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Mudlogging Report for the ITB OIL, LLC MURPHY #1 Well
375N 330W SEc SW SW
Section 26, T09N, R14W
Clark County, Illinois
Depths Taken from K.B. @ 591'

Mudlogging was conducted from 12/3/2017 thru 12/10/2017. Samples were taken from 200' to 3344' T.D. depths. Each sample was examined via a microscope and under a fluorescent lamp to detect any oil shows, and any odor was noted. The following results came from mudlogging:

When compared to the Deverick Heirs #1 Well to the west, this well ran approximately 9 feet lower structurally on the top of the Devonian Limestone. There were numerous shows of oil encountered in this well.

A show of oil was found in the shallow Kickapoo Sandstone at 200'-212' in a medium fine white quartz sandstone. There was scattered fluorescence, and some fine oil droplets were released when crushing fluorescing pieces. There was no appreciable gas spike here. This zone calculated Sws of .38 to .47, which is considered good for this type sand. Due to the fairly good show of oil, this zone could be considered for production.

A show of oil was found in a shaley Penn. Sandstone at 502'-518' in a fine clear white quartz sandstone. There was up to 40% overall fluorescence, and some fine oil droplets were released when crushing fluorescing pieces. There was no appreciable gas spike here. This zone calculated Sws of .33 to .47, which is considered good for this type sand. Due to the fairly good show of oil, this zone could be considered for production.

A show of oil was found in the produced Upper Partlow Sandstone at 552'-580' in a medium to coarse grained clear white quartz sandstone. There was up to 50% overall fluorescence, and some good oil was released when crushing fluorescing pieces. There was a good gas spike of over 140 gas units here. This zone calculated Sws of .17 to .39, which is considered very good for this type sand. This zone has been significantly produced in this area.

A show of oil was found in the much produced Lower Partlow Sandstone at 642'-686' in a clear quartz coarse well rounded good porosity sandstone. There was up to 70% overall fluorescence, and some good free oil was released when crushing fluorescing pieces. There was a good 167 gas units spike here. This zone calculated Sws of .30 to .51, which is considered good for this type sand. This zone has been significantly produced in wells very close to this well.

A show of oil was found in what appears to be the Aux Vases Sandstone at 758'-776' in a medium fine amber stained clear quartz sandstone. There was overall fluorescence of up to 25% with some good oil droplets released when crushing fluorescing pieces. There was no appreciable gas spike here. This zone calculated Sws of .36 to .57, which is considered good for this type sand. This zone was produced in some areas at some distance from this well. Due to the fairly good show of oil, this sandstone should be considered for production.

A slight show of oil was found in the upper part of the Fredonia Limestone a small two foot thick zone at 788'-790' depth in a light tan white oolitic limestone. There was up to 20% overall fluorescence, and almost no oil was released when crushing fluorescing pieces. There was no appreciable gas spike here. This zone calculated Sws of .59 to .68, which is considered not productive. This zone is not considered for production.

There was no show of oil found in the Rosiclare Sandstone at 838'-843' in a medium coarse clear good porosity quartz sandstone. There was no fluorescence and no odor detected in this zone. However, porosities of up to 16% and productive Sws values as low as of .31 were found in this zone. Because there were no shows of oil found in samples, completion of this zone is not recommended.

A slight show of oil to show of oil was found in McClosky dolomitic limestone zone at 888'-896' in a tan fine sucrosic dolomite rich oil saturated limestone with, in part, some tan white medium oolitic limestone with fluorescence. Samples had very fine cuttings with good odor and were possibly washed out, leaving only scattered fluorescence. No appreciable gas spike was found for this zone. Very good Sws of as low as .33, with porosities of up to 23%, were found here. This zone is highly recommended for production.

A show of oil to show of oil was found in a rather thin Lower Carper Sandstone at 1765'-1770' in a light blue-green tinted gray white very fine grained sandstone. This sandstone was quite firm and very calcareous, enough so that the PE curve on the e-log seemed to be indicating almost a limestone. Samples had good odor and up to 60% overall fluorescence with some pieces fading over time, but most yielded some oil when crushed. Data shows a gas spike of up to 25 gas units for this zone, with calculated Sw values as low as .48 and porosities of up to 9 to 15%. A 64 minute drill stem test was conducted through this zone from 1766' to 1793'. This resulted in ISIP 17#/63 MIN, recording 10' of mud with a show of oil in tool. This zone is highly recommended for production.

There were several shows of oil found in the Devonian Limestone Section. A slight show of oil was found in the Lingle Limestone at 1918' to 1925'. This was a dolomitic light tan limestone with some pieces having dolomite possibly lining cavities and very scattered fluorescence with fluorescing pieces yielding little to no oil. This zone, because of the weak show of oil, is not recommended for production.

A good show of oil was found at in the Grand Tower at 1938'-1944' in a tan white to white dolomitic limestone. This zone had good odor and up to 80% overall fluorescence yielding good free oil droplets especially when crushing fluorescing pieces. There appears to be some pieces with oil filling small cavities. Sws values for this zone were .59 to as high as .65, with porosities as high as 14%. An 184 minute drill stem test was conducted through this zone from 1932' to 1956'. This resulted in ISIP 27#/121 MIN, FSIP 62#/182 MIN, with 15' of mud with a show of oil in tool and 75' of gas in pipe. Because its free oil yielding and good show of oil, this zone is highly recommended for production, even though Sw values seem to calculate somewhat wet. A nice gas spike of up to 50 gas units was found here.

Another show of oil was found in the Grand Tower Limestone at 1964'-1968' in a mostly chalky matrixed fine sucrosic dolomite with good fluorescence and strong odor. Fluorescing pieces yield some oil. this zone had a good gas spike of 75 gas units. Sws values for this zone were .43 to as high as .53, with porosities as high as 9.5%. This zone is highly recommended for production.

There was a show of oil in the Geneva Dolomite at 2028'-2042' in a light tan chalky fine sucrosic friable dolomite with good odor and up to 20% overall fluorescence. Many very similar looking pieces do not fluoresce indicating possibly some water associated with the zone. A moderate gas spike of 29 units came from this zone. Sws calculated to be from .55 to around .65, with porosities as high as 12.5%. This zone could be considered for completion, however, careful treatment should be utilized when attempting production from this zone. It is recommended that only a small portion of the best calculated Sw footage be perforated, with minimal stimulation.

There was no show of oil found coming from the Dutch Creek Sandstone, however a very good looking, good porosity medium fine to almost coarse grained clear quartz sandstone was found at 2084'-209' depths. This zone had crossplot porosites as high as 18 %, and a good Sw value of .50 at the best porosity footage, indicating productivity. Applying caution and care, this zone, could be considered for production.

An interesting and possibly good potential zone was found in the Silurian Edgewood Formation, with a slight show of oil at 2842'-2850'. There was scattered fluorescence in an almost pure white friable fine grained limestone that seemed to have microvugs. Crushing these fluorescing pieces yielded good abundant free oil drops. The 2850'-2860' sample had good odor. Sws for this zone were very good and calculated to be as low as .38 and averaging in the .40s. Porosities were also good with some being up to 14%. This zone is highly recommended for completion.

A slight show of oil was found in the Ft. Atkinson Limestone Section at 2966'-2969' in a coarsely crystalline microfractured limestone with scattered pieces with blue green white fluorescence. There was no notable odor coming from samples, but crushing fluorescing pieces did yield some oil. Sw values were not good, (.77 to over 1.0). Also, porosity values were very low of only 2 to 3 %. This zone is not recommended for production.

There was another Ft. Atkinson Section very slight show of oil at around 3007' to 3020' area. Fluorescence was found in a single piece or two of blue green tinted gray fine grainstone limestone. The sample had no odor. The fluorescing pieces did yield some oil when crushed. Some Sw values were around .47 to as low as .38, with porosities of 7.8%. Because of the slight show of oil, this zone is not recommended for production.

The Trenton Limestone had many shows of oil essentially starting just below the top of the formation at around 3135' to the Platteville at 3298'. All shows were of a similar looking lithology, being a chalky white tan microfractured crystalline to sublithographic limestone having white edges to fractures. Fluorescence seemed to progressively increase as it was being drilled into the deeper parts of the formation, to as high as 20% overall fluorescence. Most porosity values were low and around 3 to 4 to up to around 5.5%. Sw values using an Rw of .07, were as low as .45, and many averaging in the .50s. This very thick zone is highly recommended for production.

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