**MICHAEL J. WREATH**

**Petroleum Geologist**
**310 [redacted]**
**Larned, Kansas 67550**
**(316) 285-6508**

# GEOLOGICAL REPORT

DRACH NO. 1
NW NW SE SECTION 1-22S-13W
STAFFORD COUNTY, KANSAS

| | |
|---|---|
| Operator: | Mark Dobrinski<br>Box 147<br>Lorraine, Kansas 67459 |
| Well: | Drach No. 1 |
| Location: | NW NW SE Section 1-22S-13W<br>Stafford County, Kansas |
| Field: | Drach Oil Field |
| Wellsite: | Flat sandy wheat field |
| Elevation: | GL: 1872 DF: 1880 KB: 1882 |
| Casing: | Surface: 8 5/8" @ 361'/275 sacks cement<br>Production: 5½" @ 3728' (log)/125 sacks cement |
| Total Depth: | RTD: 3732 -1850 LTD: 3729 -1847 |
| Commenced: | March 22, 1986 |
| Completed: | March 28, 1986 (with rotary) |
| Samples: | Samples were examined from 2800 feet to rotary total depth. |
| Contractor: | Mohawk Rig 8 |
| Formation Tests: | There were three (3) drillstem tests by Diamond Testing, Inc. |
| Electrical Logs: | Neutron-Laterolog-Gamma Ray-Caliper by Gearhart. |
| Log Analysis: | Gordon Young |

| FORMATION TOPS | SAMPLES | | GEARHART | |
|---|---|---|---|---|
| Anhydrite | 690 | +1192 | 692 | +1190 |
| Topeka | 2812 | - 930 | 2808 | - 926 |
| Heebner | 3188 | -1306 | 3182 | -1300 |
| Toronto | 3211 | -1329 | 3205 | -1323 |
| Douglas | 3225 | -1343 | 3218 | -1336 |
| Brown Lime | 3319 | -1437 | 3314 | -1432 |
| Lansing | 3336 | -1454 | 3331 | -1449 |
| Base Kansas City | 3567 | -1685 | 3562 | -1680 |
| Viola | 3591 | -1709 | 3590 | -1708 |
| Simpson Shale | 3642 | -1760 | 3642 | -1760 |
| Simpson Sand | 3665 | -1783 | 3664 | -1782 |
| Arbuckle Sand | 3690 | -1808 | 3690 | -1808 |
| Arbuckle Dolomite | 3693 | -1811 | 3692 | -1810 |
| Total Depth | 3732 | -1850 | 3729 | -1847 |

## SAMPLE ZONE DESCRIPTIONS

(Depths are adjusted to log measurements)

### TOPEKA

2878-2883 Limestone; white; sub-blocky, crumbly, very fine crystalline; fossiliferous; good intergranular porosity; trace light oil stain, light yellow fluorescence; no odor, fair white cut; one (1) drop of free oil.

2926-2942
2946-2952 Limestone; white; sub-blocky, firm, fine crystalline; chalky and slightly fossiliferous; good porosity; few pieces with oil scum on fractures.

2984-2992 Limestone; white, light grey; sub-blocky, firm, fine crystalline; fair intercrystalline porosity; no oil shows.

3023-3060 Limestone; white; sub-blocky, moderately soft, fine crystalline, slightly chalky with dull white and very light brown chert; very good vugular porosity; no oil shows.

3084-3115 Limestone; white; sub-blocky, firm, gritty, slightly chalky; good intercrystalline and vugular porosity; no oil shows.

### TORONTO

3205-3218 Limestone; white, blocky, moderately hard, very fine crystalline; poor porosity, chalky in part; rare dead oil fracture stain; no fluorescence or odor.

### DOUGLAS

There were no sandstones or carbonates developed in the Douglas section from 3218 feet to 3314 feet.

### LANSING-KANSAS CITY

3356-3360 B Limestone; white, sub-blocky, firm, fine crystalline; fair intercrystalline porosity; trace dark oil stain; light yellow fluorescence; very light odor, white cut; rare oil film.

3370-3374 D Limestone; white; sub-blocky to blocky, moderately hard; fine to very fine crystalline, slightly chalky; poor porosity; no oil shows.

3412-3415 G — Limestone; white; sub-blocky. firm, very fine crystalline; slightly oolitic, moderately good intergranular porosity; trace oil stain, light yellow fluorescence; no odor, streaming white cut, trace free oil.

3454-3460 H — Limestone; white, blocky, firm, very fine crystalline; well developed large oolicasts; very good porosity; moderately common oil stain, spotty yellow fluorescence; very light odor, good white cut, moderately good show of heavy and light free oil when crushed.

Drillstem test no. 1 3453-3466 (rotary); 3448-3461 (log)

Testing periods: 30"-30"-15"-30"/ Blow: IF: one (1) inch and decreasing; dead in 16"/ FF: No blow/ Recovered: 40' heavy drilling mud. Pressures: ISIP: 956 psi IFP: 59 - 68 psi
FSIP: 888 " FFP: 78 -105 "
HH : 1848-1800 psi BHP: 105° F.

NOTE: Charts indicated severe plugging on both openings.

3476-3480 I — Limestone; white; sub-blocky, brittle, very fine crystalline, oolitic and small medium developed oolicasts; moderately good porosity; rare dead oil stain, light yellow fluorescence; no odor, slight streaming white cut; no free oil.

3493-3498 J — Limestone; white; sub-blocky, firm, very fine crystalline, chalky in part; moderately good intercrystalline porosity; moderately common oil stain, light yellow fluorescence, light odor, white cut; fair show of free oil.

Drillstem test no. 2, 3494-3506 (rotary); 3489-3501 (log)

Testing periods: 45"-45"-45"-45"
Blow: IF: steady weak (1") blow; FF: very weak, dead in 13"
Recovered: 80' watery mud
Pressures: ISIP: 911 psi IFP: 59-65 psi
FSIP: 888 " FFP: 68-73 "
HH : 1877-1848 psi BHT: 109° F.

3516-3522 K — Limestone; white; sub-blocky to blocky, very fine crystalline; medium developed small oolicasts; moderately good porosity; trace black oil stain, light yellow fluorescence; no odor, white cut; no free oil.

VIOLA

3590-3642 — Chert; bone white, white, light brown, light yellow; "fresh", rare light filmy oil stain, dull yellow fluorescence; no odor, slight white cut; rare light oil film.

SIMPSON

3665-3668 Sandstone; very light brown, sub-blocky, hard, "clean", medium grained quartz, sub-rounded, well sorted; fair intergranular porosity; trace light brown oil stain; very dull white fluorescence; no odor, fair white cut; no free oil.

ARBUCKLE

3690-3692 Sandstone; clear, moderately hard, medium grained quartz, sub-rounded, well sorted; fair intergranular porosity; trace oil stain, few saturated with oil; light yellow fluorescence; moderate odor, white cut, trace free oil; fair show of free oil when crushed.

3692-3700 Dolomite; light brown, sub-blocky, firm, very fine crystalline; slight silty; fair intercrystalline porosity; moderately common oil stain, light yellow fluorescence; moderately strong odor, good white cut; fair show of free oil.

3700-3702 Dolomite; white, sub-blocky, moderately hard, fine crystalline; moderately good intercrystalline porosity; common oil stain, light yellow-white fluorescence; strong odor, good white cut, good show of free oil when crushed, with grey "birdseye" chert.

Drillstem test no. 3, 3672-3702 (rotary); 3672-3702 (log)

Testing periods: 30"-30"-30"-30"
Blow: IF: strong blow off bottom of bucket (11") in 25 minutes
FF: fair blow (4")/ Recovered: 360' gas in pipe/
220' total fluid: 40' gassy oil cut mud: 25% gas, 10% oil, 65% mud
180' gassy heavy oil cut mud: 30% gas, 40% oil, 5% water, 25% mud
Pressures: ISIP: 1169 psi; IFP: 73-78 psi; HH: 1994-1970 psi
FSIP: 1149 " ; FFP: 108-112 psi; BHT: 109° F.

3706-3714 Dolomite; white, sub-blocky, moderately hard, fine to trace medium crystalline; moderately good intercrystalline porosity; moderately common oil stain, light yellow-white fluorescence; strong odor, good white cut, moderately good show of free oil.

3714-3729 Dolomite; white, very light grey, very light brown; sub-blocky to blocky, hard, fine to very fine crystalline; fair intercrystalline porosity; trace oil stain, light yellow-white fluorescence; moderately strong odor, good white cut, fair show of free oil drops and oil film.

## STRUCTURAL CORRELATION

| | DRACH #1 NW NW SE 1-22-13w | LOVE #1 N/2NE SW 1-22-13w | WELZBROD #1 SW SW NE 1-22s-13w | LOVE #2 SE NE SW 1-22s-13w | LOVE #1 SW NE SE 1-22s-13w |
|---|---|---|---|---|---|
| Heebner | -1300 | -1297 | | -1298 | -1285 |
| Lansing | -1449 | -1444 | -1461 | -1448 | -1434 |
| Base Kansas City | -1680 | -1663 | | -1687 | -1663 |
| Viola | -1708 | -1713 | | -1736 | -1682 |
| Simpson Shale | -1760 | -1743 | | -1804 | -1734 |
| Arbuckle | -1808 | -1804 | -1821 | not rched | -1792 |
| Total Depth | -1847 | -1818 | -1948 | -1818 | -1868 |
| | ARB. 1986 | 123 BOPD ARB. 1961 | D&A 1948 | D&A 1962 | 73 BOPD ARB. 1962 |

In view of the favorable oil recovery and bottom hole pressures encountered in the Arbuckle, it was recommended that production casing be set to further test the Drach No. 1 for commercial oil production.

Gordon Young recommends perforating the following zones:

Arbuckle
3706-3708
3690-3692

Lansing-Kansas City
3517-3520 K
3476-3480 I
3370-3374 D — ? Tight + Wet on E Log

Michael Wreath (geologist) recommends perforating the following zones:

Arbuckle
3706-3708 Perf 6/86
3690-3692 Perf 6/86

Lansing-Kansas City
3476-3480 I Perf 6/86
3454-3456 H Perf 6/86

The Arbuckle zone from 3706-3708 feet should be selectively perforated and acidized first. If more fluid is desired or necessary, the Arbuckle zone from 3690-3692 feet should also be selectively perforated and acidized. Production from the two Arbuckle zones may be comingled if desired.

The Lansing-Kansas City zones should be perforated and acidized before the well is abandoned.

All measurements are from the kelly bushing elevation, and Gearhart's measurements of formation tops, zones and total depth are taken as correct.

## PRODUCTION CASING

Ran 91 joints (3733') of 14 lb., new 5½" production casing. Set one (1) foot off bottom at 3728' (log). Cemented by Halliburton with 20 barrels Salt Flush, 125 sacks 50-50 Pozmix cement with 2% gel, 18% Salt and 0.75% CFR-2. Last 50 sacks blended with 5 lbs. Gilsonite per sack. Displaced plug with 90.73 barrels of water. Ran centralizers on collars No's 1, 2, 5, 6, 7 and 10. Plug down 12:10 a.m. 29 March, 1986.

Insert did not totally close and plug came up hole five (5) feet by wire line. Repressured and pumped plug back down.

Left head on with pressure until about 4:00 a.m. 29 March, 1986.

Shoe joint 14.40 feet. Plug at about 3714 feet (log). Four (4) joints of tubing left on location. Rat hole was plugged with ten (10) sacks cement.

Respectfully,

Michael J. Wreath

Michael J. Wreath
Petroleum Geologist