

PLUG AND ABANDONMENT PROCEDURE

Engineer: Taj Brar (970-339-1088)

Cell: 303-720-1810

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. (~170sx for top plug; 300 sx for Foxhills plug, ~230 sx for SX/SH plug and 80 sx for NB/CD plug). See attached WBD for cement blends.
8. TOOH and stand back 2-3/8" TBG.
9. MIRU wireline services. RIH gauge ring for 4-1/2" casing to 7900'.
10. PU 4-1/2" CIBP and RIH on W/L to +/-7800'. Set CIBP. Dump bail 2 sacks of cement on top of CIBP.
11. PU RIH with CCL-GR-CBL-VDL. Run from 7800' to surface to verify cement behind 4-1/2" CSG. Email log results to engineer. Cement blend and squeeze jobs will be changed based on log results.
12. PU two 1' 3-1/8" perf guns loaded with 3 spf, 0.5" EHD, 120 phasing. Shoot 1' of squeeze holes at 6950' and 6750'. RD wireline

13. PU 4-1/2" CICR and RIH on 2-3/8" TBG to 6780'. Hydrotest TBG to 3000 psi while RIH. Set CICR.
14. Initiate circulation using water containing biocide. Note rate, pressure and circulation.
15. MIRU cementing services. Pump 80 sacks of 50/50 Poz "G" w/ 20% silica flour, 3% gel, 0.1% sodium metasilicate and 0.4% FL-52 mixed at 13.5 ppg and 1.71 cuft/ sk yield. with 20% excess used and considering hole size of 10".
16. Underdisplace by 3 BBL. Unsting from CICR and dump remainder on CICR.
17. PUH 9 stands. Circulate (2 X TBG Vol + Excess) to CLR TBG. RD cementing services
18. Load hole and circulate with 9.0 ppg mud containing biocide.
19. P&SB 4230' of TBG (69 Stands). LD remainder.
20. 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 4200' and 4600'. RD wireline.
21. PU 4-1/2" CICR and RIH on 2-3/8" TBG to 4230'. Set CICR
22. Initiate circulation through CICR using water containing biocide. Note rate, pressure and circulation.
23. MIRU cementing services. Preflush with 5 bbl of H2O; 20 bbl of sodium metasilicate; 5 bbl of H2O.
24. Pump 230 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 with 20% excess used and considering hole size of 10". Cement from 4600' to 4200'.
25. Underdisplace by 3 BBL. Unsting from CICR and dump remainder on CICR.
26. PUH 9 stands. Circulate (2 X TBG Vol + Excess) to CLR TBG. RD cementing services.
27. Load hole and circulate with 9.0 ppg mud containing biocide.

28. P & SB 780' (13 stands) of TBG. LD remainder.
29. 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 1450' and 750'. RD wireline.
30. PU 4-1/2" CICR and RIH on W/L to 780'. Set CICR
31. TIH with 2-3/8" TBG to 780'.
32. Initiate circulation through CICR using water containing biocide. Note rate, pressure and circulation.
33. MIRU cementing services.
34. Pump 300 sacks of Type III w/ cello flake and CaCl₂, mixed at 14.0 ppg and 1.53 cuft/sk. Cement from 1450' to 750'. Volumes calculated considering 10" hole size and 20% excess.
35. Underdisplace by 3BBL. Unsting from CICR and dump remainder on CICR.
36. PUH 9 stands. Circulate (2 X TBG Vol + Excess) to CLR TBG. RD cementing services.
37. Load hole and circulate with 9.0 ppg mud containing biocide.
38. RU wireline services. Crack closest coupling at 600' or shoot off (as deep as possible above cement top). RD wireline.
39. Circulate with mud w/ biocide to remove any gas.
40. NDBOP, NDTH.
41. NU BOP on casing head. Install 4-1/2" pipe rams.
42. RIH with 2-3/8" TBG into casing stub to TOC inside 4-1/2".
43. RU Cementing services. Spot 170 sx of Type III w/ celloflake and CaCl₂ mixed at 14.0 ppg and 1.53 cuft/sk and with 20% cement excess and 10" hole size. Cement from +/-

700' to 100'. PUH to 100' & circulate 9.0 PPG mud w/ biocide to clear TBG. TOOH.

WOC 4 hrs

44. TIH and tag cement plug. If plug top is below 100', top as necessary.
45. 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
46. 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.
47. Have excavation contractor notify One-Call to clear for excavating around wellhead and flowline removal.
48. 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.
49. Have welder cut off 8-5/8" surface casing at least 5' below ground level.
50. MIRU ready cement mixer. Use 4,500 psi compressive strength redi-mix cement (sand and cement only, no gravel) Fill STUB. RDMO cement services.
51. 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.
52. Properly abandon flowlines as per Rule 1103.
53. Have excavation contractor back fill hole with native material. Clean up location and have leveled.
54. Submit Form 6 to COGCC. Provide "As Plugged" wellbore diagram identifying the specific plugging completed.