

Geological Report

API #15-015-23378

OXY USA, INC.  
Chesney "A" No. 229  
1320' FSL, 2000' FEL  
Sec. 21-T25S-R5E  
Butler Co., Kansas  
El Dorado Field

~~CONFIDENTIAL~~

Contractor: Allen Drilling Co., Rig #2.  
Commenced: 6:30 PM November 1, 1993. Reached R.T.D. 2385' at  
12:10 PM November 6, 1993.

Completed:

Casing: 8 5/8" at 263' with 200 sacks cement.  
5 1/2 " at 2383' with 375 sacks cement.

Elevations: K.B. 1389', Gr. 1384'.

Total Depth 2385' -996

Samples: 10' wet and dry from 500' to 2350'; 5' wet and dry from  
2350' to 2385'.

Drilling Time: One foot from 500' to 2385'.

Logging Program: Atlas Wireline- SBT Bond Log with Gamma Ray.

Drill Stem Tests: Admire 602-630'; Oread 1332-1375'.

Geologist: Herbert R. Johnson

Vertical Hole Deviation Surveys:

1/2	degree	at	263'
3/4	"	"	630'
3/4	"	"	1147'
1	"	"	1375'
1	"	"	1893'
3/4	"	"	2385'

K C C

MAR 25 1994

Formation Tops

Admire	609	+780
Burlingame	766	+623
White Cloud	842	+547
Topeka	903	+486
Oread	1328	+ 61
Heebner	1367	+ 22
Toronto	1381	+ 8
Douglas	1401	- 12
Lansing	1626	-237
Base Lansing	1763	-374
Kansas City	1915	-526
Base Kansas City	2075	-680
Checkerboard	2143	-754
Altamont	2192	-803
Pawnee	2228	-839
Cherokee	2271	-882
Conglomerate	2354	-965
Arbuckle	2365	-976
R.T.D.	2385	-996

RECEIVED  
STATE CORPORATION COMMISSION  
DEC 17 1993  
CONSERVATION DIVISION  
Wichita, Kansas

MAR 25 1991

## Sample Description

- 500-505 Sandstone, tan, very fine grained, friable, micaceous, poor to fair porosity, well stained, fluorescence, good show free oil.
- 505-584 Interbedded limestone and shale, NS.
- 584-594 Sandstone, gray, tan, very fine grained, poor porosity, slightly calcareous, light stain, fluorescence, show free oil.
- 594-600 Shale, gray.
- 600-603 Limestone, gray, fine crystalline, fossiliferous, dense.
- 603-609 Shale, gray, green.
- 607-609 Limestone, grayish brown, fossiliferous, dense.

## Admire Sand 609 +780

- 609-623 Sandstone, gray, tan, fine grained, micaceous, friable, poor to fair porosity, well stained, fluorescence, good odor, good show free oil.
- 623-630 Shale, gray, green with interbedded gray siltstone.

Circulated 15 minutes for samples at 1375'

D.S.T. No. 1 602-630' 15-30-45-60

1st. Open: Weak blow increasing to bottom of bucket in 7 minutes.

2nd. Open: Weak blow increasing to bottom of bucket in 12 minutes.

Recovered 135' muddy saltwater with few specks oil.

IHMP 273 psi, IFP 111-80 psi, ICIP 91 psi, FFP 80-80 psi, FCIP 91 psi, FHMP 303 psi. BHT 84 degrees F.

- 630-635 Siltstone, gray, argillaceous, poor porosity, trace stain, fluorescence, free oil.
- 635-656 Shale, gray.
- 656-659 Limestone, brown, fine crystalline, dense.
- 659-664 Sandstone, white, fine grained, poor to fair porosity, fluorescence, good show free oil.
- 664-690 Shale, gray with thin interbeds of limestone.
- 690-766 Interbedded limestone and shale, NS.

## Burlingame 766 +623

- 766-804 Limestone, white, tan, fine crystalline, dense, trace fluorescence. Note: The samples were ground very fine so it was very difficult to ascertain rock properties such as porosity and oil shows.
- 804-815 Shale, gray, greenish gray, pyritic.
- 815-818 Limestone, white, buff, fine crystalline, dense.
- 818-842 Shale, gray.

## White Cloud 842 +547

- 842-857 Sandstone, brown, gray, very fine grained, shaley, micaceous, poor to fair porosity, yellow fluorescence, fair stain, good show free oil. Interbedded siltstone shale.
- 857-861 Limestone, brown, fine crystalline, dense.
- 861-903 Shale, gray.

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Topeka 903 +486

- 903-930 Limestone, tan, gray, fine crystalline, dense (cuttings ground very fine).  
930-945 Limestone, grayish brown, fine crystalline, dense.  
945-956 Limestone, gray, tan, brown, fine crystalline, dense.  
956-962 Sandstone, gray, very fine grained, disaggregated, trace free oil.  
962-972 Shale, gray.  
972-984 Sandstone, gray, tan, very fine grained, interbedded with gray siltstone, poor to fair porosity, light stain, fluorescence, trace free oil.  
984-990 Siltstone, gray, micaceous with interbedded shale.  
990-1018 Shale, gray.  
1018-1028 Limestone, off white to cream, fine crystalline, dense, trace fluorescence.  
1040-1046 Limestone, tan, fine crystalline, fossiliferous, dense.  
1046-1054 Limestone, white, gray, mottled, dense.  
1054-1066 Shale, gray, sandy.  
1066-1088 Limestone, gray, tan, fine crystalline, dense.  
1088-1108 Shale, gray.  
1108-1117 Limestone, tan, brown, fine crystalline, dense.  
1117-1118 Shale, black, carbonaceous.  
1118-1133 Limestone, off white, gray, fine crystalline, dense.  
1133-1144 Siltstone, & Shale, trace fluorescence in siltstone.  
1144-1154 Limestone, tan, brown, fine crystalline, dense, 30% fluorescence.  
1154-1164 Shale, gray.  
1164-1177 Limestone, tan, fine crystalline, slightly vugular, trace poor to fair porosity, 10% fluorescence.  
1177-1186 Shale, gray.  
1186-1196 Limestone, off white, light buff, fine crystalline, chalky, dense.  
1196-1199 Shale, gray.  
1199-1209 Limestone, tan, fine crystalline, fossiliferous, dense.  
1209-1211 Shale, black, carbonaceous.  
1211-1220 Limestone, white, light tan, fine crystalline, dense.  
1220-1232 Limestone, white, fine crystalline, abundant clear, coarse calcite crystals indicating possible vugular porosity, general fluorescence, trace stain.  
1232-1250 Limestone, white, tan, fine crystalline, chalky.  
1250-1270 Limestone, white, fine crystalline, vugular.  
1270-1278 Limestone, tan, fine crystalline, chalky, poor porosity, 10% FLUORESCENCE.  
1278-1328 Shale, gray, pyritic.

Oread 1328 +61

- 1328-1348 Limestone, tan, gray, off white, fine crystalline, dense, NS.  
1348-1366 Limestone, tan, fine crystalline, vugular, abundant secondary coarse calcite crystals, 10% fluorescence, trace stain.  
Lost circulation at 1366'. When circulation resumed, oil was circulated to the mud pit. Circulated for samples 30 minutes at 1366' Mixed mud, drilled to 1375' and circulated for samples 20 minutes.  
1366-1367 Limestone, gray, brown, fine crystalline, dense.

Heebner 1367 +22

- 1367-1371 Shale, black, carbonaceous.

1371-1373 Limestone, grayish brown, fine crystalline, dense.  
1373-1375 Shale, gray.

Strap	1398.61'
Board	<u>1398.61'</u>
Difference	0.0

D.S.T. No. 2 1332-1375' 15-30-30-60  
1st. Open: Good blow, bottom of bucket in 4 minutes.  
2nd. Open: Bottom of bucket in 5 minutes.  
Recovered 150' drilling mud (Chlorides 1500 PPM)  
IHMP 600 psi, IFP 68-68 psi, ICIP 113 psi, FFP 90-90  
psi, FCIP 113 psi, FHMP 578 psi. BHT 83 degrees F.

1375-1380 Shale, gray, green.

Toronto 1381 +8

1381-1401 Limestone, white, cream, fine crystalline, poor porosity, yellow fluorescence.

Douglas 1401 -12

1401-1422 Shale, gray.  
1422-1424 Limestone, brown, fine crystalline, dense.  
1424-1464 Shale, gray.  
1464-1480 Sandstone, gray, very fine to fine grained, micaceous, poor porosity, NS.  
1480-1544 Shale, gray.  
1544-1550 Limestone, tan, fine crystalline, dense.  
1550-1560 Sandstone, gray, very fine grained, poor porosity, NS.  
1560-1574 Siltstone, gray with interbedded very fine grained sandstone and shale.  
1574-1580 Limestone, tan, fine crystalline, dense.  
1580-1626 Shale, gray.

Lansing 1626 -237

1626-1631 Limestone, off white, light gray, fine crystalline, dense, spotted stain and fluorescence.  
1631-1638 Limestone, off white, fine crystalline, 10% poor to fair porosity, light spotted stain, fluorescence, fair show free oil.  
1638-1674 Limestone, white, tan, gray, fine crystalline, dense, trace spotted fluorescence.  
1674-1684 Limestone, brown, fine crystalline, partly intercrystalline porosity, fair to good porosity, strong odor, bright fluorescence, fair show free oil.  
1684-1700 Limestone, white, tan, fine crystalline, 15% poor to fair porosity with stain and fluorescence.  
1700-1763 Limestone, off white, gray, tan, fine crystalline, dense.

Base Lansing 1763 -374

1763-1768 Shale, gray.  
1768-1774 Limestone, gray, fine crystalline, dense.  
1774-1915 Shale, gray.

Kansas City 1915 -526

1915-1921 Limestone, gray, brown, fine crystalline, dense.  
1922-1928 Limestone, buff, fine crystalline, dense.  
1928-1936 Limestone, tan, cream, fine crystalline, poor to fair porosity, light stain, 80% fluorescence, trace free oil.  
1936-1946 Limestone, gray, cream, tan, fine crystalline, fossiliferous, dense, partly oolitic, spotted fluorescence.  
1946-1964 Limestone, tan, fine crystalline, fossiliferous, poor to fair porosity, light spotted stain, fluorescence, trace free oil, fair odor. 5% Chert, white.  
1964-1982 Limestone, tan, fine crystalline, partly chalky, trace fair to good porosity, with stain and fluorescence.  
1982-1987 Limestone, tan, fine crystalline, fair porosity, light stain, fluorescence.  
1987-2002 Limestone, white, cream, fine crystalline, partly chalky, poor to fair porosity, light stain and fluorescence, trace free oil.  
2002-2007 Limestone, white, fine crystalline, chalky, poor porosity, 10% fluorescence.  
2007-2017 Limestone, off white, tan, fine crystalline, dense.  
2017-2020 Shale, black, carbonaceous.  
2020-2026 Limestone, off white, fine crystalline, chalky, poor porosity, trace spotted stain and fluorescence, trace free oil.  
2026-2039 Limestone, off white, light tan, fine crystalline, dense, trace fluorescence, trace free oil; 5% Chert, white.  
2039-2041 Shale, black, carbonaceous.  
2041-2056 Limestone, off white, chalky, dense, trace fluorescence.  
2056-2066 Siltstone, gray, gray shale.  
2066-2075 Limestone, grayish brown, oolitic, dense, NS.

Base Kansas City 2075 -686

2075-2143 Shale, gray, slightly pyritic.

Checkerboard 2143 -754

2143-2150 Limestone, tan, fine crystalline, dense.

2150-2186 Shale, grayish green with interbedded gray siltstone and very fine grained shaley sandstone, NS.

2186-2192 Shale, AA with interbedded siltstone and very fine grained, tight sandstone. Trace gray sandstone, very fine grained with poor porosity, stain and fluorescence, trace free oil.

Altamont 2192 -803

2192-2204 Limestone, off white, tan, buff, fine crystalline, dense.

2204-2228 Shale, grayish green, reddish brown, dark gray.

Pawnee 2228 -839

2228-2254 Limestone, tan, buff, brown, fine crystalline, dense.

2254-2256 Shale, black, carbonaceous.

2256-2271 Limestone, tan, brown, fine crystalline, dense.

Cherokee 2271 -882

- 2271-2273 Shale, black, carbonaceous.
- 2273-2275 Limestone, tan, fine crystalline, dense.
- 2275-2282 Siltstone, light green, dense, NS.
- 2282-2306 Shale, light grayish green, gray.
- 2306-2311 Siltstone, gray, micaceous, firm.
- 2311-2332 Shale, dark gray, pyritic.
- 2332-2339 Limestone, white, tan, brown, gray, fine crystalline, pyritic, dense.
- 2339-2342 Shale, black, carbonaceous.
- 2342-2346 Sandstone, white, very fine grained, pyritic, dense, NS.
- 2348-2354 Limestone, white, gray, mottled, fine crystalline, very pyritic, dense.

Conglomerate 2354 -965

- 2354-2360 Chert, white, gray, translucent to opaque with very fine sand grain matrix, NS.
- 2360-2365 Chert, white, reddish tan, oolitic, pyritic, NS.

Arbuckle 2365 -976

- 2365-2383 Dolomite, white, light tan, fine to medium crystalline, dense, trace fluorescence, very faint odor; trace white to gray chert.
  - 2383-2385 Dolomite, off white, gray, medium to coarse crystalline, trace fair porosity, 10% fluorescence, trace free oil. 5% Chert, white.
- Reached R.T.D. 2385' at 12:10 PM November 6, 1993.