CORE ANALYSIS REPORT

FOR

J. C. BROWN
J. C. BROWN NO. 4-B WELL
DOUGLAS COUNTY, KANSAS

CORE LABORATORIES, INC.
Petroleum Reservoir Engineering
TULSA, OKLAHOMA

May 3, 1985

REPLY TO
7304 EAST 38TH STREET
TULSA, OKLAHOMA
74145

J. C. Brown
Rural Route 3
Baldwin, Kansas 66006

Attn: Mr. J. C. Brown

Subject: Core Analysis Data
J. C. Brown No. 4-B Well
Douglas County, Kansas
CLI File 3408-850076

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.

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

Very truly yours,

CORE LABORATORIES, INC.

J. Michael Edwards

J. Michael Edwards
District Manager

JME:ja

3 cc - Addressee
3 cc - Kansas Land Investment, Inc.
Attn: Mr. Jim Mietchen
222 East 3rd Street
Ottawa, Kansas 66067

J. C. Brown
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Procedure Page

Handling and Analytical Procedures

Diamond coring equipment and air were used to obtain 2-1/8 inch diameter cores between 687.0 and 700.5 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.

CORE LABORATORIES, INC.

Petroleum Reservoir Engineering

DALLAS, TEXAS

J. C. BROWN
J. C. BROWN NO. 4-B WELL
DOUGLAS COUNTY, KANSAS

DATE : 5-3-85
FORMATION : SQUIRREL SAND
DRLG. FLUID: AIR
LOCATION :

FILE NO. : 3408-850076
API NO. :
LABORATORY: TULSA, OKLAHOMA

CONVENTIONAL PLUG ANALYSIS

SAMPLE NUMBER	DEPTH FEET	PERM PLUG	FLD POR	OIL% POR	WTR% POR	DESCRIPTION
	687.0-87.3					SH
1	687.3-88.0	0.61	17.8	31.5	41.9	SD FN GRN CALC SL/SHY MICA
	688.0-89.0					LM
2	689.0-90.0	0.80	17.7	21.8	57.3	SD FN GRN SL/CALC SL/SHY MICA
3	690.0-91.0	2.5	20.6	19.8	44.0	SD FN GRN SL/CALC SHY MICA
	691.0-91.5					SH
4	691.5-92.0	72.	22.7	22.2	33.7	SD FN GRN SL/CALC MICA
5	692.0-93.0	37.	21.6	31.0	33.0	SD FN GRN SL/CALC MICA
6	693.0-94.0	33.	17.5	28.3	51.2	SD FN GRN SL/CALC MICA
7	694.0-95.0	21.	21.6	32.5	33.5	SD FN GRN SL/CALC MICA
8	695.0-96.0	12.	21.2	31.4	34.6	SD FN GRN SL/CALC SH LAMS MICA
9	696.0-97.0	27.	19.0	23.5	49.4	SD FN GRN SL/CALC SL/SHY MICA
10	697.0-98.0	0.20	17.3	14.9	61.1	SD FN GRN SL/CALC SH LAMS MICA
	698.0-99.0					SH
11	699.0- 0.0	1.9	22.0	28.2	38.3	SD FN GRN SL/CALC SH LAMS MICA
	700.0- 0.5					SD SH LAMS

$h = 5.5$

$\phi = 20.4$

$S_o = 28.7$

$S_w = 39.7\ (36)$

$\bar{V} = .493$

CORE LABORATORIES, INC.
Petroleum Reservoir Engineering
DALLAS, TEXAS

Well J. C. Brown No. 4-B

CORE SUMMARY AND CALCULATED RECOVERABLE OIL

FORMATION NAME AND DEPTH INTERVAL: Squirrel Sand 687.0 to 700.5 feet

FEET OF CORE RECOVERED FROM ABOVE INTERVAL	13.5	AVERAGE TOTAL WATER SATURATION: PER CENT OF PORE SPACE	39.2
FEET OF CORE INCLUDED IN AVERAGES	6	AVERAGE CONNATE WATER SATURATION: PER CENT OF PORE SPACE	36.0 (e)
AVERAGE PERMEABILITY: MILLIDARCYS	34.0	OIL GRAVITY: °API	34° (e)
PRODUCTIVE CAPACITY: MILLIDARCY-FEET	204	ORIGINAL SOLUTION GAS-OIL RATIO: CUBIC FEET PER BARREL	
AVERAGE POROSITY: PER CENT	20.5	ORIGINAL FORMATION VOLUME FACTOR: BARRELS SATURATED OIL PER BARREL STOCK-TANK OIL	1.05 (c)
AVERAGE RESIDUAL OIL SATURATION: PER CENT OF PORE SPACE	28.2	CALCULATED ORIGINAL STOCK-TANK OIL IN PLACE: BARRELS PER ACRE-FOOT	961

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.*)

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.

CORE LABORATORIES, INC. *Petroleum Reservoir Engineering*

COMPANY J. C. BROWN FILE NO. 3408-850076

WELL J. C. BROWN NO. 4-B WELL DATE 5-3-85

FIELD FORMATION SQUIRREL SAND ELEV.

COUNTY DOUGLAS COUNTY STATE KANSAS DRLG. FLD. AIR CORES

LOCATION

CORRELATION COREGRAPH

VERTICAL SCALE: 5" = 100'

Gamma Ray
RADIATION INCREASE →

Permeability
MILLIDARCIES
1000 100 10 1

Depth Feet
650
700
750

Porosity
PERCENT
30 20 10 0

Total Water
PERCENT PORE SPACE
100 80 60 40 20 0

Oil Saturation
PERCENT PORE SPACE
0 20 40 60 80 100