

4) Casing and Cementing Program:

| <u>Casing</u> <u>size</u> | <u>interval</u> | <u>weight</u> | <u>grade</u> | <u>connection</u> | <u>Design Factors</u> <u>Coll.,Burst,Ten.</u> |
|------------------------------|-----------------|---------------|--------------|-------------------|--|
| 9-5/8" | 0-1,300' | 36 # | K-55 | ST&C | 3.32,13.7,9.04 |
| 7" | 0-5,500' | 23# | J-55 | LT&C | 1.24,2.82,1.68 |
| | 5,500'-7,800' | 26# | J-55 | LT&C | 1.22,3.22,5.70 |

Collapse design considers maximum anticipated mud weight at string T.D. with casing fully evacuated. Burst design uses 0.44 psi/ft for bottom hole pressure and assumes maximum surface pressure as .45 times this number. Tension design considers weight of string in air.

Cementing

9-5/8" Attempt to cement to surface in one stage using:

1st Lead: 200 sx Class H + 5 pps gilsonite + 12% CalSeal + 1% CC
 2nd Lead: 1090 sx Light C + 5 pps gilsonite + 2% CC
 Tail: 205 sx class C + 2% CC

| | | | |
|---------------|----------|------------------|----------|
| Hole size | 14-3/4" | | |
| cmt yield/wt: | 1st lead | 1.56 cu.ft./sk | 14.5 ppg |
| cmt yield/wt: | 2nd lead | 1.92 cu.ft./sk | 12.6 ppg |
| cmt yield/wt: | tail | 1.34 cu. Ft./sx. | 14.8 ppg |
| excess: | 100% | | |

7" Cement in one stage with 160 sx 65:35:6 Poz:H:Gel + 10% gilsonite, tailed with 200 sx class H w/ 0.6% fla

| | | | |
|-------------|----------------------|------------------|----------|
| hole size | 8-3/4" | | |
| cmt yield: | lead | 2.23 cu.ft./sk | 12.1 ppg |
| cmt yield: | tail | 1.18 cu. Ft./sx. | 15.6 ppg |
| top of lead | 5000' (excess: 50%) | | |
| top of tail | 6500' (excess: 50%) | | |

note: cement volumes will be adjusted by fluid caliper on the 9-5/8" and electric caliper on the 7" string. Cement types and additives may change based on actual downhole conditions.

5) Type and Characteristics Proposed Circulating Medium:

| <u>from</u> | <u>to</u> | <u>type</u> | <u>wt.</u> | <u>Vis</u> | <u>wl</u> |
|-------------|-----------|----------------|------------|------------|-----------|
| 0 | 6,000' | fw/gel/lime | 8.4-8.6 | 28-30 | nc |
| 6,000' | 7,800' | fw/gel/poylmer | 8.5-8.7 | 32-34 | <15 |

No abnormal pressures are anticipated, however, sufficient quantities of mud materials shall be maintained for the purpose of assuring well control. Loss of circulation will be the primary concern, thus an adequate store of lost circulation material shall be maintained. Visual monitoring equipment shall be in place in the pits to detect volume changes.