

Pumped 6 bbls. of 10# brine down the tubing to obtain the Cavern Compressibility Factor. Casing pressure was 375 psi and the tubing pressure was 370 psi. CAVERN COMPRESSIBILITY FACTOR = 6 bbls./((370 - 352)psi = 6 bbls./18 psi = 0.333 bbls./psi.

Daily test guage pressures were recorded:

7/12/91	-	Casing Pressure	375 psi	--	Tubing Pressure	-	370 psi.
7/13/91	"	"	368	"	"	"	362
7/14/91	"	"	364	"	"	"	362
7/15/91	"	"	362	"	"	"	358
7/16/91	"	"	362	"	"	"	358
7/17/91	"	"	360	"	"	"	358

Cavern pressure had stablized for test.

July 19, 1991 a dual pen pressure recorder was connected to the well head. A 0 to 500 psi to the tubing and a 0 to 2000 psi to the casing. Valves and fitting were also installed on the tubing and casing for connecting a deadweight tester. A deadweight tester with measurement capability of from 5 psi to 2,000 psi in increments of 0.1 psi was used for the test.

8:50 A.M. started pumping nitrogen down casing at 300 SCF/min.  
 11:30 A.M. - Nitrogen/brine interface in cavern below casing seat as indicated by nitrogen injection pressure leveling off. Bled brine out of tubing to prevent over-pressuring the well while injecting nitrogen. Transport had 96 bbls. of bled off brine which is the capacity of the 9 5/8" - 4 1/2" annulus.  
 11:45 A.M. - Pumped 4,500 SCF of nitrogen below 9 5/8" casing seat. Total volume of nitrogen pumped was 52,800 SCF.  
 $\Delta T = 0$  at 12:10 P.M. 7/19/91.

Date	-	Real Time	-	$\Delta T$	-	Casing Pressure	-	Tubing Pressure	-	$\Delta P_C$	-	$\Delta P_t$
7/19/91		12:10 P.M.		0		1189.9		389.7				
7/20/91		11:00 A.M.		22.9		1186.2		386.2		-3.9		-3.5
7/21/91		11:30 A.M.		47.4		1184.7		384.1		-1.5		-2.1
7/22/91		12:00 (noon)		71.9		1183.7		384.1		-1.0		-0
7/23/91		11:45 A.M.		95.65		1182.5		381.0		-1.2		-3.1
7/24/91		11:50 A.M.		119.8		1182.2		380.8		-0.3		-0.2
7/25/91		12:40 P.M.		144.3		1181.7		380.4		-0.5		-0.4

Test Concluded.

#### TEST DISCUSSION:

The slope of the brine pressure curve during the last 48 hrs. of the test os 0.3 psi/day. The slope of the nitrogen pressure curve is 0.4 psi/day. The yearly loss using the higher nitrogen slope is: 0.4 psi/day X 0.33 bbls/psi X 365 days/year = 48.18 bbls. This is not a significant loss without using the accepted ratio of nitrogen to LPG leakage rate of 10/1. The well has Mechanical Integrity with no significant loss.