C142

TABLE 2
Rock-Eval Pyrolysis Data from Paleozoic Samples in Nebraska

| EPR No. | Depth (ft) | TOC | S1 mg/gm | S2 mg/gm | S3 mg/gm | HI | OI | T-Max |
|---|---|---|---|---|---|---|---|---|
| Southland #1 Cranmore C141 | | | | | | | | |
| 77423A | 5754 | .03 | 0.02 | 0.47 | 0.91 | 1566 | 3033 | - |
| B | 5769 | .03 | 0.02 | 0.37 | 1.10 | 1233 | 3666 | - |
| * Southland Royalty #1 Withers C142 | | | | | | | | |
| 77424A | 4848 | 10.83 | 5.04 | 77.69 | 2.35 | 717 | 21 | 422 |
| B | 4893 | 0.04 | 0.03 | 0.10 | 0.62 | 250 | 1550 | - |
| C | 4921.8 | 0.01 | 0.01 | 0.18 | 0.47 | 1880 | 4700 | - |
| D | 4963 | 0.09 | 0.02 | 1.14 | 0.38 | 1266 | 422 | - |
| Diamond Shamrock #34-21 Christenson B582 | | | | | | | | |
| 77425A | 7077 | 0.04 | 0.03 | 0.51 | 0.22 | 1275 | 550 | - |
| B | 7102 | 0.01 | 0.02 | 0.14 | 0.54 | 1400 | 5400 | - |
| Diamond Shamrock #1 Deaver B581 | | | | | | | | |
| 77426A | 7100 | 0.10 | 0.03 | 1.27 | 0.25 | 1270 | 250 | - |
| Southland Royalty #1 Jensen C144 | | | | | | | | |
| 77420A | 5151.5 | 0.03 | 0.02 | 0.37 | 0.36 | 1233 | 1200 | - |
| B | 5172.5 | 0.09 | 0.0 | 1.19 | 0.34 | 1322 | 377 | - |
| Southland Royalty #1 Rush Creek C143 | | | | | | | | |
| 77421A | 5043.5 | 0.01 | 0.02 | 0.20 | 0.61 | 2000 | 6100 | - |
| B | 5066.0 | 0.02 | 0.02 | 0.27 | 0.58 | 1350 | 2900 | - |
| C | 5077 | 0.03 | 0.04 | 0.34 | 0.65 | 1133 | 2166 | - |
| D | 5088 | 0.06 | 0.04 | 0.80 | 0.35 | 1333 | 583 | - |
| American Petrofina #1 Toof C139 | | | | | | | | |
| 77422A | 5980.5 | 0.06 | 0.03 | 0.76 | 0.65 | 1266 | 1083 | - |
| B | 6002.5 | 0.03 | 0.02 | 0.36 | 1.04 | 1200 | 3466 | - |
| C | 6013.5 | 0.06 | 0.0 | 0.81 | 0.32 | 1350 | 533 | - |

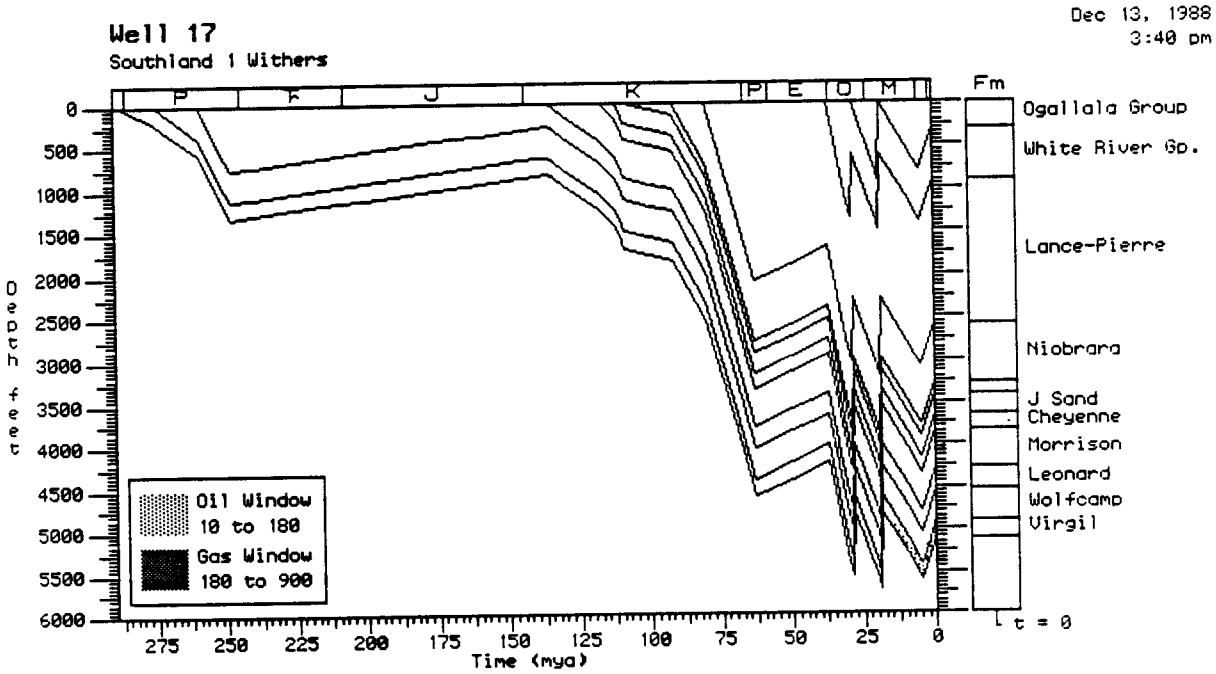
C142

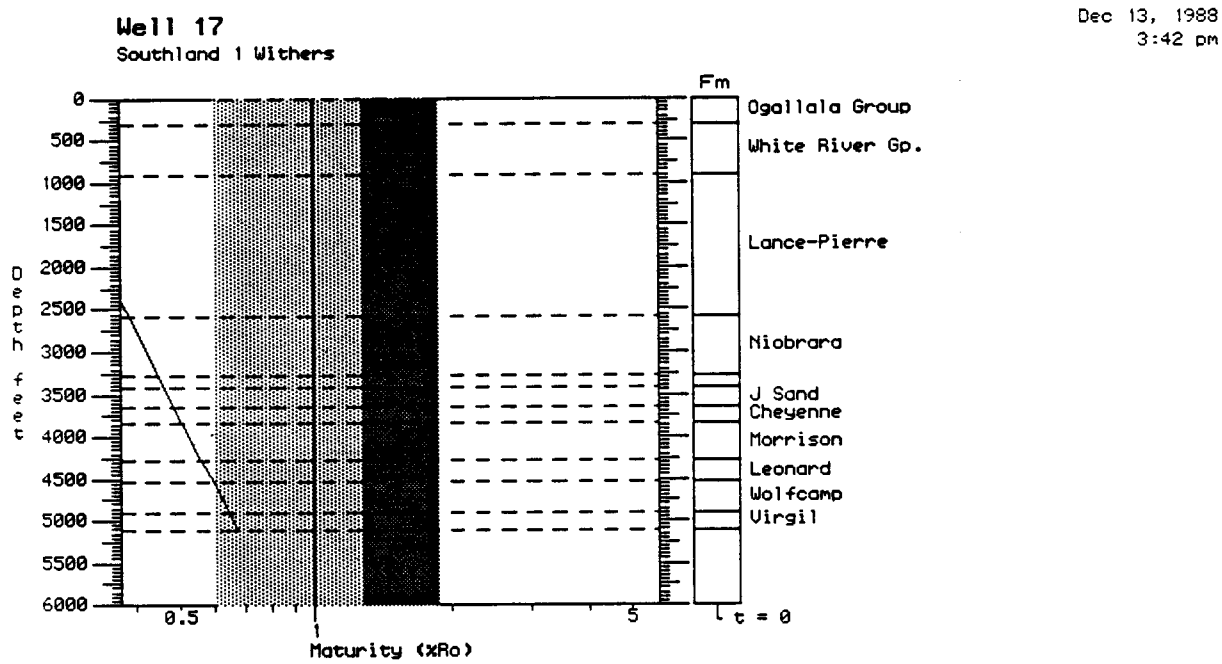
R1 = ROCKY1 DATA  O = OIL  C = CONC(KER)
R2 = ROCKY2 DATA  B = BIT  W = WHOLE ROCK
K = KER

GENERAL PURPOSE LAYOUT FORM GO-467-1

NAME _____ PROGRAM SYMBOL _____ PAGE _____
PROJECT NO. _____ PROBLEM DESCRIPTION _____ DATE _____
CHARGE NO. _____

| USGS ID: Depth: ~~COFRCID~~#CSAOPTID | MMDDYY | SMPL WT. | S1 | S2 | S3 | T MAX | S1 S1+S2 | S2/S3 | HI | OI | TOC |
|---|---|---|---|---|---|---|---|---|---|---|---|
| T226_5A__4025 | R2060890 | 10.0 | .10 | 1.20 | .34 | 428 | 0.08 | 3.53 | 206 | 58 | 1.26 |
| T226_6__4034 | R2060890 | 11.0 | .09 | .81 | 0.00 | 425 | 0.10 | 0.00 | 147 | 0 | 1.06 |
| T226_1__4041 | R2060890 | 5.3 | 11.32 | 148.49 | 2.89 | 419 | 0.07 | 51.38 | 496 | 9 | 23.46 |
| T226_2__4041 | R2060890 | 5.8 | 9.48 | 137.24 | 2.43 | 420 | 0.06 | 56.48 | 541 | 9 | 20.56 |
| T226_3__4041 | R2060890 | 10.6 | 3.77 | 44.81 | 1.23 | 419 | 0.08 | 36.43 | 400 | 11 | 12.81 |
| C142_1B__4839 | R2060890 | 10.5 | 5.71 | 83.80 | 1.18 | 424 | 0.06 | 71.02 | 519 | 7 | 9.65 |
| C_142_1A__4839 | R2060890 | 49.7 | 5.49 | 44.16 | .50 | 424 | 0.11 | 88.32 | 473 | 5 | 17.27 |
| C_142_2__4841 | R2060890 | 10.5 | 5.71 | 94.00 | 1.06 | 425 | 0.06 | 88.68 | 555 | 6 | 17.33 |
| C_142_3__4844 | R2060890 | 50.8 | .13 | .33 | .24 | 448 | 0.28 | 1.38 | 64 | 47 | 0.58 |
| B_505_5__8650 | R2060890 | 80.3 | .27 | .18 | .07 | 350 | 0.60 | 2.57 | 600 | 233 | 0.04 |
| B_505_4__8656 | R2060890 | 80.7 | .23 | .18 | .09 | 351 | 0.56 | 2.00 | 600 | 300 | |
| C_794_9__6608 | R2060890 | 80.5 | .79 | 1.93 | .51 | 434 | 0.29 | 3.78 | 87 | 23 | |
| C_794_8__6590 | R2060890 | 50.2 | .47 | 4.34 | .25 | 445 | 0.10 | 17.36 | 259 | 14 | |
| ~~#0502100001 01RR~~ | ~~2060890~~ | ~~37.2~~ | ~~.29~~ | ~~.45~~ | ~~.37~~ | ~~405~~ | ~~0.39~~ | ~~1.22~~ | ~~70~~ | ~~57~~ | |
| ~~1050210000201RR~~ | ~~2060890~~ | ~~31.0~~ | ~~.09~~ | ~~.90~~ | ~~.01~~ | ~~435~~ | ~~0.09~~ | ~~90.00~~ | ~~130~~ | ~~1~~ | |


Dec 13, 1988
3:40 pm
Well 17
Southland 1 Withers
P
F
J
K
P
E
O
M
Fm
Ogallala Group
White River Gp.
Lance-Pierre
Niobrara
J Sand
Cheyenne
Morrison
Leonard
Wolfcamp
Virgil
t = 0
Depth feet
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
Oil Window
10 to 180
Gas Window
180 to 900
275
250
225
200
175
150
125
100
75
50
25
0
Time (mya)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3:42 pm
Well 17
Southland 1 Withers
Fm
Ogallala Group
White River Gp.
Lance-Pierre
Niobrara
J Sand
Cheyenne
Morrison
Leonard
Wolfcamp
Virgil
t = 0
Depth feet
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
0.5
1
5
Maturity (xRo)

# SOURCE ROCKS

WELL NAME: SOUTHLAND ROYALTY 1 WITHERS

| FOOTAGE | FORMATION | TOC | S1 | S2 | HI | TMAX | PI |
|---|---|---|---|---|---|---|---|
| 4838.7 | Permian | 14.13 | 4356 | 3465 | 246 | 439 | 0.11 |
| 4848.1 | " | 6.82 | 2037 | 16937 | 243 | 439 | 0.10 |
| 4839.1 | " | 11.01 | 3765 | 27682 | 251 | 441 | 0.11 |
| 4840.9 | " | 20.75 | 6272 | 51631 | 248 | 439 | 0.10 |

# OILS

| OIL | % VOL. | % SAT. | % AROM. | % NSO. | % ASPH. | S/A |
|---|---|---|---|---|---|---|
| 1 | 58.3 | 59.1 | 29.2 | 6.9 | 4.8 | 2.02 |
| 2 | 15.0 | 56.9 | 21.0 | 15.6 | 6.5 | 2.71 |
| 3 | 13.0 | 55.1 | 26.3 | 8.2 | 10.3 | 2.09 |
| 4 | 13.9 | 57.9 | 23.7 | 12.1 | 6.3 | 2.44 |
| 5 | 20.6 | 52.4 | 27.1 | 17.1 | 3.4 | 1.93 |
| 6 | 25.9 | 59.3 | 23.2 | 16.3 | 1.2 | 2.56 |
| 7 | 18.0 | 42.3 | 33.9 | 12.8 | 11.0 | 1.25 |
| 8 | 33.8 | 44.4 | 29.0 | 11.2 | 15.4 | 1.53 |
| 9 | 7.1 | 39.3 | 25.7 | 22.6 | 12.4 | 1.53 |
| 10 | 22.7 | 56.7 | 17.6 | 22.3 | 3.4 | 3.21 |
| 11 | 22.6 | 51.0 | 26.2 | 15.6 | 7.2 | 1.95 |
| 12 | 14.1 | 52.8 | 23.3 | 17.5 | 6.4 | 2.27 |
| 13 | 30.2 | 44.7 | 24.8 | 24.1 | 6.4 | 1.80 |
| 14 | * | 29.0 | 19.6 | 5.8 | 45.6 | 1.48 |
| SOUTHLAND I WITHERS 15 | 1.6 | 47.7 | 26.9 | 10.8 | 14.5 | 1.48 |
| 16 | 22.6 | 68.9 | 24.6 | 4.7 | 1.8 | 2.82 |
| 17 | 29.4 | 51.3 | 23.0 | 18.5 | 7.2 | 2.23 |
| 18 | 30.1 | 54.8 | 35.9 | 8.5 | 0.8 | 1.52 |
| 19 | 25.8 | 54.5 | 25.3 | 14.9 | 5.3 | 2.16 |
| 20 | 20.7 | 56.9 | 26.3 | 14.1 | 2.7 | 2.16 |

continued...

# OILS

| OIL | % VOL. | % SAT. | % AROM. | % NSO. | % ASPH. | S/A |
|---|---|---|---|---|---|---|
| 21 | * | 52.3 | 34.6 | 8.5 | 4.6 | 1.51 |
| 22 | * | 27.4 | 13.4 | 36.8 | 22.4 | 2.04 |
| 23 | * | 32.3 | 32.0 | 13.4 | 22.3 | 1.01 |
| 24 | * | 40.3 | 27.0 | 19.3 | 13.4 | 1.49 |
| 25 | * | 49.8 | 33.5 | 7.7 | 9.0 | 1.49 |
| 26 | * | 33.0 | 18.0 | 8.7 | 40.3 | 1.83 |

Key

* = Not Determined
Sat + Arom + NSO + Asph normalized to 100%

## Nickel and Vanadium contents of oils

| Oil No. | Ni (ppm) | V (ppm) | Ni/V |
|---|---|---|---|
| 2 | 6.2 | 14.1 | 0.4 |
| 4 | 24.6 | 2.4 | 10.3 |
| 5 | 4.1 | 5.7 | 0.7 |
| 7 | 10.1 | 51.6 | 0.2 |
| 9 | 14.8 | 49.2 | 0.3 |
| 10 | 9.8 | 23.8 | 0.4 |
| 11 | 10.8 | 28.9 | 0.4 |
| 12 | 7.2 | 34.9 | 0.2 |
| 13 | 10.2 | 36.2 | 0.3 |
| 15 | 18.7 | 10.0 | 1.9 |
| 16 | 15.8 | 23.8 | 0.7 |
| 17 | 15.0 | 54.1 | 0.3 |
| 18 | <0.8 | 0.3 | ---- |
| 19 | 10.6 | 37.5 | 0.3 |
| 20 | 12.6 | 2.8 | 4.5 |

(15) SOUTHLAND ROYALTY 1 WITHERS

# OILS

| OIL | Pr/Ph | Pr/17 | 17/26 | 18/19 |
|---|---|---|---|---|
| 1 | 1.23 | 0.83 | 7.08 | 1.00 |
| 2 | 1.50 | 0.50 | 5.21 | 1.03 |
| 3 | 1.61 | 0.54 | 6.13 | 1.03 |
| 4 | 1.48 | 0.46 | 5.21 | 1.07 |
| 5 | 1.13 | 0.41 | 2.88 | 1.04 |
| 6 | 1.60 | 0.40 | 5.88 | 1.04 |
| 7 | 1.46 | 0.95 | 3.08 | 1.25 |
| 8 | 0.97 | 0.80 | 3.07 | 1.14 |
| 9 | 1.59 | 0.72 | 4.51 | 1.05 |
| 10 | 1.67 | 0.43 | 4.54 | 1.07 |
| 11 | 1.62 | 0.41 | 5.26 | 1.06 |
| 12 | 1.40 | 0.75 | 3.33 | 0.94 |
| 13 | 1.55 | 0.51 | 4.07 | 1.06 |
| 14 | 1.56 | 0.44 | 4.72 | 0.96 |
| SOUTHLAND / WITHERS 15 | 1.54 | 0.52 | 10.10 | 1.18 |
| 16 | 1.60 | 0.50 | 5.15 | 1.03 |
| 17 | 1.58 | 0.46 | 5.89 | 1.04 |
| 18 | 1.22 | 1.07 | 7.42 | 1.07 |
| 19 | 1.73 | 0.54 | 5.41 | 0.97 |
| 20 | 1.11 | 0.93 | 4.15 | 1.02 |

continued...

OILS

| OIL | Pr/Ph | Pr/17 | 17/26 | 18/19 |
|---|---|---|---|---|
| 21 | 1.55 | 0.40 | 6.46 | 1.07 |
| 22 | 0.74 | 0.66 | 3.24 | 0.98 |
| 23 | 1.18 | 0.62 | 3.51 | 0.91 |
| 24 | 1.39 | 0.69 | 4.94 | 0.82 |
| 25 | 1.47 | 0.91 | 4.80 | 0.84 |
| 26 | 1.53 | 0.51 | 2.97 | 1.01 |

# OILS

| OIL | BB/aa | 20S/20R | 22S/22R | %27 | %28 | %29 |
|---|---|---|---|---|---|---|
| 1 | 1.95 | 0.78 | 1.63 | 40 | 22 | 38 |
| 4 | 1.49 | 1.00 | 1.44 | 45 | 21 | 34 |
| 5 | 1.55 | 0.71 | 1.33 | 38 | 30 | 32 |
| 8 | 1.56 | 1.07 | 1.33 | 42 | 20 | 38 |
| 9 | 1.42 | 0.86 | 1.47 | 42 | 19 | 39 |
| 11 | 1.03 | 0.96 | 1.41 | 41 | 22 | 37 |
| 12 | 1.40 | 0.95 | 1.42 | 43 | 21 | 36 |
| SOUTHLAND / WITHERS 15 | 1.35 | 0.97 | 1.40 | 47 | 17 | 36 |
| 16 | 1.68 | 0.94 | 1.13 | 41 | 24 | 35 |
| 17 | 1.68 | 0.86 | 1.43 | 54 | 43 | 43 |
| 18 | 1.70 | 1.00 | 1.38 | 44 | 18 | 38 |
| 19 | 1.50 | 1.00 | 1.36 | 49 | 26 | 25 |
| 20 | 1.63 | 0.96 | 1.43 | 54 | 43 | 43 |
| 22 | 1.71 | 1.15 | * | 39 | 31 | 30 |
| 24 | 1.69 | 1.02 | 1.33 | 44 | 20 | 36 |
| 25 | 1.58 | 1.10 | 1.38 | 43 | 18 | 39 |
| 26 | 1.61 | 1.10 | 1.20 | 41 | 20 | 39 |

Key

* = Not calculated

# OILS

| OIL | DELTA 13Csat | DELTA 13Carom |
|---|---|---|
| 1 | -28.8 | -28.5 |
| 2 | -30.1 | -29.3 |
| 3 | -30.3 | -29.7 |
| 4 | -30.1 | -29.3 |
| 5 | -28.9 | -28.1 |
| 6 | -30.2 | -29.2 |
| 7 | -30.3 | -29.8 |
| 8 | -30.3 | -29.8 |
| 9 | -30.5 | -30.0 |
| 10 | -30.5 | -29.8 |
| 11 | -30.4 | -29.5 |
| 12 | -30.2 | -29.5 |
| 13 | -30.6 | -29.8 |
| 14 | -30.3 | * |
| SOUTHLAND / WITHERS 15 | -30.1 | -30.1 |
| 16 | -30.5 | -29.5 |
| 17 | -30.7 | -30.2 |
| 18 | -28.5 | -27.6 |
| 19 | -30.5 | -30.2 |
| 20 | -28.2 | -27.4 |

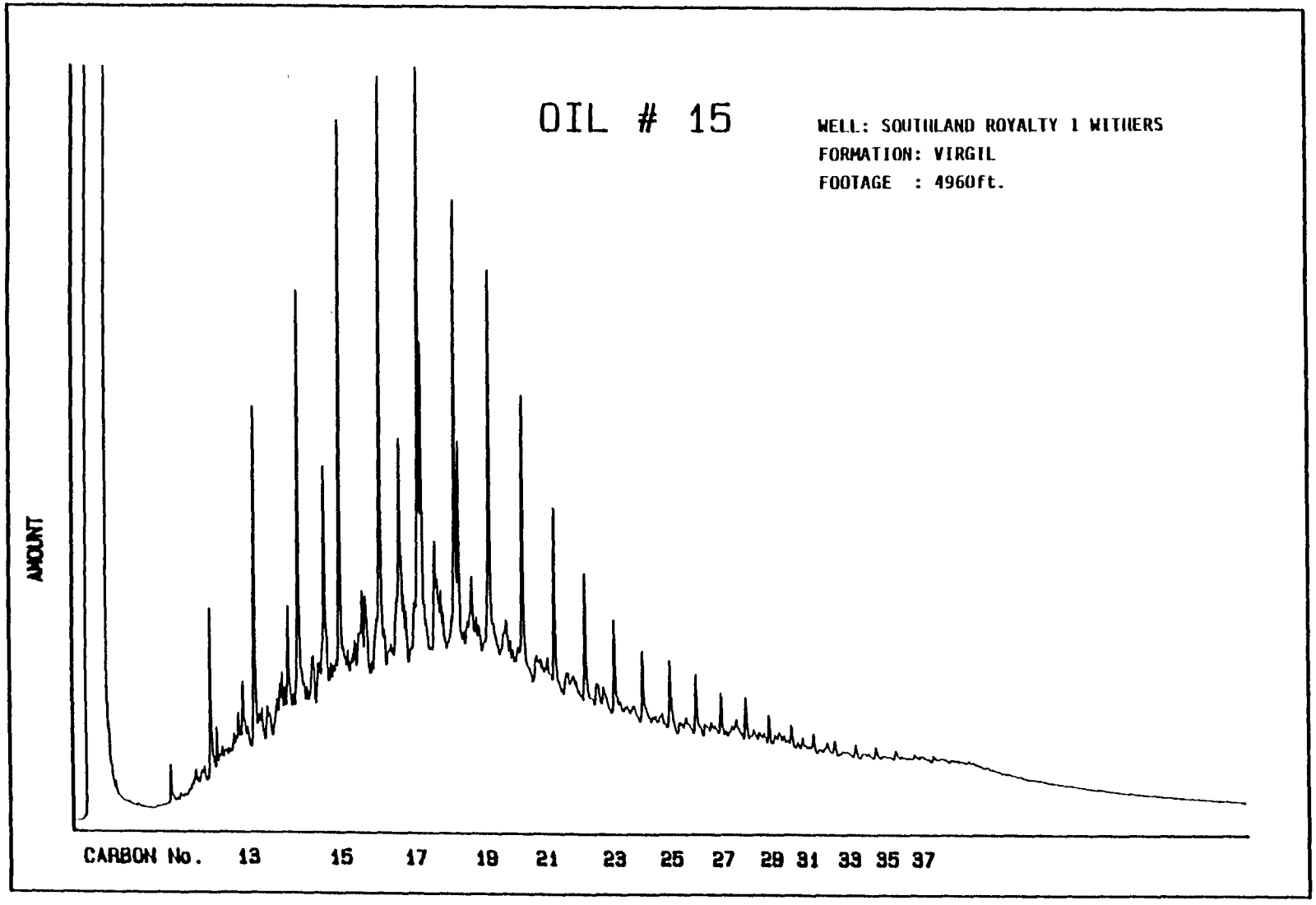
continued...

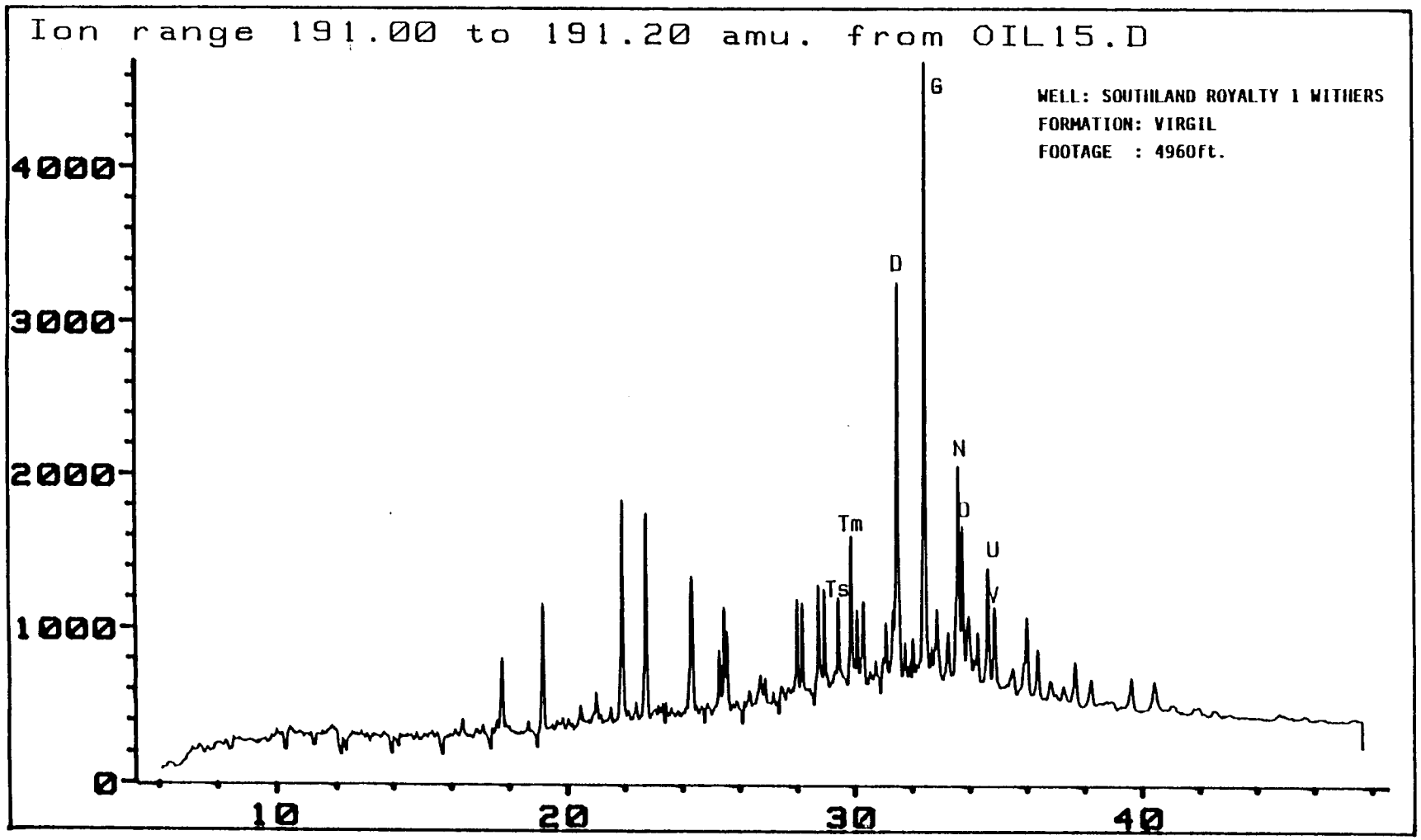
# OILS

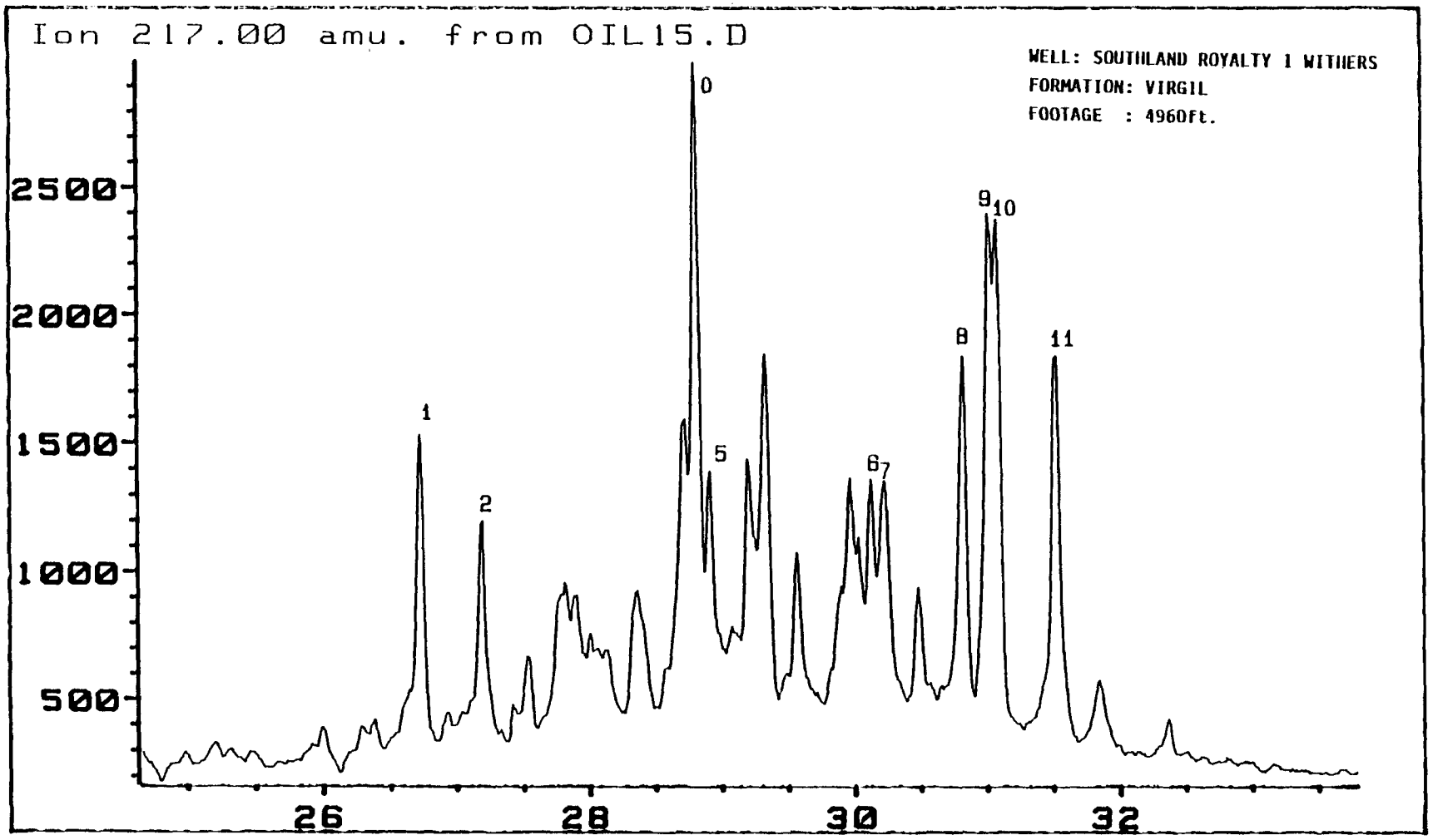
| OIL | DELTA 13Csat | DELTA 13Carom |
|---|---|---|
| 21 | -30.2 | * |
| 22 | -28.3 | -27.9 |
| 24 | -29.7 | -29.4 |
| 25 | -30.2 | -29.9 |

Key

* = Not Analyzed


OIL # 15
WELL: SOUTHLAND ROYALTY 1 WITHERS
FORMATION: VIRGIL
FOOTAGE : 4960ft.
AMOUNT
CARBON No. 13 15 17 19 21 23 25 27 29 31 33 35 37


Ion range 191.00 to 191.20 amu. from OIL15.D
WELL: SOUTHLAND ROYALTY 1 WITHERS
FORMATION: VIRGIL
FOOTAGE : 4960ft.
G
D
N
D
U
V
Tm
Ts
4000
3000
2000
1000
0
10
20
30
40


Ion 217.00 amu. from OIL15.D
WELL: SOUTHLAND ROYALTY 1 WITHERS
FORMATION: VIRGIL
FOOTAGE : 4960ft.
2500
2000
1500
1000
500
26
28
30
32
1
2
0
5
6
7
8
9
10
11