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 SOLARIS WATER MIDSTREAM, LLC FOR APPROVAL OF A SALTWATER DISPOSAL WELL, LEA COUNTY, NEW MEXICO. CASE NO. 20113

REPORTER'S TRANSCRIPT OF PROCEEDINGS

EXAMINER HEARING

April 18, 2019

Santa Fe, New Mexico

BEFORE: PHILLIP GOETZE, CHIEF EXAMINER
TERRY WARNELL, TECHNICAL EXAMINER
WILLIAM V. JONES, TECHNICAL EXAMINER
DAVID K. BROOKS, LEGAL EXAMINER

This matter came on for hearing before the New Mexico Oil Conservation Division, Phillip Goetze, Chief Examiner; Terry Warnell and William V. Jones, Technical Examiners, and David K. Brooks, Legal Examiner, on Thursday, April 18, 2019, 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.

REPORTED BY: Mary C. Hankins, CCR, RPR
New Mexico CCR #20
Paul Baca Professional Court Reporters
500 4th Street, Northwest, Suite 105
Albuquerque, New Mexico 87102
(505) 843-9241

APPEARANCES

FOR APPLICANT SOLARIS WATER MIDSTREAM, LLC:

JAMES G. BRUCE, ESQ.
Post Office Box 1056
Santa Fe, New Mexico 87504
(505) 982-2043
jamesbruc@aol.com

FOR INTERESTED PARTY NGL WATER SOLUTIONS:

DEANA M. BENNETT, ESQ.
MODRALL, SPERLING, ROEHL, HARRIS & SISK, P.A.
500 4th Street, Northwest, Suite 1000
Albuquerque, New Mexico 87102
(505) 848-1800
deanab@modrall.com

FOR INTERESTED PARTY THE NEW MEXICO STATE LAND OFFICE:

ANDREA ANTILLON, ESQ.
NEW MEXICO STATE LAND OFFICE
Office of General Counsel
301 Old Santa Fe Trail
Santa Fe, New Mexico 87501
(505) 827-5872
aantillon@slo.state.nm.us

FOR INTERESTED PARTY EOG RESOURCES:

ADAM G. RANKIN, ESQ.
HOLLAND & HART, LLC
110 North Guadalupe, Suite 1
Santa Fe, New Mexico 87501
(505) 988-4421
agrankin@hollandhart.com

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EXHIBITS OFFERED AND ADMITTED

(1:37 p.m.)

EXAMINER GOETZE: So on to the next case, Case Number 20113, application of Solaris Water Midstream, LLC for approval of a saltwater disposal well, Lea County, New Mexico.

Call for appearances.

MR. BRUCE: Mr. Examiner, Jim Bruce of Santa Fe representing the Applicant. I have three witnesses.

MS. BENNETT: Deana Bennett, from Modrall Sperling on behalf of NGL Water Solutions Permian, LLC.

MS. ANTILLON: Andrea Antillon on behalf of the State Land Office. I don't have any witnesses today, but I did want to make a statement for the record.

EXAMINER GOETZE: Very good. We'll do that at the end.

MR. RANKIN: Good morning [sic], Mr. Examiner. Adam Rankin on behalf of EOG Resources, with the law firm of Holland & Hart. No witnesses.

EXAMINER GOETZE: All right. Mr. Bruce, how many witnesses do you have?

MR. BRUCE: Three witnesses.

EXAMINER GOETZE: Would you folks please stand, identify yourself to the court reporter and be

sworn in?

MR. WOOD: Brian Wood.

MR. FANSHIER: Craig Fanshier.

MR. DIXON: Drew Dixon.

(Mr. Wood, Mr. Fanshier and Mr. Dixon sworn.)

DREW DIXON,

after having been first duly sworn under oath, was questioned and testified as follows:

DIRECT EXAMINATION

BY MR. BRUCE:

Q. Will you please state your name and city of residence for the record?

A. Yes. My name is Drew Dixon, and I reside in Houston, Texas.

Q. Who do you work for and in what capacity?

A. I work for Solaris Water Midstream, LLC as the vice president of land, regulatory and permitting.

Q. Have you previously testified before the Division?

A. I have.

Q. And were your credentials as an expert petroleum landman accepted as a matter of record?

A. They were.

Q. And are you familiar with the land matters

involved in this application?

A. Yes, I am.

MR. BRUCE: Mr. Examiner, I tender Mr. Dixon as an expert petroleum landman.

EXAMINER GOETZE: Okay. Ms. Bennett?

MS. BENNETT: No objection.

EXAMINER GOETZE: Mr. Rankin?

MR. RANKIN: No objection.

EXAMINER GOETZE: Ms. Antillon?

MS. ANTILLON: No objection.

EXAMINER GOETZE: Okay. Please proceed.

Q. (BY MR. BRUCE) Mr. Dixon, can you look at Exhibit 1 and briefly describe this for us?

A. Yes. Exhibit 1 is a map depicting the location of the Solaris Aspen SWD No. 1 well location in Section 35 of Township 24 South, Range 33 East as it relates to horizontal well development in and around various sections and townships in the area.

Q. And it looks like the -- these are not only drilled but permitted horizontal wells?

A. That is correct.

Q. And pretty much all of them are stand-up wells?

A. That is correct.

Q. And what is Exhibit 2?

A. Exhibit 2 is a further map location

depicting -- excuse me -- an additional map depicting the location of both the Aspen SWD No. 1 well that we've applied for and the Telluride well that we've also applied for and been to hearing.

Q. Okay. Could you just briefly outline the current status of the -- of the permitting of the well?

A. Okay. Yes. So we applied for the Aspen well. I believe it was received by the NMOCD on August 13, 2018. In October of 2018, on the 2nd, we had our on-site with the BLM as to the location of that well. And I guess that's where we've come to today, without approval of the injection permits.

Q. There was an objection -- or objections is more proper to the administrative application?

A. Yes. There have been objections to that application by several parties.

Q. Let's go -- EOG is here today. What is -- what is the basis of their -- what is the reason for their objection, to the best of your knowledge?

A. It is my understanding that it is due to a company policy that was changed in late 2018 where -- in which they now ask for third-party SWDs to be located in certain locations in the section in which they're the mineral, I guess, lessee, which is within the hard line 330 and then around 1,400 feet from either the north or

south lines of the respective sections.

Q. And is this so they can plan and drill their own horizontal producing wells, oil- and gas-producing wells?

A. That is my understanding. Yes.

Q. Looking at Exhibit 2, for the Aspen well, obviously the 790 feet from the north line doesn't meet EOG's current requirements, correct?

A. That is correct.

Q. The 230 feet from the west line would meet that requirement?

A. Yes. That is correct.

Q. Now, did EOG ask that Solaris move the well?

A. They did. It was in early -- well, late 2018, early 2019.

Q. Okay. At this point would it be easy to move the well location?

A. No. There have been additional applications in the area. There may remain some minor flexibility, but given how far we have gotten with both the federal on-site and additional applications in the area, it would be -- it would be difficult, not to mention it would cost additional money for survey as far as other --

Q. And based upon current policy and other

applications for saltwater disposal wells in this area, are you kind of hemmed in on where you can locate a well at this point?

A. There is -- there is limited space in which to move the well.

Q. And finally, what is Exhibit 3?

A. So Exhibit 3 is a map that was generated at my direction depicting the surface ownership in and around the Aspen well.

Q. Okay. And what is -- who is the surface owner where the well is located?

A. So the well is located on the BLM lands.

Q. And the blue is State of New Mexico land, light blue?

A. That is correct.

Q. And in the past, the land office has indicated some hesitancy about it being too close to State of New Mexico land; is that correct?

A. That is correct. Yes.

Q. And how far is NGL --

A. The closest --

Q. Wait. Let me -- I take it back.

NGL purchased some ranch land out here; is that correct?

A. That is -- that is correct? They purchased

some surface and some grazing leases.

Q. Okay. And how close is the closest chunk of NGL's land?

A. The closest property of NGL's surface ownership is approximately 1.66 miles away.

Q. Were Exhibits 1 through 3 prepared by you, under your supervision or compiled from company business records?

A. Yes, they were.

Q. And in your opinion, is the granting of this application in the interest of conservation and the prevention of waste?

A. Yes, it is.

MR. BRUCE: Mr. Examiner, I'd move the admission of Exhibits 1 through 3.

EXAMINER GOETZE: Ms. Bennett?

MS. BENNETT: No objection.

EXAMINER GOETZE: Mr. Rankin?

MR. RANKIN: No objection.

EXAMINER GOETZE: Ms. Antillon?

MS. ANTILLON: No objection.

EXAMINER GOETZE: Exhibits 1, 2 and 3 are so admitted.

(Solaris Water Midstream, LLC Exhibit Numbers 1, 2 and 3 are offered and admitted

into evidence.)

EXAMINER GOETZE: Ms. Bennett, it's your witness.

MS. BENNETT: Thank you.

CROSS-EXAMINATION

BY MS. BENNETT:

Q. Nice to see you again, Mr. Dixon.

A. Yes.

Q. I, as you know, represent NGL.

And I just had a question about your Exhibit 3. I see that you've identified the BLM land, state land and then NGL surface ownership. And although the area where Aspen is proposed to be drilled is not on NGL's fee land, it's within their ranch boundaries. Is that your understanding?

A. That is my understanding. Yes.

Q. And that they hold a grazing lease issued by the BLM?

A. That is my understanding at this time. Yes.

Q. Just out of curiosity, is BLM the surface and mineral owner there?

A. I believe they are. Yes.

Q. And --

A. That would be in that -- yes. Let me see if it's on the map here or -- it would have been contained

within our notice, on the C-102, but yes.

Q. More of an intellectual pursuit then.

A. Okay.

Q. And then I think you said that you are sort of hemmed in, that you can't move the Aspen well based on other applications?

A. I said it would be challenging. There are other applications in the area, so it's limited, correct.

Q. And do you know how far the Aspen well is from NGL's Moab well?

A. I had it. Maybe Jim can help me.

The Moab, it's probably just over -- well --

Q. It looks like it's a little --

A. It looks to be located on the orange boundary, so about 1.66 miles away, give or take, correct.

Q. In that little orange triangle up at the top?

A. On the fee lands, yes.

Q. And I think that's the only question I had -- the only questions I had for you. Thank you. Oh, actually, I did have one more question. I apologize.

When I was looking through the materials, I noticed that you didn't have a reservoir engineering study in your materials; is that correct?

A. I believe that is correct in this instance. Yes.

Q. Thank you.

EXAMINER GOETZE: Mr. Rankin.

CROSS-EXAMINATION

BY MR. RANKIN:

Q. Mr. Dixon, I just want to make sure -- I want to get some clarification on the extent to which you're hemmed in here so I'm clear on for the record. What specific wells in the area are limiting your ability to move or relocate the Aspen SWD to -- to meet EOG's internal policy requirements for location of SWDs?

A. Okay. So there have been applications of NGL and OWL to our west, the Sparrow and the Landfill No. 1. And then as far as moving north, it would be the Moab, which, you know, as I mentioned, there is some limited ability to move, but -- then to the east, the Patriot.

Q. Okay. So to the extent there is some limited ability to move, what -- what is that? How much do you think -- what is the flexibility there to identify a different location?

A. I'd have to go through and look at each individual one in conjunction with each other. I can't answer that at this time.

Q. But would it be possible to move that well 100

feet?

A. It would possibly be possible to move it 100 feet.

Q. So my understanding from your testimony is that the Aspen is within the -- the 330-foot distance that EOG has identified from the west line as acceptable to EOG, but it doesn't meet the distance from the north line; is that right?

A. That is correct.

Q. And is it your understanding that that location request from EOG is -- is because they have concerns about interference with the well development plans in the spacing unit?

A. Well, so it's my understanding that's just simply a companywide policy now. There are other things that EOG can do -- so I don't know if they've actually laid out their development plan here, and there is not a witness from EOG to testify if they have. But my prior experience is there are things that an operator can do, to either do side tracks or back builds or forward builds, that this shouldn't be a problem, the location of our well. The main concern would be the vertical portion being inside the hard line because then their lateral field is at least east of our well. So they'll be at the 330 lease line with their closest well. So

it's simply a location of the pad that can be in question, in my opinion.

Q. Okay. But -- but I was asking, I guess, what your understanding was of EOG's concerns. So you're not clear, as you sit here --

A. As it simply relates to this well, I'm not clear.

Q. All you know is where EOG has asked you to put this well?

A. So they have not asked us, absent a discussion around it, a formal location to put this well. They've simply asked if we could comply with their newest policy that was rolled out in December.

Q. Okay. So based on that, you don't know why -- exactly what their reasons are? You just know that they've got a certain area that they want you to try to stay within?

A. For all future wells, correct.

Q. And this well is how far from that area, roughly?

A. Roughly, 4-, 500 feet.

Q. From -- because it's too far to the south; is that right?

A. Too close to the north line.

Q. Too close to the north.

A. Correct.

Q. So it's a couple hundred feet too close to the north of EOG's requested locations?

A. Correct.

But there are other reasons we still want to remain it -- keep it here (indicating) because we've secured pipeline right-of-way to this point and various other things, so it's in our benefit -- and surveyed and an on-site with the BLM -- to keep it at this spot.

Q. Okay. But sitting here today, you can't tell me whether or not you can build that well a couple hundred feet to the south to meet EOG's location requirements?

A. I cannot tell you definitively. I can tell you that we can't do it without significant additional cost to us and delay.

MR. RANKIN: Nothing further.

EXAMINER GOETZE: Ms. Antillon?

MS. ANTILLON: I have nothing.

CROSS-EXAMINATION

BY EXAMINER GOETZE:

Q. Okay. First question is: How far do we notice and from what location?

A. So do we have our C-108? It would contain -- actually, that may be -- Brian will be able to speak

better to that.

MR. BRUCE: Our next witness.

Q. (BY EXAMINER GOETZE) The landman doesn't know where we noticed, huh?

A. Well --

Q. Okay. That's fine.

MR. BRUCE: The original C-108 did contain the info, but that was based on a half mile --

EXAMINER GOETZE: Okay. That's just what I wanted to get at. So that's the question, and you have no answer. We'll save it for your next witness.

MR. BRUCE: Yes, sir.

Q. (BY EXAMINER GOETZE) So at this point, to re-affirm what you've said in testimony, there just seems to be no place to go, that this is the position you're willing to stay as the surface location as proposed in the original application?

A. That is our desire. Yes.

Q. You have not had any amended locations? This is -- this is the real one?

A. Yes.

(Cell phone ringing.)

EXAMINER GOETZE: I'm done with this witness. You may move on to your next witness.

MR. BRUCE: Mr. Wood.

BRIAN WOOD,

after having been previously sworn under oath, was questioned and testified as follows:

DIRECT EXAMINATION

BY MR. BRUCE:

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

A. Brian Wood.

Q. Where do you reside?

A. Santa Fe, New Mexico.

Q. And what is your occupation?

A. I'm the president of Permits West.

Q. And what does Permits West do with respect to saltwater disposal wells?

A. We prepare saltwater disposal applications.

Q. And what is your relationship to Solaris in this case?

A. We're a contractor for them, and we've prepared a number of SWD applications for them in two years.

Q. Okay. And have you previously testified before the Division?

A. Yes, I have.

Q. And were your credentials as an expert regulatory person accepted as a matter of record?

A. Yes, they were.

MR. BRUCE: Mr. Examiner, I tender Mr. Wood as an expert in oil and gas regulatory affairs.

EXAMINER GOETZE: Ms. Bennett?

MS. BENNETT: No objection.

MR. RANKIN: No objection.

MS. ANTILLON: No objection.

EXAMINER GOETZE: Very good. Proceed.

Q. (BY MR. BRUCE) Mr. Wood, you've got several exhibits in front of you. The first one is Exhibit 4. That's the C-108 for the proposed well; is it not?

A. Correct.

Q. Now, this is signed by Bonnie Atwater from Solaris. Have you reviewed the contents of this C-108?

A. Yes, I have.

Q. And do you agree with its contents?

A. Yes.

Q. And getting to Mr. Goetze's question, did you also review the notice necessary for this well?

A. Yes. What I was specifically looking at was -- it was prepared under the old half-mile-radius area of review. We're now under the one-mile radius. So there were a couple of additional parties notified.

Q. Okay. We'll get more into that.

Let's go -- I've numbered the pages. And I warned the examiner that somewhere along the line my

counting abilities faded, and there is no page 22, but all the other pages are numbered. I don't know how that happened.

EXAMINER GOETZE: It doesn't matter, as long as they're numbered. Whatever you want to call them, we'll look for them.

(Laughter.)

Q. (BY MR. BRUCE) Could you turn to page 3, Mr. Wood, and briefly identify the well's location and the well data?

A. Okay. The well's staked at 790 from the north line and 230 from the west line in Section 35, Township 24 South, Range 33 East.

Q. And what is the injection formation?

A. There will be the Devonian.

Q. And that's open hole, correct?

A. That is correct.

Q. And to the best of your knowledge, will this be a commercial saltwater disposal well?

A. That is right.

Q. If you turn to page 4, what are the -- just summarize the proposed operations, the injection rates, et cetera.

A. The proposed maximum injection rate would be 30,000 barrels of water per day. The average injection

rate would be 15,000 barrels of water per day. I calculated on the standard 0.2 psi per foot. The maximum injection pressure would be 3,252 psi. It's thought that the main source of disposal water will be Wolfcamp and Bone Spring produced water.

Q. And do we have a geologist today to describe geology?

A. Yes, we do.

Q. Does page 8 contain a wellbore sketch of the proposed well?

A. Yes.

Q. And if this well is properly drilled, will its design and construction prevent movement of fluids between zones?

A. That is right.

Q. Looking at pages 12, 13 and 14, does that identify the wells in the area of review?

A. Page 12 shows a half-mile radius and then a two-mile radius. Page 13 has several radii depicting the wellbores of the horizontal wells on these slides. And in Section -- excuse me. Page 14 identifies the wells that are in the area of review, one-half-mile radius area.

Q. Do any of the wells in the one-half-mile area of review penetrate the injection zone?

A. None.

Q. And turning back to page 13, I think this exhibit is a little easier to read pertaining to one of the questions. Section 35 appears to be state surface and minerals; does it not?

A. Correct.

Q. And then moving on to page 15, et cetera, are there water samples showing the quality or lack thereof of the Wolfcamp and Bone Spring water?

A. Yes. Page 16 is a sample from the Brushy Draw well formation. It does not appear to be identified on this.

Q. At the top of the page.

A. Oh, I'm sorry. Yes. It's Wolfcamp. Probably the critical parameter is the TDS. TDS was measured at 213,000 parts per million. On page 17, we've got a Bone Spring sample. The TDS in this sample is 185,000 parts per million.

Q. And do pages 18 and 19 show the injection water?

A. Page 19 is an analysis of the Devonian, and it shows the TDS is measured at 203,000 parts per million.

Q. Now, you've prepared quite a few C-108s, haven't you?

A. That's right.

Q. And you've looked at water quality -- or I should say water analyses in a large area of southeast New Mexico?

A. Yes.

Q. Is some of that data shown on Exhibit 5?

A. Yes.

Q. And was that prepared by you?

A. It was.

Q. And it appears to contain water sample analyses from the Bone Spring, 2nd and 3rd Bone Spring, Upper Bone Spring, Delaware. What is the general TDS in all of these wells?

A. In general, it's six figures. It's 100,000 parts per million or higher.

Q. And based on all this data, do you anticipate any compatibility issues between injection water and formation water?

A. I do not.

Q. Are there any sources of fresh water in this area?

A. There are not.

Q. And I think at the last hearing on the Telluride well, there was some talk about fresh water in the area. Apparently the Rustler Formation is the deepest freshwater source?

A. Even that is kind of brackish water. There may be some very isolated small, shallower fresh aquifers, but they're thousands of feet above the Devonian.

Q. And in your review of the C-108 and in compliance with the new rules, did you look at the one-mile region from the well location and the surface location?

A. Correct.

Q. And does Exhibit 6 correctly reflect not only the surface owner but the oil and gas lessees or operators in this area?

A. That is correct.

MR. BRUCE: Mr. Examiner, Exhibit 7 is simply my Affidavit of Notice showing that notice was given to all of these parties, and they did receive actual notice.

Q. (BY MR. BRUCE) And, again, were Exhibits 4, 5 and 6 either prepared at your direction and/or compiled from company business records?

A. Exhibit 4 was prepared by the company itself.

Q. Right.

A. I prepared Exhibit 5 and Exhibit 6.

Q. And Exhibit 7 is mine?

A. Correct.

Q. In your opinion, is the granting of this

application in the interest of conservation and the prevention of waste?

A. Yes.

MR. BRUCE: Mr. Examiner, I move the admission of Exhibits 4, 5, 6 and 7.

EXAMINER GOETZE: So just out of curiosity, 4 is the C-108?

MR. BRUCE: The C-108.

EXAMINER GOETZE: Mine just says nothing. So that being the case, Exhibit 4 is the C-108 as amended and provided.

Ms. Bennett?

MS. BENNETT: No objections to the admission.

MR. RANKIN: No objections.

MS. ANTILLON: No objections.

EXAMINER GOETZE: Very well. Exhibits 4, 5, 6 and 7 are so entered into the record.

(Solaris Water Midstream, LLC Exhibit Numbers 4 through 7 are offered and admitted into evidence.)

EXAMINER GOETZE: And, Ms. Bennett, your witness.

MS. BENNETT: Thank you.

CROSS-EXAMINATION

BY MS. BENNETT:

Q. I just had a couple of probably cleanup questions. In the C-108, I'm used to seeing an affirmative statement from the Applicant stating that they've examined the geologic information. And I see there is a letter in here, and that might be what you're using as the affirmative statement. But I didn't see either sort of a form affirmative statement that is a part of the C-108. I didn't see that in here. I might have just overlooked it.

A. Yeah. I think that's -- page 25 of that exhibit is -- you know, it addresses the seismicity potential. It doesn't explicitly address, you know, the possibility of leaking into an aquifer.

Q. Uh-huh. So I'll leave this to others to decide whether that qualifies as the affirmative statement as required by the C-108 in .12, I guess it is.

The other thing I noticed is that the Aspen well is fairly close to State of New Mexico lands; I think a quarter mile or so. But I didn't see the State Land Office as a party that was given notice, and obviously that's -- they're here today, so that's not an issue in terms of actual notice. But was there a reason that they weren't on the notice list given the proximity

of the state lands to the proposed well?

A. I'm assuming -- I did not send out the notice, but I'm assuming that (A) they're not the surface owner; (B) they're not a well operator.

Q. Those are the only questions I had.

EXAMINER GOETZE: Mr. Rankin?

MR. RANKIN: No questions.

EXAMINER GOETZE: Ms. Antillon?

MS. ANTILLON: No questions.

CROSS-EXAMINATION

BY EXAMINER GOETZE:

Q. Welcome back, Mr. Wood.

For clarity of the record, yes, under the new rules, you have to notify the mineral owners, state land, as well as BLM if it's within the half-mile radius. So --

MR. BRUCE: Within the half-mile radius?

EXAMINER GOETZE: Regardless. Regardless. The rule changed on the 28th. Mr. Brooks has reminded me numerous times over that the mineral estates do have to be noticed.

MR. BRUCE: Okay.

EXAMINER GOETZE: Typically, we do have them going up because of surface right-of-way issues, things like that, but yeah. Mineral ownership, it's no

longer "or." It's "and."

With regard to the affirmation statement, this is a deficiency. We would like a statement. Induced seismicity is above and beyond. Do we have one on record?

MR. BRUCE: Section 12 of the -- page 5.

EXAMINER GOETZE: Section 12.

MS. BENNETT: There is a statement on page 5.

EXAMINER GOETZE: Page 5. We've got it? There you go.

MS. BENNETT: Uh-huh. But it doesn't -- I guess that is --

EXAMINER GOETZE: Well, no. There should be -- attachment six, typically with these, we do have a signature page with someone -- just because you have it in the C-108, we don't know who testified to this evaluation, whether it's the person at the front desk or the guy delivering the postage -- or the green cards. So it's -- that is a deficiency that needs to be provided.

You have a geologist coming up?

MR. BRUCE: Yes.

Q. (BY EXAMINER GOETZE) I assume you went back through ALL Consulting's application -- original

administrative application and included those things brought forward. What I'm seeing here is ALL Consulting plus your input. So you reviewed ALL Consulting's --

A. Yes. I reviewed -- yeah.

Q. And you found no major issues?

A. We did not do any calculations.

Q. Other than the fact -- just the content of the C-108?

A. Right.

EXAMINER GOETZE: With that, I will -- oh, we never gave the opportunity to Mr. Jones.

CROSS-EXAMINATION

BY EXAMINER JONES:

Q. I could throw a question or two in, I guess.

Did we confirm the BLM owns the subsurface here in this -- under this well site?

MR. BRUCE: We can confirm that. I'm 99.9999 percent sure.

Q. (BY EXAMINER JONES) But they do own the surface.

A. Correct.

Q. So when you're preparing these C-108s, the actual well design, do you interact with the BLM as to make sure that they're okay with --

A. That'll be part of the application for permit

to drill. They've got a fairly -- excuse me -- a fairly involved questionnaire as far as, you know, casing, cement, specifications of your casing. They even now require what they call a casing design assumption worksheet. In other words, how did you decide to run this particular string of casing, which really, here it is, but how did you come to that decision?

Q. And what about this Intercontinental Potash or -- I thought I saw something about that here. Does that change anything, or did you --

A. I can't address, you know, the potash company's plans. They did drill a number of what they called geotechnical foundation boreholes out there. It's showing up in the State Engineer's database. I think they were typically about 75 feet deep. My thought is that, you know, that's exactly what they describe it as. They're looking at perhaps some type of surface facility versus actually evaluating the well body that might be, you know, much deeper.

Q. So are you aware of what's going to be on the surface here as far as facilities? I know the C-108 doesn't really usually include the tank batteries and all that stuff.

A. I'm going to defer to Mr. Dixon on that.

Q. The geologist?

A. No. The landman and vice president.

Q. Okay. Okay. And didn't -- okay. That's it.

EXAMINER JONES: I'll pass it on.

EXAMINER BROOKS: No questions.

CROSS-EXAMINATION

BY EXAMINER WARNELL:

Q. One question, Mr. Wood. What's the TD of the Aspen?

A. It will be 17,960 feet. That's 1-7-9-6-0.

Q. Thank you.

EXAMINER GOETZE: Okay. No further questions for this witness.

MS. BENNETT: I'm sorry. May I ask a follow-up question to Mr. Jones' question?

EXAMINER GOETZE: Yes, you may.

MS. BENNETT: Thank you.

RECROSS EXAMINATION

BY MS. BENNETT:

Q. So a moment ago you were saying that when you apply for the BLM APD, there will be a number of communications and a checklist that you'll need to fill out, and that will kind of determine the casing design and the well construction at that point. Is that an accurate sort of restatement of what you said?

A. Well, I mean, what the process is, you know,

the Applicant will go ahead and prepare, you know, their wellbore design, as they've done here, but it will be much more detailed than what's presented here in the C-108. We upload that to BLM's online filing system called AFSMSS. And there are number of checklists on there. In other words, add this attachment, add this attachment, add this attachment. And one of the new requirements that the AFSMSS system has is this casing design assumption worksheet, because in the past, you were providing, for instance, your casing specs, your cement specs, but there was really no decision on how did you decide to run, you know, J-55, 5-1/2-inch or whatever it may be. So that's kind of a new wrinkle that the BLM has brought forth in the AFSMSS.

Q. Have you gone through that process before with the BLM where you uploaded all that information and then had subsequent conversations with BLM?

A. Oh, have we ever.

Q. Okay. And has BLM ever asked the Applicant to change its well casing or its well design?

A. Yes.

Q. And in the instance -- if that were to happen here, then would you need to return to the Division to get approval for your well design?

A. It would probably depend on the changes. I

mean, certainly, for instance, you know, if we were changing, I'll say, the top of the cement, I think the Division would want to know that. Changing the tubing or annulus, they would want to know that.

Q. So there are certain things that could change that would require you to come back or that would at least weigh in favor of coming back --

A. Yes.

Q. -- to inform the Division of changes to the well design?

A. Uh-huh. Right.

Q. Thank you.

EXAMINER GOETZE: And to that end, I will make one note on that. There are specific items under the Code of Federal Regulations that state that changes to certain things do not require notification. It can be handled administratively. One of those is the change of casing design such that it accommodates, even in drilling the well, the ability to make modifications based upon drilling. It's unusual for us to come back for hearing just because you changed the well design, unless it's an issue with, say, not sealing all the salt zones or you changed it such that the parameters of the well -- operational boundaries have changed. Then we like to see it. But other than that, typically we just

get a notice because it'll be a BLM -- and it'll be Onshore Number 2 that they will have to live with. We go forward with this application so that BLM has an idea of what we're asking. So we may not come back to hearing. It may just be papers handed out to everybody. Okay?

MS. BENNETT: Thanks.

EXAMINER GOETZE: I'm done with this witness. Thank you.

CRAIG FANSHIER,

after having been previously sworn under oath, was questioned and testified as follows:

DIRECT EXAMINATION

BY MR. BRUCE:

Q. Mr. Fanshier, where do you reside?

A. I live in Sheridan, Oregon.

Q. Have you spent time in New Mexico?

A. I've spent quite a bit of time here in New Mexico since about 2007.

Q. Okay. We'll get into that in a little bit. And what is your technical background?

A. I've been a hydrogeologist for 32 years, working largely in the U.S. but a little bit in the Middle East and been spending a lot of time in New Mexico and Utah as of late, at least the last --

since '07.

Q. Okay. Have you previously testified before the Division?

A. I have not testified before this Division.

Q. Could you summarize your -- maybe your educational background and then go into a little bit of what you've done in your working life?

A. I graduated from the University of Oregon with a degree in geology in 1983, and then after that, a couple years off. And then I got a job at the USGS and started doing hydrogeologic characterizations of all types of different facilities starting with military bases, then moved on to consulting firms. And I've been working with doing hydrogeologic characterizations of landfills, mines, industrial facilities and on, and working with water resources, contaminant transport, et cetera.

And then in the last few years, I've been doing quite a bit of work for Intrepid Potash. I actually am kind of running their drilling programs for doing solution mining with Class 3 injection wells. So I run the drilling program and the directional components of it in Moab, Utah, where we've done a pretty amazing thing with our directional program of actually -- not just doing a lateral, but making many

sidetracks, then stepping up our mile and doing it again and interlocking the boreholes of two laterals with, say -- or two directional wells with six to eight laterals per well with a pretty high rate of success in connection.

One of the things I've been doing is working here in New Mexico. I've been working on hydrogeologic characterizations of a large swath of the land around Carlsbad. I started with Intrepid Potash doing the hydrogeologic characterization for the new solar pods where we studied, you know, the formations in that area, being the Rustler primarily, with the Culebra and the Magenta members. And now I'm working on well field design for brackish water and managing and implementing of policies for the program to extract water in a reasonable fashion and, you know, working with the OSC on those well designs and permits and applications and water rights compliance.

Q. And have you been involved in oil and gas projects?

A. Yeah. I've been looking at some prospects where I look at the geology for determining, you know, what kind of production in the areas from well log reviews and then looking at the geology information that was in whatever wells to see if there was some potential

for recovery of petroleum products.

Q. Does that include looking at the Devonian Formation?

A. You know, I have not particularly studied the Devonian for oil and gas production. Our focus has always been shallower in the Wolfcamp, the Bone Spring and whatnot.

Q. Okay. And have you looked at, for purposes of this hearing, some data on the Devonian Formation?

A. I have looked at the Devonian in this area and got some familiarity with it.

Q. Okay. Do you have any professional certifications?

A. I am a registered geologist in the state of Oregon and a registered geologist -- hydrogeologist in the state of Washington.

Q. What is your relationship to Solaris in this matter?

A. I was retained as a consulting hydrogeologist.

Q. Okay. Have you dealt with Solaris before?

A. Yes, I have, a little bit in working out some contract specs, not a lot of work. But I'm associated with some other people that I work quite a bit for that deal with Solaris.

Q. Okay. With respect to their saltwater disposal

issues?

A. Not particularly with their saltwater disposal issues but more providing the brackish water supplies.

Q. Okay.

MR. BRUCE: Mr. Examiner, I tender Mr. Fanshier as an expert geologist and hydrogeologist.

MS. BENNETT: No objection.

MR. RANKIN: No objection.

MS. ANTILLON: No objection.

EXAMINER GOETZE: Very well. He's so qualified.

Q. (BY MR. BRUCE) Mr. Fanshier, there are a few exhibits that we have for you. They're pretty simple. What is Exhibit 8?

A. 8 is your basic stratigraphic section of that part -- of this part of the country or that portion of the state.

Q. And in this case, this well will inject into the Siluro-Devonian Formation; is that correct?

A. Yes, sir.

Q. And is the -- from what you reviewed, is the Devonian a good candidate for -- and we'll get into more detail on this in a minute -- a good candidate for injecting salt water?

A. Yes, it is.

Q. And is Exhibit 9 simply the structure map compiled from data that has been presented to the Division previously?

A. Yes.

Q. And then finally Exhibit 10, is that a well analysis that shows some porosity and permeability data in the Devonian?

A. Yes, sir.

Q. Okay. These are fairly good porosity and firm numbers?

A. Yes, they are.

Q. Let's go into some of the -- some of the issues. Now, first of all, and this has come up, you know, protecting groundwater. What do you have to say about that?

A. Well, you know, the first thing we do protecting groundwater resources is our casing and well design and cementing. And when we look at that initial schematic, you can see it extends through the upper -- or the shallow groundwater sources, primarily the Rustler Formation, which, you know, has those small beds with their members, with the Magenta and the Culebra, which are surrounded by thick units of mudstone.

Q. So the wellbore design in this case would protect the fresh water?

A. Yes, it would.

You know, you can see there are multiple layers of casing. But, you know, above and beyond just the casing design, it's the care of installation of those. And in my experience, you know, we take great care at actual drilling our boreholes, preparing the boreholes, running the casing and cementing, you know, calculating volumes, making sure we have excesses and pressure testing the shoe, et cetera, and that gives us our external mechanical integrity and internal mechanical integrity in the well. And then, furthermore, you have the packer and the production string that are isolated from the upper bore -- upper casing. So through all those measures, you have a protection of groundwater resources.

Q. And what about the Devonian rocks? What have you reviewed regarding the suitability of the Devonian rocks for saltwater disposal?

A. Well, I mean, the -- the ability and capabilities of the Devonian, it's well known and understood. And, actually, the State has considered it as one of the primary candidates for allowing injection. When you look at it -- you read the various publications. They all talk about the high degree of porosity and permeability of those units and the ability

to take volumes of water. And we can easily look at the just the production records of all the wells around in the area and the production and, you know, empirically proves it.

(Cell phone ringing.)

EXAMINER GOETZE: Would you get that, Mr. Brooks?

EXAMINER BROOKS: Okay. Go ahead.

EXAMINER GOETZE: Fire away. Continue.

THE WITNESS: Oh, let's see. As far as the suitability goes, it's well understood and documented that it works very well as an injection zone.

Q. (BY MR. BRUCE) And so based on what you reviewed, where this well is located, the Devonian's there, and it will accept water?

A. Yes, sir.

Q. Is there a need for accepting large volumes of water in this area?

A. Well, you know, we have a system. We have extraction of oil and gases, and we're -- it's a benefit to society. And through that part of society, there are so many things we need to do. We need to transport the gases to market and the fluids to market, and we need to manage the products that come out of our wells. And we do produce salt water with high TDS in it, and that's

managed now. We're having all these people coming and we're actually developing -- or they're developing, you know, sophisticated systems to transport, store, treat and inject into these formations. And so together we're actually working with, you know, the State, their agencies, the producers to manage these fluids, and this is an acceptable practice. So really we're all part of the same team.

Q. And looking at it -- you saw Solaris Exhibit 1, with the wells in this area. There is substantial oil and gas development activity in this area; is there not?

A. Yes. There is a substantial amount of drilling, planned and conducted, in this area.

Q. And you need to dispose of the -- and those wells generally produce a fair amount of water?

A. Yes, they do. And the reason these wells are doing so well is because of the hydraulic stimulation, which requires large volumes of fluid. And we get flowback from that, and we have to manage that, along with the produced water normally associated with it.

Q. So you need to dispose of that water somewhere to keep the oil and gas production?

A. We have to dispose of it someplace to manage -- to allow oil and gas production to continue.

Q. What about Devonian production from this area?

A. Petroleum production?

Q. Petroleum production.

A. You know, there has been some production from structural anticlines in the Devonian. There's an Antelope Ridge about nine-some miles northeast of here that had some -- it had production, but it has declined to zero by 2017. And when we look at the records, it only produced one barrel of oil in 2016, but it did produce substantial volumes of water. And so that production from the petroleum is -- from that Devonian rocks carries nine miles away.

But we also look at some of the published literature production from the Devonian. We see it's spread across the region. There are little pockets here and there, but a large portion of it was in the Central Basin Platform and the Midland Basin, those larger productions. And not that I've studied it extensively, but it has to do with where and the facies it is, you know, the onshore ramp and the basin and where the -- those productions were.

Q. So there is not much chance in this immediate area of adversely affecting oil and gas production from the Devonian Formation?

A. No. I do not believe there is much chance of finding much petroleum in that area. I mean, we hit a

barrel or two of salt when we're drilling -- or oil when we're drilling through the salts for our Class 3 injection wells, but they're more of a nuisance than anything beneficial economically. You know, we take the mining terms of economic which don't directly apply to here. It has to -- the burden of proof is that you have to be able to produce it at an economic gain, not just have it occur.

Q. So, again, the Devonian is a good candidate for saltwater disposal?

A. It's a good candidate for saltwater disposal.

Q. Do you have anything else at this point, Mr. Fanshier?

A. Like I said before, I think we are a team, and I think everybody's working together the best we can to make this industry of us work for society, for the producers, for the State and the regulatory unit bodies. So I'm happy to be here. I'm actually -- my geologist -- I'm enjoying the research potential, looking into this and learning a lot about these rocks, and I've had a lot of fun actually doing it. So it's -- it's my pleasure to be involved, and I thank you for your time and consideration.

Q. In your opinion, is the granting of this application for saltwater disposal in the interest of

conservation and the prevention of waste?

A. I think it is.

Q. And Exhibits 8, 9 and 10, they weren't prepared by you, were they?

A. No, sir.

MR. BRUCE: Mr. Examiner, these were simply submitted at the last hearing for the Solaris Telluride well in Case 20114. I'd ask that they be incorporated into the record.

MR. RANKIN: No objection.

MS. BENNETT: No objection.

MS. ANTILLON: No objection.

EXAMINER GOETZE: Exhibits 8, 9 and 10 are so entered.

(Solaris Water Midstream, LLC Exhibit Numbers 8, 9 and 10 are offered and admitted into evidence.)

EXAMINER GOETZE: It's unusual to have a happy geologist.

(Laughter.)

EXAMINER JONES: Ms. Bennett, it's your witness.

MS. BENNETT: No questions.

EXAMINER JONES: Mr. Rankin.

CROSS-EXAMINATION

BY MR. RANKIN:

Q. Just a couple of questions, Mr. Fanshier. Based on your testimony today of yourself and others, there is a fair amount of injection disposal of salt water in the Devonian and the surrounding area?

A. I can't testify to the exact location of it specifically to the well, but as a statewide and a regionwide, yes, we are using it quite abundantly.

Q. So I guess --

A. I'd have to get into the area of review, you know, half mile, mile and a half. To make that quantification exactly at that microbe of a scale, I can't do that, but I can do it as a regional scale. We are using it quite a bit.

Q. So regionally it's suitable and a good candidate for disposal within this area?

A. Yes, sir.

Q. And so whether this well is at its proposed location or a couple hundred feet to the south wouldn't adversely impact in any way the wells to dispose of salt water intending to be injected. Is that a fair statement?

A. Yes, sir.

MR. RANKIN: No further questions.

MS. ANTILLON: No questions.

EXAMINER GOETZE: I'll give Mr. Jones a chance.

CROSS-EXAMINATION

BY EXAMINER JONES:

Q. Do you expect the porosity development off the flank here to be real similar to this Antelope Ridge 5-1/2 percent porosity that is in Exhibit 10? I know you didn't prepare this. It's from the Roswell Geological Society.

A. Yeah. You know, all these numbers are -- that's a very specific spot analysis, whether it came from a core or some kind of drill stem test. What we find is that you have to include -- really we're looking at these things for what -- we can treat this as an aquifer, which is essentially what it is. It has this porous media, whether it's a, you know, bedrock unit or a sand or gravel. It's all porous media that allows fluids to move through it. And so we look at bulk properties more than exact, specific pinpoints, and when we read the literature over and over and over again, it talks about the paleo processes that develop the porosity in that area -- or in the unit. And so it generally has high porosity and permeability formation-wide. And that is due to a lot of the paleo

processes, the paleo karst, et cetera.

And I worked on various things where we look at the microscopic, you know, a single borehole. We had a certain belief of what it will do from confining zones and rock mechanics, but actually when we start poking it, it starts to violate those simple conceptions because of all the other larger structural things. And so we see it more acts as a homogeneous -- more of a homogeneous than an isotropic situation. We get these permeabilities over such a large range --

Q. Okay.

A. -- and they'll be interconnected, sir.

Q. Okay. It sounds like it's -- you predict it to be kind of homogeneous as far as -- and predict it to be -- have decent porosity?

A. Yes, sir.

Q. This Antelope Ridge, they list 1,600 feet of gross pay. So can you talk about the bottom or the top of that in the Devonian?

A. Gross pay and the net pay there?

Q. It's like thickness of the formation.

A. Yeah.

Q. So is that what you're looking at here, 1,600 feet of Devonian?

A. That's what they're talking about there. That

includes the Silurian-Fusselman also. So it's --

Q. Okay. That's it. That's all my questions.

EXAMINER GOETZE: Mr. Brooks?

CROSS-EXAMINATION

BY EXAMINER BROOKS:

Q. Well, you probably told us everything we need to know about it already, but do you have any opinions about induced seismicity in this area?

A. You know, I have not specifically studied that. But when I take the general ideas of a unit that has this kind of permeability, porosity and then I look at the other layers of geology around it that act as confining beds, which limit the vertical migration of water both up and down, you have this separation from the bedrock, the Precambrian bedrock structures. So, you know, we have these -- that's why we have -- it's isolated enough that I do not believe that we would actually get fluids down into the bedrock from these wells constructed as specified in the well schematic.

Q. So you're not expecting any increase in seismic activity?

A. I'm not expecting any at least, you know, from a bedrock -- from a Precambrian bedrock movement.

Q. Yes, sir. Thank you.

EXAMINER GOETZE: Mr. Warnell.

EXAMINER WARNELL: No questions.

EXAMINER JONES: Oh, no questions?

No. I don't have any questions for this witness.

MR. BRUCE: Nothing further.

EXAMINER GOETZE: But we do have a statement that wishes to be read into record by the State Land Office.

So we offer you the opportunity.

MS. ANTILLON: Thank you.

And thank you, Mr. Examiner, as well.

As I said, my name is Andrea Antillon. I'm here on behalf of the State Land Office. We did not receive notice of this application, so we are still reviewing it and have concerns with the spacing due to very close proximity to State Trust Lands.

But in addition to that, I also wanted to mention and bring to the attention and ask the examiner and the Division to take notice of a pattern of action by the Applicant, Solaris Water Midstream, that the State Land Office disagrees with and is seriously concerned by. Solaris is engaged in applying to the Railroad Commission of Texas for multiple disposal wells all along the New Mexico-Texas state line into the Delaware Mountain Group, and these saltwater disposal

wells are very close. They're within about a half a mile, many of them, within the state of New Mexico, which will water out state minerals for current and future state oil and gas production --

MR. BRUCE: I'm going to object to this, Mr. Examiner. I mean, this is --

MS. ANTILLON: -- and it has a detrimental effect on oil and gas production in New Mexico.

EXAMINER BROOKS: Excuse me. Let Mr. Bruce make his objection.

MR. BRUCE: I would just simply -- I mean, she's stating things as facts, and there is no evidence to back these up.

EXAMINER GOETZE: Well, it's just a statement. It's not --

EXAMINER BROOKS: It's not evidence anyway.

EXAMINER GOETZE: Yeah.

MS. ANTILLON: And I can see that this application is for disposal into the Devonian, whereas, the Texas applications are the Delaware Mountain Group, but I just wanted to state that because Solaris' actions are disconcerting to the State Land Office and wanted to make you guys aware of that as well.

Thank you.

EXAMINER GOETZE: Thank you very much.

Back to you, Mr. Bruce.

MR. BRUCE: No further questions.

EXAMINER GOETZE: Closing statements?

EXAMINER JONES: Did we get Exhibit 10 --

EXAMINER GOETZE: The exhibits are in.

And with that summary, let's go ahead and take Case 20113 under advisement with the condition that you're going to provide an affirmation statement.

MR. BRUCE: Yup.

EXAMINER GOETZE: And provide that to all of the participants via email.

And I give it back to the man with the Excel spreadsheet.

EXAMINER JONES: Thank you, Phil.

(Case Number 20113 concludes, 2:39 p.m.)

STATE OF NEW MEXICO

COUNTY OF BERNALILLO

CERTIFICATE OF COURT REPORTER

I, MARY C. HANKINS, Certified Court Reporter, New Mexico Certified Court Reporter No. 20, and Registered Professional Reporter, do hereby certify that I reported the foregoing proceedings in stenographic shorthand and that the foregoing pages are a true and correct transcript of those proceedings that were reduced to printed form by me to the best of my ability.

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

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 in the final disposition of this case.

DATED THIS 28th day of April 2019.

MARY C. HANKINS, CCR, RPR
Certified Court Reporter
New Mexico CCR No. 20
Date of CCR Expiration: 12/31/2019
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