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BEFORE THE  
NEW MEXICO OIL CONSERVATION COMMISSION  
CONFERENCE ROOM, STATE LAND OFFICE BUILDING  
SANTA FE, NEW MEXICO

October 4, 1972

EXAMINER HEARING

IN THE MATTER OF:

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

Case No. 4839

IN THE MATTER OF:

Application of Continental Oil  
Company for a waterflood project,  
Lea County, New Mexico.

Case No. 4840

BEFORE: Elvis A. Utz,  
Examiner.

TRANSCRIPT OF HEARING

dearnley, meier & mc cormick

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1 MR. UTZ: Case 4839.

2 MR. HATCH: Case 4839: Application of Continental  
3 Oil Company for a unit agreement, Lea County, New Mexico.

4 MR. KELLAHIN: Tom Kellahin, of Kellahin and Fox,  
5 Santa Fe, appearing on behalf of the Applicant, Continental  
6 Oil Company.

7 At this point, Mr. Examiner, we would like to move  
8 to consolidate Cases 4839 and 4840 for the purpose of  
9 testimony today.

10 MR. UTZ: Cases 4839 and 4840 will be consolidated  
11 for the purpose of testimony, separate orders, however, will  
12 be written on each of the cases.

13 MR. KELLAHIN: I have one witness to be sworn.

14 \* \* \* \*

15 VICTOR T. LYON,

16 was called as a witness, and after being duly sworn, testified  
17 as follows:

18 DIRECT EXAMINATION

19 BY MR. KELLAHIN:

20 Q Will you please state your name and occupation?

21 A I am Victor T. Lyon, L-y-o-n, and I am employed by  
22 Continental Oil Company as a conservation coordinator  
23 in the Hobbs Division Office, Hobbs, New Mexico.

24 Q What is your professional capacity, Mr. Lyon?

25 A I am a graduate engineer, and have practiced petroleum

1 engineering for the past twenty-five years.

2 Q Have you previously testified before the Commission or  
3 one of its hearing examiners and made your qualifications  
4 as an engineer a matter of record?

5 A Yes, I have.

6 Q Have you examined and are you familiar with the facts  
7 surrounding Cases 4839 and 4840?

8 A Yes, I am.

9 Q Are you also familiar with the area in Lea County that  
10 is the subject of this application?

11 A Yes, sir.

12 MR. KELLAHIN: Mr. Examiner, are the witness's  
13 qualifications acceptable?

14 MR. UTZ: Yes, they are.

15 Q (By Mr. Kellahin) Mr. Lyon, will you please state  
16 briefly what the Applicant seeks by these two  
17 applications?

18 A Cases 4839 and 4840 are applications of Continental Oil  
19 Company for approval of the Langlie-Lynn (Queen) Unit  
20 Agreement and for authority to install and operate a  
21 waterflood project in the Langlie-Mattix Pool within  
22 the boundaries of that unit agreement.

23 Q You have prepared what has been marked as Exhibit One,  
24 and which is before the Examiner, is that right?

25 A Yes. Exhibit One is a copy of the unit agreement for

- 1 the Langlie-Lynn (Queen) Unit.
- 2 Q What form did you use for this unit agreement?
- 3 A This is a federal form which is rather new to our office,  
4 and may be new to the New Mexico Oil Conservation  
5 Commission, but it is a form which has been in use in  
6 the Rocky Mountain states for several years. The unit  
7 agreement has attached to it Exhibits A, B, and C.  
8 Exhibit A is a plat showing the unit area, the tracts  
9 involved, the numerical designation, the acreage, the  
10 location of the wells, and other data pertinent to the  
11 unit agreement.
- 12 Q What is the area involved?
- 13 A The area described is the Southeast quarter of Section  
14 22; the Southwest quarter and West half of the Southeast  
15 quarter of Section 23; the Northwest quarter and the  
16 West half of the Northeast quarter and the North half  
17 of the Southwest quarter of Section 26; and the Northeast  
18 quarter of the Northeast quarter of Section 27; all in  
19 Township 23 South, Range 36 East, Lea County, New Mexico.
- 20 Q What kind of acreage are we talking about here, state  
21 land, federal land?
- 22 A This unit is comprised of federal and state land only.
- 23 Q What is the acreage?
- 24 A The total area is 760 acres with 360 acres being federal  
25 land, this is 47.37 percent of the unit area. There

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- 1 are 400 acres of state land, and this is 52.63 percent  
2 of the unit area.
- 3 Q Do you have preliminary approval from the U.S.G.S.?
- 4 A Yes, we have preliminary approval from the U.S.G.S. by  
5 a letter dated May 5th, 1972. The agreement is approved  
6 as performed by the Commissioner of Public Land in a  
7 letter dated May 9th, 1972.
- 8 Q What is the unitized formation?
- 9 A The unitized formation as described in Section 4 of the  
10 agreement is the interval between the top of the  
11 Penrose, a member of the Queen formation, to a point  
12 100 feet above the top of the Queen formation, which  
13 includes the lower 100 feet of the Seven Rivers formation.  
14 The top of the Queen formation and the top of the  
15 Penrose formation are shown at the depths of 3,548 feet  
16 and 3,710 feet; respectively, on the gamma ray sonic  
17 log run in the Albert Gackle-Sinclair "A" State Number 6  
18 located 660 feet from the south line and 1,980 feet from  
19 the west line of Section 23, Township 23 South, Range  
20 36 East. This log, or a copy of it, is being presented  
21 as Exhibit Number 1B, and these tops are shown marked  
22 on that log.
- 23 Q All right, sir, in accordance with the agreement, what  
24 does the agreement provide in the way of the operator?
- 25 A It provides that Continental Oil Company will be the

1 unit operator.

2 Q Does the agreement provide for tract participation?

3 A Yes, it does.

4 Q What is that?

5 A Section 12 of the agreement provides for participation  
6 based on eighty percent estimated ultimate primary  
7 recovery; fifteen percent current revenue; and five  
8 percent current oil production rate.

9 Q What is Exhibit C attached to the unit agreement?

10 A Exhibit C shows participation of each of the tracts which  
11 are shown and depicted in Exhibit A.

12 Q Is there a section of the agreement that provides for  
13 expansion of the unit area?

14 A Yes, Section 3 provides for expansion of the unit area  
15 and, as a matter of fact, we do have under consideration  
16 at this time expansion of the unit area to include the  
17 remainder of the Albert Gackle-Sinclair "A" State lease  
18 which is in the East half of the Southeast quarter of  
19 Section 23.

20 Q This would expand your unit area to what acreage?

21 A An additional eighty acres, and it would bring the unit  
22 area to 840 acres.

23 Q You have already referred to what is marked as Exhibit  
24 One. Would you please refer to Exhibit Two, and identify  
25 it and explain what information it contains?

- 1 A Exhibit Two is a location plat showing the unit area  
2 by the dashed line. It shows the area, the location  
3 of the wells, the ownership of the those wells, and the  
4 leases for a radius of at least two miles surrounding  
5 the unit area. The proposed injection wells are shown  
6 by triangles circumscribed around each of the wells.  
7 There are two wells located on the outside of the unit  
8 area, one is the Texas-Pacific State Number 84, and the  
9 other is the Albert Gackle-Sinclair State Number 5.  
10 These wells have been discussed with the operators of  
11 them, and we have worked out a tentative lease-line  
12 agreement whereby cooperative injection will take place  
13 to protect correlative rights.
- 14 Q What kind of pattern of development is there here with  
15 regard to your injection wells?
- 16 A This is essentially a peripheral pattern particularly  
17 to the north with a staggered 80-acre five-spot pattern  
18 across the common boundaries on the north, with the  
19 offset operators.
- 20 Q I notice there is Wolfson acreage in Section 22 in the  
21 Northeast quarter, what kind of effect will the unitized  
22 formation and agreement have on this acreage?
- 23 A We have had contact with Wolfson, and they advise their  
24 wells are not in mechanical condition so that they can  
25 cooperate in a waterflood project.

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1 Q And how about the Gackle acreage?

2 A The Gackle acreage will either cooperate as we have  
3 shown or that acreage will be included in the expansion  
4 of the unit so correlative rights will be protected.

5 Q Do you have anything else you would like to comment on  
6 with regard to Exhibit Two?

7 A I might point out that this unit area is on the western  
8 flank of the Central Basin Platform, and that the unitized  
9 formation goes to gas at about the location of the  
10 eastern boundary of that unit. Consequently, the wells  
11 east of this unit area are not in a position to cooperate  
12 in the waterflood or to be affected by it.

13 Q I draw your attention to what has been marked Applicant's  
14 Exhibits 3A through 3I, and ask you to briefly describe  
15 what these exhibits contain.

16 A Exhibits 3A through 3I are logs of each of the proposed  
17 injection wells. Multiple Exhibit 3 and multiple Exhibit  
18 4 are designated in the same area. A refers to the  
19 Number Eight Well; B refers to the Number Nine Well;  
20 C to the Number Ten Well; D to the Eleven Well; E to  
21 the Twelve Well; F to the Thirteen Well; G to the Gackle-  
22 Sinclair State Number Three; H to the Gackle-Sinclair  
23 State Number Seven; and I to the Shell State "J-K"  
24 Number Four.

25 We have shown on each of these logs the top of the

1 Queen formation and the intervals which have been  
2 perforated and open to production.

3 Q What zones are you going to inject into, Mr. Lyon?

4 A We will be injecting into the unitized formation which  
5 is the lower 100 feet of the Seven Rivers and the Queen  
6 formation above the top of the Penrose.

7 Q Now, referring you to what has been marked Applicant's  
8 Exhibits 4A through 4I, I ask you to identify them and  
9 explain what information they contain.

10 A Exhibits 4A through 4I are schematic diagrams showing  
11 the manner in which each of the proposed injection wells  
12 has been completed showing the existing depths and the  
13 amount of cement used in setting the casing. These  
14 exhibits show the perforations, the approximate locations  
15 of the packers which will be tension packers, the tubing,  
16 and the statement to the effect that corrosion resistant  
17 internal links will be used on the tubing. In addition,  
18 although not shown, the space above the packer between  
19 the tubing and the casing will be filled with fluid and  
20 surface connection will be fitted either with a pressure  
21 gauge or a rupture disc so that if there is any entrance  
22 of fluid into that chamber, it will be noted without  
23 delay.

24 Q Do these schematic diagrams reflect how the wells are  
25 presently completed or how you propose to complete them?

1 A How the wells will be completed for injection.

2 Q Are these proposed nine injection wells currently  
3 producing?

4 A Yes, they are in a producible condition. I looked  
5 this morning to see which of the wells were producing  
6 in July, and if I can just find my notes, I will tell you.  
7 There are only two wells in the unit area which were  
8 not producing in July. I don't seem to be able to find  
9 my notes.

10 Q Well, you can provide the Examiner with that information  
11 as to the current rate of production on these nine wells.

12 MR. UTZ: I think that is the usual thing that we  
13 need, and we would appreciate receiving that.

14 MR. KELLAHIN: Yes, sir.

15 MR. UTZ: Mr. Lyon, you may find them in the next  
16 few minutes, if not, you will present them?

17 THE WITNESS: Yes, sir-- here's my list of wells.

18 Okay, Number Eighteen is shut in, Number Twelve is  
19 also shut in at the present time, or it was in July.

20 Incidentally, during July, the nineteen wells in the unit  
21 area produced an average of 50.9 barrels of oil per day;

22 40.6 barrels of water per day; and 817 MCF of gas per day.

23 This is an average of 2.7 barrels of oil; 2.1 barrels of  
24 water; and 43 MCF of gas per well per day.

25 MR. UTZ: What was the high and the low?

1 THE WITNESS: The largest producer produced 179  
2 barrels, or about six barrels per day during July.

3 MR. UTZ: Okay.

4 Q (By Mr. Kellahin) According to your information, Mr.  
5 Lyon, is this Langlie-Lynn area a feasible one for the  
6 use of waterflood?

7 A Yes, we have studied the area, and we have concluded  
8 that it is economically and physically feasible for a  
9 waterflood area.

10 Q Do you have any data with regard to your calculated  
11 secondary recovery?

12 A Yes, Exhibit Number Five is a data sheet showing  
13 pertinent data on the unit area and the calculations  
14 which lead us to the conclusion that it was feasible  
15 for waterflood. It shows that of the 768 acres in the  
16 unit area, 530 acres are considered floodable, with  
17 the pattern we have proposed. The reservoir has an  
18 average porosity of 18.2 percent and an average net  
19 pay of 6.5 feet with a water saturation of 35.7 percent.  
20 Our calculations have indicated that there is in place  
21 a total of 3,646,000 barrels of oil and primary  
22 recovery is estimated at 17.4 percent of that. Secondary  
23 recovery will be in the nature of 14.6 percent of the  
24 total oil in place, which is about 84.4 percent of the  
25 primary recovery from this area.

- 1 Q I refer you to Applicant's Exhibit Number Six and ask  
2 you to identify it.
- 3 A Exhibit Six is a copy of an analysis of the water which  
4 is proposed to be used in this waterflood project.
- 5 Q What is the volume of water to be injected?
- 6 A I will have to refer to my notes. Yes, we expect  
7 injection at a rate of 6,000 barrels per day, with a  
8 maximum pressure of 2,000 pounds.
- 9 Q I was going to ask you how much water do you anticipate  
10 being injected in the whole project.
- 11 A I will refer to my study. We expect to inject 11,600,000  
12 barrels of water, approximately, and of this, we can  
13 expect 5,892,000 gallons of water to be water produced  
14 in the area, but outside of the unit area.
- 15 Q That then is the source of water in this area?
- 16 A Yes, sir.
- 17 Q What other sources of water will you use?
- 18 A The areas to the west, south, and northwest are large  
19 water producing areas, and we expect to either gather  
20 this water for injection into our injection wells or  
21 we will turn around to the water disposal wells into  
22 which we have been injecting produced water from the  
23 area and pump that water back out to use in the waterflood  
24 project.
- 25 Q Will any other water flood areas be affected by your

1 proposed waterflood project?

2 A No.

3 Q What is the reservoir drive mechanism during primary  
4 recovery?

5 A This is primarily a depletion type drive mechanism of  
6 solution gas.

7 Q It is then your opinion that the area can be successfully  
8 and economically waterflooded?

9 A We believe it can.

10 Q Will waterflooding the unit area result in the recovery  
11 of oil that would not be otherwise recovered, thus  
12 preventing waste?

13 A Yes.

14 Q Will your application in any way impair the correlative  
15 rights of any other parties?

16 A We think the unit will protect the correlative rights  
17 of all parties involved.

18 Q Do you have anything else you would like to add at this  
19 time?

20 A I don't believe so.

21 MR. KELLAHIN: Mr. Examiner, we move for the  
22 introduction of Applicant's Exhibits One through Six.

23 MR. UTZ: Without objection, Exhibits One through  
24 Six will be entered into the record of this case.

25 (Whereupon Applicant's Exhibits One through Six,

1 inclusive, were entered in evidence.)

2 MR. KELLAHIN: That concludes our direct examination,  
3 Mr. Examiner.

4 MR. UTZ: Are there questions of the witness?

5 (No response)

6 \* \* \* \*

7 CROSS EXAMINATION

8 BY MR. UTZ:

9 Q Mr. Lyon, in your exhibits, do we have a complete list  
10 of your injection wells showing the locations?

11 A I don't think so, Mr. Examiner, but I will be glad to  
12 furnish that to you. I don't believe that I have that  
13 material with me though. I can give you the unit letter  
14 designation, but I don't think I have the footage-- yes,  
15 I do. Number Eight is 660 feet from the north--

16 Q Just a minute, let me get my exhibit.

17 A Okay.

18 Q All right.

19 A Six hundred sixty feet from the north and east lines of  
20 Section 27. Number Nine, which is Exhibit B, is 440  
21 feet from the north and 1,980 feet from the east of  
22 Section 26. Number Ten, which is C, is 1,980 feet from  
23 the north and 660 feet from the west of Section 26.  
24 Number Eleven, which is D, is 1,980 feet from the south  
25 and west of Section 26. Number Twelve, which is E,

1 is 1,980 feet from the north and east of Section 26.  
2 Number Fifteen, which is F, is 1,980 feet from the  
3 south and 660 feet from the west of Section 26. The  
4 Gackle-Sinclair Number Three Well, which is G, is 1,980  
5 feet from the south and 660 feet from the west in  
6 Section 23. The Gackle-Sinclair Number Seven, which is  
7 H, is 660 feet from the south and 1,980 feet from the  
8 east of Section 23. The Shell State "J-K" Number Four,  
9 which is I, is 640 feet from the south and 1,650 feet  
10 from the east of Section 22.

11 Q Mr. Lyon, does your Exhibit Two include the entire unit,  
12 the outline of the entire unit?

13 A Yes, as it will be initially and the way it will be if  
14 it is not expanded.

15 Q Is there a description of the entire unit in your  
16 agreement?

17 A With this new form, I don't think they describe it anymore.

18 Q Well, do you have the description anywhere in your  
19 other exhibits?

20 A I believe it is in the application.

21 MR. HATCH: Exhibit A, which is attached to the  
22 unit agreement.

23 MR. KELLAHIN: The acreage is also described in the  
24 application.

25 Q (By Mr. Utz) If I recall your Exhibit Four, you are going

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1 to inject through protected tubing under a packer in  
2 every case?  
3 A Yes, sir.  
4 Q With either a rupture plate or gas gauge at the surface?  
5 A Correct.  
6 MR. UTZ: Are there any other questions of this  
7 witness?  
8 (No response)  
9 MR. UTZ: If not, you may be excused.  
10 (Witness excused.)  
11 MR. UTZ: Any statements in this case?  
12 (No response)  
13 MR. UTZ: Cases 4839 and 4840 will be taken under  
14 advisement.  
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25I N D E XWITNESSPAGE

VICTOR T. LYON

Direct Examination by Mr. Kellahin

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Cross Examination by Mr. Utz

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E X H I B I T SAPPLICANT'SADMITTEDOFFERED

Exhibit #1 Unit agreement

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Exhibit #1A

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Exhibit #1B

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Exhibit #1C

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Exhibit #2 Location plat

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Exhibits 3A-I Logs

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Exhibits 4A-I Schematic diagrams

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Exhibit #5 Data sheet

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Exhibit #6 Analysis

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