

HORIZONTAL DRILLING PROCEDURE

Date: August 14, 1998
WFE No.: 105194
WFE Test: Total - 4333, 110 EHC - 4333, 110
WOC: WI - 100.0100 WRI - 100.0100
WFE Days: Orig Days - 15 Comp. Days - 10
Purpose: Drill horizontal well
Elevation: GL - 1,944' KB - 1,933' TD - 7,937' FBTD - 7,930'
Surface Casing: 4-1/2" O.D., 10#, 1-55 set at 1,155'. Cement w/ 100 sk, circ. 10 sk to reserve.
Reduction Casing: 3-1/2" O.D., 10.5# x 17#, K-55 set at 7,936', UV tool at 4,222'. Cement 1st stage w/ 100 sk, circ. Cement 2nd stage w/ 100 sk, circ. Circulated 100 sk 1st stage tool during the first stage, and circulated 105 sk to surface during the second stage.
Tubing: 224 jts. of 2-7/8" O.D., 6.8#, K-55 tubing, 1 2-7/8" x 3-1/2" TAC, 10 jts. of 2-7/8" O.D., 6.8#, K-55 tubing, elast. st., CN, perf. tub, mud anchor w/ bullplug.
Rods/Pump: 2-7/8" and 1-1/4" rods on 1-1/2" insert pump.
Perforations: 1061-1067', 1136-1139', 1192-1196', 1210-1214', 1231-1233', 1242-1245'
Estimated JBHP: 400 psi

TARGET INFORMATION

KOP: 7,155' TVD EOC: 1,904.1' MD, 7,250' TVD Azimuth: Due North
Radius: 45' TD: 7,911.1' MD, 7,115' TVD

- Safety:
 - Hold daily safety meetings explaining the proposed procedure.
 - H2S concentration - 5,000 PPM
 - Keep TIW on rig floor for all pipe connections at all times.
 - Use 10# Brine to kill well if necessary.

ILLEGIBLE

1. Lockout/tagout energy source. RDMO pumping unit. Prepare location as necessary for pulling unit. Test safety anchors 10,000#, if necessary.
2. MHP pulling unit. Kill well as necessary. Install rod stripper. Inset pump and BOOH w/ rods, laying down. Install 3-1/16" HM dual ram hydraulic BOP blind rams in bottom and 2-7/8" pipe rams in top with Cirrus annular. BOOH w/ tubing.
3. RU wireline company. Install and test lubricator. Make pipe ring run to 7,155'. Set top of 3-1/2" CIBP at 7,155' MD. Rig down wireline company.
4. TIW w/ 2-7/8" O.D. tubing and anchor to 7,154' MD. Test plug to 1000 psi. Release packer and hot water tubing to clean up paraffin. Circulate hole clean w/ fresh water. BOOH and lay down packer. Set cement retainer and TIW to 7000'. Set cement retainer and strip out. Sting back into cement retainer. RU Halliburton. Squeeze cement perforations with lead cement 100 sk Premium Cement w/ 0.5% HALAD-9 and tail cement 100 sk Premium Cement w/ 1.0% GACI-Anny. Sting out of retainer and reverse circulate. BOOH w/ 2-7/8" O.D. tubing. RD Halliburton and WOC. 1/8" to 3-5/4" drill collars and 4-5/4" bit. TIW. Drill cement retainer and cement to 7,130'. BOOH laying down.
5. RU wireline company. Install and test lubricator. Make pipe ring run to 7,130'. Set top of 3-1/2" CIBP at 7,155' MD. Rig down wireline company.
6. ND BOP. NU 3-1/16" HM x 2-7/8" 3rd EYE adapter flange. Install 2-7/8" master valve. RDMO pulling unit.
7. Clean location. Pulls and line 4-1/2" x 14' x 14' pump jct. MHP horizontal pulling unit package. NU 3-1/16" HM dual ram hydraulic BOP (with blind rams in bottom and 2-7/8" pipe rams in top) and 3-1/16" HM annular. Test BOP to 7,170 psi. With test plug.
8. TIW w/ 3-1/2" window mill, 12000 lb watermelon mill and sliding water unit. Pumping up 1000' O.D., 11.4#, K-115, A/B drillpipe to 7,100' MD. Set 1/8" CIBP at 7,100' MD. Annular plug and BOOH.
9. PU 3-1/2" Baker Whidstock assembly, starting mill, and orientation sub. TIW w/

