

Amoco Westan Cavanaugh #1
API# 05-005-06203
Re-Entry and Re-P&A

Objective:

Find well and prep to re-enter well. Drill out all plugs. Plug well again with improved plugging requirements.

Procedure:

1. Contractor to obtain Line locates for ground disturbance. Locate well or casing stump. Have surveyor gather an as built survey of well location for records. Refer to all COA's from COGCC approved Form 6.
2. Construct location and temporary access for the site.
3. Dig up stump of original surface casing. Cut off marker and prep for a slip on collar with pup joint to get surface flange to ground level. Install 8-5/8" x 11" 3K flange.
4. Back fill area and prep for rig.
5. Submit Form 42 electronically to COGCC 48 hours prior to MIRU. Notify COGCC Inspector 24 hours prior to MIRU.
6. MIRU drilling rig and auxiliary equipment. Pre-mix mud tanks to 10.0 ppg MW.
7. Install 11" 3K BOP plus rotating head. Conduct 250 psi low / 2000 psi high pressure test.
8. Pick up 7-7/8" PDC bit, bit sub, and two drill collars. Drill out surface plug from surface to about 40'. Continue TIH to plug #2 at 178'. Drill through surface casing shoe at 214', continue drilling cement to approximately 250'.
9. Circulate hole clean when surface plug is drilled out. Wash and ream to next expected plug at 1490'. Circulate hole with clean mud. Discard old mud in waste tank. Drill plug #3 (Fox Hills) carefully to avoid sidetracking. Expect bottom of plug at 1680'. Take returns through gas buster if hydrocarbons or pressure are present when plug is drilled. Do not go through choke manifold unless necessary to minimize strain on surface casing shoe. Notify local fire department if any flaring takes place.
10. Wash and ream in hole and circulate continuously with fresh mud. Discard the original well fluid in waste tank. Expect heavy flow of cuttings, slough, dehydrated mud, old cement, and oil/gas in returns. Pump sweeps and circulate as needed. Raise mud weight as needed to control sloughing and oil/gas flow. If bridge or obstruction is encountered, attempt to wash or otherwise remove with minimum rotation to avoid sidetracking out of old hole. Circulate through gas buster and control flare with mud weight. Avoid going on choke unless necessary to protect casing shoe.
11. Tag J Sand cement plug #4. Anticipated tag at 8027'.
12. Condition mud as necessary until well bore is stable.
13. Drop gyro tool, TOH and lay down BHA.
14. Check gyro tool to ensure all data recorded properly. If necessary, MIRU wireline and run gyro from surface to PBSD through 4" drill pipe, recording stations every 100' and last station at PBSD.
15. RIH with 4" drill pipe open-ended.
16. Rig up cement equipment and pump plugs as follows:
 - Plug 1: 7400' to 6900' (plug isolating Niobrara-Codell) 150 sx Class G "Nio" cement w/ silica flour, retarder, and additives as needed. Assume 8.5" hole size plus 10% excess.

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- Lay down drill pipe to 3200'.
- Plug 2: 3200' – 3000' (base of Upper Pierre) 125 sx Class G cement, mixed at 15.8 ppg plus accelerator and additives as needed. Assume 10.5" hole size plus 10% excess. If full returns not maintained while pumping cement, WOC six hours and tag plug.
- Lay down drill pipe to 1900'.
- Plug 3: 1900' to 1400' (90' below base of Fox Hills to 1400') 290 sx Class G cement, mixed at 15.8 ppg plus accelerator and additives as needed. Assume 10.5" hole size plus 10% excess. WOC six hours and tag plug (**required tag by COGCC**).
- Plug 4: 1400' to 700' (30' above U Arapahoe aquifer) 400 sx Class G cement, mixed at 15.8 ppg plus accelerator and additives as needed. Assume 10.5" hole size plus 10% excess. If full returns were not achieved, WOC and tag plug. Adjust cement volume for plug #5 to circulate cement to surface.
- Plug 5: 700' to surface. Approximately 350 sx Class G cement, mixed at 15.8 ppg plus accelerator and additives as needed. Assume 10.5" hole size plus 10% excess. Adjust cement volume as necessary to circulate cement to surface.

17. ND surface equipment.

18. Rig down rig and all other auxiliary equipment. Move off location.

19. Cut off casing 4' below ground level or as approved by COA's.

20. Weld on metal plate and/or dry hole marker as per regulation.

21. Restore surface location and reclaim per arrangements with the surface developer.

22. Ensure all cement tickets are mailed or emailed to the Denver office for subsequent reporting.