

BEFORE THE
OIL CONSERVATION COMMISSION
STATE OF NEW MEXICO

The following proceedings before the Oil Conservation Commission, State of New Mexico, came on pursuant to legal notice of publication, and at the time and place as set out below.

NOTICE OF PUBLICATION
STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

The State of New Mexico, by its Oil Conservation Commission hereby gives Notice pursuant to law of the following public hearing to be held April 18, 1949, beginning at 10:00 o'clock A. M. on that day in the City of Santa Fe, New Mexico in the Senate Chambers.

STATE OF NEW MEXICO TO:

All named parties to the following case
and Notice to the Public:

CASE NO. 180

In the matter of the application of American Republics Corporation for an order granting permission to drill eight unorthodox locations, on its Robinson "A" and "B" leases, located in sections 27, 34 and 35, Township 17 South, Range 29 East, N. M. P. M., in the Grayburg Jackson pool of Eddy County, New Mexico, and for permission to unitize certain tracts for proration and allowable purposes.

Given under the seal of the Oil Conservation Commission of New Mexico, at Santa Fe, New Mexico, on April 1, 1949.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

BY (Signed) R. R. Spurrier
R. R. SPURRIER, Secretary

(SEAL)

BEFORE: Hon. R. R. Spurrier, Secretary and Member

REGISTER:

John E. Cochran, Jr., Artesia, N.M., for American Republics Corporation.

William B. Macey, Artesia, New Mexico, for American Republics Corporation.

M. O. Krouskop, Hobbs, New Mexico, for Lea County Operators.

Frank C. Barnes, Santa Fe, New Mexico for Oil Conservation Commission.

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Elvis A. ~~Fitz~~, Santa Fe, New Mexico for Oil Conservation Commission.

H. G. Ellis, Artesia, New Mexico for Buffalo Oil Company

George A. Graham, Santa Fe, New Mexico for Oil Conservation Commission.

COMMISSIONER SPURRIER: Let us consider that the Commission is open for formal hearing in the absence of the other two Commissioners or either one of the other two. The minutes of the Commission will show that I have been instructed to sit as an examiner and I will sit for the purpose of taking the record only.

Mr. Graham, will you read the advertisement for the first and only case?

(Reads the notice of publication in Case No. 180)

COMMISSIONER SPURRIER: Mr. Cochran, you are appearing, I assume, for American Republics Corporation?

A. Yes, I am and we also have Mr. William B. Macey and Mr. M.O.Krouskop.

Mr. COCHRAN: Mr. Spurrier, American Republics Corporation owns certain producing properties in The Grayburg-Jackson Pool of Eddy County, New Mexico and among the properties owned by that company are what is designated as the Robinson "A" lease which

is described as follows, to-wit:

ROBINSON "A" LEASE, Las Cruces Serial No. 028775(a), described as SE $\frac{1}{4}$ Section 27, NE $\frac{1}{4}$ Section 34 and W $\frac{1}{2}$ NW $\frac{1}{4}$ Section 35, Township 17 South, Range 29 East, N.M.P.M., in Eddy County, New Mexico, and containing 400 acres;

and the

ROBINSON "B" LEASE, Las Cruces Serial No. 028775(b), described as NE $\frac{1}{4}$, E $\frac{1}{2}$ NW $\frac{1}{4}$ and E $\frac{1}{2}$ SW $\frac{1}{4}$ Section 27, E $\frac{1}{2}$ and E $\frac{1}{2}$ W $\frac{1}{2}$ Section 35, Township 17 South, Range 29 East, N.M.P.M., and containing 800 acres.

The Robinson "A" lease consists of 400 acres and the Robinson "B" lease consists of 800 acres. Both of these leases are producing leases. American Republics Corporation makes this Application to drill eight (8) unorthodox, "five spot" locations on these two leases - four of these locations to be on each of these leases and American Republics also makes application to create, for proration and allowable purposes, three units. Now, in the drilling of these unorthodox locations, it is not American Republic's intention, nor do they ask that they be granted any additional allowable from these wells or the unit tract upon which the wells are located but, they would simply produce the total allowable as fixed by the Commission for the total number of developed forty acre units from the total number of wells on the three proration units. And, after the completion of these "five spot" wells, at no time, would any well, located upon these units, be permitted to produce in excess of the top allowable as set by the Commission.

We have a witness, Mr. Macey, we would like to have sworn.

(Witness sworn)

William B. Macey, having been first duly sworn, testified as follows:

DIRECT EXAMINATION BY MR. COCHRAN:

Q. State your name.

A. William B. Macey

Q. Whom do you represent?

A. I represent American Republics Corporation.

Q. In what capacity?

A. As Division Engineer in New Mexico.

Q. As Division Engineer in New Mexico, are you familiar with the Robinson "A" and "B" leases and the wells located on these leases?

A. Yes, sir.

Q. Mr. Macey, have you testified before the Commission before?

A. Yes, I have.

Q. Mr. Spurrier, do you accept Mr. Macey's qualifications?

A. Yes, I do.

MR. COCHRAN: Mr. Macey, I hold here what is "Applicant's Exhibit No. 1". Now, is that the same map - is the map which you hold identical to the map which Mr. Spurrier has before him?

A. Yes, it is the same with the exception that the unit areas are not outlined.

MR. COCHRAN: Will you, Mr. Macey, point out, in the map which Mr. Spurrier has, marked "Exhibit "A", the location of your Robinson "A" and "B" leases?

Mr. Macey points out the leases on the map held by Mr. Spurrier and states that the "A" lease comprises 400 acres and the "B" lease comprises 800 acres.

Q. Mr. Macey, are both of these leases federal leases.

A. Yes, sir.

Q. Mr. Macey, how many wells have been drilled on the "A" lease?

A. We have drilled a total of eleven (11) wells, of which ten

are producing at the present time.

Q. What happened to the other well?

A. The other well was abandoned at the end of 1948 due to the mechanical defects in the well.

Q. I notice that on Mr. Spurrier's map no notation is made as to the abandonment of Well No. 2. Will you make a notation on there to the affect that there is temporary abandonment?

(Mr. Macey makes such a notation)

Q. Now, Mr. Macey, how many wells have been drilled on the "B" lease?

A. A total of twenty (20) wells have been drilled on the "B" lease.

Q. How many of these wells are producing?

A. Of the twenty (20) wells drilled, eighteen (18) are producing. Two of them being wells which are producing from the Grayburg-Keely zone and the remaining of the wells are producing from the upper San Andres formation.

Q. What is the spacing pattern that these wells are drilled on?

A. The Grayburg-Jackson wells are drilled as center locations in each forty (40) acre unit in every case, except two wells which are producing from the Grayburg-Keely zone as ten (10) acre locations. These wells being located in the northeast quarter of Section 27.

Q. Mr. Macey, in your application it is stated that you do not believe that one well in the center of a forty (40) acre legal subdivision is sufficient to obtain all of the recoverable oil under that forty (40) acre tract and that you believe that a greater ultimate recovery of oil would be obtained if you were permitted to drill certain "five spot" locations. Will you

explain to the Commission the reason for your belief that one well will not drain those forty (40) acres and why you feel that the drilling of "five spot" locations will enable you to produce oil that might not otherwise be recovered and obtain a greater ultimate recovery of oil from these leases?

A. Well -- in completing our wells on this particular area - in this particular area we set our production casing and center it and then drill approximately two hundred (200) more feet of alternate production and barren zones in our natural production zone as well as - as far as our hourly production is considered good - sometimes by measuring in a five gallon bucket - by that I mean that we have a fairly low production in almost every case. This leads us to believe that we have a very low permeability and in acidizing these wells, we frequently find underground pressures, which are very high, and very abnormal, for this particular depth and in some instances it is impossible to acidize zones due to the fact that they are too tight and the pressures required to affectively break up the zone are prohibitive.

We have had one unusual circumstance to prove to us the point that we are not draining forty (40) acres with one (1) well. In 1929 we drilled our Number 2 "A" well to a total depth of two thousand one hundred and fifty (2150) feet. The well was drilled as a one hundred and forty (140) foot location out of the northeast corner of Section 34. In the summer of 1947 we lost some equipment in the hole and the well had to be abandoned. From the date of completion until the time it was abandoned the well produced a little under ninety thousand

(90,000) barrels of oil. In the fall of 1948 we drilled our Number 12 "A" well, this well being located six hundred sixty (660) feet out of the northeast corner of Section 34. The distance between the Number 2 "A" and the Number 12 "A" is three hundred ten (310) feet on the surface. We completed this well for an initial production of three hundred twenty-eight (328) barrels per day and at the present time this well has a bottom hole pressure which is within twenty-five (25) percent of the virgin pressure of the reservoir. Therefore, inasmuch, as we had already produced a total of ninety thousand (90,000) barrels from this forty (40) acre unit to start with, we are firmly convinced that this particular production zone in this area had never been sufficiently drained or apparently had never been drained at all.

MR. COCHRAN: Now, Mr. Macey, in your application you ask for permission to drill eight (8) "five spot" locations - the measurements from section line on each well are set forth in the application. Will you point out to Mr. Spurrier, the location of these eight (8) "five spot" locations on his map?

Mr. Macey points out the location on the map and states

We plan to drill all of 13, 14, 15, 16 of the "A" Lease and the rest of 23, 24, 25 and 26 of the "B" Lease. All of these wells will be completed in the Grayburg-Jackson pool.

Q. If you are granted permission to drill these wells, how will they be drilled?

A. It is our plan to drill the wells one at a time to start with and if the information which we obtain supports our present ideas in regard to the reservoir there is a good possibility that we will drill the wells two at a time.

Q. Would it be possible, Mr. Macey, that if the results you obtain from drilling one or more of these wells were unfavorable then, you might wish to modify the number of wells that you propose to drill now?

A. Yes, sir if we run into some unforeseen things we do not want to be obligated to drill the wells.

Q. Mr. Macey, in your application it is stated that if you are permitted to unitize certain specific tracts for proration and allowable purposes that the creation of such unitized tracts would enable you to produce the wells on each unit at a more effective and more efficient rate of withdrawal and thereby you would obtain the greater ultimate recovery of oil. Will you explain to Mr. Spurrier how the location of these proration units would enable you to accomplish that?

A. This particular reservoir is definitely a solution gas drive reservoir - by that I mean the entire energy present necessary for movement of the oil to the bore hole comes from the gas in solution.

Q. If the gas which is in such zone of the wells at the edge of the structure sufficient to produce a very small amount of water?

A. Two to four gallons a day but we do not consider that there is any effective water drive in this particular area, and we have never found any evidence of a gas cap.

Q. Now, in this particular type of reservoir a control of gas oil ratio, the effective control of gas oil ratio is very desirable, is it not?

A. Taking the Unit Number 2 Area, it is at the present time - we have ten producing wells in this area and it is our intention

to drill four "five spot" locations. By drilling these four "five spot" locations we hope to obtain sufficient production so that we can control the gas oil ratios - each of the wells, by that I mean, that in the event that we find that it is no event to flow a well at the rate of thirty-seven (37) barrels per day. At that rate of flow we would have our oil and gas ratio - we would cut that back and produce our old ratio and therefore be producing the allowable from ten (10) units out of fourteen (14) wells. We can more effectively control our ratios and in the end increase our recovery and increase the amount of oil which we will produce per number drop in bottom hole pressure.

Q. Mr. Macey, the three (3) proposed areas that you wish to create for proration purposes are described in detail in your application, is that correct?

A. That is right.

Q. Will you point out to Mr. Spurrier these three proposed unit areas?

A. Yes, Unit Area I, Robinson "B" Lease, NE/4, E/2 NW/4 and E/2 SW/4 Section 27, Township 17 South, Range 29 East, N.M.P.M.; Unit Area II, Robinson "A" Lease, SE/4 Section 27, NE/4 Section 34, W/2 NW/4 Section 35, Township 17 South, Range 29 East, N.M.P.M.; Unit Area III, Robinson "B" Lease, E/2, E/2 W/2 Section 35, Township 17 South, Range 29 East, N.M.P.M.

Q. Is it true that the drilling of each "five spot" location will cut the second well on the forty (40) acre unit.

A. Yes, it is.

Q. It is not your intention and you do not ask the Commission that you be granted any additional allowable for these tracts?

A. That is right.

Q. If you are permitted to unitize these three proposed areas for proration and allowable purposes how would those particular units be produced as far as the allowable is concerned?

A. We would take tests - periodic tests to determine the effective rate at which we would produce each well and through these tests we would take our allowable - prorate it among all the wells in such a manner that we would use the least amount of energy in producing that amount of oil.

Q. Now, using No. 2 as an example, at the present time, that is comprised of ten (10) forty (40) acre units, is it not?

A. It is.

Q. Now, if you drill the "five spot" locations then you would simply produce the allowable approved by the Commission from the fourteen (14) wells instead of ten (10) wells now producing.

A. That is correct.

Q. Is it your plan to produce any wells in Number 2 as top allowable, as set out by the Commission?

A. No, we are not planning to produce any wells in Number 2 as top allowable wells as set out by the Commission.

Q. Now, Mr. Macey, is the Grayburg-Jackson Pool different from other pools in the State? I mean by that that you testified that the formation here is very tight - Now, would this same thing apply to other pools in New Mexico?

A. No. There may be other conditions existing in certain other fields but I do not believe that this particular application even applies to the entire Grayburg-Jackson field, however I - there may be some other fields where similar production practices would be applied however I believe they would be few in numbers.

MR. COCHRAN: Mr. Spurrier, I have a letter from Mr. Morrell's office which I would like to introduce. (Letter introduced and marked Exhibit #2.) This letter is addressed to me and is dated March 29, 1949 and is signed by R. E. Canfield, Acting Supervisor, Oil and Gas Operations, United States Department of the Interior Geological Survey, which letter, among other things states that no objection is offered to this application by that office. It is their opinion that the drilling of additional wells should be encouraged to increase the ultimate recovery of oil and gas from the Grayburg-Jackson pool. Now, Mr. Spurrier - Grayburg Oil Company of New Mexico and Western Production Company, as you know, have been drilling some "five spot" locations and, at the present time, they have completed some seven such wells and they have two additional wells drilling and it is our belief that it would probably be good testimony to make a part of this record if Mr. Krouskop would state generally the results which they have obtained thus far in the drilling of "five spot" locations in this particular area and in fact in the leases in Section 26.

(Mr. Krouskop takes the stand)

MR. COCHRAN: Your name is M. O. Krouskop?

A. It is.

Q. You are employed by the Grayburg Oil Company of New Mexico?

A. Yes, I am

Q. You have drilled a number of "five spot" locations ON Grayburg and Western Production leases adjoining American Republics leases?

A. Yes, I have.

Q. Will you state briefly, Mr. Krouskop, the results which you have obtained from the wells completed thus far and tell Mr. Spurrier something about the bottom hole pressures that your recently completed wells have?

A. Seven (7) of the unorthodox locations which were authorized by the New Mexico Oil Conservation Commission Order Number 791 have been drilled within the Grayburg cooperative and unit area, all but one of these wells were completed for initial production of well over top allowable. Daily potential ranges from forty (40) to three hundred eighty-nine (389) barrels per day and to date the production of these "five spot" wells has had no apparent affect upon the performance of their offset wells - that is, there has been no abnormal deviation in daily production potential, nor in bottom hole pressure, nor has there been created any significant changes in the gas alterations, - static or in any static bottom hole pressures, have been obtained on the first five (5) of these wells completed to date. Now, the fact that it took any where from eight (8) to twenty-seven (27) days for these wells to reach static condition would indicate the very (tight nature of this reservoir) and while we were obtaining three of these pressure build-ups, we conducted tests of several of these wells in order to try to establish interference between the inside well and its immediate offsets and these tests of a period of forty (40) minutes in length showed that we had no interference between wells. In comparing bottom hole pressure of these "five spot" or inside wells with average pressure of their immediate offsets, it has been found that in but one instance the pressure of the inside

well has been higher than the average pressure of the offset. This pressure difference ranging from sixty-five (65) pounds to two hundred (200) pounds, and in the one case where the "five spot" pressure is lower, this pressure difference was eighty-six (86) pounds, and in consideration of these observations and the excellent performance records of the "five spot" wells completed to date, why, it is my belief that the Grayburg Oil Company of New Mexico and the Western Production Company, Incorporated, will recover considerable oil that otherwise would be left in place in the reservoir.

MR. STALEY: What was the earliest pressure that you had - the history of the - How long ago was the first pressure taken? The first you have any record of?

A. That was in the old area, three hundred fifty (350) to four hundred (400) pounds at that time.

Q. How will these pressures compare with those?

A. They are quite a bit higher pressures.

MR. COCHRAN: Mr. Spurrier, do you have any questions, or does any one have any further questions?

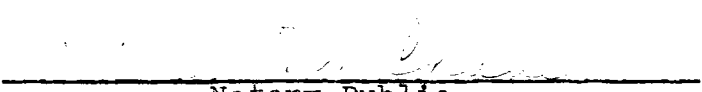
MR. SPURRIER: No questions. There being no further questions to be properly brought up before the Commission and no one has anything else to say, the meeting is adjourned.

STATE OF NEW MEXICO)
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COUNTY OF SANTA FE)

I, Virginia M. Chavez, Notary Public, hereby certify that the foregoing transcript of proceedings before the Oil Conservation Commission of the State of New Mexico, at the time

and place therein set out, is a true record of such proceedings to the best of my knowledge, skill, and ability.

DATED at Santa Fe this 21st day of April, 1949.


Notary Public

My Commission expires April 10, 1950

Santa Fe Office