

**WELL NAME:** Marhofer #1  
**COMPANY:** Parrish Corp  
**LOCATION:** 27-20S-23W  
Ness County Kansas  
**DATE:** 08/29/97

TRILOBITE TESTING L.L.C.

OPERATOR : Parrish Corp

DATE 8/26/97

WELL NAME: Marhofer #1

KB 2214.00 ft

TICKET NO: 10040

DST #1

LOCATION : 27-20S-23W Ness KS

GR 2209.00 ft

FORMATION: Cherokee Sand

INTERVAL : 4346.00 To 4381.00 ft

TD 4381.00 ft

TEST TYPE: CONV

RECORDER DATA

| Mins              | Field  | 1      | 2      | 3   | 4   | TIME DATA-----         |
|-------------------|--------|--------|--------|-----|-----|------------------------|
| PF 45 Rec.        | 10332  | 10332  | 13849  |     |     | PF Fr. 0320 to 0405 hr |
| SI 60 Range(Psi ) | 4025.0 | 4025.0 | 4375.0 | 0.0 | 0.0 | IS Fr. 0405 to 0505 hr |
| SF 45 Clock(hrs)  | 12 hr  | 12 hr  | 12 hr  |     |     | SF Fr. 0505 to 0550 hr |
| FS 60 Depth(ft )  | 4378.0 | 4378.0 | 4356.0 | 0.0 | 0.0 | FS Fr. 0550 to 0650 hr |

|                | Field  | 1      | 2      | 3   | 4   |                               |
|----------------|--------|--------|--------|-----|-----|-------------------------------|
| A. Init Hydro  | 2128.0 | 2170.0 | 2152.0 | 0.0 | 0.0 | T STARTED 0100 hr             |
| B. First Flow  | 81.0   | 87.0   | 181.0  | 0.0 | 0.0 | T ON BOTM 0310 hr             |
| B1. Final Flow | 152.0  | 187.0  | 202.0  | 0.0 | 0.0 | T OPEN 0320 hr                |
| C. In Shut-in  | 1347.0 | 1389.0 | 1409.0 | 0.0 | 0.0 | T PULLED 0650 hr              |
| D. Init Flow   | 182.0  | 233.0  | 316.0  | 0.0 | 0.0 | T OUT 0915 hr                 |
| E. Final Flow  | 314.0  | 346.0  | 359.0  | 0.0 | 0.0 |                               |
| F. Fl Shut-in  | 1347.0 | 1386.0 | 1399.0 | 0.0 | 0.0 | TOOL DATA-----                |
| G. Final Hydro | 2108.0 | 2083.0 | 2076.0 | 0.0 | 0.0 | Tool Wt. 2100.00 lbs          |
| Inside/Outside | O      | O      | I      |     |     | Wt Set On Packer 20000.00 lbs |
|                |        |        |        |     |     | Wt Pulled Loose 75000.00 lbs  |
|                |        |        |        |     |     | Initial Str Wt 52000.00 lbs   |
|                |        |        |        |     |     | Unseated Str Wt 56000.00 lbs  |
|                |        |        |        |     |     | Bot Choke 0.75 in             |
|                |        |        |        |     |     | Hole Size 7.88 in             |
|                |        |        |        |     |     | D Col. ID 2.25 in             |
|                |        |        |        |     |     | D. Pipe ID 3.80 in            |
|                |        |        |        |     |     | D.C. Length 0.00 ft           |
|                |        |        |        |     |     | D.P. Length 4331.00 ft        |

RECOVERY

Tot Fluid 855.00 ft of 0.00 ft in DC and 855.00 ft in DP  
 200.00 ft of Gas In Pipe  
 120.00 ft of Gassy Mud Cut Oil  
 0.00 ft of 5%gas 15%mud 80%oil  
 120.00 ft of Gassy Slight Mud Cut Oil  
 0.00 ft of 5%gas 5%mud 90%oil  
 180.00 ft of Gassy Mud Cut Oil  
 0.00 ft of 5%gas 20%mud 75%oil  
 435.00 ft of Free Oil

SALINITY 0.00 P.P.M. A.P.I. Gravity 38.00

BLOW DESCRIPTION

Initial Flow:  
 Strong blow bottom of bucket in 19 min

Initial Shut In:  
 Bled down for 10 min, blow back to 3"  
 in water bucket

Final Flow:  
 Strong blow bottom of bucket in 10 min

Final Shut In:  
 Bled down for 10 mins, built back to  
 1" in water bucket

SAMPLES:

SENT TO:

Test Successful: Y

MUD DATA-----

| Mud Type | Chemical   |
|----------|------------|
| Weight   | 9.40 lb/cf |
| Vis.     | 52.00 S/L  |
| W.L.     | 10.20 in3  |
| F.C.     | 0.00 in    |
| Mud Drop |            |

|                |                |
|----------------|----------------|
| Amt. of fill   | 0.00 ft        |
| Btm. H. Temp.  | 132.00 F       |
| Hole Condition |                |
| % Porosity     | 0.00           |
| Packer Size    | 6.75 in        |
| No. of Packers | 2              |
| Cushion Amt.   | 0.00           |
| Cushion Type   |                |
| Reversed Out   |                |
| Tool Chased    |                |
| Tester         | Darren Amerine |
| Co. Rep.       | John Rose      |
| Contr.         | LD Drilling    |
| Rig #          |                |
| Unit #         |                |
| Pump T.        |                |

Operator.....: Parrish Corp  
Well Name.....: Marhofer #1  
DST Number.....: 1

Location.: 27-20S-23W Ness Co.KS      Recorder No...: 10332  
Test Type: conv                      Recorder Depth: 4378  
Formation: Cherokee Sand              Test Interval.: 4346-4381

RESERVOIR CALCULATIONS: Fluid calculations based on shut-in #2

RESERVOIR PARAMETERS USED:

|                              |                   |                   |
|------------------------------|-------------------|-------------------|
| Net Pay.....                 | 5.00 ft           | > per John        |
| Porosity.....                | 15.00 %           |                   |
| Bottom Hole Temp.....        | 132.00 F          |                   |
| Specific Gravity.....        | 0.028             |                   |
| API Gravity.....             | 38.00             |                   |
| Compressibility.....         | 0.000005 /psi     |                   |
| Viscosity.....               | 5.0260 cp         |                   |
| Total Recovery.....          | 855.00 ft         |                   |
| Total Flowing Time.....      | 90.00 min.        |                   |
| Flow Rate.....               | 173.40 bbls/d     |                   |
| Final Flowing Pressure.....  | 346.00 psi        |                   |
| Horner Slope.....            | 31.1700 psi/cycle |                   |
| Extrapolated Pressure.....   | 1399.77 psi       |                   |
| Formation Volume Factor..... | 1.04              | Reservoir/Surface |
| Well Bore Radius.....        | 3.94 in           |                   |

RESULTS:

|                                 |                   |
|---------------------------------|-------------------|
| Effective Permeability.....     | 941.987343 md     |
| Flow Capacity.....              | 4709.9367 md.ft   |
| Transmissibility.....           | 937.1143 md.ft/cp |
| Skin Factor.....                | 32.0827           |
| Radius of Investigation.....    | 561.46707 ft      |
| Damage Ratio.....               | 5.6978            |
| Productivity Index.....         | 0.1646 bbls/psi.d |
| Productivity Index W/O Damage.. | 0.9376 bbls/psi.d |

Operator.....: Parrish Corp  
Well Name.....: Marhofer #1  
DST Number.....: 1

Location.: 27-20S-23W Ness KS      Recorder No...: 13849  
Test Type: CONV                      Recorder Depth: 4356  
Formation: Cherokee Sand            Test Interval.: 4346-4381

RESERVOIR CALCULATIONS: Fluid calculations based on shut-in #2

RESERVOIR PARAMETERS USED:

Net Pay.....: 6.00 ft > per Lloyd  
Porosity.....: 21.00 %  
Bottom Hole Temp.....: 132.00 F  
Specific Gravity.....: 0.028  
API Gravity.....: 38.00  
Compressibility.....: 0.000007 /psi  
Viscosity.....: 4.4950 cp  
Total Recovery.....: 855.00 ft  
Total Flowing Time.....: 90.00 min.  
Flow Rate.....: 173.40 bbls/d  
Final Flowing Pressure.....: 359.00 psi  
Horner Slope.....: 31.1700 psi/cycle  
Extrapolated Pressure.....: 1399.77 psi  
Formation Volume Factor.....: 1.04 Reservoir/Surface  
Well Bore Radius.....: 3.94 in

RESULTS:

Effective Permeability.....: 702.054833 md  
Flow Capacity.....: 4212.3290 md.ft  
Transmissibility.....: 937.1143 md.ft/cp  
Skin Factor.....: 32.0302  
Radius of Investigation.....: 366.10497 ft  
Damage Ratio.....: 6.0033  
Productivity Index.....: 0.1666 bbls/psi.d  
Productivity Index W/O Damage.: 1.0002 bbls/psi.d

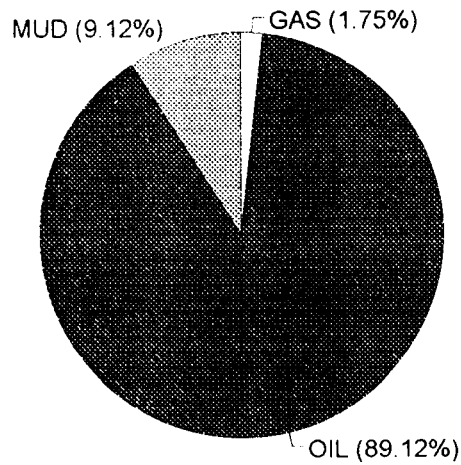
# CALCULATED RECOVERY ANALYSIS

DST 1

TICKET

| SAMPLE  |   | TOTAL |  | GAS |      | OIL |      | WATER |      | MUD |      |
|---------|---|-------|--|-----|------|-----|------|-------|------|-----|------|
|         |   | FEET  |  | %   | FEET | %   | FEET | %     | FEET | %   | FEET |
| DRILL   | 1 | 435   |  |     | 0    | 100 | 435  |       | 0    |     | 0    |
| PIPE    | 2 | 120   |  | 5   | 6    | 80  | 96   |       | 0    | 15  | 18   |
|         | 3 | 120   |  |     | 0    | 80  | 96   |       | 0    | 20  | 24   |
|         | 4 | 180   |  | 5   | 9    | 75  | 135  |       | 0    | 20  | 36   |
|         | 5 |       |  |     | 0    |     | 0    |       | 0    |     | 0    |
|         | 6 |       |  |     | 0    |     | 0    |       | 0    |     | 0    |
| WEIGHT  | 1 |       |  |     | 0    |     | 0    |       | 0    |     | 0    |
| PIPE    | 2 |       |  |     | 0    |     | 0    |       | 0    |     | 0    |
|         | 3 |       |  |     | 0    |     | 0    |       | 0    |     | 0    |
|         | 4 |       |  |     | 0    |     | 0    |       | 0    |     | 0    |
| DRILL   | 1 |       |  |     | 0    |     | 0    |       | 0    |     | 0    |
| COLLARS | 2 |       |  |     | 0    |     | 0    |       | 0    |     | 0    |
|         | 3 |       |  |     | 0    |     | 0    |       | 0    |     | 0    |
|         | 4 |       |  |     | 0    |     | 0    |       | 0    |     | 0    |
|         | 5 |       |  |     | 0    |     | 0    |       | 0    |     | 0    |
| TOTAL   |   | 855   |  |     | 15   |     | 762  |       | 0    |     | 78   |

|             |          |   |          |   |         |
|-------------|----------|---|----------|---|---------|
|             |          |   | HRS OPEN |   | BBL/DAY |
| BBL OIL =   | 10.83564 | * | 1.5      | = | 173.4   |
| BBL WATER = | 0        | * |          | = | 0       |
| BBL MUD =   | 1.10916  |   |          |   |         |
| BBL GAS =   | 0.2133   |   |          |   |         |



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## AK-1 Recorder Increments Listings

Test:

Date: 8/26/97

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|                 | Time | Pressure<br>PSIG | <><br>Pressure |
|-----------------|------|------------------|----------------|
| ***Start Flow 1 | 0    | 87.0             | 87.0           |
|                 | 3    | 176.0            | 89.0           |
|                 | 6    | 1249.0           | 1073.0         |
|                 | 9    | 1237.0           | -12.0          |
|                 | 12   | 111.0            | -1126.0        |
|                 | 15   | 117.0            | 6.0            |
|                 | 18   | 127.0            | 10.0           |
|                 | 21   | 139.0            | 12.0           |
|                 | 24   | 145.0            | 6.0            |
|                 | 27   | 153.0            | 8.0            |
|                 | 30   | 158.0            | 5.0            |
|                 | 33   | 172.0            | 14.0           |
|                 | 36   | 182.0            | 10.0           |
|                 | 39   | 187.0            | 5.0            |
|                 | 42   | 187.0            | 0.0            |
|                 | 45   | 187.0            | 0.0            |

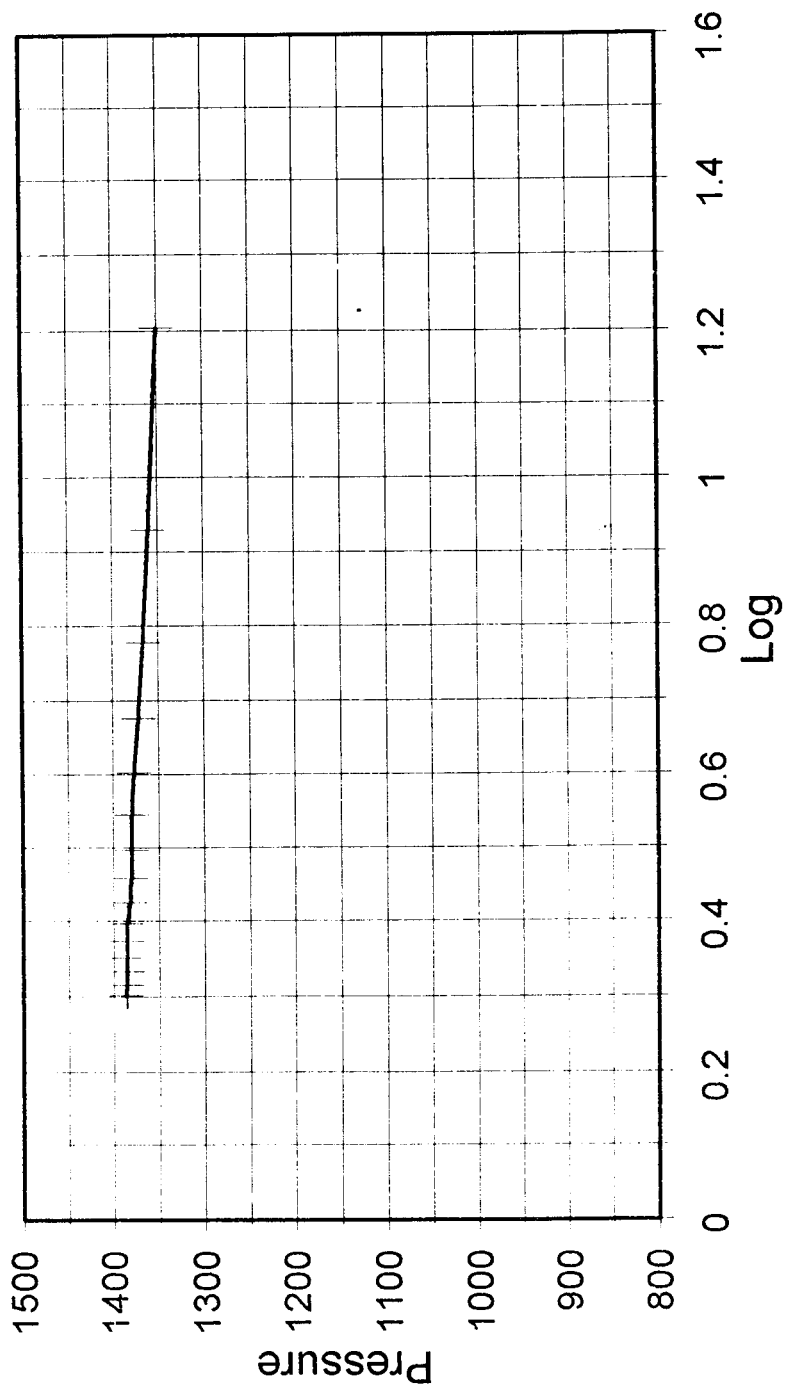
|                   | Time | Pressure<br>PSIG | Log<br>Horn T | <><br>Pressure | (T+dT)/dT |
|-------------------|------|------------------|---------------|----------------|-----------|
| ***Start Shutin 1 | 3    | 1350             | 1.204         | 1350.0         | 16.0      |
|                   | 6    | 1360             | 0.929         | 10.0           | 8.5       |
|                   | 9    | 1367             | 0.778         | 7.0            | 6.0       |
|                   | 12   | 1372             | 0.677         | 5.0            | 4.8       |
|                   | 15   | 1377             | 0.602         | 5.0            | 4.0       |
|                   | 18   | 1380             | 0.544         | 3.0            | 3.5       |
|                   | 21   | 1380             | 0.497         | 0.0            | 3.1       |
|                   | 24   | 1381             | 0.459         | 1.0            | 2.9       |
|                   | 27   | 1382             | 0.426         | 1.0            | 2.7       |
|                   | 30   | 1385             | 0.398         | 3.0            | 2.5       |
|                   | 33   | 1386             | 0.374         | 1.0            | 2.4       |
|                   | 36   | 1386             | 0.352         | 0.0            | 2.3       |
|                   | 39   | 1386             | 0.333         | 0.0            | 2.2       |
|                   | 42   | 1386             | 0.316         | 0.0            | 2.1       |
|                   | 45   | 1387             | 0.301         | 1.0            | 2.0       |
|                   | 48   | 1387             | 0.287         | 0.0            | 1.9       |
|                   | 51   | 1387             | 0.275         | 0.0            | 1.9       |
|                   | 54   | 1387             | 0.263         | 0.0            | 1.8       |
|                   | 57   | 1389             | 0.253         | 2.0            | 1.8       |
|                   | 60   | 1389             | 0.243         | 0.0            | 1.8       |

|                 | Time | Pressure<br>PSIG | ◇<br>Pressure |
|-----------------|------|------------------|---------------|
| ***Start Flow 2 | 0    | 233.0            | 233.0         |
|                 | 3    | 228.0            | -5.0          |
|                 | 6    | 228.0            | 0.0           |
|                 | 9    | 230.0            | 2.0           |
|                 | 12   | 238.0            | 8.0           |
|                 | 15   | 244.0            | 6.0           |
|                 | 18   | 256.0            | 12.0          |
|                 | 21   | 261.0            | 5.0           |
|                 | 24   | 275.0            | 14.0          |
|                 | 27   | 283.0            | 8.0           |
|                 | 30   | 293.0            | 10.0          |
|                 | 33   | 299.0            | 6.0           |
|                 | 36   | 311.0            | 12.0          |
|                 | 39   | 319.0            | 8.0           |
|                 | 42   | 325.0            | 6.0           |
|                 | 45   | 346.0            | 0.0           |

|                   | Time | Pressure<br>PSIG | Log<br>Horn T | ◇<br>Pressure | (T+dT)/dT |
|-------------------|------|------------------|---------------|---------------|-----------|
| ***Start Shutin 2 | 3    | 1272             | 1.491         | 1272.0        | 31.0      |
|                   | 6    | 1339             | 1.204         | 67.0          | 16.0      |
|                   | 9    | 1359             | 1.041         | 20.0          | 11.0      |
|                   | 12   | 1368             | 0.929         | 9.0           | 8.5       |
|                   | 15   | 1370             | 0.845         | 2.0           | 7.0       |
|                   | 18   | 1371             | 0.778         | 1.0           | 6.0       |
|                   | 21   | 1376             | 0.723         | 15.0          | 5.3       |
|                   | 24   | 1376             | 0.677         | -10.0         | 4.8       |
|                   | 27   | 1376             | 0.637         | 0.0           | 4.3       |
|                   | 30   | 1381             | 0.602         | 5.0           | 4.0       |
|                   | 33   | 1382             | 0.571         | 1.0           | 3.7       |
|                   | 36   | 1383             | 0.544         | 1.0           | 3.5       |
|                   | 39   | 1384             | 0.520         | 1.0           | 3.3       |
|                   | 42   | 1385             | 0.497         | 1.0           | 3.1       |
|                   | 45   | 1385             | 0.477         | 0.0           | 3.0       |
|                   | 48   | 1385             | 0.459         | 0.0           | 2.9       |
|                   | 51   | 1386             | 0.442         | 1.0           | 2.8       |
|                   | 54   | 1386             | 0.426         | 0.0           | 2.7       |
|                   | 57   | 1386             | 0.411         | 0.0           | 2.6       |
|                   | 60   | 1386             | 0.398         | 0.0           | 2.5       |

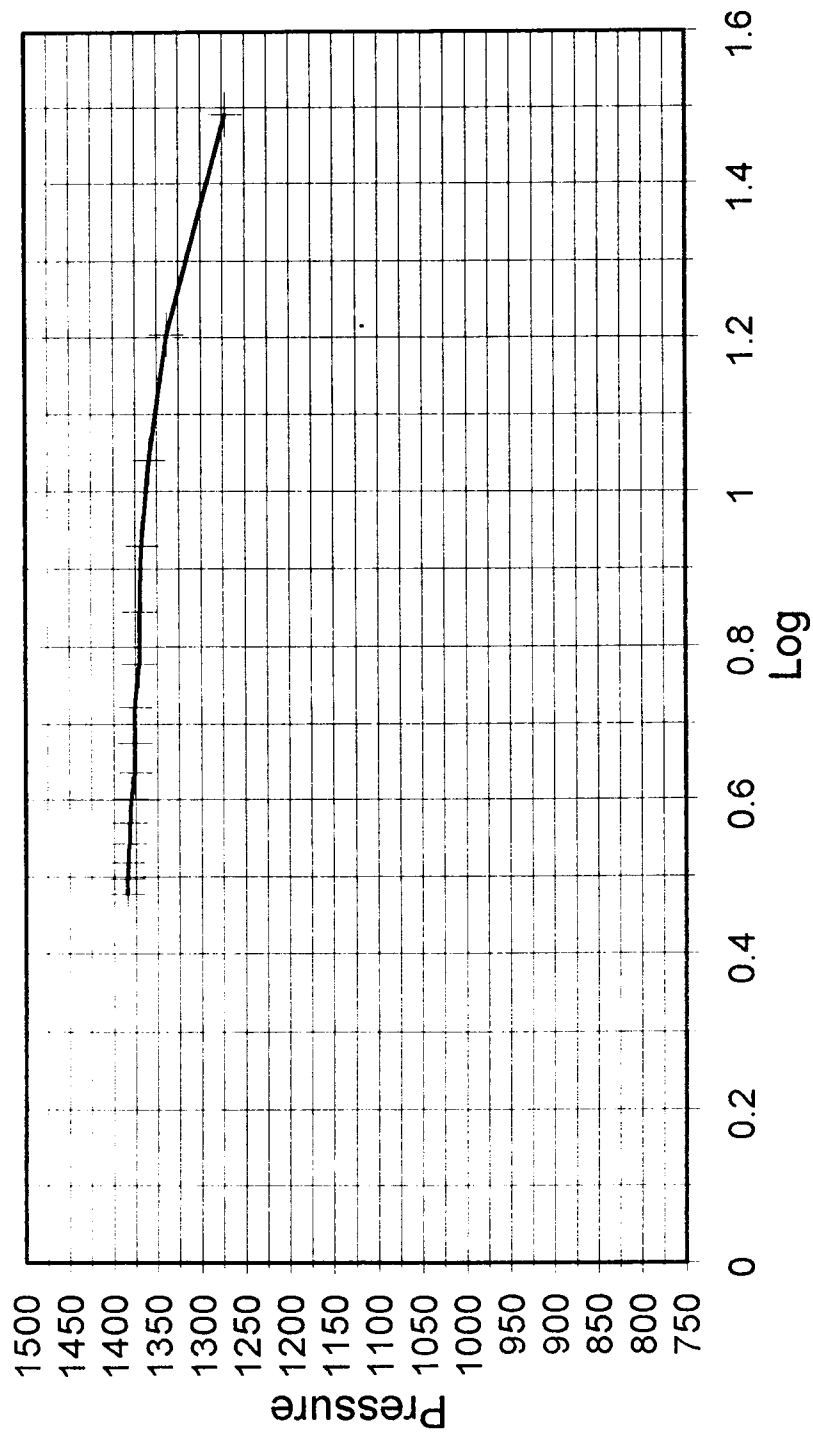
# Horner Plot: Shut-in #1

P \* 1395.67 Slope 28.802

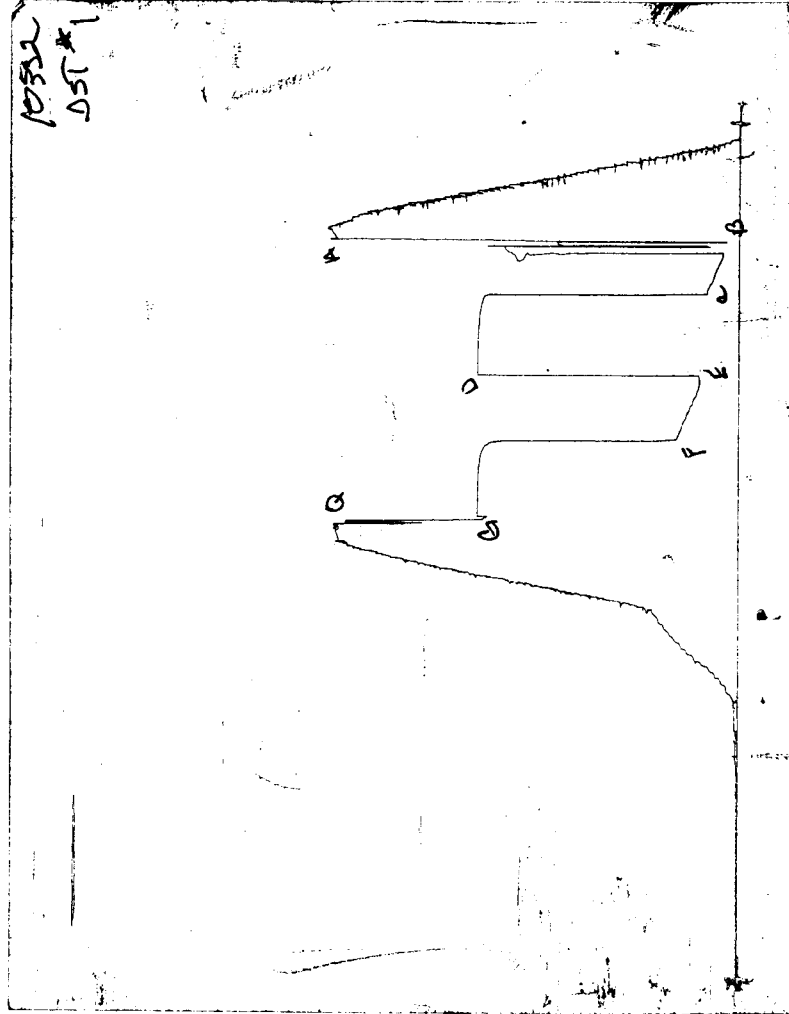


# Horner Plot: Shut-in #2

P\* 1399.77 Slope 31.170

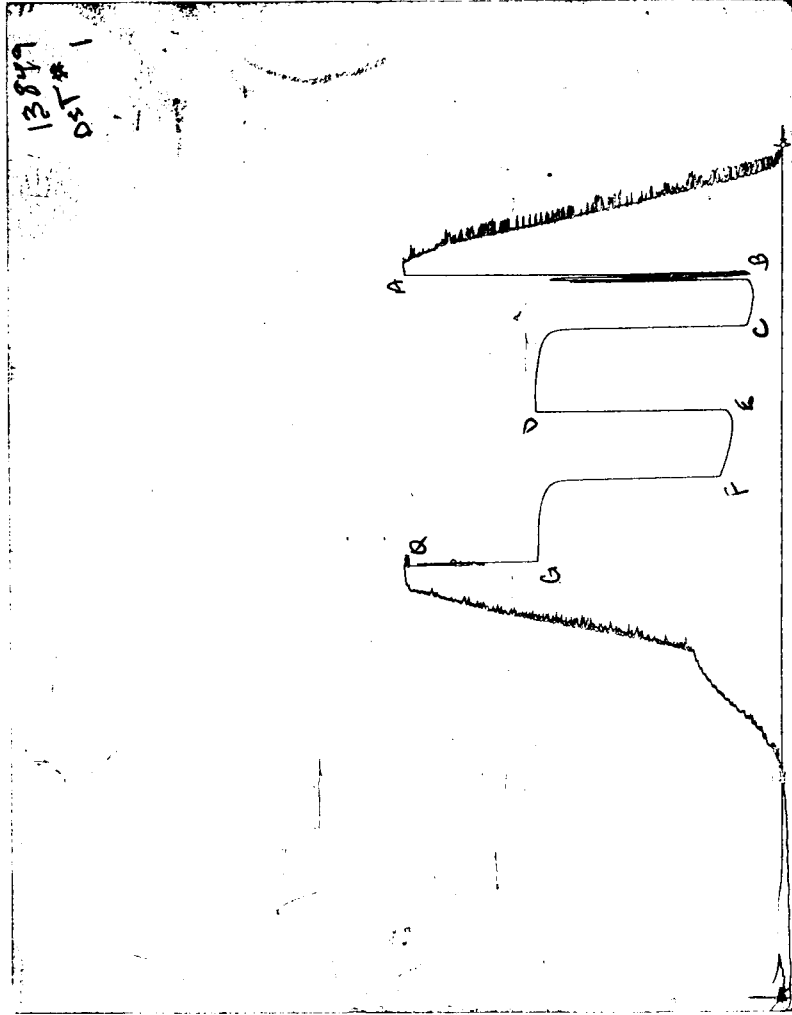


# CHART PAGE



This is a photocopy of the actual AK-1 recorder chart

CHART PAGE



This is a photocopy of the actual AK-1 recorder chart

NAME Marhofer DST # 1 RECORDER # 10332  
HYD. MUD. 2.142 (2170) FINAL HYD. MUD 2.055 (2083)

| FLOW<br>MINUTES<br>INTERVAL | INITIAL SHUTIN<br>MINUTES<br>INTERVAL | FINAL FLOW<br>MINUTES<br>INTERVAL | FINAL SHUTIN<br>MINUTES<br>INTERVAL |
|-----------------------------|---------------------------------------|-----------------------------------|-------------------------------------|
| 6 87 B                      |                                       | 1 .230 233 <sup>E</sup>           |                                     |
| 4 176                       | 1.333 1350                            | 2 .225 228                        | 1.256 1272                          |
| 3 1249                      | 1.345 1360                            | 3 .225 228                        | 1.322 1339                          |
| 4 1237                      | 1.350 1367                            | 4 .227 230                        | 1.342 1359                          |
| 2 111                       | 1.355 1372                            | 5 .235 238                        | 1.351 1368                          |
| 2 117                       | 1.360 1377                            | 6 .241 244                        | 1.353 1370                          |
| 0 127                       | 1.363 1380                            | 7 .253 256                        | 1.354 1371                          |
| 7 139                       | 1.363 1380                            | 8 .258 261                        | 1.359 1376                          |
| 1 145                       | 1.364 1381                            | 9 .272 275                        | 1.359 1376                          |
| 153                         | 1.365 1382                            | 10 .280 283                       | 1.359 1376                          |
| 6 158                       | 1.368 1385                            | 11 .290 293                       | 1.364 1381                          |
| 0 172                       | 1.369 1386                            | 12 .298 299                       | 1.365 1382                          |
| 1 182                       | 1.369 1386                            | 13 .307 311                       | 1.366 1383                          |
| 1 187                       | 1.369 1386                            | 14 .315 319                       | 1.367 1384                          |
| 1 187                       | 1.369 1386                            | 15 .321 325                       | 1.368 1385                          |
| 5 187 c                     | 1.370 1387                            | 16 .342 346 <sub>r</sub>          | 1.368 1385                          |
|                             | 1.370 1387                            | 17                                | 1.368 1385                          |
|                             | 1.370 1387                            | 18                                | 1.369 1386                          |
|                             | 1.370 1387                            | 19                                | 1.369 1386                          |
|                             | 1.372 1389                            | 20                                | 1.369 1386                          |
|                             | 1.372 1389 <sub>o</sub>               | 21                                | 1.369 1386 <sub>g</sub>             |
|                             |                                       | 22                                |                                     |
|                             |                                       | 23                                |                                     |
|                             |                                       | 24                                |                                     |
|                             |                                       | 25                                |                                     |
|                             |                                       | 26                                |                                     |
|                             |                                       | 27                                |                                     |

TRILOBITE TESTING L.L.C.

OPERATOR : Parrish Corp  
 WELL NAME: Marhofer #1  
 LOCATION : 27-20S-23W Ness KS  
 INTERVAL : 4346.00 To 4386.00 ft

DATE 8/26/97  
 KB 2214.00 ft TICKET NO: 10041 DST #2  
 GR 2209.00 ft FORMATION: Cherokee Sand  
 TD 4386.00 ft TEST TYPE: CONV

RECORDED DATA

| Mins |             | Field  | 1      | 2      | 3   | 4   | TIME DATA-----         |
|------|-------------|--------|--------|--------|-----|-----|------------------------|
| 30   | Rec.        | 13849  | 13849  | 10332  |     |     | PF Fr. 2300 to 2330 hr |
| 60   | Range(Psi ) | 4375.0 | 4375.0 | 4025.0 | 0.0 | 0.0 | IS Fr. 2330 to 0030 hr |
| 30   | Clock(hrs)  | 12 hr  | 12 hr  | 12 hr  |     |     | SF Fr. 0030 to 0100 hr |
| 60   | Depth(ft )  | 4352.0 | 4352.0 | 4383.0 | 0.0 | 0.0 | FS Fr. 0100 to 0200 hr |

|                | Field  | 1      | 2   | 3   | 4   |                   |
|----------------|--------|--------|-----|-----|-----|-------------------|
| Init Hydro     | 2178.0 | 2266.0 | 0.0 | 0.0 | 0.0 | T STARTED 2000 hr |
| First Flow     | 132.0  | 231.0  | 0.0 | 0.0 | 0.0 | T ON BOTM 2250 hr |
| Final Flow     | 506.0  | 533.0  | 0.0 | 0.0 | 0.0 | T OPEN 2300 hr    |
| In Shut-in     | 1337.0 | 1399.0 | 0.0 | 0.0 | 0.0 | T PULLED 0200 hr  |
| Init Flow      | 537.0  | 654.0  | 0.0 | 0.0 | 0.0 | T OUT 0500 hr     |
| Final Flow     | 831.0  | 852.0  | 0.0 | 0.0 | 0.0 |                   |
| Fl Shut-in     | 1317.0 | 1386.0 | 0.0 | 0.0 | 0.0 |                   |
| Final Hydro    | 2158.0 | 2120.0 | 0.0 | 0.0 | 0.0 |                   |
| Inside/Outside | I      | I      | O   |     |     |                   |

RECOVERY

Est Fluid 1900.00 ft of 0.00 ft in DC and 1900.00 ft in DP  
 00.00 ft of Gas In Pipe  
 00.00 ft of Gas Mud Water Cut Oil-12%g 15%w 18%w 55%o  
 00.00 ft of Gas Mud Water Cut Oil-10%g 15%w 20%w 55%o  
 20.00 ft of Gas Mud Water Cut Oil-25%g 10%w 25%w 40%o  
 30.00 ft of Gas Mud Water Cut Oil-20%g 6%w 24%w 50%o  
 40.00 ft of Gassy Mud Heavy Oil Cut Water  
 50.00 ft of 20%gas 5%w 35%oil 40%water  
 50.00 ft of Slight Oil Mud Cut Water-5%o 5%w 90%w  
 CALINITY 18000.00 P.P.M. A.P.I. Gravity 0.00

TOOL DATA-----  
 Tool Wt. 2100.00 lbs  
 Wt Set On Packer 20000.00 lbs  
 Wt Pulled Loose 95000.00 lbs  
 Initial Str Wt 52000.00 lbs  
 Unseated Str Wt 54000.00 lbs  
 Bot Choke 0.75 in  
 Hole Size 7.88 in  
 D Col. ID 2.25 in  
 D. Pipe ID 3.80 in  
 D.C. Length 0.00 ft  
 D.P. Length 4331.00 ft

LOW DESCRIPTION

Initial Flow:  
 Strong blow, bottom of bucket in 3 min

Initial Shut In:

Bled down for 10 mins, built back to  
 no blow

Final Flow:

Strong blow bottom of bucket in 1.5min

Final Shut In:

Bled down for 10 mins no blow back

SAMPLES:

SENT TO:

MUD DATA-----  
 Mud Type Chemical  
 Weight 0.00 lb/cf  
 Vis. 0.00 S/L  
 W.L. 0.00 in3  
 F.C. 0.00 in  
 Mud Drop

Amt. of fill 0.00 ft  
 Btm. H. Temp. 158.00 F  
 Hole Condition  
 % Porosity 0.00  
 Packer Size 6.75 in  
 No. of Packers 2  
 Cushion Amt. 0.00  
 Cushion Type  
 Reversed Out  
 Tool Chased  
 Tester Darren Amerine  
 Co. Rep. John Rose  
 Contr. LD Drilling  
 Rig #  
 Unit #  
 Pump T.

Test Successful: Y

Operator.....: Parrish Corp  
Well Name.....: Marhofer #1  
DST Number.....: 2

Location.: 27-20S-23W Ness Co.KS      Recorder No....: 13849  
Test Type: conv                      Recorder Depth: 4352  
Formation: Cherokee Sand              Test Interval.: 4346-4386

RESERVOIR CALCULATIONS: Fluid calculations based on shut-in #2

RESERVOIR PARAMETERS USED:

|                              |                        |            |
|------------------------------|------------------------|------------|
| Net Pay.....                 | 10.00 ft               | > per John |
| Porosity.....                | 20.00 %                |            |
| Bottom Hole Temp.....        | 158.00 F               |            |
| Specific Gravity.....        | 0.029                  |            |
| API Gravity.....             | 37.00                  |            |
| Compressibility.....         | 0.000008 /psi          |            |
| Viscosity.....               | 3.4620 cp              |            |
| Total Recovery.....          | 1900.00 ft             |            |
| Total Flowing Time.....      | 60.00 min.             |            |
| Flow Rate.....               | 227.60 bbls/d          |            |
| Final Flowing Pressure.....  | 852.00 psi             |            |
| Horner Slope.....            | 72.9730 psi/cycle      |            |
| Extrapolated Pressure.....   | 1415.08 psi            |            |
| Formation Volume Factor..... | 1.05 Reservoir/Surface |            |
| Well Bore Radius.....        | 3.94 in                |            |

RESULTS:

|                                 |                   |
|---------------------------------|-------------------|
| Effective Permeability.....     | 183.649329 md     |
| Flow Capacity.....              | 1836.4933 md.ft   |
| Transmissibility.....           | 530.4718 md.ft/cp |
| Skin Factor.....                | 3.2644            |
| Radius of Investigation.....    | 166.98180 ft      |
| Damage Ratio.....               | 1.5812            |
| Productivity Index.....         | 0.4042 bbls/psi.d |
| Productivity Index W/O Damage.. | 0.6391 bbls/psi.d |

Operator.....: Parrish Corp  
Well Name.....: Marhofer #1  
DST Number.....: 2

Location.: 27-20S-23W Ness Co KS      Recorder No...: 13849  
Test Type: conv                              Recorder Depth: 4352  
Formation: Cherokee Sand                      Test Interval.: 4346-4386

RESERVOIR CALCULATIONS: Fluid calculations based on shut-in #2

RESERVOIR PARAMETERS USED:

|                              |                   |                       |
|------------------------------|-------------------|-----------------------|
| Net Pay.....                 | 13.00 ft          | <i>&gt; per Lloyd</i> |
| Porosity.....                | 26.00 %           |                       |
| Bottom Hole Temp.....        | 158.00 F          |                       |
| Specific Gravity.....        | 0.029             |                       |
| API Gravity.....             | 37.00             |                       |
| Compressibility.....         | 0.000009 /psi     |                       |
| Viscosity.....               | 1.0460 cp         |                       |
| Total Recovery.....          | 1900.00 ft        |                       |
| Total Flowing Time.....      | 60.00 min.        |                       |
| Flow Rate.....               | 227.60 bbls/d     |                       |
| Final Flowing Pressure.....  | 852.00 psi        |                       |
| Horner Slope.....            | 72.9730 psi/cycle |                       |
| Extrapolated Pressure.....   | 1415.08 psi       |                       |
| Formation Volume Factor..... | 1.05              | Reservoir/Surface     |
| Well Bore Radius.....        | 3.94 in           |                       |

RESULTS:

|                                 |                   |
|---------------------------------|-------------------|
| Effective Permeability.....     | 42.845797 md      |
| Flow Capacity.....              | 556.9954 md.ft    |
| Transmissibility.....           | 532.5003 md.ft/cp |
| Skin Factor.....                | 3.5837            |
| Radius of Investigation.....    | 121.33283 ft      |
| Damage Ratio.....               | 1.6765            |
| Productivity Index.....         | 0.4042 bbls/psi.d |
| Productivity Index W/O Damage.. | 0.6776 bbls/psi.d |

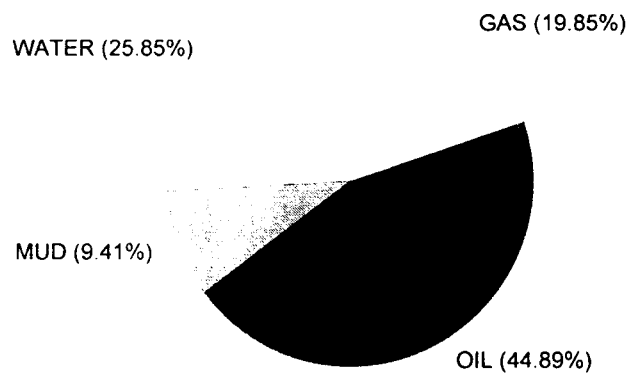
# CALCULATED RECOVERY ANALYSIS

DST 2

TICKET 10041

| SAMPLE  |   | TOTAL |    | GAS  |    | OIL  |    | WATER |    | MUD   |   |
|---------|---|-------|----|------|----|------|----|-------|----|-------|---|
|         |   | FEET  | %  | FEET | %  | FEET | %  | FEET  | %  | FEET  | % |
| DRILL   | 1 | 300   | 12 | 36   | 55 | 165  | 18 | 0     | 15 | 45    |   |
| PIPE    | 2 | 100   | 10 | 10   | 55 | 55   | 20 | 20    | 15 | 15    |   |
|         | 3 | 420   | 25 | 105  | 40 | 168  | 25 | 105   | 10 | 42    |   |
|         | 4 | 180   | 20 | 36   | 50 | 90   | 24 | 43.2  | 6  | 10.8  |   |
|         | 5 | 540   | 20 | 108  | 35 | 189  | 40 | 216   | 5  | 27    |   |
|         | 6 | 360   |    | 0    | 5  | 18   | 90 | 324   | 5  | 18    |   |
| WEIGHT  | 1 |       |    | 0    |    | 0    |    | 0     |    | 0     |   |
| PIPE    | 2 |       |    | 0    |    | 0    |    | 0     |    | 0     |   |
|         | 3 |       |    | 0    |    | 0    |    | 0     |    | 0     |   |
|         | 4 |       |    | 0    |    | 0    |    | 0     |    | 0     |   |
| DRILL   | 1 |       |    | 0    |    | 0    |    | 0     |    | 0     |   |
| COLLARS | 2 |       |    | 0    |    | 0    |    | 0     |    | 0     |   |
|         | 3 |       |    | 0    |    | 0    |    | 0     |    | 0     |   |
|         | 4 |       |    | 0    |    | 0    |    | 0     |    | 0     |   |
|         | 5 |       |    | 0    |    | 0    |    | 0     |    | 0     |   |
| TOTAL   |   | 1900  |    | 295  |    | 685  |    | 708.2 |    | 157.8 |   |

|            |          |   |          |   |           |
|------------|----------|---|----------|---|-----------|
|            |          |   | HRS OPEN |   | BBL/DAY   |
| BBL OIL=   | 9.48474  | * | 1        | = | 227.6     |
| BBL WATER= | 5.463324 | * |          | = | 131.11978 |
| BBL MUD=   | 1.987956 |   |          |   |           |
| BBL GAS =  | 4.1949   |   |          |   |           |



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## AK-1 Recorder Increments Listings

Test:

Date: 08/26/97

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|                 | Time | Pressure<br>PSIG | ◇<br>Pressure |
|-----------------|------|------------------|---------------|
| ***Start Flow 1 | 0    | 231.0            | 231.0         |
|                 | 3    | 251.0            | 20.0          |
|                 | 6    | 360.0            | 109.0         |
|                 | 9    | 366.0            | 6.0           |
|                 | 12   | 388.0            | 22.0          |
|                 | 15   | 407.0            | 19.0          |
|                 | 18   | 412.0            | 5.0           |
|                 | 21   | 428.0            | 16.0          |
|                 | 24   | 460.0            | 32.0          |
|                 | 27   | 498.0            | 38.0          |
|                 | 30   | 533.0            | 35.0          |

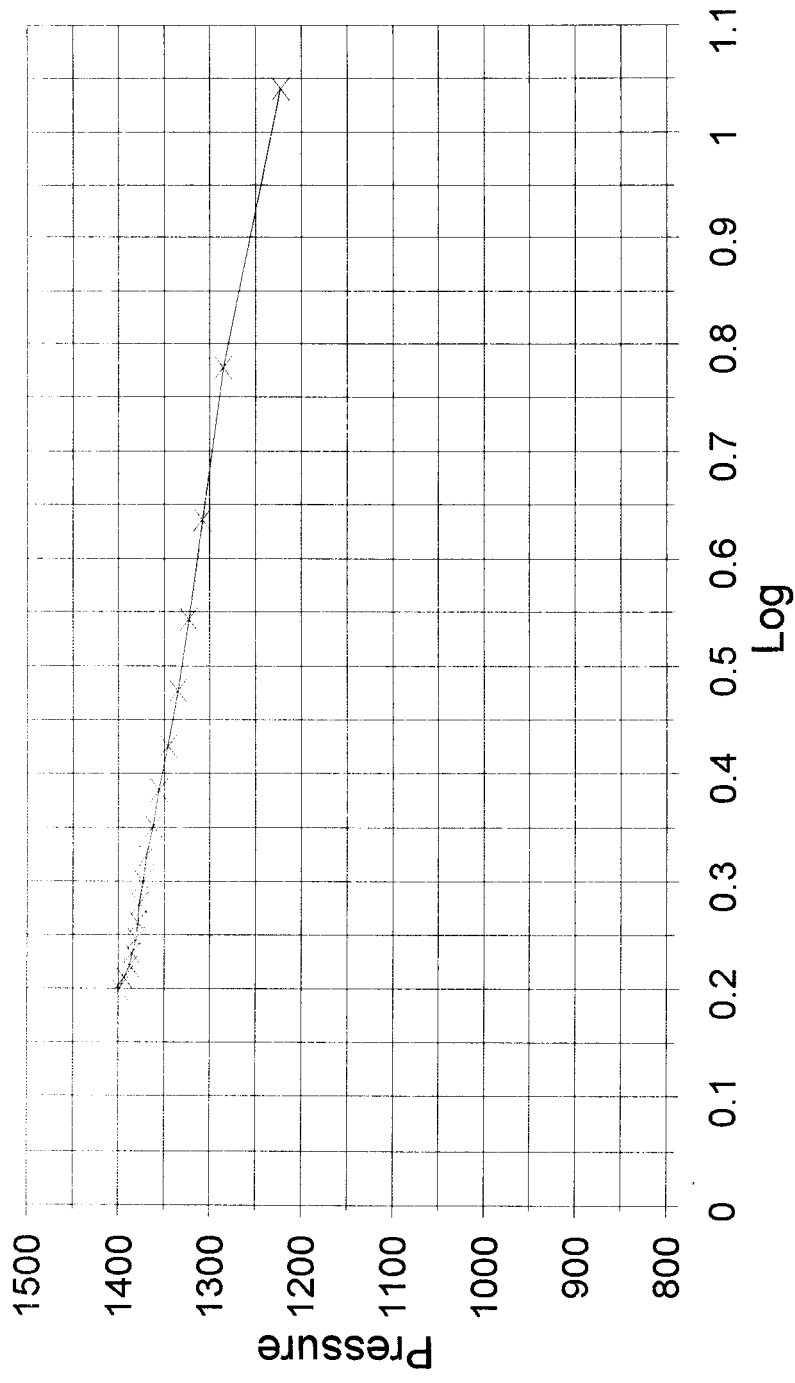
|                   | Time | Pressure<br>PSIG | Log<br>Horn T | ◇<br>Pressure | (T+dT)/dT |
|-------------------|------|------------------|---------------|---------------|-----------|
| ***Start Shutin 1 | 3    | 1223             | 1.041         | 1223.0        | 11.0      |
|                   | 6    | 1285             | 0.778         | 62.0          | 6.0       |
|                   | 9    | 1308             | 0.637         | 23.0          | 4.3       |
|                   | 12   | 1323             | 0.544         | 15.0          | 3.5       |
|                   | 15   | 1335             | 0.477         | 12.0          | 3.0       |
|                   | 18   | 1346             | 0.426         | 11.0          | 2.7       |
|                   | 21   | 1356             | 0.385         | 10.0          | 2.4       |
|                   | 24   | 1362             | 0.352         | 6.0           | 2.3       |
|                   | 27   | 1369             | 0.325         | 7.0           | 2.1       |
|                   | 30   | 1373             | 0.301         | 4.0           | 2.0       |
|                   | 33   | 1377             | 0.281         | 4.0           | 1.9       |
|                   | 36   | 1379             | 0.263         | 2.0           | 1.8       |
|                   | 39   | 1381             | 0.248         | 2.0           | 1.8       |
|                   | 42   | 1385             | 0.234         | 4.0           | 1.7       |
|                   | 45   | 1388             | 0.222         | 3.0           | 1.7       |
|                   | 48   | 1399             | 0.211         | 11.0          | 1.6       |
|                   | 51   | 1399             | 0.201         | 0.0           | 1.6       |

|                 | Time | Pressure<br>PSIG | ◇<br>Pressure |
|-----------------|------|------------------|---------------|
| ***Start Flow 2 | 0    | 654.0            | 654.0         |
|                 | 3    | 654.0            | 0.0           |
|                 | 6    | 654.0            | 0.0           |
|                 | 9    | 654.0            | 0.0           |
|                 | 12   | 671.0            | 17.0          |
|                 | 15   | 697.0            | 26.0          |
|                 | 18   | 723.0            | 26.0          |
|                 | 21   | 752.0            | 29.0          |
|                 | 24   | 776.0            | 24.0          |
|                 | 27   | 797.0            | 21.0          |
|                 | 30   | 824.0            | 27.0          |
|                 | 33   | 852.0            | 28.0          |

|                   | Time | Pressure<br>PSIG | Log<br>Horn T | ◇<br>Pressure | (T+dT)/dT |
|-------------------|------|------------------|---------------|---------------|-----------|
| ***Start Shutin 2 | 3    | 1268             | 1.322         | 1268.0        | 21.0      |
|                   | 6    | 1304             | 1.041         | 36.0          | 11.0      |
|                   | 9    | 1326             | 0.885         | 22.0          | 7.7       |
|                   | 12   | 1341             | 0.778         | 15.0          | 6.0       |
|                   | 15   | 1349             | 0.699         | 8.0           | 5.0       |
|                   | 18   | 1358             | 0.637         | 9.0           | 4.3       |
|                   | 21   | 1362             | 0.586         | 38.0          | 3.9       |
|                   | 24   | 1373             | 0.544         | -23.0         | 3.5       |
|                   | 27   | 1378             | 0.508         | 5.0           | 3.2       |
|                   | 30   | 1381             | 0.477         | 3.0           | 3.0       |
|                   | 33   | 1383             | 0.450         | 2.0           | 2.8       |
|                   | 36   | 1387             | 0.426         | 4.0           | 2.7       |
|                   | 39   | 1388             | 0.405         | 1.0           | 2.5       |
|                   | 42   | 1389             | 0.385         | 1.0           | 2.4       |
|                   | 45   | 1391             | 0.368         | 2.0           | 2.3       |
|                   | 48   | 1393             | 0.352         | 2.0           | 2.3       |
|                   | 51   | 1393             | 0.338         | 0.0           | 2.2       |
|                   | 54   | 1393             | 0.325         | 0.0           | 2.1       |
|                   | 57   | 1393             | 0.312         | 0.0           | 2.1       |
|                   | 60   | 1396             | 0.301         | 3.0           | 2.0       |
|                   | 63   | 1396             | 0.291         | 0.0           | 2.0       |
|                   | 66   | 1396             | 0.281         | 0.0           | 1.9       |
|                   | 69   | 1397             | 0.272         | 1.0           | 1.9       |
|                   | 72   | 1397             | 0.263         | 0.0           | 1.8       |
|                   | 75   | 1397             | 0.255         | 0.0           | 1.8       |
|                   | 78   | 1397             | 0.248         | 0.0           | 1.8       |

# Horner Plot: Shut-in #1

P\* 1454.31 Slope 275.304



# Horner Plot: Shut-in #2

P\* 1415.08 Slope 72.973

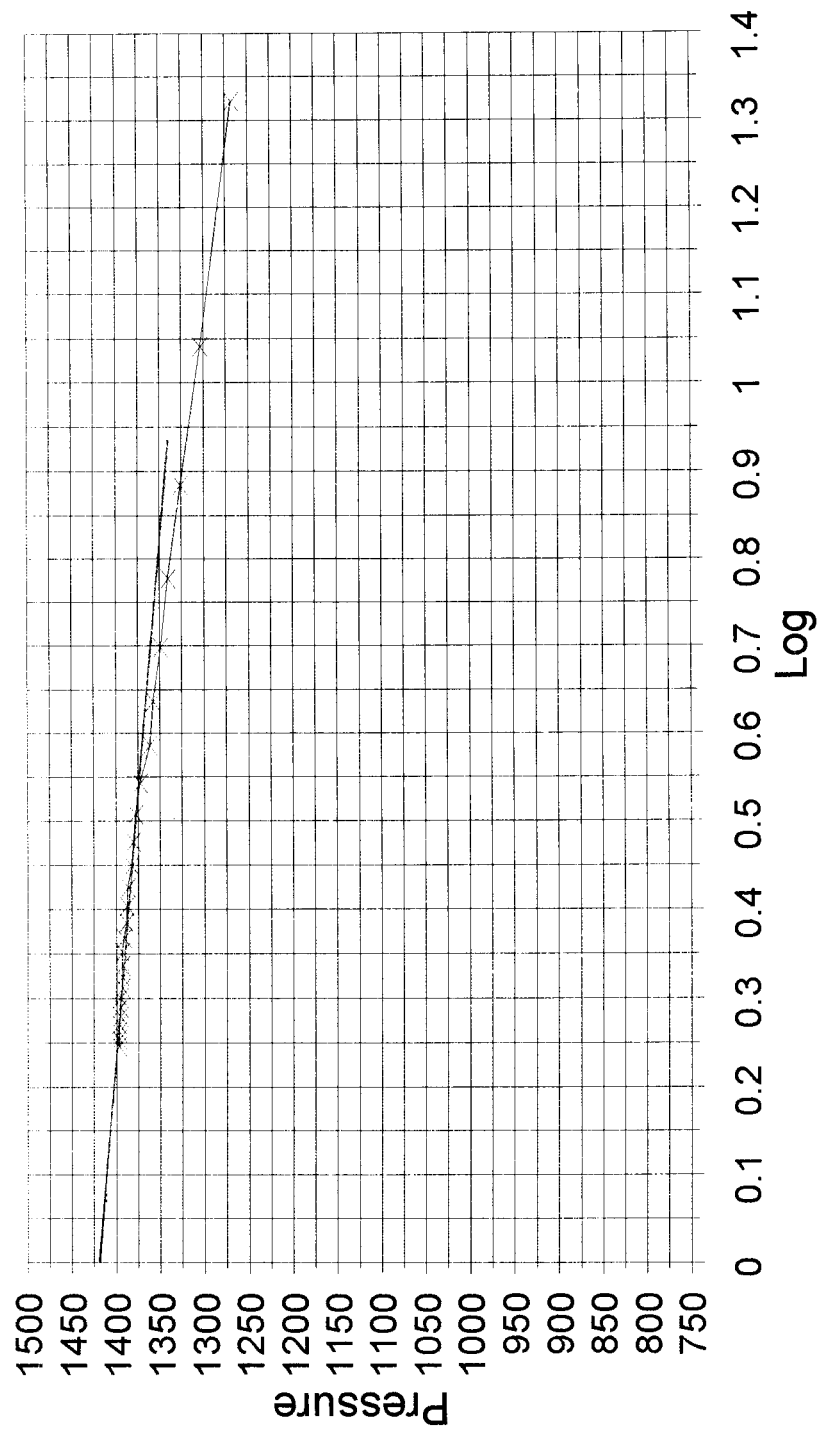
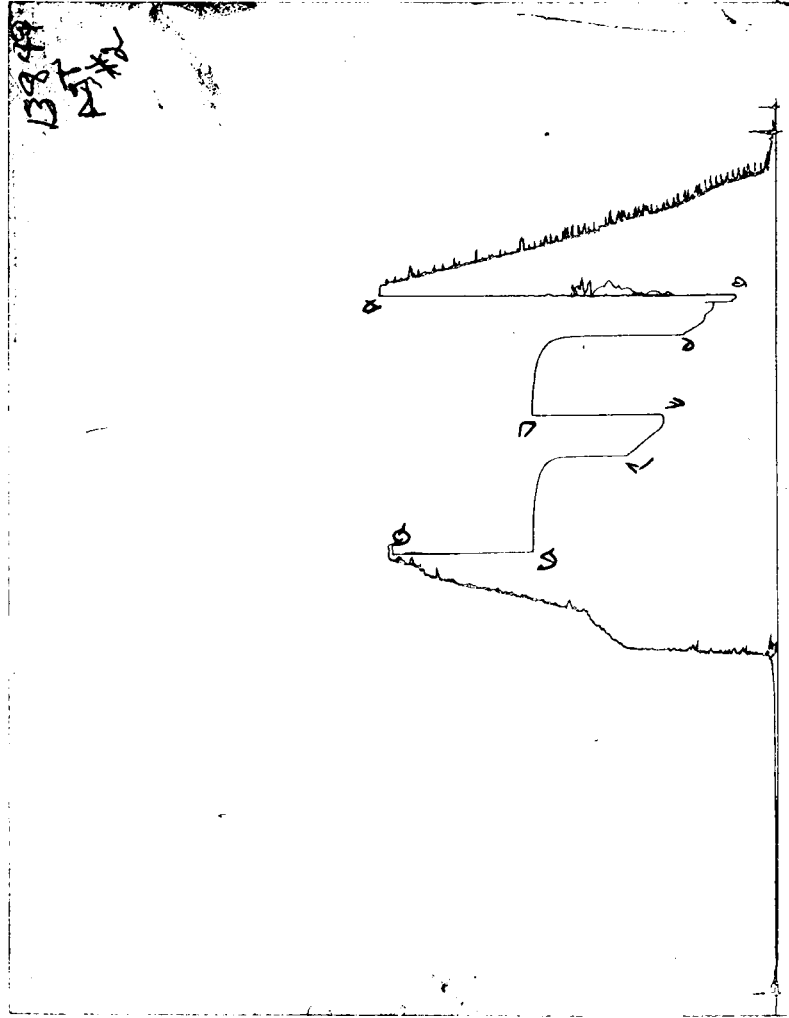
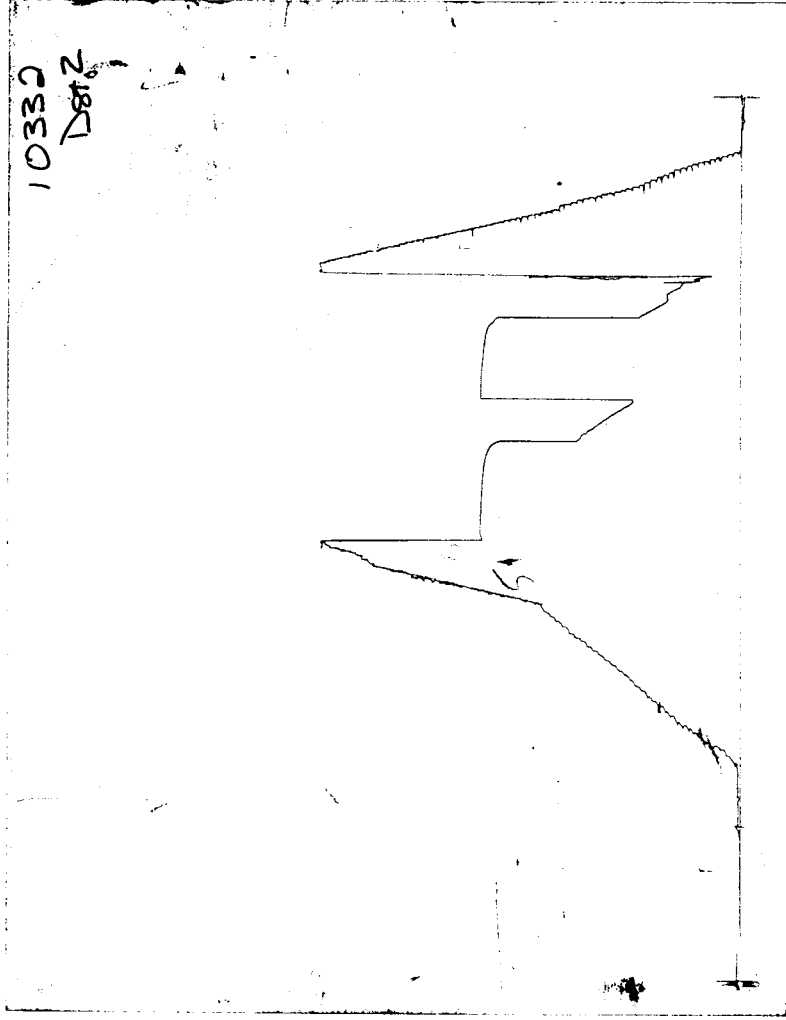


CHART PAGE



This is a photocopy of the actual AK-1 recorder chart

CHART PAGE



This is a photocopy of the actual AK-1 recorder chart

WELL NAME \_\_\_\_\_ DST # \_\_\_\_\_ RECORDER # \_\_\_\_\_

INIT. HYD. MUD. \_\_\_\_\_ FINAL HYD. MUD \_\_\_\_\_

|                                                     |                                                       |                                                   |                                                     |
|-----------------------------------------------------|-------------------------------------------------------|---------------------------------------------------|-----------------------------------------------------|
| INITIAL FLOW<br>MINUTES <u>30</u><br>INTERVAL _____ | INITIAL SHUTIN<br>MINUTES <u>60</u><br>INTERVAL _____ | FINAL FLOW<br>MINUTES <u>30</u><br>INTERVAL _____ | FINAL SHUTIN<br>MINUTES <u>60</u><br>INTERVAL _____ |
|-----------------------------------------------------|-------------------------------------------------------|---------------------------------------------------|-----------------------------------------------------|

|       |  |          |      |    |  |                |      |
|-------|--|----------|------|----|--|----------------|------|
|       |  |          | 1    |    |  |                |      |
|       |  | 5 1.106  | 1223 | 2  |  | <del>000</del> |      |
|       |  | 6 1.162  | 1285 | 3  |  | 1.147          | 1268 |
|       |  | 9 1.183  | 1308 | 4  |  | 1.179          | 1304 |
|       |  | 12 1.196 | 1323 | 5  |  | 1.199          | 1326 |
|       |  | 15 1.207 | 1335 | 6  |  | 1.213          | 1341 |
|       |  | 18 1.217 | 1346 | 7  |  | 1.220          | 1349 |
|       |  | 21 1.226 | 1356 | 8  |  | 1.228          | 1358 |
|       |  | 24 1.232 | 1362 | 9  |  | 1.232          | 1362 |
|       |  | 27 1.238 | 1369 | 10 |  | 1.236          | 1373 |
|       |  | 30 1.242 | 1373 | 11 |  | 1.240          | 1378 |
|       |  | 33 1.245 | 1377 | 12 |  | 1.243          | 1381 |
|       |  | 36 1.251 | 1389 | 13 |  | 1.247          | 1383 |
|       |  | 39 1.253 | 1384 | 14 |  | 1.250          | 1387 |
|       |  | 42 1.256 | 1385 | 15 |  | 1.251          | 1388 |
| 1.265 |  | 45 1.259 | 1388 | 16 |  | 1.252          | 1389 |
|       |  | 48 1.261 | 1399 | 17 |  | 1.254          | 1391 |
|       |  | 51 1.265 | 1399 | 18 |  | 1.256          | 1393 |
|       |  | 54       |      | 19 |  | 1.256          | 1393 |
|       |  | 57       |      | 20 |  | 1.256          | 1393 |
|       |  | 60       |      | 21 |  | 1.256          | 1396 |
|       |  |          |      | 22 |  | 1.257          | 1396 |
|       |  |          |      | 23 |  | 1.257          | 1396 |
|       |  |          |      | 24 |  | 1.257          | 1397 |
|       |  |          |      | 25 |  | 1.257          | 1397 |
|       |  |          |      | 26 |  | 1.257          | 1397 |
|       |  |          |      | 27 |  | 1.257          | 1397 |

WELL NAME \_\_\_\_\_ DST # \_\_\_\_\_ RECORDER # \_\_\_\_\_

INIT. HYD. MUD. \_\_\_\_\_ FINAL HYD. MUD \_\_\_\_\_

| INITIAL FLOW |          | INITIAL SHUTIN |          | FINAL FLOW |          | FINAL SHUTIN |          |
|--------------|----------|----------------|----------|------------|----------|--------------|----------|
| MINUTES      | INTERVAL | MINUTES        | INTERVAL | MINUTES    | INTERVAL | MINUTES      | INTERVAL |
|              |          |                |          | 1          |          |              |          |
| 208          | 231      |                |          | 2          | .590 654 |              |          |
| 226          | 251      |                |          | 3          | .590 654 |              |          |
| 324          | 360      |                |          | 4          | .590 654 |              |          |
| 330          | 366      |                |          | 5          | .590 654 |              |          |
| 350          | 388      |                |          | 6          | .606 671 |              |          |
| 367          | 407      |                |          | 7          | .629 697 |              |          |
| 371          | 412      |                |          | 8          | .653 723 |              |          |
| 386          | 428      |                |          | 9          | .679 752 |              |          |
| 414          | 460      |                |          | 10         | .701 776 |              |          |
| 449          | 498      |                |          | 11         | .720 797 |              |          |
| 480          | 533      |                |          | 12         | .745 824 |              |          |
|              |          |                |          | 13         | .770 852 |              |          |
|              |          |                |          | 14         |          |              |          |
|              |          |                |          | 15         |          |              |          |
|              |          |                |          | 16         |          |              |          |
|              |          |                |          | 17         |          |              |          |
|              |          |                |          | 18         |          |              |          |
|              |          |                |          | 19         |          |              |          |
|              |          |                |          | 20         |          |              |          |
|              |          |                |          | 21         |          |              |          |
|              |          |                |          | 22         |          |              |          |
|              |          |                |          | 23         |          |              |          |
|              |          |                |          | 24         |          |              |          |
|              |          |                |          | 25         |          |              |          |
|              |          |                |          | 26         |          |              |          |
|              |          |                |          | 27         |          |              |          |