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:

APPLICATION OF BTA OIL PRODUCERS FOR SALT WATER DISPOSAL, EDDY COUNTY, NEW MEXICO

CASE NO. 10268

REPORTER'S TRANSCRIPT OF PROCEEDINGS

EXAMINER HEARING

BEFORE: MICHAEL E. STOGNER, Hearing Examiner

March 21, 1991
10:30 a.m.
Santa Fe, New Mexico

This matter came on for hearing before the Oil Conservation Division on March 21, 1991, at 10:30 a.m. at Oil Conservation Division Conference Room, State Land Office Building, 310 Old Santa Fe Trail, Santa Fe, New Mexico, before Paula Wegeforth, Certified Court Reporter No. 264, for the State of New Mexico.

FOR: OIL CONSERVATION DIVISION

BY: PAULA WEGEFORTH
Certified Court Reporter
CSR No. 264

I N D E X

March 21, 1991
Examiner Hearing

CASE NO. 10268

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E X H I B I T S

A P P E A R A N C E S

FOR THE DIVISION: ROBERT G. STOVALL, ESQ.
General Counsel
Oil Conservation Commission
State Land Office Building
310 Old Santa Fe Trail
Santa Fe, New Mexico 87501

FOR THE APPLICANT: CAMPBELL & BLACK, P.A.
Attorneys at Law
BY: WILLIAM F. CARR, ESQ.
110 North Guadalupe
Santa Fe, New Mexico 87501

* * *

EXAMINER STOGNER: Call next case, 10268, which is the application of BTA Oil Producers for a salt water disposal in Eddy County, New Mexico.

Did I get did county right, Mr. Carr?

MR. CARR: Yes, sir.

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

EXAMINER STOGNER: May it please the examiner, my name is William F. Carr with the law firm of Campbell & Black, P.A., of Santa Fe. We represent BTA Oil Producers, and I have one witness.

EXAMINER STOGNER: Are there any other appearances in this matter?

Will the witness please stand and be sworn?

(Whereupon the witness was duly sworn.)

EXAMINER STOGNER: Mr. Carr.

MR. CARR: At this time we call Mr. Salmon.

VAN STEPHEN SALMON,

the Witness herein, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. CARR:

Q. Would you state your full name for the record, please?

A. Yes. My name is Van Stephen Salmon.

Q. Where do you reside?
A. Midland, Texas.
Q. By whom are you employed and in what capacity?
A. I'm employed by BTA Oil Producers as a petroleum engineer.
Q. Mr. Salmon, have you previously testified before the Oil Conservation Division and had your credentials as a petroleum engineer accepted and made a matter of record?
A. Yes.
Q. Are you familiar with the application filed in this case on behalf of BTA Oil Producers?
A. Yes.
Q. And are you familiar with the subject well?
A. Yes.
MR. CARR: Are the witness' qualifications acceptable?
EXAMINER STOGNER: For the record, let's go over those qualifications again if you could, Mr. Carr.
MR. CARR: All right.
Q. (By Mr. Carr) Mr. Salmon, could you briefly summarize for the examiner your educational background?
A. Yes. I graduated from Texas Tech -- it was called Texas Technological College at the time; it's Texas Tech now -- in January of 1966 with a bachelor of science in civil engineering. Following that I was employed by Pan American Petroleum for five years as a petroleum engineer,

and I have worked for BTA Oil Producers for 20 years as a petroleum engineer.

Q. Mr. Salmon, does your geographic area of responsibility for BTA include the portion of southeastern New Mexico which is involved in this application?

A. Yes.

Q. And are you familiar with the facts surrounding the drilling and -- original drilling and subsequent shutting in of the Pardue C No. 1 Well?

A. Yes.

MR. CARR: Are the witness' qualifications acceptable?

EXAMINER STOGNER: Mr. Salmon is so qualified. Thank you, Mr. Carr.

Q. (By Mr. Carr) Could you briefly state what BTA seeks with this application?

A. Yes. BTA is requesting authority to dispose of produced water in its 8808 JV-P Pardue C Well No. 1.

Q. What is the present status of this well?

A. The well is currently shut in.

Q. Could you identify what has been marked as BTA Exhibit No. 1 for the examiner?

A. Yes. This is the OCD form C-108 and its supporting documents.

Q. What is the injection interval that is proposed?

A. We are proposing to inject water into the Cherry

Canyon part of the Delaware from 3,500 to 3,875 feet.

Q. Mr. Salmon, let's now turn to the plat contained in the Exhibit No. 1 that is on the fifth page, and I'd ask you to identify that for the examiner and just briefly review what it shows.

A. Yes. This is a plat of the well and its surrounding area. Its scale is one inch equals 4,000 feet. The subject well is located at the center of the two circles. The official location is 176 feet from the south line, 1,550 feet from the west line, Section 11, Township 23 south, Range 28 east, in Eddy County, New Mexico.

The outside circle is a radius of two miles. The smaller circle is a radius of a half mile that defines the investigation area. There are 14 wells shown on the map other than the proposed injection well within the half-mile radius.

Q. Since the application was filed, has one additional well been drilled within the area of review?

A. Yes. The Pardue C No. 1-Y was drilled as a replacement well for this well. It is located just northwest of this well. Its location is 611 feet from the south line and 1,504 feet from the west line of the same section.

Q. And that is a well drilled by BTA?

A. Yes.

Q. The leasehold ownership in the area of review, is that set forth in this exhibit somewhere?

A. Yes. The last page of the exhibit is a certification by Dorothy Houghton that she notified the surface owner and the offset mineral owners within a half mile.

It shows the surface owner on this least is Mississippi Chemical Corporation out of Carlsbad, New Mexico. Bird Creek is one of the offset mineral owners. They operate in the northwest quarter of Section 14, which is just to the south of the well. They also operate in the northeast quarter of Section 15, which is just to the southwest of the well.

Oryx Energy operates in the southeast-southeast quarter of Section 10, which is to the west of the well. Pogo Producing operates in the northeast quarter of the southeast quarter of Section 10, which is to the west-northwest of the well. And RB Operating Company operates in the southeast quarter of Section 11 and in the northeast quarter of Section 14, which is to the east and southeast of the well.

BTA is not shown there, but we operate in the west half of Section 11.

Q. Mr. Salmon, would you go to the portion of this

exhibit which contains tabular data on the wells within the area of review which penetrate the injection zone -- I believe those are pages 6 through 12 of the exhibit -- and review them for the examiner?

A. Yes. The tabular data for the offset wells are shown in this exhibit. I believe it starts right after this map.

The first well listed is pretty typical of the wells in the area. It's the Pardue C Well No. 2. It's located -- the well name shown first following this is the location. This well was located 560 feet from the south line, 660 feet from the west line of Section 11, Township 23 south, Range 28 east. It's an oil producer in the Delaware. Eight-and-five-eighths-inch casing was run in the well to 527 feet. It was cemented with 400 sacks of cement, and it's circulated.

Five-and-a-half-inch casing was run in the well to TD. It's the production string. It was run to 6,250 feet. Again, the cement was circulated.

The next piece of information that is shown is the date drilled or the spud date. This was February the 22nd, 1990, on this well.

Following this, the record of completion shows the perforations: 6,031 to 6,140 feet. Initial potential: 158 barrels of oil per day flowing. Completed on March the

8th, 1990.

Q. Now, Mr. Salmon, for each of the wells in the area of review, similar information is presented on the following six pages?

A. This is true. The surface casing was all run close to the same depth. Some of it a little shallower or a little deeper. Cement was either circulated on them, or if we didn't have the information, there was sufficient cement that it very well should have circulated or at least came close.

On the five-and-a-half-inch casing, the tops of cement ranged from a thousand feet below the surface to circulating on the ones that we have information on. On the wells that we don't have information on, there was plenty of cement to get it put in to get up this high.

The next page shows one well that is different than the other wells in the area. This is the 8808 JV-P Pardue Well No. 1. This well was drilled as an Atoka producer with a TD of 12,868 feet. It again has the upper part of the well bore protected pretty well with 16-inch pipe ran to 433 feet with the cement circulated. Ten-and-three-quarter-inch pipe ran to 2,614 feet, with again the cement circulating. Seven-and-seven-eights-inch pipe ran to 10,700 feet, with the top of the cement brought it back up to 450 feet.

Q. Mr. Salmon, what is the location of that well?

A. Of the Pardue Well No. 1? This is -- we had a typo on the sheet on this particular well. The location on the form here is shown as 2,310 feet from the south and 660 feet from the east line.

Q. And you have --

A. The correct location is 660 feet from the west line.

Q. And you have reviewed all of the information in this tabular presentation, and aside from that, it's correct and accurate?

A. This is true. And the Pardue C 1-Y was not included in the tabular presentation. It was drilled after this was prepared, but it's essentially completed like the other Delaware wells are.

Q. Mr. Salmon, are there any plugged and abandoned wells within the area of review which penetrate the injection zone?

A. No.

Q. Will you refer to the schematic drawing of the proposed injection well, which is on page 4 of this exhibit, and review the present proposed completion for the examiner?

A. Yes. The data shown here is -- shows the present status and some of the projected completion data.

The original perforate TD was 6,250 feet. The -- it was originally completed in the Delaware from 6,041 to 6,114 feet.

We currently have a cast-iron bridge plug. The number shown on this sheet was the proposed set in depth. We have now set that. We set it at 5,915 feet. We capped it with 35 feet of cement.

The proposed injection interval from 3,500 to 3,875 feet is shown here. We have not actually perforated in that interval at this time.

In addition, the two-and-seven-eighths-inch fiberglass tubing and the Baker Loc-Set Packer that is shown on the schematic are not in the well bore at this time, but they are -- this is what we're proposing to run.

Again, on this well we feel that the surface will be well protected. The top of the cement on the five-and-a-half-inch casing is at a thousand feet, and we ran eight-and-five-eighths-inch casing to 535 feet, and the cement is circulated.

Q. Will the annular space be filled with a fluid and the well equipped with a gauge so that that space can be pressure tested as required by the Federal Underground Injection and Control Program rules?

A. Yes.

Q. Now, under what formation is it you're proposing

to inject?

A. It will be the Cherry Canyon part of the Delaware.

Q. And what is the source of the water you propose to inject in this?

A. The source of the water will be the lower Delaware, roughly in the interval from 6,000 to 6,200 feet, mainly from the BTA Pardue leases.

Q. And so --

A. We may dispose of some off-lease water.

Q. And what is presently being done with this water?

A. It is currently being trucked.

Q. What volumes are you proposing to inject in this well?

A. We're asking for a 500-barrel-of-water-per-day average rate with a maximum daily rate of a thousand barrels per day.

Q. Is this going to be an open or closed system?

A. It will be open.

Q. Do you propose to inject by gravity or under pressure?

A. We anticipate that we will be injecting under pressure. Until we run injectivity tests, we can't be a hundred percent sure.

Q. What would you anticipate being the maximum pressure you would need to use?

A. We are asking for a maximum pressure of 1,250 pounds.

Q. And how does this compare to the two-tenths pound per foot of depth to the top of the injection interval standard that is utilized by the OCD?

A. It is higher than that. The two-tenths standard would be approximately 700 pounds.

Q. If you have to go above 700 pounds, how would you recommend that be handled?

A. As I understand it, if we go above the 700 pounds, within 60 days we will be required to run a step-rate test to show what the fracturing pressure of the formation is, and future injection pressures will be required to stay below that pressure.

Q. Could you refer to the water analyses of the injection fluid contained in this exhibit, and I believe they are on pages 15 through 19 of the exhibit?

A. Right. These are labeled as Exhibits A-1 through A-5. They are -- were filed with the application here.

These show the water analysis from various Delaware-producing wells on the BTA Pardue leases. The well does have a fairly high chloride. Sodium chloride on

the first one is 196,000 milligrams per liter. It is above 190,000 on all of the Delaware wells.

The total dissolved solids is shown as being 290,000 milligrams per liter. It is over 290,000 on all of the Delaware water analyses.

Q. Basically you will be injecting Delaware water back into the Delaware formation?

A. Yes, we will be.

Q. Are there --

A. We think that the waters will be compatible because it is Delaware water going into Delaware. In addition, we asked Waylan Martin with Martin Water Labs to give his opinion on the compatibilities of the water, and following the Exhibit A-5 is a sheet labeled Exhibit B.

Q. That's page 20 of this exhibit?

A. That is a letter from Waylan Martin stating that he feels that they will be compatible.

Q. Mr. Salmon, are there fresh-water zones in the area?

A. Yes.

Q. Would you refer to the plat which is on page 21 of this exhibit and identify that for Mr. Stogner?

A. Yes. This is a plat of the same area as the previous plat. It -- the blue areas with the numbers on them are the approximate locations of fresh-water wells.

Q. And are they producing from the Ogalala?

A. Yes, they are producing from the Ogalala.

Q. And behind that plat you have water analyses for each of the wells indicated?

A. We have water analyses for 1, 2, 3, 4, 5, 6 and 7 that correlate with the wells with the numbers shown on the plat.

One of the samples, which is Sample No. 4, -- it's No. 1 on the second sheet -- is Pecos River water that we included just for comparison. This water is shown to be relatively fresh, of course, compared to the Delaware with a chloride of 4,048 or less, and a total dissolved solids of 11,192 or less.

Q. Now, the last page of this exhibit is the certification that notice was provided in accordance with OCD rules on February 21; is that right?

A. That's right.

Q. Could you identify what has been marked BTA Exhibit No. 2?

A. Yes. This is a spectral-density, dual-space neutron log ran by Halbritton Logging Services on the subject well.

Towards the bottom of the log in the intervals from 6,041 to about 6,114 the original perforations are shown. This is the main Delaware pay in the area, and this

will be the source from other wells of the water that we will be disposing into.

Above this, at 9,015 feet, it is shown that we have a cast-iron bridge plug, and that we have capped that interval with 35 feet of cement.

The proposed -- or the top of the Cherry Canyon is shown at 3,419 feet, and the injection interval is not shown on -- is not marked on the log, but it would be 3,500 to 3,850 feet.

We feel that -- the gamma ray is on the left tract. There's a well-defined shale section from about 3,450 to 3,374 above the zone.

There's another well-defined shale tract starting at -- or several small shale intervals starting at about 3,800 and going down to 3,920 that we feel like will be a good seal to confine the water to the interval.

Q. Mr. Salmon, have you examined available geologic and engineering data on this area, and as a result of this examination, have you found any evidence of open faults or other hydrologic connections between the disposal zone and any underground source of drinking water?

A. No.

Q. In your opinion, will granting this application be in the best interests of conservation, the prevention of waste and the protection of correlative rights?

A. Yes.

Q. Have you reviewed Exhibits 1 and 2, and can you testify as to their accuracy?

A. Yes.

MR. CARR: At this time, Mr. Stogner, we would move the admission of BTA Exhibits 1 and 2.

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

(Whereupon Applicant's Exhibits 1 and 2 were admitted into evidence.)

MR. CARR: That concludes my direct examination of Mr. Salmon.

EXAMINATION

BY EXAMINER STOGNER:

Q. Mr. Salmon, in looking at page 4 -- that is your proposed completion -- I show the bottommost perf, proposed perf, at 3,875, and then the 35 sacks of cement on top of a cast-iron bridge plug setting at 5,900 feet. That looks about -- what? -- about a hundred and -- I mean -- I'm sorry -- about almost 2,000 feet of open space, or what are we looking at there?

A. Yes, that would be about 2,000 feet.

Q. Do you see any problem on that or any potential problem?

A. No, I don't think it would create a problem.

There is cement behind the casing over that whole interval. If it creates a problem, we can, if requested, set another plug in there.

Q. Was that cast-iron bridge plug, when it was set, tested?

A. I'm not familiar with the testing or how it was tested. I can't testify to that.

Q. On your fiberglass tubing, do you know the specifications on that particular tubing?

A. No.

Q. Could you provide me with that information?

A. Yes, we can.

Q. Has BTA used fiberglass tubing in any other injection wells in southeast New Mexico?

A. I'm not personally familiar with any. I can check on that, and if we have, I can supply the information. But I'm not personally familiar with any.

Q. In referring to page 3, the top of the cement and your five-and-a-half-intermediate casing was measured by temperature survey at one thousand feet.

A. Yes.

Q. Now, when I refer to -- starting on page 6 -- and you said this was a typical well, though, No. 2, Pardue C Well?

A. Yes.

Q. Something jumps out in front of me here, and we need to go over it a little bit.

A. Okay.

Q. In the intermediate -- I'm sorry. In the production string of casing, five-and-a-half-inch casing, you ran 1,317 sacks of cement, and it circulated?

A. Yes.

Q. But the well underneath it appears to be the same -- correct me if I'm wrong -- and that had 1,300 sacks of cement, but the top of the cement was measured at 1,100. I don't know how it was measured.

Was that temperature survey? Do you know?

A. I'm assuming it was, yes. We use the temperature survey to define the cement on our wells.

Yeah, there is a difference there of a thousand feet, and this could very well be -- I can't tell you exactly why they are different.

Q. Let's keep continuing on to page 7, and the -- in this particular case, the casing that's open to their proposed interval would be the seven and five-eighths; is that correct?

A. The seven and seven-eighths. You're talking about --

Q. I'm sorry, seven and seven-eighths.

A. You're talking about the Pardue well No. 1?

Q. Yes, sir.
A. Yes.
Q. And then the top of cement is at 450 feet?
A. Right.
Q. Do you know if that was temperature survey or calculations?
A. I'm sure it was a temperature survey.
Q. And same with the Pardue No. 1?
A. Yes.
Q. Temperature survey?
A. Yes.
Q. Okay. On page 8, I don't have a top of cement. Could you provide that for me either by temperature survey -- if this being some other operator, either temperature survey or a calculation?
A. I don't have that, but we can see if we can get that from the operator or from the New Mexico forms, or we will provide it with calculation. I don't have it.
Q. And if you have to calculate it, if you would, show your calculations.
A. Yes. Yes, if we calculate it, we will.
Q. And as I continue on through here, I don't show a top of cement for any of the wells after that in the producing string?
A. Right. Right. We didn't have it on the

outside-operated wells, but we will see if we can obtain that and get it to you.

Q. Okay. Also, if you'll provide the completion interval on that number -- the replacement well, the No. 1-Y for the production string.

A. Right. I can give that to you.

Q. Okay.

A. The completion interval of the No. 1-Y -- it was perforated from over the gross interval 6,020 to 6,098 feet.

Q. How about the production string?

A. The production string was five and a half inch; ran to 6,200 feet, and the cement circulated.

Q. Do you know how much cement it took to circulate?

A. 1,300 sacks.

Q. Will the Cherry Canyon take this fluid, or will there be stimulation required?

A. We anticipate a -- I think we anticipate an acid job. Then we will run injectivity tests. If it won't take it at that point, it may require a fracture treatment.

Until we run our injectivity tests, we aren't a hundred percent sure what we'll be needing.

Q. Do you know what the --

EXAMINER STOGNER: Before I ask this next question,

Mr. Carr, what are your next witness' credentials?

MR. CARR: This is the only witness we'll call.

EXAMINER STOGNER: Oh, I'm sorry. I thought you said two. I'm sorry.

MR. CARR: If I said two, I misspoke.

EXAMINER STOGNER: No. I'm thinking previously.

Q. (By Examiner Stogner) Do you know what the thickness of the Cherry Canyon in this interval of the Delaware is, Mr. Salmon?

A. I don't have a specific bottom of the Cherry Canyon. The way our -- we're picking it is that it would go down almost to the Brushy Canyon, which would -- the next top I have on the log is 4,668 feet, but I don't have a specific bottom on the Cherry Canyon.

Alls that I've ever picked on logs and alls we've ever picked for the Cherry Canyon has been the top, and I don't have a specific base of the Cherry Canyon.

Q. And your Cherry Canyon is shown to be at -- the top of the Cherry Canyon -- 3,410; is that correct?

A. 3,419.

Q. 3,419.

A. And whether officially the rest of this will be Cherry Canyon, I really don't know.

Q. Now, is it necessarily true that the top of the Cherry Canyon is also the top of the Delaware?

A. No. The top of the Delaware would be on up the log. You have the Bell Canyon, which is also part of the Delaware, at 2,613 feet, and then the top of the Delaware, where I would pick it, would be 2,580 feet.

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

Double-check me, Mr. Carr. I'll need information on the specifications for the --

MR. CARR: Fiberglass tubing.

EXAMINER STOGNER: -- fiberglass tubing.

MR. CARR: And you need either actual or calculated tops of cement for all wells that don't have it in the exhibit, and if they are calculated, you'd like to see the actual calculations.

EXAMINER STOGNER: That's right. And if you'll provide me with that information, Mr. Carr --

MR. CARR: Will do.

EXAMINER STOGNER: -- subsequent to the hearing.

MR. CARR: Yes, sir.

EXAMINER STOGNER: Other than that, I have no other questions at this time.

Anything further?

MR. CARR: Nothing further, sir.

EXAMINER STOGNER: I'm going to leave the record on this case open pending that additional information,

Mr. Carr, so I guess we'll adjourn this particular case for today.

(The foregoing hearing was concluded at the approximate hour of 10:55 a.m.)

* * *

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 10268, heard by me on 21 March 1991.

, Examiner
Oil Conservation Division

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

REPORTER'S CERTIFICATE

I, PAULA WEGEFORTH, a Certified Court Reporter and Notary Public, DO HEREBY CERTIFY that I stenographically reported these proceedings before the Oil Conservation Division; and that the foregoing is a true, complete and accurate transcript of the proceedings of said hearing as appears from my stenographic notes so taken and transcribed under my personal supervision.

I FURTHER CERTIFY that I am not related to nor employed by any of the parties hereto, and have no interest in the outcome hereof.

DATED at Santa Fe, New Mexico, this 20th day of April, 1991.

Paula Wegeforth

PAULA WEGEFORTH
Certified Court Reporter
CSR No. 264, Notary Public

My Commission Expires:
September 27, 1993