

CORE ANALYSIS REPORT

FOR

KANSAS LAND INVESTMENT, INC.
WOODHEAD NO. 28 WELL
DOUGLAS COUNTY, KANSAS

CORE LABORATORIES, INC.
Petroleum Reservoir Engineering
TULSA OKLAHOMA

REPLY TO
7304 EAST 38TH STREET
TULSA, OKLAHOMA
74145

November 8, 1984

Kansas Land Investment, Inc.
222 E. 3rd. St.
Ottawa, Kansas 66067

Attn: Mr. Jim Mietchen

Subject: Core Analysis Data
Woodhead No. 28 Well
Douglas County, Kansas
CLI File 3408-840280

Gentlemen:

Cores taken in the subject well in the Squirrel sand formation were received in the Tulsa laboratory for special analytical testing described on the Procedure Page.

The accompanying Coregraph presents the binomially averaged core analysis data in graphical form to aid correlation with downhole electrical surveys.

Tabular presentation of the measured physical properties may be found on page one of this report.

Empirical estimates of stock tank oil in place may be found on page two.

Core analysis data from the cored interval 665.0 and 676.0 feet exhibits good porosity and fair matrix permeability development. This zone should be oil productive after formation treatment.

It is a pleasure to have this opportunity of serving you.

Very truly yours,

CORE LABORATORIES, INC.



J. Michael Edwards
District Manager

JME:MCH:jeh
5 cc: Addressee

Kansas Land Investment, Inc.
Woodhead No. 28 Well
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Procedure Page

Handling and Analytical Procedures

Diamond coring equipment was used to obtain 2 1/8-inch diameter cores between 665.0 and 676.0 feet.

The cores were preserved at the well site by client representative.

The core was transported to Tulsa by motor freight.

Plug analysis was made in intervals requested.

Fluid removal was accomplished by using high temperature retorts.

Porosity was determined by Summation of Fluids technique.

Horizontal air permeability on plugs measured without Klinkenberg correction.

Temporary storage of cores in Tulsa laboratory awaiting additional instructions.

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Petroleum Reservoir Engineering

DALLAS, TEXAS

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KANSAS LAND INVESTMENT, INC.
 WOODHEAD NO. 28 WELL

DATE: 11-8-84
 FORMATION: SQUIRREL SAND

FILE NO: 3408-840290
 ENGINEER: HUDSON
 ELEVATION:

DOUGLAS COUNTY, KANSAS
 LOCATION:

SMP. NO.	DEPTH	PERM. TO AIR MD. PLUG	POROSITY PERCENT	FLUID OIL	SATS. WTR.	STB/AF	DESCRIPTION
ROUTINE PLUG SUMMATION OF FLUIDS							
1	665.0-66.0	0.2	16.4	24.5	48.9	620	SD, SLTY, SHY, MICA
2	666.0-67.0	10.0	20.8	28.3	37.0	968	SD, SL/CALC, MICA LM
3	667.0-68.0						LM
4	668.0-68.3	0.4	12.8	11.9	75.6	232	SD, CALC, SHY, MICA
5	668.3-68.8						LM
6	668.8-69.0						SD, SLTY, SHY, MICA
7	669.0-70.0	3.5	18.7	20.8	42.9	788	SD, SLTY, SHY, MICA
8	670.0-71.0	46.0	21.8	41.1	31.6	1103	SD, SL/CALC, MICA
9	671.0-72.0	37.0	21.5	37.6	30.3	1107	SD, SL/CALC, MICA
10	672.0-73.0	39.0	21.1	35.4	32.2	1054	SD, SL/CALC, MICA
	673.0-74.0	2.2	21.2	35.2	32.0	1068	SD, SLTY, SH/LAMS, MICA
	674.0-75.0	49.0	21.9	31.1	36.3	1028	SD, SL/CALC, MICA
	675.0-76.0	2.9	18.8	23.7	50.0	695	SD, SL/CALC, SHY, MICA

5.0 21.4 34.7 32.5 36.5

$V_A = .21 (75\%)$
 $V_B = .95 (25\%)$

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Petroleum Reservoir Engineering
DALLAS, TEXAS

Page 2 of 2 File 3408-840290
 Well WOODHEAD NO. 23

CORE SUMMARY AND CALCULATED RECOVERABLE OIL

FORMATION NAME AND DEPTH INTERVAL: SQUIRREL SAND 665.0-676.0

FEET OF CORE RECOVERED FROM ABOVE INTERVAL	11	AVERAGE TOTAL WATER SATURATION: PER CENT OF PORE SPACE	41.7
FEET OF CORE INCLUDED IN AVERAGES	10	AVERAGE CONNATE WATER SATURATION: PER CENT OF PORE SPACE	37.0 (e)
AVERAGE PERMEABILITY: MILLIDARCYS	19.0	OIL GRAVITY: °API	
PRODUCTIVE CAPACITY: MILLIDARCY-FEET	190	ORIGINAL SOLUTION GAS-OIL RATIO: CUBIC FEET PER BARREL	
AVERAGE POROSITY: PER CENT	19.5	ORIGINAL FORMATION VOLUME FACTOR: BARRELS SATURATED OIL PER BARREL STOCK-TANK OIL	1.05 (c)
AVERAGE RESIDUAL OIL SATURATION: PER CENT OF PORE SPACE	29.0	CALCULATED ORIGINAL STOCK-TANK OIL IN PLACE: BARRELS PER ACRE-FOOT	866

Calculated maximum solution gas drive recovery is ^{121(e)} barrels per acre-foot, assuming production could be continued until reservoir pressure declined to zero psig. Calculated maximum water drive recovery is barrels per acre-foot, assuming full maintenance of original reservoir pressure, 100% areal and vertical coverage, and continuation of production to 100% water cut. (Please refer to footnotes for further discussion of recovery estimates.)

FORMATION NAME AND DEPTH INTERVAL:

FEET OF CORE RECOVERED FROM ABOVE INTERVAL		AVERAGE TOTAL WATER SATURATION: PER CENT OF PORE SPACE	
FEET OF CORE INCLUDED IN AVERAGES		AVERAGE CONNATE WATER SATURATION: PER CENT OF PORE SPACE	
AVERAGE PERMEABILITY: MILLIDARCYS		OIL GRAVITY: °API	
PRODUCTIVE CAPACITY: MILLIDARCY-FEET		ORIGINAL SOLUTION GAS-OIL RATIO: CUBIC FEET PER BARREL	
AVERAGE POROSITY: PER CENT		ORIGINAL FORMATION VOLUME FACTOR: BARRELS SATURATED OIL PER BARREL STOCK-TANK OIL	
AVERAGE RESIDUAL OIL SATURATION: PER CENT OF PORE SPACE		CALCULATED ORIGINAL STOCK-TANK OIL IN PLACE: BARRELS PER ACRE-FOOT	

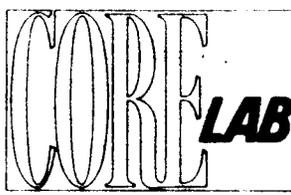
Calculated maximum solution gas drive recovery is barrels per acre-foot, assuming production could be continued until reservoir pressure declined to zero psig. Calculated maximum water drive recovery is barrels per acre-foot, assuming full maintenance of original reservoir pressure, 100% areal and vertical coverage, and continuation of production to 100% water cut. (Please refer to footnotes for further discussion of recovery estimates.)

(c) Calculated (e) Estimated (m) Measured (*) Refer to attached letter.

These recovery estimates represent theoretical maximum values for solution gas and water drive. They assume that production is started at original reservoir pressure; i.e., no account is taken of production to date or of prior drainage to other areas. The effects of factors tending to reduce actual ultimate recovery, such as economic limits on oil production rates, gas-oil ratios, or water-oil ratios, have not been taken into account. Neither have factors been considered which may result in actual recovery intermediate between solution gas and complete water drive recoveries, such as gas cap expansion, gravity drainage, or partial water drive. Detailed predictions of ultimate oil recovery to specific abandonment conditions may be made in an engineering study in which consideration is given to overall reservoir characteristics and economic factors.

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Petroleum Reservoir Engineering

COMPANY KANSAS LAND INVESTMENT, INC. FILE NO. 3408-840290
 WELL WOODHEAD NO. 28 DATE 11-8-84
 FIELD _____ FORMATION SQUIRREL SAND ELEV. _____
 COUNTY DOUGLAS STATE KANSAS DRLG. FLD. _____ CORES _____
 LOCATION _____

CORRELATION COREGRAPH

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VERTICAL SCALE: 5" = 100'

Gamma Ray
RADIATION INCREASE →

Permeability _____
MILLIDARCIES

Porosity _____
PERCENT

Total Water _____
PERCENT PORE SPACE

Oil Saturation _____
PERCENT PORE SPACE

