

BEFORE THE INDUSTRIAL COMMISSION
OF THE STATE OF NORTH DAKOTA

IN THE MATTER OF A HEARING CALLED ON A MOTION OF THE
COMMISSION TO CONSIDER THE TEMPORARY SPACING FOR THE
DEVELOPMENT OF THE WRITING ROCK-RED RIVER POOL, DIVIDE
COUNTY, NORTH DAKOTA, TO REDEFINE THE LIMITS OF THE
FIELD, AND ENACT SUCH SPECIAL FIELD RULES AS MAY BE
NECESSARY.

CASE NO. 1681
ORDER NO. 1851

TEMPORARY ORDER OF THE COMMISSION

BY THE COMMISSION:

Pursuant to legal notice this cause came on for hearing at 9:00 a.m. on the 22nd day of May, 1979, in Bismarck, North Dakota, before the Industrial Commission of North Dakota, hereinafter referred to as the "Commission."

NOW, on this 22nd day of May, 1979, the Commission, a quorum being present, having considered the testimony adduced and the exhibits received at said hearing, and being fully advised in the premises,

FINDS:

(1) That due public notice having been given as required by law, the Commission has jurisdiction of this cause and the subject matter thereof.

(2) That geological and engineering evidence, presented to the Commission bearing on the matter of well spacing indicates that the Writing Rock-Red River Pool, as classified and defined by this temporary order should, for a period not to exceed eighteen (18) months from date of this order, be developed on a pattern of one well to 320 acres in order to drain efficiently the recoverable oil from said pool, assure orderly and uniform development, avoid the drilling of unnecessary wells, and prevent waste in a manner to protect correlative rights.

(3) That a temporary 320 acre spacing in the Red River Pool in this field will result in the efficient and economical development of the field as a whole and will operate so as to prevent waste and provide maximum ultimate recovery, will avoid the drilling of unnecessary wells and will protect correlative rights.

(4) That the flaring of gas produced with crude oil in this field would constitute waste.

(5) That certain special field rules are necessary to prevent waste and protect against the pollution of surface waters.

IT IS THEREFORE ORDERED:

(1) That the Writing Rock-Red River Pool is hereby classified and defined as that common source of supply of crude oil and natural gas found in the Red River formation, in and under the following described tracts of land in Divide County, North Dakota, to wit:

Township 161 North, Range 101 West, 5th PM
All of Sections 3, 4, and 9

Township 162 North, Range 101 West, 5th PM
All of Sections 33 and 34

together with those additional quarter sections, or governmental lots corresponding thereto, as may be proven productive by wells drilled as direct offsets to wells included in the limits as set forth above, provided further that such extensions of the pool boundaries shall include only sufficient acreage to form a spacing unit for such wells.

(2) That effective this date 320 acres per well is established as the temporary spacing for the development of the Writing Rock-Red River Pool.

(3) That all wells drilled in the Writing Rock-Red River Pool shall be located not less than 660 feet from the spacing unit boundary, nor closer than 1980 feet to a well permitted to or producing from the pool.

(4) That spacing units in the pool shall consist of any two adjacent quarter sections of governmental lots corresponding thereto, within the same section; however, the Commission reserves the right to designate specific spacing units upon application of any interested party, after notice and hearing.

(5) That the N/2 of Section 3, Township 161 North, Range 101 West, Divide County, North Dakota, is hereby designated a spacing unit for the Writing Rock-Red River Pool, and the well located thereon shall be the well for such spacing unit.

(6) That no well shall hereafter be drilled in said pool except in conformity with the spacing pattern set forth above without special order of the Commission after due notice and hearing.

(7) That the following rules concerning the casing, tubing, and equipping of wells shall apply to the subsequent drilling and operation of wells in the Daneville Field:

(a) The surface casing shall consist of new or reconditioned pipe that has been previously tested to 1000 pounds per square inch. The casing shall be set and cemented at a point not higher than 600 feet below the surface of the ground unless another casing program is approved by the State Geologist. Cementing shall be by the pump and plug method and sufficient cement shall be used to fill the annular space outside of the pipe to the surface of the ground or the bottom of the cellar. Cement shall be allowed to stand a minimum of 12 hours before drilling the plug or initiating tests.

(b) The producing or oil string shall consist of new or reconditioned pipe that has been previously tested to 3000 pounds per square inch. Casing shall be set and cemented at a point not higher than the top of the producing zone or the gas-oil contact, whichever is lower. Cementing shall be accomplished in one or more stages and sufficient cement shall be used to protect the producing formation and to adequately cover all salt sections encountered, and isolate the Dakota-Lakota Series. The cement shall be allowed to stand a minimum of 24 hours before drilling the plug or initiating tests. After cementing, the casing shall be tested by application of pump pressure of at least 2000 pounds per square inch. If, at the end of 30 minutes this pressure shall have dropped 150 pounds per square inch or more, the casing shall be repaired. Thereafter, the casing shall again be tested in the same manner. Further work shall not proceed until a satisfactory test has been obtained.

(c) All well-head fittings and connections shall have a working pressure in excess of that to which it is anticipated they will be subjected.

(d) All wells shall be tubed with tubing to be set not higher than the top of the producing formation or the gas-oil contact, whichever is lower.

(e) The gas-oil ratio of each well and the reservoir pressure of flowing wells shall be measured during the months of May and November and in pumping wells when the rods are pulled, but at least once annually, and reported to the State Geologist within 15 days following the end of the month in which they are determined. Pressure measurements shall be made at or adjusted to a subsca datum of 9,000 feet after the well has been shut in for 48 hours. All gas-oil ratio and reservoir pressure determinations shall be made under the supervision of and by methods approved by the State Geologist.

(8) That all wells producing in the Writing Rock Field shall be allowed to produce at an unrestricted rate for a period of 60 days commencing on the first day oil is produced through well-head equipment from the ultimate producing interval after casing has been run; after that, oil production from such wells shall not exceed an average of 200 barrels of oil per day for a period of 60 days; after that, oil production from such wells shall not exceed 150 barrels of oil per day for a period of 60 days; hereafter, oil production from such wells shall not exceed an average of 100 barrels of oil per day; if and when such wells are connected to a gas gathering and processing facility, the foregoing restrictions shall be removed and the wells shall be allowed to produce at a maximum efficient rate.

(9) That no salt water shall be stored in unlined pits in this field. Material used to line pits must be approved by the State Geologist.

(10) That the Dakota Formation in and under the Writing Rock Field, as herein defined, be and the same is hereby designated a salt water disposal reservoir.

(11) That the State Geologist is hereby authorized to approve requests to utilize wells in the Writing Rock Field for salt water disposal purposes.

(12) That for the purposes of division of production to owners of interests in spacing units established by this order, and proven productive prior to the date hereof, this order shall be retroactive to the date of first production.

(13) That this order shall cover all of the Writing Rock-Red River Pool, common source of supply of crude oil and natural gas as herein defined, and shall continue in full force and effect until the 1st day of December, 1980.

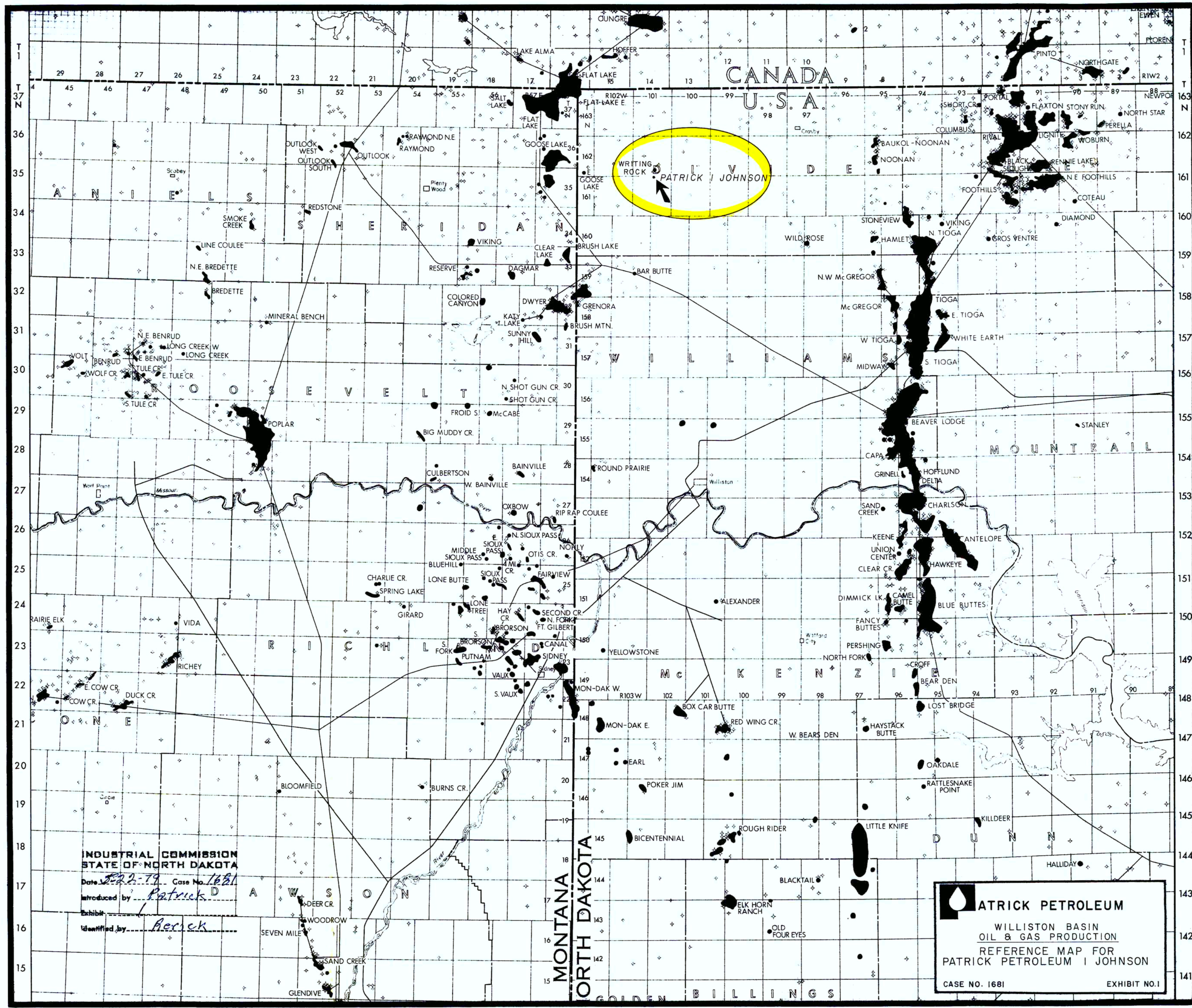
DONE, in Bismarck, North Dakota, this 22nd day of June, 1979.

THE NORTH DAKOTA INDUSTRIAL COMMISSION


Arthur A. Link, Governor


Allen I. Olson, Attorney General

Myron Just, Commissioner of Agriculture




INDUSTRIAL COMMISSION
STATE OF NORTH DAKOTA

Date 12-22-79 Case No. 1681

Introduced by Patrick D

Identified by Berrick

**PATRICK PETROLEUM**

WILLISTON BASIN
OIL & GAS PRODUCTION

REFERENCE MAP FOR
PATRICK PETROLEUM I JOHNSON

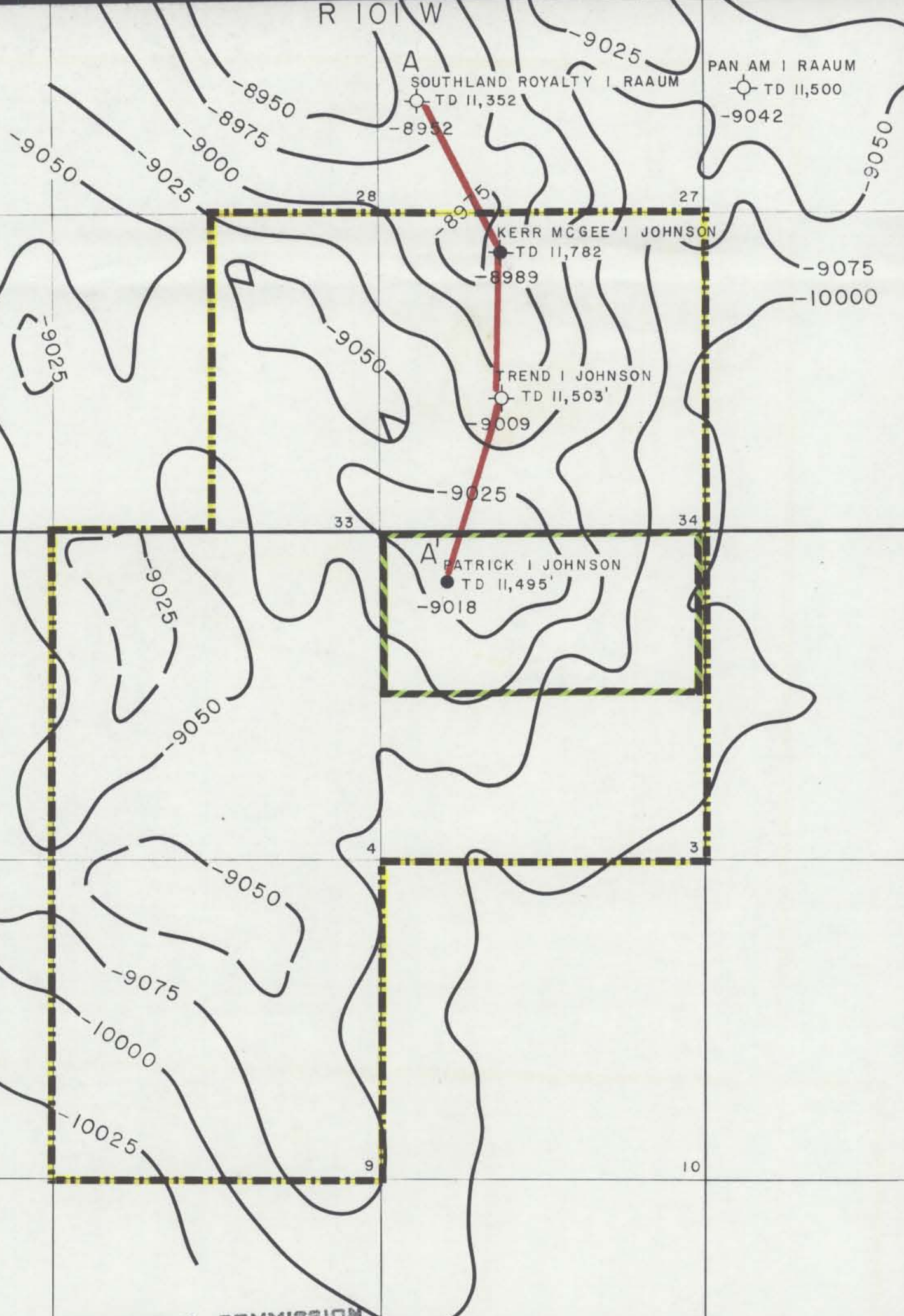
CASE NO. 1681

EXHIBIT NO. 1

T-6N

T-6N

R 101 W



INDUSTRIAL COMMISSION
STATE OF NORTH DAKOTA
Date 5-22-79 Case No. 1681
Introduced by PATRICK
Exhibit 2
Identified by Patrick

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PATRICK PETROLEUM

WRITING ROCK FIELD
DIVIDE COUNTY, NORTH DAKOTA

ORDOVICIAN RED RIVER
FORMATION STRUCTURE MAP
FORMLINED TO SEISMIC CONTROL

CONTOUR INTERVAL: 25'

SCALE 1"=2000'
CASE NO. 1681

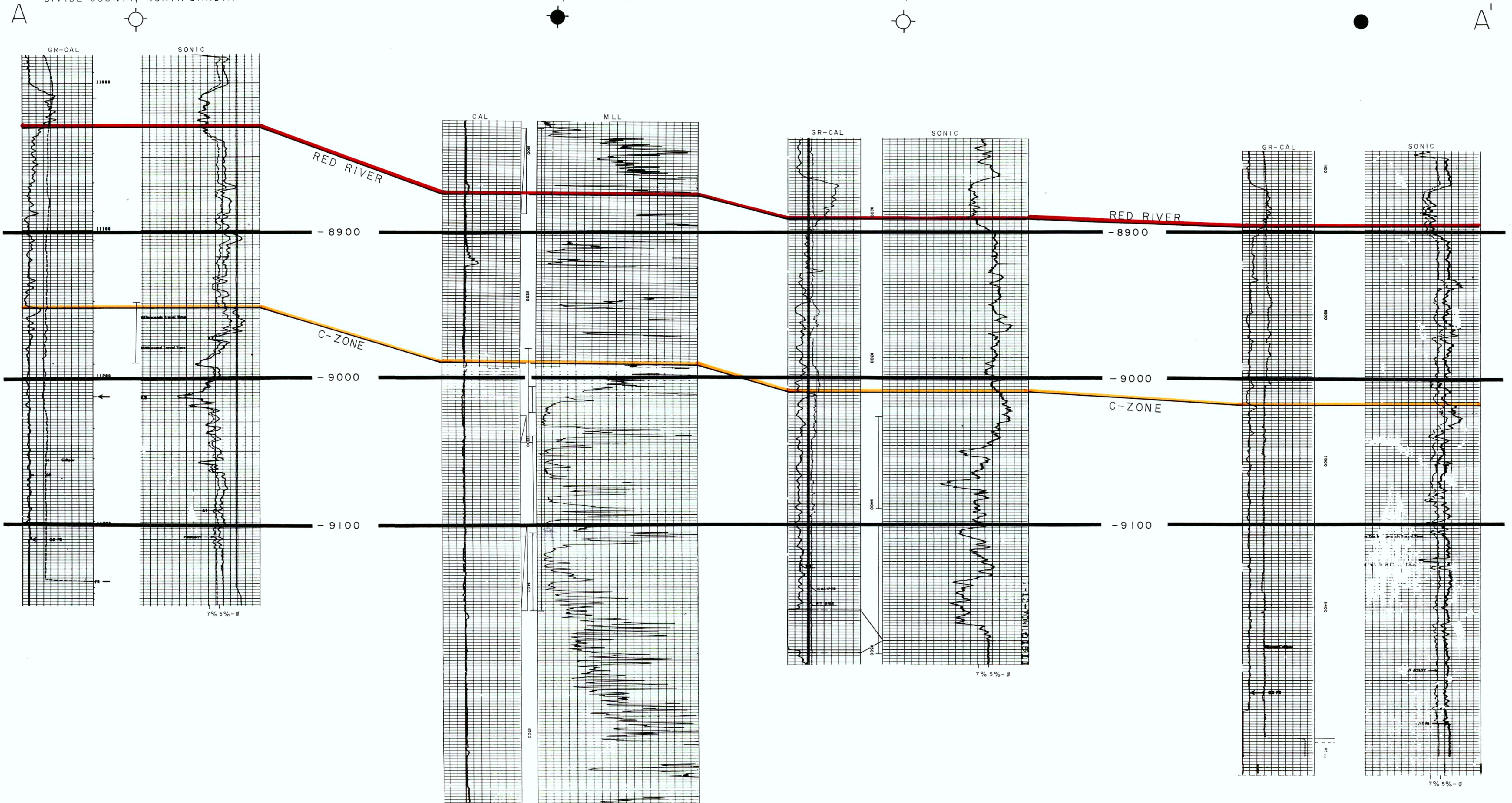
5/9/79 DCR
EXHIBIT NO.2

SOUTHLAND ROYALTY I RAAUM
NW SW S-27 T162N-R101W
DIVIDE COUNTY, NORTH DAKOTA

KERR MCGEE I JOHNSON
NE NW S-34 T162N-R101W
DIVIDE COUNTY, NORTH DAKOTA

TREND I JOHNSON
NE SW S-34 T162N-R101W
DIVIDE COUNTY, NORTH DAKOTA

PATRICK PETROLEUM I JOHNSON
NW NW S-3 T161N-R101W
DIVIDE COUNTY, NORTH DAKOTA



- DST #3 11149-90' (30-60-180-180) Rec. 770' sli MCSW, 1630' WC
MFE 1800 cc sli MCSW
HP 5959-5921
FP 867-933, 950-1174
SIP 5058

- Core #4 11085-143'
- Core #5 11280-300'
- Core #6 11359-417'
- DST #4 11085-417' (240-30) Rec. 1320' WC, 180' sli OCWC, 460' GC & sli OCMSW.
HP 6320-6320
FP 1045-1355
SIP 4230 (30 min.)
- DST #5 11262-80' (240-30) Rec. 4 gal. free oil, 1390' WC, 180' OCWC, 240' MCSW.
HP 6220-6220
FP 680-820
SIP 4750 (30 min.)
- DST #6 11236-300' (240-45) Rec. 1760' G, 50' free oil, 90' HO & GCWC, 90' sli O & GCWC, 1320' GCWC, 720' GCM.
HP 6380-6380
FP 715-1115
SIP 4525 (45 min.)
- DST #7 11296-357' (open 25 min.) Packer failed. Rec. 720' G, unloaded 720' HO & GCM, unloaded 780' HO & GCWC, unloaded 450' HO & GCM, Rec. 1700' GCM.
FP 1008-1143
- DST #8 11363-417' (180-30) Rec. 1500' WC, 315' M.
HP 6300-6300
FP 700-890
SIP 4750 (30 min.)

- DST #3 11320-403' - Misrun
- DST #4 11310-403' - Misrun
- DST #5 11341-403' - (90-120-120) Rec. 376' WC, w/trace of oil, 1792' WC, 188' WC, sli GC, 658' SGC & MCSW, w/trace of oil, 630' SW, 31' M.
MFE 2400 cc Mud
HP 6317-6317
FP 1114-1223, 1241-1784
SIP 5211-5030
- DST #6 11380-96' - Misrun
- DST #7 11414-503' (90-180-120) Rec. 2099' SGC & WCM, 750' SGC & MCW, 3290' GCSW, 1786' GCSW.
MFE 1.35 CFG, 300 cc Oil, 2000cc SW
HP 6288-6250
FP 207-4077
SIP 5209-5081

POROSITY (ϕ) BASED ON
DOLOMITE LITHOLOGY
 $V_{ma} = 23,000$ ft/sec
 $\Delta t_{ma} = 43.5 \mu$ sec/ft

INDUSTRIAL COMMISSION
STATE OF NORTH DAKOTA
Date 5-22-79 Case No. 1681
Introduced by PATRICK
Exhibit 3
Identified by _____

- DST #6 11264-86' (60-60) Rec. 2712' WC, 206' OM - Misrun
MFE 900 cc OM
HP 6198-6181
FP 1278-1295
- DST #7 11252-301' - Misrun



PATRICK PETROLEUM

WILLISTON BASIN
DIVIDE COUNTY, NORTH DAKOTA

WRITING ROCK FIELD

ORDOVICIAN RED RIVER FORMATION
STRUCTURAL CROSS SECTION

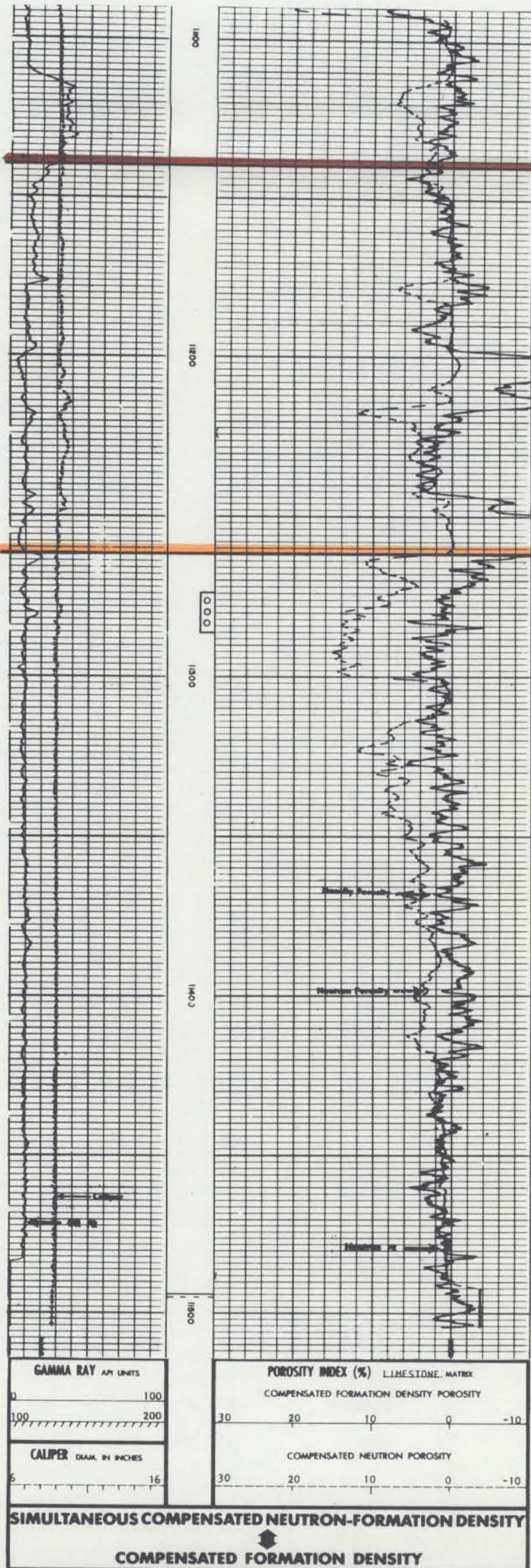
HORIZONTAL SCALE 1"=400'
VERTICAL SCALE 2.5"=100'

CASE NO. 1681

MAY 9, 1979
DCR

EXHIBIT NO. 3

PATRICK PETROLEUM COMPANY I JOHNSON
1100' FWL 800' FNL SECTION 3 T161N - R101W
DIVIDE COUNTY, NORTH DAKOTA



RED RIVER

C-ZONE

- 1-Perforated 11,274-86'
- 2-Attempted to acidize w/2000 Gallons 15% MSR
- 3-Perforated 11,274-86'
- 4-Acidized w/2000 gallons 15% MSR
- 5-Acid fraced w/8500 gallons 28% & 11,000 gallons of water gel pads

Completed 4/1/79
IPP 50 BOPD & 22 BWPD
GOR 756

CASE NO. 1681
EXHIBIT NO. 4

INDUSTRIAL COMMISSION
STATE OF NORTH DAKOTA
Date 5-22-79 Case No. 1681
Introduced by PATRICK
Exhibit 4
Identified by _____

GAMMA RAY AM UNITS

0 100 200

CALIPER DIAM. IN INCHES

6 16

POROSITY INDEX (%) Limestone Matrix

COMPENSATED FORMATION DENSITY POROSITY

30 20 10 0 -10

COMPENSATED NEUTRON POROSITY

30 20 10 0 -10

SIMULTANEOUS COMPENSATED NEUTRON-FORMATION DENSITY

COMPENSATED FORMATION DENSITY

R 101 W

T-62N

T-61N

29

28

27

32

33

34

5

4

3

8

10

INDUSTRIAL COMMISSION
STATE OF NORTH DAKOTA

Date 5-22-79 Case No. 1681

Introduced by PATRICK

Exhibit 5

Identified by

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PATRICK PETROLEUM

WRITING ROCK FIELD
DIVIDE COUNTY, NORTH DAKOTA

PATRICK PETROLEUM AND
JOINT PARTNERSHIP
LEASE OWNERSHIP MAP

SCALE 1"=2000'
CASE NO. 1681

5/9/79 JW
EXHIBIT NO. 5

10-26-81
100%

10-27-81
75%

11-7-81
5%

1-30-80
75%

1-26-80
2-11-81
100%

REQUESTED
320 AC.
WELL UNIT

11-7-81
75%

11-23-81
8-9-84
100%

10-22-81
79%

11-4-81
2-15-84
100%

12-14-81
100%

10-22-81

12-9-81
8-7-84
100%

100%

79%

11-4-81
2-15-84
100%

REQUESTED AREA
FOR FIELD SPACING

10-27-81
8-9-84
98%

99%

100%

100%

Notice of Publication

N.D. INDUSTRIAL COMMISSION
BISMARCK, NORTH DAKOTA

The State of North Dakota by its Industrial Commission hereby gives notice pursuant to law and the rules and regulations of said Commission promulgated thereunder of the following public hearing to be held at 9:00 a.m. on May 22, 1979, in the Large Hearing Room, State Capitol Building, Bismarck, North Dakota.

STATE OF NORTH DAKOTA TO:

All named parties and persons having any right, title, interest or claim in the following case and notice to the public. CASE NO. 1681: On a motion of the Commission to consider the temporary spacing for the development of the Writing Rock-Red River Pool, Divide County, North Dakota, to redefine the limits of the field, and enact such special field rules as may be necessary.

(May 9, 1979)

Affidavit of Publication

State of North Dakota, County of Divide, SS.

JOHN M. ANDRIST, of said County and State, being first duly sworn, on his oath says: That The Divide County Journal, a continuation of the Crosby Eagle, is a weekly newspaper of general circulation, printed and published in the city of Crosby, in said county and state, by John M. Andrist, Editor, and has been such newspaper during the times hereinafter mentioned; and that I, JOHN M. ANDRIST, the editor, during all such times have been the editor of said newspaper, and have personal knowledge of all the facts stated in this affidavit; and

that the advertisement headed Notice of Publication

a printed copy of which is hereunto attached, was printed and published in said newspaper for a period of 1 consecutive weeks, to wit:

May 9, 1979

Subscribed and sworn to before me May 11, 1979

Ruby Ruppert
Notary Public, Divide County, N. D.

(Seal)

My Commission Expires January 21, 1980

621
Date 5/31/79
HAROLD NELSON
State Printer