

15-145-21513

7-22s-19w

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**WELL REPORT**  
Clute Oil Woelk #1-7  
Sec. 7-T22S-R19W  
Pawnee County, KS

Well Location: SWNENE (990' fnl & 990' fel)  
Total Depth: 4520' RTD & 4522' LTD Simpson Fm.  
Drillstem Test: DST #1 4304'-4320' Mississippian Chert  
Rec: 10' O&WCM (2% Oil, 12% Water & 86% Mud)+ 110' WCM  
Sample Chamber: 4000ml Water w/scum oil  
Chlorides: approx. 30,000ppm (filtrate?)  
IF 30" Weak Blow - 3" IFP 29-59#  
ISI 60" Dead ISIP 1326#  
FF 30" Weak Blow - 1" FFP 67-81#  
FSI 30" Dead in 3 min. FSIP 1282#  
(See attached Drillstem Test Report)

Geological Services: Supervision and Sample Examination 2100' -TD

Surface Casing: 885' - 8-5/8"  
Production Casing: 2486' - 4-1/2"

Log Tops:	NESWNW Sec. 36	NENENE Sec. 7	SWNENE Sec. 7
<b>KB</b>	Klepper-Musenberg 2109	Harnish #1 2113	Woelk #1-7 2108
Anhydrite	1215 +894	1220 +893	1230 +878
Winfield (Chase)	2231 -122	2264 -151	2272 -164
Base Florence	2437 -328	2462 -349	2472 -364
Wabaunsee	2936 -827	2976 -863	2986 -878
Topeka	3226 -1117	3288 -1175	3296 -1188
Heebner	3606 -1497	3661 -1548	3664 -1556
Lansing/Kansas City	3686 -1577	3747 -1634	3749 -1641
Base Kansas City	3981 -1872	4056 -1943	4057 -1949
Fort Scott	4126 -2017	4204 -2091	4204 -2096
Cherokee Shale	4142 -2033	4220 -2107	4216 -2108
Cherokee Sand	Absent	4276 -2163	Absent
Mississippian Chert	4222 -2113	4323 -2210	4306 -2198
Kinderhook	4272 -2163	4376 -2263	4356 -2248
Viola	4381 -2272	4495 -2382	4378 -2270
<b>TD</b>	4800	4670	4522

Discussion: The Woelk #1-7 encountered no commercial pay zones below the Heebner Shale (3664'). The Woelk #1-7 did confirm the structural interpretation within the Lower Pennsylvanian to Ordovician interval and this interval did thin by 120' to that present in the Harnish #1. The resulting formations tops, comparing the Woelk #1-7 to the Harnish #1, began as being 8 feet low at the Heebner Shale and ended by being 112 feet high at the Viola horizon. Although there were sample shows in the: Lansing/Kansas City (3), Mississippian Chert and Viola Formations. For the most part potential reservoirs below the Heebner Shale were characterized by highly porous

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rock with little permeability. In many cases the original rock fabric has been completely altered and now is comprised of chalk. This high alteration of the original rock fabric and resultant tight nature of the reservoir rock may be a result of being too high in terms of paleo-structure. Based on promising log calculations the decision was made to run production casing to 2486' in order to evaluate the gas potential of the Herington, Krider, Winfield and Towanda Members of the Chase Group.

#### STRUCTURE

The Woelk #1-7 was drilled to evaluate a structural feature suggested by well data and single point seismic data. Mapping of this data indicated that a well positioned in SWNE Section 7-T22S-R19W would encounter prospective pay zones in the Chase, Lansing/Kansas City, Cherokee, Mississippian, Kinderhook and Viola in a structural position higher than those in the Harnish #1, an offset well in the NENENE Section 7-T22S-R19W. Interpretation of the structural position of the prospective pay zones above the Mississippian proved to be inaccurate and the Woelk #1-7 was lower than the Harnish #1 on these zones. However, the structural interpretation on the Mississippian Chert and Kinderhook was "right on", while the structural top of the Viola proved to be 100' higher than expected. The structural top of the Viola Formation even proved to be higher than that of the highest well in Merritt Field (approximately 2 miles to the northwest). The Woelk #1-7 proved the existence of a deep positive structure in the northeast quarter of Section 7-T22S-R19W. This structure is offset at shallower horizons (Chase) in a northeasterly direction and may be centered in the southwest quarter of Section 5-T22s-R19W.

#### CHASE

The Chase zones were not Drillstem tested due to a miscalculation of the drill pipe tally by the drilling contractor. The tally indicated that when we had reached our test point, at 2280', we were 30 feet deeper (2310') than thought. *This later proved not to be the case when we were able to conduct a pipe strap.* The decision was made to drill on without testing and to evaluate the Chase interval based upon logs.

The log suite (Dual Induction and Dual Compensated Porosity logs) of the Chase zones in the Woelk #1-7 indicate these zones to be have an excellent potential for significant gas reserves. The Chase zones, in the Woelk #1-7, have a structural position approximately flat to that in the Becker Oil Price #2 (W/2SENE Section 19-T22S-R19W). The Price #2 was completed in January 2002 at a rate of 130 MCFGPD from the Towanda and Herington Members of the Chase Group. The Dual Compensated Porosity Log indicates the Chase zones to have equivalent porosity and exhibit Neutron/Density crossover (gas indicator) similar to that in the Price #2. Based upon the above stated log character, log calculations and the abundance of shallow gas wells in the surrounding area the decision was made to run 4-1/2" production casing to a depth of 2486 feet and to evaluate the Towanda, Winfield, Krider and Herington Members of the Chase Group through pipe.

#### LANSING/KANSAS CITY

Three zones in the Lansing/Kansas City (G, I and J) had fair to good samples shows. It was, also, at this point that the gas detector was determined to be not functioning properly. Upon testing the gas detector system was found to have a feedline leak which resulted in inadequate flow from the mud trap to the detection unit. *All readings above 4200' are suspect, to the low side, and some shows may have been missed.* The Lansing/Kansas City "G" zone (3900'-3907') had a excellent drilling break. Samples had good porosity but were chalky. Dry samples showed faint fluorescence on less than 5% of the samples. The "G" zone produces oil at Rozel Field, two miles to the northeast. The Lansing/Kansas City "I" zone (3953'-3964') had a good to excellent drilling break. Samples had fair intergranular to good oomoldic porosity but were chalky in part. Approximately 5% of samples had fair to good fluorescence and a weak cut. The Lansing/Kansas City "J" zone (3990'-4000') had a poor drilling break but good sample shows. Samples have fair intergranular porosity, some vuggy porosity, faint odor, fair to good stain and instant cut and fluorescence on approximately 5% of the pieces. This zones tested a small amount of oil and may have produced in a well at Merritt Field.

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*CHEROKEE*

The Cherokee Interval (4216'-4270') is much thinner, in the Woelk #1-7, than that of the Harnish #1 and no significant amount of sand was encountered. The Woelk #1-7 drilled into a Pennsylvanian Conglomerate "rubble" from 4270' to the top of the Mississippian Chert at 4306'. The Lower Cherokee Limestone (4252'-4266') had a poor drilling break but did have a slight sample and gas detector show. Samples are described as having fair intergranular porosity, some bright yellow fluorescence and slow cut on less than 5% of the pieces.

*MISSISSIPPIAN*

The Mississippian Chert (4306' - 4356') had good sample and gas detector shows. The poor fluid recovery in DST #1 and decreasing shut-in pressure indicate the Chert to be tight. The Mississippian Chert zone was produced in several wells at neighboring Merritt Field, Burdett Field and Givens Field. I believe that this interval could be productive if encountered in an area that has abundant natural fracturing of the chert.

*KINDERHOOK*

The Kinderhook section (4356'-4378') thins dramatically from 119 feet in the Harnish #1 to 22 feet in the Woelk #1-7. Unfortunately, during drilling of this unit the drill bit gave out. This resulted in unreliable drilling times and very poor samples. The samples are described as: Sandstone, white to green, poor to good porosity and no show. The pinch out of such a large amount of the Kinderhook section suggests the potential for stratigraphic entrapment of hydrocarbons in this area.

*VIOLA*

The Viola Formation (4378'-4488') is structurally 112 feet high to that in the Harnish #1. Unfortunately, the drilling of the top of the Viola interval was also effected when the drill bit "cratered". The remainder of the Viola interval drilled slowly. Samples are described as: Chert, white to light grey to brown, highly weathered, trace dead oil stain to Limestone, white, chalky, cherty, with some gas bubbles. The presence of gas bubbles and little to no gas kick on the gas detector suggest low BTU gas or another leak in the gas detector feedline. Should the Viola develop greater porosity in this area in a favorable structural position commercial hydrocarbon production might be achieved.

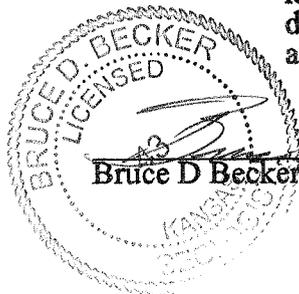
*WHAT NEXT?*

Should production testing of the Chase Group, in the Woelk #1-7, yield significant gas reserves, a gas market must be established. It is believed that Becker Oil has plans to hook the Price #2 up to its gathering system which is presently located a few miles south in Township 23 South and Range 19 West. Should the gathering system be extended to the Price #2 we would only need to lay two to three miles of pipeline to connect the Woelk #1-7.

Expiration of the Price and Ellis leases (SE Section 6-T22S-R19W and SW Section 5-T22S-R19W) require that a well be drilled on one of these parcels before year's end. If significant gas production is established in the Chase at the Woelk #1-7, a case can be made for drilling a Chase well in the SWSWSW Section 5-T22S-R19W.

The Woelk #1-7 leaves several geological questions unanswered about the Woelk Prospect. If the Cherokee interval, in the Harnish #1, is indicative of a channel deposit, where is the axis of this channel and does it contain significant sand? Can porous and permeable reservoirs within the Lansing/Kansas City G, I and J zones be located? Can areas of fractured Mississippian Chert be located? Additional seismic data in the form of a 3-D seismic survey may go a long way in determining the answers to the above questions.

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