

BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico

July 22, 1964

EXAMINER HEARING

IN THE MATTER OF:

Application of Shell Oil Company for a
waterflood project, Lea County, New Mex-
ico. Applicant, in the above-styled
cause, seeks authority to institute a
waterflood project in the Langlie-Mattix
Pool by the injection of water through
four wells at unorthodox locations in Sec-
tion 21, Township 24 South, Range 37 East,
Lea County, New Mexico.

Case No. 3081

BEFORE: DANIEL S. NUTTER, Examiner.

TRANSCRIPT OF HEARING

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NEW MEXICO OIL CONSERVATION COMMISSION

EXAMINER HEARINGSANTA FE, NEW MEXICOREGISTERHEARING DATE JULY 22, 1964TIME: 9 A.M.

NAME:	REPRESENTING:	LOCATION:
John F Russell	Union Oil Co. of Cal.	Roswell, N.M.
L.E. Thomas	Amerada	Hobbs -
Robert L Spettawood	Shell Oil Company	Roswell, N.M.
A.E. Snyder	Amerada	Midland, Tex
John J Lacey	Innesco Oil	Durango, Colo
John A. Dirsch	El Paso Nat Gas	Gal, N.M.
R. S. Cooke	Union Oil Co. of Calif.	Midland, Tex.
J.B. Wristy to	Hinkle, Bondurant & Christy	Roswell, NM
J.P. Benton	British-American Oil Prod.	Midland, Texas
Richard P. Marvin	Peth, Montgomery, Feltner & Andrews	Santa Fe
CARL L. WAIGHAM	TEXACO	MIDLAND TEX.
Ray Crow	General American Oil Co	Loco Hills New Mexico
M.A. McConnell	Phillips Pet. Co.	Odessa, Tex.
L.P. White	ECW	Santa Fe
Jason Kellie	Kellie & Fox	Santa Fe
Ralph L Gray	WMA & Ed. R. Hudson	Artesia, N.M.
Richard L. Gray	Fair Oil Company	Tyler, Tex

NEW MEXICO OIL CONSERVATION COMMISSION

EXAMINER HEARING

SANTA FE, NEW MEXICO

REGISTER

HEARING DATE JULY 22, 1964 TIME: 9 A.M.

NAME:	REPRESENTING:	LOCATION:
<i>Marshall Smith</i> <i>Raymond Laws</i>	<i>R. W. Byram</i> <i>Wilson Oil Co</i>	<i>Santa Fe</i> <i>Arthur D. W.</i>

MR. NUTTER: The hearing will come to order, please.
The first case this morning will be 3081.

MR. DURRETT: Application of Shell Oil Company for a
waterflood project, Lea County, New Mexico.

MR. MORRIS: If the Examiner please, I'm Richard Morris
of Seth, Montgomery, Federici and Andrews, Santa Fe, New Mexico,
appearing on behalf of the Applicant, Shell Oil Company. I will
have one witness in this case, Mr. Bob Spottswood, and I ask that
he be sworn as a witness at this time.

(Witness sworn.)

(Whereupon, Applicant's
Exhibits 1 through 7
were marked for identi-
fication.)

ROBERT L. SPOTTSWOOD

called as a witness, having been first duly sworn on oath, was
examined and testified as follows:

DIRECT EXAMINATION

BY MR. MORRIS:

Q Mr. Spottswood, would you please state your name, by
whom you are employed, in what position and where you are located?

A My name is Robert L. Spottswood and I'm employed by
Shell Oil Company as the Division Reservoir Engineer in Roswell,
New Mexico.

Q Have you previously testified before the New Mexico



Oil Conservation Commission or one of its Examiners?

A No, I have not.

Q Would you briefly outline your education and experience in the petroleum industry?

A I studied petroleum engineering at the University of Oklahoma and graduated in 1953 with a Bachelor of Science Degree. I went in the Army for a couple of years as an engineering officer in military pipeline operations. Since then I've had approximately nine and a half years' experience with Shell Oil Company as assistant field engineer in Wyoming and in Montana, as a reservoir engineer in Montana and Colorado, and I've recently finished a two-year research reservoir assignment in Houston with Shell Development Company. I'm a registered professional engineer in Texas.

Q Are you familiar with the application of Shell Oil Company in Case 3081?

A Yes, I am.

MR. MORRIS: Mr. Examiner, are Mr. Spottswood's qualifications acceptable?

MR. NUTTER: They are.

Q What is the purpose of Shell's application in this case?

A Our purpose, or Shell Oil Company's purpose seeks authority to institute a waterflood project on our J. F. Black



lease in Section 21, Township 24 South, Range 37 East, Langlie-Mattix field in Lea County, New Mexico.

Q If you would refer now to what has been marked as Exhibit No. 1 in this case, would you state what that is and what it shows?

A Exhibit No. 1 is a plat which shows Shell's 120-acre lease outlined in red in the Langlie-Mattix Pool. The location of our proposed injection wells are shown in green with those green circles there. The plat also shows other wells in the area and the formations they have produced from or are producing from, and lease ownership is also shown on this exhibit.

Q The exact location of your injection wells is set forth on another exhibit that we'll get to in a few minutes, is that correct?

A Yes, sir.

Q If you would refer now to what has been marked as Exhibit 2 in this case, state what it is and what that shows.

A Exhibit 2 is a large contour map. It's a structure map that's contoured on the top of the Queen which was prepared utilizing all available logs in the area, those that were available to us. Shell's Black lease is located on the west flank of a north-south trending regional high which extends several miles. The Langlie-Mattix oil accumulation associated with this



regional trend is limited updip by a gas-oil contact and downdip by a water and/or porosity deterioration.

The Gross Queen to Grayburg interval is approximately 260 feet based on sparse log and core data. The oil-productive interval in the vicinity of the Black lease, and this is outlined in red, is probably confined to the upper 150 feet of the Queen section. There is good correlation across this area which suggests reservoir continuity.

As has been seen on this contour map, there is a dip of approximately 120 feet across our lease from the north dipping down to the south. We are approximately the same structurally as the lease to the immediate east where a waterflood has been started in the Langlie-Mattix interval in April of this year, and you'll notice to the right there the George Buckles waterflood to the immediate east of us.

Also down to the south, the Amerada Woolworth unit, there's a pilot waterflood started in the Langlie-Mattix Pool. Off to the east of us in Section 23, mile and a half or so, is another waterflood that Shell is currently putting in the Langlie-Mattix Pool. The interval immediately above the Queen is tight and there's a water-bearing sand below. This lack of pay quality sandstone immediately above the Queen is confirmed by core analysis and log data on a water injection well recently drilled by Amerada in the



section just to the south of our lease. If you'll notice, that's Well No. 38 there in Section 28. The bulk of the Queen productive interval consists of fine grain quartz sandstone relatively thin bedded, separated by an anhydritic dolomite ranging in thickness from a few feet to a maximum of 30 feet.

The primary production has been due to a solution gas drive mechanism with possibly some gas cap expansion. Original gravity of the crude was 39 degrees API, and the last reservoir pressure in our Black No. 1, and you'll notice the T. A. well there was 121 PSIG on June the 18th, 1964.

Q Would you briefly outline the development of your Black lease and the status of the production of that lease and the wells located thereon to the present time?

A Development of this lease was started during late 1936 with the drilling of Black No. 1. Wells 2 and 3 were drilled in 1937. Pipe was set just above the Queen and the wells were completed open hole. Black No. 1 was temporarily abandoned after declining to one barrel per day oil on March the 3rd, 1963.

Black No. 2 was abandoned in the Langlie-Mattix pay after the production had declined to less than one barrel of oil per day in April of 1948. The well was then sold to El Paso Natural Gas, who has been producing gas from the Jalmat of the Yates pay.

Shell Black No. 3 is currently producing three barrels of



oil per day. Cumulative oil from the lease is approximately 300,000 barrels. Needless to say, all of these wells are in the stripper stage or have been in the stripper stage in the Langlie-Mattix Pool.

Q Based upon the past production from these wells, the geology in this area, the current state of production, has your company made a study concerning the feasibility of secondary recovery in this area?

A Yes, we have made a study.

Q What has that study shown?

A We plan to install a waterflood on our lease which will consist of drilling the four injection wells shown on this Exhibit 2, the contour map, and also on Exhibit 1, the lease plat map, and continue the 20-acre pattern already established in the field to the east. The unorthodox location of these injectors are shown on Exhibit 3. I might refer to the table.

Here you see the proposed location, the proposed injection well number, the location, the distance from the section line, the casing detail, estimated total depth and the estimated vertical limits of the Langlie-Mattix pay. Looking back now to Exhibit No. 2, after drilling the four injection wells we are negotiating with El Paso right now to purchase back Black No. 2, and if we're unable to do that we possibly will drill a producer near Black



No. 2.

Q Mr. Spottswood, your proposal then will represent an extension of the pattern that is in effect on the Buckle's waterflood immediately to the east of your properties?

A That's right. I'd like now to refer, continuing the development of our proposed waterflood, to the exhibits marked 4, 5, 6 and 7. I'll talk from Exhibit No. 4. All of these are diagrammatic sketches of proposed water injection wells, but talking from Exhibit No. 4, we are planning, as you can see here, to set surface pipe 7-5/8" at approximately 250 feet and circulate cement there. We're estimating 250 sacks. Then we propose, or are planning, to drill on down through the Langlie-Mattix pay and nicking the top of the Grayburg, setting 4-1/2" casing on this particular well.

We're estimating approximately 3740 feet and we'll cement these, all of them, with approximately 150 sacks of cement which should bring the top up above the Jalmat gas pay to approximately 2500 feet. As you can see on the bottom there we have put the approximate perforated interval, 3470 to 3730. This will be adjusted when we run logs to, of course, get water into the interval that we think the oil is located, most of the oil is located.

The tubing string is 2" and we will set it on a retrievable-type packer, fill the annulus with inhibited water, and we'll have



internally plastic-coated 2" tubing. As you can see, we are planning to set the tubing and the retrievable packer down into the top of the Langlie-Mattix pay.

Q Are each of your other injection wells to be completed in substantially similar manner?

A Yes, they all will be.

Q As shown on Exhibits 5, 6 and 7?

A Right.

Q What are your plans for developing a source of water to inject into these four injection wells for use in the water-flood project?

A We plan to drill a Santa Rosa water source well which will be located in the West Half of the Southeast Quarter of Section 21. If for some reason the Santa Rosa is poor in this particular well, we'll drop on down to the Rustler to get our water supply.

Q What do you estimate your requirements will be for the water that you develop from whatever source on a per day basis and total?

A We estimate each injection well will take approximately 300 to 350 barrels of water per day for a total daily injection rate of some 1400 barrels. Total make-up water will be approximately one million barrels. We have noticed in this general area



that two water sources have been developed, the Rustler formation by Buckles Company to the east in Section 22 on their flood operation there, and further to the east in Section 23 where we are currently completing a well in the Rustler on our other flood in this area.

We understand that Amerada to the south of us in Section 27 has a Santa Rosa water source well that has been producing for over a year. We have discussed water source problem and the water source development in this area with the State Engineer's Office and are planning to furnish them with an analysis of the water, the original fluid level, completion gauges and other information on our water source well on our Black lease.

Q Has other information pertinent to this application been furnished to and discussed with the State Engineer's Office?

A Yes, it has. We're expecting to see response in our producers within nine months or so and expect peak oil production should be reached in less than two years and our estimated flood life now is approximately ten years.

Q What conclusions can you draw from this, Mr. Spottswood, concerning the effectiveness of your proposed secondary recovery project and its effect upon conservation of oil and gas in New Mexico?

A We believe this proposed project is in the interest of



conservation and should result in recovery of otherwise unrecoverable oil, thereby preventing waste and we believe that the project can be accomplished without violating correlative rights.

Q Were Exhibits 1 through 7 prepared by you or at your direction and under your supervision?

A Yes, they were.

MR. MORRIS: We offer Shell's Exhibits 1 through 7 in this case.

MR. NUTTER: Shell's Exhibits 1 through 7 will be admitted in evidence.

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

MR. MORRIS: That's all I have of Mr. Spottswood at this time.

MR. NUTTER: Does anyone have any questions of Mr. Spottswood?

CROSS EXAMINATION

BY MR. NUTTER:

Q This pattern that you have selected here is a continuation of the Buckles pattern, is that correct?

A Yes, it is.

Q Have you discussed this flood with Texaco, who owns the lease to the north and west of your proposed injection wells?



A Yes. We have discussed it with Texaco.

Q Have you discussed it with Continental and Skelly to the west?

A No, we haven't.

Q Do you know if any of these three companies is planning any flooding activity on their own leases?

A Right now I don't know that they are.

Q The location of your wells is such that it would affect their wells, however, isn't it?

A Yes, sir. Of course, we are putting energy in our particular flood and we're hoping to reach most of that energy in performance from our wells, as you can see, with open sides all around we are going to supply energy to those people.

Q So that you expect that the effect you would have on their wells would be a beneficial effect rather than a detriment?

A Very definitely.

Q You say that the No. 2 is presently owned by El Paso?

A Yes, sir.

Q But that you are going to attempt to buy it back from them, and if that is unsuccessful you would drill other wells in that 40-acre tract?

A That's right.

Q The lease to date has produced some 300,000 barrels of



oil. Have you an estimate as to the recovery you will obtain from the secondary efforts?

A We are using an approximate one to one ratio here, 300,000 barrels of secondary oil.

Q These times that you were expecting, the nine months, two years and ten months, that's from the date injection commences?

A Yes, sir, right.

Q When do you think that this will actually go on injection?

A I think it would be within a couple of months at the latest. We have our management approval and so we're waiting on the Commission, and so we're anxious to get started ourself.

Q Mr. Buckles is actually injecting water into this well?

A Yes, sir, he started in April and is injecting water.

Q Have you, incidentally, started injection over in the Plains Unit yet?

A No, sir. The Plains Unit is the one --

Q In Section 23.

A No, sir, we haven't tested our water source well yet, so this week we'll have a pump gauge test on it. We'll be ready to start injecting, I would say, by the first of September there.

Q You used existing wells there and didn't have to drill any?



