

## HSR-LEONARD 12-22A

## 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 catch and remove plunger, isolate production equipment and remove any automation prior to rig MIRU.
2. MIRU slickline services. Pull bumper spring and tag bottom in the 2-7/8" liner (last tagged on 7/31/2012 at 7,436'. RDMO slickline services.
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 by PU w/ 2-3/8" tbg (4.7#, J-55, 8rd EUE) to break any sand bridges. Do not exceed the safety tensile load of 57,384 lbs (80% of upset yield strength).
7. TOOH and SB +/- 7,100' of tbg, LD the remainder.
8. PU scraper for 4-1/2" (M-75, 11.6, LTC) csg on 2-3/8" tbg and TIH to +/- 7,440'. TOOH, SB tbg, and LD the scraper.
9. MIRU Wireline. PU CIBP for 4-1/2" csg (11.6#, M-75, LTC) on wireline. RIH and set CIBP at 7,430' w/ 2 sk of cmt on top (Note: collar is at +/- 7,414' & the liner top is +/- 7,440'). RDMO Wireline.
10. PU CIBP for 4.5" csg (11.6#, M-75, LTC) on wireline. RIH and set CIBP at 7,090' (Note: Collars are at 7,063' & 7,105'). POOH and LD the setting tool. Pressure test CIBP to 1000 psi for 15 min. RDMO Wireline.
11. TIH 2-3/8" tbg and tag the CIBP (at +/- 7,090') while hydrotesting each stand to +/- 3000 psi.
12. MIRU Cementing Services. Spot 30 sx (+/- 41 cuft) 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 7,090' to 6,750' on top of CIBP.
13. PUH w/ 2-3/8" tbg to +/- 6,200' (+/- 26 jts) and circulate tbg clean. POOH, SB +/- 4,170' of tbg, LD remainder.
14. MIRU Wireline. PU and RIH two 1' perf guns (3-1/8", 3 spf, "Big Hole" 0.6" EHD, 7" penetration, 120° phasing, 2' net, 6 total holes) to 4,535'. Perf bottom squeeze holes at 4,535' then PUH to 4,135' and perf top squeeze holes in 4-1/2" prod csg. POOH and LD perf guns. RDMO wireline.
15. PU CICR for 4-1/2" csg (11.6#, M-75, I-70) on 2-3/8" tbg and set at +/- 4,165'.
16. MIRU Cementing Services. Pump 5 bbls of fresh water, 20 bbls of metalillicate, and 5 bbls of fresh water followed with 200 sx (+/- 230 cuft) of cmt (Class 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. Under displace by 3bbls of cement, sting out of CICR and dump cmt on CICR. Planned cement is from 4,535' to 4,135' in 9" OH (plus 40% excess) & from 4,535' to 4,035' in 4-1/2", 11.6# csg. PUH to +/- 3,435 (+/- 24 jts) and circulate to clean tbg. TOOH and SB +/- 1,300' of tbg and LD remainder. RDMO Cementing Services.
17. MIRU wireline. PU a jet cutter and RIH to +/- 1,190' to cut 4-1/2" csg. 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 to the surface csg and install 4-1/2" pipe rams. Install 3,000 psi ball valves on both csg head outlets. Install a choke or choke manifold on one outlet.

19. TOOH 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 on the BOP.
21. TIH w/ 2-3/8" tbg to +/- 1,290'.
22. MIRU Cementing Services. Pump 10 bbls of SAPP (Sodium Acid Pyrophosphate) followed by 20 bbls of fresh water containing biocide. Spot 370 sx (+/- 492 cuft) of cmt (Type III w/ cello flake and CaCl<sub>2</sub> as deemed necessary) mixed at 14.8 ppg at 1.33 cuft/sk. Planned cement is from 1,290' to 1,190' stub plug in 4-1/2", 11.6# csg stub, 1,190' to 620' in 9" OH (plus 60% excess), and from 620' to 420' inside 8-5/8", 24# surface csg. PUH to 250' and circulate tbg clean. RDMO Cementing Services. WOC for 4 hrs.
23. TIH w/ 2-3/8" tbg and tag TOC and if TOC is deeper than 420' contact engineer for possible further cement work. TOOH and LD 2-3/8" tbg.
24. 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.
25. RDMO WO rig.
26. NOTE: Instruct cementing & wireline contractors to email copies of all job logs/job summaries & invoices to [rscDJVendors@anadarko.com](mailto:rscDJVendors@anadarko.com) within 24 hours of the completion of the job.
27. Wellsite supervisor should turn all paper copies of cementing reports/invoices and logs into Joleen Kramer.
28. Have excavation contractor notify One-Call to clear for digging around wellhead and flowline removal.
29. Excavate hole around surface casing enough to allow welder to cut 8-5/8" casing minimum 5' below ground level.
30. Welder cut 8-5/8" casing minimum 5' below ground level.
31. 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.
32. Have welder spot weld on steel marker plate. (Note: marker shall be labeled with well name and number, legal location (¼ ¼ description) and API number.
33. Properly abandon flowlines as per rule 1103.
34. Have excavation contractor back fill hole with native material. Clean up location and have leveled to plant any vegetation required.
35. Submit Form 6 to COGCC. Provide "As Plugged" wellbore diagram identifying the specific plugging completed.

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