CASE 3651: Application of OLEN F. FEATHERSTONE FOR CREATION OF NEW POOL & POOL RULES, LEA COUNTY

Case No.

3651

Application, Transcript,
Small Exhibits, Etc.

GOVERNOR
DAVID F. CARGO
CHAIRMAN

State of New Mexico
Oil Conservation Commission

LAND COMMISSIONER
GUYTON B. HAYS
MEMBER

STATE GEOLOGIST
A. L. PORTER, JR.
SECRETARY - DIRECTOR

P. O. BOX 2088
SANTA FE

October 22, 1968

Mr. Don Stevens
LeMay & Stevens
Petroleum Consultants
Post Office Box 2244
Santa Fe, New Mexico

Re: Case No. 3651
Order No. R-3315-B
Applicant:

Olen F. Featherstone

Dear Sir:

Enclosed herewith are two copies of the above-referenced Commission order recently entered in the subject case.

Very truly yours,

A. L. PORTER, Jr.
Secretary-Director

ALP/ir

Carbon copy of order also sent to:

Hobbs OCC x
Artesia OCC
Aztec OCC
Other Mr. Charles White for Tenneco Oil Company

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
COMMISSION OF NEW MEXICO FOR
THE PURPOSE OF CONSIDERING:

CASE No. 3651
Order No. R-3315-B

APPLICATION OF OLEN F. FEATHERSTONE
FOR THE CREATION OF A NEW POOL AND
SPECIAL POOL RULES, LEA COUNTY, NEW
MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on September 4, 1968 at Santa Fe, New Mexico, before Examiner Elvis A. Utz.

NOW, on this 22nd day of October, 1968, the Commission, a quorum being present, having considered the testimony, the record, and the recommendations of the Examiner, 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 by Order No. R-3315, dated September 11, 1967, a new pool in Lea County, New Mexico, classified as an oil pool for Permo-Pennsylvanian production was created and designated the North Morton Permo-Pennsylvanian Pool.

(3) That by said Order No. R-3315, temporary special rules and regulations were promulgated for said North Morton Permo-Pennsylvanian Pool providing for 80-acre spacing units, limited well locations, and an 80-acre proportional factor of 5.67 for allowable purposes, and providing that said temporary rules be reconsidered at an examiner hearing to be held in September, 1968.

(4) That in January, 1968, Case 3651 was reopened upon the application of Tenneco Oil Company seeking amendment of the temporary special rules and regulations promulgated by said Order No. R-3315 to provide for 160-acre spacing units and the establishment of a 160-acre proportional factor of 7.67 for allowable purposes on a temporary basis; that said application for amendment was denied by Order No. R-3315-A.

(5) That pursuant to the provisions of Order No. R-3315, this case was reopened September 4, 1968, to allow the operators in the subject pool to appear and show cause why the North Morton Permo-Pennsylvanian Pool should not be developed on 40-acre spacing units.

(6) That at the time Order No. R-3315 was issued there was one well completed in the subject pool and that well was located in the SW/4 NW/4 of Section 32, Township 14 South, Range 35 East, NMPM, Lea County, New Mexico.

(7) That at the time Order No. R-3315-A was issued three additional wells had been completed in the subject pool in SE/4 NE/4, the NW/4 SE/4, and the SE/4 NW/4 of Section 31, said Township and Range.

(8) That subsequent to the issuance of said Order No. R-3315-A, two additional wells have been completed in the subject pool in the SW/4 NE/4 and the NE/4 SW/4 of said Section 31; that at the time of the subject hearing, one additional well was being drilled in the NE/4 NW/4 of Section 6, Township 15 South, Range 35 East.

(9) That the pool has been and is being developed on what is essentially a 40-acre spacing pattern.

(10) That the occurrence of a water/oil contact at a subsea depth of approximately a minus 6420 feet indicates that the wells located in the N/2 of said Section 31 and the well located in the SW/4 NW/4 of said Section 32 do not have 80 productive acres each to be dedicated to said wells.

(11) That the evidence presented concerning reservoir characteristics of the subject pool, including pressure data and production data, does not establish that one well in the North Morton Permo-Pennsylvanian Pool can efficiently and economically drain and develop 80 acres.

(12) That in order to afford the owner of each property in the pool the opportunity to produce his just and equitable share of the gas and oil in the pool, to prevent reduced recovery which might result from the drilling of too few wells, and to otherwise prevent waste and protect correlative rights, the Special Rules and Regulations governing the North Morton Permo-Pennsylvanian Pool should be abolished and said pool continue to be developed on 40-acre units.

IT IS THEREFORE ORDERED:

(1) That the special rules and regulations governing the North Morton Permo-Pennsylvanian Pool promulgated by Order No. R-3315 are hereby abolished.

(2) That jurisdiction of this cause is retained for the entry of such further orders as the Commission may deem necessary.

DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

DAVID F. CARGO, Chairman

GUYTON B. HAYS, Member

A. L. PORTER, Jr., Member & Secretary

esr/

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
COMMISSION OF NEW MEXICO FOR
THE PURPOSE OF CONSIDERING:

CASE No. 3651
Order No. R-3315-A

APPLICATION OF TENNECO OIL COMPANY
FOR AN AMENDMENT TO ORDER NO. R-3315,
LEA COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on January 24, 1968, at Santa Fe, New Mexico, before Examiner Daniel S. Nutter.

NOW, on this 19th day of February, 1968, the Commission, a quorum being present, having considered the testimony, the record, and the recommendations of the Examiner, 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 by Order No. R-3315, dated September 11, 1967, a new pool in Lea County, New Mexico, classified as an oil pool for Permo-Pennsylvanian production was created and designated the North Morton Permo-Pennsylvanian Pool.

(3) That by said Order No. R-3315, temporary Special Rules and Regulations were promulgated for said North Morton Permo-Pennsylvanian Pool providing for 80-acre spacing units, limited well locations, and an 80-acre proportional factor of 5.67 for allowable purposes, and providing that said temporary rules be reconsidered at an examiner hearing to be held in September, 1968.

(4) That the applicant, Tenneco Oil Company, seeks amendment of the temporary Special Rules and Regulations promulgated by Order No. R-3315 to provide for 160-acre spacing units and the establishment of a 160-acre proportional factor of 7.67 for allowable purposes on a temporary basis.

(5) That since the promulgation of the temporary Special Rules and Regulations providing for 80-acre spacing units in the subject pool, several oil wells, dispersed over a substantial portion of what is believed to be the areal extent of the subject pool, have been drilled and completed on 80-acre spacing units.

(6) That the evidence presented by the applicant concerning reservoir characteristics of the subject pool, including reservoir pressure data and gas-oil ratio data, does not establish that one well in the North Morton Permo-Pennsylvanian Pool can efficiently and economically drain and develop 160 acres.

(7) That the applicant has not established that the amendment of the temporary Special Rules and Regulations governing the subject pool would prevent the economic loss caused by the drilling of unnecessary wells, avoid the augmentation of risk arising from the drilling of an excessive number of wells, prevent reduced recovery which might result from the drilling of too few wells, or otherwise prevent waste or protect correlative rights.

(8) That the subject application should be denied.

IT IS THEREFORE ORDERED:

(1) That the subject application is hereby denied.

(2) That jurisdiction of this cause is retained for the entry of such further orders as the Commission may deem necessary.

DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

DAVID F. CARGO, Chairman

GUYTON B. HAYS, Member

A. L. PORTER, Jr., Member & Secretary

esr/

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
COMMISSION OF NEW MEXICO FOR
THE PURPOSE OF CONSIDERING:

CASE No. 3651
Order No. R-3315

NOMENCLATURE

APPLICATION OF OLEN F. FEATHERSTONE
FOR THE CREATION OF A NEW POOL AND
SPECIAL POOL RULES, LEA COUNTY, NEW
MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on September 6, 1967, at Santa Fe, New Mexico, before Examiner Daniel S. Nutter.

NOW, on this 11th day of September, 1967, the Commission, a quorum being present, having considered the testimony, the record, and the recommendations of the Examiner, 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 the applicant, Olen F. Featherstone, seeks the creation of a new oil pool for Permo-Pennsylvanian production in Lea County, New Mexico, including a provision for 80-acre spacing units.

(3) That the Olen F. Featherstone Mobil-State Well No. 1, located in Unit E of Section 32, Township 14 South, Range 35 East, NMPM, Lea County, New Mexico, has discovered a separate common source of supply which should be designated the North Morton Permo-Pennsylvanian Pool; that the vertical limits of said pool should be the Lower Wolfcamp and the Upper Pennsylvanian formations as found in the interval from 10,305 feet to 10,605 feet on the log of the aforesaid Olen F. Featherstone Mobil-State Well No. 1;

and that the horizontal limits of said pool should be the NW/4 of said Section 32, Township 14 South, Range 35 East, NMPM, Lea County, New Mexico.

(4) That in order to prevent the economic loss caused by the drilling of unnecessary wells, to avoid the augmentation of risk arising from the drilling of an excessive number of wells, to prevent reduced recovery which might result from the drilling of too few wells, and to otherwise prevent waste and protect correlative rights, temporary special rules and regulations providing for 80-acre spacing units should be promulgated for the North Morton Permo-Pennsylvanian Pool.

(5) That the temporary special rules and regulations should provide for limited well locations in order to assure orderly development of the pool and protect correlative rights.

(6) That the temporary special rules and regulations should be established for a one-year period in order to allow the operators in the subject pool to gather reservoir information to establish the area that can be efficiently and economically drained and developed by one well.

(7) That this case should be reopened at an examiner hearing in September, 1968, at which time the operators in the subject pool should be prepared to appear and show cause why the North Morton Permo-Pennsylvanian Pool should not be developed on 40-acre spacing units.

IT IS THEREFORE ORDERED:

(1) That a new pool in Lea County, New Mexico, classified as an oil pool for Permo-Pennsylvanian production, is hereby created and designated the North Morton Permo-Pennsylvanian Pool, with vertical limits comprising the Lower Wolfcamp and the Upper Pennsylvanian formations as found in the interval from 10,305 feet to 10,605 feet on the log of the Olen F. Featherstone Mobil-State Well No. 1, located in Unit E of Section 32, Township 14 South, Range 35 East, NMPM, Lea County, New Mexico, and horizontal limits comprising the NW/4 of said Section 32.

(2) That temporary Special Rules and Regulations for the North Morton Permo-Pennsylvanian Pool are hereby promulgated as follows:

SPECIAL RULES AND REGULATIONS
FOR THE
NORTH MORTON PERMO-PENNSYLVANIAN POOL

RULE 1. Each well completed or recompleted in the North Morton Permo-Pennsylvanian Pool or in the Lower Wolfcamp or Upper Pennsylvanian formation within the defined vertical limits of said pool within one mile thereof, and not nearer to or within the limits of another designated Wolfcamp or Pennsylvanian oil pool, shall be spaced, drilled, operated, and produced in accordance with the Special Rules and Regulations hereinafter set forth.

RULE 2. Each well shall be located on a standard unit containing 80 acres, more or less, consisting of the N/2, S/2, E/2, or W/2 of a governmental quarter section; provided, however, that nothing contained herein shall be construed as prohibiting the drilling of a well on each of the quarter-quarter sections in the unit.

RULE 3. The Secretary-Director of the Commission may grant an exception to the requirements of Rule 2 without notice and hearing when an application has been filed for a non-standard unit comprising a governmental quarter-quarter section or lot, or the unorthodox size or shape of the tract is due to a variation in the legal subdivision of the United States Public Land Surveys. All operators offsetting the proposed non-standard unit shall be notified of the application by registered or certified mail, and the application shall state that such notice has been furnished. The Secretary-Director may approve the application upon receipt of written waivers from all offset operators or if no offset operator has entered an objection to the formation of the non-standard unit within 30 days after the Secretary-Director has received the application.

RULE 4. Each well shall be located within 150 feet of the center of a governmental quarter-quarter section or lot.

RULE 5. The Secretary-Director may grant an exception to the requirements of Rule 4 without notice and hearing when an application has been filed for an unorthodox location necessitated by topographical conditions or the recompletion of a well previously drilled to another horizon. All operators offsetting the proposed location shall be notified of the application by registered or certified mail, and the application shall state that such notice has been furnished. The Secretary-Director may

approve the application upon receipt of written waivers from all operators offsetting the proposed location or if no objection to the unorthodox location has been entered within 20 days after the Secretary-Director has received the application.

RULE 6. A standard proration unit (79 through 81 acres) shall be assigned an 80-acre proportional factor of 5.67 for allowable purposes, and in the event there is more than one well on an 80-acre proration unit, the operator may produce the allowable assigned to the unit from the wells on the unit in any proportion.

The allowable assigned to a non-standard proration unit shall bear the same ratio to a standard allowable as the acreage in such non-standard unit bears to 80 acres.

IT IS FURTHER ORDERED:

(1) That the locations of all wells presently drilling to or completed in the North Morton Permo-Pennsylvanian Pool or in the Lower Wolfcamp or Upper Pennsylvanian formation within the defined vertical limits of said pool within one mile thereof are hereby approved; that the operator of any well having an unorthodox location shall notify the Hobbs District Office of the Commission in writing of the name and location of the well on or before October 1, 1967.

(2) That each well presently drilling to or completed in the North Morton Permo-Pennsylvanian Pool or in the Lower Wolfcamp or Upper Pennsylvanian formation within the defined vertical limits of said pool within one mile thereof shall receive a 40-acre allowable until a Form C-102 dedicating 80 acres to the well has been filed with the Commission.

(3) That this case shall be reopened at an examiner hearing in September, 1968, at which time the operators in the subject pool may appear and show cause why the North Morton Permo-Pennsylvanian Pool should not be developed on 40-acre spacing units.

(4) That jurisdiction of this cause is retained for the entry of such further orders as the Commission may deem necessary.

DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

DAVID F. CARGO, Chairman

GUYTON B. HAYS, Member

A. L. PORTER, Jr., Member & Secretary

esr/

BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
September 4, 1968

EXAMINER HEARING

IN THE MATTER OF:

Case No. 3651 being reopened pursuant to the provisions of Order No. R-3315, which Order created the North Morton Permo-Pennsylvanian Pool, Lea County, New Mexico, and established 80-acre spacing units for said pool for a period of one year.

Case 3651

(Reopened)

BEFORE: Elvis A. Utz
Examiner

TRANSCRIPT OF HEARING

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MR. UTZ: Case 3651.

MR. HATCH: Case 3651, reopened. In the matter of Case Number 3651 being reopened pursuant to the provisions of Order Number R-3315, which Order created the North Morton Permo-Pennsylvanian Pool, Lea County, New Mexico.

MR. CONNELLY: Mr. Examiner, I'm Harry S. Connelly, Jr., of the lawfirm of Stephenson, Campbell and Olmsted, entering our appearance on behalf of Mr. Owen F. Featherstone, an operator on the field. Mr. Don Stevens with the Texas Bar will handle the questioning. We have one witness, Mr. Bill LeMay who was sworn earlier this morning in another cause.

MR. STEVENS: Here are some exhibits to be marked.

(Whereupon, Applicant's Exhibits Numbers 1 through 5, inclusive, were marked for identification.)

MR. UTZ: Are there any other appearances in this case?

MR. WHITE: Charles White appearing on behalf of Tenneco and we'll have a statement at the conclusion of the case.

MR. UTZ: Anymore appearances? You may proceed. Let the record show that this is the same witness that was sworn in the previous case.

WILLIAM J. LeMAY

called as a witness, having been previously duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. STEVENS:

Q Would you state your name, occupation, place of residence?

A Yes. William J. LeMay, Consulting Geologist, Santa Fe, New Mexico.

Q Have your qualifications as a geologist expert witness been made a matter of record with this Commission?

A Yes, they have.

Q As a petroleum geologist on behalf of Mr. Owen F. Featherstone, have you made a study of the North Morton Field?

A Yes, I have.

Q Could you state briefly the position of Mr. Featherstone in relation to spacing pattern in the field?

A Mr. Featherstone was the operator of the initial discovery well, the Featherstone Number 1 Mobil Federal which is located 2310 feet from the north line and 330 feet from the west line of Section 32, Township 14 South, Range 35 East.

One year ago, Mr. Featherstone applied for 80 acre spacing in the North Morton Pool and the Commission has made temporary spacing rules which were to be reviewed in the year and this is the review of the temporary spacing.

Mr. Featherstone is the operator of four wells in the

field and Tenneco Oil Company operates two wells. There are a total of six producing wells in the North Morton Field.

Exhibit Number 1 shows these wells are identified at the bottom and they're also identified as to whether they are currently pumping and flowing. It also shows, Exhibit Number 1, the relationship of the North Morton Pool with the Morton Pool to the south and west. Only three wells in the Morton Pool are shown, but actually, there are more wells in Section 7 and Section 12 of 15, 34. There are very marked similarities between the two fields which I will go in to.

As you will notice on Exhibit Number 1, which is contoured on top of the pay, there is a nose going off the Morton Field in a northerly direction. On the initial discovery well, which is Exhibit Number 2, the Featherstone Federal Number 1 Mobil State, the net pay has been identified and by drillstem test data and oil-water contact, was established at a minus 6420 subsea datum. This oil-water contact has been verified by other wells in the field, but as shown on Exhibit Number 1, the minus 6420 has some variation; mainly, in the northwest part of the field which indicates a partial water drive or at least a water action coming in from the northwest. That well, which is the Featherstone Number 1 Tenneco Federal, is a pumping well producing approximately a thousand barrels of water per day, and

it looks like the field probably will be watering out from the northwest.

There is a tight section or a facies change separating the Morton field from the North Morton field. This is shown on Exhibit 1 by the dashed line which is colored in red, and these wells have been tight in the upper pay and have shown dissimilar reservoir characteristics to the producing Permo-Penn carbonate in the North Morton Field.

Other dry holes in the area are a Tenneco well in Section 25 of 14, 34, the well Union drilled in Section 32 which is a south offset to the discovery well, a well in Section 29, 14, 35. Previously, there were two dry holes drilled in Section 6, Texas Crude and Pan American drilled the one in the north end of Section 6 and it was attempted to be re-entered by Hanagan Petroleum Corporation, but they could not get down, so they staked location for a twin which is noted on the exhibit, as well as another well which location has been staked down, the Tenneco-Maxwell Number 1, but as of yesterday, there was no report of any surface casing being run so I assume it's just a location.

The characteristics of the field are indicated both on Exhibits 1 and 2. Exhibit 2 being a log, detailed log of the discovery well, the Mobil State Number 1, indicating the vertical

limits of the North Morton Permo-Penn Field as outlined by the Commission in the previous case, 3651. These vertical limits are indicated by shale bodies, both above and below the main pay.

It also shows the datum, the top of the pay, which has been the datum that Exhibit 1 was contoured on and it shows the oil-water contact at the minus 6420.

Q Would you explain the significance of Zones 1 and 2 as shown on Exhibit 2? And where --

A Yes.

Q -- are they producing in the field?

A This was brought up in previous re-opening of Case 3651, the zonation of this Permo-Penn pay, whereby relatively tight carbonate, approximately ten foot thick, separates porosity in the so-called Zone 1 and Zone 2. Actually, from a regional point of view, I don't believe this probably is a real barrier in the reservoir, but locally, it seems to be affected.

And on Exhibit 1, there's only one well currently completed in Zone 2, and it is the highest well in the field, the Tenneco Number Number 1 Fee which is indicated by the circle in Section 31. It is approximately about 1980 from the south and east lines.

Q Excuse me, Mr. LeMay. Is that the Owen Featherstone

Number 1 Tenneco Fee?

A That's correct. The Featherstone Number 1 Tenneco Fee, and it is the highest well in the field and it was high enough so that Zone 2, instead of being water-bearing, was oil-bearing, and it is the only Zone 2 Well perforated in the field and is currently one of two flowing wells. The remainder of the wells are pumping.

Q Are all other wells in the field below the oil-water contact in Zone 2?

A Yes, they are.

MR. STEVENS: I would like to ask the Commission at this time to take administrative notice of Order Number 3315-A wherein Tenneco had requested 160-acre spacing for this field which was denied by the Commission in that Order.

Q Mr. LeMay, on your Exhibit 1, do all wells in the field, are they all productive and completed from Zone 1?

A Except for the previously mentioned Owen Featherstone Number 1 Tenneco Fee which was completed from Zone 2.

Q Was the only one productive in that well?

A Yes, it was, by drillstem test information, it did flow oil and would be productive.

MR. UTZ: But it's only completed in the bottom zone?

THE WITNESS: Right, sir.

Q Referring to Exhibit 3, would you explain the significance?

A Exhibit 3 is pressure information collected in the North Morton Field. The number of wells are indicated on the bottom in blue and pressure is plotted against time as is cumulative production, monthly production and number of wells.

As you will note, the original bottom hole pressure in the field, which is a drillstem test pressure from the discovery well, the Mobil State Number 1, indicated 4,044 pounds initial bottom hole pressure.

Subsequently, the Mobil State Number 1 had a 48-hour shut-in pressure and there was some decline registered. The other two pressures which were recorded in November and December of 1967 were drillstem test pressures and they show a decline of approximately 150 pounds.

The first of the year, the Mobil State underwent a 70-hour shut-in pressure and this conformed very closely with the Amerada Federal Number 1 on a 70-hour bottom hole pressure, the difference well being the margin of accuracy in measurement.

Following that, the Tenneco Federal Number 1 DST-2 confirmed this. In May of 1968, the Tenneco Anderson Federal Number 1 had a marked decline, and notice the reservoir pressure decline, and registered a bottom hole pressure of 3900 pounds on

a 24-hour shut-in bottom hole pressure.

In the most recent well, the Tenneco Maxwell Number 2 registered initial and shut-in bottom hole pressures on drillstem tests of 3330 and 3110 which falls off the chart. And this is a very rapid loss of reservoir pressure.

I might mention that on that Tenneco Maxwell Number 2, the fluid recovery was low and some reservoir damage could possibly be present, which might account for some of the low pressure, but as will be indicated by Exhibit Number 5, much of the pressure in the field is being lost by the production of the oil. Currently, there's approximately, has been approximately 250,000 barrels of oil recovered from the field and the monthly production is averaging 33,000 barrels of oil per month.

Q Could you explain the declines and the climbs in the production figures as shown by the yellow line on Exhibit 3?

A Well, the yellow line will correspond with the colored in blue area at the bottom which is strictly a function of additional wells being drilled in the field. For a long time, there was only one well, the discovery well in November, and then another well was drilled; a third well was completed in December, and two additional wells in 1968 brought the average monthly production up from the six wells producing in the field.

Q Could you also discuss the Amerada Federal Number 1 and

Tenneco Fee Number 1 drillstem test pressures which seem to be lower than the subsequent Mobil State and Tenneco Federal Number 1 pressures which are one bottom hole, one drillstem test?

A Well, I attribute the lower pressures indicated by the Amerada Federal Number 1 and the Tenneco Fee Number 1 to some formation damage because they were a limited shut-in pressure, two hours, I believe, and this is compared to a better pressure indication of a 70-hour shut-in pressure that the Mobil State and the Amerada Federal encountered; and therefore, I think there is some leeway in there, considering the fact that both are drillstem pressure data and bottom hole pressure data.

Q Going to the plat marked Exhibit 4, would you explain the significance of that to the Commission?

A Yes, Exhibit 4 shows the basic data and the economics of the North Morton Permo-Penn Area. The Number 1 indicates the value of oil, the net working interests, production taxes, lifting costs, well costs and the artificial lift equipment which is operative on four out of the six wells in the field and it is anticipated that the other two wells will go on artificial lift equipment shortly.

The recoverable oil in barrels per acre foot has been estimated at 136,000 -- that should be 136 barrels per acre foot. The average net pay in the field is 12 feet which is the

actual measured net pay in the Featherstone Mobil State Number 1 and is a field average, as well. Therefore, the recoverable oil in barrels per acre would be 1,632 barrels per acre with an average of 12 feet of pay.

As an economic comparison, the two columns, 40-acre units and 80-acre units, are set out so that the Commission can see the economics based on 40 and 80-acre spacing. Recoverable oil would be 65,280 barrels under 40-acre spacing; under 80 acres, this would be 130,560 barrels.

I might say, offhand, this will compare very closely with the Morton Field. The Morton Field as an average production, cumulative production of 100,000 barrels per well per day, but only two wells out of eight now produce over 1,000 barrels of oil per month.

These fields are very similar. Probably, the Morton Field being a little larger and having a little more net pay would be slightly better than the North Morton Field.

The operators estimated gross revenue would be $161,186.00 for 40 acres; under 80 acres, it would be $322,372.00. The lifting costs and the production taxes are subtracted from this figure to arrive at Item Number E, the operators net income, which would be $144,504.00 under 40-acre spacing; $289,008.00 under the 80-acre spacing.

The investment would be $175,000.00 in both cases which would result in a loss under the 40-acre spacing and a very slight gain under the 80-acre spacing, and as indicated by the asterisk at the botton of the page, these figures do not take into account the risk of drilling dry holes nor do they take into account any discount of cash flow, rate of return calculations.

Q In your opinion, would an economic loss result in the drilling of 40-acre spacing?

A Definitely.

Q Would you recommend to a client of yours, drilling in this field if 40-acre spacing were in effect and presuming that such other operators would drill additional 40-acre spacing?

A I would not recommend a client to drill on 40-acres, no.

Q Would you explain to the Commission the significance of Exhibit Number 5?

A Yes. Exhibit Number 5 is production history from the Owen Featherstone wells in the North Morton Pool. Because the wells have not been shut-in for pressure interference tests, Exhibit Number 5 is a good indication of the nature of the decline in each and every well in the field.

The first well on Exhibit Number 5 is the Featherstone Mobil State. As you'll notice, the tubing pressure initially was 710 pounds, and in the period of approximately one year, this has declined to 300 pounds. Currently, the well is actually flowing on a 1864ths-inch choke with 280 pounds flowing tubing pressure.

There's something that's interesting in conjunction with this Mobil State Well. The west offset to the Mobil State, which is the Featherstone Amerada Federal, has an interesting relationship there. The Amerada Federal was shut down because of mechanical difficulties and was put back on production June 19th. At this time, the Mobil State was flowing 400 barrels of oil per day with 425 pounds flowing tubing pressure. This Amerada Federal, the west offset, was put back on production on the 19th. And by July 22nd, the Mobil State had a flowing tubing pressure of 375 pounds. There's a loss of 50 pounds there and it was producing only 300 barrels of oil per day instead of the previous 400 and it was producing on a 1564ths-inch choke.

Again, on August 1st, the Mobil Well was flowing 350 barrels of oil per day, back up 50, on a 1864ths-inch choke with 330 pounds. Again, the Amerada Well was down and was put back on production on that date, and by August 5th, the pressure on the Mobil State Well had dropped to 300 pounds from 330 pounds on the flowing tubing pressure with a loss of an additional 50 barrels

of oil per day. So the interconnection of the reservoir between these wells, I think, is well demonstrated by this field example.

The other wells, as shown on Exhibit Number 5, all of which, if they're flowing, have indicated flowing tubing pressure dropped to the point where they are put on the pump; the Amerada Federal was flowing, initially, and is currently on the pump producing large volumes of water. The Tenneco Fee is still flowing, but you'll notice the drop in tubing pressure there from January to July of 930 pounds to 400 pounds, and the Tenneco Federal Well was initially flowing at 450 pounds, and as I indicated previously, it is currently on the pump, so I think the decline in this reservoir pressure is well verified and the drop in pressure is well confirmed. The evidence supports the drop in reservoir pressure both from the measured pressure and from the tubing pressure on the wells and the wells going to water.

Q From this evidence that you have gone through, what is your opinion as to whether or not 80-acre spacing will drain, in fact, 80 acres or more?

A I believe it's definite that 80-acre spacing will --that a well will adequately drain 80 acres or more, probably more than 80 acres.

Q What would be your recommendation to the Commission as regards the proposed extension or making permanent the 80-acre spacing?

A I would recommend to the Commission that they make permanent the 80-acre allowable of 5.76 times the basic allowable as well as the 80-acre spacing as originally set forth in the first hearing a year ago.

Q Were Exhibits 1 through 5 prepared by you or under your supervision?

A Yes, they were.

MR. STEVENS: Mr. Examiner, we would like to request at this time that these exhibits be offered in evidence.

MR. UTZ: Without objection, Exhibits 1 through 5 will be entered into the record in this case.

(Whereupon, Applicant's Exhibits Numbers 1 through 5, inclusive, were admitted into evidence.)

MR. STEVENS: And we have no further questions on direct.

CROSS EXAMINATION

BY MR. UTZ:

Q Mr. LeMay, you mentioned two new locations or possibly one drilling well. Where would they be located?

A They are the circles, Mr. Examiner, on Exhibit 1; one being a twin to the well in the north half of Section 6. It's a twin to the Texas Crude Pan American dry hole in Section 6. The other one is in an announced location, approximately 1980 from the south and 660 from the east of Section 31, 14, 35. I do not

believe either one of these are drilling wells as yet. They would be in conformance with the spacing pattern of the field.

Q Now, you've drawn in a water-oil contact around this nosing area. What do you base that on?

A That is based on drillstem test data from the wells that have been drilled in the field, and I crowded it on the northwest end, bringing it across the 6400 foot, the minus 6400 foot contour line because of the present performance of the Tenneco Number 1 Amerada, I mean Tenneco Number 1 Federal -- I'm sorry, the Owen Featherstone Number 1 Tenneco Federal. It is producing large quantities of water from Zone 1 with some oil.

Q Do you know how the acreage is dedicated to the producing wells in this pool?

A Yes. The 80s run north-south.

Q All of them?

A Yes.

Q So that the three northernmost wells, the three that are located in the south half of the north half of Section 31, would have the 40 to the north of them dedicated?

A Correct. And, consequently, the two wells in the south half of Section 31 have the southern 40 dedicated to them.

Q Now, is there any question in your mind as to the productivity of the acreage in the south half of the south half of Section 31? Are those three wells shown on Exhibit 1?

A I think there could always be some question, sir. It would be very hard to prove because of, probably, reservoir deterioration. The area is certainly high enough to produce, but as indicated previously, that Texas Crude Pan American Well did not have a good drillstem test. They did recover some oil and, evidently, Hanagan believes it will be productive because they tried to get in that well to recomplete it, and they're subsequently drilling a second well.

Q The acreage in the north half of the north half of Section 31 is certainly questionable as far as productivity is concerned, is it not?

A Well, it is on the basis of the oil-water contact, sir. I think there's a lot of factors concerning this Permo-Penn Zone that are not cut and dry. It's not like the Bough-C. It's not that easy to analyze because you do have variations within the reservoir itself that can account for different types of production.

I might indicate that the closing of contours on the 64 and 6450 interval was strictly interpretative. I've seen other maps that indicate the area opens up again, that this is a general ridge through Sections 30 and 31 and because of lack of any control, I did close those contours but it's purely interpretive. I have seen other interpretations that support the data.

Q Now, you have pretty good control on your 6400 contours, have you not?

A Well, there's actually nothing directly north of those wells which is lower than 6400 foot. In other words, we don't have a well directly north of the three producing wells which verifies the north dip. There is dip from the Tenneco Fee which is the flowing well to those three producers, but north of the 6400 foot line, we don't have any wells, and if we did have one, it would cut the oil-water contact, of course. There could be some projection there.

Q Who is going to drill or who has spudded the location in the northeast of the southeast quarter of 31?

A That is Tenneco.

Q Tenneco?

A Correct.

Q It's obvious that the operators in this pool have actually drilled on 40-acre spacing, isn't that correct, and intend to continue?

A So far, that seems to be the case, sir. They drill actually on the 80-acre unit, but the Commission has allowed flexible spacing, so I think the tendency is to crowd producing wells as is done in quite a few fields when you're afraid of it.

Q Now, who does the location in Section 6 belong to, that acreage?

A Hanagan Petroleum Corporation.

Q Hanagan?

A Yes, sir. They have not sent a form in indicating that they set surface location yet, so it may be a location that probably isn't drilling yet.

Q That dry hole shown right next to that location, does that reach the Pennsylvanian?

A Yes, sir, it did. And they did recover some oil from the Pennsylvanian. I don't have that scout ticket with me, but I have others; but my memory indicates that they recovered a little bit of oil and some water, and it wasn't enough so that Pan American and Texas Crude felt it could make commercial completion. But Hanagan tried to re-enter that hole and failed, so he's drilling a twin.

Q Now, these people at the present time are receiving an 80-acre allowable.

A That's correct. I might point out, with the exception of, I think, two wells, the Tenneco B and the original discovery well, the Mobil State, production is below top allowable. I don't have recent production data on the two Tenneco wells. Well, I do.

The Tenneco Anderson Federal, from my records, show it was completed in May and it produced 6206 barrels in May, 4672 barrels in June and 4242 barrels in July, indicating below top allowable.

Tenneco Maxwell Number 2 was completed in July and the July production 4,077 since it was completed July 10th. This may be a better well than the other one because it only had 20 days to produce and it produced 4,077 barrels, but it is a pumping completion, also.

Q The difference between an 80-acre top allowable and a 40-acre top allowable, in this instance, would be about 48 or 49 barrels based on a n al allowable, is that correct?

A I believe so, s I didn't check that. I might mention --

Q If your water-oil contact is correct here, well, en the three northern wells in this pool would certainly be getting too much allowable and would be draining some of the south half of the pool, would they not? In other words, you can't drain 80 acres if you don't have 80 acres to drain.

A That's true. The interpretation is certainly a conservative one on the exhibits and I show it as a nose. I've seen other interpretations that show it opening up again to the north because, regionally, you have a structural ridge going through the area from Morton to North Morton and, again, further north.

Q I think I interrupted you. Do you have something more?

A I was just going to mention some reservoir characteristics that I am in agreement with which was brought out by Tenneco at their previous hearing requesting 160-acre spacing, the fact

that there is a very low GOR and that it was anticipated that there would be rapid pressure decline to the bubble point, which I think was less than 1000 pounds. At that point, the pressure decline would not be as rapid in the production, loss would not be as rapid.

Q That was a solution drive pool, is that right?

A Yes. There could be a component of water drive in the northwest end because of the encroachment of water, but it had a very low GOR, exceptionally low, compared to other Permo-Penn Fields like the Morton Field and the High Plains and the East Saunders.

MR. UTZ: Are there any other questions of the witness?

MR. STEVENS: I would like to ask one more question

REDIRECT EXAMINATION

BY MR. STEVENS:

Q Mr. LeMay, how does this reservoir compare with the Bough-C reservoirs wherein an oil-water contact is sometimes ill-defined; that is, the further down-dip you drill, the greater amount of water you get and the lesser amount of oil, but there's no well-defined contact? Is this possibly of that nature?

A I think it is. I think the pay is so erratic and has been proven to be so erratic. The fact that you do have two wells in Section 6 that are high enough to produce that don't, and maybe they worked that one with the plugged producer, Hanagan thinks so,

that you can ascribe variations in the so-called oil-water contact or in a well's ability to produce oil or water by variations in the quality of the pays. The two zones, Zone 1 and Zone 2, were brought up in the previous testimony. I, personally, don't subscribe to this on a regional sense because you're dealing with a type of reef, wherein in the Bough C, you have a little different factor in the reservoir itself. It's more defined. But in a reef that varies in porosity and permeability, you can have perched water tables, you can have irregular oil-water contacts, and it's a very complex stratigraphic situation.

Q On the well in Section 32 which shows to be a dry hole, was there any oil produced in the drillstem test in that well?

A No, but a very large interval was tested. I have the drillstem test here. That's the Union of California Number 1 State 32. It is high enough to produce, and it is another factor that tends to go against this minus 6420 oil-water contact. This oil-water contact, I might bring out, was established on drillstem test data and has been kind of a sacred column to me for awhile but the production data in this recent Union well which -- tends to cast out upon its validity.

Now, the drillstem test from 10,382 to 10,567, was open one hour. Gas was recorded to thirty-five minutes and the recovery was 500 feet of water in gas-cut mud, plus 3,662 feet of

salty sulphur water. No oil indicated with initial shut-in pressures of 3957, initial and final. This well was drilled in February, completed in February, and that would correspond very closely with Exhibit Number 3, although I did not plot this well because it was a dry hole, but it would support the pressure decline indicated on Exhibit 3. But there's a case where pay was encountered high enough, but no indications of oil, only water.

MR. STEVENS: No further questions.

MR. UTZ: Are there any other questions of the witness? The witness may be excused. Any statements?

MR. WHITE: If the Examiner please, I'm Charles White. Tenneco is one of these operators in the pool and they certainly urge the Commission to make permanent the special pool rules.

MR. UTZ: Are there any other statements? The case will be taken under advisement. The hearing will be adjourned until 1:30.

I N D E X

E X H I B I T S

Number	Marked for Identification	Received in Evidence
Applicant's Exhibits 1 through 5	2	15

STATE OF NEW MEXICO)
) ss.
COUNTY OF BERNALILLO)

I, CHARLOTTE MACIAS, Notary Public in and for the County of Bernalillo, State of New Mexico, do hereby certify that the foregoing and attached Transcript of Hearing before the New Mexico Oil Conservation Commission was reported by me; and that the same is a true and correct record of the said proceedings, to the best of my knowledge, skill and ability.

Witness my Hand and Seal this 4th day of October, 1968.

Charlotte Macias
Notary Public

My Commission Expires:

February 10, 1971.

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 3651 heard by me on Sept. 4, 1968.

New Mexico Oil Conservation Commission

Case. 3651
Heard 9-4-68
Rec. 9-9-68

This is another Case I am going in the pool wanting to drill on the high & dedicate either dry or questionable acreage. There are 6 wells in the pool and 1 location by Dennco all are 40 A.c. tracts.

According to contour maps presented the water / oil contact all acreage to the North & west of the wells.

Since this pool has been and still is being developed on 40 A.c. spacing I recommend that the 80 A.c. order to be denied such order to protect the correlative rights of the acreage being claimed by 80 A.c. allowables.

Thos G. Mabry

Don Nutter

'60 SEP 30 AM 8 14

BEFORE THE OIL CONSERVATION COMMISSION

STATE OF NEW MEXICO

IN THE MATTER OF ESTABLISHING
80-ACRE SPACING UNITS FOR THE
NORTH MORTON PERMO-PENNSYLVANIA
POOL, LEA COUNTY, NEW MEXICO.

No. 3651

ENTRY OF APPEARANCE

Come now Stephenson, Campbell & Olmsted and enter their appearance herein as attorneys for Owen F. Featherstone in the above entitled matter.

STEPHENSON, CAMPBELL & OLMSTED

By Jas. Stephenson Jr.

STEPHENSON,
CAMPBELL & OLMSTED
ATTORNEYS AT LAW
P. O. BOX 877
SANTA FE, NEW MEXICO

GOVERNOR
DAVID F. CARGO
CHAIRMAN

State of New Mexico
Oil Conservation Commission

LAND COMMISSIONER
GUYTON B. HAYS
MEMBER

P. O. BOX 2088
SANTA FE

STATE GEOLOGIST
A. L. PORTER, JR.
SECRETARY - DIRECTOR

February 19, 1968

Mr. Charles White
White, Gilbert, Koch & Kelly
Attorneys at Law
Post Office Box 787
Santa Fe, New Mexico

Re: Case No. 3651
Order No. R-3315-A
Applicant:
Tenneco Oil Company

DOCKET MAILED
Date 8/22/68

Dear Sir:

Enclosed herewith are two copies of the above-referenced Commission order recently entered in the subject case.

Very truly yours,

A. L. PORTER, Jr.
Secretary-Director

ALP/ir

Carbon copy of order also sent to:

Hobbs OCC x
Artesia OCC
Aztec OCC
Other Mr. J. B. Jordon, Mr. Jim Jennings, Mr. Charles Hicks and Mr. Jason Kellahin

Docket No. 3-68

DOCKET: EXAMINER HEARING - WEDNESDAY - JANUARY 24, 1968

9 A.M. - OIL CONSERVATION COMMISSION CONFERENCE ROOM,
STATE LAND OFFICE BUILDING - SANTA FE, NEW MEXICO

The following cases will be heard before Daniel S. Nutter, Examiner, or Elvis A. Utz, Alternate Examiner:

CASE 3704 (Continued from the December 20, 1967, Examiner Hearing)

Application of New Mexico Salt Water Disposal Company, Inc., for salt water disposal, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to dispose of produced salt water into the Bough "D" zone of the Pennsylvanian formation in the perforated interval from 9844 to 9875 feet in its Ainsworth Well No. 1 located in Unit H of Section 19, Township 9 South, Range 34 East, Vada-Pennsylvanian Pool, Lea County, New Mexico.

CASE 3711: In the matter of the hearing called by the Oil Conservation Commission upon its own motion to consider the amendment of Rule 509 of the Commission Rules and Regulations and Commission Form C-109 to permit the production of the bonus discovery oil allowable assigned to multiple discovery wells to be produced from any discovery zone in any proportion; and to further amend said rule to permit applications for the bonus discovery allowable to be heard on dockets other than the regular pool nomenclature docket in instances where the applicant will present the evidence.

CASE 3712: In the matter of the hearing called by the Oil Conservation Commission upon its own motion to consider the amendment of Rule 701 of the Commission Rules and Regulations and secondary recovery Orders Nos. R-1244, R-1311, R-1456, R-1470, R-1505, R-2064, R-2178-B, R-2268-A, R-2269, R-2403, R-2541, R-2622, R-2664, R-2700, and R-2795, to delete therefrom all references to the State Engineer or the State Engineer Office.

CASE 3713: In the matter of the hearing called by the Oil Conservation Commission upon its own motion to consider the amendment to Rule 103 of the Commission Rules and Regulations to require that well identification signs for wells drilled hereafter shall designate the location of said wells by quarter-quarter section rather than quarter section as now required.

CASE 3714: Application of Continental Oil Company for a dual completion, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to dually complete its State "O" Well No. 1 located in Unit F of Section 16, Township 17 South, Range 32 East, Lea County, New Mexico, in such a manner as to permit the production of gas from the perforated interval 3140 to 3160 feet, Maljamar-Queen Gas Pool and the injection of water for secondary recovery purposes into the Grayburg-San Andres formations in the interval from 3700 to 4050 feet through parallel strings of 2-inch tubing.

CASE 3715: Application of Gulf Oil Corporation for an amendment to Order No. R-3345, Lea County, New Mexico. Applicant, in the above-styled cause, seeks the amendment of Order No. R-3345, which order authorized the Gulf Stuart Langlie Mattix Unit Waterflood Project. Applicant proposes to substitute the Stuart "B" Well No. 2 located in Unit I and the Stuart "C" Well No. 3 located in Unit K as water injection wells in said project in lieu of the Stuart "A" Well No. 1 located in Unit J and the Stuart "D" Well No. 4 located in Unit L, all in Section 10, Township 25 South, Range 37 East, Langlie-Mattix Pool, Lea County, New Mexico.

CASE 3716: Application of Carter Foundation Production Company for salt water disposal, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to dispose of produced salt water into the Ellenburger formation through the perforated interval from 9580 to 9680 feet in its E. C. Hill "E" Federal Well No. 5 located in Unit E of Section 35, Township 23 South, Range 37 East, Teague-Ellenburger Pool, Lea County, New Mexico.

CASE 3651 (Reopened):

Application of Tenneco Oil Company for an amendment to Order No. R-3315, Lea County, New Mexico. Applicant, in the above-styled cause, seeks the re-opening of Case No. 3651 and the amendment of Order No. R-3315 entered therein which order promulgated temporary pool rules for the North Morton-Pennsylvanian Pool, Lea County, New Mexico, including the establishment of 80-acre proration units for a period of one year. Applicant now seeks the amendment of said order to provide for 160-acre spacing and proration units on a temporary basis.

CASE 3717: Application of Aztec Oil & Gas Company for a dual completion and salt water disposal, Lea County, New Mexico. Applicant, in the above-styled cause, seeks the authority to dually complete its State "AJ" Well No. 2 located in Unit N of Section 1, Township 18 South, Range 36 East, Arkansas Junction-San Andres Pool, Lea County, New Mexico, in such a manner as to permit the production of oil from the Upper San Andres formation in the interval from 5047 to 5079 feet and to permit the disposal of produced salt water in the Lower San Andres formation in the interval from 5430 to 5462 feet through parallel strings of 2-inch tubing.

CASE 3718: Application of Cabot Corporation for salt water disposal, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to dispose of produced salt water in the Wolfcamp, Pennsylvanian, Mississippian, and Devonian formations in the overall interval from 9406 to 12,689 feet in its H. L. Lowe "C" Well No. 1 located in Unit N of Section 26, Township 13 South, Range 37 East, King-Devonian Pool, Lea County, New Mexico.

WESTERN UNION
TELEGRAM

W. P. MARSHALL, CHAIRMAN OF THE BOARD
R. W. McFALL, PRESIDENT

The date line on domestic telegrams is LOCAL TIME at point of origin. Time of receipt is LOCAL TIME at point of destination

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LA112 PRB560 ==

:SFB281 244P PDT AUG 30 68 LA543 =
:L RWA036 PD ROSWELL NMEX 30 330P MDT =
:A L PORTER JR =
SECRETARY DIRECTOR OIL CONSERVATION COMMISSION
STATE LAND =OFFICE BLDG SANTA FE NMEX =

=RE CASE NO 3651 PLEASE DISREGARD PREVIOUS TELEGRAM
RELATIVE =TO THE SUBJECT CASE WE HAVE DECIDED TO HAVE
STEVENS AND LEMAY =PRESENT OUR CASE BEFORE THE
COMMISSION ON SEPTEMBER 4 1968 =
OLEN F FEATHERSTONE =

=4 1968 ALSO 3651 =

WU1201 (R2-65)

THE COMPANY WILL APPRECIATE SUGGESTIONS FROM ITS PATRONS CONCERNING ITS SERVICE

WHITE, GILBERT, KOCH & KELLY
(GILBERT, WHITE AND GILBERT)
ATTORNEYS AND COUNSELORS AT LAW
LINCOLN BUILDING
SANTA FE, NEW MEXICO 87501

CARL H. GILBERT (1891-1963)
L. C. WHITE
WILLIAM W. GILBERT
SUMNER S. KOCH
WILLIAM BOOKER KELLY
JOHN F. McCARTHY, JR.

POST OFFICE BOX 787
TELEPHONE 982-4301
(AREA CODE 505)

August 29, 1968

Mr. Elvis Utz
New Mexico Oil Conservation Commission
P. O. Box 2088
Santa Fe, New Mexico

Dear Elvis:

Enclosed is a telegram from Featherstone agreeing with Tenneco's request that Case 3651 be postponed for thirty days. Please place this in the file.

Sincerely,

L. C. WHITE

LCW:el
Encl.

'68 AUG 30 AM 8 25

CLASS OF SERVICE
This is a fast message unless its deferred character is indicated by the proper symbol.

WESTERN UNION TELEGRAM

W. P. MARSHALL
CHAIRMAN OF THE BOARD

R. W. McF. (103).
PRESIDENT

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LA232 SSC404

1968 AUG 23 PM 5 52

L RWA043 PD=ROSWELL NMEX 28 450P MDT=
WHITE GILBERT KOCH AND KELLEY=
LINCOLN BLDG SANTA FE NMEX=

RE CASE NO 3651 IN THE MATTER OF RE OPENING CASE NO 3651
WE AGREE WITH TENNECO OIL COMPANY AND RESPECTFULLY REQUEST
THAT HEARING ON THIS CASE BE POSTPONED FOR THIRTY (30)
DAYS SO THAT ADDITIONAL INFORMATION MAY BE OBTAINED=
OLEN F FEATHERSTONE==

MAIN OFFICE

'68 AUG 30 AM 8 25

3651 (30)=

WU1201 (R2-65) THE COMPANY WILL APPRECIATE SUGGESTIONS FROM ITS PATRONS CONCERNING ITS SERVICE

CLASS OF SERVICE
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WESTERN UNION TELEGRAM

W. P. MARSHALL
CHAIRMAN OF THE BOARD

R. W. McF. (101).
PRESIDENT

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1968 AUG 23 PM 5 53

L RWA042 PD=ROSWELL NMEX 28 450P MDT=

'68 AUG 29 AM

A L PORTER JR=
SECRETARY DIRECTOR OIL CONSERVATION COMMISSION
STATE LAND OFFICE BLDG SANTA FE NMEX

RE CASE NO 3651 IN THE MATTER OF RE-OPENING CASE NO 3651 WE AGREE WITH TENNECO OIL COMPANY AND RESPECTFULLY REQUEST THAT HEARING ON THIS CASE BE POSTPONED FOR THIRTY (30) DAYS SO THAT ADDITIONAL INXORMATION MAY BE OBTAINED=
OLEN F FEATHERSTONE==

3651 30=

WU1201 (R2-65) THE COMPANY WILL APPRECIATE SUGGESTIONS FROM ITS PATRONS CONCERNING ITS SERVICE

Docket No. 26-68

DOCKET: EXAMINER HEARING - WEDNESDAY - SEPTEMBER 4, 1968

9 A.M. - OIL CONSERVATION COMMISSION CONFERENCE ROOM,
STATE LAND OFFICE BUILDING - SANTA FE, NEW MEXICO

The following cases will be heard before Elvis A. Utz, Examiner, or Daniel S. Nutter, Alternate Examiner:

CASE 3847: (Continued from the August 21, 1968, Examiner Hearing)

Application of K. K. Amini for compulsory pooling, Lea County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests in the Bough "C" zone of the Pennsylvanian formation underlying the NE/4 of Section 5, Township 10 South, Range 34 East, Lea County, New Mexico. Said acreage to be dedicated to a well to be drilled in the SW/4 NE/4 of said Section 5, adjacent to the Vada-Pennsylvanian Pool.

CASE 3513: (Reopened)

In the matter of Case No. 3513 being reopened pursuant to the provisions of Order No. R-3179-A, which order established 160-acre spacing units and a 160-acre proportional factor of 4.77 for allowable purposes for the Vada-Pennsylvanian Pool, Lea County, New Mexico, for a period of one year. All interested parties may appear and show cause why the pool should not be developed on less than 160-acre spacing units and show cause why the 160-acre proportional factor of 4.77 should or should not be retained.

CASE 3849: Application of Penroc Oil Corporation for a waterflood project, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks authority to institute a waterflood project by the injection of water into the Grayburg formation through its Phillips State Well No. 4 located in Unit I of Section 27, Township 17 South, Range 28 East, Artesia Pool, Eddy County, New Mexico.

CASE 3850: Application of Pan American Petroleum Corporation for salt water disposal, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to dispose of produced salt water into the Bough (Permo-Pennsylvanian) formation in the interval from approximately 9590 feet to 9634 feet in its Federal "A" Well No. 3 located in Unit J of Section 13, Township 9 South, Range 35 East, Bough (Permo-Pennsylvanian) Pool, Lea County, New Mexico.

CASE 3851: Application of Mobil Oil Corporation for a waterflood expansion, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to expand its Bridges State Waterflood Project by the injection of water into the San Andres formation through an injection well recently completed at a location 660 feet from the South line and 560 feet from the West line of Section 24, Township 17 South, Range 34 East, Vacuum Pool, Lea County, New Mexico.

CASE 3852: Application of Mobil Oil Corporation for a triple completion, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval for the triple completion (conventional) of its Bridges State Well No. 126 located in Unit J of Section 11, Township 17 South,

Range 34 East, Lea County, New Mexico, in such a manner as to produce oil from the Abo, Middle Pennsylvanian and Morrow formations, Vacuum Field, through parallel strings of tubing.

CASE 3651: (Reopened)

In the matter of Case No. 3651 being reopened pursuant to the provisions of Order No. R-3315, which order created the North Morton Permo-Pennsylvanian Pool, Lea County, New Mexico, and established 80-acre spacing units for said pool for a period of one year. All interested parties may appear and show cause why said pool should not be developed on 40-acre spacing units.

CASE 3853: Application of Tenneco Oil Company for a waterflood expansion, Lea County, New Mexico. Applicant, in the above-styled cause, seeks the expansion of its Mesa Queen Waterflood Project, Mesa-Queen Pool, by the conversion to water injection of two additional wells located in the SW/4 NW/4 of Section 20 and the NW/4 SE/4 of Section 16, both in Township 16 South, Range 32 East, Lea County, New Mexico. Applicant further seeks an administrative procedure whereby said project could be expanded to include additional lands and injection wells as may be necessary to complete an efficient injection pattern.

CASE 3854: Application of Sinclair Oil & Gas Company for salt water disposal, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to dispose of produced salt water into the Yates formation in the perforated interval from 3636 feet to 3700 feet in its Ballard DE Federal Well No. 6 located in Unit L of Section 22, Township 20 South, Range 34 East, Lynch Field, Lea County, New Mexico.

CASE 3431: (Reopened):

In the matter of Case No. 3431 being reopened pursuant to the provisions of Order No. R-3100-A to permit Sinclair Oil & Gas Company to show cause why its W. H. Turner Well No. 1 located in Unit L of Section 29, Township 21 South, Range 37 East, Lea County, New Mexico, a dual completion in the Drinkard and Blinebry Oil Pools, should not be completed in accordance with the provisions of Rule 112-A of the Commission Rules and Regulations.

CASE 3855: Application of Sunray DX Oil Company for a waterflood project, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to institute a waterflood project by the injection of water into the Seven Rivers formation in the interval from approximately 3693 feet to 3733 feet in its H. D. Greer Well No. 1 located in Unit C of Section 21, Township 22 South, Range 36 East, South Eunice Pool, Lea County, New Mexico.

CASE 3856: Application of Skelly Oil Company for a waterflood project, Rio Arriba County, New Mexico. Applicant, in the above-styled cause, seeks authority to institute a waterflood project by the injection of water into the Gallup formation through its Jicarilla "B" Wells Nos. 5 and 6 located in Units L and F, respectively, of Section 32, Township 25 North, Range 5 West, Otero-Gallup Pool, Rio Arriba County, New Mexico.

CASE 3857: Application of Coastal States Gas Producing Company for special pool rules, Lea County, New Mexico. Applicant, in the above-styled cause, seeks the promulgation of special pool rules for the Tulk-Pennsylvanian Pool in Township 14 South, Range 32 East, Lea County, New Mexico, including a provision for 160-acre spacing and proration units with the assignment of 80-acre allowables.

In the alternative, applicant seeks the creation of a new pool for Pennsylvanian oil production from its State "26" Well No. 1 located in Unit D of Section 26, said Township and Range, and promulgation of the aforesaid special rules therefor.

WHITE, GILBERT, KOCH & KELLY
(GILBERT, WHITE AND GILBERT)
ATTORNEYS AND COUNSELORS AT LAW
LINCOLN BUILDING
SANTA FE, NEW MEXICO 87501

CARL H. GILBERT (1891-1963)
L. C. WHITE
WILLIAM W. GILBERT
SUMNER S. KOCH
WILLIAM BOOKER KELLY
JOHN F. McCARTHY, JR.

POST OFFICE BOX 787
TELEPHONE 982-4301
(AREA CODE 505)

January 19, 1968

Case 3651

OFFICE
JAN 22 AM 8 21

Mr. A. L. Porter
Secretary=Director
New Mexico Oil Conservation Commission
P. O. Box 2088
Santa Fe, New Mexico

Dear Mr. Porter:

Enclosed find original and two copies of Application of Tenneco Oil Company for 160-Acre spacing and proration units in the North Morton Permo-Pennsylvanian Oil Pool. This case has been set for hearing on January 24th, 1968.

Very truly yours,

W. B. KELLY

WBK:cc

BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION

APPLICATION OF TENNECO OIL COMPANY
FOR AN AMENDMENT TO ORDER NO. R-3315,
TO ALLOW 160-Acre SPACING AND PRORATION
UNITS ON A TEMPORARY BASIS IN THE NORTH
MORTON PERMO-PENNSYLVANIAN OIL POOL,
LEA COUNTY, NEW MEXICO

Case 3651

MAIN OFFICE OCC

'68 JAN 22 AM 8 21

A P P L I C A T I O N

Tenneco Inc. is the owner and operator of certain oil wells presently producing in the North Morton Permo-Pennsylvanian Pool, Lea County, New Mexico. That said pool was created by the Oil Conservation Commission of the State of New Mexico under Order No. R-3315 issued on September 11, 1967.

That the special rules adopted on a temporary basis in said Order provided for 80-Acre spacing and proration units.

That since said pool rules have been adopted additional wells have been drilled and new production and drainage information is available, that shows that wells drilled on a 160-acre spacing and proration units will efficiently and economically drain and develop said pool. Such information further shows that the drilling of more than one well on each 160-acre proration unit will result in the drilling of unnecessary wells and economic loss therefrom.

WHEREFORE, Applicant requests this Commission to enter its Order amending Order No. R-3315 to allow for 160-acre spacing and proration units on a one year temporary basis.

WHITE, GILBERT, KOCH & KELLY

By _____
Attorneys for Tenneco Oil Company

WHITE, GILBERT, KOCH & KELLY
ATTORNEYS AT LAW
P. O. BOX 787
SANTA FE, NEW MEXICO 87501

AMERADA PETROLEUM CORPORATION

P. O. BOX 2040

TULSA, OKLAHOMA 74102

January 17, 1968

New Mexico Oil Conservation Commission
P. O. Box 2088
Santa Fe, New Mexico 87501

Attention: Mr. A. L. Porter, Jr.

RE: Case 3651 (Reopened)
Hearing January 24, 1968

Gentlemen:

Amerada Petroleum Corporation supports the application of Tenneco Oil Company to establish, on a temporary basis, 160-acre oil spacing and proration units for the North Morton Permo-Pennsylvanian Pool.

Amerada has an over-riding royalty interest in one of the existing wells in this pool and also has undeveloped adjacent leases.

Very truly yours,

R. L. Hocker

RLH:sp

MAIN OFFICE O

'68 JAN 19 AM 8 5

GOVERNOR
DAVID F. CARGO
CHAIRMAN

State of New Mexico
Oil Conservation Commission

LAND COMMISSIONER
GUYTON B. HAYS
MEMBER

P. O. BOX 2088
SANTA FE

STATE GEOLOGIST
A. L. PORTER, JR.
SECRETARY - DIRECTOR

September 11, 1967

Mr. Harry Connelly
Stephenson, Campbell & Olmsted
Suite 100 Petroleum Building
Post Office Box 877
Santa Fe, New Mexico

Re: Case No. 3651
Order No. R-3315
Applicant:
OLEN F. FEATHERSTONE

DOCKET MAILED
Date 9-11-68

Dear Sir:

Enclosed herewith are two copies of the above-referenced Commission order recently entered in the subject case.

Very truly yours,

A. L. PORTER, Jr.
Secretary-Director

ALP/ir

Carbon copy of drder also sent to:

Hobbs OCC x
Artesia OCC
Aztec OCC
Other Mr. J. B. Jordan and Mr. Booker Kelly

DOCKET NO. 26-67

DOCKET: SPECIAL HEARING - WEDNESDAY - AUGUST 30, 1967

OIL CONSERVATION COMMISSION - 9 A.M. - MORGAN HALL, STATE LAND OFFICE BUILDING, SANTA FE, NEW MEXICO

CASE 3644: In the matter of the hearing called by the Oil Conservation Commission upon its own motion to consider the revision of Paragraph (1) of Order No. R-3221, to provide that the effective date for the prohibition of surface disposal of produced water from the North Bagley-Upper Pennsylvanian, North Bagley-Middle Pennsylvanian, North Bagley-Lower Pennsylvanian, North Bagley-Wolfcamp, and Northeast Bagley-Wolfcamp Pools, Lea County, New Mexico, or within one mile thereof, be changed from November 1, 1967, to some earlier date.

NOTE: A COPY OF THIS DOCKET WAS MAILED TO ALL PRODUCERS IN THE ABOVE-MENTIONED POOLS ON AUGUST 11, 1967.

DOCKET NO. 27-67

DOCKET: EXAMINER HEARING - WEDNESDAY - SEPTEMBER 6, 1967

9 A.M. - OIL CONSERVATION COMMISSION CONFERENCE ROOM, STATE LAND OFFICE BUILDING - SANTA FE, NEW MEXICO

The following cases will be heard before Daniel S. Nutter, Examiner, or Elvis A. Utz, Alternate Examiner:

CASE 3431 (Reopened and continued from the August 9, 1967 Examiner Hearing)

In the matter of Case 3431 being reopened pursuant to the provisions of Order No. R-3100 to permit Sinclair Oil & Gas Company to show cause why its W. H. Turner Well No. 1 located in Unit L of Section 29, Township 21 South, Range 37 East, Lea County, New Mexico, a dual completion in the Drinkard and Blinebry Oil Pools, should not be completed in accordance with the provisions of Rule 112-A of the Commission Rules and Regulations.

CASE 3645: Application of Skelly Oil Company for special pool rules, Lea County, New Mexico. Applicant, in the above-styled cause, seeks the promulgation of special pool rules for the Lazy "J" Pennsylvanian Pool, including a provision for 80-acre spacing units for that area east of a line drawn through the centers of Sections 26 and 35, and south of a line drawn along the south line of Sections 33, 34, and 35, all in Township 13 South, Range 33 East, Lea County, New Mexico.

CASE 3646: Application of Texaco Inc. for a waterflood project, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to institute a waterflood project by the injection of water into the Delaware Sand through 12 wells in the Cotton Draw Unit Participating Area and through 3 wells on off-setting leases in Sections 10, and 28, Township 25 South, Range 32 East, Paduca-Delaware Pool, Lea County, New Mexico.

CASE 3647: Application of Tenneco Oil Company for two waterflood projects, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to institute two waterflood projects by the injection of water into the Delaware Sand through two wells on its State Monsanto Lease, in Section 16, and through one well on its J. D. Sena, Jr. Lease, in Section 28, both in Township 25 South, Range 32 East, Paduca-Delaware Pool, Lea County, New Mexico.

CASE 3648: Application of Tenneco Oil Company for a dual completion, Rio Arriba County, New Mexico. Applicant, in the above-styled cause, seeks approval of the dual completion (conventional) of its Jicarilla "A" Well No. 8 located in Unit H of Section 17, Township 26 North, Range 5 West, Rio Arriba County, New Mexico, in such a manner as to permit the production of Tapacito-Gallup oil and Basin-Dakota gas through tubing, and the casing-tubing annulus, respectively, by means of a cross-over assembly.

CASE 3649: Application of Texas Pacific Oil Company for a dual completion, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval for the dual completion (conventional) of its Ella Drinkard Well No. 2 located in Unit E of Section 25, Township 22 South, Range 37 East, Lea County, New Mexico, in such a manner as to produce oil from an undesignated Ellenburger pool and from another undesignated pool, either pre-Ellenburger or Granite Wash, through parallel strings of tubing.

CASE 3650: Application of Albert Gackle for down-hole commingling, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to commingle production from the Jalmat and South Eunice Pools in the well-bore of his Esmond "B" Well No. 3 located in Unit H of Section 33, Township 22 South, Range 36 East, Lea County, New Mexico, with the assignment of a single allowable to said commingled production.

CASE 3635 (Corrected Notice):

Case 3635, Application of Cities Service Oil Company for an Exception to Order No. R-3221, Chaves County, New Mexico, was heard by the Commission on August 16, 1967. This notice is being given and the case will be re-opened to correct the location of one of the surface pits which were the subject of the hearing. The correct location of said pit is Unit E of Section 2, Township 14 South, Range 31 East, Chaves County, New Mexico, rather than Unit L of Section 2 as previously advertised.

CASE 3651: Application of Olen F. Featherstone for the creation of a new pool and special pool rules, Lea County, New Mexico. Applicant, in the above-styled cause, seeks the creation of a new Permo-Pennsylvanian pool for his Mobil-State Well No. 1 located in Unit E of Section 32, Township 14 South, Range 35 East, Lea County, New Mexico, and for the promulgation of special rules therefor including a provision for 80-acre proration units.

CASE 3652: Application of Depco, Inc. for a unit agreement, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval of its Artesia Unit Area comprising 2400 acres, more or less, of State lands in Townships 17 and 18 South, Range 28 East, Eddy County, New Mexico.

CASE 3653: Application of Depco, Inc. for a waterflood project, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks authority to institute a waterflood project in its Artesia Unit Area by the injection of water into the Grayburg formation through 15 wells, Artesia Pool, Eddy County, New Mexico.

CASE 3654: Application of Mobil Oil Corporation for a waterflood expansion and for an amendment of Order No. R-1244, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to expand its Bridges-State Waterflood Project by the conversion to water injection of its Bridges-State Wells Nos. 63 and 73 in Units K and G of Section 13; Wells Nos. 3 and 6 in Units O and E of Section 23; Well No. 47 in Unit K of Section 24; Well No. 5 in Unit C of Section 26, and Well No. 52 in Unit A of Section 27; its State G Well No. 3 in Unit G of Section 24 and State J Wells Nos. 1 and 4 in Units I and A of Section 22, all in Township 17 South, Range 34 East, Vacuum Pool, Lea County, New Mexico.

Applicant further seeks the amendment of Order No. R-1244 to provide that future operation and expansion of said project would be subject to the provisions of Rule 701-E of the Commission Rules and Regulations.

ir/

'67 AUG 17 PM 4 25

BEFORE THE

OIL CONSERVATION COMMISSION OF NEW MEXICO

IN THE MATTER OF THE APPLICATION OF OLEN F. FEATHERSTONE FOR CREATION OF A NEW POOL AND FOR THE PROMULGATION OF SPECIAL POOL RULES IN LEA COUNTY, NEW MEXICO.

Case No. 3651

A P P L I C A T I O N

Comes now the applicant, Olen F. Featherstone, whose address is Petroleum Building, Roswell, New Mexico, and applies to the Oil Conservation Commission of New Mexico for establishment of special pool rules for the pool discovered by his #1 Mobil-State Well in Lea County, New Mexico, and in support thereof would show the Commission:

1. That applicant is the operator of the Mobil-State Well #1, located 2310 feet from the north line and 330 feet from the west line of Section 32, Township 14 South, Range 35 East, Lea County, New Mexico.

2. The subject well is completed in the Permo-Pennsylvanian with perforations from 10,428 to 10,456 feet.

3. The subject well has discovered a new separate common source of supply which should be designated a Permo-Pennsylvanian Oil Pool.

4. The subject well is presently the only well completed in the subject pool.

5. That one well may be reasonably expected to efficiently and economically drain and develop not less than 80 acres.

DOCKET MAILED

Date 8-23-67

6. That drilling and developing the pool on 40 acre spacing and proration units would be uneconomical, resulting in waste through the drilling of unnecessary wells, and that such development would not result in the recovery of any significant amounts of additional oil.

7. That applicant proposes the adoption of special field rules for the subject pool including the following provisions:

a) Spacing and proration units of 80 acres, consisting of the North half, South half, East half or West half of any governmental quarter section, with wells to be located within 150 feet of the center of either quarter-quarter section in the 80-acre unit, together with suitable provisions for exceptions to said rules, assignment of allowables with an 80-acre proportional factor, and such other provisions as the Commission may deem proper.

WHEREFORE, applicant requests the Commission to set this application for hearing before the Commission's duly appointed examiner, and that after notice and hearing as provided by law, the Commission enter its order adopting special pool rules for the subject pool in Lea County, New Mexico.

Respectfully submitted,

Olen F. Featherstone

BY: Donald G. Stevens

Donald G. Stevens
LeMAY & STEVENS
P.O. Box 2244
Santa Fe, New Mexico

Agents for Applicant

CLASS OF SERVICE
This is a fast message unless its deferred character is indicated by the proper symbol.

WESTERN UNION TELEGRAM

W. P. MARSHALL, CHAIRMAN OF THE BOARD
R. W. McFALL, PRESIDENT

SYMBOLS
DL = Day Letter
NL = Night Letter
LT = International Letter Telegram

The filing time shown in the date line on domestic telegrams is LOCAL TIME at point of origin. Time of receipt is LOCAL TIME at point of destination

1967 SEP 5 PM 3 59

LA107 KA603 LC386 PNA326 (22)

(K TUB344) 2 EX PD FAX TULSA OKLA 5 350P CDT.=
NEW MEXICO OIL AND GAS CONSERVATION COMMISSION=
MORGAN HALL STATE LAND OFFICE BLDG
SANTA FE NMEX ATTN A L PORTER JR=

AMERADA PETROLEUM CORPORATION AS A LEASE OWNER ADJACENT TO THE DISCOVERY WELL FOR A NEW POOL IN THE PERMO PENNSYLVANIAN SUPPORTA THE APPLICATION OF OLIN F FEATHERSTONE FOR 80 ACRE SPACING IN CASE 3651 ON SEPT 6 1967=

R L HOCKER PRORATION ENGINEER=

=3651 6 1967 ALSO 80=

WU1201 (R2-65) THE COMPANY WILL APPRECIATE SUGGESTIONS FROM ITS PATRONS CONCERNING ITS SERVICE

CLASS OF SERVICE
This is a fast message unless its deferred character is indicated by the proper symbol.

WESTERN UNION TELEGRAM

W. P. MARSHALL, CHAIRMAN OF THE BOARD
R. W. McFALL, PRESIDENT

SYMBOLS
DL = Day Letter
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LT = International Letter Telegram

The filing time shown in the date line on domestic telegrams is LOCAL TIME at point of origin. Time of receipt is LOCAL TIME at point of destination

LA095 NSC427 (10)

NS MDA109 PD=MIDLAND TEX 5 355P CDT= 1967 SEP 5 PM 3 20
NEW MEXICO OIL CONSERVATION COMM, ATTN DANIEL S NUTTER
EXAMINER= STATE LAND OFFICE BLDG SANTA FE NMEX=

CASE 3651 SEPT 6 1967: MOBIL OIL CORP AS AN INTERESTED ROYALTY OWNER SUPPORTS THE APPLICATION OF OLEN F FEATHERSTONE FOR CREATION OF A NEW PERMO-PENNSYLVANIAN POOL FOR THE MOBIL STATE WELL #1 AND FOR PROMULGATION OF SPECIAL RULES INCLUDING A PROVISION FOR 80 ACRES SPACING=

IRA B SITT DIVN OPERATIONS ENGR=

=3651 6 1967 #1 80=

WU1201 (R2-65) THE COMPANY WILL APPRECIATE SUGGESTIONS FROM ITS PATRONS CONCERNING ITS SERVICE

STEPHENSON, CAMPBELL & OLMSTED
ATTORNEYS AT LAW

DONNAN STEPHENSON
JACK M. CAMPBELL
CHARLES D. OLMSTED
HARRY S. CONNELLY, JR.

JAMES B. ALLEY, JR.

'67 AUG 21 AM 7 [illegible]

SUITE 100 PETROLEUM BUILDING
207 SHELBY STREET
P. O. BOX 877
SANTA FE, NEW MEXICO 87501
TELEPHONE 982-3596
AREA CODE 505

August 18, 1967

New Mexico Oil Conservation Commission
State Land Office Building
Santa Fe, New Mexico

Re: Featherstone Application
No. 3651

Gentlemen:

Please file the enclosed Entry of Appearance in the above matter.

Very truly yours,

Harry S. Connelly, Jr.

HSC/jb

Aug 21 AM 7 45

BEFORE THE OIL CONSERVATION COMMISSION OF THE STATE OF NEW MEXICO

IN THE APPLICATION OF
OLIN F. FEATHERSTONE FOR 80 ACRE
SPACING IN SEC. 32, T 14 S, R 35 E. N.M.P.M.
AN UNDESIGNATED AREA
LEA COUNTY, NEW MEXICO

NO. 3651

ENTRY OF APPEARANCE

Comes now Stephenson, Campbell & Olmsted, Attorneys at Law, and hereby enter their appearance in the above entitled cause as New Mexico counsel for Olin F. Featherstone.

STEPHENSON, CAMPBELL & OLMSTED

BY: Harry Stephenson

STEPHENSON, CAMPBELL & OLMSTED
ATTORNEYS AT LAW
P. O. BOX 877
SANTA FE, NEW MEXICO

TENNECO OIL COMPANY · P. O. BOX 1031 · 1800 WILCO BUILDING · MIDLAND, TEXAS 79701

January 26, 1968

White, Gilbert, Koch and Kelly
P. O. Box 787
Santa Fe, New Mexico 87501

Re: Case 3651 (Re-opened)
Hearing January 24, 1968

Attention: Mr. Lewis White

Gentlemen:

Attached is the data requested by the Conservation Commission at the subject hearing. Would you please forward the following to the attention of Mr. Nutter:

1. Copies of Halliburton drill stem tests for the four Olen F. Featherstone operated wells in the North Morton Permo-Penn Field.

2. Large size copies of Exhibits Nos. 1-5.

3. A revised copy of Exhibit No. 9.

4. A revised pressure data sheet (Exhibit No. 8a), showing field measured drill stem tests and the correction made to obtain the data for Exhibits Nos. 8 and 9.

5. A copy of the shut-in bottomhole pressure data, measured after all wells had been producing through December, 1967. This data was measured by Tefteller, Inc.

The pressure discrepancies noted on the cross sections and Exhibits Nos. 8 and 9 were due to using scout ticket data on the former, as compared to Halliburton office corrections on the latter. The additional data that we are supplying should help to clarify any discrepancies. Should you desire any additional data, please contact us.

Very truly yours,

F. J. McDonald
District Production Superintendent

MJD:lr

Enclosures

Morrow Sand #1
DST #2 - 10,370'-1460' (Zone 1) ORIGINAL BOTTOM HOLE

Flow Time	1st Min. 20	2nd Min. 90	Date	7-22-67	Ticket Number	436484 S	
Closed In Press. Time	1st Min. 60	2nd Min. 125	Kind of Job	OPEN HOLE	Halliburton District	LOVINGTON	
Pressure Readings	Field	Office Corrected	Tester	C. L. CASTELLOW	Witness	M. PENFIELD	
Depth Top Gauge	10450 Ft.	Blanked Off no	Drilling Contractor	MORAN OIL PROD. & DRILLING CORP.		LC	
BT. P.R.D. No.	1397	Hour Clock 12	Elevation	4052' DF	Top Packer	10365'	
Initial Hydro Mud Pressure	4824	4832	Total Depth	10460'	Bottom Packer	10370'	
Initial Closed in Pres.	3995	4005	Interval Tested	10370' - 10460'	Formation Tested	Permo Penn-sylvania	
Initial Flow Pres.	- 1 2224 2	1192* 2290	Casing or Hole Size	7 7/8"	Casing Perfs. Top / Bot.		
Final Flow Pres.	- 1 3716 2	2260 3487	Surface Choke	1" Adj.	Bottom Choke	3/4"	
Final Closed in Pres.	3948	3986	Size & Kind Drill Pipe	4 ½" H-90	Drill Collars Above Tester I.D. - LENGTH	2.50" - 420'	
Final Hydro Mud Pressure	4778	4848	Mud Weight	8.7	Mud Viscosity	35	
Depth Con. Gauge	Ft.	Blanked Off	Temperature	°F Est. 158 °F Actual	Anchor Size & Length	ID 2.50" OD 5 3/4" X 6½"90'	
BT. P.R.D. No.		Hour Clock	Depths Meo. From	Rotary Table	Depth of Tester Valve	10345 Ft.	
Initial Hydro Mud Pres.			Cushion TYPE water AMOUNT 1000 Ft.		Depth Back Pres. Valve	none Ft.	
Initial Closed in Pres.			Recovered	Feet of REVERSED:			
Initial Flow Pres.	1 2		Recovered	55 BBLS. Feet of oil & gas.			
Final Flow Pres.	1 2			36.6 BOPH X 24 = 880 BOPD RATE			
Final Closed in Pres.			Recovered	Feet of			
Final Hydro Mud Pres.			Recovered	Feet of			
Depth Bot. Gauge	10456 Ft.	Blanked Off yes	Oil A.P.I. Gravity	42.4	Water Spec. Gravity	-	
BT. P.R.D. No.	1398	Hour Clock 24	Gas Gravity	-	Surface Pressure	380# ½" choke	
Initial Hydro Mud Pres.	4799	4848	Tool Opened	4:40 P.M. A.M. P.M.	Tool Closed	9:35 P.M. A.M. P.M.	
Initial Closed in Pres.	3880	4025	Remarks	Tool opened for a 20 minute first flow with good blow, increased to strong blow. Gas at surface in 21 minutes. Tool closed for a 60 minute initial closed in pressure. Reopened tool for a 90 minute final flow, mud at surface in 20 minutes, oil & mud in 30 minutes. Flowed oil into pit. No gauge on fluid. Closed tool for a 125 minute final closed in pressure.			
Initial Flow Pres.	- 1 2315 2	1355* 2355					
Final Flow Pres.	- 1 3374 2	2449 3533					
Final Closed in Pres.	3834	4007					
Final Hydro Mud Pres.	-	4864					

Loco Name MORIL STATE Well No. 1 Test No. 2
Loco Owner/Company Name OLEN E. FEATHERSTONE
Owner's District ROSWELL
Sec. - Twp. - Rge. 32 T 14S R 35E
County LEA State NEW MEXICO
Field Area NORTH LOVINGTON
Mea. From Tester Valve

FORMATION TEST DATA * QUESTIONABLE 13

SPECIAL PRESSURE DATA 13

Gauge No.	1397		Depth	10,450'		Clock	12 hour		Ticket No.	436484		
	First Flow Period 20 Min		Initial Closed In Pressure 60 min			Second Flow Period 90 min			Final Closed In Pressure 125 min		
	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	Log $\frac{t+\theta}{\theta}$	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.		Time Defl. .000"	Log $\frac{t+\theta}{\theta}$	PSIG Temp. Corr.
P_0	.000	1192*	.000	∞	2260	.000	2290		.000	90+125	3487
P_1	.032	1439	6 .0426	12/6 4.33	3906	.102	2991		.087		3931
P_2	.064	1704	12 .0852	32/12 2.66	3949	.204	3400		.174		3949
P_3	.096	1993	18 .1278	38/18 2.11	3970	.306	3485		.261		3959
P_4	.128	2260	24 .1704	44/24 1.91	3982	.408	3480		.348		3966
P_5			30 .2130	50/30 1.68	3989	.510	3510		.435		3970
P_6			36 .2556	56/36 1.55	3993	.612	3487		.522		3974
P_7			42 .2982	62/42 1.48	3995				.609		3977
P_8			48 .3408	68/48 1.42	3998				.696		3982
P_9			54 .3834	74/54 1.37	4000				.783		3984
P_{10}			60 min .4260	80/60 1.33	4005				.870		3986

Gauge No.	1398		Depth	10,456'		Clock	24 hour				
P_0	.000	1355*	.000		2449	.000	2355		.000		3533
P_1	.0158	1786	.0213	4.33	3926	.051	3063		12.5 + 90 .0431	1025/125 = 8.20	3953
P_2	.0316	1960	.0426	2.66	3970	.102	3444		25 + 90 .0862	4.60	3970
P_3	.0474	2231	.0639	2.11	3993	.153	3526		37.5 + 90 .1293	1237.5/362.5 = 3.40	3979
P_4	.0630	2449	.0852	1.91	4002	.204	3528		50 + 90 .1724	2.80	3984
P_5			.1065	1.68	4009	.255	3551		62.5 + 90 .2155	1662.5/787.5 = 2.11	3993
P_6			.1278	1.55	4016	.306	3533		75 + 90 .2586	2.20	3995
P_7			.1491	1.48	4018				87.5 + 90 .3017	2.03	3998
P_8			.1704	1.42	4021				100 + 90 .3448	1.90	4000
P_9			.1917	1.37	4023				112.5 + 90 .3879	1.80	4002
P_{10}			.2130	1.33	4025				125 + 90 .4310	1.72	4007
Reading Interval		5		6			15			125	Minutes

REMARKS: * Questionable

SPECIAL PRESSURE DATA

[illegible] Amerada-Federal #1
DST #1 - 10,429' - 10,480' (ZONE 1 w/[illegible] in 2 w/2[illegible] Wtr).

	1st (Min.)	2nd (Min.)
Flow Time	20	120
Closed In Press. Time	95	180

Pressure Readings	Field	Office Corrected
Depth Top Gauge	10,478	Blanked Off: NO
BT. P.R.D. No.	1516	Hour Clock: 12
Initial Hydro Mud Pressure	4805	4881 (4935)
Initial Closed in Pres.	3865	3921 (3978)
Initial Flow Pres. 1	-	2570 (2627)
Initial Flow Pres. 2	3325	3402 (3455)
Final Flow Pres. 1	-	3712 (3766)
Final Flow Pres. 2	3730	3798 (3852)
Final Closed in Pres.	3865	3908 (3964)
Final Hydro Mud Pressure	4760	4834 (4895)
Depth Cen. Gauge	Ft.	Blanked Off
BT. P.R.D. No.		Hour Clock
Initial Hydro Mud Pres.		
Initial Closed in Pres.		
Initial Flow Pres. 1		
Initial Flow Pres. 2		
Final Flow Pres. 1		
Final Flow Pres. 2		
Final Closed in Pres.		
Final Hydro Mud Pres.		
Depth Bot. Gauge	10,478	Blanked Off: YES
BT. P.R.D. No.	1496	Hour Clock: 24
Initial Hydro Mud Pres.	4850	4913 (4929)
Initial Closed in Pres.	3869	3964 (3980)
Initial Flow Pres. 1	-	2688 (2701)
Initial Flow Pres. 2	3420	3445 (3460)
Final Flow Pres. 1	-	3764 (3780)
Final Flow Pres. 2	3734	3845 (3861)
Final Closed in Pres.	3869	3960 (3993)
Final Hydro Mud Pres.	4761	4860 (4895)

BEFORE EXAMINER NUTTER
OIL CONSERVATION COMMISSION
EXHIBIT NO. 15
CASE NO. 13657

Date	11-1-67	Ticket Number	460688 - S
Kind of Job	OPEN HOLE	Halliburton District	LOVINGTON
Tester	MR. CASTELLOW	Witness	MR. RICKEY
Drilling Contractor	MORAN OIL PROD. & DRILLING CORPORATION IC		
Elevation	4057' K.B.	Top Packer	10,422'
Total Depth	10,480'	Bottom Packer	10,429'
Interval Tested	10,429'-10,480'	Formation Tested	PERMO PENNSYLVANIA
Casing or Hole Size	7 7/8"	Casing Perfs. Top / Bot.	-
Surface Choke	1" ADJUSTABLE	Bottom Choke	3/4"
Size & Kind Drill Pipe	4" H-90	Drill Collars Above Tester (I.D. - LENGTH)	2.50" x 420'
Mud Weight	9.1	Mud Viscosity	36
Temperature	°F Est. / 162 °F Actual	Anchor Size & Length	ID 2.50" / OD 5 3/4" X 51'
Depths Mea. From	ROTARY TABLE	Depth of Tester Valve	10,400' Ft.
Cushion (Type / Amount)	1000' WATER Ft.	Depth Back Pres. Valve	- Ft.
Recovered	1000 Feet of Water cushion		
Recovered	3 BBLS. of Drilling mud		
Recovered	4 BBLS. of Oil & gas cut mud		
Recovered	REVERSED OUT 85 BBLS. of Oil (70 BOPH x 24 = 1680 BOPD)		
Oil A.P.I. Gravity	-	Water Spec. Gravity	-
Gas Gravity	-	Surface Pressure	1/2" CHOKE 580# psi
Tool Opened	7:40 PM	Tool Closed	2:35 AM

Remarks: Opened tool for 20 minute 1st flow. Closed tool for 95 minute initial closed in pressure. Reopened tool for 120 minute 2nd flow with a strong blow; gas to surface in 15 minutes, fluid at surface in 20 minutes and oil at surface in 35 min. Flowed 140 barrels in 120 minutes on 1/2" choke. Closed tool for 180 minute final closed in pressure.

Legal Location Sec. - Twp. - Rng.	SEC. 31 - 14S - 35E
Lease Name	AMERADA FEDERAL
Well No.	1
Test No.	1
Field Area	N. LOVINGTON
Lease Owner/Company Name	OLEN F. FEATHERSTONE / MORAN OIL PROD. & DRILLING CORPORATION
County	LEA
State	NEW MEXICO
Owner's District	ROSWELL

FORMATION TEST DATA 10

SPECIAL PRESSURE DATA 10

R. Calculate [illegible] [illegible] & [illegible]
14S-35-E-Sec 31
11-9-67
ANDERSON

Gauge No.	1516		Depth	10,470'		Clock	12 hour		Ticket No.	460688	
	First Flow Period		Initial Closed In Pressure			Second Flow Period			Final Closed In Pressure		
	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	Log $\frac{t+\theta}{\theta}$	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.		Time Defl. .000"	Log $\frac{t+\theta}{\theta}$	PSIG Temp. Corr.
P_0	.000	2570	.000		3712	.000	3402		.000		3798
P_1	.0423	2835	.0602		3876	.135	3775		.119		3883
P_2	.0846	3180	.1204		3892	.270	3798		.238		3890
P_3	.1269	3436	.1806		3899	.405	3798		.357		3894
P_4	.1690	3712	.2408		3906	.540	3798		.476		3899
P_5			.3010		3910	.675	3798		.595		3901
P_6			.3612		3915	.810	3798		.714		3903
P_7			.4214		3917				.833		3906
P_8			.4816		3919				.952		3908
P_9			.5418		3921				1.071		3908
P_{10}			.6020		3921				1.190		3908

Gauge No.	20min 1496		Depth	95min 10,476'		Clock	120min 24 hour		180		
P_0	.000	2688	.000		3764	.000	3445		.000		3845
P_1	.0208	3000	9.5+20 / .0303	3.11	3917	.0683	3820		18+120 / .060	7.65	3928
P_2	.0415	3292	19+20 / .0606	2.05	3930	.1366	3843		36+120 / .120	4.33	3937
P_3	.0623	3524	28.5+20 / .0909	1.64	3939	.2049	3845		54+120 / .180	3.22	3942
P_4	.0830	3764	38+20 / .1212	1.53	3946	.2732	3845		72+120 / .240	2.67	3946
P_5			48.5+20 / .1515	1.42	3951	.3415	3845		90+120 / .300	2.34	3951
P_6			57+20 / .1818	1.35	3955	.4100	3845		108+120 / .360	2.11	3953
P_7			67+20 / .2121	1.30	3957				126+120 / .420	1.95	3955
P_8			76+20 / .2424	1.26	3960				144+120 / .480	1.83	3957
P_9			85.5+20 / .2727	1.23	3962				162+120 / .540	1.74	3960
P_{10}			95+20 / .3030	1.21	3964				180+120 / .600	1.66	3960
Reading Interval	5		9.5			20			18		Minutes

REMARKS:

10

SPECIAL PRESSURE DATA

Tenneco Fee #1
DST #2 - 10,396'-457' - Zone 1

	1st Min.	2nd Min.				
Flow Time	18	60	Date	12-4-67	Ticket Number	493117 S
Closed In Press. Time	1st Min. 60	2nd Min. 120	Kind of Job	OPEN HOLE	Halliburton District	BROWNFIELD
Pressure Readings	Field	Office Corrected	Tester	JACK ANDREWS	Witness	H. RICKET
Depth Top Gauge	10371 Ft.	Blanked Off no	Drilling Contractor	MORAN DRILLING COMPANY		INC
BT. P.R.D. No.	689	Hour Clock 24	Elevation	4017'	Top Packer	10,387'
Initial Hydro Mud Pressure	-	4667	Total Depth	10,457'	Bottom Packer	10,396'
Initial Closed in Pres.	-	3833	Interval Tested	Net pay 61' 10,396' - 10,457'	Formation Tested	Permo - Penn.
Initial Flow Pres.	- 1	*	Casing or Hole Size	7 7/8"	Casing Perfs. Top	
	- 2	*			Bot.	
Final Flow Pres.	- 1	*	Surface Choke	1" Adj.	Bottom Choke	7/8"
	- 2	*				I.D. - LENGTH
Final Closed in Pres.	-	3828	Size & Kind Drill Pipe	4" H-90	Drill Collars Above Tester	2¼" - 420'
Final Hydro Mud Pressure	-	4655	Mud Weight	8.5	Mud Viscosity	43
Depth Gen. Gauge	Ft.	Blanked Off	Temperature	°F Est. / °F Actual -	Anchor Size & Length	ID 2¼" - 2½" X OD 6"-5 3/4" 61
BT. P.R.D. No.		Hour Clock	Depths Mea. From	Rotary Bushing	Depth of Tester Valve	10,366 Ft.
Initial Hydro Mud Pres.			Cushion	TYPE water AMOUNT 1000 Ft.	Depth Back Pres. Valve	none Ft.
Initial Closed in Pres.			Recovered	Feet of		
Initial Flow Pres.	1		Recovered	Feet of	FLOWED OIL THROUGH ½" CHOKE @ 138 BARRELS	
	2		Recovered	Feet of	PER HOUR. 138x24 = 3320 BOPD	
Final Flow Pres.	1		Recovered	Feet of		
	2					
Final Closed in Pres.			Recovered	Feet of		
Final Hydro Mud Pres.			Oil A.P.I. Gravity	-	Water Spec. Gravity	-
Depth Bot. Gauge	10456 Ft.	Blanked Off yes	Gas Gravity	-	Surface Pressure	530# psi
BT. P.R.D. No.	115	Hour Clock 12	Tool Opened	2:15 P.M. A.M. P.M.	Tool Closed	6:33 P.M. A.M. P.M.
Initial Hydro Mud Pres.	4681	4708	Remarks	Opened tool for a 18 minute first flow.		
Initial Closed in Pres.	3823	3859		Took a 60 minute initial closed in pressure. Re-		
Initial Flow Pres.	- 1	*				
	3405 2	3529		opened tool for a 60 minute final flow withstrong		
Final Flow Pres.	- 1	3430				
	3691 2	3711		blow. Gas to surface in 12 minutes, oil to surface		
Final Closed in Pres.	3801	3857		in 20 minutes with flow pressure of 530# Psi. Clos-		
Final Hydro Mud Pres.	4681	4701		ed tool for a 120 minute final closed in pressure.		
				* Unable to read.		

Legal Location Sec. - Twp. - Rge. Sec. 31 Twp 14 So. Rge 35 E. NMPM Field Area WILDCAT

Lease Name TENNECO FEE Well No. 1 Test No. 2

Lease Owner/Company Name OLEN F. FEATHERSTONE

Mea. From Tester Valve

County LEA State NEW MEXICO

Owner's District ROSWELL

FORMATION TEST DATA 13

SPECIAL PRESSURE DATA 13

EXTRAPOLATED PRESSURE GRAPH 3 Sept 13

INTERPRETATIONS AND CALCULATIONS 13

Gauge No.	689		Depth	10371'		Clock	24 hour		Ticket No.	493[illegible]7		
	First Flow Period		Initial Closed In Pressure			Second Flow Period			Final Closed In Pressure			
	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	Log $\frac{t+\theta}{\theta}$	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.		Time Defl. .000"	Log $\frac{t+\theta}{\theta}$	PSIG Temp. Corr.	
P_0			.000	---	3348	UNABLE	TO READ		.000	---	3670	
P_1	UNABLE	TO	.0208		3714	DUE TO	CLOCK		.0202 .0405		375[illegible]* 3764	
P_2	READ	DUE	.0416		3755	SPRING	SLIPPAGE		.0607 .0810		3773* 3783	
P_3	TO CLOCK	SPRING	.0624		3776				.1012 .1215		3787* 3794	
P_4	SLIPPAGE		.0832		3789				.1620		3803	
P_5			.1040		3801				.2025		3810	
P_6			.1248		3810				.2430		3815	
P_7			.1456		3817				.2835		3821	
P_8			.1664		3824				.3240		3824	
P_9			.1872		3828				.3645		3826	
P_{10}			.2080		3833				.4050		3828	

Gauge No.	115		Depth	10456'		Clock	12	hour		
P_0	.000	**	.000	---	3430	.000	3529	.000	---	3711
P_1	.020	**	.0402	.600	3753	.067	3581	.0402 .0805	1.145 .874	3775* 3793
P_2	.040	3026	.0804	.396	3789	.134	3694	.1207 .1610	.726 .627	3800* 3813
P_3	.060	3139	.1206	.299	3808	.201	3709	.3013 .2415	.555 .499	3815* 3824
P_4	.080	3258	.1608	.242	3819	.268	3711	.3220	.418	3833
P_5	.100	3344	.2010	.203	3830	.335	3711	.4025	.361	3839
P_6	.120	3430	.2412	.175	3839	.402	3711	.4830	.318	3844
P_7	1st [illegible]		.2814	.154	3846	2nd flow		.5635	.284	3848
P_8			.3216	.137	3852			.6440	.257	3850
P_9			.3618	.124	3857			.7245	.235	3852
P_{10}			.4020	.113	3859			.8050	.217	3857
Reading Interval	3		6			10			13	Minutes

REMARKS: * Unequal intervals ** Unable to read

SPECIAL PRESSURE DATA

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EXTRAPOLATED PRESSURE GRAPH 3541

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INTERPRETATIONS AND CALCULATIONS

13

TENNECO FEDERAL #1
INT. - 10,455'-480' - ZONE 1

Flow Time	1st Min. 15	2nd Min. 120	Date	1-13-68	Ticket Number 460675 - S
Closed In Press. Time	1st Min. 60	2nd Min. 240	Kind of Job	OPEN HOLE	Halliburton District LOVINGTON
Pressure Readings	Field	Office Corrected	Tester	CASTELLOW	Witness RICKEY
Depth Top Gauge	10,470 Ft.	Blanked Off NO	Drilling Contractor	MORAN OIL PROD. & DRILLING CORPORATION	
BT. P.R.D. No.	689	Hour Clock 12	Elevation	4057' G.L.	Top Packer 10,448'
Initial Hydro Mud Pressure	4834	4823	Total Depth	10,480'	Bottom Packer 10,455'
Initial Closed in Pres.	3926	3970	Interval Tested	(NET PAY 12') 10,455'-480'	Formation Tested ~~PERMO~~ PENNSYLVANIAN
Initial Flow Pres.	- 1	918	Casing or Hole Size	7 7/8"	Casing Perfs. Top - Bot. -
	2366 2	2081	Surface Choke	1" ADJUSTABLE	Bottom Choke 3/4"
Final Flow Pres.	- 1	2113	Size & Kind Drill Pipe	4½" H-90	Drill Collars Above Tester I.D. - LENGTH 2.50" x 445'
	3423 2	3426	Mud Weight	9.0	Mud Viscosity 35
Final Closed in Pres.	3926	3982	Temperature	°F Est. 156 °F Actual	Anchor Size & Length ID 2.50" OD 5 3/4" x 25'
Final Hydro Mud Pressure	-	4823	Depths Mea. From	ROTARY TABLE	Depth of Tester Valve 10,428' Ft.
Depth Cen. Gauge	Ft.	Blanked Off		TYPE AMOUNT	Depth Back Pres. Valve NONE Ft.
BT. P.R.D. No.		Hour Clock	Cushion	WATER 1000' Ft.	
Initial Hydro Mud Pres.			Recovered	FLOWED 1000' Feet of water cushion	
Initial Closed in Pres.	1		Recovered	FLOWED 70 Feet of oil BBLS.	
Initial Flow Pres.	2		Recovered	REVERSED 60 Feet of oil BBLS.	
Final Flow Pres.	1		Recovered	REVERSED 3 Feet of salt water	
	2		Oil A.P.I. Gravity	43.6	Water Spec. Gravity 1.032
Final Closed in Pres.			Gas Gravity	-	Surface Pressure ON ½" CHOKE 190# psi
Final Hydro Mud Pres.			Tool Opened	A.M. P.M. 10:20 AM	Tool Closed A.M. P.M. 5:35 PM
Depth Bot. Gauge	10,476 Ft.	Blanked Off YES	Remarks	Tool opened for a 15 minute first flow. Rotated tool for a 60 minute initial closed in pressure. Tool reopened with a good blow. Gas at the surface in 65 minutes - fluid at the surface in 40 minutes of the second flow. Oil to the surface in 50 minutes. Flowed 70 barrels of oil in 70 minutes on a ½" choke. Took a 240 minute final closed in pressure.	
BT. P.R.D. No.	115	Hour Clock 24			
Initial Hydro Mud Pres.	4813	4884			
Initial Closed in Pres.	3933	3987			
Initial Flow Pres.	- 1	UNABLE			
	2612 2	2595			
Final Flow Pres.	- 1	TO READ			
	3449 2	3449			
Final Closed in Pres.	3933	3989 *			
Final Hydro Mud Pres.	4769	4822			

Legal Location Sec. - Twp. - Rng. 31 - T 14S - R 35E
Lease Name TENNECO FEDERAL Well No. 1 Test No. 2
Lease Owner/Company Name OLEN F. FEATHERSTONE
Field Area WC. LOVINGTON County LEA State NEW MEXICO
Mea. From Tester Valve
Owner's Distrct ROSWELL, NEW MEXICO

* See Next Page

FORMATION TEST DATA

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Gauge No. 689	Depth 10,470'		Clock 12 hour					Ticket No. 460675		
	First Flow Period		Initial Closed In Pressure			Second Flow Period		Final Closed In Pressure		
	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	Log (t+θ)/θ	PSIG Temp. Corr.	Time Defl. .000"	PSIG Temp. Corr.	Time Defl. .000"	Log (t+θ)/θ	PSIG Temp. Corr.
P_0	.000	918*	.000	-----	2113	.000	2081	.000	-----	3426
P_1	.102	2113	.0417	.537	3918	.1377	2894	.1667	.817	3929
P_2			.0834	.346	3934	.2754	3348	.3334	.577	3945
P_3			.1251	.258	3945	.4131	3467	.5001	.455	3954
P_4			.1668	.207	3952	.5508	3563	.6668	.378	3961
P_5			.2085	.172	3957	.6885	3522	.8335	.324	3966
P_6			.2502	.148	3959	.826	3426	1.0002	.285	3970
P_7			.2919	.130	3961			1.1669	.254	3973
P_8			.3336	.115	3965			1.3336	.229	3975
P_9			.3753	.104	3968			1.5003	.209	3977
P_{10}			.417	.095	3970			1.667	.192	3982
Gauge No. 115	Depth 10,476'		Clock 24 hour							
P_0			.000	-----	3436*	.000	2595	.000	-----	3449
P_1	UNABLE	TO READ	.0203	.545	3936	.0663	2952	.0801	.819	3945
P_2			.0406	.353	3954	.1326	3396	.1602	.580	3960
P_3			.0609	.264	3965	.1989	3489	.2403	.457	3967
P_4			.0812	.211	3971	.2652	3581	.3204	.380	3974
P_5			.1015	.176	3974	.3315	3540	.4005	.326	3980
P_6			.1218	.151	3978	.398	3449	.4806	.286	3982
P_7			.1421	.133	3982			.5607	.255	3985
P_8			.1624	.118	3985			.6408	.230	3987
P_9			.1827	.106	3987			.7209	.210	3987
P_{10}			.203	.097	3987			.801	.193	3959*
Reading Interval				6		20			24	Minutes

REMARKS: * QUESTIONABLE.

* Discussed This Point With [illegible] Tulsa [illegible] Okla. And He Agreed This Point Was [illegible] To Read. We [illegible] As [illegible] At 3957 psig. [illegible]

Tenneco Oil Co.

SPECIAL PRESSURE DATA

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BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
January 24, 1968

IN THE MATTER OF:

Application of Tenneco Oil Company for amendment to Order R-3315, Lea County, New Mexico

Case No. 3651
Reopened

BEFORE: Daniel S. Nutter, Examiner

TRANSCRIPT OF HEARING

MR. NUTTER: We will call Case 3651.

MR. HATCH: Case 3651, reopened, Application of Tenneco Oil Company for amendment to Order R-3315, Lea County, New Mexico.

MR. WHITE: If the Examiner please, Charles White of Gilbert, White and Gilbert, Santa Fe, New Mexico, appearing on behalf of the Applicant. We have two witnesses to be sworn at this time.

MR. NUTTER: I might ask if there are other appearances.

MR. JORDAN: J. B. Jordan, Union Oil Company of California, Roswell. I may have a statement at the conclusion of the testimony.

MR. JENNINGS: Mr. Examiner, I am James T. Jennings, of Roswell, appearing on behalf of Mr. R. M. Moran and K. McPeters, Western Reserve Oil Company, and Mr. A. T. Williamson.

MR. NUTTER: Are there any other appearances?

MR. HICKS: I am Charles W. Hicks, general manager for Olen F. Featherstone.

MR. NUTTER: Is that H-i-c-k-s?

MR. HICKS: Yes.

MR. NUTTER: For Featherstone.

MR. KELLAHIN: If the Examiner please, Jason Kellahin, Kellahin and Fox, Santa Fe, appearing for Stoltz and Company.

MR. WHITE: If the Examiner please, I believe before proceeding, I believe Mr. Hicks would like to make a statement for the record.

MR. HICKS: I would like to make this following statement for the record: Olen F. Featherstone is the present operator in the North Morton Permo-Penn Pool. Since the discovery well, Tenneco has conducted reservoir studies and has obtained engineering data relating to the pool. Tenneco and Featherstone have worked out a tentative agreement whereby Tenneco will take over the operation, therefore Tenneco is the Applicant herein and will present the case, and Featherstone joins in the Application.

MR. NUTTER: Thank you, Mr. Hicks.

(Witnesses sworn.)

(Applicant's Exhibits 1 through 14 marked for identification.)

* * * * * * *

B. S. DESADIER, called as a witness, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. WHITE:

Q Will you state your full name for the record,

name of your employer, your position and where you are located?

A My name is Bluford Desadier,

Q How do you spell that?

A The last name is D-e-s-a-d-i-e-r. I am employed by Tenneco Oil Company as a District Geological Engineer for the Midland District,located in Midland, Texas.

Q Have you previously testified before an Examiner of the New Mexico Oil Conservation Commission?

A No, sir, I have not.

Q Will you briefly state your education, the educational and professional backbround?

A I graduated from the University of Houston in 1952 with a Bachelor of Science Degree in Geology. I have been employed by Tenneco Oil Company as a geological engineer since that date. I came to the West Texas Area in 1958; I have been the District Geological Engineer for the Midland District since 1960.

MR. WHITE: Are his qualifications acceptable?

MR. NUTTER: Yes, they are.

Q (By Mr. White) Are you familiar with the Olen F. Featherstone Application in Case No. 3651 and with the Order R-3315?

A Yes, sir, I am.

Q Have you made a geological study of the North Morton-Penn Pool?

A Yes, sir, I have.

Q Since the issuance of Order R-3315, which was September 11th, 1967, have additional wells been drilled in the area?

A Yes, sir, there have been additional wells drilled, three wells completed and one well presently drilling.

Q Has more reservoir data been obtained on this pool since the discovery well?

A Yes, sir.

Q Will you briefly state what Tenneco seeks by the present application?

A We seek to amend special pool rules and regulations to provide for 160-acre spacing and proration units on a temporary basis.

Q Now, will you refer to Exhibit 1 and explain that exhibit, please?

A Yes, sir. Exhibit 1 is an area map of the area in question and it is presented to show four main points. First of all,the orientation of the North Morton area to the East Saunders Pool, which is located at the upper left-hand

corner of the map, to the High Plains Pool, and to the North Morton Pool and to the Morton Pool to the south. Secondly, to show ownership of acreage in a developed area of the North Morton Field, the various owners of the acreage are shown in different colors, being Amerada in red, Tenneco in yellow, the Featherstone interest in green and Union of California in blue. Thirdly, that the well density in the pool has not exceeded one well per 160 acres at the present time; and fourthly, to show the lines of cross-section which will be referred to later. Cross-section A, A prime from the East Saunders Pool through the High Plains Pool into the North Morton Pool.

Cross-section B, B prime from the Morton Pool into the North Morton Pool, that's shown in a blue line, and cross-section C, C prime, across the North Morton Pool shown in a green line.

Q Are you familiar with any other reservoirs where the Commission has adopted similar rules to what you are recommending today?

A Yes, sir, the East Saunders Pool and the High Plains Pool.

Q Will you refer to Exhibit 2 and explain that exhibit, please?

A Exhibit 2 is a regional stratigraphic cross-section; it's AA prime, shown on Exhibit 1. It goes from the East Saunders Pool through the High Plains Pool into the North Morton Pool. It's to show two main points; first, that the geologic sections in East Saunders, High Plains and North Morton are correlative, and to aid in the correlation, we have drawn lines of correlation and shown the correlation markers in red on this exhibit. Secondly, that the vertical limits of the North Morton Permo-Penn is correlative to the producing interval in the East Saunders Pool and the High Plains Pool.

Q Are each of these two pools on 160-acre spacing?

A Yes, sir, they are.

Q Now, will you refer to Exhibit 3 and explain that exhibit, please?

A Yes, sir. Exhibit 3 shows the structure relationship of the Morton and North Morton Pools and is introduced to show three main points: First, that Morton and North Morton Pools produce from the same geologic interval in the Permo-Penn. The vertical limits of the North Morton Pool are shown on the well on the extreme right of the section. Secondly, that there is a difference in the oil-water contact in the Morton and North Morton Field, establishing that they are separate reservoirs and fields. The oil-water

contact for the Morton Pool is at a minus 6350, plus or minus. The oil-water contact for the Morton Pool is at a minus 6420, with one zone of porosity exhibiting an oil-water contact somewhere between minus 6450 and minus 6470. We have shown the oil-water contact at a minus 6470, which we believe is as low as it could be. Third, this cross-section illustrates that there is a facies change between the Morton Pool and the North Morton Pool, resulting in porosity discontinuity between the two fields and further establishing the fact that they are separate fields.

Q Now, will you refer to Exhibit 4, please?

A Exhibit No. 4 is an east-west cross section through the North Morton Pool, and we wish to establish four main points with this exhibit. First, that the zones of porosity are continuous and correlative throughout the field. Secondly, that the oil-water contact of minus 6420 established by drillstem test applies to the two major zones of porosity. Third, that a second oil-water contact of a minus 4670, applies to a third zone of porosity in the Tenneco Fee. That's the Featherstone Tenneco Fee No. 1. The zone did not produce in any other wells in the field and it's areal extent is believed to be small. Fourth, this exhibit shows drillstem tests and completion information with pertinent data for the various wells.

Q Mr. Desadier, from a geological standpoint, what is the possibility that the North Morton Pool might be in communication with a large aquifer, and could be affected by water influx?

A I think that the possibility of this pool being in contact with a large aquifer is very small, in fact, non-existent.

Q Now, will you refer to Exhibit 5 and explain that, please?

A Exhibit No. 5 is a contour map showing the structural relationship of Morton and North Morton fields. We wish to establish three main points with this exhibit. First, a structural configuration of the reservoir; secondly, the area of breaching, which limits the Morton Field to the north and the North Morton Field on the south, this is the red outline of the jagged line. And third, the east and west productive limits of the North Morton Field as now defined by the oil-water contact of a minus 6420 and these lines are going over in blue on the exhibit.

Q Were these exhibits prepared by you or under your direction?

A Yes, they were.

Q Does this complete your testimony on direct?

A Yes, it does.

MR. WHITE: That's all we have of this witness on direct.

MR. NUTTER: Are there any questions of this witness?

CROSS EXAMINATION

BY MR. PORTER:

Q Did I understand you to say that the Morton Field to the north and North Morton Field to the south are both limited?

A Yes, sir. The red outline, which is the area of breaching of the reservoir, does limit the North Morton Field to the south by virtue of a permeability barrier and porosity discontinuity. It also limits the Morton Field to the north. There are two dry holes within that area.

MR. PORTER: That's all I have.

MR. NUTTER: Are there any other questions? Mr. Jennings.

CROSS EXAMINATION

BY MR. JENNINGS:

Q Mr. Desadier, how many wells has Tenneco drilled in this pool?

A Tenneco has at the present time no wells in the pool.

Q Have they drilled any dry holes in the area?

A Yes, sir, we drilled the Tenneco Shell State No. 1.

Q What's the location of that well?

A That well is located in Section 25, in the southwest quarter of the southeast quarter.

Q When was that completed?

A That well was drilled in 1962.

Q Did you testify at the prior hearing in this case when the 80-acre spacing was established?

A No, sir, I have not testified.

Q Does Tenneco have any immediate plans to drill any wells in the area?

A I prefer to have that question answered later. I think we'll bring that out.

Q Can you answer my question; do you, or do you not know?

A I do not know.

Q What is your capacity with Tenneco?

A I am the District Geological Engineer for the Midland District.

Q Are you familiar with any arrangements that your Company has made, with the proposed arrangement that has been made with Featherstone that Mr. Hicks mentioned?

A What do you mean?

Q Mr. Hicks made a statement at the opening that there was a proposed deal between Tenneco and Featherstone whereby Tenneco would become the operator of this property.

MR. WHITE: If the Examiner please, I don't believe the witness is qualified to answer that, and I believe that is a matter involving the parties.

MR. NUTTER: I am not sure it's a geological question.

MR. JENNINGS: I grant you that it is not.

MR. NUTTER: I am not aware that the geologist would be aware of any dealings.

MR. JENNINGS: I am asking if he is familiar with the terms of it.

MR. NUTTER: Are you familiar with the terms, if such an agreement exists?

THE WITNESS: No, sir, I am not.

MR. JENNINGS: That's all the questions I have.

CROSS EXAMINATION

BY MR. NUTTER:

Q Mr. Desadier, it appears from your cross-section, which is the east-west cross-section across the pool there, that you've got four wells which have perforations in them. Now, if you take the third well from the left, that's the first producing well, that's the Tenneco Fee No. 1 and we

have zones one, two and three, and two and three are both productive?

A Yes.

Q We move to the next well and that has zone two and three and only one zone is productive and two and three are below the oil-water contact?

A Yes.

Q We move to the next well and only one is productive, the one over to the right is the one that floors me. We have one, two and three. One is below the oil-water contact. Two is below the oil-water contact, but it has oil below the oil-water contact, and then No. 3 is back in the water again. How does this happen?

A That well on test, sir, made only two percent oil. It made ninety-eight percent water and we would not consider that that was actually an oil test.

Q So actually, you only have three producing wells in the pool, then, rather than four, is this correct?

A The second well from your left, the Tenneco Federal --

Q Yes, sir.

A -- is now a producing well. We did not have the information regarding the potential of that well at the time

that the exhibits were prepared.

Q Evidently, its pay is going to be in zone one only?

A Since then, the pay is perforated in zone one.

Q What is the status of this Anderson well, then?

A That well is shown as temporarily abandoned 11-13-67.

Q Because it made two percent oil and ninety-eight percent water?

A Yes.

MR. PORTER: In other words, we have a situation where we do have four producing wells?

THE WITNESS: Going from left to right, the first well produces from the upper zone, the next one from the middle zone, the next well from the upper zone and the next well from the upper zone. So in the four wells, we have only two wells that have the same zone productive as far as adjacent wells are concerned.

Q (By Mr. Nutter) There's no correlation of production from the first well to the second well, is there, because the first one, you said would be producing from zone one, the second from zone two?

A There is no correlation of production by virtue

of the fact that the Featherstone-Tenneco Fee No. 1 was not completed in zone one. However, we have, it was not marked on the section, we have a drillstem test from 10,396 to 10,457 by driller's measurements which should be moved upward 12 feet by log measurements.

Q That would be 10,384 then?

A Yes, sir.

Q 10,384 to --

A 10,445.

Q Let me see if I can find that on my log, then.

A That test, sir, would cover the interval of zone one, colored in green, and that drillstem test flowed oil.

Q Do you have the results of that drillstem test?

A That drillstem test, I have marked on the Exhibit, flowed oil. I have a more complete description of that test on the scout ticket.

Q I wonder if you would give us that?

MR. WHITE: While he's reaching for it, I might state that these exhibits here are difficult to read. We had larger blown up exhibits, but for some reason or other they didn't get here. We will supply the Commission with some blown up exhibits that are more readable.

MR. NUTTER: These are easier to handle.

Q (By Mr. Nutter) Do you have those drillstem test results there?

A Yes, sir, the drillstem test shown as 10,396 through 457, open 1 hour 20 minutes, used 1,000 feet of water blanket, gas to the surface in 18 minutes, oil to the surface in 20 minutes, flowed 100 barrels of oil in 1 hour, reversed out 70 barrels of oil.

Q What was the oil to the surface in?

A Twenty minutes.

Q Flowed 100 barrels of oil in 1 hour and reversed out 70. Would the drillstem test from 456 to 487 which would be the interval that the well was perforated in, show only 306 barrels of oil in a hundred and twenty minutes, according to the exhibit?

A Yes, the drillstem test on that well showed signs of heavy damage. Also the permeability is a little lower than zone one.

Q I wonder why the operator completed in zone two rather than zone one. He had a better zone than zone one.

A I can't answer that question.

Q This was drilled by Featherstone?

A Yes.

Q As we go further east, zone one becomes the

producing zone and zone two and zone three are watered out evidently, in the next well and the well to the east of that also, is that correct?

A Yes, sir.

Q Actually these wells, if you look at them on the plat, are not drilled on 160-acre spacing; they are drilled on staggered 80-acre locations?

A Our point at the present time is there is a density of only one well per 160 acres.

Q You have the wells fading in and fading out on 80-acre locations rather than 160-acre?

A I believe with the correlation or that we would have established a correlation over a greater distance than 80 acres, but the wells themselves are located on 80-acre proration units.

MR. NUTTER: Thank you. Are there any further questions of Mr. Desadier?

MR. JENNINGS: I would like to ask one further.

CROSS EXAMINATION

BY MR. JENNINGS:

Q Is the Tenneco Fee well that Mr. Nutter has been discussing with you, is that actually completed in a completely different zone than the other wells which you discussed?

A I don't understand what you mean. It's completed where the perforations are shown on the exhibit.

Q But that zone is not found in any of the other wells, is not productive in any of the other wells shown there?

A The porosity zone is located in other wells, but it is not oil productive in the other wells.

Q If I understand your testimony, that is a new and different zone which might qualify for a new discovery allowable.

A No, sir, you do not understand my testimony if you understand it that way. That zone, in my previous testimony I said an oil-water contact of minus 6420 applied to the upper two porosity zones. In our opinion that zone has the same oil-water contact as the zone one.

Q Are the pressures the same?

A I do not have first hand knowledge of the pressure information. That will be brought out later.

Q It's not your feeling that that is a separate zone which would in any way entitle the operator to a discovery allowable?

A I do not believe that they are separate zones.

MR. JENNINGS: That's all.

MR. NUTTER: Any other questions? The witness may be excused.

(Witness excused.)

MR. WHITE: At this time we offer Exhibits 1 through 5.

MR. NUTTER: Applicant's Exhibits 1 through 5 will be admitted in evidence.

(Whereupon, Applicant's Exhibits 1 through 5 admitted in evidence.)

* * * * * * *

J O H N J. L A C E Y, called as a witness, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. WHITE:

Q Will you state your name, by whom you are employed, in what capacity, and where you are located?

A My name is John J. Lacey I'm an employee of Tenneco in the Midland District Office, as a District Reservoir Enginee .

Q Have you previously testified as a petroleum engineer before the Commission, and have your qualifications been accepted?

A Yes.

Q Mr. Lacey, I direct your attention to Exhibit 6,

and will you explain that, please, in part?

A Exhibit 6 is a tabulation of volumetric oil reserve estimates in the North Morton Pool. I would like to defer discussion of most of this exhibit until later on in the testimony and bring out only that the porosity and net pay shown are based on logs within the producing wells and has reference primarily to the main producing horizon in the North Morton Pool, which is this upper porosity zone which has been established by previous testimony to be continuous throughout all the wells.

Q Is that all that you care to comment on?

A Yes, I would like to defer further discussion of data on this exhibit until later.

Q Will you refer to and explain Exhibit 7?

A Exhibit 7 is a tabulation of pertinent completion data, potential data and potential test of the three producing wells in the field. It does not include the recently completed Tenneco Federal No. 1, which I understand was completed the day before yesterday. We did not have the data on this well at the time this exhibit was prepared. It also shows the cumulative production by wells up to 1-1-68.

The only additional point I might bring out is that the potential test of these wells indicates they have a

substantial productivity and are capable of producing at a rate substantially in excess of their present allowables, by their high flowing tubing pressure and the small choke size.

Q In your opinion, can these wells make 160-acre allowable?

A In my opinion, they very definitely can. There is additional data of pi test taken in Amerada Federal No. 1 which has a pi of close to four and flowing bottom hole pressure was in excess of 3800 pounds psig, which is a further indication of the high productivity of these wells.

MR. PORTER: Mr. Lacey, what is the current allowable?

A THE WITNESS: It would be 5.67 times the basic.

MR. PORTER: The factor is 5.67?

THE WITNESS: Yes, sir, I believe that is correct.

Q (By Mr. White) Now, will you refer to Exhibit 8 and explain that exhibit, please?

A Exhibit 8 is a tabulation of the bottom hole pressure data in the North Morton Permo-Penn Pool with the pressure data with regard to the main upper producing interval that is productive, appears to be productive in all of the presently producing wells, although not completed in the Tenneco Fee. What it shows is the measured bottom hole

pressures in these wells at a minus 6400 foot datum and the date that this data was obtained and shows the calculated reservoir pressure from these measured pressures. I might point out that the measured pressures are very close to a complete buildup condition and in every case were in excess of 99% of what was the true reservoir pressure.

Q How were the reservoir pressures calculated, from observed pressures?

A The reservoir pressure was calculated on bottom home shutin pressure buildup curves and extrapolation of these on dst, pi tests were therefore available.

Q In your opinion, would you consider the bottom hole pressure data to be good, fair or poor?

A In my opinion, I considered this bottom hole pressure data to be excellent and representative of the reservoir pressure of the main producing interval of the pool.

Q Will you now refer to Exhibits 9 and 10, collectively, and explain those exhibits?

A Exhibit 9 is a graphical presentation of the production and pressure history of the North Morton Permo-Penn Field of the main producing horizon. Exhibit 10 is a well location plat of this pressure data showing the location of the presently producing wells in the pool, and

the distance between them.

Q Now, refer back to 9.

A Exhibit 9 shows the original reservoir pressure in this pool at the time of its discovery was 4,044 psig as it was observed in a drillstem test in the Mobil State No. 1. It also shows that the initial pressures observed in the Amerada Federal and the Tenneco Fee, that the pressure observed in the reservoir at these locations was substantially below the original reservoir pressure observed in the Mobil State and that the pressure in the reservoir at these locations was in fact being influenced by producing offsets. What I am saying is that the drillstem test pressure in the Amerada Federal drillstem test 1, which is in the main producing horizon at the time that test was taken, the Mobil State was the producing offset and that at the time the drillstem test 2 in the Tenneco Fee in the main producing interval of the pool, the time that test was taken, both the Amerada Federal and the Mobil State were producing. The next pertinent piece of pressure information on the exhibit is the bottom hole pressure that was observed in the pool in January, the first part of January, 1968. You will note that the pressures observed in the Amerada Federal and the Mobil State are very close together and this pressure was observed in the pool after the field had

been shut in for approximately 72 hours and the reservoir pressure was permitted to stabilize.

The last pressure piece of information is the drillstem test pressure in the Tenneco Federal No. 1 which was taken in January in this main producing interval and it shows that the observed reservoir pressure at this location was 3,987 psig and was within four to seven psig of the stabilized pressures observed in the field at the end of December.

Q Does this exhibit demonstrate that the pressure communication exists between the wells in the pool, in your opinion?

A In my opinion, this exhibit demonstrates that there exists, in fact, very excellent communication in this main producing horizon of the North Morton Permo-Penn Field and that this exhibit, in conjunction with Exhibit 10, demonstrates that this pressure communication has been observed over distances that would indicate not less than 160-acre drainage of the producing wells since it would require only something like a distance of 1320 feet between wells to show drainage on 160 acres.

Q These are all in excess, they are all in excess except the one well, Featherstone No. 1?

A The distance between the Featherstone Mobil

State and Amerada Federal is 1,040 feet. I would point out to you that the distance between the Amerada Federal No. 1 and the Tenneco Federal No. 1, which are completed, or, let me state this again. The distance between these two wells is 2,640 feet and we observe a pressure influence in this main producing horizon.

Q Now, will you refer to Exhibit 11?

A Exhibit 11 is a tabulation showing the comparison of rock and fluid properties and by fluid properties, I mean the properties of the reservoir, oil in the East Saunders Permo-Penn Pool, the High Plains Penn Field and the North Morton Permo-Penn Field, or pool.

Q These are on 160-acre spacing?

A The two High Plains and Permo-Penn are presently on 160 spacing and proration. The exhibit shows that the rock properties in the order of porosity, water saturation and permeability for these three pools is approximately the same. It also shows that the properties of the reservoir, oil in the North Morton Pool, show one significant difference from the two other pools and this is in the saturation pressure of the reservoir oil which was measured to be 858 psig, as compared to 2346 in the East Saunders and 2,625 psig in the High Plains. Also that the solution, gas-oil ratio in the North Morton Permo-Penn Pool is 377 cubic feet per barrel

as compared to the 939 in the East Saunders and 1,125 in the High Plains-Penn.

Q What makes this difference important?

A The significance of this difference is that what might be the recovery, primary recovery from the North Permo-Penn Field under a solution gas drive producing mechanism. I think in testimony presented in the East Saunders and High Plains, both of these fields have been producing under a solution gas drive as a predominant producing mechanism, and this would be equally applicable to the North Morton Permo-Penn Field.

With similar rock properties with this type of producing mechanism, the primary recovery from the North Morton Permo-Penn Field as a percent of the original stocktank oil in place, would be substantially lower than what you would get in East Saunders and High Plains. I might point out here that the bottom hold fluid, the bottom hole analysis of these three fields were all taken by Core Laboratories and are measured, observed laboratory data. At the time we obtained the sample in the North Morton Permo-Penn Pool, we were aware that its properties were somewhat unusual; however, we discussed both with Core Laboratory and the independent service company that obtained the sample

for them, at great length, as to the condition of this well and the conditions under which we took the sample of the reservoir oil in the North Permo-Penn, and have every reason to believe that it is a good and accurate sample of the reservoir oil that exists in this pool.

Q Will you identify Exhibit 12 and explain that exhibit, please?

A Exhibit 12 is a graphical representation of the predicted reservoir performance in the North Morton Permo-Penn Pool. What it shows is that the field will probably experience a relatively rapid pressure decline until the reservoir pressure reaches the bubble point pressure of the oil of 858, at which point only approximately 5.4% of the original stocktank oil in place will be recovered and that the ultimate recovery from this pool under primary producing mechanism would be on the order of 15.8%

Q Is this recovery usually low, in your opinion?

A This recovery, in my opinion, appears reasonable in view of the fluid properties of the oil in this pool.

Q Now, will you refer back to Exhibit 6, and tell what additional information it shows besides that which was previously discussed?

A The lower portion of Exhibit 6 shows, on a

volumetric basis, what the reserves in the North Morton Permo-Penn Pool might be, based on the data from logs, fluid sample and the reservoir performance prediction, based on the fluid properties of the Schilthius material balance calculation. It shows that the primary recovery should be approximately in the order of 74 barrels of oil per acre foot and for an average thickness of 12 feet in this main producing interval in the pool, that the recovery will be on the order of 890 barrels an acre.

Q Will you explain Exhibit 13?

A Exhibit 13 is a tabulation of economics of drilling a well in the North Morton Pool under various spacing considerations in this main producing interval of the pool, and based on what we believe to be reasonable investment cost for drilling and completing a well and ultimately equipping this well with some type of artificial lift equipment which we will undoubtedly need and operating costs of both flowing and under artificial lift. The exhibit shows that under 40-acre spacing it would result in an economic loss of $133,906.00. Under 80-acre spacing with 12 feet of pay in the main producing interval, it would result in a direct economic loss to an operator of $60,012.00, and only under a 160-acre spacing can an operator even hope to realize any

profit from his investment.

Q Will you correlate this with Exhibit 14?

A Exhibit 14 is a graphical representation of the economics. It includes the data on Exhibit 13 and shows what the profit, after investment, direct operating costs and taxes, would be to an operator under various spacing with 12 feet of pay and what it would be if ultimate or future development in the field should indicate that the average net pay of this main producing interval is substantially greater than 12 feet. For example, it shows that if the average net pay was double what we see now in this main producing interval, that it would take something more than 40 acres for an operator to show a break-even proposition.

Q In your opinion, would a prudent operator develop this pool on an 80-acre spacing?

A In my opinion, a prudent operator would develop this field on 160 acres.

Q In your opinion, would the granting of this application be in the interest of conservation and the prevention of waste and the protection of correlative rights?

A Yes.

Q Do you care to make any further general statement in conclusion of your testimony?

A Well, I might add, because of the fluid properties that we have observed in this field, it probably will be a candidate for some type of pressure maintenance or secondary recovery ultimately, and that it would behoove the operators in this field to not delay in having this considered, because we are going to see this pressure decline. I would also like to point out that in our request for temporary 160-acre spacing for a year, that if additional data should indicate this is not the proper spacing, it is always possible that the spacing can be changed. However, if the field is permitted to be drilled, developed on 80 acres, and it results in over-drilling for maximum recovery, that there is going to be economic loss incurred here that's going to be irretrievable. In other words, it's an error that wouldn't be able to be corrected.

Q What you are seeking is 160-acre spacing to the special rules and proration units?

A That is correct.

Q Were Exhibits 6 through 14 prepared by you or under your direction?

A Yes, they were.

MR. WHITE: At this time, we offer Exhibits 6 through 14.

MR. NUTTER: Applicant's Exhibits 6 through 14 will be admitted in evidence.

(Whereupon, Applicant's Exhibits 6 through 14 admitted in evidence.)

MR. WHITE: That concludes our testimony on direct.

MR. NUTTER: Any questions of Mr. Lacey?

CROSS EXAMINATION

BY MR. JENNINGS:

Q Referring to Exhibit No. 1, Mr. Lacey, is it possible to, in the light of the ownership of the acreage, to develop this field on 160-acre spacing without forced pooling or without pooling of some type?

A Well, the answer to your question is: I really don't know because (1) we don't know what the ultimate productive limits of this pool will be and/or what precisely the ownership of the acreage will be when it is ultimately developed.

Q But the exhibit shows that in Section 31, that the acreage is checkerboarded in 80-acre tracts, does it not?

A Yes, it does.

Q Is the ownership split that way?

A Yes, I believe it is.

Q Tenneco just owns, I believe it's the yellow?

A Yes.

Q Referring to that exhibit, I see there are two, are those proposed locations, one in the east half of the southeast and one in the west half of the northeast?

A Well, the answer to your question is here they are locations that could be considered by Tenneco management depending on what the ultimate outcome of this hearing and other considerations are. In other words, what I am saying is, I, as an engineer, in an engineering capacity for Tenneco Oil Company, do not make the decisions as to what wells will be drilled or not drilled, I only prepare Tenneco management the data on which to make their decisions.

Q One other question. I am not very fast on my mathematics, but I believe you testified that you could estimate an 890-barrel recovery per acre in 12 foot of pay?

A That's right.

Q What would that result in, in recoverable reserves on 80-acres on that basis?

A I believe the reserves for 80 acres on that basis are shown in Exhibit 13, approximately 71,200 barrels.

Q Haven't some of the wells produced half that much already?

A Yes, I believe some of the wells have produced 20,000 barrels or so.

Q I assume from your testimony, that in another four or five months those wells will be completed?

A What I am saying here is if this field is permitted to be developed on 80-acre spacing, that the average,ultimate average recovery for wells in the field will be on this order of magnitude. Obviously if wells aren't drilled at the same time and completed at identically the same time, one well will have somewhat higher recovery than a well drilled later, just by the difference of the time of their completion. What I am saying is that the average recovery for the pool under 80-acre development would be of this order of magnitude, yes.

Q When you speak of the average, do you also refer to that dry hole that was drilled or are you just referring --

A I don't believe there's a producing well in the pool at the present time.

Q In your Exhibit 13, in allocating your cost to your well that has no figure, no consideration was given to any risk factor in there, is that true? That's just the actual out-of-pocket expense for drilling the wells?

A Yes, this is our estimate. Obviously it's our estimate since we have not yet drilled a well in the pool.

MR. JENNINGS: Mr. Beverage of Western Reserve would like to ask a couple of questions.

MR. NUTTER: Are you an attorney?

MR. JENNINGS: He's one of the owners.

MR. NUTTER: You are questioning in your own behalf, then?

MR. BEVERAGE: Yes.

CROSS EXAMINATION

BY MR. BEVERAGE:

Q I would like to ask Mr. Lacey, if it would now be in order, earlier a question was asked of Mr. Desadier regarding bottom hole pressures specifically in the Tenneco Fee and he passed any answer, stating that pressure data would be discussed at a later time. Would it be in order now to ask a question regarding pressure data?

A Yes, yes.

Q In your Exhibit No. 4 which is cross-section C, we earlier discussed all of the wells and I now would like to ask you a question regarding the data that is presented here on the Tenneco Fee. Mr. Desadier stated that in his judgment the three zones that are indicated to be either productive or capable of producing have a common oil-water contact and therefore they have a continuous zone. There is pressure data from drillstem test taken on these different zones indicated below. Are you familiar with these measured bottom hole pressures?

A Well, yes. Are you asking me is that the data that is presented here on the exhibit?

Q Does it seem to indicate to you as an engineer, that you are measuring the same zone in tests 1, 2 and 3?

A That we are measuring the same?

Q Yes, the same producing horizon.

A The same, well, I believe all three of the tests are within the defined vertical limits of the North Morton Permo-Penn Pool. Is this what you mean?

Q Yes. Then would you expect that the pressures would vary on an initial 3823 to 3925 in the same zone? What I am trying to say, thus far, the only evidence presented to state, or that was stated, that these are a continuous producing horizon, is your pick of an oil-water contact, and sometimes this is helpful in the pool, but in any pool when you have other data, will you also consider that? Now, I am asking you now, can we measure the indicated bottom hole pressures?

A Yes.

Q Do they indicate you are in one common zone or is there a possibility that these are separate and unique zones, with this pressure differential?

A By this you mean separate reservoir entities?

Let me put it this way. I don't believe the data that we have to date either proves or disproves this possibility. I think it's possible that more data accumulated will maybe make a more firm establishment of whether it is or is not.

Q Of course, we can determine that at the time.

A My answer to your question is I do not know.

Q Using the facts here, do they tell you anything?

A Well, they tell me --

Q Well, I can read, the final shutin pressure of drillstem test was 3731 pounds.

A Yes.

Q The final shutin for drillstem test No. 3 is 3939; does that give you any indication?

A Well, the analysis of pressures observed in drillstem test can suggest lots of facts. They can suggest that depending on the length of time that shutin pressure was permitted to build up, would suggest different orders of permeability of different zones in the pool, they could indicate different reservoir pressures. What I am saying is, if you are asking me if this suggests that these two pressures differ I would say yes. If you are asking me if these are definitely separate reservoirs, my answer is: No, it does not suggest this although this is a possibility.

Q It is a possibility. That is my only question.

A I believe it's going to take some additional data to support what you are suggesting.

Q But you just now stated that it suggests a lot of facts and would it be valid for us to include among those facts the possibility that separation does exist?

A Along with different --

Q Along with other different things.

A Different permeability could show the same things.

Q But it would be valid?

A Yes.

Q What would be just a rough estimate in the area colored green, how many feet are we talking about in the Tenneco Fee?

A Feet of pay?

Q Feet of pay.

A Where it is presently completed?

Q Well, where it is colored green. There are three different horizons; is it in the order of five feet, ten feet, fifty feet?

A I believe that colored green there is intended to show a top and bottom of a correlative porous zone and not intended to show what we might estimate in the productive pay.

Q It's labeled "top of pay"?

A Right.

Q It doesn't mean top of pay?

A Right, top of pay within a given interval, there's obviously going to be some section that's going to be of a very low order of porosity magnitude. Without getting a large scale log out and calculating what the net pay is, I would estimate there's something like that on the order of maybe 20 feet total, for all three zones in there.

Q But it would be in the order of 20 feet?

A This is just an estimate.

Q O. K. Now, on Exhibit, I believe it was 12, excuse me, Exhibit No. 11, when you discussed the bottom hole fluid samples?

A Yes.

Q Referring to the column headed North Morton Permo-Penn Field. We see the figure 12 net feet of pay which appears that it might correlate with the number one zone?

A I believe we pointed out in previous testimony that our whole testimony is based on the communication in the main producing interval of the North Morton Permo-Penn Field.

Q That's my question. Then you are really

considering zone number 1 here?

A Since it's correlative and appears to be productive in all the producing wells in the field, although not completed in one.

Q It does appear to be productive. So we are not considering in this study Exhibit No. 11, zone two and three in the Tenneco Fee, is that correct?

A Are you asking in terms of net pay?

Q I'm asking in terms of all the data in the column North Morton Permo-Penn Field.

A No, no.

Q In your study, your examination of the report, was there any indication of a sample from the second and third zone in the Tenneco Fee that is not included here?

A No, we have one bottom hole fluid analysis in the North Morton Permo-Penn Field and it was taken in the Featherstone Amerada Federal No. 1. This well was selected as being the well to use for two reasons: (1) there had been production obtained from it and it was completed and producing from the interval which to us appeared to be the main producing section and which additional development was intended to substantiate that we wanted a sample from the interval which was really to represent where most of the oil was located and would come from.

Q It would be the zone one, on the cross-section?

A That's right, and this is the sample we had.

MR. BEVERAGE: That's all.

REDIRECT EXAMINATION

BY MR. WHITE:

Q Zone one is the most illustrative and you think that it's the one that has the communication throughout the pool?

A Yes, I think we have definitely established that.

Q If you took that into consideration, would it alter your figures on Exhibit 11?

A Without having a bottom hole fluid analysis from that well --

Q It would be impossible to say?

A It would be impossible to say.

MR. WHITE: That's all.

RECROSS EXAMINATION

BY MR. NUTTER:

Q Referring to your Exhibit No. 9, these bottom hole pressures, the first point here is the 4044 which is the calculated drillstem test bottom hole pressure on the Mobil State No. 1 on July 22?

A Yes, sir.

Q The next one is labeled Mobil State No. 1, 48-hour shutin, bottom hole pressure and the first part of September you had, Exhibit No. 9 indicates that would have been something under 4,000 pounds. Would that point be misplotted on this exhibit?

A Yes, sir, we're looking now at the 48-hour shutin pressure on the Mobil State.

Q Yes, sir, and on Exhibit 8, it lists that it is actually measured 4,005, that it was calculated to 99.4% buildup, so your calculated maximum would be 4013, so that point would move up maybe three-quarters of an inch on this?

A Yes, sir, I believe that point has been misplotted.

Q Now, the next pressure point is the drillstem test on the Amerada Federal No. 1, and that was 3960, I presume.

A Yes, sir.

Q Which of the drillstem tests over here on Exhibit No. 4 would that be?

A I believe it would be drillstem test one, drillstem test 10,429 to 10,480.

Q Final shutin there is given as 3869?

A Well, now, it may be. Without examining the drillstem test, the report from the service company that took it, it may be possible that one of these has been

plotted on the basis, generally, drillstem test tools have two pressure elements in them and we may be looking at this 3869, would be the one pressure element and the 3960 the other. Without really examining the service company's report I can't make an adequate explanation of that.

Q I was having a little difficulty matching the pressure showing for Tenneco Fee No. 1 with any of the drillstem tests shown for the Tenneco Fee No. 1. Now, in response to questions by Mr. Beverage, you stated that sometimes these drillstem test pressures might indicate lots of things. They may indicate local permeability pinchout, lack of complete pressure buildup and things like that. I wonder, in view of these many factors that have to be considered, how reliable this exhibit would be in showing that these pressures have declined across this field during the time that these drillstem test pressures were made. We take our Amerada Federal No. 1 and when it hits 70-hour shutin pressure on January the 2nd, it had a pressure there of 3960 which is higher than the final shutin pressure on the drillstem test deal and it had produced for two months?

A Yes, sir, I thought I had brought this out in my testimony on Exhibit 9. I pointed out that at the time the drillstem test pressure was taken in the Amerada Federal

No. 1, that the Mobil State was producing and it was a producing offset, such that the production from the Mobil State was actually affecting the reservoir pressure at the location of the Amerada Federal.

Q Isn't that also a possibility that the drillstem test pressure doesn't as accurately reflect reservoir pressure as a pressure bomb run later on a regular bottom hole pressure test after being shutin for 70 hours?

A The fact that the bottom hole pressure on the Amerada Federal on the 1st of January was higher than what it was observed on a drillstem test in that well prior to any withdrawals from it is exactly what I would expect, since the entire field had been shut in for 72 hours and the reservoir pressure within the entire pool was now permitted to come to an equilibrium condition.

Q Does this also show the drillstem test pressure may have been in error, isn't it a possibility?

A No, sir, it doesn't to me. We can get the drillstem test reports on these wells. We examined this data very, very carefully and felt that it was extremely good and accurate and in view of the high psig and the good permeability, that we were going to see reservoir pressure very quickly in these wells, under the conditions that the reservoir was then existing.

Q But still this bottom hole pressure on the drillstem test on the Amerada Federal No. 1, the 3960 doesn't appear as one of the pressures over here on Exhibit No. 4.

A Well, now, here again, it may be the same, the drillstem test pressures that are shown on Exhibit 4 may be what was from one of the pressure elements in the drillstem test tool and I would really have to go back and get the drillstem test report from the service company. These reports are available.

Q If they have different elements of them, they are giving different pressures, then, the whole thing is not really reliable?

A No, I don't believe this is right. Of the two pressure elements, they will never check exactly, although they are both calibrated,but they will never check exactly to within the pound of each other but these elements are accurate within a tenth of one percent in their pressure range and I believe that this data is,in fact, reliable and true.

Q Now, do I understand in response to questions by Mr. Jennings that what you regard as the main pay here and the one that you calculated your 12 feet of net pay,is zone number one?

A It's the uppermost producing interval. That is, appears to be productive in all of the producing wells, although not completed in one, right.

Q And the Tenneco Fee No. 1 isn't perforated in that zone?

A Although it has a drillstem test in that zone --

Q Of 100 barrels an hour, I think.

A But which indicates that it is productive.

Q Mr. Lacey, if your solution gas-oil ratio is so much lower here than it is in the East Saunders and High Plains, and as a result your reservoir volume factor is so much lower that you have to lower your recovery factor to that percent that you used, what was it, 15%?

A 15.8.

Q Do you think that it might also follow that drainage efficiency might be affected? After all, what is our means of moving this oil through the reservoir in solution gas reservoir, it's the gas that's in the oil.

A I'm sorry, Mr. Nutter, I don't know if I quite understand your question.

Q My question simply is this: The Commission has found that with the gas-oil ratios that they have over in the High Plains and in the East Saunders, and after a series of hearings in those pools, they did establish that evidently

one well was efficiently draining 160 acres and here we've got lesser gas-oil ratio, we have a much lower recovery factor that you have used in your computations and I am wondering if the efficiency of the drainage might not be lower and it might not drain that 160-acre tract.

A My answer to your question is, I believe as an engineer, and I believe it has been established in industry for considerable length of time that ultimate recovery by an internal solution gas drive producing mechanism will not be altered or changed significantly by spacing or density of wells.

Q Except as a matter of time?

A Well, one may reach the economic limit. What I am saying, recovery is the percent of the oil in place. This recovery efficiency is fixed regardless of how close or far apart the wells are.

Q Here on Exhibit No. 11, which shows all of the various characteristics of these three pools, they're very similar in almost every facet except the one facet that provides the energy to drive the oil to the well bore. Here we're much lower.

A Well, right, here again, like I say, I don't believe distance or distances that the oil has to travel is

a consideration. It's the amount of expansibility available in the oil that determines the recovery.

Q There is less --

A What I am saying is low solution gas-oil ratio and low bubble point under a producing solution gas-oil drive in my opinion is not affected at all by the well spacing. If you can show that the wells can and do and are draining, the distance, this would be more a function of the continuity of the pay. I think there's been, this point has been discussed a considerable length by industry for a substantial number of years, and I think it's been to many people's satisfaction that recovery is not a function of density of well spacing under this producing mechanism.

Q We have less mechanism here than we do in the others, though, don't we, because we have less gas in solution?

A We have less expansibility available.

RECROSS EXAMINATION

BY MR. PORTER:

Q I understood you to say that your expansibility was your determining factor here?

A Well, it is one of the important determining factors. There are other factors that are, that come into consideration of this. The relative permeability characteristics

of the rock and, in other words, what I am saying here is it's possible with fluid characteristics of East Saunders and High Plains to have some, I don't know and I don't believe they exist here, but you could have extremely unfavorable relative permeability characteristics that could result in a primary recovery as low as the North Morton Permo-Penn Pool or lower. It's the properties of the oil and the properties of the residual rock.

Q But your gas-oil ratio does have relationship to the expansibility that you have here, is that right?

A Yes.

MR. PORTER: Excuse the interruption, Mr. Nutter.

MR. NUTTER: I believe that's all I have. I have something else on my mind, but I can't think of it. Are there any other questions of Mr. Lacey?

MR. KELLAHIN: I have one.

RECROSS EXAMINATION

BY MR. KELLAHIN:

Q Getting back to the pressures on your Exhibit No. 12, Exhibit No. 9, it shows that Tenneco Fee No. 1 drillstem test No. 2, where is that drillstem test No. 2 shown in the other exhibits?

A I believe on Exhibit 4, this Exhibit 4 in Tenneco Fee, the No. 2 drillstem test, this is the test, the drillstem

test that covers this upper producing interval in the well.

Q Is that the 3981 figure that you are referring to there?

A I am sorry. What did you say?

Q Is that the 3981 --

A I thought it was the, well, let's see, the 10,456, no it would have to be the 10,396 to 457.

MR. WHITE: Mr. Kellahin, we are going to put Mr. Desadier back on the stand and I think he can explain these exhibits to your satisfaction.

MR. KELLAHIN: As to the pressures?

THE WITNESS: Well as to which drillstem test interval the pressure on Exhibit 9 relates.

Q (By Mr. Kellahin) Mr. Lacey, you did prepare Exhibits 8 and 9, did you not?

A Yes, sir.

Q But you did not use the pressure shown on Exhibit 8 in preparing Exhibit 9?

A In the preparation of Exhibit 9, we used the calculated reservoir pressures that we had determined from an analysis of the drillstem test before, submitted to us.

Q Then your Tenneco Fee No. 1 is in the wrong place on the exhibit, on Exhibit 8 and 9, then, isn't it, because it shows a calculated pressure of 3897, or is that supposed

to be a 3897?

A The Tenneco Fee drillstem is supposed to be at 3897, right, it's shown on Exhibit 8 there.

Q Then throughout the others, with the exception of the error pointed out by Mr. Nutter, on your Mobil State No. 1 48-hour shutin test they are all based on your Exhibit No. 8, calculated pressure?

A Yes, sir.

MR. KELLAHIN: Thank you.

MR. NUTTER: Are there any other questions of Mr. Lacey? He may be excused.

(Witness excused.)

MR. NUTTER: Were you going to recall Mr. Desadier?

MR. WHITE: Yes, sir.

MR. NUTTER: Were you going to put on some testimony, Mr. Jennings?

MR. JENNINGS: Not testimony, but statements.

MR. NUTTER: I thought we might recess.

MR. DESADIER: May we make a statement before we recess?

MR. NUTTER: Yes.

MR. DESADIER: It looks like there has been a typographical error on the exhibit.

MR. WHITE: Which exhibit are you referring to, Mr. Desadier?

MR. DESADIER: Let me find it here, the pressure under measured actual bottom hole pressure at 3960 from drillstem test. We have a scout ticket here on that well which shows that pressure to be 3869, both initial and shutin.

MR. PORTER: That's on the Amerada Federal?

MR. DESADIER: That's on the Amerada Federal; would you like to see the ticket, sir?

MR. NUTTER: Is that the pressure of November 2nd?

MR. WHITE: Yes.

MR. DESADIER: Yes, sir.

MR. PORTER: Where should that be corrected there, under measured bottom hole pressure?

MR. DESADIER: Yes, sir.

MR. PORTER: And not under the calculated?

MR. DESADIER: No, that should be measured bottom hole pressure, drillstem test.

MR. PORTER: Right.

MR. NUTTER: We will recess the hearing until 1:30.

(Whereupon, a noon recess was taken.)

MR. NUTTER: The hearing will come to order. Mr. White, did that conclude your direct case in this Case No. 3651?

MR. WHITE: Mr. Examiner, during the noon hour, Mr. Desadier discovered that the drillstem test figures on Exhibit 4 are correct and those on Exhibit 9 are correct and he would like to explain the two exhibits and reconcile them.

MR. NUTTER: So you want to call Mr. Desadier only for that purpose?

MR. WHITE: For that sole purpose only.

MR. JENNINGS: Mr. Lacey was the last witness. I would like to ask him some questions also.

MR. NUTTER: Would you resume the stand, Mr. Lacey?

RECROSS EXAMINATION

BY MR. JENNINGS:

Q Mr. Lacey, referring to Exhibit No. 13, I understand that exhibit 13 was prepared by you, Mr. Lacey.

A Under my direction, yes.

Q Referring to that exhibit, it appears that according to your calculations an 80-acre spacing established in this pool would result in a considerable loss to the operator?

A Yes, sir.

Q In the event that this application is denied, would you recommend to your management that they not drill on any of the five of the 80-acre tracts that you have in the area described in Exhibit No. 1, I believe.

A The answer to your question is, and I thought I had stated it previously, my position with Tenneco Oil Company is as an engineer and as such I would submit to Tenneco management the facts as I see them and they would, Tenneco management would make the decision as to whether they would or would not drill. I am saying I would not make a recommendation as such, but only present the facts as I understood them.

Q What is your position?

A As a district reservoir engineer.

Q Are you called upon to make recommendations to the management of your position?

A Sometimes.

Q Well, now, could you answer my question? Would you recommend to your management that they not drill these wells?

A I would recommend to management that they look at this field very, very carefully before they made a decision

to drill on 80 acres. This would be my recommendation to my management.

Q Mr. Lacey, are you aware of the fact that various offers have been made to your management to farm out this acreage?

A No, sir, I am not.

Q Is there anyone here in your organization that would be in a position to testify concerning this?

A Concerning the offers to --

Q To farm out the Tenneco acreage on any basis?

A Well, not unless some additional witnesses are brought forth, neither myself, I'm not prepared and cannot answer questions on this and I don't think Mr. Desadier is. We would have to enter some additional witnesses.

Q Is there anyone else here from your organization?

A Yes, sir, there is.

Q Who?

A Well, can I consult with Mr. White?

MR. WHITE: If you know, go ahead and state.

Q I have just asked you, yes or no?

A Mr. McDonald is here, who, I believe, would be qualified to answer your questions along this line.

MR. JENNINGS: That's all.

MR. NUTTER: Any further questions of Mr. Lacey? He may be excused.

(Witness excused.)

MR. NUTTER: Would you call Mr. Desadier, please?

MR. WHITE: This is solely for the purpose of clarifying Exhibits 4 and 8.

MR. NUTTER: All right.

* * * * * * *

B. E. D E S A D I E R, recalled as a witness, having been previously duly sworn, was examined and testified as follows:

REDIRECT EXAMINATION

BY MR. WHITE:

Q Mr. Desadier, did you, during the noon hour, make further effort to reconcile Exhibits 4 and 8?

A Yes, sir, we did.

(Whereupon, Applicant's Exhibit 15 marked for identification.)

Q And I'll hand you what has been marked Exhibit 15, and ask you to identify it and use this in reconciling the two exhibits, if you will, please.

A All right. Exhibit 15 is the formation test data for drillstem test from 10,429 to 10,480 feet in the Featherstone Amerada No. 1 well.

MR. JENNINGS: What did you identify that exhibit as?

MR. NUTTER: It's a new exhibit, it will be 15, is that correct?

MR. WHITE: Yes, 15, I have already marked it as 15.

A Mr. Examiner, this exhibit shows that the field read pressure for the final closedin pressure of this well, was 3869 pounds, which is the pressure shown for this drillstem test on Exhibit No. 4. This is also the pressure which shows on the scout ticket for this well. There is another piece of this. The second page of that exhibit --

Q You mean Exhibit 15?

A Yes, sir, as the office corrected pressure read by the Halliburton Company in Duncan, Oklahoma, which shows the final shutin pressure to be 3960, which is the pressure that appears on Exhibits 8 and 9.

MR. NUTTER: Now, what is the 3869?

THE WITNESS: The 3869, Mr. Nutter is the field read pressure which is reported at the well site, read by the field engineer. That pressure is not as accurate usually, as the office read pressure, because it's read with a gauge in the field.

MR. NUTTER: So the 3960 that you have plotted on Exhibit 9 is the pressure reported from the Halliburton office. Exhibit 4 is the pressure which the engineer in the

field read.

THE WITNESS: Yes, which was reported on the scout ticket.

MR. NUTTER: I see.

THE WITNESS: And which was subsequently reported by us on Exhibit 4.

MR. WHITE: We will offer Exhibit 15 and ask to withdraw it and submit a xerox copy later.

MR. NUTTER: All right.

(Whereupon, Exhibit 15 admitted in evidence.)

MR. WHITE: 8 is correct as it is now, is it not?

THE WITNESS: Yes, both 8 and 9 are correct with the exception of the misplotted point on Exhibit 9.

MR. JENNINGS: Is that Exhibit 8 still correct? Does that need correction?

THE WITNESS: I believe I stated that Exhibit 8 is correct as submitted.

MR. NUTTER: The 3960 was the office pressure and the pressure you gave before the lunch break was the field pressure, so they are both correct?

THE WITNESS: Yes.

MR. NUTTER: How about all these other drillstem test pressures?

MR. LACEY: All the other drillstem pressures on Exhibit 4 are theoretic pressures that appear on the scout ticket.

MR. NUTTER: All the drillstem pressures on Exhibits 8 and 9 are office pressure?

MR. LACEY: All the pressures on Exhibits 8 and 9 are the corrected pressures after the data had been submitted to Halliburton's Duncan office and extrapolation made. They are the most accurate.

MR. NUTTER: And Exhibit 4 is the field pressure?

MR. LACEY: Yes, basically the data is not in conflict.

MR. NUTTER: Any further questions of Mr. Desadier?

RECROSS EXAMINATION

BY MR. KELLAHIN:

Q Mr. Desadier, do you have the information on Exhibit 15 as to these other wells showing the calculated office pressures?

A I'm not, --

MR. WHITE: We can get this, if the Commission please, and it might be very helpful to everyone. We will resubmit Exhibit 4 and show the field pressures and opposite that the corrected pressures as made in the office. Then they will be right next to each other.

MR. NUTTER: Can you attach the Halliburton report for each of those pressures, Mr. White?

MR. LACEY: Yes, sir, we can submit all the field reports and the office corrections.

MR. NUTTER: It seems in this case that these pressures have become a rather important factor. We would appreciate it if you would submit those; would that be satisfactory with you, Mr. Kellahin?

MR. KELLAHIN: Yes, sir.

MR. WHITE: We will be glad to.

MR. NUTTER: Any other questions of the witness? He may be excused.

(Witness excused.)

MR. NUTTER: Do you wish to call Mr. McDonald, Mr. Jennings?

MR. JENNINGS: No.

MR. NUTTER: Do you wish to, Mr. White?

MR. WHITE: No, sir, I have no desire.

MR. NUTTER: Does this conclude your direct case then, Mr. White?

MR. WHITE: Yes, sir.

MR. NUTTER: Does anyone have any testimony they wish to offer in this case? Statements?

MR. JORDAN: J. W. Jordan, Union Oil Company of California and Roswell, and Union supports Tenneco's application for 160-acre spacing.

MR. NUTTER: Thank you, Mr. Jordan.

MR. KELLAHIN: Mr. Examiner, I am representing Stoltz and Company. Stoltz and Company is the owner of an interest in the south half of Section 36, in 14, 34, and the east half of Section 1, in 15, 34, which is adjacent to the area involved in this application. Stoltz and Company is opposed to the application of Tenneco Oil Company for the reason it is their opinion that any type of accumulation that is involved here, one well will not efficiently and economically drain 160 acres. In addition, we feel that the evidence that has been offered by Tenneco Oil Company, particularly with the pressure information which has not been submitted to the Commission, and we assume is forthcoming at some future date, on the present record, the pressure information certainly leaves a great deal to be desired in that it is inaccurate and not supported by any data which has been submitted to this Commission.

Now, the pressures are quite significant when we're considering the ability of one well to efficiently and economically drain 160 acres and it is this very information

which has been utilized by the proponents of 160-acre spacing to show that drainage is occurring over an area of 160 acres or more. Now, at this late date they come back and say that the pressures they used are calculated pressures. When the witness was on the witness stand, he said, well, there were two pressure bombs and perhaps this was a reading from another pressure bomb. We don't know what pressures these are or where they came from or what their significance is. We might point out if they do have two pressure bombs in a drillstem test, if you are in salt water and 150 feet apart, you could have one pound's difference in pressure which then could be used here to show whatever you wanted to show.

I think the source of these pressures absolutely must be established. In addition, they've compared this area to the North Morton Permo-Penn Field and the other East Saunders Permo-Penn Field and the High Plains Penn Field and the producing mechanism, of course, appears to be solution gas and the solution gas-oil ratio in the North Morton Permo-Penn Field is 377 as compared to in excess of a thousand in High Plains Field and almost a thousand in the East Saunders Field. We submit that the gas-oil ratio is a very significant factor and does not indicate that this particular pool should be developed on 160-acre spacing. We recommend that the

Commission continue with the 80-acre spacing, as it now exists.

MR. NUTTER: Mr. Jennings.

MR. JENNINGS: Mr. Examiner, I would like to make this statement on behalf of R. M. Moran, Western Reserves Oil Company, Mr. McPeters and Mr. Williamson, who are participants in the wells that have been drilled in the area to date. As the Commission recognizes, the wells have been drilled more or less on 80-acre spacing, and after one or two wells were in, the present order was established.

Now, the parties whom I represent participated in each of the wells that has been drilled. There are three wells that have been drilled in the area and with reference to Exhibit No. 1, it will appear that Section 31 , which is the critical section, is checkerboarded on 80-acre spacing, or an 80-acre pattern. Tenneco has been offset in several ways for sometime and have not elected to do anything to protect their acreage and now they come in and are asking that this Commission change the rule which was established after hearing and only on a temporary basis, last September, to allow 160-acre spacing.

Well, the corolary of this is the next Commission hearing we will be faced with a forced pool arrangement whereby Tenneco will seek to back in under each of the wells that we have drilled and since we have been, I'm quite aware of the

rules of the Commission and the first pooling Statute, but since we have been put to this expense, we have taken all the risk, we can't help but feel that it would be grossly unfair and premature at this time to determine that this should be based on 160-acre spacing, when by reason of our arrangement we were forced to develop it on an 80-acre.

I think that the Commission ought to take a real long look at it and possibly forestall any action at this time on the 160-acre spacing until they have had an opportunity to look at the entire situation and possibly the parties have had additional opportunity to work out some satisfactory solution because it will work very much of a hardship, and I'm sure that we'll be faced with this forced pooling and here's the operator who has gone in there and spent their money, local people, they have spent their money and done all the discovery work and Tenneco now will come back and want to force pool it.

If you look at the map again of this Exhibit 1, Tenneco is here asking for 160-acre spacing and they don't have a 160-acre tract in the whole area any place they can drill. There are some possible locations, they have not elected to do this to protect the rights on any of those. I want to reaffirm or join Mr. Kellahin's argument on this

160-acre spacing at this time. I certainly don't think from the exhibits and the testimony that they have presented today there is any showing in light of the gas-oil ratios that this well would drain 160 acres. I think it's premature at this time and it would certainly result in our correlative rights being impaired.

MR. NUTTER: Does anyone else have a statement?

MR. HICKS: Charles Hicks for Olen Featherstone. We would like to join with Tenneco in requesting the Commission to grant the 160-acre spacing and proration unit. We don't agree with Mr. Desadiers' statement that the upper and the middle zone are the same reservoirs. We would like to further state that we have been negotiating with Tenneco since December, which may be one of the reasons they haven't drilled a well in there so far. We feel like that the 160 acres is best for all concerned economically. We represent 15/16ths of the Featherstone group and Mr. Jennings' people that he referred to, Moran and all, represent the other sixteenth. Thank you.

MR. NUTTER: Mr. White.

MR. WHITE: I would like to make one comment. There has been additional reservoir data obtained and we feel that upon the geological and engineering evidence

that has been presented today at this hearing does, in our opinion, show that one well on 160 acres will efficiently and effectively drain the same. Mr. Kellahin says that in his opinion, his operators' opinion, that one well will not; however, neither he nor did Mr. Jennings, present any testimony to the contrary to oppose our testimony. Mr. Jennings says that his people have gone to a great risk in developing this originally on an 80-acre pattern and gone through all the hardships and did all this discovery work. That can be said in any hearing where you ask for special field or pool rules to increase the spacing pattern.

As was brought out, apparently they had a 1/16th interest as against a 15/16th interest in the same discovery. We specifically submit and urge the Commission to grant special rules for 160-acre spacing and allowables and as Mr. Kellahin has often said, it's always easier to go back and infill than it is to drill one or too many wells and never recover the expense encountered. We are merely asking for temporary pool rules and we can come back here a year from now, or whenever the Commission sees fit, and present additional reservoir data for the orderly development of the pool. Thank you.

MR. NUTTER: Thank you, Mr. White. Anything further in Case 3651 reopened? If there's nothing further

in Case 3651 reopened, we will take the case under advisement.

STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

I, ADA DEARNLEY, Court Reporter in and for the County of Bernalillo, State of New Mexico, do hereby certify that the foregoing and attached Transcript of Proceedings before the New Mexico Oil Conservation Commission was reported by me, and that the same is a true and correct record to the best of my knowledge, skill and ability.

WITNESS my hand and seal this 2nd day of February, 1968.

Ada Dearnley
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BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
September 6, 1967

EXAMINER HEARING

IN THE MATTER OF:

Application of Olen F. Featherstone for the creation of a new pool and special pool rules, Lea County, New Mexico.

CASE 3651

BEFORE: Daniel S. Nutter, Examiner

TRANSCRIPT OF HEARING

MR. NUTTER: The next case will be case 3651.

MR. HATCH: Case 3651, Application of Olen F. Featherstone for the creation of a new pool and special pool rules, Lea County, New Mexico.

Mr. connelly; I am Harry S. Connelly, Junior, of Stephenson, Campbell and Olmsted, appearing on behalf of the applicant, Olen Featherstone, and I have one witness who has not been sworn, and request that he be sworn.

(Witness sworn.)

(Applicant's Exhibits 1 through 4 marked for identification.)

D O N H. F O R D , called as a witness, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. CONNELLY:

Q Would you please state your name?

A Don H. Ford.

Q Mr. Ford, have you testified before the Oil

Conservation Commission in the State of New Mexico previously?

A No, I haven't.

Q Would you please give the Examiner a brief rundown of your education and your experience, please?

A I finished the University of Texas in 1955 with a Bachelor's degree in Geology and minor in Chemistry. In 1956, I took some additional work toward a Master's degree. Thereafter, I went to work for the Railroad Commission of Texas as a Junior Engineer in their San Angelo District for approximately eight months. Then I went to work for El Paso Natural Gas Company as an exploration geologist, until 1960; 1960, I went to work for Century Exploration Company in their Rocky Mountain area as an exploration geologist, and worked with them until 1962. From 1962 to the present, I have been a consulting geologist located in Roswell, New Mexico.

MR. CONNELLY: Are those qualifications satisfactory?

MR. NUTTER: Yes, they are; proceed.

Q (By Mr. Connelly) Are you personally familiar with the area in which the applicant has made his application for the creation of a new pool and for promulgation of special pool rules in Lea County, New Mexico?

A Yes, I am.

Q Is Mr. Featherstone the operator of the Mobil

State Well No. 1 located 2310 feet from the north line and 330 feet from the west line of Section 32, Township 14 South, Range 35 East, Lea County, New Mexico?

A Yes, he is.

Q Is the subject well completed in the Permo-Pennsylvanian with perforation from 10,428 to 10,456 feet?

A Yes, that is the interval of perforations.

Q Now, referring you to what has been marked as Applicant's Exhibit 1, which I might add there are four exhibits which are arranged in chronological order, would you please identify Exhibit No. 1 and explain it?

A Exhibit No. 1 is a structure contour map on the top of the Permo-Penn section within this area and essentially it shows the Morton Field and the area just immediately north approximately six miles, including the Olen F. Featherstone well situated in Section 32. It also shows the structural differences in the fields and the separation between the two, the Morton Field situated in the Southwest quadrant of the map from the Olen F. Featherstone No. 1 Mobil-State Well in Section 32. The separation is essentially due to the fact that the Texas crude well in the north part of Section 6 and the one in the south part of Section 6 were found to be wet in the Permo-Penn zone where they did develop some porosity

and permeability. These fields are even trapped by structure but they're also of stratigraphic significance in the development of porosity over the structures.

Q Does this exhibit show whether or not the Morton Field in the southwest quadrant and the field in the north quadrant are of the same pay zone and so forth?

A They are apparently of two different zones, but they are from the same formation, the Permo-Penn formation, but their development of permeability and porosity within the Permo-Penn section here does develop at two different levels within this area.

Q Does the exhibit show anything as to the possible area of drainage from the north field?

A Well, it does show, basically, a continuity or a correlative marker between the Tenneco Well situated in 14 South, 34 East, Section 25 and the Olen Featherstone in Section 32. From these two wells we can fairly well determine the oil-water contact and there does seem to be continuity of permeability and porosity between these two wells involved.

MR. NUTTER: What is that water-oil contact?

THE WITNESS: That water-oil contact is a minus 6420.

MR. NUTTER: Thank you.

Q (By Mr. Connelly) Now, referring to the northern well marked 1-6280 Mobil-State, is this the only well presently completed in this particular pool that we're referring to?

A Yes, it is just recently completed, in August, the first.

Q Now, referring you to what has been marked as Applicant's Exhibit 2, would you kindly identify the said exhibit and explain it's significance to the Examiner?

A All right. On our structure contour map you can see the A-A prime section which represents the line of this cross section going from the Union well in the Morton Field in the northwest quarter of Section 7, 15, 35 through the Texas Crude wells which are situated in the Section 6, 15, 35, and on over to the Olen F. Featherstone Mobil-State and then northwest to the Tenneco No. 1 Shell-State, the dry hole. I think the basic significance of this cross section is that it does show the differences in the water tables between the two Permo-Penn producing areas,and the Union well extends into the Texas Crude Pan American-State Well in the south part of Section 6, has an oil-water contact of a minus 6358. And then going on over to our area, or the recently discovered area, we have a lower water table of a minus 6420.

Q Does the exhibit two show that, anything as to

porosity varying in the interval from well to well and so forth?

A Well, it does. It does show that porosity development is in this Olen F. Featherstone well, or the permeability in which the oil was found had a lower stratographic interval within the section from the Morton Field.

Q I refer you to what has been marked Applicant's Exhibit 3 and ask you to please identify it and explain its significance to the Examiner.

A Well, Exhibit 3 is the reservoir and well data of the Featherstone No. 1 Mobil-State. I think basically the significance of this exhibit is that we have a well, very permeable well that's capable of producing at a very good rate from a rather thin reservoir. It shows, for instance, the current production test, it shows three hundred forty-eight barrels per day, with the gas-oil ratio of 538 from a 1064 choke. It seems to have a very good flow rate but it's not too thick of a zone.

Q As you stated, it shows a good performance of a commercial well. Is this due to high porosity or thick zoning or is it probably due to the permeability.

A I think it's due to the permeability. We have calculated permeability from Halliburton's, which is

Exhibit 3a, from their calculations of 420 millidarcies of this 14 foot section. This was calculated from the flow rates of the drill stem test of the producing interval. I think the permeability is the reason why it is producing at the good rate.

Q Now, please refer to Exhibit No. 4. Would you kindly identify Exhibit No. 4 and explain its significance to the Examiner?

A Exhibit No. 1 basically compares the economic considerations based on this reservoir data that we have in the well from a 40-acre unit as compared to an 80-acre unit. the 40-acre unit has a calculated pore volume as a basis of reference, show to be very marginal while the 80-acre unit shows to be quite a bit better.

Q Is the 80-acre unit, in your opinion, an optimistic computation?

A Based on pore volume calculation, it is optimistic.

Q Is it considered, the profit to investment ratio? Is that, in your opinion, a reasonable profit to investment ratio of 1.34 to 1?

A Well, it is in the sense that they are being developed with that profit to investment ratio today.

Q Now, are you acquainted with the rules of the pool to the southwest of Exhibit 1, as to what rules have

been adopted by the Commission for that particular pool, the Morton Pool?

A Yes, sir.

Q Are they basically the same rules as you are requesting in this particular pool?

A Yes, sir. they are.

Q Now, if the Commission granted you 80-acre spacing, in your opinion, would this economically and efficiently drain ghe reservoir and protect the correlative rights of others who may be within the particular area?

A Yes, it would, based on that data we have now.

Q Were Exhibits 1 through 4 prepared by you or under your direction and supervision?

A Yes, they were.

MR. CONNELLY: At this time, Mr. Examiner, I would like to move that Exhibits 1 through 4 be admitted into evidence.

MR. NUTTER: Exhibits 1 through 4 will be admitted in evidence.

(Whereupon, Applicant's Exhibits 1 through 4 admitted in evidence)

Q (By Mr. Connelly) In your opinion, is the 80-acre spacing commensurate with the conservation practices of the Conservation Commission?

A Yes, it is consistent with their regulations.

MR. CONNELLY: I have no further questions of this witness.

MR. NUTTER: Are there any questions of Mr. Ford?

CROSS EXAMINATION

BY MR. NUTTER:

Q Mr. Ford, do you have any idea as to the smiliarity between this reservoir and the Morton reservoir to the south other than they are producing from the same formation, although at a different level?

A Yes, sir. Well, yes, I do have some idea on the similarities. The Morton Field seems to have a lower permeability; I think submitted to you on the Union's application for 80-acres, was 69 millidarcies permeability.

Q And you have no measurement of permeability other than this calculated permeability for the drill stem test?

A No, that's the only permeability measurement that we have.

Q You didn't take any cores?

A I might point out one thing that we did just before this hearing. I have a bottomhole pressure reading, a thirty-day bottomhole pressure, and it was four thousand

and two which it's as marked on the Exhibit 3, under 6 of Item J. Now, that pressure on the drill stem test was four thousand and five, the bottomhole pressure at the time of the test, so after one month's production of approximately seventy-five hundred barrels of oil, why, we have had no significant drop in bottomhole pressure, which would indicate that this permeability is here.

Q Well, now, this recoverable oil estimate that you have got on Exhibit 4 of 136 barrels per acre foot, is that taken from the data presented here on Exhibit No. 3?

A Yes, it is.

Q For porosity and water saturation and recovery factor and so forth?

A Yes, it certainly is.

Q Now, the Morton area is on 80-acre spacing, is it not?

A Yes, it is.

Q Is that a temporary order or permanent Rules, or just what is the status there?

A I am not familiar whether it's permanent now or not. It was the 1965 Order, I believe. I believe at that time that it may have, that they had at that time drilled and submitted in evidence three wells. I am not familiar with

whether it's permanent or temporary.

MR. CONNELLY: It's permanent.

A I think it is permanent.

Q (By Mr. Nutter) They may have been on temporary rules at one time, but they're perhaps permanent now.

A I think probably they are.

Q Have you proposed horizontal limits for this pool?

A No, I haven't.

Q I think we have a case coming up on the regular Commission hearing on the 13th and there's a paragraph there relating to this pool, a proposal for the pool and the discovery allowable?

A Yes, sir.

Q I believe that that was advertised to designate the northeast quarter, the northwest quarter of Section 32 as being the horizontal boundaries, I am not sure.

A Yes, that is right, the northwest quarter of Section 32 has advertised.

Q Now, when we are talking about, by the Permo-Penn formation, that's a rather vague term?

A Yes, it is.

Q We would have to have some vertical limits. What would you propose for the vertical limits here? Is a marker at 10,610?

A There is a good change of lithology at that marker there and on below there with the lithologic -- the rocks are dissimilar to that above. I think in this particular well it would be from 10,320 to 10,605 or 6 there at the top of the shale marker.

Q I believe that that case that is set for the 13th is advertised this to be the North Morton, if I am not mistaken.

A Yes, it is designated the North Morton.

Q Do you know whether or not another well is contemplated at this time?

A There is another well drilling.

Q What is its location?

A In the center of the southwest southwest of Section 29, Olen F. Featherstone No. 1 Anderson.

Q So it's approximately half a mile north?

A Yes, sir, it's a half a mile north.

Q What's the present depth of the well, do you know?

A They are at W. O. C. at 4520 feet after setting eight and five-eighths.

Q Are there any other questions of this witness? He may be excused.

(Witness excused.)

MR. NUTTER: Do you have anything further, Mr.

Connelly?

MR. CONNELLY: No, sir, I do not.

MR. NUTTER: Does anyone have anything they wish to offer in case 3651?

MR. JORDAN: G. B. Jordan, Union Oil Company of California. I would like to state that Union supports Featherstone's application.

MR. NUTTER; What office are you with?

MR. JORDAN: Roswell.

MR. NUTTER: Roswell, thank you.

MR. KELLY: Mr. Examiner, Booker Kelly, White, Gilbert, Koch and Kelly, on behalf of Tenneco Oil Company and Tenneco supports the application.

MR. CONNELLY: Mr. Examiner, there's one thing in reading over the application. The present well, the Featherstone Mobil-State No. 1, I don't know if it's appropriate at this time to ask for an exception as to it's --

MR. FORD: It's not 150 feet from the center.

MR. NUTTER: It looks like a 330 --

MR. FORD: It is a 330.

MR. NUTTER: It would automatically be accepted if we put out rules providing for one hundred fifty feet of the center.

MR. KELLY: I don't believe they actually went into the rules in the Morton Field but it's my understanding that those are flexible rules to allow for locations.

MR. NUTTER: He proposed rules similar to the Morton pool.

MR. CONNELLY: Yes, as far as Paragraph 7 A of the application is for flexible location and flexible rules for the pool.

MR. NUTTER: Right.

MR. CONNELLY: Which is what we are seeking. I am almost positive they are identical, I mean the same verbage that is used here was used in the Morton.

MR. NUTTER: In the Morton. Thank you. Anything else to be offered in Case 3651? Mr. Hatch?

MR. HATCH: Telegrams from Mobil and from Amerada supporting the application of Olen Featherstone.

MR. NUTTER: If there's nothing further in this case, we will take the case under advisement.

STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

I, ADA DEARNLEY, Notary Public in and for the County of Bernalillo, State of New Mexico, do hereby certify that the foregoing and attached Transcript of Proceedings before the New Mexico Oil Conservation Commission was reported by me, and that the same is a true and correct record to the best of my knowledge, skill and ability.

WITNESS my hand and seal this 18th day of October, 1967.

Ada Dearnley
Notary Public

My commission expires

June 19, 1971.

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 3651, heard by me on 9/6, 1967.

[signature], Examiner
New Mexico Oil Conservation Commission

TENNECO OIL COMPANY

Exhibits for NMOCC Case No. 3651 (Reopened)
~~Temporary Pool Rules~~
N. Morton (Permo-Penn) Field, Lea Co., N. M.

January 24, 1968

BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION

APPLICATION OF TENNECO OIL COMPANY
FOR AN AMENDMENT TO ORDER NO. R-3315,
TO ALLOW 160-Acre SPACING AND PRORATION
UNITS ON A TEMPORARY BASIS IN THE NORTH
MORTON PERMO-PENNSYLVANIAN OIL POOL,
LEA COUNTY, NEW MEXICO

Case 3651

A P P L I C A T I O N

Tenneco Inc. is the owner and operator of certain oil wells presently producing in the North Morton Permo-Pennsylvanian Pool, Lea County, New Mexico. That said pool was created by the Oil Conservation Commission of the State of New Mexico under Order No. R-3315 issued on September 11, 1967.

That the special rules adopted on a temporary basis in said Order provided for 80-Acre spacing and proration units.

That since said pool rules have been adopted additional wells have been drilled and new production and drainage information is available, that shows that wells drilled on a 160-acre spacing and proration units will efficiently and economically drain and develop said pool. Such information further shows that the drilling of more than one well on each 160-acre proration unit will result in the drilling of unnecessary wells and economic loss therefrom.

WHEREFORE, Applicant requests this Commission to enter its Order amending Order No. R-3315 to allow for 160-acre spacing and proration units on a one year temporary basis.

WHITE, GILBERT, KOCH & KELLY

By _____
Attorneys for Tenneco Oil Company

WHITE, GILBERT, KOCH & KELLY
ATTORNEYS AT LAW
P. O. BOX 787
SANTA FE, NEW MEXICO 87501

bcc: Mr. F. J. McDonald
Tenneco Oil Company

AMERADA PETROLEUM CORPORATION

P. O. BOX 2040

TULSA, OKLAHOMA 74102

January 17, 1968

New Mexico Oil Conservation Commission
P. O. Box 2088
Santa Fe, New Mexico 87501

Attention: Mr. A. L. Porter, Jr.

RE: Case 3651 (Reopened)
Hearing January 24, 1968

Gentlemen:

Amerada Petroleum Corporation supports the application of Tenneco Oil Company to establish, on a temporary basis, 160-acre oil spacing and proration units for the North Morton Permo-Pennsylvanian Pool.

Amerada has an over-riding royalty interest in one of the existing wells in this pool and also has undeveloped adjacent leases.

Very truly yours,

R. L. Hocker

RLH:sp

NEW MEXICO OIL CONSERVATION COMMISSION
RECEIVED
JAN 19 1968

EXHIBIT NO. 6

NORTH MORTON PERMO-PENN FIELD
LEA COUNTY, NEW MEXICO
VOLUMETRIC OIL RESERVE ESTIMATES

Basic Data:

Porosity	10.7% (logs and core averages)
Net pay	12'
Water saturation	30% (log estimates)
Initial FVF	1.24 (PVT data)
Recovery factor	15.8% (Schilthius Material Balance Method)

Calculations:

$$\text{Ultimate oil recovery} = \frac{(7758)\ (\emptyset)\ (1\text{-}Sw)\ (R.\ F.)}{Boi}$$

$$= \frac{(7758)\ (.107)\ (.70)\ (15.8)}{1.24}$$

$$= 74.17 \text{ bbls/ac.-ft.}$$

For a net pay thickness of 12':

Ultimate oil recovery = 74.17 bbls/ac.-ft. X 12 ft.

= 890 bbls/acre

EXHIBIT NO. 7

NORTH MORTON PERMO-PENN FIELD
LEA COUNTY, NEW MEXICO
INDIVIDUAL WELL DATA

	Mobil State #1	Amerada Federal #1	Tenneco Fee #1
Elev.	4053' KB	4057' KB	4069' KB
TD	10,724'	10,660'	10,690'
PBTD	10,660'	10,593'	10,569'
Casing	5-1/2" @ 10,690', Cmt'd. w/200 sx.	5-1/2" @ 10,623', Cmt'd. w/200 sx.	5-1/2" @ 10,602' Cmt'd. w/200 sx.
Perfs.	10,428-30, 10,434-38, 10,444-48, 10,452-56	10,445, 447, 449, 451, 453, (all 2 SPI)	10,450-70, 10,498-506 (all 1 SPI)
Treatment	Ac/500 gals.	Ac/500 gals.	Ac/2500 gals. in 2 stages
Date	8-1-67	11-9-67	12-14-67
Init. Pot.	Flwd. 132 BO in 12 hrs., 8/64" ck., TP 725 PSI, 538 GOR, 42.4° API	Flwd. 96 BO in 6 hrs. 12/64" ck. TP 675 PSI 182 GOR, Grav. N. A.	Flwd. 408 BO in 24 hrs., 13/64" ck., TP 1175 PSI 600 GOR, 43° API
12-67 Prod.	9887 BO	8772 BO	3189 BO
Cum. Prod. 1-1-68	44,425 BO	12,024 BO	3189 BO

Total Field Cum. 1-1-68: 59,638 BO

EXHIBIT NO. 8

NORTH MORTON PERMO-PENN FIELD
LEA COUNTY, NEW MEXICO
BOTTOM HOLE PRESSURE DATA

Well	Date	Measured Actual BHP @ -6400' Datum	Calculated Reservoir BHP	Measured Press. As % of Cal-Culated Press.
Mobil State No. 1	7-22-67	4019 PSIG (DST)	4044 PSIG	99.4
	9-2-67	4005 PSIG (48 hr. SIBHP)	4013 PSIG	99.8
	1-2-68	3976 PSIG (70 hr. SIBHP)	3984 PSIG	99.8
Amerada Federal No. 1	11-2-67	3960 PSIG (DST)	3960 PSIG	100.0
	1-2-68	3972 PSIG (68-1/2 hr. SIBHP)	3980 PSIG	99.8
Tenneco Fee No. 1	12-4-67	3870 PSIG (DST)	3897 PSIG	99.3
Tenneco Federal No. 1	1-13-68	3987 PSIG (DST)	3987 PSIG	100.0

K·E 1 YEAR BY DAYS X 180 DIVNS. KEUFFEL & ESSER CO. ANY FISCAL YEAR 359-140L MADE IN U.S.A.

PRESSURE - psig

3700 50 3800 50 3900 50 4000 50

July 5 10 15 20 25 | August 5 10 15 20 25 | September 5 10 15 20 25 | October 5 10 15 20 25 | November 5 10 15 20 25 | December 5 10 15 20

1967

243 BOPD

2558 OPD

323 BOPD

420 BOPD

705 BO

Original BHP- Mobil State #1
DST # 2

Mobil State #1
48 Hr. SIBHP

Amerada Federal #1
DST #1

Tenneco Fee #1
DST #2

EXHIBIT 9

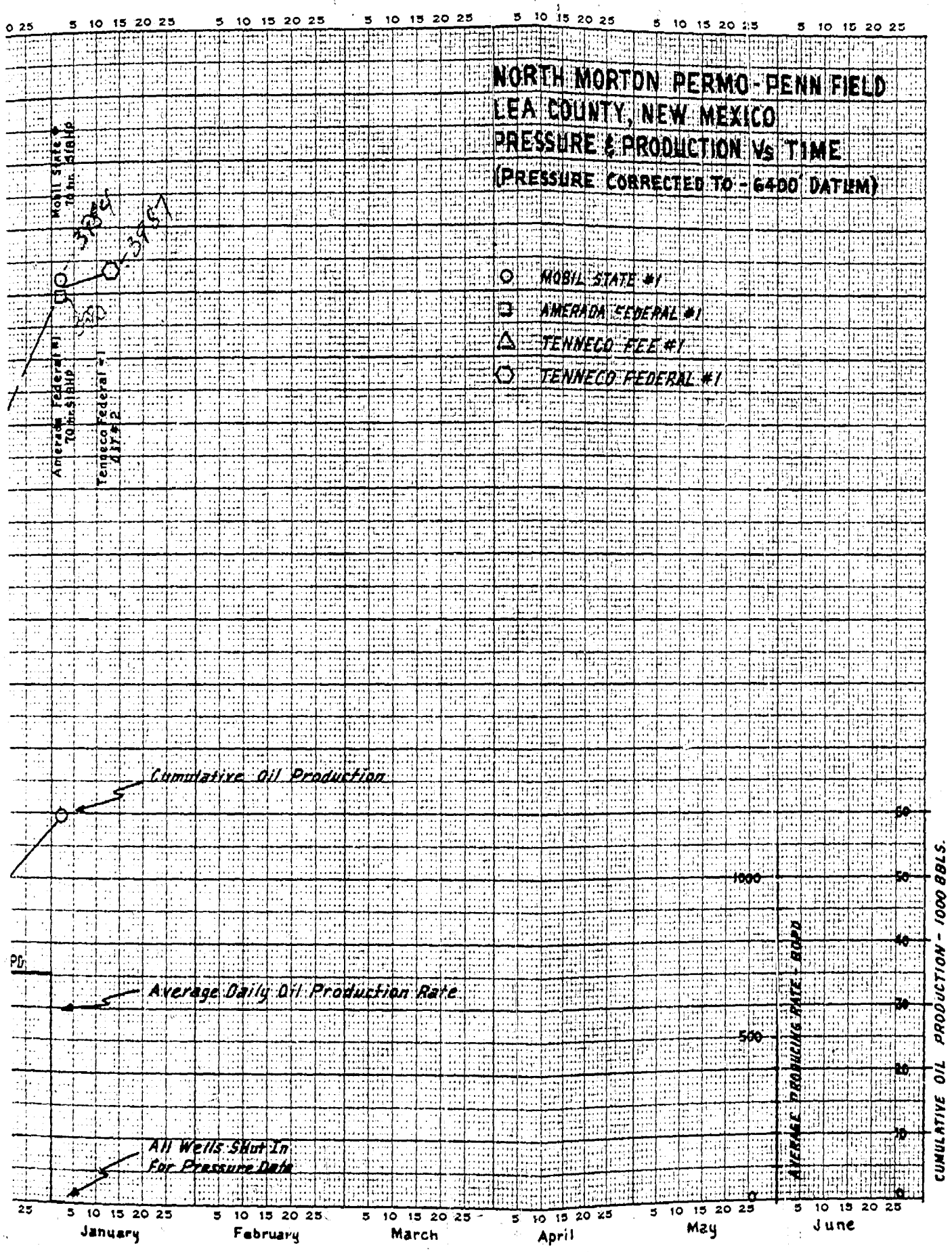
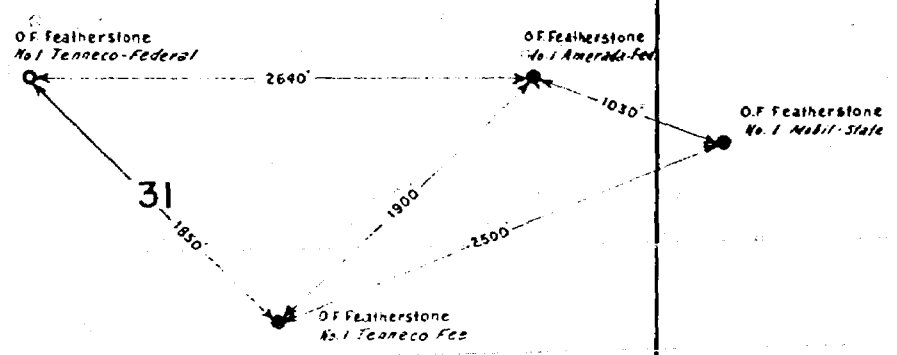

NORTH MORTON PERMO-PENN FIELD
LEA COUNTY, NEW MEXICO
PRESSURE & PRODUCTION Vs TIME
(PRESSURE CORRECTED TO -6400 DATUM)
MOBIL STATE #1
AMERADA FEDERAL #1
TENNECO FEE #1
TENNECO FEDERAL #1
Mobil State #1 70 hr. Shut-in
Amerada Federal #1 70 hr. Shut-in
Tenneco Federal #1 All #2
Cumulative Oil Production
Average Daily Oil Production Rate
All Wells Shut In For Pressure Data
AVERAGE PRODUCING RATE - BOPD
CUMULATIVE OIL PRODUCTION - 1000 BBLS.
1000
500
0
50
40
30
20
10
0
January
February
March
April
May
June
1968

EXHIBIT 10

R - 35 - E

T
14
S



32

LOCATION PLAT

N

TENNECO OIL COMPANY
A SUBSIDIARY OF TENNECO CORPORATION

NORTH MORTON PERMO-PENN FIELD
LEA COUNTY, NEW MEXICO

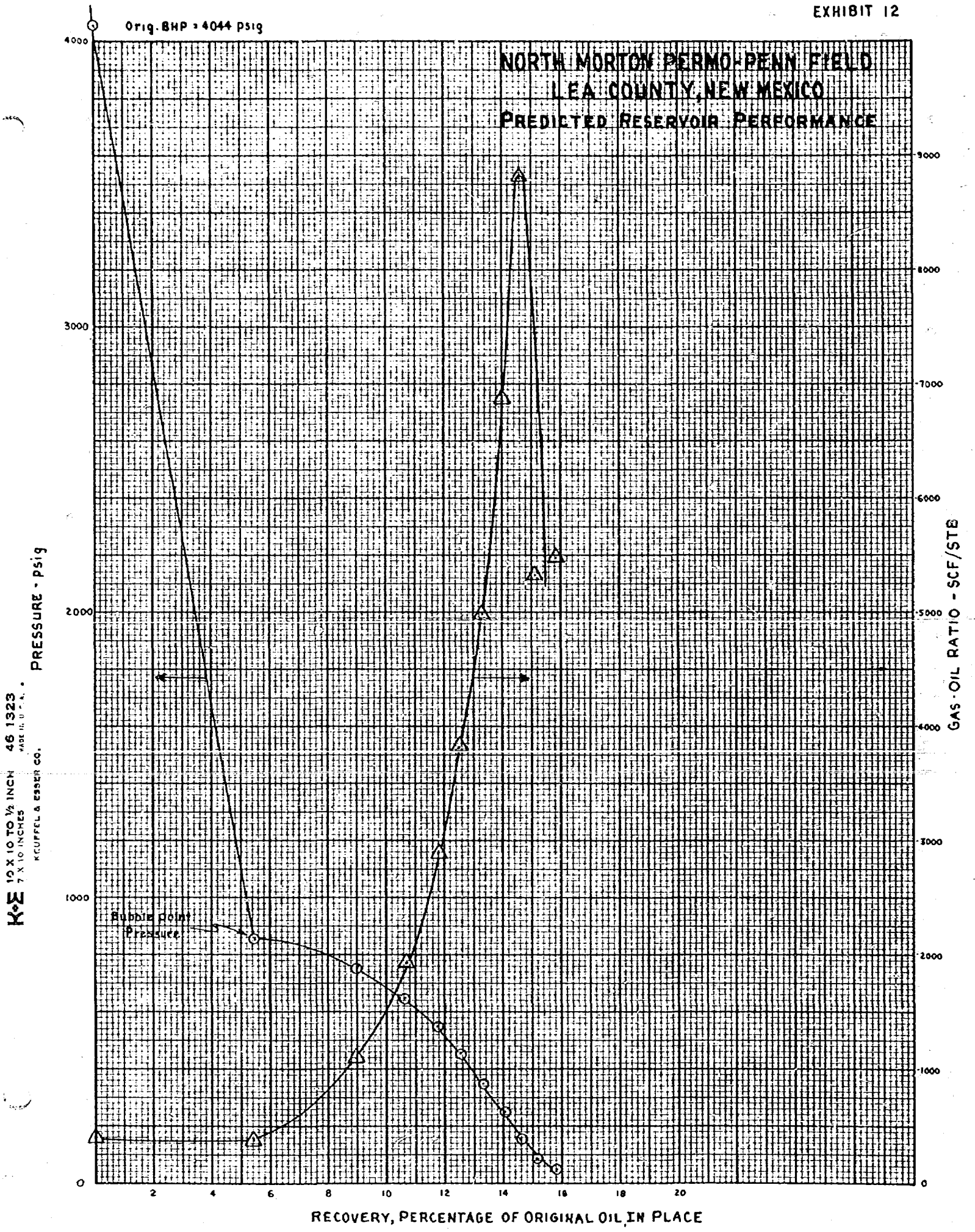
SCALE: 1" = 1000'

EXHIBIT NO. 11

NORTH MORTON PERMO-PENN FIELD
LEA COUNTY, NEW MEXICO
COMPARISON OF ROCK AND FLUID PROPERTIES
FROM BOTTOM HOLE FLUID SAMPLES

	East Saunders Permo-Penn Field	High Plains Penn Field	North Morton Permo-Penn Field
Depth to top of pay	10,366'	10,437'	10,435'
Net pay, ft.	18.3	25	12
Porosity, %	8.1	10	10.7
Water saturation, %	32.1	32	30
Permeability, md.	46.2(core)	103(DST)	41.7(P.I. data)
Original reservoir pressure, psig	3914	3942	4044
Saturation pressure, psig	2346	2625	858 –
Original solution GOR, SCF/STB	939	1125	377
Initial formation volume factor, bbl./bbl.	1.527	1.653	1.236
Stock-tank oil gravity, °API @ 60° F.	44.4	44.1	44.8
Gas specific gravity	N. A.	0.87	0.78
Reservoir temperature, °F.	155	154	157
Initial reservoir oil viscosity, cp.	0.295	N. A.	0.709

EXHIBIT 12



K&E 10 X 10 TO ½ INCH 46 1323
7 X 10 INCHES
KEUFFEL & ESSER CO.

EXHIBIT NO. 13

NORTH MORTON PERMO-PENN FIELD
LEA COUNTY, NEW MEXICO
ECONOMICS FOR VARIOUS SPACING PATTERNS

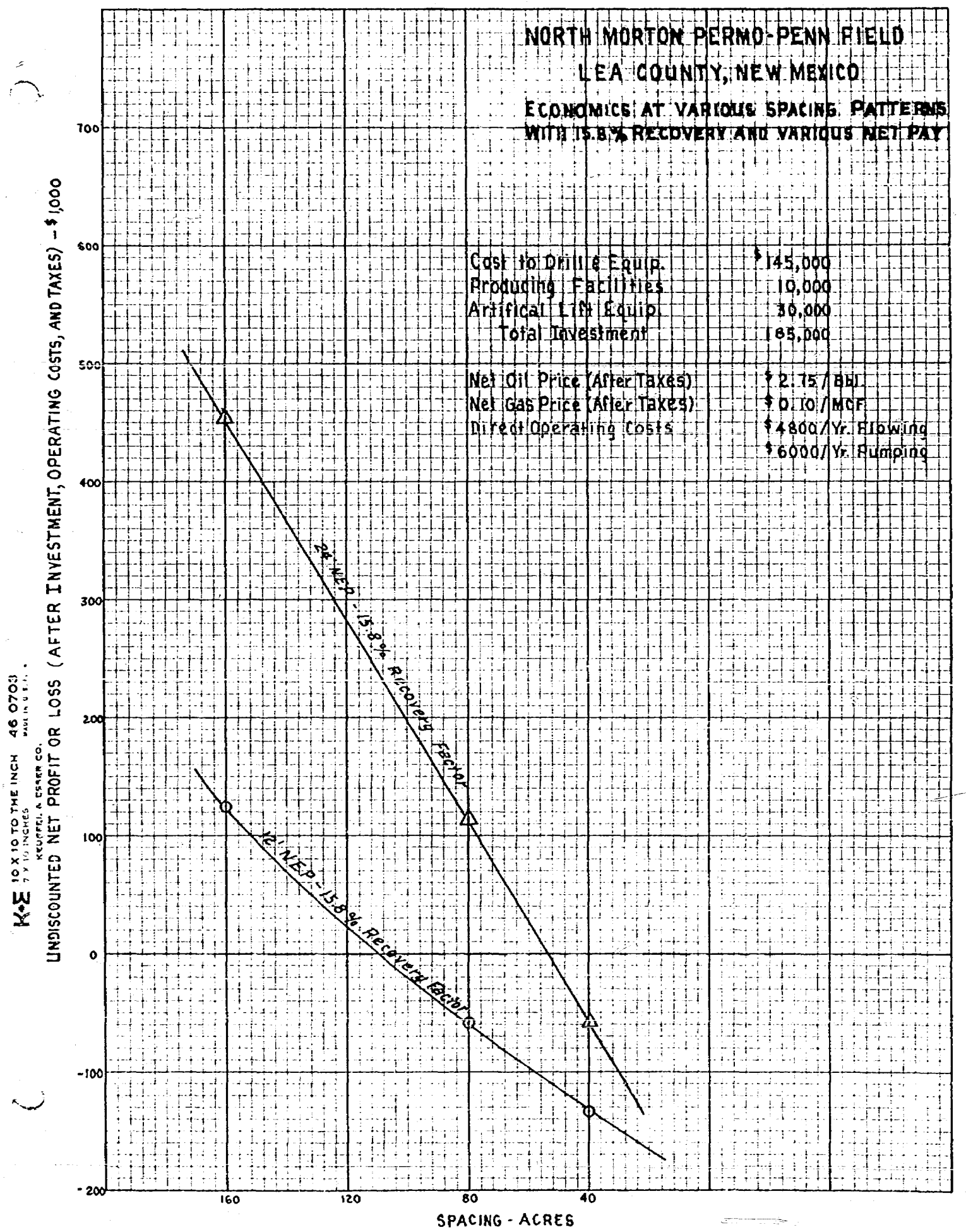
Basic Data:

Net oil value, after production taxes	$2.75/bbl. (estimated)
Net gas value, after production taxes	$0.10/MCF (estimated)
Net interest, after royalty	82.5%
Production taxes	6.5% (estimated)
Lifting costs	$4800/year/well flowing $6000/year/well artificial lift
Well investment	$145,000 drill and equip 10,000 production equipment 30,000 artificial lift equipment $185,000 Total

Economics:

		WELL SPACING		
		40 Acre	80 Acre	160 Acre
1.	Recoverable oil, bbls.	35,600	71,200	142,400
2.	Recoverable gas, MMCF	61.6	123.2	246.4
3.	Net oil revenue, $2.75 X .825 X (1)	$80,812	$161,624	$333,248
4.	Net gas revenue, $100 X .825 X (2)	$5,082	$10,164	$20,328
5.	Total net revenue, after royalty and production taxes (3) + (4)	$85,894	$171,788	$343,576
6.	Operating costs	$34,800	$46,800	$34,800
7.	Net operating revenue, after taxes and royalty (5) - (6)	$51,094	$124,988	$308,776
8.	Investment	$185,000	$185,000	$185,000
9.	Profit or (Loss) (7) - (8)	($133,906)	($60,012)	$123,776
10.	Profit-to-investment ratio (9)÷(8)	Loss	Loss	0.67:1

EXHIBIT 14


NORTH MORTON PERMO-PENN FIELD
LEA COUNTY, NEW MEXICO
ECONOMICS AT VARIOUS SPACING PATTERNS
WITH 15.8% RECOVERY AND VARIOUS NET PAY
Cost to Drill & Equip. $145,000
Producing Facilities 10,000
Artifical Lift Equip. 30,000
Total Investment 185,000
Net Oil Price (After Taxes) $2.15 / BBL
Net Gas Price (After Taxes) $0.10 / MCF
Direct Operating Costs $4800/Yr. Flowing
$6000/Yr. Pumping
UNDISCOUNTED NET PROFIT OR LOSS (AFTER INVESTMENT, OPERATING COSTS, AND TAXES) - $1,000
700
600
500
400
300
200
100
0
-100
-200
160
120
80
40
SPACING - ACRES
24 NEP - 15.8% Recovery Factor
Ye NEP - 15.8% Recovery Factor
K+E 10 X 10 TO THE INCH 46 0703
7 X 10 INCHES
KEUFFEL & ESSER CO.

NORTH MORTON PERMO-PENNSYLVANIAN POOL
Lea County, New Mexico

Order No. R-3315, Adopting Temporary Operating Rules for the North Morton Permo-Pennsylvanian Pool, Lea County, New Mexico, September 11, 1967.

Application of Olen F. Featherstone for the Creation of a New Pool and Special Pool Rules, Lea County, New Mexico.

CASE NO. 3651
Order No. R-3315

ORDER OF THE COMMISSION

BY THE COMMISSION: This cause came on for hearing at 9 a.m. on September 6, 1967, at Santa Fe, New Mexico, before Examiner Daniel S. Nutter.

NOW, on this 11th day of September, 1967, the Commission, a quorum being present, having considered the testimony, the record, and the recommendations of the Examiner, 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 the applicant, Olen F. Featherstone, seeks the creation of a new oil pool for Permo-Pennsylvanian production in Lea County, New Mexico, including a provision for 80-acre spacing units.

(3) That the Olen F. Featherstone Mobil-State Well No. 1, located in Unit E of Section 32, Township 14 South, Range 35 East, NMPM, Lea County, New Mexico, has discovered a separate common source of supply which should be designated the North Morton Permo-Pennsylvanian Pool; that the vertical limits of said pool should be the Lower Wolfcamp and the Upper Pennsylvanian formations as found in the interval from 10,305 feet to 10,605 feet on the log of the aforesaid Olen F. Featherstone Mobil-State Well No. 1; and that the horizontal limits of said pool should be the NW/4 of said Section 32, Township 14 South, Range 35 East, NMPM, Lea County, New Mexico.

(4) That in order to prevent the economic loss caused by the drilling of unnecessary wells, to avoid the augmentation of risk arising from the drilling of an excessive number of wells, to prevent reduced recovery which might result from the drilling of too few wells, and to otherwise prevent waste and protect correlative rights, temporary special rules and regulations providing for 80-acre spacing units should be promulgated for the North Morton Permo-Pennsylvanian Pool.

(5) That the temporary special rules and regulations should provide for limited well locations in order to assure orderly development of the pool and protect correlative rights.

(6) That the temporary special rules and regulations should be established for a one-year period in order to allow the operators in the subject pool to gather reservoir information to establish the area that can be efficiently and economically drained and developed by one well.

(7) That this case should be reopened at an examiner hearing in September, 1968, at which time the operators in the subject pool should be prepared to appear and show cause why the North Morton Permo-Pennsylvanian Pool should not be developed on 40-acre spacing units.

IT IS THEREFORE ORDERED:

(1) That a new pool in Lea County, New Mexico, classified as an oil pool for Permo-Pennsylvanian production, is hereby created and designated the North Morton Permo-Pennsylvanian Pool, with vertical limits comprising the Lower Wolfcamp and the Upper Pennsylvanian formations as found in the interval from 10,305 feet to 10,605 feet on the log of the Olen F. Featherstone Mobil-State Well No. 1, located in Unit E of Section 32, Township 14 South, Range 35 East, NMPM, Lea County, New Mexico, and horizontal limits comprising the NW/4 of said Section 32.

(2) That temporary Special Rules and Regulations for the North Morton Permo-Pennsylvanian Pool are hereby promulgated as follows:

SPECIAL RULES AND REGULATIONS
FOR THE
NORTH MORTON PERMO-PENNSYLVANIAN POOL

RULE 1. Each well completed or recompleted in the North Morton Permo-Pennsylvanian Pool or in the Lower Wolfcamp or Upper Pennsylvanian formation within the defined vertical limits of said pool within one mile thereof, and not nearer to or within the limits of another designated Wolfcamp or Pennsylvanian oil pool, shall be spaced, drilled, operated, and produced in accordance with the Special Rules and Regulations hereinafter set forth.

RULE 2. Each well shall be located on a standard unit containing 80 acres, more or less, consisting of the N/2, S/2, E/2, or W/2 of a governmental quarter section; provided, however, that nothing contained herein shall be construed as prohibiting the drilling of a well on each of the quarter-quarter sections in the unit.

RULE 3. The Secretary-Director of the Commission may grant an exception to the requirements of Rule 2 without notice and hearing when an application has been filed for a non-standard unit comprising a governmental quarter-quarter section or lot, or the unorthodox size or shape of the tract is due to a variation in the legal subdivision of the United States Public Land Surveys. All operators offsetting the proposed non-standard unit shall be notified of the application by registered or certified mail, and the application shall state that such notice has been furnished. The Secretary-Director may approve the application upon receipt of written waivers from all offset operators or if no offset operator has entered an objection to the formation of the non-standard unit within 30 days after the Secretary-Director has received the application.

(NORTH MORTON PERMO-PENNSYLVANIAN POOL - Cont'd.)

RULE 4. Each well shall be located within 150 feet of the center of a governmental quarter-quarter section or lot.

RULE 5. The Secretary-Director may grant an exception to the requirements of Rule 4 without notice and hearing when an application has been filed for an unorthodox location necessitated by topographical conditions or the recompletion of a well previously drilled to another horizon. All operators offsetting the proposed location shall be notified of the application by registered or certified mail, and the application shall state that such notice has been furnished. The Secretary-Director may approve the application upon receipt of written waivers from all operators offsetting the proposed location or if no objection to the unorthodox location has been entered within 20 days after the Secretary-Director has received the application.

RULE 6. A standard proration unit (79 through 81 acres) shall be assigned an 80-acre proportional factor of 5.67 for allowable purposes, and in the event there is more than one well on an 80-acre proration unit, the operator may produce the allowable assigned to the unit from the wells on the unit in any proportion.

The allowable assigned to a non-standard proration unit shall bear the same ratio to a standard allowable as the acreage in such non-standard unit bears to 80 acres.

IT IS FURTHER ORDERED:

(1) That the locations of all wells presently drilling to or completed in the North Morton Permo-Pennsylvanian Pool or in the Lower Wolfcamp or Upper Pennsylvanian formation within the defined vertical limits of said pool within one mile thereof are hereby approved; that the operator of any well having an unorthodox location shall notify the Hobbs District Office of the Commission in writing of the name and location of the well on or before October 1, 1967.

(2) That each well presently drilling to or completed in the North Morton Permo-Pennsylvanian Pool or in the Lower Wolfcamp or Upper Pennsylvanian formation within the defined vertical limits of said pool within one mile thereof shall receive a 40-acre allowable until a Form C-102 dedicating 80 acres to the well has been filed with the Commission.

(3) That this case shall be reopened at an examiner hearing in September, 1968, at which time the operators in the subject pool may appear and show cause why the North Morton Permo-Pennsylvanian Pool should not be developed on 40-acre spacing units.

(4) That jurisdiction of this cause is retained for the entry of such further orders as the Commission may deem necessary.

DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.

CASE # 3651

EXHIBIT C

RESERVOIR & WELL DATA
Olen F. Featherstone
#1 Mobil State Well

1. Location - 2310' FNL, 330 FWL
Sec. 32, T-14-S, R-35-E
Lea County, New Mexico

2. Well Data:

a.	Elevation	4,040'
b.	Total Depth	10,716'
c.	Plug Back Depth	10,590'
d.	Top Permo-Penn Formation	10,320' (-6280)
e.	Top of Pay	10,428' (-6380)
f.	Net Pay	14 feet (Acoustic Log)
g.	Perforated Intervals	10,428'-30', 10,434'-38' 10,444'-48', 10,452'-58'
h.	Treatment	500 gallons acid
i.	Completion Data (8-1-67)	
(1)	Oil Production	264 BOPD based on 132 barrels of oil for 12 hours.
(2)	Gas-Oil Ratio	538 cubic feet/bbl.
(3)	Choke Size	8/64 inch
(4)	Tubing Pressure	750 lbs.
(5)	Water Cut	-0-
j.	Current Production Test (8-30-67)	
(1)	Oil Production	348 bbls.
(2)	Gas-Oil Ratio	538 cubic ft./bbl. (Est.)
(3)	Choke Size	10/64 Inch
(4)	Tubing Pressure	710 lbs.
(5)	Water Cut	-0-
(6)	Bottom Hole Pressure (Survey 9-2-67)	4002 lbs.

3. Reservoir Data:

a.	Average Porosity - %	9.0%
b.	Net Pay	14.0 Feet
c.	Permeability - md	420 md
d.	Water Saturation - %	22.0%
e.	Recovery Factor	25.0
f.	Initial Bottom Hole Pressure	4005 (DST)
g.	G.O.R.	538 cubic feet to bbl.
h.	Gravity	42°

BEFORE EXAMINER NUTTER
OIL CONSERVATION COMMISSION
EXHIBIT NO. 3
CASE NO. 3651

CASE 3651

EXHIBIT No. 3

FEATHERSTONE
MOBIL St. #1

Liquid Proc

CASE 3651

EXHIBIT No. 3a

			PRESSURE	PF
B.T. Gauge Numbers			1397	
Initial Hydrostatic			4837	
Final Hydrostatic			4848	
1st Flow	Initial	Time -----	1192	
	Final		2290	
Initial Closed In Pressure			4005	
2nd Flow	Initial	-----	2260	
	Final		3487	
Final Closed In Pressure			3986	
Extrapolated Static Pressure	Initial		4028	
	Final		4012	
Slope psi/cycle	Initial		23	
	Final		23	

Drill Collar Length	ft.
Drill Collar I.D.	in.
Drill Pipe Factor	bbls./ft.
Hole Size	in.
Footage Tested	ft.
Mud Weight	lbs./gal.
Viscosity, Oil or Water	cp
Oil API Gravity	—
Water Specific Gravity	—

Remarks: DST #2 10,370 - 10,460
Assuming: 55 BOPH. 14' Net pay.

SUMMARY

Gauge No. 1397
Depth 10,450

Gauge No.
Depth

Product	Equation	Initial	Final	Initial	Final	Units
Production	$Q = \frac{1440\ R}{t}$		1320			bbls./day
Transmissability	$\frac{Kh}{\mu} = \frac{162.6\ Q}{m}$		9350			md. ft./cp
Indicated Flow Capacity	$Kh = \frac{Kh}{\mu}\ \mu$		5850			md. ft.
Average Effective Permeability	$K = \frac{Kh}{h}$		65			md.
	$K_1 = \frac{Kh}{h_1}$		420			md.
Damage Ratio	$DR = .183\ \frac{Ps - Pf}{m}$		4.18			—
Theoretical Potential w/Damage Removed	$Q_1 = Q\ DR$		5517			bbls./day
Approx. Radius of Investigation	$b \leq \sqrt{Kt}$ or $\sqrt{Kt_0}$		85			ft.
	$b_1 \leq \sqrt{K_1 t}$ or $\sqrt{K_1 t_0}$		215			ft.
Potentiometric Surface *	$Pot. = El - GD + 2.319\ Ps$					ft.

BEFORE EXAMINER NUTTER
OIL CONSERVATION COMM.
CASE NO. 3651

NOTICE: These calculations are based upon information furnished by you and taken from Drill Stem Test pressure charts, and are furnished you for your information. In furnishing such calculations and evaluations based thereon, Halliburton is merely expressing its opinion. You agree that Halliburton makes no warranty express or implied as to the accuracy of such calculations or opinions, and that Halliburton shall not be liable for any loss or damage, whether due to negligence or otherwise, in connection with such calculations and opinions.

INTERPRETATIONS AND CALCULATIONS

EXHIBIT D CASE #3651

ECONOMIC CONSIDERATION FOR
VARIOUS SPACING UNITS
NORTH MORTON PERMO-PENN AREA
LEA COUNTY, NEW MEXICO

1. Basic Data:
   a. Value of Oil — 3.05 per bbl.
   b. Net Interest (Operator's) — 81.25%
   c. Production Taxes — 6.29%
   d. Lifting Cost — 0.10 per bbl.
   e. Well Cost — 145,000.00

2. Recoverable Oil - bbls. per acre ft. (Estimated) — 136.00 bbls.

3. Recoverable Oil - bbls. per acre - Est. — 1,904 bbls. per acre

4. Economic Comparison for:

	40 Acre Unit	80 Acre Unit
a. Recoverable	76,160 bbls.	152,320 bbls.
b. Operators Estimated Gross Revenue (81.25% x bbls x 3.05)	188,724.00	377,448.00
c. Operator's Lifting Cost (.10 x bbls.)	7,616.00	15,232.00
d. Production Taxes	11,850.00	23,700.00
e. Operator's Net Income	169,258.00	338,516.00
f. Investment	145,000.00	145,000.00
g. Profit	24,258.00	193,516.00
h. Profit to Invest Ratio	0.169 to 1	1.34 to 1

BEFORE EXAMINER NUTTER
OIL CONSERVATION COMMISSION
EXHIBIT NO. 4
CASE NO. 3651

CASE 3651

EXHIBIT No. 4

R-34-E

R-35-E

T 14 S

T 15 S

25

30

29

36

31

32

1

6

5

8

7

12

MORTON FIELD

NORTH MORTON FIELD

-6450

-6400

-6350

-6300

-6433

-6486

-6391

-6393

-6396

-6394

-6398

-6358

-6396

-6362

-6420

-6296

-6318

-6298

-6276

BEFORE EXAMINER [illegible]

CASE NO. 3651

EXHIBIT NO. 1

STRUCTURE MAP OF MORTON - NORTH MORTON AREA

Datum: Top Pay

C.I.: 50 Feet

Pay tight

W. J. LeMay - Geologist

Case No. 3651

WELL IDENTIFICATION

F = Flowing
P = Pumping

Olen F. Featherstone - #1 - Tenneco Federal

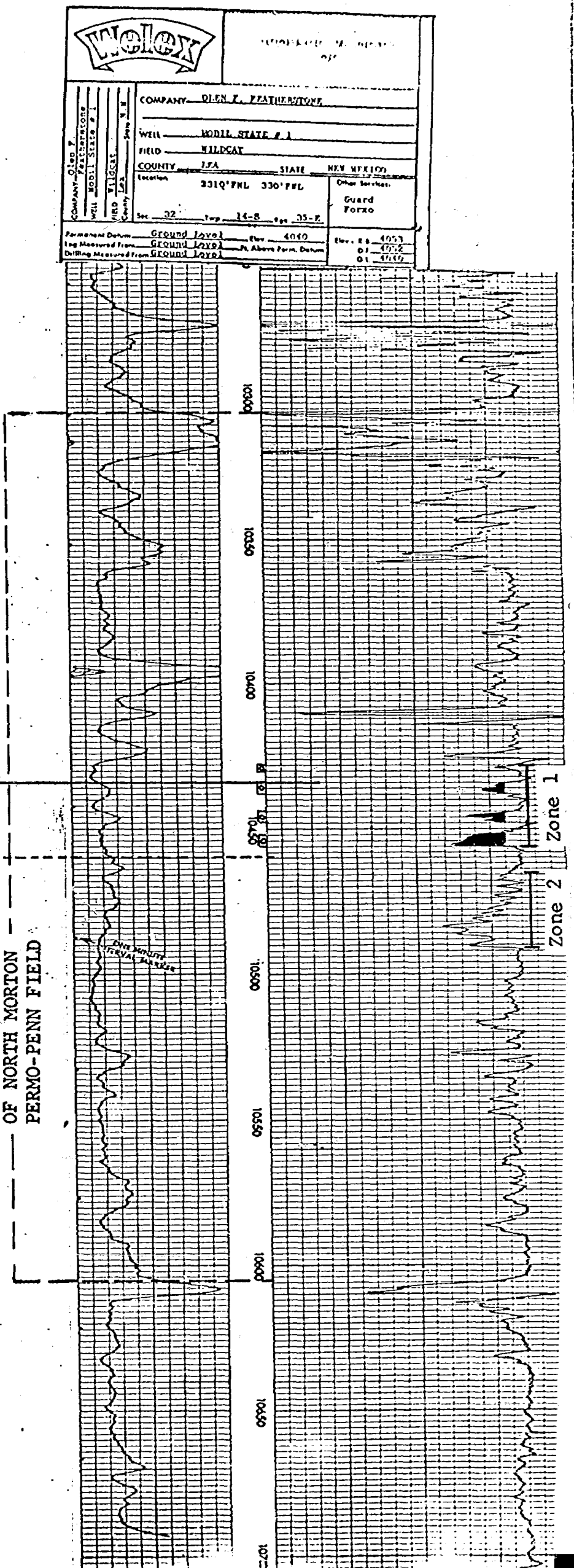
Olen F. Featherstone - #1 - Amerada-Federal

Tenneco Oil Co. - #2 - Maxwell

Tenneco Oil Co. - #1 - Anderson-Fed.

Olen F. Featherstone - #1 - Ten.-Fe

Olen F. Featherstone - #1 - Mobil-S



TOP PAY

Oil-water contact
-6420

VERTICAL LIMITS
OF NORTH MORTON
PERMO-PENN FIELD

BEFORE EXAMINER UTZ
OIL CONSERVATION COMMISSION
Oppo's Exhibit No. 2
CASE NO. 3651

CASE NO. 3651
EXHIBIT NO. 2
TYPE LOG
FEATHERSTONE NO. 1
MOBIL STATE
(Discovery well)
Net pay

W. J. LeMay - Geologist

PRESSURE - psig

3700 50 3800 50 3900 50 4000 50

July 1967 Aug. Sept. Oct. Nov. Dec. Jan, Feb. Mar. Apr. 1968 May June July

CASE NO. 3651
EXHIBIT NO. 3
NORTH MORTON FIELD
OIL PRODUCTION VS. RESERVOIR
PRESSURE VS. TIME

W. J. LeMay - Geologist

Original BHP - Mobil State #1
DST #2

Mobil State #1
48 Hr. SIBHP

Amerada Federal #1
DST #1

Tenneco Fee #1
DST #2

Mobil State
70 Hr. SIBHP

Amerada Federal #1
70 Hr. SIBHP

Tenneco Federal #1
DST #2

Monthly Oil Production

Tenneco Anderson Federal No. 1
24 Hr. SIBHP

Cumulative Oil Production

Tenneco Maxwell No. 2
DST Press. ISIP 3330
FSIP 3110

5000 10,000 15,000 20,000 25,000 30,000 35,000 40,000

MONTHLY OIL PRODUCTION

0 50 100 150 200 250 300

CUMULATIVE OIL PRODUCTION -1000 BBLS.

BEFORE EXAMINER UTZ
OIL CONSERVATION COMMISSION
EXHIBIT NO. 3
CASE NO. 3651

Case No. 3651

Exhibit No. 4

ECONOMIC CONSIDERATION FOR
VARIOUS SPACING UNITS
NORTH MORTON PERMO-PENN AREA
LEA COUNTY, NEW MEXICO

1. Basic Data:
   a. Value of Oil — 3.05 per bbl.
   b. Net Interest (Operator's) — 81.25%
   c. Production Taxes — 6.29%
   d. Lifting Cost — 0.10 per bbl.
   e. Well Cost — 145,000.00
   f. Artificial Lift Equipment — 30,000.00

2. Recoverable Oil - bbls, per acre ft. (Estimated) — 136.00 bbls.

3. Net Pay (average) — 12 feet

4. Recoverable Oil - bbls. per acre - Est. — 1,632 bbls. per acre

5. Economic Comparison for:

	40 Acre Unit	80 Acre Unit
a. Recoverable	65,280 bbls	130,560 bbls.
b. Operators Estimated Gross Revenue (81.25% x bbls x 3.05)	161,186.00	322,372.00
c. Operator's Lifting Cost (.10 x bbls.)	6,528.00	13,056.00
d. Production Taxes	10,154.00	20,308.00
e. Operator's Net Income	144,504.00	289,008.00
f. Investment	175,000.00	175,000.00
g. Profit	(30,496.00)	114,008.00
h. Profit to Invest Ratio	loss	.65 to 1 *

* The above figures do not take into account the risk of dry holes.

BEFORE EXAMINER UTZ
OIL CONSERVATION
EXHIBIT NO. 4
CASE NO. 3651

Exhibit No. 5

Case No. 3651

NORTH MORTON POOL
PRODUCTION DATA

Mobil State

1967

MONTH	STATUS	OIL	WATER	GAS MCF	TUBING PRESSURE	CHOKE SIZE
August	F	8138	-0-	-0-	710	10/64
September	F	7655	-0-	-0-	700	10/64
October	F	10022	-0-	5350	650	12/64
November	F	9687	-0-	9651	650	12/64
December	F	9772	-0-	3537	600	12/64
1967 TOTAL		45274				
1968						
January	F	10596	-0-	5154	575	12/64
February	F	11157	-0-	4859	560	14/64
March	F	13567	-0-	6243	560	14/64
April	F	11792	-0-	5738	500	14/64
May	F	11299	-0-	4381	490	13/64
June	F	11230	-0-	5757	425	15/64
July	F	11854	-0-	6039	300	16/64
1968 TOTAL		81505				
TOTAL		126779				

BEFORE EXAMINER UTZ
OIL CONSERVATION
EXHIBIT NO. 5
CASE NO. 3651

NORTH MORTON POOL
PRODUCTION DATA

Amerada Federal

1967

MONTH	STATUS	OIL	WATER	GAS MCF	TUBING PRESSURE	CHOKE SIZE
November	F	1652	-0-	1445		
December	F	10303	-0-	4103	650	11/64
1967 TOTAL		11955				
1968						
January	F	8255	-0-	4489	650	11/64
February	F	9418	-0-	4924	600	11/64
March	F	11390	-0-	5615	570	11/64
April	F	9780	-0-	4783	500	13/64
May	F	9120	Trace	4198	490	10/64
June	F	4997	140 BWPD	2633	250	15/64
July	P	5664	150 BWPD	2633		
1968 TOTAL		58624				
TOTAL		70579				

Well dead July 11, 1968 installed pump

NORTH MORTON POOL
PRODUCTION DATA

Tenneco Fee

1967 MONTH	STATUS	OIL	WATER	GAS MCF	TUBING PRESSURE	CHOKE SIZE
December	F	2508	-0-	428		
1967 TOTAL		2508				
1968						
January	F	7408	-0-	11180	930	14/64
February	F	3197	-0-	6790	570	14/64
March	F	5890	-0-	5533	570	14/64
April	F	9663	-0-	5377	475	13/64
May	F	9751	-0-	5356	450	15/64
June	F	7592	-0-	4422	400	15/64
July	F	8037	-0-	4260		
1968 TOTAL		51538				
TOTAL		54046				

NORTH MORTON POOL
PRODUCTION DATA

Tenneco Federal

1968

MONTH	STATUS	OIL	WATER	GAS MCF	TUBING PRESSURE	CHOKE SIZE
February	F	2369	1015 BWPD	1143	450	12/64
March	F	368	1085 BWPD	63		
April	F	27	1100 BWPD		250	14/64
May	P	884	1070 BWPD	125		
June	P	3494	984 BWPD	130		
July	P	2467	1020 BWPD	697		
1968 TOTAL		9609				
TOTAL		9609				

New Mexico Portion
Arkansas - White - Red
Basin Report

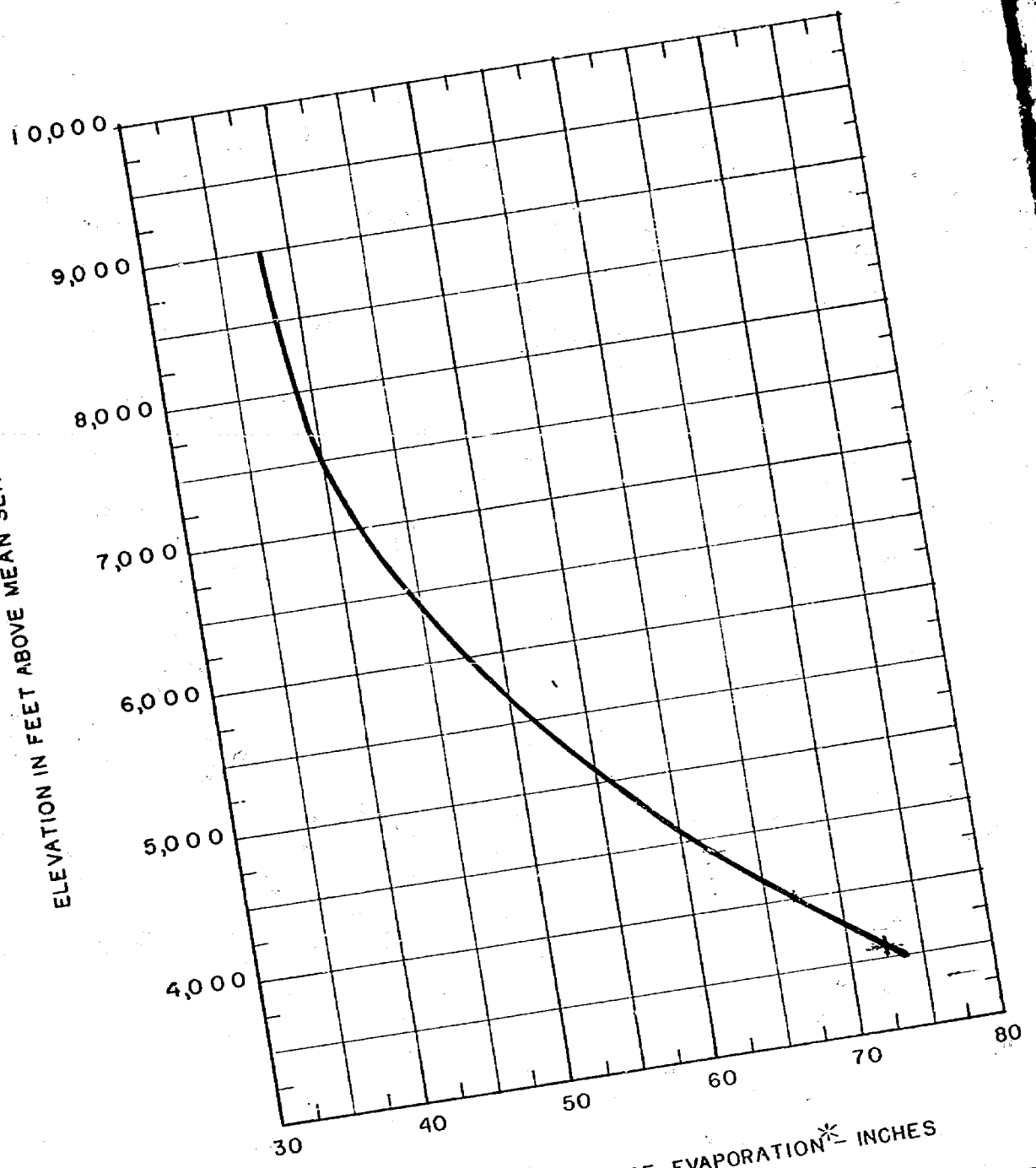


FIG. 7
ELEVATION-EVAPORATION RELATIONSHIP
ARKANSAS BASIN NEW MEXICO
1930–1951
NEW MEXICO PORTION A.W.R. BASINS

*Pan evaporation converted to water surface evaporation by use of 0.7 pan coefficient

Attachment 3

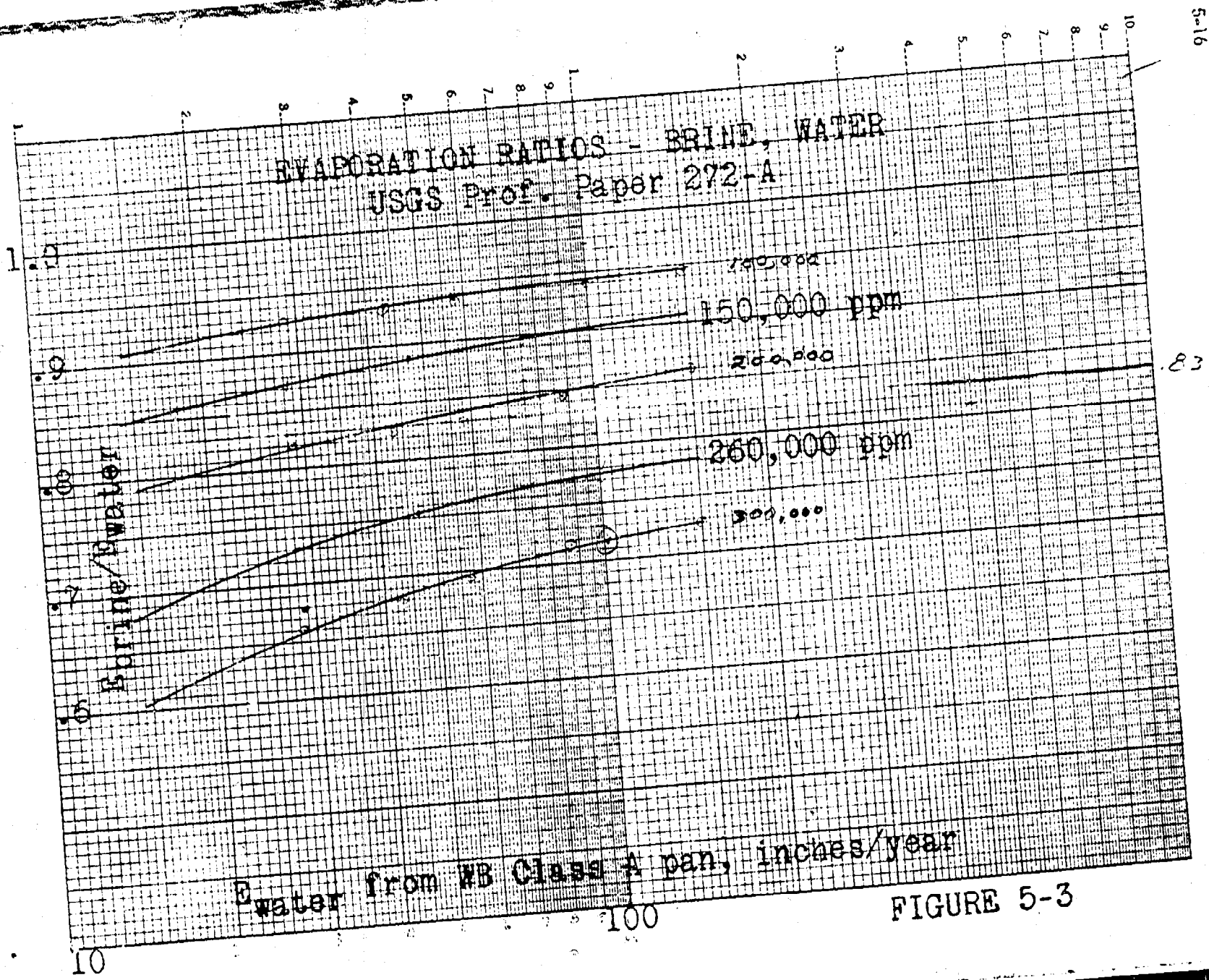


FIGURE 5-3

From Chapter 5 Progress Report No. 20
Office of Saline Water, 1958

5-16

Attachment 10

NORTH MORTON PERMO-PENN FIELD
LEA COUNTY, NEW MEXICO
BOTTOMHOLE PRESSURE DATA

Well	Elevation K. B.	Date	DST No. & Interval	DST Pressures PSIG (FSIP) Field Readings	DST Pressures PSIG (FSIP) Office Corrected	Extrapolated** DST Pressure PSIG	Shut-In BHP PSIG	Pressure Corrected To-6400' Datum (.307 psi/ft. Gradient) PSIG	
								Office Corrected	Calculated Reservoir
Mobil State No. 1	4053'	7-22-67	2-10,370'-460'	3834	4007	4032	----	4019	4044
		9-2-67*	---	----	----	----	3971	4005***	4013
		1-2-68*	---	----	----	----	3947	3976***	3984
Amerada Federal No. 1	4057'	11-2-67	1-10,429'-480'	3869	3960	3960	----	3960	3960
		1-2-68*	---	----	----	----	3972	3972***	3980
Tenneco Fee No. 1	4069'	12-4-67	2-10,396'-457'	3801	3857	3884	----	3870	3897
Tenneco Federal No. 1	4069'	1-13-68	2-10,455'-480'	3933	3987	3987	----	3987	3987

* These BHP were obtained with Amerada Pressure Bomb after completing wells.

** Extrapolated from plot of pressure vs log $\frac{T + \Delta T}{\Delta T}$.

*** These are corrections of the SIBHP made in the Midland District Production Office of Tenneco Oil Company.

EXHIBIT 8a