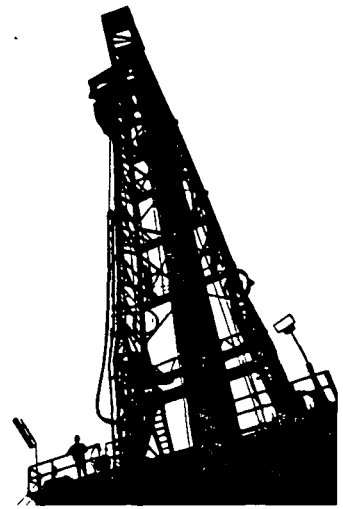


Appendix P



Injectivity Test Results

11-15-85 Subj: CC to SF

Log + File

SSSDP 16937	
Supplier	Nicholson WPT
Carrier	DATA
Received By	DTR
Date	11/27/85

To: Dave Rabb

Date: November 26, 1985

Subject: Potential Testing of Openhole Interval 3515' - 4710' and Results of Mini-Injection Test

Well Test Decision Committee (RWN) (JHS) (GWR)

A mini-injection test of the openhole interval from 3519' (13-3/8" casing shoe) to 4710' (present T.D.) was conducted at noon on 11/26/85. The results of this test indicate that there is essentially no potential of flowing the well for a production test of this interval.

The mini-injection test was conducted according to the procedure in a memo from RWN to DTR dated 11/25/85. This procedure was recommended by the well test committee on Monday November 25, 1985. The testing was suspended after step 4 of that procedure.

Mini-Injection Test Results

As per the procedure, 200 BBLs. of 2% KCL treated canal water was circulated into the open hole. The drillstring was pulled to about 3400'. The pipe rams were closed and a 1000 psi maximum pressure gauge with 20 psi increments was installed in the stand pipe at the floor near the rig drillers station. The injection started at 12:11 p.m.

<u>Minutes</u>	<u>Injection Rate</u>	<u>Pressure</u>
1	2 BPM	300 psig
2	2	335
3	2	380
4	2	420
5	2	450-(shut into watch
6	0	300 fall-off)
7	0	220
8	0	180-(min. press. 150
9:30	12 SPM (2.47BPM)	375 psig) (slowly inc.
10:10	17 SPM (3.5BPM)	510 to 5 BPM)
10:30	20 SPM	550
10:45	24	575
11:00	24	600-(Press. climbing
11:20	0	540 rapidly, shut in
13:00	0	320 @620 psig)
14:00	0	280
15:30	0	230-(Press. dropping very slowly)

003551

The estimated fluid pressure in the wellbore at 4710' is about 2200 psi. The normal hydrostatic pressure which is generally considered as in-situ formation pressure in this area is about 2040 psi. The 620 psi surface pressure with the wellbore pressure gave a differential of 780 psi into the formation. With any reasonable permeability, the fluid should have easily pumped into the formation.

However, the mini-injection indicated a very "tight" or low permeability in this section of the wellbore.

Recommendation

It is recommended that no flow test be attempted in this section of the wellbore and that drilling (and or coring) continue until such time as there are some indications that a permeable zone has been penetrated.

At some depth around 5500' (below which Dr. Elders considers a flow test and re-injection could cause problems with testing below the 9-5/8" casing at 6000') another mini-injection test maybe warranted.

Well Test Committee

R. W. Nicholson
R. W. Nicholson

John Sass
John Sass

G. W. Reich 11-27-85
G. W. Reich

APPENDIX H
INFORMATION REPORT # 2

Flow Test Committee Meeting

December 4, 1985

Attendees: Reich, Nicholson, Priest (Recorder), Elders, Grogan, Harper, Zebal, Mulliner and McIntyre

The well is now at a depth of 5418' with about 2000' of open hole. As per previous plans, a second "mini-injection" test was scheduled for about 5500'. At 5418' we pulled out of the hole to change bits and decided to initiate the second mini-injection at that time. The hole was shut in and the drilling mud was pressured up to a maximum of 850 psi with one pump operating. Strokes/minute, total strokes and pressure were recorded every 30 seconds for 13 minutes at which time the pump was turned off and decreasing pressures were recorded at 10 second intervals for about 4 minutes. The well was again pressured up with full strokes for 1½ minutes and again the pump was shut off and pressure fall off was recorded for about 7 minutes. The results of the mini-injection test are plotted in Figure 1. About 80 barrels of drilling mud were injected into the formation, indicating possible flow potential. A more comprehensive injection (maxi-injection) test with treated water was then recommended and initiated.

The "maxi-injection" test began with displacing the drilling mud in the borehole with KCl and BaCl treated water. Both pumps were activated and pressure was brought up to maximum attainable (1500 psi) with 85 SPM. Data similar to the mini-injection test were recorded every 30 seconds. This situation was maintained for 45 minutes, whereupon the strokes were reduced to 40 per minute for 5 more minutes until 4000 total strokes were recorded. Pumps were then shut off for about 5 minutes and the data were recorded every 10 seconds. Pumps were again turned on the well pressured up for a total of 5000 strokes at a maximum pressure of 1300 psi for 9 minutes. Pumps were then turned off and decreasing pressure recorded for 4 minutes. The results of this injection test are plotted in Figure 2. This test essentially resulted in loss of 1000 barrels of treated water into the formation which was a further indication of potential for flowing the well at this depth.

Two temperature logs were run by the USGS Wednesday morning. The first run was made from 1700' to total depth (T.D.), 5378', at a rate of 25 ft/min., the second was made from 3300' to T.D., 5346', at a rate of 16 ft/min. T.D. varied somewhat due to settling of the mud during static conditions. Static conditions started at 2:00 a.m., Wednesday, December 4. The first log was completed at

Figure 1. MINI INJECTION 5418 ft

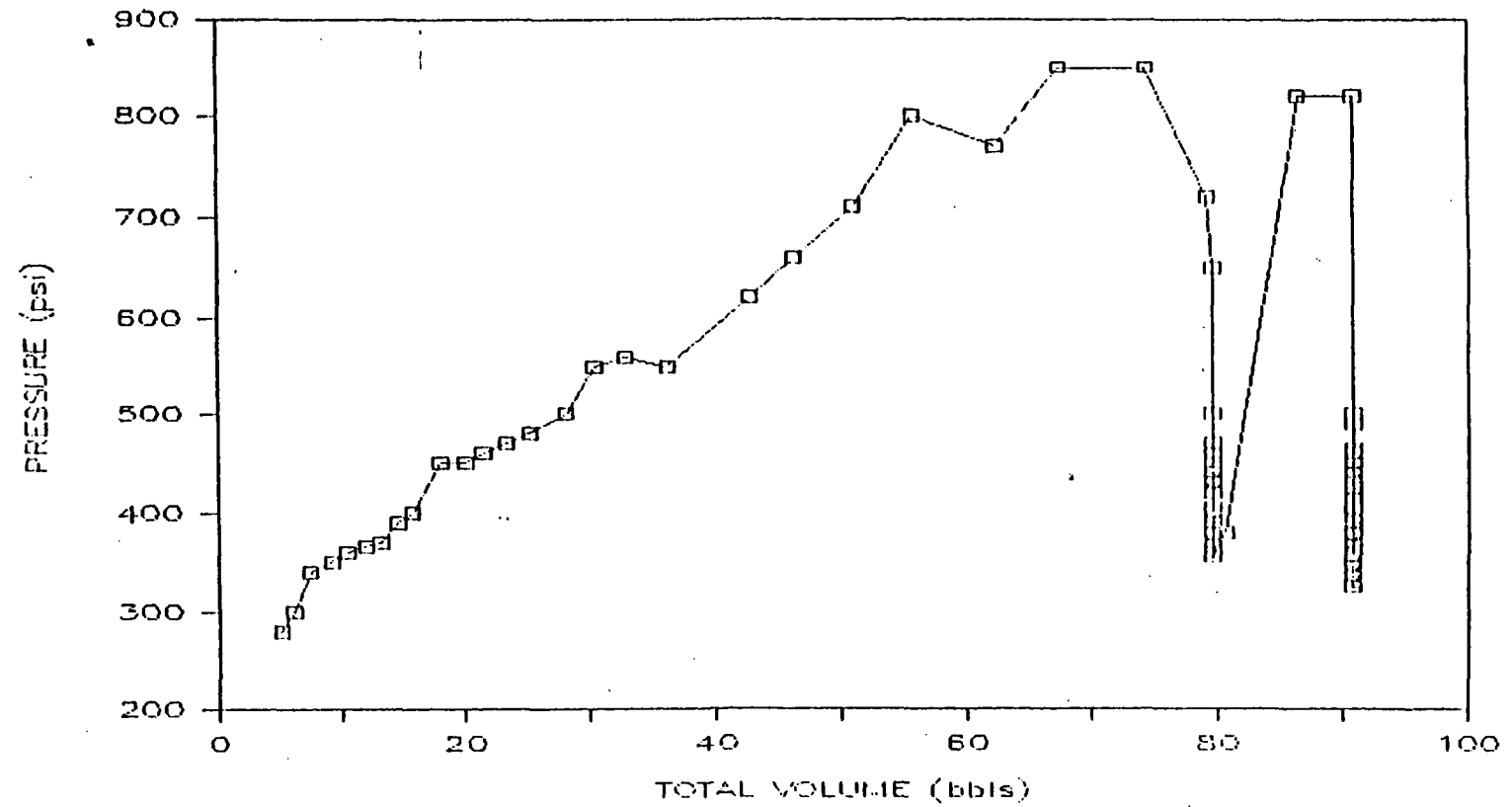
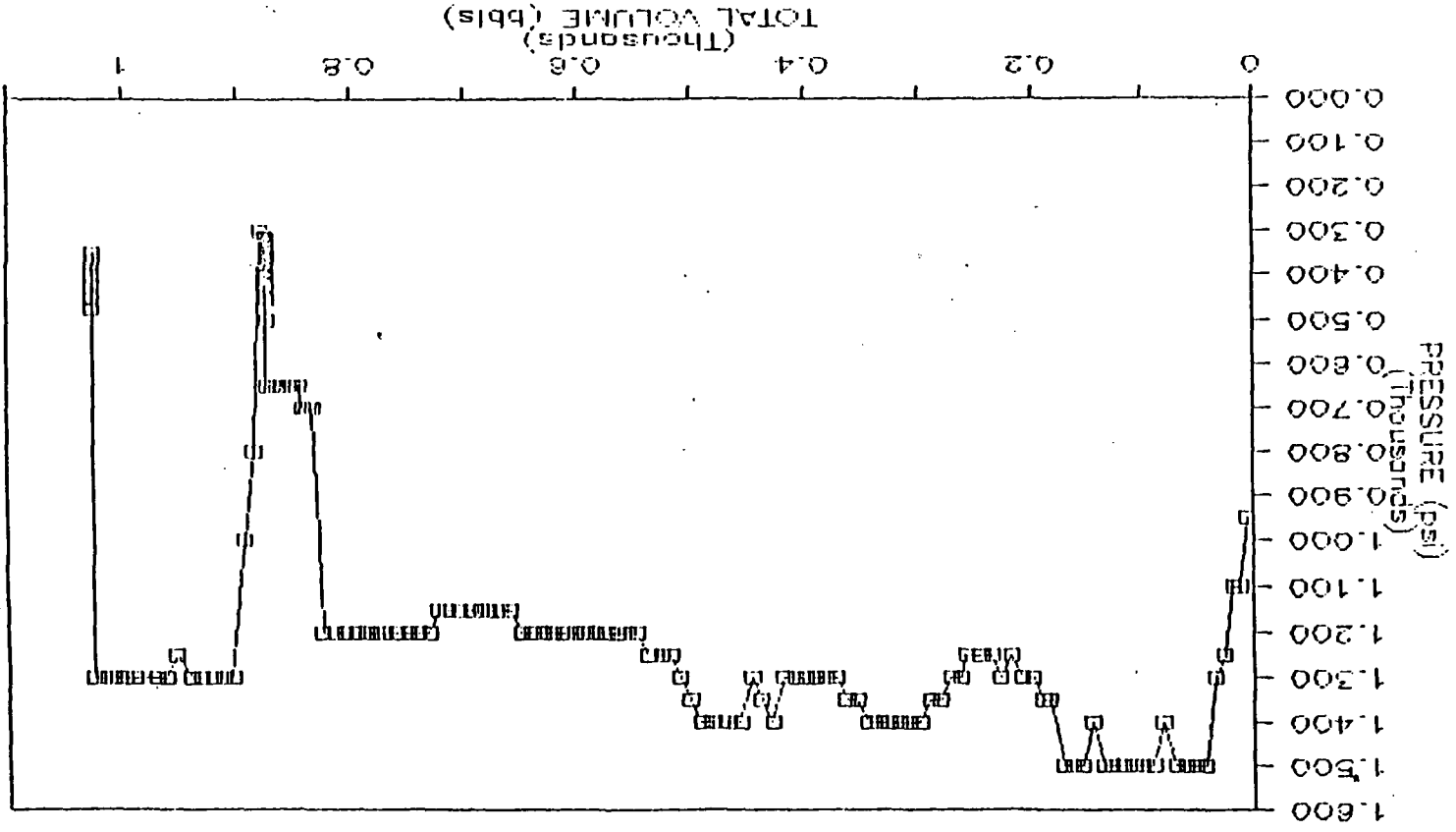


FIGURE 2. MAXI INJECTION TEST 5418 FT.



8:20 a.m., the second log was completed at 11:45 a.m. The bottom hole temperature (BHT) of the first log was 350°F, while the BHT of the second log was 376.4°F. The logs were similar in general trends, the later being smoothed somewhat and averaging about 20°F greater temperatures. Heating capacity, transmissivity and conductivity were cited as being the controlling factors for regional trends. Some indication of recharge occurred at 4700' where epidotized claystone predominates. The area from 4640' to 5070' was cited as being a possible fault zone. Secondary mineralization is prevalent but production capability is probably poor as no large thermal break appeared on the log. Water losses during the injection tests were attributed to this possible fault zone and to loss at the bottom of the hole.

In general, no promising flow zone was seen on the temperature logs. We probably could get some fluid from the fault zone, but not enough for a commercial prospect (a commercial prospect is defined as giving greater than 300,000 bbl/min. returns).

Following discussion of the data at hand, the Flow Test Committee voted on the following:

- 1.) Whether or not to flow at this depth? This was voted "no" on the basis of data from two injection tests, temperature logs, and the mud log, all of which showed nothing convincing, only suggesting weak possibilities. With so much open hole, mixing of fluids would probably occur reducing the scientific benefits of fluid collection.
- 2.) To make any more tests at this depth? This question too, was voted "no" as we have enough data to reasonably conclude that flowing the well at this time would probably produce some fluids but not enough for commercial purposes.
- 3.) Next course of action: Drill ahead and take a core at 5600' or when a significant lithologic change occurs (whichever comes first). Then continue drilling to the 6000' casing point, keeping in mind the potential for a flow zone between here and there and acting accordingly if that zone appears.