Anadarko
Petroleum Corporation

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Date: 5/20/2015
PLUG AND ABANDONMENT PROCEDURE
RUSCH 44-15, API 05-123-21233

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 from surface to 7590' making gradient stops every 1000'. Forward pressure bomb results to Evans Engineering. RDMO slickline services and pressure bomb services. Note: Do not run pressure survey after the well has been blown down and/or killed w/ water.
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 biocide treated water. NDWH. NUBOP. Unseat landing jt, LD.
6. Notify cementers to be on call. Provide volumes listed below:
    6.1 Niobrara plug: 60 sx (91 cu-ft) Thermal 35 w/ 0.5% CFR-2 and 0.25% FMC, mixed at 15.6 ppg and 1.51 cu-ft/sk yield. Cement volume based on 970' in 4 ½" casing.
    6.2 Sussex suicide: 290 sx (334 cu-ft) 0:1:0 'G' w/ 0.25 pps cello flake, 0.5% CFR-2, 0.2% FMC, 0.5% LWA, mixed at 15.8 ppg and 1.15 cu-ft/sk yield. Cement volume based on 720' in 4 ½" casing and 520' in a 10" OH with 20% excess. Caliper on file.
    6.3 Foxhills plug: 290 sx (386 cu-ft) Type III w/ 0.25 pps cello flake, 0.3% CFL-3, 0.3% CFR-2, and CaCl2 as necessary, mixed at 14.8 ppg and 1.33 cu-ft/sk yield. Cement volume based on 100' in 4 ½" casing, 386' in a 10" OH with 40% excess, and 200' in 8 5/8" casing. Utilized caliper readings from 4100' – 4300'.
7. TOOH 2 3/8" tubing landed at 7508'. Stand back 2 3/8" tubing.
8. MIRU WL. RIH gauge ring for 4 ½" 11.6# casing to 7500'. POOH.
9. PU 4 ½" 11.6# CIBP and RIH with WL. Set at +/- 7490' to abandon J Sand perfs. PT to 1000 psi for 15 minutes. RDMO WL.
10. RIH with 2 3/8" tubing to +/- 7490', tag CIBP and PUH 5'. Hydrotest tubing to 3000 psi while RIH.
11. MIRU cementers. Pump Niobrara plug: 60 sx (91 cu-ft) Thermal 35 w/ 0.5% CFR-2 and 0.25% FMC, mixed at 15.6 ppg and 1.51 cu-ft/sk yield. Plug to cover 7490' – 6520'. RDMO cementers.
12. PUH to +/- 6200'. Reverse circulate with biocide treated water to displace cement and clear tubing.
13. POOH. Stand back 3900' of tubing.
14. MIRU WL. PU 3 1/8" perf guns with 3 spf, 120 degree phasing, 0.50" EHD and RIH with WL. Shoot 1' of squeeze holes at 4390' and 2' of squeeze holes at 3870'. RDMO WL.
15. PU and RIH with CICR and 2 3/8" tubing, set CICR at +/- 3900'. Establish circulation with rig pump using biocide treated water.

TOC – 6546'
NB Top – 6925', SX Top – 4079', FHM – 806'
Offset to Merlin 13-15HZ Pad
Crops
Gyro Completed 12/4/2014
No Known Casing Issues
Noble Trade Well

16. MIRU cementers. Establish circulation with biocide treated water and precede cement with 5 bbl biocide treated water, 20 bbl sodium metasilicate, and another 5 bbl water spacer.
17. Pump Sussex suicide: 290 sx (334 cu-ft) 0:1:0 'G' w/ 0.25 pps cello flake, 0.5% CFR-2, 0.2% FMC, 0.5% LWA, mixed at 15.8 ppg and 1.15 cu-ft/sk yield to place cement between perfs from 4390' to 3870'. Under displace and sting out of CICR to leave 3 bbls (~200') on top of retainer. Cement volume based on 10" OH with 20% excess. Caliper readings across part of interval. RDMO cementers.
18. PUH to +/- 3400'. Reverse circulate with biocide treated water to displace cement and clear tubing.
19. POOH. Stand back 1010' of tubing.
20. MIRU WL. Shoot off 4 ½" casing at or below 910'. RDMO WL. Circulate casing with biocide treated water to remove any gas.
21. NDBOP, NDTH.
22. Install BOP on casing head with 4 ½" pipe rams.
23. TOOH 4 ½" casing, LD.
24. RIH with 2 3/8" tubing to 1010' inside 4 ½" casing.
25. MIRU cementers. Establish circulation with biocide treated water and precede cement with 10 bbl SAPP and a minimum 20 bbl fresh water spacer. Pump Foxhills plug: 290 sx (386 cu-ft) Type III w/ 0.25 pps cello flake, 0.3% CFL-3, 0.3% CFR-2, and CaCl2 as necessary, mixed at 14.8 ppg and 1.33 cu-ft/sk yield. Plug to cover 1010' – 910' in 4 ½" casing, 910' – 524' in 10" OH with 40% excess, and 524' – 324' in 8 5/8" casing. Utilized caliper readings from 4100' – 4300'. RDMO cementers.
26. PUH to 100' and circulate with biocide treated water to displace cement and clear tubing.
27. WOC per cement company recommendation. Tag cement at or above 424'. If not, consult with Evans Engineering.
28. MIRU 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.
29. Instruct cementing and wireline contractors to email copies of all job logs/jobs summaries to rscDJVendors@anadarko.com within 24 hours of completion of the job.
30. Supervisor is to submit paper copies of all invoices, logs, and reports to Evans Engineering Specialist.
31. Excavation crew to notify One Call to clear excavation area around wellhead and for flowlines.
32. Excavate hole around surface casing enough to allow welder to cut casing minimum 5' below ground level.
33. Welder cut casing minimum 5' below ground level.
34. Fill casing to surface using 4500 psi compressive strength cement, (NO gravel).
35. Spot weld on steel marker plate. Marker should contain well name, well number, legal location (1/4 1/4 descriptor) and API number.
36. Obtain GPS location data as per COGCC Rule 215 and send to rscDJVendors@anadarko.com.
37. Properly abandon flowlines per Rule 1103. File electronic Form 42 once abandonment complete.
38. Back fill hole with fill. Clean location, level.

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