

5. Pressure Control Equipment:

The blowout preventer equipment (BOPE) shown in Exhibit D will be utilized for the 12-1/4" and 8-3/4" hole sections. The assembly will consist of a 3000 psi WP double ram-type preventer (4-1/2" pipe and blind rams) and a 1500 psi WP annular preventer (API RP53 Fig 2.c.5). This BOPE assembly will be nipped up on the surface casing and used continuously until setting the 7" casing at $\pm 12,900'$. All BOPE will be tested as follows:

- Prior to drilling out from surface casing – test all BOPE to 500 psi using rig pump.
- Prior to drilling out from 9-5/8" casing – test ram-type preventers and choked manifold to 3000 psi and annular preventer to 70% of rated WP using independent tester and test plug.

The BOPE shown in Exhibit D will be utilized for the 6-1/8" hole section. The assembly will consist of a 10,000 psi WP double ram-type preventer (4" pipe and blind rams) and a 5000 psi WP annular preventer above the drilling spool and a 10,000 psi WP single ram-type preventer (pipe rams) below the spool (API RP53 Fig 2.c.9). A rotating head will be installed on top of the annular preventer. All BOPE will be tested as follows:

- Ram-type preventers and choke manifold to 10,000 psi and annular preventer to 70% of rate WP.

All BOP's will be hydraulically operated. Pipe rams will be operationally checked each 24 hour period. Blind rams will be operationally checked on each trip out of hole. The kill line will be 2" minimum and will include a remote connection. The choke line will be 3" minimum. Complete choke manifold schematics are shown in Exhibit E & F.

6. Proposed Mud System:

The proposed mud system will be a combination of fresh water, brine, cut brine, and polymer gel. The depth and mud properties of the mud system are listed below.

Depth	Type	Weight (ppg)	Viscosity (sec)	Waterloss (cc)	ph
0-700'	Fresh Water	8.3-8.8	28-30	N.C.	9-10
700'-4900'	Brine Water	10.0-10.2	28-30	N.C.	9-10
4900'-12,900'	FW/Cut Brine	8.5-9.0	28-30	N.C.	9-10
12,900'-13,800'	Brine/XCD	10.0-15.0	30-40	10-20	9-10