

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:

CASE NOS: 21090

APPLICATION OF AWR DISPOSAL LLC
FOR APPROVAL OF SALT WATER DISPOSAL WELL IN
LEA COUNTY, NEW MEXICO.

REPORTER'S TRANSCRIPT OF PROCEEDINGS

EXAMINER HEARING

MARCH 5, 2020

SANTA FE, NEW MEXICO

This matter came on for hearing before the New Mexico Oil Conservation Division, EXAMINERS FELICIA ORTH, KATHLEEN MURPHY, PHILLIP GOETZE and DYLAN COSS on Thursday, March 5, 2020, at the New Mexico Energy, Minerals, and Natural Resources Department, Wendell Chino Building, 1220 South St. Francis Drive, Porter Hall, Room 102, Santa Fe, New Mexico.

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1 HEARING EXAMINER ORTH: We are back on the record
2 after a short break, and as I understand it, we have
3 three -- the three matters that we will hear witnesses for.
4 The first -- and we'll just take them in order that they
5 are on the original docket.

6 The first one is numbered as Number 7. It's case
7 21090, AWR Disposal, well named Twin Sister. Then we have
8 Number 19, which is Case Number 21118, operation -- or
9 operating well named Arnott Ram, and then the third one is
10 Number 27, Case Number 21130, Texland Petroleum, and the
11 name of the well is Murphy.

12 Does anyone believe we have any other hearings
13 this morning?

14 (No audible response.)

15 HEARING EXAMINER ORTH: Okay. Those are the
16 three we'll do, and we will do them in that order.

17 Ms. Bennett, I see, is seated at counsel.

18 MS. BENNETT: Good morning, Deana Bennett on
19 behalf of AWR Disposal LLC from Modrall Sperling.

20 MS. ANTILLON: Andrea Antillon on behalf of the
21 State Land Office.

22 HEARING EXAMINER ORTH: Thank you. You are the
23 only two appearances I saw in it the images for 20190.
24 Thank you.

25 MS. BENNETT: Good morning again. I have one

1 witness with me, Mr. Neel Duncan.

2 HEARING EXAMINER ORTH: Mr. Duncan, do you swear
3 or affirm that the testimony you are about to give will be
4 the truth, the whole truth, and nothing but the truth?

5 MR. DUNCAN: I do.

6 MS. BENNETT: Thank you. As I mentioned a moment
7 ago, Mr. Duncan and I are here on behalf of AWR Disposal
8 LLC, seeking approval of a salt water disposal well.

9 And we are doing sort of a hybrid presentation
10 today of witnesses, Mr. Duncan who will be presenting the
11 affidavit of three experts, and this is the process we have
12 used before in a number of hearings, so we will be using
13 that process again today.

14 NEEL LAWRENCE DUNCAN

15 (Sworn, testified as follows:)

16 DIRECT EXAMINATION

17 BY MS. BENNETT:

18 Q. I placed before you a number of materials that we
19 will be going through today that have the affidavits of our
20 experts in them. We have excerpted some slides from our
21 fault slip probability analysis done by Mr. Todd Reynolds
22 who has previously testified before the Division, so those
23 are the slides we will be showing on the monitor when we get
24 to that portion of the presentation. But for now, we need
25 to start with some basics.

1 **So, Mr. Duncan, if you would you, please, state**
2 **your full name for the record.**

3 A. Neel Lawrence Duncan.

4 **Q. And, Mr. Duncan, for whom do you work?**

5 A. Integrated Petroleum Technologies.

6 **Q. Have you been retained by AWR?**

7 A. Yes, I have.

8 **Q. What are your responsibilities for AWR?**

9 A. Engineering, drilling and development of salt
10 water disposal wells in southeast New Mexico including the
11 subject area.

12 **Q. Have you previously testified before the Oil**
13 **Conservation Division?**

14 A. Yes.

15 **Q. And were your credentials accepted as a matter of**
16 **record?**

17 A. Yes.

18 **Q. Are you familiar with the application that AWR**
19 **filed in this matter?**

20 A. I am.

21 **Q. A moment ago you testified you are familiar with**
22 **the lands that are at issue in this matter.**

23 A. Yes.

24 **Q. Are you familiar with the salt water disposal**
25 **well that AWR is proposing in this matter?**

1 A. Yes.

2 MS. BENNETT: At this time I would like to tender
3 Mr. Duncan as an expert in operations and engineering
4 matters.

5 HEARING EXAMINER ORTH: Any questions about his
6 qualifications by the Examiners?

7 EXAMINER GOETZE: No.

8 HEARING EXAMINER ORTH: No.? Thank you. So
9 recognized. Ms. Antillon?

10 MS. ANTILLON: No objection.

11 HEARING EXAMINER ORTH: Thank you.

12 BY MS. BENNETT:

13 **Q. Mr. Duncan, let's turn to Tab 1 of the materials.**
14 **Is the material behind Tab 1 the application that I --**

15 MS. BENNETT: And for the Examiners' benefit,
16 this is double sided, so I apologize in advance if that's
17 not to your liking.

18 THE WITNESS: It's not a benefit.

19 MS. BENNETT: It's fewer pages, but may be harder
20 to work through, so please let me know if you prefer single-
21 sided going forward, but for the moment I'm following the
22 general hearing guidelines.

23 EXAMINER MURPHY: That's great.

24 BY MS. BENNETT:

25 **Q. So behind Tab 1 is the exhibit that I -- or the**

1 application that I filed on AWR's behalf; is that right?

2 A. Yes.

3 Q. And starting on Page 4 of the materials, is that
4 the C-108 that Mr. Chris Weyand prepared?

5 A. Yes, it is.

6 Q. And Mr. Weyand has prepared C-108s for other salt
7 water disposal well applications; is that right?

8 A. Yes, he has, for AWR and others.

9 Q. And what does AWR seek under this application?

10 A. We seek approval to drill and operate the Twin
11 Sister SWD well.

12 We have proposed a Devonian depth of 14652 to
13 16318 that will be verified as drilled. We seek from the
14 C-108 an injection rate of 50,000 barrels a day -- we will
15 talk about that later -- and the tubing size will be 7 inch
16 by 5 1/2 inch down to the packer.

17 Q. Has AWR calculated maximum psi and the average
18 psi on Exhibit 4?

19 A. Yes. The maximum based on depth interval is
20 about 2930 psi, and the average is expected to be slightly
21 under 2200 psi.

22 Q. A moment ago you mentioned the tubing size that
23 AWR proposes, which is 7 by 5 1/2 inch. Is that more or
24 less the industry standard at this point for the Devonian
25 wells?

1 A. It is.

2 **Q. Why is that?**

3 A. It reduces friction, it reduces the horsepower
4 required, allows you to inject more in a single well, so it
5 reduces the number of wells we will have to develop.

6 **Q. Thank you. Has AWR considered whether fishing
7 operations are feasible in a deep well like this?**

8 A. Yes, we have, and we have testified to that in
9 previous hearings.

10 **Q. Okay. Has AWR retained a reservoir engineer to
11 conduct a study of the injection zone for this well?**

12 A. Yes, Scott Wilson of Ryder Scott.

13 **Q. Has Mr. Wilson previously testified before the
14 Division?**

15 A. Yes.

16 **Q. If you would turn to Tab 2. Does Tab 2 contain
17 Mr. Wilson's affidavit and his reservoir engineering study?**

18 A. Yes, it does.

19 **Q. And his study starts on Page 29; is that right?**

20 A. That's correct.

21 **Q. In his affidavit does Mr. Wilson confirm that
22 using the tubing size we just discussed for this well will
23 reduce friction in the wellbore?**

24 A. Yes.

25 **Q. Does he also confirm that using the proposed**

1 tubing size will only have a very small impact on core
2 pressures in the formation?

3 A. Yes.

4 Q. Is it his opinion that the tubing size that AWR
5 is proposing will not cause fractures in the formation?

6 A. Yes.

7 Q. Did he also perform a study that models migration
8 of fluids away from the wellbore?

9 A. Yes.

10 Q. Did he conclude that over a period of 20 years
11 the majority of fluids injected will stay within a mile of
12 where the well is located?

13 A. Yes.

14 Q. Thanks. Let's turn now to Tab 3. Has AWR
15 retained a geologist to prepare a geologic analysis of the
16 area where the well is proposed?

17 A. Yes, Kate Zeigler, Dr. Kate Zeigler.

18 Q. Thank you. And has Dr. Zeigler previously
19 testified before the Division?

20 A. Yes, she has.

21 Q. Were her credentials accepted as a matter of
22 record?

23 A. Yes.

24 Q. Has Dr. Zeigler performed a similar analysis for
25 AWR --

1 A. Yes, she has.

2 Q. -- in the past? So and her affidavit is Pages 46
3 to 50, and then her study is after that?

4 A. Yes. And there's some larger format exhibits
5 appended to the back of this for ease of viewing, if the the
6 examiners so wish to go to those.

7 Q. Right.

8 MS. BENNETT: At the back of the materials, at
9 the very end there is a larger cross section that we have
10 appended to the back. It's the same as Dr. Zeigler's cross
11 section, but we created a larger one for the Examiners'
12 benefit.

13 Q. Does Dr. Zeigler find that the area where the
14 well is located is suit -- or proposed to be located is
15 suitable for injection at these rates?

16 A. Yes.

17 Q. Did she conclude there is a permeability barrier
18 above and below the injection zone which will prevent the
19 migration of fluids?

20 A. Yes.

21 Q. Did she also testify that she found no evidence
22 of open faults or other hydrologic connections within the
23 disposal zone and underground sources of drinking water?

24 A. Yes.

25 Q. Okay. Let's turn to Tab 4, then. What's behind

1 **Tab 4?**

2 A. It's the affidavit of Dr. Steven Taylor.

3 **Q. And who is Dr. Taylor?**

4 A. He's seismologist that AWR retained to both
5 review the studies of Todd Reynolds and also to testify as
6 to the seismicity in the area. He also monitors all of our
7 seismic monitors in New Mexico and Texas and Colorado.

8 **Q. And he has testified before the Division before;
9 is that right?**

10 A. Yes.

11 **Q. And his credentials were accepted as a matter of
12 record?**

13 A. Yes.

14 **Q. So Mr. -- or Dr. Taylor's exhibits contain his
15 affidavit and then two studies. He has included his own
16 study; correct?**

17 A. Yes.

18 **Q. In his study he actually -- a moment ago you
19 testified that he looks at his own seismic monitoring data
20 and includes that in the study; is that right?**

21 A. Yes, in addition to the USGS and others.

22 **Q. Do you know if New Mexico Tech recently published
23 its catalogue of seismic events through February of 2020?**

24 A. Yes, it did.

25 **Q. Do you know if Dr. Taylor included that**

1 information in his report?

2 A. Yes, he did.

3 Q. So his report includes historic and current
4 seismic data?

5 A. Yes.

6 Q. Let's then turn to the FTI Platt Sparks report
7 which starts on Page 67 of the materials, Tab 4-B.

8 A. The affidavit, yeah.

9 Q. Who prepared this report?

10 A. Todd Reynolds, who is FTI Platt Sparks.

11 Q. And has Mr. Reynolds previously testified before
12 the Division?

13 A. Yes, he has.

14 Q. Were his credentials accepted as a matter of
15 record?

16 A. Yes, they were.

17 Q. In Mr. Reynolds' previous testimony, did he
18 testify about use of the Stanford fault slip probability
19 analysis?

20 A. Yes.

21 Q. Is that what is contained in his report that we
22 are going to talk about?

23 A. Yes, it is, and that's been generally accepted as
24 the valid tool.

25 Q. So let's turn to Page 74. Unfortunately the

1 tabbing page number got cut off, but it's Exhibit Number 1
2 to Mr. Reynolds' report, and it's also on the screen.

3 A. Yes.

4 Q. If you would, would you walk us through this map
5 and explain it to the Examiners what we are looking at here?

6 A. Okay. So what we did is we initially modeled all
7 the -- the wells with pending SWD applications at the rates
8 that have been applied for in those applications. We always
9 do that. We look at all pending applications of ours and
10 others. We also --

11 Q. Mr. Duncan, before you move on --

12 A. Yes.

13 Q. -- are the salt water disposal wells the squares
14 that are identified on the map?

15 A. Yes, they are squares.

16 Q. Okay.

17 A. And the lines on the map inside this 100
18 kilometer -- 100 square mile circle, these are faults,
19 these are known faults.

20 Q. Okay. So what Mr. Reynolds did first was plot
21 all of the pending and approved SWD applications along those
22 known faults or within a 100 square mile?

23 A. Yes, he did.

24 Q. Okay. And that's what this map shows?

25 A. That's what this map shows. And what happened

1 when he did that was that we show fault slip in the year
2 2030.

3 Q. If all of the wells are running?

4 A. If all the wells are running at the applied-for
5 rates.

6 Q. And by all the wells, you mean all of the wells
7 that have been applied for within the 100 --

8 A. Yes. All the wells that are represented by
9 squares on this diagram. Okay. So we thought, well, okay,
10 our Twin Sisters Well doesn't work, but then -- twin Sisters
11 Well is the one here. But then we made some changes
12 consistent with our recommendations to the Division during
13 the Trident Sparrow case where there is no injection within
14 half a mile to a fault, and there is a limited injection of
15 20,000 barrels per day within three quarters of a mile of a
16 fault, and then everything works and there is no fault slip
17 potential.

18 Q. And so Mr. Reynolds reran this fault slip
19 probability analysis, but he removed five wells; is that
20 right?

21 A. Yes.

22 Q. And those are, those five wells are within a half
23 mile of the fault of concern?

24 A. Yes.

25 Q. And when you said a moment ago about the

1 recommendations taken from Trident and Sparrow, you said
2 that the recommendation was no wells within a half mile of a
3 fault, but really that's no wells within a half mile of a
4 fault of concern; is that right?

5 A. Yes. Fault of concern, thank you.

6 Q. So could you show -- point to the wells that are
7 the wells that were removed from Mr. Reynolds's analysis?

8 A. They are in the filled-in red squares.

9 Q. So he reran the analysis without those wells?

10 A. Yes.

11 Q. Are two of those wells AWR wells?

12 A. Yes, they are.

13 Q. And so Mr. Reynolds -- and we have acknowledged
14 that two, two of the wells that are problem wells, wells of
15 concern, are AWR wells?

16 A. Yes.

17 Q. So we are not being self-selecting here?

18 A. No.

19 Q. Okay. When Mr. Reynolds ran the model without
20 those addition -- without those wells in the model, you
21 mentioned that there was no fault slip potential or much
22 lower fault slip potential; is that right?

23 A. Yes.

24 Q. Let's turn to the next page then of the
25 materials.

1 A. Just slide it down. It's a PDF.

2 **Q. So this is two pages later in the materials.**

3 **This is Page 76 in the materials.**

4 A. Right. So in addition to dialing back the
5 injection rate of the well within three-quarters of a mile,
6 which was the yellow dot on the map, we have dialed others
7 back and eliminated some wells. But everything else is
8 going for the application, except for Twin Sisters, we
9 dialed that back to 30,000 for modeling. And if we go to
10 the next page, you can see that fault, this is 20 --

11 MS. BENNETT: Sorry, it's skipping. Thanks for
12 being patient with us while we do this.

13 THE WITNESS: First time on this screen.

14 EXAMINER MURPHY: Thank you, though.

15 A. Okay. There is 2040, again, very low fault slip
16 potential. We don't start getting concerned about these
17 until these, these get to .5 and go on to 2045.

18 **Q. Before we do that, though, there is a number of**
19 **fault slips listed in that right-hand column. What my**
20 **understanding is that Mr. Reynolds divvies up each fault**
21 **into segments; is that right?**

22 A. Yes. These are all fault segments based on
23 orientation, and you can see the way the model is run, it
24 looks at those individual fault segments, so you have very,
25 very low probability, even zero probability. And then again

1 low probability of slip, and it's all -- it's color coded
2 from green to red.

3 Q. I'm going to skip back to the very first page
4 though, because on the first page it identifies the -- the
5 segments; right? So that's where we can see the correlation
6 between the segment numbers?

7 A. Yes, that's correct.

8 Q. And then the right-hand column. So we are
9 looking at Segments 15 and 16 for, for example on -- in the
10 segments that have the higher fault slip potential at 2045?

11 A. Yes, and they are here.

12 Q. Okay. And so even at 2045, using the
13 recommendation that we just talked about, there is very
14 little fault slip potential?

15 A. Yes, we are still below, well below .5.

16 Q. Okay. And so with that, Mr. Taylor was -- I'm
17 sorry -- Mr. Reynolds was comfortable in his report. He
18 stated that using these assumptions and these
19 recommendations that the Twin Sisters Well, which is not
20 located anywhere near one of the faults of concern by which
21 Mr. Reynolds used a prescribed modeling for his analysis, he
22 testified that he thinks there is very little risk of
23 induced seismicity based on the Twin Sisters Well?

24 A. Yes. The Twin Sisters Well is not even the
25 driver for what's happening in the fault slip model, it's

1 the other wells.

2 Q. So the modeling that Mr. Reynolds did is sort of
3 unintended or happy coincidence of having the Twin Sister
4 application pending today; is that right?

5 A. Yes.

6 Q. And he concludes that the Twin Sisters Well has
7 very little chance of increasing fault slip; is that right?

8 A. Yes.

9 Q. So Mr. Taylor and FTI Platt Sparks found there
10 was very little risk of induced seismicity from the Twin
11 Sisters Well; is that right?

12 A. Yes.

13 Q. Great. Let's turn then to Exhibit 5. The first
14 exhibit behind Exhibit 5 is an affidavit from Chris Weyand;
15 is that right?

16 A. That's correct.

17 Q. And Chris Weyand, we already settled, is the
18 consultant who prepared the C-108?

19 A. Yes.

20 Q. In his affidavit does he testify that he
21 determined who the notice parties were and provided me with
22 that notice?

23 A. Yes.

24 Q. Let's then turn to Exhibit 5-B. Is that an
25 affidavit prepared by me?

1 A. Yes, it is.

2 Q. And behind Exhibit 5, do you see mailing lists
3 showing that mailing was done in this case?

4 A. Yes.

5 Q. And starting on Page 95 through about Page 120,
6 is that the notice letter that I provided to the parties?

7 A. Yes.

8 Q. And on Page 121, is that an affidavit of
9 publication showing that publication of this hearing was
10 made on February 20, 2020?

11 A. Yes, it is.

12 Q. And then if you look behind the next page it says
13 additional exhibits, and that's where we have the larger
14 cross section.

15 A. Yes.

16 Q. And then the next few pages, is it your
17 understanding those are excerpts from the C-108 that were a
18 little blurry from the copying and printing?

19 A. Yes, these are helpful.

20 Q. So these are just clearer examples or clearer
21 copies of what's in the C-108?

22 A. Yes.

23 Q. Okay. Were Exhibits 1 through 5 created by you
24 or prepared under your supervision or direction and compiled
25 from company business records?

1 A. Yes, they were.

2 MS. BENNETT: With that I would move that
3 Exhibits 1 through 5 be admitted into the record.

4 HEARING EXAMINER ORTH: Ms. Antillon?

5 MS. ANTILLON: No objection.

6 HEARING EXAMINER ORTH: They are admitted.

7 (Exhibits 1 through 5 admitted.)

8 MS. BENNETT: Thank you. With that, I have no
9 further questions for Mr. Duncan at the moment.

10 HEARING EXAMINER ORTH: Ms. Antillon, do you have
11 questions?

12 MS. ANTILLON: No questions.

13 HEARING EXAMINER ORTH: Mr. Coss?

14 EXAMINER COSS: Okay, I was hoping you were going
15 to start with Phil.

16 Good morning, Mr. Duncan. Nice to see you again,
17 twice in one week. I feel fortunate. So the first question
18 I have jotted down here is all of the faults that were
19 modeled were faults of concern. Could you clarify how you
20 -- the difference between faults and faults of concern as
21 defined here?

22 THE WITNESS: The faults of concern has a
23 particular orientation, and the -- as you can see, the
24 straight north-south faults don't really show up as risk in
25 the model. But if you start changing that orientation

1 slightly to a, to a -- toward an east-west, they become more
2 prone to slip, and it's just because of the stresses in the
3 world.

4 EXAMINER COSS: Okay.

5 THE WITNESS: And I can't go too far down that
6 road. I am not a geophysicist or seismologist.

7 EXAMINER COSS: Okay. Well, so all of these
8 faults then, these are documented faults?

9 THE WITNESS: They are documented faults, yes.
10 Yes.

11 EXAMINER COSS: In Dr. Taylor's testimony, does
12 it talk about -- does he reference the faults, like
13 literature that he uses to ascertain these fault properties?

14 THE WITNESS: Dr. Reynolds does.

15 EXAMINER COSS: Dr. Reynolds

16 THE WITNESS: Yeah, he lists the sources of
17 those.

18 EXAMINER COSS: Does he reference -- how far does
19 Dr. Reynolds suggest that the faults extend, to what surface
20 depth?

21 THE WITNESS: They are deep faults. They are --
22 I don't know where exactly they start, but these are deep
23 faults.

24 EXAMINER COSS: Or where they terminate. Do
25 these faults cut across the Wolfcamp?

1 THE WITNESS: I believe they do.

2 EXAMINER COSS: Is there any, does he address
3 whether the fluid will migrate up or down the fault and
4 potentially --

5 THE WITNESS: As to the Twin Sisters Well, that's
6 not a risk. The risk may be with the other wells that are
7 closer to the fault, but we don't go into that because we're
8 addressing the Twin Sisters Well here in terms of sealing
9 from injection fluids migrating. Another subject could be
10 discussing other wells that are closer to the faults.

11 EXAMINER COSS: Okay. and I heard you mention
12 something about potentially lowering the injection rate for
13 the Twin Sisters in relationship to induced seismicity
14 effects from cumulative effects of all the wells in the
15 area.

16 THE WITNESS: The C-108 has 50,000 in the 5thask.
17 The reservoir doesn't look like it will support more than
18 30,000 anyway, so --

19 EXAMINER COSS: That was going to be my next
20 series of questions. Does Dr. Zeigler's testimony discuss
21 the reservoir properties of this particular area kind of
22 specifically or more a discussion of the Devonian in
23 general?

24 THE WITNESS: More in Scott Wilson's testimony
25 where he has a curve drawn, and it shows about 32,000

1 barrels a day is about tops for this well based on
2 permeability.

3 EXAMINER COSS: Based on permeability. Is that
4 from the most recent wells drilled in the area?

5 THE WITNESS: Yeah. We found in general that the
6 rates are quite a bit less than 50,000.

7 EXAMINER COSS: Okay. And did the reservoir
8 properties, has there been any discussion -- is there any
9 discussion in this application about reservoir properties in
10 relationship to any of these faults. Do you think that the
11 faults have, have potentially decreased reservoir quality
12 near them or in kind of -- kind of in the general zone where
13 there has been faulting on either side?

14 THE WITNESS: I haven't done that study. I think
15 NGL's geologist does look at that, but it's not part of this
16 hearing.

17 EXAMINER COSS: Not part of this hearing?

18 THE WITNESS: Not part of the exhibits.

19 EXAMINER COSS: Thanks. I believe those are all
20 of my questions.

21 HEARING EXAMINER ORTH: Thank you. Ms. Murphy?

22 EXAMINER MURPHY: Mine are similar to yours, Mr.
23 Coss, but can you scroll up a couple.

24 MS. BENNETT: Sure, and I have a slightly
25 different presentation.

1 EXAMINER MURPHY: That one there. So the Trident
2 Sparrow, were these the same faults in the Trident Sparrow?

3 THE WITNESS: In the Trident and Sparrow case by
4 NGL, we had some additional information from Marathon that
5 they shared with us that those -- that's not reflected, so
6 part of this map does look a little bit different than the
7 Trident and Sparrow case because we had seismology from
8 Marathon to incorporate.

9 EXAMINER MURPHY: Are these totally different?

10 THE WITNESS: No, they are not totally different.

11 EXAMINER MURPHY: Because she gave me a GIS shape
12 file.

13 THE WITNESS: Yes.

14 EXAMINER MURPHY: I actually, not that I can
15 remember, but I thought they went further to the southeast.

16 THE WITNESS: There is a little bit of a
17 difference on the south end, but --

18 EXAMINER MURPHY: From the Sparrow Trident case?

19 THE WITNESS: Yes.

20 EXAMINER MURPHY: They go further to the
21 southeast and north?

22 THE WITNESS: Yes, right.

23 EXAMINER MURPHY: These go to the north?

24 THE WITNESS: This is the north end, yeah, that
25 wasn't on there. Yeah, and this is a slightly different

1 area, but it's on the same fault trend.

2 EXAMINER MURPHY: So like that similar case, you
3 have on here the red squares, there is several of them
4 there.

5 THE WITNESS: Yes.

6 EXAMINER MURPHY: You said they have been removed
7 because they are within a half mile of this fault system?

8 THE WITNESS: Yeah. We did the modeling
9 consistent with our previous recommendation to eliminate
10 certain faults within -- eliminate certain wells within the
11 half mile proximity to a known fault.

12 EXAMINER MURPHY: And so on this map here, the
13 red squares, the applications have been withdrawn?

14 THE WITNESS: We will withdraw what are numbered
15 as 17 and 11, I believe. Find those. They are on my list.
16 It will be the Petes and the Final SWD, 17 -- sorry -- 17
17 and --

18 EXAMINER GOETZE: 33.

19 THE WITNESS: 33, thank you.

20 EXAMINER MURPHY: So those are going to be
21 removed for the same reason that --

22 THE WITNESS: Trident Sparrow?

23 EXAMINER MURPHY: -- Trident Sparrow case?

24 THE WITNESS: Yes.

25 EXAMINER MURPHY: And would you make the same

1 recommendation about wells within a half to three-quarter
2 mile of these two faults.

3 THE WITNESS: Yes. Yeah, and we, we will present
4 some data on those.

5 EXAMINER MURPHY: And so you just said there were
6 two that were going to be removed, but there is several, and
7 you said that the red squares would be removed?

8 THE WITNESS: Yes. But they aren't -- well,
9 that depends on --

10 EXAMINER MURPHY: They're other companies?

11 THE WITNESS: They're other companies; right.

12 EXAMINER MURPHY: Are you going to give me the
13 GIS file for this?

14 THE WITNESS: I will give you everything you
15 want.

16 EXAMINER MURPHY: Okay. And there is other
17 existing SWDs, there is a couple, one to the extreme north
18 and one to the extreme south, is that right, active SWDs?

19 THE WITNESS: Yes. Those with API numbers are
20 active SWDs.

21 EXAMINER MURPHY: So they are not -- they are
22 putting in around 30,000 barrels a day also?

23 THE WITNESS: Yes. But they are modeled
24 according to what they are reporting or what they are
25 permitted for, whichever is greater.

1 EXAMINER MURPHY: The fault that's straight
2 north-south, so there's splays -- there is one splay that
3 comes off of that, and then that continues to the southeast.

4 THE WITNESS: Yes.

5 EXAMINER MURPHY: And that was the Trident
6 Sparrow area. The one that had 18, 14, 17, 18 -- I can't
7 see the numbers -- 16?

8 THE WITNESS: Yeah, we took the Trident off this
9 map, so -- I don't know where my --

10 EXAMINER MURPHY: I'm just asking about the GIS
11 shape file.

12 THE WITNESS: Yeah.

13 EXAMINER MURPHY: Isn't it the one that we have
14 that you gave me several weeks ago, is that an extension to
15 the southeast?

16 THE WITNESS: Yeah, it's slightly. This may be
17 slightly different, but because we didn't use the Marathon
18 data in this application.

19 EXAMINER MURPHY: So you can't say that these
20 wells are -- these faults are one large fault system?
21 That's what I'm getting at.

22 THE WITNESS: Well, it likely is, but I can't --
23 I can't testify to that.

24 EXAMINER MURPHY: Okay. All righty. No further
25 questions.

1 HEARING EXAMINER ORTH: Mr. Goetze?

2 EXAMINER GOETZE: Thank you. First, as a matter
3 of record, your C-108 application, the well design, is your
4 well design such that it will be protective of underground
5 sources of drinking water as presented?

6 THE WITNESS: Yes.

7 EXAMINER GOETZE: Okay, thank you. So next you
8 pulled the two AWR applications, or are planning to, that
9 you feel are in proximity to the fault system representing a
10 higher risk?

11 THE WITNESS: Yes.

12 EXAMINER GOETZE: And none of the other ones you
13 have out there -- well, wondering now, but we like to
14 wonder. So would AWR -- and then there is a 30,000 barrel a
15 day a good ask as far as injection and limitation?

16 THE WITNESS: Yes, that's fine.

17 EXAMINER GOETZE: Compared to what you are
18 planning to use this well for, this is not something that
19 would cause you a burden?

20 THE WITNESS: It won't cause -- it won't cause
21 heartache, especially with the proximity in this faulted
22 area, we will be happy to be a little more cautious.

23 EXAMINER GOETZE: Is AWR going to install some
24 sort of seismic array in this zone?

25 THE WITNESS: Yes. We have access -- AWR has

1 access to the NGL seismic data.

2 EXAMINER GOETZE: Okay. Hopefully some day we
3 will get access to the NGL seismicity. If we were to ask
4 AWR to provide us what they see, and say the director has
5 suggested to us to look at private sources and see if they
6 can become part of the public catalogue, so we would just
7 ask you to think about that.

8 THE WITNESS: All right.

9 EXAMINER GOETZE: We have an array out there, and
10 we are trying to fill in gaps, it would be nice to be able
11 for everybody to have availability of information, so --

12 THE WITNESS: The more we come to hearing, the
13 more data you get.

14 EXAMINER GOETZE: Well, I know, but --

15 EXAMINER MURPHY: That's what we are here for.

16 EXAMINER GOETZE: It's piling up. The GIS map
17 becomes one of our guidance and with accurate increase
18 ongoing thing.

19 THE WITNESS: Right.

20 EXAMINER GOETZE: Other than that, I have no more
21 questions for this witness. Thank you.

22 HEARING EXAMINER ORTH: Thank you. Ms. Bennett,
23 do you have any follow-up.

24 MS. BENNETT: Yes, I may. One quick follow-up.

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REDIRECT EXAMINATION

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BY MS. BENNETT:

Q. Mr. Duncan, Mr. Coss asked you some questions about the inputs Mr. Reynolds used in his study.

A. Yes.

Q. Let's look at Page 75 of the materials. Do you have that in front of you?

A. I do.

Q. That's on the screen now, too. Does this show the input parameters that Mr. Reynolds used?

A. Yes.

Q. Does it have, in the upper right-hand column, a box that says stress data. Do you see that? Or left-hand column.

A. Yes.

Q. Sorry.

A. Yes.

Q. Did he put in the reference steps that he used for calculation?

A. Yes.

Q. And then does it have a fault slip assumption that he made in the box in the left or right? The 85 degrees?

A. Yes.

Q. Does he say that he consulted the Snee-Zoback

1 paper for both the stress gradient and the stress, maximum
2 horizontal stress --

3 A. Yes.

4 Q. And then he notes that he took some information
5 from the Striker 6 SWD Number 2 well. Is that an NGL well?

6 A. That's an NGL well.

7 Q. Do you know if NGL has a seismic monitor at
8 Striker 6?

9 A. We have a seismic monitor that's covering Striker
10 6. I believe in Striker 6 we also ran dipoles on it, so
11 there's quite a bit of information on that well.

12 Q. Can you show, if I go to the map, is the Striker
13 6 identified in the map?

14 A. It's in the south here. I think it's that one,
15 but I would have to check the API number. It's one of the
16 two.

17 Q. It's relatively close to Twin Sister?

18 A. Yeah, in the area.

19 MS. BENNETT: Those are the only follow-up
20 questions I have.

21 HEARING EXAMINER ORTH: All right. Is there
22 anything further from anyone?

23 EXAMINER MURPHY: I have a question. So you were
24 pointing out on Page 65 there is the locations of the
25 seismic stations Striker 3, 2, 6, and is it Salty Dog?

1 THE WITNESS: Salty dog is across the Texas line.

2 EXAMINER MURPHY: Is it? I just assumed that was
3 the name. But you have three seismic stations right
4 there --

5 THE WITNESS: We have --

6 EXAMINER MURPHY: -- showing that the Striker 6
7 is going to be near where the Flowers will be. Is that
8 right?

9 THE WITNESS: The Twin Sisters.

10 EXAMINER MURPHY: The Twin Sisters.

11 MS. BENNETT: Yes. Yes.

12 THE WITNESS: Yes.

13 EXAMINER COSS: And I would thank you for
14 pointing out the FSP can put parameters, because I noticed I
15 was in flipping through looking for them, and the hydrologic
16 parameters derived from the Striker 6 well, I imagine that
17 those logs, many of them have probably been provided to the
18 Division, but I was hoping that you all could provide some
19 of the analysis and a nice copy of electronic logs that
20 mention the dipoles on it, and if those could be provided in
21 this case as well.

22 THE WITNESS: We did Fed Ex those to the Division
23 in, in -- on CD roms, but I don't know where those might be
24 right now.

25 EXAMINER COSS: I will take a look for them.

1 THE WITNESS: If you find them, if you don't find
2 them, let me know --

3 EXAMINER COSS: If I think I need more, I will
4 ask for it.

5 EXAMINER MURPHY: I would like to point out on
6 Page 64 there is the lat-long of those seismics for the
7 Striker 2, 3, and 6.

8 THE WITNESS: Yes.

9 HEARING EXAMINER ORTH: Anything else at all?
10 (No audible response.)

11 HEARING EXAMINER ORTH: No? All right. Thank
12 you very much, Mr. Duncan and Ms. Bennett.

13 MS. BENNETT: With that I would ask that case
14 Number 21090 be taken under advisement.

15 HEARING EXAMINER ORTH: Thank you. It will be --
16 Ms. Antillon?

17 MS. ANTILLON: The State Land Office has a quick
18 statement. We are reviewing this application and we do have
19 some concerns about the well spacing due to its close
20 proximity to state trust land.

21 HEARING EXAMINER ORTH: Thank you.

22 MS. BENNETT: Thank you.

23 (Taken under advisement.)

24

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1 STATE OF NEW MEXICO
2 COUNTY OF BERNALILLO

3

4 REPORTER'S CERTIFICATE

5

6 I, IRENE DELGADO, New Mexico Certified Court
7 Reporter, CCR 253, do hereby certify that I reported the
8 foregoing proceedings in stenographic shorthand and that the
9 foregoing pages are a true and correct transcript of those
10 proceedings that were reduced to printed form by me to the
11 best of my ability.

12 I FURTHER CERTIFY that the Reporter's Record of
13 the proceedings truly and accurately reflects the exhibits,
14 if any, offered by the respective parties.

15 I FURTHER CERTIFY that I am neither employed by
16 nor related to any of the parties of attorneys in this case
17 and that I have no interest in the final disposition of this
18 case.

19 Dated this 5th day of March 2020.

20

21 _____
22 Irene Delgado, NMCCR 253
23 License Expires: 12-31-20
24
25