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## GEOLOGICAL REPORT

BEREXCO, INC.  
No. 1 Dyer  
NW NE Sec. 11-21S-34W  
Finney County, Kansas

CONTRACTOR: Beredco, Inc., Rig No. 4  
SPUDDING: December 27, 1984  
COMPLETED: January 12, 1985  
SURFACE CASING: 8 5/8" @ 461 KBM  
ELECTRIC LOGS: Great Guns, DILG, BCN, BCD  
ELEVATIONS: 2958 KB 2955 DF 2945 GL  
FORMATION TOPS: (Electric Log)

|                         |              |
|-------------------------|--------------|
| Stone Corral Anhydrite  | 2045 (+ 913) |
| Base Anhydrite          | 2116 (+ 842) |
| Heebner Shale           | 3831 (- 873) |
| Toronto Limestone       | 3846 (- 888) |
| Lansing-Kansas City     | 3873 (- 915) |
| Base Kansas City        | 4338 (-1380) |
| Marmaton                | 4362 (-1404) |
| Fort Scott              | 4471 (-1513) |
| Cherokee Shale          | 4488 (-1530) |
| Atoka                   | 4603 (-1645) |
| Morrow Shale            | 4675 (-1717) |
| Morrow Sand Zone        | 4693 (-1735) |
| Mississippian           | 4715 (-1757) |
| Mississippi Saint Louis | 4839 (-1881) |
| Log Total Depth         | 4943 (-1985) |

Samples were examined microscopically from 3700 feet to Rotary Total Depth, and all zones having shows of oil and/or gas were drill stem tested where warranted. Following is a description of zones of interest and drill stem tests.

### TORONTO ZONES:

3852-3856 Limestone, cream to buff, finely crystalline and chalky, scattered poor pinpoint and intercrystalline porosity, no show of oil.

## LANSING-KANSAS CITY ZONES

3883-3891

"A" Zone

Limestone, buff to tan, dense to finely crystalline, some brown dense, scattered fair intercrystalline porosity, no show of oil.

3899-3902

"B" Zone

Limestone, cream to buff to tan, finely crystalline and partly fossiliferous, poor to fair intercrystalline porosity, no show of oil.

3933-3937

"C" Zone

Limestone, cream to buff, finely crystalline and chalky, scattered poor intercrystalline and vugular porosity, no show of oil.

3954-3959

"D" Zone

Limestone, buff to tan, dense to finely crystalline, some chalky, scattered poor intercrystalline porosity, no show of oil.

3977-3986

"E" Zone

Limestone, cream to buff, some tan, some gray, finely crystalline and chalky, poor intercrystalline and vugular porosity, no show of oil.

4001-4006

4012-4017

"F" Zone

Limestone, buff, some tan, dense to finely crystalline and chalky, cherty in part, poor to fair scattered vugular and intercrystalline porosity, no show of oil.

4028-4042

"G" Zone

Limestone, buff, some tan, finely crystalline and oolitic, good ooliticastic porosity, no show of oil.

4089-4096

"H" Zone

Limestone, buff to tan, some gray, finely crystalline and oolitic, fair to good ooliticastic porosity, fair to good spotted stain, slight show of free oil, good odor.

DST No. 1

4066-4100

30-45-120-90; Weak blow throughout test, increasing to 3½ inches into water; Recovered 120' of muddy water.

ISIP 1084# FSIP 1075# IFP 30-30# FFP 40-80#

4153-4167

4173-4190

"J" Zone

Limestone, buff, some tan, finely crystalline and oolitic, good ooliticastic porosity, 98% barren, few fragments with fair spotted stain, no free oil, no odor.

4217-4225  
4230-4235  
"K" Zone Limestone, cream, some buff, finely crystalline and chalky, scattered poor to fair intercrystalline porosity with trace of poor spotted stain, no odor, no free oil, no value.

4268-4278  
"L" Zone Limestone, buff, dense to finely crystalline, poor scattered intercrystalline porosity, scattered fair spotted stain, slight show of free oil, good odor. Some fair stain on fracture faces in dense, tan to brown limestone.

DST No. 2 30-45-120-90; Weak blow throughout test; Recovered 110' of watery mud.  
4252-4285

ISIP 1213# FSIP 1164# IFP 20-30# FFP 40-70#

4308-4312  
4317-4328  
"M" Zone Limestone, cream, chalky, some finely crystalline, some sub-oolitic, poor intercrystalline and scattered ooliticastic porosity, trace of poor spotted stain, no odor, no free oil, this well tested water at higher datum in Thunderbird well.

## MARMATON ZONES:

4362-4371  
"A" Zone Limestone, buff, fine to medium crystalline, fossiliferous in part, some slightly oolitic, fair scattered vugular porosity, fair to good spotted stain, fair to good show of free oil, good odor.

DST No. 3 30-45-120-90; Weak blow, increasing to good blow throughout test; Recovered 1380' of Water.  
4328-4385

ISIP 1223# FSIP 1223# IFP 130-320# FFP 330-688#

4394-4397  
"B" Zone Limestone, cream to buff, dense and chalky, mostly tight, no show of oil.

4410-4424  
"C" Zone Limestone, buff, finely crystalline, chalky and oolitic, fair to good ooliticastic porosity, some fair spotted stain with much barren porosity, some dense limestone with stain, slight show of free oil, no odor.

4436-4444 Limestone, buff, dense to finely crystalline and chalky, some scattered poor intercrystalline porosity, some scattered poor spotted stain, slight show of free oil, faint odor, some dense and some fossiliferous with stain.

4457-4460

4464-4468

"D" Zone

Limestone, buff to tan, dense to finely crystalline and chalky, some sucrosic, some fossiliferous, poor intercrystalline porosity, scattered poor to fair spotted stain, very slight show of free oil, faint questionable odor.

DST No. 4

4387-4465

30-45-120-90; Good blow throughout test; Recovered 1050' of saltwater with two feet of free oil on top of recovery.

ISIP 1124# FSIP 1114# IFP 80-270# FFP 280-509#

## FORT SCOTT ZONES:

4478-4482

Limestone, buff to tan, dense to finely crystalline, fossiliferous and partly oolitic, scattered fair intercrystalline and interfossil porosity, spotted dark to dead stain on dense peices, scattered fair live oil stain, slight show of free oil, good odor.

DST No. 5

4454-4490

30-45-30-45; Weak blow, died in 44 minutes; Recovered 20 feet of mud with a few oil specks.

ISIP 886# FSIP 549# IFP 70-70# FFP 70-70#

## CHEROKEE ZONES:

4493-4497

Limestone, buff to tan, some brown dense, some finely crystalline, scattered poor vugular porosity, scattered light spotted stain, very slight show of free oil, fair odor.

4510-4513

Limestone, buff to tan and brown, some mottled, dense to finely crystalline, poor to fair vugular porosity, some intercrystalline porosity, scattered fair spotted stain, very slight show of free oil, good odor.

4524-4528

Limestone, tan, some brown, some mottled, dense to finely crystalline, scattered poor vugular porosity, scattered poor spotted stain, very slight show of free oil, fair to good odor.

4528-4603

The remainder of the Cherokee section consisted of tan to brown, dense to finely crystalline, tight limestones with rare traces of stain in tight pieces. The lower 20 feet of the section contained traces of tight, silty sand, but no sand of reservoir quality.

DST No. 6 30-45-120-90; Weak blow, increasing to fair, then  
4479-4570 to good blow throughout test; Recovered 260' of  
gas in drill pipe, 5' of clean oil, 90' of heavily  
oil cut watery mud (30% oil - 30% water - 30% mud -  
10% gas).

ISIP 876# FSIP 876# IFP 40-50# FFP 60-70#

#### ATOKA ZONES:

4603-4608 Limestone, white to cream, finely crystalline,  
some medium crystalline, partly chalky, partly  
fossiliferous, poor to fair intercrystalline poro-  
sity, some pinpoint porosity, fair to good spotted  
stain, fair to good show of free oil, fair odor.

The lower Atoka consisted of buff to tan to brown  
dense limestones, mostly tight, with rare traces of  
poor stain, and some buff to tan chert. No sand  
was found in the section.

DST No. 7 30-45-30-45; Weak blow, died in 48 minutes; Recover-  
4575-4650 ed 20' of drilling mud.

ISIP 678# FSIP 320# IFP 30-30# FFP 40-40#

#### MORROW ZONES:

4693-4705 Many medium to large, partly orange tinted, clear  
to frosted sand grains, subangular to partly sub-  
round, rare to occasional cluster of medium grained  
sand with fair to good spotted to saturated stain,  
fair show of free oil, faint odor, some very fine  
grained silty sand with light spotted stain, some  
very large, frosted, subangular quartz grains, some  
white medium grained sand clusters with no show.

The Morrow shales are dark gray to black, partly  
carbonaceous, partly micaceous shales.

DST No. 8 30-45-90-90; Weak blow, died in 100 minutes; Recov-  
4654-4725 ered 100' of mud with a few oil specks.

ISIP 1599# FSIP 1598# IFP 50-50# FFP 60-70#

#### MISSISSIPPIAN ZONES:

4715-4730 Limestone, buff to tan and brown, some mottled,  
dense, some finely crystalline, scattered gray to  
black partly oolitic chert, some white opaque chert,  
zone has no visible porosity and no show of oil.

- 4730-4740 Limestone, buff, finely crystalline, partly sandy, scattered poor intercrystalline porosity, some coarsely crystalline, fossiliferous with poor to fair intercrystalline porosity, rare trace light spotted stain, very slight show of free oil, no odor.
- 4740-4793 Limestone, cream to buff, some tan, dense to finely crystalline, some chalky, some sandy, mostly tight with occasional traces of light spotted stain.
- 4793-4800 Limestone, sandy, buff to tan, some cream, fine to medium crystalline, scattered poor to fair intercrystalline porosity, scattered poor light stain, very slight show of free oil, faint questionable odor.
- DST No. 9 30-45-120-90; Good blow throughout test; Recovered  
4720-4800 360' of watery mud, 440' of muddy water.
- ISIP 1114# FSIP 1015# IFP 30-170# FFP 170-330#
- 4800-4839 Limestone, cream to buff, some tan, partly sandy, dense to finely crystalline, some chalky, mostly tight, no show of oil.

#### MISSISSIPPI SAINT LOUIS ZONES:

- 4839-4850 Limestone, cream to buff, finely crystalline, partly sandy, some chalky, scattered poor intercrystalline porosity, no show of oil.
- 4850-4944 This section consisted to cream to buff to tan, dense limestones, The section was mostly tight throughout and contained no shows of oil.
- 4944 ROTARY TOTAL DEPTH

#### RECOMMENDATIONS:

Sample examination, drill stem testing, and electric logging revealed no zones of possible commercial production of oil or gas, with the exception of the Cherokee limestones. These zones, however, are poorly developed, and are do not appear to be capable of commercial production.

Respectfully submitted,

Robert C. Lewellyn  
Petroleum Geologist