

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
July 6, 1961

EXAMINER HEARING

Case 2333

TRANSCRIPT OF HEARING

MR. WATSON: Will you have some Exhibits we can present the Commission:

THE WITNESS: I'll have two Exhibits.

MR. WATSON: Exhibit 1 is a map of the area, a photo-static copy of the map of the area; and Exhibit Number 2 is a cross-section.

(Exhibits Nos. 1 and 2 marked for identification.)

V. P. S H E L D O N, called as a witness, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. WATSON:

Q Will you please state your name and your occupation.

A V. P. Sheldon, Geologist.

Q Have you testified previously before the Oil Conservation Commission?

A I have.

Q And your qualifications have been accepted here?

A I believe so, sir.

Q You are familiar with the present application of Nash, Windfohr and Brown with reference to a new pool in Eddy County, New Mexico?

A I am familiar with it.

Q Have you been engaged for Nash, Windfohr and Brown as a geologist in connection with these two wells?



A I have.

Q Are you familiar with the application of Nash, Windfohr and Brown in this case?

A Yes, sir, I am.

Q Mr. Sheldon, are you familiar with the development of the Abo Reef Pools in Eddy County, New Mexico?

A I have followed them, yes.

Q Have you followed them rather closely?

A Yes, sir.

Q You do have a producing well of your own in one of the fields?

A Yes.

Q You have done work as a geologist in other areas?

A Yes, I have.

MR. WATSON: At this time, I would like to amend the application of Nash, Windfohr and Brown to exclude the south half of the southeast quarter, 23 Range 30 as a part of the area we are requesting to be included. The reason for excluding the south half of the southeast quarter of Section 23 is that acreage is owned by Nash, Windfohr and Brown and it was included inadvertently in the application.

MR. NUTTER: That is all of Section 24, the northeast section of 23 and the north half of the southeast, Section 23?

MR. WATSON: That is correct.

MR. NUTTER: Your application will be so amended.

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Q (By Mr. Watson) Mr. Sheldon, based on your experience in the area and the work you have done on this for Nash, Windfohr and Brown development on the Jackson 22 B well and 23 B well in Section 24, will you please state your opinion as to whether or not the discovery constitutes a new discovery?

A It is my opinion now after the drilling that it does.

Q Can you give your reason for that, please, sir?

A Yes, sir. Do you wish me to?

Q Refer to your Exhibit, yes, sir.

A Exhibit 1 which is a photostat map merely shows the lines of cross-section from east to west across the lower part of the tier of sections having three oil pools: The Local Hills Abo, the Cedar Lake Abo, and our proposed Jackson Abo. You will note that the cross-section is relatively a straight line. Of course, I have to dip both north and south perhaps a quarter of a mile to get all the wells on, but I tried conscientiously not to contort the thing. It's as near a true situation as I can present.

Then we get into the cross-section which I have labeled a schematic cross-section designed to illustrate separate stratigraphic traps near the crest of the reef porosity. Near the upper portion of the cross-section you will notice a dashed line marking the original crest of the Abo reef structure.

Originally, it did appear that probably these three pools were one. We had no evidence of it, but it could have been.



First, there was the Cedar Lake which Sinclair opened up and they tabbed the oil-water contact at a minus 3450, plus or minus a few feet, and that has been proven by six wells. That contact does hold up. They have had a rather expensive gas cap, nearly 150 feet of gas cap on top of the oil. In fact, most of their porosity above water happened to be gas.

I am not testifying for Sinclair. That is from the record. Then the local Hill Field opened with a rather nice oil column of something over 150 feet, perhaps, with a definite oil-water contact and minus 3212, plus or minus a few feet. We received the idea of drilling a well on the Nash, Windfohr and Brown lease conscientiously trying to keep at the very crest of the structure and the Jackson B 22 was drilled. It was slightly back reef in the sense that we were some 200 feet below the top of the Abo before porosity was encountered. We had typical dream shale and so on, but to shorten up the story, we do consider it slightly backward.

We appeared before this Commission for an unorthodox location because we wanted to get slightly south of the first well. We made an oil well, but it is our feeling now we couldn't possibly move south of that and complete an oil well. It would be water. For in the process of completing and testing the two wells an oil-water contact minus 3320 has been established, again, plus or minus a very few feet, so we have three oil-water contacts for the three oil pools. Notice on the cross-section the

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various expanse of that yellow which is representative schematically of the Abo reef porosity which is full of water. If you will recall, in the Empire Abo which is a fine field, many wells have penetrated the entire six to seven hundred foot of Abo reef without ever having found water. Not so in Cedar Lake or Local Hill or our proposed Jackson Abo. There, we seem to have a hundred, two hundred feet of reef porosity full of hydrocarbons. And then great sections, maybe five or six hundred feet of porosity, full of water. I would assume that the reef porosity is continuous from field to field. I would assume that all three fields are under full water draft because the various portions of the reef has water in it, and then, if the water is not moving, I haven't figured this out from a fine mathematical standpoint, but I presume the expansion potential of the water in the reservoir is very nearly enough to flood the small reef crest because that is what I construe them to be. They are nothing but the very top of the little individual reef peaks which have hydrocarbons forced up into them.

There is no permeability bearing area on the reef itself. It is merely the fact that hydrocarbons have been pushed up into the top of these peaks and held there, but we have three oil-water contacts.

In addition, in the case of the situation between Local Hills and the Jackson Abo, they now have seven dry holes. Chambers and Kennedy, McIntire 10 and the Woolley B Number 1 which is



the southeast southeast section 22, and I understand by word of mouth that T. P. which is now drilling in the southwest of the southwest quarter of 21 looks very dismal as of this point as being a dry hole. That could change.

So, we have rather good proof -- rather, good evidence -- not proof. We have rather good evidence at the moment certainly that Local Hills and the Jackson are separate. There are no dry holes so far as in between Cedar Lake and Jackson Abo, but we have the distinct oil-water contact and if one believes in surface topography, I might add there is a very large ditch in there which I am afraid to drill the well in. That's poor geology.

So, we contend that we have a new discovery probably of small magnitude. Should I go into it?

Q Mr. Sheldon, you're familiar with the fact, I believe, that the acreage involved here which is the northeast quarter and the north half of the southeast quarter, Section 23 and also of Section 24 that is all included in the Jackson Federal oil-gas lease on 55264, is that correct?

A No. The acreage in Section 24 is the Jackson B and the acreage in 23 is the Gissler. It is a Federal lease and it is owned by Nash, Windfohr and Brown.

Q Both areas are owned by Nash, Windfohr, Brown?

A Yes.

Q Both are Federal leases?

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A Both are Federal leases.

Q At the present time, there are no Abo wells within one mile from the other boundaries of either of those leases, is that right?

A That is right, yes.

Q Now, in connection with this application, Mr. Sheldon, the application to establish field rules to consist of rules established by the Oil Conservation Commission except for the determination of G. O. R. in accordance with the provisions of Rule 506. What is the situation with reference to the G. O. R. in the these Jackson Abo wells, 23 B and 22 B?

A The 23 B, referring again to the cross-section, shows two drill stem tests having been taken, uppermost of which was some four and a half million to gas together with seventeen barrels oil per hour with a ratio of twelve thousand.

The second drill stem test was at a lower level testing approximate bottom, twenty feet of the oil column just above the water flowed twenty barrels oil per hour. We did not take the ratio, but from playing it by ear, it was a fairly low ratio. It was not particularly high, probably in the order of a thousand, fifteen hundred.

Then, perforations were made from about minus 3290 to minus 3305 and a ratio on the first test was 6900 cubic feet which has gradually worked down until on June 27th it was 5500 cubic feet flowing at the rate sixty-five barrels oil per day.



MR. NUTTER: What was the perforation interval?

THE WITNESS: Minus 3390 to 3305.

MR. NUTTER: Thank you.

A Bottom of perforations are left in ten feet from the known oil-water contact. If we perforate higher, we would run into that four and a half million feet of gas we encountered in the first drill stem test which would make us a higher ration. On the Jackson B 22, we had -- there again, the first drill stem test was from approximately minus 3210 to minus 3240. It was strongly of gas.

The next test was from minus 3240 to 3290 and it was thirty barrels oil per hour with a very high ratio. It was about ten thousand. Just what it was, I don't exactly know, because you see, it blew our mercury out of our gauge.

Then the third drill stem test which was designated on the cross-section was all sulfur water.

MR. NUTTER: No oil recovery?

THE WITNESS: No oil recovery.

Q (By Mr. Watson) Mr. Sheldon, what is being done with the gas produced from these wells?

A It's being sold to Phillips.

Q In the field rules we are asking for, we have requested ten thousand.

A Perhaps seven thousand would be all right. Ten thousand was somewhat arbitrary. Our contention is, however, that



since the evidence seems to prove that this is a separate reservoir which is quite gappy, that is the operator was penalized by the enforcement of a Statewide rule of two thousand cubic feet, the wells would be uneconomical. It is possibly, primarily a gas reservoir. It is our contention that the granting of the high ratio could have no adverse effect on this property or any offset owners' property because I see no way that the withdrawal of gas could expand the gas cap over anyone else' property. It's this small reservoir and by the withdrawal of the gas, I don't believe we could possibly adversely affect any offset operator.

Q Do you know the approximate cost of these wells, this Jackson Abo?

A Mr. Windfohr advised that with a directional survey and everything else, about \$100,000.

Q In the event this Jackson 23 B would be permitted, will that produce its allowable oil?

A Yes, it will.

Q In the event it was allowed to produce only the proportion of the allowable represented by the G. O. R. of 2000 to 1, do you think the well would pay out?

A It would take a long time. I rather doubt if it would be economical.

Q Mr. Sheldon, do you know of any way that the allowance or exception to the G. O. R. to provide 10,000 to 1 ratio in this particular area could have any adverse effect on any opera-



tors in that area?

A I cannot think of any way that it would have an adverse effect.

Q Do you have anything else you wish to add to your testimony at this time, Mr. Sheldon?

A I believe not.

Q These Exhibits 1 and 2, were they prepared under your supervision?

A They were.

Q You prepared the Exhibits yourself?

A I prepared Exhibit 2.

MR. WATSON: We'll offer Exhibits 1 and 2 in evidence.

MR. NUTTER: Exhibits 1 and 2 will be entered in evidence.

Is there anything further, any questions of Mr. Sheldon?

MR. MORRIS: Yes, sir.

CROSS EXAMINATION

BY MR. MORRIS:

Q How did you reach the depth of minus 3520, approximately as you projected the southwest corner of 19, Exhibit 2?

A From the contour map on top of the Abo, and assuming that the well -- let me start over. I have contoured the area on top of the Abo as best I can. On these two projection points I have used the top of the Abo from the map. Then the top of the porosity I simply moved down there about twenty or thirty



feet because all the low wells encountered porosity very near the top of the Abo itself. It is an arbitrary figure, but I do not believe you could have a point any higher. If anything, they will be lower.

Q You would have no control between the Jackson Pool and your Cedar Lake over here. This is all by projection?

A That is admitted, yes, sir.

Q Do you feel that you have a completely unique situation here in the Jackson, in your proposed pool that would call for this 10,000, 7,000 to 1, whatever it is excepting as to the G. O. R.? Do you think you might come up here? Do you think it's completely unique or do you feel that this might be something that we'd run into again in the Abo formation?

A I suspect it's something we'll run into again.

Q Are there other instances of it in the Abo up to date?

A Well, I don't know hardly what to say concerning Sinclair, but it is known from the completion records that most of the Turner-Cedar Lake reservoir is gas, by volume, I mean, because the cross-section shows less than a fifty foot of oil column in the Jackson, in the case of the Jackson. In the case of the Nash, Windfohr, Brown Jackson, we seem to have less than forty foot of true oil column, and it's been very difficult to get a satisfactorily low ratio. Now, there is probably a five or ten foot interval under the Jackson lease where one could secure a thousand cubic feet ratio, but with the water moving, which it



surely will, since oh, 99% of this reef is full of water. Let me say 99% is merely a wild guess. Expanse is going to definitely move water in and --

MR. PORTER: 100% is all, you know.

THE WITNESS: 100% is all.

A And the Cedar Lake is going to water rapidly, and we anticipate the same thing -- I think we'll have to continue flood back squeeze and move back up the section, and I think the payout in the field will be gas.

MR. MORRIS: Thank you, sir.

CROSS EXAMINATION

BY MR. PORTER:

Q What is the gravity, Mr. Sheldon? Is it about the same contact as in the Empire Abo?

A Yes, Mr. Porter. I think I heard them say 43. It is a yellow oil very similar to the Empire Abo.

Q Does that carry throughout in the Cedar Lake, too, Cedar Hills?

A I don't know. I have never --

Q You have never seen it?

A I didn't look up the record on it and I have never seen it.

Q On 23 B, where you had a G. O. R. of 6100 to 1 and then a few weeks or months later another ratio taken was 5500?

A It has fallen to 5500 in a matter of some three weeks.



On June 4 it was 7,018 and on June 27th, Phillips gas cleaning plant at 5505. That fluctuation might be merely testing technique.

Q You anticipate also that your water problem is going to increase?

A I certainly do.

Q Well, don't you think it may be aggravated by higher withdrawal rates?

A It will be hastened by higher withdrawal rate, but the operator will be selling his product.

Q You say you're selling the gas at the present time?

A Yes.

MR. PORTER: That's all I have.

CROSS EXAMINATION

BY MR. NUTTER:

Q Mr. Sheldon, as I understand it, on the cross-section you have two wells over on the left-hand structure being the Local Hills Abo. Then we have three dry holes being the Sinclair McIntyre, the Chambers Kennedy, Sinclair Number 1 and T. P. Woolley B Number 1.

A Yes, sir.

Q And then we get back on the proposed Jackson Abo with two wells there and then we have no wells until we get over on the Cedar Lake area where we have one well depicted on the Exhibit?



A That's right.

Q Is the oil column as well as the gas column depicted by this one Sinclair well in the Cedar Lake area typical of the entire pool?

A Yes. That is a composite situation, really. The cross-section shows Number 65, but I have personally checked all the wells in the field and the oil-water contact and the gas-oil contact bears out.

Q And there are six or eight wells in that pool?

A Eight, I believe.

Q What method is the operator in Cedar Lake using? Are they perforating low and getting low ratios on their wells?

A They are perforating low and getting -- according to the records filed with the Commission and also according to the gasoline plant measurements -- they're getting ratios in the order of fifteen hundred.

Q Is that atypical of the ratios in Cedar Lake?

A According to my check of the records, yes, sir, but they're also going to water, you know. They have one top allowable oil well at the moment. The rest of them are water.

Q They're not making top allowable oil?

A No.

Q Are they having to pump these wells in Cedar Lake?

A I don't know.

Q Now, which well is it that is producing approximately



fifty-five
~~twenty-five~~ hundred?

A No. 23.

Q How about 22? What kind of ratio do you have on it?

A About sixteen hundred. That is a quirk which I cannot explain.

Q What are these little circles?

A Completion perforation intervals.

Q That well is completed higher than Number 23, but it has a lower ratio, is that correct?

A That's right. Still, we seem to have evidence of very satisfactory cement jobs. At least, we have no contrary evidence.

Q The Number 23 on the lower drill stem test making any water at all?

A Yes, it made twenty barrels oil an hour and recovered some one hundred twenty-five foot of water below the reverse circulation when we pulled it. It made no water to the surface.

Q And on the third drill stem test on 22 well, it made all sulfur water?

A Gas and no show of oil.

Q So it would appear that you have the oil-water contact fairly well defined?

A Quite well.

Q How reliable do you think this picture of the gas-oil contact or is that the line between the red and green, gas-oil contact?

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A Yes, it is, yes.

Q Do you it's pinned down with a fair degree of accuracy?

A Yes, within say, ten feet.

Q How do you account for the fact that 22 crossing the gas-oil contact being perforated in the gas produces only sixteen hundred to one ratio and the other well perforated well below the gas-oil contact, has an extremely high ratio?

A Well, of course, there is a possibility that we have a bad cement job, but the operator did use -- first we used -- much to the geologist's consternation -- used an oil base mud, centralizers were used, the job went off fine, the perforations were made and had to be acidized a second time before we got anything to get through them. Certainly there was no drop in pressure. Mechanically, the situation seemed to be all right, but I say there is a possibility that may be it isn't.

Q Are both single completions?

A Yes.

Q Are Nash, Windfohr and Brown contemplating drilling any additional wells in this area?

A That is a difficult question. We have a State well to the west.

Q I notice a little circle on the Exhibit directly west of 22.

A That is State on the ground, it has never been filled ~~on paper, but State on the ground. That would be the location~~

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that Windfohr will drill, I think, if he drills.

Q You don't know yet?

A He hasn't made the final decision. I think it would matter to quite an extent on this particular Hearing, if we are penalized, or he is penalized, and if the operator is penalized. That might have quite a bearing on his decision.

Q Mr. Sheldon, are you aware of more or less the general policy of the Commission to be rather conservative in dedicating acreage, defining pools to include land that hasn't been proven productive yet?

A Yes, I am, and Nash, Windfohr and Brown -- I mean as far as we are concerned, we could tighten this up considerably.

Q The south half would be more in keeping with what has been approved productive to date?

A It would be. In fact, we don't think the north half of 24 is productive.

Q You probably wouldn't drill up there anyway?

A Not at the moment.

MR. NUTTER: Are there any further questions?

CROSS EXAMINATION

BY MR. UTZ:

Q Mr. Sheldon, I gather that you feel that this water drive, this pool has quite an active water drive?

A Yes, I do feel that it will have a very active water drive.



Q That will assist in the recovery of the oil in the pool as well as the gas cap?

A Properly handled, it should flush the oil out.

Q Do you feel that the water drive would be just as effective in the gas cap as it does in the oil zone?

A I should think so.

Q But, at the same time, the well will be rather rate sensitive because of the active water drive?

A Yes.

MR. UTZ: That's all.

MR. NUTTER: Are there any further questions of Mr. Sheldon.

He may be excused.

(Witness excused.)

MR. NUTTER: If there are no other questions in this case, the case will be taken under advisement.

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