

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 BOPCO, L.P. TO INSTITUTE
A PILOT WATERFLOOD PROJECT IN THE
DELAWARE FORMATION IN THE POKER LAKE UNIT,
EDDY COUNTY, NEW MEXICO CASE NO. 14552

TRANSCRIPT OF PROCEEDINGS
Examiner Hearing
October 28, 2010
1:32 p.m.
1220 South St. Francis Drive
Santa Fe, New Mexico 87504

BEFORE: DAVID BROOKS, HEARING EXAMINER
WILL JONES, TECHNICAL EXAMINER

REPORTED BY: CONNIE JURADO, RPR, NM CCR #254
Paul Baca Professional Court Reporters
500 Fourth Street NW, Suite 105
Albuquerque, New Mexico 87102

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1 MR. BROOKS: At this time we will
2 call Case Number 14522, Application of BOPCO, LP, to
3 institute a pilot waterflood project in the Delaware
4 formation in the Poker Lake Unit, Eddy County, New
5 Mexico. Call for appearances.

6 MR. BRUCE: Mr. Examiner, Jim Bruce
7 of Santa Fe representing the applicant. I have one
8 witness.

9 MR. BROOKS: Very good. Would the
10 witness please state your name, please.

11 MR. CRUZ: Carlos Cruz.

12 MR. BROOKS: Swear in the witness.

13 (Note: Witness sworn.)

14 MR. BROOKS: You may proceed, Mr.
15 Bruce.

16 CARLOS CRUZ

17 After having been first duly sworn under oath,
18 was questioned and testified as follows:

19 EXAMINATION

20 BY MR. BRUCE:

21 Q Mr. Cruz, can you identify Exhibit 1 and
22 discuss the wells at issue in this case and maybe a
23 little bit what you're seeking in this application.

24 A Certainly. Actually, this is a little
25 snapshot of our Poker Lake Nash Draw field unit here.

1 What I have marked here all the way to the right,
2 they are all blue, but the 188Y is a current disposal
3 well. The proposed injection wells are to the left
4 of that, the 166, the 150, the 151 and the 162. In
5 red, I have marked wells that I have had favorable
6 results, oil increase or gas increase, due to the
7 injection in the 188Y disposal well.

8 Q And in what zone is the 188Y injecting
9 into and what zone will the four new injection wells
10 be injecting into?

11 A The 188Y is in the Lower Brushy Canyon Y
12 Sand, and the rest will be the same. For the 166 and
13 the others will be the Lower Brushy Canyon --

14 Q And these --

15 A -- will be the Y sands.

16 Q And these four, the new -- when I say the
17 new wells, they are existing producing wells at this
18 time?

19 A That is correct.

20 Q Okay. In looking at this, there is a
21 dashed line, dark dashed line to the west and
22 northwest. What does that represent?

23 A The --

24 Q The dashed lines?

25 A Oh, these dashed lines? That's actually

1 our PA.

2 Q Is that also the --

3 A And the unit boundary.

4 Q The Poker Lake Unit boundary?

5 A That is correct.

6 Q Okay. In looking at this, is the federal
7 government the owner of the surface of all proposed
8 injection wells?

9 A Yes.

10 Q And is BOPCO the only operator in the
11 Delaware formation as to all wells or acreage within
12 a half a mile of the injectors?

13 A Yes, we are.

14 Q Okay. Let's move on to your Exhibit 2 and
15 discuss the results of that 188Y and what you hope to
16 accomplish with the new injector wells.

17 A Okay. The 188Y was placed on injection
18 back in 2007. We have injected a total of 2.3
19 million barrels of water in that well. Since then,
20 we have seen some good results, production increases
21 in that PLU 167, the 152, and the 184. Now, these
22 are, you know, they started pretty good, the 167,
23 152, 184. Since the last year, the 184 has seen a
24 little increase. So it has only taken about a year
25 or so for us to see something there. So that's what

1 gives us a good, warm, fuzzy feeling, a little
2 confidence that this could be something good for us.

3 Q Now, looking at your Exhibit 1, is there
4 any particular orientation you think the water would
5 flow in this --

6 A Yes. The fracture plane actually is
7 northeast, southwest, and we know that from fracture
8 mapping in this field here. So as we can see from
9 the 188Y, we can see responses in the 167. A little
10 bit further west, we will see 152, 184, but that
11 gives us pretty good confidence that it is looking
12 like it should theoretically.

13 Q Okay. So by injecting into the four
14 additional wells, you hope to benefit the wells
15 immediately to the south and the wells immediately to
16 the north of the four injectors?

17 A That is correct. That's what we're
18 looking for.

19 Q Do you have anything else to say on
20 Exhibit 2, Mr. Cruz?

21 A No, sir.

22 Q Looking at Exhibit 3, could you summarize
23 what you hope to do with your -- insofar as the
24 amount injected into the wells?

25 A Okay. Based on our -- this is input for

1 our model, our waterflood model. We're looking at
2 probably about -- it's kind of a low injection there,
3 on the 250 barrels of water per day per well. We're
4 looking at kind of the maximum pressure we could
5 inject at based on the OCD's .2 PSI per foot before
6 we do a step rate test, and I am just going to go
7 with that maximum surface pressure plus the
8 hydrostatic, of course, which gives us 5200.

9 Q So you will initially comply with the .2
10 PSI per foot?

11 A That is correct.

12 Q And what type of an incremental recovery
13 do you hope to obtain on the offset wells? And I
14 will refer you to Exhibit 4.

15 A Based on this -- the model that we worked
16 on, it looks like over a period of 15 to 25 years or
17 so, we will get like 72,000 barrels of oil expected
18 per well. That's what we're expecting.

19 Q And what is Exhibit 5?

20 A Exhibit 5 shows just a response based on
21 the model as we're injecting water. We looked -- and
22 we see an initial response probably five to seven
23 years after injection has commenced of about
24 250 barrels a day. And then gradually increasing
25 around after, it looks like, ten years or so, we will

1 start getting a more favorable increase.

2 Q Okay. And what are the project costs?

3 And I refer you to Exhibit 6.

4 A As per well, broken down per well, the
5 total cost is \$667,686. And that's, of course,
6 including flow lines, packers, any type of plugs we
7 have to set, all that, everything included.

8 Q And what do the economics show? And I
9 will refer you to Exhibit 7.

10 A Economics based on a current price model
11 that we're using now, we're probably expecting to
12 recover a rate of return like 31 percent, 31.7
13 percent, and a PV10 of like \$1,120,000 per well.

14 Q Now, in this scenario, you used
15 incremental economics with no incremental operating
16 costs. Why is that?

17 A We don't really see any incremental
18 operating costs after placing the well at injection.
19 All we're going to have is our pump that probably we
20 won't be doing a whole lot of maintenance to it, so
21 it won't be anything that should cause us any issues
22 there.

23 Q Okay.

24 A That's why I went with that case.

25 Q And what is Exhibit 8?

1 A Exhibit 8 is just a summary of our PV10
2 per well to the left there, each well, and then we
3 simply multiply that by four for the four wells
4 except for the rate of return, of course.

5 Q And finally what is summarized in Exhibit
6 9?

7 A Exhibit 9, I wanted to show the wells, the
8 zones that we're going to inject into, which are the
9 zones that they are currently perforated in, how many
10 holes per zone within that Lower Brushy Canyon,
11 packer depths, where we're going to set the packers
12 upon -- in commencing the injection, the rate we will
13 be injecting at, and average cost per well, of
14 course, expected incremental oil recovery from them,
15 and the PV10s.

16 Q In your opinion, is this project
17 economically and technically feasible at this time?

18 A Yes.

19 Q Let's move on to your Exhibit 10. That's
20 the one we only have one copy of, Mr. Cruz. Maybe
21 you can put that in front of the examiners and then
22 discuss for them what that shows.

23 A What that is is, of course, a
24 cross-section of the five wells, the 188Y, the 166,
25 the 150, the 151, and the 162. That's showing the

1 tops of that Lower Brushy Canyon, how we divide it up
2 V, W, X, Y, Z, and also I have got in there -- I had
3 it kind of highlighted a little, but the
4 perforations, the current perforations per zone,
5 which the farthest three wells are in the Y --
6 actually, all of those are in the Y -- that's where
7 we have perforations.

8 The only one that is not in the Y is the
9 farthest this way to the west, 162, which is right
10 there, farthest to the left there. That's actually
11 in the V and the W in there, but I don't intend to
12 add any perforations in there since these wells were
13 fracture stimulated, and the fractures do grow
14 throughout the Lower Brushy Canyon. So there is
15 really no need to add perfs in the Y.

16 Q And is the Lower Brushy Canyon continuous
17 across this area?

18 A Yes. Yes, it is.

19 Q Next, Mr. Cruz, I have handed you Exhibits
20 11 through 14. Briefly, what are these?

21 A These C-108s are applications applying for
22 the injection into each one of these wells.

23 Q So there is a separate C-108 for each of
24 the proposed injection wells?

25 A That is correct, yes.

1 Q Let's just run through one of them.

2 Exhibit 11 -- they are all pretty similar in content,
3 are they not, Mr. Cruz?

4 A Yes.

5 Q Could you describe, running through this,
6 how you are going to put each well on injection and
7 discuss the current and proposed well configurations?

8 A Okay. The current well configuration, the
9 PLU 150 actually is TA'd right now with a cast iron
10 bridge plug set above the Lower Brushy Canyon. So
11 we're going to drill that out, run in there, clean
12 the wellbore out, and we're going to run a Lokset
13 packer on the internal plastic coated tubing to that
14 depth of the 150 of about 7200 feet.

15 Now, that is not the top of the Lower
16 Brushy. That is just where I want to set the packer.
17 The Lower Brushy that we permitted -- the permitted
18 intervals is the entire Lower Brushy. I want to set
19 the packer closer to the perms because I want to
20 protect that casing. I don't want to inject too far
21 and damage the casing or anything.

22 Q And will each of the injection wells be
23 properly completed such that there will be no
24 movement of fluids into another formation?

25 A That is correct. Yes. Of course, we will

1 use packer fluid also behind the packer, and we will
2 perform these integrity tests of the casing.

3 Q Now, there's also a data sheet on wells
4 within the area of review for each of these C-108s.
5 And, again, that shows that the only offset operator
6 is BOPCO; is that correct?

7 A That is correct.

8 Q And are there any plugged and abandoned
9 wells in the area of review?

10 A No, sir.

11 Q And what type of water will you be
12 injecting into these wells?

13 A That will be Delaware produced water.

14 Q Therefore, there will be no compatibility
15 problems?

16 A That is correct. Yes.

17 Q And we won't go through the others, but
18 there is a C-108 which is similar for each of the
19 proposed wells, correct?

20 A Yes.

21 Q Were Exhibits 1 through 10 prepared by you
22 or under your supervision or compiled from company
23 business records?

24 A By me and with my supervision.

25 Q And in your opinion is the granting of

1 this application in the interests of conservation and
2 the prevention of waste?

3 A Yes.

4 MR. BRUCE: Mr. Examiner, I am
5 handing you Exhibit 15, which is merely the affidavit
6 of notice. The only party entitled to notice was the
7 BLM, and this shows that the BLM did receive notice.
8 In addition, the OCD Artesia office was notified of
9 this application.

10 MR. BROOKS: Very good.

11 MR. BRUCE: I move the admission of
12 Exhibits 1 through 15.

13 MR. BROOKS: 1 through 15 are
14 admitted.

15 (Exhibits 1 through 15 admitted.)

16 MR. BRUCE: I have no further
17 questions of the witness.

18 MR. BROOKS: Okay. This area is in
19 the Poker Lake Unit, correct?

20 A That is correct.

21 MR. BROOKS: And the Delaware
22 formation is part of the unitized interval for the
23 Poker Lake Unit?

24 A Yes, sir.

25 MR. BROOKS: Okay. Very good. I

1 will pass to Mr. Jones. Take advantage of his
2 expertise here.

3 MR. JONES: I think this is great,
4 but you picked a little narrow interval there. Is
5 that just the absolute best pay possible?

6 A Which one is that?

7 MR. JONES: Every one of these
8 injection wells are pretty narrow.

9 A The perforated interval?

10 MR. JONES: The perforated interval.

11 A Yes. I mean, like I said, right now all
12 of those have been fractured stimulated.

13 MR. JONES: Okay.

14 A So the fracture does grow within the Lower
15 Brushy Canyon, so I don't see a need to perforate
16 there.

17 MR. JONES: Okay. Did you have your
18 pump in there on those costs that you're going to
19 need?

20 A Yes.

21 MR. JONES: Triflex or something?

22 A Well, that one, we already have one.

23 MR. JONES: You already have one?

24 A Right there where it says battery. I have
25 upgraded that pump there, so I have one there as a

1 backup so I intend to use that one.

2 MR. JONES: Okay. And the packer
3 setting depths, you're proposing them at exactly
4 where you're setting on the C-108s, and you want them
5 there? You don't want them exact -- in other words,
6 you need language in the permit to allow them exactly
7 at that point.

8 A Okay.

9 MR. JONES: Because it looks like,
10 for instance, Number 150, you show 7050 for the
11 packer and perfs are 7250, which is 205 feet away.
12 We normally do 100 feet unless somebody asks for
13 something in advance and has a reason for it.

14 A Right. I want to -- yeah, I need to
15 change that. I want to actually do it within 50 feet
16 of the perfs. That's what I want to do. It should
17 be 7200 actually.

18 MR. JONES: Okay.

19 A I mean, I had changed it here on my little
20 form here, but I do intend to go around 7200,
21 probably within 50 feet or so of the perfs and also
22 to minimize any harm to the casing. Leave such a big
23 gap while we are putting the produced water down
24 there. I want to keep the packer closer to the
25 perfs.

1 MR. JONES: So that stuff is pretty
2 corrosive?

3 A Produced water can be, I guess.

4 MR. JONES: Do you put anything in
5 it? Any kind of --

6 A I am right now on another well because
7 that's -- it's not as bad, but like, say, like in the
8 Avalon, that's pretty corrosive with CO2. In that
9 mix of water, that's pretty corrosive. I do there.
10 We generally don't here, not with the produced water.
11 It is not as bad as the Avalon.

12 MR. JONES: Did Brad Gibson or your
13 Land Department work with you on this?

14 A Yes. Andy Morrison.

15 MR. JONES: Andy Morrison.

16 A He's the one watching the Poker Lake.
17 Brad did also a little, Brad Glasscock.

18 MR. JONES: Glasscock.

19 A Yes. He did also a little, but mainly
20 Andy. This is his area of the Poker Lake.

21 MR. JONES: Well, it looks like you
22 got some response, and you actually have a model that
23 you ran on this?

24 A Yes.

25 MR. JONES: Is it a little --

1 A That CMG, actually, our reservoir engineer
2 ran it. It is a Computer Modeling Group, I think
3 it's called, the program.

4 MR. JONES: Okay.

5 A The inputs and all of that were from me.
6 I provided him with those --

7 MR. JONES: You had to give them all
8 --

9 A -- looked at it and put the stuff that
10 makes sense in there instead of just the model. We
11 based that model on the PLU 166 and with the response
12 in 165.

13 MR. JONES: Okay.

14 A I looked at that that way.

15 MR. JONES: Okay.

16 A And the pressures I took from the actual
17 .2 PSI per foot surface plus hydrostatic.

18 MR. JONES: You didn't need more
19 pressure to --

20 A I really don't think we will. These Lower
21 Brushy Canyons take water pretty well.

22 MR. JONES: Oh, okay.

23 A So I didn't see the need for it based on
24 what we see in the 188Y. I mean, we put quite a bit
25 of water in there, and it is pretty low pressure.

1 MR. JONES: Okay. There was a -- on
2 your chart, on Exhibit 1, you had a Well Number
3 153 --

4 A That one -- yeah, it is actually the 184.
5 It's a Delaware well. The 153 is a gas well, Morrow
6 well. That is a Morrow well.

7 MR. JONES: Okay.

8 MR. BROOKS: I had not asked about
9 this because I thought Mr. Jones would, and he did,
10 but I just want to clarify the answer. The usual
11 rule that we have and what we normally put in our
12 orders is that the packer will be set within 100 feet
13 of the top of the uppermost perforation. Now, my
14 understanding is that despite the discrepancy in the
15 figures, that you actually do intend to be within
16 that?

17 A Within 50 feet, yes.

18 MR. BROOKS: Yeah. So if we require
19 it to be within 100 feet, that won't interfere with
20 anything you're planning to do?

21 A Right.

22 MR. BROOKS: The other question that
23 I had was now the perforations, are they marked,
24 these marks to the left --

25 A Actually, no, sir. They are --

1 MR. BROOKS: Where are the
2 perforations marked down here?

3 A Let me see. They are pretty light. This
4 is --

5 MR. BROOKS: This is why I was
6 asking. Are these the perforations?

7 A Those are the actual perforations.

8 MR. BROOKS: These blue things that
9 are written --

10 A Yes, sir.

11 MR. BROOKS: That was confusing me
12 because you said that the one to the farthest to the
13 left was not perforated in the Y, and it looks like
14 it is.

15 A Well, it is not, sir. This is the top of
16 the Y.

17 MR. BROOKS: Oh, okay.

18 A It is perforated on the X.

19 MR. BROOKS: Oh, so the Y --

20 A That is the top --

21 MR. BROOKS: -- where the Y is
22 indicated here is actually down below there?

23 A Yeah. That is the top of it, so this is
24 the Y section. These are perforated here.

25 MR. BROOKS: I was assuming that this

1 box --

2 A Right. It's a little misleading. That is
3 the top of it, sir.

4 MR. BROOKS: Okay. That clarifies
5 your response. Thank you. Nothing further.

6 MR. BRUCE: We have nothing further
7 in this matter, Mr. Examiner. We will get a couple
8 more of those cross-sections to the division, and we
9 can make those darker.

10 MR. BROOKS: Well, I don't know that
11 we need more. This one will go to the exhibit book.
12 If we had more, we would probably just throw them
13 away. You may step down. And if there is nothing
14 further, Case Number 14552 will be taken under
15 advisement.

16 (Discussion held off the record.)

17 MR. BROOKS: You didn't qualify your
18 expert, but maybe we ought to supplement the record.
19 That can be done very briefly.

20 Q (By Mr. Bruce) Mr. Cruz, can you please
21 state your full name and city of residence for the
22 record?

23 A Carlos Cruz. Midland, Texas.

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

1 A BOPCO, LP. I am the West Texas Division
2 production superintendent.

3 Q Have you previously testified before the
4 division?

5 A Yes, sir, I have.

6 Q And were your credentials as an expert
7 engineer accepted as a matter of record?

8 A Yes.

9 Q And are you familiar with the engineering
10 matters related to this past application?

11 A Yes.

12 MR. BRUCE: I tender the witness as
13 an expert, Mr. Examiner.

14 MR. BROOKS: Well, since I've already
15 heard his testimony and he sounded very expert, I
16 will accept him as an expert. And with that, Case
17 Number 14552 will be taken under advisement.

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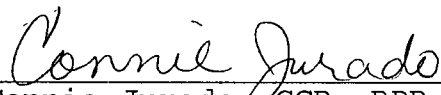
I do hereby certify that the foregoing is
a complete record of the proceedings in
the Examiner hearing of Case No. 14552
heard by me on Oct 28, 2010
David K. Brooks Examiner
Oil Conservation Division

REPORTER'S CERTIFICATE

I, CONNIE JURADO, do hereby certify that I reported the foregoing case in stenographic shorthand and transcribed, or had the same transcribed under my supervision and direction, the foregoing matter and that the same is a true and correct record of the proceedings had at the time and place.

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 whatsoever in the final disposition of this case in any court.

WITNESS MY HAND this 28th day of October, 2010.



Connie Jurado, CCR, RPR
New Mexico CCR No. 254
Expires: December 31, 2010