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## State of Colorado 2

### API 05-081-05704

#### Plugging Procedure

1. Dig and fence off an 8' x 8' x 6' (L x W x D) pit to accommodate cement cleanup.
2. Move in and rig up a contract workover rig with pipe racks, catwalk, rig pump and rig tank.
3. Move in and spot one 400 bbl tank and fill with fresh water.
4. Lay flow lines from the wellhead to the rig tank.
5. Check and record tubing pressure and casing pressure. Bleed-off any pressures to rig tank.
6. Pump 30 bbl fresh water down the tubing for well control.
7. Remove upper wellhead. Install a 7-1/16" 5000 psi hydraulically operated double gate BOP equipped with 2-3/8" pipe rams in the top gate and blind rams in the bottom gate. Function test both the blind and pipe rams. Hook up a flow line from the BOP to the rig tank.
8. Prep to pull tubing. Pick up and un-land tubing, release retrievable packer and remove hanger. Note: Arrow Model R packer is set at 6524' in 15,000# compression.
9. POOH standing back.
10. RU wireline and run gauge ring to 6550'.
11. Run CBL to confirm cement top which is believed to be 5750'.

**Plug 1 (Squeeze Fort Union perforations from 6580'-6650')** Cement yield assumed for all plugs is 1.15 ft<sup>3</sup>/sk.

12. Pick up a cast iron cement retainer (CICR) dressed for 5-1/2", 17# casing and trip in hole on tubing. Set retainer @ 6530' or ~50' above the top perforation.
13. Rig up cementers and establish an injection rate and pressure through the CICR. Sting out of the CICR. Mix 75 sacks (~15 bbl) of cement and displace to end of tubing. Note tubing volume @ 6530' is ~25.3 bbl.
14. Sting into the retainer and squeeze the perforations with 60 sacks (~12 bbl.) of cement below the CICR.
15. Sting out and POOH slowly to 6430'. Reverse out cement leaving 100' of cement on top of the retainer.

**Spacer 1 (6430' – ~75' below TOC (believed to be 5750'))**

16. Mix and spot 9 ppg Poz Gel from 6430' to 5825' or 75' below TOC~ 16 bbl. POOH to ~75 below TOC'.

**Plug 2 (balanced plug across TOC)**

17. Lay a 150' balanced cement plug from 5675' to 5825' with 25 sacks (~5 bbl.) which includes +25% excess. POOH laying down to 75' above TOC and reverse out cement.

**Spacer 2 (5675'– 3050')**

18. Mix and spot 9 ppg Poz Gel from 5675' to 3050' (61 bbl). POOH laying down to 3,050'.

### **Plug 3 (balanced plug)**

19. Lay a 130' balanced cement plug from 3050' to 2920' with 20 sacks (~4 bbl.) which includes +25% excess. POOH laying down to 2920' and reverse out cement.

### **Spacer 3 (2920' – 435')**

20. Mix and spot 9 ppg Poz Gel from 2920' to 435' (~ 58 bbl). POOH laying down to 300', standing back remainder.

21. Attempt to break circulation through confirmed holes in casing at 435' up 5-1/2" by 8-5/8" casing annulus. If circulation can be established prepare to cement squeeze holes and casing shoe as follows.

### **Plug 4 (cement squeeze casing shoe at 378' with cement from 300' to 435')**

22. PU CICR and set at 300'.

23. Mix 55 sks cement (~11 bbl.) which includes +25% excess. Pump 50 sks below retainer sting out and leaving 5 sks cement on top of CICR. Laying down one joint to 270' and reverse out cement.

### **Spacer 4 (270' – 50')**

24. Mix and spot 9 ppg Poz Gel from 300' to 50' (~ 5.5 bbl). POOH laying down.

25. Nipple down the BOP and remove the tubing spool. Cut off casing head 3' below ground level.

### **Plug 5 (surface plug in the 5-1/2" casing and the 5-1/2" x 8-5/8" ann.)**

26. Using 1" line pipe, spot a surface cement plug from 50' to surface in the 5-1/2" casing with ~7 sks and 5-1/2" x 8-5/8" annulus with ~15 sacks.

27. Install a regulation dry hole marker on casing stub. Note the GPS coordinates of the wellbore location for future reference.

28. Backfill around the dry hole marker and the cement pit.

29. Rig down and move off all rig and rental equipment.

30. Reclaim location per COGCC requirements.