

BEFORE THE  
OIL CONSERVATION COMMISSION  
Santa Fe, New Mexico  
January 24, 1962  
EXAMINERS HEARING

-V- - - - -

IN THE MATTER OF:

Application of Tenneco Oil Company for a pressure  
maintenance project in the Totah-Gallup Oil Pool, San  
Juan County, New Mexico. Applicant, in the above-styled  
cause, seeks permission to institute a pressure mainten- : CASE  
ance project in the Totah-Gallup Oil Pool by the inject- : NO. 2484  
ion of water into the Gallup formation on its Glenn H.  
Callow Lease in Sections 27, 28 and 33, Township 29 North,  
Range 13 West, San Juan County, New Mexico. Applicant  
further proposes the promulgation of special rules and  
regulations to govern the operation of said project.

BEFORE:

ELVIS UTZ, EXAMINER

TRANSCRIPT OF HEARING

MR. HINKLE: I would like to enter an Appearance on  
behalf of Clarence Hinkle, Roswell. We have one witness, Mr. Lacey.

MR. UTZ: Are there any other appearances?

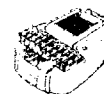
MR. VERITY: George Verity of Verity, Burr & Cooley of  
the above case 2483, for Southwest Production.

MR. HINKLE: Mr. Examiner, this case is more or less a  
repetition of Case 2483 in that the Application of Aztec and the  
Application of Tenneco are quite similar. The same Pool is involved,  
there is only a different acreage. We have four Exhibits, all of  
which are in order here which you can pass out.

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MR. MORRIS: Will you stand and raise your right hand, please? (Witness complies.) Do you solemnly swear that the testimony you are about to give will be the truth, the whole truth, and nothing but the truth, so help you God?

MR. LACEY: I do.

JOHN J. LACEY

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

DIRECT EXAMINATION

BY MR. HINKLE:

Q Your name is J. J. Lacey.

A Yes, it is.

Q What is your position with Tenneco, Mr. Lacey?

A I am employed as a District Engineer, Tenneco's District, Durango, Colorado.

Q How long have you been employed by Tenneco?

A Approximately four and a half years. I have been in Durango three and a half years.

Q Are you familiar with the development in the San Juan area?

A Yes, I am.

Q Are you familiar with the Application which Tenneco has made in this particular case?

A Yes, I am.

Q Have you ever testified before the Oil Conservation

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Commission? A Yes, I have.

Q Did you testify in the case in which an 80-acre spacing was set up in this field?

A Yes, I was a witness when temporary field roads were established.

Q What is the nature of the Application which has been filed?

A We are requesting permission to institute a pressure maintenance project by injecting water in certain Gallup Wells in the Totah-Gallup Pool.

Q In your previous testimony in connection with the 80-acre spacing, did you introduce Exhibits in that case, showing the cross section of this area?

A Yes, approximately a year ago when temporary fields were established we estimated cross sections showing geological evidence that a continuous reservoir extending MIA.

Q And you have prepared some Exhibits for this hearing in connection with this case? A Yes, I have.

(Marked Tenneco's Exhibit 1 for Identification.)

Q I refer you to Tenneco's Exhibit No. 1 and ask you to explain to the Commission what it shows.

A Exhibit No. 1 is a map showing the location of the Gallup Wells on Tenneco's Callow lease, and the wells of the near by offset operators and those wells circled in red are the ones we proposed to convert to injection wells, and the project areas

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outlined in hatched lines which consist of our Callow lease and 80-acre

Q Is this in between the projects No. 1 and No. 2 of Aztec, which was justified to in Case 2483?

A Yes, it is. This is the area in between the two project areas shown in Aztec's previous hearing. I might point out that to their Exhibits 1 and 2 presented in the previous hearing, we are in general agreement with that they are equally applicable to our testimony.

Q Do you agree with the limits of the producing area as shown on Aztec's Exhibit No. 1 which was introduced in Case No. 2483?

A Yes, we are in general agreement with the outline, with the outlines as shown on that Exhibit.

Q In connection with your application, did you file copies of the electrical logs of the wells which are shown in red on Exhibit No. 1?

A Yes, we have introduced with our Application electrical logs on the wells we propose to convert to injection wells.

Q Do you have any comment to make with respect to the electrical logs?

A None, other than except they show the zone sand in the lower Gallup in which we propose to inject water.

(Marked Tenneco's Exhibit 2 for identification.)

Q Now, Mr. Lacey, would you refer to Tenneco's Exhibit No. 2 and explain what it shows?



A Exhibit No. 2 is a list of the proposed wells, the wells we propose to convert to injection, it shows the casing size, the depth set, the cement used to cement these, the cement tops and the intervals perforated open to production. This Exhibit, in conjunction with a log submitted on our Application will show that we have the zone. There is just one zone open and it is isolated from all other geological formations that we propose to inject water with.

(Mark Exhibit 3 for identification.)

Q Now, refer to your Exhibit No. 3 and explain what that shows.

A I might point out that there is a typographical error in Exhibit 3. The rock properties permeability says the month of August, that should be Md. August, and this Exhibit 3 shows the properties of the reservoir fluid, what they were, and what we estimated them to be now, in the vicinity of our lease; and the porosity, permeability, Connate Water Saturation and estimated residual water saturation at the water plug of the reservoir well, and currently oil is being produced by Volumetric Depletion.

Q Does this show substantially the same thing as Aztec's No. 5?

A Yes, it does.

Q That is in Case No. 2483?

A There are some slight difference in the numbers, but it essentially is identical to Aztec's Exhibit.

Q What is your source of information for Exhibit No. 3?



A Our source of information is the testimony in data which we presented originally in the order established of temporary field rules and the data we obtained on the wells on our lease and in the immediate areas.

(Mark Exhibit 4 for identification.)

Q Now, refer to your Exhibit No. 4 and explain what that shows.

A Exhibit No. 4 is a plot of production rate on log written scale versus time and it shows the actual producing rate from our lease as of December 1, 1961 and shows what we estimate to be the predicted producing rates on continued primary operations and what they would be under pressure maintenance. It shows the predicted primary recovery as 89 barrels and the acre foot. The predicted ultimate recovery is 187 barrels. We estimate that the additional oil recovery will be 111 per cent of primary recovery.

Q This also indicates that you intend to start your injection of water about June, 1962, is that right?

A Yes, it does appear that we would anticipate some response then in the latter part of '62, September.

Q I believe you heard the testimony of Mr. Burrows in the Aztec case this morning and there was some mention of the possibility that this area would be unitized with that of Aztec, either in connection with Section 34 and also acreage which lies to the north-west,

A Yes, Tenneco Oil Company has been negotiating with Aztec

and we are regarding the unitization of their property in Section

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34 with our proposed water flood pressure maintenance of our properties in Section 27 and the north half of 23. We are in very nearly an agreement as far as the participation is concerned and we anticipate within the very near future that units be formed consisting of our properties and their properties in Section 27, 28 and 34 and proposed injection wells are so located with this in mind.

Q And even if you do unitize, there would be no change in the location of injection wells?

A No, there would not be.

Q There would be no necessity for it?

A Right.

Q What is the character of the land, that is, Federal or State or what not, that is involved in your leases?

A All of the acreage closed in the Hatched line is Federal acreage and I believe Aztec.

Q Is it all included in one lease?

A No, it is not. There is the south half of the southwest border of 21, that is a separate lease.

Q But all the rest is one?

A But the acreage in 27, 28 and the north half of 33 would be basic.

Q Are you asking for an increased allowable in connection with this Application?

A No, we are not, we are asking just for permission for



water injection.

Q Do you have anything you would like to say with regard to the adoption of special Federal Rules in connection with these projects?

A No, we have no objection to the rules that are proposed by Pan-American in their hearing for water flood, for pressure maintenance in the Totah-Gallup Pool and we are in general agreement with that and they would be acceptable to us.

Q State whether or not, in your opinion, that if you are successful in injection of water in this area, would it be in the interest of conservation and waste?

A Yes, if the field is produced only by primary, there is going to be a substantial amount of oil left in the ground which could be recovered.

Q This would promote the greater ultimate recovery in the field?

A Yes, it would.

MR. HINKLE: And that is all of my testimony.

MR. UTZ: Do you wish to offer the Exhibits?

MR. HINKLE: Yes. I would like to offer Exhibits 1 through 4.

MR. UTZ: Without objection they will be accepted into the record.

(Whereupon Tenneco's Exhibits 1 through 4 admitted in evidence.)

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## CROSS EXAMINATION

BY MR. UTZ:

Q Mr. Lacey, if the unitization is successful, do you plan to maintain the suggested injection pattern?

A Yes, we do. We anticipate the unit will be formed at leased Aztec property in Section 34 and we would follow the injection pattern as described or located on our map and Aztec's map.

Q Why would it be necessary to have five injection wells along your Aztec lease line in Section 28 and 29?

A The proposed pattern here is, I suppose, to be described as a double ended line drive and we are in effect having a line of injectors on each end of the unit and pushing the oil toward the center. By having all injectors along this line, we feel that a minimum amount of oil is going to cross lease lines and we will be able to maintain the proper injectivity that we desire in order to make the flood front advance the way we think it should.

Q Well, if the area is unitized, would the oil in the cross lease lines be of any consequence?

A I am speaking here now of the unit consisting of the four sections essentially 27, 28, 34 and the north half of 33. There has been, this is the unit I am talking of which would be a separate entry from the Projection Area 1, described in Aztec's testimony.

Q But my question was pointed toward this, that if you were successful in unitizing the whole area with Aztec?

~~A If we were successful in unitizing the entire area, our~~

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leases with Aztec's area as Projects 1 and 2 are proposed patterns of water injection, would still be essentially the same if it would be a traverse line of injectors across the field, this double end line drive, as differentiated from Pan-American's proposed Crystal Center Line Drive.

Q You feel this is a more efficient drive?

A No, I would not say more efficient, it is essential modification line drive. Pan-American's proposal is a line drive of sorts and so is this. I would say they would very nearly be the same.

Q Do you plan on adding injection wells in this unit?

A No, we would not, we might delay putting some of the wells on injection, for example, the wells of 10, 16, and 13, those might be delayed being put on injection, in other words, we would put injectors first along these other lines and then add additional ones, depending on the project.

Q You think the center of your Section 28 would be sufficiently swept by the water, if you don't add any wells?

A Yes, we do.

Q That is quite a distance across there?

A Yes, it is, but, however, we don't feel that the distance -- there are several advantages to flooding in this manner, so to speak, of lease water is handled. There would be lease put through and it will proceed at a rapid rate and we will have the flood over with and wouldn't handle a lot of produced water and have it



taking off and that you might anticipate is a five spot value or something like that.

Q Now, was the suggested order you made the same as Pan-American's order?

A Well, we were going to propose to the Commission that we be allowed as much flexibility in producing the oil from this project as possible since it is vitally important to control the advance of the flood project for maximum first and recovery. However, since the orders are probably already issued for Pan-American that the Commission will probably want uniformity or standardization of the orders issued in the Pool that we would certainly have no objection.

MR. UTZ: Are there any other questions?

MR. VERITY: I have a question.

# CROSS EXAMINATION

BY MR. VERITY:

Q Do you propose in injecting water in your No. 13 well in your north half of Section 33, is it your opinion, that injection of water in this well, in no way will offset the correlative well?

A Yes.

Q Is it further your representation that injection of water into that well, will in no way lessen or decrease the ultimate recovery of oil to be had from the two wells in the south half of 33?

A My opinion is that it would not hurt them but it will



probably increase their ultimate output by the maintenance of pressure in the reservoir.

MR. VERITY: That is all.

MR. UTZ: Are there any other questions?

MR. IRBY: Frank Irby, State Engineer.

CROSS EXAMINATION

BY MR. IRBY:

Q Mr. Lacey, did you give any testimony concerning the source of the water for this project?

A No, I have not. We have not yet decided from where we are going to obtain a water source since there are several alternatives, however, I might make mention of the fact that we are considering as a possible source of supply, the lower portion of the Pictured Cliff formation which is gas bearing in the very upper part but primary and by and large a water-bearing sand in this area in the lower parts. The log suggested that the lower water-bearing portion might be successfully produced, water produced from them, without in any way damaging or injuring the gas producing building formation.

MR. IRBY: Thank you.

CROSS EXAMINATION

BY MR. UTZ:

Q You don't know which wells you will make water wells out of?

A We have producing Pictured Cliff wells on our lease. We



have one which is temporarily abandoned because of excessive water production and we are considering the possibility of deepening this well for the purposes of testing the Pictured Cliff to see if the water will be adequate in both volume and characteristic, compatible with the Gallup.

Q Where is that well located?

A It is located approximately between our No. 12 and No. 13. I think Aztec's Exhibit 1 shows these Pictured Cliff wells. Yes, it does. This Pictured, temporarily abandoned Pictured Cliff well is on a line between our No. 12 and 13.

Q Would that be the No. 2 well?

A Yes, it would. I might point out that our Callow lease is on the extreme western edge of the West Kutz Pictured Cliff field. There are no producing Pictured Cliff wells to the west and southwest of our lease. The Pictured Cliff formation is entirely water bearing.

#### REDIRECT EXAMINATION

BY MR. HINKLE:

Q You heard the testimony Mr. Burrows gave in Aztec's case in regard to the possibility of developing a water Morrison formation in a well which they propose to drill. If you unitize this area with Aztec is there a possibility that you would also use that water in the area which is now under consideration?

A I would say very definitely that in the event that our properties are unitized in their entirety with Aztec, it would be



very possible we would use the Morrison formation as a source of supply.

Q So that is one reason why you are not definite with your water supply as until you know what the situation is with reference to where this unit will be?

A Yes.

MR. UTZ: Are there any other questions? The witness may be excused.

(Witness excused.)

MR. UTZ: Are there any statements? The case will be taken under advisement.

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STATE OF NEW MEXICO     )  
                                   )  
 COUNTY OF BERNALILLO    )    ss

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

*Katherine Peterson*  
 COURT REPORTER

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 2484, heard by me on Jan. 24, 1962.

*[Signature]*, Examiner  
 New Mexico Oil Conservation Commission

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I N D E XWITNESSPAGE

JOHN J. LACEY

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MARKED FOR IDENTIFICATION

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ADMITTED IN EVIDENCE

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