

CROW FLAT 20 FEDERAL COM # 4
DRILLING PLAN
PAGE 2

4. Casing Program

<u>INTERVALS</u>	<u>LENGTH</u>	<u>CASING</u>	<u>BURST PSI</u>	<u>COLLAPSE PSI</u>	<u>TENSION LBS</u>	<u>TORQUE FT-LBS</u>
<u>Surface</u> 0 - 500'	500'	13 3/8" 48# H-40 STC	1730	740	322M	3220
<u>Intermediate</u> 0 - 2000'	2000'	8 5/8" 32# J-55 STC	3930	2530	372M	4020
<u>Production</u> 0 - 1700'	1700'	5 1/2" 17# L-80 LTC	7740	5359	338M	3410
1700' - 7500'	5800'	5 1/2" 17# J-55 LTC	5320	4680	247M	2390
7500' - 9800'	2300'	5 1/2" 17# L-80 LTC	7740	6290	338M	3410

Cementing Program

<u>HOLE SIZE</u>	<u>DEPTH</u>	<u>CEMENT</u>	<u>YIELD CF/SX</u>	<u>% EXCESS</u>	<u>TOC</u>	<u>WOC HRS</u>
<u>Surface</u> 17 1/2"	500'	Lead: 210 sxs lite + 2% CACL2 +1/4#/sx celloflk (12.7#/gal) Tail: 250 sxs Cl "C" + 2% CaCl2 + 1/4#/sx celloflk (14.8#/gal)	1.88 1.35	100	Surf.	18
<u>Intermediate</u> 12 1/4"	2000'	Lead: 506 sxs lite + 5% +1/4#/sx celloflk (12.7#/gal) Tail: 250 sxs Cl "C" + 2% CaCl2 + 1/4#/sx celloflk (14.8#/gal)	2.1 1.35	100	Surf.	12
<u>Production</u> 7 7/8"	9800'	Lead: 578 sx Class H w/3% KCl + 1% FL-25 + .1% sodium metasilicate + 5#/sx gilsonite + 1/4#/sx celloflake + .003 gal/sx FP-13L	1.6	30	7000'	24

The cement volumes for the 5 1/2" casing will be revised pending the caliper measurement from the open hole logs.

5. Minimum Specifications for Pressure Control