

CORE ANALYSIS REPORT

FOR

KANSAS LAND INVESTMENT, INC.  
WOODHEAD NO. 44 WELL  
DOUGLAS COUNTY, KANSAS

CORE LABORATORIES, INC.  
*Petroleum Reservoir Engineering*

TULSA, OKLAHOMA

July 23, 1985

REPLY TO  
7304 EAST 38TH STREET  
TULSA, OKLAHOMA  
74145

Kansas Land Investment, Inc.  
222 East Third  
Ottawa, Kansas 66067

Attn: Mr. Jim Mietchen

Subject: Core Analysis Data  
Woodhead No. 44 Well  
Douglas County, Kansas  
CLI File 3408-850145

Gentlemen:

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

The accompanying Coregraph presents 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.

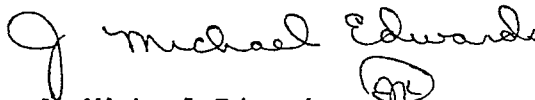
Empirical estimates of stock tank oil in place may be found on page two.

Histograms of porosity and permeability in addition to a graph of permeability versus porosity may be found on pages three and four.

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

Very truly yours,

CORE LABORATORIES, INC.



J. Michael Edwards  
District Manager

JME:jk

5 cc - Addressee

Kansas Land Investment, Inc.  
Woodhead No. 44 Well  
CLI File 3408-850145

Procedure Page

#### Handling and Analytical Procedures

Diamond coring equipment and air were used to obtain 2-1/8 inch diameter cores between 701.0 to 711.1 feet.

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

The cores were transported to Tulsa by bus.

Plug analysis was made in intervals requested.

Fluid removal was accomplished 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 for a period of thirty days without additional charge.

KANSAS LAND INVESTMENT, INC.  
 WOODHEAD NO. 44 WELL  
 DOUGLAS COUNTY, KANSAS

DATE : 7-23-85  
 FORMATION : SQUIRREL SAND  
 DRLG. FLUID: AIR  
 LOCATION :

FILE NO. : 3408-850145  
 API NO. :  
 LABORATORY: TULSA, OKLAHOMA

CONVENTIONAL PLUG ANALYSIS

SAMPLE NUMBER	DEPTH FEET	PERM PLUG	FLD POR	OIL% POR	WTR% POR	DESCRIPTION
1	701.0- 2.0	0.25	15.9	14.1	63.8	SD FN GRN SL/CALC SHY MICA PYR
2	702.0- 3.0	4.4	15.0	18.4	66.8	SD FN GRN SL/CALC SHY MICA PYR
3	703.0- 4.0	11.	21.1	36.4	37.5	SD FN GRN SL/CALC SL/SHY MICA
4	704.0- 5.0	17.	21.3	33.7	37.9	SD FN GRN SL/CALC PYR MICA
5	705.0- 6.0	17.	22.7	38.6	32.6	SD FN GRN SL/CALC PYR MICA
6	706.0- 7.0	16.	22.3	38.0	32.9	SD FN GRN SL/CALC PYR MICA
7	707.0- 8.0	21.	20.4	28.4	40.4	SD FN GRN SL/CALC PYR MICA
8	708.0- 9.0	5.0	17.3	33.3	45.7	SD FN GRN SL/CALC SH LAMS MICA
9	709.0-10.0	0.78	17.8	27.3	50.4	SD FN GRN SL/CALC SH LAMS MICA
10	710.0-11.0	3.3	20.7	30.5	40.3	SD FN GRN SL/CALC SH LAMS MICA
	711.0-11.1					SD SHY
		5.0	21.6	35.0	36.3	
					33.0	

$$\bar{V}_K = .18 \text{ (86\%)} \\
\bar{V}_B = .90 \text{ (14\%)}$$

These analyses, opinions or interpretations are based on observations and materials supplied by the client to whom, and for whose exclusive and confidential use, this report is made. The interpretations or opinions expressed represent the best judgment of Core Laboratories, Inc. (all errors and omissions excepted); but Core Laboratories, Inc. and its officers and employees, assume no responsibility and make no warranty or representations, as to the productivity, proper operations, or profitability of any oil, gas or other mineral well or sand in connection with which such report is used or relied upon.

**CORE LABORATORIES, INC.**  
*Petroleum Reservoir Engineering*  
 DALLAS, TEXAS

KANSAS LAND INVESTMENT, INC.  
 WOODHEAD NO. 44 WELL

DATE : 7-23-85  
 FORMATION : SQUIRREL SAND

FILE NO. : 3408-850145  
 ANALYSTS : HUDSON

\*\*\* CORE SUMMARY AND CALCULATED RECOVERABLE OIL \*\*\*

DEPTH INTERVAL: 703.0 TO 709.0

FEET OF CORE ANALYZED : 6.0 FEET OF CORE INCLUDED IN AVERAGES: 6.0

-- SAMPLES FALLING WITHIN THE FOLLOWING RANGES WERE AVERAGED --

PERMEABILITY HORIZONTAL RANGE (MD.)	:	0.00 TO 30.	(UNCORRECTED FOR SLIPPAGE)
FLUID POROSITY RANGE (%)	:	10.0 TO 100.0	
OIL SATURATION RANGE (%)	:	20.0 TO 40.0	
WATER SATURATION RANGE (%)	:	30.0 TO 50.0	

SHALE SAMPLES EXCLUDED FROM AVERAGES.

AVERAGE PERMEABILITY (MILLIDARCIES)		AVERAGE TOTAL WATER SATURATION	:	37.5
ARITHMETIC PERMEABILITY	:	(PERCENT OF PORE SPACE)		
GEOMETRIC PERMEABILITY	:			
HARMONIC PERMEABILITY	:	AVERAGE CONNATE WATER SATURATION	:	(C) 34.2
		(PERCENT OF PORE SPACE)		
PRODUCTIVE CAPACITY (MILLIDARCY-FEET)		OIL GRAVITY (API)	:	(E) 30.0
ARITHMETIC CAPACITY	:			
GEOMETRIC CAPACITY	:	ORIGINAL SOLUTION GAS-OIL RATIO	:	(E) 1.
HARMONIC CAPACITY	:	(CUBIC FEET PER BARREL)		
AVERAGE POROSITY (PERCENT)	:	ORIGINAL FORMATION VOLUME FACTOR	:	(C) 1.05
		(BBLS SATURATED OIL/STOCK-TANK BBL)		
AVERAGE RESIDUAL OIL SATURATION	:	ORIGINAL STOCK-TANK OIL IN PLACE	:	(C) 1013.
(PERCENT OF PORE SPACE)		(BARRELS PER ACRE-FOOT)		

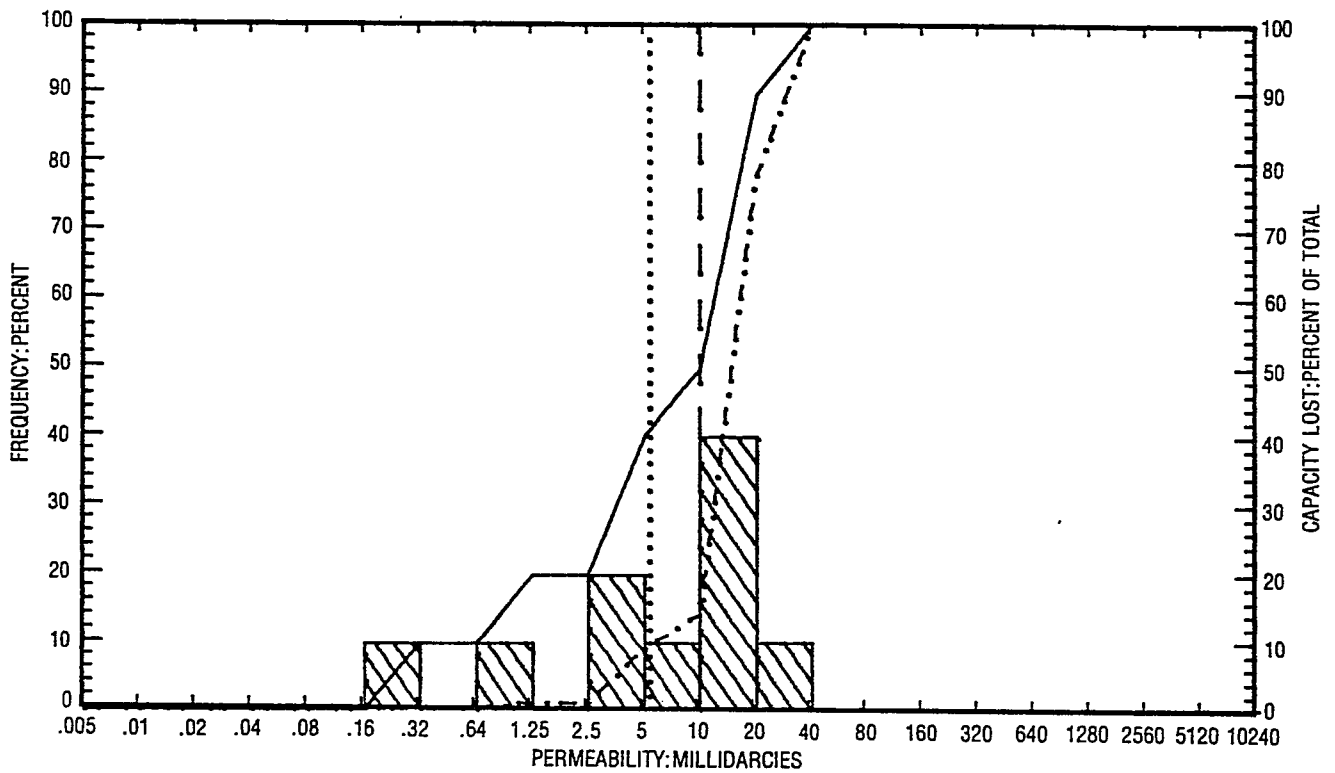
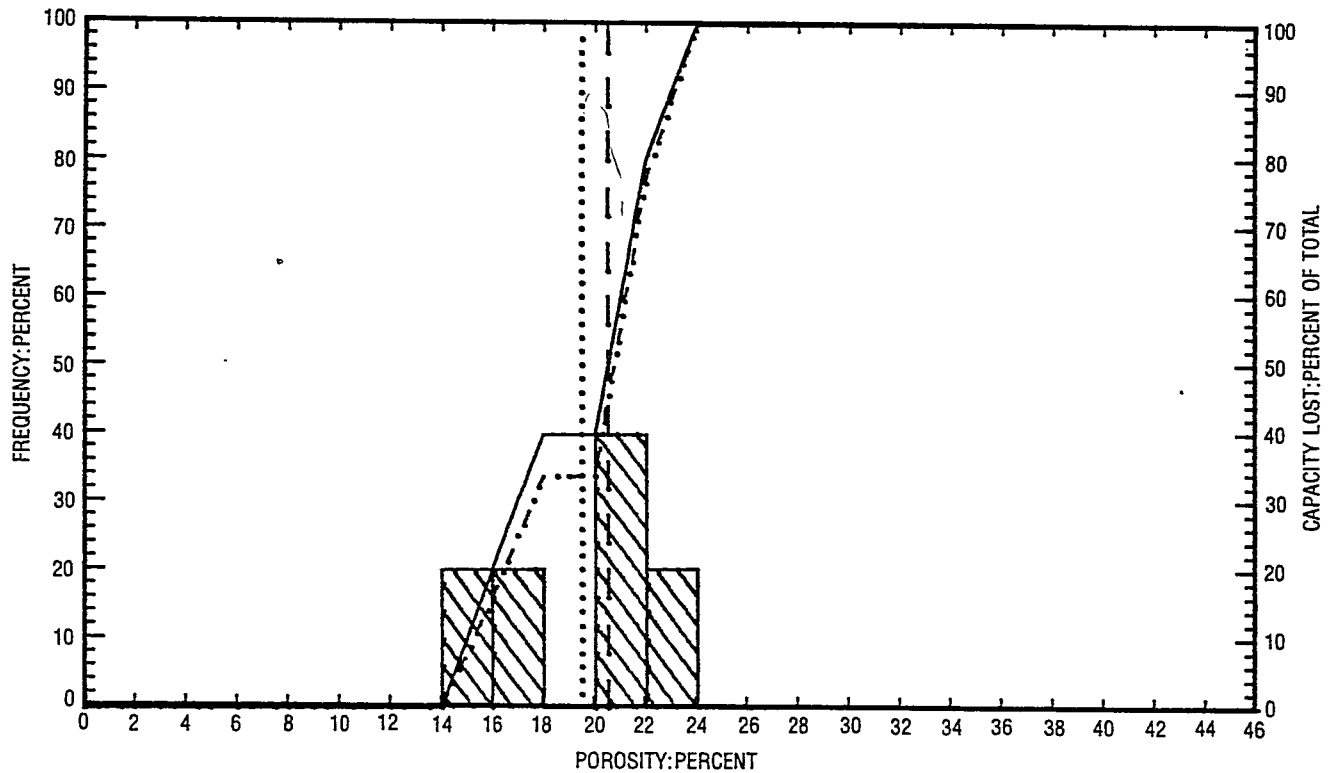
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CALCULATED MAXIMUM SOLUTION GAS DRIVE RECOVERY IS \_\_\_\_\_ BARRELS PER ACRE-FOOT, ASSUMING PRODUCTION  
 COULD BE CONTINUED UNTIL RESERVOIR PRESSURE DECLINED TO ZERO PSIG. CALCULATED MAXIMUM WATER DRIVE  
 RECOVERY IS \_\_\_\_\_ BARRELS PER ACRE-FOOT, ASSUMING FULL MAINTENANCE OF ORIGINAL RESERVOIR PRESSURE  
 100% AREAL AND VERTICAL COVERAGE, AND CONTINUATION OF PRODUCTION TO 100% WATER CUT.

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(C) CALCULATED      (E) ESTIMATED      (M) MEASURED      (\*) REFER TO ATTACHED LETTER.

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PERMEABILITY AND POROSITY HISTOGRAMS Page 3

KANSAS LAND INVESTMENT, INC.  
WOODHEAD NO. 44 WELL

DOUGLAS COUNTY, KANSAS

LEGEND

- ARITHMETIC MEAN POROSITY ..... 20
- GEOMETRIC MEAN PERMEABILITY ..... 5
- MEDIAN VALUE ..... 22
- CUMULATIVE FREQUENCY \_\_\_\_\_
- CUMULATIVE CAPACITY LOST ..... 20

100.

PERMEABILITY: MILLIDARCIES

10.

1.

0.1

0.0 4.0 8.0 12.0 16.0 20.0 24.0

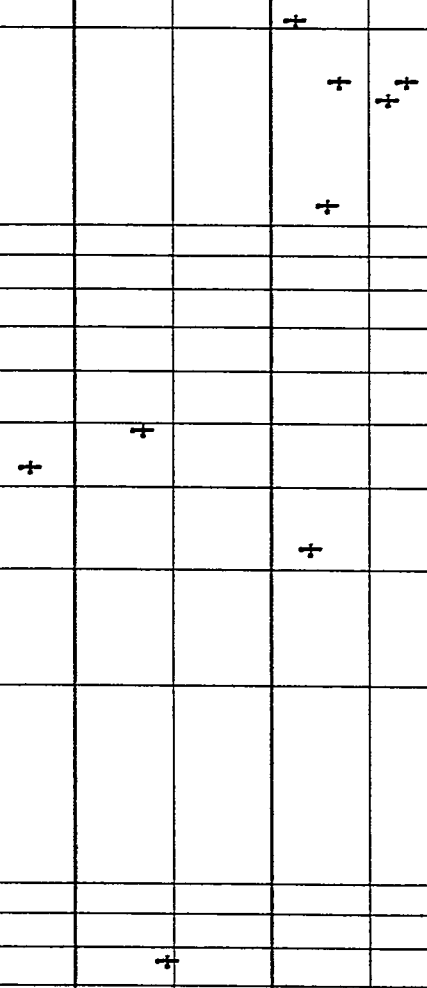
POROSITY PERCENT

PERMEABILITY VS. POROSITY

KANSAS LAND INVESTMENT, INC.  
WOODHEAD NO. 44 WELL

DOUGLAS COUNTY, KANSAS

Page 4





COMPANY KANSAS LAND INVESTMENT, INC. FILE NO. 3408-950145  
 WELL WOODHEAD NO. 44 WELL DATE 7-23-85  
 FIELD \_\_\_\_\_ FORMATION SQUIRREL SAND ELEV. \_\_\_\_\_  
 COUNTY DOUGLAS COUNTY STATE KANSAS DRLG. FLD. AIR CORES \_\_\_\_\_  
 LOCATION \_\_\_\_\_

# CORRELATION COREGRAPH

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VERTICAL SCALE: 5" = 100'

**Total Water** \_\_\_\_\_  
 PERCENT PORE SPACE  
 100 80 60 40 20 0

**Oil Saturation** \_\_\_\_\_  
 PERCENT PORE SPACE  
 0 20 40 60 80 100

**Gamma Ray**  
 RADIATION INCREASE →

**Permeability** \_\_\_\_\_  
 MILLIDARCIES  
 1000 100 10 1

**Porosity** \_\_\_\_\_  
 PERCENT  
 30 20 10 0

Depth  
 Feet

650

700

750

