

CAVERNS FEDERAL #1  
THE SUPERIOR OIL COMPANY  
DRILLING, DRILL STEM TESTS, CASING AND CEMENTING  
PROGRAMS

1. Set 50'  $\pm$  of 20" 94# H-40 ST&C using rat hole machine. Cement to surface with RediMix cement.
2. Drill 17-1/2" hole to 500'  $\pm$  or 50' into San Andres. Run 13-3/8" 48# H-40 ST&C casing to T.D. Weld first five joints of casing. Cement to surface w/ 170 sxs Hallib Light cement, followed by 300 sxs class "C" + 2% CaCl<sub>2</sub>. 100% Open Hole excess. Cut off 20" and 13-3/8" casing. Install 13-3/8" - 3000# WP slip-on csg head with 13-5/8" 5000# WP top flange. NU 13-5/8" Series 1500 BOP. Test casing to 600#.
3. Drill 12-1/4" hole to 1850'  $\pm$  (50' into Delaware). Anticipate lost circulation w/ possibility of dry drilling. Run GR-BHC log. Run 10-3/4" 40.5#, K-55 ST&C to T.D. Weld first five joints of casing. Use four centralizers. Cement to surface w/ 160 sxs Hallib Light cement containing 8#/sx salt, 1/4#/sx Flocele, and 5#/sx Gilsonite, followed by 300 sxs class "C". 100% open hole excess. Land 10-3/4". Install 13-5/8" - 5000# x 10" - 5000# csg spool w/ 10" - 5000# x 13-5/8" double studed flange. NU 13-5/8" Series 1500 BOP and Hydril. Test rams to 5000#, Hydril 3500# and csg to 2000#.
4. Drill 9-7/8" hole to 7700'  $\pm$  (100' into Wolfcamp). Mud logging unit will be on location at 1850'. Run GR-BHC, FDC-CNL, and DLL-MSFL logs. Run 7-5/8" 26.4# S-95 LT&C csg. Cmt w/ 125 sxs TLW containing 0.5% CFR-2 and 1/4#/sx Flocele, followed by 300 sxs "H" w/ 0.5% CFR-2. 25% open hole excess. (Top of cement at 5700'  $\pm$ ).
5. Land 7-5/8" casing in 10-3/4" casing spool. Cut off 7-5/8" casing and install 7-1/18" - 10,000# x 10" - 5000# tbg head w/ 7-1/16" - 10,000# x 10" - 5000# plus 10" - 5000# x 13-5/8" - 5000# double studed flange. NU 1500 Series 13-5/8" BOP and Hydril. Press test rams to 5000#, Hydril 3500# and casing 3000#. Drill out cmt, float equip and 10' of new formation. Test csg seat 14 PPG equiv.
6. Drill 6-1/2" hole to 11450'  $\pm$ . Anticipate gas press from Atoka - Morrow 10,050 - 11,450'. Drill Stem Test is anticipated in the Morrow Zone @ 11,050'. DST flow periods and Shut-In time will be determined on location. Run GR-BHC, FDC-CNL, and DLL-MSFL logs.