



Note - Liner top sometimes squeezed tie back string usually 10<sup>1</sup>/<sub>4</sub>".  
All slurries mixed with 0% free water.  
Preflushes used on all strings.

GEOHERMAL WELL PROGRAM

Fish Lake, Nevada

Well No. 88-11

(1) After site has been leveled and graveled and the sump built (make sump large enough that flow test's can be conducted for 24 hours if necessary). Have a company specializing in conductor and rat hole drilling, drill a 36" hole to a depth of 25' to 30'. Install a joint of 30" lapweld, plainended casing. Level the casing and cement using local ready-mix. A cellar 10'x10'x 2' will be dug out and boxed-in with 3"x12" rough planks. Install an 8" fiberglass drain pipe buried from the cellar to the sump. The contractor who builds the site can provide the men and equipment to build the cellar and drain line, and back fill and level around the cellar. It is recommended that the rat and mouse holes be dug at the same time as the conductor pipe hole.

(2) Move in the rotary tools and rig up. Weld on a 30" riser of the same casing as the conductor pipe and install the flow line and the fill-up line.

(3) Mix spud-mud as recommended by the mud company.

(4) Spud-in with a 26" hole opener and drill a 26" hole to  $\pm$  60'. This will insure that the hole is centered and to facilitate picking up the 17½" B.H.A. After picking up the 17½" B.H.A., drill to  $\pm$  300'. Survey at 150' and 300'. Pick up a 26" hole opener and open the 17½" hole to 26". Lay down the 26" tools and run 20", 94#, H-40 ST&C casing. Tack weld or bakerlok all couplings. Cement to the surface using class "G" cement with 2%  $\text{CaCl}_2$ . W.O.C. 6 hours.

(5) Cut off 20" Casing and weld on a 20" flange. Nipple up a 20" hydraulic gate or 20" hydril,drilling nipple and connect the flow line.

(6) Drill a 17½" hole to 1000' using mud as prescribed by the mud co. Run wire line deviation survey each 150' or as necessary. Run a locked-in B.H.A. to prevent excessive hole deviation and to stabilize the drill collars in the large diameter hole. Circulate and condition the hole and mud and run an Eastman Multi-shot deveation survey on the trip out of hole to run 13⅞" casing. Run and cement 13⅞" 54.53 K-55 Buttress Casing. Tack-weld or Bakerlok the bottom 4 joints. Cement to surface and W.O.C. 12 hours.

(7) Nipple up on 13⅞" W.O.G. casing head with a 12⅞" C.S.O. gate. The B.O.P.E. stack will constist of 12⅞" wear ring, a cross over spool, a 13⅞" C.S.O. gate, a single gate with pipe rams, banjo box with blind flanges, double gate with drill collar and blind rams and drilling nipple. Connect flow line and fill up lines.

(8) The 12¼" section of hole will be drilled to 6000' or the first entry or lost circulation zone that is determined to be of sufficient temperature to run 9⅞" casing. A sand plug would be set across this zone and a cement plug set. Circulation would be established and the conditioned to run the 9⅞" casing. A minimum of 200' of lap will be used into the 13⅞" surface casing. W.O.C. 12 hours.

(9) Run in hole with a 8½" B.H.A. and clean out into the top of the 9⅞" casing. Shut pipe rams and test the casing lap with 1000 psi

(9) for 5 minutes. If lap is leaking POH and cement squeeze the lap and repeat the test. If lap test is successful then drill out the float collar and float shoe and clean out cement and sand plugs to bottom. Drill ahead using fresh water or brine as hole conditions dictate. Test or temperature survey all entrys or lost circulation zones as needed. It may be deemed advantageous to install a rotating head and air drilling capability during this section of hole. If commercial temperatures and fluids entry rates are attained the hole will be compleated as follows: The open hole section of the well will have a liner installed or not depending upon hole conditions. The top section of the well will be tied-back to surface with 10 3/4 " casing and cemented to surface. An expansion spool and 2 new gate valves will be installed. If the well is found to be non commercial then a gate valve will be installed and operations suspended.