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

July 25, 1973

EXAMINER HEARING

IN THE MATTER OF: Application of Yates Drilling Company for a unit agreement, Eddy County, New Mexico.	Case No. 5030
IN THE MATTER OF: Application of Yates Drilling Company for a waterflood project, Eddy County, New Mexico.	Case No. 5031

BEFORE: Richard L. Stamets,
Examiner.

TRANSCRIPT OF HEARING

MR. STAMETS: We will call next Case 5030: Application of Yates Drilling Company for a unit agreement, Eddy County, New Mexico.

MR. LOSEE: A. J. Losee, of Losee and Carson, Artesia, appearing on behalf of the Applicant. We have one witness we would like to be sworn.

MR. STAMETS: Are there other appearances in this case?

(No response)

MR. LOSEE: Mr. Examiner, I would move to consolidate for hearing purposes this case, Case 5030, and the waterflood project, Case 5031.

MR. STAMETS: Without objection, Case 5030 and Case 5031 will be consolidated for testimony.

* * * *

PEYTON YATES,

was called as a witness, and after being duly sworn according to law, testified as follows:

DIRECT EXAMINATION

BY MR. LOSEE:

Q Would you state your name, please?

A Peyton Yates.

Q Where do you live, and what is your occupation?

A I live in Artesia, New Mexico, and I'm a petroleum engineer.

Q What education and experience have you had in the field of a petroleum engineer?
A I graduated in 1965 from the University of Texas with a bachelor of science degree in petroleum engineering. In 1966, I received, from the same school, a masters degree in petroleum engineering.
Q Since your graduation, what experience have you had in the field of petroleum engineering?
A I was employed for a total of two years with Chevron Oil Company in Utah. That two-year period was followed by two years of service in the United States Army. In September of 1970, I went to work for Yates Drilling Company in Artesia, and have been there ever since.
Q And since you have joined Yates, have you been familiar with the Artesia field in Eddy County, New Mexico?
A Yes.

MR.LOSEE: Are Mr. Yates's qualifications acceptable?

MR. STAMETS: They are.

Q (By Mr. Losee) Would you state the purpose, first of Application 5030?
A The purpose of Application 5030 is to secure approval of the Artesia Metex Unit agreement, which consists of 2016.93 acres, more or less, of State land.
Q And would you state the purpose of the application in Case 5031?

A There are several purposes. First of all, we would like approval of a waterflood project on the unit land that we have mentioned with 14 Grayburg injection wells. We also would like approval of a procedure to affect changes in the injection wells by administrative approval of the Commission without having to show response to the waterflood.

Q Please refer to what has been marked as Exhibit One, and explain what it portrays.

MR. STAMETS: Let me ask one question at this point. Do you anticipate that any of these additional injection wells might be at non-standard locations?

THE WITNESS: Mr. Examiner, there is the possibility where we have two wells on a 40-acre tract where I could anticipate in the future that there might be some non-standard locations.

MR. STAMETS: So to allow you additional injection wells as standard and non-standard wells no closer than 330 feet from the boundary of the unit would be the sort of thing you would be looking for?

THE WITNESS: Yes, sir.

Q (By Mr. Losee) Please refer to what has been marked as Exhibit One, and explain what is portrayed by that exhibit.

A Exhibit One consists of a plat of the general area in

which the Artesia Metex Unit is proposed. It shows the land ownership in and around the unit area, and also shows the wells that have been drilled in and around the unit area.

Q Please refer to what has been marked as Exhibit Two-- Or before we refer to Exhibit Two, Mr. Yates, would you give a brief statement of the history of the development of production in the Grayburg and Queen sands in the unit area?

A Yes, sir. The proposed unit area is within what is called the Artesia Queen Grayburg San Andres field. The discovery well was drilled in 1924. There was no further development of the field within this unit area until 1948, and by that time, the discovery well had produced over 63,000 barrels of oil.

Development started over again on a much increased scale and was completed by 1956, at which time there were 54 producing wells within the unit area. The unit area has produced 1,203,000 barrels of oil up to 1/1/73. At present, there are 20 wells on production in the unit area, which produce 1 barrel of oil a day.

Q Now, would you refer to Exhibit Two and explain what is portrayed in this exhibit?

A We have more detail in Exhibit Two of the unit area. We have the unit outlined, the proposed tract numbers

for the tracts that will be included within the unit area.

We also have indicated the injection wells with a triangle drawn around each one of these proposed injection wells,of which there are fourteen.

Q How many available logs are there on these fourteen injection wells?

A There are six available logs.

Q Will you turn to Exhibit Number Three, and does this exhibit contain the logs on those six injection wells?

A Yes, with a possible exception of the San Andres not being reached in some of the wells. You can see on the first log portrayed that we did pick a well that would show the entire interval from the Queen through the San Andres, which is going to be the interval which will be unitized.

Q Would you point out-- I take it that Well No. 12 is a typical log of a typical injection well?

A That's correct. The production is primarily from the Metex zone, although there has been production from the Loco Hills zone. We anticipate most production to come out of the Metex.

Q Do you have any figures on the permeability and porosity in the Loco Hills and the Metex?

A We have one porosity log of a well drilled in Section 25

that was a deep well, and they ran the porosity across this interval, and it indicated a porosity of fifteen percent for the Metex.

We do have permeability for the Metex in an adjacent area, which indicates an average permeability in the area of 20 millidarcies.

Q Would you please refer to what has been marked as Exhibit Four, being diagramatic sketches on the 14 injection wells, and describe this exhibit?

A Yes. sir. There are two types of wells that we have to deal with in this area, those that do not have production string at the present, and only have surface casing in them; and those that do have production string placed in them.

We have tried to indicate here which wells have casing already in them and which wells do not. By casing, I am speaking of production casing. In those wells that do not, we propose to do the following, and the first sketch in Exhibit Four is one of those wells.

Q That is Well No. 40 on Tract One, is that correct?

A Yes. We propose to run a 4 and a half inch casing to the total depth. As you can see, the total depth is indicated at the bottom of the sketch. We are going to cement the 4 and a half inch casing with 200 sacks of cement. We calculate the estimated top of the

cement to be around 1300 feet. We will then perforate the pay zones, the Loco Hills through the Metex, from 1810 through 2010 feet and perforate the various sand intervals that are within that interval.

MR. STAMETS: I believe each of these exhibits has a little block on the right-hand side that explains what you propose to do with each individual well, and that would include any packing, is that right?

THE WITNESS: That's right, Mr. Examiner. You will notice on those wells that already have production casing within the block, we propose to set a 2 inch cement line tubing, because that's all we need to do with the well.

Q (By Mr. Losee) In this example, your cement is going to be an estimated 4 to 5 hundred feet above your perforations?

A That's correct.

Q And you run the cement and tubing and set it on a tension packer?

A Yes. Also on the sketch, we have listed when the well was completed, the elevation, total depth, the pay interval, when the well was completed in the perforations, and the initial treatment. As you will see, most of these were shot with nitroglycerin, from 200 to 400 quarts. We have also indicated in each case the top of the Loco Hills formation on the lower left-hand side,

our thought being that that would be the uppermost zone that we will be injecting into.

We have also indicated on the drawings that we will have in addition to the cement line tubing that we will place on the casing a valve and gauge by which we can observe any packer leaking.

Q Now, there is one of these wells, the Edie C.K. No. 1 where there was a question about production.

A Yes. We wanted to point out to the Commission that it has been reported to us by the operator of the well that there is 7 inch casing set in the well. We were unable to find a report of it in the Commission files, but we have taken the operator's word, and have it on the diagramatic sketch as being there.

We do not know, and neither does the operator, at what depth this casing may be set, or the amount of cement used to set it. Of course, once we re-enter the well, if we find out that the casing is not actually there, we intend to treat it as we would the other wells that do not have casing.

Q What is the proposed source of your water, Mr. Yates?

A We are negotiating with two firms at this time for fresh water from caprock, the Double Eagle Corporation and the Yucca Water Company.

Q And you would anticipate that one of those companies

would furnish the water?
A Yes.
Q Do you propose to re-inject your produced water?
A Yes.
Q Would this be through a particular well, or just any of the wells?
A We do not have any well in mind. It would probably be through all of the wells.
Q At what pressure do you propose to inject this water?
A The injection pressure would be 1500 pounds. Anything above that would possibly create unneeded fractures. We also plan to inject initially somewhere in the neighborhood of 5000 to 5500 barrels a day in the 14 wells, and anticipate an average of 4200 barrels a day after we have the pressure for the unit.
Q Do you have an opinion as to whether the proposed casing method and injection method will protect any fresh water in the area?
A Yes.
Q What is that opinion?
A That it will. The methods we are taking to observe the annulur pressure will assure us that the well will not be able -- that we will be able to determine if any water is escaping our casing and possibly contaminating fresh water areas.

Q Please refer to what has been marked as Exhibit Five, and explain what is detailed on this exhibit.

A Exhibit Five is a tabulation of accumulative production and present well production capabilities. We have listed all of the wells in the unit area, first under their old lease and well number, then the tract number and new well number.

Besides that, we have accumulative oil production for each well, and then besides that, we have listed the April, 1972 through April, 1973 monthly oil production. The purpose of this exhibit is to show the wells are presently in a stripper state.

You will notice in some cases, there are two wells listed on the same tract. These wells, as I mentioned earlier, are wells where we have two wells on the same 40-acre tract. Their production was reported together, and we were unable to separate them.

Q What was the maximum monthly production in April of 1973 for any of these wells?

A The maximum monthly production for any wells within this area was 78 barrels for the State 64 Well No. 110. As you notice, there were twenty wells on production in April of 1973, with an average production of 1 barrel a day each.

Q Do you have an opinion as to whether these wells are

in an advanced stage of depletion?
A Yes, I do.
Q And are they in such a condition?
A Yes, sir.
Q Your Exhibit Number Five shows that the accumulative production was 1,203,000 barrels of oil. Do you have an estimate as to the amount of oil that would be recovered by your waterflood project?
A Yes, we do. We estimate approximately 1,150,000 barrels of oil would be recovered.
Q And this is oil that would not be otherwise recovered except for a waterflood project?
A The most that I could possibly assign as remaining primary would be somewhere in the neighborhood of 15 to 20 thousand barrels of oil.
Q Now, please refer to what has been marked as Exhibit Six, and explain what is detailed on this exhibit.
A Exhibit Six consists of a list of the tracts by tract number of the working interest ownership. We have listed those parties within each tract, and those that have signed up or that we have received a verbal commitment from or no commitment from.

As you can see, we have received something in the neighborhood of 98.9 percent commitment. The other parties have not replied at this time to our inquiries

as to whether or not they would participate.

Q And those two tracts upon which you have not either received a sign-up or a verbal commitment are tract 8 and tract 22, is that correct?

A That's correct.

Q Is that represented on your Exhibit Number Two by the two exterior tracts in which Kersey Company is the operator?

A That's correct.

Q Do you think the commitments you have give you substantial control of the unit area?

A Yes, we do. And I might add also that we really do not anticipate any problem with those parties that are listed as not having committed themselves. We do believe this will be resolved.

Q Now, please turn to what has been marked as Exhibits Seven and Eight, being the unit agreement and the unit operating agreement for the Artesia Metex Unit Area, and explain the proposed allocation formula.

A The proposed formula for participation is based upon eighty-five percent of accumulative production and fifteen percent surface acreage of the tract.

Q Would you explain how the formula was arrived at?

A The formula was arrived at by negotiations between the working interest owners. The purpose of using the

surface acres would be necessary in order to account for the fact that there were in many cases two wells on one forty-acre tract.

Q Has this unit agreement been approved by the Commissioner of Public Lands?

A We have received approval from the Commissioner of Public Lands as to form of the agreement. The date of that letter we received was June 16th of this year-- Pardon me, June 12th of this year.

Q Have you issued an invitation to all working and overriding royalty owners to join the unit?

A Yes, we have.

Q Were Exhibits One through Seven prepared by you or under your direction?

A Yes, sir.

MR. LOSEE: We move for the introduction of Exhibits One through Seven.

MR. STAMETS: Without objection-- Let me ask you one thing. I have here Exhibit Seven and Exhibit Seven-B.

MR. LOSEE: Let's call them One through Seven-A and Seven-B.

MR.STAMETS: Without objection, Exhibits One through Seven-A and Seven-B will be admitted in evidence.

(Whereupon the aforementioned exhibits were entered in evidence.)

MR.LOSEE: That concludes our direct examination.

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CROSS EXAMINATION

BY MR. STAMETS:

Q Mr. Yates, do you know if there are any old holes plugged and abandoned inside the unit area which might not be properly plugged and abandoned under today's plugging procedures?

A Sir, I know there are plugged and abandoned wells within the unit area, but I cannot tell you whether they were properly plugged and abandoned under today's procedure.

Q Have you looked into it enough to see if these would give you any trouble with water escaping up hole into the dry formations?

A We considered the possibility, but I have not gone into all the producing wells. One of the wells was re-entered, and it is plugged and abandoned. I do feel this one was properly plugged and abandoned, but I have not looked into the wells. We have considered the problem as to whether or not there will be trouble with some of the abandoned wells, and there is this possibility.

Q What would the operator intend to do if one of these old abandoned wells should start flowing oil or water or both?

A Well, if it would flow oil, we would try to run a production string down and complete it. If it were too wide, or if we saw any signs of fluid coming from one of these wells, we would take steps to either plug and abandon the well properly or to complete the well properly.

Q If I understand you, at this time, you propose to inject only into the Loco Hills and the Metex zones of the Grayburg?

A This is correct.

Q Do you anticipate--

A May I expand on that?

Q Yes.

A There is a possibility we might want to inject into the Premier sand of the Grayburg, although we are not very hopeful of the Premier, based on other parties' experiences. At this time, I could not say we would want to inject into the Queen sand intervals, but there is a possibility that we may wish to come to you in the future to do so. But I do not see that at this time.

Q On your series of exhibits labeled Number Four, you show packers, but you don't indicate where these will be set. Have you made a determination as to where these would be set? Would these all be within one

hundred feet of the injection interval?

A Yes, sir. I would like to point out on the right center of the page on each sketch, we have stated where we intend to set the packer.

Q So as an example, on the first page, the packer would be set at 1785 feet?

A Yes, sir. I think we have stated that on every one of them.

Q Looking further down on this exhibit, I find that the K Well No. 1 was set with 75 sacks of cement. Do you think that is a sufficient amount of cement to protect the casing and the hole with 1500 pounds of pressure?

A I remember seeing that 75 sacks, and I wondered myself at that time whether it would be sufficient. I think we will be able to tell, and if we have any problem with losing pressure or with losing water-- We will, of course, monitor the wells with radio-active tracers, and if there is any sign of communication-- This will be one well we will watch carefully, and if there is any sign of communication, we will take remedial measures to get more cement down there.

Q If water were to escape vertically behind the pipe, would it tend to come up the annulur space between the 5 and a half and 8 and five-eighths inch casing?

A It would, yes. If it got above the calculated top of

the cement or above the actual top of the cement, yes, it would.

Q So if there was some method of monitoring that annulur space, at least that type of leaking could be detected?

A Right.

Q I have essentially the same set of questions relative to the Gulf State No. 1. There are eighty-five sacks of cement. Would your answer be roughly the same in that case?

A Yes, it would.

Q And of course, the same applies to the C.K. State "W" without the 7 inch casing which may or may not be there?

A Yes, sir.

Q And the Edie"C" State with 40 sacks of cement?

A Yes.

Q Mr. Yates, do you get out in the field quite a bit?

A Yes, sir.

Q Are you familiar with the injection wells of your operations, your other operations?

A Yes, sir.

Q Are those wells equipped with gauges that can be read on the annulur space? I know almost every order we write says there will be one, is this actually being done, to your knowledge?

A Yes, to my knowledge, it is. We have requested field

personnel to put them on. In fact, I think, if I remember correctly, we have experienced pressure increase, and witnessed it with a gauge.

Q On the annulur space between the injection tubing and the casing?

A Yes, sir.

Q And this would indicate a repair was needed?

A Yes, sir.

Q What happens to gauges in the oil fields that are left out in the open?

A Well, obviously they aren't any good after a few years, they rust. The best technique is to have them fixed up, and in a routine manner, your company will check the gauges, use portable gauges to check the regular gauges.

Q Is this a standard type of gauge that the Commission could acqure and utilize over a wide area?

A I don't see why not, sir. That would be up to the Commission. I would think that the Commission could find a standard type gauge, yes. Really, sir, the only thing I would say is any sign of pressure, even a gauge that might read a few pounds over, probably would be adequate.

Q Is there a more foolproof, easy-to-see, attention-attracting device, gauge or system, to determine leakage

in injection wells?

A Yes, you can take the gauge off, and if you see water coming out, it would certainly attract attention. I don't know of any other simple procedure.

Q So just having the annulus open in your opinion is more effective than having a gauge opened?

A Yes.

Q What about a well taking water under vacuum?

A If you had a leak behind the casing?

Q Right.

A You would not be able to witness it either with a gauge or by other detection. The only way you could determine this is by routine measurements, trying to determine it with some kind of survey.

Q But you are not anticipating this, you would expect the pressure to increase?

A Right. If we did not get pressure, we would go in and find out why not.

Q Getting back to the C.K. No. 7, you would work with the Commission's District Office in coming up with an appropriate program of completing this well which would protect the fresh waters of the zones in the area?

A We would be most happy to, yes.

Q I have one other question. On your Exhibit Number Two, in Section 30 of 18, 28, in the Southwest quarter of

the Northwest quarter, Tract 22, you show an injection well, and this is one of the parties that you have some indication may not join. Would this cause any great problem to the project?

A No, sir. I would anticipate, number one, if the party did not join, that we would obviously not use that injection well, and would probably try to change the injection well immediately to the west of the No. 108 in order to better protect the oil that would be within the unit area.

However, I would like to point out with respect to the tract and the uncommitted party that the party has expressed some interest in possibly selling his interest. He just said that he really wasn't interested in a waterflood project, but we do not think that non-commitment is non-cooperation.

MR. STAMETS: Are there any questions of the witness?

(No response)

MR. STAMETS: If not, the witness may be excused.

(Witness excused.)

MR. STAMETS: Is there anything further in Cases 5030 and 5031?

(No response)

MR. LOSEE: I have no statement in either of the

cases.

MR. STAMETS: In that case, Cases 5030 and 5031 will be taken under advisement.

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STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

I, RICHARD E. McCORMICK, a Certified Shorthand Reporter, 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.

Richard C. McCormick
CERTIFIED SHORTHAND REPORTER

I do certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 5030 heard by me on July 25, 1973.
Richard E. Stamets

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EXHIBITS

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