

HARKIS 12-2

PLUG AND ABANDON PROCEDURE

1. Provide 48 hr notice to COGCC prior to rig up per request on approved Form 6 (e.g. call field coordinator, submit Form 42, etc.). Call IOC (970-506-5980) at least 24 hr prior to rig move. Request they isolate production equipment and remove any automation prior to rig MIRU.
2. MIRU Slickline. Pull bumper spring and tag bottom. PU Pressure bomb on slickline and RIH to 7,614'. Log to surface with stops every 1,000'. RDMO Slickline.
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 WO rig. Kill well as necessary w/ water containing biocide. ND WH, NU BOP.
6. Unseat and LD landing joint. PU w/ 2-3/8" tbg (4.7#, J-55) to break any sand bridges. Do not exceed the safety tensile load of 57,384 lbs (80% of upset yield strength).
7. TOO and SB 2-3/8" tbg (+/- 7,586').
8. MIRU wireline. PU gauge ring for 4-1/2" csg (11.6#) on wireline and RIH +/- 7,550'. POOH and LD gauge ring.
9. PU CIBP for 4-1/2" csg (11.6#) on wireline and RIH to 7,530'. Set CIBP in csg. POOH and LD setting tool. Pressure test CIBP to 1,000 psi for 15 min. RDMO wireline.
10. TIH w/ 2-3/8" tbg while hydrotesting to 3,000 psi. Tag CIBP and PU 5' from tag.
11. MIRU Cementing Services. Spot 70 sx (+/- 96) of cmt (Class 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 from 7,530' to 6,500'.
12. PU to 6,000' and circulate tbg clean. PU to 4,910' while LD tbg.
13. Spot a balanced plug w/ 70 sx (+/- 80 cuft) of cmt (Class G, 0.4% CD-32, 0.4% ASA-301) mixed at 15.8 ppg and 1.15 cuft/sk from 4,910' to 4,020'. RDMO Cementing Services. NOTE: DV tool is at 4,864'.
14. PUH to 3,600' and circulate the tbg clean. WOC for 4 hrs.
15. TIH w/ 2-3/8" tbg and tag TOC. If TOC is deeper than 4,032' contact engineering for possible further cement work.
16. TOO and SB +/- 1,400' of tbg, LD the remainder.
17. MIRU wireline. PU jet cutter on wireline and RIH to +/- 1,300'. Cut csg and circulate bottoms up. Continue to circulate to remove any gas in the wellbore. RDMO wireline.
18. ND BOP and tbg head. NU BOP on the surface csg w/ 4-1/2" pipe rams. Install 3,000 psi ball valves on the csg head outlets. Install a choke or a choke manifold on one of the outlets.
19. TOO and LD 4-1/2" csg. If unable to pull csg, contact the engineer and notify the COGCC.
20. Remove the 4-1/2" pipe rams and install 2-3/8" pipe rams.
21. TIH w/ 2-3/8" tbg to +/- 1,400', 100' inside the csg stub.
22. MIRU Cementing Services. Pump 10 bbls of SAPP (Sodium Acid Pyrophosphate) followed by 20 bbls of fresh water containing biocide. Spot 240 sx (+/- 319 cuft) of cmt (Type III w/ cello flake and CaCl₂ as deemed necessary) mixed at 14.8 ppg at 1.33 cuft/sk. Planned cement is from 1,400' to 1,300' stub plug in 4-1/2, 11.6# csg stub,

- 1,300' to 901' in 8-1/2" OH (from closest caliper, plus 40% excess), and from 901' to 690' inside 8-5/8", 24# surface csg. RDMO Cementing Services.
23. PUH to 250' and circulate tbg clean. WOC for 4 hrs.
24. TIH w/ 2-3/8" tbg and tag TOC and if TOC is deeper than 701' contact engineer for possible further cement work. TOO H and LD 2-3/8" tbg.
25. MIRU wireline. PU CIBP on wireline for 8-5/8" (24#) csg and TIH to +/- 80'. Set CIBP and test to 1000 psi for 15 min. POOH and LD wireline. RDMO wireline.
26. RDMO WO rig.
27. NOTE: Instruct cementing & wireline contractors to email copies of all job logs/job summaries & invoices to rscDJVendors@anadarko.com within 24 hours of the completion of the job.
28. Wellsite supervisor should turn all paper copies of cementing reports/invoices and logs into Joleen Kramer.
29. Have excavation contractor notify One-Call to clear for digging around wellhead and flowline removal.
30. Excavate hole around surface casing enough to allow welder to cut 8-5/8" casing minimum 5' below ground level.
31. Welder cut 8-5/8" casing minimum 5' below ground level.
32. MIRU ready cement mixer. Fill the last 80' inside the 8-5/8" prod. casing until 10' below surface. Use 4,500 psi compressive strength redi-mix cement (Sand and Cement only, no gravel) to finish filling surface casing to top of cut off.
33. Have welder spot weld on steel marker plate. (Note: marker shall be labeled with well name and number, legal location (1/4 1/4 description) and API number.
34. Properly abandon flowlines as per rule 1103.
35. Have excavation contractor back fill hole with native material. Clean up location and have leveled to plant any vegetation required.
36. Submit Form 6 to COGCC. Provide "As Plugged" wellbore diagram identifying the specific plugging completed.

Michael Sax – Production Engineer I
 970-339-1449 – Office 310-613-1637 – Cell
Michael.sax@anadarko.com