

Procedure to Plug & Abandon Well

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NWSW Sec 4-T4N-R63W

Weld County, CO

Proposed Work:

Displace OBM

- 1.) MIRU workover rig, pump and tank. Blow down well through Night Cap to tank.
- 2.) ND Night Cap, NU BOP.
- 3.) RIH 2-3/8" workstring with mule shoe to +/- 9,000'. Circulate 10.3 lb weighted spacer (~645 bbls) to displace OBM and to roll hole clean. Send to gas buster and flare as necessary.

Plug Well

- 4.) TOH with 2-3/8" tubing to +/- 6,734' (landing point).
- 5.) RU cementers. Set balanced plug with 350 sxs of 15.8 ppg Class G 'Neat' cement down tubing.

Calculated Sacks for Balanced Plug in Open Hole to Cover Niobrara - Plug #1

Assume Class G Neat

Desired Coverage From 6,734' (6,406' TVD in Nio B) to 5,730' (5,699' TVD & 606' TVD above Top of Nio A @ 6,305' TVD) = 1004' All 8-1/2" OH

Yield : 1.15 cu ft / sx

$$1004 \text{ lin ft} \times \frac{0.3941 \text{ cu ft}}{1 \text{ lin ft}} \times \frac{1 \text{ sx}}{1.15 \text{ cu ft}} = 344 \text{ Sacks Cement}$$

- 6.) Pick up tubing string to +/- 4,250' (1,000' above planned TOC). **WOC.**
- 7.) **MIRU Slickline. RIH to tag cement top. Confirm >400' cement coverage over Niobrara. If coverage is not adequate set another balanced cement plug to achieve required TOC. (100 sacks will be ~ 300 linear feet).**
- 8.) Once adequate cement in OH above Nio, MIRU cementers for Sussex plug.
- 9.) RU cementers. Set 140 sxs balanced plug of 15.8 ppg Class G 'Neat' cement down tubing.

Calculated Sacks for Balanced Plug in Open Hole to Cover Sussex - Plug #2

Assume Class G Neat

Desired Coverage From 4,250' (100' below top of Sussex) to 3,850' (300' over Sussex) = 400'

All 8-1/2" OH

Yield : 1.15 cu ft / sx

$$400 \text{ lin ft} * \frac{0.3941 \text{ cu ft}}{1 \text{ lin ft}} * \frac{1 \text{ sx}}{1.15 \text{ cu ft}} = 137 \text{ Sacks Cement}$$

10.) RU cementers. Pump 440 sx balanced plug of 15.8 ppg Class G 'Neat' cement across Fox Hills and surface casing shoe.

Calculated Sacks for Plug Across Surface Casing - Plug #3

Assume Class G Neat

Desired Coverage From 2,500' to 1,330' = 1,170' (919' below surface shoe to 251' inside surface casing)

251' 9-5/8" Casing

Yield : 1.15 cu ft / sx

$$251 \text{ lin ft} * \frac{0.434 \text{ cu ft}}{1 \text{ lin ft}} * \frac{1 \text{ sx}}{1.15 \text{ cu ft}} * 1.3 = 123 \text{ Sacks Cement}$$

919' 8-1/2" OH

Yield : 1.15 cu ft / sx

$$919 \text{ lin ft} * \frac{0.3941 \text{ cu ft}}{1 \text{ lin ft}} * \frac{1 \text{ sx}}{1.15 \text{ cu ft}} = 315 \text{ Sacks Cement}$$

$$\text{Total Sacks} = 438 \text{ Sacks Cement}$$

- 11.) POOH 2-3/8" tubing laying down. **WOC.**
- 12.) **MIRU Wireline. Tag TOC to confirm height. Must be shallower than 1400'.**
- 13.) **If confirmed, perform "bradenhead" test to ensure well is not flowing up 9-5/8" casing or that any pressure builds.**
- 14.) RIH 2-3/8" and mule shoe to 100' for surface cap.
- 15.) **RU cementers. Set 35 sxs plug from 100' to surface of 15.8 ppg Class G 'neat' cement down tubing.**
- 16.) POOH tubing.
- 17.) Observe cement top and top off as necessary if cement falls.
- 18.) RDMO.

Reclaim

- 19.) Excavate around wellhead to 8' below grade, cut off 9-5/8" casing weld on cap.
- 20.) Obtain GPS location data as per COGCC Rule 215.
- 21.) Backfill hole and reclaim surface to original conditions.