

3-14-20E

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CORE ANALYSIS REPORT

FOR

KINDERHOOK OIL AND GAS COMPANY

HODGES NO. 2 WELL

~~SENECA~~ COUNTY, KANSAS

DOUGLAS

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RECEIVED
STATE CORPORATION COMMISSION

JUN 06 1984

CONSERVATION DIVISION
Wichita, Kansas

JUL 27 1984

State Geological Survey
WICHITA BRANCH

3-14-20E

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CORE LABORATORIES, INC.
Petroleum Reservoir Engineering
TULSA, OKLAHOMA

May 3, 1984

REPLY TO
7304 EAST 38TH STREET
TULSA, OKLAHOMA
74145

3 14 20E

Kinderhook Oil and Gas Company
R.R. 2 Box 906
Waukee, Iowa 50263

Attn: Mr. Jim Christensen

Subject: Core Analysis Data
Hodges No. 2 Well
Ottawa County, Kansas
CLI File 3408-840077

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 Surface Core-Gamma Log and 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.

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

Core analysis data on the cored interval between 767.1 and 776.0 feet exhibits excellent porosity and good matrix permeability development. This Squirrel 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

J. Michael Edwards
District Manager

JME:MCH:jeh
7 cc Addressee

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Kinderhook Oil and Gas Company
Hodges No. 2 Well
CLI File 3408-840077

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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 766.0 and 777.0 feet.

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

The cores were transported to Tulsa by motor freight.

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 awaiting additional instructions.

RE LABORATORIES, INC
 Petroleum Reservoir Engineering
 DALLAS, TEXAS

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KINDERHOOK OIL AND GAS
 HODGES NO. 2 WELL

DATE: 5-2-84
 FORMATION: SQUIRREL SAND
 DRLG. FLUID:
 LOCATION:

FILE NO: 3408-840077
 ENGINEER: HUDSON
 ELEVATION:

OTTAWA COUNTY, KANSAS

SMP. NO.	DEPTH	PERM. TO AIR MD. PLUG	POROSITY PERCENT	FLUID SATS. OIL	WTR.	GR. DEN.	DESCRIPTION
ROUTINE PLUG SUMMATION OF FLUIDS							
	766.0-67.1						SHALE
1	767.1-68.0	3.2	20.9	22.9	46.9		SD, SLTY, SHY, MICA
2	768.0-69.0	10.0	22.4	31.1	38.1		SD, SL/CALC, MICA
3	769.0-70.0	16.0	20.5	27.4	47.9		SD, SL/CALC, MICA
4	770.0-71.0	40.0	23.4	35.4	37.3		SD, SL/CALC, MICA
5	771.0-72.0	46.0	22.4	44.8	32.6		SD, SL/CALC, MICA
6	772.0-73.0	14.0	21.7	34.6	36.7		SD, SL/CALC, MICA
7	773.0-74.0	35.0	21.7	31.8	37.1		SD, SL/CALC, MICA
8	774.0-75.0	5.8	20.3	29.5	40.8		SD, SLTY, CALC, SHY, MIC
9	775.0-76.0	21.0	18.6	23.8	45.1		SD, CALC, MICA
	776.0-77.0						SHALE, SDY

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CORE LABORATORIES, INC.

Petroleum Reservoir Engineering

DALLAS, TEXAS

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Well HODGES NO. 2

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CORE SUMMARY AND CALCULATED RECOVERABLE OIL

FORMATION NAME AND DEPTH INTERVAL: SQUIRREL SAND 766.0-777.0

FEET OF CORE RECOVERED FROM ABOVE INTERVAL	11	AVERAGE TOTAL WATER SATURATION: PER CENT OF PORE SPACE	40.3
FEET OF CORE INCLUDED IN AVERAGES	9	AVERAGE CONNATE WATER SATURATION: PER CENT OF PORE SPACE	35.0 (e)
AVERAGE PERMEABILITY: MILLIDARCY	20.9	OIL GRAVITY: °API	
PRODUCTIVE CAPACITY: MILLIDARCY-Feet	188	ORIGINAL SOLUTION GAS-OIL RATIO: CUBIC FEET PER BARREL	
AVERAGE POROSITY: PER CENT	21.3	ORIGINAL FORMATION VOLUME FACTOR: BARRELS SATURATED OIL PER BARREL STOCK-TANK OIL	1.05 (c)
AVERAGE RESIDUAL OIL SATURATION: PER CENT OF PORE SPACE	31.3	CALCULATED ORIGINAL STOCK-TANK OIL IN PLACE: BARRELS PER ACRE-FOOT	943

Calculated maximum solution gas drive recovery is 132(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: MILLIDARCY		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 sustained 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.

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 representation as to the productivity, proper operation, or profitability of any oil, gas or other mineral well or sand in connection with which such report is used or relied upon.

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COMPANY: KINDERHOOK OIL AND GAS

WELL: HODGES NO. 2

COUNTY, STATE: OTTAWA COUNTY, KANSAS

CLI FILE NO: 3408-840077

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CALCULATED STOCK TANK BARRELS PER ACRE FOOT, IN PLACE, FROM THE SUBJECT WELLS ARE LISTED BELOW.

<u>DEPTH</u>	<u>STOCK-TANK/ACRE-FOOT</u>
767.1-68	820
768-69	1024
769-70	788
770-71	1084
771-72	1117
772-73	1014
773-74	996
774-75	889
775-76	754