

DRILLING PROGNOSIS

CASING PROGRAM:

Holes will be drilled to accommodate all casing on location, 60" to 70" of 20" to be set by Rathole digger.

CONDUCTOR CASING:

Hole Size	Depth	Casing Size	Weight	Grade	Coupling
17-1/2"	800'	13-3/8"	54.5	K-55	ST&C

SURFACE CASING:

Hole Size	Depth	Casing Size	Weight	Grade	Coupling
12-1/4"	500'	9-5/8"	26#	N-80(S-80)	ST&C
12-1/4"	2000'	9-5/8"	36#	K-55	ST&C
12-1/4"	500'	9-5/8"	36#	N-80	ST&C

PRODUCTION CASING:

Hole Size	Depth	Casing Size	Weight	Grade	Coupling
8-3/4"	7000'	4-1/2"	11.6#	K-55	LT&C
8-3/4"	3000'	4-1/2"	11.6#	N-80(P-110)	LT&C

MUD PROGRAM:

Depth	Mud Wt.	Vis.	W.L.	Additives
0-800	Native	Native	N/C	Bentonite, Non-Dispensing Additives
800-1300	8.8 - 12.0	38-42	30-20	Bentonite, Non-Dispensing Additives
1300-T.D.	12.0 or as hole conditions dictate			Dispersed System

NOTE: It is entirely possible that we may encounter a serious salt water flow just below 1300'. The mud will be in excellent shape to commence immediate weighting of the mud system and with sufficient treating chemicals to possibly convert to a dispersed system to handle the salt water. A pneumatic bottle capable of storing 5000 sx of barite, complete with first line and stand-by Air Compressors will be installed and filled prior to drilling below the 13-3/8" casing.

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Our geologic position may be sufficient to allow ourselves to drill a normal pressured hole. However, we will be ready to weight up immediately as required.

Depth	Mud Wt.	Vis.	W.L.	Additives
1300-T.D.	As required	As required	20-4	Those required to maintain a satisfactory system to allow the well to be drilled safely and economically.

NOTE: Maintain maximum 12.0 ppg (89.8 lb./cu.ft.) if no salt water flow is encountered.

A more precise mud program cannot be determined due to the nature of the salt water flows throughout the Willamette Valley. A normal pressure system of not more than 12.0 ppg. will be provided unless the salt water is encountered necessitating immediate weight up. A constant pit watch, with all automatic alarm systems functioning, will be maintained in a strong effort to contain the flow.

CEMENT AND CEMENTING:

a. A skid-mounted cementing unit will be placed on the location and will remain there continuously. A cement field storage bin will also be on location continuously.

20" "Stove-Pipe":

Cement w/ Ready-Mix to 95'

13-3/8" Conductor at 800' ±: 988'

a. 730 sx Class G cement w/3% CaCl. Slurry weight at 15.8 ppg. Cement should circulate to surface.

b. Top out: 50 sx Class G cement w/3% CaCl. Slurry weight at 15.8 ppg.

9-5/8" Surface at 3000'±:

a. Lead: 525 sx Dio-mix A (50/50 Pozzalan) w/4% Gel. Slurry weight at 13.6 ppg.

b. Tail: 822 sx Class G. Slurry weight at 15.8 ppg.

c. Top out: 50 sx Class G w/3% CaCl.

4-1/2" Production at 10,000':

a. Lead: 400 sx Class G w/required amount of retarder to give 3-4 hrs. pumping time.

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b. Tail: 400 sx Class G Neat. Slurry weight at 15.8 ppg.

FLOATING EQUIPMENT AND CENTRALIZERS:

13-3/8" Conductor Casing:

Floating Equipment: Install a 13-3/8" down-jet float shoe. Thred-lok and Tack-weld thoroughly. Install an insert flapper-type baffle between the second and third joint from the shoe. Tack-weld and Thred-lok thoroughly.

Centralizers: Install one 13-3/8" Centralizer 15' from casing shoe. Stop-lok same. Install one 13-3/8" Centralizer 30' from casing shoe. Stop-lok same.

Install one Centralizer each joint for ten (10) joints, riding on casing collars, then every other joint for five centralizers. Install one (1) 13-3/8" x 20" Centralizer inside the 20" stove-pipe.

9-5/8" Surface Pipe:

Floating Equipment: Install a manual fill 9-5/8" down-jet float shoe, Thred-lok and Tack-weld thoroughly. Install a manual fill 8-5/8" float collar one joint from casing shoe. Thred-lok and Tack-weld thoroughly. Be certain a 3" or 4" fill-up mud line is available.

Centralizers: Install one (1) 9-5/8" Centralizer 15' from casing shoe. Install one (1) 9-5/8" Centralizer 30' from casing shoe. Stop-lok each unit.

Install one (1) 9-5/8" Centralizer for each joint for 15 joints, units to be riding on casing collars. Install one (1) Centralizer every other joint for 15 Centralizers. Install two (2) 9-5/8" x 13-3/8" Centralizers inside the 13-3/8" conductor casing.

4-1/2" Production Casing:

Floating Equipment: Install one (1) 4-1/2" down-jet manual fill-float shoe and Thred-lok thoroughly. Caution: Do Not weld on N-80 or higher strength casing.

Install a 4-1/2" manual fill-float collar one joint from casing shoe. Thred-lok both ends of the collar.

Centralizers: Install one (1) 4-1/2" Centralizer at 15' and 30' above the casing shoe. Stop-lok same. Install one (1) 4-1/2" Centralizer per joint, riding on casing collars, for 30 Centralizers. Then one (1) 4-1/2" Centralizer every other joint for ten (10) Centralizers.

NOTE: Any, and all, possible producing zones will be covered with a minimum of one (1) 4-1/2" Centralizer.

Cable-Type Wall Wipers: Cable-Type Wall Wipers will be installed each 10' from 30' below, across, and up to 30' above any, and all, possible producing zones.

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NOTE: The casing will be reciprocated through a full joint (if possible) while circulating, mixing, and displacing cement.

Mud Logging: Install unit and be operational at time of spud. Log well at 10' intervals if drilling will permit near surface, otherwise at 30' intervals. Reduce to 10' intervals as soon as ROP will allow.

Any drilling break will be checked for flow and samples circulated to surface for evaluation.

Call daily mud logging report to Houston office daily or see that same transmitted by teletype or included with the well supervisors morning report. Transmit a full report to include:

- a. Drilling breaks and shows
- b. Lithology
- c. Background Gas, connection and Trip Gas
- d. Chromatograph Analysis where sample is taken
- e. Houston Office: 713/961-1633
Dr. Richard Hohlt

LOGGING PROGRAM

0-3000' (Surface Hole)

1. DIL - Sonic-GR - FDC-CNL
2. HRD
3. SWC

TD 3000' or as Directed

1. DIL - Sonic-GR - FDC-CNL
2. HRD
3. SWC
4. Any other Logs as Directed by Well-Site Geologist
5. Velocity Log: Velocity Shots to be made from T.D. through Surface Pipe or as Directed.

CONVENTIONAL CORING & DST:

1. A DST will be taken from any zone which, in the opinion of both the well logger and well supervisor merits such.
2. Conventional coring points, if any, will be given from the Houston office as the well progresses in depth or if DST indicates a zone of cored interest.

DEVIATION AND SURVEYS:

1. A single-shot survey will be taken each 300± feet from surface through 3000 feet. Surveys shall be taken each 500' below the 8-5/8" surface pipe and a survey will be taken on all bit trips from surface through T.D.

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2. Every effort will be made, including a packed BHA to maintain a maximum deviation of 5° or a maximum of 1° in any 100' of hole. Consult with the Houston office should it appear deviation is going to exceed the 5°.

3. A multi-shot will be conducted over the 12-1/4" hole from T.D. through 800 feet.