BEFORE THE DEPARTMENT OF WATER RESOURCES

OF THE STATE OF IDAHO

IN THE MATTER OF APPLICATION)
FOR PERMIT NO. 63-32573 IN)
THE NAME OF M3 EAGLE LLC)
_____) VOLUME VIII

(Pages 1741 through 1936)

BEFORE

HEARING OFFICER: GARY SPACKMAN

Date: May 11, 2009 - 9:00 a.m.

Location: Idaho Department of Water Resources
322 East Front Street
Boise, Idaho

REPORTED BY:

JEFF LaMAR, C.S.R. No. 640

Notary Public

APPEARANCES:

For M3 Eagle LLC:
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BY MR. JEFFREY C. FEREDAY
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For North Ada County Groundwater Users Association:
BY MR. JOHN THORNTON
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For Eagle Pines Water Users Association and Individually:
BY MR. ALAN SMITH
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Eagle, Idaho 83616
Appearing Individually:
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APPEARANCES (Continued):

Also Present:
Jerry Peterson
Jason Smith
Sandy Hemenway
Michele Edl

I N D E X

W I T N E S S E S

E X H I B I T S

THE HEARING OFFICER: Okay. We are recording now. This is a continuation of the hearing for application for appropriated water No. 63-32573 in the name of M3 Eagle, and the date is May 11th. The hour is approximately 9:15 a.m.

We've talked about rescheduling or at least scheduling some additional days for this hearing, and we've identified June 5th and June 23rd as days that we'll schedule in case we need to go longer. And hopefully we can finish more quickly than that.

And, Mr. Fereday, you had a preliminary matter you wanted to talk about before we begin testimony.

MR. FEREDAY: Yes. Thank you, Mr. Hearing Officer.

Last Wednesday, the day after our last hearing session, M3 Eagle's managing partner, Mr. Brownlee, received an e-mail from the staff's Sean Vincent inquiring as to whether the staff could enter M3 Eagle's property to do seismic studies running one line down Big Gulch.

And Mr. Brownlee responded, and that was -- excuse me, that was Friday, May 8th, Mr. Brownlee responded to Mr. Vincent by e-mail

saying that we -- he thought we ought to talk about this here. And that's the -- just the purpose of this.

I just want to make sure that because this is an ongoing case that we've discussed how this is all going to take place in the context of this hearing.

Did I say Vincent? I meant Mr. Owsley.

THE HEARING OFFICER: Oh, yeah.

MR. FEREDAY: I'm sorry. If I said Sean Vincent, I meant Owsley, Mr. Owsley sent the e-mail. Mr. Brownlee responded on Friday. So with just kind of want to know what the plan is for that and what the timing might be.

My sense is that M3 will be willing to open its property, but we just wanted to alert you to this, just because of the unusual situation that we have an ongoing hearing that is focused on this very same property. So that's the purpose for this preliminary.

THE HEARING OFFICER: Well, I'm assuming that these -- and I'm guessing this is a seismic -- some sort of seismic testing that's anticipated. And I think there was some

discussion about the worth of doing that seismic testing, perhaps during the previous testimony.

And I would not expect that testing to be completed and be available for submittal to the Hearing Officer as evidence. So it seems to me that all of that future testing, and I assume there will be additional data gathering that will occur as time goes on, some of that anticipated data gathering will be discussed, and the Department needs to take the information that it has and go forward and make a decision.

So that's my intent as the Hearing Officer, and I view this other operation as being right now extraneous to the hearing process, not something I want to consider at all.

MR. FEREDAY: Thank you.

THE HEARING OFFICER: Nor do I think it's appropriate for me as a Hearing Officer. And the extent I can, I'll stay out of those discussions and instruct the same. I don't want to be part of it. Okay.

MR. FEREDAY: Okay. Thank you.

THE HEARING OFFICER: Anything further on that subject?

MR. FEREDAY: No.

THE HEARING OFFICER: Okay. Other parties?

Again, it's a little tough sometimes for me as a Hearing Officer to maintain my neutrality and objectivity in this process. But I want to insulate myself from these kinds of discussions. And I know they've been going on, but it's -- it should not affect where I'm headed or where we're headed in this hearing.

MR. FEREDAY: Well, thank you, Mr. Hearing Officer.

And we recognize that the Department has funding from the legislature to do hydrogeologic studies in a few parts of the state, including north Ada, and that those studies have been ongoing. So it just is, I guess, a coincidence that our hearing has to come up in the middle of that. But I appreciate your comments.

THE HEARING OFFICER: Okay. Let's see. I think we finished with testimony of Mr. --

MR. FEREDAY: Mr. Utting.

THE HEARING OFFICER: Yeah. Mr. Mark Utting had just finished testifying. And I think at this juncture we had agreed to call Department witnesses. And I have not established an order for that presentation. I've left it up to them.

Mr. Vincent, what is your preference at this point?

MR. VINCENT: I'm going to go first today.

THE HEARING OFFICER: Okay. Why don't you come forward, if you would.

MR. ALAN SMITH: Before we start, Judge --

THE HEARING OFFICER: Mr. Smith?

MR. ALAN SMITH: And I hope you don't mind me referring to you as "Judge," but --

THE HEARING OFFICER: Well, "Mr. Spackman" would be fine. I feel some discomfort with that.

MR. ALAN SMITH: "Mr. Hearing Officer" seems a little awkward.

But we have a motion under rule 14 at the -- 413 at the close of the applicant's case. Our motion is to dismiss. Eagle Pines Water Association and the individual protestants move to dismiss application 63-32573 in the name of M3 Eagle on the following grounds. And I believe North Ada County Groundwater Users Association joins with us in this motion.

Item No. 1, M3 is not a municipality under Idaho Code 42-202(b)(4). They have applied for this water right as a municipal water right. It's been admitted by Mr. Brownlee in his

testimony, as president of M3, that they are not a municipality.

Item 2, M3 is not a municipal provider. The statute states "a municipality that provides water for municipal purposes to the residents and other users within its service area."

And section (b) provides that "any corporation or association holding a franchise to supply water for municipal purposes, or a political subdivision of the state of Idaho authorized to supply water for municipal purposes," and the critical language here is, "and which does supply water."

M3 does not supply any water to a municipality or for any municipal purposes within any service area.

Section (3) -- or (c) -- and I don't know if you have the statute before you.

THE HEARING OFFICER: I don't, but I'm familiar with it.

MR. ALAN SMITH: But it provides that "a corporation or association which supplies" -- and I would point out that both section (b) and (c) are in the present tense, "which supplies water

for municipal purposes through a water system regulated by the state of Idaho."

It's clear that subsection (c) is intended to cover independent entities like United Water, Boise Water Corporation, Eagle Water that are already supplying water to municipalities. It is not -- the statute is not intended to provide for a planned community to come within any of those (a), (b), or (c) provisions of the statute.

I don't care what the rest of the statute says. M3's got to get by these three first, and they cannot do that. The words "and which does supply" are in the conjunctive. It doesn't say "or which does supply or which may in the future want to supply" or be a wannabe type municipal corporation. It says "and," and that's conjunctive, not disjunctive, and it's worded in the present tense.

So is subsection (3). That's worded in the present tense, "which does supply or which supplies water." And again, I think that's only intended to cover independent entities like United Water, Eagle Water, or whatever.

It is clear from this statutory language that it is intended to cover only

independent suppliers. M3 is not now supplying water for municipal purposes, and certainly does not own, control, or operate a public water supply.

Again, subsection (c) is in the present tense. It appears to me that it would be a real stretch of the logical and common sense statutory construction to conclude that M3 qualifies for a municipal water right. This statutory language dictates that no such water right can or should be granted to a for-profit corporation.

We request a ruling on this motion under rule 413(c). The applicant has rested its case. And we would also urge the Department to enter a declaratory ruling under rule 400 that planned communities do not qualify for municipal water rights. They're not contingent to any municipality. And we feel that it would be foolish of the Department not to enter a declaratory ruling in this matter within the next few days and to put a stop to this before we get to the May 28th and 29th hearings, and north Ada County group has to bring down an expert witness at considerable cost when we don't feel that

there's any basis or foundation for them to be applying for a municipal water right.

And we feel that a declaratory judgment is necessary, or declaratory ruling by the director, as these things are going to be popping up all over the state of Idaho. We've already wasted your time, the court reporter's time. Mr. Owsley and Mr. Vincent have been sitting here for a week, seven days, and it's clear that M3 knew from the start that they did not qualify for a municipal water right. And we would therefore move to dismiss and in the alternative for a declaratory ruling so that we don't have to be back here in another year or two fighting another one of these.

Thank you.

THE HEARING OFFICER: Thank you, Mr. Smith.

Mr. Fereday, do you want to respond? Do you want a moment to prepare? What's your druthers?

MR. FEREDAY: I can respond to that, I believe.

THE HEARING OFFICER: Okay.

MR. FEREDAY: Mr. Smith is concerned that the statute, at least as he reads it, is in the

present tense. A water right application is in the future tense, by definition. The question is, whether this water right will be granted to allow an entity to have a municipal water right where they otherwise qualify under the definition provided by the 1996 act, Municipal Water Rights Act, as a municipal provider, which includes a private corporation.

Now, Mr. Smith may not be aware of what this statute provides. But this statute enacted in 1996 was intended in substantial part to allow the formation of entities that would qualify upon filing of sufficient application for the status of municipal water provider.

If what Mr. Smith says is correct, then that entire thrust of the statute was without foundation and would be rendered useless. The statute is otherwise.

It clearly allows entities that are not yet providing municipal water to provide it by proving up in an application form the elements sufficient to show a future needs, planning horizon type water right.

Under Mr. Smith's theory, the only entities in the entire world that would ever be

able to provide municipal waters are those that are doing it now.

MR. ALAN SMITH: That's right.

MR. FEREDAY: And therefore, no new entity could be formed because they couldn't ever file an -- a sufficient application. This is, frankly, nonsense.

The -- the municipal water right statute clearly contemplates that applications can be filed, and sets forth the procedures by which an application can be set forth to make out a case as a municipal water provider.

The Department has already allowed this in at least one other case, and never has it been suggested that the statute really intended and that the legislature really intended to do nothing at all with the 1996 act.

So given that, we -- we believe that Mr. Smith's motion should be denied. We believe that the Department, in fact, has taken substantial steps, even as recently as last week, in putting together a policy, a guidance, setting forth exactly the rules by which a private corporation, such as a planned community developer, can establish, is entitled to establish

a future needs municipal water right and become, through that process, a municipal provider.

Mr. Smith's motion should be denied.

THE HEARING OFFICER: Okay. Mr. Smith, any response?

MR. ALAN SMITH: Yes, I do have.

What he's asking you to do, Judge, is stretch the statute. I don't think you can do that. This statute is poorly written. It's one of the worst statutes I've ever seen in my life. And after 14, 15 years on the bench, I've looked at a few of them.

I think if this has been granted, it's time for the Department to close Pandora's box, otherwise you're going to have these all over the state wanting municipal water rights when they do not qualify under the clear language of this statute. And it's time for Pandora's box to be closed.

The future-use argument, I don't care what you want to argue there. You got to get by these first three, (a), (b), and (c). And it's all worded in the present tense. And it's all talking about water systems that are supplying water to municipalities and because of growth new

water rights are needed.

It's probably only intended to apply to areas contiguous to a municipality, not eight or ten miles away off of Highway 16 from the city of Eagle. Thank you.

MR. JASON SMITH: I have copies of just like the one page that we're talking about, if you guys want them. If not, that's fine too.

THE HEARING OFFICER: Let's go off the record.

(Recess.)

MR. ALAN SMITH: Can I make just one more statement, Mr. Spackman, before you rule?

THE HEARING OFFICER: Well, I guess we can have another round. I don't want to unduly prolong the discussion, I guess.

MR. ALAN SMITH: Okay. I just wanted to inquire as to whether this issue was raised in any other case that's already granted this. I doubt that it was.

THE HEARING OFFICER: No, I don't recall that, although there probably are water rights that have been issued -- and when I say "water rights," water right permits that have been issued for municipal purposes in both protested and

nonprotested considerations of the Department where applications have been filed. My guess is there are.

You raise an interesting argument, Mr. Smith, and I appreciate you reading the statutes. The particular code section that you're referring to -- and I don't know whether you were looking at the code itself or whether you were looking at the act as it was passed by the legislature.

But the definitions are now codified in Idaho Code Section 42-202(b). And so there are definitions and, as you stated, they're in the present tense, at least as I read them.

I also read (a), (b), and (c) as being distinctly separate types of entities. In other words, the (a) would be a typical municipality, a city, that is providing the water service, potable and culinary water.

(b) would be a United Water type entity, as I understand it, that has a franchise and is governed by the Public Utilities Commission. And they set the rates.

(c), in my opinion, is a different type of entity that the Public Utilities

Commission doesn't oversee, but they are subject to regulation by DEQ and other entities. In other words, they're an association or something else, provides water for a group of users within a development or -- and we have seen a number of those.

So then I guess -- and as I read these three, it seems to me that the most likely of the three that M3 Eagle would fit within is the third or the (c) definition. So now I guess the question is what does the "present tense" definition mean.

And I think we really have to go beyond the definition and look at the other statutes that really describe what the Department is supposed to be doing with these. And I haven't done an entire review.

Have you looked all the way through 42-203(a), 42-204, which are the statutes that govern the issuance of a permit, Mr. Smith? Have you looked at those? Mr. Smith?

MR. ALAN SMITH: Yes, sir.

THE HEARING OFFICER: Have you looked at Idaho Code Section 42-203(a) and 204?

I might ask you the same question,

Mr. Fereday.

I don't find at least specific language that talks about how that permit is supposed to be issued to a municipality. The language that I find regarding the issuance of something by the Department to a municipality is in 42-219, which -- and the title of that is "Issuance of a license." And --

MR. ALAN SMITH: 42-219?

THE HEARING OFFICER: 219. And at least in the code -- it starts at the bottom of the page. And I haven't looked at the other part, but I don't think that it's been amended. But I will look.

It has not. Anyway, I start at the -- about midway through the first paragraph, and it says, "A license may be issued to a municipal provider for an amount up to the full capacity of the system constructed or used in accordance with the original permit, provided that the Director determines that the amount is reasonably necessary to provide for the existing uses and reasonably anticipated future needs within the service area and otherwise satisfies the definition requirements specified in this chapter for such

use."

And so, Mr. Smith, in my opinion, the definition that is in 42-202(b), even though it's in the present tense, would apply at the time the Department examines the beneficial use after the opportunity has been given for development and construction and placing the water to beneficial use, and that the status of that entity at the time of that examining the license is when that present tense would apply.

And I think that's consistent with what the Department has done with other uses. The Department receives applications for irrigation from people that are not yet irrigators that are not yet domestic users, and that are not yet commercial or industrial users, and we receive them in anyway.

So based on that, Mr. Smith, I'll deny the motion, and we'll move on. Okay?

MR. ALAN SMITH: All right. I would like to call to your attention 42-222 --

THE HEARING OFFICER: Okay.

MR. ALAN SMITH: -- which states in the last paragraph -- and this is on change in the point of diversion, "The municipal provider" --

that's about the third or fourth line down -- "shall provide to the Department sufficient information and documentation to establish that the appellant qualifies as a municipal provider." I don't see that they've ever done that.

THE HEARING OFFICER: Okay. But Idaho Code Section 42-222 specifically addresses changes in an existing water right, a perfected water right. And I think it also addresses issues of forfeiture, extensions of time to avoid forfeiture.

But it does not apply, 42-222, in the context of this particular hearing. So it's not an issue today.

MR. FEREDAY: Mr. Spackman?

THE HEARING OFFICER: Yes.

MR. FEREDAY: If I could just respond. And I appreciate your ruling. But I would hope that the -- these protestants would not seek to continue this debate potentially through appeal. And I just would point out, in addition to the points that you've made, also section 202(2) specifically describes how the place of use is to be determined.

And it states that it's the location

of where the water under this municipal water right "is to be used." "Is to be used," not where it already is used.

The definitions that Mr. Smith is referring to also specifies language such as "reasonably expected" or "is or becomes entitled" in terms of the service area. So it's very clear that this is, as you say, analogous to the irrigator who is not yet an irrigator but wants to become one. That's the whole concept of our prior appropriation system in this state is that people get to apply now for something they are not yet doing. That's the idea. So I would hope that this ends this debate.

THE HEARING OFFICER: Okay. Well, in the way of argument, now, I guess we've got more argument ongoing. I hate to take too much time because I don't intend to change my ruling, Mr. Smith.

MR. ALAN SMITH: I realize that. I just want to say --

THE HEARING OFFICER: Okay.

MR. ALAN SMITH: -- that an irrigator wanting a water right is not similar to a municipality. Where they say where it's intended

to be used, they're talking about a new subdivision growing out off of a municipality that needs additional water through an independent entity or corporate provider or whatever. I still don't think they've come within the definition of a municipal provider. And with that, I'll end my argument.

THE HEARING OFFICER: Okay. All right. I've ruled. It's on the record. Let's move forward.

MR. ALAN SMITH: We do have another motion, your Honor.

THE HEARING OFFICER: Okay.

MR. ALAN SMITH: In fact, sir, I've got two more.

THE HEARING OFFICER: Okay.

MR. ALAN SMITH: I believe one was based on the request for admissions 1, 2, and 3 by Attorney Beeman where M3 has admitted that they are not a corporation, not a corporate provider. They've already admitted all that. That's binding for all purposes in this hearing.

And since it was Attorney Beeman's request for admissions, and Mr. Thornton is going to argue that on behalf of north Ada County, and

we do join in their motion. For the record, we want to argue this.

THE HEARING OFFICER: Okay. Mr. Thornton?

MR. THORNTON: Yeah. The points that we want to make and have on the record, Mr. Hearing Officer, is document M3's response to interrogatory November 28th, 2008, pages 16 and 17. The requests for admissions 1, 2, and 3.

MR. FEREDAY: Mr. Hearing Officer, if I could, we haven't been provided with a copy of this document. It would be helpful if we could at least see what Mr. Thornton is referring to.

MR. JASON SMITH: I have pages 16 and 17, but I don't have the entire thing, Jeff.

MR. FEREDAY: Okay.

MR. JASON SMITH: Is that okay?

MR. FEREDAY: Yes.

MR. JASON SMITH: Do you need one too, sir?

THE HEARING OFFICER: I probably need one. I think so. Some of these things -- I think sometimes they're erroneously filed with the Department or the Hearing Officer. But these are answers to discovery, and at least in a court of law they aren't filed with the court. So they need to be provided if there's something that

you're relying on.
MR. THORNTON: Okay. And I've got the full document in my hand, Mr. Hearing Officer.
THE HEARING OFFICER: Okay.
MR. THORNTON: So the answers to request for admissions. Admission No. 1, "M3 admits that it is not a corporation or association which supplies water for municipal purposes through a water system regulated by the State of Idaho as a public water supply."
Admission No. 2 is "M3 admits it is not a corporation or association holding a franchise to supply water for municipal purposes or a political subdivision of the state of Idaho authorized to supply water for municipal purposes, and which does not supply water for municipal purposes to users within its service area."
Admission No. 3, "M3 admits that it is not a municipality."
And then we, North Ada County Groundwater Users Association, joined by Eagle Pines Water Users Association, and individual protestants, move to dismiss application No. 63-32573 as applicant M3 Eagle admits it does not qualify for a municipal water right.

MR. FEREDAY: Is that counsel's argument?
MR. THORNTON: Yes.
THE HEARING OFFICER: Okay. Mr. Fereday?
MR. FEREDAY: We would rest on our previous argument and on the comments you made in your previous ruling.
THE HEARING OFFICER: And the argument is that M3 Eagle is not yet a corporation or association that supplies, presently supplies.
Okay. Denied. I'll deny the motion, Mr. Thornton and Mr. Smith.
Other motions?
MR. ALAN SMITH: I have a third motion Judge -- or, Mr. Spackman. North Ada County Groundwater Users joins with Eagle Pines Water Users Association and the individual protestants and moves to dismiss this application on the ground that M3 has not met its burden of proof, as it has not shown by a preponderance of the evidence, one, that the application is made in good faith when it has applied for a municipal water right and does not qualify as a municipality or a municipal provider under rule 42-202 -- or statute 42-202(b).
Two, M3 has not shown the water supply

is sufficient for a high-capacity pumping for a large municipality.
Three, it has not shown by a preponderance of the evidence that the new municipal use will not damage existing water rights. In fact, most of their own evidence, both in testimony and in their second amended application in support of their application, states exactly the contrary. They recognize that artesian wells will stop flowing, that domestic and irrigation well users may have to deepen their wells or lower their pumps.
Four, M3 has not shown that the aquifer is not going to be mined, which will conflict with the local public interest. We would again urge the Department to issue a declaratory ruling under rule 400. This issue has been raised by the protestants in the hearing and is properly before the Water Resources Department.
If you fail to close Pandora's box, you will be involved in these community hearings all over the state of Idaho. The north Ada County group has been out many thousands of dollars in order to protest this matter, and some of their group have jobs in jeopardy because they've had to

take so much time off work to fight this thing.
But we move under those four grounds that they have not carried their burden of proof and would ask you to dismiss their application.
THE HEARING OFFICER: Okay. Thank you, Mr. Smith.
Mr. Fereday?
MR. FEREDAY: Mr. Hearing Officer, M3 has indeed carried its burden, certainly its burden to make a prima facie showing. We believe that the evidence is overwhelming with regard to good faith, sufficient water supply, no injury, and certainly with regard to the so-called aquifer mining issue.
We submit that the record so far is quite clear that this case more than meets our burden to sustain the granting of a water right.
If Mr. Smith and his colleagues wish to contest on these four grounds, they are going to have to put on substantial evidence that by a preponderance of the evidence shows that their theories are correct. And we await their case.
Thank you.
THE HEARING OFFICER: Okay. Mr. Smith?
MR. ALAN SMITH: That is a misstatement,

sir. We do not have the burden of proof. We're not the applicant. They are. And we don't have to show any of this that he's talking about.

THE HEARING OFFICER: Okay. Thank you.

In every matter that comes before the Department, the Department always wishes for and every consultant, Mr. Smith, that I've ever heard testify will tell you that we need more data and information than we have. The Department needs to take the data and information that it has, it needs to consider the application as it comes in.

I think we do not yet have all of the information that I want to consider in this matter, either good or bad. I understand the applicant has rested.

If I were in a situation where there were no information that had come in or that the information is minimal, I might consider your motion. But I think the information that's come in is substantial, I think it's credible, and I won't say that it's determinative yet, but at least from my perspective there's sufficient information that's been presented to establish prima facie case. The motion is denied.

Okay. Other matters?

MR. ALAN SMITH: That's all I have, Judge.

THE HEARING OFFICER: Okay. Mr. Vincent. Let's go off just for a minute.

(Recess.)

THE HEARING OFFICER: Okay. We are recording again after distribution of some documents.

And PowerPoint's ready to go for you, Sean?

MR. VINCENT: Yeah.

THE HEARING OFFICER: Okay. Mr. Sean Vincent has been called.

And I anticipate, Mr. Vincent, that you'll narrate your testimony. There's no one here to examine you at this point.

THE WITNESS: That's correct.

THE HEARING OFFICER: So I'll swear you in, you may narrate your testimony, and then be subject to examination.

And for the parties, as you contemplate asking questions -- and I may tell you that again, but Mr. Vincent does not have an attorney here to protect him. And so I view that somewhat as my job as a Hearing Officer. So I'd ask both -- all of you to be respectful of him in

the examination process.

Mr. Vincent, if you'll raise your right hand.

SEAN VINCENT,

having been called as a witness by the Department, was duly sworn and testified as follows:

THE HEARING OFFICER: Thank you. Please be seated.

And by the way, as he narrates it, if parties wish to object to any portion of this, you're welcome to do that. Even though the exchange isn't quite the same, please feel free to be active in voicing objections.

Okay. Mr. Vincent?

DIRECT NARRATIVE TESTIMONY

BY SEAN VINCENT:

THE WITNESS: On behalf of hydrology staff, I'd like to thank the Hearing Officer for giving us an opportunity to set the record straight on several topics where there appears to be confusion. I'll start by trying to clarify a few overarching issues, and then I'd like to respond

to some of the comments that were made by HLI in their response to our March 2nd, 2009 staff memorandum.

I have a lot of information to cover today, and I want to be accurate, so I'm going to be reading my testimony.

Let me start by clarifying what I perceive to be staff's role of the hearing process. In response to the Hearing Officer's written request, we performed a review of the technical documentation provided in support of M3's water right application.

THE HEARING OFFICER: Okay. Mr. Vincent, now one of the things that we -- and I'm sorry to interrupt you, but I also need to protect the court reporter to some degree, because I think he has, in the exchange between questions and answers, usually he has a little bit of a respite in between.

And if you're reading rapidly through -- I don't know, Jeff, I suspect it will be tough on you.

So if you can pause and not be too speedy.

MR. FEREDAY: And, Mr. Hearing Officer, if

I could, Mr. Vincent is reading from a narrative text that we do not appear to have.

Could that be made available to us as well, please?

THE WITNESS: Certainly.

THE HEARING OFFICER: Mr. Vincent, do you have a problem with that?

THE WITNESS: No.

THE HEARING OFFICER: After the reading? You don't care about having it right now?

MR. FEREDAY: Yes, at least after it's read and before we inquire, we would appreciate that.

THE HEARING OFFICER: Okay. I think that's doable.

Okay. Mr. Vincent, I'm sorry to interrupt you.

THE WITNESS: I'm going to restart that slide.

THE HEARING OFFICER: Good.

THE WITNESS: Let me start by clarifying what I perceive to be staff's role in the hearing process. In response to the Hearing Officer's written request, we performed a review of the technical documentation provided in support of M3's water right application. The breadth of our

scope generally begins and ends with that assignment.

The Hearing Officer has full access to the supporting documentation, so a large part of our responsibility was to point out inconsistencies that we found in the data, analyses, and conclusions with respect to the topics that he identified for us to look at.

Basically, we are looking for inconsistencies of a technical nature that have bearing either on the hydrogeologic conceptual model or the assessment of hydrologic impacts.

We are neither for nor against approval of M3's water right. And it wouldn't matter if we were because ultimately it's not our decision. I happen to agree with certain aspects of HLI's testimony and M3's holistic approach to water resource development, but that is beyond the scope of my assignment and I won't be discussing those opinions today.

Before I address the HLI response to our staff memorandum, I want to talk about something that has been bothering me about our write-up, and I believe that it reflects a failure on our part to effectively communicate the

intended significance of one of our analyses. It has to do with our drawdown calculation that is described in section 4A of the staff memorandum.

The analysis was intended as a reality check to verify the reasonableness of the M3 model predictions.

THE HEARING OFFICER: Okay. Mr. Vincent, can we go to that particular document, which I think is -- is it 50?

MR. FEREDAY: 50, correct.

THE HEARING OFFICER: Okay. So that we can at least look at that particular...

MR. FEREDAY: Mr. Vincent, is that figure 3 of Exhibit 50, page 22?

THE WITNESS: That's correct.

THE HEARING OFFICER: What page?

MR. JASON SMITH: 22.

THE HEARING OFFICER: Figure 3. Okay. Go ahead, Mr. Vincent.

THE WITNESS: It has to do with our drawdown calculation that is described in section 4A of the staff memorandum. The analysis was intended as a reality check to verify the reasonableness of the M3 model predictions. It's a calculation, not a calibrated flow model.

As described in the staff memo, it's what's called an image well analysis, and it's based on the Theis well hydraulics equation. The development of the Theis equation involved the use of a number of simplifying assumptions.

Despite the fact that those idealized assumptions never occur in real aquifer systems, the Theis equation has proven to be a very robust and commonly applied predicter of the hydraulic response to pumping. It was used, for example, to evaluate the City of Eagle Water right application.

Something that's important to understand about the Theis drawdown equation is that it is transient, which means that drawdown is a function of time. It's a directly proportional relationship. The greater the time, the greater the predicted water-level drawdown at a given location.

In reality, most aquifer systems that are subjected to new pumping stresses will eventually reach a new equilibrium in which water levels are lower but nonetheless stable with increasing time -- provided, that is, that there is ample recharge, which is why staff was focused

in part on understanding the mechanisms of recharge to the PGSA.

The problem is that it's difficult to estimate when, if ever, equilibrium will occur and how much lowering of water levels will occur before that time. The saving grace here is that drawdown based on the Theis solution is a function of the logarithm of time so that the difference between the drawdown at, say, 90 days and one year, a difference of approximately .6 log cycles, isn't as significant as you might expect, and it's not nearly as significant as the difference between the predicted drawdown at ten minutes and a thousand minutes because that represents a two log cycle difference in time.

Department staff typically looks at a time frame of one year in order to evaluate hydrogeologic impact predictions using the Theis solution. It has been argued that this is conservative, and certainly that's the case for some aquifer systems. But a little conservatism isn't a bad thing, from our perspective.

Our chosen time frame of one year is the same as that used by the Idaho Department of Environmental Quality for projecting long-term

drawdown for public-water-supply wells, and the same time frame that was chosen for evaluating the City of Eagle Water right application.

As explained in the staff memorandum, HLI performed and presented results of a nearly identical image well analysis in the year one progress report, Exhibit 12, and got similar results for their, quote, "worst case," end quote, scenario for a time period of 90 days as we got using a one-year time frame and aquifer properties from HLI's analysis of the SVR-7 aquifer test.

We both predicted 8 feet of drawdown at the intersection of Floating Feather and Highway 16, a randomly chosen location several miles away from the M3 pumping center. They calculated only 4 feet for their best case at 90 days.

For comparison they calculated approximately 5 feet at the same location after 50 years with the H-match version of their numerical model, and approximately 7 feet with the T-match version.

Based on the similar magnitude of these numbers, we judged their model-based prediction to be within the bounds of what is

reasonable, assuming a laterally continuous aquifer system that is hydraulically connected to one or more sources of recharge.

That doesn't mean that their prediction is correct, but it does mean that it's within the realm of reason, given the underlying assumption of continuity. In retrospect, I regret that we chose to present the results of our intermediate calculation for a time frame of 50 years because it more likely overestimates impacts than the one-year snapshot -- provided, that is, that there is hydraulic connection to the regional aquifer system from M3's pumping center.

Although we pointed this out in the staff memorandum text, we only presented the figure for the 50-year prediction, and I think that we unintentionally may have given the wrong impression to readers of our memo.

If we had to do it over again and we could only show results for one time frame, we would only present the graphic for the one-year time period since that is what was used to assess reasonableness.

We also pointed out that neither our drawdown analysis nor HLI's numerical model was

used to predict impacts on hydraulically-connected reaches of the Boise River.

And now I'd like to address some of the major issues that were raised in HLI's response to the March 2nd, 2009 staff memorandum, which is Exhibit 45.

First, there are a couple of places in the response where HLI implies that we are somehow holding M3's consultant to a higher standard. Specifically, HLI feels that, quote, "this aquifer's boundaries is defined far beyond what in our experience is customarily deemed necessary in evaluating a water right application," end quote, and conclusions, quote, "It is not customary to require applicants for groundwater permits to answer all questions regarding the recharge mechanism for a basin. This would seem an onerous and unrealistic requirement," end quote.

HLI also felt compelled to point out that, quote, "M3 has spent over $2 million over the last three years studying the north Ada County hydrology," end quote.

There are several points that I'd like to make with reference to these statements.

First, we are grateful for the data

collection and analysis that was performed on behalf of the applicant, and we think that it improves our understanding of the hydrogeology in north Ada County. This was one of our primary conclusions of our staff memorandum, and those sentiments were expressed repeatedly.

The data gathering and processing efforts were generally of high quality. On the other hand, the application process is not a quid pro quo in which a water right is granted or denied based upon the amount of money that is spent on supporting studies.

In case there's any confusion, Department staff was not asked by the Hearing Officer to consider how much money was spent in our technical analysis of the submitted materials. That's in part because the sustainability of the resource and the potential impacts to existing water right holders are independent of the amount of money spent on characterization.

Other water right applicants have also decided to perform expensive aquifer characterization studies. Hydrogeologic work that was performed in support of the Avimor water right application, for example, included a well drilling

and installation program, routine water-level monitoring, a geochemical analysis, and aquifer testing and data analysis.

We are not holding M3 to a higher standard than other applicants. In fact, it is HLI that was compelled to point out where existing standards are too low. For example, in the Aquifer Test Prospectus, Exhibit 69, which was provided to staff for comments in November of 2007, HLI noted, quote, "the majority of the testing to date has been of too short of duration to be useful for aquifer analysis. Unfortunately, most of the existing testing has been of generally poor design, as well, and this has caused the data from both short and long-term testing to be of limited value for aquifer characterization."

In Exhibit 12, the reanalysis of 16 aquifer tests the Eagle/Star area, HLI stated, quote, "We believe that all water right applications should be obliged to provide the data needed to understand and manage the resource. Properly designed and conducted pumping tests are part of the process that provides these data. We believe that all applicants for withdrawal of significant quantities of groundwater be required

to provide the rigorous and defensible aquifer test data that would be generated following the recommendations below. All groundwater users in the region, present and future, would benefit were these recommendations to be followed and become standard procedure."

The list of recommended aquifer test procedures that follows this statement includes conducting the tests before the irrigation season, which it should be noted is less restrictive than the January/February time frame that Mr. Utting described in his testimony.

Other recommendations included using a high pumping rate from 900 to more than 2700 gallons per minute, selecting test wells based upon well construction, and collecting water-level recovery data for at least a week.

While we agree with HLI on the need for quality data, we also would point out that HLI offered these opinions without solicitation. Moreover, the Department never stipulated that HLI be required to reanalyze 15 aquifer tests that were performed by other investigators or to construct a seven-layer flow model. They decided to take on those onerous challenges themselves.

On the other hand, we did expect that HLI would make good on the testing that they scoped out in the Aquifer Test Prospectus, Exhibit 69, a document that was reviewed and commented on by Department staff.

However, in lieu of the planned large-scale regional test, which involved the design and installation of two large-bore, fully penetrating wells, HLI conducted two smaller scale, constant rate aquifer tests using pumping rates at the low end of their recommended range and test wells that are substandard by HLI's own assessment.

The first aquifer test conducted by HLI in support of this application was performed using the Kling irrigation well. The well was pumped for 3,000 minutes, a little more than two days, at a rate of approximately 900 gallons per minute. HLI described the partially penetrating test well in the following passage from Exhibit 12.

Quote, "The Kling irrigation well is completed in the upper 109 feet of the Pierce Gulch Sand Aquifer, which is about 275 feet thick at this location. The already small open area of

the well screen in the Kling irrigation well is significantly and irreversibly clogged, is subject to sand production, and is not suitable for long-term use as a regional supply well. The Kling irrigation well is poorly documented, poorly designed, and poorly constructed of marginal materials. Since the well was completed 19 years ago, a general deterioration of the well allowed by the marginal materials and caused partly by the inefficient design has resulted in a reduced well efficiency and yield. The proportion of water derived from various parts of the screen, and therefore the aquifer, is not known. The partial clogging of the well screen renders this analysis, and any future analysis, for aquifer coefficients uncertain," end quote.

You may recall that Mr. Squires described the Kling irrigation well as, quote, "a piece of crap," end quote, during his testimony on April 24.

The second test was performed by pumping from the SVR-7 test well for a period of nine days, also at a rate of approximately 900 gallons per minute. HLI pointed out on page 7 of the response to IDWR staff memorandum,

Exhibit 45, that, quote, "M3 did not construct this well. It was already cased, and therefore could not be effectively logged. The existing lithologic and geophysical logs for SVR-7 are of poor quality. They were obtained with an uncalibrated geophysical logging unit by a driller having what we consider to be insufficient training and understanding of geophysical principles," end quote.

Elsewhere in Exhibits 44 and 12, HLI referred to the, quote, "relatively small diameter," end quote, well as being, quote, "poorly constructed with perforated casing and a louvered well screen," end quote.

They also noted that details concerning the annular seal are, quote, "somewhat limited," end quote and that, quote, "the degree of penetration is not accurately known because of the well construction," end quote.

HLI concluded that, quote, "Ideally, future aquifer tests should be conducted on wells that are properly completed in a significant portion of the aquifer and which are fully penetrating."

However, what we end up having to rely

upon as the basis for water right application is not data from the regional scale test that was proposed by HLI and reviewed by Department staff, but instead from two smaller scale tests using existing wells that don't fully penetrate the target aquifer and, in the estimation of HLI, are poorly constructed and poorly documented.

HLI's willingness to now rely upon aquifer test data from partially penetrating, poorly-constructed wells is inconsistent with their recommendations and their tendency to ignore for discount data from poorly-constructed wells elsewhere. Mr. Owsley is planning to further address this issue in his narrative.

Moreover, HLI led staff to believe that the SVR-7 aquifer test would not be relied upon in a significant way for the M3 application. In an e-mail to the Department dated March 3, 2008, that was submitted by staff to the parties on the first day of the hearing, HLI described the SVR-7 aquifer test as merely, quote, "an opportunity," end quote, and indicated that, quote, "although this does not take the place of our planned regional scale aquifer test using an efficient large-bore production well that fully

penetrates the aquifer at a higher discharge rate, pumping this well for a somewhat prolonged period would provide us with some useful data and could help us to refine our aquifer testing plan."

HLI also indicated, quote, "We view this opportunity as a small-scale test using monitoring wells close to the pumping well and no attempts will be made to contact well owners or to measure the wells of others as we intend to do in the regional scale aquifer test of our prospectus using a large-bore production well."

HLI further downplayed the significance of the proposed SVR-7 test by concluding, quote, "It is not the mother of all aquifer tests, rather it is an opportunity to extend an already planned well development pumping test into a research effort that could yield some meaningful results," end quote.

Although the significance of the SVR-7 aquifer test was originally downplayed by HLI, the short time frame given the Department for approval hinted otherwise.

HLI's representative informed the Department, quote, "I regret that you do not have more time to consider this proposal, but we need

to move forward with our contracted work while we have the rental test equipment on site. If the Department can approve this request, we commit to making every effort to obtain good quality and meaningful data, but we would literally need to know tomorrow in order to make arrangements."

Based on HLI's correspondence, we were both surprised and disappointed to read in the SVR-7 aquifer test report, which we did not receive until January of this year, that, quote, "Our earlier recommendation for the need to conduct a major, regional scale aquifer test of the Pierce Gulch Sand Aquifer beneath the north Eagle foothills has been met by the SVR-7 test. The data obtained from the SVR-7 nine-day test has been used to calibrate and update the existing M3 Modflow numerical groundwater model," end quote.

Thus what had originally been described to us as a small-scale test is apparently now being viewed as a major regional-scale test, and the data from it have been relied upon for the prediction of long-term impacts from pumping.

Regardless of scale, it is our opinion that the SVR-7 test ended prematurely and

inconclusively with the test data from the observation well with the greatest response to pumping suggesting that after applying all corrections, negative hydraulic boundary had been encountered.

Because long-term testing generally is performed to evaluate hydraulic boundary conditions and the test ended before boundary conditions could be established, we respectfully disagree with HLI's opinions in Exhibit 45 that, quote, "extending the test would have added no significant information," end quote, and, quote, "adjusting the drawdown data from the Big Gulch stock well to correct for this trend generated a drawdown plot (figure 6) with almost all of the apparent end of test increase in drawdown removed."

Let me show you what I'm talking about. This is figure 6 from Exhibit 45. It's a plot of trend-corrected drawdown versus the logarithm of time in the monitoring well closest to the test well.

The increase in the slope of the data trend that have identified with the upper red circle is diagnostic of the cone of depression

encountering a negative hydraulic boundary, as is the increase in the value of the derivatives, which I've identified with the lower red circle.

All external influences have already been removed from these data so there doesn't appear to be a more plausible explanation. The drawdown plot clearly shows that the aquifer test ended while the slope of the data was still changing, and equivalently, the value of the derivative was still increasing.

Ending the test while those things are occurring is contrary to the goal of establishing boundary conditions in order to assess long-term performance of the aquifer. The fact that the derivative values have increased by more than a factor of two is cause for concern to staff because, although inconclusive, it suggests that the boundary -- that the drawdown data possibly were being affected by more than one hydraulic boundary.

Here, according to Squires, Wood, and Osiensky, Exhibit 67, is a plot of data from a relatively short term test in the Goddard No. 2 well, which also is completed in the PGSA. Drawdown is plotted as increasing with depth on

this plot so the downward deflection is analogous to the upward deflection in the Big Gulch stock well.

In any event, the change in slope was interpreted, correctly in my estimation, to be a negative hydraulic boundary which affects groundwater flow in the vicinity of this PGSA well. Though short term, this test was at least run long enough for the change in the slope to stabilize.

Notice that the late time data do not deviate from the second linear trend. If presented, the derivative values would be unchanging along the second trend line, which is not the case for the late data collected in the Big Gulch stock well during the SVR-7 aquifer test.

It's my understanding that the Goddard No. 2 well has been producing water for more than ten years, so a single negative boundary does not mean that pumping is unsustainable, but it does cause there to be increased drawdown and it can contribute to long-term water level declines.

Also, a negative boundary could contribute to a sustainability problem if, in

combination with other boundaries, they collectively cause the aquifer to be compartmentalized.

We don't necessarily think that this happens at M3. But because it's located at the basin margin, it is our opinion that boundary conditions should be thoroughly evaluated, if at all possible.

Mr. Squires testified that he conducted 30-day aquifer tests when he was an employee of United Water Idaho. Running a longer term test allows for better definition of aquifer boundary conditions, which is important when you're interested in assessing the long-term response to pumping like United Water Idaho is for their production wells.

I think it's safe to say that everyone in this room would be interested in knowing the same thing for the PGSA and the overlying shallow aquifer system in the vicinity of M3.

Although we think continued pumping would have been worthwhile, I want to emphasize that interpretation of the drawdown data from the Big Gulch stock well, which was the well closest to SVR-7 and the only observation well with more

than 1 foot of drawdown, was made difficult by its well construction.

It's only 180 feet deep, and according to the summary of well and aquifer details table in the SVR-7 report, Exhibit 44, the top of the PGSA is 180 feet deep at that location. HLI nonetheless considers it to be a PGSA well, according to a notation in the same summary table.

The indicated aquifer top depth of 180 feet in the summary table is contradicted in the text from the same report, which indicates that the top of the PGSA is 240 feet deep at this location.

That passage, which is based on the 240-foot top of aquifer depth, acknowledges that the Big Gulch stock well, quote, "maybe completed about 100 feet above the top of the Pierce Gulch Sand Aquifer," but nonetheless concludes, quote, "we believe it neither invalidates the analysis of data from this well, nor our interpretation of aquifer properties," end quote.

Note that 100 feet deeper than the depth of the Big Gulch stock well is 280 feet, not 240 feet, as suggested in the middle of the passage, and not 180 feet as indicated in the

summary table.

Here is figure 3 from the same report. The PGSA beneath the Big Gulch test well on this cross-section is shown at a depth of 280 feet, which agrees with the reference in the text to there being a 100-foot difference between the total depth of the well and the top of the aquifer, which I've identified with a red arrow on this cross-section.

The next topic from the response to the staff memorandum that I'd like to address is HLI's taking exception to our characterization of the stratigraphy in the study area as being complex.

THE HEARING OFFICER: Okay. Mr. Vincent, I'm wondering -- now you're changing subjects a little bit, I'm wondering if this would be a good place for us to take a morning break?

THE WITNESS: Sure.

THE HEARING OFFICER: Would that be okay?

MR. FEREDAY: Yeah.

THE HEARING OFFICER: We're digesting a lot of material, and maybe give everybody a chance to catch up a little bit. So let's break for 15 minutes.

MR. THORNTON: 15?

THE HEARING OFFICER: Yeah. Let's go off the record.

(Recess.)

THE HEARING OFFICER: Okay. We are recording again.

Mr. Vincent, you may continue.

THE WITNESS: I'm going to start over on that last slide.

THE HEARING OFFICER: Thank you.

THE WITNESS: The next topic from the response to the staff memorandum that I'd like to address is HLI's taking exception to our characterization of the stratigraphy in the study area as being complex.

HLI's current stance on this issue is inconsistent with the fact that there are numerous references to complexity and heterogeneity in the package of information that was submitted in support of M3's water right application.

Going all the way back to 1981, Wood and Anderson, Exhibit 19H, stated, quote, "The stratigraphic relationships within the Idaho group beneath the western plain are complex," end quote.

More recently, a 2002 report authored

by Wood and Clemens on the geologic and tectonic history of the Western Snake River Plain, Exhibit 19D, stated, quote, "The distribution of sand aquifers in the fluvial-lacustrine section is complex, but in just the last few years we are gaining a clearer understanding of the depositional history and gross features of the sedimentary architecture."

In a 2008 report, Exhibit 12, HLI attempted to explain what might have caused drawdown in water level recovery data to suggest very different aquifer boundary conditions in different monitoring zones within the PGSA at M3. They stated quote, "These apparent contradictions support the conclusion that the aquifer system is heterogenous and does not match well with the simplified models envisioned for the analytical methods of analysis," end quote.

It is staff's interpretation that a heterogeneous system that cannot be described by a simplified model is a complex system.

An indication that the stratigraphy is nonuniform and that the nature of groundwater flow is complex is the recent determination by HLI that fracture flow possibly is important in addition to

porous media flow, but only in certain portions of the aquifer.

On page 6 of Exhibit 44, the text states, quote, "The cemented nature of the aquifer along with relatively large transmissivities calculated from numerous aquifer tests supports the possibility of fracture flow in addition to porous media flow. This type of flow would allow for higher transmissivities in a somewhat cemented sand or sandstone aquifer, than would porous media flow itself. We do not postulate that the entire Pierce Gulch Sand Aquifer is cemented because there are many instances of sand production in wells and borehole collapse to suggest otherwise. As a general rule, cementation appears to increase with proximity to the basin margin and in the vicinity of known structural faulting."

Beyond what's been written in the supporting documentation, I think the fact that the M3 flow model comprises seven layers, three of which are used to represent the PGSA, is, in and of itself, a fairly convincing argument that the hydrostratigraphy in the area is complex."

Consider, for example, that the Department has implemented conjunctive management

for the Eastern Snake Plain using a one-layer flow model, and M3's model is used to describe groundwater flow in only a portion of the smaller Western Snake Plain.

Complex stratigraphy also is suggested by the fact that none of the 13 geologic cross-sections contained in M3's submittal No. 27 in support of the application identify formal geologic units, such as formations, or correlate stratigraphy between any of the boreholes.

Here's one of those cross-sections from Exhibit 27. If the stratigraphy is not particularly complex, as indicated by HLI in Exhibit 45, geologic correlation should be a relatively straightforward process and one that would be worthwhile from the standpoint of developing an understanding of the subsurface.

This geologic cross-section is figure 5 from the year one progress report, Exhibit 2. The section runs from the southwest to the northeast through Big Gulch on M3 property. Question marks are used between SVR-7 and SVR-6 to indicate uncertainty in the stratigraphic relationships between these wells, both of which occur on the same side of the West Boise/Eagle

fault. That indication of uncertainty suggests that the stratigraphy beneath M3 is complex.

Also notice this depiction of the PGSA from Exhibit 2 as having concave upward top and bottom structures with a continuously increasing dip as you move further to the northeast, which is to the right on this diagram. I've added red lines to show how the dip of the contact between the PGSA and the underlying Terteling Springs formation dramatically increases as you move further along section and away from the center of the basin.

The nearly horizontal red line represents the dip of the contact near the City of Star well, and the much steeper solid red line illustrates that the dip is thought to be much steeper near the intersection of the PGSA with land surface. As far as I know, this stratigraphic complexity is not discussed in the supporting documentation.

Notice now that the finalized version of this same section, figure 3 from Exhibit 44, shows a somewhat different but also difficult to explain interpretation in which the dip of the PGSA bottom structure between TW-4 and TW-2 is

more than double the slope of the bottom structure between TW-1 and TW-4.

Note that the projection of the contact between the PGSA and the underlying mudstone using the steeper dip would cause the so-called green line to be located well to the northeast side of SVR-6. In fact, the projection of the contact, which I've drawn on the figure using a dashed red line, intersects land surface near SVR-10, which is northeast of the West Boise/Eagle fault.

However, this is contrary to the inferred location shown on figure 2 in Exhibit 44, the SVR-7 aquifer test report. The green line is instead shown on the southwest side of the West Boise/Eagle fault, which would require an even steeper dip between TW-2 and SVR-6 than the already increased dip that was shown on the last slide.

A slight steepening might be expected as you move closer to the sediment source, but the increase in dip necessary to keep the green line on the west side of SVR-6 is dramatically greater and, as I mentioned, the geologic mechanism that would cause this to occur is not explained in the

supporting documentation.

I'd like now to go back to figure 5 in Exhibit 2, which is the year one progress report. Notice that this figure shows an abrupt water-level change between SVR-7 and SVR-6. The water level in the shallower SVR-7 well is roughly 200 feet higher than in the well with a deeper completion interval, SVR-6.

The fact that this significant water-level difference appears to occur on the well same side of the known West Boise/Eagle fault also is contrary to our expectations based on the information that we've been provided. A much lower water level in the deeper well might be expected on opposite sides of a no-flow barrier, but it is not expected between wells on the same side of a fault, especially in an area, whereas Mr. Squires testified, there's supposed to be an upward hydraulic gradient.

The cause for the dramatic change in dip and apparent strong downward hydraulic gradient are not explained in the HLI submittals and suggest to staff that the hydrostratigraphy beneath the M3 property is complex. I should also point out that the pronounced downward vertical

gradient is not explained by the so-called green line because the aquifer underlying the PGSA is laterally continuous in the southwest direction according to the conceptualization shown on this figure.

Based on my experience characterizing and modeling faulted fluvial deltaic aquifers in Texas, a plausible explanation for what's going on between SVR-7 and SVR-6 is that the stratigraphic section is cut by an unidentified fault, which most likely parallels the West Boise/Eagle fault. This possibility could dramatically change the significance of the so-called green line on the hydrogeology beneath M3.

Since I'm on the topic of vertical hydraulic gradients, I should mention that there also is a downward vertical hydraulic gradient between the unnamed alluvial sand aquifer and the upper layers of the PGSA and the TW-1 piezometer nest based on the water-level data that are presented in Exhibit 44, table 2.

However, the same dataset indicates that the gradient is upward toward the unnamed alluvial aquifer in the TW-4 piezometer nest. I have not seen the existence of a downward vertical

hydraulic gradient in the TW-1 piezometer nest discussed in the supporting documentation or heard it described in any of the testimony. The complex vertical gradient distribution makes tenuous the Exhibit 2 conclusion, quote, "These measured vertical gradients that exist in the foothills region also serve to refute the prevailing notion of the foothills as a recharge area," end quote.

Incidentally, the TW-1 and TW-4 are located on opposite sides of the fault that was identified by Wood in his 2007 report, Exhibit 19B.

MR. FEREDAY: Excuse me, Mr. Vincent. Could you repeat that last point. I don't believe that was on your slide.

THE WITNESS: Incidentally, TW-1 and TW-4 are located on opposite sides of the fault that was identified by Wood in his 2007 report, Exhibit 19B.

MR. FEREDAY: Thank you.

THE WITNESS: Additional complexity is revealed by looking at figure 1 from the response to our staff memorandum, Exhibit 45. There is a break in the West Boise/Eagle geologic fault north of M3 in the area that I've circled in red. I'm

not sure whether the offset was caused by a transverse fault or some other mechanism, but whatever the cause, the nonlinearity of this feature complicates the hydrogeology of the PGSA since it transects both the shallow and deep strata.

One last indication that there is complexity is the water-level trend analysis that was performed by HLI for the SVR-7 aquifer test. The trend analysis was performed in order to correct drawdown and water-level recovery data for regional water-level trends, which is standard practice.

However, HLI did not calculate a single water-level trend for all of the PGSA wells on M3 property during the period of monitoring. Instead, and contrary to what you would expect for a trend that is, quote, "regional," unquote, a different trend was calculated for each and every well that exhibited measurable drawdown. In fact, two different water-level trends were estimated for some of the wells.

The trend correction is described on page 17 of the SVR-7 aquifer test report. Quote, "The water-level trend visually identifiable at

TW-2 and TW-4 appeared as a declining level over the course of the entire test, including the week before the test began. The peak of the 2008 water levels in the aquifer near these wells appeared to occur just prior to March. Beneath the eastern portion of the M3 property, however, the water levels appeared to be rising before the start of the test and declining at the end. Based on linear projections of the pretest and posttest trends observed in SVR-7, Flack Corral 6-inch stock, Flack Corral 4-inch stock, and the Little Gulch stock wells, the 2008 peak in water levels in this area appeared to occur sometime during the period March 17 to 19. Because of the peak occurring during the test, two separate equations were generated for the estimated water-level trend at each well: one for the rising level period, and one for the declining level period. Trends could not be estimated for the aquifer near the pumping well, SVR-7, and the nearby Big Gulch stock well using the pretest data because pretest pumping caused water levels to fluctuate obscuring any visually discernible trends. Instead we used the data collected during the two months following completion of the test," end quote.

I want to point out to the Hearing Officer that calculating a different regional trend or multiple trends for each well using data that span the period of tests is not common practice. Typically, an analyst picks a single well outside the area of pumping influence to determine a single pretest trend for the entire aquifer, or perhaps calculates an average pretest trend using a couple of wells.

HLI's trend analysis, however, suggests that the background trend in the PGSA beneath M3 varies both with depth and location, and the need for that unusually complicated analysis suggests complexity to us.

I also want to point out that attempting to calculate a different trend for the pumping and recovery period in each and every well that has been impacted by pumping is a difficult undertaking and makes analysis of all the aquifer test data uncertain, especially analysis of the water-level recovery data.

I want to talk some more about the trend correction, but this time it's in the context of water-level recovery, rather than stratigraphic complexity. Specifically, we noted

in the staff memorandum that the Kling domestic well did not appear to recover from the Kling irrigation well test and that water levels in the Big Gulch stock well also seemed to indicate delayed or incomplete recovery from the SVR-7 nine-day aquifer test.

HLI's response to these concerns included the following statement: Quote, "HLI has explained why the water levels in measured wells did not recover to pretest levels during the recovery measurement period, including the annual fluctuation in regional water levels shown in all monitored wells in the area. It would be unusual, and a contradiction to standard well recovery analyses using methods based on the Theis equations, for water levels in the Boise River Valley wells to fully recover in hydraulic tests within the same amount of time as the drawdown occurred. However, to assure IDWR that the aquifer did indeed recover, the attached figure 5 shows that the water levels in TW-1, completed in the PGSA about 50 feet from the Kling domestic well, recovered within two weeks."

Here is figure 5 from HLI's response to the staff memorandum. The labeling by HLI

indicates that the water levels in TW-1 are the orange colored data and the water levels in TW-4 are the green data. I've identified the water levels in TW-1 during the Kling irrigation and SVR-7 tests by drawing red circles around those data.

Note that the maximum water-level change is such a small fraction of 1 foot that it's almost imperceptible during both the Kling irrigation and SVR-7 aquifer tests. It's therefore difficult to determine, based on looking at this figure, whether or not there was any drawdown in TW-1 during either test.

Further complicating interpretation of this figure is the fact that TW-1 is a nested piezometer which monitors water levels at five different elevations. According to table 1 in Exhibit 44, which is the SVR-7 aquifer test report, none of the five zones responded to pumping during the SVR-7 test, and according to page 200 of the Exhibit 12, the shallowest piezometer, zone five, quote, "Did not react at all to pumping," end quote.

The text on page 205 from the same report indicates that the minimum end-of-test

drawdown among the other four TW-1 piezometers was 6.5 feet in zone one. Because figure 5 for the response to the staff memorandum indicates almost imperceptible drawdown during the Kling irrigation test and the smallest drawdown in any of the four zones that did respond to pumping was 6.5 feet, the only logical interpretation is that the orange line represents the water levels in zone five of TW-1, which, like the Kling domestic well, is identified by HLI as being completed in the shallow alluvial aquifer system.

It's difficult to reconcile HLI's conclusion that the water level in TW-1 recovered within two weeks, with indications that the water level in zone five did not respond to pumping in either of M3's aquifer tests. The indication from the aquifer test reports is that there was no water-level decline from which to recover.

I want to focus now on the SVR-7 aquifer test. This hydrograph is figure C-3 from Exhibit 44, which is the SVR-7 aquifer test report. It's an arithmetic plot of water level versus time.

The blue colored data are the water levels after correcting for barometric pressure

fluctuations. The period of monitoring encompasses the period of pumping and water-level recovery. You can see that the water levels declined quickly in response to the onset of pumping on March 10, 2008, and they partially recover in response to the pump being shut off on March 19.

In our staff memorandum, we expressed concern with the fact that water levels in the Big Gulch stock well, which, again, was the closest monitoring well to the SVR-7 test well, and the only observation well to have more than 1 foot of drawdown during the nine-day test, did not appear to be trending toward full recovery.

Note that the water level at the end of the water-level recovery period, 12 days after the pump was shut off, was approximately 4/10ths of a foot lower than the water level that was measured immediately prior to turning on the pump. Incomplete or delayed water-level recovery are concerns to staff because they can be indications that the aquifer is of limited extent.

This is figure 26 from Exhibit 44, the SVR-7 aquifer test report. The water-level recovery data from the previous figure have now

been plotted in the standard format for quantitative analysis, which is as residual drawdown, the difference between the original pretest water level and the water level during recovery, versus the logarithm of the ratio "T," the time since the pump was turned on, divided by "T" prime, the time since the pump was turned off. Note that the data on this plot have not yet been corrected for regional water-level trend.

The main thing I want to point out about this plot is that the first data to be collected after the pump shut off are the blue colored dots in the upper right-hand part of the plot, and the data in the lower hand portion of the plot are the last recovery data that were collected. So the recovery time increases to the left on this diagram.

Also note that the ending residual drawdown values are approximately 4/10ths of a foot, which means the water levels at the end of the recovery period are 4/10ths of a foot lower than the pre-pumping level. That's the same determination that I made for the previous slide because these are the same water-level data. They've just been plotted differently to

facilitate analysis.
This is figure 27 from Exhibit 44, the SVR-7 aquifer test analysis report. This plot is of the same data one more time, only now they've been corrected for the water-level trend. Our review of this diagram was the basis for our comment about the apparent failure to achieve water-level recovery in the Big Gulch stock well.
MR. FEREDAY: Excuse me, Mr. Hearing Officer.
Mr. Vincent, when you mentioned these various figures that are exhibits, that does not mean that your material that you've added to them were part of the exhibit; right? I would like you to just clarify which portions of each of these that you've added material to. That would be helpful to us.
THE WITNESS: It's generally something that's been circled or boxed in red. In fact, in every case, save for the green line box, I've used red to denote that those are my marks.
MR. FEREDAY: Okay. Thank you.
THE WITNESS: This plot is of the same data one more time, only now they've been corrected for the water-level trend. Our review of this diagram

was the basis for our comment about the apparent failure to achieve water-level recovery in the Big Gulch stock well. That conclusion was based not only on the ending residual drawdown values, which are slightly more than half of a foot on this diagram, but the fact that the data trend is not toward zero residual drawdown, but instead toward a positive residual drawdown of approximately one quarter of a foot.
The positive, non-zero intercept is diagnostic of an aquifer of limited extent, and that is a major concern for staff in the context of evaluating the sustainability of the resource.
HLI's analyst acknowledged the possibility of late and/or incomplete recovery in the caption on the right side of the figure. It says, "S over S prime less than one suggests late or incomplete recovery. However, incomplete correction for seasonal declining regional water-level trend over 12 days of recovery is most probable cause of apparent incomplete recovery," end quote.
We also noted that the late time recovery data, which are the blue dots in the lower left-hand corner of the plot, are located

above the trend line. That was not commented on by HLI's analyst, however.
As it turns out, HLI had misapplied the trend correction for the Big Gulch stock well. As described on page 24 of their response to the staff memorandum, Exhibit 45, quote, "We inadvertently omitted a minus sign to the correction. By applying the minus sign to the correction, the revised recovery plot, figure 7 below, now projects close to the total recovery point of the graph as is expected through standard well pumping and recovery theory. The small difference between the actual plot and a perfect projection may be the result of incomplete correction for trend, or it could be the effects of the edge of aquifer boundary discussed above and noted in our reports."
Here, then, is figure 7 from the response to the staff memorandum, Exhibit 45. This figure is a plot of the water-level recovery data from the Big Gulch stock well after applying the revised correction, which you'll recall is based on analysis of data that were collected in this same well after the test had been conducted.
With the revised correction, the

residual drawdown at the Y-intercept is only slightly positive, approximately 5/100ths of a foot. Nonetheless, HLI's analyst again acknowledges the possibility of late or incomplete recovery, but this time indicates that it was caused -- that it was, quote, "caused either by: a) incomplete correction for seasonal declining regional water-level trend, or b) hydraulic effects of nearest known no-flow boundary, the edge of the aquifer green line on the site plan," end quote.
This is figure 23 from Exhibit 44, which purportedly is a plot of trend-corrected recovery data from the SVR-7 pumping well. Note that the trend-corrected residual drawdown at T over T prime equals one for the pumping well is approximately 1/10th of a foot, which is somewhat larger than for the revised correction on the Big Gulch stock well.
Again, the caption acknowledges that the recovery appears to be late or incomplete based on the trend line but, unlike in the case of figure 27 for the Big Gulch stock well, the analyst considers late data that don't plot along the trend line in concluding, quote, "projection

of the end of recovery data would likely intersect residual recovery equals zero at T over T prime equal one, indicative of complete recovery."

Beyond pointing out this inconsistency in the treatment of the late recovery data, the reason that I wanted to drag everyone through this rather difficult material is to emphasize that the regional water-level trend corrections that were applied to the recovery data effectively mask the true response of the aquifer. In other words, the drawdown that was caused by pumping in the two wells with the most drawdown, SVR-7 and the Big Gulch stock well, is not of sufficient magnitude in relation to the various water-level correction factors to definitively assess whether or not the aquifer recovery was delayed or possibly even incomplete.

The fact that uncertainty about the regional water-level trend was used to explain residual drawdown intercepts of both 0.05 feet and 0.25 feet in the Big Gulch stock well, and 0.1 feet in the nearby SVR-7 well, supports the idea that in the case of the SVR-7 test where the maximum recoveries are only on the order of a foot or two, a well specific regional trend analysis

based on data that were collected after the test makes evaluation of aquifer boundary conditions using the water-level recovery data tenuous.

Based on this figure, it is our opinion that the aquifer was not stressed enough by pumping at 900 gallons a minute for nine days to facilitate a more definitive -- definite analysis of the recovery data.

Before we move on from figure 23, I want to point out that the first data points to plot along the trend line, which I've circled in red, are for residual drawdown values of slightly less than 1.5 feet, and the maximum residual drawdown value of any data point on this plot is approximately 2.3 feet, which I've also circled in red.

The 2.3-foot maximum residual drawdown suggest that there may be a problem with figure 23, which again is the trend-corrected water-level recovery plot for the pumping well during the nine-day SVR-7 aquifer test.

Table 2 from Exhibit 44, the SVR-7 aquifer test report, indicates that the maximum measured drawdown in the pumping well was 29.79 feet, and that after correcting for well

loss, the maximum drawdown in the pumping well was 7.51 feet.

The 2.3-foot maximum residual drawdown on figure 23 is therefore more than 5 feet less than the maximum drawdown after correcting for well loss. This rather large and unexplained discrepancy suggests to staff that the data shown on figure 23 may not be representative of water levels in the pumping well during recovery.

The next topic that I'd like to address is that of aquifer continuity. On page 4 of their response to staff memorandum, HLI stated quote, "Again, the evidence in published reports, together with recent studies we have compiled, supports the conclusion that the PGSA is laterally extensive and hydraulically interconnected over a regional scale. All new evidence we have uncovered continues to point to that conclusion. We do not subscribe to the staff's apparent belief that there is a lack of clarity with respect to this issue."

Staff cannot reconcile this statement with findings from a previous study that was conducted for the Treasure Valley Hydrologic Project by two of M3's experts, Mr. Ed Squires and

Dr. Spence Wood.

That study was documented in a 2001 report, Exhibit 19E, that was submitted as part of a seven-document package entitled "Documentation Provided by S.H. Wood, Ph.D., Professor Emeritus."

The first excerpt from the 2001 report speaks both to the complexity and lateral extent issues for sedimentary aquifers in the Boise area, which according to the HLI numerical model, is located between the PGSA recharge area and M3. The introduction to the report is a nice summary of the hydrogeologic setting southeast of M3.

It begins, quote, "The cold water aquifer system beneath the city of Boise is composed of sandy sediments interbedded with claystone and mudstone that were deposited near the shores of lakes which filled the Western Snake Plain during the late Miocene and Pliocene epochs (10 to 1.7 million years ago). The sand layers are deposits of stream channels, beach sands winnowed by wave action, deltas built out into the lake, and possibly density flows across the lake bottom from collapse of parts of the delta shelf. These depositional environments do not produce broadly distributed sand layers. Instead the sand

layers are typically restricted in their horizontal and vertical continuity by interbedded mudstone or lateral termination into mudstone.

The difficulty here lies with correlation of sand layers and determination of their shapes. Important is to predict whether sand layers found in wells have some sort of hydraulic connection, and which are not interconnected. By analogy to modern sedimentary environments and subsurface studies of others, our goal is to obtain at least a partial understanding of the three-dimensional geometrical shapes of sand aquifers. Structural downwarping coupled with normal faulting along the margins of the plain further complicates the stratigraphic section."

The next excerpt also touches on both complexity and continuity issues and appears later in the same document. That statement reads, quote, "In the past, aquifers were typically named for the geologic formations in which they occurred. However, the variety of depositional environments of the lake-stream systems and the changing environments with fluctuating lake level tells us that the sand units are complex. In

previous reports, the aquifer systems are associated with a set of geologic formations originally defined by Malde and Powers. The stratigraphic order and characteristic lithology of formations is a useful framework, because the changing lithology in some cases can be attributed to basinwide geologic events or progressions of similar depositional environments across the basin. However, it is unlikely that these formation units reliably relate to hydraulic connectivity of aquifers."

Next, on page 44 of the 2009 report for the SVR-7 aquifer test, Exhibit 44, HLI explains that, quote, "These conclusions are, of course, only preliminary and additional monitoring (currently ongoing) will help to clarify and test our understanding of interconnectivity."

For the benefit of the Hearing Officer, I'd like to emphasize what's been said here. In rebuttal to our staff memo, HLI implies that staff is somehow misguided in thinking that there is a lack of clarity with regard to the scale of aquifer interconnectivity. But in their last supporting submittal, based on the most recent data that they've collected, they indicate

that additional monitoring is needed to help clarify their preliminary conclusions regarding aquifer interconnectivity.

Suffice it to say that hydraulic interconnectivity is a concern to staff because the assumption of connectivity to an off-site source of recharge is the basis for the numerical model that was applied to predict hydrologic impacts.

Lastly, in the response to our staff memorandum, Exhibit 45, HLI asserts, quote, "The staff evidently does not dispute that PGSA groundwater moves many miles from the east-southeast into the area beneath the M3 property knowledge of Eagle, and that it comes from at least as far away as Garden City," end quote.

HLI appears to have arrived at their conclusion about what staff thinks based on the affidavit of Dr. Dale Ralston, a portion of which is presented later in HLI's response to our staff memorandum.

HLI's assumption about what staff thinks about the scale of aquifer interconnectedness is wrong on several counts.

One, just because staff does not specifically state opposition to an HLI concept does not indicate our endorsement of the idea.

Two, with all due respect to Dr. Ralston, he does not speak for hydrology staff and we don't speak for him. He is not a neutral party in this matter. None of my staff has had any communications with Dr. Ralston relative to M3's pending water right application.

Three, whether the PGSA beneath M3 is hydraulically connected to PGSA wells in Garden City is significant in that there are historical data for production wells in the Garden City area, and if those wells are hydraulically connected to M3 it is an argument against aquifer compartmentalization. However, demonstrating hydraulic connection to the primary recharge sources is equally important in the context of validating M3's conceptual and numerical models. According to the numerical modeling report, Exhibit 16, these include the New York Canal and the Boise River above Capitol Bridge, not the Boise River in Garden City.

Four, we have documented our concerns about faulting near M3 and the possibility that it

may limit hydraulic communication with the PGSA elsewhere. The indication by HLI on page 18 of Exhibit 45 that we offered, quote, "no lines of evidence," end quote, in our staff memorandum to justify such a concern is not correct. I'll further address this issue in a moment.

Five, the Goddard Street No. 2 well is located between M3 and the postulated recharge source areas.

Squires, Wood, and Osiensky documented that the 551-foot deep Goddard No. 2 well was impacted by a hydraulic barrier (i.e., no-flow) boundary in their 1992 report entitled "Hydrogeologic Framework of the Boise Aquifer System, Ada County, Idaho," Exhibit 67.

They also presented an aquifer test data plot for the Goddard No. 2 well and identified the point on the curve where there was an increase in the slope of the drawdown trend as indication of a negative hydraulic barrier.

According to HLI's response to our staff memo, Goddard No. 2 is a PGSA well. So there apparently is some sort of a flow barrier in the PGSA between M3 and the postulated recharge area. As I mentioned earlier, Goddard No. 2

nonetheless has been in production for more than a decade, so my concern is not that this well taps into a hydraulically isolated portion of the aquifer, but rather that M3's numerical model might not be an accurate predicter of impacts since it does not simulate this hydraulic barrier.

Six, on page 25 of the response to staff memorandum, HLI specifically identifies several new, also modern day recharge sources that were not simulated as areas of concentrated recharge in the M3 numerical model. One of these is, quote, "where the PGSA rises up dip to the present-day Boise River gravels east of the United Water Idaho Swift well."

However, inspection of figure 11 within the 1992 report, Exhibit 67, suggests that the Swift well, which I've identified with a small red dot, is on the upthrown side of the West Boise/Eagle fault, which I've emphasized with a dashed red line. The estimated offset across the fault is 800 feet, which is indicated on the left side of the fault trace below the large red arrow. If this is the case, hydraulic communication between this newly identified recharge area near the Swift well and the PGSA at M3 likely is

limited by the fault.

Seven, as indicated in our staff memorandum, we are concerned about lateral continuity because for the M3 numerical model to be an accurate representation it is required to connect the PGSA beneath M3 to assumed recharge sources in east Boise (i.e., the Boise River upstream from Capitol Bridge and the New York Canal).

We noted in the staff memorandum that, quote, "HLI has not presented geologic data to support the existence of the PGSA beneath the Boise River," end quote. In retrospect, we probably should have stated "beneath the Boise River above Capitol Bridge," since that's the postulated recharge area. But I think that the intended meaning was clear enough because this statement was in the context of a discussion of recharge from the Boise River and New York Canal.

HLI offered the following response to our statement in Exhibit 45, quote, "HLI's 2007 report clearly shows the PGSA geophysical signature 400 feet beneath the river at the UWID Swift wells which are located on the banks of the Boise River at Lakeharbor. The base of aquifer

map clearly shows that the PGSA continues up dip under the Boise River at least well into west Boise and probably beyond," end quote.

There are several points that I'd like to make with reference to HLI's response to our statement about the extent of the PGSA east of M3.

One, HLI is correct in pointing out that they identified the PGSA near Lakeharbor. We stand corrected.

Two, Lakeharbor is not a recharge area in the M3 numerical model.

Three, the phrase, quote, "probably beyond," end quote, does not constitute geologic evidence that the PGSA is upstream from Capitol Bridge -- is present upstream from Capitol Bridge.

Four, in HLI's 2007 report, Exhibit 2, the Swift well, which I've circled in red, is located on the downthrown side of the West Boise/Eagle fault on the map showing the extent of the bottom of the PGSA. Note that the fault is located on the northeast side of the Boise River, near the Swift well on this figure. This indeed suggests that there may be hydraulic continuity between the PGSA at M3 and beneath Garden City, but, as previously discussed, this fault location

is different than that shown on the map in the 1992 report, Exhibit 67.

Like the 1992 report, the Wood and Clemens 2002 report, Exhibit 19D, shows the Eagle/West Boise fault to be on the southwest side of the Boise River near the Swift well, which I've identified on figure 10 with a red dot. We are not aware of any new data that justify relocating the West Boise/Eagle fault from its mapped location, albeit approximate, in the 1992 and 2002 reports.

Five, the driller's log and the near surface geophysical signature for the Swift well, which I've circled in red in the upper-right corner of figure 4 from Exhibit 45, indicate that there is at least 30 feet of blue clay on top of what HLI identified as the PGSA.

The surficial clay layer shows up as a kick to the right on the gamma log, which is the left strip chart in the area that I've circled, and a deflection to the left on the resistance log, which is the strip chart on the right.

If laterally continuous, that clay layer would limit hydraulic communication between the PGSA and the alluvial aquifer system. As

discussed by Mr. Glanzman, the geochemistry data indicate that PGSA groundwater has not had much contact with clay, which also suggests that communication with the Boise River is not significant in the vicinity of the Swift well.

Six, the figure showing the bottom of the PGSA in HLI's 2007 report, figure 3 from Exhibit 2, does not show contour lines east of the Garden City Fairgrounds or south of Cloverdale Avenue. The contours also do not extend west beyond the Canyon/Ada County line or into Gem County. The lateral extent of the PGSA shown on this figure based on geologic data is therefore considerably smaller than the modeling domain of the M3 numerical model.

Seven, extrapolation of hydrogeologic conditions at Lakeharbor through west Boise and beyond is not justified based on the information contained in HLI's submittals. The 1992 Squires, Wood, and Osiensky report, Exhibit 67, indicates not only that there are negative boundaries in the PGSA, but also that there's a major discontinuity in the underlying cold water aquifer system -- quote, "The west Boise deep artesian aquifers should be truncated to the north or northeast by

down-to-basin normal faults such as the West Boise/Eagle fault and/or beveled off up dip by an erosional angular unconformity. Virtually all well-completion/pump capacity tests of production wells in this region have shown indications of such negative hydraulic boundaries in the subsurface."

MR. FEREDAY: Mr. Hearing Officer, it is noon. Maybe it's a good time to take a break.

THE HEARING OFFICER: What do you think, Mr. Vincent? Is this a good time?

THE WITNESS: Sure.

THE HEARING OFFICER: Starting on another subject?

THE WITNESS: Yeah.

THE HEARING OFFICER: Let's break for an hour. Let's come back at 12:05.

MR. FEREDAY: 1:05.

THE HEARING OFFICER: 1:05. I'm sorry.

(Lunch recess.)

THE HEARING OFFICER: We're recording again after the lunch recess.

We've decided on course of action related to the presentation of the parties' testimony. And we've determined in our

discussions that Department staff will attempt at least to present all of their narrative testimony today, and then copies of that narration will be provided to the parties, both in hard copy and over the website. The document will be posted, or documents. And the parties have agreed to that.

And then we'll hold off on the examination or cross-examination of the Department witnesses until we convene on the 28th of May. I think all the parties are in agreement on that.

Okay. Mr. Vincent, do you want to continue your testimony at this point?

THE WITNESS: Yes.

THE HEARING OFFICER: Thanks.

THE WITNESS: I'll resume my testimony with a new topic: Faulting. HLI seems to take exception to our assertions that the PGSA might be faulted and that this faulting could serve as a partial or complete aquifer boundary.

Specifically, HLI concludes in Exhibit 45 that, quote, "with perhaps one exception, there's no evidence that the major faulting in the deep volcanic basement rocks, including that detected by the magnetometer survey conducted by M3 Eagle in 2007, offsets, or even

breaks, the shallower water-bearing units, including the PGSA.

The available evidence actually shows the opposite, that the deep-seated faults do not propagate to land surface or penetrate the younger sediments above. An exception is the mapped basin bounding West Boise/Eagle fault extending into and apparently truncating the sedimentary section," end quote.

They also wrote in Exhibit 45 that, quote, "Major faulting that formed the Western Snake Plain generally does not significantly cut or offset the younger sedimentary units (shallower than 1,000 feet) in the basin on the north side of the plain," end quote, and mentioned, quote, "HLI did commission seismic reflection and magnetometer surveys mainly to determine deep structural features," end quote.

Let me be clear on this point, hydrology staff does not know whether there is fault gouge or fine-grained sediments infilling the fault plain or whether there is offset of the PGSA across the fault that was mapped by Wood in his 2007 report, Exhibit 19B. We also don't know whether and, if so, how much any of those factors

affect groundwater flow.

We do know, however, that faults can and do exert control on groundwater and aquifers beneath the Western Snake Plain and elsewhere acting as partial and in some cases more or less complete barriers to flow. That's why we're so interested in understanding the location and hydrologic functioning of faults in north Ada County and why we've commissioned BSU's center for subsurface geophysical investigation to conduct a seismic study using a larger seismic source than was previously used. BSU's lead investigator would like to get started within the coming month.

We are grateful to M3 for allowing us access to their property. The report for that study is not anticipated until next year and the analysis would probably be conducted in the fall of this year, is the schedule.

Another thing that we know about faults is that they don't typically occur in isolation. In the 1992 report, Exhibit 67, Squires, Wood, and Osiensky used the term, quote, "zone," end quote, to describe the faults that truncate and serve to limit the areal extent of the Boise aquifer system which separates M3 from

the Boise River recharge area. They stated, quote, "The Boise aquifer system is limited in areal extent and depth. The sedimentary basin is bounded on the north by the crystalline rocks of the idaho Batholith where sedimentary strata lap onto or are faulted against these relatively impermeable granitic rocks. The cold-water bearing section is further truncated along the basin-bounding fault zone and other down-to-basin normal faults," end quote.

The implication of the last sentence is that there are normal faults that are located away from the basin margin that also cut through the cold-water sedimentary aquifers.

We also know that HLI convinced their client that a study of the deep structural features was pertinent to this water right application, which involves pumping from an overlying sedimentary aquifer. The rationale for HLI commissioning a geophysical survey that, according to Dr. Wood, is not relevant to the PGSA groundwater study is unclear to staff.

The rationale for submitting a nonrelevant but site-specific study in support of their water right application also is unclear to

staff. Moreover, a focus on deep structural features is not apparent in the report documenting the inconclusive seismic reflection survey that was commissioned by HLI.

That report, Exhibit 13, included the following statement, quote, "The deep water table at the site means that the seismic signal must propagate through a significant thickness of unsaturated sediments prior to reaching the primary target, which in this case is the stratigraphy associated with the fresh water aquifer and the fault that appears in traverse the property," end quote.

Also unclear to staff is why HLI now believes that the fault map by Wood using a magnetometer survey, quote, "does not act as a no-flow boundary as speculated by IDWR staff," end quote, when in their analysis of aquifer test data from the Kling irrigation well test they concluded, quote, "Since the Aqtesolv analyses used to generate a curve match required the use of a fault acting as a no-flow boundary, and because other subsurface geophysical mapping by HLI suggests a buried fault trace, it appears likely that such a fault may be present in the vicinity

of the Kling well and that it may control groundwater movement in the aquifer to some extent," end quote.

Here's a copy of a drawdown data plot from the Kling irrigation well test. It's figure 88 from Exhibit 12. I want you to notice the notation that's been highlighted with a red circle. It says, quote, "Best fit with no-flow boundary 1,500 feet to the northeast from pumping well," end quote.

And then below that it says, quote, "Derivative analysis supports method. Good fit throughout entire test period," end quote.

I really don't see how it can be considered speculative on the part of staff to think that the fault that was identified by Wood in the panhandle of M3's property approximately 1,500-foot northeast of the Kling irrigation well acts as a no-flow boundary, when it was HLI's only analyst that first proposed the idea in a submittal to the Department.

Before I go on, I want to point out something to the Hearing Officer. Staff does not appreciate being accused of being speculative or the implication that we are unaware of, quote,

"basic principles of hydrogeology," end quote, when all we have done is to review and try to make sense of the information that we have been provided by M3's consultant.

That the fault mapped by Wood in his 2007 report might exert some level of control on groundwater flow in the PGSA is not an idea that we come -- we came up with on our own. HLI was compelled to identify the panhandle fault on four different well location maps in the report documenting the reanalysis of 16 aquifer tests.

They also used the fault package in the computer-aided aquifer test program Aqtesolv in order to analyze test data from the Kling irrigation well test. It was HLI, not the Department, that pointed out, quote, "Geophysical evidence (Wood, 2007) suggests that a structural fault may be present between TW-4 and the monitored wells lying to the west (TW-1, TW-3, and Kling irrigation well). Such a fault, if present, could have attenuated and/or delayed the response to the portions of Pierce Gulch Sand Aquifer lying to the west of the fault, caused by pumping the Pierce Gulch Sand Aquifer at a location east of the fault. In a manner similar to the SVR-7 test,

pumping from the Kling irrigation well (located west of the possible fault) caused no measurable drawdowns in wells lying to the east of the fault, supporting the concept of a structural fault," end quote.

Given this statement and the previously discussed aquifer test analysis, it's inconsistent for HLI to accuse the Department of being speculative and to now assert that, quote, "In short, there is no support for a suggestion that faulting offsets the PGSA, much less that it serve as a no-flow boundary," end quote.

Dr. Wood's testimony that he doesn't believe that the magnetometer survey was relevant to the PGSA groundwater study seemingly is at odds with the fact that this work was commissioned by HLI and performed by Dr. Wood in the context of a study of PGSA groundwater.

Let me give another example where conclusions by HLI are inconsistent with their analysis concerning negative (i.e. barrier or no-flow) boundaries. The following statement appears in Exhibit 45 in response to our staff memorandum: Quote, "Negative hydraulic boundaries can be confirmed by pumping tests of properly

constructed wells in the aquifer under investigation when they are evidenced by an increased rate of drawdown. Significant negative hydraulic boundaries did not show up in the nine-day SVR-7 aquifer test or in the 30-day Lexington Hills test, both of which we consider to be of sufficient duration to have revealed boundaries. Indeed, as our previously submitted reports show, positive (recharge) boundaries were evident in those tests," end quote.

I happen to disagree with that statement, but its meaning is pretty clear. According to HLI, there was no indication of negative (i.e., barrier or no-flow) boundaries during the SVR-7 and Lexington Hills aquifer tests -- rather there were indications of recharge boundaries in both tests.

Now, I've already discussed the analysis of data from the SVR-7 aquifer test, but I haven't yet talked about HLI's reanalysis of the Lexington Hills test.

So here's what's written in Exhibit 12, the only submittal that discusses the Lexington Hills 30 day aquifer test: Quote, "As noted in the hydrogeologic overview section of

this report, the West Boise/Eagle fault lies approximately one-half mile to the northeast of the Lexington Hills well No. 1. Review of well driller's reports and the hydraulic data included in the CH2M Hill report indicate this fault acts as a no-flow barrier and edge to the Pierce Gulch Sand Aquifer. We incorporated the effects of this no-flow boundary into all the log-log type-curve analysis."

It's reasonable to assume that the understanding of the role of faults in the Boise Basin has evolved over the years. If so, however, I've not seen where changes in that understanding are explained in HLI's submittals. All we know for sure is that HLI's current stance is much more definitive than previously offered by M3's team of experts.

Consider, for example, the following quote from the 1992 report that was authored by Squires, Wood, and Osiensky, Exhibit 67: Quote, "In addition to the basin-bounding fault zone of the Boise Front, which truncate the lateral extent of aquifer units, other faults within the sedimentary section of the valley impede groundwater flow and limit the lateral extent of

aquifer units. The extent to which these faults cut the sedimentary sequence above 1,000 feet is presently -- is not presently known. The amount of movement (offset) that has occurred along these faults and the degree to which they affect groundwater movement is poorly understood at present."

More recently, HLI offered figure 2 in their response to our staff memorandum, Exhibit 45, as evidence that, quote, "Major faulting that formed the Western Snake Plain generally does not significantly cut or offset the younger sedimentary units (shallower than 1,000 feet) in the basin on the north side of the plain. Figure 2 shows in detail the nature of faults in the basin," end quote.

Inspection of figure 2 reveals that it can't be used directly to support that argument since the beginning depth of the profile is greater than 1,000 feet. There simply are no data in the shallow section that includes the target aquifer. Indeed, the deep faults aren't shown as propagating to land surface on this figure but, based on the information in one cross-section that doesn't extend into the shallow section, it's

unclear whether the understanding of the hydrogeologic significance of shallow faults has improved since the 1992 report, which, at that time, described the level of understanding as poor."

MR. FEREDAY: Excuse me. Mr. Vincent, could you describe which cross-section to which you just referred.

THE WITNESS: It's figure 2 from Exhibit 45.

MR. FEREDAY: Oh, okay.

MR. THORNTON: Question: And if you're referring to this one, Mr. Vincent, then they're both figure 2 and figure 3 on the same page?

THE WITNESS: That's correct. Figures 2 and 3.

MR. THORNTON: Okay. So you're referring to both figure 2 and 3 or just --

THE WITNESS: Yes, I didn't reference figure 3, but it is also on -- on this slide.

MR. THORNTON: Okay.

THE WITNESS: And it does have the same lack of data in the shallow section.

MR. THORNTON: Okay.

THE WITNESS: As explained in our staff

memorandum, the authors of Exhibit 33G, a 2002 report that was prepared for the Treasure Valley Hydrologic Project and offered as supporting documentation by M3, indicated that faulting along the basin margin adds complexity and uncertainty to the hydrogeologic setting.

They stated, quote, "In addition to complexity inherent in deposition and erosion, a series of major faults bisect the stratigraphic section along the northern basin margin. The hydrologic impact of these faults is poorly understood, but they are likely to be an important influence on groundwater flow in the Boise-area aquifers," end quote.

As mentioned previously, the sustainability of the target aquifer at M3 is a function of whether there is strong hydraulic connection with the significant source of recharge. In this case primary sources of recharge are thought to be distant from M3. As such, it should come as no surprise to M3's experts that we are concerned about faulting. Here then is how the fault issue looks from our perspective:

One, a basin-margin fault was

identified by HLI, which conceptually might limit hydraulic connection to the primary off-site recharge sources.

Two, HLI then used the fault package of an aquifer test analysis software program to analyze the test data based on their understanding of the hydrogeologic setting and the goodness of fit of the test data to the theoretical response of a no-flow boundary.

And then three, HLI dismissed the potential implications of faulting in their last submittal by saying, quote, "The influence of structural basin-margin faulting, which is known to exist in the general vicinity, is not addressed here," end quote.

The rationale for not addressing the fault issue is unclear to staff.

I'd now like to touch on an issue which I think now serves to distract us from the central issue, and that is the issue of groundwater flow direction.

While I would agree that our ability to accurately predict hydrologic impacts is directly related to our knowledge of aquifer boundaries and these ultimately impact flow

direction, the magnitude of the actual impacts that would be caused by pumping are insensitive to whether groundwater flows northwest from M3 toward the Payette River or west toward the Boise River.

I agree with Mr. Fereday and Mr. Squires on that point. That's because the primary impact of pumping is water-level decline. And in accordance with the principle of superposition, the distribution and amount of water-level decline that occurs is independent of the flow direction.

However, HLI implied otherwise in Exhibit 2 when they stated, quote, "The groundwater proposed to be withdrawn by M3 Eagle for its development will be from subsurface flow that has already departed the Boise Basin on its way to the Payette Basin, so that impacts to existing area water users in the lowlands near Eagle are predicted to be so small as to be insignificant," end quote.

Though intuitively appealing, this assertion is contradicted by HLI's own modeling, which predicts water-level declines of approximately 5 feet extending several miles in the upgradient direction for both versions of the

M3 model. In other words, there is no reason to expect that the hydrologic impacts will be less significant if groundwater flow is to the Payette Basin.

The more important issue in terms of long-term impacts is whether there is strong hydraulic communication between the PGSA beneath M3 and a significant source of recharge.

HLI makes essentially the same argument as the basis for concluding in Exhibit 45 that, quote, "PGSA groundwater in the M3 Eagle vicinity is tributary in large part to the Payette River. We do not anticipate measurable impact to the Boise River in the reaches downgradient from the Eagle site," end quote.

The bottom line is that drawdown in the alluvial aquifer along hydraulically-connected reaches of the Boise River will reduce flow in the river. As stated in our staff memorandum, neither HLI nor the Department has evaluated the impacts of pumping on senior surface water right holders.

Before I finish, I would like to go on record that Department staff does not particularly enjoy the role of adverse witness and having to get up here and defend ourselves. Staff is

unanimous in believing that part of the reason that we are in this situation is because two of HLI's most important submittals were late and their submittals and testimony have inconsistencies.

Having said that, some contradictions are unavoidable and admittedly many of these are not significant in the context of M3's water right application. Others, however, are more critical, and an attempt should be made to resolve them. An apparent contradiction still needing resolution is how the PGSA could be so transmissive and strongly recharged by water from both surficial waters and leakage from the modern-day Boise River and New York Canal, as asserted by HLI and assumed in the M3 flow model, when, according to Mr. Glanzman's testimony, the PGSA has no connection to shallow aquifers and, according to his geochemical analysis, the water beneath M3 is almost exclusively sourced from the, quote, "geologically ancestral Boise River," end quote.

The terminology that Mr. Glanzman used to describe the source of PGSA water is geologically ancestral, not premodern. The geologic time scale extends back more than

4 billion years so when a registered professional geologist like Mr. Glanzman speaks using the materials "geologically ancestral," he or she is talking about something that happened a very long time ago.

Now, I heard Mr. Glanzman testify that he understands "geologically ancestral" to apply to something that is more than 1,000 years old. Less than a minute later, however, he testified that he understands "geologically ancestral" to mean, quote, "as much as 1,000 years old," end quote.

Having listened to that testimony, I'm really not sure what "geologically ancestral" means to him. By his second definition, something more than 1,000 years old would be classified as older than geologically ancestral, which is a difficult concept to fathom since 1,000 years isn't even a blip on the geologic time scale.

Mr. Glanzman also indicated that carbon age dating can't be used for water that's less than 5,000 years old and that the only thing that he can say for sure about the age of PGSA groundwater is that it's somewhere between zero and 5,000 years old.

The problem with that is that he used carbon age dating as the basis for describing PGSA water as being sourced not from the Boise River, but from the geologically ancestral Boise River. He made that distinction, staff did not.

To further the confusion, HLI was compelled in their response to our staff memorandum to point out, quote, "From this model, they estimated the PGSA groundwater from the Goddard No. 2 and HP wells to be about 2,960 years old. These sealed production wells are located about 1 mile south of the Boise River and have been pumped for at least a decade, so the estimated age should be accurate," end quote.

Thus despite Mr. Glanzman's testimony, HLI feels that 2,960 years, an age that's intermediate between zero and 5,000 years, is not only accurate, but should be reported in a document that was addressed to the Hearing Officer using three significant digits.

While there remains a serious disconnect regarding the residence time issue, the similarity in major ion chemistry between UWID wells and M3 wells is support, though certainly not conclusive, for hydraulic connection to wells

in the Boise Valley. Having said that, I'm not an expert on geochemistry.

It's not just inconsistencies with complicated technical issues that we've struggled with in our review of M3's submittals. It's inconsistencies with seemingly straightforward concepts. It's difficult, for example, to reconcile HLI's statement in the Aquifer Test Prospectus, quote, "generally speaking, the longer the test the better," end quote, with the statement in their response to our staff memorandum, quote, "it is a common misconception that the longer the test the better," end quote.

One more set of observations before I close. I spent a fair amount of everyone's time this morning trying to address some of the major technical issues that were raised in HLI's response to the staff memorandum. It needs to be recognized, however, that there simply is not enough time to respond to all of HLI's criticisms. HLI accused staff of being incorrect on six different occasions, inaccurate on three occasions, speculative on three occasions, misleading on three occasions, and inappropriate on two occasions.

Our analyses were described as being quote, "deeply flawed," end quote, and our rationale as having, quote, "no scientific basis," end quote.

HLI criticized staff for not discussing something from Dr. Ralston's affidavit, which as a document that we were not assigned to review. Staff also was criticized for not evaluating and discussing a series cross-sections that are clearly labeled "draft," which were given to us without a location map and which are not referenced by HLI in any of their own submittals, and which are devoid of both former geologic interpretation and stratigraphic determination between boreholes.

Despite these factors, HLI's opinion of the cross-sections on page 10 of Exhibit 45 is that, quote, "All are significant to our analysis and support our conclusions about the nature of hydrogeology in the area and the lack of any PGSA truncating faults here other than the WBE fault," end quote.

HLI accused staff of incorporating unintentional bias and significant errors and implied that we were cursory or incomplete in our

review of their information on three occasions. We were criticized for not addressing uncertainty that's inherent in the use of data from wells that have unknown and/or questionable well construction, even though the aquifer test data provided by HLI as the basis for M3's application comes from two test wells that are, by their own estimation, partially penetrating, poorly documented, and poorly constructed.

Moreover, I'm not aware that staff ever committed to performing a well construction uncertainty analysis of M3's data or that that should be our responsibility. I suggest that HLI might address the inconsistencies in their submittals rather than trying to pin additional responsibilities on staff.

Review of M3's supporting materials is already a large responsibility. By my count, M3's submittals in support of this application include nine different technical reports prepared by HLI, three geologic submittals containing a total of 19 separate geologic cross-sections, 11 composite diagrams, nine maps, one master's thesis, seven publications that were authored or coauthored by Dr. Spence Wood, ten Treasure Valley Hydrologic

Project reports, 22 miscellaneous data submittals, the rebuttal to our staff memorandum, and eight different submittals dealing with the qualifications of M3's hydrogeologic experts.

A frustration for me as a reviewer is that there are important aspects of hydrogeologic conceptual model that are uniquely located in at least five different documents: the reanalysis of aquifer tests (Exhibit 12), the SVR-7 nine-day aquifer test report (Exhibit 44), the geochemical characterization report (Exhibit 43), the groundwater flow modeling report (Exhibit 16), and the one-year progress report (Exhibit 2).

Moreover, important information such as the fact that the Goddard No. 2 well produces 3,000-year-old PGSA groundwater, was only recently introduced to us via the response to our staff memorandum.

In closing, there are a lot of high-quality data that have been collected and analyzed on behalf of M3. And it seems to me, based upon some of the early testimony, that M3 is doing the right thing both in trying to minimize consumptive use of water and in helping to develop a better understanding of the hydrogeology in

north Ada County.

Frankly, however, our job as technical reviewers has been made difficult by the timing and the sheer volume of the submittals and by the numerous and difficult to resolve inconsistencies within them.

Staff feels that there remain several unresolved issues that are germane to making a reasonably confident assessment of long-term hydrologic impacts, and we stand by our initial recommendation for a high-rate, long-term pumping test to help better evaluate aquifer boundary conditions in the vicinity of M3.

We agree with Mr. Utting that the best way to predict long-term response to pumping, particularly in a complicated hydrogeologic setting such as that in north Ada County, is to measure it rather than to simulate it.

That's all I have. I'm glad to stand for questions.

THE HEARING OFFICER: Okay. Thank you, Mr. Vincent. Based on our previous discussion, I think we'll defer your examination until the 28th of this month.

Is that acceptable to all the parties,

again?

MR. THORNTON: Yes, it is.

MR. ALAN SMITH: Yes.

THE HEARING OFFICER: Okay. And you'll provide written copies of what you have before the end of the day?

THE WITNESS: I will, yes.

THE HEARING OFFICER: Thank you, Mr. Vincent.

In the order of presentation of testimony, Mr. Owsley, are you next?

MR. OWSLEY: I am. Can I take five minutes?

THE HEARING OFFICER: Sure.

(Recess.)

THE HEARING OFFICER: Okay. We're recording again after a brief recess.

We've talked about the documents that Mr. Vincent had referred to, either a PowerPoint presentation or his accompanying narrative. And we have marked the PowerPoint presentation as Exhibit 901.

(Exhibit 901 marked.)

THE HEARING OFFICER: And his narrative that he's presenting to the parties will be marked

as Exhibit 902.
(Exhibit 902 marked.)
THE HEARING OFFICER: And then Mr. Owsley's PowerPoint presentation has been marked as 903.
(Exhibit 903 marked.)
THE HEARING OFFICER: We anticipate that the underlying narrative document will be marked as 904 when that is copied and presented to the parties.
So I will receive Exhibit 901 into evidence, and the others we'll discuss at the time they're presented.
(Exhibit 901 admitted.)
THE HEARING OFFICER: Okay. Are we ready to go again?
MR. THORNTON: Uh-huh.
THE HEARING OFFICER: Mr. Owsley, stand.

DENNIS OWSLEY,
having been called as a witness by the Department, was duly sworn and testified as follows:

THE HEARING OFFICER: Thank you. Please be seated.
And I may have neglected to do this

with Mr. Vincent, although he previously testified, but will you please state your name, spell it for the record, and also state for us your position with the Department of Water Resources, and a little bit about your training.
THE WITNESS: Okay. My name is Dennis Owsley, O-w-s-l-e-y. I'm a hydrogeologist here at the Idaho Department of Water Resources. I work in this building at 322 East Front Street, Boise.
A little about my training. I have a bachelor's degree in geology from the University of Idaho. I have a master's degree in hydrology, also from the University of Idaho. I am currently a professional registered geologist in the state of Idaho. I have approximately six years experience as a technical hydrogeologist.
THE HEARING OFFICER: Okay. Thank you. You may narrate your testimony.

DIRECT NARRATIVE TESTIMONY
BY DENNIS OWSLEY:
THE WITNESS: This narrative testimony was developed in response to the April 1st memo prepared by HLI in response to our March 2nd staff memorandum. I coauthored the March 2nd staff

memorandum and appreciate this opportunity to provide testimony in response to the comments provided by HLI in the memo.
Our March 2nd staff memo was developed in request of the Hearing Officer. We provided a summary of the technical work submitted by M3 in support of this water right application. I feel the technical work completed for this investigation was of high quality. However, some of the assumptions and conclusions related to the work leave me with some questions and concerns.
I would like to identify some specific questions that are due to inconsistencies in the data submitted by M3 and the testimony I've listened to in this hearing. But first, I'd like to start by showing the presentation of the submitted data, highlighting the review process we were challenged with.
As in most large scale hydrogeologic investigations, a comprehensive summary report is completed at the end of the project to provide a summary and discussion of the work collected through the investigation, including any conclusions drawn from the research.
As quoted from page 3 of Exhibit 2,

the HLI one-year progress report, which is also included in this second amended water right application, HLI states, quote, "A comprehensive report is anticipated to be completed in time to be presented in support of IDWR's review of M3 Eagle's water right application. HLI's comprehensive report will contain the supporting data files and findings based upon additional well tests, hydrological data collected from additional well studies, and completion of a Modflow numerical model. In the meantime, and the water study progress, additional reports will be issued to document and present refinements of the findings presented here," end quote.
A comprehensive report would have been beneficial to the Department's review. Multiple historic reports are presented in the supporting documentation for this water right and referenced in the April 1st, 2009 HLI memorandum, which appear to have a significant importance to HLI's conceptual model. However --
THE HEARING OFFICER: Okay. Mr. Owsley, will you also slow down --
THE WITNESS: Okay. Sorry.
THE HEARING OFFICER: -- for Mr. LaMar.

MR. THORNTON: Smoke was coming out of his ears.
THE HEARING OFFICER: You just need to be deliberate in going through this.
THE WITNESS: Sure.
THE HEARING OFFICER: And for those of us who are here, we all want to finish the hearing. But when it comes in this way, it's just -- it's just a constant barrage.
THE WITNESS: Gotcha.
THE HEARING OFFICER: Thanks. Go ahead.
THE WITNESS: However, many of these historic reports were not directly referenced in the HLI authored reports to support the data collected from this project.

As highlighted in our staff memo, HLI has completed a large amount of work in their efforts of characterizing the aquifers beneath the M3 site. This has resulted in a large volume of information being submitted in support of this water right application. However, the submittal of the information was lacking organization. I would like to present the list of submitted documents to highlight this point.

This slide shows the documentation in

support of the water right application as it was presented to the Department. The submittals are not organized chronologically or by category.

This slide shows how I organized the submittals based on similar categories. I would just like to reemphasize that without a comprehensive report and the sheer volume of documents submitted, this lack of organization created some confusion at times during the review.

Two documents in support of this water right were submitted after the November 26th, 2008 deadline for submission of supporting documentation. These two documents provided important information regarding the hydrogeologic conditions beneath the M3 site and represent a significant portion of the work completed by HLI.

The timing of these reports resulted in the Department requesting an extension in time in our deadline of the staff memorandum. The timing of these reports also did not allow the Department an opportunity to discuss our questions and concerns with these documents with HLI prior to releasing the staff memorandum.

I would now like to focus this testimony on my response to Exhibit 45, HLI's

April 1st memorandum, and where applicable, incorporating the testimony I've listened to in this administrative hearing.

The remaining testimony points out inconsistencies with technical information presented to date. I have organized this presentation with respect to general hydrogeologic categories.

The topics of interest I would like to cover include north Ada County stratigraphy, faulting, aquifer continuity between the Boise and Payette, M3 Eagle's aquifer testing, aquifer boundaries, recharge sources, water levels and trends in the aquifer, M3 Eagle's modeling, geochemistry analysis, and aquifer sustainability.

The first topic I would like to discuss is the stratigraphy of north Ada County.

I would like to reemphasize HLI's response to our description of the area's geology as complex. On page 2 of Exhibit 45, the HLI response to the staff memorandum, HLI states, quote, "The stratigraphy in the area is not particularly complex, although it may appear so on a cursory look," end quote. And quote, "In any event, we do not consider the stratigraphy in this

area to be overly complex, although it may appear so on a cursory look," end quote.

As Mr. Vincent testified, there are multiple lines of evidence that indicate the hydrogeology of the area is complex. We've also heard testimony from Mr. Squires in which he referred to the hydrogeology of the area as, quote, "complicated," end quote.

We have also heard testimony from Mr. Glanzman that the study area was a, quote, "complex groundwater basin," end quote. HLI's claim that the stratigraphy is not complex is inconsistent with the lines of evidence Mr. Vincent pointed out, as well as previous testimony from M3's expert witnesses.

THE HEARING OFFICER: Okay. Again, would you please slow down just a little, take a breath between each sentence, Mr. Owsley.
THE WITNESS: Yes, sir.
THE HEARING OFFICER: We'll get through it. Thanks.
THE WITNESS: These two images are clips from the geologic map included by M3 in the submittal of supporting documentation for this water right (Exhibit No. 33T). We referenced this

map when describing the Pierce Gulch Sand in our staff memo.

In response to our description and citation of this map, HLI states on page 3 of Exhibit 45, quote, "Othberg and Stanford (1992) compiled some of the mapping done earlier by S.H. Wood and W. Burnham but did not define or investigate the PGS. Othberg and Stanford did not even map the Pierce Gulch Sand in the Eagle USGS quadrangle, although it outcrops there. Rather, they were focused entirely on the terrace gravels, which lie above the PGS and are not involved in M3 Eagle's application," end quote.

The staff referenced the Othberg and Stanford map as it was the only published geologic map submitted in support of this water right. The PGS is shown as an outcrop on this map and is specifically defined in the legend on the map.

THE HEARING OFFICER: Where is that, Mr. Owsley?

THE WITNESS: Eagle is right here where I'm pointing to and this is just due east of Eagle in the foothills (indicating). This lighter blue shaded area represents the outcrop of the Pierce Gulch Sand. This first blue box on the top is the

description of the geologic unit and the map, and I will read it.

It says, "Sand of the Pierce Gulch formation, pale yellow, gray arkosic sand overlain by pebble and cobble gravel. Sand includes cross-bedded and fore-set bedded sequences named by W.L. Burnham and H.S. Wood, written communication unpublished manuscript, 1989."

Also on page 3 of the response, HLI states, quote, "We do not believe it -- we do not believe it technically correct to refer to the PGS as a formation at this time," end quote.

Again, the staff referred to the PGS as a formation based on the description on the geologic map HLI provided to the Department. In addition, it is inconsistent for HLI to claim the Pierce Gulch Sand is not a formation when we heard Dr. Wood's April 4th testimony referring to the Pierce Gulch Sand as a formation."

The base of the aquifer is one of the two boundaries that HLI states they have currently defined. However, figure 4 of Exhibit 44 does not indicate the base of the aquifer is fully defined beneath the M3 property. For example, look at test well No. 4, specifically at the lower

completion of the well. Terteling Springs Mudstone is drawn through the bottom of the aquifer in this well.

Test well No. 3 and test well No. 4 are the two wells in which we heard Mr. Squires testify that they had, quote, "great uncertainty," end quote, in correlating the geologic units between them. Even with what is considered great -- great certainty, in correlating units under the M3 property using the high-quality borehole data that exists on the property, some inferences and interpretations must be made to correlate the geologic units. These interpretations get larger as you move further away from the M3 property due to the lack of high quality borehole data.

This is the same slide again, however, I would like to point out two additional items related to this slide. First, is the identification of the target aquifer and the United -- UWID State and Linder test wells. The top of the Pierce Gulch Sand Aquifer in this picture is hard to distinguish in the geologic and geophysical logs between what is identified as the overlying, quote, "undifferentiated alluvial

aquifers and aquitards," unquote. The fact that a screened portion overlaps the boundary line drawn further supports this observation.

The depiction of the thickness of the Pierce Gulch Sand Aquifer in this figure is inconsistent with other HLI documents. For example, Exhibit 12, the reanalysis of 16 aquifer tests report identified the Pierce Gulch Sand to be 525 feet thick at this location. However --

THE HEARING OFFICER: What location was that, Mr. Owsley?

THE WITNESS: The location of UID (sic) State and Linder test wells.

However, this figure shows the Pierce Gulch Sand Aquifer to be only approximately 300 feet thick at this same location of the UWID State and Linder test wells.

MR. FEREDAY: Excuse me. Mr. Owsley, could you tell us where -- was that Exhibit 12? Did you have a page reference?

THE WITNESS: Sure.

MR. FEREDAY: Exhibit 12? Didn't you just refer to Exhibit 12, or maybe I misheard you about --

THE WITNESS: I'll reread that sentence.

For example, Exhibit 12, the reanalysis of 16 aquifer tests report, identified the Pierce Gulch sand to be 525 feet thick at this location.

MR. FEREDAY: At the location of --

THE WITNESS: Of UWID State and Linder test wells.

MR. FEREDAY: Okay.

THE WITNESS: These inconsistencies create challenges when trying to distinguish the Pierce Gulch Sand Aquifer from the, quote, "undifferentiated alluvial aquifers and aquitards," unquote, that comprise the Treasure Valley Aquifer system.

One last point on this slide, and then we will move on.

Looking now at test well 3 and the completion intervals within it. The elevations of the saturated intervals of this well range from 2,453 feet above mean sea level to 2,355 feet above mean sea level. Ground surface identified on this map near Linder Road and the Boise River is labeled at 2,518 feet above mean sea level. Therefore, the elevation of the water-bearing zones in test well No. 3 are equivalent to the

elevation of water-bearing zones that are approximately 65 feet to 165 feet below the Boise River near Linder Road.

This quote is from Exhibit 68, a report prepared by Dr. Wood. Based on the interpretations pointed out in the previous cross-section that was developed using high quality data, I agree with his statement that says, quote, "One should view with distrust cross-sections attempting to correlate over distances of several miles, unless the section is along strike, and the sedimentary facies is identified," end quote.

Some final comments I'd like to make regarding the stratigraphy of the area are related to the documents in Exhibit 27 titled Cross-sections of wells near M3 Eagle with construction and lithology (13 total).

On page 10 of Exhibit 45, HLI states, quote, "M3 Eagle submitted 16 subsurface cross-sections with its materials on November 26th, 2008, and an additional four cross-sections on January 29th, 2009," end quote. And continues with, quote, "It is unclear whether staff evaluated the originally submitted 16; the

staff memo does not discuss them. They are all significant to our analysis and support our conclusions about the nature of the hydrogeology in this area and the lack of any PGSA-truncating faults here other than the WBE fault," end quote.

I would now like to point out a few issues related to these submittals. This slide shows an example of one of the submitted figures in Exhibit 27. Note that there is no attempt in correlating geologic units between wells. All of the figures included in this exhibit are labeled draft with an original date of August 2006.

Also, as we saw during this hearing, the map to accompany these diagrams was not presented until halfway through this hearing. These diagrams were not previously referenced in any HLI-authored documents prior to Exhibit 45. In addition, these diagrams were not previously available to the Department, although they are dated back in 2006.

The next topic I would like to cover is faulting. This issue has been discussed significantly in this hearing, however, I would like to briefly discuss it.

This is figure 2 from Exhibit 45. As

Mr. Vincent pointed out in his testimony, the upper 1,000 feet of data for these profiles is not provided, limiting the use of this data to make assumptions regarding the upper 1,000 feet.

We have heard testimony that geologic surface features in the area are rare, limiting the ability to identify or map faults at the surface. We have also heard testimony that well logs cannot indicate the presence or absence of faulting.

Considering the seismic survey attempted by BSU on the M3 property was unsuccessful, it appears no data has been collected to support the lack of any faults that may be present in the upper 1,000 feet of the sedimentary section.

To further emphasize this point that shallow faults may exist on the property, I would like to point to Dr. Wood's testimony that, quote, "there was faulting going on but it was not as intense," end quote, when he was discussing the depositional environment of the upper sedimentary sequence. Later he testified he has observed faults in the Pierce Gulch Sand.

In conclusion, there is currently no

research that has been conducted to confidently rule out the presence of faults in the upper sedimentary sequence. If faults do exist, they may play on important role in groundwater flow in the area. They could serve as either conduits or flow barriers depending on the absence or presence of fault gouge. Or, more importantly in my opinion, could offset sedimentary units, increasing the hydraulic connections between different strata and reducing the hydraulic connection between withing the same strata.

The next topic I would like to discuss is the aquifer continuity between the Boise and Payette Basins. As we have heard through this testimony, the regional flow direction is not a significant aspect of the water right application. HLI spent a considerable amount of time and effort trying to illustrate the PGSA extending to the Payette Basin.

This slide shows part of page 1 of Exhibit 2, the one-year progress report developed by HLI. In this introduction paragraph, the connection to the Payette Basin is referred to three times, as highlighted in red. In my opinion, establishing a connection to the assumed

recharge mechanisms is more important than determining where the water flows once it leaves the site.

This figure -- this is figure 1 of Exhibit 18, showing HLI's representation of the regional groundwater flow in the Pierce Gulch Aquifer. There are several observations I would like to note regarding this figure.

HLI states on page 10 of Exhibit 45 that, quote, "The piezometer level map of the PGSA wells, based on reliable data from available wells completed in the PGSA." Additionally, on page 33 of Exhibit 45, HLI states, quote, "We selected 59 wells for our second measurements because these were the only ones we were confident -- we were confident were completed within the PGSA, and they were the only ones that remained as candidates after a rigorous analysis weeded out wells of poor and/or unknown construction," end quote.

It should be noted that there are only approximately 20 of the 59 wells that are confidently identified as PGS wells plotted on this groundwater map.

However, one of the wells, Caldwell test well No. 19, is one of the wells used to

develop the groundwater contours. This well is also one of the only four wells that lies west of the Ada/Canyon County line that were used to develop this map. It is noted in the data accompanying the flow map that the Caldwell well may be completed above the PGSA. HLI agrees that it's currently unknown whether or not this well is completed into or above the PGSA.

Data for the Zigler well, the well in the northwest corner of the map and located in the Payette Valley, was not provided in the -- by HLI in the accompanying data with the report, Exhibit 18. This well appears to be an important well in the inferred northwest groundwater flow as this well is the furthest most northwestern well.

I researched the well log for this well. This well is 176 feet deep that is composed primarily of silt and contains only 6 feet of saturated sand. It is not apparent to me that this well is completed in the PGSA.

The inclusion of data from these wells is inconsistent to HLI's statement that only wells confidently determined to be PGSA wells were -- with reliable data were used to construct this map.

This is a zoomed-in image of the previous slide focused on the M3 area that contains the majority of the data points plotted on the regional map. The quote, "green line," end quote, on the map represents a no-flow barrier and has significant importance on the groundwater flow direction. Notice at the termination of the line the groundwater flow abruptly changes to the north.

THE HEARING OFFICER: Termination where, Mr. Owsley?

THE WITNESS: Approximately right at the county line.

THE HEARING OFFICER: So the intersection of the Ada/Canyon County line and the green line depicted?

THE WITNESS: Yes, sir.

THE HEARING OFFICER: Okay. Go ahead.

THE WITNESS: To support the continuity between the Boise and Payette Basins, HLI states on page 11 of Exhibit 45, quote, "The normal resistivity logs for the Ted Daws No. 1 well submitted to IDWR in November 2008 and discussed in our January 2009 submittal clearly show that the sand unit called the Pierce Gulch Sand Aquifer

is a widespread deposit that extends to the Payette River Valley north of New Plymouth (figures 3 and 4)," end quote.

And on page 17, quote, "The identical log characteristics that HLI has shown in Boise area wells occur in the Ted Daws No. 1 well and the adjacent Virgil Johnson No. 1 well" --

THE HEARING OFFICER: Okay. Are you referring to another -- you're just narrating? You're not referring to a slide?

THE WITNESS: Correct.

-- "adjacent Virgil Johnson No. 1 well and also in the geophysical logs to the west near the town of Payette and south to Lake Lowell," end quote.

Continued on page 17, HLI states, "However, Dr. Ralston did not evaluate these geophysical logs from just wells that were described above and did not evaluate the Zigler well. Id. at 103-104. It appears the staff also did not," end quote.

HLI is correct that the staff did not review the geophysical logs for the mentioned wells in the Payette Basin for two reasons. First, the April 1, 2009 memo prepared by HLI is

the first and only authored -- HLI-authored document in which these wells are specifically referenced. The quote that is currently on the screen is the extent of the discussion of these wells in the 2009 submittal.

It reads, quote, "Indeed, the identified characteristic, quote, "'geophysical signature,'" end quote, "of the base of the Pierce Gulch Sand Aquifer appears to be present from deep petroleum exploration bores beneath the cities of Meridian, Caldwell, and Payette, Idaho (S.H. Wood personal communication, 2009) suggesting that the Pierce Gulch Sand Aquifer is extensive to not only the Payette River Valley but also to the Snake River Valley," end quote.

The subject wells are not directly referenced in the 2009 submittal.

The second reason the staff did not review the geophysical logs for the Daws and Johnson wells is because the logs were not properly identified and difficult to read. The slides shown here are the geophysical logs as they were submitted to the Department. Several issues made the review of these logs difficult.

First, it is unclear as to what the

labels RB1, BC1, TD1, and VJ1 represent. Second, there was not a map to accompany these plots to show their location. And third, the legibility of the actual data on the plots was difficult to read.

The Department was unaware of the significance of these plots until we read the April 1, 2009 memo from HLI.

This slide shows the two hydrogeologic profiles of the Pierce Gulch Sand Aquifer submitted in support of this application that extend into the Payette River Basin. Although similar, the two profile lines are not in the same location. They do, however, follow the general strike of the aquifer as defined to the northwest. Therefore, the change in dip cannot account for the different depths of the Pierce Gulch Sand Aquifer between the Payette River. The differences between the two profiles suggest additional information is necessary to better define this aquifer on a regional scale."

The next topic for discussion is aquifer testing. There are a few observations I would like to address on this topic.

This slide is figure 24 from

Exhibit 44 showing the drawdown plot for the Big Gulch stock well in the January 2009 submittal. The sudden increase at the end of the test raised questions for the Department and we commented accordingly in the staff memo.

This is figure 6 from Exhibit 45. HLI responded to our comments in the staff memo by correcting the drawdown data with the regional aquifer trend in an attempt to account for the late rises in water-level declines. Note the increase is apparent in the corrected water levels as it was in the original submittal. In addition, to the text on the graph states, quote, "Rise in apparent drawdown and derivatives after 6,000 minutes may reflect boundary effects of nearest known no-flow boundary, the edge of the aquifer shown in the site plan as the green line," end quote.

The presence of a hydraulic boundary is suspected by the boundary and HLI. A test of longer duration would have provided additional information needed to determine the significance of such a boundary.

This slide is figure 27 of Exhibit 44. This plot is a recovery plot of the Big Gulch

stock well. Note the deviation from the blue line on the left side of the plot. This deviation indicated an incomplete recovery in the water levels, meaning the water level did not fully recover to the pretest level. Again, we commented accordingly in our staff memo.

This slide is figure 7 of Exhibit 45. HLI presented this plot in response to our comments regarding the lack of recovery. This is a plot of drawdown recovery data that was previously shown but corrected for a trend that was misapplied to the data in the original submittal. Note the correction reduces the deviance from the straight blue line. The data also come closer to approaching full recovery.

Possible reasons for incomplete recovery are stated in the text on this plot that include, quote, "S over S prime less than one suggests late or incomplete recovery. Apparent late recovery caused by either a) incomplete correction for a seasonal declining regional water-level trend or b) hydraulic effects of the nearest known no-flow boundary -- the edge of the aquifer (green line on the site plan)," end quote.

The next topic I would like to discuss

is aquifer boundaries.

This is -- this slide shows figure 3 from Exhibit 44.

The quote, "green line," end quote is one of the two boundaries that HLI states they have defined. As we heard in Mr. Vincent's testimony, based on this figure, it is unclear as to how the base of the aquifer can daylight on the west side of SVR No. 6. Additional questions are related to the water-level fluctuations across the green line, as it appears in this figure that permeable sediments could be in contact across the line.

This slide shows figure 3 of Exhibit 2. The map depicts the elevation contours in which represent the bottom of the aquifer. The bottom of the Pierce Gulch Sand Aquifer is considered equivalent to the top of the underlying thick mudstone.

Equating the extent of the Pierce Gulch Sand Aquifer to the extent of the mudstone involves making the assumption that the sediments that directly overlie the mudstone are composed of deltaic sands. As I previously testified, the distinction between the Pierce Gulch Sand Aquifer

and the undifferentiated alluvial aquifers and aquitards that exist throughout the regions become less distinct with distance from the M3 property.

This slide shows figure 3-4 of Exhibit 33D. This figure depicts the subdivisions of Idaho group sediments in the Treasure Valley after Squires, et al., 1992 and Wood 1994."

These subdivisions of the sedimentary units is supported through the data and testimony submitted in support of this water right application. Note the gray lope on the northeast side of the group of classifications. This gray shaded area represents the lake margin deposits, which would indicate the -- include the deltaic sands of the Pierce Gulch Aquifer.

The limited extent of these lake margin deposits supports the earlier testimony I provided that the lake margin sediments merged into the finer-grained deposits within the basin. This depiction of the sedimentary units within the Treasure Valley indicates the lake margin deposits are not as extensive as conceptualized by HLI.

I would now like to focus on recharge mechanisms to the target aquifer. HLI specifies five sources of recharge that they feel are likely

in their opinion. Some of these recharge sources have been previously considered, others have not.

As shown on this slide, HLI states from page 25 of Exhibit 45 that, quote, "There are like -- there likely is recharge at least at these locations: 1), the Boise River in the upper basin (above Capitol Bridge); 2) where PGSA rises up dip to the present-day Boise River gravels east of the United Water Idaho (UWID) Swift well (in the vicinity of Farmers Union Ditch Company's river diversion; 3) added pressure head from the flood irrigation and irrigation laterals off the New York Canal and other main canals; 4) recharge along the eastern edge of the -- eastern edge of the basin northeast of Eagle; and 5) from groundwater moving into the aquifer under an upward gradient from below," end quote.

I would like to address each of the potential sources in the following slides.

The quote on the slide is from page 28 of Exhibit 45. It states, quote, "Staff for some reason combines reaches long known to be gaining with reaches long known to be losing apparently to suggest," quote, "'considerable uncertainty,'" end quote, "in the seepage analysis," end quote.

Staff referenced the various estimates of the gains or losses associated with the Boise River in the staff memorandum to show there is considerable uncertainty in the estimated -- in the estimates and sources of such estimates.

I will now explain the reference estimates to highlight the uncertainty within these estimates.

This slide shows table 1 from Exhibit 50, the IDWR staff memorandum. The table shows four different measurements of gains or losses associated with the Boise River in the reach between Lucky Peak and Glenwood Bridge.

The first estimate, labeled IDWR, 2009, represents the difference in the gauge readings from Lucky Peak to Glenwood Bridge for the nonirrigation season (November through March). Only the winter flow measurements were used in the estimate to eliminate any losses or returns from irrigation diversions. The results from these calculations resulted in a net gain of 14 cubic feet per second.

The second estimate, labeled USGS, 1997, represents the results from the 1999 USGS report that was submitted as an exhibit by the

protestants last week titled "Stream-flow Gains and Losses in the Lower Boise River Basin, Idaho, 1996 through 1997."

The results from this study indicate a net gain of 52 cubic feet per second based on a seepage analysis along the lower reach of the river above Glenwood Bridge.

The third estimate, labeled Urban and Petrich, 1998, was the estimate used in the Treasure Valley Hydrologic Report. The data used for this estimate are unknown, other than it represents the reach of the river between the Lucky Peak Dam and Capitol Bridge. The result of this estimate was a loss of 21 cubic feet per second.

The fourth and final estimate libeled Urban 2005 is an updated estimate for the Treasure Valley Hydrologic Project. Again, the data used for this estimate is unknown, other than it represents the reach from Lucky Peak to Capitol Bridge in the year 2000.

The calculations used to produce this estimate are unclear, as a gauge did not exist at Capitol Bridge in the year 2000. The results from this estimate indicate a net loss of 110 cfs,

cubic feet per second.

In summary, I included this table in the staff memorandum to highlight to the Hearing Officer the current level of uncertainty in the gains and loss associated with the Boise River.

This slide shows one of the submitted cross-sections developed by HLI in Exhibit 26. With respect to PGSA exposure under the Boise River, HLI states on page 28 of Exhibit 45 that the geophysical signature of the Swift well represents the PGSA 400 feet beneath the river.

According to this figure, the PGSA is depicted from approximately 75 feet to 225 feet below the Boise River at the same well. This inconsistency questions the certainty of identifying this interval of this well as PGSA.

In addition, the region identified as the PGSA in the two central wells of this diagram is not distinguishable from the undifferentiated alluvial aquifers and aquitards in the upper left section of this diagram.

MR. FEREDAY: Mr. Owsley, I'm sorry. I didn't quite catch that. You said that this Swift well depth interval was inconsistent with what other measurement?

THE WITNESS: With this figure.

MR. FEREDAY: Which depth estimate was inconsistent with this figure?

THE WITNESS: I'll reread it.

With respect to the PGSA exposure under the Boise River, HLI states on page 28 of Exhibit 45 that the geophysical signature of the Swift well represents the PGSA 400 feet beneath the river. According to this figure, the PGSA is depicted from approximately 75 feet to 225 feet below the Boise River at this same well.

MR. FEREDAY: Okay. Thank you.

THE WITNESS: With respect to the third source of proposed recharge, we have heard testimony regarding the age and travel time of the ground water in the PGSA. It is still unclear to staff as to how the irrigation water seepage upstream from Cole Road is available as recharge -- as a recharge source to the PGSA.

The fourth source of recharge was not included in the numeric model developed to predict impacts from pumping in the PGSA. There was no attempt to identify or quantify the specific mechanisms that could be contributing recharge to the PGSA in the eastern edge of the basin

northeast of Eagle.
HLI's fifth and final source of proposed recharge to the PGSA is from ground water moving into the aquifer from the thick mudstone. HLI's recharge from groundwater moving into the aquifer from an upward gradient from below is not viewed as a significant source of recharge to the PGSA based on HLI's finding in the modeling report that stated, quote, "The difference between runs with and without this upward flow from beneath the Pierce Gulch Sand Aquifer were found to be so small (maximum increase in water levels in the Pierce Gulch Sand Aquifer of less than 0.1 foot) that an eighth layer was deemed unnecessary," end quote. Page 17 of Exhibit 16. Therefore, it seems today HLI would suggest this recharge mechanism and not model it as one.
These quotes are from page 28, Exhibit 45, and the top one states, quote, "In past studies and HLI's more recent, it is shown that the PGSA receives substantial recharge primarily from the Boise River and associated canal systems," end quote. No specific references are provided to support this statement.
The second quote states, quote, "This

issue of water availability for the proposed project does not, in our view, require M3 Eagle to work out the exact PGSA recharge mechanisms in the Boise Basin," end quote.
Department agrees that the exact recharge mechanisms in the Boise Basin do not need fully identified, but an attempt to characterize and quantify the recharge mechanisms to the aquifer in which the water right application should be done.
The third quote, also from Exhibit 45, states, quote, "The aquifer is strongly recharged," end quote. This statement is not referenced with any documentation to support this statement.
Now I'd like to change the focus of this testimony to water-level trends.
THE HEARING OFFICER: Mr. Owsley, before you go there, this might be a good time for us to take the afternoon break, full 15 minutes, and we'll switch out. Okay? So let's go off the record.
(Recess.)
THE HEARING OFFICER: Mr. Owsley, you may continue.

THE WITNESS: Thank you.
Now I'd like to change the focus of this testimony to water levels and trends. This slide is figure 46 of Exhibit 44. It is a plot of the water-level data collected by HLI in the M3 test wells. The dates on the plot range from July of 2006 to October of 2008. There are several observations I would like to point out with this graph.
First, I would like to point out four wells that all show a similar downward trend over of the past three years of monitoring. The wells are SVR-7, SVR-9, TW No. 2, and TW No. 3. They are the two blue plots and the pink and green plots on the graph.
THE HEARING OFFICER: Okay. Will you identify for us which is which?
THE WITNESS: Sure.
THE HEARING OFFICER: Because we can't read it. At least I can't.
THE WITNESS: This top blue line (indicating) is SVR No. 7. The second blue line is SVR No. 9. The pink line is TW No. 2. And the green line is TW No. 3. These wells are all located in the central portion of M3.

THE HEARING OFFICER: Mr. Owsley, what is the -- what are the gradations of scale on the Y-axis? Can you tell me?
THE WITNESS: Every foot. These are 1-foot increments, and the water levels have been adjusted -- either had elevations added or subtracted so they could all plot on the same graph.
THE HEARING OFFICER: And over what period of time is this?
THE WITNESS: It starts back in July of 2006, and the last data that's presented is October of 2008.
THE HEARING OFFICER: So approximately two years?
THE WITNESS: Yeah, for a couple of the wells we have three -- three -- three data points that fall on different years. For example, August of 2006, 2007, and 2008 are available in SVR No. 7, similar for SVR No. 9. We have three data points we can look at within individual years.
THE HEARING OFFICER: Okay.
THE WITNESS: A close visual inspection of the water level -- water levels from these four wells on the M3 property shows a declining trend

over the past few years. This trend is interesting, considering the testimony that water levels are rising down in the valley in wells believed to be completed into the same aquifer.

Next, I'd like to point out two more wells on this graph. The wells are United Water State and Linder test well and TW No. 1. These wells are represented with the orange plot, United Water test well -- State and Linder test well, and the maroon plot, TW-1 on the graph. Notice the significantly different seasonal water level fluctuation exhibited in these wells when compared to the first four identified.

TW No. 1 is located down in the southwest portion of the, quote, "panhandle" section of the property. United Water State and Linder well is located near the intersection of State Street and Linder Road.

The Department noted this change in water level fluctuations in the staff memorandum, and HLI responded on page 20 of Exhibit 45, quote, "The PGSA, as monitored by M3 Eagle's more westerly wells, are confined with lower storitivity and thus show a greater water-level drawdown and recovery from the collective pumping

from the aquifer to the south. Such responses are consistent with the basic principles of hydrogeology," end quote.

And, quote, "The fact that the water level fluctuations between the two wells is," quote, "'nearly an order of magnitude greater,'" end quote, "does not justify staff's implication that the two well groups lie in separated geologic units. Such a difference would be expected, given the location of these wells relative to the pumping wells that are causing the seasonal drawdowns," end quote.

The staff did not ever imply that the two groups of wells were in separate geologic units. This difference in fluctuations does not support HLI's claim that the fluctuations are due to the proximity of the pumping centers, or one would expect the State and Linder monitoring well would have a greater response to such pumping than TW No. 1.

The response by HLI is not supported by the data presented in figure 46, as the seasonal fluctuations in State and Linder (closer to the pumping wells) are approximately 5 feet, whereas the same seasonal fluctuations in TW No. 1

are on the order of 16 feet.

On page 14 of Exhibit 2, HLI states, quote, "A water-level change map of measured water levels in comparison to the water levels reported on driller's reports is planned for HLI's comprehensive report," end quote.

The Department has not received a water-level change map from HLI. However, HLI does appear to have knowledge of water-level changes when they quote on page 27 of Exhibit 45 that, quote, "many of the wells completed in the PGSA have water-level elevations that are at or above the levels reported by the well driller when the well was initially completed," end quote.

It should be noted that many of the PGSA identified wells on the M3 property have water levels that are below the level they were when drilled.

Now I'd like to change the focus of this testimony to the groundwater modeling category. This slide shows two quotes from HLI documents that discuss the southeastern boundary of the model that state on page 29 of Exhibit 45, quote, "The Boise River and New York Canal seepage values were not directly input to the model," end

quote.

I agree that the seepage values were not directly input into the model, but I do think the seepage is represented in the model. This idea is supported by the statement made by HLI on page 28 of Exhibit 16 that states, quote, "We assume that a significant portion of this general head flow into the model's southeastern boundary originated as seepage from both the Boise River and the New York Canal," end quote.

This slide shows tables 3 and 4 from Appendix B of Exhibit 16. These tables show the water budgets for the most current model runs performed by PGG. The inflow rates assigned to the PGSA in the southeastern corner of the model are based on losses from the Boise River and New York Canal and are higher than all of the combined pumping within these layers (Layers 5, 6, and 7) that represent the PGSA.

In the upper table, table 3, the total inflow in the southeast corner is 114.77 cubic feet per second. The total pumping from this table is 94.12 cubic feet per second for these layers over the entire model domain.

In the lower table, table 4, the total

inflow in the southeastern corner of the model is 106.82 cubic feet per second. The total withdrawal from these layers for the entire model domain due to pumping is 94.4 cubic feet per second.

The amount of water entering the model is an approximate amount that is similar to a better known rate of current discharge. A slight error in the inflow component to the model would result in the predicted impacts to be underestimated.

I would like to change the focus of this testimony to the geochemistry work completed in support of this application. I have only a few observations related to this topic.

First, we heard testimony from Mr. Glanzman that the TDS values in the Pierce Gulch Aquifer ranged from approximately 80 milligrams per liter to over 400 milligrams per liter. He later testified that the low TDS value indicates you are near a recharge zone.

The lowest TDS value from PGSA wells came from the State and Linder well, which is tens of miles from the speculated recharge area. I'll identify the State and Linder well right here on

the map. It's, again, near the intersection of State Street and Linder Road.

The location in which the State and Linder well is located is defined as a discharge area for the PGSA by HLI, an inconsistency in the conceptual model and geochemical results.

It does not appear that many (or any) shallow, non-PGSA identified wells were sampled and analyzed. The analysis of the overlying aquifers when compared to the PGSA analysis would provide information related to the interconnectivity between the aquifers.

I would now like to change the focus of this to aquifer sustainability. The quote on this slide is presented on page 40 of Exhibit 45. On this page HLI states, quote, "Although the staff refers to lines of evidence suggesting the aquifer may be limited, not even listing -- not even a listing of such evidence appears in the staff memo," end quote.

The lines of evidence the staff was referring to was the lack of recovery in the Big Gulch stock well and the current downward decline in the monitored water levels in test wells completed on the M3 property. A response to the

lack of recovery was presented in Exhibit 45 and presented in this testimony. However, the fact that the water-level declines on the M3 property exist without being nearby a significant source of pumping questions the recharge rates and long-term sustainability of the aquifer.

An additional concern regarding the long-term sustainability was presented through the testimony that the southeast Boise groundwater management area exists although very productive aquifer materials exist in the area. The southeast Boise groundwater management area exists on the edge of the Treasure Valley aquifer system, much like the M3 area.

The southeast Boise groundwater management area is underlain with highly transmissive aquifer materials, much like the M3 Eagle area.

And finally, the recharge mechanisms to the southeast Boise area are limited, although it exists within this basin that receives a significant amount of recharge on an annual basis.

There are a few final miscellaneous comments I would like to make. This slide shows two quotes presented by HLI regarding the

Department's uncertainties regarding the hydrogeology of the area.

The first quote from page 38 of Exhibit 45 states, quote, "The largest uncertainties in understanding the hydrogeology of the north Ada County area, in our opinion, derive from the data available from poor quality driller's reports and poorly constructed or dilapidated domestic and irrigation wells that are so prevalent here," end quote.

And later, on page 40 of Exhibit 45, HLI states, quote, "The staff does not address in its report the uncertainty inherent in the use of data from wells that are not sealed, whose construction is both unknown and questionable, and that may be receiving groundwater from (or leaking into) aquifers other than the PGSA. This omission is significant," end quote.

HLI is actually contributing to these uncertainties in the understanding of the hydrogeology by using poorly-constructed wells to collect data and reference such wells in support of their conclusions. Examples of such uses are, one, the SVR No. 7 well was used as the pumping well in the nine-day aquifer test. This well,

admitted by HLI, has construction issues.
Two, the Big Gulch stock well, which was the closest observation well to the pumping well in the SVR No. 7 nine-day aquifer test has unknown construction.
Three, the Kling irrigation well was used as a pumping well in HLI's first aquifer test. This well, again, has construction issues.
And four, the Eagle Pines well, which is documented by HLI to be unsealed, is referenced twice in the response to the staff memorandum as, quote, "another example of remarkably stable water levels in the PGSA," on page 38 of Exhibit 45.
This slide shows figure 27 of Exhibit 45. This figure depicts the Eagle Pines Water Association old and new irrigation well diagrams. Note the annular seal on both wells is identified as "Unsealed Annular Seal."
On page 40 of Exhibit 45, HLI states, quote, "The staff does not address in its report the uncertainty inherent in the use of data from wells that are not sealed, whose construction is both unknown and questionable, and that may be receiving groundwater or leaking into aquifers other than the PGSA. This omission is

significant," end quote.
And again on page 38 of the same document, Exhibit 45, HLI states, quote, "Another example of remarkably stable water levels in the PGSA," end quote.
By referring to the water levels in this well that is identified by Mr. Squires as unsealed, HLI is not consistent with their previous statements regarding the use of data from unsealed wells.
And that concludes my narrative testimony.
THE HEARING OFFICER: Okay. Thank you, Mr. Owsley.
Now, do we have a document that we can mark as Exhibit 903, I believe?
THE WITNESS: Correct.
THE HEARING OFFICER: Is that what you have?
THE WITNESS: Yes. Would you like this copy?
THE HEARING OFFICER: Is that document -- do you have one that's marked 903, Michele?
MS. EDL: She's got it logged. I don't see one with the sticker.

THE HEARING OFFICER: Is there one that's marked?
MS. EDL: There it is, yeah.
THE HEARING OFFICER: Okay.
THE WITNESS: Okay. Do you want that?
THE HEARING OFFICER: No.
Mr. Owsley's narrative is concluded. And at this point, unless there's some objection, I'll receive the slide presentation into evidence.
MR. FEREDAY: No objection.
THE HEARING OFFICER: Okay. Other parties?
MR. THORNTON: No objection.
MR. ALAN SMITH: No objection.
THE HEARING OFFICER: Okay. It's received into evidence.
(Exhibit 903 admitted.)
THE HEARING OFFICER: Again, Mr. Owsley, you'll be expected to come back for examination the 28th and 29th. Probably the 28th. Okay?
THE WITNESS: Thank you.
THE HEARING OFFICER: Okay. Now, I think would be Mr. McVay.
Is he here?
While we're doing that, Mr. Vincent, did you make copies? Do you have those available?

MR. VINCENT: I did, yeah.
THE HEARING OFFICER: Okay. Thank you. Why don't we distribute those while we're waiting for Mr. McVay.
Why don't we go off the record.
(Recess.)
THE HEARING OFFICER: Okay. I guess we are recording again.
Would you mark that as 906, please, Exhibit 906.
(Exhibit 906 marked.)
THE HEARING OFFICER: Okay. We've resumed recording, and Mr. Michael McVay has come forward. We've marked a couple of documents, and I want to just clean up the record for purposes of ensuring that the documents we have discussed are received into evidence.
So according to our records, Exhibits -- or the documents marked as Exhibits 901 through 903 have been received into evidence.
(Exhibit 902 admitted.)
THE HEARING OFFICER: 904 is a copy of Mr. Owsley's narrative, which is printing right now, and he'll distribute.

Exhibit 905 is a copy of the upcoming PowerPoint presentation prepared by Mr. McVay, and also contains his narrative. So there will only be one document and -- that relates to the PowerPoint presentation. And then we've also marked a document as Exhibit 906, which is a memorandum that's referred to in some of the documentation, I'm told, that's previously been submitted. And I don't -- Mr. McVay says that he doesn't intend to refer to this document, but maybe we'll just wait and see what happens as we go through and then talk about the admission of this document at the end.

Anybody?

MR. FEREDAY: Yes. Mr. Hearing Officer, since we're on this subject of this document, 906, Exhibit 906, which is a January 28th, 2009 memo to Dennis Owsley from Mike McVay, copies to Misters Vincent and Raymondi, this -- I understand from a brief conversation I had with Mr. McVay that this is, I guess, his original effort with regard to his water-level measurement work.

That effort, evidently, resulted in two memos, this being the first, this January 28th being the first, and the second being what became

Exhibit A to the staff's March 2nd memorandum. And at this point we have not seen this January 28th memo before and I think, as Mr. McVay I think recognized, there has been some confusion because of a reference in the March 2nd memo to some 16 wells that he worked with when, in fact, his Exhibit A only referred to ten. There were some other discrepancies as well that we were somewhat confused about.

But this, I assume, will help to answer those questions, so I think it should come in.

THE HEARING OFFICER: Okay. Any objection to receiving this document into evidence from the parties?

MR. ALAN SMITH: None. That's 906?

THE HEARING OFFICER: It's 906.

MR. ALAN SMITH: No objection.

MR. THORNTON: No objection.

THE HEARING OFFICER: Mr. Edwards?

MR. EDWARDS: No.

THE HEARING OFFICER: Okay. Document marked as Exhibit 906 is received into evidence.

(Exhibit 906 admitted.)

THE HEARING OFFICER: Mr. McVay, if you'll

stand please and raise your right hand.

MICHAEL McVAY,

having been called as a witness by the Department, was duly sworn and testified as follows:

THE HEARING OFFICER: Thanks. Please be seated.

If you would state your name, spell it for the record, and then describe your position with the Department of Water Resources and a brief description of your education and experience, please.

THE WITNESS: My name is Michael McVay, M-i-c-h-a-e-l, McVay, M-c-, capital V-a-y. I'm a staff hydrogeologist with the Department of Water Resources. I've been here for just a little bit over a year now. Before that I worked for approximately 16 months at the Department of Environmental Quality for the State of Idaho. And previous to that I was in graduate school at the University of Idaho studying hydrology through the geology department.

Prior to my education, my master's education, I worked for approximately 16 months at

an environmental engineering firm in Laramie, Wyoming, called Tri-Hydro, where I performed some groundwater studies, groundwater remediation, engineering remediation, and mine waste remediation.

And my undergraduate degree was from the University of Idaho in 2003 in geological engineering.

THE HEARING OFFICER: Okay. You may narrate your testimony.

THE WITNESS: Thank you.

DIRECT NARRATIVE TESTIMONY

BY MICHAEL McVAY:

THE WITNESS: I would like to thank the Hearing Officer for this opportunity to provide testimony narrating the water level analyses which I performed. In January of 2009, Dennis Owsley requested that I performed a water level analysis of 17 north Ada County area wells. All of the wells are part of the State of Idaho groundwater-level database. These are the historical water-level data for this area.

In particular, Dennis asked me to look at the data and attempt to identify any

water-level patterns that will allow for the differentiation of wells completed in the Pierce Gulch sands from wells completed in other water-bearing strata.

Restated, this analysis was conducted to compare water levels from different wells to each other in an effort to identify Pierce Gulch completions from other wells -- based on water level behavior. This undertaking was not intended to determine the periods of rising and declining water levels in individual wells.

When I plotted the available water-level data, it was apparent that the data spanned different time periods and were collected on variable sampling frequencies. Therefore, it seemed most appropriate to find a time period that allowed for the comparison of the largest number of wells over the longest period of time.

For the first analysis, I chose the general time period of 1996 to 2003 because this is the longest period of time in which all wells have data.

For the second analysis, I chose a general time period of 1996 to 2008.

As illustrated in this table, the data

for the 17 wells span different time periods. Since I was trying to compare the wells to each other, I wanted to compare the wells over a common time period. Because some of the wells don't have data until 1996, I chose it as the earliest year in the dataset. Similarly, I did not conduct the first analysis up to present. But because several of the wells did not have -- or excuse me, similarly, I did not conduct the first analysis up to present, but because several of the wells did not have data. Excuse me.

THE HEARING OFFICER: Okay. Mr. McVay, will you also just slow down and be deliberate.

THE WITNESS: It felt really slow.

THE HEARING OFFICER: No. Need to go about half the speed you're going.

THE WITNESS: All right. So let me restate that last sentence. I kept stumbling over myself.

The first analysis I did not conduct up to present because they didn't -- most of the wells didn't have data up to 2008.

In any time series analysis, the data needs to be collected and analyzed for equal time-steps. Since the historical monitoring network data had been collected on variable sample

frequencies, I felt it was necessary to filter data to roughly equal time-steps.

THE HEARING OFFICER: Okay. Mr. McVay, you're at the same speed you were before, I think.

THE WITNESS: That felt slower.

THE HEARING OFFICER: You need to drop the speed by half. Okay?

THE WITNESS: Were you able to get that first sentence, or should I repeat?

THE HEARING OFFICER: I think the reporter is getting it down.

THE WITNESS: Okay.

THE HEARING OFFICER: But we're trying to digest it as it comes through, and what you're referring to, and he is as well.

THE WITNESS: Okay.

THE HEARING OFFICER: I don't mean to badger you.

THE WITNESS: No, that's okay. I'm nervous and going fast.

THE HEARING OFFICER: Just go really slow, please.

THE WITNESS: Okay. I'll repeat the second sentence.

Since the historical monitoring

network data had been collected on variable sampling frequencies, I felt it was necessary to filter the data to roughly equal time-steps. Often the same general time period each year is chosen to determine the long-term trend in water levels.

Indeed, this is the current procedure employed in trend determination and model trend calibration for the Eastern Snake River Plain Aquifer.

One reason for filtering to equal time-steps is to avoid artifact trends that misrepresent the dataset. This concept is illustrated with synthesized hypothetical data in the following figures.

THE HEARING OFFICER: Okay. I'll tell you the same thing. You're at the same meter you were before. Maybe we need to set a metronome out here. But just really slow it down. Take a breath between sentences. Count to two, go on to the next one.

Thank you.

THE WITNESS: Okay. One reason for filtering to equal time-steps is to avoid artifact trends that misrepresent the dataset. This

concept is illustrated with synthesized hypothetical data in the following figures.

This figure illustrates synthetic water-level data collected monthly over the entire time span. This hypothetical plot displays seasonal variation and a stable long-term trend of negative .007 inches per year, which I would consider stable. So I created this data, I synthesized it to illustrate a point.

To simulate the effect of nonuniform sampling frequency, I created subsets of data from the data used in figure 1 by instituting random sampling frequencies. To do this, first I picked a random starting date and used the RAND function in Excel to generate random numbers from one to 12. This random numbers represented the amount of time in months between sampling dates. So what I did is I used this random number generator to select dates on a random frequency from the original dataset.

This figure utilizes the same data population as in figure 1, with a delayed -- however, with the data collected on a random frequency. The plot illustrates how variable sampling frequencies can create false or artifact

trends. Note the apparent trend is two orders of magnitude different from the trend in the previous plot. In the previous plot, it was negative 0.007 inches per year, and in this plot it's negative .12 inches per year. I repeated this exercise a few times just to show how the random sampling frequency can affect water-level trends.

This figure is another random sampling frequency plot created using the RAND function in Excel. I created several of these graphs to illustrate the artifact concept. Note the trend in this data is two orders of magnitude different than the trend in figure 1. It also has a different sign. So this is a positive .13 inches per year, and it's just another random sampling frequency that I generated.

This figure is another random sampling frequency plot. Note the periods of different apparent trends. Note also that the long-term trend of this data is one order of magnitude different than the trend in figure 1. This one is negative 0.06 inches per year.

Again, this is another figure -- oops, excuse me. Another figure illustrating trends associated with random sampling frequencies. Note

that the trend of this data is two orders of magnitude different (and has the opposite sign) than the dataset from figure 1.

This final figure illustrates how filtering to yearly values can assist in eliminating artifact trends that result from variable sampling frequencies. This data was filtered from the figure 2 dataset using a two-month window for data capture. Note the similarity in trend values between figure 1 and this figure. First figure was negative 0.007 inches per year, negative .006 inches per year in this figure.

Another reason for filtering to yearly data is to reduce the variability associated with short-term trends, i.e., seasonal fluctuations. The best-case scenario is to pick the same date during the most stable period of year. In short, try to pick a date before or after the irrigation season.

The variable sampling frequencies present in the historical monitoring network dataset create two issues that forced me to deviate from the best-case filtering scenario.

First, the beginning of the irrigation

season is difficult to assess. Since data is collected sporadically -- pardon me, there is not a good record of when the water levels begin to drop each year, in each well -- excuse me, each year in each well, and often only relative high-water levels are recorded.

MR. FEREDAY: Excuse me. Mr. McVay, could you explain to me what you mean by "relative high-water levels."

THE WITNESS: When looking at the hydrograph, when you see a peak or a low water level, you can't assume that's the high of the season or the high of the year because we don't have a complete record. All's you know is that the two data points on either side of it are lower. So all's we know for sure is it's relatively higher than the ones next to it and not seasonally or yearly high.

MR. FEREDAY: Thank you.

THE WITNESS: As can be seen in this table, a common high-water level date is hard to assess. The dates of the highest yearly water level varied over the period of record, and the table displays averages of these dates for each well. The dates in red are the results of averaging spring and --

spring and fall high-water level dates, and as such they offer little meaning.

But what we can see is -- is if we average dates that are similar, you know, we got middle of March, October, late March, middle of March, late April, late April, mid-May, September, March again, October 13th -- or October, September, March. And the point of this is with good data we probably would be able to differentiate when irrigation pumping starts to effect the water levels in all wells. However, in this dataset it changes well to well, from season to season, and largely -- and due to the sporadic nature of the data.

MR. FEREDAY: Excuse me. Mr. McVay, just because I've got what is only a black-and-white copy here, your presentation also will be up on the web so it can be seen in color?

THE WITNESS: Yes.

MR. FEREDAY: Okay. Thank you.

THE WITNESS: Did you need me to point out the red ones in this?

MR. FEREDAY: Well, actually, it might be helpful if you could just name which ones are in red.

THE WITNESS: Okay. So well 4 north, 1 west, 13 --

MR. FEREDAY: How about coming down and giving the dates on the right.

THE WITNESS: Sorry. A little less cumbersome.

The fourth date down, 2 July and 10 July, are both -- I would call them erroneous averages. They're averaging vastly different dates.

Down towards the bottom we have 22nd July and 29 May, and both those are also erroneous averages.

MR. FEREDAY: Thank you.

THE WITNESS: The second reason it is not possible to pick the same pre-irrigation date is because there are data gaps that make selecting the same date, or even same month, impossible for all wells. Therefore, to assemble a large enough record to analyze, I chose a three-month window with which to capture the data.

The most frequent data measurements occurred in the March, April, May window, which allowed me to compare the largest number of wells.

Although it was not possible for me to

choose a date for each well that is absolutely before seasonal changes take effect, it is important to note that every effort was made to select the earliest and most similar dates in each well. For most of the wells, I was able to pick very similar dates, which reduced the variability associated with seasonal water-level changes.

And as you can see on these wells up here (indicating), the first well, they're almost all in March. I have an April, some Aprils towards the end, and then a May at the very end of it.

Second well here you can see I've got an April, the rest are Marches. And most of them are typically like that. There are a couple, the far bottom right corner, we have a little more variability. And we get months from all three -- or we get all three months of the data range in that one. And admittedly, there's more variation in wells like that.

And here's a continuation of that same table. I know you can't see it on your copies, but there are several dates in red. And the first well you could see the bottom dates are in red, the bottom center row, we have a couple dates in

red in 1997.

And then on the next page, the top right, I have some -- two dates in 2008 that are in red. The dates shown in red text I found data selection errors in the water-level data that I chose. So that's what the red is representing, some errors that I had made.

The most significant error was in well 4 north, 1 east, 3DAD1. An apparent copy-and-paste error led me to report an incorrect water level for 2007 and completely omit the information for 2008.

Instead of a declining water level, this well now appears stable with a slight rise of 0.009 feet per year. I classified this well as undifferentiated, and HLI classified it as Terteling Springs in their response memo. I would defer classification to HLI.

MR. FEREDAY: Excuse me. Mr. McVay, I just wanted to make sure I understand this. This figure 10 on page 15 is something that you've done since the March 2nd memo; is that right?

THE WITNESS: Correct.

MR. FEREDAY: Okay.

THE WITNESS: In preparing for this, I

noticed I made many errors, and so I wanted to graph them up and show you what those errors caused.

MR. FEREDAY: I see. Thank you.

THE WITNESS: There was also an area in graphing well 5 north, 1 east, 26DCD1. I erroneously chose the February date in 1997 instead of the March date. This did not change the conclusions about this well. This well still groups with other Dry Creek area wells based on water-level behavior, which was my main conclusion.

There was another error in graphing well 5 north, 3 east, 12CCA1, again, I erroneously chose the February date in 2008 instead of the May date. The trend changed from negative 0.32 feet per year to negative 0.42 feet per year. This did not change the conclusions about this well. This well still exhibits a slight downward trend during the period I analyzed.

So after selecting a generally similar time span, filtering the data to yearly spring measurements, I graphed the data. I then visually compared the graphs, looking for similarities and differences, that would allow me to classify wells

based on water-level behavior. I placed linear regression approximations on the graphs to facilitate comparison of wells by linear trends.

Once I completed the analysis, I submitted my results to Dennis Owsley and Sean Vincent. This occurred twice, as Dennis asked me to re-review any wells with more current data.

The second analysis utilized fewer wells because fewer wells had data beyond 2003. Therefore, two memos were submitted to Dennis and Sean.

The first memo dated January 28, 2009 (Memo 1) included 17 wells. However, well 5 north, 1 east, 32DBD1 had only fall data and was not included in the analysis. Therefore, 16 wells were evaluated for the general data comparison period of 1996 to 2003.

Due to the data constraints (i.e., lack of measurements) four wells were evaluated for the time period of 1996 to 2002, and one well was evaluated for the time period 1996 to 2004. The graph for well 5 north, 1 east, 32DBD1 was included in the figures for completeness of record because Dennis had asked me to review 17 wells.

The second memo dated March 2nd, 2009

(Memo 2) included ten wells. However, well 5 north, 1 east, 32DBD1 only had fall data that was not included in the analysis. Regrettably, I included this well in the calculation of the average trend and in the presented range of trends.

The range that I should have reported is positive 0.13 feet per year to negative 0.49 feet per year instead of the reported negative 0.11 feet per year to negative 1.06 feet per year. And average trend for the well should have been negative 0.20 feet per year, instead of the reported 0.29 feet per year.

These adjusted trend values also reflect the changes associated with correcting data selection errors in wells 4 north, 1 east, 3DAD1, and well 5 north, 3 east, 12CCA1.

The conclusions from these analyses are:

No. 1, wells in the Dry Creek area exhibit a similar water-level pattern that is different from the other wells I reviewed.

No. 2, there is no water-level pattern that allows for the differentiation of water-level fluctuations in the Pierce Gulch Aquifer from

non-Pierce Gulch water-level behavior in the wells I reviewed, except for those in Dry Creek.

No. 3, all non-Dry Creek wells -- excuse me. No. 3 applies to memo one only, the first analysis. All non-Dry Creek wells that I reviewed, except for 4 north, 2 west, 7AAC1 display negative water-level trends over the period analyzed with a range of negative .21 feet per year to negative .49 feet per year, and an average trend of negative 0.27 feet per year.

The fourth conclusion applies to memo 2 only. All non-Dry Creek wells that I reviewed, except for 4 north, 1 east, 11BBB1 and 4 north, 1 east, 3DAD1 display negative water-level trends over the period analyzed. The non-Dry Creek wells displayed trends ranging from positive 0.13 feet per year to a negative 0.49 feet per year with an average trend of negative 0.20 feet per year.

It is interesting to note that both 4 north, 1 east, 11BBB1 and 4 north, 1 east, 3DAD1 are classified as Terteling Springs by HLI.

Next I would like to address some of the comments provided by HLI in the final technical memorandum response to IDWR staff memo, or better known as Exhibit 45.

In the final paragraph on page 29 -- it's a continuation -- excuse me -- from the final paragraph on page 29, the first sentence on page 30, HLI asserts, quote, "All but one of the wells analyzed by HLI and McVay show increasing water levels over the past 6 to 12 years."

I do not agree with this statement. As discussed earlier, it is important to pick equal time intervals for analysis. The data records for these wells are collected on different -- different and varying time schedules. By using the records as is, HLI may have incorporated apparent trends caused by variable collection frequencies.

Furthermore, the statement is based on hand-drawn lines that encompass different data periods. The choice of different data periods in an attempt to illustrate rising levels -- excuse me, rising water levels, is not, in my opinion, an objective, unbiased method of water-level analysis.

My analyses were not intended to assign a water-level trend to any aquifer, and only to compare water levels in an effort to identify the aquifers.

The next several slides depict the HLI analysis of water levels using the entire dataset for each well.

This figure is a screen capture of the HLI response figure 8. Hand-drawn lines are superimposed on hydrograph to illustrate recent trend. The data that were collected during the time span illustrated by the blue lines were collected on frequencies different than the data preceding this period, which may produce artifact trends as previously discussed.

Local minima and maxima in this dataset cannot be assumed to be water-level inflection points, only data inflection points. Note the HLI trend is applied to approximately the last seven years.

Also note that the lines cut through some of the data.

This next feature -- excuse me. This next figure is a screen capture of HLI response figure 9. Hand-drawn lines are superimposed on the hydrograph to illustrate recent trend. Data that were collected during the time span illustrated by the blue lines were collected on varying frequencies.

Notice how the amplitude and frequency of the latter data are different than the preceding data, which may indicate artifact trends due to changes in sample frequency. Again, local minima and maxima in the dataset cannot be assumed to be water-level inflection points, only data inflection points. Note the HLI trend is applied to approximately the last seven years.

Also note that lines -- that the lines cut through some of the data.

This figure is screen capture of HLI response figure 10. Hand-drawn lines are superimposed on the hydrograph to illustrate recent trend. Data were collected on varying frequencies, which may produce artifact trends. Local minima and maxima in the dataset cannot be assumed to be water-level inflection points, only data inflection points. Note the HLI trend is applied to approximately the last four years.

This figure is a screen capture of the HLI response figure 11. Hand-drawn lines are superimposed on the hydrograph to illustrate recent trend. Data were collected on varying frequencies, which may produce artifact trends. Local minima and maxima in the dataset cannot be

assumed to be the water-level inflection points, only the data inflection points. Note the HLI trend is applied to the last four years.

Note also how the lines cut through some of the data.

This figure is a screen capture of HLI response figure 12. Hand-drawn lines are superimposed on the hydrograph to illustrate recent trend. Data were collected on varying frequencies, which may produce artifact trends. Local minima and maxima in the dataset cannot be assumed to be water-level inflection points, only data inflection points. Note the HLI trend is applied approximately to the years 1980 to 1990.

Note also how the lines cut through much of the data.

This figure is a screen capture of HLI response figure 13. Again, hand-drawn lines are superimposed on the hydrograph to illustrate recent trend. Data were collected on varying frequencies which may produce artifact trends. Local minima and maxima in the dataset cannot be assumed to be water-level inflection points, only data inflection points.

THE HEARING OFFICER: Okay. Mr. McVay, do

we have a number of additional hydrographs that are similar to these?
THE WITNESS: No. This is it.
THE HEARING OFFICER: Okay. I just didn't see the need to repeat.
THE WITNESS: Okay. Note the HLI trend is applied to the last eight years -- years.
As can be seen in these figures, the analysis proposed by HLI appear to be based solely on judgment, as evidenced by the analysis of different time periods and time spans as well as allowing the lines to cross data that do not fit the trend being illustrated. Furthermore, the chance exists that artifact trends are present in the data plotted in these figures as evidenced by the changes in amplitude and frequency of -- observable in the graphs.
I believe filtering to yearly data is a more objective approach.
In their response memo, HLI criticizes the lack of statistical rigor in the analyses. As discussed previously, the data constraints inherent with sporadic sampling frequencies prevented me from using a more rigorous approach.
HLI also contends that filtering the

data to yearly time-steps incorporates unintentional bias into the analysis. I believe that filtering in this manner is the only way to avoid the bias associated with artifact trends. I also feel that picking variable time spans during different time periods, as was done in the response memo, invokes much more bias than filtering.
HLI further disagrees with the use of linear regression lines across the entire time period for which I analyzed, stating that this approach masked periods of rising and falling water levels.
The purpose was not to identify periods of differing water-level behavior in each well, it was to compare the wells to each other, and as such, a linear regression estimation was employed to compare the wells over the entire time span. Indeed, part of the reason for utilizing the linear regression was to remove the effects of the shorter-term trends.
HLI also expresses concern over the dates selected for each well and concern about discrepancies in the number of wells used in the analyses. HLI states, quote, "A review of the

IDWR online record, however, indicates that most of these data were not collected within the March 1st to May 31st time frame," end quote.
A review of the dates presented earlier in figures 8 and 9 indicate that most of the data were collected in the spring filtering window. HLI also expresses confusion about the number of wells used and the time periods that were chosen. This confusion appears to be based on the fact that two memos were submitted, but only one was included in the staff memorandum.
HLI also expresses concern that wells 4 north, 1 west, 11DDA1 and 4 north, 1 east, 14CCB2 were not analyzed. They state that these wells are a better representation of the Pierce Gulch Aquifer than the wells that were analyzed. They further disagree with many of the wells used in the analysis because they are not completed in the Pierce Gulch Aquifer.
It is important to remember that these analyses were not intended to assign a trend value to the Pierce Gulch Aquifer, only to compare the wells that I was given to assess similarities and differences. I did not review any other wells beyond the 17 that I was given.

Thank you. I appreciate the opportunity to narrate my testimony.
THE HEARING OFFICER: Okay. Thank you, Mr. McVay.
(Exhibit 905 marked.)
THE HEARING OFFICER: Now we have a document that's been marked as Exhibit 905. That's a representation of the PowerPoint presentation and his narration.
Any objection to its admission?
MR. FEREDAY: No objection.
MR. THORNTON: No objection.
MR. EDWARDS: No objection.
MR. ALAN SMITH: No objection.
THE HEARING OFFICER: Okay. It's received into evidence.
(Exhibit 905 admitted.)
THE HEARING OFFICER: Okay. Do we have anybody else from the Department, Mr. Vincent?
MR. VINCENT: No.
THE HEARING OFFICER: Okay. All right. What's the pleasure of the parties at this point? Knock off early for the day?
MR. ALAN SMITH: Sounds good.
THE HEARING OFFICER: I'm not sure there's

anywhere else we go today, unless there's suggestions.
MR. FEREDAY: I think we still have the Owsley narrative coming up? Is it on its way?
MR. VINCENT: He's getting it right now.
MR. ALAN SMITH: 904 is not admitted yet?
MR. JASON SMITH: Not yet.
THE HEARING OFFICER: Well, rather than stay on the record, let's go off for a minute.
(Recess.)
THE HEARING OFFICER: We're recording once more.
And Mr. McVay has finished his testimony. Mr. McVay, I'll remind you that you'll need to come back to be examined, probably on the 28th of this month.
THE WITNESS: Okay.
(Exhibit 904 marked.)
THE HEARING OFFICER: And we also have a document that's been distributed by Mr. Owsley. It's been marked as Exhibit 904. I propose that it also becomes part of the record.
Parties? Mr. Fereday?
MR. FEREDAY: Yes.
THE HEARING OFFICER: Okay. Protestants,

is it acceptable to you?
MR. THORNTON: Yes.
MR. ALAN SMITH: Yes.
MR. EDWARDS: Yes.
THE HEARING OFFICER: It is received into evidence.
(Exhibit 904 admitted.)
THE HEARING OFFICER: Okay. Other matters we need to talk about today?
I know Debbie Gibson is preparing another amended notice of hearing that we'll send out. It looks to me as if just -- well, let's close the record at this point in time, and then we'll just talk.
(Proceedings adjourned at 4:23 p.m.)
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REPORTER'S CERTIFICATE

I, JEFF LaMAR, CSR No. 640, Certified Shorthand Reporter, certify:

That the foregoing proceedings were taken before me at the time and place therein set forth, at which time the witness was put under oath by me.

That the testimony and all objections made were recorded stenographically by me and transcribed by me or under my direction.

That the foregoing is a true and correct record of all testimony given, to the best of my ability.

I further certify that I am not a relative or employee of any attorney or party, nor am I financially interested in the action.

IN WITNESS WHEREOF, I set my hand and seal this 21ST day of May, 2009.

JEFF LaMAR, CSR NO. 640
Notary Public
Eagle, Idaho 83616

My commission expires December 30, 2011

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