CASE 3429: Appli. of CONTINENTAL for two waterflood projects, Lea County, New Mexico.

Case Number

3429

Application

Transcripts.

Small Exhibits

ETC.

GOVERNOR
JACK M. CAMPBELL
CHAIRMAN

State of New Mexico
Oil Conservation Commission

LAND COMMISSIONER
GUYTON B. HAYS
MEMBER

P. O. BOX 2088
SANTA FE

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

September 15, 1966

Mr. Jason Kellahin
Kellahin & Fox
Attorneys at Law
Post Office Box 1769
Santa Fe, New Mexico

Re: Case No. 3429
Order No. R-3115
Applicant:

CONTINENTAL OIL COMPANY

Dear Sir:

Enclosed herewith is a copy of the above-referenced Commission order recently entered in the subject case. Letter pertaining to conditions of approval and maximum allowable to follow.

Very truly yours,

A. L. PORTER, Jr.
Secretary-Director

ALP/ir

Carbon copy of order also sent to:

Hobbs OCC X
Artesia OCC
Aztec OCC

Other Mr. Frank Irby

3429
Hind. 7-19-66
Rec. 7-19-66

1. Grant Cont. approval of their Tremont-Hardy unit waterflood. Approve 28 injection wells as listed on attached sheet.

Thirst. Mtg.

1. Injection wells shall be completed as shown in exhibits 5-1 thru 5-28. of this case. All injection shall be under a packer ~~[illegible]~~ and thru Plastic coated tubing. The annulus shall be either left open or filled with inert fluid with a pressure gauge at the surface.

Thirst. Mtg.

Memo

From

A. L. PORTER, JR.
SECRETARY-DIRECTOR

7/2[illegible] 2 PM

To [illegible]

Frank [illegible] by [illegible]
of the letter [illegible]
[illegible] discuss
it with us.

Memo

From

A. L. PORTER, JR.
SECRETARY-DIRECTOR

7/21

To Elvex,

Vic Ryan called
and asked if
we needed any
more information.
If so call him.

STATE OF NEW MEXICO

STATE ENGINEER OFFICE

SANTA FE

S. E. REYNOLDS
STATE ENGINEER

ADDRESS CORRESPONDENCE TO:
STATE CAPITOL
SANTA FE, NEW MEXICO 87501

July 20, 1966

Mr. A. L. Porter, Jr.
Secretary-Director
Oil Conservation Commission
Santa Fe, New Mexico

Dear Mr. Porter:

Reference is made to the hearing on July 19th on the application of Continental Oil Company, being Oil Conservation Commission Case 3429 in which I expressed the opinion that the casing program in the State KM-36 #1 well was inadequate for the protection of the waters in the Ogallala formation. Information set forth in the Ground Water Report #6 of the State Bureau of Mines & Mineral Resources, New Mexico Institute of Mining & Technology shows that the base of the Ogallala formation is at elevation 3375 above sea level and that the saturation of this formation is at 3430 above sea level. The water level lowerings since these measurements were taken are indicated as very slight in the latest publication of the Geological Survey giving annual water level declines. The decline of the water table in this specific area is approximately 3 feet below the high, which was more than 20 years ago and which indicates a present saturation of approximately 52 feet in the Ogallala formation.

It is not my intention to tell the Commission how it should enforce the sub-section 65-3-11-2 of the New Mexico Statutes Annotated, 1953.

FEI/ma
cc-Jason W. Kellahin

Yours truly,

S. E. Reynolds
State Engineer

By: Frank E. Irby
Frank E. Irby
Chief
Water Rights Div.

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BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
July 19, 1966

EXAMINER HEARING

IN THE MATTER OF: Application of Continental Oil Company for a unit agreement, Lea County, New Mexico,

-and-

Application of Continental Oil Company for two waterflood projects, Lea County, New Mexico.

Case No. 3428 & 3429

BEFORE: ELVIS A. UTZ, Examiner

TRANSCRIPT OF HEARING

NEW MEXICO OIL CONSERVATION COMMISSION

EXAMINER HEARING

SANTA FE, NEW MEXICO

REGISTER

HEARING DATE JULY 19, 1966 TIME: 9 A.M.

NAME:	REPRESENTING:	LOCATION:
[illegible]	Skelly Oil	Tulsa, Okla.
[illegible]	Skelly Oil Co.	Hobbs, N.M.
Leonard [illegible]	Self	[illegible], Texas
[illegible]	Seth, Montgomery [illegible]	[illegible] - Santa Fe
[illegible]	Tidewater Oil Co.	Hobbs, N.M.
R M Anderson	Sinclair	Midland [illegible]
J. P. [illegible]	[illegible]	Hobbs, N.M.
V. T. [illegible]	" "	"
[illegible]	[illegible]	Midland, [illegible]
[illegible]	Self	[illegible]
Booker Kelly	[illegible]	S.F.
[illegible]	State Engineer Office	Santa Fe
[illegible]	[illegible]	[illegible]

NEW MEXICO OIL CONSERVATION COMMISSION

EXAMINER HEARING

SANTA FE , NEW MEXICO

REGISTER

HEARING DATE JULY 19, 1966 TIME: 9 A.M.

NAME:	REPRESENTING:	LOCATION:
Bill [illegible]	Midwest [illegible]	Mid[illegible]
J H Hoover	Gulf Oil Corp	Roswell N M
W V Kastler		
N Dau[illegible]	[illegible]	Santa Fe
[illegible]	[illegible]	[illegible]
Ralph [illegible]	[illegible]	[illegible]
Norbert McIntyre	Midwest Oil Corp	Midland, Texas

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MR. UTZ: The next Case will be 3428.

MR. HATCH: Application of Continental Oil Company for a unit agreement, Lea County, New Mexico.

MR. KELLAHIN: If the Examiner please, I believe in the interest of time, we could consolidate this Case for the purposes of the record with Case 3429, since they deal with the same subject matter and there is an unusual situation in Case 3429, in that we are asking for an approval of a waterflood together with an offsetting cooperative waterflood by the same operator. The explanation is tied in with Case 3428.

MR. UTZ: The unit requested in 3428 will be the unit that will be used to accomodate the waterflood in 3429?

MR. KELLAHIN: That is correct, and also there is an offsetting waterflood in Case 3429.

MR. UTZ: For purposes of testimony, 3428 and 3429 will be consolidated. Separate orders will be written on each case.

MR. HATCH: Application of Continental Oil Company for a unit agreement, Lea County, New Mexico, and application of Continental Oil Company for two waterflood projects, Lea County, New Mexico.

MR. KELLAHIN: If the Examiner please, we will have two witnesses I would like to have sworn.

(Witnesses sworn.)

MR. UTZ: Are there other appearances? You may proceed.

* * *

V I C T O R T. L Y O N, called as a witness herein, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q Would you state your name, please?

A Victor T. Lyon, L-y-o-n.

Q By whom are you employed and in what position, Mr. Lyon?

A Continental Oil Company as supervising engineer in the Hobbs District Office, Hobbs, New Mexico.

Q In connection with your position, do you have anything to do with the area involved in the Eumont-Hardy Unit and the Unit Agreement and waterflood?

A Yes, sir.

Q Have you testified before the Oil Conservation Commission of New Mexico and had your qualifications made a matter of record?

A Yes, sir.

MR. KELLAHIN: Are the witness' qualifications acceptable?

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MR. UTZ: Yes, he has previously qualified.

Q (By Mr. Kellahin) Mr. Lyon, are you familiar with the application of Continental Oil Company in Case 3428?

A Yes, sir. Case 3428 is the application of Continental Oil Company for an approval of the Eumont-Hardy Unit.

Q Does the unit also seek authority to install a waterflood in the unit area and approval of the centralized tank battery, or is that in the other case?

A That is in the other case.

(Whereupon, Applicant's Exhibit 1 marked for identification.)

Q (By Mr. Kellahin) Referring to what has been marked as Exhibit Number 1, will you identify the Exhibit and discuss it?

A Exhibit Number 1 is the proposed Unit Agreement for the Eumont-Hardy Unit. It is a modified Federal form and contains the usual provisions in it. There is attached to it Exhibit A, which is a plat of the unit area showing the tract numbers and other pertinent information, and Exhibit B, which is a list of the leases with the tract number and the owner and the tract participation shown thereon.

Q What is the total unit area?

A The total unit area is approximately 1930 acres, and a fraction, 1930.23, I believe.

Q Attached to the unit is the usual exhibit B showing

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a tabulation of the leases and the ownership, is that correct?

A Yes, sir.

Q What percentage of the unit is Federal and what per cent is State and what percentage is Fee?

A There are three Federal tracts which comprise 197.61 acres, or 10.24 per cent of the unit area. There are eight State tracts containing 916.90 acres, or 47.5 per cent of the unit area. The remaining seven tracts contain 815.72 acres. They are patented lands which amounts to 42.26 per cent of the unit area.

Q Does the unit cover all formations or are you unitizing only a single formation?

A We are seeking to unitize the Yates, Seven Rivers and Queen formations, which comprise the Eumont Pool.

Q How is that defined in the Unit Agreement?

A It is defined by referring to radioactivity log of Continental Oil Company's State A-36 Well Number 10, which is Exhibit 3 in the bounded Exhibits. It is shown by a red line at the top of the Yates, 2700 feet, and another red line at the top of the Grayburg on the base of the Queen at 3776 feet.

Q What is the basis of tract participation under the terms of the Agreement?

A Section 13, beginning on page 13 of the Unit Agreement

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provides that tracts will participate on the basis of 60 per cent of each tract's cumulative production to September 1st, 1963, and 40 per cent on the basis of the tract's floodable acre-feet.

Q Do you have an exhibit which shows the parameters for each of these tracts?

(Whereupon, Exhibit 1-1 marked for identification.)

A Yes, sir. Exhibit 1-1, which is the first Exhibit in the bound booklet, is a schedule of participation parameters showing the value of each of the parameters and the weight given to it, and at the extreme right is each tract's total unit participation.

Exhibit 1-2, which is the second sheet in the bound booklet, is an isopach map from which the figures in the column headed Floodable Acre-Feet on Exhibit 1-1 was taken. The number indicated in there is the estimated floodable acre-feet as shown on Exhibit 1-2, and then the column to the right of that shows the percentage of the floodable acre-feet weighted at 40 per cent for each tract.

(Whereupon, Exhibit 1-2 marked for identification.)

Q (By Mr. Kellahin) So Exhibit 1-2 covers the participation factor for each tract, is that the fact of it?

A Yes, sir.

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Q Now, your cumulative production, was it taken from the reports prepared by the New Mexico Oil and Gas Engineering Committee?

A Yes, it was.

Q Would you describe the salient points covered by the Unit Agreement?

A Yes, sir; as I stated, it is a modified Federal form, if such a term is applicable; Section 2 describes the unit area, and perhaps I should make that a matter of record.

In Township 20 South, Range 37 East, the south half south half of Section 25, and all of Section 36; In Township 20 South, Range 38 East, Lots 1, 2, 3, and 4, and the southeast quarter of the southwest quarter of Section 31; in Township 21 South, Range 36 East, Lots 1, 8, and 9 of Section 1; and in Township 21 South, Range 37 East, Lots 3, 4, 5, and 6 of Section 5, and Lots 1 through 12, 14, 15 and 16, the northwest quarter of the southeast quarter, and northeast quarter of southwest quarter of Section 6, a total of 1930.23 acres.

Section 4 describes the manner the unit can be expanded, although we do not anticipate that expansion will be necessary. Section 6 designates Continental Oil Company as unit operator, and Section 7 provides for resignation or removal of the unit operator. Section 8 for a successor unit operator in the event of removal or resignation. Section 13,

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as I previously testified, describes the manner in which each tract participates.

Section 14 defines the tracts which are qualified for unit participation. Section 16 provides for royalty settlement. Section 23 designates the effective date and term and the effective date will be the first day of the month following the committment to the unit of 85 per cent of the surface area, the filing of a counterpart in the County Office, and the approval of the Land Commissioner and the USGS.

Q Offsetting this unit, there is another proposed waterflood project, is there not?

A Yes, sir.

Q What's the reason for that, Mr. Lyon?

A Well, this 160 acres immediately adjoining the unit to the north, which is outlined, I believe, on Exhibit 2 in the booklet in red, is a part of the Eumont participating area for the Southeast Monument Unit. The USGS has refused to delete this area from that unit so that it can participate in the Eumont-Hardy Unit, consequently, it will be necessary to flood this reservoir by a cooperative waterflood project.

Q Has preliminary approval of the proposed Unit Agreement been obtained from the USGS and the State Land Commissioner?

A Yes, sir. We received preliminary approval from the

USGS by a letter dated March 16, 1966, and I have discussed the agreement in detail with Mrs. Rhea of the State Land Commissioner's Office.

Q What per cent of interest have executed or ratified the agreement at this time?

A At this time, the agreement has been ratified by 71.5 per cent of the working interest owners, 18.8 per cent of the Fee royalty owners, and 19.1 per cent of the overriding royalty owners.

Q Do you anticipate you'll have any difficulty in obtaining 85 per cent of the working interest owners?

A I do not think so.

Q Were Exhibits 1 through Exhibit 1-2 prepared by you or under your supervision?

A Yes, sir.

MR. KELLAHIN: That's all the questions I have at this time of this witness. I'll offer in evidence Exhibits 1 through 1-2.

(Whereupon, Exhibits 1 through 1-2 offered in evidence.)

MR. UTZ: Exhibit 1 was the Unit Agreement?

MR. KELLAHIN: Yes, sir.

MR. UTZ: And 1-2 is the structure map?

A The isopach map.

MR. KELLAHIN: We also have Exhibit 1-1, which is

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the tabulation of the data on each tract.

MR. UTZ: Without objection, Exhibits, 1, 1-1 and 1-2 will be entered into the record.

(Whereupon, Exhibits 1 through 1-2 admitted in evidence.)

CROSS EXAMINATION

BY MR. UTZ:

Q Will you explain again why the USGS is not going to let you put the 160 acres in this waterflood project?

A I am afraid I can't explain it. All I know, they would not permit it.

Q They just said no and didn't give you any reason?

A Yes, they did give me a reason. They said that this does not comprise all of the participating area for the Eumont Pool in the Southeast Monument Unit, and they do not feel that it is proper to take a part of a participating area from one unit and put it in another. If this had involved the entire Eumont participating area, I believe that they would have permitted it to go into this unit.

Q You are not ready to pledge the entire participating area of the Eumont unit at this time?

A Most of it is gas.

Q Is the balance of the flood a part of SEMU unit or any part of it part of the SEMU unit?

A There is no acreage inside the Eumont-Hardy Unit

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which is a part of the Southeast Monument Unit.

MR. UTZ: Are there other questions?

CROSS EXAMINATION

BY MR. PORTER:

Q Is this the old Hardy Pool?

A Yes, sir.

Q And some of these wells must be more than 20 years old?

A Nearly 30.

Q I note quite a difference in cumulative production from well to well.

A Yes, there's a large difference.

MR. PORTER: I don't have any further questions.

MR. UTZ: Are there any further questions of Mr. Lyon? He may be excused.

(Witness excused.)

MR. KELLAHIN: I would like to call the next witness, Mr. Boylan.

J. P. B O Y L A N, called as a witness herein, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q Would you state your name, please?

A James P. Boylan, B-o-y-l-a-n.

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Q By whom are you employed and in what position, Mr. Boylan?

A I am employed by Continental Oil Company as a senior engineer in the Hobbs District Production Office.

Q In connection with your duties as a senior engineer do you have anything to do with the area involved in the Eumont-Hardy waterflood project?

A Yes, sir, I do.

Q And the SEMU offsetting waterflood project?

A I do.

Q Have you ever testified before the Oil Conservation Commission and made your qualifications a matter of record?

A Yes, sir, I have.

MR. KELLAHIN: Are the witness' qualifications acceptable?

MR. UTZ; They are.

Q (By Mr. Kellahin) Mr. Boylan, you heard Mr. Lyon's testimony in regard to the Eumont-Hardy Unit Agreement; now what is the purpose of this unit?

A This unit is being formed for the purpose of conducting waterflood operations in the unit area.

(Whereupon, Applicant's Exhibit 2 marked for identification.)

Q (By Mr. Kellahin) Now, referring to what has been marked as Exhibit Number 2, would you discuss the information

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shown on that Exhibit?

A Exhibit 2 is a plat of the Eumont-Hardy Unit area and an area two miles in each direction from the unit boundary. Lease ownership and location and identification of wells are shown in the usual manner. The formation from which each well is producing is shown by a letter symbol which is explained in the legend.

Q Now, from the Exhibit, it would appear that there are several wells to the south of the unit area which have been plugged and abandoned. Why were these wells not included in the unit?

A These wells had a very poor primary producing history. It is not considered economically justified to re-enter these wells or to drill replacement wells. Because the area would have no value to the unit it was not included in the unit area.

Q Actually, under the formula adopted, they would have no participation anyway if they have no primary production?

A Very little, if any.

(Whereupon, Exhibit 3 marked for identification.)

Q (By Mr. Kellahin) Now, referring to what has been marked Exhibit Number 3, will you describe the information shown on that Exhibit?

A Exhibit Number 3 is the radioactivity log run on

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Continental Oil Company's State A-36 Well Number 10. As stated by Victor Lyon, this is the type log identifying the unitized formation. The log shows by a horizontal red line the top of the Yates formation at a depth of 2700 feet. In similar manner the top of the Grayburg, which is also the base of the Queen formation is shown at 3776 feet. The vertical interval between these two depths is the unitized formation.

Q What is the specific interval which is to be flooded in the waterflood project?

A The pay in this area is the Penrose member of the Queen formation. This is the specific interval which is to be flooded in this project.

Q Now, why is it necessary, then Mr. Boylan, to include such a large interval in the section to be flooded when the section to be flooded is so small?

A The Eumont Pool consists of the Yates, Seven Rivers and Queen formations and since there is no other production from the gross interval in this area, we felt it was proper to include the entire pool vertical interval in the unitized formation.

Q You say there's no production from the Seven Rivers and Queen, what about the Grayburg, is there any Grayburg production?

A There is no Grayburg production in the immediate unit

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area. It is productive some distance to the north of the unit area.

Q And you say there is no Queen production; what is the character of the formation?

A The character of the Queen formation is relatively tight to the extent of being considered nonproductive.

Q So the only productive zone is the Penrose, in your opinion?

A In my opinion, the only productive zone in the unit area is the Penrose member of the Queen formation.

Q Would you give a brief history of the Eumont-Hardy Unit area?

A Referring again to Exhibit 2, the Texaco, Incorporated J. P. Alexander Well Number 1 located 3300 feet from south line and 1980 feet from west line of Section 5, Township 21 South, Range 37 East and designated by a red circle was completed April 24, 1937 as the discovery well in the Eumont-Hardy Unit area. This well was completed for an initial potential of 53 barrels of oil per day flowing, no water, with a gas oil ratio of 704 from the Penrose Sand member of the Queen formation.

A total of 48 oil wells and one gas well have been drilled within the unit area. Initial development took place during the period 1937 to 1941. A second stage development

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period occurred during 1956 and 1957. During initial development, the majority of the wells were completed open hole and shot. Wells drilled during the second stage of development were cased to total depth and sand fraced. During 1955 the majority of the old wells were also sand fraced with treatments ranging from 5,000 to 40,000 gallons.

As of April 1, 1966, 33 of the wells in the unit area were still producing,14 were shut in, and two were plugged and abandoned.

Q What is the current daily average production for the unit area?

A During the month of March, 1966, the unit area averaged 69 barrels of oil per day with 17 barrels of water per day and 1.28 million cubic feet of gas per day, for an average gas oil ratio of 18,550 cubic feet per barrel. This is an average of 2.1 barrels of oil per day per well. Maximum daily oil production from any one well during March, 1966 was 8.9 barrels per day. The above producing rates indicate the reservoir is at or very near the economic limit of production.

Q You would say, in any event, it's at a stripper stage, is it not?

A That is correct.

Q Now, what is the cumulative production for the unit area?

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A Cumulative production as of April 1, 1966 for the unit area totaled 2,870,473 barrels of oil.

Q What was the reservoir drive mechanism during the primary production?

A The reservoir drive mechanism for the Eumont-Hardy Unit is a combination of gas cap expansion and solution gas drive. The Eumont-Hardy Unit is located in an isolated section of an oil rim on the Eumont Gas Pool.

(Whereupon, Exhibit 4 marked for identification.)

Q (By Mr. Kellahin) Now, referring to what has been marked as Exhibit Number 4, would you identify that Exhibit and discuss what is shown on it?

A Exhibit Number 4 is a tabulation of data in regard to the reservoir rock, fluid characteristics and estimated waterflood performance.

Q In your opinion, is waterflooding feasible in the Eumont-Hardy area?

A Yes. After reviewing the available data in regard to porosity, permeability, oil saturation, oil recovery under primary operations, and calculations by accepted methods as to anticipated performance under waterflooding, my opinion is that the unit area can be successfully and economically waterflooded.

Q Will waterflooding, in your opinion, result in the

production of oil that would not otherwise be recovered?

A Yes. It is estimated that approximately 2,100,000 barrels of oil will be recovered by waterflooding which would not be recovered otherwise. The above amount includes 112,000 barrels of estimated waterflood recovery for the SEMU-Eumont lease, which is proposed to be cooperatively flooded with the Eumont-Hardy Unit.

Q In connection with the SEMU-Eumont lease flood, what do you propose to do there? How many wells will you use for injection in that area?

A Two wells will be used for injection on the SEMU-Eumont lease.

Q In your opinion, in order to protect the owners in the SEMU-Eumont Unit, is it necessary to flood this portion of the unit?

A In my opinion it is. If it were not flooded cooperatively with the unit area, probably oil would be transferred or drained across the lease line.

Q Which would result in a loss to the owners?

A That is correct.

Q Will flooding, in your opinion, protect the correlative rights of the owners in the two units?

A It will.

(Whereupon, Exhibit 5 marked for identification.)

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Q (By Mr. Kellahin) Referring to what has been marked as Exhibit Number 5, will you explain what has been shown on that Exhibit?

A Exhibit Number 5 is a tabulation of the wells which are proposed to be converted for water injection. The size and setting depth of each casing string, the amount of cement used and the interval open to the formation is shown for each well. Exhibits 5-1 through 5-28 are schematic diagrams for each well showing the same information as that tabulated on Exhibit Number 5.

(Whereupon, Exhibits 5-1 through 5-28 marked for identification.)

Q (By Mr. Kellahin) As a general proposition, how will your injection wells be completed?

A The injection wells will be completed with tubing and packers, the water being injected through tubing under a packer set in the casing.

Q Will you use a coated tubing, or do you know what will be used at this time?

A There probably will be some measure taken to protect the tubing from corrosion. Some coating will probably be applied.

Q Will you use inhibitors in the water, or do you know?

A I would assume that the injection water will be

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inhibited for corrosion.

(Whereupon, Exhibit 6 marked for identification.)

Q (By Mr. Kellahin) Now, referring to what has been marked as Exhibit Number 6, will you discuss what is shown on that Exhibit?

A Exhibit Number 6 is a map showing the structural configuration on the top of the Penrose Sand member of the Queen formation with a contour interval of 25 feet. This particular area was designated the Hardy Oil Pool until the Eumont Pool was established. As shown on Exhibit Number 6, this oil accumulation in the Eumont Pool occurs in a synclinal area near the edge of the Eumont Pool. The oil productive limits are defined to the northwest and south by gas oil contact. The producing limit is determined to the east by permeability pinch-out.

(Whereupon, Exhibit 7 marked for identification.)

Q (By Mr. Kellahin) Referring to what has been marked as Exhibit Number 7, would you identify that Exhibit and discuss it?

A Exhibit Number 7 is a map of the unit area showing the proposed waterflood pattern. The injection wells are designated by their usual triangular symbol. You will note that the westernmost row of wells are all proposed to be

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injectors. The reason for this is to create a water barrier to confine oil to the unit area. It is planned to stop or reduce injection rates in this row of wells when a barrier has been created.

The proposed injection wells in the second row from the western boundary will not be placed in service as injectors until water breakthrough has occurred in these wells. The other injection wells shown on Exhibit Number 7 will be used as injection wells on a normal 80 acre five-spot pattern throughout the life of of the flood.

You will note that there are two dry holes located in Lots 1 and 8 in Section 6, Township 21 South, Range 37 East, these wells demonstrated poor producing characteristics during primary producing operations, and it is not proposed to re-enter these wells or drill replacement wells. It is believed that the oil in place can be adequately swept to producing wells by the injection wells in this area.

Exhibit Number 7 also shows the proposed location of the central tank battery and the location of the injection station.

Q Do you seek in this application, approval of the use of a central tank battery for this unit?

A Yes, sir, we do.

Q Now, will this central tank battery have adequate

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testing facilities?

A Yes. A test facility in the central battery will permit at least one test per month on each producing well in the unit area. In addition metering facilities will permit continuous metering of the total water injected, and monitoring meters will provide very accurate estimates of the water injected into each injection well.

Q How much water do you anticipate to be injected in this waterflood project?

A Initially we expect to inject approximately 12,000 barrels of water per day into the 24 injection wells in the first stage of the project. The first stage to which I refer is the period during which full injection rates will be carried on in the westernmost row of wells. During this stage, the second row of wells from the western boundary will consist entirely of producing wells. The second stage of operation will begin at the time that water injection is reduced in the westernmost row of wells when the four injection wells in the second row are in operation.

Q What is the source of the water to be employed in this waterflood project?

A Primarily the water will be obtained from the Cass-Penn Wells, approximately two miles to the north northwest. It may be necessary to supplement this water with water to be

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purchased from the E-M-E salt water disposal system. Produced water from the unit area will be injected when the volumes are sufficient to justify its use.

Q Now, an analysis of the water involved has been furnished to the office of the State Engineer, has it not?

A Yes, sir, that is correct.

Q What is the maximum allowable which you anticipate for this unit?

A There are 43 wells which will be in operation during waterflooding, each on a 40 acre tract or lot. This number multiplied by 42 provides a maximum allowable of 1,974 barrels of oil per day.

Q Then, you don't plan to have a pilot project on this unit, is that correct?

A No, sir. The unit area is producing at approximately the economic limit at this time. There appears to be no useful information which can be gained by installing a pilot. In the interest of efficiently flooding the unitized area, we propose to install a full scale flood.

Q Are you familiar with the application for approval of the SEMU-Eumont flood which is a part of this case?

A Yes. The application of Continental Oil Company for authority to install a waterflood on the Southeast Monument Unit Eumont Lease in the area described as the southeast

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quarter northwest quarter northeast quarter of southwest quarter, and north half southeast quarter Section 25, Township 20 South, Range 37 East. This waterflood is to be conducted in cooperation with the Eumont-Hardy Unit waterflood. The reasons for its being flooded on a cooperative basis rather than a part of the unit area were discussed by Mr. Lyon in his testimony in Case Number 3428.

Q Now, referring again to Exhibit Number 2, is the SEMU-Eumont Lease and the surrounding area for two miles in each direction shown?

A Yes, it is.

Q And it also shows the injection wells, does it not?

A Yes, sir, it does.

(Whereupon, Exhibits 9 and 10 marked for identification.)

Q (By Mr. Kellahin) Referring to what has been marked as Exhibit Number 9, would you identify that Exhibit, please?

A Exhibit Number 9 is a tabulation of all the injection wells in the Eumont-Hardy Pool Unit.

Q Does it give the well location in each instance?

A Yes, sir, it does. It gives the footage location of each of the wells listed.

Q Now, referring to what has been marked as Exhibit Number 10, would you identify that Exhibit?

A Exhibit Number 10 is the same information for the two proposed injection wells located on the SEMU-Eumont Lease.

Q Also again, it gives the footage location in each case, does it not?

A Yes, sir, it does.

(Whereupon, Exhibit 8 marked for identification.)

Q (By Mr. Kellahin) Now, referring back to what has been marked as Exhibit Number 8, would you identify that Exhibit and discuss it, please?

A Exhibit Number 8 is a tabulation showing the casing pattern in Continental's SEMU Wells Numbers 52, 55, which are proposed to be injection wells.

(Whereupon, Exhibits 8-1 and 8-2 marked for identification)

Q (By Mr. Kellahin) Referring to what has been marked as Exhibit 8-1 and 8-2 would you identify those Exhibits?

A Exhibit Numbers 8-1 and 8-2 are schematic representations of the information showing on Exhibit Number 8.

Q And the completion in these injection wells is substantially the same as those in the Hardy Unit, is that correct?

A Yes, sir, that is correct.

Q In your opinion, will the granting of this application both as to the Eumont-Hardy Unit and the SEMU-Eumont Lease result in the prevention of waste and protection of correlative

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rights?

A Yes, sir. It is well recognized that secondary recovery operations under a unit will recover oil that would not otherwise be recovered and will protect correlative rights. The cooperative agreement under which the SEMU-Eumont Lease will be flooded in cooperation with the Eumont-Hardy Unit will permit the recovery of secondary oil under this tract in such a manner that correlative rights will be protected.

Q Were Exhibits 2 through 10 prepared by you or under your supervision?

A Yes, sir, they were.

MR. KELLAHIN: I would like to offer at this time Exhibits 2 through 10 exclusively.

(Whereupon, Exhibits 2 through 10 offered in evidence.)

MR. IRBY: I would like to object to the admission of the Exhibits until the identification is straightened out.

MR. KELLAHIN: I don't follow you, Mr. Irby.

MR. IRBY: The Exhibits submitted to the State Engineer, with the exception of two plats, all have two Exhibit numbers on them. The original number, I take it, was typed in and then these numbers have been replaced with red pencil and the numbers on the Exhibits submitted to the State Engineer do not correspond with the numbers put into the

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record by the testimony.

MR. LYON: May I straighten that up?

MR. IRBY: If you will, please.

MR. LYON: There are two numbers on the Exhibits, the one in red using Roman numerals. These are the Exhibits referred to in the application. The other number which uses Arabic rumbers are the Exhibit numbers which we have referred to in our testimony.

MR. IRBY: What's the purpose of the double numbering system?

MR. LYON: Well, one of the Exhibits, Exhibit 4, was not attached to the application and it may have been a matter of bad planning on my part, but because of the different sequence I used the different system of numbering.

MR. IRBY: Then the typed number is the number used in the testimony?

MR. LYON: Yes, sir.

MR. IRBY: Mr. Lyon, your first plat shows parts of Township 37 and 8 east 20 and 21 south, and the only Exhibit number I can find on it is a red Roman numeral II.

MR. KELLAHIN: That is also Exhibit 2.

MR. IRBY: It is referred to in the testimony as Exhibit 2?

MR. KELLAHIN: Correct.

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MR. IRBY: Then the other plat --

MR. UTZ: As far as your Exhibit Roman numeral II and Exhibit 2 are both Exhibit 2, is that correct?

MR. LYON: Correct.

MR. UTZ: There shouldn't be any confusion there, then.

MR. IRBY: Then down toward the bottom you have another plat that shows apparently the same area, and is marked Exhibit I in Roman numeral red.

MR. KELLAHIN: That's the same as Exhibit Number 2.

MR. LYON: We filed two applications in this case and they were set up in a different manner than we filed them. Our second application covered the cooperative flood of the SEMU Eumont Lease and the plat that was attached to that is the plat that you have marked there as Exhibit 1.

MR. KELLAHIN: They are both the same Exhibit.

MR. IRBY: They are identical?

MR. KELLAHIN: Yes, they were filed in two separate applications.

MR. IRBY: The one that you have filed with State Engineer as Exhibit 1 is referred to as what number in the testimony?

MR. LYON: It has been consolidated and it is the same exhibit, Exhibit 2.

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MR. IRBY: It is Exhibit 2?

MR. LYON: Yes, sir.

MR. IRBY: I withdraw my objection to the admission of the Exhibits.

MR. UTZ: The Exhibits will be entered into the record.

(Whereupon, Exhibits 2 through 10 admitted in evidence.)

MR. KELLAHIN: That's all I have on direct examination.

CROSS EXAMINATION

BY MR. UTZ:

Q You stated that the source of water,at least some of the water or all that's available from the Cass-Penn Pool would be used for this flooding operation. What type of water is this?

A The Cass-Penn Pool produced water as a brine.

Q What type of water will be used to supplement this?

A In case that there wouldn't be sufficient water, of Cass-Penn Pool water, why, then it's proposed to purchase water from, I believe, the E-M-E -- Is that correct?

MR. KELLAHIN: Yes.

A -- salt water disposal system, which is also a brine.

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Q Now, the Exhibits 5 series, I believe if I recall, show injection through tubing and under a packer?

A Yes, sir. That is correct.

Q And you were a little vague as to whether this tubing would be lined or whether you would use coupons in your injection water.

A I feel certain that the brine will be treated for corrosion -- the injection water will be treated for corrosion with an inhibitor and as an additional protection, the injection lines and tubing will be coated with some sort of a protective coating.

Q Then your testimony now is that the tubing will be coated and the injection will be treated?

A Yes, sir, that is correct.

Q I presume you will use coupons as a matter of checking this injection water for corrosion?

A Yes, sir.

Q This little 160 acre unit just to the north of your Eumont-Hardy Unit, what do you choose to call that unit, SEMU Eumont Unit or what? I presume you are, in this application, requesting the approval of this waterflood unit as well as the Eumont-Hardy Unit?

MR. KELLAHIN: Yes, sir.

MR. LYON: It really isn't a unit. It's a part of a

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unit. We just call it our SEMU Eumont Lease. I can't see why we can't continue to call it that.

MR. KELLAHIN: It is already unitized.

MR. UTZ: I realize that it is united with a lot of other acreage --

MR. KELLAHIN: Yes.

MR. UTZ: -- but the other acreage is not a waterflood --

MR. KELLAHIN: That's right.

MR. UTZ: -- a waterflood has to have a name for purposes of designation. What should we call it, the SEMU waterflood?

A I propose to call it the SEMU Eumont Lease waterflood.

MR. UTZ: I don't believe I have any further questions. Anyone else have any questions?

MR. IRBY: Yes. Frank Irby, State Engineer's Office.

CROSS EXAMINATION

BY MR. IRBY:

Q On your Exhibit Number 3, Mr. Boylan, the log has numbers preceded by a plus and minus starting at the top and going down the right-hand side, what do these numbers mean?

A These numbers are the subsea elevation which corresponds to the number written on the left side.

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Q On your Exhibit -- I believe it's Number 5, the schematic drawings of the individual injection wells --

A Yes, sir.

Q -- your Well State "F" 1 Number 3, which is 5-11 --

A Yes.

Q -- on your surface casing it is set at 1318 feet with ten sacks of cement and you calculate the top to be at 1250. What prevents the water in the Ogallala from wasting into the lower formations?

A What depth is the Ogallala at that point?

Q The base of it is variable. I would say from 250 to 350. It might possibly go to 400.

Q Well, the first restriction would be the ten sacks of cement around the base of the casing, and the second restriction would be that the pressure at the surface will be less than it would be at depth and so therefore, the water would not travel down the well bore against a pressure gradient.

Q What is the pressure at the bottom at that setting of that cement and what creates that pressure?

A I would estimate that the pressure at that point would be roughly the normal pressure gradient in the earth, or a generally accepted pressure gradient which is .43 pounds per square inch per foot of depth, which would, in this case,

be roughly 600 pounds pressure. The pressure in the Ogallala at 350 feet of depth would be estimated at roughly one-half of 350, or 175 pounds per square inch.

Q What is causing this pressure at 1250, just the natural --

A It's the normal hydrostatic gradient encountered in the formations as you penetrate the formations.

Q Is there any fluid or gas between the bottom of the Ogallala and the cement to hold this water up?

A I can't state for a fact but I would imagine that the casing was run by fluid in the hole and I would assume that there is some sort of fluid behind the casing. Probably mud that was in the hole when the casing was run.

Q Well, I would assume the same thing but I can't accept assumption. I can't accept your conclusion that there is hydrostatic pressure between the bottom of the Ogallala and 1250 feet on this well. I firmly believe that the Ogallala water is wasting through.

MR. KELLAHIN: I object to this, there's nothing in the record in the first place to even show there's any Ogallala water here, and Mr. Irby wants to testify, well, let's put him under oath and have him testify, but to assume and make a conclusion that Ogallala is being wasted in a well that was drilled some 30 years ago in conformance with the rules then

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in effect, I think is objectionable. I object to it.

MR. IRBY: Very well. Then I will state an objection for the State Engineer, thatwe object to the casing program that now exists with respect to the surface casing on State "F" 1 Number 3, State "F" Number 4 and State "KM" 36 Number 1. I have no further questions.

MR. KELLAHIN: With reference to the objection that has been stated by the State Engineer --

MR. UTZ: What Exhibit are you looking at?

MR. KELLAHIN: I'm not looking at an Exhibit.

MR. UTZ: You are looking at this brochure?

MR. KELLAHIN: Yes, which will show that the wells involved in the objection were drilled and have been producing since 1938 to 1940. No objections ever have been stated by the State Engineer heretofore, the objection does not go to the conversion of these wells to water injection at this time. It goes to a condition that existed and has existed throughout the life of the well, and to ask us to go in and recomplete these wells at this time without any evidence whatever that any leakage is occurring, or even that there is any Ogallala water present in this area, I think, is an unreasonable demand on the part of the State Engineer.

MR. IRBY: I might say, Mr. Kellahin, that these wells are within the Lea County Underground Water Basin

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designated by the State Engineer, and the records in the office show that Ogallala water does exist in this area, and the law concerning waste of water has existed since long before these wells were drilled.

MR. KELLAHIN: I believe that the engineer is in error in saying this is within the Lea County Basin. The State "F" Wells, I am informed, are not within the area of the Lea County Underground Basin, which would certainly indicate that in the State Engineer's opinion, no Ogallala water is present.

MR. IRBY: What is the location of the "F" Wells? It doesn't indicate on the Exhibit 2 that I have anything except the numbers of the wells.

MR. KELLAHIN: Well, they're in a different range and it's outside the Township.

MR. IRBY: The diagramatic sketches do not give descriptions of the wells, they give these numbers that I quoted to you, and they don't correspond with the numbers on your Exhibit 2.

MR. UTZ: What were the numbers and names of the wells again?

MR. KELLAHIN: Here's a description of the well locations, all of them.

MR. IRBY: Well, thank you.

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MR. KELLAHIN: I gave you one once.

MR. UTZ: What are the names and numbers of the wells again, Mr. Irby?

MR. IRBY: State "F" 1 Number 3 --

MR. UTZ: Number 3 and Number 4, and the other one was what?

MR. IRBY: "KM" 36 Number 1.

MR. UTZ: All right, we have the locations of those wells.

MR. IRBY: Admittedly.

MR. UTZ: In Section 31.

MR. IRBY: Now that I have the description, the "F" Wells are outside the Lea County Basin. The "KM" 36 Number 1 is inside the Lea County Basin.

MR. UTZ: Will this fact have any bearing on your objection?

MR. IRBY: I withdraw my objection to "F" 1 Number 3 and 4.

MR. KELLAHIN: That leaves us then only with the State "KM" 36.

MR. IRBY: Yes.

MR. KELLAHIN: I again submit there is no evidence in the record to show that either Ogallala water is present in this area or that leakage is occurring.

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RECROSS EXAMINATION

BY MR. UTZ:

Q Mr. Boylan, referring to Exhibit 5-15 where your eight and five-eighths casing is used as a surface casing set at 1733, and you calculate the top of the cement at 900 with 200 sacks, now, is that your calculation or was that taken from previous records, or did Continental drill this well to begin with?

A I can't answer for certain whether Continental drilled this well. John Kelly drilled the well. I can't answer whether this is a current calculation or whether it was calculated by the company which drilled the well. We will obtain this information and submit it to the Commission.

Q I presume that you also don't have any information as to whether the well was drilled with mud or not. We can assume that it was drilled with mud, that when they set the casing there would be mud behind the casing.

A I don't have that detailed information at this time.

Q Would you furnish the Commission with that information, too?

A Yes.

Q If the well was drilled with mud, since you are an engineer, can you state what the condition behind the pipe

would be under those circumstances?

A In my opinion the pipe was set in a hole filled with mud and was cemented around the bottom with 200 sacks of cement, and the annular surface between the surface casing and the formation is at the present time filled with mud.

Q The reason being that there would be no place else for the mud to go?

A That is correct.

Q And when they circulated the cement, the mud would flow out the surface and come back into the pits?

A That is correct. The mud would be displaced from the top of the hole.

Q So it's pretty safe to assume that the annulus, or outside the casing is mudded up above the cement drilling mud?

A Yes, sir, in my opinion.

Q Do you know whether there's any Ogallala water? Do your records show any Ogallala water in any quantities in this area?

A I do not have that information at this time.

MR. PORTER: You don't know whether there is any fresh water at all?

A No, sir.

Q (By Mr. Utz) Could you examine your company records and make a determination of whether you have had any water

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problem in your drilling in this area?

A Yes, sir, I will.

Q If remedial work should be deemed necessary in this well, would the procedure be to perforate and squeeze the surface casing?

A No, sir. I would propose that if remedial work is necessary that they remove the well head and run a string of one inch pipe on the outside of the surface casing until they tag cement, and at that point inject cement until it's circulated to the surface.

Q If your annulus is full of mud, how are you going to get the one inch down?

A I assume that the one inch would penetrate the mud and tag the cement.

Q If you force the cement down there, what would happen to the mud?

A The mud would be forced out the top of the hole.

Q Probably pretty dry by now?

A It could very well be.

Q At any rate, due to the condition of the mud at the present time, it might be a pretty sorry cement job?

A That we would have to evaluate in the field.

MR. PORTER: Mr. Irby -- Excuse me, Mr. Examiner -- what would it take in the way of information to satisfy the

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State Engineer that there's no leakage occurring or no danger of leakage? What information could they supply you with that would remove your objection?

MR. IRBY: I don't know how it could be supplied, Mr. Porter, without going down that annulus because it's my honest opinion that there is no hydrostatic pressure below the Ogallala formation until you pass through the red beds and the red beds have permeability in various sections, and it is also my opinion that the water in the Ogallala can penetrate this mud in the bore if it is there.

MR. PORTER: Your objection would still remain if it could be proven that the mud was behind the pipe?

MR. IRBY: Yes, sir. I would have to maintain my objection.

MR. PORTER: What if there is no water in there in the immediate area?

MR. IRBY: No water in the Ogallala at that particular point?

MR. PORTER: Right.

MR. IRBY: I would withdraw my objection, but this, admittedly, is on the fringe of the basin. Township 38 is only two or three miles wide, isn't it, this far south?

A I can't say.

MR. LYON: No, it's farther west than that. It's

a full township.

MR. IRBY: 38 is?

MR. LYON: Yes.

MR. IRBY: This is where we have the correction line?

MR. LYON: Yes.

MR. PORTER: Township 38, I think, is full that far south. Up north, I think it does have some partial sections along the State line. Township --

MR. IRBY: Off the record.

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

MR. IRBY: I will do this, to help out on reconciling this problem; I will check any data we have on the wells in the northwest quarter of Section 36, 20 South, 37 East, I believe that's the location of that well, is it not?

MR. KELLAHIN: I believe it is.

MR. IRBY: And if we have any information on the base of the Ogallala or the ology underneath it, or the water contained in these formations, I will transmit to the Commission and to Mr. Kellahin. It's not my object to get my hand in Continental's pocket, but I want to be assured that this water isn't being wasted and there are things that clearly indicate to me that it might be.

MR. LYON: Mr. Irby, I would like to point out that this Exhibit 2 does designate the leases and has the well

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numbers. I don't think that there's any information withheld on this Exhibit.

MR. IRBY: How do you mean? I think you will find out they are identified --

MR. UTZ: Just a minute. There's some discussion that can be handled outside the Hearing. We have a lot of cases and I am anxious to get through today. Unless you have something for the record, I would request that you carry on with your conversation at some other time and place.

Is there anything else in this case?

MR. IRBY: I have nothing more.

MR. KELLAHIN: Nothing.

MR. UTZ: The case will be taken under advisement and we will take a ten minute recess.

(Whereupon, the Hearing was recessed for ten minutes.)

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I N D E X

E X H I B I T S

EXHIBIT	MARKED FOR IDENTIFICATION	OFFERED	ADMITTED
No. 1	4	9	10
No. 1-1	6	9	10
No. 1-2	6	9	10
No. 2	12	26	29
No. 3	13	26	29
No. 4	17	26	29
No. 5	18	26	29
Nos. 5-1 through 5-28	19	26	29
No. 6	20	26	29
No. 7	20	26	29
No. 8	25	26	29
Nos. 8-1 & 8-2	25	26	29
No. 9	24	26	29
No. 10	24	26	29

STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

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

Witness my Hand and Seal this 27th day of July, 1966.

NOTARY PUBLIC

My Commission Expires:

June 19, 1967.

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 3428 & 29 heard by me on July 19, 1966.

, Examiner
New Mexico Oil Conservation Commission

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OIL CONSERVATION COMMISSION
P. O. BOX 2088
SANTA FE, NEW MEXICO

October 18, 1966

Mr. Jason Kellahin
Kellahin & Fox
Attorneys at Law
Post Office Box 1769
Santa Fe, New Mexico

Dear Sir:

Reference is made to Commission Order No. R-3115, recently entered in Case No. 3429, approving the Continental Eumont Hardy Waterflood Project.

Injection shall be through the 28 authorized water injection wells, each of which shall be equipped with plastic-coated tubing and with a packer, said packers to be set at least 3400 feet deep. The casing-tubing annulus shall be left open or shall be filled with an inert fluid and closed with a pressure gauge at the surface.

As to allowable, our calculations indicate that when all of the authorized injection wells have been placed on active injection, the maximum allowable which this project will be eligible to receive under the provisions of Rule 701-E-3 is 2058 barrels per day when the Southeast New Mexico waterflood allowable factor is 42 and assuming that the two wells located in Units A and H of Section 6, Township 21 South, Range 37 East, are returned to production.

Please report any error in this calculated maximum allowable immediately, both to the Santa Fe office of the commission and the appropriate district proration office.

OIL CONSERVATION COMMISSION
P. O. BOX 2088
SANTA FE, NEW MEXICO

In order that the allowable assigned to the project may be kept current, and in order that the operator may fully benefit from the allowable provisions of Rule 701, it behooves him to promptly notify both of the aforementioned commission offices by letter of any change in the status of wells in the project area, i.e., when active injection commences, when additional injection or producing wells are drilled, when additional wells are acquired through purchase or unitization, when wells have received a response to water injection, etc.

Your cooperation in keeping the commission so informed as to the status of the project and the wells therein will be appreciated.

Very truly yours,

A. L. PORTER, Jr.
Secretary-Director

ALP/DSN/ir

cc: Mr. Frank Irby
State Engineer Office
Santa Fe, New Mexico

Oil Conservation Commission Offices in Hobbs and Artesia

CONTINENTAL OIL COMPANY

P. O. BOX 460
HOBBS, NEW MEXICO

PRODUCTION DEPARTMENT
HOBBS DISTRICT
L. P. THOMPSON
DISTRICT MANAGER
G. C. JAMIESON
ASSISTANT DISTRICT MANAGER

1001 NORTH TURNER
TELEPHONE: EX 3-4141

55 JUL 12 AM

July 8, 1955

State Engineer
P. O. Box 1079
Santa Fe, New Mexico

Attention of Mr. Frank E. Irby

Gentlemen:

As requested by your letter dated July 1, 1955, forwarded herewith is an analysis of the water produced from our Cass Penn Pool and an analysis of a sample from the E-M-E salt water disposal system. At the time our application for authority to install a waterflood in the Eumont-Hardy Unit was submitted, we were uncertain that the Cass Pool would supply enough water. Tests conducted since that time assure us that that source of water will be adequate. Consequently, it is doubtful that it will be necessary to use water from the E-M-E system in this project.

It is our present intention to re-inject produced water in this waterflood project. If you have additional questions, please do not hesitate to contact this office.

Yours very truly,

cc:

TELEPHONE: HOBBS 393-6215

KE-TONE®

UNITED CHEMICAL CORPORATION

OF NEW MEXICO

800 SOUTH LEECH P. O. BOX 1499

HOBBS, NEW MEXICO 88240

JUL 12 AM 8

Company Continental Oil Company

Field Skaggs

Lease Sampling Date 5-26-65

Type of Sample Penn Water

IONIC FORM	me/l *	mg/l *
Calcium (Ca^{++})	75.85	1520
Magnesium (Mg^{++})	35.03	426
Sodium (Na^{+}) (Calculated)	562.43	12,930
Bicarbonate (HCO_3^-)	16.40	1000
Carbonate ($CO_3^{=}$)	Not	Found
Hydroxide (OH^-)	Not	Found
Sulphate ($SO_4^{=}$)	75.99	3650
Chloride (Cl^-)	580.92	20,600
ph @ 68 ° F ---------- 6.4		
Dissolved Solids on Evap. at 103° - 105° C		
Hardness as $CaCO_3$	110.88	5544
Carbonate Hardness, as $CaCO_3$ (temporary)	16.40	820
Non-Carbonate Hardness as $CaCO_3$ (permanent)	94.48	4724
Alkalinity as $CaCO_3$		
Specific Gravity @ 68° F ---------- 1,026		

* mg/l = milligrams per Liter

* me/l = milliequivalents per Liter

CASS - PENN WATER
TO BE USED IN EUMONT-HARDY
WATER FLOOD -

Makes Water Work

B-344-B
REV. 4-1-64

CONTINENTAL OIL COMPANY

PRODUCTION RESEARCH DIVISION

WATER ANALYSIS REPORT

Company Continental Oil Company — Date March 4, 1966 — No. W-6657

Well E-M-E SWD-I No. 1 — Location

Field E-M-E SWD System — Formation

State New Mexico — County Lea — Depth

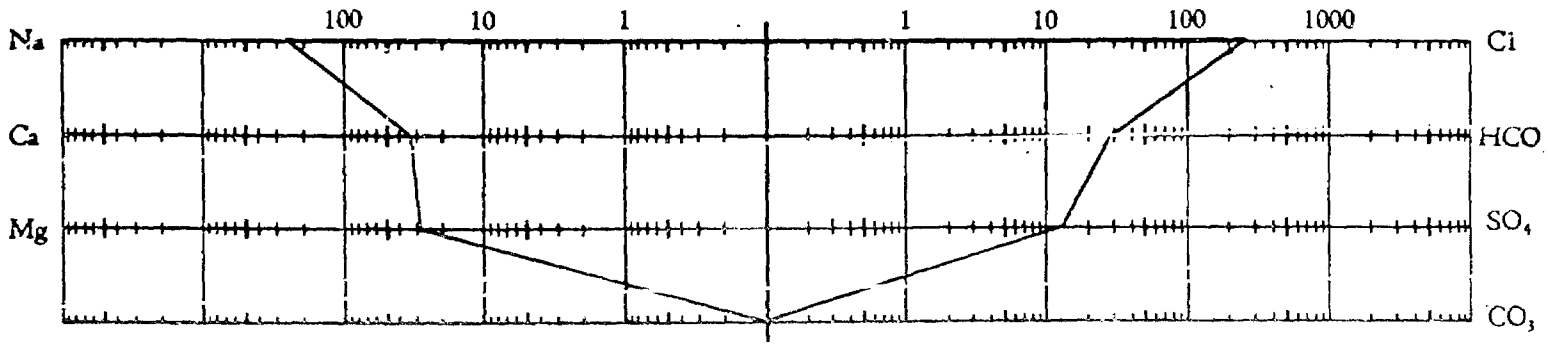
Sample Source Wellhead — Date Collected February 20, 1966

Specific Gravity 1.014 — Resistivity at 75 °F .378 ohm Meters — pH 6.8

	meq/L	mg/L (ppm)		meq/L	mg/L (ppm)
Total Dissolved Salts		19,00	Sodium (Na)	256.19	5,890
Hydrogen Sulfide		894			
Chlorides (Cl)	276.11	990	Magnesium (Mg)	29.00	348
Sulfates (SO_4)	13.12	630	Calcium (Ca)	33.60	672
Carbonates (CO_3)		0			0
Bicarbonates (HCO_3)	29.02	1,770	Iron (mg/L) Total	0	Dissolved 0
Free Hydroxyl (OH)			Suspended Solids		33

WATER ANALYSIS PATTERN

SCALE MEQ/LITER



Remarks:

Sample No. 5

TO BE USED IN REED-SANDERSON WATER FLOOD.

B. M. Casad

Analysis Requested by: R. L Freeborn

Copies to: MHD-RGP-LPT-JAQ-JLD-NGC-TMA

CONTINENTAL OIL COMPANY
P. O. BOX 460
HOBBS, NEW MEXICO

PRODUCTION DEPARTMENT
HOBBS DISTRICT
L. P. THOMPSON
DISTRICT MANAGER
G. C. JAMIESON
ASSISTANT DISTRICT MANAGER

1001 NORTH TURNER
TELEPHONE: EX 3-4141

AUG 25 AM 7 47

August 24, 1966

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

Re: Case No. 3429

Dear Mr. Utz:

At the conclusion of the hearing on the captioned case, you requested that we furnish any additional information which is available, showing the presence of fresh waters in the area of our State KM Well No. 1, located in Unit D of Section 36, T20S, R37E.

I have discussed this situation with our production foremen and have visited the area personally in an attempt to determine the existence and location of fresh water.

Continental Oil Company operates a water station located approximately in the center of the NW/4 SE/4, Section 35, T20S, R37E. This station is supplied by three wells which are located in Units I, J, and K of this section. Each of the three wells is drilled to a TD of 100'. These and other wells in this same general area produce from what seems to be an alluvial deposit coincident with Monument Draw, a local topographic feature. This feature is a shallow (15-20') stream bed approximately a quarter-mile in width, running east-southeasterly through the unit area. Our water station is located immediately above the northern rim of the draw and Skelly Oil Company's Hill Well No. 5 (C-6-21-37) is located just below the southern rim of the draw. The attached map is a rough approximation of the location of the features discussed above.

It has been found by the oil operators and ranchers that water can be found erratically within and along the sides

of Monument Draw. There are no windmills or other water wells north of the Draw in this area for a distance of at least two miles. The nearest Ogallala water is reported to be at Oil Center, approximately 2 1/2 miles west of the unit boundary.

Continental Oil Company has three wells which were apparently drilled to the Ogallala in this general area. One is located in Unit L, 14-21S-36E, at a depth of 197'. If this well has produced, there is no record of it in our office.

Another well is located in Unit H-18-21-36, at a depth of 300'. There is no record of any production from this well.

The third well is located in Unit D-20-21-36, at a depth of 201'. Our records indicate this well to be dry.

It is realized that this is rather scant data as to the existence of fresh water in this area. However, as scarce as water is, it would appear that the ranchers would have drilled wells if there were a likelihood of finding water. It is also obvious that our using the State KM-36 No. 1 as a water injection well will not change any condition affecting fresh water sources which have existed during the 12 years since the well was completed. We have no information which would indicate that any fresh water is being endangered by the condition of this well. In the absence of evidence showing a probability of damage, it would be appreciated if the State KM-36 No. 1 would be approved as an injection well in its present condition.

Yours very truly,

LPT-JS

cc: Mr. Frank Irby
State Engineer's Office
Capitol Building
Santa Fe, New Mexico

BEFORE THE OIL CONSERVATION COMMISSION

OF THE

STATE OF NEW MEXICO

IN THE MATTER OF THE APPLICATION OF CONTINENTAL OIL COMPANY FOR APPROVAL OF THE EUMONT-HARDY UNIT AGREEMENT EMBRACING 1930.23 ACRES, MORE OR LESS, LOCATED IN TOWNSHIP 20 SOUTH, RANGES 37 AND 38 EAST AND TOWNSHIP 21 SOUTH RANGES 36 AND 37 EAST, NMPM, LEA COUNTY, NEW MEXICO; FOR PERMISSION TO INSTALL AND OPERATE A WATERFLOOD WITHIN THE BOUNDARIES OF SAID UNIT AREA: AND FOR PERMISSION TO PRODUCE THE UNIT WELLS INTO A CENTRAL TANK BATTERY.

Case 3429

A P P L I C A T I O N

Comes now Applicant, Continental Oil Company, and respectfully requests approval of the Eumont-Hardy Unit Agreement, permission to install and operate a waterflood within said unit, and permission to produce the unit wells into a central tank battery. The Eumont-Hardy Unit Agreement embraces the following described acreage:

New Mexico Prime Meridian

Township 20 South, Range 37 East

Section 25: S/2 S/2
Section 36: All

Township 20 South, Range 38 East

Section 31: Lots 1, 2, 3, and 4, SE/4 SW/4

Township 21 South, Range 36 East

Section 1: Lots 1, 8, 9

Township 21 South, Range 37 East

Section 5: Lots 3, 4, 5, and 6
Section 6: Lots 1 through 12, 14, 15, 16, NE/4 SW/4, NW/4 SE/4

Containing 1930.23 acres, more or less, in Lea County, New Mexico, and in support thereof Applicant would show:

DOCKET MAILED

Date 7-6-61

1. That the Eumont-Hardy Unit Agreement is attached hereto and marked Exhibit I.
2. Designation of Unit Area and preliminary approval of the Unit Agreement by the U. S. Geological Survey was given March 16, 1966.
3. That the attached lease plat marked Exhibit II shows the Eumont-Hardy Unit and surrounding area.
4. That production in the Unit Area is at an advanced stage of depletion and that recovery by primary methods is at or near the economic limit.
5. That engineering investigations indicate that waterflooding the Eumont-Hardy Unit Area will be physically and economically feasible.
6. That agreement between the Working Interest Owners has proceeded to the extent that a logical and systematic secondary recovery operation is assured.
7. That the formation to be unitized and waterflooded is the Yates, Seven Rivers and Queen formations which are specifically indicated on the radioactivity log of the Continental Oil Company State A-36 No. 10 well attached hereto and marked Exhibit III.
8. That all proposed injection wells are or will be completed in such a manner that injected water will be confined to the unitized formation. The present status of all proposed injection wells is shown on the tabulation of injection well data attached hereto and marked Exhibit IV.

9. That applicant proposes to inject a total of approximately 12,000 barrels of water per day into the 28 proposed injection wells on an 80-acre five-spot pattern. Said water will be obtained from the Cass-Pennsylvanian Pool approximately two miles northwest of the Unit boundary and/or the E-M-E Salt Water Disposal system.

10. That the said waterflood will be installed and operated in conformance with Rule 701E.

11. That the producing operations can be carried on more efficiently if all Unit wells are produced into a central tank battery, which will be served by automatic custody transfer equipment.

12. That the proposed unitization and secondary recovery will result in the recovery of hydrocarbons which would not be recovered by primary methods and is therefore in the interest of conservation and prevention of waste.

Wherefore, Applicant respectfully requests that this matter be set for hearing before the Commission's duly qualified Examiner and that upon hearing an order be entered approving the Eumont-Hardy Unit Agreement, granting permission to install and operate a waterflood within the Unit Area and permitting the production of the Unit wells into a central tank battery as described herein above.

Respectfully Submitted,

for L. P. THOMPSON
District Manager
Hobbs District

LPT-JS

EUMONT-HARDY POOL UNIT - INJECTION WELL DATA

EXHIBIT_

Company, Lease and Well No.	Total Depth and/or PBD	Surface Casing Size	Surface Casing Depth	Surface Casing Cement	Int. Casing Size	Int. Casing Depth	Int. Casing Cement	Production Casing Size	Production Casing Depth	Production Casing Cement
Continental Oil Company										
State 25 No. 2	3800'	8 5/8	311	250		None		5 1/2	3799'	1360
State A-25 No. 1	3800'	8 5/8"	349	225		None		5 1/2	3799	1450
State A-36 No. 1	3845'/3790'	10 3/4"	224'	225	7 5/8"	1378	425	5 1/2	3520	425'
								4" slotted liner		3489'
State A-36 No. 4	3810'/3780'		None			None		5 1/2	3515'	900
State A-36 No. 5	3800'/3797'	8 5/8"	331	225		None		5 1/2"	3799'	1506
State A-36 No. 8	3800'/3796'	8 5/8"	323	225		None		5 1/2"	3798'	1313
State A-36 No. 9	3830'/3813'	8 5/8"	290'	225		None		5 1/2"	3829'	250
State A-36 No. 11	3835'	8 5/8"	324'	250		None		5 1/2"	3834'	800
State A-36 No. 12	3800'	8 5/8"	344	250		None		5 1/2"	3799	915
State F-1 No. 2	3807'	10 3/4"	245'	225	7 5/8"	1355'	425	5 1/2"	3496'	425
State F-1 No. 3	3742'	7"	1318'	10		None		5 1/2"	3570'	600
State F-1 No. 4	3780'	7"	1187-1332'	5		None		5 1/2"	3510'	900
State KK-36 No. 1	3823'	8 5/8"	298'	225		None		5 1/2"	3819'	400
State KK-36 No. 2	3715'	8 5/8"	327'	225		None		5 1/2"	3714'	400
State KM-36 No. 1	3683'	8 5/8"	1373'	200		None		7"	3598'	200
Meyer B-31 No. 1	3790'	10 3/4"	192'	225	7 5/8"	1369'	425	5 1/2"	3506'	425
								4" perf. liner		3502-379
Meyer B-31 No. 3	3800'/3793'	8 5/8"	323	225		None		5 1/2"	3799'	1360
Anadarko										
Mae Currie No. 1	3773'	10 3/4"	180	100	8 5/8"	1328'	100	7"	3492'	100
Pan American										
Hill "A" No. 2	3785'	13"	298'	200	9 5/8"	1385'	500	7"	3515'	300
Hill "A" No. 4	3770'	13"	293'	20	9 5/8"	1373'	500	7"	3510'	300
Hill "A" No. 6	3750'	13"	271'	180	8 5/8"	1386'	500	5 1/2"	3528'	225
Hill "C" No. 3	3755'	13"	311'	200	9 5/8"	1336'	500	7"	3465'	300
Hill "C" No. 4	3780'	13"	268'	200	9 5/8"	1373'	500	7"	3522'	300

EUMONT-HARDY POOL UNIT - INJECTION WELL DATA

EXHIBIT No. 5

Total Depth and/or PBD	Surface Casing Size	Surface Casing Depth	Surface Casing Cement	Int. Casing Size	Int. Casing Depth	Int. Casing Cement	Production Casing Size	Production Casing Depth	Production Casing Cement	Producing Int. (P) Perf. (OH) Open Hole
3800'	8 5/8	311	250		None		5 1/2	3799'	1360	(P)3656-3794'
3800'	8 5/8"	349	225		None		5 1/2	3799	1450	(P)3665-3791'
3845'/3790'	10 3/4"	224'	225	7 5/8"	1378	425	5 1/2	3520	425'	(OH)3520-3790'
							4" slotted liner		3489'-3790'	
3810'/3780'		None			None		5 1/2	3515'	900	(OH)3515-3780'
3800'/3797'	8 5/8"	331	225		None		5 1/2"	3799'	1506	(P)3662-3792'
3800'/3796'	8 5/8"	323	225		None		5 1/2"	3798'	1313	(P)3602-3790
3830'/3813'	8 5/8"	290'	225		None		5 1/2"	3829'	250	(P)3683-3798'
3835'	8 5/8"	324'	250		None		5 1/2"	3834'	800	(P)3600-3734'
3800'	8 5/8"	344	250		None		5 1/2"	3799	915	(P)3610-3744'
3807'	10 3/4"	245'	225	7 5/8"	1355'	425	5 1/2"	3496'	425	(OH)3496-3807'
3742'	7"	1318'	10		None		5 1/2"	3570'	600	(OH)3570-3742'
3780'	7"	1187-1332'	5		None		5 1/2"	3510'	900	(OH)3510-3780'
3823'	8 5/8"	298'	225		None		5 1/2"	3819'	400	(P)3645-3769
3715'	8 5/8"	327'	225		None		5 1/2"	3714'	400	(P)3630-3700'
3683'	8 5/8"	1373'	200		None		7"	3598'	200	(OH)3598-3683'
3790'	10 3/4"	192'	225	7 5/8"	1369'	425	5 1/2"	3506'	425	(OH)3506-3790'
							4" perf. liner		3502-3790'	
3800'/3793'	8 5/8"	323	225		None		5 1/2"	3799'	1360	(P)3654-3788'
3773'	10 3/4"	180	100	8 5/8"	1328'	100	7"	3492'	100	(OH)3492-3773'
3785'	13"	298'	200	9 5/8"	1385'	500	7"	3515'	300	(OH)3515-3785'
3770'	13"	293'	20	9 5/8"	1373'	500	7"	3510'	300	(OH)3510-3770'
3750'	13"	271'	180	8 5/8"	1386'	500	5 1/2"	3528'	225	(OH)3528-3750'
3755'	13"	311'	200	9 5/8"	1336'	500	7"	3465'	300	(OH)3465-3755'
3780'	13"	268'	200	9 5/8"	1373'	500	7"	3522'	300	(OH)3522-3780'

EXHIBIT No. 5

Eumont-Hardy Injection Well Data
Page 2

Company, Lease and Well No.	Total Depth and/or PBD	Surface Casing			Int. Casing			Production Casing		
		Size	Depth	Cement	Size	Depth	Cement	Size	Depth	Cement
Skelly Oil Company										
Hill No. 1	3870'	10 3/4"	186'	150		None		7"	3530'	500
Hill No. 3	3730'	16"	158'	150		None		7"	3520'	250
Hill No. 5	3741'	16"	134'	150		None		7"	3510'	250
Gulf Oil Company										
Bell Ramsay No. 1	3820'/3816'	8 5/8"	409'	325		None		5 1/2"	3820'	375
Two States										
Hill No. 2	3785'	7 5/8"	286'	175		None		5 1/2"	3528'	250

EXHIBIT No. 5

Well Data

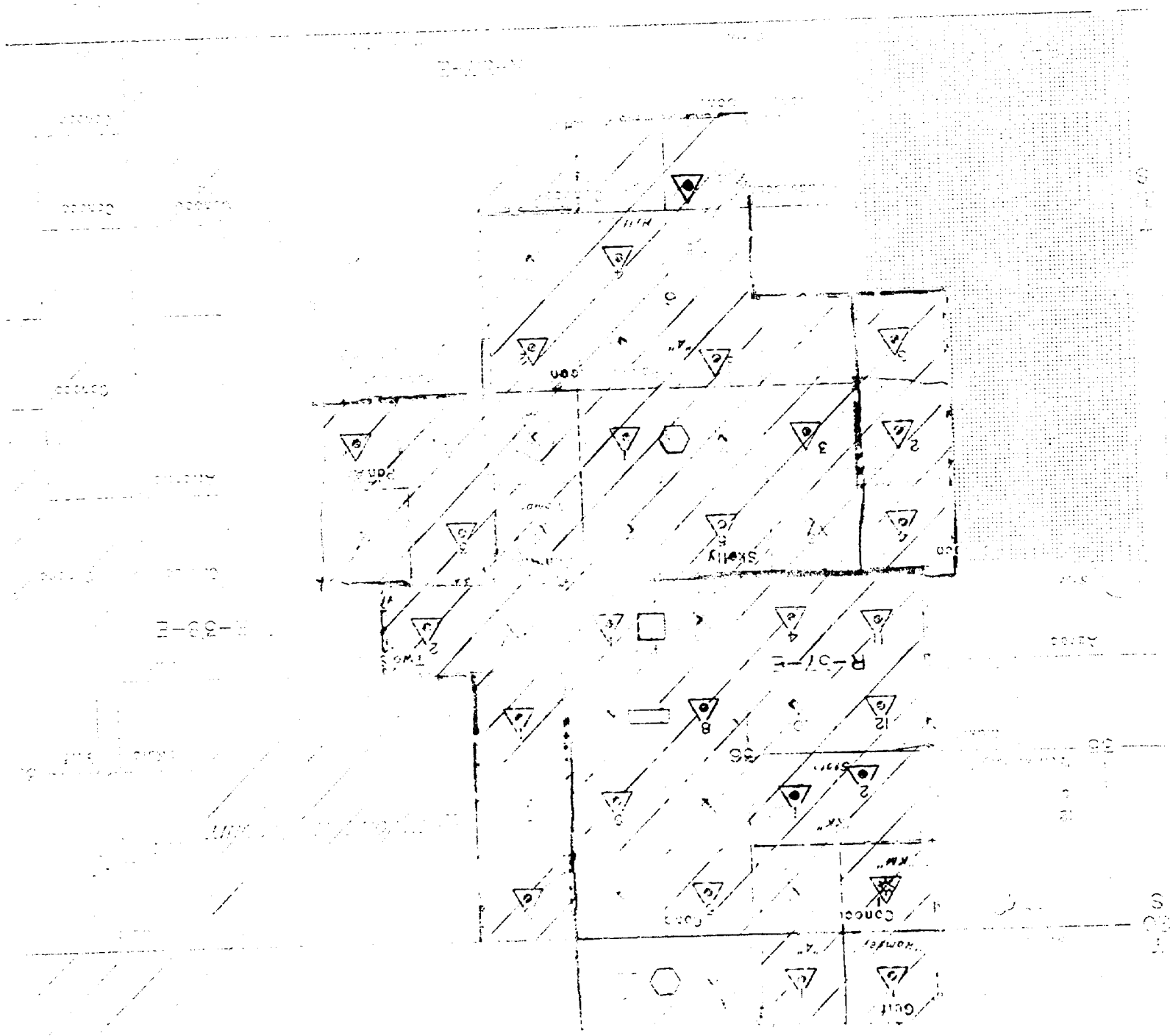
Total Depth and/or PBD	Surface Casing Size	Surface Casing Depth	Surface Casing Cement	Int. Casing Size	Int. Casing Depth	Int. Casing Cement	Production Casing Size	Production Casing Depth	Production Casing Cement	Producing. Int. (P)Perf. (OH)Open Hole
3870'	10 3/4"	186'	150		None		7"	3530'	500	(OH)3530-3870'
3730'	16"	158'	150		None		7"	3520'	250	(OH)3520-3730'
3741'	16"	134'	150		None		7"	3510'	250	(OH)3510-3741'
3820'/3816'	8 5/8"	409'	325		None		5 1/2"	3820'	375	(P)3660-3762'
785'	7 5/8"	286'	175		None		5 1/2"	3528'	250	(OH)3528-3785'

Continental's application for hearing requesting permission to produce the Unit waterflood into a central tank battery -

This request was not advertised can we still allow in the Order -

309-A
309-B

- Injection well controls have been put in letter - shall the same procedure be followed here?



EUMONT-HARDY POOL UNIT - INJECTION WELL LOCATIONS

Company, Lease and Well No.	Location
Continental Oil Company	
State 25 No. 2	660' FS & EL Sec. 25-20-37
State 25 "A" No. 1	660' FSL, 1980' FWL Sec. 25-20-37
State A-36 No. 1	660' FS & EL Sec. 36-20-37
State A-36 No. 4	660' FSL, [illegible] FWL Sec. [illegible]-20-37
State A-36 No. 5	660' FNL, [illegible] FEL Sec. [illegible]-20-37
State A-36 No. 8	[illegible]' FS[illegible]ec. 36-20-[illegible]
State A-36 No. 9	[illegible]60' FNL, [illegible]60' FEL Sec. 36-20-37
State A-36 No. 11	660' FS & WL Sec. 36-20-37
State A-36 No. 12	1980' FSL, 660' FWL Sec. 36-20-37
State F-1 No. 2	1980' FNL, [illegible]60' FEL Sec. 1-21-36
State F-1 No. 3	3[illegible]00' FNL & 660' FEL Sec. 1-21-36
State F-1 No. 4	660' FN & EL Sec. 1-21-36
State KK-36 No. 1	1980' FNL & WL Sec. 36-20-37
State KK-36 No. 2	2310' FNL, 990' FWL Sec. 36-20-37
State KM-36 No. 1	700' FNL, 660' FWL Sec. 36-20-37
Meyer B-31 No. 1	1980' FSL, 660' FWL Sec. 31-20-38
Meyer B-31 No. 3	660' FN & WL Sec. 31-20-38
Anadarko	
Mae Currie No. 1	2310' FS & WL Sec. 6-21-37
Pan American	
Hill "A" No. 2	[illegible]300' FNL & 660' FEL Sec. [illegible]-21-37
Hill "A" No. 4	3300' FSL & 1980' FEL Sec. 6-21-37
Hill "A" No. 6	2970' FNL & 1980' FWL Sec. 6-21-37
Hill "C" No. 3	660' FNL & 440' FWL Sec. 5-21-37
Hill "C" No. 4	1980' FN & WL Sec. 5-21-37
Skelly Oil Company	
Hill No. 1	1980' FNL & 1980' FEL Sec. 6-21-37
Hill No. 3	1980' FNL & 660' FWL Sec. 6-21-37
Hill No. 5	608.3' FNL & 1867' FWL Sec. 6-21-37
Gulf Oil Company	
Bell Ramsey No. 1	660' FS & WL Sec. 25-20-37
Two States	
Hill No. 2	1980' FWL, 660' [illegible] Sec. 31-20-38

BEFORE EXAMINER UTZ
OIL CONSERVATION COMMISSION
EXHIBIT NO. [illegible]
CASE NO. [illegible]

SEMU-EUMONT LEASE - INJECTION WELL LOCATIONS

Company, Lease and Well No.	Location
Continental Oil Company	
SEMU No. 52	1980' FN & WL Sec. 25-20-37
SEMU No. 55	1980' FS & EL Sec. 25-20-37

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. 3429
Order No. R-3115

APPLICATION OF CONTINENTAL OIL COMPANY
FOR [illegible] WATERFLOOD PROJECTS, LEA COUNTY,
NEW MEXICO.

<u>ORDER OF THE COMMISSION</u>

<u>BY THE COMMISSION:</u>

This cause came on for hearing at 9 a.m. on July 19, 1966, at Santa Fe, New Mexico, before Examiner Elvis A. Utz.

NOW, on this 15th day of September, 1966, the Commission, a quorum being present, having considered the testimony, the record, and the recommendations of the Examiner, and being fully advised in the premises,

<u>FINDS:</u>

(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, Continental Oil Company, seeks permission to institute a waterflood project in the [illegible] Unit area, [illegible] Pool, by the injection of water into the [illegible], Seven Rivers, and Queen formations through [illegible] injection wells in Sections [illegible] and 36, Township 20 South, Range [illegible], Township [illegible] South, Range [illegible] East, Section [illegible], Township [illegible] South, Range 38 East, Sections [illegible], Township [illegible] South, Range 37 East, NMPM, Lea County, New Mexico.

(3) That the applicant also seeks permission to institute a [illegible] waterflood project [illegible], by the injection of water into the [illegible] formations through [illegible] injection wells in Section 25, Township 20 South, Range 37 East, [illegible], Lea County, New Mexico.

(3) That the wells in both project areas are in an advanced state of depletion and should properly be classified as "stripper" wells.

(4) That the proposed waterflood projects should result in the recovery of otherwise unrecoverable oil, thereby preventing waste.

(5) That the subject application should be approved and the projects should be governed by the provisions of Rules 701, 702, and 703 of the Commission Rules and Regulations.

IT IS THEREFORE ORDERED:

(1) That the applicant, Continental Oil Company, is hereby authorized to institute two waterflood projects in the Eumont Pool by the injection of water into the Yates, Seven Rivers, and Queen formations through the following-described wells in Lea County, New Mexico:

EUMONT HARDY UNIT WATERFLOOD PROJECT

COMPANY AND LEASE	WELL NO.	LOCATION FOOTAGE	SECTION	TOWNSHIP	RANGE
				NMPM	
Continental Oil Company					
State 25	2	660' FSL & 660' FEL	25	20 South	37 East
State 25 "A"	1	660' FSL & 1980' FEL	25	20 South	37 East
State A-35	3	1980' FSL & 660' FEL	35	20 South	37 East
State A-36	8	1980' FSL & 1980' FEL	36	20 South	37 East
State A-36	9	660' FSL & 760' FEL	36	20 South	37 East
State A-36	10	1650' FSL & 1650' FEL	36	20 South	37 East
State A-36	11	1980' FSL & 660' FEL	36	20 South	37 East
State A-36	12	660' FSL & 660' FEL	36	20 South	37 East
State A-36	13	660' FSL & 1980' FEL	36	20 South	37 East
State A-36	14	1980' FSL & 1980' FEL	36	20 South	37 East
State A-36	15	760' FSL & 660' FEL	36	20 South	37 East
State A-36	16	760' FSL & 1980' FEL	36	20 South	37 East
Mayer B-31	1	660' FSL & 660' FWL	31	20 South	38 East
Mayer B-31	3	660' FSL & 660' FEL	31	20 South	38 East
State E-1	2	1980' FSL & 660' FWL	1	21 South	36 East
State E-1	3	1980' FSL & 660' FEL	1	21 South	36 East
State E-1	4	660' FSL & 660' FWL	1	21 South	36 East

Anadarko				
Mae Currie	1	2310' FSL & 2310' FWL	6	21 South 37 East
Pan American				
Hill "A"	2	3300' FNL & 660' FEL	6	21 South 37 East
Hill "A"	4	3300' FSL & 1980' FEL	6	21 South 37 East
Hill "A"	6	2970' FNL & 1980' FWL	6	21 South 37 East
Hill "C"	3	660' FNL & 440' FWL	5	21 South 37 East
Hill "C"	4	1980' FNL & 1980' FWL	5	21 South 37 East
Shelly Oil Company				
Hill	1	1980' FNL & 1980' FEL	6	21 South 37 East
Hill	3	1980' FNL & 660' FWL	6	21 South 37 East
Hill	5	608.3' FNL & 1867' FWL	6	21 South 37 East
Gulf Oil Company				
Bell Ramsey	1	660' FSL & 660' FWL	25	20 South 37 East
Two States				
Hill	2	660' FSL & 1980' FWL	31	20 South 38 East

SEMU EUNICE LEASE COOPERATIVE WATERFLOOD PROJECT

COMPANY AND LEASE	WELL NO.	LOCATION FOOTAGE	SECTION	TOWNSHIP RANGE NMPM
Continental Oil Company				
SEMU	52	1980' FNL & 1980' FEL	25	20 South 37 East
SEMU	55	1980' FSL & 1980' FWL	24	20 South 37 East

(2) That the subject waterflood project shall be governed by the provisions of Rules 701, 702, and 703 of the Commission Rules and Regulations.

(3) That monthly progress reports of the waterflood project herein authorized shall be submitted to the Commission in accordance with Rules 706 and 1120 of the Commission Rules and Regulations.

(*) 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

Jack M Campbell
JACK M. CAMPBELL, Chairman

Guyton B. Hays
GUYTON B. HAYS, Member

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