BEFORE THE

Oil Conservation Commission

SANTA FE, NEW MEXICO

July 11, 1956

IN THE MATTER OF:

CASE NO. 1094

TRANSCRIPT OF PROCEEDINGS

DARNLEY-MEIER AND ASSOCIATES
COURT REPORTERS
605 SIMMS BUILDING
TELEPHONE 3-6691
ALBUQUERQUE, NEW MEXICO

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NEW MEXICO OIL CONSERVATION COMMISSION
MABRY HALL - STATE CAPITOL
SANTA FE, NEW MEXICO

REGISTER

HEARING DATE July 11, 1956 - Hobbs TIME: 9:00 a.m.

NAME:	REPRESENTING:	LOCATION
Hans Winkler	Amerada Oil Co.	Roswell
Jack Ballew	- - -	Dallas, Tex
[illegible]	[illegible]	[illegible]
[illegible]		
V. T. Lyon	Continental Oil Co	Roswell
D. H. Carney	El Paso Natural Gas	El Paso
C. M. Lindsey	" "	Hobbs
R. L. Dewey	Humble Oil & Refining Co.	Midland Texas
Don Walker	Kerr-McGee Oil Corp.	Ft Worth, Texas

ILLEGIBLE

BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
HOBBS, NEW MEXICO
JULY 11, 1956

IN THE MATTER OF:

CASE NO. 1094: Application of Barney Cockburn in compliance with Rule 701 (a) of the Commission's Statewide Rules and Regulations for an order granting permission to inject water into the Queen horizon of the Corbin Pool, Lea County, New Mexico, and for permission to continue to produce oil from the Grayburg-San Andres formation of the Maljamar Pool. Applicant, in the above-styled cause, seeks permission to inject water in the Corbin Pool into its Wyatt-Phillips Well No. 5 located in the NE/4 NW/4 of Section 33, into their Wyatt-Phillips Well No. 6 located in the SW/4 NW/4 of Section 34, and into their Wyatt-Phillips Well No. 8 located in the NW/4 NW/4 of Section 34, all in Township 17 South, Range 33 East, Lea County, New Mexico, for the purpose of secondary recovery from the Queen formation of the Corbin Pool and further to continue to produce oil from the Grayburg-San Andres formation of the Maljamar Pool through said Wyatt-Phillips Well No. 8.

BEFORE:

Warren W. Mankin, Examiner.

T R A N S C R I P T O F P R O C E E D I N G S

MR. MANKIN: The next case on the docket is 1094.

MR. GURLEY: Application of Barney Cockburn in compliance with Rule 701 (a) of the Commission's Statewide Rules and Regulations for an order granting permission to inject water into the Queen horizon of the Corbin Pool, Lea County, New Mexico, and for permission to continue to produce oil from the Grayburg-San Andres formation of the Maljamar Pool.

Bring your witnesses forward to be sworn.

(Witnesses sworn.)

MR. LOSEE: Mr. Miller.

C H A R L E S P. M I L L E R,

a witness, of lawful age, called on behalf of the applicant, having been first duly sworn on oath, testified as follows:

DIRECT EXAMINATION

BY MR. LOSEE:

Q Would you state your name, please?

A My name is Charles P. Miller.

Q Where do you live, Mr. Miller? A Hobbs, New Mexico.

Q What is your occupation? A Petroleum geologist.

Q Mr. Miller, have you previously testified before the Oil Conservation Commission? A Yes, sir, I have.

Q Do you know when that was?

A I believe it was in July, 1952, in Santa Fe.

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

MR. MANKIN: They are.

Q Have you had occasion to study the Barney Cockburn Wyatt-Phillips leases located in Sections 33 and 34, Township 17 South, Range 33 East, with reference to this water pilot project?

A I have.

Q Did you study this with any other person?

A I did.

Q Who was that person? A Mr. Buckles.

Q Where is that firm located? A Monahans, Texas.

Q Do you have, or have you prepared, a platt showing the leases

in question? A I have, sir.

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

Q Is there anything about this map that you think should be explained to the Examiner?

MR. MANKIN: Do you have additional copies of that?

MR. LOSEE: Surely.

A I believe the map is self explanatory. The legend explains the different types of wells showing the locations of the proposed injection well, location of the presently producing Queen sand wells and the acreage to be included in the injection project. I believe the map is self explanatory.

MR. LOSEE: We will offer the map as Applicant's Exhibit A.

MR. MANKIN: Is there any objection to the introduction of Exhibit A in this case? If not, it will be so entered.

(Whereupon, Exhibit A was admitted in evidence.

Whereupon, Exhibit B was marked for identification.)

Q Have you and Mr. Buckles had occasion to prepare a contour map of the structures involved in this proposed area?

A We have, sir.

Q I will hand you Applicant's Exhibit B, and ask you if that is the map? A That is the map.

Q Would you like to explain that map to the Commission?

A It is a structural contour map prepared on top of the Queen sand, contoured on an interval of one hundred feet, expresses itself

in the form of a plunging anticline or nose of a regional feature that passes through the Maljamar continuing easterly; prepared primarily to show the position of the acreage region geographically with reference to the structure.

MR. LOSEE: We will offer that map as Applicant's Exhibit B.

MR. MANKIN: Is there any objection to the introduction of Exhibit B? If there is not, it will be accepted in evidence.

(Whereupon, Exhibit B was received in evidence.

Whereupon, Exhibit C was marked for identification.)

Q Have you and Mr. Buckles had occasion to prepare the production history of the Wyatt-Phillips and Federal leases?

A We have.

Q I will hand you what has been marked as Applicant's Exhibit C, and ask you if this is the history you have prepared?

A Yes, sir, this is a compilation showing yearly production of individual wells in the area referred to as east Maljamar, with particular reference to Barney Cockburn leases. The tabulation includes also production from beds deeper than Queen. In other words, includes some production from Grayburg wells, but the wells are identified, and we will be able to distinguish which are Queen and which are not.

MR. LOSEE: We offer this as Applicant's Exhibit C.

MR. MANKIN: Is there any objection to the introduction of Exhibit C in this case? If not, it will be received in evidence.

(Whereupon, Exhibit C was received in evidence.)

MR. LOSEE: Will you mark this as Exhibit D?

(Whereupon, Exhibit D was marked for identification.)

Q Have you and Mr. Buckles had occasion to prepare the other necessary data with reference to this proposed project?

A We have prepared considerable data;as to whether or not it covers the subject completely, I can't say, but we think it does.

Q I will hand you what has been marked as Exhibit D and ask you if this is a statement of the data that you and Mr. Buckles have prepared with reference to the application?

A Yes, sir.

Q Would you explain the relationship of this data to the proposed project?

A Be glad to. We felt perhaps it would be advisable to prepare this tabulation to present for the examination of the Commission and with the Commission's permission, I will now read some of the data we wish to submit. I will not read this verbatum, but I will get the high point. We are presenting four exhibits, first, the platt showing the acreage and showing the input wells; secondly, the structure contour map, thirdly, the production history by wells by years, and fourthly, the data which I will now read. First, we discussed the reservoir and flood characteristics, namely, of the formation to be water flooded, which is the Queen sand; estimated productive area, two hundred and fifty acres, composition of the formation is sand, structure is a small plunging anticline or a nose; type of reservoir drive is solution gas plus expanding gas cap; the regional reservoir pressure has been estimated as approximately five hundred sixty pounds

per square inch; present reservoir pressure determined on offset wells recently at sub-sea depth of plus four hundred and eighteen feet, shows a maximum of four hundred and forty pounds, and a minimum of three hundred five pounds. We believe the gas cap is present in the original status of the field, and if the gas -- and that the gas cap exists at the present time; the average thickness of the effective pay is estimated to be twelve feet, average depth of the pay is approximately thirty-eight hundred and fifty feet; the average porosity which has been estimated from nearby core analysis, 14.5 per cent, average permeability estimated as the above basis, sixty millidarcies; connate water content, as estimated above, forty per cent of core, gravity of oil averages approximately thirty-five degrees A.P.I.; viscosity of oil is estimated to be four centapoises. Under our second heading, we discussed the primary performance, date first well completed, Queen, January, 1955, Cockburn Federal No. 1; the Queen wells produced no water. The stage of present depletion is estimated to be twenty-five per cent. Number of wells now producing, twelve. Present daily production per well averages eighteen barrels of oil. Present estimated oil saturation fifty-five per cent of core space. Gas repression has not been used in this area. Gas-oil ratio was estimated as originally having been less than four hundred cubic feet per barrel; gas-oil ratio at present as reported on the Commission forms C-16, is estimated to be approximately four hundred cubic feet per barrel. Initial production of each well at date of completion current production is on a tabulation and attached hereto. Under our third heading, injection data, source of water for injection, will be shallow sand at a depth of approximately 125 feet; injection

water will be fresh, injection water probably will be treated with bactericide and a corrosion inhibitor. Injection wells probably will be Phillips No. 5, 6 and 8; exact pattern will be decided later. No additional injection pressure is anticipated. The initial volume of water anticipated for injection will be two hundred barrels per well per day. The ultimate anticipated is two hundred barrels per day. The ultimate surface pressure anticipated is five hundred pounds. Under our fourth heading of results anticipated, we have entries, estimated additional water recovery as direct result of flooding, five thousand one hundred and eighteen barrels per flooded acre; estimated residual oil at abandonment is twenty-five per cent of core space. Now, in addition to the foregoing, I have a tabulation which is strictly statistical and I don't believe it is necessary to read it at this time. It has been presented as an exhibit.

Q Mr. Miller, have similar water flood projects been successfully operated in a similar structure in the producing field to your knowledge?

A Well, not within the immediate area, but in the Permian basin, yes.

Q Do you feel like this proposed project would increase the ultimate recovery from this red sand?

A We believe very definitely that it will.

Q Will the correlative rights of any of the offset operators be endangered by reason of this proposed project after it is put into operation?

A We don't feel that their rights will be endangered. Fact is, we think they will be helped by it.

Q Their ultimate recovery will be greater?

A Their ultimate recovery, we think, will be greater.

Q Now, part of this application, the applicant requests permission to, with reference to Wyatt-Phillips Well No. 8, to inject water into the red sand horizon and to continue to produce from the Grayburg-San Andres formation of the Maljamar Pools; would you just explain how that is proposed to be accomplished?

A Well, there are several methods in which it can be accomplished, I believe. In referring to the application we made to the Commission, we stated we would set tubing on a packer above our Grayburg pay and inject water into the Queen formation through perforations. I don't turn to that point right now, but --

Q Paragraph 7?

A -- it is in the application, I am sure.

Q Do you feel like this method can be used successfully in injecting water into one formation and producing the other?

A It is primarily a mechanical problem. I believe it can be done.

Q You mentioned earlier in your testimony that Mr. Buckles had assisted you with the preparation of this data; did Mr. Buckles address a letter to you or Mr. Cockburn with reference to the project?

A There is a letter addressed to Mr. Cockburn. You have it. I do not have the original.

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

Q I will hand you what has been marked Applicant's Exhibit E, and ask you if that is the letter Mr. Buckles presented on his opinion?

A Yes, sir, that is the letter.

MR. LOSEE: We will offer this as Applicant's Exhibit E.

MR. MANKIN: Is there any objection to the introduction of Exhibit D and E in this case? If not, they will be introduced in evidence.

(Whereupon, Exhibits D and E were admitted in evidence.)

MR. LOSEE: Will you mark these as Exhibits F and G.

(Whereupon, Exhibits F and G were marked for identification.)

Q Mr. Miller, have the offset operators to the Wyatt-Phillips and Federal lease been notified of the proposed application?

A They have, sir.

Q I will hand you what has been marked as Exhibit F and ask you if you will state what that is?

A Exhibit F is a letter written by Mr. L. F. Fitzgerald, manager of the production department of Phillips Petroleum Company in response to my telephone conversation to him asking if Phillips would have any objection to the water flooding project. This is his reply.

Q Would you state, in general, what the reply is?

A It is a very brief answer, if you don't object, I will read it.

Q All right.

A It is a letter dated July 5, 1956, signed Mr. L. F. Fitzgerald, production manager, "Phillips Petroleum Company, in re: Barney Cockburn application to inject water in the Queen sand, parts of Sections 33 and 34, Township 17 South, Range 33 East, Lea County,

New Mexico.

"Mr. Charles P. Miller, P. O. Box 385, Hobbs, New Mexico.

"Dear Mr. Miller: This is in response to the subject application filed by Barney Cockburn for water injection into the Queen sand in the above described properties. Phillips Petroleum Company has no objections to the application or to the injection of water into the Queen sand. Very truly yours, L. E. Fitzgerald."

Q I will hand you what has been marked Applicant's Exhibit G, and ask you what that is?

A This is a letter addressed to the Oil Conservation Commission, Santa Fe, New Mexico, signed by Mr. Marshall Riley, Vice-President, Carper Drilling Company.

Q In general terms, does Carper Drilling Company object to the proposed project?

A With the Commission's permission, I will read the last paragraph. It is a very brief paragraph.

MR. MANKIN: Proceed.

A "Please be advised that as an offset operator to Barney Cockburn Wyatt-Phillips and Federal leases, we have no objection to the proposed water injection project and duo completion of Wyatt No. 8."

MR. LOSEE: We will offer Applicant's Exhibits F and G.

MR. MANKIN: Is there any objection to F and G? If not, they will be so entered.

(Whereupon, Exhibits F and G were admitted in evidence.)

Q Mr. Miller, do you have anything further to add in support of this application?

A Well, I might state that is a trial run, we think it will work; we would like to be given the opportnnity to try it, and if given, we will keep the Commission advised of our results, and if we find it doesn't work, I am sure we will be the first that will want to quit.

MR. LOSEE: I believe that is the applicant's case.

MR. MANKIN: All right.

BY MR. MANKIN:

Q Mr. Miller, on your Exhibit D, which is the data sheet, under primary production performance, I think it was strictly a slip of the tongue, you indicated the date the first well was completed, January, 1955. You meant January, 1951, didn't you?

A That was strictly a slip.

Q Referring back in that same Exhibit D, to reservoir and flood characteristics, you indicated the average thickness of effective pay was twelve feet. Has there been some recent completions in the Queen on the Wyatt-Phillips lease in Wells Nos. 1 and 7, that is on the Cockburn lease, Wells Nos. 1 and 7 and -- 7 and 8, where the recent completions which it was found to be separate zones in the Queen as differentiated from the original completions in Wells Nos. 1 and 2, does this twelve feet cover both zones, or was that the prior zone that has been completed before this time?

A That is the aggregate effective oil sand in the Queen formation on the east Maljamar field.

Q Which includes these two zones that have been found in the Queen as shown by Wells 1 and 7, and Wells 1 and 8 on another quarter?

A I consider it comprehensive, covering all.

Q Those would be a combining aggregate of twelve feet?

A Covering all.

Q What, in regard to produced water in this Corbin field of Queen sand, do you have any characteristics of this water as to salinity?

A Yes, let me look in the file. I believe I have here an analysis made on that. This is an analysis on the water taken from the well in the east Maljamar, depth of a hundred and twenty-five feet, made by Treat-Rite Chemical Company. Do you care to have me read the analysis?

Q I believe that is the water you intend to use?

A I believe so.

Q I meant the produced water now being produced out of the oil wells.

A At the present time, we are producing no water that I know of.

Q So therefore, as to compatability of the fresh water and the water which will be taken in a depth of approximately one hundred and twenty-five feet, there is no problem of compatability now?

A No.

Q Referring, again, to Exhibit A, which was the platt, I believe you showed two water wells which you expect to get the water from in this project; is that still the present thinking?

A If we find we need additional wells, we can get it very easily. There seems to be a very great supply of fresh water.

Q As far as the total water demand, as you now anticipate, for this project, it would amount to what amount of water per day?

A Using two injection wells, it would amount to four hundred

barrels a day.

Q However, you do anticipate three?

A Yes, we anticipate the No. 6 well will come under the influence of water, and when it does, we will use it for a water injection.

Q It was indicated in your Exhibit D that there was twelve wells now producing in the area which was intended to be flooded. Does that include all wells of the Wyatt-Phillips lease and the Cockburn Phillips lease?

A Just the Queen sand wells.

Q That does not include the Maljamar wells in the Grayburg formation?

A No, and I pointed that fact out in my tabulations.

Q I was wondering what kind of pattern you call this particular flood. I cannot put my finger on the type of flood. Have you attempted to designate what type of pattern flood this would be?

A Off the record, I will say it is a trial-error. We don't know, we are going to have to try and see.

Q It is not a five-spot or a nine-spot or any particular --

A No, we asked for permission to alter our plans after we get through.

BY MR. GURLEY:

Q Now, these letters that you received and entered as your exhibits herein, they are the only two letters that you received from offset operators?

A They are the only offset operators.

Q They are the only offset operators?

A Yes.

BY MR. REEDER:

Q Mr. Miller, referring to these 1, 2, 7 and 8, and Wyatt-Phillips 6 and 11, those at one time were believed to be completed in a different horizon, but there was separation; do you now still believe that these formations are separate, or one?

A I adhere to the theory that they are more or less one.

Q That there is no separation?

A Well, now, locally, there may be, but I think from looking at it from a broad point of view in a matter of water flooding, that the ultimate effect will be as though they are one.

Q In other words, the flood will affect both of them?

A I feel very confident of that.

Q It will affect all wells?

A I feel confident of that. Insofar as, that is, the Queen sand. We are talking about the Queen sand?

Q Yes, the two members of the Queen sand. Mr. Miller, regarding your water, your injection water, is that not from the Ogallala?

A Yes, it is from the shallow sand, probably not to exceed a depth of a hundred and twenty-five to a hundred and fifty feet.

Q And, in that location that would be the Ogallala, which is the aquifer of the overlying water district. Has any effort been made on the part of Mr. Cockburn to contact the State Engineer's Office to determine their feelings relative to the use of this water?

A That is a question I am not prepared to answer. I do not know. I can't answer that question, but being as it was not assigned in the district, I presume he considered it not necessary to contact

him.

Q Is there any other deeper potential source of water in the area that is known?

A I have often considered the Santa Rosa sand as an aquifer, providing that the zone has not been contaminated with salt water as a result of improperly cased wells.

Q Does the applicant intend to make any provision for transfer of allowable or increased allowable as the flood progresses?

A We are not asking for any increase at the present time, but, here again, I wish to emphasize the fact that we will keep you informed of our progress and, if we find it is satisfactory, it may become necessary to ask for a transfer of allowables, but at the present time we don't contemplate that.

MR. REEDER: I have a statement I would like to make.

MR. MANKIN: Mr. Miller, you started to read a while ago the analysis of this water which you intend to use in these wells to flood the Queen sand. Is a copy of that available?

A I have a copy, and I believe Mr. Losee has a copy.

MR. MANKIN: Would you care to submit that as an exhibit, so we may be aware of it?

A I see no objection to it.

(Whereupon, Exhibit H was marked for identification.)

BY MR. LOSEE:

Q Mr. Miller, this is a copy of the water analysis on the two water wells, is it not, sir? A Yes.

Q It is marked as Exhibit H? A Yes.

MR. LOSEE: We offer this as Applicant's Exhibit H.

MR. MANKIN: Is there any objection to entering Exhibit H in evidence in this case? If not, it will be so entered.

(Whereupon, Exhibit H was admitted in evidence.)

MR. MANKIN: Mr. Miller, this was, these samples were taken from these two water wells as shown on your Exhibit A, is that correct?

A It was taken from one of them, I am not sure which.

MR. MANKIN: In other words, it is in the immediate area?

A Yes, sir, it is so marked at the head of the analysis.

MR. MANKIN: Is there any other questions of the witness in this case? Do you have any further witnesses?

MR. LOSEE: No, sir.

MR. MANKIN: If there are no further questions of this witness, the witness may be excused.

(Witness excused.)

MR. MANKIN: Is there any statements to be made or anything else to be introduced in this case?

MR. REEDER: If the Examiner please, I would like to recommend that even though the area of these water wells, these fresh water wells, may be outside the defined water basin, that water to be used is water from the Ogallala which is at present our water supply and our aquifer, and that the water situation is serious enough in southeast Lea County to warrant very serious study and considerable thought as to whether this water should or should not be used for a potential flood.

I should like to recommend that the applicant be required to

take the entire matter up with the State Engineer's Office and possibly investigate an additional source of fresh water to be used for the flood. We don't have enough water right now to waste a single barrel of it, and I think that if at all possible, the supply of water should be found from an additional source.

MR. MANKIN: I had in mind a similar request to make of counsel. If the applicant would be agreeable to merely requesting permission for this from the State Engineer's Office for the use of the quantities of water from them, and of course, I will apprise the State Engineer's Office of the problem when I return to Santa Fe, but in the interim, if the applicant could request that they be given the approval of the State Engineer's Office which has control of all the fresh water in the State of New Mexico, and such that they may give you your permission, even though it is outside the declared basin, they are thinking of extending them.

MR. LOSEE: If the Examiner please, by way of explanation we will be happy to comply with the Examiner's request, and I will contact the State Engineer's Office. The reason the applicant has not heretofore contacted the State Engineer is that he obtains his jurisdiction over the underground water only by his act in bringing them into the underground basin, and even though he were to bring this area in at a later date, the date of priority of the applicant's application of the water to beneficial use would relate back to the time in which he started to withdraw the water from the well. We will ask for their permission and ask them to advise you.

MR. MANKIN: That is true, but he still has complete control of all underground waters whether it is in a declared basin or not,

and therefore, should be apprised of the situation. And, in that same relation, you might be aware of the present possibility of salt water disposal in Lea County which the State Engineer has asked, and the subject of another case and they likewise, in this particular problem as well, even though it is not a declared basin, they want to have the fresh water properly taken care of, so I am sure that they will probably give the approval, but they would like to be apprised of the situation.

MR. LOSEE: We will be happy to advise them.

MR. MANKIN: I will acquaint them of this hearing as soon as I return to Santa Fe. Any further statements?

MR. REEDER: If the Examiner please, I would like to point out that land owners have had extreme difficulty in securing water for their stock, farms and so forth, and as a private citizen, and not as a staff member of the Commission, I would like to enter my objection to the use of the overall water as a flood water for this project.

MR. MANKIN: Any other statements in this case?

MR. LOSEE: If the Examiner please, I would like to have the application in Paragraph 7 amended to conform with the testimony of the Engineer, that part of it which relates to the input of water into Wyatt-Phillips wells Nos. 5 and 8 initially to be made at five barrels, which was undoubtedly an error, and to conform with the engineer's testimony that it is contemplated that it will be two hundred barrels per well per day.

MR. MANKIN: And, you indicate No. 5 and 8 and No. 6, of course, indicates none, but that is at the present time, but when it

is started, it will probably be at the two hundred rate also?

MR. LOSEE: Yes. May I make a resume of this?

MR. MANKIN: Proceed.

MR. LOSEE: If the Examiner please, I believe the testimony and the exhibits entered indicate that the correlative rights of the offset operators, Phillips Petroleum Company and Carper Drilling Company will not be endangered, and if anything, the ultimate recovery will be increased, and they have so filed their consent to the application. As Mr. Miller has pointed out, it is initially an experimental water flood project, and with the idea of preventing waste and promoting conservation of the oil and will enable the applicant to obtain a greater ultimate recovery of oil as he testified, about five thousand barrels per flooded acre. We believe the testimony and the exhibits support the application and respectfully ask the consideration of the Commission to the granting of the application.

MR. MANKIN: Is there any further statements? If not, we will take the case under advisement.

C E R T I F I C A T E

STATE OF NEW MEXICO)
: ss
COUNTY OF BERNALILLO)

I, THURMAN J. MOODY, Notary Public in and for the County of Bernalillo, State of New Mexico, do hereby certify that the foregoing and attached Transcript of Proceedings before the New Mexico Oil Conservation Commission was reported by me in Stenotype and reduced to typewritten transcript by me and/or under my personal supervision, and that the same is a true and correct record to the best of my knowledge, skill and ability.

WITNESS my Hand and Seal, this, the 24th day of July, 1956, in the City of Albuquerque, County of Bernalillo, State of New Mexico.

Thurman J. Moody
Notary Public.

My Commission Expires:

April 3, 1960.