

Booth Steam Project

Location: Sec. 18, TWP25S, RNG21E

Flood Pattern: Inverted 5-Spot

Well Spacing: 330' (producer to producer) center injector
total 2.5 acre pattern, $\frac{1}{2}$ acre spacing.

Wells to follow:

Ave. permeability for

11, 12, 15, 16, 18,

Booth #16: Drilled on October 7, 1980, to a total depth of 810' - casing was set at 805' - 4½" 10# casing. Cemented to surface with 50% Silica flour cement with good returns. The core indicated the following:

Average Permeability	146.2 md
Average Porosity	22.5%
Average Percent Oil Saturation	52.2%
Average Percent Water Saturation	36.0%
Average Oil Content	919 bbl/ac-ft
Total Oil Content	19,294 bbl/ac

Total feet of oil core 21.0'

12/8/80 Ran CBL - excellent bonding
5/6/81 Log and perforate, 751' to 770' - 20 shots
28 gram - PML glass jets 3.5" OD - spot
50 gal. 15% HCL - frac well with 800#
20-40 sand, 700# 10-20 sand. Treating
pressure 1500-1900 psi - breakdown 3000 psi
at 19 to 24 BPM. SI @ 200 psi - used 110
bbl. gelled brine - 30 of which was flush.
5/25/81 SML TD 791' - ran in 772' 2-7/8" EUE w/S
nipple at 772'
7/7/81 Preheat for 2½ hrs.-generator unable to go
to high fire
7/8/81 Preheat for 45 min. and start injection at
11:15 AM
7/12/81 Stop injection at 10:23 PM (108 hrs.) - well
on injection 92 hrs.
WHP before inj = 0 psi
WHP 15 min. prior to SI = 730 psi
WHP 40 min. after SI = 390 psi
WHP 12 hrs. after SI = 0 psi
7/13/81 4:15 PM run thermometer
@ 752' T = 274° F
@ 750' T = 260° F
@ 767' T = 220° F

Well seemed to be tight as WHP staged within 20 psi of steam outlet pressure. Steam quality averaged 70-76%, steam temp averaged 500° F.

7/15/81 4:00 PM - ran Temp Survey - all of injection
appeared to be going into the sand - max heat
was at 763' or close to the bottom of the sand.
Temp @ 763' = 214° F 66 hrs. after SI.
7/16/81 Ran 4' x 1½" ss insert - pump on 1-5/16"
OD tubing

Booth #16: (continued)

7/17/81 10:00 AM - put well on pump - 11:15 AM
well pumped down - 2% oil - 80 BWPD -
surface temp 110° F

7/19/81 Well test 0 BOPD - 4.5 BWPD

8/7/81 9:30 AM - 10:00 AM - .02 BO - .3 BW PO

8/10/81 10:46 AM - 10:55 AM - .04 BO - .26 BW PO

8/13/81 7:57 AM - 8:10 AM - .68 BW PO

8/19/81 8:50 AM - 9:10 AM - .04 BO - .24 BW
3:05 PM - 3:17 PM - .12 BW

8/20/81 8:57 AM-9:12 AM .28 BW PO
6:50 AM-6:58 AM .12 BW trace oil

8/24/81 9:30 AM-10:30 AM .04 BO .44 BW PO

8/25/81 9:22 AM-11:20 AM .44 BW PO
3:25 PM-3:30 PM .08 BW PO

8/26/81 9:00 AM-8:20 AM .20 BW PO
6:15 PM-6:22 PM .12 BW PO

8/27/81 8:15 AM-8:25 AM .04 BO .10 BW PO

8/28/81 9:07 AM- 9:16AM .17 BW PO

8/31/81 11:04 AM-11:18 AM .28 BW PO

9/1/81 9:45 AM-10:01 AM .24 BW PO
6:15 AM-6:26 PM .12 BW PO

9/2/81 3:00 PM-3:20 PM .20 BW PO

9/3/81 17 min. Bucket test .20 BW

9/4/81 6 min. test .14 BW PO

9/5/81 Pumped off in 15 min. .20 BW

9/11/81 9 :27 AM-9:45 AM .34 BW PO

9/15/81 Pumped off in 16 min. .20 BW

9/30/81 Pumped off .8 BW

10/5/81 Pumped off in 10 min. .36 BW

10/12/81 Pumped off in 10 min. .22 BW

10/26/81 Pumped off in 27 min. .48 BW

PRESENT OPERATIONS

As of 11 November a total of 40,700 BBL of steamed water has been introduced into this pattern. There has also been produced approximately 5000 BBLs of water, and a negligible amount of oil. On the 20th of October steam output of scale was analyzed by Treatolite and found to contain the following:

75.3%	Sodium Chloride
11.2%	Sodium Sulfate
.7%	Iron Oxide
12.8%	Wt. Loss at 900°C

Scale removed from the #12 downhole pump indicated the following:

34.21	Wt. Loss at 900°C
19.71%	Iron Oxide
36.23%	Calcium Carbonate
9/85%	Calcium Sulfate

Wells # 11, 12, 15, and 16 are being pumped once per week while continuous injection is attempted in the #18. Formation temperatures are being monitored more closely and some indication of temperature response seems to be evident in the #14 and #12. An observation well is being drilled and cored halfway between the #18 and the #15. These cores will be analyzed for residual saturations.

The initial lack of response was believed to have been an emulsion, caused by the heating at the wellbores of the producers.