

CASE 2377: Appli. of WILLIAMSON,
N.R. for a waterflood project in
the Seven Lakes Pool.

John J. Goss

-asa / No.

237

Application, Transcript,
and Exhibits, Etc.

607 San Mateo
Albuquerque, New Mexico
October 3, 1961

New Mexico Oil Conservation Commission
Santa Fe,
New Mexico

Attn: Mr. Dan Nutter

Gentlemen:

In a hearing before the Commission on September 20, 1961, certain information was requested concerning Application for Waterflood filed by Mr. N. R. Williamson. This data is tabulated below:

Existing Wells

Mesa Retailers, Inc., et al
No. 1 Santa Fe "A"

Water Supply Well

330'/N & 990'/E Lines
Section 19, T18N-R10W

660'/N & 580'/W Lines
Section 20, T18N-R10W

All the following wells are in Section 18, T18N-R10W:

No. 1
No. 2
No. 3
No. 5
No. 6
No. 2-W
No. 3-W

450'/S & 1050'/E Lines ✓
940'/S & 325'/E Lines ✓
400'/E & 260'/S Lines ✓
340'/S & 1700'/E Lines ✓
2320'/E & 280'/S Lines ✓
~~720'/E & 780'/S Lines~~
~~700'/S & 1330'/E Lines~~

Proposed Wells

Section 18, T18N-R10W:

No. 1-W
No. 4-W

720'/E & 5'/S Lines
1380'/E & 200'/S Lines

Yours very truly,

N. R. Williamson
N. R. WILLIAMSON

NRW:clt

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
September 20, 1961

EXAMINER HEARING

CASE 2377

TRANSCRIPT OF HEARING

DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CM 3-6691

ALBUQUERQUE, NEW MEXICO

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
September 20, 1961

EXAMINER HEARING

IN THE MATTER OF:

Application of N. R. Williamson for a waterflood project in the Seven Lakes Pool, McKinley County, New Mexico. Applicant, in the above-styled cause, seeks permission to institute a waterflood project in the Seven Lakes Pool in Sections 18 and 19, Township 18 North, Range 10 West, McKinley County, New Mexico. Applicant further seeks the establishment of procedures for obtaining administrative approval of extensions to the proposed waterflood project.

) Case
) 2377

BEFORE:

Daniel S. Nutter, Examiner

TRANSCRIPT OF HEARING

MR. NUTTER: Hearing will come to order, please. Next case will be No. 2377.

MR. MORRIS: Application of N. R. Williamson for a waterflood project.

MR. KELLAHIN: Jason Kellahin, Kellahin & Fox, representing the applicant, and we will have two witnesses I would like to have sworn, please.

(Witnesses sworn.)

MR. KELLAHIN: Mr. Williamson is the first witness.

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N. R. WILLIAMSON

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

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q Would you state your name, please?

A N. R. Williamson.

Q Are you the applicant in this case, Mr. Williamson?

A Yes.

Q What business are you engaged in?

A I am in the oil business.

Q Have you had practical experience in the oil business?

A Yes, sir, I have.

Q Have you testified before this Commission and stated your qualifications?

A Yes, I have.

MR. KELLAHIN: Are the qualifications of the witness acceptable?

MR. NUTTER: Yes, they are.

Q Mr. Williamson, are you familiar with the application in the case before the Commission at this time?

A Yes.

Q Briefly, what are you proposing in this application?

A Well, I am proposing to, of course, put on a waterflood on this acreage in McKinley County, which consists of three



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sections. This is an unproved area; there have been a tremendous amount of wells -- I say a tremendous amount, 30 or 40 wells -- drilled back since 1911, 1912, 13, brought up through the years, very old area, some of the first oil in New Mexico, and we want to go in and try to develop this thing into -- there is no reservoir energy in this thing, no gas drive or water drive.

Q Let's get the area identified, Mr. Williamson. Referring to what has been marked as Exhibit No. 1, is that a plat showing the area involved here?

A Yes, it is.

Q Did you purchase the wells shown on the plat?

A That's right.

Q Do you control any acreage other than that on which the wells are located?

A Yes, sir.

Q Would you describe to the Commission and Examiner what acreage you do control?

A I control Section 20, all of Section 20, all of Section 18, and the N/2 of 19, and the S/2 of 17.

Q Then you do have all of the acreage which would offset this proposed waterflood project, is that correct?

A That's right.

Q The wells shown on the exhibit, some are designated by a circle and some by a double circle. What is the difference in these wells?



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A Well, your double circles are the proposed injection wells. The others are existing wells. They haven't been producing wells up to this time.

Q Were all of them drilled at the time you purchased the acreage?

A Yes.

Q Did you not drill a test well?

A I did drill a test well, which is here as Well No. 7, and that was a --

Q Was that 7 or 4?

A No. 4, I am sorry, which was the well which was drilled as an exploration well for a core analysis only.

Q Now, what is the formation involved, the producing formation which you propose to flood?

A It is the Mesaverde sand, what they call the Meniffee section of the Mesaverde.

Q What depth is it found in this area?

A Approximately 350 feet.

Q Are these wells producing?

A They haven't been producing until the last two or three weeks; I have put the wells on production at this time.

Q How did you put them on production?

A They had pump jacks, the equipment was there; I just started pumping the wells and producing them.

Q What kind of production did you achieve by pumping?



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A Well, anywhere from one to three barrels a day.

Q Per well?

A Per well.

Q What are the characteristics of the fluid produced?

A Well, I get about 90 percent oil and about 10 percent water. This water, I haven't had an analysis run, but it appears to be fresh water; it doesn't have too much salt, very little in it.

Q Is it the formation, or do you think there is water encroachment?

A No, I think it is connate water.

Q Has this area ever been produced on a commercial basis?

A To my knowledge, no. I know it hasn't in the past, well, twenty or thirty years. Before that it would be hard for me to say, in 1911, 12, whether this was commercial or not. I don't know.

Q These particular wells on the tract controlled by you were not drilled at that time, were they?

A No, sir.

Q When were they drilled?

A Well, the well listed as No. 1, to my understanding was drilled in 1950; No. 2, No. 3, No. 5 and No. 6 were drilled approximately from '57 to '58, along in that period of time.

Q Do you know what kind of casing program was used in those wells?



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A These wells have 4-1/2 casing. Rather, No. 2 and No. 3 and No. 5 and No. 6 have 4-1/2 casing set, supposedly, on top of the pay with an open hole completion. No. 1 has 5-1/2 casing, supposedly on top of the pay with an open hole completion.

Q You drilled the No. 4 well?

A That's right.

Q And did you describe its completion?

A No, I didn't.

Q How was it completed?

A This was drilled as an exploration well, pipe was set on top of the pay and cement to the surface -- in fact, the pipe was set two foot from the top of the pay and set to the surface, 4-1/2 casing.

Q Do you encounter any pressure in this reservoir?

A Are you talking about bottomhole pressure?

Q Yes, sir.

A There are no bottomhole pressures of any significance in this reservoir. There is no energy at all to drive this reservoir, to the best of my knowledge.

Q In your opinion, is it practicable and economical to produce the oil there by pumping?

A No, it isn't.

Q Would it be economically feasible to do so?

A No.

Q Do you know what the gravity of the oil is?



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A This oil is 32 gravity according to Rider Scott in Wichita Falls.

Q As I understand it, your proposal is to inject water in the wells designated by the double circle on the plat:

A That's right.

Q What is the nature of your proposed operation in a little more detail, Mr. Williamson?

A Well, our intentions are to go into this thing and inject water into these individual wells which you mentioned, and then, if this pilot, or if this flood is successful we intend to extend this. I would like to get permission to extend it at the rate of 160 acres per year if that would be permissible.

Q And do you ask the Commission to, in the event they see fit to approve this project, to set up an administrative procedure for expansion on that basis?

A Yes, sir, I do.

Q Without necessity for further hearing?

A That's right.

Q Unless, of course, there is objection made. What volumes of water do you propose to inject in the injection wells?

A I propose to start off with a volume of water of approximately 500 barrels per day, which there, again, will be regulated by, after this thing, or if it is effective, by the regulations with the Commission as to how much oil we can produce.

Q Are you familiar with the Commission's Rule 701?



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A Yes, I am.

Q Do you understand that makes a definite provision for allowables of projects of this type?

A Yes, sir.

Q Do you think you can operate within the provision of Rule 701 on this project?

A Yes, I do.

Q Will the formation take water on gravity?

A Yes, it will take water on gravity at -- I couldn't say what rate of speed this will take, but it will take water on a hydrostatic head on gravity.

Q Do you propose to inject on a hydrostatic head?

A No, with an injection pump, which will apply a certain amount of pressure to the reservoir.

Q What pressures do you anticipate using?

A From 250 to 275 pounds, that is the calculation at this time.

Q You said you planned, initially, to inject at the rate of approximately 500 barrels per day?

A Yes.

Q What is your source of water for this purpose?

A Well, there is a flowing water well, that is in Section 20, marked on this plat, water well, which flows approximately 470 barrels of water a day and I intend to put a pump in this well to supply a sufficient amount of water to inject into this



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formation.

Q You already spoke of possible expansion of this project at the rate of 160 acres per year?

A Yes.

Q Will additional volumes of water be needed for that purpose?

A That is true.

Q Do you anticipate that the well available will supply sufficient water for that purpose?

A From an engineering standpoint and calculations I would say lifting this water from a depth of two to three hundred foot of depth, which would be economical, this would produce in the neighborhood of 2,500 to 3,000 barrels of water per day.

Q Would that be sufficient for the project?

A That would be sufficient for the project I am speaking of for covering 160 acres within the first year.

Q What is the depth at which this water well is completed?

A From a thousand and fifty foot to approximately 1,150 foot.

Q What is the nature of the water, character of the water?

A The water is a fresh water, compatible with the reservoir water, compatible with the oil, no congealing of the two.

Q Then you have sufficient water in sufficient quantity, and of the proper character to carry on this project, in your opinion, is that correct?



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A That is true.

Q Now, Mr. Williamson, is there any other oil development in the vicinity of this project?

A No, sir, there are not. The only oil production is, the closest oil production is in the Red Mountain in the Hoshph, approximately ten, twelve miles away, at least.

Q You had no offsetting operators producing from this same formation?

A That is true.

Q What is the general nature of the terrain around this area?

A Well, it's sort of a hilly country, lots of mesas sticking up out of the ground. It is not at all flat, level-type country.

Q Is there any farming in the area?

A No, as far as I know there is not any farming within 50, 60, 70 miles of this thing.

Q On your injection wells, what kind of casing program do you propose for them?

A I propose to set 4-1/2 pipe, two foot in the pay sand, cement to surface and start injecting the water down the casing with no casing or packer.

Q You propose to inject through the casing?

A That's right.

Q Did you encounter any fresh water zone in the drilling of the No. 4 well?

A Yes, this is a fresh water zone there at approximately



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80 feet.

Q Any others?

A To my knowledge, no.

Q In your opinion will the casing and cementing program you are proposing adequately protect that fresh water zone?

A Yes, I think by circulating the cement on your casing you would adequately protect the water zone.

Q In the 350 feet you drilled did you encounter any other pay formation productive of oil or gas?

A Yes, we do have a pay sand that comes in there at approximately 290 foot, but I don't think it would be adequate for waterflooding.

Q Will that be cemented off in your injection wells?

A Yes.

Q Will the cementing and casing program protect that water zone?

A Yes.

Q These are not one basic lease, are they?

A No.

Q Do you have any plans as to protection of lease lines as this waterflood expands?

A In this exhibit here -- what I anticipate doing, actually, is putting these wells down to the lease line and drill line injection wells, which will protect each and everyone as a royalty holder, and also I have discussed this with Santa Fe Railroad, as



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possible going into unitization at a later date.

Q Is Santa Fe Railroad the owner of the mineral rights?

A That is true, in the N/2 of 19 and S/2 of 17.

Q Who is the owner in Section 18 and 20?

A Mr. Ferriss.

Q That is Section 18, what about Section 20?

A That is Indian leases.

Q You have the leases on all this acreage?

A That's right.

Q Have you found Santa Fe Railroad amenable to unitization of this area?

A Yes.

Q Have you taken the matter up with the Bureau of Indian Affairs?

A I have discussed it with it -- I say "with it," I have discussed it with the Department in Farmington.

Q But no steps have been taken, as yet, toward unitization?

A I have just briefly discussed with them to see what the thoughts were along that line.

Q Will the program, as you initially planned it, have any effect on those leases?

A It won't have any effect on any Indian leases at this time; rather, the pilot stage won't have any effect on any Indian leases.

Q That will afford ample time to work out a unit agreement?



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A That is true.

Q Was Exhibit No. 1 prepared by you or under your supervision?

A Yes.

MR. KELLAHIN: At this time I would like to offer in evidence Exhibit No. 1.

MR. NUTTER: Applicant's Exhibit 1 will be entered in evidence.

Q Do you have anything to add to your testimony, Mr. Williamson?

A Nothing I can think up.

MR. NUTTER: Are there any questions of Mr. Williamson?

MR. MORRIS: Yes, sir.

CROSS EXAMINATION

BY MR. MORRIS:

Q Mr. Williamson, are there other wells in this immediate area drilled to the same formation, owned by other operators?

A No.

Q How far away is the nearest well that might be completed in this formation?

A To my knowledge there aren't any wells completed in this formation within, I would think I would be safe in saying ten or fifteen miles.

MR. NUTTER: That is producing wells?

A That's right.



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Q So, as an operator, it is all your project?

A That's true.

Q The only people you have to keep happy are the royalty owners?

A That's right.

MR. MORRIS: That's all.

BY MR. NUTTER:

Q Have Nos. 9 and 10 been drilled yet?

A No.

Q You say when you do drill them you will put them down right on the line?

A Within five foot of the line, I think that is what is customary with the law to protect legal lines.

Q Do you have a footage location for the other wells that have been drilled?

A I do have, I don't have the plats with me, because I had all this surveyed. I couldn't tell just exactly how these oil wells were in there at the time I took the property over, and I had this survey and each well put on a plat, which I didn't bring with me, but I would be glad to supply the Commission with that information.

Q We would need the footage information.

A It is drawn to scale here, but all our big portion of these old wells are unorthodox locations.

Q Now, here in the SE/4 of Section 16, you call this the



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Ferriss lease?

A Yes, sir.

Q These are the Ferriss?

A No. 2 and so on.

Q Do you anticipate the No. 4 will be put on production?

A No, that will be an injection well. No. 4, as you see there, you have No. 7 right above it, which won't be an existing well, but we will use No. 4 already drilled as an exploration well as an injection well.

Q No. 7 is out?

A Yes, No. 4 the injection well.

Q Is No. 8 drilled yet, Mr. Williamson?

A No. 8 is an existing well which was drilled, and I can't tell you when, but it is an existing well with pipe in it. The conditions of that well I can't tell you just what it is until we log it and come up with that information.

Q 2, 3, 5, 6 and 4 are all drilled?

A No. 2, 3, 5 and 6, yes, and 1, existing wells which are producing at this time.

Q So the only ones that you show here on this exhibit that haven't been drilled yet are the injection wells No. 9 and 10, is that right?

A That is true.

Q And No. 7 up there which won't be drilled?

A No. 7 won't be drilled.



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Q Mr. Williamson, is this more or less the same type of reservoir, and do you expect the same kind of conditions as Chaco Oil has in their waterflood in Red Mountain?

A Yes, something similar to that, that is true. I think this is producing from the same sands and same positions that they would be producing.

Q What procedure would you want to set up for expanding the flood at the rate of 160 acres per year?

A I would like to be able to go ahead and put this pilot flood on and see if it is going to be effective, and extend it to 160 acres within 12 months, because I do have that kind of obligation: of course, it also depends on what the Commission says.

Q You would like some sort of procedure whereby you could write a letter to the Commission and ask to add another 160 acre tract to the project area?

A That's right. It might not be on this exact ten-acre spacing, because this is close spacing. The reservoir characteristics, if they carry through we might want to put it on a wider spacing. It is according -- I will leave that strictly up to the engineers.

Q On the plat that was attached to the exhibit, there are some wells here in the NE/4 of Section 19, two injection wells and a producer: you anticipate drilling those in the near future? It shows the 9 and 10 on the line, and then two wells directly south of them.



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A This is the plat prepared by my engineers. Yes, I do, I anticipate drilling the shown wells in the NE of 19 to protect Santa Fe Railroad.

Q That will give you a total of six injection wells?

A Yes, sir, that's right.

Q When you furnish us with the location of these other wells could you furnish us with the location of those two wells as well as the two that will be close to the line?

A Yes, I can. They have been surveyed already.

MR. NUTTER: Any further questions of Mr. Williamson?

REDIRECT EXAMINATION

BY MR. KELLAHIN:

Q The wells in Section 19, will they be a part of the initial pilot project?

A Yes, they will, due to the fact that we do have to protect this property line. This will be in the initial.

Q You would want to include in the information you have already given in regard to Exhibit 1?

A That's right.

MR. NUTTER: Any further questions of Mr. Williamson?

MR. IRBY: Mr. Irby, State Engineer's Office.

BY MR. IRBY:

Q Mr. Williamson, I believe you said the depth of this water well was 900 to 11?

A No, sir, 1,050 to about 1,150 feet.



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Q Do you know anything about the casing in that well?

A The casing in that well is approximately a 945-foot, in depth. That is where the pipe is cemented and supposedly cemented to the surface. See, I just acquired this property and I can't say it was because I wasn't there when it happened, or didn't have a representative there.

Q What size casing?

A Four and a half casing.

Q And it flows constantly, has no valve on it?

A That is true. We do have a valve, yes, sir, we have a valve on it, but at the present time it is flowing for stock purposes on this ranch there. Mr. Brock asked me to leave it flowing, and for cattle purposes on that ranch I did.

MR. IRBY: That is all I have. Thank you.

MR. NUTTER: Any further questions? Witness may be excused.

MR. KELLAHIN: Call Mr. Morden as a witness, please.

AUDLEY DEAN MORDEN

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

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q Will you state your name, please?

A Audley Dean Morden.

Q What business are you engaged in, Mr. Morden?



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A Oil and gas exploration and evaluation of oil properties.

Q Are you an independent consultant?

A Yes, sir.

Q Have you previously testified before this Commission as a geologist and engineer?

A Yes, sir.

Q And had your qualifications accepted as a matter of record?

A Yes, sir.

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

MR. NUTTER: Yes.

Q In connection with your business as a consulting engineer and geologist were you employed by Mr. Williamson to make an analysis of the project which is now the subject of this hearing?

A Yes, sir, I was.

Q Did you make such an analysis?

A I did.

Q Would you state briefly what type of investigation you made in connection with this project?

A I studied the cores and the core analysis, and compared this property with existing floods, and advised Mr. Williamson what I thought the property would do, and how to do it.

Q Could we have the core analysis marked as Exhibit No. 2, please? Referring to what has been marked as Exhibit No. 2, Mr. Morden, is that the core analysis which you used?

A Yes, sir.



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Q Prepared by Rider and Scott Company?

A That's right, sir.

Q In your opinion are they competent engineers?

A Very much so.

Q Have you checked the information contained in that core analysis?

A Yes, I have.

Q Do you believe it to be correct?

A Yes, sir.

Q On the basis of your examination of the core analysis would you give the Examiner your summary of the characteristics of this reservoir as you have found it to be?

A It is a very, very porous sand, with very good permeabilities, and it would appear to me that it would be ideal for a shallow flood. It seems to fit the picture of shallow floods that are already in existence.

Q Of course, the analysis speaks for itself, but, roughly, would you tell us what the permeabilities of the formation are?

A The average porosity is in the range of 28 percent, and permeabilities, roughly 400.

Q And you consider that excellent for the purposes proposed by Mr. Williamson.

A I do.

Q Have you made any analysis of the oil reserves in this area?



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A Yes, sir, I have; from the core analysis, you have, roughly, from 55 to 65,000 barrels per ten-acre location.

Q Under the waterflood, as proposed by Mr. Williamson, would you be in a position to estimate what your recoveries might be on this project?

A I would estimate that probably someplace between 70 and 90 percent of total recovery on a flood of this type.

Q Would that oil be otherwise recovered?

A As Mr. Williamson stated, at the rate of one to three barrels per day, which is certainly not commercial.

Q In your opinion, as an engineer, would that be a feasible method of production?

A No, sir, it certainly wouldn't be economical.

Q In your opinion as an engineer is a waterflood a feasible method of production for this area?

A Yes, it is.

Q Are you familiar with the source of water to which Mr. Williamson testified?

A Yes, sir, I am.

Q Do you know the characteristics of this water?

A The fresh water, we have a preliminary analysis which indicates 314 parts per million of chloride and 1680 parts per million of sulfate, SO_4 .

Q That is fresh water?

A Yes, sir, it is.



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Q Is it compatible to the fluid found in the reservoir?

A It is, sir.

Q In connection with your recommendations to Mr. Williamson, what type of project did you recommend to him?

A Just exactly what Mr. Williamson has presented.

Q Did you recommend the initial injection of approximately 500 barrels per day?

A Yes, sir, I believe, from studying the porosity and permeabilities that that should be the optimum amount of fluid to inject in the reservoir.

Q I believe Mr. Williamson testified that the gravity of this oil is 32, is that correct?

A Yes, sir.

Q Do you think, with the injection program as outlined by Mr. Williamson, there is any danger of channelling of water?

A Not at the pressures Mr. Williamson has indicated he is going to use.

Q Which would be approximately 250 pounds?

A Yes.

Q Would you advocate use of any different pressure than that?

A No, sir, from what we know now that should be the best.

Q Are you familiar with the provisions of the Commission's Rule 701?

A Yes, sir, I am.



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Q In your opinion can this project be operated within the scope of those provisions?

A I believe it can.

MR. KELLAHIN: At this time we would like to offer in evidence Exhibit No. 2 which is a core analysis prepared by an independent engineering company.

MR. NUTTER: Applicant's Exhibit No. 2 will be admitted into evidence.

MR. KELLAHIN: That is all the questions I have of the witness.

MR. NUTTER: Any questions of Mr. Morden?

CROSS EXAMINATION

BY MR. NUTTER:

Q What is the average number of net feet of pay?

A Nineteen.

Q And, as the core analysis shows, you have 10 percent residual oil saturation and a porosity of 28.1?

A Yes, sir.

Q That calculates 58 to 60,000 barrels per ten-acre tract?

A Yes, sir, going on the core analysis that is right.

MR. NUTTER: Any further questions of Mr. Morden? He may be excused. Do you have anything further, Mr. Kellahin?

MR. KELLAHIN: That is all, Mr. Nutter.

MR. NUTTER: Does anyone have anything they wish to offer in Case No. 2377? Take the case under advisement and the hearing is adjourned.



DEARNLEY-MEIER REPORTING SERVICE, Inc.

FARMINGTON, N. M.
PHONE 325-1182

ALBUQUERQUE, N. M.
PHONE 243-6691

STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

I, JUNE PAIGS, 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.

IN WITNESS WHEREOF I have affixed my hand and notarial seal this 5th day of October, 1961.

Jane Paigs
Notary Public-Court Reporter

My commission expires:

May 11, 1964.



I N D E X

WITNESSES

PAGE

N. R. WILLIAMSON

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Cross Examination by Mr. Irby	17

AUDLEY DEAN MORDEN

Direct Examination by Mr. Kellahin	18
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E X H I B I T S

NUMBER

IDENTIFIED

ADMITTED

Applicant's 1	3	13
2	19	23

DEARNLEY-MEIER REPORTING SERVICE, Inc.

FARMINGTON, N. M.
PHONE 325-1182

ALBUQUERQUE, N. M.
PHONE 243-6691



No 26-61

DOCKET: EXAMINER HEARING - WEDNESDAY - SEPTEMBER 20, 1961

9:00 A.M. - OIL CONSERVATION COMMISSION CONFERENCE ROOM
STATE LAND OFFICE BUILDING - SANTA FE, NEW MEXICO

The following cases will be heard before Daniel S. Nutter, Examiner, or Elvis A. Utz, as alternate examiner:

- CASE 2376: Application of the Oil Conservation Commission on its own motion to abolish certain portions of the San Simon and Wilson Pools in Lea County, New Mexico; to create a new pool for oil production in Township 21 South, Range 35 East, to be designated the North San Simon-Yates Pool; and to establish a limiting gas-oil ratio for said North San Simon-Yates Pool.
- CASE 2377: Application of N. R. Williamson for a waterflood project in the Seven Lakes Pool, McKinley County, New Mexico. Applicant, in the above-styled cause, seeks permission to institute a waterflood project in the Seven Lakes Pool in Sections 18 and 19, Township 18 North, Range 10 West, McKinley County, New Mexico. Applicant further seeks the establishment of procedures for obtaining administrative approval of extensions to the proposed waterflood project.
- CASE 2378: Application of The Atlantic Refining Company for a triple completion, Lea County, New Mexico. Applicant, in the above-styled cause, seeks permission to complete its Carlson Federal "A" Well No. 2, located in Unit J, Section 23, Township 25 South Range 37 East, Lea County, New Mexico, as a triple completion (conventional) in the Paddock, Blinebry and Tubb-Drinkard Pools, the production of oil from each pool to be through parallel strings of 2-inch tubing.
- CASE 2379: Application of The Atlantic Refining Company for a triple completion, Lea County, New Mexico. Applicant, in the above-styled cause, seeks permission to complete its Langlie Federal Well No. 2, located in the NW/4 SE/4 of Section 12, Township 25 South, Range 37 East, Lea County, New Mexico, as an oil-oil-oil triple completion in an undesignated Paddock Pool and in the Justis-Blinebry and Justis Tubb-Drinkard Pools.

- CASE 2380: Application of Consolidated Oil & Gas, Inc. for a non-standard gas proration unit, San Juan County, New Mexico. Applicant, in the above-styled cause, seeks the establishment of a 320-acre non-standard gas proration unit in the Blanco Mesaverde and Basin Dakota Gas Pools comprising the NE/4 of Section 9, and the NW/4 of Section 10, all in Township 31 North, Range 13 West, San Juan County, New Mexico. Said unit is to be dedicated to applicant's Segal Well No. 1-9, located in the NE/4 NE/4 of said Section 9.
- CASE 2381: Application of Southwest Production Company for an order pooling all mineral interests in the Basin-Dakota Gas Pool in the E/2 of Section 22, Township 30 North, Range 12 West, San Juan County, New Mexico.
- CASE 2382: Application of Morris R. Antweil for a non-standard gas proration unit, Lea County, New Mexico. Applicant, in the above-styled cause, seeks the establishment of a 230.95-acre non-standard gas proration unit in the Eumont Gas Pool, consisting of Lot 4 in Section 1, and Lots 1, 2, 3, 7 and 8 in Section 2, all in Township 21 South, Range 35 East, Lea County, New Mexico. Said unit is to be dedicated to applicant's L. W. White Well No. 1, located in the NE/4 NE/4 of said Section 2.
- CASE 2383: Application of C. H. Sweet Oil Company for an exception to Rule 309-A, Lea County, New Mexico. Applicant, in the above-styled cause, seeks an exception to Rule 309-A to permit the oil produced from applicant's McKinley "B" lease, located in the SE/4 NE/4 of Section 20, Township 18 South, Range 38 East, Lea County, New Mexico, to be transported, prior to measurement on said McKinley "B" lease, to applicant's Grimes lease located in the NE/4 SE/4 of said Section 20.
- CASE 2384: Application of General American Oil Company of Texas, for an exception to Rule 309-A, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks an exception to Rule 309-A to permit the Loco Hills oil production from applicant's State Lease B-1778, located in Section 36, Township 17 South, Range 29 East, NMPM, Eddy County, New Mexico, to be transported, prior to measurement on said State Lease B-1778, to applicant's Federal Lease LC 060520, located in Section 31, Township 17 South, Range 30 East.

CASE 2385: Application of Texaco Inc. for a unit agreement and for a waterflood project, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval of the West Lovington Unit Agreement, covering 2,472 acres, more or less, in Townships 16 and 17 South, Range 36 East, Lea County, New Mexico. Applicant further seeks authority to institute a pool-wide waterflood in the West Lovington Pool by the injection of water into the San Andres formation through 18 wells in Sections 3, 4, 5, 6, 7, 8, and 9, Township 17 South, Range 36 East.

CASE 2386: Application of Continental Oil Company for the establishment of two non-standard oil proration units in the Empire-Abo Pool, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks the establishment of two non-standard oil proration units in the Empire-Abo Pool described as follows:

(1) Lot 2 and the Southernmost 12.06 acres in Lot 1, Section 30, Township 17 South, Range 29 East, Eddy County, New Mexico, comprising 40 acres. Applicant proposes to dedicate said unit to its State S-30 Well No. 1, 2310 feet from the North line and 330 feet from the West line of said Section 30.

(2) Lot 3 and the Northernmost 11.83 acres of Lot 4, all in said Section 30, comprising 40 acres. Applicant proposes to dedicate said unit to its State S-30 Well No. 3, to be drilled at a standard location in said unit.

CASE 2387: Application of Continental Oil Company for permission to dispose of salt water, Lea County, New Mexico. Applicant, in the above-styled cause, seeks permission to dispose of produced salt water from the Anderson Ranch Wolfcamp Pool into the Wolfcamp formation through its Anderson Ranch Unit Well No. 8, located 1980 feet from the South line and 660 feet from the East line of Section 11, Township 16 South, Range 32 East, Lea County, New Mexico.

Letter 377

KELLAHIN AND FOX
ATTORNEYS AT LAW
54 1/2 EAST SAN FRANCISCO STREET
POST OFFICE BOX 1713
SANTA FE, NEW MEXICO

YUCCA 3-9396
YUCCA 2-2991

JASON W. KELLAHIN
ROBERT E. FOX

August 28, 1961

Oil Conservation Commission
of New Mexico
Box 871
Santa Fe, New Mexico

Gentlemen:

Attached is the application of N. R. Williamson for approval of a water flood secondary recovery project in the Seven Lakes Pool, McKinley County, New Mexico; a copy of this application has been forwarded to the New Mexico State Engineer.

Yours very truly,

Jason W. Kellahin
JASON W. KELLAHIN

jwk:mas
enclosures 3
cc: State Engineer with enclosure

*Received
9/1/61*

OIL CONSERVATION COMMISSION

P. O. BOX 871
SANTA FE, NEW MEXICO

October 19, 1961

Kellahin & Fox
P. O. Box 1713
Santa Fe, New Mexico

Attention: Mr. Jason Kellahin

Gentlemen:

Enclosed herewith are two copies of Commission Order No. R-2095, entered in Case No. 2377, approving the N. R. Williamson Seven Lakes-MV Waterflood Project.

According to our calculations, when all of the proposed producing wells have been completed, and when all of the authorized injection wells have been placed on active injection, the maximum allowable which this project will be eligible to receive under the provisions of Rule 701-E-3 is 208 barrels per day.

Please report any error in this calculated maximum allowable immediately, both to the Santa Fe office of the Commission and the appropriate District proration office.

In order that the allowable assigned to the project may be kept current, and in order that the operator may fully benefit from the allowable provisions of Rule 701, it behooves him to promptly notify both of the aforementioned Commission offices by letter of any change in the status of wells in the project area, i.e., when active injection commences, when additional injection or producing wells are drilled, when additional wells are acquired through purchase or unitization, when wells have received a response to water injection, etc.

OIL CONSERVATION COMMISSION

P. O. BOX 871
SANTA FE, NEW MEXICO

-2-

October 19, 1961

Reilahn & Fox
P. O. Box 1713
Santa Fe, New Mexico

Your cooperation in keeping the Commission so informed
as to the status of the project and the wells therein will
be appreciated.

Very truly yours,

A. L. PORTER, Jr.,
Secretary-Director

ALP/DSH/esr
Enclosures

cc: Mr. Emory Arnold
Oil Conservation Commission
1000 Rio Brazos Road
Artec, New Mexico

Mr. J. E. Kapteina
Oil Conservation Commission
P. O. Box 871
Santa Fe, New Mexico

C
O
P
Y

BEFORE THE OIL CONSERVATION COMMISSION

STATE OF NEW MEXICO

IN THE MATTER OF THE APPLICATION
OF N. R. WILLIAMSON FOR APPROVAL
OF A WATER FLOOD PROJECT IN THE
SEVEN LAKES POOL, MCKINLEY COUNTY,
NEW MEXICO.

A P P L I C A T I O N

Comes now N. R. Williamson and applies to the Commission for approval of the injection of water in the Mesaverde formation, Seven Lakes Pool, Section 18 and 19, Township 18 North, Range 10 West, N.M.P.M., and for adoption of procedures for administration approval of extensions of the proposed water flood project and in support thereof would show:

1. That there is attached hereto, marked Exhibit A, and made a part hereof, a plat showing location of proposed injection wells and location of wells within a radius of two miles from said injection wells which said wells are producing from the Mesaverde formation. Said plat also indicates ownership of lands within the two-mile radius.

2. No log is available of the proposed injection wells since they have not been drilled.

3. Attached hereto, marked Exhibit B, and made a part hereof, is a description of the proposed wells' casing program.

4. It is proposed that water will be injected in the Mesaverde formation and what has been designated as zone "B" shown on the attached Exhibit B after casing has been set at a depth of approximately 337 feet as is more fully shown on Exhibit B. Water will be injected at the rate of approximately 500 barrels per day providing that the reservoir will take this

amount of fluid at a maximum pressure of 275 pounds.

(a) It is proposed to secure fresh water for injection purposes from a well located on the NW/4 NW/4 Section 20, Township 18 North, Range 10 West.

(b) It is proposed to, at a later date, inject water into the zone designated "A" on Exhibit B.

(c) In the event the water flood project proves successful, it is proposed to expand said project from time to time as further engineering practices and experience may indicate.

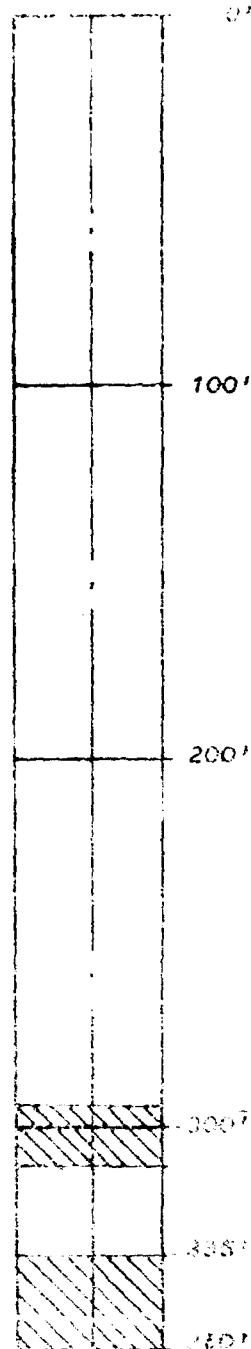
WHEREFORE, applicant prays that this matter be set for hearing before the Oil Conservation Commission or its duly appointed examiner; and that after notice and hearing, said project be approved and that in granting said approval, the Commission adopt procedures whereby administrative approval for the expansion of said project may be obtained without notice and hearing.

Respectfully submitted,

N. R. WILLIAMSON

By Jason W. Kellah
P. O. Box 1713
Santa Fe, New Mexico

ATTORNEYS FOR APPLICANT



This is a proposed completion of injection wells, to be installed for a water flood project in the Seven Lakes Pool

To drill a 2 7/8" hole and set 5 1/2" casing to approximate depth of 337 ft., which will be 2 feet in the Mesa Verde, which is the known pay sand in this area.

After running casing and cementing to surface, will drill plug and core sand and complete these wells as an open hole completion, which will be in the "B" ZONE

After completion is made on injection wells, I would at this time start injecting fresh water at the rate of approx. 500 bbls. per day, providing this reservoir will take this amount of fluid, with a maximum of 275 lbs. pressure.

The water supply will come from a well drilled to a depth of 2850 ft. in the NW 1/4 of the NW 1/4 of sec. 20, T. 18 N. R. 10 W. This well, at the time of plugging, the operator at that time ran 4 1/2" casing to a depth of 918 feet, which is the top of the lower water sand. This well flowed fresh water from approx. 950 feet to 1050 feet from the surface. I am sure this well will produce adequate water for this proposed flood. This water was tested at the time the well was drilled and flowing fresh water, analysis made at this time proved the water was adequate and compatible with oil from this reservoir, and would be sufficient for flooding purposes.

At a later date and adequately testing the "B" ZONE, either proving or disproving an effective or ineffective project on this zone.

If this project is effective, I would also attempt a water flood on the "A" ZONE

300' "A" ZONE 296 to 311

335' "B" ZONE 325 to 340

EXHIBIT "B"

Case 2277

OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO

Date

10/9

CASE

2377

Hearing Date

9 am 9/20

DSO @ SF

My recommendations for an order in the above numbered cases are as follows:

Enter an order authorizing N.R. Williamson
to put in a water flood in the Leon
Lakes Pool, McKinley Co, N.M.

Provide for injection into the MV formation
thru the following wells

Ferris No. 11-W 5' FSL + 720' FEL Sec 18, 18N, 10W
12-W 780' FSL 720' FEL 18-18-10
13-W 700' FSL 1330' FEL 18-18-10
14-W 1380' FSL 1380' FEL 18-18-10

Also authorize the following non-std locs. for
producers

Ferris #1 450' FSL 1050' FEL 18-18N-10W
#2 940' FSL 325' FEL 18-18N-10W
#3 260' FEL 400' FEL 18-18N-10W
#4 2320' FSL 2320' FEL 18-18-10W

Also provide for Administrative Expansion
of project area upon good cause
being shown. Project area is defined
as SW 1/4 SE 1/4 and SE 1/4 SE 1/4 of 18 + NE 1/4 NE 1/4 of 19

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
COMMISSION OF NEW MEXICO FOR
THE PURPOSE OF CONSIDERING:

CASE No. 2377
Order No. R-2095

APPLICATION OF N. R. WILLIAMSON
FOR PERMISSION TO INSTITUTE A
WATERFLOOD PROJECT IN THE SEVEN
LAKES POOL, MCKINLEY COUNTY, NEW
MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 o'clock a.m. on September 20, 1961, at Santa Fe, New Mexico, before Daniel S. Nutter, Examiner duly appointed by the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission," in accordance with Rule 1214 of the Commission Rules and Regulations.

NOW, on this 18th day of October, 1961, the Commission, a quorum being present, having considered the application, the evidence adduced, and the recommendations of the Examiner, Daniel S. Nutter, and being fully advised in the premises,

FINDS:

(1) That due public notice having been given as required by law, the Commission has jurisdiction of this cause and the subject matter thereof.

(2) That the applicant, N. R. Williamson, seeks permission to institute a waterflood project in the Seven Lakes Pool in an area defined in pertinent part as the S/2 SE/4 of Section 18 and the NE/4 NE/4 of Section 19, all in Township 18 North, Range 10 West, NMPM, McKinley County, New Mexico, by the injection of water into the Ferris Well No. 2-W, located 780 feet from the South line and 720 feet from the East line, and into the following described wells which are to be drilled at unorthodox locations:

Ferris Well No. 1-W, located 5 feet
from the South line and 720
feet from the East line,

Ferris Well No. 3-W, located 700 feet
from the South line and 1330
feet from the East line, and

-2-

CASE No. 2377
Order No. R-2095

Ferris Well No. 4-W, located 200 feet
from the South line and 1380
feet from the East line,

all in said Section 18.

(3) That the applicant further seeks approval of the unorthodox locations of the following-described producer wells in the project area:

Ferris Well No. 1, located 450 feet
from the South line and 1050
feet from the East line,

Ferris Well No. 2, located 940 feet
from the South line and 325
feet from the East line,

Ferris Well No. 3, located 260 feet
from the South line and 400
feet from the East line, and

Ferris Well No. 6, located 280 feet
from the South line and 2320
feet from the East line,

all in said Section 18.

(4) That the producing wells in the project area have reached an advanced state of depletion and should be classified as "stripper" wells.

(5) That the proposed waterflood project should be authorized and should be governed by the provisions of Rule 701 of the Commission Rules and Regulations, including those provisions regarding allocation of allowables; provided however, that the Secretary-Director of the Commission, upon the showing of good cause, should be authorized to approve the expansion of the waterflood project in 160-acre increments.

IT IS THEREFORE ORDERED:

(1) That the applicant, N. R. Williamson, is hereby authorized to institute a waterflood project in the Seven Lakes Pool in an area defined in pertinent part as the S/2 SE/4 of Section 18 and the NE/4 NE/4 of Section 19, all in Township 18 North, Range 10 West, NMPM, McKinley County, New Mexico, by the injection of water into the Ferris Well No. 2-W, located 780 feet from the South line and 720 feet from the East line, and into the following-described wells which are to be drilled at unorthodox locations:

Ferris Well No. 1-W, located 5 feet
from the South line and 720
feet from the East line,

-3-

CASE No. 2377
Order No. R-2095

Ferris Well No. 3-W, located 700 feet
from the South line and 1330
feet from the East line, and

Ferris Well No. 4-W, located 200 feet
from the South line and 1380
feet from the East line,

all in said Section 18.

(2) That the applicant is hereby authorized to locate the following-described producer wells at unorthodox locations in the project area:

Ferris Well No. 1, located 450 feet
from the South line and 1050
feet from the East line,

Ferris Well No. 2, located 940 feet
from the South line and 325
feet from the East line,

Ferris Well No. 3, located 260 feet
from the South line and 400
feet from the East line, and

Ferris Well No. 6, located 280 feet
from the South line and 2320
feet from the East line,

all in said Section 18.

(3) That the operation of the waterflood herein authorized shall be governed by Rule 701 of the Commission Rules and Regulations, including those provisions regarding allocation of allowables.

PROVIDED HOWEVER, That the Secretary-Director of the Commission, upon the showing of good cause, shall be authorized to approve the expansion of the waterflood project in 160-acre increments.

(4) That monthly progress reports of the waterflood project herein authorized shall be submitted to the Commission in accordance with Rule 704 and Rule 1119 of the Commission Rules and Regulations.

(5) That jurisdiction of this cause is retained for the entry of such further orders as the Commission may deem necessary.

-4-

CASE No. 2377
Order No. R-2095

DONE at Santa Fe, New Mexico, on the day and year herein-
above designated.

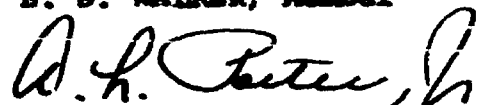
STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION



EDWIN L. MECHEM, Chairman



E. S. WALKER, Member



A. L. PORTER, Jr., Member & Secretary



esr/

CORE ANALYSIS

W. C. CAPRON & N. R. WILLIAMSON

J. Ferris Lease

Well Exploration "A"

9/11/11

BEFORE EXAMINER NUTTER
OIL CONSERVATION COMMISSION
EXHIBIT NO. <u>2</u>
CASE NO. <u>2327</u>

McKinley County, New Mexico

RYDER SCOTT COMPANY
PETROLEUM ENGINEERS
WICHITA FALLS, TEXAS

FEATHERSTON BUILDING
922 EIGHTH STREET

RYDER SCOTT COMPANY
PETROLEUM ENGINEERS

WICHITA FALLS, TEXAS

TELEPHONE
723-7119

COMPANY W. C. Capron & N. R. Williamson

LEASE J. Ferris WELL NO. Expl. A FORMATION Mesa Verde Sand

COUNTY McKinley STATE New Mexico DATE 2/6/61

CORE CHART

VERTICAL SCALE 5" = 100'

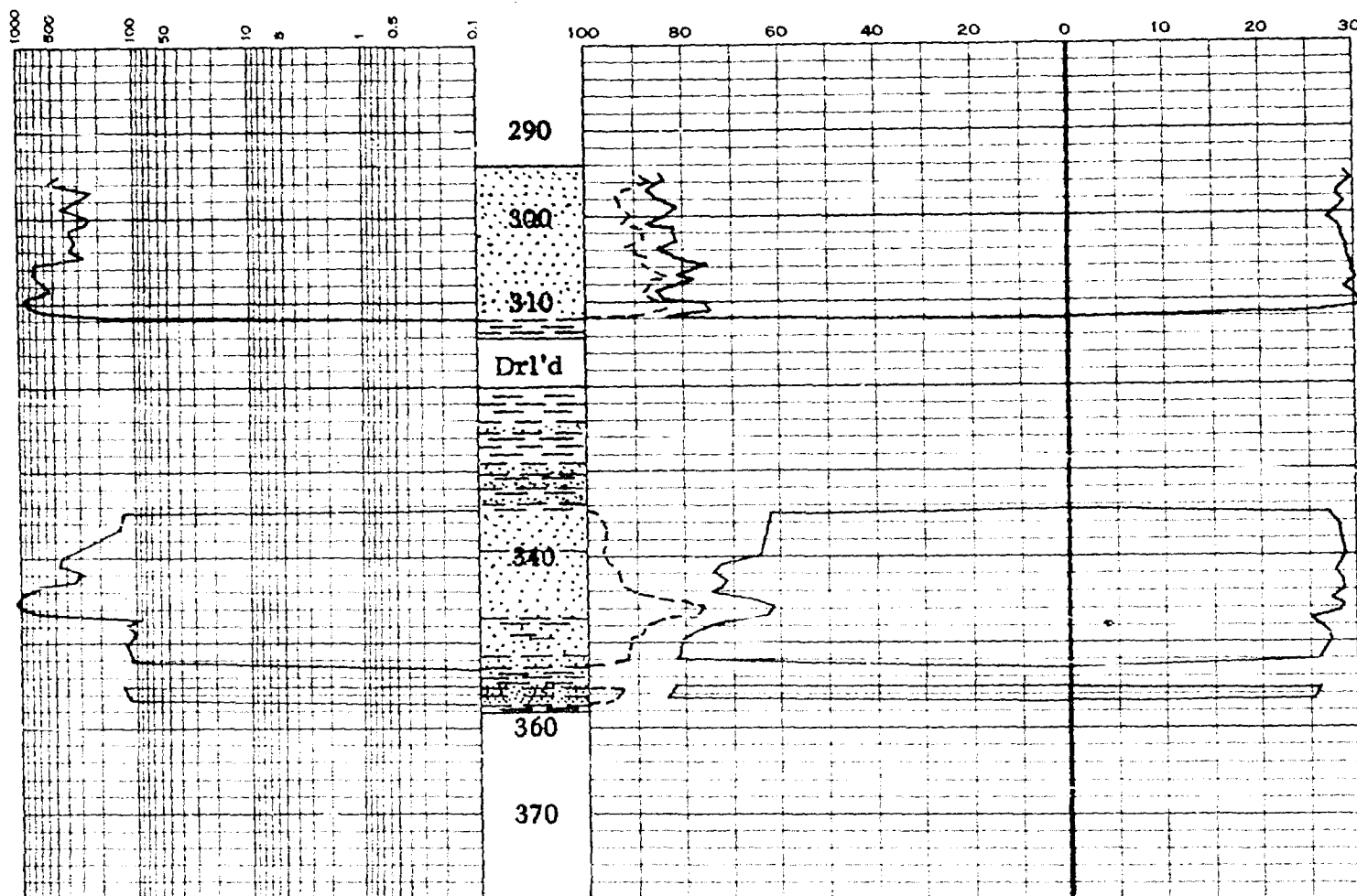
RESIDUAL OIL SATURATION - - -
% PORE SPACE

0 20 40 60 80 100

PERMEABILITY
MILLIDARCIES

TOTAL WATER SATURATION ———
% PORE SPACE

EFFECTIVE
POROSITY
PERCENT



AVERAGES: POROSITY 28.1 % RESIDUAL OIL SATURATION 10.4 %
PERMEABILITY 463 MD TOTAL WATER SATURATION 77.8 %

RYDER SCOTT COMPANY
PETROLEUM ENGINEERS

WICHITA FALLS, TEXAS

COMPANY W. C. Capron & N. R. Williamson INTERVAL CORED 294' - 314' and 320' - 358'
 LEASE J. Ferris WELL NO. Expl. A CORE LOSS INTERVAL None Reported
 LOCATION 660' FSL & 1315' FEL, Sect. 18, FORMATION Mesa Verde Sand
T18N, R10W TYPE OF CORE Rotary (Air & Water)
 COUNTY McKinley STATE N. Mex. DATE CORED 1/28/61 ELEVATION 6508
 REMARKS _____

CORE ANALYSIS DATA

SAMPLE NUMBER	DEPTH FEET	EFFECTIVE POROSITY %	PERMEABILITY MILLIDARCIES	SATURATION		PROBABLE PRODUCTION	REMARKS
				OIL %	WATER %		
1	295.4	29.0	455.	10.3	86.2		Upper zone (Samples Nos. 1 - 19)
2	296.1	29.5	563.	12.3	85.5		
3	297.0	28.2	229.	7.4	88.4		
4	297.8	27.9	304.	6.2	85.3		
5	299.0	28.9	428.	7.3	81.7		
6	299.9	27.9	246.	9.1	84.0		
7	300.7	26.8	278.	7.8	87.9		
8	301.6	27.9	366.	11.0	82.0		
9	302.9	28.3	323.	11.0	81.7		
10	303.9	28.4	364.	7.3	86.6		
11	304.9	28.5	287.	12.1	81.3		
12	305.7	29.6	715.	11.6	75.3		
13	306.6	29.8	724.	16.9	81.1		
14	307.6	30.3	622.	13.4	78.2		
15	308.5	28.9	547.	11.4	87.4		
16	309.3	30.4	897.	12.7	85.0		
17	310.1	31.0	833.	15.0	75.5		
18	310.9	30.6	732.	16.3	74.9		
19	311.8	26.1	188.	10.3	84.0		
20	335.6	27.2	139.	2.4	63.5		Lower zone (Samples Nos. 20 - 37) Samples 20, 21 and 22 selected in Ryder Scott laboratory on 2/1/61.
21	337.0	27.9	145.	4.4	64.1		
22	339.9	28.4	428.	4.1	64.8		

COMPANY W. C. Capron & N. R. LEASE AND WELL NO. J. Ferris Expl. A PAGE NO. 2
Williamson

CORE ANALYSIS DATA

SAMPLE NUMBER	DEPTH FEET	EFFECTIVE POROSITY %	PERMEABILITY MILLIDARCIES	SATURATION		PROBABLE PRODUCTION	REMARKS
				OIL %	WATER %		
23	341.2	28.1	445.	4.6	72.9		
24	341.9	27.7	279.	5.7	74.6		
25	342.7	28.3	342.	5.8	71.8		
26	343.3	28.4	675.	6.2	72.5		
27	344.2	28.4	841.	8.1	74.1		
28	344.9	27.3	1510.	17.3	66.6		
29	345.5	28.0	1667.	23.8	62.4		
30	346.2	27.5	679.	22.4	63.8		
31	347.1	25.0	90.	16.1	70.4		
32	348.0	25.7	130.	11.7	75.7		
33	349.1	27.0	106.	10.6	79.2		
34	350.4	27.2	148.	8.8	80.6		
35	352.0	26.1	127.	8.8	82.1		
36	355.5	26.2	146.	7.1	82.6		
37	356.7	25.7	118.	6.3	84.3		

Cored formation from 398' - 407' and from 447.7' - 453.7' was also received, however, ultra violet light revealed no oil shows, therefore, it was not analyzed.

EXPLANATION OF CORE CHART

The results of the core analysis are shown on the graph sheet which has a vertical scale of 5 inches = 100 feet. This is the conventional scale of electrical logs.

At the base of the core chart the arithmetical average values of effective porosity, permeability, oil saturation and water saturation are listed. These average values include only those which are predicted as productive of oil.

REPORTING OF CORE ANALYSIS

The report is a brief form to furnish measured values of the effective porosity, the permeability, the oil saturation and the water saturation.

Recovery values are reported in our complete core analysis report which is furnished when a detailed study of the core for valuation purposes is requested by the client.

OIL AND WATER SATURATIONS

The oil and water saturation values are measured and calculated as percent of the effective pore space or void space of the rock. Coring operations usually alter the saturations from their natural reservoir values, therefore these measured values should be used only with proper interpretation.

PRICE SCHEDULE

Per Sample Analyzed

1 thru 10	\$7.50
11 thru 20	7.25
21 thru 30	7.00
31 thru 40	6.50
41 thru 50	6.00
51 or more	5.00

Estimates of primary and secondary oil recovery are available with this report at an additional charge of \$0.50 per test.