



GEOLOGICAL REPORT

Thompkins #EE2
 API#: 15-073-24203-00-00
 1060' FSL, 1300' FEL
 Sec. 16 T28S R11E
 NW NW SE SE
 Greenwood County, Kansas

Date: 3/17/2014

Operator: Entranco Energy, LLC / P.O. Box 578, Dewey, OK 74029 / License #34133

Drilling Contractor: Southwinds Energy, LLC, Fred Jones, driller

Wellsite Geologist: Julie Shaffer – On location from 650' to 1869'
 Harley Gilbert

Dates Drilled: Set surface on 2/25/2014
 Drilled on 2/26-27/2014, 3/6, 7 & 10/2014

Total Depth: 2284.5'

Elevation: 1047' Surveyed

Drilling Fluid: Mud & chemical mixture

Surface Casing: 42.5' of 8 $\frac{3}{8}$ " surface casing cemented to surface

Electric Logs Run: Density-Neutron, Induction, and Temperature logs

Formation Tops: Formation tops were picked from the Density-Neutron logs

Rock Color Desc.: GSA rock color chart (dry cuttings)

Status: **OIL WELL/SWD WELL**

| | | | |
|-------------------|---|----------------|----------------|
| Oil Shows: | Kansas City Limestone (1 st pay break) | 1128.5-1132.5' | Trace oil show |
| | Kansas City Limestone (2 nd pay break) | 1158.5-1170' | Trace oil show |

Notes: Well cuttings were examined at the drill rig and discarded. Select samples of zones of interest were saved and examined in the laboratory with a binocular microscope and black-light.

** Indicates the best interval of the zones of interest

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FIELD and LABORATORY SAMPLE EXAMINATION

2/26/2014

0-682' Samples not examined

2/27/2014

Top of the Lansing Limestone @ 682' (+365') - (7' higher than Wingrave #16)

682-826' Limestone, soft overall, drilled fast, no hydrocarbon show/odor

826-972' Shale, medium gray

Top of the Kansas City Limestone @ 972' (+75') - (6' higher than Wingrave #16)

972-982' Limestone, hard, no hydrocarbon show/odor

982-1005.5' Shale, medium gray, silty towards bottom

1005.5-1010' Limestone

1010-1022' Shale

3/6/2014

1022-1054' Limestone, hard

1054-1098' Limestone, soft

1098-1121' Limestone, hard

1121-1124' Stark Shale, black, carbonaceous

1124-1128.5' Limestone, hard

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Top of the 1st Pay Break in the Kansas City Limestone @ 1128.5' (-81.5')

1128.5-1130' Limestone, light gray, very fine grained (silt size grains), locally medium crystalline, pisolitic texture in few chips, overall well cemented limestone, few chips with 6+% intergranular (sandy) porosity, minor pinpoint vuggy porosity, 30-40% very pale yellowish-brown mottled oil staining, good petroliferous odor, 30+% heavily mottled, bright yellowish-green hydrocarbon fluorescence. Samples exhibited an even, slow, medium-bright milky blue oil cut in black light, no residual show in white light; after crushing and repeating the solvent test there is no change. Heavy trace shale.

1130-1132.5' Limestone, light gray, very fine grained (silt size grains), locally medium crystalline, less than 10% of chips with 8-10% pinpoint vuggy and intergranular (sandy) porosity, with oil in pore spaces, 5% pale yellowish-brown fully saturated oil staining, good petroliferous odor, sheen on pit water and cuttings, 20% heavily mottled, bright yellowish-green hydrocarbon fluorescence. ****(The few chips caught with high porosity, saturation and fluorescence appear to correlate to the 1131-1132.5' interval).** Samples exhibited an even, moderately-fast, bright milky blue oil cut in black light, no residual show in white light; after crushing and repeating the solvent test

there is a heavy, bright yellowish-blue oil cut in black light, light brown residual oil show in white light. Heavy trace shale.

- 1132.5-1146' Limestone, hard, trace shale
- 1146-1150.5' Hushpuckney Shale, black, carbonaceous
- 1150.5-1158.5' Limestone, hard

Top of the 2nd Pay Break in the Kansas City Limestone @ 1158.5' (-111.5')

- 1158.5-1168' Limestone, off-white/light gray, very well cemented, very fine grained, 2-5% chips with fair intergranular porosity and minor very pale yellow oil staining, overall tight, poor porosity, <5% of cuttings display a uniform, bright yellow hydrocarbon fluorescence. Samples exhibited an even, slow, faint bright milky blue oil cut in black light, no residual show in white light; after crushing and repeating the solvent test there is an even, medium-bright milky blue oil cut in black light, no residual show in white light.
- 1168-1170' **Limestone, off-white/very light gray, pale brown oil staining, very fine grained texture with some chalky texture, 8-10% pinpoint vuggy and intergranular porosity, 10% of chips display good porosity with medium-dark brown oil staining and uniform, bright yellow hydrocarbon fluorescence; 20% of chips display a significantly less oil stain and saturation with a medium-bright yellowish-white hydrocarbon fluorescence. Samples exhibited an even, moderately-slow, medium-bright milky blue oil cut in black light, no residual show in white light; after crushing and repeating the solvent test there is an even, fast, bright milky blue oil cut in black light, light brown residual oil show in white light.

- 1170-1172' Limestone, hard
- 1172-1200' Limestone, soft, no hydrocarbon show/odor

3/7/2014

- 1200-1450' Samples not examined

3/10/2014

- 1450-1460' Shale, medium gray

Top of the Pawnee Limestone @ 1460' (-413')

- 1460-1463' Limestone
- 1463-1464.25' Mulberry Coal
- 1464.25-1467' Shale, medium-light gray
- 1467-1489' Limestone
- 1489-1492' Lexington Shale, black, carbonaceous, abundant micro-coal strands
- 1492-1509' Shale, medium gray, silty

Top of the Oswego Limestone @ 1509' (-462')

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1509-1527' Limestone, light olive gray, no significant oil staining, fine grained, smooth texture, poor porosity, oil odor, <1% solid bright yellowish-green oil fluorescence

1527-1530' Summit Shale, black, carbonaceous

1530-1536' Shale, dark gray

1536-1544' Limestone

1544-1548' Mulky Shale, black, carbonaceous

1548-1548.75' Mulky Coal

1548.75-1552' Shale, light gray

1552-1554' Limestone

1554-1557' Shale, medium gray, silty

1557-1562' Squirrel Sandstone, light gray, silty-shale, no hydrocarbon show/odor

1562-1606' Shale, dark gray

Top of the Verdigris Limestone @ 1606' (-559')

1606-1614' Limestone

1614-1617' Croweburg Shale

1617-1617.5' Croweburg Coal

1617.5-1682' Shale, light gray to dark gray

1682-1686' Weir Shale

1686-1758' Shale, dark gray

1758-1762' Limestone

1762-1778' Shale, light gray

1778-1780' Rowe Coal

1780-1841.5' Shale, dark gray, pyritic

1841.5-1842' Riverton Coal

1842-1844' Shale, dark gray, pyritic

Top of the Mississippi @ 1844' (-797')

1844-1859' Limestone, off-white, sandy, dolomitic, no hydrocarbon show/odor

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1859-1869' Limestone, dark brownish-gray, hard, no hydrocarbon show/odor

Note: Good porosity in the Mississippian from 2000-2104'.

Geo T.D. @ 1869'

1869-2284.5' Samples not examined

Top of the Chattanooga Shale @ 2174' (-1127')

Top of the Arbuckle @ 2211' (-1164')

Note: Minor porosity throughout the Arbuckle; nothing of major significance.

Well T.D. @ 2284.5'

**Julie Shaffer
Geologist**

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