BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO

IN THE MATTER OF:

CASE 1849: **Application of Western Natural Gas Company for an exception to the overproduction shut-in provisions of Order R-520, as amended by Order No. R-967 for 3 wells in the Jalmat Gas Pool.**

TRANSCRIPT OF HEARING

JANUARY 6, 1960

BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
JANUARY 6, 1960

IN THE MATTER OF:

CASE 1849 Application of Western Natural Gas Company for an exception to the overproduction shut-in provisions of Order R-520, as amended by Order No.R-967: for 3 wells in the Jalmat Gas Pool. Applicant, in the above-styled cause, seeks an order permitting the following-described gas wells in the Jalmat Gas Pool, Lea County, New Mexico, to compensate for their overproduced status without being completely shut-in in order to prevent possible waste.

Wells Federal No. 1 Well, SW/4 NE/4 of Section 6, T-26-S, R-37-E.

Guthrie No. 1 Well, SW/4 SE/4 of Section 34, T-23-S, R-36-E.

State McDonald A-15 Well No. 1, NW/4 SW/4 of Section 15, T-22-S, R-36-E.

BEFORE:

Daniel S. Nutter, Examiner.

TRANSCRIPT OF PROCEEDINGS

MR. NUTTER: We will take Case No. 1849.

MR. PAYNE: Case 1849. Application of Western Natural Gas Company for an exception to the overproduction shut-in provisions of Order R-520, as amended by Order No. R-967, for 3 wells in the Jalmat Gas Pool.

MR. COOLEY: William C. Cooley of Burns & Cooley, Farmington, New Mexico, appearing on behalf of the Western Natural Gas Company. We have one witness, Mr. Scott.

(Witness sworn)

W. B. SCOTT,

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

DIRECT EXAMINATION

BY MR. COOLEY:

Q Mr. Scott, will you state your full name to the Commission, please?

A W. B. Scott.

Q Where do you reside, Mr. Scott?

A Midland, Texas.

Q What is your occupation?

A Petroleum production engineer.

Q By whom are you employed?

A Western Natural Gas Company.

Q Do you hold any degrees of higher education?

A Yes. I graduated from the University of Texas in 1958 with a B. S. in petroleum engineering.

Q Will you briefly outline your experience since graduation?

A I was employed by Western Natural Gas in Houston, and transferred to Midland, Texas division office, and assigned to the

engineering department as a production engineer. I received training in the field on completions and workovers and testing various wells.

Q Mr. Scott, does the area of Lea County, New Mexico fall within your geographical area of supervision?

A Yes, it does.

Q In particular, does the Jalmat Gas Pool fall within your supervision?

A Yes, it does. I'm in charge of production in the Jalmat and also oil production in Lea County.

Q Mr. Scott, does Western Natural Gas Company own a gas well in the Jalmat Gas Pool of Lea County, New Mexico known as the Wells Federal No. 1?

A Yes, they do.

Q Have you prepared a plat showing the location of this well and the offsetting leases?

A Yes, I have.

(Thereupon, Applicant's Exhibit No. 1 was marked for identification.)

Q I hand you what has been marked for purposes of identification Exhibit No. 1, and ask you if this is a plat to which you refer?

A Yes, it is.

Q Will you briefly explain the significance?

A The area shown, shaded in yellow, is the designated

acreage to the Wells Federal No. 1 circled in red.

Q What is the location of the well with respect to the section lines?

A You mean the footages?

Q Yes.

A I don't have the footages indicated here on the plat.

Q What quarter-quarter section is it in?

A It is in the SW of the NW/4 of Section 6, Township 26 South, Range 37 East.

Q Do you have the well history on that well, Mr. Scott?

A Yes, I do.

Q Would you briefly outline the history of this well?

A The well was completed October 19 of 1939 at a TD of 3540. It was shot from 3416 to 3505. It tested 75 barrels of fluid, 95 percent salt water. It was then plugged back to 3530; tested 27 barrels of fluid with 30 percent salt water. It was then plugged back to 3395, treated with a thousand gallons of acid, and tested 20 barrels of fluid with 40 percent salt water. It was then plugged back to 3370, perforated from 2830 to 3150, and tested fifteen million cubic feet of gas per day.

Q Has this well been on proration in the Jalmat Gas Pool since they instituted proration there?

A Yes, sir, it has.

Q Are you aware of its present status with regard to proration?

A Present status. It was shut-in -- it was shut-in September the 4th, 1959.

Q For what reason?

A Due to overproduction.

Q And what is the amount of overproduction at this time, or as of January 1st, 1960?

A It is overproduced in the amount of sixty-five million five hundred and seventy-one thousand MCF, and it has been shut-in since January 4th, 1959. As of December the 19th it was slightly over seven months overproduced.

MR. NUTTER: Since when?

A September the 4th, 1959.

Q (By Mr. Cooley) This well was voluntarily shut-in when it was realized by your company and El Paso Natural Gas Company that the well was substantially overproduced?

A That is correct.

Q In relating the well history of the Wells Federal No. 1, I note that you make several references to the occurrence of salt water in this well throughout the producing life. Has there been any water problems experienced?

A Well, when the well is subjected to prolonged shut-in periods, it is necessary to swab the water off and return the well to production.

Q You mean a minor type of workover is required before it can be put back on production?

A That is right.

Q Do you have any idea how long a period of time is necessary for appreciable quantities of water to accumulate in the well bore of the Wells Federal No. 1?

A No, I don't, but as of the test that we ran a pressure survey in December -- excuse me -- that was November of 1959 -- it indicated that we had seven hundred and seven feet of fluid, which would amount to seventy-four days total shut-in.

Q Then after seventy-four days of shut-in, you accumulated seven hundred and seven feet of fluid in the well bore?

A That's right.

Q What type of test was this to which you refer, that was taken on November 17th, 1959?

A It was bottom hole pressure survey run on a wire line.

Q How is it possible to ascertain the liquid level in a well bore by pressure survey?

A Well, the pressure is measured at various depths, and when there is an increase in the density of fluid or medium, then there is an increase in pressure, and by plotting these points of pressure versus depth, you can determine where the liquid level of the well is.

Q Have you prepared an Exhibit which sets forth the results of the pressure survey to which you refer?

A Yes, we have.

(Thereupon, Applicant's Exhibit No. 2 was marked for identification.)

Q I hand you what has been marked for identification purposes Exhibit No. 2, and ask you if this is the plat and Exhibit to which you refer?

A That is correct.

Q Would you in some detail explain the significance of this Exhibit?

A This survey was run by Coleman Engineering Survey, Hobbs, New Mexico on the Wells Federal No. 1, Lea County, New Mexico. It shows that the pressure is plotted as the abscissa and also the ordinate as the depth. The various pressures were plotted, and as you can see, from 2500 to 3000 feet, that there is quite an increase in gradient and slope of the curve, resulting in an intersection of the two at 2663 feet, which is the indicated top of the fluid.

Q Now, to go into some more additional detail, into the manner in which this test reflects the presence of liquid at a given level in this well, can it be correctly stated that the .004 gradient, shown at the first four levels where pressure tests were taken, would indicate the presence of gas?

A Yes, it would.

Q And that as we proceed to the sharply increased gradient at the three thousand foot test, it must necessarily be something other than gas, some type of fluid?

A That is correct.

Q Are you aware of whether the type of water that is produced from the Wells Federal No. 1 is of a salient nature?

A I think it is of a corrosive nature, but I have no test or water analysis to prove it is definitely saline.

Q But you feel it is definitely of a corrosive nature?

A I think there is a possibility.

Q Of the various types of fluids that could possibly be present in the well bore, would it be correct to state that this water would be the heaviest, thus fall to the bottom?

A That is true. In this case here I believe that water would naturally be on the bottom, and if there is oil or fluid, it would be immediately above the water.

Q Thus, the corrosive water present in this well would be on at least a portion of the perforations and the well bore?

A That is correct.

Q Can you state as a professional petroleum engineer as to what your opinion would be as to the possibilities of causing waste and damage to the well bore as a result of permitting such quantities of liquid and particularly the corrosive water to which you testified, to stand on the well bore of the Wells Federal No. 1 for any prolonged period of time?

A Yes, I think there is a good possibility that waste would occur if water was allowed to stand in the well bore for a prolonged period of time.

Q Could you be somewhat more detailed in the manner and types of waste and the ways in which it could come about as a result of permitting this liquid to stand on the well bore?

A There is a possibility of swelling, to a more or less degree, depending on the type of reservoir that you would have, but it is our general opinion along with other operators that to keep water off of the formation is by far the best idea.

Q Well, assuming that swelling did take place in the reservoir, would it have any effect upon the ultimate recovery from the well?

A I believe that there is the possibility that you might decrease your permeability due to this and thereby decrease your production ultimately.

Q Are there any other possibilities or hazards caused by permitting water to stand on the well bore?

A Other than this corrosion, there may be remedial work necessary and cause premature abandonment of the well and undue necessary expense.

Q This is corrosion of what, Mr. Scott?

A Of the casing or the tubing and anything that the salt water would be in contact with, insofar as the well.

Q Again, will you state for the record when this well was drilled?

A It was drilled in December of -- excuse me -- October 19, 1959.

Q And is there considerable probability that this casing has deteriorated simply from age, to a certain degree?

A I think there is a possibility.

Q And does the age combined with this hazard-- or of corrosive liquid standing in the casing, increase this hazard?

A I believe it does, yes.

Q In the event that sufficient quantities of liquid should accumulate in the well bore, such as to necessitate a workover, are there any hazards involved in this type of activity?

A Hazards? I don't believe I understand.

Q Hazards of losing the well or possibly damaging the well bore as a result of having to work the well over?

A Well, there would be considerable expense in going in and trying to replace the casing, and if necessary, the expense would be more than the economic limit of the well, and, therefore, result in waste and abandon the well prematurely to replace this casing.

Q Mr. Scott, do you have any idea as to what amount of fluid or what amount of gas would be necessary to alleviate this problem in the Wells Federal No. 1?

A Well, due to large quantities of water present, I believe that fifty percent of the allowable would be enough to keep the well bore clear of fluid.

Q Do you feel that would be the minimum that you could reasonably expect to keep the well bore clear?

A At this time I believe that that would be possibly the minimum.

Q While producing this well at top allowable, have you encountered any water problems throughout its producing history?

A I believe there is water present, but by shutting the well in as we have, it was brought to our knowledge here that we had larger quantities present than we thought we had.

Q Are you aware of what the December allowable for this well was in 1959?

A I believe so. Nineteen million one hundred fifty-five thousand MCF.

Q Assuming that you were permitted to produce at fifty percent of this rate until such time as the overproduction was compensated for, approximately how long would it take to make up the well's present overproduction?

A (No response)

Q Do you understand the question?

A About seven months, I believe.

Q Is it your professional opinion that there is more than seven months of productive life remaining in the particular area of the Jalmat Gas Pool in which the Wells Federal No. 1 is located?

A I think there is, yes, sir.

Q In view of this fact, do you feel that the granting of this application could in any way impair the correlative rights

of offset operators?

A No, I don't think it would impair them.

Q Do you feel that the granting of this application could in any way cause waste?

A No, I don't believe that it would cause waste.

Q Do you hold the opinion that waste will be caused if this application is not granted?

A Yes, I do.

MR. COOLEY: Mr. Examiner, we offer into evidence Exhibits 1 and 2 in this case.

MR. NUTTER: Western's Exhibits Nos. 1 and 2 will be entered.

(Whereupon, Western's Exhibits Nos. 1 and 2 were received in evidence.)

MR. COOLEY: We have no further questions on direct.

CROSS EXAMINATION

BY MR. PAYNE:

Q Mr. Scott, is this well located to the flange of the pool down dip from a structural high?

A It is located in an area where there -- there are water problems in the immediate area, yes.

Q Which particular operators do you have in mind?

A Jal Oil and El Paso.

Q Now, you say that you do have water problems even when you produce this well at normal allowable rates, is that right?

A I imagine that we do, yes.

Q Well, have you found it necessary to unload the liquids when you are producing the well normally?

A In the past, if the well is shut-in for any length of time, we have had to swab the well in order to return it to production.

Q To your knowledge, when you swabbed the well, did you materially damage the formation?

A Well, the well wasn't going to be shut-in for any extended length of time. For a short period, I don't think that it would perhaps damage it as much as the extended length of time.

Q Would it be feasible to unload the liquids in this well daily and then produce it? Let me ask you this, is this well tubed?

A Is this well what, sir?

Q Tubed?

A Tubed? Yes, it is.

Q Does it have a blow down string?

A No, it does not.

Q Now, could you unload the liquids from this well daily and then produce the well?

A Unload the liquids daily and then produce the well?

Q And then shut the well in?

A We haven't tested it to that nature, so I couldn't say definitely whether we could or not.

Q Now, is there any possibility that there is a correlation between the amount of water that this well makes and the depth of the perforations?

A Through the production history, as the well was completed originally, and due to the continuous plug-back operation, I believe that -- yes, there is a chance that the water is coming possibly from a lower part of the perforations.

Q Would it be feasible to control your water problem by plugging this well back?

A It would be feasible, yes.

Q But would you have as good a producing well if you did, from the standpoint of gas production?

A Well, I couldn't state whether it would be better or not, but --

Q Do you feel you are getting any gas from these lower perforations?

A I feel we are.

Q If you plug it back, in all probability you would get less gas, wouldn't you?

A In proportion, yes.

MR. PAYNE: That's all. Thank you.

MR. NUTTER: Any further questions?

QUESTIONS BY MR. UTZ:

Q Mr. Scott, have you run any field tests to determine minimum volume of the flow you would have to have to keep this well

clear of liquids?

A No, sir, we haven't.

Q Would you object to doing that when you get the well back on the line?

A No, sir, we would not.

MR. UTZ: That's all.

QUESTIONS BY MR. NUTTER:

Q You said after the well had been shut-in for seventy-four days you had seven hundred and some odd feet of liquid in the hole, --

A Seven hundred and seven.

Q -- now, you don't know whether that was a stabilized fluid level or whether it was still building up?

A That's right. We do not know whether it was stabilized at that time or not.

Q Now, as you were reading off those various tests that you took, the last one that you -- you know this was when you were completing the well and plugging it back -- the last one that you read was 20 barrels of fluid and 40 percent of water. What was the interval?

A 20 barrels of water and 40 percent --

Q 20 barrels of fluid, 40 percent water, that was the last one prior to the one where you had the fifteen million. What was the interval?

A Plug-back depth was -- 3395 was the plug-back depth.

Q Now, did the well have casing in it at the time?

A Yes. It is cased to 3381 with seven inch casing.

Q So, what was that, an open hole, then, from 3381 to 3395?

A That is correct.

Q Okay. Now, your next test yielded fifteen million cubic feet of gas, --

A That's correct.

Q -- what was that perforated interval?

A 2830 to 3150.

Q In other words, it was a good two hundred and thirty-one feet, at least, higher than the previous high perforations?

A From 31 -- that is pretty close, yes.

Q Did this gas test that yielded fifteen million cubic feet of gas show any water?

A Well, sir, our records on this particular well are rather old **from** back in '39, and I couldn't find any other data on that particular test other than this figure which was written in the completion history.

Q What has been the average daily rate of production from the well prior to the time you shut it in, in September?

A It varies somewhat.

Q Do you have daily rates of production or monthly rates?

A Monthly rates.

Q Would you give us, say, the last six months of production?

A Is that up to September?

Q Up to September, yes, sir.

A All right. For April it would be 50,390 MCF; 11,429; 2,625; 7,111, 7,118. In September it was 1,535.

MR. COOLEY: Is that September production just four days?

A Evidently; the well was shut-in on September 4th.

Q (By Mr. Nutter) Now, none of those are as high as the allowable for the month of December, or even close to it, except April, is that correct?

A That is correct.

Q What about the other three months there in 1959, January and February and March?

A January, eight million six hundred and forty-eight. February was forty-three million, three hundred and eight. March was fifty-two million and fifty-five.

Q Fifty-two --

A Fifty-two thousand and fifty-five.

Q Fifty-two zero fifty-five, then?

A Right, and fifty thousand three hundred and ninety.

Q So it looks like February, March and April is what got you in trouble, correct?

A Yes, sir.

Q Now, during the month of June, you produced two thousand six hundred and twenty-five MCF, correct?

A Two thousand six hundred, that is correct.

Q Now, do your records indicate that you had to get a swabbing unit during that month to swab that well?

A No, sir, our records do not indicate that.

Q So maybe fifty percent of the allowable wouldn't be necessary to keep the well from being water-logged?

A It is possible it might not take that much. However, until we could test the well and find out exactly how much, then that is the figure that we will have to assume.

Q Do the logs show any record of any bentonitic material present in the well here, or any other similar materials that swell up when water --

A Well, sir, we don't have any logs on this well or any core analysis data, so I don't think we could state that there has been any material in the sand, but as we -- as I stated before, we tried to keep the water off of it, just in case there is that possibility.

Q But you don't have any evidence that the reservoir or the sand would swell up if water were present?

A No direct knowledge, no.

Q Water will probably be there whether you had the well shut-in or not; it would be moving through the sand, wouldn't it?

A If the well were shut-in, I don't imagine it would be

moving.

Q If the well were producing, the water would be present anyway, wouldn't it?

A Yes, sir.

MR. NUTTER: Does anyone have any further questions of the witness?

QUESTIONS BY MR. PAYNE:

Q Has your company considered the possibility of installing a pump jack on this well --

A No, sir, I don't believe we have explored that.

Q -- such as Mr. Olson has done on some of his wells in the immediate area?

A No, sir, I don't believe so.

QUESTIONS BY MR. NUTTER:

Q Would you check your service company records and find out if you did have to have a pulling unit out there in the month of June and let us know, or a swab unit?

A I certainly will.

MR. NUTTER: Any further questions of the witness?

MR. COOLEY: I have two questions on redirect examination.

MR. NUTTER: Mr. Cooley.

REDIRECT EXAMINATION

BY MR. COOLEY:

Q Mr. Scott, you testified on cross examination that Jal

Oil Company and El Paso Natural Gas Company had encountered similar problems in this area. Are you aware of whether they have applied for and obtained similar relief, as requested here?

A Yes, sir, they have applied, and I believe they have gotten relief.

Q In answer to a question by Mr. Nutter, you stated that you were unable to say as to whether this seven hundred and seven foot fluid level, which you encountered on November 17, 1959, was a stabilized fluid level. Have you calculated it mathematically, the pressure that would be obtained, or the level that would be obtained, assuming an extrapolated bottom hole pressure?

A You mean the level in the tubing?

Q Yes. What is your estimated bottom hole level on this well?

A According to extrapolation, the pressure is four hundred and ninety pounds.

Q Assuming that to be the true bottom hole pressure, would you have a stabilized level greater than seven hundred seven feet?

A I don't believe I understand --

Q Would the pressure of four hundred and ninety feet drive a hydraulic head higher than seven hundred and seven feet?

A No, it would not.

Q It would not?

A I must be confused with the question.

Q Let's start over. Assuming a given bottom hole pressure and assuming that you have a given density of fluid, --

A That's right.

Q -- is it possible to ascertain how far up the well bore this pressure will drive that fluid?

A Yes, it is.

Q Have you attempted to calculate what that is, assuming four hundred ninety pound bottom hole pressure?

A I haven't calculated it, no, sir.

Q Can you quickly calculate what that would be?

A I think so. Assuming this gradient of this water here?

Q Yes, please.

MR. PAYNE: Mr. Cooley, while your witness is making up the computation, do you propose to amend your application, excluding the Guthrie No. 1 and State McDonald A-15 Well?

MR. COOLEY: At the close of this witness' testimony I propose to amend our application, Mr. Payne.

MR. PAYNE: All right, sir.

A I will have to extrapolate this to get the pressure.

MR. NUTTER: Mr. Scott, if you desire, you could give us that information at the same time you submit the report on whether you had any swabbing units out there in the month of June, and I think you will be able to tell whether there was a stabilized level or not, probably.

MR. COOLEY: We will submit that information. I have

no further questions of this witness.

MR. NUTTER: The witness may be excused.

(Witness excused)

MR. NUTTER: Do you have anything further to offer, Mr. Cooley?

MR. COOLEY: No further evidence to offer. However, I would at this time, Mr. Examiner, move the Commission to permit us to amend our application in this case, to delete therefrom the portions of the application which request relief for the State McDonald A-15 No. 1 Well in Section 15 of Township 22 South, Range 36 East, NMPM, and similarly to delete that portion of our application which requests relief for the Guthrie No. 1 Well in the SW/4 of the SE/4 of Section 34, Township 23 South, Range 36 East, NMPM.

MR. NUTTER: And you wish to dismiss those two wells?

MR. COOLEY: To delete that portion of the application.

MR. NUTTER: It shall be done. Does anyone have anything further they wish to offer in Case 1849? We will take this case under advisement and the hearing is adjourned.

STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

I, J. A. Trujillo, 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 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 15th day of January, 1960, in the City of Albuquerque, County of Bernalillo, State of New Mexico.

J. A. Trujillo
NOTARY PUBLIC

My Commission Expires

October 5, 1960

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 1849, heard by me on 1-6, 1960.

J. A. Trujillo, Examiner
New Mexico Oil Conservation Commission