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**NUCLEAR REGULATORY COMMISSION**

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in Situ Uranium Recovery Facility

Docket Number: 40-9075-ML

ASLBP Number: 10-898-02-MLA-BD01

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UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

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ATOMIC SAFETY AND LICENSING BOARD PANEL

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HEARING

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In the Matter of: : Docket No.  
POWERTECH USA, INC. : 40-9075-ML  
: ASLBP No.  
(Dewey-Burdock In Situ : 10-898-02-MLA-BD01  
Uranium Recovery :  
Facility) :

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Wednesday, August 20, 2014

Hotel Alex Johnson  
Ballroom  
523 6<sup>th</sup> Street  
Rapid City, South Dakota

BEFORE:  
WILLIAM J. FROEHLICH, Chairman  
DR. RICHARD F. COLE, Administrative Judge  
DR. MARK O. BARNETT, Administrative Judge

1 APPEARANCES:

2 On Behalf of Powertech USA, Inc.:

3 CHRISTOPHER S. PUGSLEY, ESQ.

4 ANTHONY J. THOMPSON, ESQ.

5 of: Thompson & Pugsley PLLC

6 1225 19<sup>th</sup> Street, N.W.

7 Suite 300

8 Washington, DC 20036

9 (202) 496-0780

10 contact@athompsonlaw.com

11

12 On Behalf of the Consolidated Intervenors:

13 DAVID FRANKEL, ESQ.

14 of: Aligning for Responsible Mining (ARM)

15 P.O. Box 3014

16 Pine Ridge, South Dakota 57770

17 (605) 515-0956

18 arm.legal@gmail.com

19 and

20 BRUCE ELLISON, ESQ.

21 of: Law Offices of Bruce Ellison

22 P.O. Box 2508

23 Rapid City, South Dakota 57709

24 (605) 348-9458

25 belli4law@aol.com

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WASHINGTON, D.C. 20005-3701

1 and

2 THOMAS J. BALLANCO, ESQ.  
3 945 Taraval Street  
4 Suite 186  
5 San Francisco, California 94116  
6 (650) 296-9782  
7 harmonicengineering1@mac.com

8

9 On Behalf of the Oglala Sioux Tribe:

10 JEFFREY C. PARSONS, ESQ.  
11 of: Western Mining Action Project  
12 P.O. Box 349  
13 Lyons, Colorado 80540  
14 (303) 823-5738  
15 wmap@igc.org

16 and

17 TRAVIS E. STILLLS, ESQ.  
18 of: Energy & Conservation Law  
19 1911 Main Avenue  
20 Suite 238  
21 Durango, Colorado 81301  
22 (970) 375-9231  
23 stills@frontier.net

24

25

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25

On Behalf of the Nuclear Regulatory Commission:

MICHAEL CLARK, ESQ.

PATRICIA JEHLE, ESQ.

of: Office of the General Counsel

Mail Stop - O-15 D21

U.S. Nuclear Regulatory Commission

Washington, D.C. 20555-0001

(301) 415-2011 (Clark)

(301) 415-8366 (Jehle)

michael.clark@nrc.gov

patricia.jehle@nrc.gov

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9:00 a.m.

CHAIRMAN FROEHLICH: Good morning, all.  
We'll come to order.

The first item of business for today is the continuation of our discussion having to do with newly-acquired data. The Board is anxious to get an understanding of exactly what this data is and how this data is used or could be used in relation to the admitted contentions.

Since much of the discussion is going to revolve around geology and hydrology, I think we're going to rely a great deal on our expert witnesses, rather than the attorneys who are translating what they've been told. And to accomplish that, I would like at this point to ask the witnesses in Panel 2 to please rise. Raise your right hand. Do you solemnly swear or affirm that the statements you make in this hearing before the ASLBP will be true and correct to the best of your knowledge and belief?

And while we have you standing, do you adopt your pre-filed testimony as your sworn testimony in this proceeding?

The record will reflect the witnesses responded affirmatively to both. You may be seated.

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1 Thank you, Ms. Henderson.

2 I'm only going to begin this inquiry, and  
3 you'll have to excuse me because I am only a lawyer by  
4 training. The Exhibit OST-19 is a press release that  
5 Powertech issued dated July 16, 2014. And in there it  
6 states that "the data that has been acquired by the  
7 company is historical drillhole logs and maps prepared  
8 by TVA from the '70s and '80s when the Dewey-Burdock  
9 uranium deposit was originally discovered, as well as  
10 digitized data generated from this work." To be  
11 complete, I'll finish the paragraph. "This data is  
12 expected to assist Powertech's planning of wellfields  
13 for the Dewey-Burdock uranium property, providing  
14 additional quality data to complement Powertech's  
15 existing database."

16 What I'd like to know, I suppose, is what  
17 are drillhole logs and how are they used in the  
18 industry? We have many qualified experts.

19 I'd like to hear from the Powertech  
20 witnesses. I'm not sure if Mr. Demuth or Mr. Lawrence  
21 wants to take the first shot at it.

22 MR. LAWRENCE: I'll take the first shot.  
23 I am Errol Lawrence. I have been a practicing  
24 hydrologist for about 25 years now. I wasn't  
25 expecting to testify on this particular issue, but I

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1 do have some background with the logs. I was a  
2 wireline engineer with Dresser Atlas in the late '70s  
3 and a wireline engineer basically runs the electric  
4 logs, although that was for oil and gas applications,  
5 but a lot of the principles are the same.

6 There's a wide variety of electric logs  
7 that can be run to evaluate subsurface conditions,  
8 reservoir conditions. Typically, in the uranium  
9 industry, it's a more limited sweep. We are looking  
10 at gamma ray logs, self-potential or spontaneous  
11 potential logs, and resistivity logs.

12 Gamma logs, as you might expect, measure  
13 natural radiation that comes from the formations  
14 around the borehole. Let me back up. The way logs  
15 are actually procured is typically when you finish  
16 drilling a well, you will lower an instrument down to  
17 the bottom of the well, and as you retrieve it, you  
18 detect -- you have instruments that pick up various  
19 responses from the formation, depending on what that  
20 instrument is. You can gather different physical  
21 characteristics about the formation.

22 JUDGE COLE: What kind of characteristics,  
23 sir?

24 MR. LAWRENCE: Some of them, for instance,  
25 resistivity measures literally the resistance of the

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1 formation to an electric current. A gamma ray  
2 measures the natural radiation that comes off the  
3 formation. Spontaneous potential measures the  
4 difference between the ground surface and the --

5 JUDGE COLE: You've got different  
6 instruments taking different measurements?

7 MR. LAWRENCE: Absolutely. Different  
8 instruments taking different measurements. What's  
9 important to note is the measurements themselves are  
10 not necessarily intrinsic measurements of lithology.  
11 It's the interpretation of that data, the signal that  
12 allows a geologist to look at a log and determine  
13 whether he's in a sand or shale or limestone  
14 sequences. So there's an interpretational stage now  
15 that goes beyond just gathering the logs.

16 JUDGE BARNETT: I understand that. Let me  
17 ask you, are you familiar in general with the data  
18 that we're talking about here?

19 MR. LAWRENCE: Yes, I am.

20 JUDGE BARNETT: What kind of logs are in  
21 that data?

22 MR. LAWRENCE: Okay, I was getting to  
23 that. The data that has been procured is similar to  
24 the data that's already been used. In fact, it's the  
25 exact same kind of data. It is the gamma ray log. It

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1 is the resistivity and some of the logs have the self-  
2 potential, not all of them, probably about half of  
3 them. And maybe --

4 JUDGE COLE: Self-potential. What does  
5 that mean?

6 MR. LAWRENCE: It measures the potential,  
7 the difference in electrical energy between --  
8 usually, you have a ground probe and then you have a  
9 probe on the instrument. So it's just a relative  
10 difference. And typically, you're going to use a  
11 self-potential curve to identify lithologic  
12 differences, the difference between basically a sand  
13 or sandstone versus a shale or a clay. So it's very  
14 commonly used for that.

15 Gamma ray also is typically used to some  
16 degree, to a lesser degree for lithology definition or  
17 distinction. However, in the uranium industry, the  
18 gamma ray's primary role is to identify mineralization  
19 since it's measuring natural radiation, as you'd  
20 expect. If you run across a uranium mineralized zone,  
21 you're going to get a spike or a kick in terms of  
22 radioactivity. So that's the primary purpose that  
23 gamma ray logs are used for. And they're very good  
24 for that.

25 JUDGE COLE: So all of these different

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1 instruments are on one probe that you insert down into  
2 the well. You do it separately.

3 MR. LAWRENCE: It depends. Sometimes  
4 there can be a series of instruments that are tied  
5 together. For instance, the gamma ray is a different  
6 instrument than the resistivity log. But a lot of  
7 times you can run them in sequence so it's a single  
8 run and that's most typically the way it's done. If  
9 you were running a more elaborate suite of logs, you  
10 might have to do several runs in the hole to get all  
11 the logs that you wanted to get. Yes.

12 I guess -- can I pull up an exhibit to  
13 show a log?

14 CHAIRMAN FROEHLICH: Yes.

15 MR. LAWRENCE: Okay, this is one of the  
16 exhibits, it would be APP-016(b) on page 27. And  
17 that's a type log, sort of a representative log that  
18 was included in the application, primarily for  
19 illustrative purposes. You might want to try and zoom  
20 in a little bit, the quality of that -- well, you're  
21 on the right page, but just if you could zoom in a  
22 little bit so we can see the lines on the log a little  
23 bit more clearly. Okay.

24 So the log itself obviously doesn't come  
25 with those horizontal lines that are indicating the

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1 different zones that have been identified out of this  
2 log. What you can see, the right hand most log is a  
3 resistivity log. And you can see the nomenclature on  
4 the right side where we talk about or show the Fall  
5 River formation, the Fuson member, and beneath that is  
6 the Chilson member of the Lakota formation.

7 And so you can see there are some distinct  
8 responses there as you go into different lithologic  
9 units. I'm not sure, I think the gamma ray -- if you  
10 can scroll down a little bit, yes, okay. So the gamma  
11 ray log is the one on the farthest right hand side --  
12 left hand side, excuse me. I might have said the  
13 thing backwards. And you can see where you have a  
14 very large kick in that gamma ray log. I think that's  
15 gamma ray. Keep going down even further. Yes. Just  
16 above where we have the Morrison contact there, you  
17 see a pretty nice kick in that gamma ray log. And  
18 that's typically an indication of mineralization.

19 JUDGE COLE: And with that, you can get  
20 the depth of the deposit also.

21 MR. LAWRENCE: Absolutely, absolutely.  
22 And that's really the primary use.

23 JUDGE COLE: Primary location of it and  
24 how far.

25 MR. LAWRENCE: You got it

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1 . Now a single log by itself doesn't  
2 really give you much information. If I just gave you  
3 that log you could look at it and say well, I can kind  
4 of see the depth of the ore. I can maybe pick the  
5 thickness of an interval, but where a log becomes  
6 valuable is when you have a lot of logs and then you  
7 can start to correlate them and demonstrate the  
8 continuity of your deposits, whether there are any  
9 breaks in that, basically the geologic dip. So you  
10 can get a lot of information, but it comes out of the  
11 interpretation of the logs and usually the more logs  
12 -- if you have quite a few logs in the area, then you  
13 can develop a better picture of what the subsurface  
14 looks like.

15 JUDGE COLE: So you have to know exactly  
16 where it's located starting at the surface, so that  
17 you can see how far they are apart and compare  
18 different levels and what's one level compared to  
19 another level.

20 MR. LAWRENCE: That is correct.

21 JUDGE COLE: You can pick out  
22 discontinuities maybe that way?

23 MR. LAWRENCE: Yes, you could, if they  
24 were present, you would see them.

25 JUDGE COLE: At a certain elevation at

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1 this particular level it doesn't exist, so it went  
2 somewhere?

3 MR. LAWRENCE: Absolutely, yes, sir, Your  
4 Honor.

5 JUDGE COLE: Okay, thank you.

6 MR. LAWRENCE: One of the things to keep  
7 in mind is these are fluvial deposits. Most of my  
8 work was done where you had kind of marine deposits  
9 that are very extensive. They go for miles and they  
10 don't really change. In this case, things change very  
11 quickly locally. You can have some changes in the  
12 thickness of the sand bodies.

13 As you can see on that particular cross  
14 section, the Chilson has been subdivided into several  
15 subunits and the same thing with the Fall River and  
16 the upper portion of the log. They don't just look at  
17 well, this is Fall River and this is Chilson. They  
18 have enough control here to subdivide these into  
19 discrete sand packages.

20 JUDGE COLE: Why would you do that?

21 MR. LAWRENCE: Because the ore zones  
22 typically are fairly discrete packages. They might be  
23 associated with one small sand member out of that --

24 JUDGE COLE: You're trying to pinpoint the  
25 location of the uranium?

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1 MR. LAWRENCE: Correct.

2 JUDGE COLE: Thank you.

3 CHAIRMAN FROEHLICH: Mr. Lawrence, I think  
4 you described two of the lines. Is the third line --

5 MR. LAWRENCE: That is the spontaneous  
6 potential.

7 CHAIRMAN FROEHLICH: Thank you.

8 MR. LAWRENCE: And depending on the  
9 environment, that particular curve can be very useful  
10 and other times it can be very frustrating because it  
11 depends a lot on how good of a connection you have of  
12 the surface and some other things. It's a more  
13 difficult log to -- it's not necessarily consistent  
14 from hole to hole like the gamma ray and the  
15 resistivity logs.

16 JUDGE COLE: You said spontaneous  
17 retention?

18 MR. LAWRENCE: Spontaneous potential.

19 JUDGE COLE: Oh, potential. Sorry, thank  
20 you.

21 MR. LAWRENCE: Also, it's commonly called  
22 a self-potential. You'll hear both terms used.

23 JUDGE BARNETT: Are these kind of logs, if  
24 interpreted by a qualified hydrogeologist, relevant to  
25 Contention 3, that is, whether or not there is

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1 adequate hydrogeological information to demonstrate  
2 ability to contain fluid migration and assess  
3 potential impacts to groundwater?

4 MR. LAWRENCE: The development of the  
5 geologic and hydrogeologic models are dependent  
6 largely on the logs, primarily the geologic model.  
7 And if I could call up another exhibit, to show you a  
8 map --

9 JUDGE BARNETT: I want to follow up. So  
10 I guess I didn't quite hear. Was the answer to your  
11 question yes, no, or something in between?

12 MR. LAWRENCE: It is yes.

13 JUDGE BARNETT: Thank you. Any other  
14 experts from Powertech that would like to answer that  
15 question? Is data like this available to a qualified  
16 hydrogeologist relevant to whether or not there's  
17 adequate ability to contain fluid migrations and  
18 assess potential impacts to groundwater?

19 MR. LAWRENCE: Can I add a little bit more  
20 since when you rephrase that question it popped in my  
21 head a little bit some additional information I'd like  
22 to put forth. The logs, the e-logs, they give us  
23 borehole data information about the geology. They  
24 don't tell us anything about the fluid properties of  
25 the aquifer. Wells will do that. When we put in

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1 wells and we measure water levels, when we conduct  
2 pumping tests, when we extract samples for water  
3 quality analysis, that's what gives us the hydrologic  
4 information. Together we combine those to come up  
5 with our hydrogeologic model. So by themselves, if I  
6 just had logs and nothing else, I wouldn't really know  
7 much about the hydrogeologic --

8 JUDGE BARNETT: But they would be part of  
9 something that would be relevant to helping you answer  
10 the question in Contention 3?

11 MR. LAWRENCE: Yes. They are and they  
12 have been used extensively. I can show you.

13 JUDGE BARNETT: Would any of the other  
14 Powertech experts like to answer that question?

15 MR. DEMUTH: Yes, sir. If I might, Hal  
16 Demuth. First, with all due respect, the relevancy  
17 issue, to me that has a legal terminology. So as the  
18 technical experts, if we could say useful, we might  
19 use that.

20 JUDGE BARNETT: I meant it in a technical  
21 sense.

22 MR. DEMUTH: Okay. Some of this  
23 discussion, there's a question of how much data are  
24 necessary. And so if I might talk for a minute about  
25 how much information do we need to make an informed

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1 decision?

2 In this case, there was information from  
3 over 1,800 wells that was used in the permit  
4 application. Data from those wells were reviewed by  
5 the NRC. They made a determination in the SER that it  
6 could safely be conducted. So as an example, if I  
7 may, if we're looking at a foundation design, how much  
8 geotechnical information do we need? Well, we need  
9 enough information to make the decision. Could more  
10 data be obtained than the data that were used for a  
11 decision? Certainly. Are they necessary or  
12 warranted? Well, in some cases they might be and in  
13 others they're not.

14 And so in this case, I would suggest that  
15 the information that Powertech used was sufficient for  
16 NRC to make a determination. And in addition, NUREG-  
17 1569 talks about a phased process of data  
18 accumulation.

19 JUDGE BARNETT: Okay, so now you're  
20 getting into legal things, so I want to ask the  
21 question as a hydrogeologist.

22 MR. DEMUTH: Okay.

23 JUDGE BARNETT: Is the data that is in  
24 these e-logs, if interpreted by a qualified  
25 hydrogeologist, could it be relevant to Contention 3?

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1 MR. DEMUTH: In my professional opinion,  
2 Powertech has demonstrated that --

3 JUDGE BARNETT: That's not the question I  
4 was asking.

5 MR. DEMUTH: If I could continue, please?

6 JUDGE BARNETT: Well, if you could answer  
7 the question, and then you can explain your answer.

8 MR. DEMUTH: There's no more data that are  
9 necessary to support the application.

10 CHAIRMAN FROEHLICH: May I interrupt? I'd  
11 like to hear from Dr. Moran and what use or what  
12 information would be useful from these logs in  
13 addition to -- I suppose what we've heard is how  
14 Powertech is using this data. I guess I'm concerned  
15 with how others might be able to use this data.  
16 Perhaps start with Dr. Moran.

17 DR. MORAN: Good morning.

18 CHAIRMAN FROEHLICH: Good morning.

19 DR. MORAN: Let me ask a procedural  
20 question. When I start talking, this is automatically  
21 on?

22 CHAIRMAN FROEHLICH: Yes. In fact, it's  
23 always on, so if you want to talk or whisper,  
24 whatever, to your colleague there, you hit the off  
25 button.

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1 DR. MORAN: Thank you.

2 JUDGE COLE: And hold it down.

3 DR. MORAN: Thank you. I'm trying not to  
4 be long winded with this. There are all kinds of  
5 reasons why these logs are relevant. And let's begin  
6 with something that Mr. Lawrence said. And it is  
7 simply not correct that these logs don't tell you  
8 anything about the water quality. That's just untrue.

9 These logs will tell you, especially when  
10 interpreted together, a great deal about the rock  
11 types, the depths at which the formations occur,  
12 sometimes where people interpreting logs encountered  
13 water, whether it was high conductivity water, meaning  
14 somewhat -- it contained high dissolved solids in it,  
15 low, etcetera. It can show you, depending on  
16 different kinds of logs because we don't really know  
17 what logs are there, they could show you whether there  
18 a currents, flow areas, fractures.

19 CHAIRMAN FROEHLICH: Can I interrupt you?  
20 May I ask Powertech are all these logs that have been  
21 discussed, are they all the gamma ray logs that Mr.  
22 Lawrence described?

23 MR. LAWRENCE: Gamma ray or resistivity  
24 and spontaneous potential. To my knowledge, there are  
25 no fracture-type logs, frack load or anything that

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1 would identify joints or fractures in the suite.

2 JUDGE COLE: Also, is this the same kind  
3 of equipment you use to determine where the water  
4 levels are and other things other than the three that  
5 are shown on the chart on the e-log? Do you determine  
6 where the water levels are by when you're drilling the  
7 well before you put instruments down?

8 MR. LAWRENCE: Yes and no. The logs  
9 themselves can give you an indication of where the  
10 water is because the resistivity log won't work when  
11 it's not in water. So when you first pick up a  
12 signal, you'll see the water level. However, that  
13 water level is usually not representative of static  
14 conditions because they've been drilling, typically  
15 with some type of a drilling mud and so the system is  
16 not -- that's not a true water level indication.  
17 That's a different type of measurement you would take  
18 later and hopefully in a well instead of a borehole.

19 CHAIRMAN FROEHLICH: Okay, I think we  
20 interrupted Dr. Moran.

21 DR. MORAN: I don't really know how far we  
22 want to take this. If I were in your position, I  
23 would have heard enough to know these are really  
24 useful. If you want me to go on, I will.

25 JUDGE COLE: What is really useless?

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1 DR. MORAN: No, useful.

2 JUDGE COLE: Oh, useful.

3 DR. MORAN: I think that an independent  
4 group of investigators working with those logs could  
5 gain a great deal of information, especially if they  
6 integrated them with the information they've already  
7 got.

8 One last comment, they used these logs to  
9 create the basis for their computer model, for their  
10 cross sections, etcetera. We can talk a long time  
11 about this, if you like.

12 JUDGE COLE: They used the 1,400 logs that  
13 they used in their application?

14 DR. MORAN: If I'm correct, I think I  
15 heard Mr. Demuth say 1,800. And to put that in  
16 perspective, I've seen various Powertech documents  
17 saying that there are more than 4,000 up to 6,000  
18 boreholes on the site. So it would be useful to know  
19 some more information from more boreholes.

20 JUDGE COLE: In your view, the 1,800 logs  
21 might not be enough to make the demonstration?

22 DR. MORAN: I think you'd have to look at  
23 the new data. Then you'd have to evaluate it. It's  
24 more data. Somebody -- TVA collected that information  
25 for a reason. They spent a lot of money to do that.

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1           And if I could add one last thing. In my  
2           experience, when an operator purchases a property,  
3           they normally have all of these logs right from the  
4           beginning. They buy the whole package. They buy the  
5           maps that are available. They buy the logs,  
6           everything they can. If there were old feasibility  
7           studies, we know that in this case. Probably they  
8           would have been transferred years ago.

9           JUDGE BARNETT: I would like to follow up  
10          with Mr. Demuth if I could, please. Could you pull up  
11          APP-061(g), please?

12          Good. Just keep scrolling down. Okay,  
13          right there. Is this figure, and there are many  
14          figures like that in there, relevant to Contention 3?

15          MR. DEMUTH: Yes, they are.

16          JUDGE BARNETT: Was this figure  
17          constructed, at least in part, from the kinds of data  
18          that we're talking about now?

19          MR. DEMUTH: Yes, it was. In fact, this  
20          figure demonstrates that NRC had requested some more  
21          level of detail in certain areas and so there was some  
22          cross sections that were constructed. Those cross  
23          sections do have the electric logs which are shown.

24          I might add that of these new data that  
25          are in the point of discussion, the discussions with

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1 Powertech, only 200 of those logs apparently are new,  
2 new information. Twelve hundred of them, they had  
3 logs on a reduced scale that they already have in  
4 their possession. So I think it's important to  
5 understand that in terms of distinctly new  
6 information, I think that may be somewhat of a  
7 misnomer. There's some additional data. But again,  
8 the data density, if I might, 1,880 data points that  
9 were used for the application on 10,580 acres is an  
10 average of 113 logs per square mile. Obviously, the  
11 distribution of those data points is not equal across  
12 the site because the focus was on the areas where the  
13 ore exists.

14 These new data are also focused on the  
15 area where the ore exists, so there's even more data  
16 density. So if 113 logs on average per square mile  
17 are not sufficient, how many do you need?

18 CHAIRMAN FROEHLICH: What use has the  
19 Staff made of well logs in the review of the Powertech  
20 application? I don't know which Staff witnesses are  
21 best able to answer. Mr. Lancaster or Mr. Prikryl?

22 MR. PRIKRYL: Sir, we used the electric  
23 logs -- the electric logs were used to create the  
24 isopach maps, the structure maps, the cross sections  
25 that were included in Powertech's application. So we

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1 reviewed -- in this case, for instance, the cross  
2 sections here, we reviewed to make sure that these e-  
3 logs were representative of the entire suite of logs  
4 that were -- that Powertech used. So we tried to  
5 determine whether the density of data was sufficient  
6 for our review and to come to a conclusion whether we  
7 could do our analysis. And so we determined from the  
8 density of data that was provided in the application  
9 that we were able to do an assessment under NEPA.

10 CHAIRMAN FROEHLICH: Just so I'm clear,  
11 the density of data, so that first, the data that you  
12 reviewed is representative of the data that they had.  
13 And then is it representative of the area to be mined?

14 MR. PRIKRYL: Yes. We looked at the  
15 locations, of course, of the electrical logs first to  
16 determine if there was an adequate density covering  
17 the ore zones.

18 CHAIRMAN FROEHLICH: And I think you had  
19 said that you used the well log data to prepare or  
20 confirm isopach maps and something else. Tell me how  
21 this data was used by the Staff?

22 MR. PRIKRYL: Well, what we did was we  
23 determined from our guidance, we looked at our  
24 guidance to determine if the Applicant had submitted  
25 sufficient information to do our analysis. Based on

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1 our review, our review procedures, we determined that  
2 the Applicant, in our acceptance criteria, we  
3 determined if they had submitted the adequate  
4 information to do our assessment.

5 JUDGE COLE: Is that principally based on  
6 the number of logs per square mile?

7 MR. PRIKRYL: No, I don't think it would  
8 be based on that.

9 JUDGE COLE: Did you review very many of  
10 the logs yourself?

11 MR. PRIKRYL: We reviewed the logs that  
12 were, for instance, here in the cross section. We  
13 reviewed those logs.

14 JUDGE COLE: But they were taken from a  
15 larger group of logs selected as being representative  
16 of the others. Is that correct?

17 MR. PRIKRYL: That's right.

18 JUDGE COLE: Now of the 1,880 different  
19 logs, I had mentioned 1,400, but I misspoke there.  
20 Thanks for correcting me there. Of the 1,880 logs,  
21 were all of those drilled by Powertech or is that  
22 information from other sources?

23 MR. PRIKRYL: My understanding is that  
24 they all came from Powertech.

25 JUDGE COLE: But did Powertech drill these

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1 holes and where did they get the information?

2 MR. PRIKRYL: These are TVA logs. That's  
3 my understanding, they're TVA logs. So they purchased  
4 them or acquired them from TVA.

5 JUDGE COLE: So this was not the 4,000  
6 logs we're talking about today that they purchased.  
7 These are other --

8 MR. PRIKRYL: It's a subset of those logs.

9 JUDGE COLE: A subset of those logs?

10 MR. PRIKRYL: Yes. So the 1,800 logs that  
11 Powertech has in their possession were used to -- in  
12 the application are a subset of the 4,000 logs that  
13 we're talking about today.

14 JUDGE COLE: Okay, thank you.

15 JUDGE BARNETT: I don't have any more  
16 questions about relevance to Contention 3. I did have  
17 a question about relevance to Contention 2 which had  
18 to do with baseline groundwater quality.

19 Mr. Lawrence, you stated that you did not  
20 get water quality information from these logs, is that  
21 correct?

22 MR. LAWRENCE: Well, one slight  
23 correction, with an SP and a resistivity combined, you  
24 can come up with sort of general conductance of the  
25 formation. But it's not like a laboratory analysis

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1 where you would have a definitive number that you  
2 would hang your hat on or a defensible number because  
3 the SP fluctuates enough where you can get sort of, I  
4 guess, order of magnitude changes in water quality  
5 based off of that for conductivity, if that makes  
6 sense.

7 JUDGE BARNETT: Dr. Moran.

8 DR. MORAN: It's incredibly useful. It  
9 gives you vertical variations in the general water  
10 quality of the water entering from the different  
11 horizontal levels. And then when you start comparing  
12 those through time, I'm sorry, through space in  
13 neighboring boreholes you can start seeing patterns.

14 And if I might add one other thing and  
15 I've said this in my written testimony, when these  
16 various investigators were doing aquifer tests, if  
17 they had been doing the same kinds of resistivity  
18 measurements, they would have learned a lot about the  
19 interpretation of their tests. So what I'm saying is  
20 yes, in this borehole information you can get a lot of  
21 ideas about water quality.

22 JUDGE BARNETT: You say a lot of ideas, so  
23 you can get salinity or conductivity, TDS?.

24 DR. MORAN: Yes.

25 JUDGE BARNETT: Anything else?

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1 DR. MORAN: And then when you tie it to  
2 the condition of your other logs, you are, of course,  
3 getting information on natural radioactivity in your  
4 gamma logs. Again, we don't know. They may have  
5 other logs in here, too. But they're interpreted in  
6 combination. They're usually not interpreting one set  
7 of logs by themselves.

8 Could I suggest one thing? We submitted  
9 a PowerPoint presentation that I was to give last year  
10 at the state hearing, to you people. I assume it's an  
11 official exhibit. I only wanted to show one slide  
12 from it. Is there an easy to bring that up? I don't  
13 know what its OST number is.

14 MR. PARSONS: Excuse me, that would be  
15 OST-005.

16 DR. MORAN: On my copy, I'd like to show  
17 you the 20th slide, number 20, if you can just skim  
18 down. That's the one. And maybe make it a little  
19 bigger.

20 This is a Powertech document. I would  
21 come back out a little bit so we can see the box.  
22 Basically, what this is showing is the drillhole map.  
23 Again, I don't know how many of all of these  
24 drillholes this represents. Is it the 1,800? Is it  
25 the 4,000? Is the 6,000? But my point of bringing it

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1 up is look at the distribution. It's mostly in a few  
2 areas. That's normal because as they've said they're  
3 focusing on the uranium. But if we're looking at  
4 overall hydrogeology, wouldn't you want to know  
5 something about the intervening areas? And therefore,  
6 wouldn't it be useful to see what's in these new logs?

7 MR. DEMUTH: Your Honor, might I add to  
8 that if I could? And I appreciate having this figure  
9 up there because I would like to imagine that we have  
10 data from approximately 1,500 points here. And what  
11 the dots on the map represent is locations that  
12 Powertech is aware that there were historic holes  
13 drilled. From that, there's approximately 1,800 that  
14 were used to assess the site geology. And then there  
15 are some additional data which they did not have in  
16 their possession, but they were aware that there was  
17 a location and a well drilled at that location.

18 So in this case, as I mentioned before,  
19 approximately out of the 1,400 new logs they've  
20 received, 200 of them are actually new data. So if  
21 you could, look at this map and say the focus of those  
22 would be where the ore is because it's for wellfield  
23 development. So pick out 200 points in that map and  
24 say what more does that tell us?

25 JUDGE COLE: Mr. Demuth, could you review

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1       how you got the 200 from 4,000?

2                   MR. DEMUTH:       The 200 is based on  
3       discussions with Powertech this morning. Out of the  
4       data set in question here or what's referred to as the  
5       new data, that approximately 1,400 of those data set  
6       or well logs have been attained and only 200 of those  
7       are truly new data points. They had data previously  
8       for those points anyway.

9                   So again, if you pick out 200 locations in  
10       the data density here, does it tell the operators some  
11       new information? Yes, it tells them information about  
12       the concentration of uranium and wellfield  
13       development.

14                   If I could also follow up on Dr. Moran's  
15       statement, the logs in question are single point  
16       resistivity. We don't have a deep medium shell  
17       induction log on which we can really do accurate  
18       calculations for salinity.

19                   As Judge Barnett had asked about, can we  
20       calculate salinity concentrations? Well, to do that  
21       from a resistivity log, first of all, we need a  
22       porosity log which we don't have. If we're going to  
23       use Archie's equation to calculate salinity from a  
24       resistivity log, which is the normal way of doing it,  
25       it's a function of porosity squared. So we can't make

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1 that calculation from especially these logs. They're  
2 single point resistivity and we don't have porosity  
3 logs either.

4 So I would submit to you that the best  
5 data for water quality are from the monitored wells  
6 that are actually sampled.

7 JUDGE COLE: For future.

8 MR. DEMUTH: Well, the logs that were  
9 included in the application where we actually have  
10 distinct monitored wells that were sampled and we have  
11 real samples and analytical results from the lab.

12 JUDGE COLE: As part of the application?

13 MR. DEMUTH: Yes, sir.

14 MR. LAWRENCE: Can I make a clarification  
15 because we're getting confused with numbers a little  
16 bit. The initial package of the new data that  
17 Powertech has received included 1,400 logs. Those  
18 logs are all concentrated in the area of the first  
19 proposed Burdock wellfield. Out of that 1,400, there  
20 were only 200 new data points.

21 And if I could pull up one map to show you  
22 the density of data, can you go back to that APP-16(d)  
23 and it would be the next to last figure on that. Not  
24 16(d), I'm sorry. Hold on one second here. 15(d),  
25 page 18. I apologize. I think it's just above this

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1 figure right here. That does not look like the right  
2 figure. Page 18, I'm sorry. Keep going down. Can  
3 you go back to the side where we can see the -- I  
4 apologize.

5 JUDGE BARNETT: Which exhibit are you  
6 looking for?

7 MR. LAWRENCE: It's the Fuson isopach map.

8 JUDGE BARNETT: Which exhibit is it in?

9 MR. LAWRENCE: It's --

10 MR. PUGSLEY: It's APP-015(d) as in dog.

11 CHAIRMAN FROEHLICH: Thank you, counselor.

12 MR. LAWRENCE: Yes, that's the one right  
13 there. Okay, if you kind of scroll down to the lower  
14 portion and you see in the box there, that's the first  
15 proposed Burdock wellfield. And the inset on the  
16 lower left-hand side is a blow up of that. And if you  
17 shoot in even more, you're going to have to really  
18 zoom in on that area. And what you're going to see is  
19 -- keep zooming in. Keep going.

20 Okay, those are values. Those are data  
21 points that were used to construct this map. And you  
22 can see from the density there that you have an  
23 awfully good control for an area. A lot of those  
24 borings are less than 100 feet or approximately 100  
25 feet apart. And what they do is they follow the ore

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1 zone.

2 I know Dr. Moran said yes, we like to know  
3 what's going on outside the ore zone, but really it's  
4 within the wellfield that's the concern of a potential  
5 fluid migration, subsurface movement of fluids. We  
6 have incredibly dense control already. Adding a few  
7 more points in there is not really going to improve  
8 our picture. We've already got an abundance of data  
9 in the area of interest, in the area where injection  
10 and extraction is going to occur. And for -- I've  
11 been on several license applications. This amount of  
12 data far exceeds what I've seen in previous license  
13 applications. So I don't really see the relevance of  
14 adding additional data into this for licensing this  
15 site.

16 Once they get ready for production, they  
17 will have even more data points within that area.  
18 They will conduct pump tests. They will have a  
19 monitoring well around the entire wellfield,  
20 monitoring points above and below. So the additional  
21 data is still to come. That's the phased process for  
22 conducting ISR.

23 I know Dr. Moran thinks a couple of guys  
24 could knock out something pretty quickly. These maps  
25 have been in progress for about six years by a

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1 geologist who has spent most of his life working this  
2 data and understands these types of formations and  
3 these types of roll-front deposits very well. But it's  
4 not something that's very easy to do. It takes a full  
5 time dedicated geologist to develop this information.  
6 That's why the NRC, they only review portions of that,  
7 particularly in areas that are contentious or in this  
8 particular instance they also wanted to see the Fuson  
9 isopach map. They requested the data and generated  
10 their own maps and were able to reasonably replicate  
11 what Powertech has done.

12 So again, more density, yes, I'm a  
13 scientist. I always want more data. But at the same  
14 time, when do you stop? This process is going to  
15 continue on. They're going to continue to collect  
16 more data throughout the entire production of the  
17 project.

18 CHAIRMAN FROEHLICH: Let me ask you just  
19 a couple of questions. Not on the data itself, but in  
20 the way it currently exists. When we're talking about  
21 1,400 well logs, are we talking about paper well logs  
22 at this point or how many of them have been digitized?

23 MR. LAWRENCE: Many of them have been  
24 digitized, but most of them are still in paper format.  
25 I have some examples I would be happy to share with

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1 you, although they're not technically exhibits since  
2 we didn't know that this was an upcoming event. I can  
3 show you what the digitized version looks like in the  
4 logs.

5 CHAIRMAN FROEHLICH: Where are the paper  
6 logs currently?

7 MR. LAWRENCE: I couldn't tell you that.  
8 It's in Powertech's possession. The portion of the  
9 original -- they haven't received all of the data at  
10 this point.

11 JUDGE COLE: Which is it easier to work  
12 with, the digitized or the paper?

13 MR. LAWRENCE: Depends on your age. I  
14 kind of like paper, but nowadays, we're going more and  
15 more toward electronic format for everything and  
16 probably will be used --

17 JUDGE COLE: For comparison purposes with  
18 other logs would the digitized be a much easier way to  
19 compare them?

20 MR. LAWRENCE: Not necessarily. I know  
21 most people who are skilled at correlating logs  
22 typically will still slide logs, you call it. You  
23 place them side by side and adjust them and see where  
24 your zones are lining up.

25 JUDGE COLE: You just roll out the papers

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1 and compare them?

2 MR. LAWRENCE: Yes. I've tried to do it  
3 electronically on some programs. I find it  
4 frustrating. I go back to the paper.

5 JUDGE COLE: I understand. I think for  
6 purposes of the motion to -- whether these documents  
7 are discoverable or not, I don't think there's any  
8 serious question or if there is I'm sure counsel will  
9 tell me that this data is either useful or relevant to  
10 Contention 3 based on what I've heard from our gamma  
11 geological experts this morning. Is there any doubt  
12 that this is relevant or relates to the conditions  
13 that affect the ability of various layers to confine  
14 liquids to address the issues that are before us in  
15 Contention 3?

16 MR. PUGSLEY: Your Honor, thank you for  
17 the opportunity. I think one perspective that is  
18 lacking in the evaluation here is what -- when we say  
19 is it relevant to Contention 3, it is what is  
20 Contention 3? Contentions in this proceeding and the  
21 issues before the Board is whether or not the  
22 information in the record of decision to characterize  
23 the Dewey-Burdock site pursuant to 10 CFR Part 40,  
24 Appendix A, Criterion 7, requirements for baseline  
25 data, is satisfied.

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1           This data we have said in our pleadings,  
2           dated August 12th, and we said yesterday, that the  
3           relevance of this data, what is it relevant to? This  
4           data is relevant to the development as has been cited  
5           in OST-019 which is the press release. It says in  
6           there to the development of wellfields, okay? We are  
7           not as a -- when we were a license applicant, we're  
8           not allowed to develop a wellfield. We are prohibited  
9           from doing that lest we run the risk of denial of our  
10          license under 10 CFR 40.32(e) or otherwise known as  
11          the construction rule.

12                 So therefore, we are required by  
13          regulation and guidance to submit adequate site  
14          characterization data which, as you heard from NRC's  
15          experts, was deemed adequate after, and I'd like to  
16          supplement that answer which is after the application  
17          and the responses to their requests for additional  
18          information, where they did request additional data of  
19          this type.

20                 What this data that we have acquired is  
21          relevant to is as it says in the press release, the  
22          development of wellfields which is done post-license  
23          issuance, but pre-operations. Pursuant to the Hydro  
24          Resources case, the Commission determined under its  
25          policy of performance-based licensing that wellfield

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1 packaged data, the data itself and what is in there  
2 and what is looked at by NRC Staff in their pre-  
3 operational inspection before you quote unquote flip  
4 the switch on the operation, is not subject to  
5 litigation.

6 What is subject to litigation in this  
7 proceeding, especially under Contention 3 is the  
8 procedures that Powertech proposes for the development  
9 of those wellfields which includes the use of data  
10 such as this. That is subject to litigation.

11 However, I can find nowhere in the  
12 Consolidated Intervenor's or the Oglala Sioux Tribe's  
13 pleadings where they have challenged those procedures.  
14 So as far as Powertech is concerned and the reason we  
15 deemed this not to be relevant to Contention 3 is  
16 because what it is relevant to per Commission  
17 precedent is not subject to litigation in this  
18 proceeding regardless of how Contention 3 is worded.

19 If the Tribe and Consolidated Intervenor's  
20 wish to state that additional data, NRC Staff should  
21 have gotten additional data to render an initial  
22 licensing decision on site characterization pursuant  
23 to Criterion 7 and NUREG-1569, Chapter 2, they are  
24 free to do so and in fact, they have. And that is  
25 fine. Our experts are prepared to deal with that

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1 issue in your questioning of Panel 2 that is soon to  
2 come. But we made a determination that it was not  
3 relevant for the very reasons that we just stated. So  
4 that is our position.

5 JUDGE BARNETT: Can I ask you a  
6 hypothetical?

7 MR. PUGSLEY: Yes, sir.

8 JUDGE BARNETT: You go out to a site and  
9 you want to characterize it and you take 100 data  
10 points. Your experts decide they only need 80 to  
11 develop the license application. The Staff reviews  
12 it. They're okay with that. But those other 20  
13 points, even though you didn't use them, are in your  
14 possession. Are those discoverable?

15 MR. PUGSLEY: No, they are not because  
16 they were not used to characterize the site. And I  
17 think you made a very important point, Judge Barnett,  
18 which is it's not just that Powertech's experts and  
19 the hypothetical would have determined the 80 data  
20 points to be adequate, the reviewing expert agency  
21 determined them to be adequate under Commission  
22 regulations. So as far as we would be concerned,  
23 those 20 data points, would they be used at the end of  
24 the day before we flip the switch? Yes. But they  
25 would be used in the wellfield package that is

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1 developed post license issuance, along with other  
2 drilling that we would be required to do because as  
3 our experts stated, you can't get a full picture of  
4 what's there until you actually put in a wellfield  
5 with a complete monitor well ring, which as I said  
6 before, we're prohibited from doing.

7 So to answer your hypothetical, Judge,  
8 will those additional 20 data points be used? Yes,  
9 but not for purposes of an initial licensing decision  
10 which is the subject --

11 JUDGE BARNETT: Are they discoverable?  
12 That's my question.

13 MR. PUGSLEY: I don't believe they're  
14 discoverable because they're not relevant to a  
15 contention on an initial licensing decision.

16 JUDGE BARNETT: I'd like to ask Mr. Clark  
17 the same hypothetical. The Applicant goes out, takes  
18 100 samples. They only use 80 of them in developing  
19 their application. The Staff says the 80 are fine.  
20 But there are 20 additional data points that they have  
21 in their possession. Are those discoverable in a  
22 contention -- in a hearing?

23 MR. CLARK: Based on Mr. Lawrence's  
24 statements, the Staff wouldn't object to the claim  
25 that they're relevant in some way or useful in some to

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1 the Staff's findings. Again, I agree with Mr. Pugsley  
2 that the focus should be on the analysis in the Final  
3 EIS when it was issued in January of 2014. If the  
4 Staff had these data, they would conceivably  
5 considered them. So the Staff doesn't object to a  
6 finding of relevance in some limited sense or some  
7 potential, that there's some potential use of these  
8 data to support some of the claims the Intervenors  
9 made in Contention 3.

10 JUDGE BARNETT: Thank you.

11 JUDGE COLE: But it's the Staff's view  
12 that they had received sufficient information to  
13 justify the issuance of a license based upon their  
14 reading of the requirements?

15 MR. CLARK: Correct. The Staff is  
16 confident they had enough information to make the  
17 findings on hydrogeology in the Final EIS. The Staff  
18 would also note that as Mr. Pugsley explained and as  
19 Mr. Lawrence explained, new information continuously  
20 comes in. There's new information now. There will be  
21 new information months from now, new information a  
22 year from now. The Board's role is to rule on the  
23 contentions that were admitted and if the Board  
24 continues to wait for new information, there will  
25 never be any resolution to this hearing.

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1 JUDGE BARNETT: Well, my hypothetical was  
2 specifically for data that is in hand now.

3 MR. CLARK: Correct. And Your Honor, did  
4 I answer your question?

5 JUDGE BARNETT: Yes, you did. Thank you.

6 CHAIRMAN FROEHLICH: But in your answer,  
7 Mr. Clark, the Staff, as well as the parties are under  
8 a continuing obligation to disclose data, not that the  
9 people are waiting for data, but to disclose data  
10 that's relevant to the contentions up to and including  
11 the time that the Board issues its decision. Is that  
12 correct?

13 MR. CLARK: That's correct, Your Honor,  
14 although they may also -- in this case, they would  
15 likely not disclose any data, but log the data as  
16 privileged. And depending on the Board's views, the  
17 Staff would also like to discuss, although perhaps not  
18 now, the form of disclosure. We're talking voluminous  
19 data that could only be reproduced, according to Mr.  
20 Clement's affidavit, at great cost. And I think under  
21 the NRC's rules at 10 CFR 2.336(a), those take into  
22 account the difficulties and the costs and time of  
23 reproducing certain data. So I submit that for  
24 another issue the Board may want to address.

25 CHAIRMAN FROEHLICH: But should they be

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1 found relevant to the contentions, they would be made  
2 available. We would have to determine under what  
3 terms and perhaps a confidentiality agreement because  
4 I guess some of this data is proprietary and business  
5 related. There would have to be restrictions, I'm  
6 sure, as well.

7 MR. CLARK: It would also be consistent  
8 with Commission precedent and federal case law to  
9 provide an opportunity to view the exhibits rather  
10 than requiring Powertech to reproduce the exhibits for  
11 the convenience of the Intervenors.

12 CHAIRMAN FROEHLICH: That may be one way  
13 to handle it, thank you.

14 From the Intervenors, would you care to be  
15 heard as to the scope of your contention and the  
16 characterization by the Applicant?

17 MR. PARSONS: Sure, Your Honor. That's a  
18 new argument being made here and so it's -- without  
19 having dissected it a little more carefully, I'm not  
20 sure I fully grasp, it seemed to me, very subtle  
21 distinctions Mr. Pugsley was trying to make. Our  
22 contention pleadings clearly discuss the inadequate  
23 characterization based on inadequate data and now we  
24 have data that we're finding out exists not just as  
25 newly-acquired data, but apparently there's additional

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1 borehole logs that were not used in the application  
2 that were not disclosed. Presumably, that's part of  
3 the information that I referenced yesterday that was  
4 included in that motion on Saturday. But I think any  
5 fair reading of the pleadings includes within this  
6 contention components of lack of adequate data to  
7 characterize, adequately characterize the  
8 hydrogeology.

9 I think Mr. Pugsley's characterization of  
10 our contention is off-base. I would be happy to brief  
11 it in a much more formal manner and comb through all  
12 of our pleadings and point out specifically for the  
13 Board where we make those points, but I don't think  
14 that's necessary. I think that as the Board has  
15 already indicated, the relevance question which is not  
16 a high burden in these proceedings has been overcome.

17 CHAIRMAN FROEHLICH: Okay. Any further  
18 argument on this from counsel?

19 MR. PUGSLEY: Your Honor, just one  
20 additional point. And certainly counsel for the  
21 Intervenors can feel free to weigh in on this. I know  
22 I've been working in this business as counsel for over  
23 13 years and my co-counsel has been in for close to 3  
24 times that much. Our experts have already told you  
25 their qualifications. Unless any of these people I've

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1 mentioned would like to contradict what I'm about to  
2 say which they can feel free to do, I am not aware of  
3 any ISR license application and subsequent record of  
4 decision where an applicant or a licensee who is  
5 seeking an amendment for a satellite wellfield was  
6 ever required to disclose every single electronic log  
7 they had because it's not, as I said previously, what  
8 was necessary for an initial licensing decision under  
9 Commission regulations. That is basically how this is  
10 done under the regulatory program. So I would  
11 respectfully submit that point as well.

12 CHAIRMAN FROEHLICH: It appears that these  
13 documents, these logs are relevant, to use the legal  
14 term, or would be useful to use the geological term,  
15 to people who are trying to characterize a particular  
16 site, to submit with their application support of a  
17 position that it would be contained, it wouldn't  
18 contained. There's connection, there's not  
19 connection. It seems like the data that would come  
20 from these type of logs would be relevant to questions  
21 that are contained in or subsumed in Contention 3 and  
22 therefore, applying the Commission's rules on  
23 disclosure, all parties are required to disclose any  
24 and all documents and data, compilations in their  
25 possession, custody, and control that are relevant to

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1 those contentions.

2 Now I fully appreciate that this data set  
3 is voluminous, would be expensive to duplicate, but I  
4 am of the opinion and the Board has concluded that it  
5 is relevant in a legal sense to the issues in  
6 Contention 3.

7 I don't know and I don't think anyone can  
8 know until they've had a chance to look at this  
9 whether it supports the conclusions that the Staff  
10 reached when it viewed the initial tranche of data or  
11 whether it contradicts or provides additional support  
12 for the position that the Intervenors advocate that  
13 the sites are not well suited for the proposal and  
14 that there's communication between various strata.

15 What we need to do is move forward with  
16 our cross examination today. But in addition, set up  
17 some opportunity for this data to be viewed by all  
18 parties to the case so that they may draw whatever  
19 conclusions, both supportive or in opposition to the  
20 positions they've already taken in the record of this  
21 case. We'll provide an opportunity in the very near  
22 future for them to file supplemental testimony, if  
23 necessary, either supporting that position or  
24 elaborating on positions already taken, not to expand  
25 the contentions, because then it would be, as Mr.

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1 Clark pointed out to me yesterday, a new contention,  
2 an amended contention. But in the context of the  
3 contentions that we have before us, the Board finds  
4 that this data is relevant and must be disclosed.

5 I had asked one of the witnesses this  
6 morning where it is physically located. I think that  
7 it should be made available wherever it is and the  
8 digitized data to the extent that can be reviewed  
9 efficiently. I would hope that the parties would be  
10 able to come to some conclusions, some kind of  
11 resolution on how this could be viewed or how the  
12 electronic data can be viewed.

13 I also would be willing to use the  
14 protective order that we have already in place or to  
15 amend it as may be necessary to protect this data from  
16 disclosure beyond the purposes of this case.

17 Mr. Pugsley?

18 MR. PUGSLEY: Judge Froehlich, a few  
19 things, if I may, because obviously we'll be the  
20 disclosing party.

21 CHAIRMAN FROEHLICH: Right.

22 MR. PUGSLEY: One, I'd like my objection  
23 to this ruling noted for the record. Secondly, if it  
24 would help the Board, I believe Powertech is going to  
25 discuss the term how a disclosure is best accomplished

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1 for the Consolidated Intervenors and the Tribe. And  
2 prior to the cross examination of Panel 3 tomorrow, we  
3 would be happy to provide you with a report on  
4 potential options for how this can be done. And I  
5 think that's it.

6 CHAIRMAN FROEHLICH: Okay. Yes, Mr.  
7 Ellison.

8 MR. ELLISON: I guess I would like to get  
9 an understanding better than I have. It was my  
10 understanding that the data that we're talking about  
11 was not 1,400 or 1,800 or 200, that we were talking  
12 about the purchase of all of the TVA borehole data.  
13 And I'm hearing a lot of different numbers. And I  
14 would respectfully request that Powertech give a  
15 definitive statement as to the number of drilling logs  
16 and maps and what not that they have acquired and also  
17 why they didn't get the rest if they didn't get the  
18 full number. Because what I'm concerned about is that  
19 as Dr. Moran said, this data is usually acquired when  
20 the property is acquired. And now we're finding out  
21 that it's apparently not the 4,000 to 5,000 which  
22 would be the overwhelming majority of the holes.

23 Powertech made a commitment to the NRC,  
24 according to NRC communications, that they were going  
25 to locate and plug all the boreholes. So it seems

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1 illogical to me that that could be accomplished by  
2 purchasing less than half or maybe a third of the  
3 data. So can we get some kind of an understanding as  
4 to the number that was actually acquired and why the  
5 rest was required, if it wasn't?

6 MR. PUGSLEY: Yes, Your Honor. I find Mr.  
7 Ellison's request acceptable for a statement of what  
8 this quote new data is about. We will provide that  
9 tomorrow for you.

10 Secondly, noting for the record that when  
11 we're talking about the number 6,000 boreholes at this  
12 site, the location of those were disclosed in the  
13 license application. So I don't think that's an issue  
14 here, but in terms of Mr. Ellison's request for a  
15 statement, that's perfectly fine.

16 MR. ELLISON: May I add? Thank you, Your  
17 Honor. May I add just one thing? I guess for the  
18 purposes of the record, I would, on behalf of  
19 Consolidated Intervenors, want to object to inquiry on  
20 Contention 3 until we have an opportunity to look at  
21 this data because unless what the Board is suggesting  
22 by a procedure, not only would there be potentially  
23 supplemental testimony, but a supplemental hearing  
24 whereby there would be examination. I guess I would  
25 object.

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1 CHAIRMAN FROEHLICH: Your objection is  
2 denied. We're going to go forward with the cross  
3 examination of Panel 3. You will have access to this  
4 additional data and any subsequent data of like as it  
5 becomes in the custody and control and possession of  
6 Powertech and to the extent there is information in  
7 that data that causes you to file a new contention or  
8 to amend an existing contention, you have that right,  
9 keeping in mind the Commission's burdens.

10 However, we will have a deadline or a date  
11 for additional testimony that would either support,  
12 supplement or maybe nothing will come of it. I can't  
13 tell at this point, but we will put in an opportunity  
14 after we get a feel for how long it will take for them  
15 to get it together and for you to look at it. Have  
16 your experts go through it. If, after your  
17 examination of that material it changes anything in  
18 what you have already filed and what we have already  
19 cross examined, you'll have the opportunity to file  
20 additional testimony on this existing contention. And  
21 we'll take it up as we have. But we'll go forward  
22 with the examination on Contentions 2, 3, and 4 today.

23 MR. PUGSLEY: Your Honor, may I  
24 respectfully request a 15-minute recess?

25 CHAIRMAN FROEHLICH: That's fine.

1       Granted.  We'll reconvene in 15 minutes and we'll  
2       start with the cross examination of Panel 2.

3               MR. PUGSLEY:  Are there going to be  
4       opening statements as well?

5               CHAIRMAN FROEHLICH:  Yes.

6               MR. PUGSLEY:  Thank you, sir.

7               CHAIRMAN FROEHLICH:  Absolutely.

8               (Whereupon, the above-entitled matter went  
9       off the record at 10:06 a.m. and resumed at 10:28  
10      a.m.)

11              CHAIRMAN FROEHLICH:  We'll be back on the  
12      record.

13              We have now Panel 2 before us, which  
14      covers Contentions 2, 3 and 4.  We'll begin with  
15      opening statements on these three contentions from  
16      each of the parties.  Please limit your statement to  
17      about five minutes, and then we'll proceed with  
18      cross-examination of these witnesses.  I believe with  
19      Panel 1 we had Staff go first.  How about we go first  
20      with Powertech today?

21              MR. PUGSLEY:  Thank you, Judge Froehlich.  
22      May it please the Court, for Panel 2 today Powertech's  
23      approach to site characterization of groundwater at  
24      the Dewey-Burdock project is consistent with NRC  
25      Regulations at 10 CFR Part 4 and Appendix A criteria

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1 as implemented under the Atomic Energy Act of 1954, as  
2 amended, and NRC Staff's guidance at NUREG-1569, which  
3 is Exhibit NRC 013, which represents Staff's expert  
4 interpretation of the Commission's Regulations as  
5 delegated to under 10 CFR Part 1.41(b)(18) and (19),  
6 and "NRC Office Manual," Chapter 0124 at 0321.

7 With respect to Contention 2, Powertech's  
8 license application in the Record of Decision contains  
9 more than adequate baseline groundwater quality in  
10 accordance with NRC Regulations at Part 40, Appendix  
11 A, Criterion 7, and Commission guidance at NUREG-1569,  
12 Chapter 2.

13 A fundamental legal question that sets the  
14 stage of Contention 2 is how the Commission's ISR  
15 Regulatory Program addresses two stages of groundwater  
16 quality data and analysis, the first being the  
17 aforementioned Criterion 7, baseline groundwater  
18 quality for initial licensing decision and Criterion  
19 5(b)(5), Commission-approved background post-license  
20 issuance and pre-operational.

21 As a general matter, Criterion 7, baseline  
22 groundwater quality, is all that is required for an  
23 initial NRC licensing decision such as the grant of  
24 license SUA-1600. For Criterion 5,  
25 Commission-approved background, a license applicant

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1 submits procedures for how additional groundwater  
2 quality data post-license issuance are obtained and  
3 submitted to NRC Staff for review prior to the  
4 commencement of operations. Such procedures are  
5 implemented by license condition; in this case,  
6 license conditions 10.10, 11.3 and 11.4 in NRC Exhibit  
7 012. Criterion 5, Commission-approved background, can  
8 only be determined after an entire wellfield,  
9 including monitor well network, is installed, which,  
10 as stated earlier today, is not permitted under the  
11 Commission's construction rule at 10 CFR Part  
12 40.32 (e) .

13 As stated previously, NUREG-1569 guidance,  
14 the Staff's expert interpretation of ISR Regulations  
15 is delegated to them by the Commission. License  
16 applicants and their consultants follow this guidance  
17 as it defines what is expected of a license applicant  
18 in order to satisfactorily satisfy Commission  
19 requirements for a license. With that said,  
20 Powertech's license application provides more than  
21 adequate groundwater quality data.

22 Powertech submitted this data to reflect  
23 site characterization of groundwater at the site at  
24 the time of application submission, which is what is  
25 required by Commission Regulations. Powertech's

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1 characterization of this actually went beyond what is  
2 required in the guidance. And as a standard practice,  
3 license conditions are imposed to require additional  
4 groundwater data.

5 NRC's FSEIS also addresses many of these  
6 issues and other additional issues including, for  
7 example, potential cumulative impacts related to the  
8 Black Hills Army Depot and other past, present and  
9 reasonably foreseeable actions, including mining  
10 operations. This approach to pre and post-license  
11 groundwater quality data and analysis is explicitly  
12 endorsed in Commission precedent in the Hydro  
13 Resources case. Two sample citations: LBP 05-20 and  
14 CLI 0601. Issues associated with this contention will  
15 be addressed by Powertech's experts, Mr. Hal Demuth  
16 and Mr. Errol Lawrence.

17 With respect to Contention 3, the same  
18 arguments apply as we just articulated in Contention  
19 2 from a legal perspective regarding Criterion 7 and  
20 Criterion 5.

21 Major points of contention in this  
22 contention involve potential presence of unplugged  
23 boreholes, breccia pipes, faults and/or fractures at  
24 the site. These issues have been addressed in the  
25 license application and the Record of Decision through

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1 extensive research of site-specific reports,  
2 discussing such features and on-the-ground studies to  
3 determine if they are present. However, Powertech  
4 does submit that this does not preclude post-license  
5 data gathering and analysis to address these issues,  
6 however, it is done post-license and is not subject to  
7 litigation in this proceeding.

8           Opposing counsel have failed to offer any  
9 concrete data studies or analyses that show any of  
10 these features are present at the Dewey-Burdock site  
11 or will not be dealt with prior to the commencement of  
12 the operations. Again, issues associated with this  
13 contention will be addressed by Mr. Hall Demuth and  
14 Mr. Errol Lawrence.

15           With respect to Contention 4, Powertech's  
16 license application and the Record of Decision  
17 adequately address groundwater quantity consumption  
18 issues and potential impacts associated with that  
19 issue. Major issues in this contention include net  
20 groundwater extraction rates during operations and  
21 restoration, potential local and regional impacts to  
22 private supply wells and water balance.

23           With respect to extraction rates,  
24 Powertech supplied its projections for these rates  
25 based on typical ISR processes and in accordance with

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1 NUREG-1569 guidance such as the continuous  
2 recirculation of native groundwater with only a  
3 one-and-a-half to three percent bleed rate, water  
4 disposal via class 5 underground injection control  
5 wells or land application and typical restoration  
6 rates using commonly accepted water treatment  
7 processes such as reverse osmosis.

8 Project extraction rates are also compared  
9 in our expert testimony to a typical center pivot  
10 system used for irrigation, which was provided for as  
11 an analogy. Opposing testimony completely  
12 mischaracterizes the groundwater consumptive use at  
13 the project over the life of the project, which is  
14 demonstrated in our expert testimony.

15 With respect to potential local and  
16 regional impacts of private supply wells, opposing  
17 counsel did not offer any concrete evidence that  
18 Powertech's license application and NRC Staff's FSEIS  
19 analyses and Record and Decision do not adequately  
20 address this issue. Powertech's license application  
21 has a comprehensive numerical groundwater model that  
22 fully supports its conclusions and NRC Staff's  
23 conclusions.

24 And finally, with respect to water  
25 balance, both Powertech's license application and the

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1 Record of Decision provide detailed discussions and  
2 analyses of the water balance at the time of the  
3 application, including all necessary input and output  
4 parameters such as production and re-injection rates,  
5 bleed rates, waste water disposal rates and other  
6 factors associated with both operations and  
7 restoration, and issues associated with this will be  
8 addressed by Powertech's witnesses, Mr. Demuth, Mr.  
9 Lawrence and Mr. Doyl Fritz.

10 The last point I would like to make, if I  
11 may, is as has been stated in several of our pleadings  
12 at no time during this proceeding did Consolidated  
13 Intervenors or the Oglala Sioux Tribe attempt to  
14 migrate their contentions from Powertech's license  
15 application to the NRC's safety evaluation report  
16 detailing the safety review of Powertech's license  
17 application and RAI responses. Thus, those  
18 conclusions in that document are not subject to  
19 litigation in this proceeding. It is important to  
20 note that many of those conclusions that are not  
21 subject to challenge are inextricably linked to the  
22 conclusions rendered in the FSEIS. We respectfully  
23 request the Board take that into account when  
24 rendering its decision.

25 And thus, in conclusion I would say

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1 Powertech's position is with respect to Contentions 2,  
2 3 and 4 that this Board should find that none of those  
3 contentions constitute ground for modification of the  
4 Record of Decision or Powertech's NRC license. Thank  
5 you.

6 CHAIRMAN FROEHLICH: Thank you, Mr.  
7 Pugsley. Commission Staff?

8 JUDGE BARNETT: Actually, I have a  
9 question for Mr. Pugsley, if that's okay.

10 CHAIRMAN FROEHLICH: Oh, please. Please.

11 JUDGE BARNETT: Mr. Pugsley, so make sure  
12 I understand. Is it your position that satisfying all  
13 the requirements of NUREG-1569 will automatically  
14 satisfy all the relevant requirements of NEPA and 10  
15 CFR Part 40?

16 MR. PUGSLEY: Yes, it is our position.

17 JUDGE BARNETT: Okay. Do you have any  
18 citations or authority that binds the Board to that  
19 conclusion?

20 MR. PUGSLEY: I do indeed, Your Honor. In  
21 NUREG-1569, which was a document issued for public  
22 comment on two occasions, there was a response to  
23 comments in there that addresses this issue, if I'd be  
24 maybe given a moment, or I can provide the citation to  
25 you later, whichever is easier.

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1 JUDGE BARNETT: That will be fine, if you  
2 would like to do that.

3 MR. PUGSLEY: All right. Thank you, sir.  
4 I will provide that to you at the end of opening  
5 statements.

6 JUDGE BARNETT: Thank you.

7 CHAIRMAN FROEHLICH: Okay. Thank you.

8 Mr. Clark?

9 MR. CLARK: As the Staff explained in its  
10 written testimony and as it will explain further  
11 today, the Staff thoroughly considered the baseline  
12 quality of groundwater in the Dewey-Burdock area, the  
13 hydrogeology in the area and the amount of water  
14 Powertech will use during the Dewey-Burdock project.

15 The Staff's witnesses on all contention  
16 are Jim Prikryl, a geochemist and geologist, and Tom  
17 Lancaster, who's the hydro-geologist. Both Mr.  
18 Prikryl and Mr. Lancaster have extensive experience in  
19 their fields.

20 The Staff's findings draw support from the  
21 extensive information it considered during its review.  
22 This includes the information Powertech submitted with  
23 its application. This also includes significant new  
24 information that Powertech submitted in the Staff's  
25 numerous requests for additional information. The

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1 Staff found that Powertech's application, including  
2 the RAI responses. met the NRC Standard Review Plan  
3 for in situ recovery applications. That's NUREG-1569,  
4 which Mr. Pugsley referred to. And in the record  
5 that's Exhibit NRC 13. This is the NRC's guidance for  
6 determining whether an applicant has met both the  
7 safety and the environmental findings necessary for  
8 the Staff to issue a license.

9 Now, the Intervenors argue that Powertech  
10 needs to provide more information in several areas,  
11 but particularly baseline water quality and  
12 hydrogeology. There are two important points,  
13 however, that the Board should keep in mind.

14 First, the Standard Review Plan  
15 acknowledges that it's appropriate for an applicant to  
16 submit certain information after it receives a  
17 license. This includes certain information relevant  
18 to both baseline water quality and hydro-geological  
19 confinement. In other words, this information doesn't  
20 need to be included at the pre-license stage.

21 Second, and as Mr. Pugsley noted, the  
22 NRC's commission has ruled that this approach complies  
23 with both the Atomic Energy Act and the National  
24 Environmental Policy Act. The best example is the  
25 case which Mr. Pugsley cited, the January 2006

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1 decision in Hydro Resources. And I'm referring to  
2 pages 5 and 6 of that decision. I don't know the NRC  
3 volume, but it's the first decision, so it begins at  
4 page 1 of that volume.

5 As the Commission further explained in  
6 Hydro Resources, it's appropriate for the Staff to use  
7 license conditions to require a licensee to submit  
8 additional information on water quality in aquifer  
9 confinement after it receives a license. In this case  
10 I'll mention the NRC's license that the Staff issued  
11 to Powertech is Exhibit NRC 12.

12 In this case, again as Mr. Pugsley  
13 mentioned, one of the more significant license  
14 conditions is License Condition 10.10. This condition  
15 requires Powertech to submit more information on  
16 baseline water quality and also confinement.  
17 Powertech needs to submit this information before it  
18 can begin operations in specific wellfields. Now,  
19 License Condition 10.10 lists 11 specific types of  
20 information Powertech needs to provide. In this  
21 proceeding, while the Intervenors object generally to  
22 the use of license conditions to gather more  
23 information, they fail to specifically challenge the  
24 sufficiency of License Condition 10.10 and they fail  
25 to address specifically those 11 data sets that

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1 Powertech will need to submit in the future.

2 But also note that apart from License  
3 Condition 10.10, Powertech's license includes numerous  
4 other conditions that are relevant to protecting  
5 groundwater. For example, License Condition 10.5  
6 requires mechanical integrity testing of wells.  
7 Condition 10.6 describes the groundwater restoration  
8 process and all the steps that Powertech needs to  
9 follow to restore the groundwater in the aquifers.  
10 Condition 11.5 requires Powertech to monitor for any  
11 possible excursions of wellfield solutions and to take  
12 corrective actions if necessary.

13 Turning to Contention 4, the Staff also  
14 closely considered the amount of water Powertech will  
15 use during the Dewey-Burdock project. The Staff  
16 reviewed a water balance that Powertech submitted with  
17 its application and this provides comprehensive  
18 information on water inputs and outputs for various  
19 phases of the Dewey-Burdock project. The Staff also  
20 prepared itself a numerical modeling report to  
21 estimate drawdown in the Madison aquifer. And as the  
22 Board on Monday, the water in the Madison aquifer is  
23 very important to the citizens of Hot Springs, Rapid  
24 City and also Edgemont. The Staff from that  
25 Powertech's water use will not affect the water

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1 supplies even in Edgemont, which is the city closest  
2 to the project.

3 In addition, the Staff considered the  
4 water rates applications that Powertech filed with the  
5 State of South Dakota. It's important to note that  
6 the state found that Powertech's annual water  
7 consumption will not exceed the recharge rates of  
8 either the Madison aquifer or the Inyan Kara aquifer,  
9 which the Board also heard about on Monday.

10 In sum, the Staff carefully considered  
11 each of the issues raised in Contentions 2 through 4,  
12 and Mr. Prikryl and Mr. Lancaster look forward to  
13 answering the Board's questions.

14 CHAIRMAN FROEHLICH: Thank you.

15 JUDGE BARNETT: I have a question for Mr.  
16 Clark.

17 CHAIRMAN FROEHLICH: Okay.

18 JUDGE BARNETT: I'm going to ask the  
19 question I did of Mr. Pugsley. I think I know the  
20 answer, but I just want to make sure I get this  
21 explicit.

22 So, is it your position, is it the Staff's  
23 position that satisfying all the requirements of  
24 NUREG-1569 will automatically satisfy all of the  
25 relevant requirements of NEPA and 10 CFR Part 40?

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1 MR. CLARK: That is the Staff's position.  
2 As I mentioned, the guidance in NUREG-1569 is directed  
3 to both the safety and environmental findings and it  
4 reflects the Staff's judgment that if an applicant  
5 provides sufficient information in the areas addressed  
6 in the NUREG, then the Staff can make the findings  
7 required under NEPA.

8 JUDGE BARNETT: Do you have any citations  
9 or authority that binds this Board to that conclusion?

10 MR. CLARK: The numerous decisions in  
11 Hydro Resources relied on the Staff's review and the  
12 findings that the Staff made consistent with the  
13 Standard Review Plan. In terms of a direct case  
14 stating that compliance with the NUREG satisfies NEPA,  
15 I'm not aware of any recent Commission precedent. I'd  
16 be happy to look into that and report back.

17 JUDGE BARNETT: Okay. Yes, if you can  
18 find citations or authority that binds this Board to  
19 that conclusion, that would help me. And I know that  
20 in your arguments both of you have addressed this with  
21 Hydro Resources. And I've looked through some of that  
22 and I can't find anything really explicit, but maybe  
23 I missed it.

24 MR. THOMPSON: Your Honor, let me just say  
25 guidance is not a regulation. We understand that.

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1 And we understand that even the licensee is not bound  
2 by the guidance. But if you want to do something  
3 different, you have to justify it in much greater  
4 detail. If you follow the guidance, you're supposed  
5 to be able to get your license. So if the Board finds  
6 the guidance inadequate, it presumably will have to  
7 have some rather serious technical and scientific  
8 justifications to do so.

9 MR. CLARK: And, Judge Barnett, if I could  
10 just mention that the Staff is aware of the Board's  
11 footnote toward the end of its recent ruling and  
12 summary disposition motions in Strata.

13 JUDGE BARNETT: That's exactly where this  
14 question came from.

15 MR. CLARK: And we're not aware of any  
16 Commission precedent saying that the Staff's guidance  
17 is binding on this Board, but our argument is that the  
18 guidance is sufficient to comply with NEPA and the  
19 Board should -- for the same reasons the Staff adopted  
20 the guidance, the Board should likewise understand  
21 that the guidance ensures that an applicant provides  
22 sufficient information to allow the Staff to make the  
23 findings. But we're aware of that footnote and we're  
24 also aware that -- is it Judge White from the Strata  
25 Board is in attendance?

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1 JUDGE BARNETT: Yes.

2 MR. CLARK: So we want to make sure that  
3 the Staff fully recognizes the issues raised in  
4 Strata.

5 MR. PUGSLEY: And to answer your question,  
6 Judge Barnett, the first citation -- I concur with Mr.  
7 Thompson's opinion. The citation I would give you is  
8 68 Federal Register 51034, which is --

9 JUDGE BARNETT: Just a little bit slower,  
10 please.

11 MR. PUGSLEY: I'm sorry.

12 JUDGE BARNETT: I've 68 Federal  
13 Register --

14 MR. CLARK: 51034.

15 JUDGE BARNETT: 034.

16 MR. CLARK: And the pin cite is 036 with  
17 a quote of, "Standard practices that have been found  
18 acceptable in demonstrating compliance at in situ  
19 leach uranium extraction facilities have been placed  
20 in the Standard Review Plan as one approach that the  
21 Staff may use in determining in compliance." And I  
22 would respectfully submit that while I do agree with  
23 you that the Hydro Resources cases do not have a  
24 specific statement saying the Board is bound to the  
25 guidance, it is worth noting that the guidance, the

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1 final version of the guidance in 2003 was developed  
2 after those Hydro Resources decisions, so it goes --  
3 it would make you think that the Staff would take  
4 Commission precedent into account when developing its  
5 guidance.

6 JUDGE BARNETT: Certainly I do want to  
7 take Commission precedence into account, but I want to  
8 take the explicit precedence into account.

9 MR. CLARK: Understood, sir.

10 CHAIRMAN FROEHLICH: All right. Next from  
11 the Oglala Sioux Tribe?

12 MR. PARSONS: Thank you, Your Honor. With  
13 respect to Contention 2, failure to -- deals with the  
14 failure to adequately determine water quality,  
15 baseline water conditions at the site. What we have  
16 in this case essentially is a deferral of substantial  
17 baseline data collection until a time in the future.  
18 You heard Mr. Clark talk about the license conditions  
19 that specifically defer collection of baseline data to  
20 the future. I understand that there is an additional  
21 package of data that comes in with wellfield  
22 development, but Criterion 7 in 10 CFR Part 40,  
23 Appendix A specifically requires a pre-operational  
24 monitoring program to, quote, "provide complete  
25 baseline data on the site in its environs."

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1           Mr. Pugsley asserts that the construction  
2 rule somehow prohibits them from providing that  
3 complete baseline data, but the construction rule  
4 exempts baseline data collection. So that is not an  
5 impediment to complying with Criterion 7, which  
6 requires that complete, again complete baseline data.

7           The current data and methodology are not  
8 adequate to assess the environmental impacts under  
9 NEPA either. NEPA requires all relevant data be  
10 included in an EIS. To the extent that an EIS -- it  
11 is argued that an EIS is not intended to be a research  
12 document, I think is the words used in the briefing on  
13 this matter. And our NEPA Regulations at 1502.22, 40  
14 CFR 1502.22 do require agencies to gather additional  
15 data and evidence unless the costs are exorbitant. No  
16 such argument or showing has been made here. The  
17 testimony confirms that the FSEIS lacks the detailed  
18 analysis of water quality as we briefed and as we  
19 submitted. Under NEPA this data is critical to  
20 informing the public and the decision makers and in  
21 assessing the environmental impacts.

22           With respect to Contention 3, which deals  
23 with the failure to assess the hydro-geological  
24 conditions at the site, a key aspect in this  
25 contention is the lack of sufficient data and improper

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1 assumptions regarding the connectivity or lack there  
2 of of underlying aquifers. The testimony in our  
3 briefly thus far in this case shows that the  
4 application and the FSEIS ignored extensive evidence  
5 and failed to gather evidence of faults, fractures,  
6 breccia formations, collapses and historical  
7 boreholes, again deferring that information to some  
8 point in the future.

9 It's our contention that in order to have  
10 a complete baseline in order to comply with NEPA you  
11 must present that data on the front end and not simply  
12 defer it to later analysis. Instead of assessing this  
13 information, as with water quality, this data is  
14 simply deferred and this analysis are deferred to the  
15 future. This approach violates NRC Regulations and  
16 NEPA.

17 Contention 4 deals with a failure to  
18 assess water quantity impacts, particularly a failure  
19 to adequately review and determine the water  
20 consumption for the project. A central feature of  
21 this argument is the lack of an appropriate water  
22 balance capable of showing the amounts of water that  
23 will be used and consumed in this process. Again, the  
24 lack of this analysis violates NEPA, cannot under NEPA  
25 be deferred to a later time and deprives the public

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1 and decision makers of an opportunity to meaningfully  
2 review the impacts from this project.

3 JUDGE BARNETT: I have a question for Mr.  
4 Parsons, if it's okay.

5 So is it your position that the procedure  
6 for FSEIS review outlined in NUREG-1569 is not  
7 consistent with the relevant requirements of NEPA  
8 and/or relevant NRC Regulations?

9 MR. PARSONS: Thank you. I think that as  
10 was explained, NUREG-1569 is guidance. It's not a  
11 regulation. It's not a statute. It's not case law.  
12 And so while it provides a road map, the requirements  
13 for compliance with NRC Regulations and NEPA are only  
14 found in those themselves. So I understand that it  
15 provides aid to companies and NRC Staff in developing  
16 their NEPA, but it's not conclusive. And so to the  
17 extent that there are identified gaps in the data or  
18 analyses that are incomplete, I don't think -- and  
19 don't meet to the level of the regulations or the  
20 statutes, that a guidance can somehow cover for that  
21 or overcome those requirements. So I'm not as  
22 familiar with the proceedings in other cases as Mr.  
23 Clark. I have made notes and will be sure to be  
24 researching that. But guidance is just guidance.

25 JUDGE BARNETT: Thank you.

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1 JUDGE COLE: Sir, you agree that if you're  
2 going to do something different than the guidance in  
3 the NUREG-1569, you have to make a demonstration of  
4 that and convince the Staff that this is a proper way  
5 to do it?

6 MR. PARSONS: Well, I think guidance is a  
7 general approach to things. What we have I think in  
8 this case is based on the site-specific  
9 characteristics. We have a unique situation here. We  
10 have a site that's been extensively explored with  
11 boreholes and other disturbances. And so to the  
12 extent that a site-specific case requires that  
13 additional analysis, I don't think you need some vast  
14 justification to provide additional data. NEPA  
15 requires that hard look. And to the extent that a --  
16 the guidance or the approach taken at another mine  
17 site that may not pose the same complications doesn't  
18 -- to the extent that that general guidance doesn't  
19 provide for a hard look at this particular site, then  
20 I would say that you need to follow the regulations  
21 and the statute and provide all the information  
22 necessary.

23 JUDGE COLE: Thank you.

24 CHAIRMAN FROEHLICH: All right. The  
25 Consolidated Intervenors, please?

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1                   MR. ELLISON: Thank you. Echoing what Mr.  
2                   Parsons said, we certainly concur that NEPA requires  
3                   that all available data be reviewed in the FSEIS  
4                   process, and one of the things that we believe the  
5                   evidence would show that one of the failures was to  
6                   include pre-mining baseline data that should have been  
7                   available from TVA from those earlier studies as to  
8                   the pre-mining baseline water quality. The evidence  
9                   clearly shows that the baseline water quality varies  
10                  sometimes dramatically within the various parts of the  
11                  proposed project area within Burdock and within Dewey.

12                  And I guess one of the questions that I  
13                  have, because I'm confused -- I keep hearing a lot of  
14                  references to baselines of each wellfield, but it's  
15                  confusing to me whether that means some kind of a  
16                  parameter of baseline water data up to the eight large  
17                  wellfields that are being proposed, or is this being  
18                  talked about for each of the individual seven wells?  
19                  And because if it is the larger grouping, multiple  
20                  wellfields lumped together as one wellfield, then the  
21                  question would seem to me to become is it the best  
22                  water quality or the worst water quality which should  
23                  have been looked at and presented and to determine  
24                  what in fact the baseline would be for that particular  
25                  wellfield?

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1           As to Contention 3, does the hydrology and  
2 geology of the area allow for containment of the  
3 mining solutions under existing technology? And  
4 noting that the down-flow impact of -- you know, once  
5 operations are over or an excursion are currently  
6 under study at the Smith Ranch. And again, the NRC  
7 should have looked at all available data, both pro and  
8 con. This concept of a certain minimal threshold  
9 doesn't seem to me to be the hard look that is  
10 required under NEPA, but yet which is being suggested  
11 by NRC Staff and Powertech and seems to be a rather  
12 constant theme throughout the proceedings.

13           The FSEIS does not mention that there were  
14 two rejections by the DNER, that the Powertech had  
15 failed to show the state agency that it was not able  
16 to protect water resources and that in fact Powertech  
17 in its 2009 application for application of the Inyan  
18 Kara -- that the Inyan Kara was so leaky it was  
19 treated as one aquifer. And then upon DNER  
20 recommendations was changed to, well, it's still  
21 sufficient to contain these mine solutions. Was there  
22 a hard look at that? Was it simply language change or  
23 was there some evidence that was presented that would  
24 have cause for a different conclusion?

25           Also there's a question of the simple

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1 modeling that was used by Powertech and assumingly  
2 approved by the NRC Staff. We would submit it shows  
3 it was not really based on real site conditions, but  
4 on some kind of generalized statement leaving out all  
5 of the most difficult parts such as showing whether  
6 the Fuson layer was actually a confined layer which  
7 sufficiently isolates an ISR process.

8 We've already discussed there is new data  
9 regarding potentially thousands of boreholes that had  
10 not been disclosed to Staff and analyzed with regard  
11 to the preparation of the FSEIS and a question as to  
12 when that data was obtained, when it could have been  
13 obtained, when Powertech was aware of the existence of  
14 such data. And there's no evidence that I think the  
15 Board is going to hear as to when the NRC Staff  
16 concludes that there is sufficient hydro-geological  
17 characteristics within the Dewey-Burdock area to with  
18 existing technology contain these fluids. There's no  
19 evidence that was presented showing of a similar ISR  
20 site that had really the same site characteristics  
21 with a plan to mine two hydrologically connected  
22 aquifers at the same time which overlap each other.

23 And then there of course is the absence of  
24 much of a discussion even though Powertech in one of  
25 its exhibits discusses how the area at the

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1 Dewey-Burdock area has an oxidized core and how that  
2 might affect such things as mitigating or even  
3 controlling excursions, let alone ultimate  
4 reclamation.

5 There's also -- lacks a study of the  
6 so-called -- the reduction area that's supposedly  
7 down-flow outside of the project area. Between the  
8 Burdock area down-flow of that immediately is that  
9 open pit which is exposed to the rain, which goes all  
10 the way down to the top of the Fall River formation,  
11 which would seem to be providing additional oxidation.  
12 That's in the flow. Has that been really studied so  
13 that once these mine solutions hit that what then is  
14 the effect as it goes further as it travels initially  
15 southwest from the project area?

16 The evidence from Dr. Moran and Dr.  
17 LaGarry will also show that in addition to potential  
18 new data potentially showing faults and fractures with  
19 the borehole data that satellite photographs in fact  
20 show that there are faults and fractures within this  
21 area. We've heard some testimony about earthquakes in  
22 the area, but it doesn't really address what would  
23 happen if there was a five point magnitude earthquake  
24 in the area. A 4.8 one was not too far away. How  
25 would that affect the ability to prevent migration of

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1 fluids? Same thing if it damaged piping.

2 There's also the question of flooding of  
3 the mine site with the holding ponds being in the  
4 100-year flood area. Last May there was a flood  
5 through that area with rainfall twice the 100-year  
6 level, and that doesn't seem to be addressed in terms  
7 of protecting surface waters.

8 There was a fire in 2012 very close to  
9 this site, and the FSEIS has not seriously discussed  
10 that fire. Well, it doesn't discuss it at all. It  
11 doesn't seriously address what would happen if a fire  
12 swept through that area in terms of any issues in  
13 terms of keeping the pumps going, you know, affecting  
14 the ability of those pumps to keep operating and  
15 prevent excursions.

16 And there's also a serious lack within the  
17 FSEIS of worst case scenarios situations. What  
18 happens if a 500-year flood comes through? What  
19 happens if a catastrophic earthquake occurs, or a  
20 fire, or there are unknown geo-hydrological features  
21 that create a serious problem? We know from Three  
22 Mile Island, Chernobyl and Fukushima that regulators  
23 told the public -- were told by the companies that the  
24 projects were safe, that an unspeakable catastrophe  
25 would never happen. If an unspeakable catastrophe

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1 were to happen at this site, we feel the FSEIS fails  
2 to seriously address that.

3 As to Contention 4 regarding groundwater  
4 quantity impacts, notice that there seems to be a lot  
5 of guessing that's going on as to -- and it's back to  
6 gross estimate. It's the amount of recharge that  
7 would be of the Inyan Kara right in this particular  
8 area. It's generally a very low rainfall-type of type  
9 area. And with 9,000 gallons per minute being used --  
10 because it's our position that contrary to Powertech's  
11 position that you really only looked at the bleed. If  
12 you further contaminate water, isn't that a use of  
13 that water? And that the FSEIS fails to consider that  
14 that increased contaminated water -- and in some areas  
15 here there were drinking water wells within the  
16 project area that Powertech has now bought up. So if  
17 there is a contamination at 9,000 gallons per minute,  
18 there's nothing really about the full volume within  
19 this entire 16-square-mile area that is potentially  
20 going to be impacted. And is that not a use? We  
21 would submit that it was and it should have been  
22 something that would be looked at by the FSEIS.

23 And I apologize. I'm not feeling very  
24 well today. I will end my remarks there. Thank you.

25 JUDGE BARNETT: I was going to ask a

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1 question of the Consolidated Intervenors. It doesn't  
2 have to be to you, Mr. Ellison, if -- yes, you don't  
3 look like you're feeling very well. Hope you feel  
4 better soon.

5 MR. ELLISON: Thank you.

6 JUDGE BARNETT: Same question that I asked  
7 the tribe. Is it your position that the procedures  
8 for FSEIS review that is outlined in NUREG-1569 is not  
9 consistent with relevant requirements in NEPA and NRC  
10 Regulations?

11 MR. FRANKEL: Thank you, Your Honor.  
12 David Frankel speaking for Consolidated Intervenors.  
13 It is our position -- we echo the position that Mr.  
14 Parsons described, that this is simply a guidance,  
15 while extremely helpful and generated with much  
16 industry and regulatory input. We're not saying it's  
17 entirely inconsistent, but we're saying it's not  
18 always automatically adequate and compliant.

19 JUDGE BARNETT: Fair enough.

20 CHAIRMAN FROEHLICH: Thank you for the  
21 opening statements. If my colleagues are ready, we  
22 can begin.

23 JUDGE BARNETT: Mr. Ellison, do you need  
24 a break for just a minute?

25 MR. ELLISON: With other counsel here, I'm

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1 fine. Thank you.

2 JUDGE BARNETT: Okay. I want to say  
3 before I get started I appreciate the questions  
4 submitted by the parties. I looked through all those  
5 very carefully and I will go through them again. It  
6 was probably not possible time-wise to ask everyone's  
7 questions; there were a lot of them, but I did look at  
8 them and in some cases incorporated them. And so I  
9 appreciate that.

10 Also, to the witnesses, I have been in  
11 your shoes before. So I served as an expert witness  
12 on cases, not uranium mines, but I know that's  
13 challenging to do. So I appreciate your willingness  
14 to be here.

15 My first question is for Dr. Moran, and  
16 this is in relation to Contention 2, failure to  
17 include necessary information for adequate  
18 determination of baseline groundwater quality. Would  
19 you please briefly describe your professional  
20 experience with ISR facility licensing or operation?

21 DR. MORAN: I'd have to go back and look  
22 at my résumé for all the details, but truthfully I  
23 don't have much licensing, formal licensing  
24 experience. I have a lot of experience looking at the  
25 hydrogeology and the geochemistry and water quality of

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1 various kinds of uranium sites and other radioactive  
2 sites, but I'm -- let me think a little bit more about  
3 specific licensing experience. Not much. Let's leave  
4 it at that.

5 JUDGE BARNETT: Okay. Thank you. You  
6 state, and I'm looking at OST-1 at page 17; I'm  
7 quoting here, "The delayed production of this critical  
8 baseline information until after licensing is not  
9 scientifically defensible as it prevents establishment  
10 of a baseline on which to identify, disclose and  
11 analyze the environmental impacts, alternatives and  
12 mitigation measures involved with the Dewey-Burdock  
13 project proposal. Scientifically defensible  
14 monitoring and mitigation of operating project is not  
15 possible based on the baseline data and analyses I  
16 have reviewed," close quote.

17 And I understand you're not a lawyer, but  
18 what is your understanding? Is there a specific  
19 regulation that you believe is not being met?

20 DR. MORAN: Again, I'm not going to try to  
21 talk about the legal aspects of that. I'm not trying  
22 to avoid answering your question. Part of what I'm  
23 saying is a lot of the area in three dimension of the  
24 Dewey-Burdock site, in my opinion, hasn't been  
25 characterized either geochemically, water quality,

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1       etcetera, just by my definition.

2                   When I look also at the relevant documents  
3       from EPA where they've been sort of coerced into  
4       commenting on the new ISL guidance. I think they  
5       started getting pushed in about 1999 to start giving  
6       their opinions on it. They also say that you have to  
7       have a more stringent kind of baseline and they say  
8       that it has to be released before application  
9       approval. That's their guidance. But it's in TENORM  
10      documents. It's not in NRC documents.

11                   JUDGE BARNETT: Okay. Is it in anything  
12      that's in evidence in this case?

13                   DR. MORAN: Yes.

14                   JUDGE BARNETT: The EPA regulations that  
15      you were just citing?

16                   DR. MORAN: Their guidance.

17                   JUDGE BARNETT: Or the guidance. I'm  
18      sorry.

19                   DR. MORAN: Yes, would you let me take one  
20      minute?

21                   JUDGE BARNETT: Sure. Go ahead. If you  
22      could just tell me the exhibit number, that's fine.

23                   DR. MORAN: I'm not sure I can. What I've  
24      got are some notes to the document. Maybe it would be  
25      more useful if I give it to you later, but --

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1 JUDGE BARNETT: That's fine. That's fine.

2 DR. MORAN: Yes.

3 JUDGE BARNETT: That's fine.

4 DR. MORAN: The point is it's in the EPA  
5 TENORM documents that NRC requested EPA to give them  
6 guidance on and it's suggesting changes to procedures.  
7 And one of the sections which I'll give you talks  
8 about providing the information before application  
9 approval.

10 JUDGE BARNETT: Okay. Thank you. You  
11 also state; I'm quoting from your testimony here,  
12 OST-1 at 18, quote, "Analytical results that rely  
13 entirely on data provided by the project proponent are  
14 not considered reliable by professional  
15 hydro-geologists and other water experts." Is that  
16 your opinion or do you have a more authoritative  
17 reference for that?

18 DR. MORAN: That's my opinion, but I would  
19 add that it's the opinion of most of the people I've  
20 ever worked with in way more than 42 mores of doing  
21 hydrogeology when they're able to say what they really  
22 think. You want independent sources of information.

23 JUDGE BARNETT: Okay. You state also on  
24 the same page, quote, "The employment of self-serving  
25 analytic methodology does not stand up to accepted

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1 scientific methods," close quote. What self-serving  
2 analytical methodology are you referring to there?

3 MR. ELLISON: Well, one of them would be  
4 if I were beginning the application process myself  
5 let's say five or six years ago, you certainly would  
6 have added in a section to look at geologic structure  
7 using air photos and satellite imagery and then you  
8 would integrate it with all of the other information  
9 rather than having them be kept in separate boxes.

10 I this situation they haven't done any  
11 significant satellite imagery interpretation, air  
12 photo interpretation. They did bring up some  
13 agricultural imagery after we criticized the fact that  
14 they hadn't in one of the earlier stages of review.  
15 They've not integrated the water quality and the  
16 hydrogeology. So all of these are in separate boxes.  
17 That's part of what I mean by that section.

18 JUDGE BARNETT: Okay. Thank you. What is  
19 your understanding of the relationship of NUREG-1569,  
20 which is, quote -- or the title is, "Standard Review  
21 Plan for In Situ Leach Uranium Extractions License  
22 Applications to NEPA Compliance?" Are you familiar  
23 with NUREG-1569?

24 DR. MORAN: I've read large portions of  
25 it. Again, to me it's guidance. It leaves out a

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1 great many important specifics. I don't think I'm the  
2 right person to say how it relates to NEPA guidance.  
3 Probably that's a legal issue.

4 But let me just add one other thing: In  
5 my experience there are many aspects of at least the  
6 water quality and the hydrogeology that I think the --  
7 and the geochemistry which NUREG-1569 doesn't  
8 specifically talk about, which I think would be  
9 required in NEPA. But that's a technical opinion, not  
10 a legal one.

11 JUDGE BARNETT: Yes, I understand. I'm  
12 not a lawyer, too, so --

13 DR. MORAN: Okay.

14 JUDGE BARNETT: -- you're walking a fine  
15 line, but you're not talking to an attorney.

16 DR. MORAN: Okay. Good. Thank you.

17 (Laughter.)

18 JUDGE BARNETT: So I'm a technical person  
19 also.

20 Okay. Following up on that, in NUREG-1569  
21 there is a statement -- that's in Exhibit NRC 13.  
22 There's a statement on page 12 that says, quote, "The  
23 Standard Review Plan is general guidance to the Staff  
24 on the type of information that is commonly acceptable  
25 for evaluating the environmental impacts of a proposed

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1 license action," close quote.

2 Do you agree with that statement?

3 DR. MORAN: Would you highlight that  
4 again? So let me read it again.

5 I would assume that's reasonable and  
6 that's their guidance, yes.

7 JUDGE BARNETT: Okay. Same document at  
8 143 states that pre-operational monitoring is  
9 conducted as part of site characterization and is  
10 addressed in Section 2 of this technical evaluation  
11 report, whereas restoration monitoring is conducted  
12 during groundwater restoration and is addressed in  
13 Section 6 of this technical evaluation report.

14 Do you agree that all the relevant  
15 portions of NUREG-1569 regarding pre-operational  
16 monitoring occur in Section 2?

17 DR. MORAN: I can't answer that. I don't  
18 know that to be the case.

19 JUDGE BARNETT: Okay. Continuing on, same  
20 document at 63, Table 2.7.3-1 lists typical baseline  
21 water quality indicators to be determined during  
22 pre-operational data collection. The accompanying  
23 text at page 64 also says, "At least four sets of  
24 samples spaced sufficiently in time to indicate  
25 seasonal variability should be collected and analyzed

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1 for each listed constituent for determining baseline  
2 water quality conditions," close quote.

3 Are there water quality indicators in that  
4 table that were not measured, or are you alleging that  
5 not enough samples were taken to satisfy that criteria  
6 in NUREG-1569?

7 DR. MORAN: Let me break that up into one  
8 question.

9 JUDGE BARNETT: Sure.

10 DR. MORAN: I'm not sure I understand  
11 exactly how you worded it, but let me try a shot at it  
12 since we're not in a court. I don't know if every one  
13 of those constituents was included on every sample  
14 that they took. There's just so much information in  
15 so many different places I can't say.

16 What I am -- well, first, what I would say  
17 is there are several other constituents I would  
18 require if I were doing this myself, and have done it  
19 in similar cases. And these are not just to be picky.  
20 These are really hydro-geologically important  
21 constituents and --

22 JUDGE BARNETT: Well, what would you pick  
23 that's not there?

24 DR. MORAN: For one, one of the most  
25 common metals that's in a roll-front water quality is

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1 strontium. Lithium. But again, this is off the top  
2 of my head.

3 JUDGE BARNETT: Sure.

4 DR. MORAN: Did I understand your question  
5 correctly, sir?

6 JUDGE BARNETT: Yes, I think so. What I'm  
7 asking is are there things in that table that are  
8 missing? And as I understood, your answer was you  
9 could not answer that specifically because there's so  
10 much data. Is that right?

11 DR. MORAN: Of this specific table --

12 JUDGE BARNETT: Correct.

13 DR. MORAN: -- compared to what they  
14 actually determined?

15 JUDGE BARNETT: Correct.

16 DR. MORAN: That I can't answer. I mean,  
17 it's voluminous.

18 JUDGE BARNETT: Sure.

19 DR. MORAN: But what I am also saying is  
20 that there are constituents that are obviously  
21 hydro-geologically important --

22 JUDGE BARNETT: That aren't --

23 MR. ELLISON: -- and they're also in  
24 EPA-recommended documents for ISL.

25 JUDGE BARNETT: Okay. Thank you. That's

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1 fair enough. Are you familiar with NRC Exhibit 091?  
2 It's title is "Staff Assessment of Groundwater Impacts  
3 From Previously Licensed In Situ Uranium Recovery  
4 Facilities." It's a memorandum to Chairman Jaczko,  
5 Commissioner Klein and Commission Svinicki from C.  
6 Miller 2009?

7 DR. MORAN: Yes.

8 JUDGE BARNETT: If so, do you disagree  
9 with the statement there that, quote, "The Staff is  
10 unaware of any situation indicating that: (1) the  
11 quality of groundwater at a nearby water supply well  
12 has been degraded; (2) the use of a water supply well  
13 has been discontinued; or (3) a well has been  
14 relocated because of impacts attributed to an ASR  
15 facility?" Do you agree with that statement, or do  
16 you disagree with that statement?

17 DR. MORAN: Well, again, let me walk that  
18 fine line. A statement is possibly true in the  
19 strictest legalistic sense, but only because based on  
20 my review of the literature and the information that  
21 supposedly was included with this memo they haven't  
22 made public the information necessary to really answer  
23 the question. There's supposedly data from three  
24 sites that this memo refers to. When you go to the  
25 actual document, the data aren't there. They have

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1 statements about the data, but the data themselves are  
2 not there. And that's for 3 sites out of maybe 30 or  
3 40 that have operated. So to me it's not a -- they  
4 really haven't answered the question.

5 JUDGE BARNETT: So if I understood  
6 correctly, you say that the Staff does not have proper  
7 foundation for that conclusion? Is that what --

8 DR. MORAN: I think, yes, that's a good  
9 way to say it.

10 JUDGE BARNETT: Okay. Finally, and then  
11 I'll move on to someone else, have you submitted any  
12 evidence that either the Black Hills Army Depot or  
13 past mining activities have impacted the baseline  
14 groundwater quality at the Dewey-Burdock site?

15 DR. MORAN: We have not submitted any  
16 information about the -- what will we call it, the  
17 Igloo site. What's the other term for that site?  
18 Yes. Well, we don't have any specific data. I do not  
19 anyway. We haven't submitted any for that. But  
20 there's plenty of information in the historical  
21 documents that we've referenced in my opinions talking  
22 about the impacts from the historical mining.

23 JUDGE BARNETT: Okay. Thank you.

24 DR. MORAN: Sure.

25 JUDGE BARNETT: Mr. Demuth, you stated;

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1 I'm looking at Exhibit APP 013 at pages 7 and 8,  
2 quote, "NUREG-1569 clearly defines three phases of  
3 groundwater monitoring." Then you're quoting  
4 NUREG-1569. "There are three distinct phases of  
5 groundwater and surface water monitoring:  
6 pre-operational, operational and restoration."

7 So the operational and restoration  
8 monitoring, will that occur outside of the NEPA  
9 process?

10 MR. LAWRENCE: Are you addressing the  
11 question to me?

12 MR. DEMUTH: He's asking me.

13 JUDGE BARNETT: Oh, I'm sorry. Mr.  
14 Demuth. I'm sorry.

15 MR. DEMUTH: Judge Barnett, I'm not sure  
16 I understand that question in terms of the legal  
17 aspects of it. Certainly that operational monitoring  
18 will occur under the regulation and reporting to NRC.  
19 And so those data will be collected, analyzed and  
20 reported in the manner specified by 1569, and  
21 certainly in a manner specified in the TR and the ER.  
22 To what extent that jumps to NEPA, I'm not the lawyer,  
23 so I can't answer that question.

24 JUDGE BARNETT: Well, who will have access  
25 to that data and can it be challenged? I'm talking

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1 about the operational and restoration data now. Will  
2 that data be publicly available, or just the  
3 applicants have that data?

4 MR. DEMUTH: My understanding is that  
5 information will be submitted to NRC. It will be  
6 publicly available certainly on ADAMS. NRC Staff  
7 could specify the exact method. But that would be  
8 public information that could be reviewed by anyone.

9 JUDGE BARNETT: Okay. You also on page 8  
10 of your testimony, quote NUREG-1569 as follows:  
11 "Wellfield hydrologic and water chemistry data are  
12 collected before in situ leach operations to establish  
13 a basis for comparing operational monitoring data.  
14 Hydrologic data are used to: (1) evaluate whether the  
15 wellfield can be operated safely."

16 So you need additional information other  
17 than what's available today to determine whether the  
18 wellfield can be operated safely? Am I reading that  
19 correctly?

20 MR. DEMUTH: Yes, you are. It would be  
21 additional confirmatory information on a wellfield  
22 scale, and that is one of the premises of 1569 and  
23 historic regulation of ISR facilities. 1569 mandates  
24 us really to collect data on a regional scale for a  
25 permit application which is prudent and warranted. As

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1 we move into a wellfield scale, then there's  
2 additional information. And one example is the pump  
3 test where you verify that your monitor wells are  
4 connected and there are valid monitoring points and  
5 also demonstrate confinement above and below. So,  
6 yes, that would be further confirmation, but it's part  
7 of a well-established process.

8 JUDGE COLE: In the latter part you're  
9 referring to the information contained in well  
10 packages?

11 MR. DEMUTH: Yes, sir.

12 JUDGE COLE: Prior to operation?

13 MR. DEMUTH: That is correct.

14 JUDGE BARNETT: Okay. Something that  
15 doesn't have anything to do with this hearing, but  
16 were the sampling results from the domestic wells  
17 shared with the property owners?

18 MR. DEMUTH: I can't answer that question.  
19 I would guess that it would be, but Powertech would  
20 have to answer that question, sir.

21 JUDGE BARNETT: Okay. If those wells are  
22 still being used, I would recommend that be done.  
23 Doesn't have anything to do with this hearing.

24 Finally, have you testified in NRC  
25 proceedings about other ISR projects?

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1 MR. DEMUTH: No.

2 JUDGE BARNETT: Okay. Thank you. Same  
3 question to Mr. Lawrence. Have you testified in NRC  
4 proceedings about other ISR projects?

5 MR. LAWRENCE: No, I have not.

6 JUDGE BARNETT: Thank you. That's all I  
7 have on Contention 2.

8 JUDGE COLE: Dr. Moran, you were asked a  
9 lot of questions about NUREG-1569. I assume you're  
10 familiar with that. If the Applicant meticulously  
11 follows the procedures in 1569, is it your view that  
12 that is or is not sufficient to qualify for obtaining  
13 a license from NRC?

14 DR. MORAN: Well once again, I don't like  
15 to avoid answering simply, but the truth is I don't  
16 know the permitting process that well, so I'm not sure  
17 I can say. But to me technically a lot of information  
18 I would require for just a hydro-geologic study that's  
19 reasonable isn't in there, in the document, in the  
20 NUREG-1569.

21 JUDGE COLE: In the well tests that they  
22 have to conduct after licensing and prior to  
23 operations, are you familiar with what the Applicant  
24 has to do then?

25 DR. MORAN: I am in general, yes, but --

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1 JUDGE COLE: Has to conduct a well  
2 package?

3 DR. MORAN: Yes.

4 JUDGE COLE: What does he have to do in  
5 that well package? What kind of information does he  
6 have to present?

7 DR. MORAN: Well --

8 JUDGE COLE: Let me give you a little more  
9 information. First of all, he has to have a  
10 wellfield. And before he operates the first one he  
11 has to conduct all those tests necessary to present  
12 the well package to NRC. Are you familiar with the  
13 things he has to do to collect the information in that  
14 well package?

15 DR. MORAN: In a general sense I am.

16 JUDGE COLE: Yes.

17 DR. MORAN: Can I respond a little bit  
18 further?

19 JUDGE COLE: Sure.

20 DR. MORAN: When I have asked colleagues  
21 about the availability of the information from  
22 comparable well package studies at other sites, nobody  
23 can point to any of them being public. So for me,  
24 part of the reason I'm pushing on this issue is if we  
25 wait to allow them to do that after permit approval,

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1 then that data goes into a black box. I don't  
2 disagree at all that they have to do some significant  
3 work, but a lot of it I'm arguing should be done  
4 earlier.

5 Can I add one other thing related to that?

6 JUDGE COLE: Sure.

7 DR. MORAN: If you compare the quality of  
8 the studies done by TVA in the late '70s and early  
9 '80s to the quality of the kinds of studies done now  
10 and the detail, what I'm arguing is they did most of  
11 what we're talking about pre-license approval in the  
12 late '70s and early '80s. We would probably have many  
13 fewer arguments if that level of work had been done.

14 JUDGE COLE: Yes, but they weren't under  
15 the NRC supervision either, too.

16 DR. MORAN: Well, they were doing this  
17 under AEC, as I recall.

18 JUDGE COLE: Okay. The purpose of this  
19 well test is to make sure that the system will  
20 function properly and they run through -- not a  
21 lixiviated solution, but regular water through this  
22 system to check to see if they have connection between  
23 the monitoring wells and whether the system is  
24 hydraulically functioning property, they've got the  
25 right amount of flow coming in. Is that your

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1 understanding also, sir?

2 DR. MORAN: We're talking about the --

3 JUDGE COLE: The test --

4 DR. MORAN: -- post-approval?

5 JUDGE COLE: -- associated with the pump  
6 package.

7 DR. MORAN: Post-license?

8 JUDGE COLE: Post-licensing,  
9 pre-operational.

10 DR. MORAN: Yes, that's my general  
11 understanding.

12 JUDGE COLE: Now, what would they learn  
13 from this information in the well package? Would this  
14 identify problems they have with operation prior to  
15 actual operation?

16 DR. MORAN: If the testing is designed in  
17 a manner that's complete, they will learn those  
18 details, but if it isn't, they won't.

19 JUDGE COLE: Well, they're going to  
20 conduct a test. They're just not going to use  
21 lixiviated water. They're going to use plain water and  
22 they're going to run a pump test and they're going to  
23 collect samples that's going to -- they'll run samples  
24 and collect the information contained in Table 7.3-1,  
25 which is quite similar to the table that you were

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1 shown before with all the chemicals on it, about 20 or  
2 25 chemicals. Looks like a pretty complete list.

3 So if they were to have a problem with  
4 boreholes or some hydraulic flow problems, would they  
5 be identified at this stage?

6 DR. MORAN: The reason I was being a  
7 little circular in my previous answer is it depends on  
8 who designed the locations of the wells and the  
9 completions of them. I mean, I seem to recall in some  
10 documents, the tens of thousands of pages we've all  
11 seen, that Powertech has been arguing that in many of  
12 these post-approval well packages that they not have  
13 to monitor some of the aquifers below the production  
14 zones. I'm not really trying to argue whether that's  
15 exactly correct. What I'm saying is you get the  
16 information you need if you put the wells in the right  
17 places and you run the tests correctly. And I can't  
18 control that here.

19 JUDGE COLE: So you're saying that you're  
20 not sure whether they test for any excursions during  
21 this pre-operational test into the lower level or the  
22 aquifer above and outside of the aquifers containing  
23 uranium?

24 DR. MORAN: I'm sure they'll do some of  
25 that. What I'm arguing is how extensive will it be?

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1 That's my answer.

2 JUDGE COLE: I don't know what you mean by  
3 how extensive.

4 DR. MORAN: Well --

5 JUDGE COLE: They're going to have an  
6 established connection and they'll run the test for so  
7 long to see if there is any hydraulic connection  
8 between the monitoring wells and the upper aquifers.

9 DR. MORAN: Right.

10 JUDGE COLE: And also they've got  
11 monitoring wells in this aquifer some distance out  
12 from the location of the wells.

13 DR. MORAN: Well, I can't speak exactly to  
14 what they're going to do in the future, but what we  
15 can already see from the thousands of pages of  
16 documents that they disagree with the existing  
17 literature. Most of the literature says there's  
18 leakage there. And they, Powertech, have disagreed  
19 with that. So I can envision similar problems in the  
20 future.

21 JUDGE COLE: Okay. But if there is  
22 leakage and it would -- and sufficient leakage such  
23 that the aquifer is not isolated, what's the  
24 consequence of that, and when you're looking at the  
25 results of the pump package?

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1 DR. MORAN: Could you repeat the question?

2 JUDGE COLE: What's the consequence of  
3 that when that when the Staff looks at it? Do you  
4 know?

5 DR. MORAN: Well --

6 JUDGE COLE: Maybe we should ask the  
7 Staff.

8 DR. MORAN: Yes, clearly the key is that  
9 the Staff has to have severe or really significant  
10 oversight capability here. But I mean, these are kind  
11 of theoretical questions to me right now, because I  
12 don't know the placements of the wells and the  
13 durations of the tests and so on.

14 JUDGE COLE: Well, let's ask the Staff  
15 members. Are you familiar with the subject we just  
16 discussed right now?

17 MR. PRIKRYL: Yes, I am.

18 JUDGE COLE: If you were to -- in your  
19 review of the pump package information what kind of  
20 problems would you be looking for and what would be  
21 the consequence of certain kinds of problems?

22 MR. PRIKRYL: Well, basically what the  
23 package has to demonstrate; and I think you already  
24 alluded to this, that the hydrologic test package has  
25 to demonstrate that the production zone is confined.

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1 That is, the monitor wells are in hydrologic  
2 communication with the production zone and also that  
3 any underlying or overlying wells are hydrologically  
4 isolated from the production zone.

5 JUDGE COLE: But how long do you have to  
6 have that test run to determine whether they are  
7 isolated?

8 MR. PRIKRYL: To tell you the truth, I'm  
9 not a hydrologist.

10 JUDGE COLE: I mean, are we talking about  
11 three days? Two days? Two hours? A week?

12 MR. LANCASTER: Yes, it wouldn't be hours.  
13 They have to have the flow rate that they would have  
14 in production and it would be not hours. That's for  
15 sure. But we'll be looking for isolation of the  
16 production aquifer and hydraulic connection between  
17 the patterned wells the monitoring wells that are in  
18 the same aquifer. In this case we'll also be looking  
19 specifically at this issue with the abandoned  
20 boreholes that weren't properly abandoned and are  
21 causing some leakage possibly. Those we'll have to --

22 JUDGE COLE: How would that manifest  
23 itself in the information in the well test package?

24 MR. LANCASTER: Well --

25 JUDGE COLE: Hydraulic flows?

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1                   MR. LANCASTER: It would be manifested in  
2 the case of a communication of fluids through the  
3 Fuson into their ore zone. During the pump test --  
4 let's say it's in the lower Chilson and you have  
5 monitoring wells in the Fall River above the Fuson,  
6 then during that pump test if there is a reaction, a  
7 drawdown of the Fall River, that would signify that  
8 there's a communication. In this case the Applicant  
9 has committed to abandoning the bore holes that have  
10 been shown to be linked to this communication in the  
11 pump tests that have been done thus far.

12                   JUDGE COLE: What kind of demonstration do  
13 they have to make for plugging these boreholes?  
14 Because there's caps and their plugs and then there's  
15 real plugs. What do they have to do?

16                   MR. LANCASTER: Well, their commitment is  
17 plugging in accordance with state requirements, as I  
18 recall, the abandonment and plugging. And that should  
19 suffice from what I understand or recall at this  
20 point.

21                   JUDGE COLE: Now, let's say they have an  
22 excursion during this pump test but you're not using  
23 lixiviant. What do you measure oat the stationary  
24 well if you're just pumping water in the system?

25                   MR. LANCASTER: Yes, you're measuring --

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1 it's measurements of head. The measurements of water  
2 levels, if you will.

3 JUDGE COLE: Okay.

4 MR. LANCASTER: Or head.

5 JUDGE COLE: Water elevation, yes.

6 (Simultaneous speaking.)

7 MR. LANCASTER: -- service measurements.

8 It's not measurement -- it's not using lixiviant  
9 obviously. It's not in the chemical realm.

10 JUDGE COLE: But that's the procedure you  
11 would use during the initial test?

12 MR. LANCASTER: Procedure? I'm not  
13 following you.

14 JUDGE COLE: Well, you said we're running  
15 the tests necessary to develop the well package.

16 MR. LANCASTER: Yes.

17 JUDGE COLE: Which the Applicant then has  
18 to present to the NRC to demonstrate that the system  
19 is working fine, there are no problems.

20 MR. LANCASTER: Right.

21 JUDGE COLE: What kind of problems do you  
22 look for and how do we measure -- is it just elevation  
23 at that point, water elevation?

24 MR. LANCASTER: Well, it's here in 1569  
25 under Section 5783, Acceptance Criteria No. 4. It

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1 specifies what we were just talking about. It also  
2 talks about verification of the accepted conceptual  
3 model of hydrology; that is, the conceptual model that  
4 has been defined under the licensing action. It will  
5 verify that as well, as well as these other actions  
6 we're looking at.

7 JUDGE COLE: Yes, do they also --

8 MR. LANCASTER: It talks to that.

9 JUDGE COLE: Do they also mention the  
10 drawdown?

11 MR. LANCASTER: Well, the way it's worded  
12 here is hydraulic -- let's see here. Isolation --  
13 let's see here. Let me see if I can see how it's  
14 stated in here. Yes, so hydraulic isolated from the  
15 vertical excursion monitoring wells.

16 JUDGE COLE: Right.

17 MR. LANCASTER: So they're demonstrating  
18 hydraulic isolation of their production zone from the  
19 vertical monitoring wells, the overlying monitoring  
20 wells. In this case we don't have underlying, and  
21 that's a whole other -- that's defined in the SER why  
22 that's not be done.

23 JUDGE COLE: Okay. And you do that by the  
24 elevation of the water?

25 MR. LANCASTER: Yes.

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1 JUDGE COLE: In the upper monitoring well?

2 MR. LANCASTER: Right. And those pump

3 tests that you were referring to --

4 JUDGE COLE: Yes.

5 MR. LANCASTER: -- when you were --

6 JUDGE COLE: Yes.

7 MR. LANCASTER: Okay.

8 JUDGE COLE: Do they also take

9 measurements on the hydraulic grade line?

10 MR. LANCASTER: Hydraulic?

11 JUDGE COLE: Hydraulic grade line. The

12 elevation of the water with a drawdown towards the

13 center well, towards the production well. Do they

14 measure that during the test to demonstrate what it

15 is?

16 MR. LANCASTER: I haven't directly

17 reviewed a wellfield package yet, but they will be

18 measuring for hydraulic connectivity between the

19 patterned wells and the perimeter monitoring wells

20 which are in the production aquifer, and those

21 measurements will be hydraulic heads to show that

22 there is a hydraulic connection. And that's the

23 purpose of --

24 (Simultaneous speaking.)

25 JUDGE COLE: Okay. But they also measure

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1 flow in each of the pipe systems so that --

2 MR. LANCASTER: Yes. Yes, right.

3 JUDGE COLE: -- you know what goes in,  
4 comes out or stays there?

5 MR. LANCASTER: That's right. Right. So  
6 they'll be reporting flow to us as well.

7 JUDGE COLE: Well, maybe we'll ask one of  
8 the Applicant's witnesses --

9 MR. LANCASTER: Sure.

10 JUDGE COLE: -- if they want to add to  
11 that situation with respect to the well pump packages.

12 Are you familiar with the work that's  
13 being done on the well packages, development of a well  
14 package? Have you ever done that?

15 MR. DEMUTH: Yes, sir. If I could answer  
16 that question?

17 JUDGE COLE: Okay.

18 MR. DEMUTH: Several things. The  
19 development of a wellfield package starts with a pump  
20 test design. Commonly there's interaction with NRC  
21 Staff, so they have some understanding of what the  
22 wellfield looks like, what the duration is going to  
23 be, those types of things. In some cases we'll  
24 perform numerical modeling to assess how long the test  
25 should be run based on the hydraulic parameters of the

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1 formation so that we see that we can actually have a  
2 cause and effect of we pump the well in the middle and  
3 we see a response at the monitor wells and that effect  
4 can be distinguished between background fluctuations,  
5 barometric fluctuations, etcetera.

6 And just so you know, sir, we have had  
7 instances where there were problem wells. And so the  
8 wellfield test does exactly what it's supposed to do,  
9 in that we run a test and we see that there's a  
10 problem.

11 JUDGE COLE: Now this is a system where  
12 you have the injection wells just as it is when you're  
13 going to go into full-time operation, and the  
14 production well is in the center, and you run through  
15 just as if you're putting in lixiviant material. Is  
16 that how you conduct your test?

17 MR. DEMUTH: No, sir. This would be what  
18 we call a pumping test where there's no injection that  
19 happens during this test. So we have a production  
20 well in the middle of a wellfield. We have monitor  
21 wells which are horizontal monitor wells surrounding  
22 the area outside where the patterns would be  
23 developed. And then we also have monitor wells in  
24 overlying and underlying sands as appropriate.

25 JUDGE COLE: Okay. So the injection wells

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1 are not used in the development of the pump package?

2 MR. DEMUTH: Commonly not. We have done  
3 some test scenarios where we've done some injection,  
4 but the typical pump test for wellfield development is  
5 a pumping process, not a pumping and injecting  
6 process. And the reason is when we're pumping and  
7 injecting during wellfield operation, the stress on  
8 the system is relatively low because most of the water  
9 is being re-injected, whereas during a pumping phase  
10 we can stress the system, as Mr. Lancaster said, to a  
11 greater degree than we'll see during operations. And  
12 also at that point we don't have approval to inject  
13 lixiviant. We only have approval to pump water out  
14 for the purposes of the pump test.

15 JUDGE COLE: Okay.

16 MR. DEMUTH: But we have founds wells that  
17 were a problem. We've gone and fixed those wells and  
18 we've rerun the test. Likewise, we've had cases where  
19 we may have a geologic pinch-out between the pumping  
20 well and a monitor well, and 1569 tells us that we  
21 have to show that this monitor well is a valid  
22 monitoring point. If we don't see a hydraulic  
23 connection between the two in the same zone, then it's  
24 not a valid monitor point.

25 JUDGE COLE: So if the water level in the

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1 monitoring well is going lower, you have a problem?

2 MR. DEMUTH: Not if you're in the same  
3 zone. We would expect it to --

4 JUDGE COLE: Oh, I understand that. I'm  
5 talking about above the aquiclude.

6 MR. DEMUTH: Correct. And so we've had  
7 instances where we've seen that and we've gone and  
8 plugged wells and we've rerun the test to show that  
9 that problem was fixed. We've also had instances  
10 where geologically a well wasn't in the right spot and  
11 we've put additional wells in to make sure that we  
12 have sufficient monitor wells to monitor that  
13 operation. So in that sense the hydraulic test  
14 packages and that approach it works to assure the safe  
15 operation of that wellfield.

16 JUDGE COLE: Prior to the time you used  
17 the pumping test or conduct the pumping test do you  
18 have to have the injection wells in place?

19 MR. DEMUTH: No, you do not. And in  
20 fact --

21 JUDGE COLE: Well, it's not a complete  
22 package, right?

23 MR. DEMUTH: Well, 1569 and the NRC  
24 Regulations do not allow us to construct all the  
25 injection wells before we have approval for the

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1 wellfield package.

2 JUDGE COLE: Okay. But you do have to  
3 conduct your monitoring wells and the center  
4 production well?

5 MR. DEMUTH: That is correct, as well as  
6 we have monitor wells within the area that will be  
7 mined that are also installed. But they're only  
8 monitor wells. They're not production wells at that  
9 point.

10 JUDGE COLE: Okay. All right, sir. Thank  
11 you.

12 DR. MORAN: Is it possible to ask a  
13 question?

14 JUDGE COLE: Did you want to say  
15 something, sir?

16 DR. MORAN: I wanted to ask a question.

17 JUDGE COLE: I might not know how to  
18 answer it, but go ahead.

19 (Laughter.)

20 DR. MORAN: Well, it's sort of a  
21 rhetorical question. If you wanted to understand more  
22 about this process, wouldn't it be wise for us to be  
23 able to go to the various state and federal agencies  
24 that hold the historic data for these well packages  
25 and put that information together and see how well

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1 we've done with all of this historically?

2 JUDGE COLE: How many instances has the  
3 preparation and conduct of a -- development of a well  
4 package identified problems that resulted in  
5 additional work and correction of problems? Is it a  
6 common thing or is it an uncommon thing?

7 MR. DEMUTH: I would say that we've done  
8 at least 40 wellfield pump tests over the years and  
9 probably 4 of those have identified some problems that  
10 resulted in additional work. So 10 or 20 percent  
11 might reveal that there needs to be some modification  
12 in terms of the wellfield design. The more normal  
13 circumstance is that it does not, and in fact it  
14 confirms the regional geology and the regional  
15 understanding that was presented during the original  
16 application.

17 JUDGE COLE: I understand. And according  
18 to the NRC rules don't they have to go through the  
19 same process for every additional wellfield that they  
20 construct before they operate it? So if they've got  
21 -- this is an example, they have five, six injection  
22 wells and a production in the middle. They conduct  
23 the necessary tests on that. Before they go to the  
24 next one they have to do the same thing. Is that your  
25 understanding?

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1 MR. DEMUTH: That is correct. Each  
2 wellfield has to be tested, not only the pumping test  
3 to determine hydraulic characteristics, connection for  
4 the monitor wells, etcetera, but also water quality  
5 monitoring.

6 JUDGE COLE: Right. All right, sir.  
7 Thank you.

8 This is a question for Dr. Moran. Chapter  
9 5 of the FSEIS assesses the cumulative impacts on  
10 groundwater from past, present and reasonably  
11 foreseeable future actions including past mining  
12 activities. Is that your understanding, that that's  
13 correct?

14 DR. MORAN: I don't recall if that's the  
15 correct wording. I'll accept that you're reading it  
16 as it's stated, but I don't recall seeing that they  
17 did what I would call a reliable cumulative  
18 evaluation.

19 JUDGE COLE: There's been some discussion  
20 about what's required under Criterion 5 and Criterion  
21 7 in 1569. Are you familiar with the difference there  
22 between --

23 DR. MORAN: No, I'm not.

24 CHAIRMAN FROEHLICH: -- Criterion 7 and  
25 Criterion 5?

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1 DR. MORAN: No, I don't recall.

2 CHAIRMAN FROEHLICH: You can't do much  
3 with Criterion 5. You got to complete Criterion 7  
4 first and then Criterion 5 requires you to collect  
5 information on really prior to operational systems.  
6 If you're not familiar with that, I can't ask a  
7 question on that.

8 DR. MORAN: I'm not familiar with the  
9 details.

10 JUDGE COLE: Yes. I think the Intervenors  
11 have criticized the Applicant, and it looks like  
12 there's some confusion about what's required under  
13 Criterion 5 and Criterion 7. Are you familiar with  
14 that situation, sir? I'll ask the NRC Staff.

15 MR. PRIKRYL: Yes, in the testimony that  
16 has been submitted by the Intervenors it seems like  
17 they don't understand the difference between Criterion  
18 7 and Criterion 5. Yes.

19 JUDGE COLE: And what do we have to do  
20 under Criterion 5? We have to develop a certain kind  
21 of water quality data that's identified as  
22 Commission-approved data?

23 MR. PRIKRYL: Yes, under Criterion 5 the  
24 Applicant or the Licensee will have to -- based on its  
25 hydro-geologic test packets and the water quality data

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1 that is collected there they will have to establish  
2 what's called Commission-approved background. And  
3 this is used to set aquifer restoration goals and it  
4 also is used to establish what's called upper  
5 contaminant levels for excursion monitoring.

6 JUDGE COLE: Yes, and they have to do that  
7 over what period, minimum period prior to operation?  
8 Is this the criterion that says you have to collect  
9 four samples over a one-year period and then collect  
10 your water quality data and average the data to start  
11 developing the Commission-approved standard?

12 MR. PRIKRYL: Yes, the criteria for  
13 establishing -- I believe it's four samples over a  
14 yearly -- quarterly sampling, yes. And that's to  
15 include the constituents that are included in  
16 NUREG-1569. The table; I believe it's 2.3.7-1, has to  
17 include all those constituents.

18 JUDGE COLE: Yes, but I've got a different  
19 number. But is it the same thing as the background  
20 water quality parameters and indicators for  
21 operational groundwater monitoring?

22 MR. PRIKRYL: Could you clarify that  
23 question, please?

24 JUDGE COLE: Is it the same list of  
25 chemicals? And it's identified as background water

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1 quality parameters and indicators for operational  
2 groundwater monitoring. It seems to have the same  
3 number of chemicals on it.

4 MR. PRIKRYL: Yes. Yes. That's correct.  
5 Yes.

6 JUDGE COLE: All right. Thank you.

7 CHAIRMAN FROEHLICH: While on the subject,  
8 at page 26 of the Staff testimony, I guess answer  
9 2.10, there's a discussion where the Staff wishes to  
10 emphasize that, quote, "Powertech provided an analysis  
11 of historical water quality data collected by TVA and  
12 recent water quality data at or near the Dewey-Burdock  
13 site only to demonstrate the consistency of  
14 groundwater quality over time."

15 With that statement in mind, at the end of  
16 the paragraph the Staff concludes, "For that reason  
17 pre-operational baseline groundwater data should not  
18 include data from historical groundwater conditions  
19 which might bias the data set." Could you explain for  
20 me? I'm not quite sure -- if you're looking at  
21 historical or what it is, how does that bias the data?

22 MR. PRIKRYL: Well, the TVA groundwater  
23 data was collected back in the late '70s, early '80s,  
24 so there's really no way to determine whether that  
25 groundwater quality is representative of the

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1 groundwater quality that currently exists at the site.

2 JUDGE COLE: Because there are still  
3 people drilling holes?

4 (Laughter.)

5 MR. PRIKRYL: Yes. So in a NEPA analysis  
6 what we're doing is we're looking at -- we're trying  
7 to describe the affected environment for baseline  
8 conditions or existing conditions, or existing  
9 groundwater conditions at this time so we can do our  
10 NEPA analysis. We can compare the impacts of the  
11 proposed action on existing conditions. So using the  
12 TVA data would possibly -- if it's not representative  
13 of existing conditions, it's going to bias the data  
14 set.

15 JUDGE COLE: It might be better. It might  
16 be worse.

17 MR. PRIKRYL: Exactly.

18 CHAIRMAN FROEHLICH: Okay. Thank you.  
19 That clarifies it.

20 I see from my colleagues that they have  
21 completed their questions, I think for the most part,  
22 on Contention 2. I note also it is noon. Would this  
23 be a convenient time to take our lunch break and then  
24 begin with the Board's cross-examination on Contention  
25 3 after lunch? Is this a convenient time?

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1 MR. PUGSLEY: NO objection.

2 MR. PRIKRYL: Your Honor, it turns out  
3 that everyone goes to the same closest restaurants and  
4 then they get jammed up. And would it be possible; I  
5 don't know where we are with the schedule, to have an  
6 extra 20 minutes for the lunch break to accommodate  
7 being able to get our food and consume it?

8 CHAIRMAN FROEHLICH: Seems reasonable. If  
9 we start at 1 hour and 20 minutes from when we break  
10 -- if we start promptly, that's certainly fine.

11 Why don't we break then for 1 hour and 20  
12 minutes and resume here at 1:20? Our intention is to  
13 begin cross-examination on Contention 3.

14 (Whereupon, the above-entitled matter went  
15 off the record at 11:59 a.m. and resumed at 1:20 p.m.)

16 CHAIRMAN FROEHLICH: Good afternoon, all.  
17 We'll be back on the record. At this point, I'd like  
18 to swear in the remaining three witnesses for this  
19 panel so that we can proceed with questions. So if  
20 Linsey McLean, Susan Henderson, and Marvin Kammerer  
21 would rise, please? Raise your right hand, please?

22 Do you solemnly swear or affirm that the  
23 statements that you will make in the hearing before  
24 the ASLBP will be true and correct to the best of your  
25 k n o w l e d g e a n d b e l i e f ?

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1           Remain standing. Do you adopt your pre-  
2           filed testimony as your sworn testimony in this  
3           proceeding?

4           The record will reflect that all three  
5           witnesses responded in the affirmative. Thank you.  
6           You may be seated.

7           Judge Barnett, I believe you had a follow  
8           up on Contention 2?

9           JUDGE BARNETT: Yes, in reference to NRC-  
10          091. Ms. Henderson?

11          MS. HENDERSON: Yes.

12          JUDGE BARNETT: Thank you for coming  
13          today. What I have here, if you remember earlier this  
14          morning I asked another witness this question. This  
15          is NRC-091 and it's a memorandum to the Commission  
16          from Ms. Miller in 2009 called Staff assessment of  
17          groundwater impacts from previously licensed in situ  
18          uranium recovery facilities. And there is a statement  
19          there that -- well, you can read the statement.

20          So my question is do you have any  
21          information that would contradict that statement?

22          MS. HENDERSON: I would tell you that the  
23          process for testing for chemical warfare agents is  
24          extremely expensive and difficult. There are only six  
25          laboratories in the United States that test for these

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1 things. The Government has long manufactured these  
2 things under extreme secrecy. They have been  
3 unwilling to divulge what they have in those  
4 chemicals. The chances that anyone could have easily  
5 tested for it would be surprising to me.

6 JUDGE BARNETT: Thank you. Mr. Kammerer,  
7 same question to you, please. Are you aware of any  
8 information that would contradict that statement from  
9 NRC Staff to the NRC Commission?

10 MR. KAMMERER: My awareness of these  
11 weapons is rather limited. However, we don't know the  
12 consequences of this type of activity, unfortunately.

13 JUDGE BARNETT: Thank you.

14 MS. HENDERSON: Could I make an additional  
15 comment?

16 JUDGE BARNETT: Sure.

17 MS. HENDERSON: Many years ago, we began  
18 to have difficulties with dead animals on the Black  
19 Hills Army Depot which is a 21,000-acre site. And I  
20 had a neighbor that lost 1,200 sheep in a 4-day period  
21 on the east side of the depot. The animals died of  
22 violent convulsions. They had grass in their mouth.  
23 No flies would land on the carcasses. We posted the  
24 carcasses with the state veterinarian in Brookings and  
25 he said I have no idea what this is. It is not an

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1 animal disease. It is not anything that I've ever  
2 seen before.

3 Now, the problem that we have with  
4 detecting contamination is we don't know exactly what  
5 chemicals are there. We don't know what the breakdown  
6 has been of them and then we have the secrecy of the  
7 Federal Government. The Federal Government does not  
8 want to admit that it is killing anybody's 1,200  
9 sheep.

10 We went to Washington to try to get  
11 somebody to help us with this. The CDC came out and  
12 said whatever you do, don't give up on this because  
13 there are terrible, horrible things there that can  
14 kill any kind of animal or human life that is exposed  
15 to it. We know there's a huge problem here, but we  
16 are powerless to deal with it.

17 JUDGE BARNETT: Okay, thank you. And I  
18 will note that Mr. Kammerer, do you have something  
19 else you'd like to say?

20 MR. KAMMERER: I wish to inform you that  
21 I had a brother and a nephew who died, a brother who  
22 had very much complications with Agent Orange and a  
23 nephew who died of the same in 'Nam.

24 JUDGE BARNETT: Okay, thank you and I will  
25 note that I have read your testimony and appreciate

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1 that in this case.

2 CHAIRMAN FROEHLICH: Let's move on to  
3 Contention 3.

4 JUDGE BARNETT: Okay, Dr. Moran, in  
5 support of this contention, you site references that  
6 the Fuson shale, am I pronouncing that correctly?

7 DR. MORAN: I've heard Mr. Demuth say it  
8 differently. What's the correct pronunciation?

9 MR. DEMUTH: Fuson.

10 JUDGE BARNETT: Fuson. I'll probably  
11 butcher that several times, but I'll try to get it  
12 straight. In support of this contention, you cite  
13 references that the Fuson shale is leaky. Is that  
14 correct?

15 DR. MORAN: Yes.

16 JUDGE BARNETT: Are you alleging that any  
17 other confining layer at the site is leaky?

18 DR. MORAN: I don't think we know. I  
19 don't think we have adequate information from these  
20 studies to say.

21 JUDGE BARNETT: But you're not alleging  
22 based on any information that you have that anything  
23 else is leaky. Your testimony is you just don't know.  
24 Is that correct?

25 DR. MORAN: In general, I don't think

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1 we've done the testing to answer it, yes.

2 JUDGE BARNETT: Understand. Okay, I'm  
3 going to throw out this question to the experts from  
4 the Applicant and I'm going to ask the Staff the same  
5 question so whoever wants to answer can. Is the Fuson  
6 shale necessary to contain ISR fluid migration at this  
7 site?

8 MR. LAWRENCE: I would say no, it is not.  
9 Some of the testing that has been done at the site has  
10 identified some vertical impediments to flow within  
11 the Chilson and within the Fall River. If you  
12 remember the type log that we had up earlier where we  
13 had subdivisions within the Fall River and also in the  
14 Chilson, some of the pump tests that were conducted  
15 had wells that were completed in different intervals  
16 within those two stratigraphic units. And there were  
17 delays in the response during pumping which would  
18 indicate there is some vertical restriction to  
19 groundwater flow.

20 JUDGE BARNETT: I understand that, but is  
21 this necessary? If that is leaky, does it make a  
22 difference in the environmental impact of this site if  
23 it is leaky?

24 MR. LAWRENCE: I don't think so. It just  
25 has to be taken into consideration in your wellfield

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1 design and how you produce the -- or how you extract  
2 the minerals.

3 JUDGE BARNETT: I ask the same question to  
4 the Staff, either one can answer.

5 MR. PRIKRYL: I believe the question is  
6 whether the Fuson is leaky or not and whether those  
7 would cause a greater impact?

8 JUDGE BARNETT: Yes, the question is not  
9 whether it's leaky, but are you depending on it not  
10 being leaky to approve the site? It is a confining  
11 layer in terms of approving the site is my question?

12 MR. PRIKRYL: No, no. I don't think so.

13 JUDGE COLE: Sir, and why is that?  
14 Because there are aquitards above and below that could  
15 take the place of the Fuson?

16 MR. PRIKRYL: Well, I guess maybe I didn't  
17 understand the question, but there are thick aquitards  
18 both above and below the Inyan Kara aquifer which  
19 consists of the Fall River and the Chilson member.

20 JUDGE COLE: But if the Fuson were a very  
21 leaky aquitard, is there a way you could operate  
22 mining uranium without the help of any barrier in the  
23 Fuson aquitard?

24 MR. PRIKRYL: I think it would be the  
25 degree of leakiness would probably play into it.

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1 JUDGE COLE: Let's say it's infinitely  
2 leaky.

3 MR. PRIKRYL: If it's infinitely leaky,  
4 then yes, it would play a role in the mining  
5 operations.

6 JUDGE BARNETT: Well, it would play a  
7 role, but would it play a role in containing the  
8 fluids?

9 MR. PRIKRYL: If it was infinitely leaky,  
10 it would not.

11 JUDGE COLE: So you could just use uranium  
12 mining from the Fall River and the Chilson, so two  
13 aquifer for mining.

14 MR. PRIKRYL: That's a possibility, yes.

15 JUDGE COLE: Has that been considered?

16 MR. PRIKRYL: I'm not sure if the  
17 Applicant or the Licensee has considered that, no.

18 JUDGE COLE: Thank you.

19 MR. DEMUTH: Judge Barnett, if I could  
20 weigh in on that question?

21 JUDGE BARNETT: Yes.

22 MR. DEMUTH: Sometimes the definition of  
23 leaky can become kind of nebulous. The room is kind  
24 of dark here, well, what's dark to me is different  
25 than what's dark to you.

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1           And so 1569 states that we have to have  
2 demonstrated that we can control fluids and there's  
3 different ways to do that. One way to do that is with  
4 geology. One way to do that is operational practices  
5 where you maintain a net bleed or a combination  
6 thereof.

7           JUDGE BARNETT: Maintain what, sir?

8           MR. DEMUTH: A net bleed meaning you over  
9 produce, you produce more fluid than you re-inject.

10          JUDGE COLE: That's what controls the  
11 flow.

12          MR. DEMUTH: Correct.

13          JUDGE COLE: Where you have a hydraulic  
14 radiant that's flowing towards the collection wells.

15          MR. DEMUTH: Even -- well, 1569, the  
16 verbiage is an aquitard, meaning restricting flow, not  
17 an aquiclude meaning that it doesn't allow any flow to  
18 occur at all. So concrete, depending on how long it's  
19 cured has a permeability that one can measure under  
20 enough stress. We refer to it typically as  
21 impermeable.

22                 So in this case, the Fuson shale, has it  
23 been demonstrated that it is a confining unit such  
24 that ISR operations can be safely conducted. Yes, it  
25 has. But to add to that, we've had sites before where

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1 we had what looked like an unplugged exploration  
2 borehole that penetrated the confining zone, but yet,  
3 through engineering practices and hydraulic control,  
4 we were able to safely mine that as well.

5 JUDGE BARNETT: Okay, could we put up APP-  
6 017, please? And I believe this is page 2. I'm not  
7 trying to trap anybody here, I'm just trying to make  
8 sure I understand. Is it possible to blow that up a  
9 little bit so we can read the formations?

10 So as I understand it, the recovery is  
11 going to be done in the Chilson member of the Lakota  
12 formation and the Fall River formation, is that  
13 correct

14 MR. DEMUTH: Yes.

15 JUDGE BARNETT: So my question is if the  
16 Fuson shale is leaking, what difference does that  
17 make?

18 MR. LAWRENCE: It depends on the  
19 locations. The wellfields in some areas you might  
20 only have a Chilson wellfield or a Chilson mineralized  
21 zone that you're going to extract from. In other  
22 areas, it might just be the Fall River. There are  
23 locations where they are stacked where you have ore in  
24 both units. We're required, the Applicant is  
25 required, to maintain the fluids within the wellfield

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1 that's being mined. So in the case where you would  
2 have an overlying Fall River that did not have  
3 mineralization and you were producing from the  
4 Chilson, you would be required to maintain your fluid  
5 control in that Chilson. So you would place  
6 monitoring points in the Fall River to demonstrate  
7 that you were not losing control of your fluids.

8 JUDGE COLE: So you wouldn't have any  
9 screens taking in liquid from the Fall River?

10 MR. LAWRENCE: No stream, no, sir.

11 JUDGE COLE: Screen.

12 MR. LAWRENCE: Oh, screen. Correct, yes,  
13 right. The wells will be designed so that they are  
14 discretely screened in the zones that they need to be  
15 for purposes of monitoring. If we are trying to  
16 monitor, if there are impacts to the overlying  
17 aquifer, then those monitor wells would be screened  
18 specifically in that zone and not through the  
19 confining unit into the deeper zone.

20 JUDGE BARNETT: So if I understood it  
21 then, you do need for the Fuson shale to be relatively  
22 impermeable. Is that correct?

23 MR. LAWRENCE: Correct.

24 JUDGE COLE: Unless you're going to mine  
25 two aquifers.

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1 MR. LAWRENCE: You would technically still  
2 need to maintain fluid control in each of the specific  
3 wellfields. At the end of the day you have to go  
4 through restoration for both of those wellfields, so  
5 it might be a little confusing if fluids are moving  
6 back and forth. But you still have to clean them both  
7 up to a year.

8 JUDGE COLE: Wouldn't it be one wellfield  
9 with a leaky aquitard in the middle?

10 MR. LAWRENCE: Well, keep in mind the Fall  
11 River and the Chilson are both over 100 feet thick.  
12 Typically, your ore zones are only 5 to 10 to 15 feet  
13 at the maximum. So when we kind of look at the  
14 Chilson, we say we're going to produce out of the  
15 Chilson, it's actually a very small portion of the  
16 Chilson that we're really producing out of. So those  
17 wells, the screens are set up so they're screened only  
18 across the mineralized portion of aquifer. So it's a  
19 very controlled system.

20 Each one of these well patterns, there's  
21 typically 100 feet on the side, so a little bit bigger  
22 than this room. We have very tight control in the  
23 geology. We have very good control on how the fluids  
24 are being transferred back and forth where they're  
25 being injected and how they're being pumped out.

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1           And so we're not really -- we look at the  
2           Chilson, but we're not producing the entire thickness  
3           of the Chilson or the entire thickness of the Fall  
4           River at any one point.

5           JUDGE COLE:    So using two mines is a  
6           pretty rare event?

7           MR. LAWRENCE:  It happens.  You can have  
8           contiguous production, but you get into difficulties  
9           because you start getting interference between the  
10          different pumping units.  So it's a lot easier to  
11          produce one unit and typically I think what they'll do  
12          is they'll start from the bottom and work their way  
13          up.  Keep in mind, you might have two or three  
14          different ore bodies just within the Chilson and they  
15          may be stacked vertically.  So you'd want to produce  
16          one and extract as much as you could.  Do the  
17          restoration, and then move up the hole, up the  
18          stratigraphic sequence.

19          JUDGE COLE:  Thank you.

20          JUDGE BARNETT:  Mr. Clark, what is the  
21          exhibit number for the FSEIS?  I'm having trouble  
22          finding that.

23          MS. JEHL:    009, NRC-009.  It's four or  
24          five -- five or six parts.

25          JUDGE BARNETT:  I didn't mark my citations

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1 as clearly as I had hoped.

2 MS. JEHLE: Excuse me, 008A through B.

3 JUDGE COLE: The Final EIS is four parts,  
4 NRC-008-A1, A2, B1, and B2.

5 JUDGE BARNETT: So on page 3-34 of the  
6 FSEIS, I'm going to address this question to the Staff  
7 and the Applicant. It's page 206 of the PDF.

8 Go to the last paragraph. There you go,  
9 right there, it's fine.

10 So I'm reading from the second sentence of  
11 the last paragraph in the FSEIS and it says, "Based on  
12 the 1979 aquifer test, Boggs & Jenkins, 1980,  
13 suggested there may be a direct connection between the  
14 Fall River and the Chilson aquifers with the Fuson.  
15 Additional aquifer pumping tests conducted in the  
16 Burdock area in 2008 also demonstrated hydraulic  
17 connection between the Fall River and the Chilson  
18 through the intervening Fuson shale. Interpretations  
19 of both the 1979 and 2008 pumping test results were  
20 found to be consistent with a leaky confined aquifer  
21 model. The Applicant developed a numerical  
22 groundwater model using site-specific geological  
23 hydrologic information. Based on the results of the  
24 numerical model, the Applicant concluded that vertical  
25 leakage through the Fuson shale is caused by

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1           improperly installed wells or improperly abandoned  
2           boreholes."

3                       So it appears in the FSEIS that it  
4           acknowledges that it is leaky, whether it's coming  
5           from boreholes or whatever else, it is leaky.

6                       I'll ask the Staff, is that correct? Am  
7           I reading that correctly?

8                       MR. PRIKRYL: Yes, that's correct.

9                       JUDGE BARNETT: Would you concur with  
10          Powertech experts -- concur that the Fuson is leaky,  
11          for whatever reason? Improperly plugged boreholes or  
12          whatever reason?

13                      MR. LAWRENCE: You're asking Powertech?

14                      JUDGE BARNETT: Yes, asking Powertech.

15                      MR. LAWRENCE: Yes, there were certainly  
16          conditions that demonstrated communication.

17                      JUDGE BARNETT: Back to my question, if  
18          these things -- if it has to be -- if you're depending  
19          on it not being permeable and it is leaky, regardless  
20          of what's causing it, how then are you meeting your  
21          criteria for not impacting the environment?

22                      MR. LAWRENCE: That goes back to the  
23          development of the wellfield data package. If you run  
24          a specific test in the area that you plan to mine, and  
25          identify leakage that is occurring, particularly if

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1 you can identify that it is an improperly abandoned  
2 borehole or improperly constructed well, as was the  
3 case in these tests, you can remedy that situation,  
4 plug that borehole, rerun the tests and show that  
5 basically you have retained confinement.

6 JUDGE BARNETT: And all that would occur  
7 outside the FSEIS?

8 MR. LAWRENCE: Yes.

9 JUDGE BARNETT: Also, if I go to OST-9  
10 please. And this is at page 61. It's actually on  
11 page 63 of the document. I'm sorry, 63 of the  
12 exhibit, page 53 of the document. Right there.  
13 Actually, you can see somebody has made the notation  
14 in the margin there.

15 So I'm reading from this. This was TVA's  
16 report of how do you respond -- I'm going to ask this  
17 of the Applicant and the Staff, how do you respond to  
18 TVA's conclusion that the "results of the aquifer  
19 tests at the project site suggested that the Fuson  
20 shale is not an effective barrier near and northeast  
21 of the shaft site"?

22 MR. LAWRENCE: If you'll notice in the top  
23 of that paragraph, the very first line says "a second  
24 aquifer test was run in which an inflatable packer was  
25 used to isolate the two aquifers."

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1           The problem with these tests was they  
2 drilled one well as you pointed out and screened it in  
3 both intervals at the same time and they counted on  
4 running an inflatable packer between the two zones of  
5 interest to run two different tests. Personally or  
6 professionally, I would never do that. I'm not sure  
7 why they ran it that way. Some people feel like  
8 packers are an adequate way to isolate zones, but in  
9 a case like this where you're trying to demonstrate  
10 you have isolation, I think that was a terribly  
11 designed pumping test.

12           JUDGE BARNETT: So your conclusion is TVA  
13 was incorrect?

14           MR. LAWRENCE: I am.

15           MR. DEMUTH: If I might add to that, Judge  
16 Barnett, the objective of these tests were to evaluate  
17 underground mining operations. This was not conducted  
18 for ISR operations. And in addition, the pumping rate  
19 as noted in the second to top paragraph was 261  
20 gallons a minute.

21           A different objective is a different type of  
22 test.

23           JUDGE BARNETT: I understand that, but if  
24 the aquifer -- I'm sorry, the aquitard is leaky, it's  
25 leaky, right? It doesn't leak under certain tests and

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1 not under others. Maybe you can see it better in  
2 certain tests and not others, but if it's leaky, it's  
3 leaky. Is that correct?

4 MR. DEMUTH: I would not dispute that, but  
5 again, what type of flux do you need to have where  
6 it's a problem or it's not a problem?

7 JUDGE BARNETT: That's what I'm asking  
8 you.

9 MR. DEMUTH: Okay. Well, in this case,  
10 our data indicates that there is not sufficient flow  
11 across the Fuson where it's an issue, except in one  
12 area where we have a well which is completed in both  
13 zones and allows it to communicate. There may be one  
14 or two unplugged exploration boreholes which are  
15 identified in the application. So in that area, the  
16 wellfield, any wellfield test is going to have to be  
17 e x a m i n e d v e r y c a r e f u l l y .

18 Other areas of the site we don't see the  
19 same issues.

20 JUDGE BARNETT: So do you contend now that  
21 based on the information you have, the Fuson shale is  
22 not leaky?

23 MR. DEMUTH: I'm not saying that. I'm  
24 saying that the Fuson shale has properties which  
25 support safe ISR mining for the site. And again,

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1 leaky is kind of a nebulous term. We have to define  
2 that. How much flow do we have across there? An  
3 aquifer sufficiently restricts flow such that ISR  
4 operations can be safely conducted. That's what we're  
5 looking for.

6 JUDGE BARNETT: I'll ask the Staff the  
7 same question. How do you respond to that statement  
8 from TVA, their conclusion that the Fuson was leaky or  
9 I'm sorry, that it is not an effective barrier near  
10 and northeast of the shaft site, understanding there's  
11 no shafts in this case? I understand that.

12 MR. PRIKRYL: Judge Barnett, I don't see  
13 that statement on this page anywhere.

14 DR. LaGARRY: Judge, I think as you were  
15 scrolling down from where you initially stopped on the  
16 page, I think one or two pages upwards I believe I did  
17 see that statement.

18 JUDGE BARNETT: Correct, correct, you're  
19 right. It's at the bottom of that page. Bottom of  
20 document page 53. Do you see it there now? I'm sure  
21 I saw it a minute ago. I have it in my notes.

22 DR. LaGARRY: Right at the bottom of page  
23 51 in the document.

24 JUDGE BARNETT: Oh, page 51, okay.

25 DR. MORAN: I thought it was on page 53.

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1 JUDGE BARNETT: Yes, I see it.

2 MR. PARSONS: Your Honor, if I may, Jeff  
3 Parsons, over here. It is on page 51. It appears to  
4 be in the third full paragraph.

5 JUDGE BARNETT: There we go. Third full  
6 paragraph, right there. "Results of aquifer tests at  
7 the project site suggest that the Fuson shale is not  
8 an effective barrier near and northeast of the shaft  
9 site." What is the Staff's response to that?

10 MR. PRIKRYL: Well, I'm not familiar with  
11 this pump test, what shaft they're talking about or  
12 what the location of the pump test itself.

13 JUDGE BARNETT: So this is --

14 MR. PRIKRYL: So I don't know if I can  
15 comment on this.

16 JUDGE BARNETT: This is in evidence. It  
17 is OST-009, TVA Draft Environmental Statement Edgemont  
18 Uranium Mine. So has the Staff looked at that  
19 document?

20 MR. LANCASTER: 1979 document or 1980  
21 something document?

22 DR. MORAN: It's 1980.

23 JUDGE BARNETT: Has the Staff looked at  
24 that document?

25 MR. LANCASTER: These TVA -- we requested

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1 this information in our REIs and I think as I recall  
2 their conclusions were it's leaky because of a variety  
3 of reasons. And one could be the boreholes not being  
4 properly abandoned or not being abandoned at all with  
5 the correct procedure for plugging and that sort of  
6 thing.

7 We recognize that the pump tests show that  
8 there is leakiness. We also recognize that the  
9 modeling of effort performed by Powertech that we  
10 reviewed as far as it's set up and assumptions and  
11 input data and that sort of thing.

12 That model, as I understand it, that  
13 Powertech did using the site data showed that this  
14 leakiness can only be explained by -- or the model  
15 would only work if it was a leaky borehole situation.  
16 And so, with the pump test showing this leaky nature  
17 and the model effort showing that it's plausible or a  
18 plausible explanation would be the unplugged  
19 boreholes.

20 Errol could respond to this better than I  
21 could, but we've looked at these documents under the  
22 safety review.

23 JUDGE BARNETT: Yes, I'm not doing that.  
24 My question is how do you respond to TVA's conclusion  
25 that there was not an effective barrier? Do you

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1 reject their conclusion? You've looked at it.

2 MR. LANCASTER: Well, their wording of  
3 effective barrier, that's sort of an ambiguity to me.  
4 What are they really trying to say there? Effective  
5 barrier. An aquitard -- and depending on the use of  
6 the groundwater, what you're trying to do, it could be  
7 you may need hydrologic conductivities that are much  
8 higher and thicknesses that are much higher. It  
9 depends on the application.

10 I would -- see, that's -- as far as the  
11 effective barrier question, I don't want to skirt the  
12 answer here, but I would say that Staff recognize that  
13 we're dealing with a leaky aquitard and our conclusion  
14 was that it's associated primarily with the borehole  
15 situation. Does that answer the question?

16 JUDGE BARNETT: My understanding, see if  
17 I've got this right, from the Applicant and the Staff  
18 is you can see that it is leaky. Your conclusion is  
19 that it's due to unplugged boreholes. Am I correct in  
20 that?

21 MR. LAWRENCE: For the most part correct.  
22 Now the data that was derived out of these pump tests  
23 was incorporated into the numerical model to address  
24 the site conditions. So we didn't ignore this data.  
25 The numbers that you see up there for the Fuson

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1 vertical hydraulic conductivity, the permeability of  
2 the Fuson are on the order of the 10 to the minus 4  
3 feet per day. The conductivities, the hydraulic  
4 conductivities for the Chilson and the Fall River, are  
5 more on the order of one to ten feet per day. So  
6 there's a five order of magnitude difference between  
7 the horizontal hydraulic conductivity of the zones we  
8 want to mine and the vertical conductivity of the  
9 confining it.

10 If you look at standard textbooks, Freeze  
11 & Cherry will tell you a ten-fold difference -- a one  
12 order difference in magnitude is enough to cause  
13 predominantly horizontal flow when you've got a  
14 pumping scenario going on. So even though there is  
15 some measurable drawdown in the overlying or  
16 underlying units when we run the pump test, it is  
17 small relative to the impact within the aquifer that's  
18 going to be mined. And I think that was shown well  
19 with the modeling that honored this data.

20 JUDGE BARNETT: Can you answer questions  
21 about the model?

22 MR. LAWRENCE: Yes, I can. I developed  
23 the model.

24 JUDGE BARNETT: So the model, as I  
25 understand it, it's been a long time since I've had

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1 groundwater, the model as I understand it, you're  
2 fitting a drawdown curve with your model. Is that  
3 correct?

4 MR. LAWRENCE: No, actually, this is a  
5 numerical model where we construct --

6 JUDGE BARNETT: It's a numerical model.  
7 But you're trying to fit a drawdown curve -- drawdown  
8 data, not a curve.

9 MR. LAWRENCE: It's more extensive than  
10 that. You're talking about using an analytical curve  
11 matching methods?

12 JUDGE BARNETT: No, I don't mean that.  
13 The data that you're trying to model is the water  
14 levels, is that right?

15 MR. LAWRENCE: Water levels, drawdowns,  
16 correct. But on a regional scale.

17 JUDGE BARNETT: But you had to add  
18 leakiness of this aquitard to fit your data, is that  
19 correct?

20 MR. LAWRENCE: What I did was I put the  
21 parameter values in that were measured in the field.  
22 So I was honoring the data that was available and  
23 again, we get back to this nothing is impermeable.  
24 Under enough stress, you can cause concrete to leak.  
25 So these particular tests were designed to evaluate

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1 for dewatering of an open pit mine. They were much  
2 higher rates. They were ten times greater than the  
3 type of rates that we're going to see certainly any  
4 particular well pattern. So the stresses were greater  
5 in this than they would be for ISR mining.

6 JUDGE BARNETT: But your modeling showed  
7 that that Fuson was leaking, correct? Your conclusion  
8 was that it was unplugged boreholes, but it was  
9 leaking. You had to add that to your model to fit the  
10 data, is that correct?

11 MR. LAWRENCE: Yes.

12 JUDGE COLE: So if you were planning to  
13 use that for ISR mining, the commitment that the  
14 Applicant has to plug these holes would apply. Is  
15 that correct?

16 MR. LAWRENCE: That is correct. That is  
17 a license condition.

18 JUDGE COLE: Then you have to change your  
19 model to account for that.

20 MR. LAWRENCE: If the Applicant wishes to  
21 use the model for additional predictive simulation,  
22 yes, we would have to update the model. But then  
23 again, if that was the case, we would update the model  
24 based on whatever new information we'd gathered from  
25 additional well installation, additional pumping

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1 tests.

2 JUDGE COLE: When you describe it as an  
3 effective barrier, it's not perfect. It has some  
4 leakage, but it's within a range that you considered  
5 to be acceptable and it will not modify what you want  
6 to do significantly?

7 MR. LAWRENCE: That is correct. It is in  
8 the same range that we see at other ISR facilities  
9 that operate.

10 JUDGE COLE: Thank you.

11 MR. DEMUTH: If I might add to that, Judge  
12 Cole, it also has to be within a range that NRC Staff  
13 who have reviewed the wellfield data package feel is  
14 acceptable. So it's not just the opinion of  
15 Powertech. NRC Staff would review that information.

16 JUDGE COLE: So the Staff has some  
17 parameters that they apply to this to say what's  
18 acceptable to become an effective barrier?

19 MR. DEMUTH: Yes, sir.

20 JUDGE COLE: All right, thank you.

21 JUDGE BARNETT: Okay, Dr. Moran. So still  
22 on the leakiness or not of the Fuson shale. In Mr.  
23 Demuth's written testimony, he says that if two  
24 aquifers are hydraulically connected, the  
25 potentiometric surfaces will be approximately the

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1 same. Do you agree with that?

2 DR. MORAN: Could I see the original?

3 JUDGE BARNETT: Yes. It is Exhibit APP-  
4 013 at Answer 32. Answer 32, it is the next to the  
5 last sentence in the first paragraph, "If there were  
6 a strong hydraulic connection between the two aquifers  
7 at this location, the water elevations would be  
8 similar." Do you agree with that?

9 DR. MORAN: I would agree with it in a  
10 static situation, unpumped, unstressed.

11 JUDGE BARNETT: Okay. Then if we look at  
12 APP-017, it's the third figure, I believe, right  
13 there. This is from Mr. Demuth's testimony and he's  
14 showing that there is differences in the head between  
15 the Fall River and the Chilson and he's alleging that  
16 if it was leaky those heads would be approximately the  
17 same. What is your conclusion based on that figure?

18 DR. MORAN: I don't know that I would  
19 conclude much from the figure. It's again that these  
20 are static situations and we have a lot of other  
21 information from active pumping tests where we see  
22 evidence of leakage. And the authors of the actual  
23 pump tests did not claim that it -- they made mention  
24 of the fact that in some cases there could be leakage  
25 through boreholes, but in other cases they were

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1 alleging or interpreting the results as though it was  
2 general leakage through the confining unit.

3 JUDGE BARNETT: I need just a minute if  
4 somebody else wants to go.

5 JUDGE COLE: This is for Dr. Moran and Dr.  
6 LaGarry. I don't know whose pre-filed testimony this  
7 appeared in, but you refer to regional structural  
8 features such as the Dewey fault zone. This might  
9 have been yours, Dr. LaGarry. And the Long Mountain  
10 structural zone. Now the location of those, the Dewey  
11 fault zone is about one mile north of the mining area.

12 DR. LaGARRY: Yes.

13 JUDGE COLE: And the Long Mountain  
14 structural zone is about 14 miles southwest.

15 DR. LaGARRY: Yes.

16 JUDGE COLE: So they're not contained  
17 within the mining area.

18 DR. LaGARRY: Yes.

19 JUDGE COLE: You suggested features  
20 associated with these zones may provide pathways for  
21 ISR solutions to migrate outside the production zone.

22 DR. LaGARRY: Yes.

23 JUDGE COLE: However, you do not refer to  
24 any publications identifying site-specific faults  
25 within or adjacent to the Dewey-Burdock site unless

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1 you consider a mile away close.

2 DR. LaGARRY: I do consider a mile away  
3 close.

4 JUDGE COLE: Even when the groundwater is  
5 traveling, you know, somewhere between one and six  
6 feet per year?

7 DR. LaGARRY: In my previous experience,  
8 I was a geological mapper and stratigrapher with the  
9 Nebraska Geological Survey. And we mapped many, many,  
10 many faults in northwestern Nebraska and adjacent  
11 South Dakota. And our finding is that these things  
12 occur in sets. And so you would have perhaps scores  
13 of joints and faults all aligned, going in the same  
14 direction because the rocks they pass through are  
15 brittle.

16 So then what's quite often the case is  
17 that the most dominant of these features stands as a  
18 representative for the whole set. So if somebody  
19 found a fault and they called it the Dewey fault, then  
20 what they might, in fact, be seeing is a zone several  
21 miles wide in which the largest crack with the most  
22 offset is, in fact, the one they identified.

23 This is true of well-known faults like the  
24 Toadstool Park fault; the White Clay-Sandoz Ranch  
25 fault in which a major fault of perhaps 100 meters of

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1 offset is well noted in the scientific literature.  
2 But you can go north and south of the White Clay fault  
3 and find multiple sets of these things. And the  
4 reason why I considered the faults noted close to  
5 Dewey-Burdock is that faults and fractures are  
6 ubiquitous throughout the entire region and it seemed  
7 entirely implausible to me that these sets of faults  
8 across the entire southern Black Hills region  
9 prevalent in rocks that we've been mapping for upwards  
10 of 20 years, that there should suddenly be a blank  
11 spot in a map.

12 It seemed far more likely to me that  
13 whatever United States Geological Survey studies that  
14 were done used this practice of assuming that the  
15 joints don't matter or the small offset faults don't  
16 matter and that instead they identify and recognize  
17 the major fault. These things are such that if you're  
18 not specifically looking for them, then you often  
19 don't find them and for some structural geological  
20 purposes all you have to do is identify the major one.  
21 For example, in the case of the White Clay fault which  
22 goes from the southern Black Hills into Nebraska to  
23 the border of Cherry County, there is one fault in the  
24 scientific literature.

25 However, we repeatedly demonstrated and

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1 published that there are scores of ancillary things.  
2 It's called an imbricated fault in which the entire  
3 region is fractured. The faults might be a couple of  
4 tenths of a mile apart, but the largest crack is  
5 chosen as a representative of the entire set. And so  
6 that's why in my opinion that a well-marked, well-  
7 known fault identified in the -- prior to the work  
8 there at Dewey-Burdock could, in fact, be a  
9 representative of a standing of an entire set of  
10 faults.

11 JUDGE COLE: Okay, so you say it's  
12 possible.

13 DR. LaGARRY: In my opinion, it's most  
14 likely that that fault represents --

15 JUDGE COLE: Even though there are no  
16 reports of faults or structural problems within the 16  
17 square mile area proposed for ISR mining?

18 DR. LaGARRY: Prior to geological mapping  
19 that we conducted with the Nebraska Geological Survey,  
20 there were no faults recognized in northwestern  
21 Nebraska either, except for these major ones that had  
22 been noted in the older literature.

23 Depending on what a geologist's purpose  
24 is, sometimes they note them, sometimes they don't.  
25 Other times, they are so ubiquitous and so common that

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1 the geologist doing the work just assumes that  
2 everybody is aware that they're there. So in the case  
3 of this mining activity in a place such as Dewey-  
4 Burdock, it's no different than the areas in northwest  
5 Nebraska that had gone 150 years of geological  
6 research, at least research going back to the early  
7 1890s, didn't notice any of these faults. However,  
8 they are there and we've discovered them subsequently.  
9 So to me, it's clear that in an area that hasn't been  
10 prospected specifically for sets of joints and faults,  
11 that they might not have been noted in the older  
12 scientific literatures.

13 JUDGE COLE: We've got 6,000 holes poked  
14 in the 16 square mile area.

15 DR. LaGARRY: That's right.

16 JUDGE COLE: Wouldn't these have  
17 identified faults somewhere in that area?

18 DR. LaGARRY: If the faults are not -- if  
19 the boreholes are not cherry picked, because let's say  
20 there's 4,000 boreholes --

21 JUDGE COLE: I don't know what that means,  
22 cherry picked.

23 DR. LaGARRY: Cherry picked means picking  
24 the ones that support what it is you want to do.

25 JUDGE COLE: I assume they didn't do that.

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1 They were looking for something else.

2 DR. LaGARRY: Now the discussions earlier  
3 about the new data that's available, it's very likely  
4 that if you have 4,000 boreholes to look at --

5 JUDGE COLE: Six thousand.

6 DR. LaGARRY: Six thousand. But then you  
7 select say a thousand of those, you select one sixth  
8 that suits your purpose. There may be faulting,  
9 fracturing, jointing, all sorts of secondary porosity  
10 present that you could see in the ones you didn't  
11 select because not all of these things are going to go  
12 through. Let's say your interest is an ore zone and  
13 you're interested in defining where the thickest parts  
14 of the ore is. Very few of them might actually go  
15 through the orebody, but there may be scores of them  
16 surrounding the orebody that could eventually have  
17 some bearing on the activity being conducted.

18 JUDGE COLE: TVA poked a lot of holes in  
19 the ground some years ago.

20 DR. LaGARRY: They did.

21 JUDGE COLE: In any of TVA's reports that  
22 you might be familiar with, did they indicate that  
23 there might be some faults in structural zones there?

24 DR. LaGARRY: That one that was just shown  
25 that we were just discussing, the TVA concluded that

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1 the leakage might have been caused by an unplugged  
2 borehole or some previously as yet undescribed  
3 structural feature in that very page we were just  
4 reviewing.

5 JUDGE BARNETT: Yes, actually, if I can  
6 follow up here, Judge Cole.

7 JUDGE COLE: Sure.

8 JUDGE BARNETT: Could we pull up OST-009  
9 again at 60. This is the TVA environmental report.  
10 I think what we're looking for is page 51 again.  
11 Actually, page 50 of the document. I'm sorry, page 50  
12 of the report. Page 60 of the exhibit. Go down to  
13 the next to the last paragraph. There you go, right  
14 there.

15 So I'm reading the next to the last  
16 paragraph. "Faults and fractures associated with the  
17 Dewey and Long Mountain structural zones which trend  
18 northwesterly (sic) through northwestern Fall River  
19 County are believed to affect groundwater movement and  
20 may be of considerable influence in future aerial  
21 effects of drawdown caused by mining."

22 I'd like to have the Applicant and the  
23 Staff respond to that. How do you interpret that?  
24 How have you addressed that?

25 MR. LAWRENCE: That looks to me more like

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1 a statement of recognition that we have the Dewey and  
2 Long Mountain structural zones. It doesn't say that  
3 those faults are within the permit area.

4 JUDGE BARNETT: They are wherever they're  
5 going to cause considerable influence in future  
6 effects of drawdown.

7 MR. LAWRENCE: And that's true. One of  
8 the things that happened in the test that was done up  
9 near Dewey was they put a well on the north side of  
10 the Dewey fault and that well had no response during  
11 the pumping test. When I developed the groundwater  
12 model, I used that as a no-flow boundary, because  
13 that's what the data had shown us.

14 In other words, I was limiting, so there  
15 was no flow across either way. Well, if you have a  
16 boundary when your drawn down cone expands out with  
17 time, once you intercept that boundary, that's as far  
18 as it can go. So it would limit the drawdown  
19 certainly from the pumping. That doesn't mean that  
20 it's going to, in any way, control the migration of  
21 fluids out of your control.

22 JUDGE BARNETT: I believe that Powertech's  
23 conclusion was that there were no faults or fractures  
24 on the site. Is that correct?

25 MR. LAWRENCE: Correct, on the site.



1 JUDGE BARNETT: Does this paragraph seem  
2 consistent with that?

3 MR. LAWRENCE: Again, I think that is  
4 regarding the faults and fractures in the zones that  
5 are outside the permit area.

6 JUDGE BARNETT: I'd like to hear the  
7 Staff's response to that.

8 MR. PRIKRYL: Well, with regard to the  
9 faults and fractures, the Dewey fault zone is outside  
10 the license area and it's about one mile outside the  
11 license area. And the Long Mountain structural zone  
12 is about 14 miles southeast of the licensed area.

13 JUDGE BARNETT: So TVA's conclusion, it  
14 may be of considerable influence in future aerial  
15 effects of drawdown caused by mining, that's  
16 happening outside of the area? Is that not in the  
17 Dewey-Burdock site, but outside?

18 MR. LAWRENCE: Correct. You get a  
19 drawdown cone that expands out. The modeling that I  
20 did show that you have some effects a couple of miles  
21 away from the site in terms of drawdown, but into the  
22 north, you're limited, and to the east because you  
23 actually run out of Fall River and Chilson, it's  
24 eroded away there. So in those areas outside of the  
25 permit boundary, you are still going to have some

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1 impacts from mining and that's been demonstrated with  
2 the model.

3 JUDGE COLE: Dr. Moran?

4 DR. MORAN: I would actually like to take  
5 a quick fluid break myself before continuing because  
6 I think there are some important things to add on  
7 that, but I'd like to -- is that possible?

8 CHAIRMAN FROEHLICH: We can keep going.

9 DR. LaGARRY: Can I direct you to the next  
10 paragraph below the one we just reviewed? "According  
11 to Walcott and Bowles, large volumes of water may  
12 migrate upward from the Minnelusa along solution  
13 collapses in breccia pipes associated with fractures."  
14 So the TVA recognizes that the area is fractured, but  
15 yet those individual fractures have remained unmapped.

16 So the older literature, in my experience,  
17 considers a lot of the things that concern me. I mean  
18 it doesn't have to be a fault with offset. There's  
19 joints. Joints are cracks in the rock, often closely  
20 spaced. They don't show any offset or structural  
21 movement. But these joints fall under what  
22 hydrologists call secondary porosity. They can hold  
23 and transmit water. But if they're ubiquitous in an  
24 area, they're often unmapped and ignored because  
25 they're ubiquitous.

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1           So what people are after is the new, the  
2 different, the unique, the showy, the big offset of a  
3 big fault that you can tie to some sort of other  
4 events in the region. So this TVA report recognizes  
5 that the whole area is fractured and that breccia  
6 pipes form along these fractures, but they didn't make  
7 it into the scientific literature for maps. But if I  
8 was to take a geological mapping field crew out there,  
9 we would find them because we're looking for them.

10           JUDGE COLE:     With these 6,000 plus  
11 boreholes in this relatively small area, wouldn't  
12 there be some evidence there of discontinuities in the  
13 --

14           DR. LaGARRY:  If we could review them all,  
15 there very might well be. And in fact, there may be  
16 many because that's the -- although that kind of data  
17 density isn't necessarily useful for something like  
18 defining an orebody or perhaps hydrological modeling,  
19 for stratigraphic work which is what I do, they're  
20 essential because if you have 100 feet between 2 data  
21 points, between 2 boreholes that can accommodate  
22 dozens of joints that would be invisible otherwise.  
23 So the more data you have, the more data points with  
24 6,000 boreholes to look at, one very well might find  
25 many, many, many of these cracks and fractures and

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1 might be able to trace them all through the project  
2 area.

3 JUDGE COLE: Well, in looking at an e-log,  
4 how -- is it easy or difficult to identify if there's  
5 a fault somewhere in that pile?

6 DR. LaGARRY: You have to look at the  
7 closely spaced ones and look for small differences in  
8 offset between them. And so it will largely depend on  
9 the quality of the logs, but if the logs are standard  
10 quality and there's enough of them and you can follow  
11 lithologic breaks as noted in the logs, you will see  
12 small amounts of offset. It's typical, the example I  
13 cited earlier of the White Clay fault which has the  
14 big one that everybody maps, has tens of meters and  
15 sometimes scores of meters of offset. But you go to  
16 the ancillary ones, the ones that radiate north and  
17 south of it and they might have a meter, two meters,  
18 three meters, four meters, five meters of offset which  
19 the original investigator didn't think was worthy of  
20 mentioning so they only mapped the big one. But for  
21 the purposes of such projects and containing fluids  
22 and the maintenance of confining layers, you know if  
23 you can recognize these things, what you're doing is  
24 you're recognizing an open pipe across which --  
25 through which fluids can migrate, both up and down and

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1 side to side. So the more dense the data, the better.

2 JUDGE COLE: And you're saying that this  
3 hasn't been investigated?

4 DR. LaGARRY: It hasn't been specifically  
5 investigated. I would find it -- enough of these  
6 things might be fatal to such an activity, and so  
7 there's really no incentive to spend a lot of time  
8 hunting for faults and joints, unless of course,  
9 that's your structural geologist or geologic mapper  
10 and you're looking for faults and joints.

11 JUDGE COLE: So the people that were  
12 reviewing these logs just weren't looking for that  
13 kind of thing?

14 DR. LaGARRY: They may not have been. One  
15 of the things I find in my own work is that prior to  
16 the widespread adoption of plate tectonics theory in  
17 the 1980s and '90s, and this includes a lot of the  
18 older scientific literature from this region, people  
19 made the assumption that rocks were more bend-y than  
20 break-y. And so they would go around -- because they  
21 used modeling clay. They used Plasticine and a big  
22 vice and they pressed the vice and they watched all  
23 the Plasticine bend and they said oh, yes, that's the  
24 geological structure we've got here. But since the  
25 advent of plate tectonics theory and the idea that the

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1 earth's crust is thin and brittle, work that's done in  
2 the 1990s and younger, makes this assumption in their  
3 work that any time there's a fault or a fold, people  
4 expect to see lots of these joints and fractures in  
5 the rock.

6 So it's a thing commonly overlooked in  
7 older scientific literature which is why site  
8 characterization on the ground is so important in a  
9 situation like this because as mining goes forward and  
10 they get to the wellfield specific data and they go  
11 forward in mining, these things pop up. And they're  
12 not considered and they're not taken into account.

13 From my reading of the technical reports  
14 and the maps provided, you can -- there's faults in  
15 the area are visible from outer space, from space  
16 shuttle radar. We've used them at other ISL sites in  
17 northwest Nebraska to locate faults that bisect the  
18 orebodies that were never found in Environmental  
19 Impact Statements or planning documents for mines. If  
20 you're specifically looking for them, then you find  
21 them. If you're not specifically looking for them or  
22 your focus is some other aspect of the geology, then  
23 typically you don't see them.

24 JUDGE COLE: Mr. Moran, you had indicated  
25 to me that you had a contribution to make in this

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1 other discussion we were having and part of this.

2 DR. MORAN: What I've heard of Dr.  
3 LaGarry's comment, I totally agree with, first.  
4 Secondly, essentially all of the old TVA-related  
5 reports and the AEC-funded reports and the old USGS  
6 reports from the '60s, '70s, and '80s, all state that  
7 there are faults and fractures that affect groundwater  
8 movement in the area. In most cases, it is true that  
9 they're not talking specifically about that specific  
10 site, but many of them are right around it. And when  
11 you overlay the site boundary for Dewey-Burdock on top  
12 of some of the new satellite images, you can see that  
13 you're darn close and that some of the other structure  
14 goes right through it.

15 MR. DEMUTH: Dr. Cole, if I could add to  
16 that. I agree with Dr. LaGarry in some situations.  
17 In regional structures, you can have multiple  
18 features. They're not a line on the map. And often  
19 you can have a disturbed zone that might occur over  
20 several miles and we see that with mapping that's been  
21 done on the Long Mountain structural zone and with the  
22 Dewey fault. The southernmost identified portion of  
23 the Dewey fault is to the north of the site and does  
24 not occur on the site.

25 Secondly, contrary to what Dr. LaGarry

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1 stated, Powertech is in the business of moving fluid  
2 to produce uranium. So a thorough understanding of  
3 the subsurface geology is really key to that. And if  
4 there are faults that impacts their operation in terms  
5 of producing uranium. So their interest, rather than  
6 being to not pay attention to the details rather is to  
7 pay great attention to the details.

8 In addition, we have worked several ISR  
9 projects that successfully mined with faults in the  
10 orebody. So the fact that there might be some small  
11 scale features in the orebody is not a deal killer and  
12 in addition, as hydrogeologists, we have other  
13 information. We have water level information. We  
14 have gradient information. We have all this other  
15 information that tells us about continuity or lack  
16 thereof in the groundwater system. So there's more  
17 than just the geology. There's more than a surface  
18 liniment that goes into understanding the conceptual  
19 model. So we have lots of pieces of information to  
20 support the conceptual model that's been presented  
21 here.

22 JUDGE COLE: All right, thank you.

23 JUDGE BARNETT: Okay, we've talked about  
24 the leaky aquitards or not, and faults and fractures  
25 a little bit. So I want to switch gears and talk

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1 about breccia. And my question is for Dr. Moran. I'm  
2 going to quote something from your testimony here and  
3 you can see it if you want. As you state, "Breccia  
4 pipe solutions or collapsed features are present in  
5 the project area that are critical to analyzing the  
6 hydrological baseline and project impacts." Is that  
7 your testimony?

8 DR. MORAN: Could I see the original,  
9 please?

10 JUDGE BARNETT: Sure. OST-1 at 21.  
11 So your expert opinion. Is that -- do you stand by  
12 that?

13 DR. MORAN: Yes.

14 JUDGE BARNETT: Okay. In the FSEIS which  
15 is NRC-008-A1 and it's at 191, and the very last  
16 paragraph. And I will let you read that. Very last  
17 paragraph about breccia pipes.

18 DR. MORAN: Okay.

19 JUDGE BARNETT: And I'm going to ask a  
20 question about the last sentence. "The Applicant  
21 presented further evidence against the presence of  
22 breccia pipes in the proposed project area including  
23 field investigations for breccia pipes, a valuation of  
24 Inyan Kara water temperatures, regional pumping test  
25 results, and evaluation of color infrared imagery."

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1 Have you examined that data?

2 DR. MORAN: Yes.

3 JUDGE BARNETT: And that is the basis of  
4 your expert opinion is from looking at this data, that  
5 there are breccia pipes?

6 DR. MORAN: It's from the review of the  
7 whole package of everything I've read, all the data,  
8 all the other reports. It's the sum total.

9 JUDGE BARNETT: So you disagree with the  
10 Staff's conclusion here as stated in the last  
11 sentence? Do you disagree with the Staff's  
12 conclusion?

13 DR. MORAN: Yes.

14 JUDGE BARNETT: Thank you. You've also  
15 cited Mr. Demuth's testimony that "results of pumping  
16 tests will be provided to NRC and EPA Staff for review  
17 and will have to demonstrate adequacy of the  
18 minestream that worked prior to our breaking each  
19 wellfield." Is that correct?

20 DR. MORAN: Could I see the original? I  
21 don't remember how I said that.

22 JUDGE BARNETT: Sure. That's OST-018 at  
23 pages 3 and 4.

24 DR. MORAN: And what was your question,  
25 sir?

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1 JUDGE BARNETT: Let me pull it up here to  
2 make sure I'm getting it right. Okay, it's the very  
3 top paragraph on page 3.

4 So your contention is that the results of  
5 this pumping test aren't there now, is that correct?  
6 And that they need these results to evaluate the site?

7 DR. MORAN: Correct. I'm assuming those  
8 are the detailed testing that they're proposing to do  
9 after license approval.

10 JUDGE BARNETT: Right. So your contention  
11 is that needs to be done now, is that correct?

12 DR. MORAN: Yes.

13 JUDGE BARNETT: Based on the procedures  
14 that they've outlined, do you have any concerns with  
15 the tests that they've proposed doing other than they  
16 should have been done now?

17 DR. MORAN: I don't know the details of  
18 all of what they're proposing to do in the future. My  
19 main concern was for the public and the regulators to  
20 really understand these issues, they have to be able  
21 to see the detailed information first, not at the same  
22 level that they're going to do later, but at greater  
23 level than what we have now.

24 JUDGE BARNETT: Okay, Dr. LaGarry. This  
25 is with reference to your testimony. INT-020 at 1.

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1 I'm looking in your -- looks like the third sentence  
2 in your first paragraph there. It says "appears by  
3 their testimonies that the Demuth and Lawrence concede  
4 that there will be excursions."

5 DR. LaGARRY: Yes, and what I mean by that  
6 is that in the reviews of the technical reports and  
7 the Final Environmental Impact Statement, all those  
8 documents concede that there are unplugged boreholes,  
9 that the confining layers are leaky. But the purpose  
10 of the licensing process is not to address those  
11 issues individually, that those issues will be  
12 addressed individually as individual wellfield plans  
13 are developed and pumping begins.

14 So in our discussions, in the discussions  
15 presented here earlier about the -- I consider the  
16 Fuson to be not -- to be unconfined. I mean that's  
17 not a confining layer. There are the TVA reports and  
18 other documents support this idea that the confining  
19 layers leak. They might be boreholes. They might be  
20 unrecognized structural features, but the bottom line  
21 is that they leak. And when the Applicant concedes  
22 and the experts, the Applicant's experts concede that  
23 yes, this is leaky and it's okay because when we  
24 develop a wellfield plan, we're going to detect these  
25 things and we're going to fix them as they happen.

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1           The question arose earlier about the pump  
2 tests that go on without lixiviant, but when one pumps  
3 lixiviant into one of these orebodies, I mean the  
4 purpose of the lixiviant is to mobilize what was once  
5 a stable mineral contained in a sandstone and  
6 mobilize it along with everything else associated with  
7 it and then suck it out of the orebody.

8           So the process of adding lixiviant, let's  
9 say I'm going to create a hypothetical situation since  
10 we haven't established that there's faults and  
11 fractures, but suppose the area was riddled with  
12 joints and faults and these were full of the mineral  
13 of interest and then when you do a pump test, they're  
14 corked up and they're plugged with minerals and they  
15 don't have any impact on the pumping test.

16           But then once you begin to dissolve these  
17 things and extract the minerals from the cracks and  
18 the joints, you're essentially uncorking the pathways  
19 that were previously corked and so now fluids can  
20 migrate around. So when writing my opinion, I  
21 envisioned a scenario where a wellfield plan was  
22 developed and it was tested and provided sound and  
23 adequate. But then as the wellfield continues to  
24 develop, some of these unplugged boreholes come into  
25 play. Some of the unrecognized faults, joints, and

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1 fractures come into play. And then the mineralization  
2 being taken away from the -- in the pore spaces in the  
3 sandstone and any cracks that might pass through  
4 there, are creating a situation that the mining  
5 process, as it develops, reveals a continuous string  
6 of small excursions and minor problems that go on as  
7 the mining progresses. Because in my opinion, the  
8 site isn't adequately characterized. So that's what  
9 I intended to convey in that sentence and also in the  
10 following paragraph.

11 JUDGE BARNETT: Okay, let me go on. Mr.  
12 Demuth and Mr. Lawrence, do you concede that there  
13 will be excursions?

14 MR. DEMUTH: No, I do not.

15 JUDGE BARNETT: Mr. Lawrence?

16 MR. LAWRENCE: No, I do not.

17 JUDGE BARNETT: Okay, Dr. LaGarry, you  
18 don't question the advisability of having an excursion  
19 plan in place, the advisability of including a plan to  
20 deal with possible excursions in the FSEIS and in the  
21 various documents. It's not a problem that you have  
22 procedures to deal with an excursion in the event that  
23 they happen. You're not saying that, is that correct?

24 DR. LaGARRY: That's correct. What I'm  
25 saying is in my professional opinion, they'll likely

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1 happen and once they do happen, the genie is out of  
2 the bottle. What I would have preferred to see  
3 through the entire permitting process is rather than  
4 defer site characterization to the wellfield stage,  
5 I would have liked, like the other expert here to my  
6 left to have seen that information to characterize the  
7 site beforehand. Otherwise, the potential risk to the  
8 public and to the contamination of other aquifers, in  
9 my opinion, it's impossible to evaluate that risk  
10 adequately.

11 JUDGE COLE: But they do characterize a  
12 site before they start drilling?

13 DR. LaGARRY: They do.

14 JUDGE COLE: Before they start mining  
15 uranium?

16 DR. LaGARRY: They do. They --

17 JUDGE COLE: You mean they do do that?

18 DR. LaGARRY: They do do that.

19 JUDGE COLE: Okay.

20 DR. LaGARRY: But it's like being in a  
21 dark room, dark means different to different people.  
22 So what's adequate for the purposes of getting a  
23 permit in mining is not adequate enough for me to feel  
24 safe drinking the local groundwater once mining  
25 begins.

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1 JUDGE COLE: I understand, sir.

2 MR. LAWRENCE: Can I make one point of  
3 clarification? An excursion is not a violation of the  
4 Clean Water Act. It is an indication that some fluids  
5 are moving away from the control of the operator and  
6 it allows them the opportunity to adjust their  
7 operating parameters so that they can pull those  
8 fluids back. So yes, excursions do happen, but that's  
9 the whole point of having the monitoring system in  
10 place so that they're identified early enough that  
11 they can be reversed.

12 And usually, the indicated parameters are  
13 constituents that are not particularly dangerous.  
14 They're chloride, conductivity, alkalinity. Those are  
15 relatively conservative constituents. They travel  
16 basically at the same speed and power.

17 JUDGE COLE: Well, they're just indicators  
18 of what's there.

19 MR. LAWRENCE: They're indicators. So  
20 that is the whole point. We have the monitoring  
21 system in place to let us know if there is a problem  
22 and then allow sufficient time to respond to that  
23 using engineering controls. And you can do a lot of  
24 things with pumping a well. You can control things  
25 pretty well.

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1 JUDGE COLE: Well, what are the tools at  
2 your disposal to control an excursion?

3 MR. LAWRENCE: Typically, the first thing  
4 that would be done is you would change up your  
5 operating parameters. Often, when you have an  
6 excursion it may be a system, a situation where you  
7 have a slightly out of balance wellfield or well  
8 pattern. Maybe one of your injectors is putting in a  
9 little bit too much water on the corner and so you  
10 don't have the hydraulic containment you need. So the  
11 quickest way to resolve that is either shut that  
12 injector off so that now you get a greater draw in  
13 toward the pumping well than you would if the injector  
14 was operating. So it's hydraulics. We've been doing  
15 this kind of stuff for 50 years. The Russians have  
16 been doing it a long time very successfully. It's not  
17 new technology. And it's effective.

18 Where it doesn't work is where you have an  
19 undetected release that goes on for a long period of  
20 time, then it's a little bit more difficult to pull it  
21 back.

22 JUDGE COLE: How could they have  
23 undetected release? Aren't you required to check for  
24 excursions in a relatively short time period?

25 MR. LAWRENCE: Yes. It's usually every

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1 two weeks.

2 MR. LANCASTER: Your Honor, just if I may  
3 refer to a license condition, 11-5. It's every two  
4 weeks. We've memorialized their excursion monitoring  
5 requirement as well as establishing the upper control  
6 limits that he talked about, the chloride, alkalinity,  
7 and conductivity.

8 JUDGE COLE: Yes, I was wondering about  
9 that. They're relatively easy to test for. That's  
10 why they're indicators because they'll increase if you  
11 have an excursion. So if you have an increase in that  
12 by a certain percentage, hey, I've got a problem, so  
13 I've got to use the tools that I have to take this,  
14 get this under control.

15 But they're so easy to measure. Why don't  
16 you do it continuously, rather than once every two  
17 weeks? Or do we do it continuously?

18 MR. LAWRENCE: I don't believe any  
19 operators do it continuously. It's certainly an idea.  
20 The technology is getting better where you can  
21 potentially put continuous monitoring devices in the  
22 hole. At that point, I'm sure it's probably a cost  
23 issue, just to maintain that equipment.

24 MR. LANCASTER: Well, I would interject  
25 that looking at our existing facilities, I don't think

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1 there would be increased benefit to that.

2 JUDGE COLE: So it's not a problem when  
3 you just check this every two weeks in operation?

4 MR. LAWRENCE: That's right.

5 JUDGE COLE: And during that two-week  
6 period, you also collect some chemical samples, right?  
7 Every two weeks during operation.

8 MR. LAWRENCE: You collect chemical  
9 samples if you have an indication based on your  
10 excursion parameters that you have an excursion  
11 occurring. Then you would go back out and resample,  
12 make sure that you still do have a legitimate  
13 excursion and then I forget the exact sequence or the  
14 timing, but that sort of initiates the whole series of  
15 more aggressive sampling to determine if you have any  
16 constituents other than the excursion parameters that  
17 are showing up.

18 JUDGE COLE: I thought that in operation  
19 every two weeks you check your indicator chemicals and  
20 then collect the sample, run everything on that series  
21 of chemicals.

22 MR. LAWRENCE: I don't believe that is  
23 every two weeks. I think it's just the excursion  
24 parameter because as you said --

25 JUDGE COLE: Whatever the rules say. That

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1 was my read on it.

2 JUDGE BARNETT: Dr. LaGarry, I'm going to  
3 ask you the same question that I've asked several  
4 other witnesses. Are you familiar with NRC-091 which  
5 is the Staff assessment of groundwater impacts from  
6 previously licensed in situ uranium recovery  
7 facilities?

8 DR. LaGARRY: Is that the one that was  
9 shown previously that you had highlighted in yellow?  
10 Yes. Well, not in the scientific literature. I mean  
11 I've been at other hearings like this, not on  
12 necessarily a panel, but in the peanut gallery, where  
13 a local dentist reported lixiviant coming out of his  
14 tap and a local landowner five miles north of the in  
15 situ leach mine talked about drilling a water well  
16 that turned out to be an artesian fountain spewing  
17 yellow-green lixiviant into her yard.

18 JUDGE BARNETT: Do you have any  
19 documentation, anything in the record, any exhibits  
20 that will contradict that statement?

21 DR. LaGARRY: Just the ones that come from  
22 the discussion, the testimony presented in 2008 at a  
23 hearing like this one. So in the documentation from  
24 the Crow Butte case, just those anecdotal instances I  
25 mentioned which I believe are in the record of that

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1 proceeding.

2 JUDGE BARNETT: So based on that, you do  
3 not agree with that statement, is that correct?

4 DR. LaGARRY: I disagree with that  
5 statement, yes, that's correct.

6 JUDGE BARNETT: Thank you.

7 CHAIRMAN FROEHLICH: Dr. LaGarry, in your  
8 testimony, INT-013 at page 5, there's a sentence  
9 there, you read it one way or you're not familiar  
10 exactly what the strata that are being referred to or  
11 what's meant by the strata. I guess it would cause  
12 some concern. That's the first -- second sentence  
13 after perforations by new and existing wells. It's  
14 the parenthetical there. The parenthetical says  
15 "Along with wells that supply drinking water (the  
16 uranium bearing strata that are a local drinking water  
17 supply and water for the livestock)" -- can you  
18 explain maybe to me what you meant there and the  
19 connection between the uranium-bearing strata and  
20 local drinking water supplies?

21 DR. LaGARRY: Okay, so the third pathway  
22 --

23 CHAIRMAN FROEHLICH: Mr. Welkie, it's the  
24 fourth line after perforations in the parenthetical.  
25 There we go. Thank you.

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1 DR. LaGARRY: Okay, it was my  
2 understanding from the documentation I read that the  
3 rocks being mined, people drink out of.

4 CHAIRMAN FROEHLICH: Beg your pardon?

5 DR. LaGARRY: People drink out of the  
6 rocks being mined.

7 CHAIRMAN FROEHLICH: That's your  
8 understanding of the document?

9 DR. LaGARRY: The documentation I read,  
10 yes.

11 CHAIRMAN FROEHLICH: Could I hear from the  
12 Staff and the applicant as to the parenthetical there  
13 because at least to a lay person this seems like it  
14 would be of concern.

15 MR. PRIKRYL: If I could take that  
16 question?

17 CHAIRMAN FROEHLICH: Please.

18 MR. PRIKRYL: The licensee is going to  
19 have to get a permit from the EPA to exempt the  
20 uranium-bearing aquifer before operations begin. So  
21 it would not be a local drinking water supply.

22 JUDGE COLE: But they could be before they  
23 exempt it?

24 MR. PRIKRYL: Yes. And I think there are  
25 some wells that people are drinking the water out of

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1 those wells. And I wouldn't advise them to do that.

2 JUDGE BARNETT: If this site eventually  
3 goes forward and everything is restored and Powertech  
4 has moved on and there's no evidence out there of  
5 Powertech anymore, how will that groundwater exemption  
6 be enforced? What would keep somebody new from coming  
7 along and then putting a well in the Inyan Kara even  
8 though you're not supposed to do that any more?

9 MR. PRIKRYL: I'm just not sure about how  
10 the state or the EPA would enforce their regulations.

11 JUDGE BARNETT: Fair enough.

12 MR. DEMUTH: Judge Barnett, if I could  
13 weigh in on that. Aquifer exemptions through 40 CFR  
14 146, the underground injection control program, those  
15 are permitted exemptions. So that water is removed  
16 from being considered as a source of drinking water.  
17 However, it's not the entire permit area. The aquifer  
18 exemption that's been applied for in the Class III UIC  
19 permit prepared by Powertech is an area that surrounds  
20 the proposed wellfields and if more wellfields were  
21 discovered, then it would be around those wellfields.  
22 And within those areas, there certainly would not be  
23 an area that somebody would want to go in 50 years  
24 post and install a drinking water well. But it  
25 wouldn't be of the quality where they would want to do

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1 it today anyway.

2 MR. LAWRENCE: And that exemption applies  
3 for drinking water. The wells can be utilized again  
4 for stock irrigation purposes if it's suitable for  
5 that.

6 JUDGE COLE: Question for the Staff on  
7 excursions, the Applicant or the Licensee, is  
8 obligated to -- when they determine an excursion,  
9 they've got to pass that information on to the NRC  
10 Staff. What are the requirements, time requirements  
11 for them to do that?

12 MR. LANCASTER: Yes, Your Honor, that's  
13 also within the same license condition that I referred  
14 to before. I think it was 11-5 here. But as soon as  
15 they -- the licensee shall notify the NRC project  
16 manager by telephone or email within 24 hours of  
17 confirming a lixiviant excursion. And then seven days  
18 later, they have to submit a letter, something in  
19 writing concerning this.

20 And the requirement goes on with the 60  
21 days, they've got to send us a report, a follow-up  
22 report of the corrective actions that were taken and  
23 the results of the corrective actions.

24 JUDGE COLE: Including chemical analyses?

25 MR. LANCASTER: Yes. So these

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1 requirements are all laid out in our license. We  
2 memorialized what has been written and what -- it's  
3 consistent with 1569.

4 JUDGE COLE: License conditions.

5 MR. LANCASTER: Its license conditions is  
6 consistent with 1569, the license condition for  
7 excursion monitoring and associated reporting.

8 JUDGE COLE: Okay. Now so the Staff is  
9 then kept up to speed on what's happening and what  
10 sort of time limits are involved in that before the  
11 Applicant and/or the Staff must do something?

12 MR. LANCASTER: Well, if it hasn't been  
13 corrected within -- I think it's 60 days. Give me a  
14 moment, Your Honor.

15 JUDGE COLE: Okay.

16 MR. LANCASTER: Okay, yes, so within this  
17 license condition which again is consistent with  
18 NUREG-1569, if an excursion is not corrected within 60  
19 days of confirmation, the licensee shall either  
20 terminate injection of liquid within the wellfield  
21 until the excursion is corrected, or increase their  
22 surety amount, surety estimates, the amount to cover  
23 a third-party cost to correct -- cost of correcting  
24 and cleaning up the excursion.

25 JUDGE COLE: That happens after 60 days?

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1 MR. LANCASTER: Sixty days, after 60 days.

2 JUDGE COLE: Do you have any information  
3 on the number of excursions that a typical line  
4 operator might have? How often do they get  
5 excursions? Are they rare? Do they get one every two  
6 years? Do they get one every three months? And on  
7 average, how long does it take them to correct the  
8 excursion? Do you have any information on that?

9 MR. LANCASTER: Yes, I don't have any --

10 JUDGE COLE: Ballpark.

11 MR. LANCASTER: Well, I deal with a  
12 particular operating facility, but I don't deal with  
13 all the operating facilities. From my experience with  
14 that one operating facility, you know, maybe one to  
15 four a year at the most it seems like. These  
16 excursions, and some of them are related to  
17 fluctuations of groundwater and other things. And  
18 it's hard to discern. But regardless, I don't think  
19 it's every day that we get an excursion, if that's  
20 what you're trying to -- we get reports on excursions.

21 JUDGE COLE: I don't know. I was asking  
22 the question.

23 MR. LANCASTER: For other operating  
24 facilities, I can't talk about those, you know. I'm  
25 not involved with those other operators.

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1 JUDGE COLE: Okay, but you have some  
2 experience with at least one plant?

3 MR. LANCASTER: Yes.

4 MR. PRIKRYL: Judge Cole, can I say  
5 something? I think there may be some information  
6 about excursions in the GEIS which may provide some  
7 information on how many excursions might have occurred  
8 during the year or every couple of years or whatever.  
9 Thank you.

10 JUDGE COLE: Do you have any information  
11 about frequency of excursions? I'll get to you in a  
12 minute, Ms. Henderson.

13 MR. LAWRENCE: I believe the SER  
14 identifies or makes some statements that most  
15 excursions are recovered within a day or several days  
16 or weeks, so they're relatively short lived.

17 JUDGE COLE: Ma'am?

18 MS. HENDERSON: There is a wonderful  
19 website called wise-uranium.org that has a huge report  
20 on excursions on ISL mining throughout the West,  
21 hundreds and hundreds and hundreds of examples where  
22 the operator never did anything about it, sometimes  
23 for years. And I submit, gentlemen, that a great many  
24 of these problems that we are having with groundwater  
25 are occurring because of these excursions.

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1 I also would refer you to a National  
2 Research Defense Council report called "Uranium  
3 Mining, the Dirty Little Secret of Uranium Mining."

4 JUDGE COLE: Thank you, ma'am.

5 JUDGE BARNETT: Okay, Dr. Moran, you  
6 stated that in your OST-001 at 21 and 22, that  
7 "satellite imagery 'shows clearly that this area is  
8 intersected by numerous faults and features.' Both  
9 circular topographic features can be seen on modern  
10 satellite imagery of the D-B site and surrounding  
11 area. It is my opinion that these circular features  
12 likely represent solution collapsed structures."

13 Do you remember that?

14 DR. MORAN: I do. I'll assume that you're  
15 reading it as is.

16 JUDGE BARNETT: Have you introduced any  
17 satellite images into the record?

18 DR. MORAN: I gave to our attorneys last  
19 fall a PowerPoint presentation. I was going to give  
20 to the state hearing groups and it was sent in to your  
21 group last fall.

22 MR. PARSONS: Your Honor, if I may, the  
23 Exhibit 005, those are slides contained within Dr.  
24 Moran's PowerPoint.

25 JUDGE BARNETT: This looks like the

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1 twelfth slide maybe, even thirteenth? Is that what  
2 you're referring to?

3 DR. MORAN: Yes, those images, yes.

4 JUDGE BARNETT: So I would like to ask the  
5 Applicant and the Staff how they would respond to his  
6 testimony in that figure?

7 MR. PRIKRYL: Well, first off, I would  
8 probably ask Dr. Moran if he's done any -- had any  
9 ground truthing to determine if those are actually  
10 faults.

11 JUDGE BARNETT: Okay, let's ask Dr. Moran.  
12 That you done any ground truthing to determine if  
13 those are fault?

14 DR. MORAN: I've been on the site, but I  
15 haven't done formal ground truthing, no.

16 JUDGE BARNETT: Thank you. I interrupted  
17 you.

18 MR. PRIKRYL: And that's also the case for  
19 the sinkhole. He's arguing that that possibly could  
20 be a breccia pipe. Is that true?

21 JUDGE BARNETT: Is that the case?

22 DR. MORAN: That's the case. What I'm  
23 -- if I might elaborate a second?

24 JUDGE BARNETT: Sure.

25 DR. MORAN: As I said earlier, to me this

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1 is just fundamental work that should have been done  
2 years ago in this study and it's not -- I don't have  
3 all of this confirmed, but I'm simply making the  
4 suggestion that these images, one of the most likely  
5 interpretations of these images is you've got these  
6 kinds of sinkhole features, collapsed structures, yes.  
7 Yes, that's my interpretation.

8 JUDGE BARNETT: Applicants, any response?

9 MR. DEMUTH: Judge Barnett, if I could,  
10 there are USGS publications that have mapped features  
11 in and around the site, peer-reviewed documents. So  
12 as a scientist, I could take such a satellite image  
13 and draw some lines on it, but that would be my  
14 opinion and it would really hold no bearing unless  
15 there were other experts that had looked at it,  
16 reviewed it, and there was some basis in my opinion.

17 So with all due respect, there's no  
18 evidence for this type of interpretation.

19 JUDGE BARNETT: So you argue that he's  
20 interpreting it incorrectly or that he does not have  
21 an adequate basis for his interpretation?

22 MR. DEMUTH: I would not agree with his  
23 interpretation.

24 JUDGE BARNETT: Have you looked at  
25 satellite images of the site?

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1 MR. DEMUTH: We've looked at color  
2 infrared radar, yes, images, in pretty good detail.

3 JUDGE BARNETT: Yes, Dr. Moran.

4 DR. MORAN: If the figures that they have  
5 made public are the ones he's talking about, they're  
6 not radar.

7 MR. DEMUTH: You are correct. It's color  
8 infrared imagery. Excuse me.

9 DR. MORAN: I would also add, let me  
10 emphasize. I'm saying this is a preliminary  
11 interpretation, but I had two of the very best remote  
12 sensors in the world confer with me when I put it  
13 together. They helped to train the earliest of the  
14 astronauts.

15 MR. LANCASTER: Yes, I would concur, it is  
16 very preliminary. I mean this is not hard evidence.

17 JUDGE BARNETT: Let me interrupt you. I  
18 agree it's -- it has been filed as evidence for a long  
19 time. I'm asking you now how do you respond to it?

20 MR. LANCASTER: Well, my response is with  
21 my colleague here, ground truthing is always necessary  
22 for a preliminary review of aerial photographs and  
23 things like that to pinpoint areas where you want to  
24 concentrate your study. In this case, we have plenty  
25 of data for this area that Staff feels has

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1 demonstrated our conclusions. And those conclusions  
2 don't agree with this preliminary evaluation method or  
3 this information that's being displayed here. We  
4 don't see any evidence of this.

5 JUDGE BARNETT: Did you ground truth this?

6 MR. LANCASTER: I didn't.

7 JUDGE BARNETT: Did the Applicant?

8 MR. LANCASTER: That was our question to  
9 -- our question to Dr. Moran is did you ground truth  
10 this?

11 JUDGE BARNETT: And now my question is  
12 these satellite images are in the record. Have you  
13 ground truthed it?

14 MR. LANCASTER: Have I gone back into the  
15 application documents and ground truthed it? I know  
16 we have data in this area and we've come to our  
17 conclusions. We don't see -- like for example, for  
18 that sinkhole to be a breccia pipe, I'm not sure of  
19 the scale of this, but I guess maybe 100 feet.

20 Dr. Moran, what's the scale on this?

21 DR. MORAN: I'd have to back up to some of  
22 the other images. I'm not sure. But could I clarify  
23 one other thing? You can't ground truth it by just  
24 looking at the documents. It was submitted, I think,  
25 in September or October of last year and part of the

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1 reason that I submitted is so that either members of  
2 the Board or members of Powertech would go out into  
3 the field and ground truth with their own imagery or  
4 air photos or something because we're not the permit  
5 applicants.

6 MR. LANCASTER: That sinkhole, what was  
7 the answer to the question whether that's -- you were  
8 trying to display a breccia pipe maybe? Is that the  
9 case here? I need the answer to that question. Is  
10 that sinkhole a depiction of a breccia pipe?

11 DR. MORAN: What I'm saying is it looks  
12 like a sinkhole and in the bigger context of the  
13 larger image, it's repeated multiple times in other  
14 places. And the most logical conclusion of my own  
15 conclusion, and these two other absolutely world class  
16 remote sensors, is it's probably a solution feature  
17 that's being expressed at the surface. And the most  
18 likely explanation in this geology is the surface  
19 expression of a breccia pipe. And if I might add,  
20 numerous government scientists over decades have been  
21 alleging that in the area. And I admit that they  
22 haven't nailed it down firmly within your site, but  
23 it's the most logical explanation given all of the  
24 information. And it's up to you guys to have ground  
25 truthed it.

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1                   MR. LAWRENCE: Can I make a comment? We  
2 have wells, monitor wells in that area. If it was a  
3 breccia pipe and it was supplying a significant amount  
4 of water, we would see evidence of it in terms of the  
5 potentiometric surface. We would see a huge recharge  
6 mound where that water is coming up. We don't see  
7 anything like that. We certainly don't see a huge  
8 discharge -- it looks like maybe there's moisture  
9 there, but I don't know if that's a topographic  
10 effect. There's certainly no running water at the  
11 surface. So even if it was a breccia pipe, what's the  
12 significance of it based on the data that we have in  
13 the area?

14                   MR. LANCASTER: Errol, that's what I was  
15 going after was what was our evaluation. Recognize  
16 that the underlying aquifers underneath the Inyan Kara  
17 are at a different potentiometric situation, so if  
18 there is a breccia pipe that comes up through the  
19 Minnelusa up into the Inyan Kara, we would have what  
20 you were describing or possibly -- you would have some  
21 effect on the potentiometric surface and we would see  
22 that.

23                   As far as the fault zone there, the --  
24 you're talking about a major fracture system so I'm  
25 assuming it's a fault zone. We would see the

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1 displacement in the structure maps that were provided.  
2 As far as -- I can't read what those two circles down  
3 there -- they're dotted, but I mean if you were to  
4 take the effort to take the data from the application  
5 that's specific to this area and as far as the  
6 hydrogeology data, the whole conceptual model that  
7 Staff accepted, and all the data that supports that  
8 model, I see disagreement in terms of just initial  
9 ground truthing.

10 JUDGE BARNETT: So Dr. Moran states in his  
11 testimony, "Neither Powertech nor the NRC Staff have  
12 presented any detailed interpretations of the D-B  
13 structural geology using high quality satellite  
14 imagery." Is he correct?

15 MR. LAWRENCE: Other than the color  
16 infrared, I would say that is correct.

17 JUDGE BARNETT: Staff?

18 MR. PRIKRYL: That's my understanding,  
19 yes.

20 MR. LANCASTER: That is our understanding.

21 JUDGE BARNETT: So why are satellite  
22 images not needed? What is your opinion about why you  
23 don't need to do that?

24 MR. LAWRENCE: If we were in an area where  
25 we had no subsurface control and doing initial

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1 reconnaissance, I would say absolutely, that would be  
2 the easiest and quickest way to get a rapid assessment  
3 of the site conditions. But keep in mind we have  
4 something like 4,000 to 6,000 boreholes of data here  
5 that have been used to do extensive subsurface  
6 mapping. And that's what we're concerned about is  
7 those subsurface units. So it's extra information.  
8 It wouldn't hurt, but I think given the stage of this  
9 project, it wasn't deemed necessary.

10 JUDGE BARNETT: Staff.

11 MR. PRIKRYL: We agree with that. We  
12 reviewed the cross sections and the structural maps  
13 and they don't indicate any kind of displacement of  
14 beds which would indicate a fault.

15 JUDGE BARNETT: Thank you. Dr. LaGarry,  
16 you state in your -- in several places, example OST-  
17 013 at 5, that the Applicant and the FSEIS concede  
18 that the Inyan Kara is unconfined in some places in  
19 the project area. I'm not quoting you exactly there.

20 DR. LaGARRY: I agree with that statement.

21 JUDGE BARNETT: Okay. And now quoting,  
22 you say "based on this admission, confinement does not  
23 exist at the site." Is that your --

24 DR. LaGARRY: Yes. That's correct. I  
25 said that earlier right in front of this microphone.

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1                   JUDGE BARNETT: Are you aware that the  
2 application states that Powertech does not propose ISR  
3 operations in the Fall River and there is where the  
4 Fall River is geologically unconfined?

5                   DR. LaGARRY: I do a lot of stratigraphy.  
6 And my experience is specifically in terrestrial rocks  
7 like these. And most of these things, like I think  
8 Bob Moran had a slide that we saw in his presentation,  
9 but the systems that create the sandstones, the  
10 sandstones are in the shape of ribbons and so  
11 depending on the density of data available, if these  
12 deposits are generally -- well, there's areas that are  
13 discontinuous.

14                   In my opinion, the density of data  
15 presented does not conclusively demonstrate that these  
16 areas are unconfined. So in the technical report and  
17 in the Final Environmental Impact Statement, those two  
18 documents acknowledge that it's a leaky aquifer to  
19 boreholes or unidentified structures or thinning to  
20 zero of the confining layers. They have been -- that  
21 situation has been recognized in different places and  
22 in different spots.

23                   But I also recognize that based on my  
24 mapping experience that without the significant,  
25 without more dense data, if you find say a dozen

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1 places where it's unconfined, there may, in fact, be  
2 several dozen places where it's unconfined. So what  
3 I want to see from the Environmental Impact Statement,  
4 I want to see if I'm going to look at these studies  
5 and be confident oh, and say that's a confined mining  
6 situation, I don't want to see admissions and  
7 concessions that they found places where it's  
8 unconfined.

9 JUDGE BARNETT: Back to my original  
10 question though, are you aware that the application  
11 states that Powertech does not propose ISR operations  
12 in the Fall River areas and areas where the Fall River  
13 is geologically unconfined?

14 DR. LaGARRY: Yes.

15 JUDGE BARNETT: Thank you. So this is  
16 Exhibit NRC-081 at page 7 on the PDF. So this is that  
17 USGS report. I'm going to ask the Applicant and the  
18 Staff, are you familiar with that report? It's a  
19 Staff exhibit.

20 MR. PRIKRYL: Yes.

21 JUDGE BARNETT: Is the Applicant familiar  
22 with that exhibit? Okay. I notice that on page 7 and  
23 let me -- go on down, please. Yes, stop right there.  
24 So I'm looking at the next to the last paragraph, last  
25 sentence or two starting with the word "collapse of

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1 beds." See where I am there? There you go. Wait a  
2 second. Let me make sure I'm at the right place here.

3 Does everybody see where I am there? I'm  
4 reading "collapse of beds overlying the evaporite zone  
5 resulted in substantive breccias and breccia pipes  
6 that extend upward to the Inyan Kara group. The same  
7 process continues today at the margin of the Black  
8 Hills. Breccia pipes constitute part of a plumbing  
9 system through which artesian waters transported low  
10 concentrations of uranium into the formation of the  
11 Inyan Kara where sandstone uranium deposits were  
12 formed."

13 Does that have any relevance to the FSEIS?

14 MR. PRIKRYL: Yes, I think we cite this  
15 publication. And also note that we agree that there  
16 are breccia pipes near the margin of the Black Hills  
17 and these have been identified, but again, no breccia  
18 pipes, we don't see any evidence of breccia pipes  
19 within the licensed area.

20 JUDGE BARNETT: Applicant?

21 MR. DEMUTH: Yes, sir. One of the  
22 challenges of permitting this project has been  
23 distinguishing the site geology from the regional  
24 geology. And there's a lot of good, published  
25 information regarding regional geology to Black Hills.

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1 And we certainly don't dispute in any way that there  
2 are breccia pipes associated with Black Hills.

3 However, Gott's own map which is APP-  
4 015(f) at 5 clearly shows us that he did not map any  
5 breccia pipes on the site. Moreover, the dissolution  
6 --

7 JUDGE BARNETT: I'm sorry, so Gott --  
8 you're referencing his figure?

9 MR. DEMUTH: I am. Correct.

10 JUDGE BARNETT: And what exhibit is that?

11 MR. DEMUTH: APP-015(f) at 5. And this is  
12 Gott's map with -- if you could zoom in on kind of the  
13 middle left portion, yes, right in there. As you'll  
14 notice, the Dewey-Burdock permit area is listed, shown  
15 in the black here. And Gott discussed breccia pipes  
16 in that they are found in proximity to the outcrop of  
17 the Minnelusa formation which is up in this area.

18 Gott and other USGS researchers have  
19 identified a dissolution front. And basically what  
20 they're saying is that the breccia pipe features have  
21 occurred between the outcrop and down to the front,  
22 but they've not been identified in other areas farther  
23 downdip. And in particular, he shows no evidence of  
24 those features on the site.

25 JUDGE BARNETT: So this figure in Gott's

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1 report, he comes to the -- I know he wasn't talking  
2 about the Dewey-Burdock site, but that dissolution  
3 front is his -- that's his or that's something you've  
4 drawn in there?

5 MR. DEMUTH: That dissolution front is  
6 from the previous page 4 of this attachment which is  
7 a USGS base and they have identified a dissolution  
8 front which you'll have to kind of zoom in up in this  
9 area. And that dissolution front that is mapped on  
10 Gott's figure came from this USGS work. So if I  
11 understand, if I read that report more carefully, you  
12 contend that I will find that where he is talking  
13 about does not extend out to Dewey-Burdock, is that  
14 correct?

15 MR. DEMUTH: Yes, sir.

16 JUDGE COLE: Is that because the material,  
17 the conditions required for formation of breccia pipes  
18 involves a certain chemical like anhydride and  
19 something else? And when those aren't present, both  
20 of them you're not going to have breccia systems?

21 MR. DEMUTH: That is correct. It's  
22 dissolution in the anhydride that results in the  
23 collapse features.

24 JUDGE COLE: Dr. Moran?

25 DR. MORAN: I'm going to be a little bit

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1 careful and just say I very much disagree with the  
2 conclusions that have just been mentioned and I'll say  
3 that my opinions on that are in writing. But I'll  
4 just add that that dissolution figure is not Gott's  
5 original figure. Gott's original figure has been  
6 submitted with my written testimony.

7 JUDGE BARNETT: What exhibit is that?

8 DR. MORAN: It's in my PowerPoint. I  
9 don't know the number. If you want to go back to that  
10 PowerPoint, we can.

11 JUDGE COLE: Number 5 is it?

12 DR. MORAN: I don't recall. You might  
13 back up one just for context. This is a re-drawing of  
14 Gott's -- one of his figures. And you'll notice at  
15 the top, the stratigraphic position of uranium  
16 deposits, just to sort of give you a feel for what he  
17 thinks, thought was going on. I'll just add that  
18 these were done, the field work was done years before  
19 '74. And it would have been before satellite imagery  
20 was used routinely. But the figure I was going for is  
21 a little further on.

22 There is the version that Powertech has  
23 created. And I think we have, if you go another  
24 figure beyond, this is Gott's actual figure. I think  
25 I'd rather just be quiet and stick with my written

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1 testimony.

2 JUDGE BARNETT: Well, one of the problems  
3 with your testimony is I don't believe that you  
4 referred specifically to these figures in your  
5 PowerPoint presentation.

6 DR. MORAN: I thought I did, but maybe I'm  
7 wrong.

8 JUDGE BARNETT: If you can find that, I'd  
9 be -- I'd like to see it. I could not find it.

10 DR. MORAN: Can we find the actual  
11 language on the slide of my OST-1?

12 JUDGE BARNETT: Why don't we take a break  
13 and see if we can find it?

14 CHAIRMAN FROEHLICH: All right, I believe  
15 a ten-minute break would be in order. We'll reconvene  
16 at 3:34.

17 (Whereupon, the above-entitled matter went  
18 off the record at 3:19 p.m. and resumed at 3:37 p.m.)

19 CHAIRMAN FROEHLICH: We'll come to order.  
20 We'll be back on the record.

21 MR. PRIKRYL: Judge Froehlich?

22 CHAIRMAN FROEHLICH: Yes?

23 MR. PRIKRYL: Could I add something?

24 CHAIRMAN FROEHLICH: Yes. Yes.

25 MR. PRIKRYL: I just wanted to get this

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1 into the record. Judge Cole asked about data on  
2 excursions earlier.

3 JUDGE COLE: Yes.

4 MR. PRIKRYL: And that information is in  
5 the GEIS, and that's Exhibit NRC 010-A-1 at page 141.

6 JUDGE COLE: Could you repeat that,  
7 please? I just put my fan in my hand.

8 MR. PRIKRYL: Okay. It's Exhibit NRC 010-  
9 A-1, and page 141.

10 JUDGE COLE: Thank you. Appreciate that.

11 MR. LANCASTER: Yes, while we're at it, as  
12 far as this operating facility I'm working with, it's  
13 more like maybe two every three years that we have  
14 excursions reported. I said one to four per year.  
15 It's a lot less than that. But it's relatively small.  
16 It's not every day. That was the whole point of that,  
17 but for the record there you go.

18 JUDGE COLE: Okay. Thank you.

19 JUDGE BARNETT: Dr. Moran, I think we left  
20 off -- and I'd asked you was that figure cited in your  
21 testimony somewhere, I believe. Is that where we  
22 were?

23 DR. MORAN: Yes, and I was reminded that  
24 it's on page 22 of my written testimony. OST-1, is  
25 it? The second full paragraph I think is what you're

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1 asking about.

2 JUDGE BARNETT: Okay.

3 MR. LAWRENCE: Can we go back to that map?  
4 I would like to see where exactly it is that Dr. Moran  
5 seems to think that breccia pipes were located within  
6 the permit boundary.

7 JUDGE BARNETT: Yes, do you have an  
8 exhibit number so we can pull it up?

9 MR. LAWRENCE: It's that one right there.

10 JUDGE BARNETT: Oh, okay. I'm sorry.

11 MR. LAWRENCE: Yes. Could you zoom in on  
12 the area then where you see the kind of little dog leg  
13 and the pink-colored -- yes.

14 JUDGE BARNETT: Dr. Moran, can you show me  
15 where you think the closest breccia pipe to the site  
16 would be?

17 DR. MORAN: Let me respond slightly  
18 differently. I have here a paper version of that,  
19 which is the original Gott figure. And if you go down  
20 and to the right a bit, you'll start to see --  
21 actually, maybe it's better to go to the key, the  
22 legend over on the explanation of the -- yes. I'm  
23 sorry. Up above. Keep going up, please, and a little  
24 bit to the right. Up.

25 So right in the right-hand column, third

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1 grouping from the bottom, topographic depression in  
2 Inyan Kara group or Younger rocks. That's what the  
3 team that worked with Gott mapped. So anything with  
4 a symbol like that or the ones above, area containing  
5 structures of possible solution origin, those are what  
6 I'm referring to. And several of those symbols are  
7 down below. If we go back onto the map, you can see  
8 where the USGS in the early '70s had mapped several of  
9 those within the Inyan Kara rock.

10 Now, you have to enlarge it a bit. And  
11 some of them would be -- yes, let's go -- it may break  
12 up if you enlarge it more, I don't know, but I can  
13 hand you the paper copy.

14 MR. LAWRENCE: Because the permit boundary  
15 starts a little bit south of the word "Dewey" there  
16 and extends down and over. It starts somewhere about  
17 -- in here is about the northern extent and goes down  
18 here. So I'm not seeing anything in that area.

19 DR. MORAN: I think we're doing two things  
20 that get us all in trouble, but -- because now you've  
21 got the permit boundary going into the Dewey fault  
22 zone. But what I'm really saying is --

23 MR. LAWRENCE: I said south of the Dewey.  
24 It says down here.

25 DR. MORAN: I'm saying that the other

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1 figure which you showed misrepresents what Gott and  
2 his field team were saying. And their information on  
3 their original map gives you -- maps several locations  
4 of possible collapse structures. He didn't prove that  
5 there were breccia pipes, but they again are these  
6 depressions that a logical geologist would say, hey,  
7 I better go out and ground truth it.

8 JUDGE BARNETT: And your contention is  
9 that some of those are on the site, the project site?

10 DR. MORAN: Or very close, yes.

11 MR. LAWRENCE: Not according to that map.

12 DR. MORAN: Well, do you have one of the  
13 figures in front of you here? Or we can show it to --

14 MR. LAWRENCE: No.

15 JUDGE BARNETT: We can't do this.

16 DR. MORAN: Do you want to take it back?

17 JUDGE BARNETT: How do you want to handle  
18 this.

19 CHAIRMAN FROEHLICH: Is that map -- the  
20 one that's there, I mean. Is that --

21 DR. MORAN: It is that figure.

22 CHAIRMAN FROEHLICH: That's that figure?  
23 And can we make lines on the map like we do in  
24 Rockville? Can you draw?

25 PARTICIPANT: I cannot draw.

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1 CHAIRMAN FROEHLICH: Can't draw?

2 MR. LAWRENCE: If you go back up to the  
3 previous -- our version of the map or Powertech's  
4 version of the map, you can kind of get a sense of  
5 where that property boundary is. And it's basically  
6 in the area that's -- where there's nothing.

7 JUDGE BARNETT: How hard would it be to  
8 tonight just hand sketch the site on that and give it  
9 to us tomorrow? Is that possible? It doesn't have to  
10 be neat or anything, just --

11 MR. LAWRENCE: I think we could do that.

12 JUDGE BARNETT: Dr. Moran, could you do  
13 the same thing?

14 DR. MORAN: It's already done on some of  
15 the other figures.

16 JUDGE BARNETT: Well, but it's not on that  
17 one.

18 DR. MORAN: You want it on that particular  
19 one?

20 JUDGE BARNETT: Yes.

21 DR. MORAN: Well, I mean, it can be done.  
22 But it's already on several of my other slides.

23 JUDGE BARNETT: In this exhibit?

24 DR. MORAN: No. Of the OST-1, yes. No,  
25 I'm sorry. Whatever this is. This is OST-5? Is

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1 this --

2 JUDGE BARNETT: Yes, there no figures in  
3 OST-1, I do not believe.

4 DR. MORAN: Oh, I'm sorry. I misspoke.

5 CHAIRMAN FROEHLICH: Much of this dialogue  
6 won't be helpful since we're going to be working from  
7 a written record. I think what has to be done is if  
8 there are those depressions or the breccia pipes,  
9 you'll have to indicate in what quadrant on the grid  
10 that is in this map they appear. And then Mr. Demuth  
11 and Mr. Lawrence can look and see if in that quadrant,  
12 in that dotted line, that square or rectangular box  
13 there is a -- well, I don't think by pointing or  
14 drawing we're going to get it very clear. Would that  
15 help? Can you --

16 DR. MORAN: We can do that tonight, sir.

17 CHAIRMAN FROEHLICH: -- do that tonight?

18 DR. MORAN: Yes.

19 MR. PARSONS: Your Honor, if I might add  
20 as well, when the question of breccia pipes came up  
21 three years ago, the Powertech Staff, including their  
22 chief geologist, went and researched and individually  
23 looked for these features. In addition, the features  
24 that Dr. Moran listed on his satellite imagery, they  
25 went on and looked for those features as well.

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1                   CHAIRMAN FROEHLICH: Let me make sure I  
2 understood that. So they have taken, someone from  
3 Powertech took the satellite images that Dr. Moran has  
4 introduced into the record and ground truthed those?

5                   MR. PARSONS: That is my understanding,  
6 yes, sir.

7                   CHAIRMAN FROEHLICH: Is that person here  
8 to testify today?

9                   MR. PARSONS: He's here. I don't know if  
10 we can put him under oath or not.

11                  CHAIRMAN FROEHLICH: There's nothing to  
12 prevent us from doing that. I'm not sure how many  
13 questions we'll have for him or how far you want to  
14 take this. If it's just a matter of corroborating  
15 whether that had been ground truthed and logical  
16 follow-ons from that and it's very limited, there  
17 would be no problem, at least from the Board's  
18 perspective. I don't know if Staff or the Intervenors  
19 would object to such a procedure.

20                  MR. PARSONS: Your Honor, if I may, it  
21 sounds like there may have also been some analysis  
22 done or some report or other information that I'm not  
23 sure -- I mean, we're getting back into some of the  
24 issues of disclosure. If there are additional data or  
25 any other information like that, documents, I think

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1 that that may be part of the inquiry as well.

2 CHAIRMAN FROEHLICH: Do I understand that  
3 you don't oppose the swearing in of a live witness in  
4 the proceeding to follow up on the questions that have  
5 been raised thus far?

6 MR. PARSONS: I may need to confer with  
7 co-counsel. I'm not sure we've had any presentation  
8 of any qualifications or other indication that this  
9 witness would be qualified to do what they say he did  
10 or she did.

11 CHAIRMAN FROEHLICH: I'd be glad to voir  
12 dire him or her prior to that. And if there are any  
13 gaps, you'd be allowed to follow up.

14 MR. PARSONS: Would you give us a moment  
15 to confer?

16 CHAIRMAN FROEHLICH: Yes.

17 (Pause.)

18 MR. PARSONS: Thank you, Your Honor. I  
19 appreciate that courtesy. I think with those caveats  
20 that we would like to make part of the inquiry as to  
21 whether there's any documents or data or other  
22 indication of other disclosures that may not have been  
23 made related to this inspection, we would not object  
24 to swearing in a witness if they're amenable.

25 CHAIRMAN FROEHLICH: Keep in mind we're

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1 not authorizing a data fishing expedition here. We're  
2 merely confirming or clarifying the exhibit that shows  
3 the satellite image exhibit.

4 Powertech, do you have any objection?

5 MR. PUGSLEY: No.

6 CHAIRMAN FROEHLICH: And Commission Staff?

7 MR. CLARK: No objection.

8 CHAIRMAN FROEHLICH: Who is this witness  
9 that you refer to, Mr. Demuth?

10 MR. DEMUTH: I would defer to counsel, if  
11 he would introduce, please.

12 MR. PUGSLEY: The witness Mr. Demuth is  
13 referring to is Mr. Frank Lichnovsky who is the senior  
14 geologist for Powertech.

15 CHAIRMAN FROEHLICH: Okay. Without  
16 objection from the parties, if you'd he'd forward,  
17 raise his right hand?

18 PARTICIPANT: Your Honor?

19 CHAIRMAN FROEHLICH: Yes, sir?

20 PARTICIPANT: If I might, my client, Mr.  
21 Dayton Hyde has shown up and taken his seat. While  
22 you're swearing in witnesses, if you wouldn't mind  
23 including him.

24 CHAIRMAN FROEHLICH: Yes, you need not  
25 stand however.

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1 PARTICIPANT: Thank you, Your Honor.

2 CHAIRMAN FROEHLICH: Okay. Sir, would you  
3 raise your right hand? Mr. Hyde as well. Thank you.  
4 Do you solemnly swear or affirm the statements you are  
5 about to make in this hearing before the ASLBP will be  
6 true and correct to the best of your knowledge and  
7 belief?

8 MR. HYDE: Yes.

9 MR. LICHNOVSKY: Yes.

10 CHAIRMAN FROEHLICH: Okay. The record  
11 will reflect that each witness has responded in the  
12 affirmative.

13 And do you, Mr. Hyde, adopt your pre-filed  
14 testimony as your sworn testimony in this proceeding?

15 The witness has responded in the  
16 affirmative. Thank you. You can take a seat in the  
17 back row, please.

18 Would you please state your name and  
19 employer for the record?

20 MR. LICHNOVSKY: Frank Lichnovsky with  
21 Powertech.

22 CHAIRMAN FROEHLICH: And what is your  
23 position with Powertech?

24 MR. LICHNOVSKY: I'm chief geologist.

25 CHAIRMAN FROEHLICH: And are you familiar

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1 with OST-005 which Dr. Moran has been referring to?

2 MR. LICHNOVSKY: Is that the map on the  
3 screen?

4 CHAIRMAN FROEHLICH: No.

5 JUDGE BARNETT: Well, I believe that comes  
6 from that exhibit, yes.

7 CHAIRMAN FROEHLICH: Okay.

8 MR. LICHNOVSKY: Yes.

9 CHAIRMAN FROEHLICH: Yes? All right. And  
10 what was the question here?

11 JUDGE BARNETT: Where is the satellite  
12 image in there?

13 CHAIRMAN FROEHLICH: Right.

14 JUDGE BARNETT: It's the satellite images  
15 on page 13 or slide 13.

16 CHAIRMAN FROEHLICH: Okay. Got it. Now  
17 ask your question.

18 JUDGE BARNETT: Have you seen this before?

19 MR. LICHNOVSKY: Yes.

20 JUDGE BARNETT: So Dr. Moran has testified  
21 that this image is what he believes could potentially  
22 be a sinkhole at the site. So my question is have you  
23 done anything to confirm or refute his interpretation  
24 of this image?

25 MR. LICHNOVSKY: Yes, I went out and

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1 looked at the site. It is not a circular feature on  
2 the ground. It's open to the southwest. It's just a  
3 low spot that a little bit of drainage goes through.

4 JUDGE BARNETT: I guess I'm confused.  
5 Isn't that a sinkhole?

6 MR. LICHNOVSKY: No.

7 JUDGE BARNETT: A low site that a little  
8 bit of drainage goes through?

9 MR. LICHNOVSKY: Yes, it's more of an  
10 erosional feature. It's not a sinkhole.

11 JUDGE BARNETT: So drainage just goes in  
12 there?

13 MR. LICHNOVSKY: It goes through it.

14 JUDGE BARNETT: Through it? Okay.

15 MR. LICHNOVSKY: Yes.

16 JUDGE BARNETT: Okay. That's all I have.

17 CHAIRMAN FROEHLICH: Okay. We now have  
18 the opinion as to whether this is a sinkhole or a  
19 breccia pipe. Are there any questions from counsel to  
20 follow up with this witness?

21 We're going to need about a five-minute  
22 break while we adjust the sound system.

23 (Whereupon, the above-entitled matter went  
24 off the record at 3:55 p.m. and resumed at 3:55 p.m.)

25 CHAIRMAN FROEHLICH: I believe we're back

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1 in business. Take your seats, please.

2 Mr. Parsons, did you have any questions  
3 for the witness?

4 MR. PARSONS: Thank you, Your Honor. I  
5 appreciate it.

6 Just one question as to whether as part of  
7 that assessment there were any written reports or  
8 other documents or data produced as a result?

9 CHAIRMAN FROEHLICH: You may answer.

10 MR. LICHNOVSKY: No. I took a picture of  
11 it and I thought I sent it to the Petrotek guys here,  
12 but they don't seem to have gotten it, so, no, there  
13 was not.

14 CHAIRMAN FROEHLICH: Staff, do you have  
15 any questions of the witness?

16 MR. CLARK: No questions, Your Honor.

17 CHAIRMAN FROEHLICH: Mr. Pugsley?

18 MR. PUGSLEY: Just one, Your Honor. If  
19 that feature on the map was indeed a breccia pipe,  
20 would it be possible for the orebody label there to be  
21 going through it?

22 MR. LICHNOVSKY: No.

23 JUDGE BARNETT: And why is that?

24 MR. LICHNOVSKY: It would be limited  
25 porosity and permeability and the solution just would

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1 not have flowed into it.

2 JUDGE BARNETT: In the breccia pipe?

3 MR. LICHNOVSKY: Yes.

4 JUDGE BARNETT: I thought the whole thing  
5 with the breccia pipe is solutions flowed quickly  
6 through it.

7 MR. LICHNOVSKY: It would be down-dropped  
8 and you'd have the shale from above down in there. It  
9 would disrupt the sands.

10 JUDGE BARNETT: So it's impossible to have  
11 a breccia pipe in the ore zone? Is that your  
12 testimony?

13 MR. LICHNOVSKY: No, in the -- or -- I  
14 lost it -- Grand Canyon area the breccia pipes do  
15 contain ore, but here it would not.

16 JUDGE BARNETT: Okay. I'm almost finished  
17 with Contention 3, fortunately, and that was the one  
18 I had the most questions about.

19 So I have a question for the Applicant.  
20 You refer to this process of operating a mine in  
21 accordance with NUREG-1569 as a phased process, is  
22 that correct, to collect some data up front and then  
23 as you go and install the wellfields you're collecting  
24 more data. Is that correct?

25 MR. DEMUTH: That is correct.

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1 JUDGE BARNETT: Okay. So my question is  
2 when you collect new data is that evaluated outside of  
3 the NEPA process, and who will have access to that  
4 data and can it be challenged, or is that just your  
5 data then?

6 MR. DEMUTH: I can't speak to the legal  
7 aspect of the NEPA process. What I can tell you is  
8 that the information will be submitted to NRC and it  
9 will be public information within the guise of  
10 regulatory reporting. Now, does that mean that  
11 Powertech is under obligation to submit all data that  
12 might refer to the grade of ore that they see in their  
13 logs? I would think not. In terms of data to support  
14 the source material license in the SER, absolutely  
15 that would be public information.

16 JUDGE BARNETT: And challengeable  
17 information?

18 MR. DEMUTH: I would have to defer to the  
19 NRC Staff in terms of whether that could be challenged  
20 or not.

21 JUDGE BARNETT: Mr. Pugsley, your argument  
22 is this is a phased process in accordance with 1569?

23 MR. PUGSLEY: It's a phased process in  
24 accordance with regulation and 1569, yes.

25 JUDGE BARNETT: Okay. For data that comes

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1 up later, does Powertech have an obligation to share  
2 that data with anyone?

3 MR. PUGSLEY: Okay. Just making sure I  
4 understand your question, are you talking, for  
5 example, data in a wellfield package?

6 JUDGE BARNETT: Correct.

7 MR. PUGSLEY: Okay. We have an obligation  
8 to share it with NRC because per license condition;  
9 and I referenced this previously, but I'll do it  
10 again, the verbiage in license conditions now for  
11 wellfield packages come in three sets. They're called  
12 review, review and written verification, review and  
13 approve. Powertech has some of that in different  
14 license conditions. But the most basic one is review.

15 Now that means that NRC has to receive a  
16 copy of the wellfield package in the information, and  
17 any information that is not declared protected under  
18 10 CFR 2.390 is -- when submitted to NRC, NRC makes it  
19 publicly available under ADAMS database. And I would  
20 ask NRC Staff counsel to tell me if I'm wrong, but  
21 that would make it publicly available. However, the  
22 data itself in those is not subject to litigation per  
23 the Hydro Resources case in this proceeding.

24 JUDGE BARNETT: Mr. Clark?

25 MR. CLARK: If I could address that? I

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1 think Mr. Pugsley is correct, there are a few nuances.  
2 When the Staff receives information, as Mr. Pugsley  
3 said, it will apply 10 CFR 2.390 to determine whether  
4 information is public or non-public. Staff also  
5 applies Management Directive 3.4, which is titled,  
6 "Release of Information to the Public." So before we  
7 see this information it would be difficult to give a  
8 good idea of just which information would be released  
9 and which wouldn't, but I believe the vast majority of  
10 the information would be released.

11 In terms of review, review and  
12 verification and review and approval, that is the  
13 licensing scheme. Review and approval, if the Board  
14 -- can I ask to bring up Exhibit NRC 12 at page 9 of  
15 the PDF. This is an example where Powertech will need  
16 a license amendment. I'm referring to the very top.  
17 This is License Condition 10.10(b). Powertech will  
18 submit for NRC review and approval hydrologic test  
19 packages for Burdock wellfields 6, 7 and 8. Powertech  
20 will need to submit a license amendment. The review  
21 and approval means the Staff will need to review and  
22 approve, if appropriate, the packages before Powertech  
23 can operate in those wellfields.

24 Any time there's a license amendment,  
25 there's an opportunity under the Atomic Energy Act

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1 under Section 189 for members of the public to request  
2 a hearing. There's also the obligation under 10 CFR  
3 Part 51 for the Staff to either perform an  
4 environmental assessment or prepare an environmental  
5 impact statement. I do not believe any of these  
6 actions would be categorically excluded from NEPA  
7 review. So the short answer is for these types of  
8 license conditions there will be further NEPA review  
9 and the public will have additional opportunities to  
10 request a hearing.

11 Now for review and review and  
12 verification, all that means is that Powertech will  
13 not necessarily need to seek a license amendment. If  
14 Powertech submits information and the Staff can't  
15 confirm that it satisfies the license conditions, the  
16 Staff will notify Powertech and inform them that if  
17 they proceed, they'll be in violation of their license  
18 conditions and that would lead to an enforcement  
19 action.

20 In that case, Powertech will either need  
21 to not take action so that they won't be violated  
22 their license conditions or they will need to seek a  
23 license amendment so that their license can be amended  
24 to conform with their planned course of action. In  
25 that case there will be another request for a license

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1 amendment, there will be another opportunity for the  
2 public to seek a hearing, and there will be further  
3 NEPA review.

4 JUDGE BARNETT: So if I remember 1569,  
5 Chapter 2 is the pre-operational data, is that  
6 correct?

7 MR. CLARK: Yes, sir.

8 JUDGE BARNETT: And then Chapter 5, what  
9 is that?

10 MR. PUGSLEY: That's entitled,  
11 "Operations."

12 JUDGE BARNETT: Right.

13 MR. PUGSLEY: That is post-license.

14 JUDGE BARNETT: Right. So that's  
15 specifically what I'm asking about. That data there,  
16 will that be available to the public and can it be  
17 challenged?

18 MR. PUGSLEY: I believe that the data in  
19 Chapter 5 is not subject to challenge unless it is  
20 subject to a license amendment proceeding. If it's  
21 under review, it's simply the hydrologic packet. The  
22 wellfield package is submitted to NRC and it is made  
23 -- unless it's protected under 2.390, it is made  
24 publicly available.

25 MR. CLARK: If I could respond?

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1 JUDGE BARNETT: Sure.

2 MR. CLARK: And I guess to reframe the  
3 question, if the data show a need for a -- if there is  
4 a licensing action, there's an opportunity for public  
5 hearing requests and also a requirement that the Staff  
6 do additional NEPA review. The question is whether  
7 the additional data show the need for a licensing  
8 action or whether they fall within this licensing  
9 action that's before the Board today.

10 In terms of whether the data will be made  
11 available for public review, some data may be  
12 proprietary, and consistent with 10 CFR 2.390 it may  
13 be withheld from public view, but the vast majority of  
14 the data will be entered into the NRC's Agencywide  
15 Documents Access Management System.

16 JUDGE BARNETT: Okay. Thank you. That's  
17 all I have on 3.

18 Ms. McLean, thank you for coming today.  
19 I have a question about your testimony in INT-014, and  
20 that is, could you just briefly summarize your  
21 testimony with regards to the concerns about the pond  
22 lining?

23 MS. McLEAN: Yes. One second here. The  
24 ponds are a shallow design and this is designed to  
25 allow for more contact, what you get between the

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1 highly chemical active wastewater and the plastics in  
2 the liner facilitating faster degradation. All the  
3 plastics do degrade over time even without this  
4 chemical exposure. We know plastics do degrade. The  
5 high levels of oxidizing chemicals will speed  
6 degradation dramatically. And this is what these  
7 chemicals do and why they are used in the ISL process  
8 to degrade the rocks.

9 The plastics used in the liners are  
10 polypropylene and polyethylene. That's taken from the  
11 permit. These are common plastics we use every day.  
12 These plastics are so easily degraded that they are  
13 the principal plastics used in the food and bottled  
14 water industry and they're easily recycled by adding  
15 chemicals to degrade and disintegrate them, and hence  
16 that's the ones that we recycle. The warranty by the  
17 manufacturer is only one year for the polypropylene  
18 and two years for the polyethylene in the project, and  
19 that is without being exposed to highly degrading  
20 chemicals. And the project is supposed to last 20  
21 years.

22 The strips of plastic will be bonded  
23 together by seams of heat or glue, and these have been  
24 shown in other EPA tests to leak. The plasticizers  
25 that are integral in all plastics give them their

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1 softness and pliability and are well known endocrine  
2 disrupters and hormone mimics. We've known that since  
3 probably the early '90s. And they're also well known  
4 to leach into foods, hence the warnings of plastic  
5 bottled juices, foods and waters. When these  
6 plasticizers are leached from the plastics, the  
7 plastics also become brittle and will then break and  
8 leak, which is why we see plastic bags that are  
9 fractured and become brittle lying on the sides of the  
10 highway and in woods after exposure to air, ozone and  
11 sunlight.

12 I would expect these --

13 MR. PUGSLEY: Your Honor, we'd like to  
14 register an objection to this testimony as I am having  
15 trouble -- I'd like an offer of relevance to hydro-  
16 geological information.

17 CHAIRMAN FROEHLICH: Your objection is  
18 noted. I believe Ms. McLean's testimony, pre-filed  
19 INT-014, discusses the problem with the ponds and the  
20 potential for water within that pond to leach into the  
21 groundwater. And I believe the bottom line of her  
22 testimony is that none of this data or this concern  
23 has been considered in the environmental assessment.

24 MR. PUGSLEY: Your Honor, I appreciate you  
25 noting my objection. Thank you.

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1 CHAIRMAN FROEHLICH: Okay. Is that an  
2 accurate statement?

3 MS. McLEAN: Yes.

4 CHAIRMAN FROEHLICH: Okay. All right.  
5 Thank you, Ms. McLean.

6 MS. McLEAN: When these plasticizers are  
7 leached from the plastics by the lixivants, the  
8 plastics become brittle and will break and then leak.  
9 And then that's why we see plastics that have been  
10 lying on the side of the road even exposed to UV  
11 light, you know, sunlight and ozone in the air and  
12 stuff over time, and rain and such -- they fracture  
13 and break and pulverize.

14 CHAIRMAN FROEHLICH: Okay. Thank you.  
15 And I will read your testimony in detail, but thank  
16 you for summarizing it briefly.

17 MS. McLEAN: Okay. I'm not finished yet.

18 CHAIRMAN FROEHLICH: You've submitted the  
19 written testimony. I think that's --

20 MS. McLEAN: Okay.

21 CHAIRMAN FROEHLICH: I think I can get the  
22 details out myself. Thank you.

23 And I would have, I guess, one follow-up  
24 for the NRC Staff and ask if the concerns with the  
25 liner and the ponds are addressed in any of the

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1 environmental documents?

2 MR. PRIKRYL: Yes, I'm looking for that  
3 right now. Just give me a second.

4 CHAIRMAN FROEHLICH: Sure.

5 MR. PRIKRYL: Okay. I think I found it.  
6 If we go to -- I believe this is Exhibit 008-A-1.

7 CHAIRMAN FROEHLICH: The EIS?

8 MR. PRIKRYL: This is the SEIS. And if we  
9 go to page 2-22. Now you go to the -- right above the  
10 bullets. I'll just go ahead and read this paragraph  
11 right above the bullets. "The classified injection  
12 well disposal option requires surface impoundments or  
13 ponds for storage and settling of uranium before  
14 injection into the deep disposal wells." And as  
15 described in SEIS Section 2.1.1.2.1, these problems  
16 are going to be designed following NRC requirements.  
17 So they have to be designed -- NRC requirements.

18 Now if we go to page 225, and let's look  
19 at the second paragraph. And do you all want to just  
20 -- let's see. This describes how the ponds are going  
21 to be designed, or the liners for the ponds.

22 JUDGE COLE: Now the purpose of the liners  
23 is just to prevent flow downward?

24 MR. PRIKRYL: Yes. Yes, to prevent  
25 contamination. If you back to the middle of the

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1 paragraph, the radium settling, spare and central  
2 plant ponds will be constructed with a lining system  
3 consisting of the following: An 80-mil HDPE primary  
4 liner, 60-mil HP secondary liner. And then there's  
5 going to be a clay liner beneath that and then a  
6 geonet drainage layer sandwiched between the primary  
7 and secondary liners. It will also have a leak  
8 detection and sump access port system. So this is how  
9 they designed in order -- so that water will not leak  
10 through the ponds.

11 JUDGE BARNETT: Okay. And Ms. McLean had  
12 submitted testimony regarding her concerns for the  
13 plastic, and we will evaluate that.

14 MR. PRIKRYL: Yes.

15 JUDGE BARNETT: And along with all your  
16 entire testimony. So thank you.

17 MR. LANCASTER: Just to add to that,  
18 License Condition 12.25 requires that monitoring wells  
19 that surround these ponds further adds for leak  
20 detection.

21 MS. McLEAN: Can I add something, please?

22 CHAIRMAN FROEHLICH: Yes, go ahead.

23 MS. McLEAN: HDPE is high-density  
24 polyethylene. The chemical is the same and the  
25 constituency is the same not matter how thick you make

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1 it. It just takes maybe a little longer to eat  
2 through. But the chemical constituency still only has  
3 a one to two-year length of life, and that is without  
4 being exposed to the high oxidative processes of the  
5 stuff in the ponds. So you can layer it and layer it  
6 and layer it and it will still eat through because  
7 it's the same type of plastic constituency.

8 And clay is not considered to be an  
9 adequate barrier either. We found that with Superfund  
10 sites in Michigan where I came from.

11 JUDGE BARNETT: Yes, I did read that it in  
12 your testimony. I remember reading that.

13 MS. McLEAN: Yes.

14 JUDGE BARNETT: So, thank you. That's all  
15 I have for Contention 3.

16 JUDGE COLE: Yes, just one more question.  
17 This is both Dr. Moran and Dr. LaGarry. In your  
18 previous testimony you indicated that Powertech needs  
19 to provide additional hydro-geological data on  
20 specific wellfields in the Dewey and Burdock area.  
21 Mr. Clark was talking about special conditions in the  
22 permit and he talked about special conditions in  
23 Permit 10.10(b), but are you aware that Special Permit  
24 Condition 10.10(a) has 11 specific items pertaining to  
25 hydro-geochemical testing and actions that are

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1 necessary for the well package design and operation?

2 DR. LaGARRY: Oh, am I aware of that? I  
3 don't recall the details of that.

4 JUDGE COLE: Yes, that's on page 8 of the  
5 permit. You have a copy of the permit.

6 DR. LaGARRY: Yes.

7 JUDGE COLE: But it lists 11 hydro-  
8 geochemical geological actions that have to be taken  
9 in conducting the well package, so it's a requirement  
10 that the Applicant has to abide by.

11 DR. MORAN: Okay. My comments were simply  
12 intended to allow the public to understand more before  
13 the license was awarded.

14 JUDGE COLE: This is for pre-operational.

15 DR. MORAN: Right.

16 JUDGE COLE: This is what you have to do  
17 to prepare the well package.

18 DR. LaGARRY: Yes, my comments were  
19 intended to convey my reservations about -- I mean, I  
20 limited my initial testimony to the issues of  
21 confinement, which is within my area. And it tied  
22 into something that I was asked about earlier about  
23 the phased process and the fact that there be the  
24 ongoing excursions issue, so that it's all part of  
25 that same thing I was trying to bring up that for me

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1 as a scientist and for the public at large we would  
2 like to have the confidence of knowing that things  
3 aren't going to be patched as they go.

4 With every iterative effort or requirement  
5 to try to patch an issue as it goes forward, it would  
6 be better in my professional opinion to deal with  
7 those at the front end so that we the public and the  
8 we scientific community can look at that and say,  
9 okay, look, this wellfield isn't going to be a  
10 continuous series of excursions and patches and  
11 problems and issues. It's all been dealt with up  
12 front and we're confident that mining can proceed more  
13 or less problem free. There's always unanticipated  
14 things.

15 But if the Applicant is conceding that the  
16 confining layers are perforated or leaky, then it  
17 comes to question that if they know it's going to be  
18 leaky and they know there's going to be a series of  
19 iterative issues that follow on once mining starts,  
20 why don't we get an opportunity to address and  
21 potentially forestall those at the front end of the  
22 proceeding? So that was my intent with that  
23 particular part of my opinion.

24 JUDGE COLE: Thank you.

25 CHAIRMAN FROEHLICH: All right. We will

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1 move now I guess to Contention 4 dealing with  
2 groundwater quantity impacts.

3 JUDGE BARNETT: Okay. Can we see OST-001  
4 at 27, Dr. Moran's testimony? Search for detailed  
5 water balance.

6 Okay. Your first sentence there and the  
7 basis for your opinion says, "In order to evaluate the  
8 adequacy of mine water-related data and management  
9 practices, it is standard practice for EISs and  
10 similar mine environmental reports to include a  
11 detailed water balance." Is that correct?

12 DR. MORAN: Yes.

13 JUDGE BARNETT: Can you cite any NRC-led  
14 EISs that include the kinds of detailed water balances  
15 that you're referring to?

16 DR. MORAN: No.

17 JUDGE BARNETT: Okay. Can we see NRC 008-  
18 A-1 at 130? Correct. Can we see the whole -- yes,  
19 there you go.

20 Okay. There's the figure. It's from  
21 FSEIS Figure 2.1-14. What do you contend that's  
22 either missing or out of balance there?

23 DR. MORAN: One of the issues I was trying  
24 to bring out is how much water will be lost through  
25 evaporation, for example, from the holding ponds if

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1 they choose to go in that direction. So you need to  
2 quantify it, or it's standard practice to do it in  
3 mining projects. The same would be how much water  
4 will be say pumped out of the Inyan Kara and then  
5 injected into some other aquifer if that is concluded  
6 to be the approach for waste disposal? Those details  
7 aren't in this document.

8 JUDGE BARNETT: Okay. If you can give me  
9 just a second here to catch up. It's hard to --

10 DR. MORAN: Sorry.

11 JUDGE BARNETT: Okay. So do make any  
12 contention that the flows that are shown there do not  
13 balance?

14 DR. MORAN: No, that's not what I said.

15 JUDGE BARNETT: Okay. I'm making sure I  
16 get it correct. So would you concur that the flows  
17 that are shown there do balance? Is that correct?

18 DR. MORAN: The truth is I haven't gone  
19 through to see if they balance. My point is that I  
20 was trying to bring up the issue that a reader can't  
21 discriminate what part is related to what. For  
22 example, evaporation and road watering and things like  
23 that, those are huge amounts of water.

24 JUDGE BARNETT: Okay. That's a fair  
25 question. I'd like to ask the Applicant how does

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1 water lost to evaporation -- how does that figure into  
2 this? I guess one of Dr. Moran's concerns is that  
3 there's no evaporation shown in the water balance.

4 MR. DEMUTH: Your Honor, I believe that  
5 that is addressed in some of the responses. First of  
6 all, the evaporation that I believe Dr. Moran is  
7 referring to in the case of small ponds prior to the  
8 Class 5 disposal, that doesn't affect the water  
9 balance. If there's some evaporation from the ponds,  
10 then less goes down the well. So the evaporation in  
11 that situation is not an issue. Either you have some  
12 that evaporates or you have less that evaporates and  
13 it goes down the disposal well. So with due respect,  
14 I fail to see the magnitude of concern of the  
15 question.

16 JUDGE BARNETT: So your conclusion is that  
17 evaporation is effectively shown in stream I and N, is  
18 that correct?

19 MR. DEMUTH: That would be correct.

20 JUDGE COLE: Evaporation is a maximum in  
21 those two because there might be some putting down  
22 underground?

23 MR. DEMUTH: Yes, the vast majority would  
24 be underground. In that situation the evaporation  
25 would actually be very small.

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1 JUDGE BARNETT: Where else could  
2 evaporation occur in the process other than those  
3 ponds?

4 MR. DEMUTH: In the deep disposal well  
5 option there should be no other evaporative losses  
6 simply because the water that's pumped out of the  
7 wellfields runs through the plant and it a contained  
8 system and it either goes to the disposal wells or it  
9 goes back to the wellfield. So we don't have an  
10 opportunity for great evaporative losses.

11 JUDGE BARNETT: Staff, would you like to  
12 weigh in on this on the --

13 MR. PRIKRYL: The Staff --

14 JUDGE BARNETT: Yes, anyone from the  
15 Staff, would you like to weigh in on Dr. Moran's  
16 concern that evaporation is not shown explicitly in  
17 the water balance?

18 CHAIRMAN FROEHLICH: We would sort of  
19 agree with Powertech's explanation. In the Staff's  
20 view water loss to evaporation is basically counted  
21 for in this water balance, and this is because  
22 evaporation would only take place for the wastewater  
23 that is diverted to the radium settling and holding  
24 ponds for disposal. So the diverted wastewater  
25 represents the water consumed by the project and

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1 therefore evaporation would not represent any  
2 additional consumptive use.

3 JUDGE BARNETT: Dr. Moran, what was your  
4 other concerns besides evaporation?

5 DR. MORAN: I think I'll just stay with my  
6 written testimony. In most of the mining world this  
7 is not a water balance. The specific ins and outs and  
8 water losses are not specified in this table.

9 JUDGE BARNETT: Well, I guess that's why  
10 I'm struggling. What is missing from this table, I  
11 guess is what --

12 DR. MORAN: Well, as I said, there is  
13 no --

14 JUDGE BARNETT: Evaporation? Okay.

15 DR. MORAN: Is one.

16 JUDGE BARNETT: Okay. But what else?

17 DR. MORAN: Any infiltration through the  
18 bottoms of the ponds. None of that is specified. If  
19 water is taken out of the Inyan Kara and then later  
20 you have to pump the residual water into a different  
21 deep formation, that's lost to the Inyan Kara. But we  
22 haven't quantified it here. At a theoretical level  
23 it's being recirculated, but not in fact.

24 JUDGE BARNETT: Is it correct that water  
25 taken from the Inyan Kara and injected in deep wells

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1 would be counted for inflows I and N? Is that the  
2 Applicant's and the Staff's --

3 MR. PRIKRYL: That's correct, yes.

4 JUDGE BARNETT: Anything else about this?

5 MR. FRITZ: I'd like to say something  
6 about that. If you'd scroll up to the upper part of  
7 the figure, it does show the -- if you look to the  
8 left, the amount that's coming Fall River and Chilson  
9 and the amount from the Madison, those streams are  
10 shown for both the Dewey and the Burdock wellfield as  
11 inputs to the water balance.

12 JUDGE BARNETT: Anything else you'd like  
13 to say, Dr. Moran, about the water balance?

14 Okay. If we could see OST-1 at 26 and NRC  
15 008-A-2 at 360?

16 MR. CLARK: I think I heard the page  
17 number as 360. Is that correct?

18 JUDGE BARNETT: Correct, of NRC 008-A-2.  
19 Oh, I'm sorry. Yes, I'm sorry. It's getting late.  
20 It's document page 360. Well, it's page 55 in the  
21 PDF. Now, could you go down to the -- yes, the top of  
22 page 4-55. Okay. I'm referring to the first  
23 paragraph. So, Dr. Moran, you state that 274.2 acre-  
24 feet per year of water is to be withdrawn from the  
25 Inyan Kara as evidence that the groundwater quantity

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1 impacts have not been properly assessed, is that  
2 correct?

3 DR. MORAN: That isn't what I said.

4 JUDGE BARNETT: Okay. What is your  
5 concern with the 274 acre-feet water?

6 DR. MORAN: I haven't mentioned any  
7 specific concern about that number.

8 JUDGE BARNETT: Okay. So I'm reading from  
9 page 26 of OST-1. Your expert opinion is that the  
10 Applicant will use and contaminate tremendous  
11 quantities of groundwater thereby  
12 preventing/restricting the use of these waters by  
13 others. Is that correct?

14 DR. MORAN: Where is that? I'm sorry, I  
15 didn't see where it was.

16 JUDGE BARNETT: It's getting late.

17 DR. MORAN: Oh, I'm sorry. Yes.

18 JUDGE BARNETT: Yes. Okay. Is that  
19 correct?

20 DR. MORAN: Right.

21 JUDGE BARNETT: And then a little bit  
22 lower you mention that -- you cite the figure of the  
23 270.2 acre-feet of water from the Inyan Kara and the  
24 888.8 acre-feet from the Madison, is that correct?

25 DR. MORAN: Correct.

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1           JUDGE BARNETT:  So now if I look at the  
2 first paragraph in the FSEIS -- and it says here; and  
3 I'll read this out:  "Based on a review of the water  
4 permit application which concluded an analysis of  
5 water availability and existing water rights, South  
6 Dakota Department of the Environment and Natural  
7 Resources concluded:  (1) approval of the application  
8 will not result in annual recharge withdrawals from  
9 Inyan Kara that exceed the annual recharge to the  
10 aquifer;  (2) there is a reasonable probability that at  
11 least 274.2 acre-feet of unappropriated water will be  
12 available;  (3) SDDENR Water Rights Program observation  
13 well data indicate that unappropriated water is  
14 available from the Inyan Kara; and  (4) there is a  
15 reasonable probability that the withdrawals proposed  
16 in the application can be made without unlawful  
17 impairment of existing water rights or domestic  
18 wells."

19           Do you agree that the FSEIS correctly  
20 summarizes the South Dakota Department of  
21 Environmental and Natural Resources' conclusion?

22           DR. MORAN:  I don't know if they've  
23 correctly summarized it.  This is from the final SEIS,  
24 is that correct?

25           JUDGE BARNETT:  Correct.

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1 DR. MORAN: I have to assume that they  
2 have, but I don't know that for a fact.

3 JUDGE BARNETT: Okay.

4 DR. MORAN: But more importantly, I don't  
5 see any of the backup for defending those conclusions.

6 JUDGE BARNETT: Okay. And then the second  
7 paragraph, it looks like the last sentence of the  
8 second paragraph, in very similar kind of language,  
9 but in this case with respect to the Madison, the  
10 FSEIS also states, "Based on a review of the  
11 application which concluded an analysis of water  
12 availability and existing water rights SDDENR  
13 concluded: (1) there's a reasonable probability that  
14 unappropriated water is available in the Madison  
15 aquifer to supply the proposed appropriation; (2)  
16 approval of the application will not result in annual  
17 withdrawals from the Madison aquifer that exceed the  
18 annual average recharge to the aquifer; and (3) there  
19 is a reasonable probability that the withdrawal  
20 proposed in the application can be made without  
21 impacting existing water rights including domestic  
22 users."

23 Do you agree with the FSEIS' summary of  
24 SDDENR's analysis of the Madison withdrawals?

25 DR. MORAN: I don't agree with the

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1 analysis. I'm willing to admit that they probably  
2 summarized it correctly, but I don't see any backup  
3 for those statements, technical backup.

4 JUDGE BARNETT: Okay. So you cite some  
5 numbers: 274 acre-feet per year from the Inyan Kara,  
6 888 acre-feet from the Madison . And I can't remember  
7 the exact language in your testimony, but you were  
8 concerned with the quantity of water. And based on  
9 SDDENR's analysis as spelled out in the FSEIS, do you  
10 still allege that they failed to adequately analyze  
11 groundwater quantity impacts?

12 DR. MORAN: Yes.

13 JUDGE BARNETT: Okay. Thank you.

14 CHAIRMAN FROEHLICH: On that subject using  
15 the figures Judge Barnett just used, the 274 acre-feet  
16 and the 888.8 acre-feet, you come up with I guess a  
17 20-year water consumption of 89.4 billion gallons over  
18 20 years for the Inyan Kara and 5.8 billion gallons  
19 over 20 years. I was wondering if that is still your  
20 contention that that is the quantity of water to be  
21 used or taken for this project.

22 DR. MORAN: As described, yes.

23 CHAIRMAN FROEHLICH: Okay. As described.  
24 Then perhaps, Mr. Fritz, can you clarify or respond to  
25 the figures over the 20-year life that Dr. Moran has

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1 put forth?

2 MR. FRITZ: Yes, I can. You're talking  
3 about the Inyan Kara water, right? The 274.2 acre-  
4 feet of water annually is the most we can have for a  
5 net diversion. We can't divert the 8,500 gallons per  
6 minute, which is how you have to convert in units to  
7 get to the other number because 98 percent of that  
8 water is re-injected as a part of the process. Our  
9 net diversion limited by the water right can only be  
10 a maximum of 274.2 acre-feet per year.

11 CHAIRMAN FROEHLICH: Okay.

12 JUDGE COLE: Could you put back on the  
13 flow diagram, the typical flow rates you had on before  
14 from figure TR RAI PNR-14 C-1, from the Dewey-Burdock  
15 RAI responses? I don't have it on this. It's in the  
16 RAI responses. You had it on earlier. It would be  
17 page 69. Here it is.

18 Now, I'd like to look at the top one there  
19 for the Fall River and Chilson and the flow diagram  
20 and look at the numbers that are coming in there. And  
21 if we follow through that flow diagram, it looks like  
22 we're taking out A from the Fall River and Chilson  
23 independent of the water that's recirculating 21  
24 gallons per minute, and B coming out of the wellfield  
25 is 2,400 gallons per minute.

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1 DR. MORAN: D is what you said?

2 JUDGE COLE: B.

3 DR. MORAN: B. I'm sorry.

4 JUDGE COLE: B. Then we pass it through  
5 an ion exchange, and in the ion exchange we remove the  
6 uranium. It's an ion exchange that's specific for  
7 uranium. Now, there are a lot of other chemicals in  
8 there that are not removed at that point. They're  
9 still in the solution, the lixiviant solution. And we  
10 take out less than one percent. And here it's 0.875  
11 percent. That's about 170 gallons a minute. And  
12 that's what we consider to be taken out of the system.  
13 We send the rest back and recirculate it and we keep  
14 recirculating it, adding a certain amount and then --  
15 well, before we do that we re-oxygenate it and send it  
16 back, but we've got contaminants that were picked up  
17 in the first cycle and we keep recirculating those.  
18 We get some dilution of that because we're taking  
19 about one percent each time. It's called a bleed.

20 Now, my question is the quality of that  
21 recirculated water deteriorates with time, and how  
22 many cycles can you have before it's a non-productive  
23 use of that water? Because there are more and more  
24 toxic chemicals being built up in that. So also, the  
25 bleed water, even the one percent, is going to be more

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1 concentrated. Then we can either put that either  
2 directly in a pipe and pump it down to a deep well or  
3 we put it in a pond losing at that rate of 170 gallons  
4 a minutes. So maximum evaporation we can have is 170  
5 gallons a minute. And how often do we have to treat  
6 this water that's being recirculated to maintain the  
7 quality that's going to effectively do the job of  
8 picking up additional uranium? And I don't know the  
9 answer to that, but is it anywhere in our record? And  
10 I'd like to ask both the NRC and the Powertech people,  
11 do they have answer to that?

12 MR. DEMUTH: Judge Cole, I'm not a  
13 chemical engineer, so with reservation I'll speak to  
14 that a little bit. The quality of that water, if it  
15 degraded to a point where it simply was not useful to  
16 optimize the mining process, they could certainly pull  
17 more bleed out of that and then run more down the  
18 disposal well. So it's to the operator's interest to  
19 maintain the quality of that water so that it's most  
20 beneficial for the mining process.

21 The exact specifics of how they would  
22 manage that in the plant, that would really be up to  
23 Powertech Staff to --

24 (Simultaneous speaking.)

25 JUDGE COLE: Yes, are you aware that

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1 that's a problem?

2 MR. DEMUTH: I wouldn't call it a problem  
3 necessarily.

4 JUDGE COLE: All right.

5 MR. DEMUTH: I'm aware that it's something  
6 the plant operations has to include, but in terms of  
7 a problem, I wouldn't characterize it in that way.

8 JUDGE COLE: All right, sir. Yes, they  
9 have a reverse osmosis unit somewhere in that  
10 building, and it's got to be used for something.

11 And I'm also concerned about the quality  
12 of the water that's going to the pond, because that's  
13 going to have a radioactive material in it. It's  
14 going to have a lot of the contaminants; arsenic and  
15 selenium, that's going to go into the pond. Now,  
16 okay, they have barriers underneath it, clay barriers  
17 and different kinds of layers of protective material  
18 that prevent it from going downward, but what about  
19 the animals that would be using this for water? Is  
20 that a serious problem and how do you prevent that?  
21 And do they use the reverse osmosis treatment units  
22 that they have to bring the quality of that water up  
23 so that it's not as a danger as it seems to me to be?

24 MR. FRITZ: I can give a quick description  
25 of that. I'm not a chemical engineer either, but I'm

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1 familiar with pond design and layout.

2 Remember in the application there are two  
3 basic methods of water disposal. One is the deep well  
4 injection and the other is land application. Deep  
5 well injection is the preferred method. If we can get  
6 our permits and if we can get suitable wells to inject  
7 the subsurface water, then the RO unit is used,  
8 because then we can get rid of the brine, which is the  
9 highly saline water that accumulates as you were  
10 saying.

11 JUDGE COLE: Wait a minute. I must have  
12 misheard your first part. If you can get permission  
13 to dump it into a deep well, it's then you want to use  
14 the RO unit?

15 MR. FRITZ: Yes.

16 JUDGE COLE: Why?

17 MR. FRITZ: Because the deep wells give us  
18 the only opportunity to get rid of the brine that's  
19 generated from an RO unit. RO unit, about 30 percent  
20 comes out as brine and 70 percent is real pure water  
21 and will go back into the process.

22 JUDGE COLE: But you're putting it into a  
23 deep well that probably has a lot of other  
24 contaminants in it. That's why it was selected as a  
25 well to accept wastewater.

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1                   MR. FRITZ: Yes, that's exactly right.  
2                   That's the only way we can get it permitted to accept  
3                   wastewater.

4                   JUDGE COLE: Now tell me again why you  
5                   would want to use a reverse osmosis unit to treat the  
6                   water before you put it in there?

7                   MR. FRITZ: Well, one of the big goals in  
8                   all this is to minimize your waste stream, because  
9                   there's regulatory and cost associated with water  
10                  disposal. If we can reduce the waste stream by going  
11                  through the RO unit down to a concentrated brine, then  
12                  we can go to a deep injection well and take the other  
13                  70 percent and go back into the wellfield with it. It  
14                  doesn't accumulate the dissolved solids that you were  
15                  talking about.

16                  If we can't for one reason or another  
17                  inject the water into a deep disposal well and we go  
18                  to land application, then we have to bring more makeup  
19                  water from the Madison and go out to the land  
20                  application because the brine from the RO unit would  
21                  be too saline to put on a land application.

22                  JUDGE COLE: Right. But you have to  
23                  dilute it with the fresh water to use it on land?

24                  MR. FRITZ: Yes, you wouldn't run it  
25                  through the process as many times. It would go out to

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1 the evaporation disposal.

2 JUDGE COLE: Yes, I would also think you'd  
3 want to use the reverse osmosis to remove the  
4 chemicals in it because you wouldn't want those;  
5 arsenic and selenium and other dangerous chemicals and  
6 radioactive materials, on the land application.

7 MR. FRITZ: Well, let me clarify one thing  
8 first. There's no radioactive chemicals going out to  
9 anything. That would be an 11(e)2 waste. That has to  
10 be taken out of these ponds by barium precipitation or  
11 some method. It can't be injected or go to the land  
12 application.

13 JUDGE COLE: But you precipitate the  
14 radium and the radium with barium sulfate in the  
15 ponds?

16 MR. FRITZ: Yes.

17 JUDGE COLE: And then you --

18 MR. FRITZ: Yes, there's no radioactive  
19 waste going out anywhere.

20 JUDGE COLE: Then you take the water from  
21 the top and remove the precipitate in the bottom?

22 MR. FRITZ: Right.

23 JUDGE COLE: And deal with it the same way  
24 you have to with radioactive materials --

25 MR. FRITZ: Yes, it goes out as an 11(e)2

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1 waste during the clean-up of the site. That's right.

2 But to get back to your question about the  
3 RO unit, if we don't have a deep disposal well, we  
4 can't use the RO because it generates a brine that we  
5 can't go to land application with. It has to go down  
6 a deep well. So the preferred method is to get these  
7 deep wells permitted and proven for disposal.

8 JUDGE COLE: I understand.

9 MR. FRITZ: And that's a pending permit  
10 right now with the EPA.

11 JUDGE COLE: And the alternative is  
12 diluting it so it's satisfactory for use on a land  
13 application?

14 MR. FRITZ: Well, not exactly diluted, but  
15 not concentrating it to the level you were talking  
16 about before. That's right.

17 JUDGE COLE: Okay. Thank you.

18 CHAIRMAN FROEHLICH: Ma'am, you wanted to  
19 add something?

20 MS. McLEAN: Yes, I would. That's not  
21 totally true because there are heavy metals that are  
22 generated that have radioactive capabilities.  
23 Thorium, strontium. They don't even measure for  
24 strontium on their list. You know, chromium,  
25 vanadium. Those things are all radioactive and

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1 they're going to be in the ponds.

2 And there's no fence that you can ever  
3 fence out Mother Nature. You're going to have small  
4 animals going in there, insects, whatever, to access  
5 the water. This is a dry area. This is a semi-arid  
6 area. And there's going to be animals and insects and  
7 all kinds of things going in there to seek that water  
8 that then take those hazardous compounds out into the  
9 environment to be bioaccumulated up the food chain.  
10 So there are going to be radioactive elements in  
11 there. There are.

12 RO actually kind of a misunderstood  
13 process really in that RO wastes about 10 times -- the  
14 typical RO wastes about 10 times more water than it  
15 purifies.

16 JUDGE COLE: Well, it dilutes what you  
17 have and you wind up with a certain percentage of pure  
18 water.

19 MS. McLEAN: It's not going to be pure,  
20 no. RO is not 100 percent. Only distillation --

21 JUDGE COLE: I understand.

22 MS. McLEAN: -- is 100 percent. So, and  
23 the other thing is is when you keep applying that over  
24 a period of 20 years you're going to increase the  
25 concentration of the stuff in the land anyway. So it

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1 doesn't matter how much you dilute it. You're still  
2 going to concentrate the metals in the land that  
3 you're doing land application or water application  
4 anyway.

5 JUDGE COLE: Thanks.

6 JUDGE BARNETT: Ms. McLean brought up a  
7 good point, a good question. How do you keep birds  
8 out of these ponds?

9 MS. McLEAN: You don't. They're going to  
10 eat insects and they're going to eat any sort of  
11 crawly things that are going to go in there. There's  
12 no way to fence out Mother Nature. There's just not.

13 JUDGE BARNETT: I want to ask the  
14 Applicant. How do you keep birds out of these ponds?

15 MR. FRITZ: I can't tell you the exact  
16 page, but there's quite an extensive mitigation plan  
17 for the ponds to exclude wildlife in both the -- and  
18 I know it's in the state permits, the land application  
19 permit, which is a related permitting action that we  
20 have to do to get the land application. It is a  
21 permit from the state. And that's got an extensive  
22 wildlife mitigation plan in it.

23 MR. PUGSLEY: Your Honor, may I ask a  
24 question, please?

25 CHAIRMAN FROEHLICH: Sure.

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1 MR. PUGSLEY: Judge Cole, was this  
2 question that you just asked that we were getting  
3 answers on was geared toward Contention 4? That's  
4 what we're discussing right now?

5 JUDGE COLE: Well, it might be a stretch,  
6 but I'm interested in it.

7 (Laughter.)

8 MR. PUGSLEY: No, I'm not questioning  
9 that, sir. I apologize. That totally came out wrong,  
10 sir.

11 (Laughter.)

12 MR. PUGSLEY: I apologize. I would like  
13 to note an objection for the record to Ms. McLean's  
14 response to this, because her CI INT-014 specifically  
15 states that she's offering testimony on Contention 3  
16 and not on Contention 4. So I'd like to register an  
17 objection to her answer.

18 CHAIRMAN FROEHLICH: Noted.

19 MS. McLEAN: I'd like to add one more  
20 thing. The heavy metals that I track are not going to  
21 be degraded. They don't go into anything different.  
22 They don't change. They don't become toxic -- less  
23 toxic over time. And so, when Powertech in 20 years  
24 pulls up stakes and leaves, the heavy metals are going  
25 to be still there and there's no kind of fences that

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1 are going to last as long as those radioactive heavy  
2 metals.

3 MR. PUGSLEY: Your Honor, same objection.

4 CHAIRMAN FROEHLICH: Noted. Your answer,  
5 Ms. McLean, though was related to the effect of the  
6 those heavy metals on groundwater? Am I correct?

7 MS. McLEAN: It will seep into groundwater  
8 eventually. Water always goes down.

9 CHAIRMAN FROEHLICH: Thank you.

10 MS. McLEAN: That's how nature recharges  
11 her aquifers.

12 JUDGE BARNETT: I have a question for Mr.  
13 Hyde. Mr. Hyde?

14 MR. HYDE: Yes.

15 JUDGE BARNETT: I have read your  
16 testimony. Thank you for including that. I want to  
17 make sure that I understand that one of your big  
18 concerns is that the Beaver Creek and Pass Creek flow  
19 through the Dewey-Burdock project area and into the  
20 Cheyenne River and that could potentially impact your  
21 wild horse sanctuary. Is that one of your big  
22 concerns?

23 MR. HYDE: Anything that flows into the  
24 Cheyenne is going to impact the wild horse sanctuary.  
25 We're talking 600 or so horses here that have to drink

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1 every day, plus a lot of wildlife. We already know  
2 from testimony from my neighbor Byron Cox that during  
3 the mining of uranium in the Edgemont area the beaver  
4 were wiped out. There are no beavers left in that  
5 whole river. You've got to consider the effect of  
6 these things on the people that have to live here.  
7 Nobody's going to come along and sweep away the damage  
8 that people from somewhere else have done to us  
9 locals. So I have no compunction about --

10 JUDGE BARNETT: Okay. Thank you, sir.

11 MR. HYDE: -- getting a little bit worried  
12 about this. I've spent 25 years building this. It  
13 could be wiped out very shortly.

14 JUDGE BARNETT: Thank you.

15 CHAIRMAN FROEHLICH: I believe that the  
16 Board has concluded with its questions for Panel 2.  
17 I'd like at this point even though it's 5:00 to give  
18 the parties a few minutes to propose any follow-on  
19 questions that they might feel are appropriate to  
20 submit to the Board to ask of Panel 2.

21 Would 10 minutes be sufficient?

22 MR. PUGSLEY: Yes, sir.

23 MR. PARSONS: That would be fine. Thank  
24 you.

25 CHAIRMAN FROEHLICH: Okay. Let's take a

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1 break for 10 minutes while the counsel prepare any  
2 proposed questions.

3 (Whereupon, the above-entitled matter went  
4 off the record at 4:59 p.m. and resumed at 5:17 p.m.)

5 CHAIRMAN FROEHLICH: We'll be back on the  
6 record. I'm pleased to report I've only received two  
7 questions that the parties have asked the -- I think  
8 going past 5:00 has its advantages.

9 (Laughter.)

10 CHAIRMAN FROEHLICH: Two follow-on  
11 questions. First for Mr. Demuth and Mr. Lawrence. Do  
12 you agree with the characterization of the license  
13 area as unique with respect to the presence of  
14 historical exploration drilling?

15 MR. DEMUTH: Your Honor, I would not  
16 consider that unique. It's very common for historic  
17 uranium projects to have thousands of exploration  
18 boreholes that there's been historic activities over  
19 time. So it's more common really than unique.

20 JUDGE COLE: Within 16 square miles 6,000  
21 holes?

22 MR. DEMUTH: Yes, sir. It's very, very  
23 common that we have uranium projects, many cases  
24 smaller project areas than this with thousands of  
25 historic wells. This exploration activity has been

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1 going on for a number of years.

2 CHAIRMAN FROEHLICH: For Drs. Moran and  
3 LaGarry. Do you agree that the net inward hydraulic  
4 radiant Powertech must maintain under License  
5 Condition 10.7 reduces the likelihood of fluids  
6 migrating away from the production zone?

7 DR. LaGARRY: I agree that it reduces it,  
8 but it may not eliminate it.

9 JUDGE COLE: It may not what?

10 DR. LaGARRY: Eliminate.

11 JUDGE COLE: Oh.

12 DR. LaGARRY: Yes, I agree with that  
13 statement. It does reduce it.

14 CHAIRMAN FROEHLICH: Dr. Moran?

15 MS. McLEAN: If we assume that it reduces  
16 it compared to a situation where you don't have it?  
17 Is that what we're saying? Is that what we're  
18 assuming?

19 JUDGE COLE: That's a fair assumption.

20 MS. McLEAN: Then I agree.

21 CHAIRMAN FROEHLICH: Okay. At this point  
22 we can dismiss Panel 2, except I realize some of the  
23 witnesses on Panel 2 will be joining us tomorrow as  
24 we'll take on Panel 3. Tomorrow we'll have to take  
25 care of a number of procedural matters, one of which

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1 being the discussion that was held concerning the map.  
2 There was some disagreement between Witness Demuth and  
3 Witness Moran. If the parties could get together  
4 after today's session and perhaps come up with a  
5 single sheet of paper or whatever, a single map that  
6 shows the well depression, whatever it was that the  
7 conflict was between the two versions of the same map.  
8 If we could have one map that I guess depicts the  
9 points that both sides were trying to make, I think  
10 that would be helpful to the record. So if the  
11 parties could get together and come up with a single  
12 map that shows the line, or if we can take one of the  
13 exhibits that is currently in the record and adjust  
14 it, mark it in some way, make it so that it reflects  
15 accurately the arguments of both parties. If that's  
16 possible, I'd like to try to do that for tomorrow's  
17 record.

18 I'd also like the parties overnight to  
19 discuss how we're going to handle the additional  
20 disclosure, what protective measures we have to put in  
21 for the data, where it will be held, what kind of  
22 access the parties will have to it and some kind of a  
23 schedule so that it will be available to them for  
24 inspection. We'll also set a date for when any  
25 additional testimony based on that additional data

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1 will have to be filed should there be any.

2 Are there any other procedural matters  
3 that I should consider overnight or that we need to  
4 address before we reconvene tomorrow morning?

5 MR. PARSONS: Your Honor, Jeff Parsons for  
6 the tribe.

7 CHAIRMAN FROEHLICH: Yes, sir.

8 MR. PARSONS: I just again wanted to flag  
9 for you the existence of a pending motion with regard  
10 to the additional disclosure matters. I realize that  
11 with the ruling this morning for additional disclosure  
12 some of the time pressure may not be quite as intense,  
13 maybe allowing for the normal course of briefing, if  
14 that's what the parties would like to do. But I just  
15 wanted to --

16 CHAIRMAN FROEHLICH: Right. I hadn't  
17 forgotten that. I was waiting to receive answers per  
18 our rules from the other parties, and then we'll be  
19 able to address that.

20 MR. PARSONS: Thank you, Your Honor.

21 CHAIRMAN FROEHLICH: Okay.

22 MR. PUGSLEY: Your Honor, would I be  
23 correct that per the rules any answers from Staff or  
24 Powertech would be due next Tuesday?

25 CHAIRMAN FROEHLICH: It came in on

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1 Saturday?

2 MR. PUGSLEY: Ten days I believe, yes.

3 CHAIRMAN FROEHLICH: Yes, sir, 10 days.

4 MR. PUGSLEY: Okay. Thank you.

5 CHAIRMAN FROEHLICH: Are there any other  
6 matters that the Board should consider overnight? Mr.  
7 Clark?

8 MR. CLARK: Just the availability of  
9 witnesses for tomorrow. For the witnesses that won't  
10 be testifying on Panel 3, do they need to return  
11 tomorrow?

12 CHAIRMAN FROEHLICH: No. No, we'll begin  
13 tomorrow -- that's why we ran late. We've finished  
14 with Panel 2. So those people who are not on Panel 3  
15 are excused and we thank them for their testimony.

16 MR. CLARK: Thank you.

17 CHAIRMAN FROEHLICH: Panel 3 includes  
18 those witnesses with filed testimony on Contentions 6  
19 and 9.

20 All right. Nothing else being necessary  
21 for today, we'll stand adjourned until 9 in the  
22 morning.

23 (Whereupon, the above-entitled matter went  
24 off the record at 5:23 p.m.)

25

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**Atomic Safety and Licensing Board Panel**  
**In the Matter of:**  
**Powertech (USA) Inc., (Dewey-Burdock In Situ Uranium Recovery Facility)**

**Docket No. 40-9075-MLA**

**ASLBP No. 10-898-02-MLA-BD01**

**Applicant's Exhibits**

<b>Exhibit Number</b>	<b>Exhibit Title (as reflected in ADAMS)</b>	<b>Exhibit Status</b>
APP-001	Dr. Lynne Sebastian Initial Testimony.	Identified and Admitted
APP-002	Dr. Lynne Sebastian CV.	Identified and Admitted
APP-003	Dr. Adrien Hannus Initial Testimony.	Identified and Admitted
APP-004	Dr. Adrien Hannus CV.	Identified and Admitted
APP-005	Representative Sample of ALAC Projects.	Identified and Admitted
APP-006	ACHP Section 106 Regulations: Text of ACHP's Regulations, "Protection of Historic Properties: (36 CFR Part 800) (incorporates amendments effective Aug. 5, 2004)".	Identified and Admitted
APP-007	National Park Service, Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation, 1983	Identified and Admitted
APP-008	South Dakota State Historic Preservation Office, Guidelines for Cultural Resource Surveys and Survey Reports in South Dakota (For Review and Compliance), 2005.	Identified and Admitted
APP-009	Level III Cultural Resources Evaluation of Powertech (USA) Inc.'s Proposed Dewey-Burdock Uranium Project (Public Version), Vol. 3 Part 6; ML100670366.	Identified and Admitted
APP-010	Michael Fosha Initial Testimony.	Identified and Admitted
APP-011	Michael Fosha CV.	Identified and Admitted
APP-012	February 11, 2013 letter from Michael Fosha to SDDENR.	Identified and Admitted
APP-013	Hal Demuth Initial Testimony.	Identified and Admitted
APP-014	Hal Demuth CV.	Identified and Admitted
APP-015-A	Revised Technical Report (TR) for the Dewey-Burdock Project; Part 1 of 22; Transmittal Letter, Change Index and Revised TR RAI Responses; ML14035A052.	Identified and Admitted
APP-015-B	Revised TR for the Dewey-Burdock Project; Part 2 of 22; Text through Sec. 2.8.5.7; ML14035A029.	Identified and Admitted



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**Applicant's Exhibits**

Exhibit Number	Exhibit Title (as reflected in ADAMS)	Exhibit Status
APP-015-C	Revised TR for the Dewey-Burdock Project; Part 3 of 22; Text Sec. 2.9 through 10.2; ML14035A030.	Identified and Admitted
APP-015-D	Revised TR for the Dewey-Burdock Project; Part 4 of 22; Plates 1.5-1 through 2.6-8; ML14035A031.	Identified and Admitted
APP-015-E	Revised TR for the Dewey-Burdock Project; Part 5 of 22; Plates 2.6-9 through 2.6-12; ML14035A032.	Identified and Admitted
APP-015-F	Revised TR for the Dewey-Burdock Project; Part 6 of 22; Plates 2.6-13 through 2.6-15; ML14035A033.	Identified and Admitted
APP-015-G	Revised TR for the Dewey-Burdock Project; Part 7 of 22; Plates 2.6-16 through 2.7-2; ML14035A034.	Identified and Admitted
APP-015-H	Revised TR for the Dewey-Burdock Project; Part 8 of 22; Plates 2.8-1 through 5.7-1; ML14035A035.	Identified and Admitted
APP-015-I	Revised TR for the Dewey-Burdock Project; Part 9 of 22; App. 2.2-A through 2.5-F; ML14035A036.	Identified and Admitted
APP-015-J	Revised TR for the Dewey-Burdock Project; Part 10 of 22; App. 2.6-A through 2.6-G; ML14035A037.	Identified and Admitted
APP-015-K	Revised TR for the Dewey-Burdock Project; Part 11 of 22; App. 2.6-H through 2.7-E; ML14035A038.	Identified and Admitted
APP-015-L	Revised TR for the Dewey-Burdock Project; Part 12 of 22; App 2.7-F through 2.7-G; ML14035A039.	Identified and Admitted
APP-015-M	Revised TR for the Dewey-Burdock Project; Part 13 of 22; App. 2.7-H 1 of 3; ML14035A040.	Identified and Admitted
APP-015-N	Revised TR for the Dewey-Burdock Project; Part 14 of 22; App. 2.7-H 2 of 3; ML14035A041.	Identified and Admitted
APP-015-O	Revised TR for the Dewey-Burdock Project; Part 15 of 22; App. 2.7-H 3 of 3; ML14035A042.	Identified and Admitted
APP-015-P	Revised TR for the Dewey-Burdock Project; Part 16 of 22; App. 2.7-J through 2.7-L 1 of 2; ML14035A043.	Identified and Admitted
APP-015-Q	Revised TR for the Dewey-Burdock Project; Part 17 of 22; App.2.7-L 2 of 2; ML14035A044	Identified and Admitted
APP-015-R	Revised TR for the Dewey-Burdock Project; Part 18 of 22; App. 2.7-M; ML14035A045.	Identified and Admitted
APP-015-S	Revised TR for the Dewey-Burdock Project; Part 19 of 22; App 2.7-N through 2.8-H; ML14035A046.	Identified and Admitted
APP-015-T	Revised TR for the Dewey-Burdock Project; Part 20 of 22; App. 2.8-I through 2.9-L; ML14035A047.	Identified and Admitted
APP-015-U	Revised TR for the Dewey-Burdock Project; Part 21 of 22; App. 2.9-M through 3.1-A; ML14035A048.	Identified and Admitted
APP-015-V	Revised TR for the Dewey-Burdock Project; Part 22 of 22; App. 3.1-B through 7.3-D; ML14035A049.	Identified and Admitted



**Atomic Safety and Licensing Board Panel**  
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**ASLBP No. 10-898-02-MLA-BD01**

**Applicant's Exhibits**

Exhibit Number	Exhibit Title (as reflected in ADAMS)	Exhibit Status
APP-016-A	Revised Response to the Request for Additional Information (RAI) for the Technical Report (TR) for the Dewey-Burdock Project; Cover Letter; ML11207A711.	Identified and Admitted
APP-016-B	Revised TR RAI Response; Text Part 1: ML11208B712.	Identified and Admitted
APP-016-C	Revised TR RAI response; Text Part 2; ML11208B719.	Identified and Admitted
APP-016-D	Revised TR RAI response; Text Part 3; ML11208B714.	Identified and Admitted
APP-016-E	Revised TR RAI Response; Exhibits Part 1; Exh. 2.6-1 through 2.6-4; ML11208B716.	Identified and Admitted
APP-016-F	Revised TR RAI response; Exhibits Part 2; Exh. 2.6-5; ML11208B763.	Identified and Admitted
APP-016-G	Revised TR RAI response; Exhibits Part 3; Exh. 2.6-6 through 3.1-1; ML11208B764.	Identified and Admitted
APP-016-H	Revised TR RAI Responses; Exhibits Part 4; Exh. 3.1-2 through 5.7-1; ML11208B767.	Identified and Admitted
APP-016-I	Revised TR RAI response; Appendices Part 1; App. 2.5-D through 2.6-G; ML11208B765.	Identified and Admitted
APP-016-J	Revised TR RAI response; Appendices Part 2; App. 2.6-H 1 of 3; ML11208B766.	Identified and Admitted
APP-016-K	Revised TR RAI response; Appendices Part 3; App. 2.6-H 2 of 3; ML11208B769.	Identified and Admitted
APP-016-L	Revised TR RAI response; Appendices Part 4; App. 2.6-H 3 of 3; ML11208B770.	Identified and Admitted
APP-016-M	Revised TR RAI response; Appendices Part 5; App. 2.7-B through 2.7-G; ML11208B771.	Identified and Admitted
APP-016-N	Revised TR RAI response; Appendices Part 6; App. 2.7-H 1 of 4; ML11208B777.	Identified and Admitted
APP-016-O	Revised TR RAI response; Appendices Part 7; App. 2.7-H 2 of 4; ML11208B778.	Identified and Admitted
APP-016-P	Revised TR RAI Response; Appendices Part 8; App. 2.7-H 3 of 4; ML11208B784.	Identified and Admitted
APP-016-Q	Revised TR RAI Response; Appendices Part 9; App 2.7-H 4 of 4; ML11208B827.	Identified and Admitted
APP-016-R	Revised TR RAI response; Appendices Part 10; App. 2.7-K; ML11208B832.	Identified and Admitted
APP-016-S	Revised TR RAI Response; Appendices Part 11; App. 2.7-L 1 of 4; ML112088833.	Identified and Admitted
APP-016-T	Revised TR RAI Response; Appendices Part 12; App. 2.7-L 2 of 4; ML11208B868.	Identified and Admitted



**Atomic Safety and Licensing Board Panel**  
**In the Matter of:**  
**Powertech (USA) Inc., (Dewey-Burdock In Situ Uranium Recovery Facility)**

**Docket No. 40-9075-MLA**

**ASLBP No. 10-898-02-MLA-BD01**

**Applicant's Exhibits**

Exhibit Number	Exhibit Title (as reflected in ADAMS)	Exhibit Status
APP-016-U	Revised TR RAI response; Appendices Part 13; App. 2.7-L 3 of 4; ML11208B864.	Identified and Admitted
APP-016-V	Revised TR RAI response; Appendices Part 14; App. 2.7-L 4 of 4; ML11208B865.	Identified and Admitted
APP-016-W	Revised TR RAI response; Appendices Part 15; App. Vol. 4 Cover; ML11208B870.	Identified and Admitted
APP-016-X	Revised TR RAI response; Appendices Part 16; App. 2.7-M; ML11208B872.	Identified and Admitted
APP-016-Y	Revised TR RAI response; Appendices Part 17; App.2.9-B through 2.9-K; ML112150229.	Identified and Admitted
APP-016-Z	Revised TR RAI response; Appendices Part 18; App. 3.1-A 1 of 2; ML11208B922.	Identified and Admitted
APP-016-AA	Revised TR RAI response; Appendices Part 19; App. 3.1-A 2 of 2; ML11208B924.	Identified and Admitted
APP-016-BB	Revised TR RAI response; Appendices Part 20; App. 6.1-A through 7.3-C; ML11208B925.	Identified and Admitted
APP-017	Figures to Accompany Demuth Initial Testimony.	Identified and Admitted
APP-018	USGS Water-Supply Paper 2220, Basic Ground-Water Hydrology, 1983.	Identified and Admitted
APP-019	National Mining Association's (NMA) Generic Environmental Report in Support of the Nuclear Regulatory Commission's Generic Environmental Impact Statement for In Situ Uranium Recovery Facilities; ML080170159	Identified and Admitted
APP-020	ISR animation (Video of ISR Operation).	Identified and Admitted
APP-021-A	Dewey-Burdock Project Technical Report (TR); re-submitted August 2009; Part 1; Text thru Sec. 2.7.1; ML092870298	Identified and Admitted
APP-021-B	Dewey-Burdock Project TR; re-submitted August 2009; Part 2; Text Sec. 2.7.2 thru 2.9; ML092870295.	Identified and Admitted
APP-021-C	Dewey Burdock Project TR; Re-submittal August 2009, Part 3; Text Sec 3 thru End; ML092870299.	Identified and Admitted
APP-021-D	Dewey-Burdock Project TR; Re-submitted August 2009; Part 4; Plate 1.5-1; ML092870313.	Identified and Admitted
APP-021-E	Dewey-Burdock Project TR; Re-submitted August 2009; Part 5; Plate 1.5-2; ML092870314.	Identified and Admitted
APP-021-F	Dewey-Burdock Project TR; Re-submittal August 2009; Part 6; Plate 2.5-1; ML092870315.	Identified and Admitted



**Atomic Safety and Licensing Board Panel**  
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**Docket No. 40-9075-MLA**

**ASLBP No. 10-898-02-MLA-BD01**

**Applicant's Exhibits**

Exhibit Number	Exhibit Title (as reflected in ADAMS)	Exhibit Status
APP-021-G	Dewey-Burdock Project TR; re-submitted August 2009; Part 7; Plate 2.6-1; ML092870316.	Identified and Admitted
APP-021-H	Dewey-Burdock Project TR; Re-submitted August 2009; Part 8; Plate 2.6-2; ML092870317.	Identified and Admitted
APP-021-I	Dewey-Burdock Project TR; Re-submittal August 2009; Part 9; Plate 2.6-3; ML092870318.	Identified and Admitted
APP-021-J	Dewey-Burdock Project TR; Re-submittal August 2009; Part 10; Plate 2.6-4; ML092870305.	Identified and Admitted
APP-021-K	Dewey-Burdock Project TR; re-submitted August 2009; Part 11; Plate 2.6-5; ML092870306.	Identified and Admitted
APP-021-L	Dewey-Burdock Project TR; re-submitted August 2009; Part 12; Plate 2.6-6; ML092870307.	Identified and Admitted
APP-021-M	Dewey-Burdock Project TR; Re-submitted August 2009; Part 13; Plate 2.6-7; ML092870309.	Identified and Admitted
APP-021-N	Dewey-Burdock Project TR; re-submitted August 2009; Part 14; Plate 2.6-8; ML092870310.	Identified and Admitted
APP-021-O	Dewey-Burdock Project TR; Re-submitted August 2009; Part 15; Plate 2.6-9; ML092870311.	Identified and Admitted
APP-021-P	Dewey-Burdock Project TR; Re-submitted August 2009; Part 16; Plate 2.6-10; ML092870312.	Identified and Admitted
APP-021-Q	Dewey-Burdock Project TR; re-submitted August 2009; Part 17; Plate 2.6-11; ML092870320.	Identified and Admitted
APP-021-R	Dewey-Burdock Project TR; re-submitted August 2009; Part 18; Plate 2.6-12; ML092870321.	Identified and Admitted
APP-021-S	Dewey-Burdock Project TR; re-submitted August 2009; Part 19; Plate 2.6-13; ML092870322.	Identified and Admitted
APP-021-T	Dewey-Burdock Project TR; Re-submitted August 2009; Part 20; Plate 2.6-14; ML092870323.	Identified and Admitted
APP-021-U	Dewey-Burdock Project TR; re-submitted August 2009; Part 21; Plate 2.6-15; ML092870324.	Identified and Admitted
APP-021-V	Dewey-Burdock Project TR; re-submitted August 2009; Part 22; Plate 2.8-1; ML092870325.	Identified and Admitted
APP-021-W	Dewey-Burdock Project TR; re-submitted August 2009; Part 23; Plate 2.8-2; ML092870326.	Identified and Admitted
APP-021-X	Dewey-Burdock Project TR; re-submitted August 2009; Part 24; Plate 2.8-3; ML092870327.	Identified and Admitted
APP-021-Y	Dewey-Burdock Project TR; re-submitted August 2009; Part 25; Plate 3.1-1; ML092870328.	Identified and Admitted
APP-021-Z	Dewey-Burdock Project TR; re-submitted August 2009; Part 26; Plate 3.1-2; ML092870329.	Identified and Admitted





**Atomic Safety and Licensing Board Panel**  
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**Applicant's Exhibits**

Exhibit Number	Exhibit Title (as reflected in ADAMS)	Exhibit Status
APP-021-AA	Dewey-Burdock Project TR; Re-submitted August 2009; Part 27; App. 2.2-A thru 2.6-B; ML092870350.	Identified and Admitted
APP-021-BB	Dewey-Burdock Project TR; re-submitted August 2009; Part 28; App. 2.6-C thru 2.7-B(partial); ML092870351	Identified and Admitted
APP-021-CC	Dewey-Burdock Project TR; Re-submittal August 2009; Part 29, App. 2.7-B (Partial) thru 2.7-F; ML092870370.	Identified and Admitted
APP-021-DD	Dewey-Burdock Project TR; re-submitted August 2009; Part 30; App. 2.7-G thru 2.8-F (partial); ML092870354.	Identified and Admitted
APP-021-EE	Dewey-Burdock TR; Re-submitted August 2009; Part 31; App. 2-8.F (Partial); ML092870357.	Identified and Admitted
APP-021-FF	Dewey-Burdock Project TR; re-submitted August 2009; Part 32; App. 2.8-G thru 2.9-A; ML092870358.	Identified and Admitted
APP-021-GG	Dewey-Burdock Project TR; re-submitted August 2009; Part 33; App. 4.2-A thru 7.3-A (partial); ML092870343.	Identified and Admitted
APP-021-HH	Dewey-Burdock Project TR; re-submitted August 2009; Part 34; App. 7.3-A (partial) thru 7.3-B; ML092870344.	Identified and Admitted
APP-022	Geochemical Data from Groundwater at the Proposed Dewey Burdock Uranium In-situ Recovery Mine, Edgemont, South Dakota: U.S. Geological Survey Open-File Report 2012-1070.	Identified and Admitted
APP-023	Uranium In-Situ Recovery and the Proposed Dewey Burdock Site, Edgemont, South Dakota, Public Meeting Talk Given by Dr. Raymond Johnson, U.S. Geological Survey, in Hot Springs, SD on Feb. 7, 2013 and Custer, SD on May 22, 2013.	Identified and Admitted
APP-024	Pre-Licensing Well Construction, Lost Creek ISR Uranium Recovery Project; ML091520101.	Identified and Admitted
APP-025	Numerical Modeling of Hydrogeologic Conditions, Dewey-Burdock Project, February 2012; ML12062A096.	Identified and Admitted
APP-026	Update on USGS research at the proposed Dewey Burdock uranium in-situ recovery mine, Edgemont, South Dakota, presentation to EPA Region 8 in Denver, CO on Feb. 22, 2012, based on USGS OFR 2012-1070.	Identified and Admitted



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Exhibit Number	Exhibit Title (as reflected in ADAMS)	Exhibit Status
APP-027-A	Report to Accompany Madison Water Right Permit Application, June 2012; ML12193A239.	Identified and Admitted
APP-027-B	Report to Accompany Madison Water Right Permit Application, June 2012, Appendix A; ML12193A234.	Identified and Admitted
APP-027-C	Report to Accompany Madison Water Right Permit Application, June 2012, Appendix B; ML12193A235.	Identified and Admitted
APP-028	Report to the Chief Engineer on Water Permit Application No. 2685-2 [Madison Aquifer], ADAMS Accession No. ML13165A160, November 2, 2012.	Identified and Admitted
APP-029	Letter Agreement between Powertech and Fall River County Commission.	Identified and Admitted
APP-030	NUREG/CR-6733, A Baseline Risk-Informed, Performance-Based Approach for In Situ Leach Uranium Extraction Licensees - Final Report, July 2001; ML012840152.	Identified and Admitted
APP-031	Decision of the TCEQ Executive Director regarding Uranium Energy Corporation's Permit No. UR03075.	Identified and Admitted
APP-032	In-Situ Leach Uranium Mining in the United States of America: Past, Present and Future, by D.H. Underhill, in IAEA TECDOC-720, Uranium In Situ Leaching, Proceedings of a Technical Committee Held in Vienna, 5-8 October 1992, September 1993.	Identified and Admitted
APP-033	Safety Evaluation Report for the Moore Ranch ISR Project in Campbell County, Wyoming, Materials License No. SUA-1596; ML101310291.	Identified and Admitted
APP-034	Safety Evaluation Report for the Nichols Ranch In Situ Recovery Project in Johnson and Campbell Counties, Wyoming, Material License No. SUA-1597; ML102240206.	Identified and Admitted
APP-035	Safety Evaluation Report for the Lost Creek Project in Sweetwater County, Wyoming, Materials License No. SUA-1598; ML112231724.	Identified and Admitted
APP-036	Safety Evaluation Report for the Strata Energy, Inc. Ross ISR Project, Crook County, Wyoming, Materials License No. SUA-1601; ML14002A107.	Identified and Admitted
APP-037	Errol Lawrence Initial Testimony.	Identified and Admitted
APP-038	Errol Lawrence CV.	Identified and Admitted



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Exhibit Number	Exhibit Title (as reflected in ADAMS)	Exhibit Status
APP-039	Materials License SUA-1597 for the Nichols Ranch ISR Project, July 2011; ML111751649.	Identified and Admitted
APP-040-A	Dewey-Burdock Project Environment Report (ER); Re-submittal August 2009; Part 1; Cover thru Sec. 3.4.2.1.1; ML09270345.	Identified and Admitted
APP-040-B	Dewey-Burdock Project Environmental Report (ER); re-submitted August 2009; Part 2; Sec. 3.4.2.1.2 thru 3.12; ML092870346.	Identified and Admitted
APP-040-C	Dewey-Burdock Project Environmental Report (ER); re-submitted August 2009; Part 1; Sec. 4 thru end; ML092870360.	Identified and Admitted
APP-040-D	ER Plate 3.1-1; ML092870380.	Identified and Admitted
APP-040-E	ER Plate 3.3-1; ML0921870381.	Identified and Admitted
APP-040-F	ER Plate 3.3-1; ML092870381.	Identified and Admitted
APP-040-G	ER Plate 3.3-3; ML092870383.	Identified and Admitted
APP-040-H	ER Plate 3.3-4; ML092870591.	Identified and Admitted
APP-040-I	ER Plate 3.3-5; ML092870386.	Identified and Admitted
APP-040-J	ER Plate 3.3-6; ML092870387.	Identified and Admitted
APP-040-K	ER Plate 3.3-7; ML092870388.	Identified and Admitted
APP-040-L	ER Plate 3.3-8; ML092870389.	Identified and Admitted
APP-040-M	ER Plate 3.3-9; ML092870390.	Identified and Admitted
APP-040-N	ER Plate 3.3-10; ML092870592.	Identified and Admitted
APP-040-O	ER Plate 3.3-11; ML092870586.	Identified and Admitted
APP-040-P	ER Plate 3.3-12; ML092870588.	Identified and Admitted
APP-040-Q	ER Plate 3.3-13; ML092870589.	Identified and Admitted



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Exhibit Number	Exhibit Title (as reflected in ADAMS)	Exhibit Status
APP-040-R	ER Plate 3.3-14; ML092870590.	Identified and Admitted
APP-040-S	ER Plate 3.3-15; ML092870394.	Identified and Admitted
APP-040-T	ER Plate 3.5-1; ML092870395.	Identified and Admitted
APP-040-U	ER Plate 3.5-2; ML092870397.	Identified and Admitted
APP-040-V	ER Plate 6.1-1; ML092870593.	Identified and Admitted
APP-040-W	ER Replacement Plates; ML093370652.	Identified and Admitted
APP-040-X	ER App. 3.3-A thru 3.3-E; ML092870411.	Identified and Admitted
APP-040-Y	ER App. 3.3-F thru 3.4-A; ML092870421.	Identified and Admitted
APP-040-Z	ER App. 3.4-B thru 3.4-E; ML092870414.	Identified and Admitted
APP-040-AA	ER App.3.5-A thru 3.5-F; ML092870416.	Identified and Admitted
APP-040-BB	ER App. 3.5-F thru 3.5-I; ML092870422.	Identified and Admitted
APP-040-CC	ER App. 3.5-J thru 3.6-C; ML092870407.	Identified and Admitted
APP-040-DD	ER App. 4.6-A; ML092870409.	Identified and Admitted
APP-040-EE	ER App. 4.14-C thru 6.1-G; ML092870413.	Identified and Admitted
APP-041	Using Groundwater and Solid-phase Geochemistry for Reactive Transport Modeling at the Proposed Dewey Burdock Uranium In-situ Recovery Site, Edgemont, South Dakota, presentation given to EPA on April 11, 2012.	Identified and Admitted
APP-042-A	Dewey-Burdock Project Revised Class III Underground Injection Control Permit Application, Revised July 2012, Cover Letter; ML12244A519.	Identified and Admitted
APP-042-B	Dewey-Burdock Project Revised Class III Underground Injection Control Permit Application, Revised July 2012, Text thru Sec. 4; ML12244A522.	Identified and Admitted



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Exhibit Number	Exhibit Title (as reflected in ADAMS)	Exhibit Status
APP-042-C	Dewey-Burdock Project Revised Class III Underground Injection Control Permit Application, Revised July 2012, Text Sec. 5 thru 8; ML12244A520.	Identified and Admitted
APP-042-D	Dewey-Burdock Project Revised Class III Underground Injection Control Permit Application, Revised July 2012, Text Sec. 9 thru end; ML12244A521.	Identified and Admitted
APP-043	Revised Response to TR RAI 5.7.8-3(b), June 27, 2012, ML12179A534.	Identified and Admitted
APP-044	Results of Acceptance Review for TR RAI Responses; ML110470245.	Identified and Admitted
APP-045	Responses to Technical Review Comments for Dewey-Burdock Large Scale Mine Permit Application; ML13144A182.	Identified and Admitted
APP-046	Doyle Fritz Initial Testimony.	Identified and Admitted
APP-047	Doyle Fritz CV.	Identified and Admitted
APP-048	Report to the Chief Engineer on Water Permit Application No. 2686-2 [Inyan Kara Aquifer], ADAMS Accession No. ML13165A168, November 2, 2012.	Identified and Admitted
APP-049	Water Right Permit No. 2626-2 Application and Permit.	Identified and Admitted
APP-050	ER RAI Responses, transmittal letter and text; ML102380516.	Identified and Admitted
APP-051	Groundwater Discharge Plan (GDP) permit application, as updated with replacement pages through November 2012.	Identified and Admitted
APP-052	Dewey-Burdock BLM Site Determinations; January 10, 2014 letter from BLM to SD SHPO; ML14014A303.	Identified and Admitted
APP-053	Gwyn McKee Initial Testimony.	Identified and Admitted
APP-054	Gwyn McKee CV.	Identified and Admitted
<del>APP-055</del>	<del>Greater Sage Grouse Management Plan, South Dakota, 2008-2017; ML12241A215.</del>	Not Offered
<del>APP-056</del>	<del>A Report on National Greater Sage Grouse Conservation Measures.</del>	Not Offered
<del>APP-057</del>	<del>Greater Sage grouse (Centrocercus urophasianus) Conservation Objectives: Final Report.</del>	Not Offered



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Exhibit Number	Exhibit Title (as reflected in ADAMS)	Exhibit Status
<del>APP-058</del>	<del>Endangered Species Act Consultation Handbook, Procedures for Conducting Section 7 Consultations and Conferences, U.S. Fish and Wildlife Service and National Marine Fisheries Service, 1998</del>	Not Offered
<del>APP-059</del>	<del>Frequently Asked Questions on ESA Consultations, USFWS.</del>	Not Offered
<del>APP-060</del>	<del>Whooping Crane (Grus americana) 5-Year Review: Summary and Evaluation, USFWS.</del>	Not Offered
<del>APP-061</del>	<del>Division of Migratory Bird Management, Important Information for Sandhill Hunters, Fall Whooping Crane Sightings 1943-1999.</del>	Not Offered
<del>APP-062</del>	<del>Black Footed Ferret Recovery Plan, Second Revision, Nov. 2013.</del>	Not Offered
APP-063	Answering Testimony of Dr, Lynne Sebastian.	Identified and Admitted
APP-064	Dr. Adrien Hannus Answering Testimony.	Identified and Admitted
APP-065	Hal Demuth Answering Testimony.	Identified and Admitted
APP-066	Errol Lawrence Answering Testimony.	Identified and Admitted
APP-067	Figure to Accompany Errol Lawrence Answering Testimony.	Identified and Admitted
APP-068	Doyle Fritz Answering Testimony.	Identified and Admitted
APP-069	Figures to Accompany Doyle Fritz Answering Testimony.	Identified and Admitted
APP-070	Gwyn McKee Answering Testimony.	Identified and Admitted
APP-071	2013 Wildlife Monitoring Report for the Dewey-Burdock Project.	Identified and Admitted



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Consolidated Intervenor's Exhibits			
ADAMS Number	Exhibit Number	Exhibit Title (as reflected in ADAMS)	Exhibit Status
INT-001		Testimony of Dr. Louis Redmond regarding Lakota Cultural Resources.	Identified and Admitted
INT-002		10/31/09 Report of Dr. Richard Abitz on Powertech Baseline Report.	Identified and Admitted
INT-003		Statement of Professional Qualifications of Dr. Louis Redmond.	Identified and Admitted
INT-004		Statement of Professional Qualifications of Dr. Hannan LaGarry	Identified and Admitted
<del>INT-005</del>		<del>Statement of Professional Qualifications of Dr. Richard Abitz.</del>	Excluded by Board Order (August 1, 2014)
INT-006		Declaration of Wilmer Mesteth regarding Lakota Cultural Resources.	Identified and Admitted
INT-007		Testimony of Susan Henderson regarding water resources issues and concerns of downflow rancher.	Identified and Admitted
<del>INT-008</del>		<del>Testimony of Dr. Donald Kelley a former forensic pathologist regarding the radiological impact on humans and other animals.</del>	Excluded by Board (At Hearing)
<del>INT-008a</del>		<del>Dr. Donald Kelley Affidavit</del>	Excluded by Board (At Hearing)
<del>INT-009</del>		<del>Statement of Qualifications of Dr. Kelley.</del>	Excluded by Board (At Hearing)
INT-010		Testimony of Peggy Detmers a Wildlife Biologist Regarding the D-B Site and Endangered Species.	Identified as Proffered
INT-010a		Statement of Qualifications of Peggy Detmers.	Identified as Proffered
INT-010b		Map - Beaver Creek Watershed.	Identified as Proffered
INT-010c		Map - Central Flyway.	Identified as Proffered
INT-010d		Map - Whooping Crane Route.	Identified as Proffered
INT-010e		Map - D-B Project Site.	Identified as Proffered
INT-010f		Google Photo - Dewey Project - close.	Identified as Proffered



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Consolidated Intervenor's Exhibits			
ADAMS Number	Exhibit Number	Exhibit Title (as reflected in ADAMS)	Exhibit Status
INT-010g		Google Photo - Dewey Project - Medium Height.	Identified as Proffered
INT-010h		Google Photo - Dewey Project - Wide.	Identified as Proffered
INT-010i		Map - 5 state area - D-B Project.	Identified as Proffered
INT-010j		GPS Google Photo - D-B Project - Close-up.	Identified as Proffered
INT-010k		GPS Google Photo - D-B Project - Drainage.	Identified as Proffered
INT-010l		GPS Google Photo - D-B Project - wideshot.	Identified as Proffered
INT-010m		Map - D-B area.	Identified as Proffered
INT-010n		GPS Google Photo - D-B Project - triangle.	Identified as Proffered
INT-010o		Diagram - Whooping Crane Bioaccumulaton.	Identified as Proffered
INT-010p		Beaver Creek Final Fecal Coliform.	Identified as Proffered
<del>INT-010q</del>	<del>PAC</del>		NOT FILED
INT-011		Testimony of Marvin Kammera, a rancher, on potential impacts on down flow ranchers as to Inyan Kara water quantity and quality.	Identified and Admitted
INT-012		Testimony of Dayton Hyde, Owner/Operator of Black Hills Wild Horse Sanctuary, on Potential Impacts and Concerns about Proposed ISL Mine on Downflow Surface and Underground Water Resources.	Identified and Admitted
INT-013		Testimony of Dr. Hannon LaGarry a geologic stratigrapher regarding fractures, faults, and other geologic features not adequately considered by Powertech or NRC staff.	Identified and Admitted
INT-014		Testimony of Linsey McLane, a Bio-chemist Regarding Bioaccumulation of Heavy Metals in Plant and Animal Species.	Identified and Admitted
<del>INT-014a</del>		<del>Powerpoint of Linsey McLane, a biochemist regarding bioaccumulation of heavy metals in plants and animal species</del>	NOT FILED
NT-014b		Linsey McLane Affidavit	Identified and Admitted





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ADAMS Number	Exhibit Number	Exhibit Title (as reflected in ADAMS)	Exhibit Status
<del>INT-15</del>	<del>INT</del>	<del>Comments on DSEIS, with Exhibits</del>	NOT FILED
INT-016		Petition to Intervene, with Exhibits.	Identified and Admitted
INT-017		Statement of Contentions on DSEIS, with Exhibits.	Identified and Admitted
INT-018		INT Statement of Contentions on FSEIS, with Exhibits.	Identified and Admitted
INT-019		Dr. Redmond Rebuttal Letter.	Identified and Admitted
INT-020		Rebuttal Written Testimony of Dr. Hannan LaGarry.	Identified and Admitted
INT-020A		Expert Opinion Regarding the Proposed Dewey-Burdock Project ISL Mine Near Edgemont, South Dakota.	Identified and Admitted
INT-021A		Violation History - Crow Butte ISL mine in Crawford, Nebraska.	Identified and Admitted
INT-021B		Violation History - Crow Butte ISL mine in Crawford, Nebraska.	Identified and Admitted
INT-021C		Violation History - Crow Butte ISL mine in Crawford, Nebraska.	Identified and Admitted
INT-022A		Violation History - Smith Highland Ranch.	Identified and Admitted
INT-022B		Violation History - Smith Highland Ranch.	Identified and Admitted
INT-022C		Violation History - Smith Highland Ranch.	Identified and Admitted
<del>INT-023</del>	<del>INT</del>	<del>Violation History - Irigaray Christiansen Ranch</del>	NOT FILED



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**NRC Staff's Exhibits**

Exhibit Number	Exhibit Title (as reflected in ADAMS)	Exhibit Status
NRC-001	Initial Testimony and Affidavits from Haimanot Yilma, Kellee L. Jamerson, Thomas Lancaster, James Prikryl, and Amy Hester	Identified and Admitted
NRC-002-R	REVISED - Statement of Professional Qualifications of Po Wen (Kevin) Hsueh.	Identified and Admitted
NRC-003	Statement of Professional Qualifications of Haimanot Yilma	Identified and Admitted
NRC-004	Statement of Professional Qualifications of Kellee L. Jamerson	Identified and Admitted
NRC-005	Statement of Professional Qualifications of Thomas Lancaster	Identified and Admitted
NRC-006	Statement of Professional Qualifications of James Prikryl	Identified and Admitted
NRC-007	Statement of Professional Qualifications of Amy Hester	Identified and Admitted
NRC-008-A-1	NUREG-1910, Supplement 4, Vol. 1, Final Report, Environmental Impact Statement for the Dewey-Burdock Project in Custer and Fall River Counties, South Dakota: Supplement to the Generic Environmental Impact .....	Identified and Admitted
NRC-008-A-2	NUREG-1910, Supplement 4, Vol. 1, Final Report, Environmental Impact Statement for the Dewey-Burdock Project in Custer and Fall River Counties, South Dakota: Supplement to the Generic Environmental....	Identified and Admitted
NRC-008-B-1	NUREG-1910, Supplement 4, Vol. 2, Final Report, Environmental Impact Statement for the Dewey-Burdock Project in Custer and Fall River Counties, South Dakota: Supplement to the Generic Environmental .....	Identified and Admitted
NRC-008-B-2	NUREG-1910, Supplement 4, Vol. 2., Final Report, Environmental Impact Statement for the Dewey-Burdock Project in Custer and Fall River Counties, South Dakota: Supplement to the Generic Environmental Impact Statement for In-Situ Leach....	Identified and Admitted
NRC-009-A-1	NUREG-1910, Supplement 4, Vol. 1, Draft Report for Comment, Environmental Impact Statement for the Dewey-Burdock Project in Custer and Fall River Counties, South Dakota: Supplement to the Generic Environmental Impact Statement....	Identified and Admitted



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Exhibit Number	Exhibit Title (as reflected in ADAMS)	Exhibit Status
NRC-009-A-2	NUREG-1910, Supplement 4, Vol. 1, Draft Report for Comment, Environmental Impact Statement for the Dewey-Burdock Project in Custer and Fall River Counties, South Dakota: Supplement to the Generic .....	Identified and Admitted
NRC-009-B-1	NUREG-1910, S4, V2, DFC, EIS for the Dewey-Burdock Project in Custer and Fall River Counties, South Dakota: Suppl to the GEIS for In-Situ Leach Uranium Milling Facilities (Chapter 5 to 11 and Appendices)....	Identified and Admitted
NRC-009-B-2	NUREG-1910, Supplement 4, Vol. 2, Draft Report for Comment, Environmental Impact Statement for the Dewey-Burdock Project in Custer and Fall River Counties, South Dakota: Supplement to the Generic .....	Identified and Admitted
NRC-010-A-1	NUREG-1910, Vol. 1, Final Report, Generic Environmental Impact Statement for In-Situ Leach Uranium Milling Facilities (Chapters 1 through 4) (May 2009) (ADAMS Accession No. ....	Identified and Admitted
NRC-010-A-2	NUREG-1910, Vol. 1, Final Report, Generic Environmental Impact Statement for In-Situ Leach Uranium Milling Facilities (Chapters 1 through 4)(May 2009) (ADAMS Accession No. ML091480244 Page 153-512	Identified and Admitted
NRC-010-A-3	NUREG-1910, Vol. 1, Final Report, Generic Environmental Impact Statement for In-Situ Leach Uranium Milling Facilities (Chapters 1 through 4) (May 2009) (ADAMS Accession No. ML091480244) Pages 513-704.	Identified and Admitted
NRC-010-B-1	NUREG-1910, Vol. 2, Final Report, Generic Environmental Impact Statement for In-Situ Leach Uranium Milling Facilities (Chapters 5 through 12 and Appendices) (May 2009) (ADAMS Accession No. ML091480188). Pages 1-272.	Identified and Admitted
NRC-010-B-2	NUREG-1910, Vol. 2, Final Report, Generic Environmental Impact Statement for In-Situ Leach Uranium Milling Facilities (Chapters 5 through 12 and Appendices) (May 2009) (ADAMS Accession No. ML091480188). Pages 273-612.	Identified and Admitted
NRC-011	Dewey-Burdock Record of Decision (Apr. 8, 2014) (ADAMS Accession No. ML14066A466).	Identified and Admitted
NRC-012	Materials License SUA-1600, Powertech (USA), Inc. (Apr. 8, 2014) (ADAMS Accession No. ML14043A392).	Identified and Admitted
NRC-013	NUREG-1569, Standard Review Plan for In-Situ Leach Uranium Extraction License Applications (June 4, 2003) (ADAMS Accession No. ML031550272).	Identified and Admitted
NRC-014	NUREG-1748, Final Report, Environmental Review Guidance for Licensing Actions Associated with NMSS Programs (Aug. 2003) (ADAMS Accession No. ML032450279).	Identified and Admitted



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**NRC Staff's Exhibits**

Exhibit Number	Exhibit Title (as reflected in ADAMS)	Exhibit Status
NRC-015	Dewey-Burdock ISR Project Summary of Tribal Outreach Timeline (Apr. 8, 2014) (ADAMS Accession No. ML14099A010).	Identified and Admitted
NRC-016	Submittal of Comments on Draft Programmatic Agreement for the Proposed Dewey-Burdock ISR Uranium Mining Project. (ADAMS Accession No. ML14077A002)	Identified and Admitted
NRC-017	Dewey-Burdock ISR Project Documents Pertaining to Section 106 of the National Historic Preservation Act (June 10, 2014), available at <a href="http://www.nrc.gov/info-finder/materials/uranium/licensed-facilities/dewey-burdock/section-106-docs.html">http://www.nrc.gov/info-finder/materials/uranium/licensed-facilities/dewey-burdock/section-106-docs.html</a>	Identified and Admitted
NRC-018-A	Final PA for the Dewey-Burdock Project. (ADAMS Accession Nos. ML14066A347).	Identified and Admitted
NRC-018-B	Final Appendix for the Dewey-Burdock Project PA. (ADAMS Accession No. ML14066A350).	Identified and Admitted
NRC-018-C	NRC PA Signature Page. (ADAMS Accession No. ML14098A464).	Identified and Admitted
NRC-018-D	Letter from ACHP finalizing Section 106. (ADAMS Accession No. ML14099A025).	Identified and Admitted
NRC-018-E	ACHP PA Signature Page. (ADAMS Accession No. ML4098A1550).	Identified and Admitted
NRC-018-F	BLM signature on PA; (Mar. 25, 2014) (ADAMS Accession No. ML14098A102).	Identified and Admitted
NRC-018-G	South Dakota SHPO PA Signature Page. (ADAMS Accession No. ML14098A107).	Identified and Admitted
NRC-018-H	Powertech PA Signature Page. (ADAMS Accession No. ML14098A110).	Identified and Admitted
NRC-019	Summary Report Regarding the Tribal Cultural Surveys Completed for the Dewey-Burdock Uranium In Situ Recovery Project. (Dec. 16, 2013) (ADAMS Accession No. ML13343A142).	Identified and Admitted
NRC-020	NRC Letter transmitting the Applicant's Statement of Work to all consulting parties. (May 7,2012). (ADAMS Accession No. ML121250102).	Identified and Admitted
NRC-021	3/19/2010 NRC sent initial Section 106 invitation letters to 17 tribes requesting their input on the proposed action. ADAMS Accession No. ML100331999.	Identified and Admitted
NRC-022	Letter to Oglala Sioux Tribe Re: Request for Updated Tribal Council Members Consultation (Sep. 8, 2010) ADAMS Accession No. ML102450647).	Identified and Admitted



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Exhibit Number	Exhibit Title (as reflected in ADAMS)	Exhibit Status
NRC-023	Powertech Dewey-Burdock Draft Scope of Work and Figures - Identification of Properties of Religious and Cultural Significance (Mar.07,2012) (ADAMS Accession No. ML120870197).	Identified and Admitted
NRC-024	NRC Staff Letter Postponing fall 2012 tribal survey. (12/14/2012). ADAMS Accession No. ML12335A175.	Identified and Admitted
NRC-025-A	HDR, Engineering Inc., "Assessment of the Visual Effects of the Powder River Basin Project, New Build Segment, on Previously Identified Historic Properties in South Dakota and Wyoming"....	Identified and Admitted
NRC-025-B	HDR, Engineering Inc. "Assessment of the Visual Effects of the Powder River Basin Project, New Build Segment, on Previously Identified Historic Properties in South Dakota and Wyoming."....	Identified and Admitted
NRC-026	WY SHPO (Wyoming State Historic Preservation Office). "Dewey-Burdock Line of Sight Analysis." Email (September 4) from R. Currit, Senior Archaeologist, Wyoming State Historic Preservation Office to H. Yilma,NRC. September 4,2013....	Identified and Admitted
NRC-027	ACHP, National Register Evaluation Criteria, Advisory Council on Historic Preservation. (Mar. 11, 2008) (2012 ADAMS Accession No. ML12262A055).	Identified and Admitted
NRC-028	Email from Waste Win Young to NRC Staff re SRST Comments Final Draft PA Dewey-Burdock SRST THPO Comments (Feb. 20, 2014) (ADAMS Accession No. ML14105A367).	Identified and Admitted
NRC-029	Letter to Cheyenne River Sioux Tribe re: Response Received Regarding Tribal Survey for Dewey-Burdock (Dec. 14, 2012) (ADAMS Accession No. ML12335A175).	Identified and Admitted
NRC-030	Standing Rock Sioux Tribe Comments - Final Draft PA Dewey-Burdock SRST-THPO Comments (Feb. 05, 2014) (ADAMS Accession No. ML14055A513).	Identified and Admitted
NRC-031	04/07/2014 Letter from the Advisory Council on Historic Preservation to the Standing Rock Sioux Tribe Concerning the Dewey- Burdock ISR Project, SD. ADAMS Accession No. ML14115A448.	Identified and Admitted
<del>NRC-032</del>		NOT FILED
NRC-033	09/13/2012 Summary of August 30,2012 Public Meeting with Powertech Inc, to Discuss Powertech's Proposed Environmental Monitoring Program related to the proposed Dewey-Burdock Project. ADAMS Accession No. ML12255A258.	Identified and Admitted



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Exhibit Number	Exhibit Title (as reflected in ADAMS)	Exhibit Status
NRC-034	Letter to Ponca Tribe of Nebraska Re: Invitation for Formal Consultation Under Section 106 of the National Historic Preservation Act (Mar. 4, 2011) (ADAMS Accession No. ML110550372).	Identified and Admitted
NRC-035	Letter to Santee Sioux Tribe of Nebraska Re: Invitation for Formal Consultation Under Section 106 of the National Historic Preservation Act (Mar. 4, 2011) (ADAMS Accession No. ML110550172).	Identified and Admitted
NRC-036	Letter to Crow Tribe of Montana Re: Invitation for Formal Consultation Under Section 106 of the national Historic Preservation Act (Mar. 04,2011) (ADAMS Accession No. ML110550535).	Identified and Admitted
NRC-037	12/3/2010 Yankton Sioux tribe requests face-to-face meeting to discuss past and current project as well as request for TCP survey. Sisseton Wahpeton and Fort Peck tribes also asked for face-to-face meeting via phone....	Identified and Admitted
NRC-038-A	Invitation for Informal Information-Gathering Meeting Pertaining to the Dewey-Burdock, Crow Butte North Trend, and Crow Butte License Renewal, In-Situ Uranium Recovery Projects (May 12, 2011)(ADAMS Accession No. ML111320251).	Identified and Admitted
NRC-038-B	Informal Information Gathering Meeting - Pine Ridge, SD Invitation to Section 106 Consultation Regarding Dewey-Burdock Project (ADAMS Accession No. ML111870622) (Package).	Identified and Admitted
NRC-038-C	Memo to Kevin Hsueh Re: Transcript for the June 8, 2011 Informal Information - Gathering Meeting Held in Pine Ridge, SD (July 8, 2011) (ADAMS Accession No. ML111870623).	Identified and Admitted
NRC-038-D	Attendee List - Informal Information Gathering Meeting Held in Pine Ridge, SD (July 8, 2011) (ADAMS Accession No. ML111870624).	Identified and Admitted
NRC-038-E	Transcript Re: Informal Information-Gathering Meeting Pertaining to Crow Butte Inc. and Powertech Inc. Proposed ISR Facilities (June 8, 2011) (ADAMS Accession No. ML111721938) (Pages 1-195).	Identified and Admitted
NRC-038-F	Presentation Slides for the Section 106 Consultation Meeting Pertaining to the Proposed Dewey-Burdock, Crow Butte North Trend, and Crow Butte LR In-Situ Uranium Recovery Projects (June 8, 2011) (ADAMS Accession No. ML111661428).	Identified and Admitted



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Exhibit Number	Exhibit Title (as reflected in ADAMS)	Exhibit Status
NRC-039	Meeting Agenda for Informal Information Gathering Pertaining to Dewey-Burdock, Crow Butte. Accompanying NRC letter with map of the proposed project boundary and digital copies of the Class III .....	Identified and Admitted
NRC-040	Letter to Richard Blubaugh, Powertech, Re: NRC Information Request Relating to Section 106 and NEPA Reviews for the Proposed Dewey-Burdock Project (Aug. 12, 2011) (ADAMS Accession No. ML112170237).	Identified and Admitted
NRC-041	8/31/2011 NRC letter from Powertech letter and proposal in response to the Aug 12, 2011 request for NHPA Section 106 info. This letter enclosed a proposal which outlined a phased approach to .....	Identified and Admitted
NRC-042	10/20/2011 NRC provided copies of the 6/8/2011 meeting transcripts to all the Tribes. Thank you Letter to James Laysbad of Oglala Sioux Tribe Enclosing the Transcript of the Information-Gathering Meeting and Unredacted Survey Pertaining....	Identified and Admitted
<del>NRC-043</del>		NOT FILED
NRC-044	1/19/2012 NRC invitation letters to all THPOs for a planned Feb 2012 meeting to discuss how best to conduct the TCP survey. (ADAMS Accession No. ML12031A280).	Identified and Admitted
NRC-045	2/01/2012 (February 14-15, 2012 meeting agenda). (ADAMS Accession No. ML120320436).	Identified and Admitted
NRC-046	3/28/2012 - NRC transmitted transcripts of the NRC face-to-face meeting in Rapid City, SD to discuss how best to conduct the TCP survey. (ADAMS Accession Nos. ML120670319).	Identified and Admitted
NRC-047	Meeting the "Reasonable and Good Faith" Identification Standard in Section 106 Review (ACHP), available at <a href="http://www.achp.gov/docs/reasonable_good_faith_identification.pdf">http://www.achp.gov/docs/reasonable_good_faith_identification.pdf</a> .	Identified and Admitted
NRC-048	NEPA and NHPA, A Handbook for Integrating NEPA and Section 106 (CEQ and ACHP), available at <a href="http://www.achp.gov/docs/NEPA_NHPA_Section_106_Handbook_Mar2013.pdf">http://www.achp.gov/docs/NEPA NHPA Section 106 Handbook Mar2013.pdf</a> .	Identified and Admitted
NRC-049	Letter to Crow Creek Sioux Tribe Re: Transmittal of Applicant's Draft Statement of Work (May 7, 2012) (ADAMS Accession No. ML 121250102).	Identified and Admitted



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Exhibit Number	Exhibit Title (as reflected in ADAMS)	Exhibit Status
NRC-050	Letter to Oglala Sioux Tribe Re: Transmittal of Transcript from Teleconference Conducted on April 24, 2012 (June 26, 2012) (ADAMS Accession No. ML12177A109).	Identified and Admitted
NRC-051	NRC Email Re: August 9, 2012 Teleconference Invitation and Revised Statement of Work Transmittal (Aug. 07, 2012) (ADAMS Accession No. ML12261A375).	Identified and Admitted
NRC-052	NRC Request Re: Scope of Work with Coverage Rate, Start Date, Duration, and Cost (Aug 30, 2012) (ADAMS Accession No. ML12261A470).	Identified and Admitted
NRC-053	Letter to Tribal Historic Preservation Officer Re: Transmittal of Tribes' Proposal and Cost Estimate of the Dewey-Burdock ISR Project (Oct. 12, 2012) (ADAMS Accession No. ML12286A310).	Identified and Admitted
NRC-054	Letter to James Laysbad, Oglala Sioux Tribe, Re: Information Related to Traditional Cultural Properties; Dewey-Burdock, Crow Butte North Trend, and Crow Butte LR ISP Projects (Oct. 28, 2011) (ADAMS Accession No. ML112980555)	Identified and Admitted
NRC-055	Letter to Tribal Historic Preservation Officers Re: Request for a Proposal with Cost Estimate for Dewey Burdock Project (Sep. 18, 2012) (ADAMS Accession No. ML12264A594).	Identified and Admitted
NRC-056	H. Yilma Email Re: Draft PA for Dewey-Burdock Project (Nov. 22, 2013) (ADAMS Accession No. ML13329A420).	Identified and Admitted
NRC-057	Dewey-Burdock Project Draft Programmatic Agreement (Nov. 22, 2013) (ADAMS Accession No. ML ML13329A466).	Identified and Admitted
NRC-058	Draft Appendix A for Dewey-Burdock Project PA (Nov. 22, 2013) (ADAMS Accession No. ML13329A468).	Identified and Admitted
NRC-059	Table 1.0 - NRC NRHP Determinations for Dewey-Burdock Draft PA (Nov. 22, 2013) (ADAMS Accession No. ML13329A470).	Identified and Admitted
NRC-060	STB Finance Docket No. 33407, Dakota, Minnesota & Eastern Railroad Corporation Construction into the Powder River Basin: Request for Review and Comment on 21 Archaeological Sites, Surface Transportation Board....	Identified and Admitted





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Exhibit Number	Exhibit Title (as reflected in ADAMS)	Exhibit Status
NRC-061	Letter to Oglala Sioux Tribe Re: Transmittal of TCP Survey Report for Dewey-Burdock Project (Dec. 23, 2013) (ADAMS Accession No. ML13357A234).	Identified and Admitted
NRC-062	NRC Overall Determinations of Eligibility and Assessments of Effects (Dec. 16, 2013) (ADAMS Accession No. ML13343A155).	Identified and Admitted
NRC-063	Draft NRC NRHP Determinations - Table 1.0 for Draft PA (Dec. 13, 2013) (ADAMS Accession No. ML13354B948).	Identified and Admitted
NRC-064	Letter from John Yellow Bird Steele, President of the Oglala Sioux Tribe Re: Refusal to Accept Dewey-Burdock In Situ Project Proposal (Nov. 5, 2012) (ADAMS Accession No. ML13026A005).	Identified and Admitted
NRC-065	Letter from Sisseton Wahpeton Oyaye Tribe Re: Refusal to Accept Dewey-Burdock In Situ Recovery Project Proposal (Nov. 6, 2012) (ADAMS Accession No. ML13036A104).	Identified and Admitted
NRC-066	Letter from Standing Rock Sioux Tribe Re: Tribal Survey Using Persons Without Sioux TCP Expertise to Identify Sioux TCP (Nov. 5, 2012) (ADAMS Accession No. ML13036A110).	Identified and Admitted
NRC-067	Email from Standing Rock Sioux Tribe Providing Comments on Final Draft PA Dewey-Burdock SRST-THPO (Feb. 20, 2014) (ADAMS Accession No. ML14059A199).	Identified and Admitted
NRC-068	Email Re: Transmittal of a Follow-up Email Pertaining to an Upcoming Field Survey for the Dewey-Burdock Project (Feb. 08, 2013) (ADAMS Accession No. ML13039A336).	Identified and Admitted
NRC-069	Letter to Oglala Sioux Tribe Re: Notification of Intention to Separate the NHPA Section 106 Process from NEPA Review for Dewey-Burdock ISR Project (Nov. 6, 2013) (ADAMS Accession No. ML13308B524).	Identified and Admitted
NRC-070	Letter to J. Fowler, ACHP, Re: Notification of Intention to Separate the NHPA Section 106 Process from NEPA Review for Dewey-Burdock IS Project (Nov. 13, 2013) (ADAMS Accession No. ML13311B184).	Identified and Admitted
NRC-071	Letter from Department of State Re: Keystone XL Pipeline Project Traditional Cultural Property (TCP) Studies (Aug. 4, 2009).	Identified and Admitted



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Exhibit Number	Exhibit Title (as reflected in ADAMS)	Exhibit Status
NRC-072	A Level III Cultural Resources Evaluation of Powertech (USA) Incorporated's Proposed Dewey-Burdock Uranium Project Locality within the Southern Black Hills, Custer and Fall River Counties, South Dakota, Vol. I, (Page 1.2 through Page 4.18)....	Identified and Admitted
NRC-073	A Level III Cultural Resources Evaluation of Powertech (USA) Incorporated's Proposed Dewey-Burdock Uranium Project Locality within the Southern Black Hills, Custer and Fall River Counties, South Dakota (Pages 5.53 through 5.106)....	Identified and Admitted
NRC-074	NRC (1980). Regulatory Guide 4.14, Radiological Effluent and Environmental Monitoring at Uranium Mills. ADAMS Accession No. ML003739941.	Identified and Admitted
NRC-075	NRC, 2009. Staff Assessment of Ground Water Impacts from Previously Licensed In-Situ Uranium Recovery Facilities, Memorandum from C. Miller to Chairman Jaczko , et al. Washington DC: USNRC, July 10, 2009d ADAMS Accession No. ML091770385.	Identified and Admitted
NRC-076	NUREG/CR-6705, Historical Case Analysis of Uranium Plume Attenuation.. (Feb. 28, 2001) (ADAMS Accession No. ML010460162).	Identified and Admitted
NRC-077	05/28/2010 NRC Staff Request for Additional Information for Proposed Dewey-Burdock In Situ Recovery Facility (ADAMS Accession No. ML101460286).	Identified and Admitted
NRC-078	09/13/2012 NRC Staff RAI: Summary of August 30, 2012 Public Meeting with Powertech Inc, to Discuss Powertech's Proposed Environmental Monitoring Program related to the proposed Dewey-Burdock Project. (ADAMS Accession No. ML12255A258).	Identified and Admitted
NRC-079	09/09/2013 NRC Staff RAI: Email Concerning Review of Powertech's Additional Statistical Analysis of Radium-226 Soil Sampling Data and Gamma Measurements and Request for Information. ADAMS (Accession No. ....	Identified and Admitted
NRC-080	12/09/2013 NRC Staff RAI: NRC Staff review of revised statistical analysis of the Radium 226 (soil) and gamma radiation correlation for screening surveys at the proposed Dewey-Burdock Project requesting additional information....	Identified and Admitted



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<b>Exhibit Number</b>	<b>Exhibit Title (as reflected in ADAMS)</b>	<b>Exhibit Status</b>
NRC-081	Gott, G.B., D.E. Wolcott, and C.G. Bowles. Stratigraphy of the Inyan Kara Group and Localization of Uranium Deposits, Southern Black Hills, South Dakota and Wyoming. ML120310042. U.S. Geological Survey Water Resources Investigation Report....	Identified and Admitted
NRC-082	Driscoll, D.G., J.M. Carter, J.E. Williamson, and L.D. Putnam. Hydrology of the Black Hills Area, South Dakota. U.S. Geological Survey Water Resources Investigation Report 02-4094. (ADAMS Accession No. ML12240A218). 2002.	Identified and Admitted
NRC-083	Braddock, W.A. Geology of the Jewel Cave SW Quadrangle Custer County, South Dakota. U.S. Geological Survey Bulletin 1063-G. (08 April 2013)....	Identified and Admitted
NRC-084-A	Butz, T.R., N.E. Dean, C.S. Bard, R.N. Helgerson, J.G. Grimes, and P.M. Pritz. Hydrogeochemical and Stream Sediment Detailed Geochemical Survey for Edgemont, South Dakota, Wyoming. National Uranium Resource Evaluation (NURE) Program....	Identified and Admitted
NRC-084-B	Butz, T.R., N.E. Dean, C.S. Bard, R.N. Helgerson, J.G. Grimes, and P.M. Pritz. Hydrogeochemical and Stream Sediment Detailed Geochemical Survey for Edgemont, South Dakota, Wyoming. National Uranium Resource Evaluation (NURE) Program,....	Identified and Admitted
NRC-084-C	Butz, T.R., N.E. Dean, C.S. Bard, R.N. Helgerson, J.G. Grimes, and P.M. Pritz. Hydrogeochemical and Stream Sediment Detailed Geochemical Survey for Edgemont, South Dakota, Wyoming. National Uranium....	Identified and Admitted
NRC-084-D	Butz, T.R., N.E. Dean, C.S. Bard, R.N. Helgerson, J.G. Grimes, and P.M. Pritz. Hydrogeochemical and Stream Sediment Detailed Geochemical Survey for Edgemont, South Dakota, Wyoming. National Uranium Resource Evaluation (NURE) Program....	Identified and Admitted
NRC-084-E	Butz, T.R., N.E. Dean, C.S. Bard, R.N. Helgerson, J.G. Grimes, and P.M. Pritz. Hydrogeochemical and Stream Sediment Detailed Geochemical Survey for Edgemont, South Dakota, Wyoming. National Uranium Resource Evaluation (NURE) Program....	Identified and Admitted
NRC-084-F	Butz, T.R., N.E. Dean, C.S. Bard, R.N. Helgerson, J.G. Grimes, and P.M. Pritz. Hydrogeochemical and Stream Sediment Detailed Geochemical Survey for Edgemont, South Dakota, Wyoming. National Uranium .....	Identified and Admitted



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Exhibit Number	Exhibit Title (as reflected in ADAMS)	Exhibit Status
NRC-085	Darton, N.H. Geology and Water Resources of the Northern Portion of the Black Hills and Adjoining Regions of South Dakota and Wyoming. U.S. Geological Survey Professional Paper 65. 1909....	Identified and Admitted
NRC-086	Epstein, J.B. "Hydrology, Hazards, and Geomorphic Development of Gypsum Karst in the Northern Black Hills, South Dakota and Wyoming." U.S. Geological Survey Water-Resource Investigation Report 01-4011....	Identified and Admitted
NRC-087	NUREG-1910, Final Report, Supplement 1, Environmental Impact Statement for the Moore Ranch ISR Project in Campbell County, Wyoming, Supplement to the Generic Environmental Impact Statement for In-Situ Leach Uranium Milling Facilities....	Identified and Admitted
NRC-088	NUREG-1910, Final Report, Supplement 1, Environmental Impact Statement for the Moore Ranch ISR Project in Campbell County, Wyoming, Supplement to the Generic Environmental Impact Statement for In-Situ Leach Uranium Milling Facilities....	Identified and Admitted
NRC-089	NUREG-1910, Final Report, Supplement 3, Environmental Impact Statement for the Lost Creek ISR Project in Sweetwater County, Wyoming. Supplement to the Generic Environmental Impact Statement for In-Situ Leach Uranium Milling Facilities....	Identified and Admitted
NRC-090	SDDENR. "Report to the Chief Engineer on Water Permit Application No. 2686-2, Powertech (USA) Inc., November 2, 2012." November 2012a. ADAMS Accession No. ML13165A168.	Identified and Admitted
NRC-091	NRC. "Staff Assessment of Groundwater Impacts from Previously Licensed In-Situ Uranium Recovery Facilities." Memorandum to Chairman Jaczko, Commissioner Klein, and Commissioner Svinicki, NRC from C. Miller....	Identified and Admitted
<del>NRC-092</del>		NOT FILED
NRC-093	EPA comments on FSEIS; (ADAMS Accession No. ML14070A230).	Identified and Admitted
NRC-094	NRC Regulatory Guide 3.11, Rev. 3, Design, Construction, and Inspection of Embankment Retention Systems at Uranium Recovery Facilities, November 2008, (ADAMS Accession No. ML082380144).	Identified and Admitted



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Exhibit Number	Exhibit Title (as reflected in ADAMS)	Exhibit Status
NRC-095	Letter to P. Strobel Re: EPAs Response Comment to FSEIS (Mar. 25, 2014) (ADAMS Accession No. ML14078A044).	Identified and Admitted
NRC-096	Comment (14) of Robert F. Stewart on Behalf of the Dept. of the Interior, Office of Environmental Policy and Compliance on Draft Supplemental Environmental Impact Statement (DSEIS), Dewey-Burdock Project.....	Identified and Admitted
<del>NRC-097</del>	<del>Request for Information Regarding Endangered or Threatened Species and Critical Habitat for the Powertech Inc. Proposed Dewey-Burdock In-Situ Recovery Facility Near Edgemont South Dakota (Mar. 15, 2010) (ADAMS Accession No. ML100331503).</del>	Not Offered
<del>NRC-098</del>	<del>FWS. Whooping Cranes and Wind Development - An Issue Paper. (Apr. 2009)....</del>	Not Offered
<del>NRC-099</del>	<del>Avian Power Line Interaction Committee. "Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006" (ADAMS Accession No. ML12243A391).</del>	Not Offered
<del>NRC-100</del>	<del>Informal Information Gathering Meetings Trip Summary (Dec. 9, 2010) (ADAMS Accession No. ML093631627).</del>	Not Offered
<del>NRC-101</del>	<del>Email from Mitchell Iverson of BLM. (June 25, 2012) &amp; Wildlife Stipulations in the Current 1986 South Dakota Resource Management Plan. (ADAMS Accession No. ML12249A030).</del>	Not Offered
<del>NRC-102</del>	<del>USGS. "Fragile Legacy, Endangered, Threatened, and Rare Animals of South Dakota, Black-footed Ferret (Mustela nigripes)." (2006), available at <a href="http://www.npwrc.usgs.gov/resource/wildlife/sdrare/species/mustnigr.htm">http://www.npwrc.usgs.gov/resource/wildlife/sdrare/species/mustnigr.htm</a>.</del>	Not Offered
<del>NRC-103</del>	<del>FWS. "Species Profile, Whooping Crane (Grus Americana)"</del>	Not Offered
<del>NRC-104</del>	<del>BLM. "Draft Environmental Impact Statement, Dewey Conveyor Project." DOI-BLM-MT-040-2009-002-EIS. (Jan. 2009b) (ADAMS Accession No. ML12209A089).</del>	Not Offered
<del>NRC-105</del>	<del>BLM. "Final Statewide Programmatic Biological Assessment: Black-Footed Ferret (Mustela nigripes)." August, 2005. Cheyenne, Wyoming: U.S. Bureau of Land Management, Wyoming State Office.</del>	Not Offered



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Exhibit Number	Exhibit Title (as reflected in ADAMS)	Exhibit Status
<del>NRC-106</del>	<del>FWS. "South Dakota Field Office, Black Footed Ferret," (Sep. 9, 2013), available at <a href="http://www.fws.gov/southdakotafieldoffice/bfferret.htm">http://www.fws.gov/southdakotafieldoffice/bfferret.htm</a>.</del>	Not Offered
<del>NRC-107</del>	<del>FWS. "Black Footed Ferret Draft Recovery Plan." Second Revision, (Feb. 2013), available at ....</del>	Not Offered
<del>NRC-108</del>	<del>South Dakota State University. "South Dakota GAP Analysis Project." Brookings, South Dakota: South Dakota State University, Department of Wildlife and Fisheries Sciences (Jan. 13, 2012), available at <a href="http://www.sdstate.edu/nrm/gap/index.cfm">http://www.sdstate.edu/nrm/gap/index.cfm</a>.</del>	Not Offered
<del>NRC-109</del>	<del>South Dakota State University. "Suitable Habitat Predicted for the Black Footed Ferret in South Dakota." available at <a href="http://www.sdstate.edu/nrm/gap/mammals/upload/blfootferret-model.pdf">http://www.sdstate.edu/nrm/gap/mammals/upload/blfootferret-model.pdf</a>.</del>	Not Offered
<del>NRC-110</del>		NOT FILED
<del>NRC-111</del>	<del>Dewey-Burdock Record of Decision (Apr. 8, 2014) (ADAMS Accession No. ML14066A466).</del>	Not Offered
<del>NRC-112</del>	<del>Travsky, A., Beauvais, G.P. "Species Assessment for the Whooping Crane (Grus Americana) in Wyoming." October 2004. Cheyenne, Wyoming: United States Department of the Interior, Bureau of Land Management, ....</del>	Not Offered
<del>NRC-113</del>	<del>Endangered and Threatened Wildlife and Plants; 12-Month Findings for Petitions to List the Greater Sage-Grouse (Centrocercus urophasianus) as Threatened or Endangered. 75 Fed. Reg. 13,909-13,959 ....</del>	Not Offered
<del>NRC-114</del>	<del>Habitat Assessment and Conservation Strategy for Sage Grouse and Other Selected Species on Buffalo Gap National Grassland, U.S. Department of Agriculture, Forest Service (Sep. 2005) (ADAMS Accession No. ....</del>	Not Offered
<del>NRC-115</del>	<del>Email with Attachments from Mitchell Iverson, BLM, RE: Meeting at 11:30 EST (June 25, 2012) (ADAMS Accession No. ML12250A802).</del>	Not Offered
<del>NRC-116</del>	<del>Attachment 1, Appendix C, South Dakota Field Office Mitigation Guidelines (June 25, 2012) (ADAMS Accession No. ML12250A827).</del>	Not Offered
<del>NRC-117</del>	<del>Appendix D South Dakota Field Office Reclamation Guidelines.</del>	Not Offered



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**Powertech (USA) Inc., (Dewey-Burdock In Situ Uranium Recovery Facility)**

Docket No. 40-9075-MLA

ASLBP No. 10-898-02-MLA-BD01

NRC Staff's Exhibits

Exhibit Number	Exhibit Title (as reflected in ADAMS)	Exhibit Status
<del>NRC 118</del>	<del>BLM Email Subject "Appendix E Wildlife Stipulations" and attachments. From M. Iverson, BLM, Acting Field Manager, South Dakota Field Office, to A. Hester, CNWRA, Southwest Research Institute. (June 25, 2012.)</del>	Not Offered
<del>NRC 119</del>	<del>BLM Email Subject "Wildlife and Special Status Stipulations in the 1896 South Dakota Resource Management Plan" and attachment. From M. Iverson, BLM, Acting Field Manager, South Dakota Field Office, to H. Yilma, Project Manager.</del>	Not Offered
<del>NRC 120</del>	<del>Peterson, R.A. "The South Dakota Breeding Bird Atlas." Jamestown, North Dakota: Northern Prairie Wildlife Research Center. 1995. <a href="http://www.npwrc.usgs.gov/resource/birds/sdatlas/index.htm">http://www.npwrc.usgs.gov/resource/birds/sdatlas/index.htm</a></del>	Not Offered
<del>NRC 121</del>	<del>BLM "Newcastle Resource Management Plan." (2000) (ADAMS Accession No. ML12209A101).</del>	Not Offered
<del>NRC 122</del>	<del>Sage Grouse Working Group (Northeast Wyoming Sage Grouse Working Group). "Northeast Wyoming Sage Grouse Conservation Plan." (2006) (ADAMS Accession No. ML12240A374).</del>	Not Offered
<del>NRC 123</del>	<del>SDGFP. "Sage Grouse Population Dynamics." (Nov. 20, 2009), available at <a href="http://gfp.sd.gov/hunting/small-game/sage-grouse-population-dynamics.aspx">http://gfp.sd.gov/hunting/small-game/sage-grouse-population-dynamics.aspx</a></del>	Not Offered
<del>NRC 124</del>		NOT FILED
<del>NRC 125</del>	<del>U.S. Fish and Wildlife Service Press Release and Draft Report to Help Sage Grouse Conservation Objectives (August 23, 2012) (ADAMS Accession No. ML12276A248).</del>	Not Offered
<del>NRC 126</del>	<del>U.S. Fish and Wildlife Service. "Greater sage grouse (Centrocercus urophasianus) Conservation Objectives: Final Report" (Feb. 2013), available at <a href="http://www.fws.gov/mountain-prairie/ea/03252013_COT_Report.pdf">http://www.fws.gov/mountain-prairie/ea/03252013_COT_Report.pdf</a></del>	Not Offered
<del>NRC 127</del>	<del>Department of Environment And Natural Resources Recommendation Powertech (USA) Inc. Large Scale Mine Permit Application. (April 15, 2013), available at <a href="http://denr.sd.gov/des/mm/documents/Powertech1/DENRRec4-15-13.pdf">http://denr.sd.gov/des/mm/documents/Powertech1/DENRRec4-15-13.pdf</a>.</del>	Not Offered



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Exhibit Number	Exhibit Title (as reflected in ADAMS)	Exhibit Status
<del>NRC-128</del>	<del>SDGFP. "Colony Acreage and Distribution of the Black-Tailed Prairie Dog in South Dakota, 2008" (Aug. 2008), available at <a href="http://gfp.sd.gov/wildlife/docs/prairedog-distribution-report.pdf">http://gfp.sd.gov/wildlife/docs/prairedog-distribution-report.pdf</a></del>	Not Offered
<del>NRC-129</del>	<del>S. Larson, FWS letter re Environmental Comments on Powertech Dewey-Burdock Project, Custer and Fall River County, South Dakota. (Mar. 29, 2010) (ADAMS Accession No. ML1009705560).</del>	Not Offered
<del>NRC-130</del>	<del>E-mail from Terry Quesinberry, Fish and Wildlife Biologist, U.S. Fish and Wildlife Service, to Amy Hester, Research Scientist, Center for Nuclear Waste Regulatory Analyses, Southwest Research Institute.....</del>	Not Offered
<del>NRC-131</del>	<del>E-mail from Terry Quesinberry, Fish and Wildlife Biologist, U.S. Fish and Wildlife Service, to Haimanot Yilma, Environmental Project Manager for Dewey-Burdock, Office of Federal and State Materials and Environmental.....</del>	Not Offered
NRC-132	Improving the Process for Preparing Efficient and Timely Environmental Reviews under NEPA.	Identified and Admitted
<del>NRC-133</del>		NOT FILED
NRC-134	Safety Evaluation Report for the Dewey-Burdock Project Fall River and Custer Counties, South Dakota. Materials License No. SUA-1600 (April 2014) ADAMS Accession No. ML14043A347.	Identified and Admitted
NRC-135	Safety Evaluation Report for the Dewey-Burdock Project Fall River and Custer Counties, South Dakota, Materials License No. SUA-1600, Docket No. 40-9075 (March 2013), ADAMS Accession No. ML13052A182.	Identified and Admitted
NRC-136-A	A - Palmer, L. and J.M. Kruse. "Evaluative Testing of 20 Sites in the Powertech (USA) Inc. Dewey-Burdock Uranium Project Impact Areas." Black Hills Archaeological Region. Volumes I and II. Archaeological Contract Series No. 251....	Identified and Admitted
NRC-136-B	Palmer, L. and J.M. Kruse Evaluative Testing of 20 Sites in the Powertech (USA) Inc. Dewey-Burdock Uranium Project Impact Areas Black Hills Archaeological Region Volumes I and II....	Identified and Admitted
NRC-136-C	Palmer, L. and J.M. Kruse. "Evaluative Testing of 20 Sites in the Powertech (USA) Inc. Dewey-Burdock Uranium Project Impact Areas." Black Hills Archaeological Region. Volumes I and II. Archaeological .....	Identified and Admitted





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Exhibit Number	Exhibit Title (as reflected in ADAMS)	Exhibit Status
NRC-137	Department of Environment and Natural Resources, Recommendation, Powertech (USA) Inc, Large Scale Mine Permit Application at 6 (April 15, 2013), available at <a href="http://denr.sd.gov/des/mm/documents/Powertech1/DENRRec4-15-13.pdf">http://denr.sd.gov/des/mm/documents/Powertech1/DENRRec4-15-13.pdf</a> .	Identified and Admitted
NRC-138	Jack R. Keene (1973). Ground-Water Resources of the Western Half of Fall River County, South Dakota. South Dakota Department of Natural Resource Development, Geological Survey, Report of Investigations, No. 109, 90 pg....	Identified and Admitted
NRC-139	U.S. Geological Survey, 2006, Quaternary fault and fold database for the United States, accessed June 20, 2014, from USGS web site: <a href="http://earthquakes.usgs.gov/regional/qfaults/">http://earthquakes.usgs.gov/regional/qfaults/</a> .	Identified and Admitted
<del>NRC-140</del>		NOT FILED
NRC-141-A	Dewey-Burdock Project Supplement to Application for NRC Uranium Recovery License Dated February 2009, Prepared by Powertech (USA) Inc. Greenwood Village, Colorado, CO. (Aug 31, 2009) (ADAMS Accession No. ML092870155). Pages 1-42	Identified and Admitted
NRC-141-B	Dewey-Burdock Project Supplement to Application for NRC Uranium Recovery License Dated February 2009, Prepared by Powertech (USA) Inc. Greenwood Village, Colorado, CO. (Aug 31, 2009) (ADAMS Accession .....	Identified and Admitted
NRC-141-C	Dewey-Burdock Project Supplement to Application for NRC Uranium Recovery License Dated February 2009, Prepared by Powertech (USA) Inc. Greenwood Village, Colorado, CO. (Aug 31, 2009) (ADAMS Accession No. ML092870155). Pages 124-132	Identified and Admitted
NRC-141-D	Dewey-Burdock Project Supplement to Application for NRC Uranium Recovery License Dated February 2009, Prepared by Powertech (USA) Inc. Greenwood Village, Colorado, CO. (Aug 31, 2009) (ADAMS Accession No. ML092870155). Pages 133-143	Identified and Admitted
NRC-141-E	Dewey-Burdock Project Supplement to Application for NRC Uranium Recovery License Dated February 2009, Prepared by Powertech (USA) Inc. Greenwood Village, Colorado, CO. (Aug 31, 2009) (ADAMS Accession No. ML092870155).	Identified and Admitted



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Exhibit Number	Exhibit Title (as reflected in ADAMS)	Exhibit Status
NRC-142	Submittal of Comments on Draft Programmatic Agreement for the Proposed Dewey-Burdock ISR Uranium Mining Project. (Mar. 17, 2014) (ADAMS Accession No. ML14077A002. Pages 5-1	Identified and Admitted
NRC-143	Letter to Oglala Sioux Tribe re: Invitation for Government-to-Government Meeting Concerning Licensing Actions for Proposed Uranium Recovery Projects. (Mar. 12, 2013) (ADAMS Accession No. ML13071A653).	Identified and Admitted
NRC-144	SRI (SRI Foundation). "Overview of Places of Traditional and Cultural Significance, Cameco/Powertech Project Areas." Rio Rancho, New Mexico: SRI Foundation. (June 8, 2012) (ADAMS Accession No. ML12262A113).	Identified and Admitted
NRC-145-A	Guidelines for Evaluation and Documenting Traditional Cultural Properties. National Register Bulletin, U.S. Department of the Interior. National Park Service. (ADAMS Accession No. ML12240A371). Pages 1-14	Identified and Admitted
NRC-145-B	Guidelines for Evaluation and Documenting Traditional Cultural Properties. National Register Bulletin, U.S. Department of the Interior. National Park Service. (ADAMS Accession No. ML12240A371). Pages 15-18	Identified and Admitted
NRC-146	2013/03/13 Powertech Dewey-Burdock LA - RE: field survey in the spring of 2013. (Mar. 13, 2013) (ADAMS Accession No. ML13078A388).	Identified and Admitted
NRC-147	2013/03/13 Powertech Dewey-Burdock LA - RE: field survey for Dewey-Burdock. (Mar. 13, 2013) (ADAMS Accession No. ML13078A384).	Identified and Admitted
NRC-148	Letter from Oglala Sioux Tribe in response to February 8, 2013 letter to Tribal Historic Preservation Officer March 23, 2013 (ADAMS Accession No. ML13141A362).	Identified and Admitted
NRC-149	2013/08/30 Powertech Dewey-Burdock LA - Request for Availability to discuss development of a PA for the Dewey Burdock Project. (Aug. 30, 2013) (ADAMS Accession No. ML13267A221).	Identified and Admitted
NRC-150	2013/11/14 Powertech Dewey-Burdock LA - Reminder: Teleconference to discuss the development of the PA for the Dewey Burdock project is scheduled for Friday. (Nov. 15, 2013. (ADAMS Accession No. ML13322B658).	Identified and Admitted
NRC-151	NRC Staff Rebuttal Testimony.	Identified and Admitted
NRC-152	Statement of Professional Qualifications of Hope E. Luhman.	Identified and Admitted



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<b>Exhibit Number</b>	<b>Exhibit Title (as reflected in ADAMS)</b>	<b>Exhibit Status</b>
NRC-153	Excerpt from Parker, P. and T. King. Guidelines for Evaluating and Documenting Traditional Cultural Properties, National Register of Historic Places Bulletin 38. (1990) (ADAMS Accession No. ML12240A371).	Identified and Admitted
NRC-154	Excerpt from Bates, R. and J. Jackson. Dictionary of Geological Terms 3rd Edition. (1984).	Identified and Admitted
NRC-155	Letter from South Dakota Historical Society re: Dewey-Burdock Project, (Jan. 2014).	Identified and Admitted
NRC-156	Johnson, R. H. "Reactive Transport Modeling for the Proposed Dewey-Burdock Uranium In-Situ Recovery Mine, Edgemont, South Dakota, USA." International Mine Water Association, Mine Water-Managing the Challenges. 2011.	Identified and Admitted



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<b>Oglala Sioux Tribe's Exhibits</b>		
<b>Exhibit Number</b>	<b>Exhibit Title (as reflected in ADAMS)</b>	<b>Exhibit Status</b>
OST-001	Opening Written Testimony of Dr. Robert E. Moran.	Identified and Admitted
OST-002	U.S. EPA, 2007, TENORM Uranium Occupational and Public Risks Associated with In- Situ Leaching; Append. III, PG 1-11.	Identified and Admitted
OST-003	US EPA, 2008, Technical Report on Technologically Enhanced Naturally Occurring Radioactive Materials from Uranium Mining, Volume 1: Mining and Reclamation Background: Previously published on-line and printed as Vol. 1 of EPA 402-R-05-007....	Identified and Admitted
OST-004	U.S. EPA, 2011 (June), CONSIDERATIONS RELATED TO POST-CLOSURE MONITORING OF URANIUM IN-SITU LEACH/IN-SITU RECOVERY (ISL/ISR) SITES, Draft Technical Report; [Includes Attachment A: Development of the Groundwater Baseline for Burdock ISL Site....	Identified and Admitted
OST-005	Powerpoint presentation prepared by Dr. Robert E. Moran.	Identified and Admitted
OST-006	Boggs, Jenkins, ?Analysis of Aquifer Tests Conducted at the Proposed Burdock Uranium Mine Site, Burdock, South Dakota,? Tennessee Valley Authority, Report No. WR28-1-520-109, May 1980.	Identified and Admitted
OST-007	Boggs, Hydrogeologic Investigations at Proposed Uranium Mine Near Dewey, South Dakota (1983).	Identified and Admitted
OST-008	Keene, Ground-water Resources of the Western Half of Fall River County, S.D., Dept. of Natural Resource Development Geological Survey, Univ. S.D., Report of Investigations No. 109 (1973).	Identified and Admitted
OST-009	TVA, Draft Environmental Statement, Edgemont Uranium Mine.	Identified and Admitted
OST-010	OST Petition to Intervene, with Exhibits.	Identified and Admitted
OST-011	OST Statement of Contentions on DSEIS, with Exhibits.	Identified and Admitted
OST-012	OST Statement of Contentions on FSEIS, with Exhibits.	Identified and Admitted
OST-013	OST Statement of Undisputed Facts submitted with OST Motion for Summary Disposition.	Identified and Admitted
OST-014	Declaration of Michael CatchesEnemy.	Identified and Admitted
OST-015	Declaration of Wilmer Mesteth.	Identified and Admitted



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<b>Exhibit Number</b>	<b>Exhibit Title (as reflected in ADAMS)</b>	<b>Exhibit Status</b>
OST-016	February 20, 2013 letter from Standing Rock Sioux to NRC Staff.	Identified and Admitted
OST-017	March 22, 2013 letter from Oglala Sioux Tribe to NRC Staff.	Identified and Admitted
OST-018	Rebuttal Testimony of Dr. Robert E. Moran.	Identified and Admitted
OST-019	Powertech Press Release.	Identified and Admitted
OST-020	E-Mail from Chris Pugsley, Powertech, re NRC Proceeding.	Identified and Admitted
OST-021	Powertech Quarterly Management Discussion and Analysis.	Identified and Admitted