STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

ORIGINAL

IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION DIVISION FOR THE PURPOSE OF CONSIDERING:

CASE NO. 14157

APPLICATION OF FOREST OIL CORPORATION FOR APPROVAL OF A SECONDARY RECOVERY PROJECT, EDDY COUNTY, NEW MEXICO

REPORTER'S TRANSCRIPT OF PROCEEDINGS

EXAMINER HEARING

BEFORE: DAVID K. BROOKS, Legal Examiner
WILLIAM V. JONES, Technical Examiner
TERRY WARNELL, Technical Examiner

August 7, 2008

Santa Fe, New Mexico

This matter came on for hearing before the New Mexico Oil Conservation Division, DAVID K. BROOKS, Legal Examiner, WILLIAM V. JONES, Technical Examiner, and TERRY WARNELL, Technical Examiner, on Thursday, August 7, 2008, at the New Mexico Energy, Minerals and Natural Resources Department, 1220 South Saint Francis Drive, Room 102, Santa Fe, New Mexico.

REPORTED BY: JOYCE D. CALVERT, P-03
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Albuquerque, New Mexico 87102

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Examiner Hearing
CASE NO. 14157

A P P E A R A N C E S

FOR THE APPLICANT:

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MR. JONES: Let's call Case No. 14157, Application of Forest Oil Corporation for Approval of a Secondary Recovery Project, Eddy County, New Mexico.

Call for appearances.

MR. BRUCE: Mr. Examiner, Jim Bruce of Santa Fe, representing the applicant. I have three witnesses, two of whom we need to dial up.

For the record, we have Vic Smith and Sean Silver on the telephone. And Vic, appearing in the case today will be three hearing examiners; Mr. Jones, Mr. Warnell, and Mr. Brooks. For your information, Brian Wood is also here, and we're going to start off the with him. You can just go back to sleep for a few minutes.

MR. JONES: Mr. Wood, would you please stand to be sworn? Okay. Vic Smith and Sean Silver. We're going to swear you guys in. The court reporter is going to swear you in. Can -- you hear me.

MR. SILVER: Yes.

MR. SMITH: Yes.

[Witnesses sworn.]

MR. BRUCE: Mr. Examiner, we'll start with Mr. Wood, please.

BRIAN WOOD

after having been first duly sworn under oath,

was questioned and testified as follows:

DIRECT EXAMINATION

BY MR. BRUCE:

Q. Mr. Wood, would you state your name and city of residence.

A. Yes. My name is Brian Wood. I live in Santa Fe, New Mexico.

Q. And what is your occupation?

A. I'm the president of Permits West.

Q. And what does Permits West do?

A. We provided regulatory services for energy companies.

Q. What is your relationship -- or the relationship of Permits West to Forest Oil Corporation in this case?

A. We prepared the C-102 and the accompanying exhibits.

Q. And have you previously testified before the Division?

A. Yes, I have.

MR. BRUCE: Mr. Examiner, I'm not qualifying Mr. Wood as an expert, just to testify as to certain facts.

MR. BROOKS: Now, you said C-102. Did you mean C-108?

THE WITNESS: C-108. I also prepared the C-102, but I meant the C-108.

Q. (By Mr. Bruce): Mr. Wood, what does Forest Oil

Corporation seek in this case?

A. Forest Oil seeks approval of a lease, secondary recovery project in the Grayburg-Jackson pool by the injection of water into one well located on State Lease B, 2613-7 covering the SE/4 of Section 16, Township 17 South, Range 13 East, Eddy County. This will be an expansion of an existing waterflood.

Q. We'll mention that expansion in a minute.

MR. BRUCE: Mr. Examiner, first we're going to turn to Exhibit 10, which is the C-108.

Q. (By Mr. Bruce): Could you identify that for the Examiner, Mr. Wood?

A. Yes. This is the application for authorization to inject that I prepared.

Q. And did you prepare that in association with Forest Oil Corporation personnel?

A. Yes, I did.

Q. And is the information on this exhibit true and correct to the best of your knowledge?

A. Yes. It is true and correct to the best of my knowledge.

MR. BRUCE: Mr. Examiner, the pages -- maybe I forgot to do it on yours, but I think they've all been numbered for ease of reference.

Q. (By Mr. Bruce): Would you refer to page 12 of

the C-108 and identify that for the Examiner, Mr. Wood?

A. Yes. That's the location of the first injection well.

Q. And what is the footage?

A. It is 760 feet from the south line, 760 feet from the east line.

Q. And if you'd move onto page 14 of the C-108, what lease is involved in this application?

A. The State B Lease, which was issued by the State Land Office.

Q. And what does that cover?

A. That covers the SE/4 of Section 16.

Q. And is that lease as to the Grayburg-Jackson pool operated by Forest Oil?

A. Yes, that is correct.

Q. Now, in preparing the C-108, did you check the pertinent records as to any water or water wells within two miles of the injection well?

A. Yes. I checked the State Engineers' online database. There are no water wells within a two-mile radius, nor did I find any during the field inspection.

Q. And is this well located west of the Ogallala aquifer?

A. Yes.

Q. Let's go back to Exhibit 1. What is this

exhibit?

A. Exhibit 1 depicts the one-half mile radius area of review that shows the existing well bores within that one-half mile radius.

Q. And does it highlight the offset operators of wells that penetrate the injection zone?

A. Yes, it does.

Q. And who are those offset operators?

A. We've got Chevron, Kersey, COG and Marbob.

Q. And who is the surface owner at the injection well site?

A. New Mexico State Land Office.

Q. And were all of these interest owners, the well operators and the surface owners notified of this application?

A. Yes, they were.

Q. And is that reflected in my Affidavit of Notice submitted as Exhibit 2?

A. Yes, it is.

Q. Let's go back to Exhibit 1 for a minute. This is an old producing area, is it not, Mr. Wood?

A. That is correct.

Q. And all of the offsetting acreage is leased, and there are operators of those leases?

A. That is correct.

Q. So there are no unleased mineral interests that

we would have to notify?

A. Correct.

Q. It's all, in fact, government acreage, is it not?

A. Yes.

Q. And then you previously mentioned that this was an expansion of an existing project. There are currently no injection wells on the State B Lease; is that correct?

A. That is correct. The injection wells Forest operates are to the east, southeast and south.

Q. Okay. And they are part of the Skelly unit?

A. That is correct.

Q. Forest Oil has an ongoing injection program on the Skelly unit?

A. Correct.

Q. And as to the Grayburg-Jackson and Skelly unit, Forest Oil also operates that; is that correct?

A. That is right.

Q. And were Exhibits 1 and 2 compiled from company business records?

A. Yes, they were.

Q. And again, you did prepare Exhibit 10; is that correct?

A. Yes.

MR. BRUCE: Mr. Examiner, at this time, I move the admission of Exhibits 1 and 2 for the record.

MR. JONES: Exhibits 1 and 2 will be admitted.

[Applicant's Exhibits 1 and 2 admitted into evidence.]

MR. BRUCE: And that's all the questions I have of this witness.

MR. JONES: Did you receive any response back from anybody?

THE WITNESS: I have not.

MR. BROOKS: Mr. Bruce didn't ask him enough questions?

MR. JONES: I guess we have no more questions. Thank you, Mr. Wood.

MR. BRUCE: Thank you, Mr. Wood. Mr. Examiner, do you mind if I stand close to that just to make sure that they hear me?

MR. JONES: Certainly.

VIC SMITH

after having been first duly sworn under oath, was questioned and testified as follows:

DIRECT EXAMINATION

BY MR. BRUCE:

Q. Mr. Smith, can you hear me?

A. Yes.

Q. And do you have Exhibits 3, 4 and 5 in front of you?

A. I do.

Q. Would you please state your name and city of residence for the record?

A. Yes. My name is Vic Smith. I reside in Parks, Colorado.

Q. And who do you work for and in what capacity?

A. I work for Forest Oil Corporation as a geologist.

Q. Have you previously testified before the Division?

A. I'm sorry, I didn't hear that.

Q. Have you previously testified before the Division?

A. No, I have not.

Q. Would you please summarize your educational and employment background for the Examiner?

A. Okay. I have a Bachelor's of Science in earth science from Ashland University in Ohio and a Master's of Science in geology from Bowling Green State University in Ohio, and I've been employed as a geologist with Texaco from 1982 to 2002 and then employed as a geologist for Forest Oil Corporation from 2002 to the present. Most of my career I've spent working in the Permian Basin.

Q. And does your responsibility at Forest include this area of Southeast New Mexico?

A. Yes, it does.

Q. And are you familiar with the geology related to this application?

A. Yes.

MR. BRUCE: Mr. Examiner, I tender Mr. Smith as an expert petroleum geologist.

MR. JONES: Mr. Smith, I think I had recognized your name for some reason, and I used to work for Texaco myself. But I think you were in Midland while I was in Denver.

THE WITNESS: Yeah. That's true. Is this Will Jones?

MR. JONES: Yeah.

THE WITNESS: Yeah. I think you were, and I was. I moved back to Denver in 1997.

MR. JONES: Okay. What group were you on? What team were you on?

THE WITNESS: When I came back in '97, I was on the Delaware Basin team until about 1999. We had a reorganization there, and then I worked for Mid-Continent from about '99 to 2002 when they closed the office.

MR. JONES: So you worked with Kevin Bittle, then, on that?

THE WITNESS: Yeah.

MR. JONES: Yeah. We'll qualify Vic Smith as an expert in petroleum geology.

Q. (By Mr. Bruce): Mr. Smith, it's my understanding

that virtually everybody worked for Texaco at one time or another.

A. I think that's true. The whole world did.

Q. Mr. Smith, could you identify Exhibit 3 for the Examiner and discuss its contents?

A. Yes. Exhibit 3 is a structure map on the top of the San Andres formation in the vicinity of Forest State B Lease. The contour interval shown on there is ten feet. The proposed injection well, the State B No. 13, is circled in red, and it's in the SE/4 of the SE/4 of Section 16.

The larger red circle that's shown on there has a half-mile radius, and that is the review area used in the C-108 application. Also shown on this map are two cross sections, one from the northwest to the southeast and one from the southeast to the northeast. And I'll discuss those shortly.

There are some color bands around wells on there. Wells -- and certainly green -- indicates Forest Oil Seven Rivers producers, and those circled in blue are producing from the Queen, Yates, Seven Rivers, Grayburg, San Andres in the Grayburg-Jackson field. Wells which are just black dots or with no encircling color are operated by others, and those are predominantly wells that are producing from the Fren pool, the Paddock formation deeper than the Grayburg San Andres.

Q. Okay. Let's move on to your first cross section, Exhibit 4 and describe what it shows.

A. Okay. Exhibit 4 starts off east cross section of the Grayburg-Jackson interval. There will be waterflooded in the State B #13. The Queen, Yates and Seven Rivers are not shown on this cross section because we will not be injecting into them. The cross section shows relative log top of the Grayburg and San Andres formations, as well as tops of significant members in those formation, and those are all labeled.

These correlations demonstrate that these zones are continuous across the State B Lease from the northwest to the southeast, and that is parallel to strike on the contour map that I discussed earlier. Existing perforations are shown on this cross section in red, and abandoned or inactive perforations are shown in dark blue.

Q. Would you, then, move on to your last exhibit, Exhibit 5, and discuss its contents?

A. Exhibits 5, like the other cross sections, is from the southwest to the northeast. It's a structural cross section, and it parallels the dip directions of the structural contours shown earlier. And correlations here, again, show that the members of the Grayburg San Andres are continuous across the State B Lease from the southwest to northeast.

Again, the perforations, the existing perforations, are shown red. Abandoned and inactive perforations are shown dark blue. And this one also has two wells on there that show

currently active water injection intervals. Those are shown in light blue. And those are on the offset Skelly unit to the east and to the south of the State B Lease. You'll notice there's one well on there, the State B 10. It has no perforations shown in it, and that's because that's a well that we have just drilled, and we have not yet completed it.

Q. Will injection occur across the entire interval that's shown on Exhibits 4 and 5?

A. Yes, it will. From the top of the Grayburg down into the Jackson, the lower Jackson.

Q. And is the injection interval continuous across the State B Lease?

A. Yes, it is.

Q. From a geological standpoint, is the reservoir susceptible to waterflooding?

A. Yes, it is. In fact, as I just discussed on the last cross section there, the Skelly unit to the south and to the east of the State B Lease currently has ongoing waterflood right now.

Q. Is there any faulting in this area that would allow the movement of fluids between formations or would allow contamination of any potential water bearing zone?

A. No, there's not.

Q. Were Exhibits 3, 4 and 5 prepared by you or under your direction?

A. Yes, they were.

Q. And in your opinion, is the granting of this application in the interest of conservation and the prevention of waste?

A. Yes, it is.

MR. BRUCE: Mr. Examiner, I move the admission of Exhibits 3, 4 and 5.

MR. JONES: Exhibits 3, 4 and 5 will be admitted.

[Applicant's Exhibits 3, 4 and 5 admitted into evidence.]

MR. BRUCE: And I have no further questions of this witness.

EXAMINATION

BY MR. JONES:

Q. Okay. Mr. Smith, what's the primary zone that you think will be best suitable for waterflood there?

A. I think all of this from the Grayburg through the Loco Hills and on down in the lower Jackson would be excellent for waterflooding. Those are -- most of those are dolomites with good intergranular porosity and the Premiere sands, that has been one of the better producing intervals, too. That's a sandstone also with good intergranular porosity. So all of them should flood pretty well.

Q. So let me get this straight: This is going to be a lease waterflood with one well?

A. Correct.

Q. Were you involved in picking the injection wells?

A. Yes, I was.

Q. Okay. And why did you pick this one? Is it the center of the lease or something?

A. Well, we don't know that we will stay with just one well. It is our intent to do a test here to see how well this works. This lease has produced since 1937, and so there's been a lot of depletion. We want to see if we can get the economic response that we anticipate. We think it will. But we're going to try this as kind of a pilot first.

And part of our reason for selecting this location was that it formed the five spot with the three new wells we just drilled, as well as one existing well, the State B 5. And we will get some support from the Skelly unit, which we also operate, offsetting this. There are four wells there that will support this as well.

Q. So Forest Oil is operating the Skelly unit?

A. Yes.

Q. Okay. And this is one lease. I don't know if you're prepared to testify about ownership on the lease or the depth of the lease. Is there a common --

MR. BRUCE: Mr. Examiner, if I could -- I could obtain information on that, but I'm reasonably certain it's a state lease with no overrides and only one working interest

owner which is Forest Oil. But I can confirm that for you.

MR. JONES: And no division of interest as far as depth goes?

MR. BRUCE: There are some depth differences. For instance, you can see COG has some wells. But I can get that information for you. Everyone at a different depth has been notified.

MR. JONES: Okay. But the actual Grayburg San Andres is all -- and any perforations would all be in the Grayburg San Andres; is that correct?

MR. BRUCE: That's correct.

THE WITNESS: Yes.

MR. JONES: Okay.

MR. BRUCE: I will supplement the record with a statement of interest ownership.

MR. BROOKS: Okay.

MR. BRUCE: And if you want to continue the matter for two weeks.

MR. BROOKS: Yeah. You do not have any further land testimony, I take it.

MR. BRUCE: No. But -- Mr. Smith?

THE WITNESS: Yes.

MR. BRUCE: Do you happen to know if Mr. Rush is available?

THE WITNESS: We can go check. I think he might have

been out this morning, but I'm not certain of that.

MR. BRUCE: Okay.

THE WITNESS: Someone is checking that right now.

MR. BRUCE: Okay.

MR. BROOKS: Okay.

EXAMINATION

BY MR. WARNELL:

Q. Mr. Smith, while we're waiting, could you tell me -- you mentioned three new wells you just drilled.

A. That is correct.

Q. That, I assume, is the State B-10. And what would the other two be?

A. The State B-10, B-11 and B-12. The B-12 is in the southeast corner of the section there, and the State B-11 is on the south line of the State B Lease centered on that State B Lease line.

MR. BROOKS: Where is the No. 10?

THE WITNESS: B-10 is on the east line, centered on the east line of the State B Lease.

MR. BROOKS: Okay. Yeah. I see it now.

Q. (By Mr. Warnell): In looking at your cross section there, Exhibit No. 5, you've got the State B-10 log?

A. Yes.

Q. What is your target zone of interest, or what will you be testing there?

A. We will -- that's -- well, if you look at the B-11, it's log is on there as well. And you can see the blue perfs at the bottom. Now, we tested that lower-most zone in the lower Jackson and found it to be wet. And all the red perfs, then, are open, currently open and producing. And we're going to -- the reason I pointed it out is that the State B-10, we're going to open very similar intervals from, you know, just below the top of the Grayburg there as shown on the cross section and down into the lower Jackson.

Q. Okay.

MR. JONES: Mr. Smith, the Skelly unit is a statutory unit; is that correct?

THE WITNESS: I'm not sure what that means.

MR. BRUCE: Mr. Examiner, it was approved by the Division. It's an old, old unit. It was pre-statutory unitization. It was just a voluntary unit, a voluntary federal unit covering about four or five sections of land, and that can be discovered from the Division's records.

MR. JONES: So that explains the sparse, short orders approving waterfloods back beyond before a certain date.

MR. BRUCE: I think it was originally put together not as a waterflood.

MR. JONES: Okay.

MR. BRUCE: It was an exploratory unit.

MR. JONES: Okay.

MR. BROOKS: Jim has been here from the beginning.

MR. BRUCE: There are some depth differences. You know, Chevron owns some deeper depths, but they're not all flooded. And the waterflood orders which I think Mr. Wood put on his Exhibit 10 -- if you look at the top page of Exhibit 10 --

MR. JONES: Okay.

MR. BRUCE: -- it does list some waterflood expansion orders which you can refer back to and see when those were done.

MR. JONES: Okay. And these wells that were -- the B-11, the B-12 and I guess the B-10, they --

MR. BRUCE: I can get you the non-standard unit -- I mean, the non-standard location order if you so desire. Those were approved, I think, late last year.

THE WITNESS: I'm sorry, guys. You're cutting in and out somewhat. We have checked, and I apologize, Bruce Rush is ill today so he's not here.

MR. BRUCE: Okay. Mr. Smith, this is Jim Bruce. Just tell him I'm going to get him on the hook a couple of weeks from now to testify.

THE WITNESS: Okay. That would be fine. We'll do that.

MR. JONES: I don't know if we have any more geology-related questions.

MR. BROOKS: I don't.

MR. BRUCE: We do have an engineer.

MR. JONES: Thanks a lot, Mr. Smith.

THE WITNESS: You bet. Thank you.

MR. BRUCE: And our final witness is Mr. Silver, who is a reservoir engineer, Mr. Jones.

SEAN SILVER

after having been first duly sworn under oath,

was questioned and testified as follows:

DIRECT EXAMINATION

BY MR. BRUCE:

Q. Mr. Silver, could you state your full name and city of residence?

A. I'm Sean Silver, and I reside in Fort Collins, Colorado.

Q. And who do you work for?

A. I work for Forest Oil Corporation as a senior reservoir engineer.

Q. Have you previously testified before the Division?

A. No, I have not testified before this Division.

Q. Have you testified before other divisions?

A. Yes. A couple of occasions to the Texas Railroad Commission.

Q. Would you summarize your educational and

employment background for the Examiner?

A. Okay. I have a Bachelor of Science in engineering degree with a geological engineering major from Purdue University. And coincidentally, I was previously employed by Texaco for about 20 years as an operations and reservoir engineer in the Texas Permian Basin. And then I was employed for almost three years at Western Gas Resources as a coal bed methane reservoir engineer in the Power River Basin in Wyoming. And then I've been employed by Forest Oil Corporation for four years working the Permian Basin in Texas and New Mexico.

Q. And are you familiar with the reservoir matters related to this application?

A. Yes. I'm responsible for the engineering matters concerning this application.

MR. BRUCE: Mr. Examiner, I tender Mr. Silver as an expert reservoir engineer.

MR. JONES: I guess we probably know a lot of the same people.

THE WITNESS: Yep.

MR. JONES: And also Kevin Bittle, did you work with him at Western Gas Resources?

THE WITNESS: Yes. Yes, I did.

MR. JONES: Well --

THE WITNESS: We still have lunch occasionally.

MR. JONES: Okay. Tell him hi.

THE WITNESS: Okay.

MR. JONES: We'll qualify Mr. Silver as an expert in petroleum reservoir engineering.

Q. (By Mr. Bruce): Mr. Silver, have you made calculations regarding secondary recovery and the economics of the waterflood project?

A. Yes, I did.

Q. And what materials did you examine in your study of the reservoir?

A. Well, I reviewed the historical performance of the primary recovery from the existing older five wells on the State B Lease. And then, of course, with the new drilling, I examined all the open hole logs, mud logs, sidewall cores, and zone testing, and then the initial production results from the B-10, 11 and 12.

And then I also studied the historical primary and secondary performance from the Skelly unit waterflood that is adjacent to the B Lease to the south and the east. And then I kind of incorporated all of that information and summarized it on Exhibit 6 as a table of reservoir data. And this table illustrates the various reservoir properties, volumetric calculation parameters, primary recovery computations, and then the anticipated secondary recovery response.

Q. And what is the basic reservoir data?

A. Let's see. We have some basic data. I listed the discovery wells, average producing depth between 3- and 4,000 feet; geological description, solution gas drive reservoir; 35 to 36 degree API gravity; initial reservoir pressure around 1,000 PSI; average porosity 7 1/2 percent; average thickness 200 feet; permeability from cores ranged from 1 to 22 millidarcies; average water saturation, 40 percent; and formation volume factor, 1.2.

And then the other performance numbers are on the current production. Then we have some calculations for primary recovery to date for those five older wells. It's just under a million barrels, and the remaining primary reserves are 183,000 barrels which yield an estimated recovery of just over 1.1 million barrels. The volumetric parameters is above -- the original oil in place was about 9.2 million barrels. The volumetric parameter is above so that yields a primary recovery factor of about 12 1/2 percent.

Q. Okay. Why don't you move onto your Exhibit 7 and describe some of the history of this portion of the pool.

A. Okay. Exhibit 7 is a cumulative production map. It shows the State B Lease and the offsetting leases. That is the large red circle showing the area of review. The Grayburg-Jackson pool was discovered over 70 years ago. The State B wells have been drilled in this portion of the pool. State B Lease is comprised of the that SE/4 of Section 16.

And the cumulative oil and gas and water production numbers are listed below each well. The B #1, 2 and 3 were all spud between 1937 and 1944. The B #4 was spud in 1960. And the B #5 was spud in 2004. And, of course, we just briefly drilled the B-10, 11 and 12. The B-10 we just initiated completion and the B-12, we're in the middle of zone testing.

So, if you exclude the B-10, which we didn't start testing yet, seven out of those wells were all productive and there were no dry holes. So within the State B Lease we currently have six active wells, the 1, 2, 4, 5, 11 and 12. The #3 has been plugged. And the #10, like I mentioned, is being completed.

Q. Would you identify Exhibit 8 for the Examiner?

A. Exhibit 8 is a plot of oil, gas, water production and well counts versus time beginning in 1970 to date. And production is through the end of February of '08. This pool has produced 963,000 barrels of oil, 726 million cubic feet of gas, and 72,000 barrels of water. February production averages about seven barrels per day per well, three MCF per well, and about six barrels of water a day per well.

This is a solution gas drive reservoir and the current oil production is declining about 5 percent. So most of these wells are in the stripper stage of their lives, and they are approaching their economic limit, which is -- I calculate a little less than one barrel a day. We mentioned we

just recently drilled the 10, 11 and 12, 11 being put on line and is producing approximately 23 barrels a day.

Of course, all three of these wells were drilled in conjunction with the injection well in order to form the five-spot pattern. And then -- so these three newly drilled wells will directly benefit from the injection from the B-13.

Q. Did you refer back to your Exhibit 7? What is the injection pattern?

A. Okay. The B-13 has the little red circle around it, and it's a 28-acre five-spot pattern with the four offsets being the B-5, the B-10, the B-11 and B-12. And then I also have offset injection from the Skelly. It's going to provide the B producers. And we also plan to perform workovers on those injection wells to boost their injectivity, those four being the 28 and the 29 to the east, 59 and 60 to the south.

Q. Okay. So you plan on workovers on some of the Skelly unit wells?

A. Yes. They will be cleaned out and re-acidized.

Q. Are there any plans for any additional injection wells on the State B Lease or in the Skelly unit?

A. Yes. As we evaluate the results from the B-13 pilots, we will evaluate converting and/or drilling more wells on the State B Lease and on the Skelly unit.

Q. And does the project area cover the entire 160-acre State B Lease?

A. Yes. We have injection and producing wells that are located on each quarter/quarter section.

Q. How much additional barrels of oil do you anticipate recovering as a result of this project?

A. Exhibits 9 is a production plot that shows the anticipated response from the injection into the B 13 and the production in the surrounding producers. Peak response is about 18 barrels a day and eight MCF a day, which we predict to see in about 20 months after injection is put on. And that should yield about 52,000 barrels of oil and 22 million cubic feet of gas over an 18-year period.

Q. And how did you calculate the reserves to be recovered by the waterflood project?

A. Referring back to the data on figure -- Exhibit 6, the predicted primary recovery from the new drills, the 10, 11 and 12, was 52,000 barrels and 22 million cubic feet, which is about 4 1/2 percent recovery factor on a 20-acre spacing. We used the secondary to primary recovery ratio of one, which will result in a secondary recovery of 52,000 barrels and 22 million cubic feet over and 18-year life and the four offset producers. So this is about a 2.3 percent recovery factor over the 40-acre safety flood area.

If we utilized the historical injection withdraw ratio of 1.7 from the wells in the Skelly unit to the south and the east, our anticipated 500-barrels-a-day injection rate

would result in a peak rate of 18 barrels a day and 276 barrels of water a day, split amongst the four offset producers.

Q. And what type of recovery are you predicting for the project?

A. We're anticipating a one-to-one, secondary-to-primary ratio.

Q. And what is the estimated life?

A. 18 years.

Q. What additional facilities will be needed for the State B project?

A. The injection well drilling completion bid is going to cost $805,000. And in addition to that, we'll have to install an injection pump, injection lines, water supply lines and a water storage tank, and estimated cost is $250,000. So that results in a total project cost of $1,055,000.

Q. And will the project be economic?

A. Yes, it will.

Q. And from an engineering standpoint, is this portion of the Grayburg-Jackson pool suitable for flood?

A. Yes, it is. It is directly accordable to the waterflood results of the Skelly to the southeast.

Q. And is this project technically and economically feasible at this time?

A. Yes, it is.

Q. Now, let's move on to Exhibit 10 the injection

application. First, if you could go to page 3 of Exhibit 10, could you briefly describe how the injection well will be completed?

A. Page 3 of the exhibit is a schematic of the injection well. We'll have 8 5/8 casing set at 430 feet, and then cemented to the surface. 5 1/2 casing will be set at 4100 feet and cemented to the surface with 100 percent excess cement in an attempt to circulate the cement to the surface. And we'll perforate from approximately 3100 feet to 3900 feet. We'll set an injection packer at 3,050 feet with 2 3/8 coated tubing going to the surface, and then we'll pump in fluid on the backside and then perform a successful mechanical integrity test.

Q. How many wells are there within the half-mile area of review?

A. Pages 20 -- 23 and 24 identify all the wells in the half-mile radius area of review. There are 45 wells in the half-mile radius that surround this injector and penetrate the injection zone.

Q. And are any of these wells plugged and abandoned?

A. There are four wells that have been plugged and abandoned in the area of review, and the schematics for those well bores are on pages 16 through 19.

Q. And do those well bore sketches show that these wells were properly plugged and abandoned?

A. Yes, they do.

Q. And to your knowledge, are the producing wells in area of review properly completed?

A. Yes, they were.

Q. And will they prevent the movement of fluids to other zones?

A. Yes, they are cemented in such a manner that they will prevent the migration of fluids.

Q. Would you summarize the injection operations?

A. These are on page 9, Section VII, No. 1, where we anticipate an average injection of 500 barrels a day, with a maximum limit of 1,000 barrels of water per day.

Q. And what will be the injection pressures?

A. Well, our top perforation is going to be approximately 3100 feet, so under the Division rules, the maximum injection pressure is initially limited to 620 PSI. And if we need to acquire higher pressure to establish a sufficient rate, then we will perform step rate tests and seek the appropriate approval from the OCD.

Q. Do you happen to know what the injection wells on the Skelly unit are injecting at?

A. They have been as high as 2,000 PSI.

Q. Okay. What is the source of injection water?

A. The injection water will be produced as Grayburg-Jackson water with makeup water, if necessary, coming

from the Skelly unit. We performed an analysis of the injection waters. These are included on pages 25 through 28. And there are no capability problems between injection and formation of the waters.

Q. In your opinion, is the granting of this application in the interest of conservation and the prevention of waste?

A. Yes, it is.

Q. And were Exhibits 6 through 9 prepared by you or under your supervision?

A. Yes.

Q. And have you reviewed the contents of Exhibit 10, and do you agree with it?

A. Yes, I do.

MR. BRUCE: Mr. Examiner, I move the admission of Exhibits 6 through 10.

MR. JONES: Exhibits 6 through 10 will be admitted.

[Applicant's Exhibits 6 through 10 admitted into evidence.]

MR. BRUCE: I have no further questions of this witness at this time.

EXAMINATION

BY MR. JONES:

Q. Okay. Mr. Silver, I think you covered it pretty good. What zones do you think is going to take the most water,

and what zones? Are you going to do anything to determine which zones are taking water? Are you going to run any kind of profiles or anything?

A. Yes. We will be running profiles on initial completion and then throughout the life of the well. I anticipate the Premiere -- looking at the profiles in the Skelly unit, we get a pretty wide distribution across the entire interval.

Q. Okay. Are you the engineer on the Skelly unit also?

A. Yes, I am.

Q. Okay. So what's your day-to-day activities on the Skelly unit? You probably have lots of other units you cover also, but what I mean is, have you run some profiles on the Skelly unit to see how it's doing?

A. We will be in the future. Of course, we have the Skelly unit, the Maljamar unit and the Caprock unit. Based on -- like you mentioned -- based on the development in our State B drilling, we anticipate an infill drilling program on the Skelly unit and an injection well conversion program there also.

Q. Okay. So you're going down -- what spacing, density, per well would you be going down to on the Skelly unit?

A. We're going to try some 10-acre infills, and

there's also an additional remaining 20-acre infill locations that still remain in the unit.

Q. Okay. So you're going to have 20-acre five-spots possibly?

A. Yeah.

Q. Okay. You use Powertools for most of your projections, the curves and everything?

A. Yes. We do a little bit of work in ARIES, but mostly in Powertools.

Q. Not Petra?

A. Vic uses Petra.

Q. So you use it for geology work also?

A. That's right.

MR. JONES: I have no more questions.

MR. BROOKS: No questions.

MR. BRUCE: Nothing further.

MR. JONES: We think you covered it pretty good, Mr. Silver and Mr. Smith and Mr. Wood.

MR. BRUCE: Mr. Examiner, if we could continue the case for two weeks, then we will supplement the record with additional land information.

MR. JONES: Okay, let's continue Case No. 14157 to August 21st.

[Hearing concluded.]

* * *

REPORTER'S CERTIFICATE

I, JOYCE D. CALVERT, Provisional Court Reporter for the State of New Mexico, do hereby certify that I reported the foregoing proceedings in stenographic shorthand and that the foregoing pages are a true and correct transcript of those proceedings and was reduced to printed form under my direct supervision.

I FURTHER CERTIFY that I am neither employed by nor related to any of the parties or attorneys in this case and that I have no interest in the final disposition of this proceeding.

DATED this 7th of August, 2008.

JOYCE D. CALVERT
New Mexico P-03
License Expires: 7/31/09

STATE OF NEW MEXICO)
)
COUNTY OF BERNALILLO)

I, JOYCE D. CALVERT, a New Mexico Provisional Reporter, working under the direction and direct supervision of Paul Baca, New Mexico CCR License Number 112, hereby certify that I reported the attached proceedings; that pages numbered 1-34 inclusive, are a true and correct transcript of my stenographic notes. On the date I reported these proceedings, I was the holder of Provisional License Number P-03.

Dated at Albuquerque, New Mexico, 7th day of August, 2008.

Joyce D. Calvert
Provisional License #P-03
License Expires: 7/31/09

Paul Baca, RPR
Certified Court Reporter #112
License Expires: 12/31/08

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. 14157

APPLICATION OF FOREST OIL CORPORATION FOR APPROVAL OF A SECONDARY RECOVERY PROJECT, EDDY COUNTY, NEW MEXICO

REPORTER'S TRANSCRIPT OF PROCEEDINGS

EXAMINER HEARING

BEFORE: DAVID K. BROOKS, Legal Examiner
WILLIAM V. JONES, Technical Examiner
TERRY WARNELL, Technical Examiner

August 7, 2008

Santa Fe, New Mexico

This matter came on for hearing before the New Mexico Oil Conservation Division, DAVID K. BROOKS, Legal Examiner, WILLIAM V. JONES, Technical Examiner, and TERRY WARNELL, Technical Examiner, on Thursday, August 7, 2008, at the New Mexico Energy, Minerals and Natural Resources Department, 1220 South Saint Francis Drive, Room 102, Santa Fe, New Mexico.

REPORTED BY: JOYCE D. CALVERT, P-03
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