NEW MEXICO OIL CONSERVATION COMMISSION

EXAMINER HEARING

SANTA FE, NEW MEXICO

REGISTER

HEARING DATE MARCH 20, 1963 TIME: 9 A.M.

NAME:	REPRESENTING:	LOCATION:
O K Gilbreath	C W Trainer	Hobbs
C W. Trainer	Self	Hobbs
T. P. Stockmar	COMPASS EXPL	DENVER
J. A. Morgan	"	Farmington
P J Farrelly	"	Denver
P. T. McGrath	U. S. G. S.	Farmington
R. S. Morris	Seth, Montgomery, Federici & Andrews	Santa Fe
George Tanner	Consolidated Oil Corp	Denver, Colo.
Jason Kellahin	Kellahin & Fox	Santa Fe
J. H. Hoover	Gulf Oil Corp.	Roswell N M
Lester Marshall	" "	"
W V Kastler	" " "	"
R. J. Davenport	International Oil & Gas Corp.	Artesia N. M.
A. L. Lowe	Lowe & Stewart	Artesia N. M.
Frank E. Irby	State Engr -	Santa Fe, N.M.
Gene Vandiver	El Paso Nat. Gas Products Co.	Farmington, New Mex.

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NAME:	REPRESENTING:	LOCATION:
A. F. Holland	Caulkins Oil	Denver
T. F. Welch	Cimarron Capitan	Artesia
Bert Murphy	✓	✓
J. O'Terrell Couch	Marathon Oil Co	Houston
Bill J. McMichael	✓	Roswell
John H. Bevan Jr.	✓	Houston
[illegible]	atty.	Albuquerque.
[illegible]		Farmington
Red Walsh	El Paso	
[illegible] Porter	OCC	Santa Fe
John L. Anderson	Marathon Oil Co.	Roswell, N.M.
H. J. Sommer	Marathon Oil Co.	Roswell, N.M.

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
March 20, 1963

EXAMINER HEARING

IN THE MATTER OF:

Application of C. W. Trainer for a unit agreement, Lea County, New Mexico. Applicant, in the above-styled case, seeks approval of the Hume-Queen Unit Area comprising 1,240 acres of State land in Township 16 South, Range 34 East, Lea County, New Mexico.

Case No. 2773

BEFORE: Elvis A. Utz, Examiner.

TRANSCRIPT OF HEARING

MR. UTZ: The Hearing will come to order. The first case on the docket will be 2773.

MR. DURRETT: Application of C. W. Trainer for a unit agreement, Lea County, New Mexico.

MR. MORRIS: I am Richard Morris of the law firm of Seth, Montgomery, Federici and Andrews, Santa Fe, New Mexico, appearing on behalf of the applicant, C. W. Trainer.

At this time, I would like to move that this case be consolidated with Case Number 2774, for the purpose of the Hearing.

MR. UTZ: Cases Number 2773 and 2774 will be consolidated for the purpose of Hearing, only separate orders

will be made for the purpose of the record. Are there any other appearances in this case?

(No response.)

You may proceed.

MR. MORRIS: We will have one witness. O. K. Gilbreth. He will be sworn at this time.

(Witness sworn.)

O. K. GILBRETH

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

DIRECT EXAMINATION

BY MR. MORRIS:

Q Mr. Gilbreth, please state your name and present profession?

A My name is O. K. Gilbreth. I am a Petroleum Engineer for C. W. Trainer of Hobbs.

Q Would you state for the Examiner and the Commission, briefly, your education and background in the petroleum industry?

A I graduated from the University of Oklahoma in June of 1947 with a Bachelor of Science degree in Petroleum Engineering. I was employed by Gulf Oil Corporation in August of 1947 and worked in various engineering capacities in West Texas and New Mexico. I performed field work for Gulf in Crockett, Texas, and Fort Worth, Texas. And, in 1954, was transferred to Roswell, New Mexico, as District Engineer. I remained in Roswell until

August of 1961, at which time I was transferred to Midland as District Engineer. I resigned from Gulf on May 1st, 1962 to accept a position with Rathwood Richard of Hobbs. I resigned on February 18th, 1962, to attend my present position with C. W. Trainer.

Q Are you familiar with the water flood application of C. W. Trainer in Cases 2773 and 2774 before the Examiner today?

A Yes, I am.

Q What does Mr. Trainer seek by these two applications?

A We are seeking approval of a unit agreement covering oil producing wells drilled in the Hume-Queen in Sections 7, 8, 9 and 17 of Township 16 South, Range 34 East in the unit agreement. Unit formations being brought about by an anticipating water injection project.

Q For which you are also seeking approval in this action?

A That is right.

Q Mr. Gilbreth, referring now to what has been marked as Exhibit A in Case 2773, would you state what that shows, please?

A Exhibit A is a map of the Hume-Queen field showing the proposed unit outline in hashered lines around the unit area include all producing wells and all dry wells drilled in the Hume-Queen field. On the exhibits, there are some numbers shown in circles. Those are the tract numbers within the units.

All lands within the unit are State lands and you will notice along the Eastern edge of the field in the west half of Section 9, a couple of dry holes and to the northwest of that and in the eastern corner of Section 8, there is a dry hole and then to the south in Section 17 there is a dry hole. These dry holes are to be utilized in the injection pattern and we will cover discussion of those on subsequent exhibits.

Q Your proposed unit area for the Hume-Queen unit includes all of the wells that have been completed in the Hume-Queen Pool even though some of them are dry holes?

A That is right.

Q Do you have available to submit to the Examiner at this time a copy of the unit agreement for which you are seeking approval?

A Yes, sir, we have.

Q And, has that been marked as Exhibit B in this case?

A It has.

Q Referring briefly to that unit agreement, what is the unitized substance in the agreement?

A The unit covers the Queen formation and is described as the Queen sand formation encountered in the area now known as the Trainer, Phillips 7. In general, it is the center of the Queen.

Q In other words, it is just the production from the Hume-Queen Wells that is being unitized?

A That is right, the Queen formation only.

Q And, who is designated as unit operator?

A C. W. Trainer is designated as unit operator.

Q Is the agreement subject to the conservation laws and orders, rules and regulations of this Commission?

A Yes, sir. One section in the agreement provides that "This agreement shall be subject to the conservation laws of the State of New Mexico; to the valid rules, regulations, and orders of the Oil Conservation Commission of New Mexico; and to all the other applicable federal, state, and municipal laws, rules, regulations and orders."

Q How many working interests do you have within the proposed unit area?

A There are 22 individual working interests in this area.

Q And, percentagewise, how many of those working interests do you have committed to the unit at this time?

A We have about 87.243 per cent.

Q Have any working interests absolutely refused to join your unit?

A Not at this point. We are hopeful that all the remainder will join.

Q Negotiations are still in progress with the remaining 13 some odd per cent?

A That is true.

Q Do you have any overriding royalty interests in this area?

A Two.

Q What is their status with respect to joining?

A We do not know at this point. They have given no indication that they will not join.

Q Their ratification is actively being sought at this time?

A That is true.

Q I believe you said that all of the area in the unit area is State land?

A That is correct.

Q Has approval been sought of the Land Office?

A Yes, sir, it has and the Land Office has given preliminary approval of the agreement in a letter dated March 8th, 1963.

Q And, is that letter marked as Exhibit C in this case?

A Yes, it is.

Q What is the jist of that letter, Mr. Gilbreth?

A This letter states as follows: "Dear Mr. Trainer: This is to confirm our telephone conversation of this date by which we verbally approved the changes in the unit agreement form, as submitted in your letter dated March 6, 1963.

"We approve your Hume-Queen waterflood as to the project and also approve the unit agreement as to form and content."

Signed Mrs. Marian M. Rhea, and the letterhead is "Office of the State Commissioner of Public Land."

Q Now, what steps will be taken to get a final approval of the Land Office?

A If we can secure the approval of the Commission and the necessary working unit owners, then we will secure approval of the Land Commissioner and file the estimate for record.

Q And, at that time, will you also plan to file executed copies of the unit agreement with the Commission?

A Yes, sir, we will.

Q Generally, Mr. Gilbreth, why do you believe that it is desirable to operate this area as a unit?

A Production is declining. We feel that something is necessary to augment production. A unit operation can be more economical. It can protect correlative rights and it can protect the interest owners for the benefit of the owners and the State of New Mexico.

Q Turning now, Mr. Gilbreth, to the aspect of our case concerning the waterflood project, it is, I believe you stated earlier, that the waterflood project is to be operated within the proposed unit area?

A Yes, sir, that is right.

Q Do you have an exhibit showing the structure of the Hume-Queen Pool in this unit area?

A Yes, sir, I have prepared a map showing a contour

on the top of the Queen Porosity and that has been marked Figure No. 1.

Q In Case 2774?

A Yes, sir.

Q Would you explain that in detail?

A This is a structure map on top of the Queen Porosity covering all producing and dry holes in the Hume-Queen field. All wells to be included in the waterflood are shown on this map. Notice that the structure itself is a gentle nose, trending northeast. It has a maximum enclosure of approximately 35 feet. There is a slight dip in the western part of Section 8 in the vicinity of the Shell State Ellis Well. Production in the field is characterized by radical permeability and porosity developments with the outer edges of the field being characterized by rather tight sections and the central part of the field being quite permeable. The average porosity in the field is about 15.7 per cent. The average permeability about 44 millidarcies and the field has an original RVF of 14.26. That is estimated.

Earlier, I mentioned the dry holes. You can see from this map that the dry holes are more or less down-dip. Some dips produce water. It appears mainly it is an absence of oil saturation that governs production. Oil contact appears to be 185. It is a solution gas drive reservoir.

Q Do you have a cross section prepared, east-west,

through this field that would show the relationship of these dry holes perhaps a little bit better?

A Yes, sir.

Q And, that has been marked Exhibit No. 2 in this case?

A Yes, it has. Exhibit 2 doesn't really show too much. It shows that the clay is continuous throughout. The reservoir has a thickness of approximately 20 feet and that there is very little relief. It does show that the pay exists in the dry hole on the eastern extremity of the cross section, Shell State Well No. 3.

Q The fact that it doesn't show much is the fact that we are trying to show, is that right?

A That is true. This is an east-west cross section through the central part of the field.

Q Do you have some data, Mr. Gilbreth, to show the performance of this Hume-Queen Pool to the present time?

A Yes, I have prepared a production performance curve which has been marked Exhibit No. 3.

Q Would you go ahead and explain that, please?

A This is simply a curve showing a plot of the monthly production rate versus time. From the curve, you can see that the initial production was obtained in November of 1956 and development was completed by 1959 and that the field reached a maximum producing rate of 10,800 barrels per month and has been declining in the more recent past. It is now producing

about 6300 barrels a month and the wells that are on decline, are declining at the average rate of 47 per cent per year.

Q Mr. Gilbreth, I see a little kick on this graph in the most recent period of production. Is there any reason for that upswing of production there?

A Yes, when unit negotiations started, there was some effort on behalf of some of the operators to maintain their production and some mechanical adjustments were made. There were no work overs. The little kick is due strictly to mechanical work. On the more recent production figures, it looks like the wells are continuing to decline or will continue to decline quite parallel to the trend that is drawn there.

Q So that doesn't show any new well or new production in the wells?

A No.

Q Do you have anything else to bring out with respect to Exhibit 3?

A Well, I'd like to point out that the decline rate in this field is very high; that in the matter of a very few years, the entire field will be at the economic limit. At the present time, many of the wells are approaching that stage.

Q And, is this shown as to individual wells by your Exhibit No. 4?

A Yes, it is.

Q Would you explain that exhibit, please?

A Exhibit No. 4 is simply a map showing the January, 1963 daily average production rate under each well in the field. I'd like to call your particular attention to the edge wells along the west and northern side of the field. The economic limit in this field is around 2.3 to 2.4 barrels per day.

Q Let me interrupt you there. The figures shown by each well, is that wells daily average production during the month of January, 1963?

A That is right.

Q Go ahead.

A You will notice around the northern and western edges of the field, there are six wells now at the economic limit. Around the southern edge, there are two other wells approaching the economic limit. Through the center of the field, the wells have better productivity and in the eastern part, in the southeast quarter and the northeast quarter, production is even higher. This again is a reflection of the better permeability and better porosity in the field. For all the producing wells, the average producing rate in January was 11.32 barrels per day.

Q That is the average figure for the entire field for one day?

A Yes.

MR. UTZ: What was that figure?

A 11.23 barrels per day. There are only seven producing wells capable of producing 15 barrels of oil a day at this time.

Q (By Mr. Morris) Looking at the pool as a whole, Mr. Gilbreth, would you classify production on this level as stripper production?

A Yes, I would, although, there are three or four wells that are still capable of producing reasonable quantities of oil. By far, the great majority of the wells are in stripper stages and with the 47 per cent per year decline, it is obvious that something needs to be done very soon to augment production.

The wells are drilled and cased in such a manner that it appears a waterflood project could efficiently be carried out here and the operators of waterflood rights in the field have agreed to a waterflood program.

Q Now, what type of waterflood program has been engineered for this pool, Mr. Gilbreth?

A We are proposing a peripheral-type injection program.

Q And, is this shown on Exhibit No. 5 in this case?

A Yes, it is.

Q Go ahead.

A Exhibit 5 is a map showing again all the wells drilled in the field with the proposed injection wells colored in red. You will note that there will be fifteen injection wells and nine producing wells with two of the injection wells to be new drilled wells. You can see from the pattern itself that every producing well would be stimulated by at least one

direct or diagonal offset and in many cases, there are two that would effect the producing well.

Q Why was it felt that a peripheral-type flood would be more efficient in this pool than some other type of flood, such as a pattern-type flood?

A There are two reasons for this. First of all, a pattern-type flood in this field, because it is long and narrow, would leave several incomplete patterns and as a result would leave considerable unswept areas with considerable low efficiency. Secondly, the more permeable and porous wells are in the center of the field and the tight wells are on the edge. It is our feeling that we can use mechanical means to put pressure to the reservoir to force the area over to the more permeable producing wells. However, we don't believe the reservoir is true enough for water in the center to get production out of the edge wells.

Q Now, these two wells to be drilled, one of them is located in the southwest quarter of the northwest quarter of Section 8 and the other is in the southeast quarter of the southeast quarter of Section 8?

A That is true.

Q Will those wells be drilled if approval is given?

A Plans are fairly well planned that this will be drilled, cased through the pay with the perforations being directed through the Queen for selected injections.

Q Now, concerning the casing program on these injection wells, have you been in touch with the Office of the State Engineer, Frank Irby, concerning the casing program and the injection that is proposed here?

A Yes, sir, this has been discussed very briefly with Mr. Irby and then I furnished him a tabulation where the casing is set in all the wells and where the cement is used, with a copy of that being sent to the Commission.

MR. MORRIS: We ask that the Commission take note of the casing information that previously has been submitted.

Q (By Mr. Morris) Have you received and replied from the office of the State Engineer concerning your casing program?

A We received a copy of a letter Mr. Irby sent to Mr. Porter of the OCC which reads as follows: "Dear Mr. Porter: Reference is made to the application of C. W. Trainer for approval of the Hume-Queen Waterflood Project located in Township 16 South, Range 34 East. Reference is also made to a letter from Mr. C. W. Trainer under date of March 8, 1963 which refers to this Waterflood case as Number 2774. The letter is addressed to me and a copy has been sent to your office. The method of casing, cementing, tubing, injection, etc., are set forth in the letter and this office offers no objection to the granting of the application, provided the casing, tubing, packer and injection method are in accordance with the letter. Yours very truly, S. E. Reynolds, the

State Engineer, by Frank E. Irby, Chief, Water Rights Division."

Q Now, Mr. Gilbreth, is your injection pattern, I mean, your casing program on your injection wells to be in conformance with the information as submitted to the State Engineering Office?

A Yes, sir, it is to be.

Q And, has that letter from Mr. Irby to Mr. Porter been marked as Exhibit 6 in this case?

A Yes, it has.

Q What would be your plans, Mr. Gilbreth, with respect to putting these wells on injection? Would they all be put on injection at the same time or would they be staggered?

A Yes, we propose to put all the wells on injection at the same time in order to carry an even flood bank. The pattern itself, of course, is similar to two line drive pattern. We feel it is necessary to carry this continuity on through.

Q This is not unusual in a peripheral-type flood to put all the wells on injection at the same time?

A No, it is not.

Q What is the estimated rate of water injections?

A In the order of 500 barrels of oil per day during the period of fill-up and after fill-up, we anticipate in the order from 200 to 250 barrels a day.

Q How long do you estimate fill-up?

A We estimate 6 to 8 months.

Q Have you given consideration to the operation of this waterflood project under Rule No. 701 of the Commission's rules and regulations?

A Yes, we have. We feel that we can operate under provisions of Rule 701. After production response is obtained, we feel that it will be necessary to curtail injection slightly for a period of approximately a year to a year and a half in order to stay within the limits. It is not a significant curtailment. According to my calculations, Rule 701 would give an allowance for the project of 700 BWPD for the seven injection wells and the nine producing wells.

Q This is information shown graphically on Exhibit No. 7?

A Yes, Exhibit No. 7 shows biannually production performance at the estimated secondary production performance. You will note shown on the curve during the year 1965, there would be some curtailment of production to stay within the limits of Rule 701.

Q What are your prospects for a successful flood in this area?

A We think the prospects are very good. This is a Queen Reservoir. It is a very few miles from the Caprock-Queen. I think nearly everyone is familiar with the success that is being obtained there. Secondary recovery in the order of 1.5 to 2.4 times primary are being obtained and we feel that

our project will recover approximately two times primary.

Q Certainly, then, Mr. Gilbreth, the operation of this project would recover oil not otherwise recoverable and thereby prevent waste?

A Yes, it would.

Q Other than the letters that we have referred to here, were all of the other exhibits prepared by you or under your direction?

A Yes, they were.

MR. MORRIS: At this time, we offer Exhibits A, B and C in Case No. 2773 and Exhibits 1 through 7 in Case No. 2774 and that completes the Direct Examination of Mr. Gilbreth.

MR. UTZ: The exhibits as stated by counsel will be accepted by the Commission as a part of this record. Is that all you have?

MR. MORRIS: That is all I have.

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

CROSS EXAMINATION

BY MR. DURRETT:

Q Yes, I have a question. Does your agreement have an agreement for subsequent joinder of parties?

A No, sir, the agreement does not have the normal provision. It simply states that any subsequent addition to the unit will be on a basis negotiated by the unit operators and the new people to come into this unit.

Q I see. Thank you.

MR. UTZ: Mr. Gilbreth, have you listed your injection

wells anywhere except the tabulations you furnished the State Engineering Office?

MR. MORRIS: They are listed in the application in this case.

MR. UTZ: There are 15 wells listed in the application?

A Yes.

MR. UTZ: Are those locations correct?

A Yes.

MR. UTZ: Out of the 9 wells that you intend to produce here, there appears to be about 4 pretty good wells, two of which are almost top allowable wells?

A Yes, that is true.

MR. UTZ: How old are those Phillips State Trainer Wells?

A I believe they were drilled in late 1956 and early 1957.

MR. UTZ: Are those wells increasing in producing ability along the lines that you have shown on your Exhibit No. 3?

A The wells are decreasing in capacity, Mr. Utz. The capacity is still very near top allowable but they are right at the edge of decline.

MR. UTZ: How do you know that they are at the edge of decline?

A We know from the decline in the capacity over last year.

what they were capable of doing last year wide open and what they are doing now wide open.

MR. UTZ: Do you have any information as to what they declined to?

A I don't have it with me.

MR. UTZ: Would you furnish that information to the Commission?

A Yes.

MR. MORRIS: Particularly what well?

MR. UTZ: All the wells on the Phillips State Lease. I won't ask you to delve into the Shell wells. It's only 23 barrels per day.

A My projections on that lease indicate it should start dropping down very rapidly after about May.

MR. UTZ: On your tabulation that you sent the State Engineer's Office, I notice 13 wells listed there. That does not include the 2 wells to be drilled?

A It does not.

MR. UTZ: And those 2 wells will be cemented in accordance, generally in accordance with the cementing program stated in these 13 wells?

A That is true. They will be drilled through, cased, cemented and then perforated.

MR. UTZ: And the top of the cement in all cases run from a thousand feet to a little over a thousand on the 13 wells?

A Yes, sir.

MR. UTZ: And that will be true on the 2 new wells?

A Yes, sir.

MR. UTZ: And you intend to inject through tubing?

A Yes, we feel that a good amount of pressure after fill-up--we figure 32,000 pounds of fill-up. We can't go to that but that is the estimate.

MR. UTZ: All these casings run through pay?

A Yes, all except the Shell W No. 1. The casing has been pulled through that. We have to run casing again and cement.

MR. UTZ: Do you intend to run that casing through the pay?

A Yes, sir.

MR. UTZ: And, you will set a packer above casing?

A Yes, sir.

MR. UTZ: Will you use anything else?

A Probably inert water or treated oil but we will have something in the packers.

MR. UTZ: What type packers do you intend to use?

A Just a hook wall packer.

MR. UTZ: It wouldn't be a permanent type?

A No.

MR. UTZ: Referring to Exhibit No. 7, I note here on your production decline you have an economic limit of

around 4700 barrels, is that correct?

A Yes.

MR. UTZ: Is that per day or month?

A Per month, yes.

MR. UTZ: And, on your waterflood project, you have stopped it at around 800 barrels per day?

A That is true.

MR. UTZ: Now, is that when you intend to abandon this project, at the 800 barrels a day?

A That is when we feel that the economic limit will be reached. The economic limit under flood would be considerably higher than under primary.

MR. UTZ: It would be twice as much?

A Yes, sir. When you get down to that stage, there will not be too many wells operating in that stage. There is only 27 barrels a day operating in the whole field, something in that neighborhood.

MR. UTZ: Any other questions of the witness?

(No response.)

If there are no further questions, the witness may be excused. Are there any statements to be made in Cases No. 2773 and 2774?

MR. DURRETT: If the Commission please, I have some correspondence that I would like to read into the record.

MR. UTZ: You may do so.

MR. DURRETT: Thank you. I would like to state that we have received a telegram from Cities Service Oil Company, and also received a telegram from Shell Oil Company stating that they support the application in both cases. Commission has also received a letter from Pure Oil Company stating that they support the application in both cases. These letters will be placed in the file and will be available if anyone desires to read them in their entirety.

MR. UTZ: Are there any other statements to be made? The cases will be taken under advisement.

STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

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

IN WITNESS WHEREOF, I have affixed my hand and notarial seal this 1st day of May, 1963.

Steven McCrystal
NOTARY PUBLIC
COURT REPORTER

My Commission Expires:

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 2223, heard by me on Mar. 20, 1963.

New Mexico Oil Conservation Commission, Examiner