STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION
State Land Office Building
Santa Fe, New Mexico

5 June 1985

EXAMINER HEARING

IN THE MATTER OF:

Application of Cities Service Oil and Gas Corporation for pool creation and contraction, and assignment of a discovery allowable, Lea County, New Mexico.

CASE 8624

BEFORE: Gilbert P. Quintana, Examiner

TRANSCRIPT OF HEARING

A P P E A R A N C E S

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I N D E X

E X H I B I T S

MR. QUINTANA: And now we'll call Case 8624.

MS. LUNDERMAN: Application of Cities Service Oil and Gas Corporation for pool creation and contraction and assignment of discovery allowable, Lea County, New Mexico.

MS. AUBREY: Karen Aubrey, Kellahin and Kellahin, representing the applicant.

I have one witness to be sworn.

MR. QUINTANA: Are there other appearances in this case?

If not, would you please stand up and be sworn in at this time?

(Witness sworn.)

MS. AUBREY: Mr. Quintana, before I question the witness I'd like to make a brief statement for the record.

I have marked as our Exhibit Eleven a copy of a letter from the Division geologist stating that the Division has no objection and in fact supports Cities' application for a new pool and discovery allowable.

I do not know whether or not

you have received a copy of that letter. It's dated June 4th, 1985.

Apparently this is similar to a letter which had been previously sent to Santa Fe after a meeting between the geologist, Jerry Sexton, and Jane Barton of Cities Service.

Rule 509 provides that in the absence of objection by the Division a case of this type will be put on the nomenclature docket and called in that manner instead of being called on the hearing docket with witnesses and lawyers present.

In the event that there is an objection by the Division then properly a case of this nature would be presented in a formal hearing as we're doing today.

I want the record to reflect that Cities has expended time, money, and effort in preparing a case, which, in our opinion, should have been put on the nomenclature docket because of the support of the Division and the lack of objection by any offsetting operator or, in fact, anyone else, to this case.

I want the record to be clear that we are not here operating under the portion of Rule 509 which provides that the applicant may request a hearing and choose to have the matter come on for a formal hearing.

JANE BARTON,

being called as a witness and being duly sworn upon her oath, testified as follows, to-wit:

DIRECT EXAMINATION

BY MS. AUBREY:

Q Would you state your name, please, for the record.

A Jane Barton.

Q And where are you employed?

A Cities Service Oil and Gas Corporation in Midland, Texas.

Q And what's your occupation, Ms. Barton?

A I'm a Regional Exploration Geologist.

Q Have you previously before the Oil Conservation Division and had your qualifications made a matter of record?

A No, I have not.

Q Would you explain for the Examiner where you obtained your professional degree and what your work experience in the field of geology has been?

A I attended Texas Tech University in Lubbock, Texas, and was degreed in 1980, and I began working with Cities Service in November of 1981.

Q Do you supervise any geologists for

Cities Service at the present time?

A Yes. Currently I have four geologists that work under me.

Q And what is your area of responsiblity for Cities Service?

A I'm Regional Geologist for southeastern New Mexico and Four Corners Division.

Q Are you familiar with the application that Cities Service has filed in being here today?

A Yes, I am.

MS. AUBREY: Mr. Examiner, I tender Ms. Barton as an expert witness in the field of geology.

MR. QUINTANA: She is considered as an expert witness.

You may proceed.

MS. AUBREY: Thank you.

Q Ms. Barton, Cities is here today seeking an oil discovery allowable for what you will prove to be a bona fide discovery well, is that correct?

A Yes.

Q And it will be Cities proof that the formation from which your well is producing constitutes a new source of supply not common to the Corbin Queen Pool, is that correct?

A That is correct.

Q In addition, Cities seeks the contraction of the Corbin Queen Pool as set forth in the application filed in its motion, is that correct?

A Yes.

Q In your review of the New Mexico rules ~~of~~ and the geology, Ms. Barton, is it your opinion that distance from current production is not a criteria for an old (not understood) allowable?

A That's true, that distance is not a criteria.

Q And in terms of the allowable you are seeking, can you tell the examiner what the allowable would be without the additional oil discovery allowable and the per barrel additional allowable we are seeking?

A Currently we are allowed to produce 80 barrels per day. If it is designated as a discovery, we would gain an additional 29 barrels, which would be a total of 109.

Q And that's based on Rule 509's position for 5 barrels for each foot of depth from the surface, is that correct?

A Correct.

Q Let me ask you some questions about the Cities Service well that we're talking about today, the Fed-

eral AA Well No. 1.

Do you know the completion date of that well?

A Yes, I do. It was March 31st, 1985.

Q And would that be the date from which the increased allowable would run in the event it's granted by the examiner?

A I believe it would be April 1st, would be the date that we would start from, according to the -- to the rules.

Q Let me have you turn now to the exhibits which have been prepared; have you look at Exhibit Number One.

There's a circle drawn on that map. Can you explain to the examiner what that circle is and what wells and other information are shown on that exhibit?

A Yes. This is a map that was done in compliance with our application. It's a production map. The circle is a 2-mile radius from our well in Section 9, the No. 1 Federal AA.

The green colored dots are Queen producers; the pink are Yates; red is San Andres; purple is Abo Reef production.

Q Are there also some Queen gas wells shown on this map?

A Yes, there are two Queen gas wells located in Section 10 to the east of our well.

Q Does Exhibit One show all the producing oil and gas wells and their formations within the 2-mile radius of your well?

A Yes, it does. It also indicates dry holes and the depths to which those were drilled.

Q Do you have any additional testimony about Exhibit Number One?

A No, I do not.

Q Let me refer you to Exhibit Number Two. It's a two part exhibit. We've marked it Exhibit Two and Two-A.

It appears to be an electrical log of the Federal AA No. 1.

Can you -- can you look at that and indicate for the Examiner the productive zones in the area?

A Yes. The productive zones in the area are noted with a green dot associated with a particular formation.

Of particular interest in this exhibit is productive formation of the No. 1 Federal AA, which is the Queen Shattuck member. The pumped interval is 4228 to 4238, a 10-foot zone, which calculates out as 25 percent porosity and 40 percent water saturation.

This is important aspect of the case in that this has extremely high porosity. Most of the adjacent Queen producers in producing fields have an average of 17 to 20 percent porosity.

Q In fact, can you testify that you found a significant difference in porosity between your Federal AA No. 1 and the other Queen wells in the area?

A Yes.

Q Exhibit Number Two is also an exhibit which was required with the C-109, is that correct?

A That is correct.

Q Let's turn now to Exhibit Number Three, which is a Queen IP map.

Can you first of all tell the Examiner where you obtained the production information that's shown on this map?

A The initial production on the potential test of all the wells was derived from scout tickets.

The accompanying Exhibit Number Four, the cumulative production was derived from New Mexico Oil and Gas Engineering Commission books, which are sent out yearly.

Q Let's look at Exhibit Number Three. Can you explain to the examiner what that shows?

A Yes. When I started working in the area in regard to the Queen formation, I wanted to determine

whether in fact we could separate our production from the No. 1 Federal AA from all surrounding Queen production.

It is true that in this particular area the Queen formation produces from the Shattuck member; however, within that upper sand member there are discontinuous sands and discontinuous porosity zones and I went in to try to determine what the difference between the various sands might be and to come up with a depositional model.

That model is that during the time of deposition the Capitan Reef is brimming the northern part of the Delaware Basin.

The Shattuck member of the Queen formation is depositing a lagoonal type setting. In this type of setting any small fluctuation of sea level will dramatically affect the type of facies that you would encounter. Even a minor variance of maybe five to ten feet would give you a difference in your facies and the productive facies of the Shattuck member is typically called the gray sand, which is a porous, very clean sand. That was deposited at adequate water depths to where evaporites (sic) did not form.

Now if you move depositionally up dip, in this area it would be to the north, you would encounter sands that have their porosity occluded by the formation of anhydrites due to the evaporation of water.

Now this is not merely one band of gray

sand and one band of tight, red sand. Due to fluctuations in the sea level, you have interfingering and have several series of different, very discontinuous sands and discontinuous porosity trends.

And that is basically what this diagram shows, modeling from the EK Queen Field noted on this map.

Q And that would be to the right of this map, is that correct?

A Right, to east.

Q Okay.

A We have inferred that there is a channel-like system which actually feeds the main productive portion of the EK Queen Field down more in the center of the map.

Now, these are very different types of sands and that is also evidenced by the fact that if you have a good IP on a well, say it flowed 600 barrels, that does not necessarily mean it will be one of the best cumulative production wells in the area.

In fact, some of your poorer IP wells that are pumpers or flow maybe 10 to 20 barrels a day, actually have cumed hundreds of thousands of barrels. So that's an indication to me that there is a marked difference in the types of sand within the Shattuck member.

And the time lines that are drawn on here are interpretive and they basically show that there were

different times of deposition and they did result in different types of sands.

If you look between lines, time lines 2-1 and -- time lines 1 and 2, excuse me, you will notice that several of those wells IP'ed, there's one that flowed 600 barrels a day and it only cumed 29,000. That indicates that it has very good reservoir quality but it is limited in extent and I've interpreted this to be more like your strand line sand and that time line would also equate over to our area where we also have a very good initial potential and to this date, hopefully, we hope to get good production, but it seems to be more characteristic of the limited reservoirs.

Now in the lower part, below time line 1, would be more like a sand delta system where you have a more continuous period of deposition; the reservoir is larger in extent, and also your initial potential may be lower due to clays, or whatever, in your matrix. You will -- you will get better production.

Q Let me have you look now at your Exhibit Four, which is a cumulative production map. And I think it might be helpful to put Four and Three up on the wall here so that you can talk about them together and compare them.

Let me have you look at Exhibit Four on which is mapped the cumulative production and compare that to Exhibit Number Three.

A Originally when this work was done, this were a series of overlays, but due to the fact that they were folded and put in folders, it was not a good idea to have overlays, so more or less you have to envision an overlay.

It's basically what I just explained, that your IP's, your best IP's do not only correspond to your best cumulative production.

The blue on Exhibit Four is the best production and the purple represents the poorest production.

Now there are some wells outside these colors that have cums less than 25,000, and (not understood.)

One thing that's very evident from this is this play is a combination of structure and stratigraphic aspects; however, the stratigraphy is the controlling factor on this production.

Structure does play a part when you get to the very edge of this field and you will start seeing evidence of oil/water contact, evidenced by water in your IP.

Q Let me have you stay there and we'll put up Exhibit Five because of it's size.

Let me have you look at Exhibit Number Five, which is a cross section from D-D', and explain what

that shows to the examiner.

A Okay, this is our cross section I constructed in conjunction with trying to establish an environment of deposition.

It's a north/south cross section over a matrix which affects the entire field, and what I learned by doing this cross section is that although this field is a continuous producing zone, that it is interspersed with dry holes in the field.

Now this dry hole swabbed 3 barrels of oil and 6 barrels of water and the porosity is much lower than the wells which are (not understood) to it.

Down dip from the dry hole we have a well that actually flowed 600 barrels, so there's really no doubt that these two reservoirs are not connected; there's no way they could be.

Proceeding even further down dip we encounter a well which is depicted by -- several of your cross sections will have these. These are wells that were drilled in the forties and they were either not logged or the films have subsequently been lost and I have no way of acquiring that information, so I basically drew in six figures and put scout ticket information as far as tops, perforations and (not understood.)

The key on this well, it was cored in the

Queen and then it covered 46 feet of the red, tight, anydritic sand, an indication that there was a dramatic facies change by a difference in sea level and also a difference in time of deposition.

Again down dip from this well you again have a producer.

Q Let's look at Exhibit Six now, which goes from A-A'.

The A to A' cross section shown on Exhibit Six includes the Cities Service No. 1 Federal AA, is that right?

A That's correct.

Q Will you look at that exhibit and tell the examiner what that shows about the continuity of the reservoir?

A Okay. The next three cross sections we'll be looking at are done after having come up with an environment of deposition and also establishing the fact that the porosity zones and/or sands are discontinuous in the Shattuck member of the Queen formation.

This cross section will separate us from the Queen producers in Section 5 and 6 and there is a Queen producer that was plugged in 1946 in Section 9 that will also separate us from the EK production further to the southeast.

This well is in Section 5, the Indian Wells Well. It is a Queen producer and it IP'ed pumping 19 barrels of oil per day, plus 1 barrel of water.

I suggest to you this is a stratigraphically younger sand than the sand which we are producing from in the No. 1 Federal AA for my correlation.

Also, there is evidence that it is a different sand, due to the difference in IP's. We IP'ed well over 400 barrels of oil per day and no water.

If these were connected, this well is structurally up dip, it should have been a flowing well and it is not.

Proceeding to the south and east, the Helmerich Kane No. 4-A is a Yates producer and it is still producing out of the Yates; however, it did drill into the Queen formation and perfs were noted at 4290 to 4309. Water was noted in the recovery; there was no indication of hydrocarbons.

This established an oil/water contact between our well, the No. 1 Federal AA, and the Queen producer which was plugged in 1946 and Helmerich Kane No. 2, which is also located in Section 9, this well actually pumping 90 barrels of oil per day plus 4 barrels of water.

To proceed further to the southeast, the No. 1 Federal AA is separated from this representative well

of the EK Queen Field by a dry hole in Section 15. This is Cities Service No. 1 State B.

They cored the Queen interval and recovered 56 feet of anhydritic, tight, red sand, another indication of a marked facies change and discontinuity of porous sand.

Q Ms. Barton, what is the color of sand that you have found in the Cities well, the No. 1 Federal AA?

A The productive interval in the Cities well is a gray, porous sand.

Q Let me have you look now at Exhibit Number Seven, which is a cross section from B to B' and can you look at that and show -- what that exhibit -- tell what that exhibit shows about the continuity of the reservoir?

A B to B' is basically a west to east cross section and will demonstrate that we are separated from the Queen producer that was plugged in 1946 in Section 10 and also the two Queen gas wells in Section 10.

The Cities Service No. 1 Federal AA being here. It's separated from the Queen producer in 10 by a (not understood) No. 5 Corbin Federal, which is a Yates producer. It also penetrated the Queen formation, perfed 4262 to 4292 and swabbed 3 barrels per day plus 50 barrels of water; again an indication of oil/water contact separation

of reservoirs.

There's no doubt in my mind that we are separated from the gas wells due to the fact that on top of the Queen formation, and also using the top of what appears to be the productive formation, these two gas wells are either flat or low to our oil producer, so that is definite indication that there is a separation of the reservoirs.

Just for the record, this well was never produced and the Cities Service No. 1 Corbin B was produced for a time but was plugged in 1974 and it only produced gas; they did not record any oil.

Q Let me have you look now at the last cross section, which runs from C to C', and explain what that shows.

A C to C' is a north/south cross section which separates the production from the No. 1 Federal AA from the northern portion of the Corbin Queen Field.

This is a representative log of the Corbin Queen production. Perfs were not recorded in this well. It is an open flow completion.

It flowed 130 barrels of oil.

I've noted what I thought was the probable producing zone due to the porosities found in the lower portion of the Queen formation.

When we proceed down dip to Section 4,

this is an on-going producing Queen well. At the time this cross section was drawn I was not able to locate a log. We do not have a log in our files nor our microfiche, and PI, Petroleum Information, did not have a film available.

When I went over to Hobbs and discussed this with Paul and Jerry Sexton, they did have form on file but it did not alter my interpretation, so I did not go back and have this re-drafted.

This log is still producing in the Queen and it IP'ed pumping 10 barrels of oil per day.

Massive perfs were noted on the scout ticket, although I'm sure the entire interval was not perforated, just selected porosity zones were, I had to go ahead and note it on the map.

Continuing to Section 3, the Cities Service No. 1 Stoltz, Wagner, and Brown, it was drilled to the Morrow and was a dry hole.

The Shattuck member of the Queen formation was never tested, nor was it cored; however, log analysis indicates it has 6 to 8 percent porosity and sample descriptions of the section describe it as a red, anhydritic sand. So you have evidence that there is a radical facies change in here and from the time lines on the previous exhibit, this is an area where I would expect to have a band of tight, anhydritic sand, which would be the seal for our

No. 1 Federal AA.

So separation of our well in Section 9 is established from the Corbin Queen.

Q Let me have you sit down, Ms. Barton.

From the information shown on the cross sections, can you conclude that there are substantial porosity differences between the Queen production which you have shown and the production -- the Corbin Queen production which you have shown and the Queen production which you have achieved in your well?

A Yes.

Q Let me have you look at Exhibit Nine, which is a structure map. As I understand your testimony, you've indicated that structure is not particulary important in determining the limits of the reservoir we're talking about.

A No, structure is an aspect but stratigraphy is the controlling factor and is the key to developing this play.

Q And now let me have you turn to Exhibit Number Ten, which is a copy of the Form C-109 which has been filed. Have you checked Cities' records and determined that all the operators listed on the C-109 in fact received copies of your -- of your filing with the Commission?

A Yes. All persons named here were mailed

a copy and we followed up by telephone conversation to make sure they had received them in the mail, and they had.

Q And no objections were registered by anyone, to your knowledge?

A Not to my knowledge.

Q To your knowledge there are no letters of objection or other indications of objection in the Commission's files?

A No.

Q Exhibit Ten shows the bottom hole pressure of the well.

A I believe it is contained on some of the engineering reports. There's a graph associated with Exhibit Ten that has all the pressure data information.

Q That would be in the letter dated April 9th to Cities from V. A. Warren (sic)?

A Yes.

Q Was this well cored, Ms. Barton?

A No, it was not cored in the Queen formation.

Q Do you know what the gas/oil ratio of the well is?

A 110.

Q Do you produce any water from this well?

A To date for every barrel of oil that we

produce, we produce a trace of water, but nothing significant.

Q And how much gas does this well produce?

A It IP'ed 53 MCF per day. I believe that has declined.

Q Is it Cities' intention to produce this well at the increased allowable over a 2-year period in accordance with the provisions of Rule 509 and to limit the allowable as provided in Rule 509?

A Yes.

Q Were Exhibits One through Ten which have been discussed today prepared by you, under your supervision and control, or by other people at Cities Service?

A Yes.

Q And have you reviewed them for their accuracy?

A Yes, I have.

Q Will the granting of this application protect correlative rights, promote conservation, and prevent waste?

A Yes.

MS. AUBREY: Mr. Examiner, I tender the exhibits in evidence and the witness for cross examination.

MR. QUINTANA: Do you have any

questions of the witness, Mr. Carr?

Any statements?

I have no questions myself.

MR. STOGNER: Mr. Quintana? I'm Michael Stogner, petroleum engineer with New Mexico Oil Conservation Division here in Santa Fe.

A Okay.

CROSS EXAMINATION

BY MR. STOGNER:

Q Ms. Barton, let us refer to the letter of January 4th, 1985, from Mr. Paul Kautz, and it says in there that last April Jerry Sexton, Paul Kautz, and yourself had a meeting down in Hobbs to discuss this matter.

What was discussed at that meeting and what -- what was the purpose of that meeting?

A Prior to that meeting we had submitted a packet similar to this, two copies to the Oil and Gas Conservation Commission and one was sent here to Santa Fe.

At that time they believed that they had a point of contention. They didn't agree with our interpretation.

So myself and Dick Scott, who is my supervisor, now the General Manager, excuse me, Geologic Manager in the Midland office, went to Hobbs and discussed

the matter.

The packet then was a little different than this one. The cumulative production map and the IP map were not drafted at that time. They were just work copies, but they were presented at that meeting.

The contention then of Paul was that we could not be separated from the Corbin Queen to the north. The well in Section 4 was his point of contention; however, after discussion, they agreed that they would not oppose our application for a discovery allowable and they -- and the letter stated they supported our application.

Q At that time did you request, or did Cities request that the OCD include this in the regular nomenclature case?

A I do not handle that and I'm not exactly sure why we were not put on your regular nomenclature docket.

Q So you weren't there for those discussions?

A No, that is handled by Gene Motter in my company, who is not present here today.

Q Did they, Mr. Motter, give you any indication of why it was not put on nomenclature or why you are down here today, or sent here today?

A No, he did not.

Q How long have you been working on this study?

A I have been working on it since April 1st. When the well was drilled it was, the primary objective was Bone Springs and/or Morrow; Queen was considered a secondary objective in the area.

Due to the shallow nature and also the development of the Queen in the area, that study had mainly been on-going in our Production Department, not in the Exploration Department, which I'm a part of.

Q When was the meeting between yourself, Jerry Sexton, and Mr. Paul Kautz, when was that in April?

A I believe it was either the last day of April or the first day of May. I cannot be exact on that date.

Q Did Cities put any more effort or any more studies between that meeting and today's hearing?

A Yes. I had the cumulative production map, the IP map drafted. I revised them somewhat, mainly just tidying them up, basically, from work maps.

I also constructed the dip cross section over the EK Queen Field. I constructed that and had it drafted, also, as supporting evidence of a model that we were using in the area.

Our Production Department is also contin-

uing to study this in more detail because we naturally are going to develop this porosity in the area. We are a major land holder, a leaseholder in the area.

Q This work that you just described to me, if we look at all the evidence that you presented here today, if we call that 100 percent, what percentage of the work that you just mentioned to me makes up for the work done between April 30th and today, roughly?

A Maybe 25 percent.

Q So about 25 percent of the evidence presented today was not available at the meeting in Hobbs between yourself and Mr. Paul Kautz and Mr. Jerry Sexton, is that right?

A It was available. It was not available in this form.

Q How was it available?

A They had the work copies of the IP map and the cumulative production map.

The only thing that was probably not in the packet that is in the packet here presently is the dip cross section over EK Queen Field.

Q So essentially all the work had been done previous to the meeting in Hobbs.

A Yes.

Q So Cities had put out all the expenditure

and all the work prior to the meeting in Hobbs.

A There's a great deal of money and time wrapped up in the drafting of this additional packet; were also drafted for this hearing.

MR. STOGNER: Mr. Quintana, I have no further questions of the witness.

MS. AUBREY: Mr. Quintana, may I ask an additional question?

MR. QUITNANA: Yes.

REDIRECT EXAMINATION

BY MS. AUBREY:

Q Ms. Barton, does Cities have a suggested limit for the new pool which you have found in your No. 1 Federal AA?

A Yes. We're suggesting that the northeast quarter of Section 9 be established as the pool limit.

Q And that the Corbin Queen Pool be contracted -- contracted as set forth in the application on file with the Commission?

A Yes.

MS. AUBREY: I believe that's all I have, Mr. Quintana.

MR. QUINTANA: I have no further questions of the witness but I do have a statement.

Do you want to introduce these exhibits?

MS. AUBREY: Mr. Quintana, I believe I tendered them, but I will do that again, if you like.

MR. QUINTANA: Exhibits One through Eleven will be entered as evidence.

I have no further questions of the witness, but, Ms. Aubrey, in reference to your statement at the beginning of the hearing dealing with this case being put on instead of going through a standard administrative procedure, I would like to clarify the reasons why this did come for hearing.

I realize that there was a lot of money expended in preparing this case and having your client come up here.

I guess this rule, what rule would it be, Rule 509 on Page G-5 of the General Rules and Regulations, the middle paragraph there gives you the option to bring a pool before a -- a pool discovery like this before a hearing, and even though our District office does not object to the presentation of this material and that they agree with your interpretation, if the Division was ever questioned and -- as to the authenticity of this data and to back up that pool extension or pool contraction, we at the

Division would not be able to back it up.

So our District Supervisor, Jerry Sexton, thought it was a good idea exercising our option to have the case be heard anyway, so this matter would be on the record, even though they were not objecting to it, and that is the reason it ended up coming before a hearing.

And I just wanted to state that for the record so that, you know, it would be known why this came before a hearing, that we weren't doing it maliciously just to have you guys come up here and present data that -- because I would never, myself, would never want anybody to come in here and present data without a reason for it, and that was the reason for it.

Are there further questions of the witness?

If not, the witness may be excused.

Case 8624 will be taken under advisement.

MS. AUBREY: Thank you.

(Hearing concluded.)

C E R T I F I C A T E

I, SALLY W. BOYD, C.S.R., DO HEREBY CERTIFY that the foregoing Transcript of Hearing before the Oil Conservation Division was reported by me; that the said transcript is a full, true, and correct record of the hearing, prepared by me to the best of my ability.

Sally W. Boyd CSR

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 8624 heard by me on JUNE 5 1985.

Gilbert P. Quintana Examiner
Oil Conservation Division