

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 APPLICATION OF CONTINENTAL
OIL COMPANY FOR AN ORDER OF THE COMMISSION DIRECTING
SHUT-IN BOTTOM HOLE PRESSURE TESTS ON CERTAIN PRODUCING
WELLS IN THE DICKINSON HEATH SAND UNIT AND THE SOUTH
HEART-HEATH POOL, STARK COUNTY, NORTH DAKOTA.

CASE NO. 1307
ORDER NO. 1412

ORDER OF THE COMMISSION

BY THE COMMISSION:

Pursuant to legal notice this cause came on for hearing at 9:30 a.m. on the 13th day of January, 1976, in Bismarck, North Dakota, before the Industrial Commission of North Dakota, hereinafter referred to as the "Commission."

NOW, on this 16 day of March, 1976, 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 shut-in bottom hole pressure information on all producing wells in Sections 28, 29, 30, 32 and 33, Township 140 North, Range 97 West, Stark County, North Dakota, in the Dickinson and South Heart Fields, will be an important factor in future decisions concerning the two fields.

IT IS THEREFORE ORDERED:

(1) That the shut-in bottom hole pressure of all producing wells in Sections 28, 29, 30, 32 and 33, Township 140 North, Range 97 West, Stark County, North Dakota, in the Dickinson and South Heart Fields, shall be determined in March, 1976, on a date agreed upon by the operators of said wells and the State Geologist.

(2) That the bottom hole pressure of said wells shall be taken simultaneously after the wells have been shut in for a period of 72 hours, in manner approved by and under the supervision of the State Geologist.

(3) That the injection of water into the Heath Pool shall cease at least 72 hours prior to the commencement of the shut-in period and shall not resume until the bottom hole pressure in all said wells has been determined.

(4) That the results of said tests shall be reported to the State Geologist on forms provided therefor.

(5) That this order shall remain in full force and effect until further order of the Commission.

DONE, in Bismarck, North Dakota, this 10 day of Feb, 1976.

THE NORTH DAKOTA INDUSTRIAL COMMISSION



Arthur A. Link, Governor



Allen I. Olson, Attorney General

Myron Just, Commissioner of Agriculture

Case 1307

LAW OFFICES OF
FLECK, MATHER, STRUTZ & MAYER, LTD.
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WARREN H. ALBRECHT, JR.

TELEPHONE
701-223-6585

December 12, 1975

Mr. Jerry VandeWalle
Attorney General's Office
State Capitol Building
Bismarck, ND 58505

Dear Mr. VandeWalle:

In re Our File No. 11962

Enclosed herewith are original and one copy of Application of Continental Oil Company. We request that the matter be placed on the docket for the January meeting of the Industrial Commission.

Very truly yours,

Ernest R. Fleck

ERNEST R. FLECK *ef*

cs
Enclosures

cc Dr. A. E. Noble w/enclosure



1307

BEFORE THE INDUSTRIAL COMMISSION

STATE OF NORTH DAKOTA

IN THE MATTER OF THE APPLICATION)
OF CONTINENTAL OIL COMPANY FOR AN)
ORDER OF THE COMMISSION DIRECTING)
SHUT-IN BOTTOM HOLE PRESSURE) APPLICATION
TEST ON PRODUCING WELLS IN THE)
DICKINSON HEATH SAND UNIT, STARK)
COUNTY, NORTH DAKOTA)

COMES NOW the Applicant, Continental Oil Company, and for
its application respectfully alleges:

1.

That it is the operator of the Dickinson Heath Sand Unit
located in Stark County, North Dakota; that its application as Oper-
ator of such unit for permission to drill two water injection wells
near the north line of Section 33, Township 140 North, Range 97 West,
Stark County, North Dakota, to protect the unitized lands from drain-
age by wells located in the South Heart Field was not granted or
allowed by the Commission.

2.

During the hearing on consolidated Cases 1266 and 1283,
somewhat confusing testimony was heard by the Commission concerning
bottom hole pressures measured at Dickinson Heath Sand Unit producing
Wells No. 27 and No. 48 during September, 1975, and drill stem test
pressures measured at certain wells in the South Heart Field prior
to running casing in the wells during late 1974 and early 1975.

3.

Continental Oil Company believes that the Commission was
not completely aware of the significance of the two different types
of pressure information supplied by the witnesses and the significance
of the times the pressures were reported, i.e., pressures measured
approximately 87,000 barrels of production from the Unit wells versus
pressures measured before wells were completed in the South Heart
Field.

1
2 4.

3 In order to resolve the question of differences in pressure,
4 which will be an important factor in future decisions concerning this
5 Unit, Continental Oil Company respectfully requests that the Commission
6 order the Operators of all producing wells in Sections 28, 29, 30, 32
7 and 33, Township 140 North, Range 97 West, Stark County, North Dakota,
8 to measure the shut-in bottom hole pressure under the supervision of
9 the State Geologist. Shut-in bottom hole pressure information on all
10 wells taken simultaneously and in the same manner will be beneficial
11 to the Commission. Attached hereto as Exhibit "A" is Continental Oil
12 Company's suggested method of testing the wells described above.
13

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15 5.

16 Continental Oil Company asserts the above bottom hole
17 pressure information is essential information which the Commission
18 should have to later again consider Continental's request for two
19 line injection wells to protect the Dickinson Heath Sand Unit from
20 drainage.
21

22 6.

23 Applicant states that pressure information can only be
24 obtained by Applicant on the wells it operates and the pressure
25 information on all producing wells in the area taken at the same
26 time is essential. Reliable pressure information should be obtained
27 under the supervision of the State Geologist on all producing wells
28 in the area.
29

30 7.

31 Applicant alleges that in order to protect the rights of
32 all owners in the Dickinson Heath Sand Unit, the Commission should
33 order 72 hour shut-in bottom hole pressure tests on all wells pro-
34 ducing from the Heath sands as described in paragraph 4 above.
35
36

1
2 Dated this 12th day of December, 1975.

3 CONTINENTAL OIL COMPANY

4 FLECK, MATHER, STRUTZ & MAYER, Ltd.
5 Attorneys for the Applicant
6 Suite 200, Professional Building
7 Bismarck, North Dakota 58501

8 By

Ernest R. Fleck
Ernest R. Fleck

9 STATE OF NORTH DAKOTA)
10) ss.
11 COUNTY OF BURLEIGH)

12 Ernest R. Fleck, being first duly sworn on oath, deposes
13 and says that he is the attorney for the applicant herein named, that
14 he has read the above and foregoing application, knows the contents
15 thereof and that the same is within the knowledge of the affiant, and
16 that the same is true to the best of his knowledge, information and
17 belief.

18
19 Ernest R. Fleck
Ernest R. Fleck

20 Subscribed and sworn to before me this 12th day of December, 1975.
21

22
23 S E A L

24 Carol Solberg
Carol Solberg, Notary Public
Burleigh County, North Dakota
My Commission Expires: 6-25-81
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EXHIBIT "A"

RECOMMENDED TEST PROCEDURE

- A. All tests will be conducted under the supervision of the State Geologist or his representative.
- B. An independent well testing organization, approved by the State of North Dakota employee supervising the tests, will be employed to conduct the tests with the Dickinson Heath Sand Unit to pay for all test work conducted on its property and the Operators in the South Heart Field paying for the tests conducted on their property.
- C. Each well owner will submit the following information to the State Geologist and the testing organization one week prior to the test.
 - 1. Correct well name and surveyed location.
 - 2. Size of threaded connections or flanges on casinghead.
 - 3. Total depth of the well measured from the landing flange.
 - 4. Size and weight of the casing (oil string).
 - 5. Depth to which the casing was run and cemented.
 - 6. The perforated interval if the casing was perforated.
 - 7. Number of joints of tubing in the wells and the total depth of tubing in the tubing string.
 - 8. Setting depth of any tubing anchors, packers or similar type of equipment in the well.
 - 9. Average daily oil and water production for the last month or since the last pump change, whichever is the shorter time period.
 - 10. The cumulative oil and water production from the well.
 - 11. Any other information required by the well testing organization.
- D. Fluid level tests will be made with an acoustical well sounder on each well while the wells are pumping but with the casing shut-in to be certain good records can be obtained with the acoustical test equipment.
- E. All wells to be tested will be shut down at the same time with the flowline and casing shut-in and remain shut-in for 72 hours. Acoustical well

sounding tests will be made on each well ^{approximately} 4, 8, 12, 16, 20, 24, 30, 36, 42, 48, 56, 64 and 72 hours after shut-in. When acceptable 72 hour tests are made on each well, the wells will be returned to production at the same time. The casing pressures will be recorded when each acoustical test is made.

F. The extrapolated bottom hole pressure will be determined as follows:

1. From the acoustical test and the well information, determine the feet of fluid in the well above the top perforations.
2. Assume an oil gradient for 34^o API oil for a constant 0.3694 pounds per foot of fluid.
3. Bottom hole pressure will then equal the feet of fluid above the perforations times 0.3694 plus the recorded casing pressure at the time of the shut-in test.
4. Data from each well test will be plotted as pressure vs. $\frac{T + \Delta t}{\Delta t}$ on semilog paper and extrapolated in the normally accepted Horner manner to determine the true reservoir pressure at infinite time. (The constant T for each well equals cumulative production divided by current producing rate (C-9). Δt for each shut-in period equals shut-in time.)

G. The testing organization will report the extrapolated true bottom hole pressures and information on all tests to the State Geologist, the South Heart Operators and the Dickinson Heath Sand Unit Operator, and include in the report any comments they wish to make on the tests, i.e., equipment problems, calibration of gauges, test equipment, etc.

580
#1.5-76
Date

Harold Nelson
HAROLD NELSON
State Printer

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 9:30 a.m. on January 13, 1976, 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. 1307: On a motion of the Commission to consider the application of Continental Oil Company for an order of the Commission directing shut-in bottom hole pressure tests on certain producing wells in the Dickinson Heath Sand Unit and the South Heart Heath Pool, Stark County, North Dakota. (Published December 30, 1975)

CERTIFICATE OF PUBLICATION

THE DICKINSON PRESS

Dickinson, North Dakota

STATE OF NORTH DAKOTA, }

County of Stark. }

Cheryl Badinger, of said state and county, being first duly

sworn, on oath says: That *s/he* is the *Bookkeeper* of the Dickinson Press, Inc., publisher of **THE DICKINSON PRESS**, a daily newspaper of general circulation, printed and published at Dickinson, in said county and state, and has been such during the time hereinafter mentioned; and that advertisement headed *Notice Of Publication*

a printed copy of which is hereunto annexed, was printed and published in **THE DICKINSON PRESS**, and in the regular and entire issue of each and every number *1* consecutive weeks, commencing on the *30* day of *December* A. D. *1975*, and ending on the *30* day of *December* A. D., *1975*, both inclusive.

Sworn to and subscribed to before me this *30* day of *Dec* A. D. *1975*.

Cheryl Badinger
Ed J. Hauck
ED J. HAUCK

Notary Public, STARK COUNTY, N. DAK.
My Commission Expires JUNE 7, 1979

AFFIDAVIT OF PUBLICATION

STATE OF NORTH DAKOTA, }
County of Burleigh. } ss.

Elaine Schlinger

, being duly sworn,
says that she is a clerk of the Bismarck Tribune Company and that
the annexed printed copy of

"Notice of Publication"

was taken from The Bismarck Tribune, a daily newspaper, which
during the whole time of publication of said notice hereinafter
stated, has been, and was printed and published in the City of
Bismarck, County of Burleigh, and State of North Dakota. That
the said notice was published in said newspaper on the following
dates: 12/29

in each and every issue of the full number thereof, commencing
on the 29th day of December 1975, and
ending on the 29th day of December 1975,
upon which days or times of publication aforesaid the said news
paper was regularly published.

Elaine Schlinger
Subscribed and sworn to before this 29th day of
December, A. D. 19 75.

Notary Public, Burleigh County, N. D.

My commission expires 3-24-76

Cost of Publication, \$ 5.38

JL-18
es

PAUL J. PATERA
Notary Public, BURLEIGH CO., N. Dak.
My Commission Expires Mar. 24, 1976.

OK
12-31-75
sm
HAROLD NELSON
State Printer

NOTICE OF PUBLICATION
N.D. INDUSTRIAL COMMISSION
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29333-12/29: 1/2