

PLUG AND ABANDONMENT PROCEDURE

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1. Call foreman or Lead Operator before rig up to isolate and remove automation and production equipment. Install fence if needed.
2. MIRU slickline services. Pull bumper spring, tag bottom. RDMO SL.
3. Provide notice to COGCC prior to MIRU per Form 6 COA.
4. Notify IOC when rig moves on location to generate work order for flowline removal and one call for line locates.
5. Prepare location for base beam rig.
6. MIRU WO rig. Kill well; circulate as necessary, with water containing biocide. ND wellhead. NU BOP's. Unseat landing joint and lay down.
7. Place cement services on will call when rig moves on location, providing expected volumes of cement needed. (~340 sx for top plug; ~570 sx for SX/SH plug and 70 sx for NB/CD plug). See attached WBD for cement blends.
8. TOOH and stand back 2-7/8" TBG.
9. MIRU wireline services. RIH gauge ring for 5-1/2" (15.5#) casing to 7900'.
10. PU 5-1/2" CIBP and RIH on W/L to +/-7820'. Set CIBP. Dump bail 2 sacks of cement on top of CIBP.
11. PU 5-1/2" CIBP and RIH on W/L to +/-7125'. Set CIBP.
12. PU RIH with CCL-GR-CBL-VDL. Run from 7100' to surface to verify cement behind 5-1/2" CSG. Email bond log to engineer, cement placement and squeeze perms in this procedure may be adjusted based on log results. Please see attached alternate procedure if CBL shows cement behind 5-1/2" csg at surface.

13. RIH on 2-7/8" TBG to +/-7125'. Hydrotest TBG to 3000 psi while RIH
14. Initiate circulation using water containing biocide. Note rate and pressure.
15. MIRU cementing services.
16. Pump 70 sacks of "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. Cement from 7125' to 6340'.
17. PUH 23 stands. Circulate (TBG Vol + Excess) to CLR TBG. RD cementing services.
18. P & SB 3880' (63 stands) of TBG. LD remainder.
19. RU wireline services. PU two 1' 3-1/8" perf guns loaded with 3 spf, 0.5" EHD, 120 phasing. Shoot 1' of squeeze holes at 4890' and 3850'. RD wireline.
20. PU 5-1/2" CICR and RIH on 2-7/8" TBG to 3880'. Set CICR
21. Initiate circulation through CICR using water containing biocide. Note rate and pressure.
22. MIRU cementing services. Preflush with 5 bbl of H2O; 20 bbl of sodium metasilicate; 5 bbl of H2O.
23. Pump 570 sacks of "G" w/ 0.25 pps cello flake, 0.4% CD-32, 0.4% ASA - 301, mixed at 15.8 ppg and 1.15 cuft/sk calculated with 20% excess and 10" hole size. Cement from 4890' to 3850'.
24. Underdisplace by 3BBL. Unsting from CICR and dump remainder on CICR.
25. PUH 9 stands. Circulate (TBG Vol + Excess) to CLR TBG. RD cementing services.
26. P & SB 1070' (18 stands) of TBG. LD remainder.
27. RU wireline services. Crack closest coupling at 970' or shoot off. RD wireline.
28. Circulate with mud w/ biocide.
29. NDBOP, NDTH.
30. NU BOP on casing head. Install 5-1/2" pipe rams.
31. TOOH with 5-1/2" casing and lay down. Install 2-7/8" pipe rams.
32. RIH with 2-7/8" TBG into casing stub to 1070'.

33. RU Cementing services. Spot 340 sx of Type III w/ cello flake and CaCl₂, mixed at 14.0 ppg and 1.53 cuft/sk, calculated with 12" hole size and 20% cement excess. Cement from 1070' to 100'.
34. PUH to 100' & circulate 9.0 PPG mud w/ biocide to clear TBG. TOOH. WOC 4 hrs
35. TIH and tag cement plug. If plug top is below 100', top as necessary.
36. MIRU wireline services. PU 8-5/8" CIBP and RIH to 100'. Set CIBP. Pressure test CIBP to 1000 psi for 15 minutes. If plug tests, RDMO wireline and WO rig.
37. 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.
38. Wellsite supervisor turn all paper copies of cementing reports/invoices and logs in to Joleen Kramer. NOTE: During the job, wellsite supervisor should instruct the logging and cementing contractors to e-mail all logs, job reports/invoices to Joleen Kramer.
39. Have excavation contractor notify One-Call to clear for excavating around wellhead and flowline removal.
40. Excavate hole around surface casing of sufficient size and depth to allow welder to cut off 8-5/8" surface casing and at least 5' below ground level.
41. Have welder cut off 8-5/8" surface casing at least 5' below ground level.
42. MIRU ready cement mixer. Use 4,500 psi compressive strength redi-mix cement (sand and cement only, no gravel) Fill STUB. RDMO cement services.
43. Have welder spot weld steel marker plate on top of surface casing. (Note: marker shall be labeled with well name and number, legal location (¼ ¼ description) and API number.
44. Properly abandon flowlines as per Rule 1103.
45. Have excavation contractor back fill hole with native material. Clean up location and have leveled.
46. Submit Form 6 to COGCC. Provide "As Plugged" wellbore diagram identifying the specific plugging completed.

Alternate Procedure if CBL shows cement behind 5-1/2" CSG at surface.

1. P&SB 830' of TBG (20 Stands). LD remainder.
2. RU wireline services. PU two 1' 3-1/8" perf guns loaded with 3 spf, 0.5" EHD, 120 phasing. Shoot 1' of squeeze holes at 1070' and 800'.
3. PU 5-1/2" CICR and RIH on wireline to 830'. Set CICR. RD wireline
4. TIH w/ 2-3/8" TBG to 830'.
5. Pump 160 sacks of Type III w/ celloflake and CaCl₂ mixed at 14.0 ppg and 1.53 cuft/sk with 20% excess. Cement from 1070' to 200'.
6. Underdisplace by 3BBL. Unsting from CICR and dump remainder on CICR.
7. Spot 50 sacks of Type III w/ celloflake and CaCl₂ mixed at 14.0 ppg and 1.53 cuft/sk from 800 to +/- 200'.
8. PUH to +/- 200'. Circulate (TBG Vol + Excess) to CLR TBG. RD cementing services.
9. RU wireline services. Crack closest coupling at 200' or shoot off.(as deep as possible above cement top). RD wireline.
10. Circulate with water w/ biocide.
11. NDBOP, NDTH.
12. NU BOP on casing head. Install 5-1/2" pipe rams.
13. TOOHS with 5-1/2" casing and lay down. Install 2- 3/8" pipe rams.
14. RIH with 2-3/8" TBG into casing stub to TOC inside 5-1/2"

15. RU Cementing services. Spot +/- 30 sx of Type III w/ celloflake and CaCl₂ mixed at 14.0 ppg and 1.53 cuft/sk and with 20% cement excess. Cement from TOC inside 5-1/2" CSG' to 100'. PUH to 100' & circulate with water + biocide to clear TBG. TOOH. WOC 4 hrs
16. TIH and tag cement plug. If plug top is below 100', top as necessary.