cementers. Plug to cover from 3910' to 3650' in an 8" open hole with 20% excess and from 3910' to 3490' in 4 1/2" casing.
18. PUH to ~3200'. Circulate with water containing biocide to clear tubing.
19. TOOH. Stand back 900', LD remainder.
20. RU WL. Cut off casing at or above 800'. RD WL.
21. Circulate casing with water containing biocide to remove any excess gas.
22. NDBOP, NDTH. Install BOP on casing head with 4 1/2" pipe rams.
23. TOOH 4 1/2" casing, LD. Replace 2 3/8" pipe rams.
24. RIH with 2 3/8" tubing to +/- 900'.
25. RU cementers. Pump Foxhills plug: 180 sx (239 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. RD cementers. Plug to cover from 900' to 800' in 4 1/2" casing, 800' to 450' in an 8" open hole with 20% excess and 450' to 250' in 8 5/8" casing. Caliper on file.
26. PUH to 150'. Circulate with water containing biocide to displace cement and clear tubing.
27. TOOH and WOC per cement company recommendations.
28. Tag cement at or above 350'. If not, consult with Evans Engineering.
29. RU WL. PU 8 5/8" 24# CIBP and RIH to 80'. Set and PT to 1000 psi for 15 minutes. If tests, RDMO WL and WO rig.
30. 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.
31. Supervisor is to submit paper copies of all invoices, logs, and reports to Engineering Specialist.
32. Excavation crew to notify One Call to clear excavation area around wellhead and for flowlines.
33. Excavate hole around surface casing enough to allow welder to cut casing 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](mailto:rscDJVendors@anadarko.com).
38. Properly abandon flowlines per Rule 1103. File electronic Form 42 once abandonment complete.
39. Back fill hole with fill. Clean location, level.