

BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
June 26, 1968

EXAMINER HEARING

IN THE MATTER OF:

Application of Kewanee Oil
Company for a unit agreement,
Eddy County, New Mexico.

CASE NUMBER
3791

IN THE MATTER OF:

Application of Kewanee Oil
Company for a waterflood
project, Eddy County, New
Mexico.

CASE NUMBER
3792
(Consolidated)

BEFORE: ELVIS A. UTZ, Examiner

TRANSCRIPT OF HEARING

MR. UTZ: Case 3791.

MR. HATCH: Case 3791, application of Kewanee Oil Company for a unit agreement, Eddy County, New Mexico.

MR. MORRIS: Mr. Examiner, I am Dick Morris of Montgomery, Federici, Andrews, Hannahs and Morris, Santa Fe, appearing on behalf of Kewanee Oil Company in Case 3791. At this time I would ask that Case 3792 be consolidated with Case 3791 for purposes of testimony and, of course, that separate orders be issued in the two cases if that be the wish of the Commission.

MR. UTZ: We'll consolidate 3791 and 92 for purposes of testimony and we will write separate orders.

MR. MORRIS: We will have two witnesses, Mr. J. W. Graham, Mr. R. S. Allison. I ask that they both stand and be sworn at this time.

(Whereupon, Exhibit 1 in Case 3791 and Exhibits "A"-"H" in Case 3792 were marked for identification.)

(Witnesses sworn.)

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

J. W. GRAHAM

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

DIRECT EXAMINATION

BY MR. MORRIS:

Q Mr. Graham, please state your name, where you reside.

A J. W. Graham, Tulsa, Oklahoma.

Q By whom are you employed?

A Kewanee Oil Company.

Q In what capacity are you employed?

A As joint interest superintendent.

Q Have you previously testified before the Commission or one of its Examiners and had your qualifications established and accepted as a matter of record?

A I have testified and my qualifications were accepted.

Q Did you hold the position of joint interest superintendent at the time you testified previously?

A It was either that or joint interest coordinator, one of the two.

Q Just briefly, what are your duties as joint interest superintendent?

A Primarily to oversee our operations as they are related to other companies, particularly nonoperated properties that are directly directed to my attention and with regard to operated properties, the initiation and prosecution of unit agreements and like-type agreements.

Q Was it within your duty to supervise and oversee the

preparation and execution of the unit agreement that is involved in this case?

A Yes, it was.

MR. MORRIS: Are the witness's qualifications acceptable?

MR. UTZ: Yes, sir, they are.

Q (By Mr. Morris) Please refer, Mr. Graham, to what has been marked as Exhibit 1 in this case and state what that is.

A Exhibit 1 is a unit agreement for the development and operation of the Square Lake "12" Unit, Eddy County, New Mexico.

Q Would you refer to Exhibit "A" attached to the unit agreement? What does that Exhibit "A" show?

A Exhibit "A" shows several tracts of land located in Township 17 South, Ranges 29 and 30 East, Eddy County, New Mexico, which we propose to unitize for the purpose of secondary oil recovery.

Q How many acres are contained within this unit?

A Approximately 1360 acres.

Q Is that all Federal acreage?

A All of the land is Federal land.

MR. HATCH: The exhibit shows 1343.96. Is it only

1360?

MR. MORRIS: 1360 would be the approximate size if all of the quarter quarter sections were standard, which I guess they are not. I think there's one exhibit there that shows that it is 1360 and some place in the unit it shows it as 1343.96.

Q (By Mr. Morris) Which is correct, Mr. Graham?

A Well, to the best of our knowledge, the 1360 would be. I might give just a bit of background on this particular unit. Our predecessor operator, Neil Saueressig, actually initiated these unit proceedings. Kewanee Oil Company subsequently acquired his interest in these lands and we proceeded to move forward with the unit operation. At that time, he had submitted a draft of the agreement to the USGS. They had inserted corrections, though, and returned it to him with a letter stating that if these corrections were adhered to, the unit agreement would be approved.

We merely took up where Mr. Saueressig left off and in order to obtain final approval from USGS on this agreement. We do not have actual information as to what acreage would constitute this 1343.96, so we have assumed that each quarter section is 40 acres.

MR. MORRIS: We would appreciate it if it could be

considered as a 1360-acre unit.

MR. UTZ: Did you add up the acreage yourself? Did you check the acreage on this?

THE WITNESS: From quarter quarter sections, yes.

MR. UTZ: From quarter quarter sections?

THE WITNESS: Yes.

MR. UTZ: Do you know that all these quarter quarter sections were even 160 acres or were there some corrections of lots?

THE WITNESS: That I do not know.

MR. UTZ: If there are some correction lots in there, then obviously 1360 is not right. Wouldn't that be a fair statement?

THE WITNESS: Yes, sir.

Q (By Mr. Morris) Mr. Graham, could you check on that and advise the Examiner as to whether the 1343 is correct or the 1360 is correct?

A Yes.

MR. MORRIS: Would that be satisfactory?

MR. UTZ: That will be satisfactory.

Q (By Mr. Morris) Mr. Graham, you mentioned that the USGS had made some requirements of your predecessor with respect to the form of the unit agreement. Have those

requirements been met in the present unit agreement?

A Yes, they have.

Q What is the ownership of the working interest in this unit?

A Kewanee Oil Company owns the 100 per cent working interest.

Q As to the overriding royalty interests that are scheduled in Exhibit "B" to the unit agreement, what percentage of commitment do you have of those interests to the unit agreement?

A We have obtained a written ratification from overriding royalty interests representing 19.2 per cent of the overriding royalties.

Q Are there any overriding royalty interests that at some future date have the option to convert to working interest?

A Yes, there are, and we have obtained ratification by 100 per cent of those overriding royalty interests.

Q Under the unit agreement, what formations are unitized?

A We are seeking to unitize the Grayburg formation as defined on Page 2 of Exhibit 1. The definition of the unitized formation has been tied to a gamma ray neutron log of Kewanee Oil Company's number 10 Bedinfield well which is the same

well located in Tract 6 as shown on Exhibit "A" of the unit agreement.

Q That is the southwest quarter of the southeast quarter of Section 1?

A Yes.

Q Who is designated as unit operator by the agreement?

A Kewanee Oil Company.

Q Is there an expiration date stated in the unit agreement by which the agreement must be approved and in effect?

A Yes. The unit agreement provides that if the agreement does not become effective on or before August 1, 1968, that it will ipso facto terminate on that date and there is no provision in the unit agreement for extension of that termination date.

MR. HATCH: What was that date again?

THE WITNESS: August 1, 1968.

Q (By Mr. Morris) I take it, Mr. Graham, you would appreciate your request for approval of this unit agreement to be expedited by the Commission?

A Yes, sir.

Q Refer to the plat again, Exhibit "A" to the unit. I note that across the north boundary of the unit, the boundary is rather irregular. Would you comment upon how that happened

to occur?

A Basically, again, this is the same unit area that Neil Saueressig had proposed. However, in addition to that, we have been in contact with the offset operator and believe that we can effect a cooperative type agreement between the properties. They did not choose to unitize with us.

Q I realize this will be covered more fully by Mr. Allison in his testimony, but are there cooperative floods that encompass the acreage immediately to the north of your proposed unit?

A Yes.

Q Is the form of the unit agreement a standard Federal form for secondary recovery operations?

A Yes. It follows basically the 1961 standard Federal form.

MR. MORRIS: Mr. Examiner, we move the introduction into evidence of Exhibit 1 in Case 3791.

MR. UTZ: Without objection, Exhibit 1 will be entered into the record of this case.

(Whereupon, Exhibit 1 in Case 3791
was offered and admitted in evidence.)

MR. MORRIS: That's all I have of Mr. Graham at this time.

MR. UTZ: Are there any questions? You may proceed.

R. S. ALLISON

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

DIRECT EXAMINATION

BY MR. MORRIS:

Q Mr. Allison, please state your name and where you reside.

A R. S. Allison, Tulsa, Oklahoma.

Q By whom are you employed and in what capacity?

A Kewanee Oil Company, secondary recovery engineer.

Q Will you state briefly your education and your experience in the petroleum industry?

A I'm a 1950 graduate from the University of Tulsa with BS degree in petroleum engineering. Since graduation, I have been employed by Kewanee in petroleum engineering capacities, having lived and worked in Oklahoma, Kansas, Texas, Illinois, Canada. The past three years I have been assigned to the Tulsa general office as secondary recovery engineer with duties covering New Mexico as well as other areas.

Q What is your familiarity with the proposed waterflood project involved in this application?

A Since Kewanee has purchased it, I have evaluated the secondary recovery possibilities, the economics of it. I have

set up the proposed flood prosecution.

MR. MORRIS: Are the witness's qualifications acceptable?

MR. UTZ: Yes, sir, they are.

MR. MORRIS: May I call the Examiner's attention to the exhibits that are attached to the original application in this case and those exhibits each have been marked as official exhibits in this hearing.

Q (By Mr. Morris) Mr. Allison, referring to Exhibit "A", attached to the application, would you state what that exhibit is and what it shows?

A Exhibit "A" shows the unit, proposed unit outline, the tracts involved and the proposed seven water injection wells within the unit.

Q The injection wells are circled in red on that exhibit?

A Yes.

Q Refer to Exhibit "B". Are the injection wells also shown on that exhibit circled in red?

A Yes.

Q What else does that exhibit show?

A Exhibit "B" is a structure contour map on top of the Loco Hills formation, showing a gently dipping structure

dipping to the east at 100 feet per mile. It would show that structure is not particularly significant as an oil trapping mechanism in this portion of the pool.

Q Does this exhibit also show the location of other injection wells in waterflood projects adjoining your proposed unit?

A Yes. It shows the Sunray water injection project to the southwest, the Texaco and Kewanee operated project to the north of this proposed unit.

Q Are the injection wells in those projects designated in some way?

A Yes. The injection wells have a large circle.

Q Does the pattern of injection wells in your proposed unit generally tie in with the pattern that has been established in these other waterflood projects?

A Yes. Our pattern is a continuation of the five-spot pattern established by the operators to the south and also the operators to the north.

Q How many wells are involved in the proposed waterflood project on your unit?

A Sixteen wells, seven of which are proposed for conversion to water injection.

Q How many of those wells are producing wells at the

present time?

A Eleven of them are active producing wells.

Q And what is the status of the other five?

A They're temporarily shut in as uneconomical to operate.

Q Would you refer to Exhibit "C" and state what that is and what it shows?

A Exhibit "C" is a graph of the daily oil production from the unit area. It shows the current production to be slightly in excess of seven barrels of oil per day for the entire unit area which, of course, is less than economic limit under primary conditions.

Q Now, that's seven barrels per day total for the eleven active wells in the unit area?

A Yes.

Q What is the highest rate of production on any one well in the unit area?

A Less than one million a day.

Q Refer to Exhibit "D" and state what that is, please.

A Exhibit "D" is basically an ownership plat showing ownership within a two-mile radius of the proposed unit.

Q Please refer to Exhibit "E" and state what that is.

A Exhibit "E" is a gamma ray neutron log of the Bedin-

field 10 well which shows the top of the Grayburg formation, the tops of the four zones that are known to produce within the proposed unit area.

Q Mr. Graham testified that the unitized formation under the unit agreement was defined with reference to the well of which this is a type log, is that correct?

A Yes, that is correct.

Q Into what zones of the Grayburg do you expect most of the injection to occur?

A The Metex zone would be the primary producing zone in the area.

Q But you are seeking authority to inject water into all sections of the Grayburg?

A Yes, correct.

MR. UTZ: That would include down through the Premier --

THE WITNESS: Yes, sir.

MR. UTZ: -- to the top of the San Andres?

THE WITNESS: Down to the top of the San Andres.

Q (By Mr. Morris) That is the way the section, the unitized formation is defined in the unit agreement, is that correct?

A That is correct, yes.

Q Please refer to Exhibit "F" and point out the information shown on there with respect to the present condition and status of the wells that will be converted to injection and in what zones you expect injection to occur in each of those wells.

A Exhibit "F" lists the seven injection wells, their location, total depth, the casing depth, the amount of cement used when the casing was set, and in the last column it shows the current completed interval for each well, which this interval would be the zones in which we would inject water.

Q Do you have an exhibit prepared that shows the diagrammatic sketch of how the injection wells will look after conversion?

A Yes. Exhibit "G" shows this.

Q This is just a standard type of injection through tubing under packer, is that correct?

A That's correct.

Q Will you fill the annular space between the tubing and the casing with an inhibited fluid?

A Yes.

Q What pressure do you anticipate for injection?

A A maximum pressure of 1800 pounds.

Q What will be your injection rate?

A 300 barrels per day per well.

Q What will be your source of your water?

A We'll initially purchase water from Double Eagle Water Company as returned produced water is developed, then we will inject this.

Q Do you know whether the other waterfloods in the area are using this same water?

A Yes, they are using this same water.

Q Do you have an analysis of the water?

A Yes. This is shown as Exhibit "H".

Q What has been the primary recovery from the wells in the unit area?

A Primary recovery has been approximately 760,000 barrels to date. 670,000, pardon me.

Q From your study of the feasibility of injecting water into the reservoir and conducting secondary recovery operations, what do you anticipate your secondary recovery will be in terms of primary?

A Minimum of seventy per cent of primary.

Q Mr. Allison, were Exhibits "A" through "H" prepared by you or under your direction?

A Yes.

MR. MORRIS: At this time, Mr. Examiner, we move the introduction of Exhibits "A" through "H" in evidence.

MR. UTZ: Without objection Exhibits "A" through "H" will be entered into the record of this case.

(Whereupon, Exhibits "A" through "H" in Case 3792 were offered and admitted in evidence.)

MR. MORRIS: That's all I have on direct from Mr. Allison.

CROSS EXAMINATION

BY MR. UTZ:

Q Mr. Allison, how many milligrams are there in a liter?

A A thousand.

Q So, you would multiply that by a thousand in order to get parts per million?

A No. Milligrams per liter is equivalent to parts per million.

Q Then it would be a million milligrams a liter, is that right?

A Parts.

Q Or parts per million. I thought there was, but I wasn't sure.

A No. A liter, if you say so. Anyway, this would be equivalent to parts per million.

Q So, this is pretty fresh water?

A Yes. It's considered fresh water.

Q Did you say whether you were going to coat the tubing or not or use coated tubing?

A No, I didn't say, but we would use plastic-coated tubing in injection wells.

Q How about the cementing program on these injection wells that you have listed, did you show that anywhere or did you make any statements?

A Yes. Exhibit "F" shows the amount of cement used on the surface casing as well as the oil string, next to the last column. Oil string cemented with from 100 to 200 sacks.

Q Now, approximately, well, let's take seven-inch casing, how much footage would 100 sacks cover?

A It would cover in excess of 500 feet.

Q And on the five and a half?

A It would be approximately the same, more than 500 feet.

Q Considerably more, wouldn't it?

A It depends on what size hole has been drilled.

Q Assuming you had a hole an inch or so bigger than the casing, four-and-a-half inch, 200 sacks would be roughly 1,000 feet?

A Yes. That particular well. That four-and-a-half-inch liner is down into the San Andres. Oh, you are looking --

you are not looking at that. Yes, I see.

Q It would be the Number 5?

A Yes. 200 sacks would be more than 1,000 feet.

Q You are going to inject through tubing in all these?

A Yes, sir, under a packer.

Q And the packer will be set within what, twenty, thirty, forty feet?

A Within sixty feet of the casing seat, within the cemented interval.

Q So, that you will have anywhere from four hundred fifty to nine or nine hundred fifty feet of cement over the top of the packer?

A Yes.

Q Referring to your Exhibit "E", is the Loco Hill, Metex, Anderson and Premier considered a part of the Grayburg?

A Yes. These are local names applied to producing zones in the Loco area. They are all part of the Grayburg formation.

Q The wells listed on your Exhibit "F", those locations and the well names are correct, I assume?

A The locations are correct and the tract numbers shown on that same exhibit are correct and the well number will not be changed, so actually, your question, yes, these are correct.

Q The operator will be Kewanee in all cases?

A Yes.

Q So, the first well will be Kewanee Root E 5?

A Under the unitized conditions, it will be Tract Number 8. Well Number 5 would be our new designation.

Q The numbers under the wells are the well numbers, then?

A Yes.

Q So, the lease name will be dropped?

A The lease name will be changed to the tract number.

Q So, it would be Tract 8, Number 5?

A Yes.

Q That will follow all the way through all seven injection wells?

A Yes.

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

(Witness excused.)

MR. UTZ: Any statements in either of these cases? The case will be taken under advisement.

I N D E X

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#1 in Case 3791	2	9
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STATE OF NEW MEXICO)
) ss
 COUNTY OF BERNALILLO)

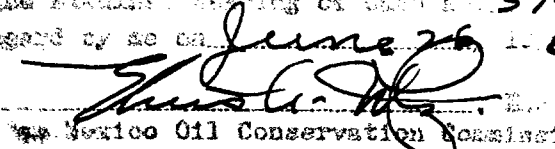
I, ADA DEARNLEY, Notary Public in and for the County of Bernalillo, State of New Mexico, do hereby certify that the foregoing and attached Transcript of Hearing before the New Mexico Oil Conservation Commission was reported by me; and that the same is a true and correct record of the said proceedings,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

Witness my Hand and Seal this 6th day of July, 1968.


 NOTARY PUBLIC

My Commission Expires:

June 19, 1971

I do hereby certify that the foregoing is
 a complete record of the proceedings in
 the hearing of Case No. 3791-82
 heard by me on June 26, 1968

 Notary Public
 New Mexico Oil Conservation Commission