STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION DIVISION FOR THE PURPOSE OF CONSIDERING:	)	CASE NO. 11,168
APPLICATION OF OXY USA, INC.	)	

ORIGINAL

REPORTER'S TRANSCRIPT OF PROCEEDINGS

EXAMINER HEARING

BEFORE: MICHAEL E. STOGNER, Hearing Examiner

December 15th, 1994

Santa Fe, New Mexico

This matter came on for hearing before the Oil Conservation Division on Thursday, December 15th, 1994, at the New Mexico Energy, Minerals and Natural Resources Department, Porter Hall, 2040 South Pacheco, Santa Fe, New Mexico, before Steven T. Brenner, Certified Court Reporter No. 7 for the State of New Mexico.

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I N D E X

December 15th, 1994
Examiner Hearing
CASE NO. 11,168

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E X H I B I T S

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A P P E A R A N C E S

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By: W. THOMAS KELLAHIN

* * *

WHEREUPON, the following proceedings were had at 3:19 p.m.:

EXAMINER STOGNER: At this time I'll call next case, Number 11,168.

MR. CARROLL: Application of OXY, USA, Inc., for waterflood expansion and qualification for the recovered oil tax rate pursuant to the "New Mexico Enhanced Oil Recovery Act", Lea County, New Mexico.

EXAMINER STOGNER: At this time I'll call for appearances.

MR. KELLAHIN: Mr. Examiner, I'm Tom Kellahin of the Santa Fe law firm of Kellahin and Kellahin, appearing on behalf of the Applicant, and I have one witness to be sworn.

EXAMINER STOGNER: Will that one witness please stand to be sworn at this time?

(Thereupon, the witness was sworn.)

EXAMINER STOGNER: Mr. Kellahin?

SCOTT GENGLER,

the witness herein, after having been first duly sworn upon his oath, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q. Mr. Gengler, for the record would you please state your name and occupation?

A. My name is Scott Gengler, spelled G-e-n-g-l-e-r, and I'm a petroleum engineer.

Q. Where do you reside, sir?

A. Midland, Texas.

Q. On prior occasions, have you testified before this agency as an expert witness in the field of petroleum engineering?

A. Yes, I have.

Q. As part of your engineering duties for your company, have you made an engineering evaluation of the opportunity for additional secondary recovery out of what is identified as the OXY-operated Myers Langlie-Mattix unit?

A. Yes, I have.

MR. KELLAHIN: We tender Mr. Gengler as an expert witness.

EXAMINER STOGNER: Mr. Gengler is so qualified.

Q. (By Mr. Kellahin) Mr. Gengler, let me ask you, sir, to turn to the locator map which is the first page of Exhibit Number 2, and let's have you identify some of the items that are shown on that display.

First of all, show us what the exterior boundary is or how to find that boundary for this particular unit.

A. Are you talking about Exhibit 1?

Q. Yes, sir.

A. Okay, you said Exhibit 2.

Q. I'm sorry, page 1 of Exhibit 1.

A. The dashed line is the outer boundary of the Myers Langlie-Mattix unit. It also includes three window areas which are not included in the unit, and those are shown as blank spots on the map, and the yellow-shaded area is the project area.

Q. What has been the historical purpose of the unit itself?

A. The purpose of the unit was to waterflood the Myers -- or the Langlie-Mattix formations under 80-acre fivespot waterfloods.

MR. KELLAHIN: Mr. Examiner, that waterflood order was issued by the Division effective on November 20th, 1973, by Division Order R-4680.

The unit itself was approved four days earlier, on November 16th, 1973, by Division Order R-4660.

Q. (By Mr. Kellahin) Give us a little short history of the waterflood operations, particularly during the Seventies, and then show us where we are now in terms of recoveries.

A. The unit was, as you said, unitized in 1973, and waterflood operations began in early 1975.

To date, 15.2 million barrels have been produced from wells within the unit, with an ultimate primary

production of 9 million barrels.

Under the current 80-acre fivespot waterflood pattern within the unit, there are approximately 688,000 barrels of oil to be recovered under this mode of operation.

Q. Is OXY beginning to reach the point in the life of this project that you need to undertake additional expansions of the waterflood project and that technology?

A. Yes.

Q. Describe for us the significance to you of the area shaded in yellow on page 1 of Exhibit 1.

A. This area is what we're calling our project area, and what we plan on doing is infill drilling this and go to 40-acre fivespot waterflood patterns.

Q. Describe for us the color code for the wells.

A. The blue wells are the infill wells that were drilled, the black wells are current injection wells, and those are in black triangles. The red triangles are wells that are currently producing that will be converted to injection.

Q. How did you determine the size and the shape of the project area for this expansion?

A. We wanted to do a small part of this unit as a kind of pilot project to determine the feasibility of the 40-acre fivespot pattern, so we took an area which we felt

was representative of most of the unit, to take a look at this pilot project.

Q. When you total up the acreage within the yellow area as your project area, am I correct in understanding that's approximately 760 acres?

A. That is correct.

Q. As the project engineer and with your expertise, do you have an engineering opinion as to whether or not it is reasonably probable to have a positive injection response for those producing wells within this project area?

A. Yes, I do.

Q. And what is that opinion?

A. I believe that there is substantial oil that has been unswept, that it can be recovered by 40-acre fivespot waterflood patterns.

Q. Before we move through the rest of the items on Exhibit 1, let me ask you to turn to what is marked, I think, as -- Did you intend this for Exhibit 2?

A. Yes.

Q. All right, Exhibit 2 is the schematic, if you will, the diagram illustration. To illustrate the concept of what you're trying to achieve, explain to us pages 1 and 2 of Exhibit 2.

A. Page 1 shows an 80-acre fivespot waterflood

pattern and shows the general shape of what we feel like is, you know, the waterflood distribution of water through the reservoirs, and it shows big holes through the middle.

Based on other units that have done this type of operation of infill drilling and going to 40-acre fivespots, we have found that this is the case, that there are areas in the middle that are unswept, that would not be swept and not recovered in an 80-acre fivespot pattern.

Q. If the Division approves this expansion of the waterflood, do you have an illustration that will illustrate what you're trying to accomplish?

A. Yes, on page number 2.

Q. All right, describe that for us.

A. This shows the drilling of the well inside that 40-acre area that's unswept and the conversion of the two injection wells -- or the two producing wells that were not injecting water, and the accompanying pattern of the waterflood that you would see as a swept area.

Q. Go back to Exhibit 1 now. Let's turn to page 2 of Exhibit 1. What have you identified for us on that page?

A. This is a description of the area that is involved in the project area.

MR. KELLAHIN: Okay. Mr. Examiner, this same description has been reformatted on the Application that

we've filed, and it's in a form more conventionally used by the Division in processing its orders like this. If you would care to look at the Application, we have reorganized that information.

Q. (By Mr. Kellahin) When we turn to page 3, what do we see on page 3?

A. This is the list of the wells that are currently in the project area and their current status.

Q. Okay. Summarize for us the project operation. You've got existing producers. How many of those producers get converted to injection?

A. Sixteen.

Q. Are there any wells that are not producers that will be utilized for injection? Do you have any plugged and abandoned wells or temporarily abandoned wells?

A. Yes, we have one plugged and abandoned injector that we plan to re-enter and convert to injection.

Q. All right. Those 16 wells, then, the re-establishment of the prior plugged injector, plus the conversion of 16 producers for injection, are all those wells accounted for when you put together the Division C-108 filing?

A. Yes, they are.

Q. All right. Within the project area, then, how many new producers are to be drilled or have been drilled

or yet to be drilled?

A. There will be 19.

Q. Nineteen total?

A. (Nods)

Q. Of the 19 total infill producers, how many of those have actually been drilled?

A. We have drilled the 19 wells.

Q. Okay. At this point, have you commenced water injection into the project area?

A. Not on 40-acre fivespot. The 80-acre fivespot has been injected into.

Q. Well, obviously, that's continuing?

A. Correct.

Q. But the new injection for which you're seeking approval and concurrently the authorization under the Enhanced Oil Recovery Act is for injection that has not yet commenced?

A. That is correct.

Q. Have you calculated as an engineer what the expected additional incremental recovery is to be from the project area attributable directly to this expansion?

A. Yes, I have.

Q. And what is that number?

A. It is approximately 1.6 million barrels.

Q. Can you forecast for us the period of time over

which that volume of oil will be recovered?

A. Somewhere between 10 and 20 years.

Q. On page 4 of Exhibit 1, you've attached a copy of the Division order that approved the unit, and then we come to a production plot.

A. Correct.

Q. If you'll look, then, on page 5, is it -- Let's have you identify and describe that information on the production plot.

A. This is a production curve with oil, gas and water production rates, along with water injection rates for the entire Myers Langlie-Mattix unit.

Q. Take us through and show us the point in time where the unit was subject to the initial waterflood on the 80-acre pattern.

A. In 1975 you can see where the water injection started, where the curve begins.

They went through and injected into parts of the field with expansion in 1978 and 1979, to fully develop all of the 80-acre fivespot patterns, and that has been ongoing since that time.

Q. Okay. The next display on page 6, what does this represent?

A. This is the oil, gas and water production rates and the water injection rates from the project area of the

Myers Langlie-Mattix unit.

Q. Okay. Again, we can see in 1975 the commencement of the initial secondary recovery for that portion of the unit that's identified by the project area description?

A. That is correct.

Q. All right. And then that production peaks and begins to fall off and established a decline attributable to the benefits of that initial waterflood on the 80-acre pattern?

A. That is correct.

Q. All right. Later in the life of the plot, then, we're seeing a slight increase in production. That's attributable to the infill drilling program that's gone on?

A. That is correct.

Q. All right. After that, then, on page 7, summarize for us what you've shown.

A. This is the data on the project. We plan to inject water, which is coming from Texaco's water system, the Jal water system, down there, which is Reef water. We plan to inject approximately 300 barrels of water per day, and we plan to start injection as soon as we get approval from the State.

Q. That estimate of volume is 300 barrels of water per day per injection well?

A. That is correct.

Q. All right. And after that is the waterflood order that was originally issued by the Division for the entire waterflood project, right?

A. That is correct.

Q. And then after that, there's a list of wells on page 11. What does this apply to?

A. These are the same wells that were listed before, only this time we have listed their proposed status under this project area.

Q. All right. So after -- If the Division approves this and after a conversion of all these things, this would be the final status?

A. That is correct.

Q. All right. Okay, and after that, on page 12.

A. These are the cost estimates for this project, to develop on 40-acre fivespot patterns of what we've -- have spent and are going to spend for this project.

Q. All right, let's turn now to the forecast, if you will, of the potential benefit of doing this work.

When we look at page 13 of Exhibit 1, is this the forecast only for the project area, or is this the whole unit?

A. This is just for the project area.

Q. Within that project area, then, help us read the curve.

A. You have the green curve through late 1994, which includes the drilling of the infill wells. We kind of hold that production fairly steady and then get a production response from the water injection. We peak out in mid-1996 and start a decline after that.

Q. All right. When you identified a while ago for the Examiner that the magnitude of secondary oil directly attributable to the enhanced recovery within this project area, the 1.6 million barrels, how is that shown on this curve? What portion of that curve is that?

A. It's the blue part. Without the water injection, these wells, these infill wells, will drop in production fairly rapidly, and we wouldn't get near the production out of these wells that we would by putting water in the ground and getting some production from the movement of oil to these wellbores.

Q. Okay. It appears, Mr. Gengler, that you've taken a rather conservative approach in identifying the project area that's shown in yellow on the first page of this exhibit?

A. Yes, that is correct.

Q. You have chosen to show less potential project area that might be benefitted by this second phase, if you will, of waterflood operations?

A. Yes, that's correct.

Q. Let's turn to the processing of the C-108. When we look at Exhibit 3, this represents your personal completion of what you believe to be all the filing requirements of the Division with regards to the C-108 filing?

A. That is correct.

Q. Let's pull this apart, if you will, and take out the big map at the back, the area-of-review map. How do we locate the one-half-mile area of review on this area-of-review map?

A. It is the purple circles in the middle of the map.

Q. With regards to the two-mile rule where the Division requires you to report the location and presence of any well as to any depth, does this display satisfy that purpose?

A. Yes, it does.

Q. Within the area of review, then, have you personally examined the available information to determine the mechanical integrity of the wells within the area of review?

A. Yes, I have.

Q. When we look at the category of wells that would be classified as plugged and abandoned, do we have any of those type wells?

A. Yes, we do.

Q. When you look at that category of well, have you examined the plugging programs for those wells to satisfy yourself as an engineer that they've been adequately plugged and abandoned so that injection into this particular portion of the reservoir would isolate those injection fluids to this formation and they could not migrate out of zone through any of those plugged and abandoned wells?

A. Yes, I have.

Q. What is your conclusion about the integrity of those plugged and abandoned wells?

A. It is my opinion that all the wells that have been plugged in this area have been plugged properly.

Q. When we look at the category of wells that are producing wells within the area of review, have you examined each and every one of those wells to determine that they are adequately cemented across your injection interval so that the casing in those wellbores is not exposed to injection waters within this interval?

A. Yes, I have.

Q. And what did you find?

A. I found that they're all cemented across the injection interval.

Q. Okay. When we look at your map here, is there a

way to identify on this map the location of any potential freshwater source, either windmill or some other means by which fresh water is produced in this area?

A. Yes, there is.

Q. And how do we find that?

A. If you look down here on the legend, there's two circles with a bar in the middle of the inner circle, and those represent the water wells that have been located within the half-mile radius, and they are found -- An example of that would be in the southeast corner of Section 31, there's two of them right there, and there's several others on the map.

Q. How did -- What means did you go through to determine the location of these freshwater sources?

A. We had someone go down to the State Engineer's Office to get all the information of all wells that have been permitted by the State, and we sent one of our field people out to the area to look around to find all the wells that they could find and plotted all those on the map.

Q. All right. So from two different sources you have attempted to locate all known freshwater sources within the area?

A. That is correct.

Q. Does your C-108 filing show an analysis of the fresh water in this area?

A. Yes, I have two freshwater analyses.

Q. And do we have an analysis of the water that's to be injected into the reservoir?

A. Not in the Application.

Q. It's part of the original filing in the waterflood, I assume?

A. That is correct.

Q. All right. What kind of injection pressures are you currently using with the injection wells in the project area?

A. They range from well to well, but on an average, approximately 1100 pounds.

Q. Are we within or above the .2-p.s.i.-per-foot-of-depth guideline the Division uses for surface pressure control?

A. Most of those wells have had step-rate tests run and are above the .2 p.s.i. per foot.

Q. All right. But their surface injection pressure has been authorized at a rate based upon injection step-rate tests?

A. That is correct.

Q. Does the actual injection interval change in the project area from what is currently being utilized as the injection interval?

A. No, it does not.

Q. You're currently using the lower Seven Rivers and Queen portion of the pool?

A. And the Penrose.

Q. And the Penrose.

Notifications of this Application were sent to the offset operators, to the owners of the surface, for each surface injection well, as noted on Exhibits 2 and 3 of Exhibit 3, Mr. Gengler?

A. That is correct.

Q. And to your knowledge, did you receive any objection or complaint for any of those interested parties?

A. I did not receive any.

Q. Let's take one of the injection well schematics, if you will, that's in the C-108. Find one that is typical, and go through the mechanics of how you propose to convert these producers to injection.

Q. I'll just take the first well, which is Myers Langlie-Mattix Unit Number 70 on page number 5. This is an open-hole completion.

Our plans are to -- in this particular wellbore, to clean out to TD, put a light acid job on it, run a packer with fiberglass-lined tubing and set the packer above the open-hole interval.

Q. Has the waterflood experienced any out-of-zone water flows as a result of water injection?

A. Not to my knowledge.

Q. Okay. We're not suffering any kind of operational problem with regards to injectivity of water into this particular portion of the pool?

A. No.

Q. Do you have an estimate for us, Mr. Gengler, of the anticipated value of the additional hydrocarbons to be recovered if the Division approves this project, not only as an expanded waterflood with the additional injection authority, but as a qualified enhanced oil recovery project pursuant to State statute?

A. Yes, I do.

Q. And what is that opinion?

A. We expect the value of the oil to be produced at $14.8 million.

Q. Were Exhibits 1, 2 and 3 prepared by you or compiled under your direction or supervision?

A. Yes, they were.

Q. When you -- Let's take a typical conversion of a producer to an injector. Once you have it converted, you'll establish what that pressure, injection pressure, is at the surface. And if it requires an injection pressure greater than the .2-p.s.i.-per-foot-of-depth criteria, then you go through the process of having a step-rate test, filing with the Division and getting approved?

A. Yes, we would inject below that .2 p.s.i. per foot until such time as we had a step-rate test on that particular wellbore, and then we would file that with the State to increase that injection if necessary.

Q. All right, and you would request the opportunity to be able to do that administratively in this particular waterflood?

A. That is correct.

MR. KELLAHIN: Mr. Examiner, that concludes my examination of Mr. Gengler. We move the introduction of his Exhibits 1, 2 and 3.

EXAMINER STOGNER: Exhibits 1, 2 and 3 will be admitted into evidence.

EXAMINATION

BY EXAMINER STOGNER:

Q. Mr. Gengler, I believe in your Application you want to convert 16 wells and then bring one back on line; is that correct?

A. That is correct.

Q. And which one is the one to be brought back with injection?

A. It's Well Number 134.

Q. Is that the one in Section 6?

A. That is correct.

Q. In the -- particular, in the northeast of the

northeast, correct?

A. That is correct.

Q. And all the rest marked with red triangles are to be converted, producers to injectors?

A. That is correct.

Q. How many producing wells will be drilled, infill?

A. There's a total of 19 wells.

Q. Have those been staked yet, or --

A. They have been drilled.

Q. They have been drilled, okay.

A. What we wanted to do was to drill those wells to verify the unswept portion, and what we found was that we completed the wells and they showed a definite drop in production within a short period of time, which makes our hypothesis of this unswept area correct.

Q. And it is the area marked in yellow in which you have the proposal to get the tax credit; is that correct?

A. That is correct.

EXAMINER STOGNER: Mr. Kellahin --

MR. KELLAHIN: Sir?

EXAMINER STOGNER: -- I believe you told me that you have that description in the Application. You wouldn't happen to have it on a floppy disc, would you?

MR. KELLAHIN: I believe we can. It's on my hard drive, and we can certainly duplicate it and submit it to

you.

EXAMINER STOGNER: If you would do that, I would appreciate it.

MR. KELLAHIN: You bet. And we will do the same thing with the well list if you'd like.

EXAMINER STOGNER: Why don't you just go ahead and submit both of them? That way it will save us from duplicating.

MR. KELLAHIN: Yes, sir.

Q. (By Examiner Stogner) Let's see, just some figures to go over. I believe you stated an additional incremental 1.6 million barrels of oil will be produced in the pilot project if everything goes okay?

A. That is correct.

Q. And that comes out to $14.8 million?

A. That is correct.

Q. And do you have an expenditure list? How much is -- I believe you did.

MR. KELLAHIN: Yes, sir.

THE WITNESS: Yes, I believe --

MR. KELLAHIN: What page is that, Scott?

THE WITNESS: It's in Exhibit Number 1, page number 12.

Q. (By Examiner Stogner) Now, you've already accrued the 18 producers, the $3.6 million?

A. That is correct.

Q. Have you upgraded the batteries, injection facilities at this point?

A. No.

EXAMINER STOGNER: I have no further questions of this witness.

Can you think of anything further, Mr. Kellahin?

MR. KELLAHIN: Just a footnote, Mr. Examiner. The process we're following for approval of this as an enhanced oil recovery is a procedure that's been authorized by the Commission. It's Commission Order R-9955-A. It was entered by the Commission in April of 1994, when it approved the expansion by OXY of its -- a portion of its Kelly-Penrose B unit in Lea County, New Mexico, and we're following that same process here.

EXAMINER STOGNER: Since you brought that up, are there any other examples besides this one OXY, that you know of, that have approved similar -- would you say portions? -- within a project area for infill? Wasn't there a Phillips not too long ago, Phillips Petroleum?

MR. KELLAHIN: Yes, sir, there was a Phillips Petroleum one, and it was the East Vacuum-Glorieta unit and that was approved in November of 1993 by Order Number R-10,020, and there are some others, Mr. Examiner.

I have not updated my list recently, but --

EXAMINER STOGNER: But that list you're referring to is one that has been put out by, I believe, Jim Morrow before he left; is that correct?

MR. KELLAHIN: That's right, and there have been some additional cases since then that have followed the same process.

EXAMINER STOGNER: And I'll look on our own record.

MR. KELLAHIN: Yeah. Very quickly, there's a Phillips case; it's our 6856. And then -- That can't be right, that's not the right order number.

We can supply that to you.

There have been a Texaco, a Phillips and an OXY case, if I remember right.

EXAMINER STOGNER: All right. If there's nothing further in Case Number 11,168 --

MR. KELLAHIN: I've got a certificate of notice here for everybody, and it's Exhibit 4.

EXAMINER STOGNER: Exhibit 4. We have admitted this, right?

MR. KELLAHIN: No, sir, you have not yet.

EXAMINER STOGNER: This represents notification to the surface owners?

MR. KELLAHIN: And to the offset operators.

We notified the surface owners for each injection

well location, plus any operators within a half mile of any injection well.

EXAMINER STOGNER: Exhibit Number 4 will be admitted into evidence.

We'll take Case Number 11,168 under advisement at this time.

(Thereupon, these proceedings were concluded at 3:50 p.m.)

* * *

CERTIFICATE OF REPORTER

STATE OF NEW MEXICO)
) ss.
COUNTY OF SANTA FE)

I, Steven T. Brenner, Certified Court Reporter and Notary Public, HEREBY CERTIFY that the foregoing transcript of proceedings before the Oil Conservation Division was reported by me; that I transcribed my notes; and that the foregoing is a true and accurate record of the proceedings.

I FURTHER CERTIFY that I am not a relative or employee of any of the parties or attorneys involved in this matter and that I have no personal interest in the final disposition of this matter.

WITNESS MY HAND AND SEAL December 27th, 1994.

STEVEN T. BRENNER
CCR No. 7

My commission expires: October 14, 1998

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 11168 heard by me on 15 December 1994

, Examin
Oil Conservation Division