

15-083-21779

# Geological Report

DK Operating, Inc.  
Antrim Unit #1-17  
70' FNL & 450' FEL  
Sec. 17 T21s R22w  
Hodgeman County, Kansas



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DK Operating, Inc.

17-214-22w

## General Data

Well Data: DK Operating, Inc.  
Antrim Unit #1-17  
70' FNL & 450' FEL  
Sec. 17 T21s R22w  
Hodgeman County, Kansas  
API # 15-083-21779-0000

Drilling Contractor: Pickrell Drilling Co. Inc. Rig #1

Geologist: Jason T Alm

Spud Date: May 30, 2012

Completion Date: June 6, 2012

Elevation: 2272' Ground Level  
2282' Kelly Bushing

Directions: Hanston KS, 6 Mi. North on NE 228 Rd. to V Rd. 2  
mi. West to NE 226 Rd. 1 mi. North to W Rd. 1/8  
mi. West, South into location.

Casing: 258' 8 5/8" surface casing  
4359' 5 1/2" production casing

Samples: 10' wet and dry, 3900' to RTD

Drilling Time: 3600' to RTD

Electric Logs: Log-Tech, Inc. "Kenyon Bange"  
CNL/CDL, DIL, MEL

Drillstem Tests: Three, Trilobite Testing, Inc. "Jim Svaty"

Problems: None

Remarks: After DST #1, gas detector wasn't accurately  
reading gas levels due to high background from  
fluid dumped during DST #1.

## Formation Tops

<b>Formation</b>	<b>DK Operating, Inc. Antrim Unit #1-17 Sec. 17 T21s R22w 70' FNL &amp; 450' FEL</b>
Anhydrite	1432', +850
Base	1466', +816
Heebner	3708', -1426
Lansing	3758', -1476
Stark	4008', -1726
BKc	4108', -1826
Pawnee	4190', -1908
Fort Scott	4262', -1980
Cherokee	4284', -2002
Mississippian	4332', -2050
RTD	4357', -2075
LTD	4360', -2078

## Sample Zone Descriptions

- Fort Scott** (4262', -1980): **Covered in DST #1**  
 Ls – Fine crystalline with poor to fair inter-crystalline and vuggy porosity, light to fair oil stain in porosity, show of free oil, good odor, bright yellow fluorescents, 100 units hotwire.
- Miss. Osage** (4332', -2050): **Covered in DST #2,3**  
 Δ – Dolo – Fine sucrosic crystalline with fair inter-crystalline and vuggy porosity, very heavy partially triptolic chert, very weathered with good vuggy porosity, light to fair oil stain in porosity, good show of free oil on cup, strong odor, bright yellow fluorescents.

**Drill Stem Tests**  
Trilobite Testing Inc.  
"Jim Svaty"

<b>DST #1</b>	<b><u>Fort Scott</u></b>	
	Interval (4239' -4290') Anchor Length 51'	
	IHP - 2100 #	
	IFP - 45" - B.O.B. 11 min.	21-59 #
	ISI - 45" - Dead	391 #
	FFP - 45" - B.O.B. 30 sec.	61-77 #
	FSI - 45" - Dead	394 #
	FHP - 1986 #	
	BHT - 121°F	
	Recovery: 1260' GIP	
	40' OSM	
	123' GOCM	23% Oil
<b>DST #2</b>	<b><u>Mississippian Osage</u></b>	
	Interval (4334' -4342') Anchor Length 8'	
	IHP - 2110 #	
	IFP - 30" - W.S.B.	17-28 #
	ISI - 30" - Dead	1349 #
	FFP - 30" - Dead	28-38 #
	FSI - 30" - Dead	1348 #
	FHP - 1996 #	
	BHT - 122°F	
	Recovery: 8' Mud	
<b>DST #3</b>	<b><u>Mississippian Osage</u></b>	
	Interval (4343' -4357') Anchor Length 14'	
	IHP - 2140 #	
	IFP - 15" - B.O.B. 2 min.	129-468 #
	ISI - 30" - Dead	1345 #
	FFP - 15" - B.O.B. 2 min.	488-713 #
	FSI - 30" - Dead	1345 #
	FHP - 2017 #	
	BHT - 129°F	
	Recovery: 248' GIP	
	868' WCO	80% Oil, 20% Water
	310' WCO	70% Oil, 30% Water
	310' WCO	50% Oil, 50% Water
	186' MCW	80% Water

## Structural Comparison

Formation	DK Operating, Inc.	Pickrell Drilling, Inc.		Pickrell Drilling, Inc.	
	Antrim Unit #1-17 Sec. 17 T21s R22w 70' FNL & 450' FEL	Selfridge #3 Sec. 8 T21s R22w C SE SE		Antrim A #1 Sec. 17 T21s R22w C NE NE	
Anhydrite	1432', +850	1411', +850	FL	NA	NA
Base	1466', +816	NA	NA	NA	NA
Heebner	3708', -1426	3680', -1419	(-7)	3715', -1436	(+10)
Lansing	3758', -1476	3726', -1465	(-9)	3766', -1487	(+11)
Stark	4008', -1726	NA	NA	NA	NA
BKc	4108', -1826	4082', -1821	(-5)	NA	NA
Pawnee	4190', -1908	NA	NA	NA	NA
Fort Scott	4262', -1980	4236', -1975	(-5)	4270', -1991	(+11)
Cherokee	4284', -2002	4258', -1997	(-5)	NA	NA
Mississippian	4332', -2050	4316', -2055	(+5)	4355', -2076	(+26)

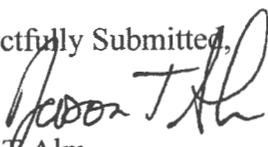
## Summary

The location for the Antrim Unit #1-17 well was found via 3-D seismic survey. The new well ran structurally as expected via the survey. Three drill stem tests were conducted one of which recovered commercial amounts of oil from the Mississippian Osage Formation. After all gathered data had been examined the decision was made to run 5 1/2 inch production casing to further evaluate the Antrim Unit #1-17 well.

## Recommended Perforations

<b>Primary:</b>		
Mississippian Osage	(4351' – 4354')	DST #3
<b>Secondary:</b>		
Fort Scott	(4284' – 4288')	DST #1
<b>Before Abandonment:</b>		
Mississippian Osage	(4336' – 4344')	DST #2

Respectfully Submitted,

  
 Jason T. Alm  
 Hard Rock Consulting, Inc.