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## PLUG and ABANDONMENT PROCEDURE

### HSR-PRINA 14-22A

#### Description

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.). Notify 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 and Core Tech. Pull production equipment and tag bottom. Record tag depth in Open Wells. RUN GYRO to 7039', making stops every 100'. RDMO Slickline and Core Tech.
3. Prepare location for base beam equipped rig. Install perimeter fence as needed.
4. Verify COAs before RU. Verify Form 17 (State Bradenhead Test) has been run within 60 days of RU. A good PT has less than 10% loss in pressure and stabilization at the end of the test. Test can be extended longer in time if need be. Contact Foreman and Engineer to confirm proceeding after pressure test.
5. Upon RU, check and record bradenhead pressure. If bradenhead valve is not accessible, re-plumb so that valve is above GL. Blow down bradenhead and re-check pressure the next day. Repeat until pressure stays at 0 psi.
6. MIRU WO rig. Spot a min of 13 jts of 2-3/8", 4.7#, J-55, EUE tbgs. Kill well as necessary using biocide treated fresh water. Verify BOP and wellhead rating, inspect for appropriate API standards, pressure test BOP according to VWP BOP testing guidelines. ND WH. NU BOP. Unland tbgs using unlanding joint and LD. Release packer set at 6341'.
7. TOOH and SB all 2-3/8" tbgs. LD packer.
8. PU and TIH with (4-1/2", 11.6#) Bit and Scraper on 2-3/8" tbgs to 7428'. TOOH and SB 6900' of 2-3/8" tbgs. LD remaining tbgs and Bit and Scraper.
9. MIRU WL. PU and RIH with (4-1/2", 11.6#) CIBP and set at +/- 7420' (collars at 7405' & 7428'). POOH. RIH and dump 2 sx cement on CIBP. POOH.
10. PU and RIH with (4-1/2", 11.6#) CIBP and set at +/- 6900' (collars at 6866' & 6908'). POOH. RDMO WL.
11. TIH with 2-3/8" tbgs to 6900'
12. Load hole with biocide treated fresh water and circulate all gas out of well. PT CIBP to 1000 psi for 15 minutes.
13. MIRU Cementers. Pump Niobrara Balance Plug: Pump 25 sx (6.9 bbl or 39 cf) Class G Cement, assuming 15.8 ppg & 1.53 cf/sk. Volume based on 400' inside 4-1/2", 11.6# production casing with no excess. Cement will be from 6900'-6500'.
14. Pull out of cement at a rate of 1 jt/min. TOOH, SB 4075' 2-3/8" tbgs. LD remaining tbgs.
15. MIRU WL. PU and RIH with two 3-1/8" perf guns with 3 spf, min 0.5" EHD, 120° phasing. Shoot 2' of squeeze holes at 4415' and 4' of squeeze holes at 4015'. RDMO WL.
16. PU and TIH with (4-1/2", 11.6#) packer on 2-3/8" tbgs. Set packer at 4075'.
17. Establish circulation to surface with biocide treated fresh water, and pump 100 bbls to clean up hole. Max pump pressure is 937 psi with fresh water at 2 bpm. If unable to circulate at that pressure, contact engineer.
18. Release packer. TOOH, SB 2-3/8" tbgs. LD packer.
19. PU and TIH with (4-1/2", 11.6#) CICR on 2-3/8" tbgs. Set CICR at 4075'.
20. MIRU cementers. Pump 10 bbls (min) of pre-flush, followed by 5 bbls fresh water spacer. Pump Sussex Squeeze: 110 sx (35.1 bbl or 197 cf), assuming 12 ppg & 1.79 cf/sk. Max pump pressure is to be 775 psi at 2 bpm with a full column of cement. Underdisplace by 3 bbls. Volume is based on 340' below the

CICR inside 4-1/2", 11.6# production casing with no excess, 400' in the 4-1/2", 11.6# annulus assuming 7.875" bit size with 60% excess and 190' on top of the CICR to cover top perfs. Collect wet and dry samples of cement to be left on rig. RDMO Cementers.

21. Pull out of cement at a rate of 1 jt/min. TOOH to 3385'. Reverse circulate to ensure no cement is left in the tbg.
22. TOOH and SB 2600' of 2-3/8" tbg. LD stinger, and remaining tbg.
23. MIRU WL. RIH and jet cut 4-1/2", 11.6# casing at 2500'. RDMO WL.
24. Attempt to establish circulation and circulate (49 bbl) with fresh water containing biocide to remove any gas.
25. ND BOP. ND TH. Un-land casing using a casing spear, not a lifting sub. Rig max pull shall be 100,000#. Max pull over string weight shall be 50,000#. If unable to unland, contact Engineering.
26. Install BOP on casing head with 4-1/2", 11.6# pipe rams.
27. TOOH and LD all 4-1/2", 11.6# casing. Remove 4-1/2", 11.6# pipe rams and install 2-3/8" pipe rams.
28. TIH with mule shoe and 2-3/8" tubing to 2600'.
29. Establish circulation to surface with biocide treated fresh water and pump at least two hole-volumes (98 bbl) to circulate all gas out of the well. Contact engineering if evidence of gas migration persists.
30. MIRU cementers. Pump Plug: Pump 50 sx (13.9 bbl or 78 cf), assuming 14 ppg & 1.55 cf/sk. Volume based on 100' inside 4-1/2", 11.6# production casing with no excess. 100' in 7.875" bit size open hole with 100% excess factor. Cement will be from 2600'-2400'.
31. Pull out of cement at a rate of 1 jt/min. TOOH to 680', LD 2-3/8" tubing.
32. Pump Stub Plug: Pump 95 sx (26.3 bbl or 148 cf), assuming 14 ppg & 1.55 cf/sk. Volume is based on 104' in 7.875" bit size open hole with 100% excess factor. 201' in the 8-5/8", 24# surface casing with no excess. The plug is designed to cover 680'-375'. Collect wet and dry samples of cement to be left on rig. RDMO Cementers. Notify engineering if circulation is ever lost during job.
33. Pull out of cement at a rate of 1 jt/min. TOOH to 150'. Reverse circulate using biocide treated fresh water to ensure the tubing is clean. TOOH, SB 480' 2-3/8" tbg. WOC.
34. TIH with mule shoe on 2-3/8" tbg and tag cement to verify appropriate coverage above the surface casing shoe. Pressure test casing to 500 psi and hold for 15 minutes. TOOH to 150', LD 2-3/8" tbg.
35. MIRU Cementers. Pump Surface Plug: Pump 50 sx (10.3 bbl or 58 cf) Class G cement, assuming 15.8 ppg & 1.15 cf/sk. Volume based on 150' inside 8-5/8", 24# surface casing with no excess. Cement will be from 150' to surface. Verify and document cement to surface. Collect wet and dry samples of cement to be left on rig.
36. Pull out of cement at a rate of 1 jt/min. TOOH, LD all 2-3/8" tbg. PU and TIH with 16' of tbg subs. Top off cement to surface. Circulate clean. RDMO cementers. TOOH and LD tbg subs. RDMO WO rig.
37. Instruct cementing and wireline contractors to e-mail copies of all job logs/job summaries to [rscDJVendors@anadarko.com](mailto:rscDJVendors@anadarko.com) within 24 hours of completion of the job.
38. Supervisor submit paper copies of all invoices, logs, and reports to VWP Engineering Specialist.
39. Excavation crew to notify One Call to clear excavation area around wellhead and for flow lines.
40. Excavate hole around surface casing enough to allow welder to cut casing a minimum 5' below ground level.
41. Welder cut casing minimum 5' below ground level.
42. Spot weld on steel marker plate. Marker should contain Well name, Well number, legal location (1/4 1/4 descriptor) and API number.
43. Obtain GPS location data as per COGCC Rule 215 and send to [rscDJVendors@anadarko.com](mailto:rscDJVendors@anadarko.com).
44. Properly abandon flow lines per Rule 1103. File electronic Form 42 once abandonment is complete.
45. Back fill hole with fill. Clean location, and level.
46. Submit Form 6 to COGCC ensuring to provide 'As performed' WBD identifying operations completed.