CASE 2012: Application of MAX PRAY for a new oil pool for Devonian production and for special rules.

Case No.

2012

Application, Transcript,
Small Exhibits, Etc.

BEFORE THE
OIL CONSERVATION COMMISSION
STATE CORPORATION COMMISSION HEARING ROOM
Santa Fe, New Mexico
July 6, 1960

EXAMINER HEARING

IN THE MATTER OF: 2012

Application of Max Pray for the creation of a new oil pool for Devonian production and for the promulgation of special rules and regulations for said pool. Applicant, in the above-styled cause, seeks an order creating a new oil pool for Devonian production consisting of the W/2 of Section 27, E/2 of Section 28, NE/4 of Section 33 and the NW/4 of Section 34, Township 12 South, Range 37 East, Lea County, New Mexico. Applicant further seeks the promulgation of special rules and regulations governing said pool including a provision for temporary 80-acre oil proration units.

BEFORE:
Mr. Elvis A. Utz, Examiner
Mr. Oliver E. Payne, Attorney

TRANSCRIPT OF HEARING

MR. UTZ: Case 2012.

MR. PAYNE: I would like to request that case 2012 be continued until the examiner hearing before examiner Utz on the 11th of July, and I might state that to my knowledge all of the parties in that area have been advised by letter from Skelly Oil Company or by telegram from Skelly Oil Company that the case is being continued to July 11.

MR. UTZ: Is there objection to counsel's motion? Case 2012 will be continued to the examiner hearing of July 11, 1960.

STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

I, LEWELLYN NELSON, Notary Public in and for the County of Bernalillo, State of New Mexico, do hereby certify that the foregoing and attached Transcript of Hearing was reported by me in Stenotype, and that the same was reduced to typewritten transcript under my supervision, and contains a true and correct record of said proceedings, to the best of my knowledge, skill and ability.

DATED this 8th day of July, 1960, in the City of Albuquerque, County of Bernalillo, State of New Mexico.

Lewellyn F. Nelson
NOTARY PUBLIC

My Commission Expires:

June 14, 1964.

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 2012, heard by me on 7-6, 1960.

New Mexico Oil Conservation Commission, Examiner

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. 2012
Order No. R-1724
NOMENCLATURE

APPLICATION OF MAX PRAY FOR THE
CREATION OF A NEW OIL POOL FOR
DEVONIAN PRODUCTION IN LEA COUNTY,
NEW MEXICO, AND FOR THE PROMULGA-
TION OF SPECIAL RULES AND REGULA-
TIONS FOR SAID POOL.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 o'clock a.m. on July 11, 1960, at Santa Fe, New Mexico, before Elvis A. Utz, Examiner duly appointed by the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission," in accordance with Rule 1214 of the Commission Rules and Regulations.

NOW, on this 21st day of July, 1960, the Commission, a quorum being present, having considered the application, the evidence adduced, and the recommendations of the Examiner, Elvis A. Utz, 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, Max Pray, seeks an order creating a new oil pool for Devonian production to be designated as the Southwest Gladiola-Devonian Pool, consisting of the SW/4 of Section 26, W/2 and SE/4 of Section 27, E/2 of Section 28, NE/4 of Section 33, and NW/4 of Section 34, all in Township 12 South, Range 37 East, NMPM, Lea County, New Mexico.

(3) That inasmuch as the area contained in the above-described Southwest Gladiola-Devonian Pool includes the SW/4 of Section 26, Township 12 South, Range 37 East, NMPM, Lea County, New Mexico, previously designated as the West Gladiola-Devonian Pool by Order No. R-1681, said West Gladiola-Devonian Pool should be abolished.

(4) That the evidence presented concerning the reservoir

characteristics of the proposed Southwest Gladiola-Devonian Pool in Lea County, New Mexico, including permeability and porosity data, does not justify a permanent order establishing 80-acre proration units in said pool, as requested; however, the evidence presented does justify the establishment of 80-acre proration units in said pool for a temporary one-year period.

(5) That the evidence presented indicates that, for the present at least, it may be uneconomical to drill wells in the Southwest Gladiola-Devonian Pool on 40-acre proration units, and that unless a temporary 80-acre proration unit order is entered, further development in said pool may be retarded.

(6) That due to the apparently limited size of said pool, a flexible rule governing well locations should be adopted.

(7) That during the one-year period in which this order will be in effect, the applicant should gather all available information relative to drainage and recoverable reserves in the subject pool.

(8) That this case should be heard again by the Commission at the regular monthly hearing in July, 1961, at which time the applicant should be prepared to prove by a preponderance of the evidence why the Southwest Gladiola-Devonian Pool should not be developed on 40-acre units.

IT IS THEREFORE ORDERED:

(1) That a new pool in Lea County, New Mexico, classified as an oil pool for Devonian production, be and the same is hereby created and designated as the Southwest Gladiola-Devonian Pool, consisting of the following-described acreage:

TOWNSHIP 12 SOUTH, RANGE 37 EAST, NMPM
Section 26: SW/4
Section 27: W/2 and SE/4
Section 28: E/2
Section 33: NE/4
Section 34: NW/4

(2) That the West Gladiola-Devonian Pool created and designated by Order No. R-1681 be and the same is hereby abolished.

(3) That temporary special rules and regulations for the Southwest Gladiola-Devonian Pool in Lea County, New Mexico, be and the same are hereby promulgated as follows, effective August 1, 1960.

SPECIAL RULES AND REGULATIONS
FOR THE
SOUTHWEST GLADIOLA-DEVONIAN POOL

RULE 1. Each well completed or recompleted in the Southwest Gladiola-Devonian Pool or in the Devonian formation within one mile of said pool, and not nearer to nor within the limits of another designated Devonian Pool, shall be spaced, drilled, operated, and prorated in accordance with the Special Rules and Regulations hereinafter set forth.

RULE 2. Each well completed or recompleted in the Southwest Gladiola-Devonian Pool shall be located on a unit containing 80 acres, more or less, which consists of any two contiguous quarter-quarter sections of a single 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 80-acre unit.

RULE 3. Unit wells shall be located within 150 feet of the center of either quarter-quarter section in the 80-acre unit. Any well which was drilling to or completed in the subject pool prior to July 6, 1960, is granted an exception to the well location requirements of this Rule.

RULE 4. For good cause shown, the Secretary-Director may grant exception to the requirements of Rule 2 without notice and hearing when the application is for a non-standard unit comprising a single quarter-quarter section or lot. All operators offsetting the proposed non-standard unit shall be notified of the application by registered mail, and the application shall state that such notice has been furnished. The Secretary-Director may approve the application if, after a period of 30 days, no offset operator has entered an objection to the formation of such non-standard unit.

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

RULE 5. An 80-acre proration unit (79 through 81 acres) in the subject pool shall be assigned an 80-acre proportional factor of 7.75 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 in any proportion.

IT IS FURTHER ORDERED:

That operators who propose to dedicate 80 acres to a well in the Southwest Gladiola-Devonian Pool must file an amended

Commission Form C-128 with the Hobbs District Office of the Commission by August 15, 1960, in order that the well may be assigned an 80-acre allowable on the September proration schedule.

IT IS FURTHER ORDERED:

That this case be reopened at the regular monthly hearing of the Commission in July, 1961, at which time operators in the subject pool shall appear and show cause why the Southwest Gladiola-Devonian Pool should not be developed on 40-acre proration units.

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

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

JOHN BURROUGHS, Chairman

MURRAY E. MORGAN, Member

A. L. PORTER, Jr., Member

esr/

DOCKET: REGULAR HEARING - TUESDAY [illegible]

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

ALLOWABLE:

(1) Consideration of the oil allowable for August, 1961.

(2) Consideration of the allowable for gas for August, 1961, for [illegible] Counties, New Mexico, also consideration of the allowable production of gas from said prorated pools in San Juan, Rio Arriba and Sandoval [illegible], New Mexico, for August, 1961.

CONTINUED CASE

CASE 2215: In the matter of the hearing called by the Oil Conservation Commission on its own motion to consider the promulgation of an order prohibiting the venting of casinghead gas from oil wells in the Cha Cha-Gallup and Bisti-Gallup Oil Pools, San Juan County, New Mexico.

CASE 2012: (Reopened) In the matter of the application of Max Frey for the establishment of 80-acre oil proration units in the Southwest Gladiola-Devonian Pool, Lea County, New Mexico.

Case 2012 will be reopened pursuant to Order No. R-1724 to permit operators in the Southwest Gladiola-Devonian Pool, Lea County, New Mexico, to appear and show cause why said pool should not be developed on 40-acre proration units.

CASE 2135: (Reopened) In the matter of the application of Hamburg & Ingram for the establishment of 80-acre oil proration units in the Southwest Gladiola-Pennsylvanian Pool, Lea County, New Mexico.

Case No. 2135 will be reopened pursuant to Order No. R-1836 to permit operators in the Southwest Gladiola-Pennsylvanian Pool, Lea County, New Mexico, to appear and show cause why said pool should not be developed on 40-acre proration units.

CASE 2337: Southeastern New Mexico nomenclature case calling for an order creating new pools and extending existing pools in Lea, Eddy, Chaves and Roosevelt Counties, New Mexico.

(i) Extend the Pearl-Queen Pool, to include:

TOWNSHIP 19 SOUTH, RANGE 35 EAST, NMPM
SECTION 15: SE/4

(j) Extend the Robinson Pool, to include:

TOWNSHIP 16 SOUTH, RANGE 31 EAST, NMPM
SECTION 25: S/2 NE/4

TOWNSHIP 17 SOUTH, RANGE 31 EAST, NMPM
SECTION 11: N/2 SE/4

(k) Extend the North Square Lake-Grayburg Pool, to include:

TOWNSHIP 16 SOUTH, RANGE 31 EAST, NMPM
SECTION 10: N/2 SW/4

(l) Extend the Vacuum-Abo Pool, to include:

TOWNSHIP 18 SOUTH, RANGE 35 EAST, NMPM
SECTION 3: NW/4
SECTION 5: SE/4

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DOCKET: REGULAR HEARING - TUESDAY - JULY [illegible]

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

ALLOWABLE:

(1) Consideration of the allowable for August, 1961.

(2) Consideration of the allowable production of gas for August, 1961, from certain pools in Lea and Eddy Counties, New Mexico, also consideration of the allowable production of gas from certain pools in San Juan, Rio Arriba and Sandoval Counties, New Mexico, for August, 1961.

CONTINUED CASE

CASE 2215: In the matter of the hearing called by the Oil Conservation Commission on its own motion to consider the promulgation of an order prohibiting the flaring of casinghead gas from oil wells in the Cha Cha-Gallup and Nageezi-Gallup Oil Pools, San Juan County, New Mexico.

CASE 2012: (Reopened) In the matter of the application of Mar Petro for the establishment of 80-acre oil proration units in the Southwest Gladiola-Devonian Pool, Lea County, New Mexico.

Case 2012 will be reopened pursuant to Order No. R-1724 to permit operators in the Southwest Gladiola-Devonian Pool, Lea County, New Mexico, to appear and show cause why said pool should not be developed on 40-acre proration units.

CASE 2135: (Reopened) In the matter of the application of Gulf Burg & Ingram for the establishment of 80-acre oil proration units in the Southwest Gladiola-Pennsylvanian Pool, Lea County, New Mexico.

Case No. 2135 will be reopened pursuant to Order No. R-1836 to permit operators in the Southwest Gladiola-Pennsylvanian Pool, Lea County, New Mexico, to appear and show cause why said pool should not be developed on 40-acre proration units.

CASE 2337: Southeastern New Mexico nomenclature case calling for an order creating new pools and extending existing pools in Lea, Eddy, Chaves and Roosevelt Counties, New Mexico.

(a) Create a new pool designated as the Eunice-San Andres Pool, and described as:

TOWNSHIP 21 SOUTH, RANGE 37 EAST, NMPM
SECTION 33: W/2 NE/4 and E/2 NW/4

(b) Create a new pool designated as the Querecho Plains-Queen Pool, and described as:

TOWNSHIP 18 SOUTH, RANGE 32 EAST, NMPM
SECTION 34: NE/4

(c) Create a new pool classified as an oil pool for Pennsylvanian production, designated as the Squyres-Pennsylvanian Pool, and described as:

TOWNSHIP 7 SOUTH, RANGE 32 EAST, NMPM
SECTION 10: SE/4

(d) Extend the South Bitter Lake-San Andres Pool, to include:

TOWNSHIP 10 SOUTH, RANGE 25 EAST, NMPM
SECTION 35: NW/4 NE/4

(e) Extend the Getty Pool, to include:

TOWNSHIP 20 SOUTH, RANGE 29 EAST, NMPM
SECTION 13: NW/4

(f) Extend the West Henshaw-Grayburg Pool, to include:

TOWNSHIP 16 SOUTH, RANGE 30 EAST, NMPM
SECTION 1: Lots 5, 6, 11, 12, 13, 14, and 15
SECTION 2: Lots 9, 10, 15, and 16

(g) Extend the Langlie Mattix Pool, to include:

TOWNSHIP 22 SOUTH, RANGE 37 EAST, NMPM
SECTION 30: W/2 SE/4

(h) Extend the Lazy J Pool, to include:

TOWNSHIP 14 SOUTH, RANGE 33 EAST, NMPM
SECTION 3: E/2 NE/4

(i) Extend the Pearl-Queen Pool, to include:

TOWNSHIP 19 SOUTH, RANGE 35 EAST, NMPM
SECTION 15: SE/4

(j) Extend the Robinson Pool, to include:

TOWNSHIP 16 SOUTH, RANGE 31 EAST, NMPM
SECTION 25: S/2 NE/4

TOWNSHIP 17 SOUTH, RANGE 31 EAST, NMPM
SECTION 11: N/2 SE/4

(k) Extend the North Square Lake-Grayburg Pool, to include:

TOWNSHIP 16 SOUTH, RANGE 31 EAST, NMPM
SECTION 10: N/2 SW/4

(l) Extend the Vacuum-Abo Pool, to include:

TOWNSHIP 18 SOUTH, RANGE 35 EAST, NMPM
SECTION 3: NW/4
SECTION 5: SE/4

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OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO

Date 7-14-60

CASE NO. 2017 HEARING DATE 7-6-60

My recommendations for an order in the above numbered case(s) are as follows:

1. Grant Mrs Pray request as follows:
✓ (a) 80 acre spacing.
✓ (b) No restrictions on pattern only because of the apparent smallness of the Pool.
✓ (c) Make order for 1 year.
✓ (d.) Pool to Consist of:

SW/4 sec. 26
~~SE SW/4~~ " 27
W/2 and SE/4, 27
E/2 sec. 28
NE/4 sec. 33
NW/4 sec. 34
all in 22 S - 37 E. Lea Co.

✓ 2. The word "Nomindature" to be on over order immediately under the order No. _____

Staff Member

✓ 3. Pool to called Southwest Gladiola - Ider.
Delete W. Gladiola as per order R-1681
E004

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BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
July 11, 1960

EXAMINER HEARING

IN THE MATTER OF:

Application of Max Pray for the creation of a new oil pool for Devonian production and for the promulgation of special rules and regulations for said pool. Applicant, in the above-styled cause, seeks an order creating a new oil pool for Devonian production consisting of the W/2 of Section 27, E/2 of Section 28, NE/4 of Section 33 and the NW/4 of Section 34, Township 12 South, Range 37 East, Lea County, New Mexico. Applicant further seeks the promulgation of special rules and regulations governing said pool including a provision for temporary 80-acre oil proration units.

Case 2012

BEFORE: Elvis A. Utz, Examiner.

TRANSCRIPT OF HEARING

MR. UTZ: Case 2012.

MR. PAYNE: Application of Max Pray for the creation of a new oil pool for Devonian production and for the promulgation of special rules and regulations for said pool.

(Applicant's Exhibits 1 through 5, marked for identification.)

MR. CAMPBELL: Jack M. Campbell, Campbell and Russell, Roswell, New Mexico, appearing on behalf of the applicant, Max Pray.

MR. UTZ: Are there other appearances?

MR. WHITE: Charles White, Gilbert, White and Gilbert, appearing on behalf of Skelly, and I have associated with me, Mr. George Selinger of Tulsa.

MR. NEWMAN: Kirk Newman of Atwood and Malone, Roswell, New Mexico, appearing on behalf of Newberg and Ingram.

MR. O'BRIEN: Jerome J. O'Brien, Monterey Oil Company.

MR. LITTLE: John Little with H. S. Moss, Dallas.

MR. PENNEL: H. D. Pennel, Midwest Oil, Midland.

MR. UTZ: We have all the appearances? You may proceed, Mr. Campbell.

MR. PAYNE: We'll swear in all the witnesses at this time.

(Witnesses sworn.)

WARREN PICKERING

called as a witness, having been first duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. CAMPBELL:

Q Will you state your name, please?

A Warren Pickering.

Q Where do you live, Mr. Pickering?

A Oklahoma City.

Q What is your profession?

A Consulting Geologist.

Q Will you please give the Examiner a brief resume of your

educational and professional background?

A I was schooled and graduated with a Bachelor of Science in Geology at the University of Minnesota in 1940. The following year I received a Master of Science degree in Geology with a minor in Metallurgy. That same year I was employed by the Pure Oil Company, transferred to Oklahoma. After one year I transferred to the California Company, which is a wholly-owned subsidiary of Standard of California. I spent eleven years with their company. In 1953 I resigned to go into employment for myself as a Consulting Geologist, and I have been doing that since that period.

MR. CAMPBELL: Are the witness's qualifications as a geologist acceptable to the Examiner?

MR. UTZ: Yes, sir, they are.

Q Mr. Pray, as a consulting geologist have you had occasion to do some work for Max Pray in New Mexico?

A Yes, sir. I think you misspoke yourself. Yes, sir, I have.

Q Are you acquainted with the application of Mr. Pray in this particular case now before the Examiner?

A Yes, sir.

Q I refer you to what has been identified as applicant's Exhibit No. 1, and ask you if you will state what that is, please.

A This exhibit is furnished fundamentally for geography rather than geology. It's simply a locator map to indicate where in Lea County, and more particularly New Mexico, the prospect

under consideration is located.

Q Does this Exhibit 1 also show where the prospect is in relation to the presently existing Gladiola Pool?

A Yes, I think it's important to point out that the Denton, King, Gladiola, Echols trend is well established and that the Gladiola prospect is a part of this trend.

Q Does it also indicate that the general situation as to Devonian pools in that area reflects that they are of relatively small areal extent?

A Yes, sir. I think it will be brought out later that the deep beds are small in area for the most part and highly complex.

Q I now refer you to what has been identified as applicant's Exhibit 2 and ask you if you will please state what that is.

A This exhibit covers roughly the same area as indicated in red on the first map, but brings us down to the more specifics as to ownership, lease ownership. Further, I have indicated on this map the position of all of the deep Devonian dry holes by indicating them with a red circle. The Devonian producing wells have been indicated with a green symbol. This pattern, this well pattern will become an important part of our testimony.

Q Will you state to the Examiner the acreage on Exhibit 2 which is owned or controlled by Max Pray as applicant in this case?

A Yes, sir. We control the Southwest Quarter of Section 27, excluding the Southeast of the Southwest. We own the Northeast

Northwest Quarter of Section 27, the Southwest of Section 22, the Northwest of Section 22. In addition we have an option to own the North Half of the Southeast of Section 28. That's all.

Q Where on this Exhibit 2 is the Max Pray well involved in this application?

A The new well is located in the Northeast of the Southwest of Section 27.

Q In the application you have suggested that the Commission establish a new Devonian oil pool. Will you point out on Exhibit 2 the area you have suggested be included in this pool?

A The area suggested encompasses the West Half of Section 27, the East Half of Section 28, the Northeast Quarter of Section 33, and the Northwest Quarter of Section 34, the total encompassing a section and a half.

Q On Exhibit 2 will you point out to the Examiner the portion of the Gladiola Pool presently existing that is shown on that exhibit?

A The Gladiola Pool appears in the East Half of Section 24; where the green symbols are prominent, that is the Southwesterly limit of the Gladiola Pool proper.

Q In your opinion is the well and the area to which you have referred completely segregated from that Gladiola Devonian Pool?

A Yes, sir, well, it's quite obvious from subsurface relationship that the three dry holes shown between the dense green symbols and the two wells shown in green in the center of the map are separate reservoirs.

Q Do you have anything further with regard to that exhibit at this time?

A No, sir, I think not.

Q I now refer you to what has been identified as applicant's Exhibit No. 3.

MR. UTZ: Before you proceed, I wonder if you would be more specific on the location of the dry holes.

A Yes, sir. The dry holes I referred to are located in the Southeast of the Northwest of Section 24 and the Northwest of the Northeast of Section 25.

MR. PORTER: The Northwest of the Northeast?

Q Northeast of the Northeast?

A I stand corrected, Northwest of the Northeast of 25. Also the Northwest of the Northeast of 26.

MR. UTZ: Thank you. You may proceed.

Q I now refer you to what has been identified as applicant's Exhibit No. 3 and ask you to state what that is.

A Exhibit No. 3 is our best effort at a geophysical interpretation of this complex area, coupled with the subsurface evaluation of the wells that have been drilled in the area.

Q When was this particular seismic information depicted on this exhibit with relation to the drilling of the well?

A This map was devised as of last April and interpreted and constructed at that time.

Q That was prior to the commencement of the Max Pray well in Section 27?

A Yes, sir.

Q Will you state for the record, do the red dots and the green dots have the same bearing that they had on the prior exhibit?

A Yes, sir, I have tried to repeat the same wells with the same symbols on the two maps for easy reference.

Q Now, you drilled this well in Section 27 on the basis of this seismic information, and what subsurface data you were able to accumulate, is that correct?

A That is correct.

Q How did that well pan out with relation to that picture?

A We were fortunate in having been led to this area by the geophysics of this particular map. However, the map did not drill out. A more serious case in point is that the top of the Devonian on Max Pray's Craig Well is 8 foot lower than the Moss No. 1 Lowe Well located in the Northwest of the Northeast of Section 34. As you can see from this map, we originally had hoped that the well would be some 175 feet higher than the Moss No. 1 Lowe Well referred to.

Q What does that indicate to you as a geologist with regard to the area?

A A glance at this map would indicate many things, but the fundamental thing is the extreme complicity of the interpretation and the fault pattern as we envision it on the Devonian in this area.

Q What does it indicate to you with regard to further development on your properties in this area?

A We feel that with this number of faults and with numerous interpretations available, caution is the better part of valor in developing or exploiting this type of reservoir.

Q Is this part of the basis for your application for 80-acre units in this area?

A Yes, sir, a very important part.

Q Now, Mr. Pickering, I want to refer you to what has been identified as applicant's Exhibit 4 and ask you to state first what that is, please.

A Yes, sir. This is a schematic cross section, including the well data on wells drilled prior to the Max Pray No. 1 Craig. This cross section was constructed after the shooting and with serious consideration being given to the shooting and, therefore, I would like to refer you back to Exhibit 4 for the positioning of this cross section.

On Exhibit 4 you will note a blue line that seems to have

gotten, excuse me, it is Exhibit 3. Exhibit 3, the geophysical map. A blue line near the South Half of the contoured construction from the Sunray Adams Well in Section 29, to the Moss No. 1 Lowe in Section 34, thence to the Lawton No. 1 Lowe in Section 35. That is the West to East extremity of this particular cross section.

Now, in addition to those three wells we have pulled into the line of cross section the new wells drilled by the Moss Petroleum Company, namely the Peck properties, to show their relationship. The critical well to our presentation was, as you can see, the Moss No. 1 B. M. Lowe, which actually cut a fault in the well indicated on this cross section entering the Devonian at the expense of Mississippian section. The geophysical material available, and the interpretation, indicated to us that we could get higher structural at the position of the well shown in red; as we have previously pointed out, this high structural attitude relative to the Moss No. 1 Lowe was not available. It did not turn out that way. Therefore, we have a thin section of Devonian at the present time.

Q Are you able to tell at this time what the thickness of that section actually is?

A No, sir, the statistics on the total water-free section are these: We topped the Devonian at a depth of 12,304 feet. We penetrated a total of 29 feet. Referring to this cross section in the Moss No. 1 Lowe, it was indicated that their water table was some 15 feet ahead or deeper than our current total depth and those

are the summation of all the facts we at this time feel we know about the thickness of this interval.

Q With regard to Exhibit No. 4 and your interpretation, what does it reflect with regard to your well in relation to the Moss Devonian well to the East of you?

A Our interpretation, as presented here, indicates that there is a graben area, a down-thrown block which separates the Max Pray Craig area from the Moss Peck area of production.

Q Is that the reason you have not, in your application, at least suggested that the Moss area be included in the definition of this pool?

A Yes, sir, that is the reason, but I would like to go further and state that it makes no particular importance as to whether or not these two wells are separated or not. The principle of spacing remains the same.

Q So far as the applicant is concerned, that isn't a matter of great moment here, is that correct?

A No, sir.

Q Now, with regard to the well itself, Mr. Pickering, will you refer to Exhibit No. 5 and state what that is, please?

A Exhibit No. 5 is my attempt to place all of the information about the well at easy access. You will note on this exhibit we have indicated the top of the Woodford simply for stratigraphic relationships. The top of the Devonian, as I have reported, was

found at 12,304. It indicates that drill stem test No. 2, the first drill stem test having been a failure in the Wolfcamp section, drill stem test No. 2, with packer seated up in the Woodford section, tested the top 15 feet, pardon me, the top 19 feet, tested the top 15 feet. My reason for confusion there is that the packer is quite a bit above the total depth of the hole, 12,200 feet. But the total depth was 12,319, the top of the sand was 04. We were, therefore, testing 15 feet.

The results of that test are indicated on this log on the left-hand side. You will notice that we recovered clean oil after one hour forty-five minutes. I should state that we reversed the oil out to tanks and recovered 105 barrels of clean oil to tanks following this test. Subsequent to the test then, knowing we had 15 feet of water free, we had never had a sample, in fact I had no experience with the Devonian in this part of New Mexico, being anxious to learn of our reservoir, we then cut an 11 foot core, which is indicated on this section. We recovered 8 feet of said core. We analyzed six samples as picked by Core Laboratories, which quite frankly was the entire core because it was whole core bulk analysis. The results of that analysis are shown on this log, even though small, I believe they are legible.

The importance of the core analysis indicates the range of permeability in the Devonian at this point of from 73 millidarcys to 1,966 millidarcys per foot. Porosities obtained ranged from

6.8% to as high as 16.3% in this particular core.

Q Does that core data up to this time indicate to you that there is a fairly large drainage area for this well?

A Yes, sir. Believing that this core is representative of the Devonian, and with the large vugs and fractures that we recovered and have analyzed, we feel that good communication will be available to us in this reservoir.

Q Based upon the limited information you now have available, do you believe that this well will efficiently and economically drain at least 80 acres?

A Yes, sir, this type of reservoir should easily do that.

Q Did you take original bottom hole pressure tests?

A As happens to many new wells, and particularly large wells, we were shut in for lack of storage space for a period of time, and we took that period to run a shut in bottom hole pressure survey.

Q Would you tell the Examiner who ran the survey for you, how it was run and what the results were, please?

A The John W. West Engineering Company on June 26, 1960 ran a twenty-four hour static bottom hole pressure test resulting in a bottom hole pressure of 4,693 pounds per square inch at a datum depth of 12,100 feet. We felt that the virgin pressure in what we considered to be a new reservoir would be vital information against which we could plot production and decline at a later date

as we learn more about this reservoir.

Q Now, Mr. Pickering, you are aware, of course, that the normal statewide spacing for oil wells in New Mexico is 40 acres, and you are here seeking a temporary order authorizing the development of this field over a one-year period on the basis of 80 acre proration units. Would you summarize for the Examiner the reasons that you are seeking this one year temporary order with regard to the reservoir and engineering features?

A The beginning of the summary should include our lack of being able to accurately map the structural relationship of the Devonian at this depth. This highly complex faulted area actually goes beyond the bounds of accuracy, for geophysics, and bringing to bear all the subsurface data from wells and the geophysics, it is an extremely difficult area to map structurally. Having been disappointed in finding only 29 feet that we have proven to be above water instead of the plus 175 that we had hoped to have, we feel that we should move very cautiously until we determine what amount of oil can be recovered from each 40 or 80-acre spacing, whatever the spacing ultimately is chosen to be. Until we learn the economic statistics from the recoveries from each well, we might be accused of being other than prudent operators by drilling a flurry of wells. We feel that 29 feet of penetration is the bare minimum to drill a well and equip same at a cost of approximately $240,000 per 40-acre location.

Q And if this authority is granted to proceed for a limited period of time on 80-acre proration units, are you prepared to recommend to Mr. Pray that he do step out and explore this area on an 80 acre basis?

A Yes, sir, following additional subsurface information in the form of geophysical review which we hope to attain, weather permitting, we will drill on an 80-acre pattern on the leases we have described as owning.

MR. CAMPBELL: I would like to offer applicant's Exhibits 1 through 5 in evidence.

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

MR. CAMPBELL: That's all the questions I have at this time.

MR. UTZ: Are there questions of the witness?

MR. PAYNE: Yes, sir.

MR. UTZ: Mr. Payne.

CROSS EXAMINATION

BY MR. PAYNE:

Q Mr. Pickering, does the applicant have any recommendation relative to a flexible pattern or a rigid pattern insofar as well locations are concerned?

A As regards the applicant and the acreage we control, we have absolutely no recommendation to make as to the rigidity. On

the contrary, we would hope for leniency on the part of the Commissioner in view of this serious and complicated structure.

Q So what you would actually propose is that the units be able to run either way and that the well, that you be allowed to drill a well in either quarter, quarter section in the 80-acre unit?

A Yes, sir.

Q Do you feel that you get as efficient drainage of a reservoir on a flexible pattern as you do on a rigid pattern?

A I think that the proof of that will remain to be seen following the development on any pattern, following the development or drilling of an 80-acre pattern, if then, and after a one year's time, it seems prudent to fill in, we'll, of course, have no objection whatsoever. To answer specifically to a location now, I think would be most difficult, in fact foolhardy, because we simply don't know all of the structural complications here.

Q Has it been your experience in the past that sometimes when the rigid well location requirement is called for that there are locations which end up not being drilled that might be drilled if you had a flexible pattern?

A Yes, sir. I can think of cases of that; however, to forestall that possibility in this particular area I would like to point out that the land ownership is quite diversified, and I believe that such will not be the case in this immediate area.

Q Now, I believe you testified that in your opinion the

Moss well completed in the Devonian in this area and the Max Pray well are isolated, so-to-speak?

A Yes, sir, I think they are separate reservoirs.

Q Did you attempt to run an interference test to prove this point one way or the other?

A My attempt has been to find out that the Moss Company have not run bottom hole pressure surveys at this time. I believe they are scheduled for the coming month. Until such bottom hole pressure is known, we have no interference or relationship between those two wells from an engineering standpoint.

Q Now, do you have a purchaser of the oil from the Max Pray well?

A Yes, sir, the Indiana Purchasing Company of Midland, Texas is running the oil by truck.

Q By truck?

A Yes, sir.

Q Does that cost more than if this were connected to a pipeline?

A Yes, sir. At the present time we have produced a total of 2,114 barrels, only 560 barrels of which have been trucked to market at a cost of twenty-four cents per barrel to we, the operator. I believe that oil is going to the Denton tank battery, tank farm.

Q Is the purchaser from the Moss well the same, or do you know?

A I can not speak for that.

Q Does this Max Pray well make water?

A No, sir. We do not have any indication.

Q Do any of the Devonian wells make water?

A Some do. I can not specifically state which wells.

Q I was just wondering if that might be a further basis for your belief that the Gladiola Devonian is completely separate from the Max Pray source of supply?

A Sir, I didn't propose to present specific evidence on that because I have been led to believe that the Moss well has already been considered a separate reservoir from Gladiola.

Q Inasmuch as the three dry holes have been drilled between the two?

A Yes, sir.

MR. PAYNE: Thank you.

MR. PORTER: I have one question.

MR. UTZ: Mr. Porter.

BY MR. PORTER:

Q Mr. Pickering, would you mind answering a question concerning this question of flexible versus rigid spacing in generalities?

A I'll be happy to if I can.

Q Do you think ordinarily that you would have as efficient drainage if you drill on either end of 80-acre units as you would

if you alternated your locations and drilled on opposite ends?

A Sir, I believe a regular pattern is by far the preference in the general case, by far the preference.

Q In other words, the drilling on opposite ends of the 80-acre units?

A Yes, sir.

Q You say you have only 29 feet of pay above the water here?

A Only 29 feet of pay proven above water. We have not found the water-oil contact.

Q I see. Now, you wouldn't be able to testify at this time as to whether you think a 255 barrel well would be too high?

A No,

Q According to my calculations, that's what you would get under an 80-acre spacing?

A 256, I believe.

Q Something like that?

A Yes, sir. If you are asking if the well is capable of making it, the answer is yes, easily.

Q It will make it? A Yes, sir.

Q In view of the fact that we have experienced trouble in some areas of Denton and Gladiola with water encroachment, I was interested in knowing whether or not the allowable might be too high.

A I should have pointed out that even though we have

penetrated the 29 feet, we have perforated only 5 feet of the section.

Q Of the 29?

A Yes. Of the very top 5 feet of 12,304 to 12,309. So we carefully stayed away from the bottom of our oil which analyzes on our analysis to be water free. We still stayed away from it as far as we could.

MR. PORTER: Thank you.

BY MR. UTZ:

Q In the event this application is granted, where would you propose your next location?

A Our next location would be one of two places, either the Northeast of the Southeast of Section 28 or the Southwest of the Northwest of Section 27. Consistent with Mr. Porter's thinking, that would be a regular staggered 80-acre pattern.

MR. UTZ: Are there other questions?

MR. PAYNE: One question further.

MR. PORTER: Mr. Payne.

BY MR. PAYNE:

Q Has it ever been your experience that when you water flooded a pool that had been developed on 80 acres, you got more oil than you did when you water flooded a similar reservoir that had been developed on 40-acre spacing?

A Yes, sir.

Q Does that indicate to you that perhaps you leave more oil in the ground when it's developed on 80 than when developed on 40?

A It depends entirely on the permeability and porosity of the area in question.

BY MR. NEWMAN:

Q Without questioning the fact that from available data that one well will drain 80 acres, if the entire 80-acre unit is underlain by the productive formation due to complexity and the existence of these faults, is it not possible that say in a given 80-acre unit, half of it would be unproductive because it was across the fault unproductive from that same reservoir?

A Yes, sir. I think the possibility of that happening is rather good in this complex area.

Q Is that one of the purposes of your recommendation of the flexible location rule on either 40 to permit the operator to pick the one that he thinks at least will be on the right side of the fault and get the pay zone?

A I believe one of the fundamental principles of conservation is to drill as few dry holes as possible. That is the purpose of the operator when he starts to look for oil, find oil.

MR. NEWMAN: That's all.

MR. UTZ: Any other questions?

MR. CAMPBELL: That's all I have, Mr. Examiner. I,

perhaps, would like to make a statement at the conclusion of the case if I may be permitted to do so.

MR. UTZ: If no other questions, the witness may be excused.

(Witness excused.)

MR. UTZ: Mr. Selinger, I believe you made the next appearance.

MR. SELINGER: We'll make a statement at the conclusion of the testimony.

MR. UTZ: You don't want to put a witness on at this time?

MR. SELINGER: No, sir.

MR. NEWMAN: We have no witnesses. We want to make a statement is all.

MR. UTZ: Are there other witnesses?

MR. PENNEL: Midwest would like to make a statement.

MR. UTZ: We will take your statements at this time.

MR. PAYNE: Mr. Selinger.

MR. SELINGER: Skelly Oil Company concurs in the application of Max Pray for temporary 80 acres. We also concur with their proposed flexibility. We have no objections to a fixed pattern for units running North and South, that is composed of the East Half and West Halves of quarter sections, nor do we have any objections to the fixed pattern of location of wells in the center

of the Northeast or the center of the Southwest Quarter of each quarter, quarter section.

We realize, of course, the complexity of the area and feel that flexibility is feasible in this particular instance. Skelly Oil Company owns the entire Southeast Quarter of Section 27, except the Northwest 40 acres, that is 120 acres. We have released a location to the field to locate a well in the center of the Northeast of the Southeast of 27 which will follow the pattern of Max Pray in his present location and his proposed location.

I also want to remind the Commission that they have at the present time classified the Moss well as the West Gladiola, and while the information is of bare factual basis, we believe that the two Devonian wells, that is the Moss well and the Max Pray well, are in the same Devonian reservoir. However, the drilling and completion of our well in between these two wells will probably definitely prove it.

MR. PORTER: Mr. Selinger, you mean that the Commission has already designated a West Gladiola Pool and it's proposed here to call this the Southwest Gladiola Pool?

MR. SELINGER: That's right, temporarily for the year's time, until the completion of our well, and then maybe West and Southwest may or may not meet.

MR. PORTER: Thank you.

MR. UTZ: Mr. Newman.

MR. NEWMAN: On behalf of Newburg and Ingram, I would like to state, one, that the acreage that we are interested in in this area, have a working interest in, is the Northeast Quarter of Section 34 and the Northwest Quarter of Section 35. We do not object to 80-acre spacing units. We think it advisable that there be as orderly development as possible until we find out if 40's can be economically drilled. We would object to a fixed pattern that wouldn't let us drill where we want to.

We don't see the faults quite as Mr. Pickering saw them initially, and we are not too durn sure where we do see them, it changes from time to time, but as interpretation now stands, the first Newburg and Ingram location would be proposed as the Northwest of the Northwest of Section 35 which would be in the pattern with the Moss Peck well, but would be out of pattern with the Pray well.

There's going to be exceptions somewhere along the line, of course, the Skelly well, which practically offsets the Moss Peck well, would be out of pattern with it. We are obviously going to have some problems in keeping on a constant pattern, and it is quite unlikely that unless an interpretation of change of Newburg and Ingram would not drill in Section 35 if they had to move over to the Northeast, Northwest. They like the Northwest, Northwest and they don't like the other. So we would object to the 80-acre spacing if it involves an inflexible spacing pattern. We think

it would cut us out of drilling at least one well in this area that we feel would be productive. This, as Mr. Newburg says, they have that much money involved, the small operators, the productivity of the well is awfully important.

MR. PORTER: Then you have four possible locations?

MR. NEWMAN: Yes.

MR. PORTER: One of which would be off pattern under either proposal?

MR. NEWMAN: Yes. We'd either be, our present proposed location, Northwest, Northwest would be on pattern with the Peck well but off pattern with the Pray. If we propose location in the Northeast, Northeast would be on pattern with the Pray, off pattern with the Moss, and we're more or less in between them, a little closer to the Moss Peck well than we are to the Pray well.

MR. UTZ: The reason you want to drill the well in the Northwest, Northwest of 35 is to get as close as you can to known production?

MR. NEWMAN: That, plus the fact that we think it's on the right side of the fault. I don't think that the East location in that quarter section would be on the wrong side of it.

MR. PAYNE: Do you think the East side would still be productive?

MR. NEWMAN: Possibly, but we don't know at what greater depth.

MR. UTZ: How about the Southwest of the Northwest of that section?

MR. NEWMAN: That I don't know. As I see the interpretation, we can't pin down exactly where the fault, we think, we think there's a fault running through there and we want to get as far away from where we think it is as possible before we cut another one in that quarter section. With the flexible spacing pattern we recommend and urge the Commission to adopt the 80-acre spacing. Without the flexible pattern we urge the adoption of 40-acre spacing so that we can go ahead and drill the wells that we think will be productive.

MR. UTZ: Thank you. Mr. O'Brien.

MR. O'BRIEN: Monterey Oil Company concurs with the Pray application asking for 80-acre spacing, but only with the flexible pattern. We feel that the areas are separated. The Max Pray and the Moss well aren't in the same reservoir. We own acreage in the Northwest, Northeast Quarter of Section 27, the East one-half of Section 22, and the East one-half of Section 21. In our information the Northeast Quarter of Section 21 would afford us a location or a well diagonally offsetting the Moss well which is in one reservoir and diagonally offsetting the Pray well which is in the other.

We, at this time, aren't definite as to which location we would like to drill. We would like to get a little more information before we make application on either of those 40 acres.

With a fixed pattern it would eliminate us from picking up the 40 acres that we wish to drill on. So, therefore, we wish for a flexible pattern on the drill sites.

MR. UTZ: Mr. Little.

MR. LITTLE: John Little with H. S. Moss. We own the West Half of Section 26 and the Northwest Quarter of the Southeast Quarter of Section 27. We are in favor of 80-acre spacing with flexibility; with rigid locations, we would prefer the 40-acre spacings. For your information, our well is not making any water, it is capable of making any increased allowable, we have completed this well approximately March 1st. It's had a good history and we have just kind of taken the idea of wait and see.

We feel like that to look at this spacing a year from now or even six months from now would give the operators an opportunity to better make a recommendation to the Commission.

MR. UTZ: As to spacing or pattern?

MR. LITTLE: Both.

MR. UTZ: If we have a flexible pattern to begin with, we might be hard pressed to change a year from now.

MR. LITTLE: I don't believe so.

MR. PORTER: What is the cumulative production of the H. S. Moss well?

MR. LITTLE: I don't have those figures with me.

MR. PORTER: Could you give me approximately?

MR. LITTLE: The well has made its allowable, less the amount that the pipeline has failed to run. We have had some pipeline proration there.

MR. PORTER: Your allowable is in the neighborhood of 223 barrels?

MR. LITTLE: Yes.

MR. PORTER: Something in excess of, oh, approximately 7,000 barrels a month?

MR. LITTLE: Yes.

MR. PORTER: It has made the allowable with the exception of the purchaser proration period?

MR. LITTLE: That's right.

MR. PORTER: You haven't had any water trouble?

MR. LITTLE: No water trouble at all. We have had opportunity to test the well. It will make 20 barrels an hour without difficulty and the flowing pressures will stay as high as they will on 8 to 10 barrels an hour.

MR. PORTER: How did your pay thickness compare with the other well?

MR. LITTLE: We have absolutely no idea how thick the pay is. We haven't found the water and we have a very, very thin section perforated.

MR. PAYNE: Mr. Little, if the 80-acre order is entered in this case, does Moss propose to communitize with Skelly Oil

Company to drill a well in the Southwest Quarter of the Southeast Quarter of Section 27?

MR. LITTLE: That I could not say. At the present time we would be willing to go into 80-acre spacing. Skelly has not asked us to join them in the drilling of this well, which I understand they have announced.

MR. PAYNE: Skelly proposes to dedicate the East Half of that quarter section then?

MR. SELINGER: That's right. For your information, Mr. Payne, we would be willing to work out an 80-acre unit with Mr. Moss, yes, sir.

MR. PAYNE: I presume that everybody here is aware that if the Commission considers these as two separate reservoirs, in other words, the West Gladiola Devonian, the Southwest Gladiola Devonian, that the 80-acre spacing, if one was concerned in this case, would go only to the Southwest Gladiola Devonian Pool.

MR. SELINGER: It would cover everything within a mile.

MR. PAYNE: Not if it's in a separate pool.

MR. SELINGER: We think it's in the same pool.

MR. PORTER: Off the record.

(Whereupon, a discussion was held off the record.)

MR. PAYNE: Let's go back on the record. Mr. Campbell, if this order is granted here on a temporary basis for a one-year period, will the applicant be willing to take interference tests

in the meantime?

MR. CAMPBELL: Let me say this, that we would be glad to discuss that with the Commission engineers. It's the opinion of our people that an interference test will probably not give us the information we desire at this time. If the Commission concludes that it will and advertises, of course we will take it. We believe that bottom hole pressure comparisons from the Moss well, when the bottom hole pressure is taken, coupled with perhaps information from the Skelly well, will pretty well establish it without direct interference tests, but if the Commission says we should, we will.

MR. PAYNE: I mean an interference test between the Max Pray well and the next well that Max Pray drills, either in Section 28 or 27, which would be, if it were in 27 it would be a diagonal offset from the existing well.

MR. CAMPBELL: If it's an oil well we will be glad to do it if the Commission requests it.

MR. UTZ: I gather, then, you may answer this question, Mr. Pickering, if you will, that you feel that you may have a water drive here?

MR. PICKERING: Yes, sir, we very definitely feel that.

MR. UTZ: In which case interference tests will be of very little value?

MR. PICKERING: That is my feeling, particularly on 80-acre pattern where interference will not show up until a good

deal of the products or the reservoir is depleted. My personal feeling, probably it is not engineering.

MR. PENNEL: H. D. Pennel, Midwest Oil. We're interested because we have a lease in the Northeast Quarter of Section 28 and a lease interest in the Southwest Quarter of Section 28. Now, I would like to go along with Mr. Kirk Newman in his discussion and Mr. O'Brien's verbatim, as they made it, and to go through this whole thing again would just be saying the same thing they have said. However, I would like to add this just for all of our education, according to my geology, the Max Pray well in the Northeast, Southwest of Section 27 correlates on the top of the Devonian, approximately a thousand feet high to the Sunray Mid-Continent well which is in the Southeast, Northeast of Section 29, a mile and a half Northwest and approximately a thousand feet high to the Monterey well which is in the Southwest, Southeast of Section 22. As you can see, we are placed in somewhat of a precarious position with our leases.

Now, we have spent a good many thousand dollars with a seismograph in there trying to figure out what happens and we have concluded this, that it's an anomalous area and we have had to stop right there. We can't map it, we don't know which way the faults go and we, therefore, feel that if we are forced, if anyone is forced in here to go to definite pattern, that very shortly someone is going to drill one or two dry holes which will probably go a

good ways toward stopping the development in the area, and there will be a lot of oil in there that will not be recovered for that reason.

We think that if we could approach this thing, and I think scientifically, and step out, make easy, short stepouts, that we will be able to get most of the oil out of the ground in this area which is bound to be small.

MR. PAYNE: It's your opinion that it's generally advantageous in a reservoir that is complex to have a flexible spacing pattern in order to get the locations drilled?

MR. PENNEL: That's right.

MR. PAYNE: That might more than make up for the oil that you recover on a rigid pattern?

MR. PENNEL: That's right.

MR. PORTER: Wouldn't that be an argument that you might dedicate a lot of dry acreage to any one well?

MR. PENNEL: I believe so, yes, sir.

MR. PORTER: I don't see how you could have one without the other.

MR. UTZ: To say the least it might be questionable. Any other statements?

MR. CAMPBELL: Mr. Examiner, I would like to make a concluding statement. As was indicated at the outset, the applicant here has no objection from its point of view either to a

fixed pattern or a flexible pattern. We believe that this, obviously, is a small areal field. It is also, as has been stated here, extremely complex. It is also true that there is a possibility that during this year's time, depending upon the rapidity of drilling and the locations of the various wells, that you will have a number of wells at the end of the year which are direct 40-acre offsets. You may have some wells dedicating acreage that might be questionable, at least that might have to be established. We are convinced you are also going to have several dry holes no matter what kind of a proration unit you set up here because of the complexity of the situation and because of the small area that is involved.

We believe that if it is started on an 80 acre proration unit, and certainly as far as our properties are concerned we can develop ours and Skelly can apparently follow with their acreage on a relatively fixed pattern, it's when we approach the edges of the reservoir that you are going to get some questionable locations. At the end of a year we can all take a look at the situation. We will know a great deal more about it. If it is developing on a 40-acre basis and it is economically feasible, I presume that people would want to infill drill and go ahead on a 40-acre basis, but we believe that everything considered in this Devonian formation, and the Commission is fully aware of the dangers and complications of water in connection with promiscuous drilling in the

Devonian formation in New Mexico, we believe that in the light of that and all the other circumstances, the field will proceed with development under an 80-acre proration unit basis.

I think only a glance at the map, if the expiration dates are on the map, will reveal as a practical matter that a great many leases in this area, due probably to the large number of dry holes drilled around here, are approaching the expiration date. So this field is going to be developed, establishing 80-acre units is not going to slow down development in this area, because of lease expiration dates and drilling obligations, we will certainly know enough at the end of one year to go on in the right direction both in the point of view of conservation and protection of the correlative rights of the multitude of owners in this limited area.

MR. PAYNE: It's also true, is it not, Mr. Campbell, that the dedication of dry acreage is strictly a matter of correlative rights and we have no one here who is opposing 80-acre spacing provided we have a flexible pattern?

MR. CAMPBELL: That is correct, and I think, if at the end of the year's period, if anyone is seriously concerned about the possibility of abuse of their correlative rights due to dedication of unproved acreage or non-productive acreage, it will come up at that hearing.

MR. O'BRIEN: May I make a statement, Monterey Oil?

MR. UTZ: Yes, sir.

MR. O'BRIEN: With relation to the dedication of the dry acreage to an 80-acre pattern, it isn't necessary that you have dry acreage dedicated to these patterns. However, in a very porous, permeable zone such as the Devonian, very steeply dipping with a high water drive, with a flexible drilling pattern you can draw all your oil out of the top location where if you drill on the outside you willleave 90% of the oil which will flow updip. So you can't drain it all, although it's all good land, so you can get it on the updip location that you can not get on the downdip location.

MR. UTZ: Would you propose a dedication of acreage below the water-oil contact?

MR. O'BRIEN: No.

MR. SELINGER: If we know what it is.

MR. UTZ: Any other statements? If there are no further statements, the hearing will be taken under advisement.

STATE OF NEW MEXICO)
: SS
COUNTY OF BERNALILLO)

I, ADA DEARNLEY, Court Reporter, do hereby certify that the foregoing and attached transcript of proceedings before the New Mexico Oil Conservation Commission at Santa Fe, New Mexico, is a true and correct record to the best of my knowledge, skill and ability.

IN WITNESS WHEREOF I have affixed my hand and notarial seal this 15th day of July, 1960.

Ada Dearnley
Notary Public-Court Reporter

My commission expires:

June 19, 1963.

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 2012, heard by me on July 6, 1960.

Examiner
New Mexico Oil Conservation Commission

No. 6

DOCKET: REGULAR HEARING - THURSDAY - JULY [illegible] 1961

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

ALLOWABLE:

(1) Consideration of the oil allowable for August, 1961.

(2) Consideration of the allowable production of gas for August, 1961, from [illegible] pools in Lea and Eddy Counties, New Mexico, also consideration of the allowable production of gas from nine prorated pools in San Juan, Rio Arriba and Sandoval Counties, New Mexico, for August, 1961.

CONTINUED CASE

CASE 2215: In the matter of the hearing called by the Oil Conservation Commission on its own motion to consider the promulgation of an order prohibiting the venting of casinghead gas from oil wells in the Cha Cha-Gallup and Ojo Chato-Gallup Oil Pools, San Juan County, New Mexico.

CASE 2012: (Reopened) In the matter of the application of Max Prey for the establishment of 80-acre oil proration units in the Southwest Gladiola-Devonian Pool, Lea County, New Mexico.

Case 2012 will be reopened pursuant to Order No. R-1724 to permit operators in the Southwest Gladiola-Devonian Pool, Lea County, New Mexico, to appear and show cause why said pool should not be developed on 40-acre proration units.

CASE 2135: (Reopened) In the matter of the application of Nearburg & Ingram for the establishment of 80-acre oil proration units in the Southwest Gladiola-Pennsylvanian Pool, Lea County, New Mexico.

Case No. 2135 will be reopened pursuant to Order No. R-1836 to permit operators in the Southwest Gladiola-Pennsylvanian Pool, Lea County, New Mexico, to appear and show cause why said pool should not be developed on 80-acre proration units.

CASE 2337: Southeastern New Mexico nomenclature case calling for an order creating new pools and extending existing pools in Lea, Eddy, Chaves and Roosevelt Counties, New Mexico.

(a) Create a new pool designated as the Eunice-San Andres Pool, and described as:

TOWNSHIP 21 SOUTH, RANGE 37 EAST, NMPM
SECTION 33: W/2 NE/4 and E/2 NW/4

(b) Create a new pool designated as the Querecho Plains-Queen Pool, and described as:

TOWNSHIP 18 SOUTH, RANGE 32 EAST, NMPM
SECTION 34: NE/4

(c) Create a new pool classified as an oil pool for Pennsylvanian production, designated as the Squyres-Pennsylvanian Pool, and described as:

TOWNSHIP 7 SOUTH, RANGE 32 EAST, NMPM
SECTION 10: SE/4

(d) Extend the South Bitter Lake-San Andres Pool, to include:

TOWNSHIP 10 SOUTH, RANGE 25 EAST, NMPM
SECTION 35: NW/4 NE/4

(e) Extend the Getty Pool, to include:

TOWNSHIP 20 SOUTH, RANGE 29 EAST, NMPM
SECTION 13: NW/4

(f) Extend the West Henshaw-Grayburg Pool, to include:

TOWNSHIP 16 SOUTH, RANGE 30 EAST, NMPM
SECTION 1: Lots 5, 6, 11, 12, 13, 14, and 15
SECTION 2: Lots 9, 10, 15, and 16

(g) Extend the Langlie Mattix Pool, to include:

TOWNSHIP 22 SOUTH, RANGE 37 EAST, NMPM
SECTION 30: W/2 SE/4

(h) Extend the Lazy J Pool, to include:

TOWNSHIP 14 SOUTH, RANGE 33 EAST, NMPM
SECTION 3: E/2 NE/4

(i) Extend the Pearl-Queen Pool, to include:

TOWNSHIP 19 SOUTH, RANGE 35 EAST, NMPM
SECTION 15: SE/4

(j) Extend the Robinson Pool, to include:

TOWNSHIP 16 SOUTH, RANGE 31 EAST, NMPM
SECTION 25: S/2 NE/4

TOWNSHIP 17 SOUTH, RANGE 31 EAST, NMPM
SECTION 11: N/2 SE/4

(k) Extend the North Square Lake-Grayburg Pool, to include:

TOWNSHIP 16 SOUTH, RANGE 31 EAST, NMPM
SECTION 10: N/2 SW/4

(l) Extend the Vacuum-Abo Pool, to include:

TOWNSHIP 18 SOUTH, RANGE 35 EAST, NMPM
SECTION 3: NW/4
SECTION 5: SE/4

ig/

BEFORE THE OIL CONSERVATION COMMISSION
OF THE
STATE OF NEW MEXICO

IN THE MATTER OF THE APPLICATION OF Max Pray)
for an Order establishing temporary 80 acre)
proration units for an undesignated oil pool)
consisting of the West Half Section 27,) Case No. 2012
East Half Section 28, Northeast Quarter)
Section 33 and Northwest Quarter Section 34,)
Township 12 South, Range 37 East, Lea County,)
New Mexico.)

APPLICATION

COMES NOW Max Pray, Applicant, by his attorneys, Campbell & Russell, Roswell, New Mexico and states:

1. He is the owner of certain leasehold interests consisting of the W½, Section 22, NW¼, N½SW¼, SW¼SW¼, Section 27, N½SW¼ Section 28, Township 12 South, Range 37 East, Lea County, New Mexico.

2. He has completed his Max Pray #1 Zealan L. Craig well in the center of the NE¼SW¼ of said Section 27 as an oil well in the Devonian formation.

3. Said well is in a heretofore undesignated common source of supply.

4. Due to geologic, resevoir and economic conditions it is desirable that said common source of supply be developed at least for the time being, upon a basis of 80 acre proration units.

WHEREFORE, applicant requests the Commission to set this matter down for hearing, before an Examiner or the Commission, publish notice as required by law, and after hearing enter its order:

1. Designating a new oil pool as the result of the completion of the Max Pray #1 Zealan L. Craig well.

2. Establishing temporary special rules for the pool providing for 80 acre proration units, said rules to be in effect for a period not to exceed one year.

Dated: June 21, 1960

Respectfully submitted,
Max Pray, Applicant
by: Campbell & Russell
P. O. Box 766
Roswell, New Mexico

Jack M. Campbell
Applicant's Attorneys

GOVERNOR
JOHN BURROUGHS
CHAIRMAN

State of New Mexico
Oil Conservation Commission

LAND COMMISSIONER
MURRAY E. MORGAN
MEMBER

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

P. O. BOX 871
SANTA FE

July 21, 1960

Mr. Jack Campbell
Campbell & Russell
Box 766
Roswell, New Mexico

Re: Case No. 2012
Order No. R-1724
Applicant:
Max Pray

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

ir/

Carbon copy of order also sent to:

Hobbs OCC X
Artesia OCC
Aztec OCC

Other

PRESSURE BUILDUP CALCULATIONS

FIELD S. W. Gladiola — WELL Cities Service Petroleum Co. - Turner D #1

FORMATION Devonian — PRODUCING INTERVAL 12263-12288

(1)	Q - PRODUCING RATE, BPD,	303	
(2)	U - VISCOSITY, CENT,	.600	
(3)	B - FVF	1.07	
(4)	M - SLOPE OF B-U CURVE, PSI/CYCLE	3.9	
(5)	H - THICHNESS OF PRODUCING ZONE, FEET,	25	
(6)	K - PERM., MD. = 162.5 Q U B/ M H		324
(7)	P_1 - PRESSURE ON SLOPE @ 1 HOUR, PSI,	4528	
(8)	P_2 - PRESSURE @ 1 SEC. = (P_1 - 3.56 M)	4514	
(9)	P_F - FLOWING PRESSURE, PSI,	4104	
(10)	$2.302(P_2 - P_F)/M$	241	
(11)	R_W - RADIUS OF DRILLED HOLE, INCHES,	3.938	
(12)	F - POROSITY, FRACTION, (ESTIMATE)	.04	
(13)	C - COMPRESS., VOL/VOL/PSI X 10^6	$.13 \times 10^6$	
(14)	$2.30 \log_{10} \left\{ \frac{10.5\ K}{F\ C\ U\ R_W\ R_W} \right\} + 0.8$	-5.75	
(15)	S - SKIN, DIMENSIONLESS, = [(10) - (14)] / 2		123
(16)	ΔP_S - PRESS. DROP DUE TO SKIN = (.868 M S)	415	
(17)	P_F^* - FLOWING PRESS. W/NO SKIN = ($P_F + \Delta P_S$)	4519	
(18)	P_E - FINAL PRESSURE, PSI,	4547	
(19)	$(P_E - P_1)$	19	
(20)	$\Delta \bar{P} = 1.151(P_E - P_1)/M$	5.61	
(21)	$\bar{T}$ - DIMENSIONLESS TIME @ 1 HOUR (FIG.1)	4.5×10^{-5}	
(22)	$FR_E^2 = 264\ K / U\ C\ \bar{T}$	2.44×10^4	
(23)	$(P_E - P_F^*)$	28	
(24)	$\log_{10} \bar{R} = (23)/ 2\ M$	3.59	
(25)	$\bar{R}$ - DRAINAGE RADIUS/RADIUS DRILLED HOLE	3900	
(26)	R_E - DRAINAGE RADIUS, FT. = (25) X R_W/12	1280	1280
(27)	F - POROSITY, FRACTION, = (22)/(26)(26)		.015
(28)	PI - PRODUCTIVITY INDEX = $Q/(P_E - P_F)$		.683
(29)	PI* - PI W/NO SKIN = $Q/(P_E - P_F^*)$	10.82	
(30)	E - COMPLETION EFFICIENCY = 100 X (28)/(29)		6.31%

CASE 2012: Application of MAX PRAY

JULY 13, 1961 HEARING

Case No.

2012

Application, Transcript,
Small Exhibits, Etc.

GOVERNOR
EDWIN L. MECHEM
CHAIRMAN

State of New Mexico
Oil Conservation Commission

LAND COMMISSIONER
E. S. JOHNNY WALKER
MEMBER

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

P. O. BOX 871
SANTA FE

July 26, 1961

Mr. Jack Campbell
Campbell & Russell
P. O. Drawer 640
Roswell, New Mexico

Re: Case No. 2012 & 2135
Order No. R-1724-A & R-1836-A
Applicant:
Max Pray & Nearburg & Ingram

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

ir/

Carbon copy of order also sent to:

Hobbs OCC x
Artesia OCC
Aztec OCC

OTHER

GOVERNOR
EDWIN L. MECHEM
CHAIRMAN

State of New Mexico
Oil Conservation Commission

LAND COMMISSIONER
E. S. JOHNNY WALKER
MEMBER

P. O. BOX 871
SANTA FE

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

July 26, 1961

Mr. Jack Campbell
Campbell & Russell
P. O. Drawer 640
Roswell, New Mexico

Re: Case No. 2012 & 2135
Order No. R-1724-A & R-1836-A
Applicant:
Max Pray & Mearbury & Ingram

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

ir/

Carbon copy of order also sent to:

Hobbs OCC x
Artesia OCC
Aztec OCC

OTHER

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 CONSIDERRING:

CASE No. 2012
Order No. R-1724-A

IN THE MATTER OF THE APPLICATION
OF MAX PRAY FOR THE ESTABLISHMENT
OF 80-ACRE OIL PRORATION UNITS IN
THE SOUTHWEST GLADIOLA-DEVONIAN
POOL, LEA COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 o'clock a.m. on July 13, 1961, at Santa Fe, New Mexico, before the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission."

NOW, on this 26th day of July, 1961, the Commission, a quorum being present, having considered the testimony presented and the exhibits received at said hearing, and being fully advised in the premises,

FINDS:

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

(2) That the evidence presented indicates that the Southwest Gladiola-Devonian Pool can be efficiently and economically drained and developed on 80-acre proration units.

(3) That to require development of the subject pool on 40-acre proration units might cause the drilling of unnecessary wells.

(4) That correlative rights will not be impaired by development of the subject pool under rules allowing wells to be located in either quarter-quarter section of the 80-acre proration unit.

(5) That development of the subject pool on 80-acre proration units will not cause waste.

(6) That the temporary special rules and regulations promulgated for the subject pool by Order No. R-1724, entered in Case No. 2012 on July 21, 1960, should be made permanent.

IT IS THEREFORE ORDERED:

(1) That the temporary special rules and regulations promulgated for the Southwest Gladiola-Devonian Pool by Order No. R-1724, entered in Case No. 2012 on July 21, 1960, are hereby made permanent.

(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

EDWIN L. MECHEM, Chairman

E. S. WALKER, Member

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

esr/

GRANTHAM, SPANN AND SANCHEZ
ATTORNEYS AT LAW
914 BANK OF NEW MEXICO BUILDING
POST OFFICE BOX 1031
ALBUQUERQUE, NEW MEXICO

EVERETT M. GRANTHAM
CHARLES C. SPANN
MAURICE SANCHEZ

TELEPHONE
243-3525

July 5, 1961

Mr. A. L. "Pete" Porter
Director, N. M. Oil Commission
Santa Fe, New Mexico

Re: Case 2215: Flaring of Casinghead
Gas in the Cha-Cha Gallup Oil Pool

Dear Mr. Porter:

Please enter my appearance as local attorney of record for El Paso Natural Gas Products Company in the above entitled and numbered cause, which is set for hearing at Santa Fe on July 13. A representative of El Paso Natural Gas Products Company will be present to make a statement in behalf of that Company.

Sincerely yours,

GRANTHAM, SPANN AND SANCHEZ

By: Charles C. Spann

CCS:rr

BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
JULY 13, 1961

IN THE MATTER OF:

CASE 2012 — In the matter of the application of Max Pray for the establishment of 80-acre oil proration units in the Southwest Gladiola-Devonian Pool, Lea County, New Mexico.

CASE 2135 — In the matter of the application of Nearburg & Ingram for the establishment of 80-acre oil proration units in the Southwest Gladiola-Pennsylvanian Pool, Lea County, New Mexico.

TRANSCRIPT OF HEARING

BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
JULY 14, 1961

IN THE MATTER OF:

CASE 2012 (Reopened) — In the matter of the application of Max Pray for the establishment of 80-acre oil proration units in the Southwest Gladiola-Devonian Pool, Lea County, New Mexico.

Case 2012 will be reopened pursuant to Order No. R-1724 to permit operators in the Southwest Gladiola-Devonian Pool, Lea County, New Mexico, to appear and show cause why said pool should not be developed on 40-acre proration units.

CASE 2135 (Reopened) — In the matter of the application of Mearburg & Ingram for the establishment of 80-acre oil proration units in the Southwest Gladiola-Pennsylvanian Pool, Lea County, New Mexico.

Case No. 2135 will be reopened pursuant to Order No. R-1836 to permit operators in the Southwest Gladiola-Pennsylvanian Pool, Lea County, New Mexico, to appear and show cause why said pool should not be developed on 40-acre proration units.

BEFORE: Honorable Edwin L. Mechem
Mr. E. S. (Johnny) Walker
Mr. A. L. Porter

T R A N S C R I P T O F P R O C E E D I N G S

MR. PORTER: The hearing will come to order, please. The Commission will take up next Case 2012.

MR. MORRIS: In the matter of the application of Max Pray for the establishment of 80-acre oil proration units in the South-

west Gladiola-Devonian Pool, Lea County, New Mexico.

MR. CAMPBELL: If the Commission please, Jack L. Campbell, Campbell & Russell, Roswell, New Mexico. In this case, I would like to enter an appearance for Ken Percy, Cities Service Petroleum Company, Moss Petroleum Company, and Wearburg & Ingram. At this time I would also like to move that Case No. 2012 and Case No 2135 be consolidated for the purpose of hearing only.

MR. PORTER: If there is no objection to the consolidation of the Cases, the Commission will consolidate the two Cases.

MR. CAMPBELL: In regard to Case No. 2135, my appearance is for Wearburg & Ingram only, as they're the only operators involved in that particular case at this time.

MR. PORTER: I would like to call for other appearances in either of the cases at this time.

MR. CHRISTIE: R. S. Christie of Amerada Petroleum. I would like to make a statement at the end of the case.

MR. PORTER: All right. Mr. Campbell, you may proceed.

MR. CAMPBELL: We have three witnesses that can be sworn.

(Witnesses sworn)

MR. CAMPBELL: I will call Mr. Pickering first.

WARREN PICKERING,

called as a witness, having been first duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. CAMPBELL:

Q Will you state your name, please?

A My name is Warren Pickering.

Q Where do you live, Mr. Pickering?

A I reside in Oklahoma City, Oklahoma.

Q What is your profession?

A I'm a consulting geologist in the employ of Mr. Max Pray.

Q You testified previously in Case No. 2012 before an Examiner for this Commission, did you not?

A Yes, sir, that is correct. I believe I was the only witness that day.

Q Will you please briefly recite for the Commission your educational and professional background?

A I was schooled at the University of Minnesota, where I finished with a Master's degree in 1941. I have been in the employ of the Pure Oil Company, and the Standard Oil Company of California, namely, the California Company. The last seven years I have been an independent consulting geologist, and for the last five years representing Mr. Pray.

Q In connection with your representation of Mr. Pray, you are acquainted, I assume, with the development in the Southwest Gladiola-Devonian Pool, are you not?

A Yes, sir, that is correct.

Q Did Mr. Pray drill the first or discovery well in that Pool?

A The well drilled by Mr. Pray, known as Zealon Pray No. 1

was considered at the time of the hearing as the discovery well. However, there was another Devonian producer at that time, the Moss No. 3 Peck.

(Thereupon, Applicant's Exhibits 1, 2, 3 were marked for identification).

Q I refer you to what has been identified as Exhibit No. 1 in these consolidated cases, and ask you to state to the Commission what that is?

A This map is a plat intended to show all of the Devonian wells drilled in the area, whether they be producers or not, so that we might be brought up to date as to development in this area.

Q Will you point out on Exhibit 1 the wells again, the locations of the wells that were Devonian wells at the time of the original hearing on this matter one year ago?

A Yes, sir. The first well producing from the Devonian was drilled by the Moss Petroleum Company, their No. 3 Peck, located in the northwest, southwest of Section 26, Township 12 South, Range 37 East. That was completed in the Devonian in February of 1960. Therefore, subsequent to that, the Max Pray No. 1 Zealon Craig, located in the northeast of the southwest of Section 27, same Township, was completed in June. Those were the two wells producing at the time of the last hearing.

Q Your testimony at that hearing was confined primarily, was it not, to the completion date on the Max Pray Zealon Craig well?

A Yes, sir, that is correct.

Q Will you point out to the Commission, using Exhibit No. 1, the Devonian wells, whether producing wells or dry holes, that have been drilled during the approximate year that has elapsed since the last hearing?

A Yes, sir. I'd be glad to. As an introductory, I might say that there have been four completions in the Devonian and four dry holes, with one well now drilling. If the Commission please, and you'll follow with me, I will locate each of these wells in the order of their completion. Some were drilled simultaneously, but we will use the date of completion as chronological order.

Well No. 1 was drilled by Mearburg & Ingram, No.1 Midhurst, located in the northwest, northwest of Section 3[illegible]. I might say that all of these refer to the same Township. That was drilled to 12,228 feet. It was a successful Devonian producer, completed in September 30, 1960.

The next well drilled in the area was the Skelly No. 2 Foster, located in the northeast, southeast of Section 27. This was a dry hole at a total depth, 12,328, and completed as a dry hole on October 2, 1960.

The next was the Max Pray No. 1 Rufus R. Craig, located in the northeast, southwest of Section 2[illegible]. This was a dry hole in the Devonian, one of the deepest in the area, drilled to 12,[illegible]66 feet, abandoned on December 4th of 1960.

The fourth well drilled was Moss Petroleum No. 4 Peck, located in the southeast of the southwest of Section 26. This was a Devonian

producer at a total depth of 12,[illegible], completed on December [illegible], 1960.

Cities Service then drilled the No. 1 Turner "B" located in the southeast, southwest of Section 2[illegible]. This was a successful Devonian producer at a total depth, 12,[illegible], completed on February [illegible], 1961.

Yearbury & Ingram, on their No. 1 Westing, located in the southeast of the northeast of Section 2[illegible], was dry in the Devonian, and a total depth of 12,2[illegible] abandoned on March 1st, 1961.

Yearbury & Ingram drilled their No. 2 Lidhurst, located in the southeast, northwest of Section 3[illegible]. This was a successful Devonian completion at a total depth of 12,230 feet, completed on June 1st, 1961. The most recent completion was a dry hole drilled by Moss Petroleum Company on their No. 1 Peck, located in the southwest of the northwest of Section 26. This well was abandoned on the 10th day of July this month, 1961 at a total depth of 12,274. You will note that that is given credit as a drilling well. Actually, the abandonment was so recent we haven't had a chance to put the spokes on the map. We are now in the process of drilling, I say we, Amerada Pray No. 1 Grady Lowe now drilling in the northeast of the northwest of Section 34, drilling below [illegible],000 feet this morning. Again, in summary, since our last hearing, there has been four producers, four dry holes, one well drilling.

Q What is the approximate cost of a dry hole to the Devonian in this Pool?

A My best figures come from our Rufus R. Craig where we did extensive drill stem testing. The figure there was $198,000.

Q If this figure is fairly representative of the cost of the dry hole to the Devonian, then there has been spent on dry holes in this area since the last hearing in the neighborhood of three-quarters of a million dollars, is that correct?

A Yes, sir. If you were to include the geophysical work and the exploratory figure, I imagine it would be close to a million dollars of expenditure.

Q What is the approximate cost of a well, a single completion to the Devonian?

A I believe the cost of $240,000 to $260,000 is appropriate.

Q So that insofar as the four producing wells are concerned, there has been approximately a million dollars spent in the area in the past year on producing Devonian wells, is that correct?

A That is correct.

Q Would you say, then, that the entry of the order for temporary 80-acre spacing has had any effect in delaying development or definition of this Pool?

A No, sir, on the contrary. We think that 80 acres would be permissible, it has encouraged drilling.

Q Would you point out to the Commission what this drilling has done with regards to defining the limits of this Devonian Pool?

A Actually, I think it's rather obvious that progressing to the north by virtue of the Rufus Craig drilled by Max Pray, the Foster well drilled by Shelly, and the now dry Moss No. 1 Peck well that we have very definitely limited the well to the north.

We know from geophysical effort that the west dip is very severe to the west, and, therefore, we believe that we are limited on the west. The east has no dry holes unless you go to the McAllister Fuel location, which is to the northeast. However, there is a well on the Midhurst that's running low, and although we haven't actually drilled a dry hole, we are quite nervous about going any further to the east. This leaves only the south available for future expansion.

Q Is there any limitation with regard to the south on dry holes to the Devonian?

A Yes, sir. We have used these several dry holes to the Devonian that are rather expanded from the field, but you notice one drilled by the Lawton Oil Company in Section 3 at a location in the southeast, southeast of the northwest, which is a definite dry hole in the Devonian, so that most certainly will be the southern limit, if it doesn't occur before that point.

Q Are there not also dry holes delineating this field to the southeast in the Nearburg-Ingram area?

A Yes, sir. That is true. However, that is a condition that is unique to that particular well being a faulted well. It is dry in the Devonian, and we are counting it as a dry hole, but we are considering it a faulted well.

Q Considering the development that has taken place in the four Sections around 27, 26, 34 and 35, and referring to the Devonian only, how many dry holes have been drilled to the Devonian in

that area?

A There have been seven dry holes drilled in the area you described.

Q So that that would represent an investment of approximately a million and a quarter dollars in the dry Devonian holes in the entire four-section area, is that correct?

A Yes, sir, that would a conservative figure.

Q How many producing wells have been drilled to the Devonian in that area?

A There have been six producers in that four-section area.

Q So, your percentages of taking production from the Devonian in that area have been less than 50/50, is that correct?

A Yes, sir, at the present time.

Q At the last hearing, you testified with regard to the general geological situation in this particular area, as to the Devonian formation. Will you state whether or not the additional development has to any great extent clarified the geological situation in this area, or does it still remain as you testified previously in a considerably complicated situation, to say the least?

A The area was presented initially based on the two wells drilled, and the outlying dry holes coupled with geophysics, it was characterized as an extremely complex faulted Devonian area. We at that time presented a map showing numerous faults, which was the best interpretation we could derive at that time. These nine wells -- eight wells drilled, one now drilling, have tended to

compliment the complexity of this area. I wouldn't say that it has defined it a great deal more as regards to the position of faulting. We know very definitely that faults are there. As a matter of fact, we found additional small faults we knew not of when the first hearing was held. I feel that the area is not beyond contouring. On the contrary, each of us could make a geologic contour map on top of the Devonian. I dare say that no two of them would be alike. As a matter of fact, we have tried, the several companies in the area, to combine our efforts for geologic purposes, and make a common map. This cannot be done and honor all of the information presented by each of the several companies. It's an extremely complex geologic problem.

Q Now, since the last hearing, of course, you have had some production history for the Max Pray Zealon Craig well in the northeast quarter of the southeast quarter of Section 27, have you not?

A Yes, sir, that is correct.

Q Will you explain to the Commission what has occurred with regard to production from that well during this period of time?

A The Max Pray Zealon Craig well began producing in July of 1960, and looked for the first three months for all the world like it was going to make its allowable; water-free production, a very strong well. Its allowable was made on each of the first four months. However, in the month of October, it was reported, and we gauged 282 barrels of salt water along with our production. This was during the time that the north 40-acre offset, the Rufus Craig

was in the process of drilling, and needless to say, we were greatly concerned about the propriety of going ahead with the Craig well at that time because it was intended to be so much structurally lower. Back to the Zealon Craig. Then, the well continued to increase in its water content until the month of January, this year, when the water increased to the point where it would not flow of its own accord. We then put it on a Robe pump on the 10th day of January, and also reduced forcibly and reduced by our own requirements the amount of production because of the water being produced, you might say, selfishly, too, because we own a half interest with the Cities Service to the south, and we weren't in a position to pull the water in, if that was being done. Therefore, we did curtail voluntarily our own production. It now makes 46 percent water per month with 4,000 barrels of net oil, which is well below its allowable.

Q In your opinion, if this well continues to act as it has been, will that well pay out, as far as an investment is concerned?

A For the last six months it's been holding rather constantly between 36 and 45 percent water production on the rate of pump that we have introduced. We feel, if this continues, it will pay out, but it's still a great question whether we can hold that water or not.

Q Would it be an over-all pay-out if it is considered in conjunction with the dry hole you have drilled to the north?

A No, sir, it will not pay for the dry hole we drilled.

Q You have stated, or indicated, that, in your opinion, this water situation has not been or was not the result of coning or pulling water into the well. What do you think has caused that water to come into this well?

A Indications are, and our reasoning is based entirely on the core analysis that we obtained from the Zealon Craig well. The method of completion included the drilling of the top 11 feet of the Devonian, at which time we ran a drill stem test to find that oil was present, and it was a commercial well. We then cut a 10-foot core on the bottom and had it carefully analyzed. There were 8 feet worthy of analysis, and the permeabilities ranged from 70, from as low as 13 to as high as 1966 millidarcies. Of the 8 feet, there were 3 feet that were very pronounced in high millidarcy feet, high permeability. It is my feeling, and the engineers seem to concur that this is not a coning effect by virtue of production, but it is actually depletion of these highly permeable zones; depletion of the oil first, and thence allowing avenue for water to encroach from the peripheral edge of the reservoir.

Q Now, at the last hearing you presented, as I recall it, the core analysis on this well, and you have recited here some of the permeabilities that were found in the core. Are you generally acquainted with the completion data on the wells that have been drilled to the Devonian since that time?

A Yes, generally speaking.

Q Has anything occurred to change the opinion that you ex-

pressed at the time of the last hearing, that, in your opinion, a well here in the Devonian with this type of core that you found, would drain 80 acres?

A No, sir. I still believe the permeability is sufficient to drain the 80 acres.

MR. CAMPBELL: I would like to offer Exhibit No. 1 in evidence, and that's all the questions I have of this particular witness at this time.

MR. PORTER: Without objection, Exhibit No. 1 will be admitted.

(Thereupon, Applicant's Exhibit No. 1 was received in evidence).

MR. PORTER: Does anyone have a question of the witness? Mr. Nutter.

MR. NUTTER: Mr. Campbell, what aspects of this will the other two witnesses go into?

MR. CAMPBELL: The bottom hole pressure comparisons as the field has been developed. There will be one witness that will testify in connection with the core taken from the field.

MR. NUTTER: This is your only geologist?

MR. CAMPBELL: Yes. I have another one, but he's not going to testify to the geological features of the matter.

CROSS-EXAMINATION

BY MR. NUTTER:

Q As I understand it, now, there are two producing wells on

the west side of the field, and four producing wells on the east side of the field; is that correct?

A Mr. Mutter, in the beginning, we prefer to call them two fields. It now appears that this is one extremely complex area, all producing from the Devonian.

Q Well, I said two on the east side, or two on the west side of the field, and four on the east side of the field, --

A That is correct.

Q -- referring to it as a single field?

A That is correct.

Q In the middle of the field there have been three dry holes drilled, is that correct?

A That is correct.

Q Do you believe there is any actual communication from the east side to the west side of the structure?

A I believe the engineers' evidence of bottom hole pressure indicate a similiarity. Geologically, it looks as though there should be a dissimiliarity. The only indication that we have geologically is perhaps a different water-oil contact in the two blocks. They seem to have a similar Genesis of evolution as regards commercial production, however.

Q Is there one main faulty block that has dropped in the center of the field, and you find these wells lower structurally than the wells to the east and west of it?

A - Mr. Mutter, I wish I could answer that and be sure of it.

I cannot answer it with certainty. The well pattern would seem to indicate that. The disposition of the wells would seem to be like that, in that some of the geophysics and particularly the Skelly Oil Company do not trend their faults north-south at all; they prefer to trend them east-west, which gives you a mild evidence of the extreme complexity that we have introduced here in this picture.

Q Has any well that you know of actually cut a fault?

A Yes, sir. The well in the northwest of the northeast of 34, drilled on the Grady Lowe, actually cut a fault at the top of the Devonian. It also had some 3200 feet of clean oil on a drill stem test, but did not appear to be worthy of completion at its early date.

Q I see.

A May I proceed?

Q Yes, sir.

A There are other small faults. Our Rufus Craig, which you will find in the southeast of the northwest of 27, cut a fault of some 90 feet of throw which introduced an extra section of new Mississippian on top of that particular bed.

Q Which wasn't encountered in any other well?

A No, sir. We have not found the faults to be in any particular position in the lithologic column.

Q Now, how about your Lowe No. 1 in the northeast of the northwest of Section 34, which is drilling at the present time?

How is that running structurally?

A I have said we're below ',000 feet, and the markers to that depth are unimportant, and you cannot depend on them, so we have no markers at the present time. I can tell you, though, that from the geophysical evidence, and the fact that the No. 1 Turner is higher than the Max Pray Pecos Crain, we are hoping with everything we have that it will be a high well, at least as high as the Turner 1 "D."

Q In going through the dry holes that have been drilled in there since the last hearing, you mentioned four, and it would appear from the map that Nearburg-Ingram Keating No. 1 was completed in March of '61. Was that a dry hole to the Devonian that was drilled since the last hearing, or did you mention that well?

A I mentioned it, and it was drilled since the last hearing. That was one of the four.

Q I have marked the four as being the No. 1 Moss Well up in Section 26, --

A Yes, sir.

Q -- the Skelly Well in 27, --

A Yes, sir.

Q -- the Max Pray Well in the northwest corner of 27, --

A Yes, sir.

Q -- and Nearburg-Ingram's No. 1 Well in the northwest of the northeast of 34?

A No, sir. The fourth well is the Keating No. 1, which is

in the southeast of the northeast of 34. The Yearbury & Inman No. 2, and the Keating No. 1, which is located in the northwest of the northeast is an old hole drilled by Lobo Petroleum Company, the No. 1 Lowe, it's date is correct, it was completed there on 4/ /44. It is the old hole in which we encountered a Devonian fault and was not completed.

Q It is dry in the Devonian?

A Yes, sir.

Q You haven't constructed any cross-section of this reservoir running from east to west to show the continuity or discontinuity of the formation, is that correct?

A No, sir. We have constructed such cross-sections, but we had not intended to present them.

Q And the engineering witness will have data to substantiate the claim that this is one field, is that correct?

A We think so, yes.

MR. NUTTER: I believe that's all. Thank you.

MR. PORTER: Mr. Morris.

BY MR. MORRIS:

Q Mr. Pickering, in the previous hearing of this case, considerable concern was expressed due to the faulting of the area, that possibly you are going to have a lot of unproductive acreage dedicated to wells if we went to 80-acre spacing. I was wondering if you would care to comment if whether the subsequent development justified that concern?

A I think the concern we had then would still be appropriate. Unfortunately, with this number of wells drilled, we have not pinpointed the bearing throw of these faults to the point of being able to set up a number of reservoirs.

Q You would be unable to say at this time that the actual dedication to the wells in existence now is proper?

A I believe the wells now are proper, simply because there are no wells that show specific faulting; for instance, to the west. Therefore, I think we're safe in assuming that we can go at least another 40 west since there's nothing to belie that assumption. We have nothing to the contrary to point up the fact that we might be contributing non-productive acreage.

MR. MORRIS: Thank you.

REDIRECT EXAMINATION

BY MR. CAMPBELL:

Q Isn't that same situation true as to the present wells on the eastern portion, the Moss 3 and 4, and the Wearburg & Ingram 1 and 2 there in Sections 26 and 35?

A Yes, sir. It's even more appropriate there because if you notice the staggered 80-acre pattern of development is there, indicating the common source of supply and productive well.

MR. CAMPBELL: That's all.

MR. PORTER: Anyone else have a question of the witness? He may be excused.

(Witness excused)

MR. PORTER: Mr. Campbell, we will recess the hearing until 1:15.

AFTERNOON SESSION

MR. PORTER: The hearing will come to order, please. Mr. Campbell, are you ready to call your next witness?

MR. CAMPBELL: Yes, sir. Mr. Motter.

E. F. MOTTER,

called as a witness, having been first duly sworn on oath, testified as follows:

DIRECT EXAMINATION

BY MR. CAMPBELL:

Q Will you state your name, please?

A E. F. Motter.

Q Where do you live, Mr. Motter?

A Hobbs, New Mexico.

Q By whom are you employed and in what capacity?

A Cities Service Petroleum Company, Division Engineer.

Q How long have you been Division Engineer?

A About four years.

Q Have you previously testified before the New Mexico Oil Conservation Commission in your capacity as a petroleum engineer?

A Yes, sir, numerous times.

Q Referring to Exhibit 1, which has been introduced in this case, will you point out to the Commission the well in which Cities

Service Petroleum Company has an interest?

A Yes. That's the Cities Service Turner "B" No. 1. He don't have the "B" on there, but it's located in the southeast, southwest quarter of Section 27, 12 South, 37 East. The well is held jointly by Cities Service and Max Pray.

Q When was that well completed?

A February 14, 1961.

Q When was the Max Pray discovery well, or the well immediately to the north completed?

A On June 15, 1960.

Q Have you made any studies to compare the bottom hole pressures in those two wells?

A Yes, sir, I have.

Q I hand you what has been identified as Applicant's Exhibit 2, and ask you to state what that is?

A This is a curve plotting bottom hole pressure versus cumulative production for the Max Pray Zealon Craig No. 1, and the Cities Service Turner No. 1. I used cumulative production between those two wells because we feel that although there is a complexity of the structure in this area, we feel that those two are producing from the same reservoir.

Q Will you refer to that, where necessary, and point out to the Commission what the comparative bottom hole pressures were with relation to the time that the tests were taken?

A Well, the first pressure was taken on the Pray Well June

26, 1960, shortly after completing. I think they had only produced some 2600 barrels of oil at that time. The next pressure plotted on that curve is March 9, 1961, that is shortly after the completion of the Cities Service well. The next two pressures were both taken on the Cities Service well just this past month, on July 20 -- excuse me -- June 20, '61, and June 2[illegible], '61. The last one being a pressure buildup test.

I would also like to point out that there has only been one bomb test other than drill stem bottom hole pressure data on the wells that Mr. Nutter referred to as the east. I would like to point out that that bottom hole pressure was taken on April 28, 1961, on the Moss Pec[illegible] No. 4, and it was 4494 pounds. And if you would plot that on a time scale close to the March 9th, 1961 survey, of course, you would find out that the pressures were almost identical in the reservoir, or were at that time.

Q What does this data indicate to you, as a reservoir engineer, in connection with the drainage that is taking place in this reservoir?

A Well, to me, it appears that at least in the vicinity of our two wells, that there was certainly drainage occurring up until the time our well was drilled, and a bottom hole pressure run on it.

Q Would it appear by reason of the comparable bottom hole pressure data on the Moss well that at least there is a possibility that drainage is occurring throughout a single reservoir here?

A Yes, I would say that.

Q Now, what other work have you done in connection with your well which will indicate a drainage area or movement of oil in this particular reservoir?

A Well, we have performed pressure buildup tests and resulting calculations, which are a engineer's tool to determine the effective permeability, the drainage radius, and several other factors.

Q Is this pressure buildup calculation a procedure that is commonly used in the oil and gas industry to indicate the well performance and so forth?

A Yes, it is.

Q Will you refer to what has been identified as Applicant's Exhibit No. 3, and advise the Commission whether this is the complete pressure buildup calculation based upon your well?

A Yes, it is. This is a pressure buildup calculation taken from data obtained June 23, 1961, as indicated on Exhibit No. 2. I would like to go through this and point out a few of the highlights that I think are important to this hearing.

Q Without going through the whole calculation with regards to the factors that are important in this hearing, such as permeability, drainage area, and production efficiency index, will you refer to this Exhibit and advise the Commission what it reflects to you?

A Yes. Item No. 6 is the average effective permeability of the formation, 324 millidarcies, which I consider good for this

Devonian reservoir.

Item 28, the calculation drainage radius, 1230 feet, which, in effect, would drain probably some 160 acres.

Item 29 is the PI with no skin effects, which is 10.8 barrels per pound drop.

Going back to this skin, Item 1?, that is a positive number, indicating that the permeability immediately around the well bore is probably less than the average formation. This is due probably to some drilling fluids still around the well bore. This well was completed, naturally, it was never acidized.

Q Do you consider that an average permeability of 324 millidarcies is a relatively high permeability?

A Yes, for this type reservoir.

Q What does it indicate to you with regard to the movement of fluids within the area of this well?

A Well, I think that it would indicate to me that we could easily drain 80 acres, and, of course, that is further pointed out by the drainage radius, which is affected by the average permeability calculation.

Q You used that permeability calculation in order to ultimately determine the drainage radius mathematically, did you not?

A That is correct.

Q Are you acquainted with the core analysis in the Pray well that was introduced at the last hearing?

A Yes. I have a copy of it.

Q Will you refer to that and state what the permeability range was in the core analysis on that particular well?

A Well, on the 8 feet cored there were eight samples, and the permeability ranged from a low of 73 to a high of 1966 millidarcies. I might point out also that there was another interval where two permeabilities have different plugs, but right adjoining each other was 1233 and 1340 millidarcies, extremely high for this reservoir.

Q Using those actual core analyses and the ranges there, your figure of 324 millidarcies on your calculated permeability is a fairly conservative figure, is it not?

A That's right. It's a little bit less than the average of the core analysis.

Q Are you acquainted with the average permeabilities on the core, which will be referred to later by another witness, that was taken on one of the Mearburg-Ingram wells?

A I have been told that the permeabilities are in the same range as the one that I have available.

Q In your opinion, as a reservoir engineer, does the permeability range here, and the calculated drainage radius, as indicated on Exhibit No. 3, indicate to you that a well may reasonably be presumed to drain at least 30 acres efficiently?

A Yes.

Q Now, what other data do you have available with regard to the production history of this reservoir?

A We have made rate time curves on all the wells producing from the Devonian reservoir.

Q Mr. Hotter, I've handed you what has been identified as Applicant's Exhibit No. 4, and ask you to state what these are?

A Well, these are decline curves, barrels per month versus rate, or excuse me, time, for each well completed in the Southwest Gladiola-Devonian Pool. I might correct these. These are identified as West Gladiola. I think the production is appearing in the Oil and Gas Engineering Committee reports as West Gladiola, and my engineers put it down as such, but it is Southwest.

Q I refer you to the second page, which is the data on the Max Pray Mealon Craig No. 1, which is to the north of your well, --

A Yes.

Q -- you will note there that there has been a substantial increase in water production from that well after it initially produced only oil. As a petroleum engineer, and particularly with reference to your knowledge of the core analysis of that well, will you state what, in your opinion, has been the cause for the water production from that well?

A Well, I agree with the previous testimony, that this is water coming from the edge of the water aquifer, and it is normally termed by engineers as an unequal advance due to permeability variations in the formation. In other words, on the more permeable streaks, the oil is produced out first, and then the water follows.

The well will probably continue to produce oil from the less permeable streaks along with considerable water.

Q What relationship, if any, do you think that this increased water production may have with the rate of production?

A I don't think it has too much effect on rate. I think that the oil has been produced in these higher permeable streaks. If we had taken a year to do it, or a month to produce it, the water would still have come along in the permeable streaks whenever so many barrels of oil had preceded it. I don't think that any under-expected normal unit allowables that we may foresee that we would see any danger from any rates that we may expect.

Q Based upon your knowledge of the bottom hole pressure comparisons in the wells in this reservoir, and upon your knowledge of the core data, and upon your knowledge of the pressure buildup calculations that you have made, what is your opinion with regard to the drainage area of a Devonian well in this Pool?

A Well, I think that we have shown here quite feasibly that it's in excess of 80 acres. I don't know if I can pin it down any greater than that. I think that following our calculations, it's somewhere around 160 acres.

Q One other question on the Exhibit No. 4, which is the series of Exhibits on the production time data. Your well, which is the first one shown there, shows a considerable decline in production in the last month or two. Will you state to the Commission what accounts for that considerable drop?

A Well, yes. That was in the last months we had available production. There have been no pressures taken since the initial pressure taken in June of 1960. That's when we were running all our pressure buildup curves and bottom hole pressures. In other words, we sacrificed 1,000 barrels of oil to get this information. I might also add, at the time we were drilling and about ready to complete our well, was about the time that the practice well started making large water cuts, and we were a little dubious to go ahead and cut a core, run bottom hole pressure, or bottom hole fuild analyses, et cetera, that is needed for real good information, due to the fact that we were skeptical whether we could make water from the well ourselves, so we tried to complete it in the most economic manner possible.

Q Have you experienced water production from your well?

A None whatsoever.

Q Has it produced, except for the last month when you were running the test, at top allowable?

A Yes. It is capable of producing at a higher rate. If you notice, the pressure buildup rate was 303 barrels a day.

MR. CAMPBELL: That's all the questions I have from this witness.

MR. PORTER: Any questions of the witness? Mr. Hutter.

CROSS-EXAMINATION

BY MR. HUTTER:

Q Mr. Hutter, in this group of Exhibits here, I notice that several of these wells had experienced a decline, the productivity

or production, at any rate, and then a buildup. On the third sheet it would appear that Midhurst reached a low point in January, and built back up again. Can you explain those fluctuations?

A No, I can't. We have another witness that will testify on his own well. I would assume, from looking at that, it was probably an artificial lift put on at that time.

MR. CAMPBELL: The next witness will be qualified to testify on that, and answer your question.

Q (By Mr. Nutter) How many of the wells in this pool are flowing?

A I think, if that is not an artificial lift, they are all flowing, with the exception of the Max Pray Well.

Q Is that the one that makes considerable water cut?

A Yes, that's correct.

Q Now, these pressures on your first Exhibit here, how many of them are from the Max Pray?

A The very first pressure.

Q The first pressure is the Craig. And the other three pressures are all from the Turner Well?

A From the Cities Service Petroleum Turner.

Q Were any pressures taken on the Craig Well that would show what the bottom hole pressure would be with relation to the Turner Well at the same time the Turner pressures were taken?

A There have been no pressures taken since the initial pressure taken in June of 1960.

Q How, on the pressure buildup calculations, Mr. Hotter, the important thing to determine the effective radius of drainage, one of the important things is the thickness of the pay, is it not?

A That's correct. We normally use the perforated interval or the exposed interval. In this case we used the open hole, 25 feet.

Q Is all of that effective pay?

A Yes, it is.

Q Is there any other effective pay in there that you haven't perforated?

A Yes, there is. In our interpretation, we think it's some 40 or 50 feet on down to the oil water contact.

Q But in the calculation you have used the 25 feet, is that correct?

A That's correct.

Q And if you had more effective pay than you actually used, that would tend to cause the effective radius of drainage to be larger than it actually would be, would it not, or given amount of production from 25 feet?

A I don't think so, because we don't have a homogeneous reservoir, and our vertical permeabilities vary as we run from one barrier to the other horizontal barriers.

Q There would be some vertical permeability?

A Yes, but not nearly as much as the horizontal permeability.

Q In other words, you don't anticipate recovering the additional 15 feet of --

A Yes. As the water aquifer moves in, it will push the oil up, but it will be over the entire drainage radius.

Q You will have vertical permeability?

A Yes, but it's not as great as the horizontal permeability.

Q Did you make a test, using 40 feet of pay to determine what the effective radius of drainage would be?

A No. I might point out that the 40 feet of pay would be hard to make that determination. You would have to calculate the permeability, and if you don't know what your producing rate was with 40 feet, I don't see what value it would be because it would be strictly an assumption. We know that 25 feet gives us a certain producing rate at a certain pressure.

Q You are also assuming that only the 25 feet is contributing oil to this well during this test, aren't you?

A That's correct.

MR. HUTTER: That's all. Thank you.

MR. PORTER: Anyone else have a question? The witness may be excused.

(Witness excused)

MR. CAMPBELL: Mr. Ingram.

TOM L. INGRAM,

called as a witness, having been first duly sworn on oath, testified as follows:

DIRECT EXAMINATION

BY MR. CAMPBELL:

Q Will you state your name, please?

A Tom L. Ingram.

Q Where do you live, Mr. Ingram?

A Roswell, New Mexico.

Q With whom are you associated?

A Nearburg & Ingram.

Q You are a partner in that organization?

A Yes.

Q What is your profession?

A Geological engineer.

Q How long have you been engaged in that?

A Since 1947.

Q You have previously qualified before the New Mexico Oil Conservation Commission in that professional capacity, have you not?

A I have.

Q Are you acquainted with the application, I'm speaking now of the Devonian formation only, the application in this case?

A Yes, I am.

Q Has your company drilled any Devonian wells in this area since the time of the original hearing?

A We have drilled three wells in the immediate area since that time.

Q Will you refer to Exhibit 1,and advise the Commission

where those wells are situated?

A The first well that we drilled is the Yearbury & Ingram No. 1 Midhurst, located in the northwest of the northwest of Section 35, which was a Devonian producer. The second well, the No. 1 Fred Keating, in the southeast of the northeast of Section 34, which was dry in the Devonian. The third well, the No.2 Midhurst, in the southeast of the northwest of Section 35, which was also a Devonian producer.

Q Have you taken any cores -- do you have any core analysis of any of those wells, as far as Devonian producers are concerned?

A We took a core in the original well, the No. 1 Midhurst, from 12,211 feet to 12,222 feet.

Q Go ahead.

A The permeabilities in this 11-foot core ranged from one-tenth to one-thousandth and ten withan average permeability over the 11 feet of 334.

Q Do you consider that to be a fairly high average permeability for the reservoir?

A Yes, we do.

Q Does that compare with the permeability based upon the pressure buildup calculations made by Mr. Hotter on the Cities Service well in the western portion of the field?

A It is within five to ten, I believe, of his estimate.

Q What is your opinion, based upon the information that you have, and upon the core analysis, and upon the test that has been

given with regard to bottom hole pressures, what is your opinion with regard as to whether or not a well in the Devonian reservoir here will efficiently and economically drain at least 80 acres?

A Well, from the data presented, and the information that we have, it certainly appears that a well will drain at least 80 acres.

Q I notice that the dry hole you drilled to the Devonian, the Keating Well, is drilled upon a diagonal offset pattern, is it not?

A That is correct.

Q Do you still believe that the order of the Commission entered as a temporary order in this case, with the right to drill in either 40-acre tract, is the appropriate type of order to encourage development in this reservoir?

A I do, and I might offer as an explanation, particularly as to the reason that we drilled our third well in the location that we did, rather than moving up directly offsetting it was, the old hole that was there, and we felt fairly certain as to the geological information there. However, due to the highly faulted nature, we were, well, we felt much safer drilling in this particular location than we did maybe in offsetting.

Q Do you concur with the testimony of Mr. Pickering that this is an extremely complicated area, geologically?

A Geologically, I think it's highly complex. It appears, from our engineering data, that,at least the drainage in the area,

that there must be some communication with it. Now, there may be minor faults. However, the separation is probably not definite, in any case.

MR. CAMPBELL: This is all the questions I have of this witness with regard to the Devonian portion of this reservoir. He will also testify in the consolidated case with reference to the Atoka-Pennsylvanian.

MR. PORTER: Does anyone have any questions of Mr. Ingram concerning his testimony on the Devonian reservoir? Mr. Hutter.

CROSS-EXAMINATION

BY MR. HUTTER:

Q As I understand it, the Lidhurst 1 "B" was an old well that was drilled back in 19[illegible]; is that correct?

A That is correct. It was drilled by Lawton Oil Corporation.

Q That recovered, according to the legend, 49 barrels of oil, and 408 barrels of salt water?

A That's the information we have, yes, sir.

Q When you drilled the No. 2 Well, did you use any special techniques to cause the bottom of that hole to drift away from the bottom of the old well?

A No, sir.

Q In other words, was there any directional drilling or anything like that?

A We attempted to drill a straight hole.

Q And you recovered 120 barrels of oil in twenty-four hours?

A That is correct.

Q Do you have any indication that there was any fault or anything separating the two wells, the old one and the new one?

A No, sir.

Q To what do you attribute the difference in productivity of those two wells?

A Fifty feet less hole.

Q You completed higher?

A That is correct.

Q What is the top of the Devonian in your No. 2 Well? It's not given on the legend there.

A The top of the Devonian in the No. 2 McHurst was 12,210 feet.

Q Do you have a subsea depth for that?

A Subsea minus 8314.

Q Is this the top of the Devonian on the 1 "B" that's minus 8317?

A That is correct, yes, sir.

Q But you completed up higher in the formation in this other well?

MR. CAMPBELL: Just a second. Was your answer yes?

A Yes.

Q (By Mr. Hutter) Mr. Ingram, could you state what is the

reason for the fluctuation of the production that's shown on the Group Exhibit that Mr. Hutter presented, particularly on the third page, your Richurst No. 1?

A During December and January we had the extremely heavy snows, and the pipeline gauger at that time was unable to get in and out. Subsequent to that, we installed a LACT unit, and we had excessive rains, and the electricity was off, so during December, January and February we were down because of bad weather, installation of LACT unit, and the power failure.

MR. CAMPBELL: Unchartered reefs, is that right?

A Yes.

Q (By Mr. Hutter) So these, then, would be surface conditions rather than bottom hole conditions that caused this fluctuation?

A That's right. We have had no difficulty bottom holewise.

Q Are all of your wells in the Devonian flowing?

A They are, yes, sir.

Q Do you have at the present time any plans for drilling in the west half of the northeast quarter of Section 35?

A The west half of the northeast quarter of Section 35? We are planning to do some geophysical work to help us ascertain whether or not it would be economical to drill in that particular location.

Q How about the west half of the southeast quarter of Section 26? Do you have any plans there?

A Well, the same thing. We were waiting particularly until Moss' well was dual, to see if he planned to dual prior to doing our exploratory work.

Q Has any attempt ever been made other than the initial completion to make a completion in the Devonian in the Keating No. 1 Well, in the northeast quarter of Section 34? Have you made any recent attempts on that?

A To recomplete in the Devonian?

Q Yes, sir.

A No, sir, we have not. We penetrated approximately 5 feet of Devonian on the initial test, and recovered considerable quantities of water out of it.

Q Do you think that those two wells are drilled in a fault block that has dropped down below the portions of the structure that lie to the east and to the west? Is the Devonian low in that area?

A The two wells you were referring to in the northeast quarter of Section 34?

Q Yes, sir.

A Of course, the well in the northwest of the northeast actually penetrated a fault. The well, the Keating Well, that we drilled, may or may not be in a fault. I mean, it is not an abnormally low well. Structurally, it is about three feet higher than the old Moss hole that was drilled in the northwest portion. However, we had an entire Mississippian section above, and they had none.

MR. NUTTER: Thank you.

MR. PORTER: Does anyone else have a question of the witness? He may be excused as far as this case is concerned and the Devonian is concerned.

REDIRECT EXAMINATION

BY MR. CAMPBELL:

Q Mr. Ingram, referring you, now, to the matter before the Commission to reopen the hearing by which Wearburg & Ingram were granted 80-acre spacing authority on temporary basis coextensive with the Devonian order, will you refer to Exhibit No. 1 in this consolidated case first, and point out to the Commission which of your wells are completed in the Atoka-Pennsylvanian formation?

A The Wearburg & Ingram No. 1 Midhurst and No. 2 Midhurst, located in the northwest quarter of Section 35, are both dually completed from the Pennsylvanian and the Devonian. The Wearburg & Ingram No. 1 Keating in the southeast of the northeast of Section 34 is completed only in the Pennsylvanian. The Moss No. 4 Peck in the southeast quarter of the southwest quarter of Section 26 has been perforated in the Pennsylvanian and packer leakage tests have been run, but to my knowledge it is not on production at this time.

Q Then, there are four wells in that immediate area which at least have found some production in the Atoka-Pennsylvanian formation, is that correct?

A That is true.

MR. CAMPBELL: Mark this Exhibit 4 in both cases.

(Hereupon, Applicant's Exhibit No. was marked for identification).

Q (By Mr. Campbell) Mr. Ingram, refer hereafter to this reservoir as the Southwest Gladiola-Pennsylvanian, to avoid confusion with another Pool. I refer you to what has been identified as Applicant's Exhibit No. 5 in the consolidated cases, and ask you to state what that is?

A Exhibit No. 5 is a subsurface structure map contoured on the top of the Atoka sand of Pennsylvanian age in the Southwest Gladiola area. It shows the location of the wells that have been drilled, that have -- well, that had been drilled in the area. The Wolfcamp producers are indicated with a single black dot, the Devonian producers with a black dot with a circle around it, and Atoka sand producers in which the large circle has been colored in half black.

Q Which of the wells have been completed since the original hearing in this case, which I believe was in December of 1960?

A The wells that have been completed since that time are the Nearburg & Ingram No. 1 Keating, the Nearburg & Ingram No. 2 Midhurst, and the actual perforation and completion attempt in the Moss No. 4 Peck.

Q As a result of the completion of those additional wells since the last hearing some six months ago, have you made any substantial changes in your contour as it appears on Exhibit here, as compared to the contour which was offered in the other hearing?

age also in this area. Now, the Midhurst No. 1 is some 1[illegible] feet away from both the Keating No. 1 and the Midhurst No. 2. Well, using this as a radius of drainage, we would have an area much larger than 80 acres.

Q Do you have available logs on your Midhurst No. 2 and your Keating Well?

A I do have.

(Thereupon, Applicant's Exhibits Nos. 6 & 7 were marked for identification).

Q (By Mr. Campbell) I refer you to what has been identified as Applicant's Exhibits Nos. 6 and 7 in these cases, and ask you to refer to them, first, to Exhibit No. 6, which is the log on the Midhurst No. 2, and then to the Keating Well, and point out to the Commission your interpretation of those logs with regard to the thickness of the Pennsylvanian section there.

A Both Exhibits 6 and 7 are garma ray neutron logs on the two wells made by the Schlumberger Corporation, and on these Exhibits we have indicated the completion data, the perforations, and the tops of the various horizons. Originally, from the Midhurst No. 1 we had estimated at the time sand pay thickness was approximately 6 feet, and based all of our reserve estimates on that particular thickness. On Exhibit No. 6, the No. 2 Midhurst in the detailed section, you will note that the entire sand section is only 4 feet thick with approximately 2 feet of that being pay, or maybe 3 feet of it being pay. The perforated interval was at 11,13½ feet

to 138 feet. That, we feel, covers the entire sand thickness in this particular well. In Exhibit No. 4, it shows also 4 feet of sand pay with approximately 2 feet of net pay, the perforations being from 11,134 feet to 3[illegible] feet.

Q At the time of the last hearing, I believe that you made some calculations of reserves under a tract, I forget whether it was 40 or 80-acre tract in this reservoir. What have the drilling of the additional wells established with regard to the reserves?

A Well, originally, based on the 4 feet of pay that we were using in the Midhurst No. 1, we had calculated reserves of approximately 60,000 barrels for an 80-acre tract. Now, with the reduction in net pay to 2 or possibly 4 feet, our reserves will have to be reduced from 30 to 60 percent, thereby leaving us recoverable reserves of from 24,000 to 40,000 barrels per 80 acres.

Q What is the cost of a well drilled to this depth only?

A The cost of drilling a well solely for Atoka-Pennsylvanian would be approximately $200,000.

Q Then, it is obviously uneconomical to drill a well just to that zone, either on 40 or 80 acres, is it not?

A That is correct.

Q Is this dual completion in order to recover the oil in this particular zone purely a salvage operation, so far as you are concerned?

A It is. It's a salvage operation. The cost, I believe,

that I reported last time was approximately $30,000 additional expenditure.

Q In order to recover the reserves that are available in this reservoir?

A That is correct. Now, the $30,000 is additional expenditure if the well is being completed in the Devonian.

MR. CAMPBELL: That's all the questions I have of this witness. Before I forget it, I would like to offer the Exhibits 1 through 7 in evidence, and I would also like to correct a statement that I made. The Moss properties are owned, of record, by H. S. Moss individually, rather than by the Petroleum Company. That's all the questions I have.

MR. PORTER: Any questions concerning the Exhibits? Did you have a question concerning the admission of the Exhibits?

MR. HUTTER: Oh, no.

MR. PORTER: They will be admitted.

(Thereupon, Applicant's Exhibits Nos. 1 through 7 were received in evidence).

MR. PORTER: Did you have a question of the witness now?

MR. HUTTER: Yes.

RECROSS-EXAMINATION

BY MR. HUTTER:

Q Mr. Ingram, you have logs on two of these Pennsylvanian wells. Does the sand thickness in the other two Pennsylvanian wells compare pretty favorably with these two?

A We submitted the log on the No. 1 Midhurst at the original hearing, and the sand thickness was slightly greater. We estimated the 5 feet of net pay from the logs on the No. 1 Midhurst.

Q At the original hearing, were detailed calculations as to the estimate of 80,000 barrels of oil per acre tract submitted based on the porosity and water saturation and all that?

A We gave the entire information as to the porosity estimate, the recovery factor and all that information.

Q Does everything stay the same except you have re-evaluated the net sand thickness?

A Everything is essentially the same. The porosity, now, in the last two wells is slightly less, which, of course, might reduce the reserves somewhat more.

Q Now, on your Exhibit, I notice that you have one fault line to the west side of the Pennsylvanian structure. Is there any indication that there is a fault on the east side of this structure, or does that fault, if present at all, occur only in the Devonian?

A By fault on the east side of the structure, do you have reference to the separation between Gladiola and Southwest Gladiola, or within the Southwest Gladiola Field?

Q I was talking about separation within the Southwest Gladiola.

A Within the Southwest Gladiola in the Atoka, we find no definite evidence of any faulting.

Q Has an attempt been made unsuccessfully to complete any

other wells in the Pennsylvanian in this Pool except the four wells, which are producing?

A No attempt has been made in the -- now, drill stem tests were taken in Moss' No. 4 Peck, and were, as I recall, they recovered nothing, and then Max Pray's north well, his 2 Craig, a drill stem test was run in it and recovered water.

Q So, the only actual attempts at completion are these four wells, which are productive from the Pennsylvanian?

A Insofar as I know. I mean these are the only four wells that they have run pipe on, and actually perforated, yes, sir.

Q The four pressures that you gave us being Midhurst No. 1, Moss Peck No. 4, No. 1 Keating, and No. 2 Midhurst. Are all of those drill stem test pressures?

A They are all drill stem test pressures.

Q Have any bottom hole pressures been run since the drill stem test on any of these wells in the Pennsylvanian?

A We ran a drill -- bottom hole pressure test in the Midhurst No. 1 as a discovery well of a new field. However, the tubing was filled with gas for the most part, and we were unable to get what we considered as a pressure.

Q Was that run at about the time of initial completion?

A That's correct.

Q No subsequent pressures have been taken on that well?

A We attempted to run another one last week, and it was of the same caliber as the first one.

Q No pressure at all, or what?

A Well, there was a pressure in it which was -- the man running it felt that it was very unreliable because he could not establish a good gradient on it. If you recall, in this particular well, we were forced to go to heavier casing in the bottom, and, therefore, were unable to run our tubing all the way down opposite the perforations on it, so that we are some 2400 feet or so above the pay, and we're unable to get our bottom hole pressure tool down at that point. But the bottom hole pressure that we obtained the other day, which I feel is unreliable, was 1601.

Q What depth was the bomb?

A Well, that is corrected down to this minus 7221, but it was 2400 feet above that datum.

Q That's the corrected pressure to the datum?

A Right, using the limited gradient that he had.

MR. MUTTER: I believe that's all. Thank you.

MR. PORTER: Does anyone else have a question? The witness may be excused.

(Witness excused)

MR. CAMPBELL: That's all the witnesses.

MR. PORTER: This concludes your testimony?

MR. CAMPBELL: Yes, sir.

MR. PORTER: Anyone else desire to present testimony? Anyone have any statement to make in the case?

MR. LITTLE: John H. Little, Jr., with H. S. Moss,

Dallas, Texas. We concur with the recommendation of the operators here that the Commission order 80-acre spacing for the Devonian and Pennsylvanian reservoirs. Thank you.

MR. PORTER: Mr. Christie.

MR. CHRISTIE: W. S. Christie, Amerada Petroleum. We are now drilling in the northeast of the northwest of Section 34. We hope it will be a producer in both zones. Based on the evidence that has been presented here today, we believe that one well will efficiently drain 80 acres in either one of the reservoirs, and, therefore, recommend that a permanent order be adopted.

MR. PORTER: Mr. Campbell, did you have any statement?

MR. CAMPBELL: No, sir.

MR. PORTER: The Commission will take the cases 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 in machine shorthand and reduced to typewritten transcript under my personal supervision, 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, the 16th day of July, 1961, in the City of Albuquerque, County of Bernalillo, State of New Mexico.

Ada Dearnley
NOTARY PUBLIC

My Commission expires:

June 19, 1963