Geological Report

OXY USA, INC.
Varner "B" No. 2
1600' FNL, 990' FEL
Sec. 17-T28S-R4E
Butler Co., Kansas
Augusta Field
API #15-015-23360

Contractor: Allen Drilling Co., Rig #2.
Commenced: 2:30 AM Dec. 12, 1993. Reached R.T.D. 2400' at 1:52 Am Dec. 16, 1993.
Completed:
Elevations: K.B. 1249', Gr. 1244'.
Casing: Surface-8 5/8" at 268' with 200 sacks cement.
Production-5½" at 2399' with 365 sacks cement.
Logging Program: Atlas Wireline Services- SBT Bond Log with Gamma Ray.
Testing Program: None.
Samples: 10 ft. dry from 1100' to 1600'; 10 ft. wet and dry from 1600' to 2350'; 5 ft. wet and dry from 2350 ft. to 2400 ft.
Total Depth: 2400' -1151
Geologist: Herbert R. Johnson

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Formation Tops

Oread	1366 - 117
Heebner	1405 - 156
Toronto	1414 - 165
Douglas	1432 - 183
Iatan	1627 - 378
Lansing	1678 - 429
Base Lansing	1830 - 581
Kansas City	1981 - 732
Base Kansas City	2184 - 935
Checkerboard	2213 - 964
Hepler Sand	2224 - 975
Altamont	2260 -1011
Pawnee	2297 -1048
Cherokee	2332 -1083
Arbuckle	2397 -1148
R.T.D.	2400 -1151

Vertical Deviation Surveys:

¼	degree @	269'
¼	" @	741'
3/4	" @	1239'
1	" @	1769'
1	" @	2263'
3/4	" @	2400'

Sample Description

1110-1120 Limestone, white, gray, tan, fine crystalline, dense.
1120-1141 Shale, gray.
1141-1146 Limestone, tan, gray, fine crystalline, dense.

1146-1148 Shale, black, carbonaceous.
1148-1151 Limestone, AA.
1151-1158 Shale, gray.
1158-1168 Limestone, white, fine crystalline, chalky, dense, NS.
1168-1178 Shale, gray.
1178-1366 Interbedded shale and limestone, NS.

Oread 1366 -117
1366-1405 Limestone, white, tan, fine crystalline, partly chalky, dense, NS.
1405-1408 Shale, black, carbonaceous.
1408-1410 Limestone, tan, fine crystalline, dense.
1410-1414 Shale, gray, green.

Toronto 1414 -165
1414-1432 Limestone, white, cream, fine crystalline, chalky, poor to fair porosity, NS.

Douglas 1432 -183
1432-1438 Shale, dark gray.
1438-1462 Sandstone, gray, very fine grained, micaceous, poor porosity, NS, with interbedded gray shale.
1462-1470 Shale, gray with interbedded siltstone and sandstone.
1470-1476 Limestone, white, fine crystalline, silty, dense.
1476-1485 Shale, gray.
1485-1490 Limestone, gray, fine crystalline, dense.
1490-1517 Sandstone, gray, very fine grained, micaceous, poor porosity with interbedded siltstone and shale.
1517-1526 Sandstone, gray, brown, very fine grained, micaceous, poor to fair porosity, light stain, dull fluorescence, interbedded gray shale and siltstone.
1526-1560 Sandstone, gray, very fine grained, micaceous, interbedded with siltstone and gray shale.
1560-1570 Shale, gray, reddish brown with minor interbedded sandstone.
1570-1627 Shale, gray.

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Iatan 1627 -378
1627-1631 Limestone, tan, fine crystalline, dense.
1631-1633 Shale, gray.
1633-1638 Limestone, white, brown, fine crystalline, dense, trace fluorescence.
1638-1660 Limestone, white, tan, gray, partly oolitic, poor to fair porosity, spotted stain, fluorescence, trace free oil.
1660-1678 Shale, gray.

Lansing 1678 -429
1678-1692 Limestone, white, gray, fine crystalline, fossiliferous, poor to fair porosity with light spotted stain and fluorescence.
1692-1720 Limestone, white, tan, fine crystalline, slightly vugular, fair to good porosity, light spotted stain and fluorescence, faint odor, trace free oil.

1720-1730 Limestone, gray, tan, fine crystalline, dense.
1730-1735 Limestone, tan, fine crystalline, fair porosity, fluorescence, trace free oil.
1735-1800 Limestone, white, gray, fine crystalline, dense, trace fluorescence.
1800-1830 Limestone, tan, grayish brown, fine crystalline, dense.

Base Lansing 1830 -581

1830-1860 Shale, gray with interbedded grayish brown limestone.
1860-1875 Shale, gray.
1875-1887 Limestone, white, grayish tan, fine crystalline, dense.
1887-1981 Shale, gray.

Kansas City 1981 -732
1981-1988 Limestone, tan, fine crystalline, oolitic and oolicastic, fair porosity, light stain and fluorescence, fair show free oil.
1988-2000 Limestone, white, light buff, fine crystalline, dense, light spotted stain and fluorescence, trace free oil.
2000-2028 Limestone, buff, cream, fine crystalline, oolitic, poor to fair porosity, light stain and fluorescence.
2028-2052 Limestone, white, gray, tan, fine crystalline, dense, trace poor porosity with spotted stain, fluorescence, trace free oil.
2052-2066 Limestone, cream, tan, chalky, fossiliferous, poor to fair porosity, light stain.
2066-2073 Limestone, white, tan, gray, fine crystalline, dense, trace poor porosity, spotted stain and fluorescence.
2073-2076 Limestone, off white, cream, fine crystalline, chalky, poor porosity, light stain, fluorescence, trace free oil.
2076-2101 Limestone, white, tan, gray, fine crystalline, dense.
2101-2103 Shale, black, carbonaceous.
2103-2107 Shale, gray.
2107-2115 Limestone, tan, fine crystalline, dense.
2125-2127 Shale, black, carbonaceous.
2127-2134 Limestone, tan, brown, fine crystalline, dense.
2134-2140 Limestone, tan, fine crystalline, fair porosity, light stain, fluorescence, fair show free oil.
2140-2147 Shale, gray, grayish green, pyritic.
2147-2162 Limestone, tan, fine crystalline, dense.
2162-2167 Shale, gray.
2167-2184 Limestone, gray, grayish tan, fine crystalline, dense.

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Base Kansas City 2184 -935

2184-2213 Shale, dark gray, black.

Checkerboard 2213 -964
2213-2218 Limestone, white, light tan, fine crystalline, dense.
2218-2224 Shale, green, silty.

Hepler 2224 -975
2224-2234 Sandstone, gray, fine grained, friable, fair porosity, light staining, fluorescence, fair show free oil.

2234-2260 Shale, green, silty.

Altamont 2260 -1011
2260-2272 Limestone, white, cream, fine crystalline, dense.
2272-2275 Shale, black, carbonaceous.
2275-2281 Limestone, white, tan, fine crystalline, dense.
2281-2297 Shale, green, gray, silty.

Pawnee 2297 -1048
2297-2324 Limestone, tan, gray, fine crystalline, dense.
2324-2328 Shale, gray.
2328-2332 Limestone, gray, tan, fine crystalline, dense.

Cherokee 2332 -1083
2332-2334 Shale, black, carbonaceous.
2334-2337 Limestone, white, tan, fine crystalline, dense.
2337-2340 Shale, black, carbonaceous.
2340-2360 Siltstone, grayish green, shaley.
2360-2373 Shale, gray, greenish gray, pyritic.
2373-2378 Limestone, gray, dark gray, fine crystalline, dense.
2378-2385 Shale, dark gray, black, pyritic.
2385-2395 Limestone, gray, grayish brown, fine crystalline, dense.
2395-2397 Shale, grayish green, black, carbonaceous.

Circulated for samples 30 minutes at 2395'.

Arbuckle 2397 -1148
2397-2400 Dolomite, white, tan, fine to medium crystalline, dense, pyritic, trace poor to fair porosity with stain and fluorescence, trace free oil, faint odor; 10% Chert, white, gray.

Circulated for samples 60 minutes at 2400'.

Reached R.T.D. 2400' at 1:52 AM December 16, 1993.

Strap	2420.98'
Board	2420.71'
Strap long to board	0.27'

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