

STIMULATION & COMPLETION  
FOR  
E.G.S.P. TENNESSEE NO. 9  
GRAINGER COUNTY, TENNESSEE

Submitted to

U.S. Department of Energy  
Morgantown Energy Technology Center

Under Contract No. DE-AC21-79MC08382

by

GRUY FEDERAL, INC.

Pittsburgh Office

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Ali Rdissi

June 23, 1980

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Dowell's Frac. Treatment Data	
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5-30-80

10:00 Checked the hole with the 4½ inch swabs.  
Top of fish at 1750 feet.  
Ran swab several times.

14:30 Recovered 48 feet of wire hooked on the swabs.

18:00 Welded a center spear to a nipple and screwed it onto  
the swab. The spear had to be welded because of its  
threads do not match the jars threads.  
Ran the spear down the hole, recovered approximately  
5 feet of wire wrapped around the spear.

18:15 Recovered all the remaining gun in one piece.

18:30 Checked the bottom of the hole.

19:00 Shut down.

6-07-80

7:00 Static wellhead pressure on the well=0psi.  
Checked the bottom of the hole with a bailer. No fluid.

10:00 Preparing for Dowell's acid treatment.

12:40 Test Dowell's line at 3500psi, OK

12:50 Start acid foam treatment.  
Acid rate =  $q_a = 2\text{BPM}$ , Nitrogen rate = 5000 CF/mn.

12:55 After filling up the hole, the formation broke down at  
1670psi. Pressure dropped gradually to 1340 psi.

13:00 After pumping 750 gal. of acid, shut pumps down to record an  
I.S.I.P. of 1300 psi (Pressure dropped from 1340 to 1300 psi)

13:00 Resumed acid pumping dropping a perforation ball sealer every  
0.5 bbls. of acid pumped. (Specific gravity of balls = 1.30)

13:07 Finished dropping 20 balls, 8 bbls. of additional acid were  
pumped since pumps shut down for I.S.I.P.

13:10 Resumed dropping 10 additional balls (one ball every 0.5 bbls.  
of acid). The last ball was dropped just prior to the acid  
foam flush. Started flushing the acid with 31 bbls. of water  
foam. No over flush.

13:15 P injection = 1640 psi,  $q_a = 2\text{BPM}$ ,  $N_2 = 5000\text{ SCF/mn}$ .  
The balling effect was apparent as the pumping pressure  
gradually increased from 1340 psi to 1670 psi.  
Finished flush. I.S.I.P. = 1670 psi.  
5mn Shut in Pressure = 1350 psi.  
10mn Shut in Pressure = 1300 psi.  
15mn Shut in Pressure = 1260 psi.

12:35 Opened the well for 5mn through a 24/64 inch positive choke to  
release the perf. balls from the perforations.

12:40 Shut the well in, leaving all the acid and foam in the formation.  
Total acid used 1500 gal. of 15% regular (3% HF and 12% HCl)  
Total Nitrogen used including cool down 106,000 SCF.

6-08-80

8:30 Dowell's frac trucks and nitrogen equipment on location.

9:50 Test lines at 3500 psi o.k.

9:57 Start pad  $Q_w$  (water rate) = 7.5 BPM  
 $Q_{N_2}$  (Nitrogen rate) = 13200 SCF/mn  
 $P$  injection (Injection pressure) = 1700 psi.

10:07 Reduced  $N_2$  rate to 1000 SCF/mn because one nitrogen pumper was down. Start sand at 4 lbs./gal. of liquid.  
 $Q_w$  = 6 BPM,  $P$  = 1690 psi.

10:10  $Q_{N_2}$  = 8800 SCF/mn,  $Q_w + \text{sand}$  = 8.9 BPM  
 Only two nitrogen pumpers operate.

10:16  $P$  = 1700 psi.

10:20 Start sand at 6 lbs/gal of liquid.  
 $Q_w + \text{sand}$  = 9.6 BPM,  $Q_{N_2}$  = 13200 SCF/mn  
 All three nitrogen pumpers pumping.

10:35 Start sand at 8 lbs/gal of liquid.  
 $P$  = 1720 psi,  $Q_w + \text{sand}$  = 10.2 BPM  
 $Q_{N_2}$  = 13200 SCF/mn

10:42  $P_{N_2}$  = 1800 psi.

10:44  $P$  = 1800 psi. Finish sand, start flush.  
 $Q_w$  = 7.5 BPM,  $Q_{N_2}$  = 13200 SCF/mn  
 $Q_{\text{Foam}}$  = 30 BPM

10:45 Shut pumps down. I.S.I.P. = 1550 psi  
 (Pressure dropped from 1800 to 1550 psi)  
 Total Bbls pumped (Water + Sand) = 371 Bbls.

10:50 5mn Shut in Pressure = 1455 psi.

10:55 10mn Shut in Pressure = 1445 psi.

11:00 15mn Shut in Pressure = 1420 psi.

12:00 After disconnecting Dowell's wellhead equipment, connected choke and gage on the 4½ inch casing, 8Rd valve. Opened well on a 12/64 inch choke.

12:15 Shut well in. Checked choke O.K. Connected a 2-3/8 inch joint of tubing to the flow line.

12:18 Opened well on 12/64 inch. Well flowing  $N_2$ , foam and water. Very little sand.

16:30 Wellhead flowing pressure = 980 psi.

16:50  $P_{\text{WHF}}$  = 940 psi, very little sand.

17:00  $P_{\text{WHF}}$  = 930 psi

17:15  $P$  = 925 psi

17:30  $P$  = 930 psi

17:45  $P$  = 930 psi

18:00  $P$  = 930 psi, very little sand

18:15  $P$  = 934 psi

18:30  $P$  = 944 psi

18:45  $P$  = 955 psi

19:00  $P$  = 950 psi

19:15  $P$  = 935 psi

19:30  $P$  = 915 psi, no sand

20:00 P = 890 psi  
20:30 P = 870 psi  
21:00 P = 860 psi  
21:30 P = 837 psi, no sand  
21:35 Shut the well in. Changed the choke to 16/64 inch.  
21:40 Opened well back on 16/64 inch.  
21:45 P = 815 psi  
22:10 P = 790 psi  
23:00 P = 760 psi  
24:00 P = 730 psi, no sand, lots of water

6-09-80

1:00 P = 690 psi  
2:00 P = 660 psi  
3:00 P = 620 psi  
4:00 P = 590 psi  
5:00 P = 560 psi  
6:00 P = 530 psi, no sand  
6:40 Shut well in to change choke to 3/8 inch.  
6:45 Opened well back on 3/8 inch.  
7:00 P = 460 psi  
7:15 P = 445 psi  
7:30 P = 430 psi  
7:45 P = 418 psi, no sand  
8:55 P = 345 psi  
9:15 P = 325 psi  
10:45 P = 300 psi, well started heading  
10:50 P = 245 psi, no sand  
11:15 P = 229 psi  
11:30 P = 215 psi  
12:00 P = 200 psi  
12:20 P = 188 psi  
12:50 P = 173 psi  
13:30 P = 149 psi  
13:45 Shut well in to change choke.  
13:46 Opened well on a 7/16 inch choke P = 147 psi.  
13:59 P = 125 psi, no sand  
14:00 P = 131 psi  
14:45 P = 106 psi, water rate started dropping a bit.  
15:05 Shut well in to open it wide open at 2 inches.  
15:10 Well open at 2 inches, P=60 psi.  
Lots of water with N<sub>2</sub> flowing in slugs.  
15:45 P = 0 to 5 psi, gage needle vibrating, lots of fluid, little sand.  
16:10 P = 0 psi, some fluid, no sand.  
16:20 No more water flowing. P = 0 psi.  
Tried to light the gas, which burned for 10mn. Moisture in the flow stream prevented it from burning continuously.

16:30 Shut well in, P = 0 psi  
16:35 Pressure static wellhead = 50 psi  
16:46 P = 85 psi  
20:00 P = 282 psi Estimated fluid recovered 260 bbls.

6-10-80

8:00 Static wellhead pressure = 456 psi in 15.5 hours.  
8:12 Opened well at 2 inches. Gas flowed first, then N<sub>2</sub>, then lots of water.  
8:26 P = 40 psi, lots of water flowing plus some sand.  
8:48 P = 7 psi, still flowing N<sub>2</sub>, water + some sand.  
8:56 No more fluid stream, only moisture in the gas. Flared the gas, recovered approximately 20 Bbls.  
11:00 Ran the bailer down the hole to check T.D. of 1837 feet with respect to ground level. Therefore, there are 33 feet of sand in the hole. Preparing to run the sand pump. Found fluid level at 835 feet.  
11:30 Started running the sand pump inside the 4½ inch casing.  
14:00 Recovered 14 feet of sand, T.D. = 1851 feet.  
16:00 Cleaned sand all the way to T.D. of 1870 feet ground level.  
16:30 Layed sand pump down. Picked up the swab for the 4½ inch casing. Swab type V. Guiberson.  
17:15 Started swabbing. Fluid level climbed to 450 feet in 6 hours that is a water influx rate of 44 gal/mn.  
17:45 Swabbing at 1120 feet.  
18:30 Finished swabbing to 1610 feet, still fluid at this level. Recovered at least 15 bbls. through this swabbing operation. Shut the well in.  
19:00 Pressure built up to 90 psi after 30mn.  
21:00 Pressure = 160 psi.

6-11-80

8:00 Pressure static wellhead = 280 psi.  
8:30 Opened well at 2 inches. Flowed gas for one minute, followed by water.  
9:00 Still flowing water. P = 0 psi  
Fluid rate decreasing fast. Recovered approximately 15 bbls. of water.  
9:15 Started swabbing the hole at 1610 feet. Recovered some fluid. Cumulative fluid recovered since unloading the well after the fracturing is nearly 330 bbls.  
14:00 Still swabbing at 1610 feet. Fluid level drops after swabbing few times, but builds up if swabbing is stopped momentarily.  
14:30 Decided to run the bailer.  
17:30 Stopped bailing fluid covering the perforations. Fluid level does not seem to drop.

17:35 Shut well in to record pressure.  
17:40 Pressure built up to 30 psi.  
17:45 P = 38 psi.  
18:00 P = 54 psi  
18:05 P = 60 psi

6-12-80

8:00 Pressure static = 228 psi in 14 hours.  
8:12 Opened well at 2 inches. Flowed gas for one minute followed by lots of water (full stream).  
8:36 No more water flowing back, only gas.  
12:00 Started bailing. Found top of sand at 1798 feet. Well carried lots of sand into the well bore.  
13:00 Measured the open flow rate through 3/8 inch plate in a 2 inch orifice well tester. P = 2.8 psi which corresponds to a gas rate of 33100 CF/D.  
16:00 Pumping sand at 1837 feet for two hours at the same spot.  
20:15 Measured the open flow. Deflection = 1 psi, through 3/8 inch orifice, Q gas = 19000 CF/D.  
20:20 Shut the well in.  
20:30 Pressure static wellhead = 25 psi in 10mn.

6-13-80

8:00 Pressure static wellhead = 198 psi.  
8:11 Opened well at 2 inches, only gas.  
8:13 Fluid started flowing after two minutes.  
8:35 No more water flowing, only gas.  
8:45 Started sand pumping. Pumping sand at 1842 feet.  
10:15 Pumping sand at 1851 feet.  
12:00 Sand pumping at 1865 feet.  
13:00 Started swabbing. Fluid level encountered at 1100 feet.  
14:00 Swabbing at 1620 feet just above the top perforation.  
16:00 Still swabbing at 1620 feet. The fluid level build up 100 feet in 35 mn, this corresponds to a water influx of approximately 2 gal/mn. At one point, it swabbed down to 1620 feet. Stopped swabbing for 35 mn. Went back in the hole, found fluid level 100 feet above 1620 feet.  
16:30 Open flow measured through an orifice of 3/8 inch,  
P = 5 psi = 139 inches of water.  
Q gas = 43000 SCF/D.  
16:40 Shut well in.  
16:50 Pressure static shut in at the wellhead = 32 psi in 10mn.

6-14-80

9:30 Static shut in pressure = 208 psi in 17 hours.  
9:35 Opened well at 2 inches. Flowed gas only for one minute, then water started coming.  
9:45 Fluid stopped, only gas.  
10:15 Shut the well in.  
10:25 Pressure built up to 32 psi in 10mn.

6-15-80

9:30 Static shut in pressure = 245 psi in 24 hours.  
9:35 Opened well at 2 inches. After flowing gas for one mn, it started flowing water.  
9:55 No more water, only gas.  
10:00 Shut well in.

6-16-80

8:00 Static shut in pressure = 245 psi in 22 hours.  
8:05 Opened well at 2 inches. Flowed gas for one minute, then water followed.  
8:30 No more water, only gas.  
10:00 Swabbing the hole with 4½ inch swabs. Fluid level at 1400 feet.  
10:30 Started Basin Survey Gamma Ray Tracer.  
T.D. found at 1835 feet K.B. Recorded Gamma Ray. The bottom two perforations could not be picked up, they are covered with sand.  
13:00 Preparing to run the sand pump.  
14:30 Decided to run the flow analyzer before cleaning the sand. Could not get the spinner to rotate in water.  
17:50 Open flow measured Q gas = 18000 SCF/D, that is P = 0.9 psi through a 3/8 inch orifice.  
18:30 Still having problems with the spinner, it is not rotating in fluid. Checked the fluid level. It built 74 feet in 2 hours or 50.5 gallons in 120mn which corresponds to a water influx of 0.42 gal/mn.  
20:30 Finished pumping 25 feet of sand. Shut well in.

6-17-80

7:30 Static shut in pressure = 178 psi in 11 hours.  
7:35 Opened well at 2 inches. The well did not bring any fluid, only gas.  
8:30 Started swabbing. Found fluid level at approximately 900 feet.  
9:00 Swabbing at 1620 feet.  
10:30 Swabbed the well dry till the depth of 1620 feet. Measured the open flow of Qg = 42000 SCF/D.

11:00 Waited one half hour for the fluid to build up, but there was no appreciable fluid.  
11:15 Started bailing. Fluid level at 1620 feet. Water resistivity measured by Basin gave  $R_w = 0.1$  which corresponds to a salinity of 11000 ppm.  
13:15 Finished bailing. Fluid level 50 feet from bottom. Water influx 61 gallons in 120 mn or 1.2 gallons/mn.  
15:00 Finished running the flow analyzer using a skirted spinner. Fluid level found with the spinner at 1668 feet.  
16:00 Ran the Gamma Ray Tracer again.  
17:00 Measured open flow = Q gas = 27000 SCF/D.  
Shut the well in.

6-18-80

9:00 Static shut in pressure = 172 psi in 16 hours.  
9:05 Opened the well at 2 inches. It flowed gas and a mist of water.  
11:00 Preparing to run 2-3/8 inch EU, 4.7 lbs/ft, J55, 8Rd tubing.  
13:00 Started running 2-3/8 inch tubing.  
15:30 Finished running 1747.61 feet of 2-3/8 inch tubing with a seating nipple at the bottom of the tubing. I.D. of seating nipple = 1.8 inches.  
16:00 Connecting the wellhead equipment, i.e. tubing head, valves, etc.  
16:30 Preparing lubricator and 2-3/8 inch swabs.  
18:30 Swabbing through the lubricator with the 2-3/8 inch swabs. Very little fluid. Fluid level found at 1650 feet. No water in the tubing after 3 trips. No gas flowing through the tubing.  
19:00 Shut well in. Pressure in tubing = 0 psi. The tubing seems to be on vacuum. Pressure in the 4½ inch x 2-3/8 inch annulus built up to 65 psi in 15mn.  
22:00 Pressure annulus = 105 psi, Pressure tubing = 0  
Opened the annulus. Left it open all night with the tubing shut in.

6-19-80

7:00 Pressure tubing = 0 psi in 9 hours, Annulus open.  
7:15 Opened tubing, no gas flowing through it, gas coming only through the annulus.  
7:30 Started swabbing in the 2-3/8 inch tubing.  
No fluid found in the tubing.  
8:30 Took the swab off and ran the sinker bar to check if the tubing is plugged. The sinker bar has an O.D. less than the I.D. of the seating nipple. Went 6 feet past the seating nipple which proved that the tubing is open at the bottom.

13:00 Dumped 35 gallons of water in the tubing (approx. 200 feet) in an attempt to create a pressure balance between the tubing and casing annulus.

16:00 Started swabbing water out of the tubing. Recovered approximately 17 bbls. Pressure in the annulus did not drop.

19:00 Still swabbing. Pressure annulus = 120 psi.  
Fluid level in the tubing is between 50 and 100 feet from bottom of the tubing. Whatever fluid is swabbed seems to be compensated by the formation feeding fluid in.  
Connected the annulus to tubing and attempted to bleed some of the annulus pressure into the tubing. The pressure dropped only 2 psi from 120 psi to 118 psi.

19:30 Started pulling 4 joints of tubing to set it above the upper perforation. As soon as the fourth joint was pulled, gas started flowing through the tubing. Tubing set at 1623.63 feet.

20:00 Shut the well in.

20:10 Pressure tubing = 20 psi, Pressure annulus = 40 psi

20:25 Pressure tubing = 50 psi, Pressure annulus = 65 psi

20:30 Pressure tubing = 65 psi, Pressure annulus = 95 psi

6-20-80

8:00 Static tubing pressure = 140 psi, Pressure annulus = 140 psi in 12 hours.

8:10 Opened well at 2 inches through the tubing, the annulus is shut in. After two minutes, it started flowing water with the gas.

8:30 Started swabbing the 2-3/8 inch tubing. Lots of fluid.

10:30 Still swabbing. Pressure annulus = 60 psi.

10:45 Measured a water influx of 7.3 gal in 17mn or 0.42 gal/mn.  
Open flow measured at  $Q_{gas} = 22500$  SCF/D  
 $P = 1.5$  psi in 3/8 inch orifice.

11:30 Pressure annulus = 60 psi  
Water influx = 8.1 gal in 35 mn or 0.23 gal/mn.

13:00 Open flow measured =  $Q_{gas} = 19000$  SCF/D  
 $P = 1$  psi in 3/8 inch orifice.

14:00 Open flow measured =  $Q_{gas} = 15000$  SCF/D  
 $P = 0.6$  psi in 3/8 inch orifice.

15:00 Open flow measured =  $Q_{gas} = 12000$  SCF/D  
 $P = 0.4$  psi in 3/8 inch orifice.  
Shut well in.

END

## SUMMARY OF TREATMENTS

	<u>Acid Treatment</u>	<u>Frac. Treatment</u>
Regular HF Acid	1,500 Gal	
Foam Rate	8 BPM	30 BPM
Foam Quality	81 %	75 %
Sand 80/100		10,000 Lbs
Sand 20/40		50,000 Lbs
Surfactant Foamer F78	8 Gal	38 Gal
Surfactant Foamer F75		25 Gal
Nitrogen Used	106,000 SCF	600,000 SCF
Nitrogen Rate	5,000 SCF/mn	13,200 SCF/mn
Perf. Ball Sealers	30 (S.G.=1.3)	
Total Foam Volume	143 Bbls	1,190 Bbls
Total Water Volume		306 Bbls

GRUY FEDERAL, INC.

FRAC. TREATMENT SCHEDULE

STAGE	BBLs OF FOAM	SAND CONC. LBS/GAL	SAND LBS	SIZE	BBLs LIQUID	CUM. BBLs LIQ + SAND	SAND CONC LBS/GAL	LIQ + SAND RATE BPM
1	238	0	0		59.5	59.5	0	7.5
2	238	1	10,000	80/100	59.5	130	4	8.868
3	476	1.5	30,000	20/40	119	281.5	6	9.552
4	238	2	20,000	20/40	59.5	362.8	8	10.236
5 disp1.	30.1	0	0	0	7.5	370.3	0	7.5

COST ANALYSIS5-28-80

Rig moving in and rigging up, 7 hrs x 55	\$385.00
Per diem - 4 Men - 4 x 50	200.00
Water hauling - 6 hrs x 35	210.00
	<u>\$795.00</u>

5-29-80

Rig - 8 hrs x 55	\$ 440.00
Per diem - 2 x 50	100.00
Water hauling - 9 hrs x 35	315.00
Dowell (for canceling frac.)	10,340.00
Schlumberger, CBL-VDL, Perf.	3,996.63
	<u>\$15,191.63</u>

5-30-80

Rig - 9 hrs x 55	\$ 495.00
Per diem - 3 x 50	150.00
Spear rental	385.00
	<u>\$1,030.00</u>

6-02-80

Rig standby - 6 hrs x 55	\$330.00
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6-03-80

Rig standby - 6 hrs x 55	\$330.00
Per diem - 3 x 50	150.00
	<u>\$480.00</u>

6-04-80

Rig standby - 6 hrs x 55	\$330.00
Per diem - 3 x 50	150.00
	<u>\$480.00</u>

6-05-80

Rig standby - 6 hrs x 55 \$330.00

6-06-80Rig standby - 6 hrs x 55 \$330.00  
Per diem - 3 x 50 150.00  
\$480.006-07-80Rig standby - 6 hrs x 55 \$330.00  
Per diem - 3 x 50 150.00  
\$480.006-08-80Rig - 16 hrs x 55 \$ 880.00  
Per diem - 2 x 50 100.00  
Dowell (Frac + Acid jobs) 30,933.69  
Basin Surveys (Frac. Beads) 845.00  
\$32,758.696-09-80Rig - 16 hrs x 55 \$880.00  
Per diem - 2 x 50 100.00  
\$980.006-10-80Rig - 11 hrs x 55 \$605.00  
Per diem - 2 x 50 100.00  
Sand pump - 4 hrs x 6 24.00  
\$729.00

6-11-80

Rig - 9 hrs x 55	\$495.00
Per diem - 2 x 50	100.00
	<u>\$595.00</u>

6-12-80

Rig - 11 hrs x 55	\$605.00
Per diem - 2 x 50	100.00
Sand pump - 4 hrs x 6	24.00
	<u>\$729.00</u>

6-13-80

Rig - 9 hrs x 55	\$495.00
Sand pump - 3 hrs x 6	18.00
Per diem - 2 x 50	100.00
	<u>\$613.00</u>

6-16-80

Rig - 11 hrs x 55	\$605.00
Per diem - 2 x 50	100.00
Sand pump - 5 hrs x 6	30.00
	<u>\$735.00</u>

6-17-80

Rig - 9 hrs x 55	\$ 495.00
Per diem - 2 x 50	100.00
Basins Survey (Spinner + Tracer Survey)	1,630.00
	<u>\$2,225.00</u>

6-18-80

Rig - 8 hrs x 55	\$ 440.00
Per diem - 2 x 50	100.00
2-3/8 inch tubing & accessories, McJunkin	6,066.65
Tubing Transportation, C.G. Collins, 7 hrs x 40	280.00
	<u>\$6,886.65</u>

6-19-80

Rig - 6 hrs x 55	\$330.00
Per diem - 2 x 50	100.00
4½ inch swab cups, 2 boxes	208.00
2-3/8 inch swab cups, 4 boxes	200.00
	<u>\$838.00</u>

6-20-80

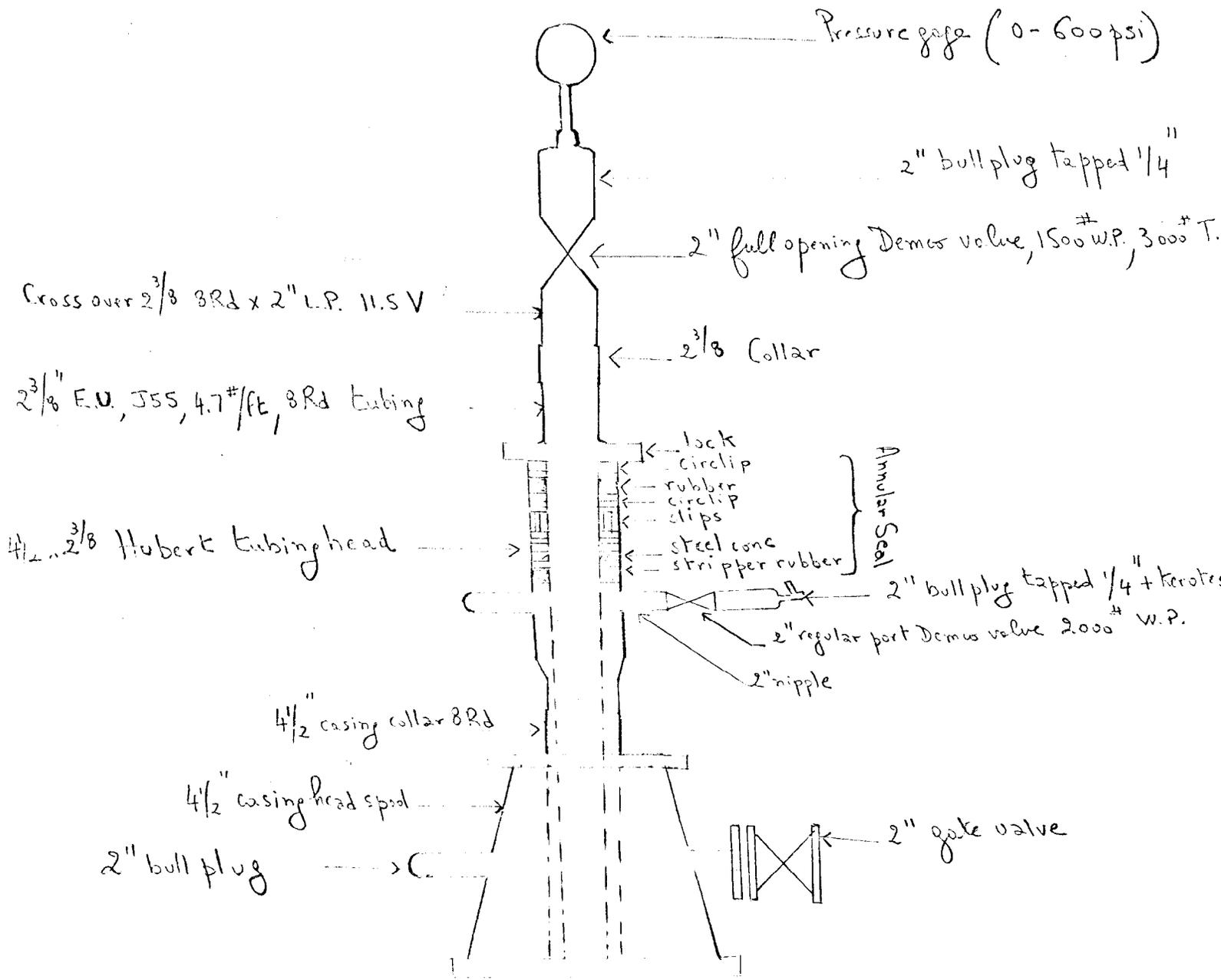
Rig + Rigging down - 9 hrs x 55	\$ 495.00
Per diem - 2 x 50	100.00
4½ inch frac valve rental (Dowell), 12 days	432.00
500 Bbls frac. tank rental - 13 days	750.00
Tank transportation	198.00
	<u>\$1,975.00</u>

Cumulative Cost	\$68,660.97
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Minus Standby caused by Dowell - 3 x 650	- <u>1,950.00</u>
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TOTAL NET COST . . . . .	\$66,710.97
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I N D E X



E.G.S.P # 9

Well head After Completion.  
Fig 1

STIMULATION TREATMENT REPORT



DATE

6-7-80

EWL 494-J PRINTED IN U.S.A.

DOWELL DIVISION OF THE DOW CHEMICAL COMPANY

WELL NAME AND NUMBER

EGSP-9

LOCATION

Avondale

CUSTOMER REPRESENTATIVE

Ali Redissi

TREATMENT NUMBER

01-35-0253

Wildcat

Chattanooga shale

JOB DONE DOWN

TUBING A  CASING B  ANNULUS C

ALLOWABLE PRESSURE

TBG: CSG 3500

Grainger

Tenn.

TYPE OF WELL

OIL A  GAS B  WATER C  INJ. D

AGE OF WELL

NEW WELL A  REWORK B

TOTAL DEPTH

1880

CIRC. BHT.

CASING SIZE

4 1/2-9.5

CASING DEPTH

1880

TUBING SIZE

TUBING DEPTH

LINER SIZE

5.5

LINER DEPTH

PACKER TYPE

PACKER DEPTH

OPEN HOLE

CSG. OR ANNUL. VOL.

30

TBG VOLUME

STATIC BHT.

PERFORATED INTERVALS

DEPTH	NO. OF HOLES	DEPTH	NO. OF HOLES	DEPTH	NO. OF HOLES
1630	-				
1850	19				

Foamed Acid

CUST. NAME Gruy Federal, Inc.

ADDRESS

CITY, STATE & ZIP CODE

REMARKS: Foamed 12-3 MA & balls to breakdown  
For information & open perts  
Used 106,000 SCF N<sub>2</sub>

FOR CONVERSION PURPOSES 24 BBLs EQUALS 1000 GALLONS

ARRIVED ON LOCATION:

TIME	INJECTION		PRESSURE	
	RATE	BBLs IN	CSG.	TBG.
1900	hrs.	Spot	Blender	Cat
0830	hrs.	Dump	flat bed	on loc.
1030	on loc.	complete	hookup	-1130 - 1 N <sub>2</sub> pump on loc.
1140				Prejob meeting
1250				Test lines - Cool N <sub>2</sub> pump
1251 1/2	2		1400	start pumping foamed 12-3 mud Acid
1252 1/2				shut down - N <sub>2</sub> problems
1302	2	18	1350	Resume pumping
1303			1350	shut down - ISIP 1300 PSI
1306	2		1300	Resume pumping
1311	2		1400	start dropping balls
1312	2		1400	20 balls dropped
1317	2	36	1450	start dropping balls
1317 1/2	2	43 1/2	1650	10 balls dropped - switch to H <sub>2</sub> O foam flush
				Flush complete

SERVICE LOG

1500 Leave loc. leave units on loc. for foam frac 6/8/80  
1500 Gal. Regular Mud Acid-12-3-Inhibited  
8 Gal. F78 Surfactant-foamer  
30 Ball sealers

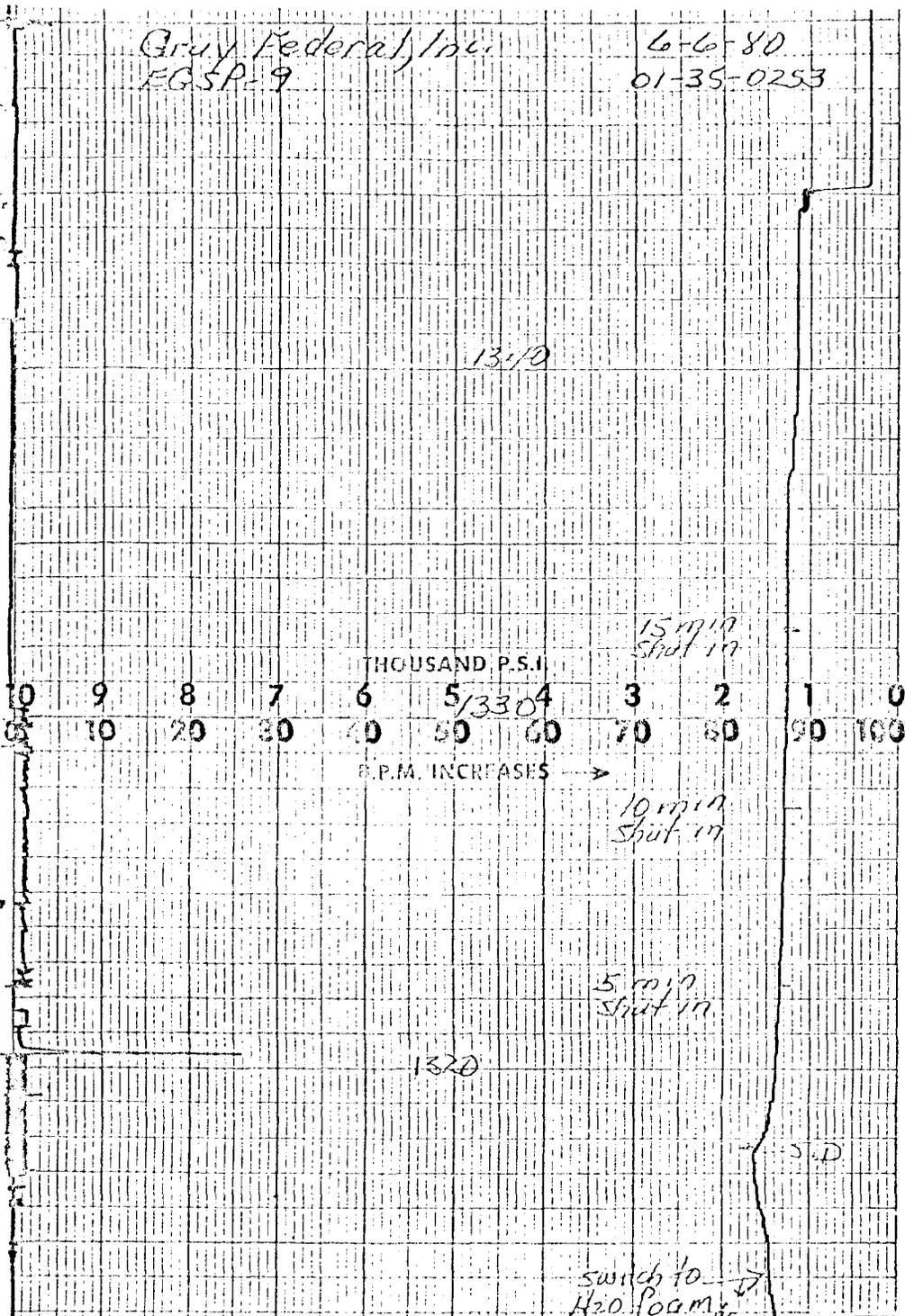
TIME LEFT LOCATION	AVG. LIQUID INJ. RATE	ADJ. INJ. RATE (SOLIDS INJ.)	TOTAL FLUID PUMPED		PROPS AND LIQUIDS INJECTED			
1. PRESSURE	AVG. PRESSURE	FINAL PUMP IN PRESSURE	OIL	WATER	TYPE	SIZE OR PURPOSE	AMOUNT	
1650	1400	1650	1600	1250				
DOWELL LOCATION			DOWELL ENGINEER					
Crossville, TN. 01-35			Branham & Meade					
CALL BACK	DATE	CUSTOMER REP. CONTACTED	CUSTOMER CONSIDERED SERVICE	<input type="checkbox"/> SATISFACTORY	<input type="checkbox"/> UNSATISFACTORY	<input type="checkbox"/> UNKNOWN	PROD. BEFORE TREATMENT TEST	PROD. AFTER TREATMENT TEST
							ALLOWABLE	DAYS TEST ALLOWABLE

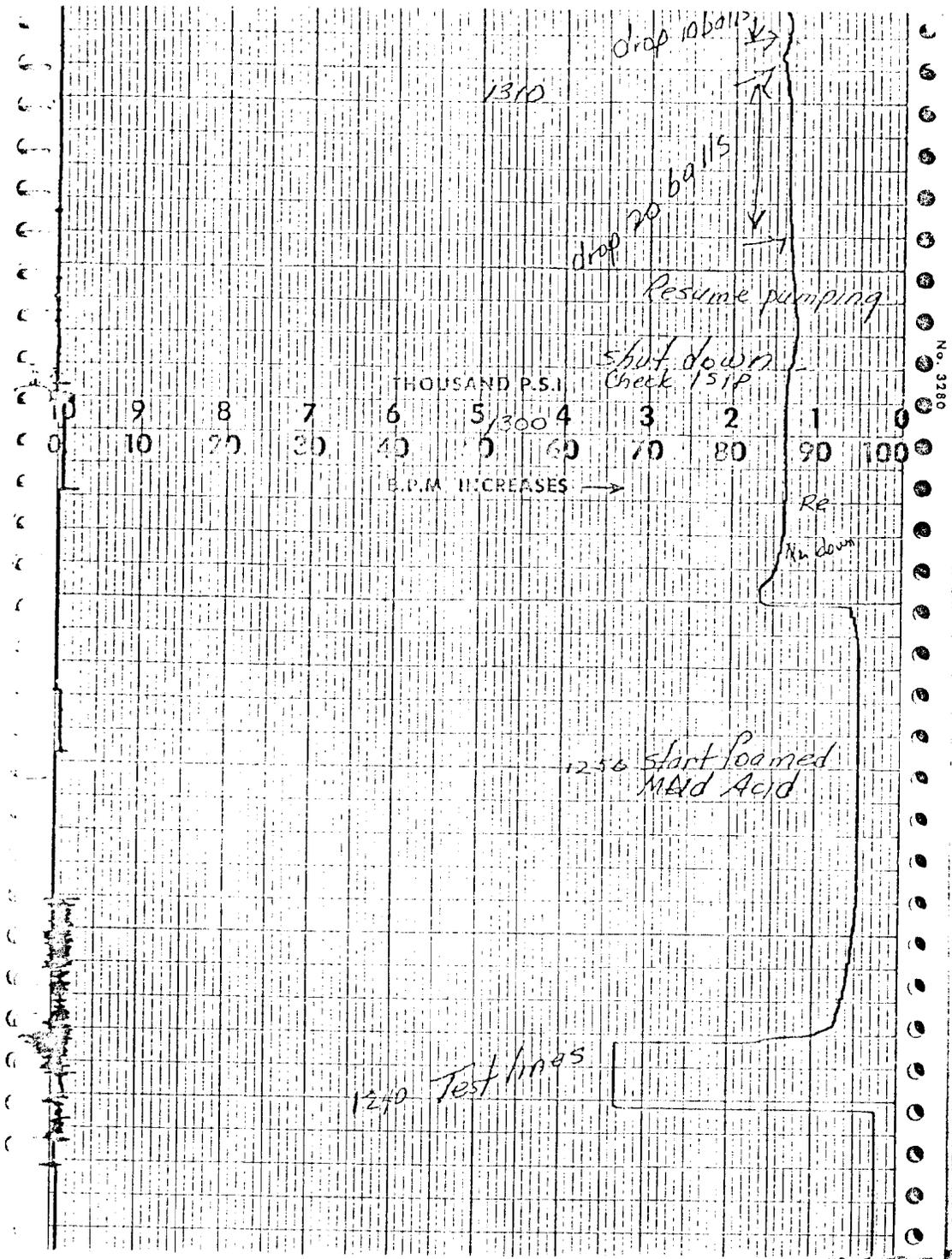
Gray Federal, Inc.  
EGSP-9

6-6-80  
01-35-0253

• DOWELL DIVISION OF THE DOW CHEMICAL COMPANY

• AUTOMATIC TREATMENT RECORD • 1" CHART • 5 MIN





Pressure  
 100  
 90  
 80  
 70  
 60  
 50  
 40  
 30  
 20  
 10  
 0

STIMULATION TREATMENT REPORT

EWL 494-J PRINTED IN U.S.A.  
WELL NAME AND NUMBER

EGSP-9

Wildcat

Granger

Foam Frae 75 Quality

CUST. NAME Gray Federal

ADDRESS

CITY STATE & ZIP CODE

REMARKS:

13,062 Gal. Foam

FG-9

used 600,000 SCF N<sub>2</sub>

FOR CONVERSION PURPOSES 24 BBLS EQUALS 1000 GALLONS

ARRIVED ON LOCATION:

DOWELL DIVISION OF THE TOW CHEMICAL COMPANY

LOCATION

Avondale

FORMATION

Chattanooga State

STATE

Tenn.

CUSTOMER REPRESENTATIVE

Ali Redissi

JOB DONE DOWN

TUBING CASING ANNULUS

A  B  C

TYPE OF WELL

OIL GAS WATER INJ.

A  B  C  D

AGE OF WELL

NEW WELL REWORK

A  B

CASING SIZE CASING DEPTH

4 1/2 - 9.5# 1880

LINER SIZE LINER DEPTH

PACKER TYPE PACKER DEPTH

OPEN HOLE CSG. OR AN RL VOL. TBG VOLUME STATIC BHT.

30

PERFORATED INTERVALS

DEPTH NO. OF HOLES DEPTH NO. OF HOLES DEPTH NO. OF HOLES

1630 1850 19

SERVICE LOG

Job discussion

Safety Mtg.

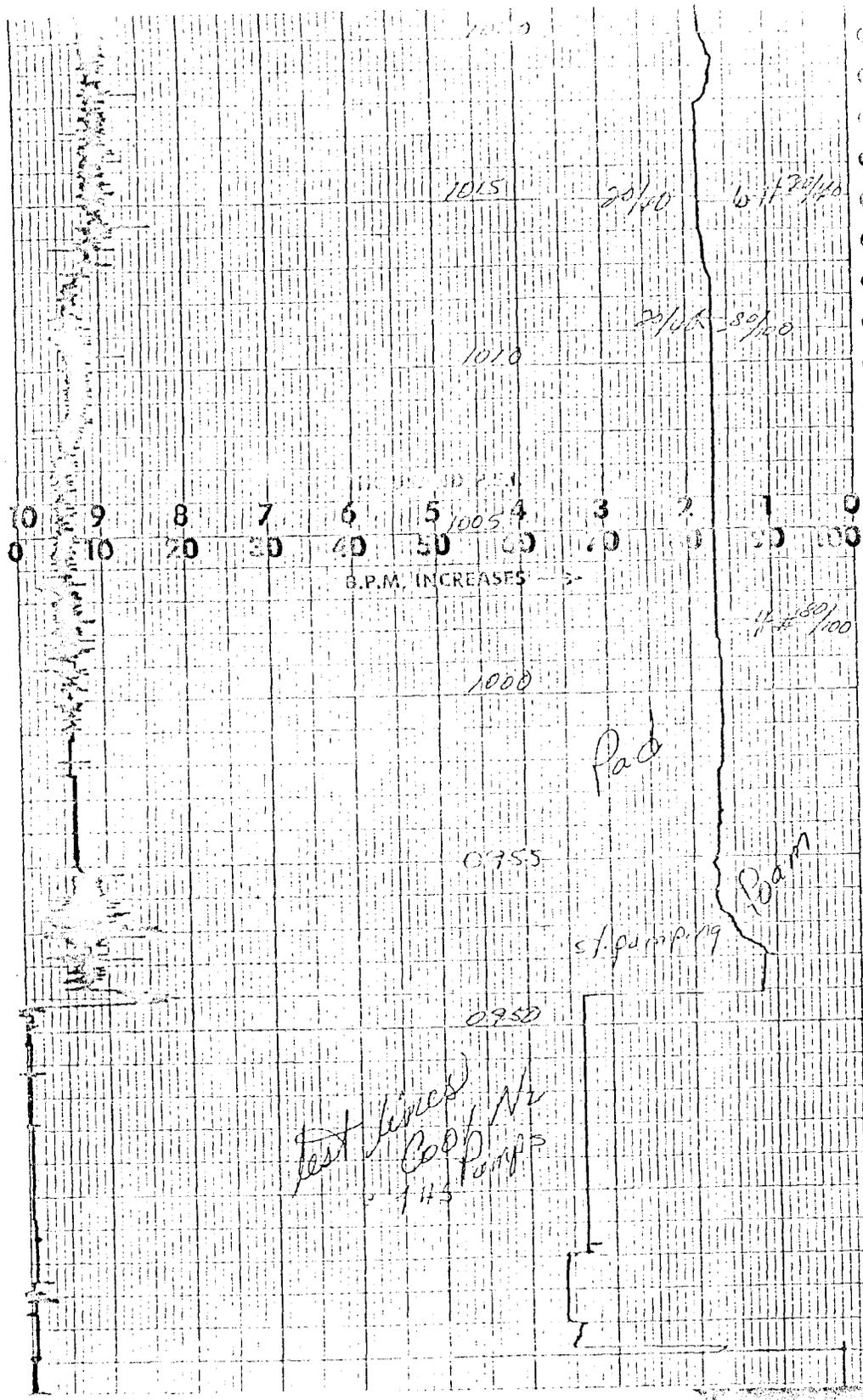
TIME	INJECTION		PRESSURE	
	RATE	BBLS IN	CSG.	TBG.
0815	on loc.	Free crew		
0940				
0952			1200	
1024	6#	60	1650	
1011	6-	100	1700	
1015	8.9#	130	1850	
1034	9.6-	282	1750	
1039	10.3	363	1800	
1040	7.5	371	1800	

0830 N<sub>2</sub> pumps  
test lines - Cool N<sub>2</sub> pumps  
start pumping - foam 75 Quality pad  
start 80/100 sand - 4# Gal. (1#)  
80/100 to 70/140 sand - 4# Gal. (1#)  
70/140 sand to 6# Gal. (1 1/2)  
6# sand to 8# Gal. (2)  
cut sand - start flush  
end flush

10,000 # 80/100 sand  
50,000 # 70/140 sand

Pump rate of fluid side varied to account for volume of sand. 25 Gal. F75  
10,000 # 80/100 sand 38 Gal. F78  
50,000 # 70/140 sand

TIME LEFT LOCATION	AVG. LIQUID INJ. RATE	ADJ. INJ. RATE (SOLIDS INC.)	TOTAL FLUID PUMPED	PROPS AND LIQUIDS INJECTED		
1300	-	7.7 Avg.	OIL 311 WATER	TYPE	SIZE OR PURPOSE	AMOUNT
MAX. PRESSURE	AVG. PRESSURE	FINAL PUMP IN PRESSURE	SHUT IN PRESSURE			
1850	1750	1800	IMMEDIATE 1500 15 MINUTES 1750			
DOWELL LOCATION	DOWELL ENGINEER					
Crossville, Tenn. 01-35	Branham & Meade					
CALL DATE	CUSTOMER REP. CONTACTED	CUSTOMER CONSIDERED SERVICE	PROD. BEFORE TREATMENT	PROD. AFTER TREATMENT		
BACK		<input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY <input type="checkbox"/> UNKNOWN	TEST ALLOWABLE	TEST ALLOWABLE		



1015

1015

20/100

10 11 20/100

1010

20/100 80/100

1000

Pad

0955

sf. pumping

Pad

0950

Test lines  
1000 Hz  
145 temp

Grain Federal  
EGSP 19

6/8/80  
01-35-0253

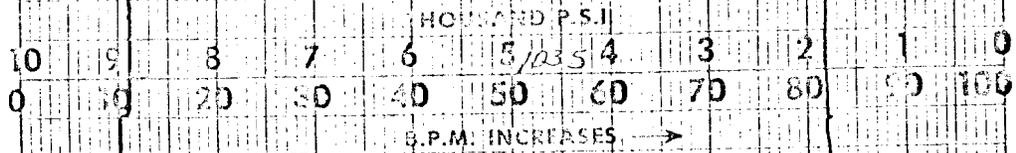
15 min

10 min

5 min

1020

3.0  
cut sand



1030

3#

1025

PRINTED IN U.S.A.

Gamma Ray tracer

1500

50

1100

50

1800

Gamma Ray

FR  
1838

CCL



# Spinner Survey

Mercurial 8 1/2" Deep

0 Pull 100

LL

Flow Analyzer

1500

Setting Run

Steady Pull

50

1100

50

1300

