

BEFORE THE
OIL CONSERVATION COMMISSION
Roswell, New Mexico
May 15, 1963

IN THE MATTER OF:)

Application of J. R. Cone for a unit)
agreement, Lea County, New Mexico.)
Applicant, in the above-styled cause,)
seeks approval of the Cone Jalmat)
Yates Pool Unit Area comprising 1,760)
acres of State land in Township 22)
South, Range 35 East, Lea County, New)
Mexico.)

Case 2802

Application of J. R. Cone for a water-)
flood project, Lea County, New Mexico.)
Applicant, in the above-styled cause,)
seeks authority to institute a water-)
flood project by the injection of water)
into the Yates formation, Jalmat Pool,)
through 4 wells located in Units J, L)
and N of Section 13, and Unit D of)
Section 24, Township 22 South, Range 35)
East, Lea County, New Mexico.)

Case 2803

BEFORE: Honorable Jack M. Campbell
Mr. A. L. "Peto" Porter
Mr. E. S. "Johnny" Walker

TRANSCRIPT OF HEARING

MR. PORTER: We will take up next Case 2802.

MR. DURREIT: Application of J. R. Cone for a unit
agreement, Lea County, New Mexico.

MR. KELLAHIN: If the Commission please, Jason Kellahin,
Kellahin & Fox, Santa Fe, appearing for the applicant. I believe

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that in the interest of time this case could well be consolidated with Case 2803, these two cases consisting of an application for a unit agreement and the waterflood project on the same unit and the testimony will overlap.

MR. PORTER: Is there any objection to the consolidation of Cases 2802 and 2803? For purposes of testimony, the cases will be consolidated.

MR. KELLAHIN: If the Commission please, we have one witness I would like to have sworn.

(Whereupon, Applicant's Exhibits Nos. 1 through 7 were marked for identification.)

(Witness sworn.)

JOHN C. BYERS

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

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q State your name, please?

A John C. Byers.

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

A I am a consulting engineer.

Q In your capacity as a consulting petroleum engineer have you been employed by J. R. Cone in connection with the two



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cases before the Commission at this time?

A Yes, I have.

Q Mr. Byers, have you ever testified before the Oil Conservation Commission before?

A It has been a number of years, I would like to be qualified.

Q Would you, for the benefit of the Commission, state briefly your education and experience as a petroleum engineer?

A I was educated at Texas Tech, graduated in 1947, I have been a practicing petroleum engineer in Texas. Since that time I have been practicing as a consultant since 1957 in Lubbock.

Q In connection with your practice as a consulting engineer since 1957, have you done work in New Mexico?

A Yes, I have.

Q Have you done work in the area involved in this application?

A Yes, I have.

MR. KELLAMIN: We submit the witness is a qualified petroleum engineer.

MR. PORTER: The Commission considers the witness qualified.

Q Mr. Byers, referring to what has been marked as Exhibit No. 1, would you identify that exhibit, please?



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A That is a unit agreement.

Q Are you familiar with the contents of that agreement?

A Yes, I am.

Q How did you become familiar with that agreement?

A I was working in the preparation of that agreement.

Q Are you familiar with the land that is covered by the unit agreement?

A I am.

Q What does it consist of?

A It consists of 1760 acres, including all or parts of Sections 13, 24, 23, 25 and 26, Township 22 South, Range 35 East, Lea County. This is a sector of the Jalmat Yates Pool.

Q What is the basic ownership of this land?

A The basic ownership is all State land.

Q Does the unit agreement contain a plat showing the area?

A It does. It is an exhibit thereto, Exhibit B, I believe it is.

Q Is this unit agreement in a form which has heretofore been approved by the Oil Conservation Commission?

A It is. It is an adaption of the State Land recommended form.

Q Has it been submitted to the Commissioner of Public



Lands?

A Yes, it has.

Q Has it been approved as to form and content by the Commissioner of Public Lands?

A It has been so approved.

Q There is no federal or fee land involved here?

A There is none involved in this unit.

Q Now, referring to what has been marked as Exhibit No. 2, would you identify that exhibit?

A Exhibit 2 is a unit operating agreement providing for the conduct of operations among the joint ownership of the proposed unit.

Q What is proposed to be done under the terms of this operating agreement, assuming it's approved by the Commission?

A It is proposed that a pilot waterflood program be instituted in the Yates Pool at the northern end of this unit, and upon execution thereof that waterflood expanded to include the entire unit.

Q Initially you only propose a pilot program?

A That is correct.

Q Mr. Byers, what is the status of this unit agreement as to the participation of the working and royalty interest?

A The royalty interests that, other than the State, is



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100% signed up. The working interest ownership is approximately 90% signed up. The remaining 10% are in agreement and waiting the circulation of appropriate agreements.

Q Have they tentatively agreed to the program?

A They have.

Q Do you anticipate, then, that you would have 100% of both working and overriding royalty interest committed to the unit?

A We do.

Q Referring to what has been marked as Exhibit No. 3, would you identify that exhibit, please?

A Exhibit No. 3, I believe, is the plat covering the area. It includes all or parts of Township 22 South.

Q Would you continue your testimony with regard to Exhibit No. 3?

A Exhibit No. 3 is a map covering all or parts of four townships with the proposed unit area in the center of that outlined as the unit itself, it's position with respect to the Yates sand production in the area, and also its position with the British American operated Jalmat Yates Sand Unit.

Q What is the situation with regard to the British American Unit?

A Our pilot flood will actually be a completion or a



continuation of British American's existing project.

Q Do you have a line agreement with the British American Petroleum Company?

A Yes, we do.

Q Do you know whether the British American is injecting at the present time in the wells shown as injection wells on your exhibit along the northern boundary?

A Along the northern unit boundary, they are not. They are waiting to complete their injection program. At the time of their hearing we asked that they not inject along the proposed line until after this unit is formed. As soon as the unit is completed and approved they will commence injection adjacent to the line.

Q Then the injection will be in direct cooperation?

A In direct cooperation.

Q The exhibit also shows two lines through a series of wells North, South, East, West.

A Those are lines through which the cross section has been prepared expressing the continuity of the Yates sand reservoirs that exist in this area and showing the relationship which exists of the extremes of the unit area.

Q The contours would indicate that this is a continuous reservoir across the unit?



A Those contours are at the top of the Yates sand section and indicate it is continuous.

Q Referring to what has been marked as Exhibit No. 4, will you identify that? Will you discuss that, please?

A Exhibit No. 4, I believe, is a cross section, is that correct?

Q Yes, that is correct.

A That cross section extends, the two cross sections on that exhibit, one extending north-south through the extent of this unit, one extending east-west beyond the limits of this proposed unit. The entire Yates sand reservoir interval is set out on that and correlation from well to well is shown.

Q Does that indicate that this is a continuous reservoir across the unit both north-south and east-west?

A It would.

Q In your opinion, Mr. Byers, as a petroleum engineer, based on your examination of available information, do you believe that this reservoir is acceptable to a successful water-flood?

A We believe so. However, we are making reservations in our own mind there, and that's the reason for the pilot program. We are convinced that there is something in the vicinity of 200,000 barrels of primary reserves left in this reservoir, and



it is our desire to endanger a minimum volume of that in an effort to prove up the validity of the reservoir.

Q And that is the reason you are now proposing the pilot program?

A The pilot program and the expansion to the full program.

Q Have you prepared a data sheet showing information on the waterflood program?

A Yes, I have.

Q Would you refer to Exhibit No. 5 and discuss the information shown on that exhibit?

A Exhibit No. 5 is a data sheet in which is set out the basic data relative to this proposed project. That data sheet includes information regarding the general nature of the reservoir with which we are dealing. Specific information with respect to the individual project, our expectations and a summary of the past history of this project.

Q Any other information on the exhibit which you wish to call attention to?

A There is a lot of specific data.

It indicates that this reservoir has the dissector of the reservoir shown within this proposed unit as of the first of the year, produced some million and a half barrels of crude oil. There's approximately just under 200,000 barrels of remaining



reserves produceable by primary methods, and that we expect to improve recovery by something in excess of 3,000,000 barrels.

Q On primary, what is the producing mechanism?

A It is solution gas.

Q Have you found any indication of an active water drive?

A None.

Q Referring to what has been marked as Exhibit No. 6, would you identify that exhibit and discuss the information shown on it, please?

A Exhibit No. 6, I believe, is a data sheet covering all the wells, tabulation of each well within the proposed unit area, the date upon which the well was completed, specific completion data as to the portions of the reservoir that have been opened, the initial productivity of the well and the present productivity of the well.

Q Now, your exhibit indicates, does it not, that all of the wells have been perforated, no open hole completions exist in this?

A That is correct. There are no open hole completions within this reservoir.

Q Are those selected perforations as to the different zones?

A Yes, they are. This reservoir has provided four



overall members altogether, the total thickness of the four members is in excess of 150 feet, only 30 odd feet are considered effective pay. These perforations are defined in the effective pay section within the reservoir.

Q Do you anticipate that the injectivity of each of these zones will be similar or the same?

A Yes.

Q How will you handle the waterflood project if that be not true?

A There will be continuous surveillance, periodic surveillance of injectivity of individual zones and if unsatisfactory injectivities are found that will be adjusted by selective plugging.

Q Is it your goal to flood all of the four zones at approximately the same rate?

A It is our anticipation that we will flood all of them simultaneously.

Q Do you think that you will have to set a packer in any further zone?

A No, we do not anticipate the use of packers with the exception along the eastern boundary as shown in the map, which I believe is Exhibit 3, there is a tendency toward a gas cap. Selective injection into the section that is above our indicated



gas-oil contact will be conducted separately through the use of packers in an attempt at isolating migration of hydrocarbon oils.

Q And you will again keep careful watch on the program as it is expanded to determine whether you are emptying the reservoir by migration of oil into the gas cap?

A Yes. It is certainly very important to us to keep a continuous watch on that simply because we lose oil if we move it into the gas cap.

Q Referring to what has been marked as Exhibit No. 7, will you discuss that information on that exhibit?

A I believe that is our diagrammatic sketch of the average condition of wells existing in the proposed unit as well as a diagrammatic sketch of our proposed completion control of injection wells and water supply wells.

Q In connection with your completions, are you familiar with the letters written by the New Mexico State Engineer as to the protection of the Santa Rosa formation?

A Yes, I am.

Q Mr. Frank Irby, by letter, advised that he would approve a completion provided that water injection shall be accomplished either by injecting into all sands through one string of tubing or by injecting selectively through two strings of tubing under a packer, provided, however, that in the case of selective



injection wells which are equipped with less than 5½" pipe, selective injections may be made through one string of tubing under a packer and into a tubing casing annulus, in which case the tubing must total depth to the shoe of the surface end of the casing.

A Yes, I am aware of that, and we would expect to conform to those requirements.

Q Now, your Exhibit No. 7 also shows your production of oil as having a rod actuated bottom hole pump?

A That's right.

Q Do you plan to operate your producing wells on a pump?

A They will be operated continuously on a pump.

Q Is it your opinion that the casing program, as shown on your Exhibit No. 7, adequately protects all producing formations?

A Yes, it does. None of the wells involved in this project have been drilled into a producing reservoir below that. There is no present production in the known reservoirs above this. Our cementing practices throughout this field have covered the entire interval with adequate cement to give protection to isolation within the reservoir.

Q Let me ask you, first, were any fresh water zones encountered in the drilling of these wells?



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A None that we know of.

Q You know that the Santa Rosa formation in some areas is considered a fresh water zone?

A Yes, I am aware of this, and this area is considered brackish.

Q Will those completions protect that zone?

A Yes, they will.

Q What is your source of water for this waterflood project?

A We expect to use Santa Rosa water for the water supply.

Q Where will you secure it?

A We will secure that through wells; we anticipate three wells uniformly spaced through the area, the first of which will be in the immediate pilot area.

Q Is this unit area located within the Lea County underground water basin?

A No, it is not.

Q What volumes of water will you require?

A We are expected to produce to require a maximum of around 8500 to 9000 barrels per day after peak.

Q When do you anticipate it would reach its peak?

A Probably not for two years after the effective date of the unit.



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Q Will this waterflood be operated entirely under the provisions of Rule 701 of the Commission rules?

A Yes.

Q Do you ask that there be an administrative procedure for expansion of the pilot program?

A We would like to have permission to expand this program upon selection by the operators without additional hearing.

Q By administrative procedure?

A That's right.

Q Were Exhibits 2 through 7 prepared by you or under your supervision?

A They were.

Q Were Exhibits 1 and 2, or the unit operating agreement in which you participated in the preparation, is that correct?

A Yes, that's right.

MR. KELLAMIN: At this time I would like to offer in evidence Exhibits 1 through 7, inclusive.

MR. PORTER: Are there any objections to the admission of these exhibits? They will be admitted to the record.

(Whereupon, Applicant's Exhibits 1 through 7 were offered and admitted in evidence.)

MR. KELLAMIN: That completes our examination of the



witness.

MR. PORTER: Any questions of the witness?

CROSS EXAMINATION

BY MR. NUTTER:

Q Mr. Byers, I believe that you stated that you had 90% of the working interest signed as far as this unit is concerned?

A Yes.

Q And you expect the other 10% of the working interest will sign?

A Yes, they will sign.

Q And they have agreed to go into the unit?

A Yes.

Q Referring to your plat, will the completion of the unit here and putting this portion of the Jalmat Pool on waterflood, will that complete the waterflood program as far as this oil-productive arm of the pool is concerned?

A It will complete it with the exception of that row of wells immediately east of this operated by Cities Service, which is federal land.

Q That's one row of 40-acre tracts?

A That is right.

Q And those are oil wells in the Jalmat?

A Those are oil wells as far as the classification is



concerned. There are one or two that are classified as gas wells.

Q Do you know whether Cities Service has been approached as far as determining whether they're willing to go into any unit?

A Yes.

Q Or whether they are planning to put their wells on waterflood?

A Yes, we discussed it with Cities Service, and Cities Service indicated that they would prefer cooperation along that line since their acreage is federal land, this being all state, we can cooperate very nicely.

Q There has been no effort to unitize this acreage in with the proposed state acreage?

A No, there has not.

Q Has the Flood in the British American property been successful or is it too early to know?

A I think it's too early. They are getting some response. The evaluation of that response is a very nebulous response.

Q So the response to date is what you might say insignificant?

A That is right.

Q Now, on your data sheet for these wells in your unit you've indicated the four zones. Does that mean that each of

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these wells is perforated in this interval under each of the four zones?

A That is correct. In some cases there will have to be some additional openings made.

Q Is it the intent of the applicant, J. R. Cone, to flood all four zones?

A Yes.

Q And all the injection zones?

A All four zones will be flooded simultaneously.

Q But there won't be any effort made to selectively inject into any of them under a differential pressure or anything like that?

A No, our intent is to flood each zone volumetrically with respect to its representation of total volume in the reservoir as best we can control it through selective flooding.

Q But without separation of the zones by packer?

A We do not believe that effective separation can be accomplished.

Q How much did you estimate was the primary oil remaining?

A About a hundred, two hundred thousand barrels, about 186,000 barrels.

Q What is the area producing at the present time, in the neighborhood of 95 barrels a day?



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A That's about right.

Q Now, Mr. Byers, you mentioned the gas cap to the east. Would you detail a little further the method that you planned to treat this gas cap?

A We will handle that gas cap through selective injection the best we can accomplish it. By injecting water separately isolated by packer into the injection wells that encounter the gas cap or effective pay section, well, say above a level of about 75 to 100 feet, which is the approximate gas-oil contact level, and if we raise the pressure in that area to a level high enough to preclude migration of oil from the oil column into that area.

Q Are you going to say that you are going to saturate the gas cap with water?

A That is correct.

Q To prevent the migration of oil?

A That is correct.

Q That would be a migration beyond Cities Service tracts?

A The total extent of that reservoir beyond Cities Service is some problem. It extends into the Cities Service area. However, the productivity of it is extremely--

Q To saturate the gas cap won't you have to saturate Cities Service?



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A No, that will be locally.

Q On the upper perforations only?

A That is right.

Q Mr. Byers, you made reference to a letter from the State Engineer's office in which he prescribed certain means of injection which would be acceptable to that office?

A That's right.

Q Would this letter, which the Oil Conservation Commission received from the State Engineer pretty much outline what you mentioned in your letter?

A Yes, it does. It covers the same material.

Q And you would expect to comply with these provisions?

A Yes, we would.

MR. NUTTER: Thank you, I believe that's all.

MR. PORTER: Does anyone else have a question of the witness? He may be excused.

(Witness excused.)

MR. PORTER: Does that conclude the applicant's testimony in this case?

MR. KELLAHIN: That concludes our case, if the Commission please.

MR. PORTER: Does anyone else have anything to offer in either one of these cases? The Commission will take the



cases under advisement.

MR. BAKER: Baker, with Atlantic Refining Company, and we would like to concur with J. R. Cone in their request for the approval of Cases 2802 and 2803.

MR. PORTER: Atlantic concurs in both cases?

MR. BAKER: Yes.

MR. BAKER: Glenn Raker, British American Oil Producing Company. We concur in support of J. R. Cone's two applications.

MR. PORTER: Anyone else have anything to say in this case? Any further statements? The case will be taken under advisement.

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STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

I, ADA DEARNLEY, Court Reporter, do hereby certify that the foregoing and attached transcript of proceedings before the New Mexico Oil Conservation Commission at Roswell, New Mexico, is a true and correct record to the best of my knowledge, skill and ability.

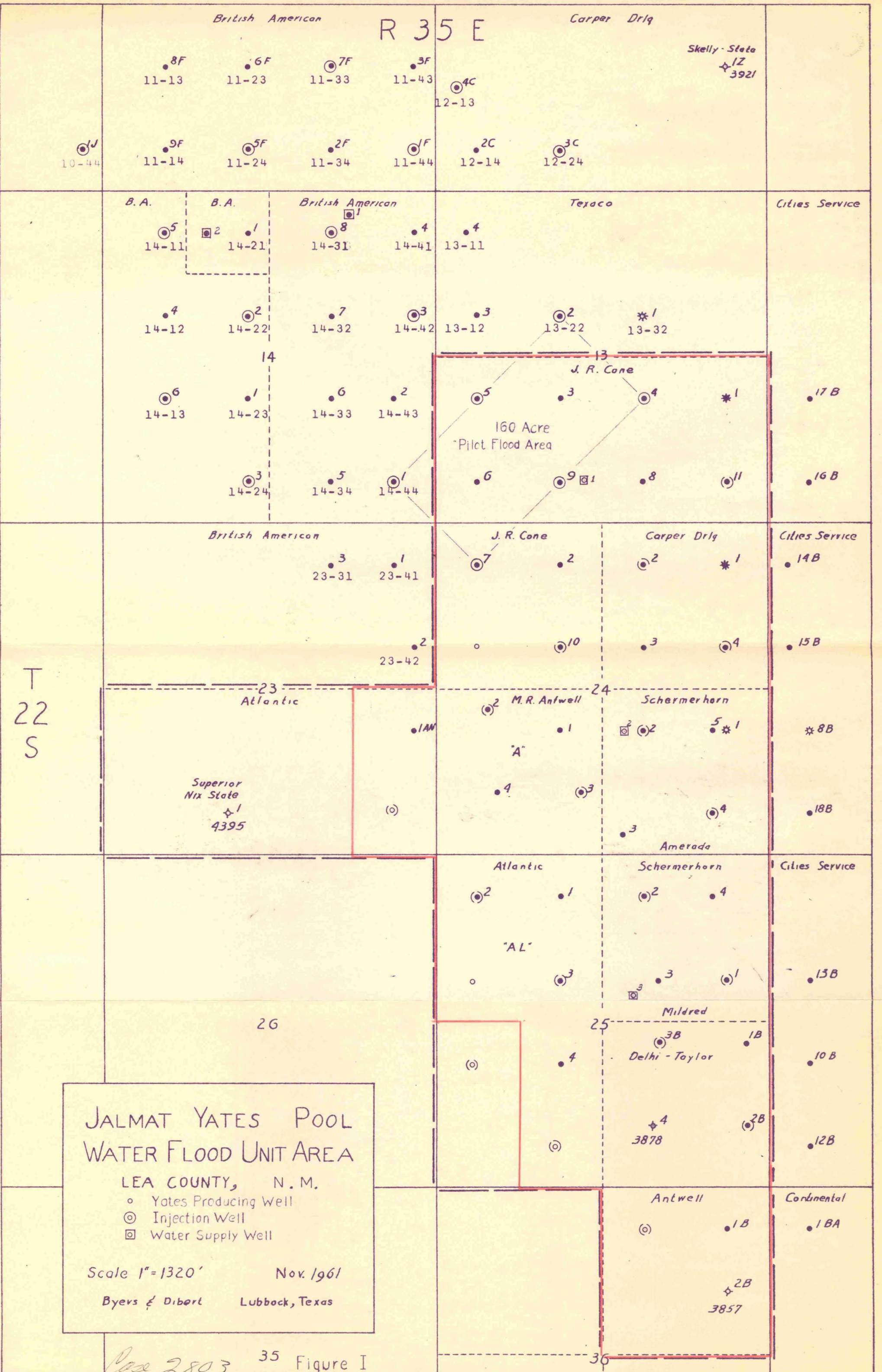
IN WITNESS WHEREOF I have affixed my hand and notarial seal this 3rd day of June, 1963.

Ada Dearnley
Notary Public-Court Reporter

My commission expires:

June 19, 1963.







State N. M. County Lea

Field Jalmat Yates

Operator J. R. Cone

Well Nix-State No. 3

Location 1980' from S &

W lines Sec 13 T22S R35E

Spudded 5/15/55

Completed 5/28/55

Casing 8 5/8" @283'

5 1/2" @4018 w/ 700 sx.

Perf 3722-58, 3778-810.

Open hole and 3828-54

TD 4040' PBTD 3988'

Elev 3600' DF

Horizon	Depth	Datum
Santa Rosa	920'	
Anhydrite	1750'	
Dolomite	3545'	
Yates	3722'	

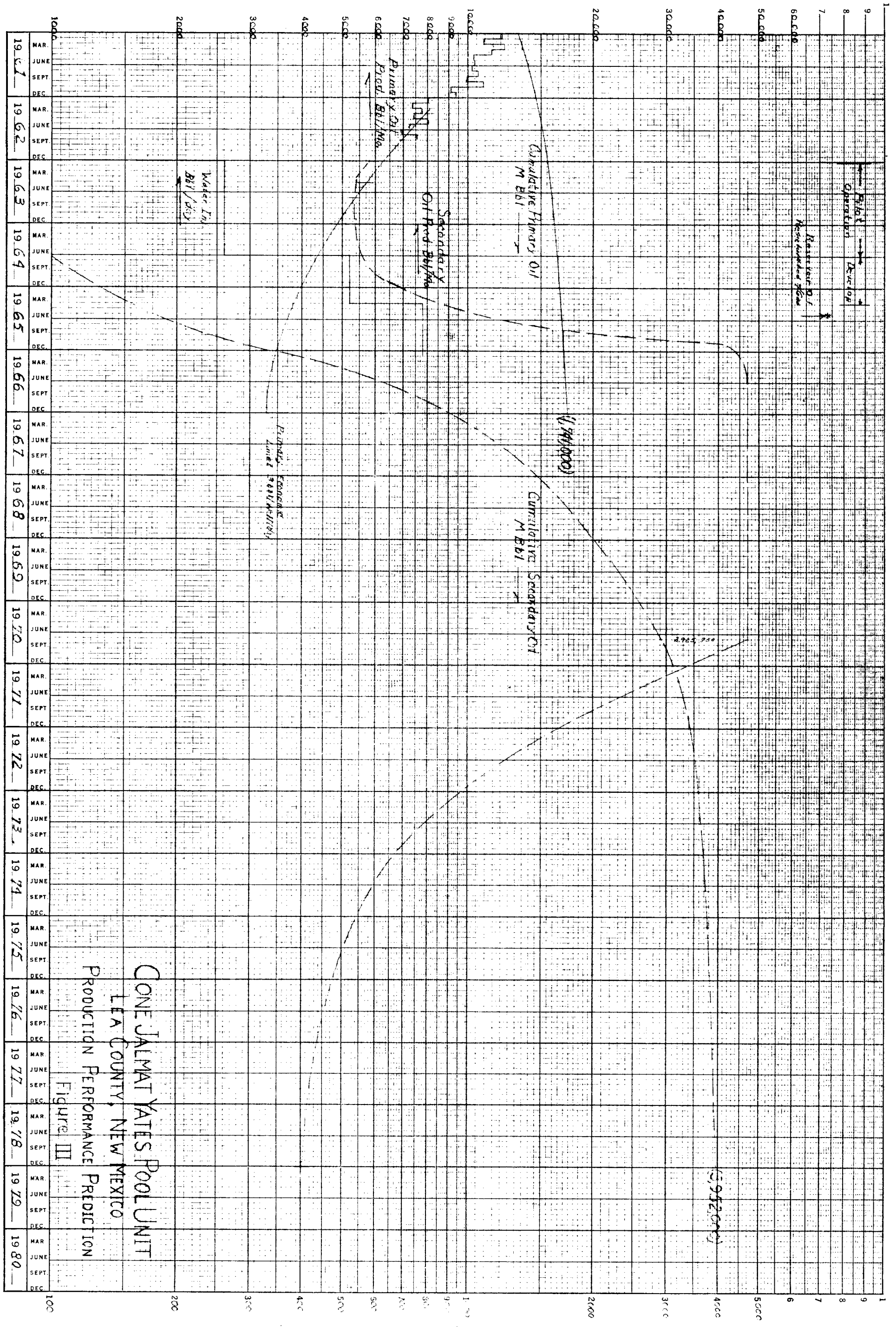
- Well treated and tested in three stages.
1. Perf 3722-58 w/ 6 spf
Pkr @ 3711' & 3762'
acidized w/ 250 gal 15% HCl then treat w/ 2000 gal lease crude & 2000 lb sand.
Breakdown @ 1500 psi
Treat @ 2800 psi
- Test zone 3722-58 after load recovered. Prod.
98 bbl/24 hrs @ GOR 536/1
P_t 50 psi
2. Perf 3778-810 w/ 6 spf
Pkr @ 3769' & 3820'
acidized w/ 250 gal 15% HCl then treat w/ 2000 gal lease crude & 2000 lb sand.
Breakdown @ 1500 psi
Treat @ 3,000 psi
- Test zone 3778-810 after load recovered. Prod.
178 bbl/11 hrs @ GOR 700/1
3. Perf 3828-54 w/ 6 spf
Pkr @ 3817' & 3868'
Breakdown w/ 12 bbl lease oil @ 1600 psi
Treat w/ 2000 gal lease crude & 2000 lb sand
Treat @ 2700 psi
- Test zone 3828-54 after load recovered. Prod.
125 bbl/4 hrs @ GOR 610/1
P_t 50 psi
- Test all zones together to flow 200 bbl clean oil/9hrs through 30/64" choke after 10 days production.
GOR 610/1, P_t 125 psi P_c 450.

Well Test

Date oil wlr GOR

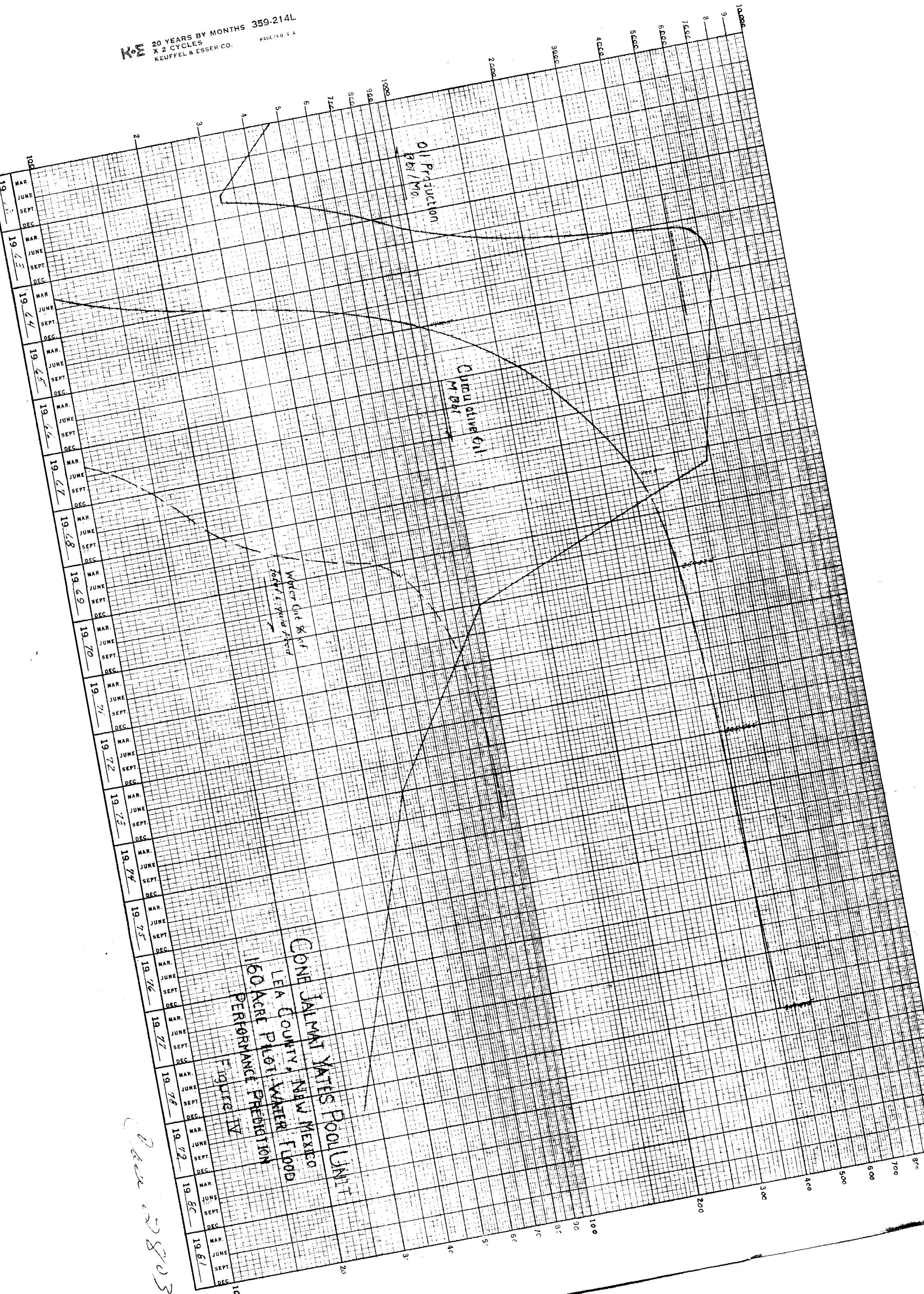
5/28/55 233 0 5258

Figure II



CONE JALMAT YATES POOL UNIT
LEA COUNTY, NEW MEXICO
PRODUCTION PERFORMANCE PREDICTION
Figure III

Check 12803



1000
 800
 600
 400
 200
 100
 50
 20
 10
 5
 2
 1

LARGE FORMAT
EXHIBIT HAS
BEEN REMOVED
AND IS LOCATED
IN THE NEXT FILE

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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. 2803
Order No. R-2495

APPLICATION OF J. R. CONE
FOR A WATERFLOOD PROJECT,
LEA COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 o'clock a.m. on May 15, 1963, at Roswell, New Mexico, before the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission."

NOW, on this 11th day of June, 1963, the Commission, a quorum being present, having considered the testimony presented and the exhibits received at said hearing, 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 Cone Jalmat Yates Pool Unit Agreement has been approved by the Commission by Order No. R-2494; that the Cone Jalmat Yates Pool Unit Area comprises 1,760 acres, more or less, of State land in Township 22 South, Range 35 East, NMPM, Lea County, New Mexico, as more fully described in said order.
- (3) That the applicant, J. R. Cone, seeks permission to institute a waterflood project in the Jalmat Pool in the Cone Jalmat Yates Pool Unit Area by the injection of water into the Yates formation through four wells located within said unit area.
- (4) That the wells in the project area are in an advanced state of depletion and should properly be classified as "stripper" wells.
- (5) That the proposed waterflood project is in the interest of conservation and should result in recovery of otherwise unrecoverable oil, thereby preventing waste.

(6) That the subject application should be approved and the project should be governed by the provisions of Rule 701 of the Commission Rules and Regulations.

(7) That all water injection should be through tubing under a packer; provided however, that selective water injection into more than one sand in wells which are equipped with less than 5 1/2-inch pipe may be through one string of tubing under a packer and through the casing-tubing annulus if the casing is perforated and squeeze-cemented from total depth to the surface casing shoe.

IT IS THEREFORE ORDERED:

(1) That the applicant, J. R. Cone, is hereby authorized to institute a waterflood project in the Jalmat Pool in the Cone Jalmat Yates Pool Unit Area by the injection of water into the Yates formation through the following-described four wells in Township 22 South, Range 35 East, NMPM, Lea County, New Mexico:

J. R. Cone Nix State Well No. 4, Unit J, Section 13
J. R. Cone Nix State Well No. 5, Unit L, Section 13
J. R. Cone Nix State Well No. 9, Unit N, Section 13
J. R. Cone Nix State Well No. 7, Unit D, Section 24

(2) That all water injection shall be through tubing under a packer; provided however, that selective water injection into more than one sand in wells which are equipped with less than 5 1/2-inch pipe may be through one string of tubing under a packer and through the casing-tubing annulus if the casing is perforated and squeeze-cemented from total depth to the surface casing shoe.

(3) That the subject waterflood project shall be governed by the provisions of Rule 701 of the Commission Rules and Regulations, including the allowable provisions thereof, and including the provisions with respect to expansion of the waterflood project.

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

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CASE No. 2803

Order No. R-2495

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

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

Jack M. Campbell

JACK M. CAMPBELL, Chairman

E. J. Walker
E. J. WALKER, Member

A. L. Porter, Jr.

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



esr/