STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION
STATE LAND OFFICE BLDG.
SANTA FE, NEW MEXICO

22 August 1984

EXAMINER HEARING

IN THE MATTER OF:

Application of Gulf Oil Exploration and Production Company for a water-flood project, Lea County, New Mexico. CASE 8312

BEFORE: Michael E. Stogner, Examiner

TRANSCRIPT OF HEARING

A P P E A R A N C E S

For the Oil Conservation Division: W. Perry Pearce
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For the Applicant: Anthony V. Sorrentino
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I N D E X

E X H I B I T S

MR. STOGNER: We will now call Case Number 8312.

MR. PEARCE: That case is on the application of Gulf Oil Exploration and Production Company for a waterflood project, Lea County, New Mexico.

MR. SORRENTINO: Mr. Examiner, my name is Tony Sorrentino, Houston attorney for Gulf Oil.

I'm appearing here today in association with the firm of Kellahin and Kellahin, and I have one witness.

MR. PEARCE: Are there other appearances in this matter?

(Witness sworn.)

MR. SORRENTINO: Mr. Examiner, this is, as Mr. Pearce has stated, Gulf's application to institute a waterflood project in the Seven Rivers and Queen formations, located in Gulf's William A. Ramsay and J. F. Janda leases in Lea County.

Our one witness today, from our Midland office, in support of our application, is Mr. Les Munson, who I will call at this time.

LES MUNSON,

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

DIRECT EXAMINATION

BY MR SORRENTINO:

Q Could you state your name and by whom you're employed, please?

A My name is Les Munson. I'm employed by Gulf Oil Corporation.

Q Mr. Munson, have you previously testified before the OCD as an expert in petroleum engineering and were your qualifications accepted at that time?

A Yes, and they were.

MR. SORRENTINO: Mr. Examiner, we would tender Mr. Munson as an expert in petroleum engineering.

MR. STOGNER: He is so qualified.

Q Mr. Munson, what specific area will be encompassed by this waterflood project?

A Mr. Examiner, your Exhibit Number One is a map of the proposed area. The proposed wells are shown as triangles in the shaded area. This shaded area is contained entirely in the J. F. Janda NCT-F Lease. This lease is located in Section 4, Township 22 South, Range 36 East.

Q Will any part of the W. A. Ramsay Lease

be included in this waterflood?

A No, there will not.

Q Mr. Munson, do you have the completed Form C-108 for the Examiner?

A Yes. Exhibit One-A is a completed Form C-108 we would like to offer.

Q You have drawn on the proposed injection wells in this project?

A Yes. Refer to Exhibit Two, which is required by Item 3 of Form C-108. This exhibit is a summary and wellbore schematics for the four proposed wells. To summarize, all four wells will be completed with 5-1/2 inch casing set at approximately 3900 feet. Cement will be circulated to surface, barring any problems. Perforations will be picked after logging these wells and their interval will be approximately from 3750 to 3875. The formation will be stimulated by acidizing.

Q Do you have plats showing the two mile area around each proposed injection well and identifying those wells within a one-half mile radius?

A Yes. Please refer to Exhibit Three, as required by Item 5 of Form C-108.

There are four plats, one for each well, identifying those wells within a one-half mile radius of our proposed injection wells.

Q Can you give us a summary of the wells within a one-half mile radius of the proposed injection

wells?

A Yes. Refer to Exhibit Four as required by Item 6 of Form C-108. The second page of that exhibit is a summary of the 25 wells in that area. The 25 wells have been identified within one-half mile radius of the proposed injection wells. Almost all of these are, in summary, almost all of these have been completed with 5-1/2 inch casing set at approximately 3900 feet.

Several of these wells are Jalmat gas completions and several are Eunice South Seven Rivers Queen completions.

All of the Jalmat wells have been completed through casing perforations.

The Eunice South completions have been completed both through casing perforations and some in open hole.

The tops of cement behind the oil strings in these wells range from the surface down to 2900 feet from surface.

Q Are there any wells plugged and abandoned in this area?

A Yes. The State 157-G No. 1-A has been plugged and abandoned. That schematic, a schematic of that wellbore is the last schematic included in this Exhibit Four.

Q Can you describe the proposed operation of this waterflood project?

A Yes. Exhibit Five, as required by Item 7 on Form C-108, gives -- gives a summary of our operations.

Our average rate that we expect to inject at is 525 barrels of water per day per well. The maximum rate is not expected to exceed 700 barrels of water per day. This injection system will be closed. The maximum injection pressure will be limited to .2 psi per foot depth to the top-most interval until an actual step rate test is run.

The results of that step rate test will then be used ot determine the appropriate pressure upon approval of the OCD.

The source of injection fluids will be from Gulf Oil's Janda and Ramsay consolidated batteries on the William A. Ramsay NCT-A Lease.

Q Has a compatibility analysis been carried out for the injected water sources in this project?

A Yes. Page -- page two of this Exhibit Number Five is an analysis of water from three sources.

The first source is produced water from the W. A. Ramsay NCT-A No. 4.

The second source is produced water from the J. F. Janda NCT-F No. 14.

And the third source is on combined waters taken from a disposal tank located at the Ramsay battery.

The analysis shows no sulfate scaling tendencies of the samples and none to mild calcium carbonate

scaling tendencies for the samples.

The next page shows several samples of these sources that have been mixed in various quantities.

The first mixture tested was 35 percent Ramsay water and 65 percent Janda water.

The second mixture was 25 percent Ramsay water; 75 percent Janda water.

The third mixture was 4 percent Janda water and 96 percent disposal water.

The fourth mixture was 11 percent Janda water and 89 percent disposed water.

It was found that in no case was there a significant scaling tendency of any kind. Martin, Martin Water's statement is to the effect "indicates no unusual problems should be expected from incompatibility of injection waters."

Q Can you give us a geological description of the injection zones, please?

A Yes. Please refer to Exhibit Six, which is that required by Item 8, Form C-108.

The two zones are the Seven Rivers and Queen zones.

The Seven Rivers is found from approximately 3350 to 3700, the gross interval of 350 feet. It is composed predominantly of dolomite with thin 10 to 20 foot zones of coarse sandy dolomite.

The Queen is found from 3700 to 3975 and

this formation is composed predominantly of dolomite sandstone with interbedded tight dolomite beds 5 feet to 20 feet thick. Porosity is developed primarily in the sandstone.

Q What fresh water zones have been identified in this area?

A The Ogallala aquifer is the principal aquifer in this area. It's found down to a base of 160 feet from surface.

The Chinle-Santa Rosa is found with a base approximately 1000 feet from surface. The Chinle and Santa Rosa formations are known to produce small quantities of water.

The undifferentiated Redbeds are found with their base at approximately 1535. They're composed of Redbed shale and silty, red silty sandstone.

Q How are these proposed injection wells to be completed?

A It is proposed to selectively perforate in the Seven Rivers-Queen zone and stimulate formation by acidizing with 15 percent hydrochloric acid.

Q Do you know of any fresh water sources within one mile of the proposed injection wells?

A No. The nearest known fresh water source is a water well that supplies water for the Robinson stock tank, which is located in Section 30, 21 South, Range 36 East.

This is approximately two miles west of

our project area. The source of that water is the Ogallala aquifer and its depth is 150 feet.

An analysis of that water is provided on the second page of Exhibit Eight.

Exhibit Nine is Gulf's affirmative statement, stating that Gulf Oil Corporation has examined available geologic and engineering data and finds no evidence of open faults or any other hydrologic connection between the injection zone and any underground source of drinking water.

Q Has Gulf notified offset operators and surface land owners of this project?

A Yes. Exhibit Ten is a copy of return receipts for notifications of this proposed project.

In addition we offer Exhibit Eleven that is proof of legal notice run in the Hobbs News Sun. That Hobbs News Sun is in the county of this proposed project.

Q Mr. Munson, were Exhibits Numbers One through Eleven prepared you or under your supervision and control?

A They were.

MR. SORRENTINO: Mr. Examiner, I offer Exhibits Numbers One through Eleven into evidence and tender the witness for any questions that you may have.

MR. STOGNER: Exhibits One through Eleven will be admitted into evidence.

Is this Exhibit Eleven?

A I don't believe so. That is -- looks like from a previous application.

MR. STOGNER: I don't have an Exhibit Eleven.

Let the record show that these Exhibits One through Eleven have been admitted into evidence.

CROSS EXAMINATION

BY MR. STOGNER:

Q To get some stuff straight here I want to back up to Exhibit Number Six-X. That is your geological data of your injection zone, is that right?

A Yes, sir.

Q Exhibit Number Seven, that's your proposed stimulation program, is that right?

A That's right, Mr. Examiner.

Q Exhibit Number Eight is your chemical analysis of fresh water within the one mile of Gulf Oil Corporation?

A It's of the closest fresh water source we could find.

Q And that's the Robinson stock tank --

A Yes, sir.

Q -- in Section 13. And Exhibit Number Nine is the affirmative statement, is that correct?

A Yes, sir.

Q Exhibit Ten is your notice of delivery.

A Yes, sir.

Q Okay. Mr. Munson, if you'll refer back to Exhibit Number One, the shaded area in Section 30, for the record would you please describe that area?

A That would be the southwest quarter of Section 4. That would be the south half of the northwest quarter of Section 4. That would be the southwest quarter of the northeast quarter of Section 4, and the west half of the southeast quarter of Section 4.

Q Thank you, Mr. Munson.

Mr. Munson, on Exhibit Number Two, which is your schematic of your proposed injection wells, you show the injection interval estimated 3750 to 3875.

Now, if you go to Exhibit Number Six you show the Seven Rivers in this area being 3350 to 3700 feet, is that right?

A Yes, sir. The vertical limits as they're described in the Eunice South Seven Rivers-Queen have a -- the top is 100 feet above the base of the Seven Rivers, and that makes it at approximately 3600 feet, and that is the vertical limit description of the Eunice South Seven Rivers-Queen. The actual formation has a greater vertical interval than that.

Q So this is a little bit deceiving.

A That is, as far as pool rules go, it is. This was our geologic -- this was a statement of our geolo-

gist and he was --he was not concerned with pool rules.

Q But you still propose to perforate in both the Seven Rivers and the Queen formations but they are both in the pool, the Eunice South Seven Rivers-Queen Pool?

A Yes, sir. We'll be limiting our perforations to that described by the Eunice South Seven Rivers-Queen.

Q Thank you, Mr. Munson.

I'd like to refer back now, also, to Exhibit Two. In each of these four wells you do propose to run a plastic-coated tube, is that right?

A Yes, sir.

Q And set a packer approximately 100 foot above your top perforation interval, is that right?

A That's right.

Q Are there any other injection wells or waterflood projects in this immediate area in the South Eunice Seven Rivers-Queen Pool?

A The only one I'm aware of is -- it's covered under Order 1820, R-1820, was our Ramsay flood, which is now -- it's been shut down, so to my knowledge there is no more --there is no injection in this immediate area at this time.

MR. STOGNER: Let the record show that I will take administrative notice of Order Number R-1820.

I have no further questions of

this witness at this time.

Are there any other questions of Mr. Munson?

MR. SORRENTINO: I have nothing further, Mr. Examiner.

MR. STOGNER: Are there any other questions of this witness? If not, he may be excused.

Is there anything further in Case Number 8312?

MR. SORRENTINO: No, sir.

MR. STOGNER: If not, this case will be taken under advisement.

(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. 8312, heard by me on August 22, 1984.

Michael E. Stogner, Examiner
Oil Conservation Division