

BEFORE THE DEPARTMENT OF WATER RESOURCES
OF THE STATE OF IDAHO

IN THE MATTER OF APPLICATIONS TO)
APPROPRIATE WATER NO. 63-32573 IN) VOLUME III
THE NAME OF THE M-3 EAGLE,) Pages 494-739
_____)

BEFORE

HEARING OFFICER: GARY SPACKMAN

Date: April 22, 2009, 9:00 A.M.

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

REPORTED BY:

COLLEEN P. KLINE, CSR No. 345

Notary Public

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1 APPEARANCES:
 2 For M3 Eagle, LLC:
 3 Givens Pursley, LLP
 4 BY MR. JEFFREY C. FEREDAY
 5 BY MR. MICHAEL P. LAWRENCE
 6 601 W. Bannock Street
 7 P.O. Box 2720
 8 Boise, Idaho 83701-2720
 9 For North Ada County Groundwater User
 10 Association:
 11 BY MR. JOHN THORNTON
 12 5264 North Sky High Lane
 13 Eagle, Idaho 83616
 14 For Eagle Pines Water Users Association and
 15 Individually:
 16 BY MR. ALAN SMITH
 17 3135 Osprey Road
 18 Eagle, Idaho 83616
 19 Appearing Individually:
 20 BY MR. NORMAN L. EDWARDS
 21 884 W. Beacon Light Road
 22 Eagle, Idaho 83616
 23
 24
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1 APPEARANCES (Continued):
 2 Also Present:
 3 Jerry Peterson
 4 Jason Smith
 5 David Head
 6 Vicky Music
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 18 63 514
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1 THE HEARING OFFICER: The appointed
 2 hour has arrived. Are you ready to start.
 3 Are you ready, Alan?
 4 MR. SMITH: I'm ready.
 5 THE HEARING OFFICER: Mr. Edwards, are
 6 you ready?
 7 MR. EDWARDS: I'm ready.
 8 THE HEARING OFFICER: I want to mention
 9 one thing as we go on. We're recording, and this
 10 is the resumption of the hearing for M3 Eagle,
 11 LLC, protested water right matter, and the date
 12 is April 22nd.
 13 We're just starting with, Mr. Fereday,
 14 your next witness.
 15 MR. FEREDAY: M3 Eagle calls Mr. Roger
 16 Dittus.
 17 THE HEARING OFFICER: Mr. Dittus, would
 18 you raise your right hand, please.
 19 ROGER DITTUS,
 20 first duly sworn to tell the truth relating to
 21 said cause, testified as follows:
 22 DIRECT EXAMINATION
 23 QUESTIONS BY MR. FEREDAY:
 24 Q. Mr. Dittus, please spell your name, and
 25 give us your business address.

1 A. My name is Roger Dittus, and my last
2 name is spelled D-i-t-t-u-s. My business address
3 is 8248 West Victory Road in Boise.

4 Q. Where are you employed?

5 A. United Water Idaho.

6 Q. What is your position with United
7 Water?

8 A. I'm the hydrogeologist for the company.

9 Q. Could you describe your background and
10 education with specific reference to
11 hydrogeology?

12 A. I have a bachelor of science degree
13 from Boise State University, 1992. I have
14 completed graduate level hydrogeology courses.
15 I'm a Registered Professional Geologist in 2001.
16 I'm a licensed drinking water operator in Idaho,
17 run geophysical logs, design wells.

18 Q. What duties do you have at United Water
19 that pertain to your expertise, which might be
20 relevant in this case?

21 A. Basically, anything that the company
22 does with ground water. I oversee our well
23 maintenance program, our aquifer storage and
24 recovery operations, water right application
25 permitting, and review of other applications that

1 we -- that we become aware of, ground water bank
2 applications, injection well permits, those type
3 of duties, monitoring.

4 Q. Exhibit 32 G, I believe, is your
5 resume. Is that resume up to date?

6 A. Yes, it is.

7 Q. Most of your duties concern United
8 Water Idaho's system here in the Boise area; is
9 that -- is that right?

10 A. That's correct.

11 Q. Do you work for United Water in -- or
12 any of its affiliated companies in other areas?

13 A. I have in the past traveled to other
14 United Water systems, Tom's River Operations in
15 Catalina, and Burbank, Delaware, and worked with
16 the engineers there.

17 Q. Has that been to deliver
18 hydrogeological advice for advice on ground
19 water?

20 A. That's right, uh-huh. Reviewing plans
21 for aquifer storage and recovery operations, or
22 similar type of work.

23 Q. How does United Water compare to other
24 companies in its affiliated Suez groups with
25 regard to its dependence on ground water.

1 A. Compared to -- compared to the average
2 or typical United Water systems, we are more
3 heavily dependent on ground water. Well, we're
4 definitely the largest ground water producer.
5 There are some smaller systems that are dependent
6 primarily on ground water, also, but they are
7 much smaller.

8 Q. How many years, did you say, you've
9 worked for United Water in these -- in this
10 capacity?

11 A. 14 years.

12 Q. Could you describe United Water's
13 overall water system, just in terms of its size,
14 cfs, number of wells, that sort of thing? And,
15 please, feel free to just -- just narrate.

16 A. Okay. Well, we -- we operate about 85
17 to 90 supply wells. We have two surface water
18 treatment plants. And we serve about 84,000
19 customer connections, which I believe is about
20 230,000 people. The system is broken up into
21 service levels, pressure zones, and those
22 communicate with each other to some -- to some
23 degree.

24 Q. And, where, generally, is your
25 service -- your service area?

1 A. Generally, in the city of Boise, but we
2 have -- we have some noncontiguous systems
3 service areas. In the Eagle area, we have a
4 service area. We -- in the past, we've had other
5 service areas, noncontinuous.

6 Q. Do you have experience monitoring or
7 designing ground water wells?

8 A. I do. It's -- it's part of what I do.

9 Q. Is this part of the -- your ongoing job
10 is to measure or monitor wells?

11 A. Yes, it is.

12 Q. Does that include determining how much
13 water they are producing from time to time?

14 A. Yeah. Basically, monitoring the health
15 of the -- of the aquifers that they are producing
16 from, looking at the efficiency of the wells,
17 trying to understand, you know, where maintenance
18 is required, and so -- so that's yes.

19 Q. You mentioned that United Water has as
20 part of its service area, part of the Eagle area.
21 Are you familiar with the wells generally in the
22 west Boise, North Ada area?

23 A. Yes, I am.

24 Q. What about the City of Eagle and Eagle
25 Water Company? Don't they have ground water

1 wells also in the area?
 2 A. That's their sole source of supply. I
 3 am familiar with them.
 4 Q. Have you ever operated any of the
 5 systems in that area for other entities?
 6 A. Up until recently, United Water
 7 was -- had a contract with the City of Eagle to
 8 operate their system.
 9 Q. Which wells were involved in that
 10 effort?
 11 A. Those were the Lexington Hills wells.
 12 Q. The M3 Eagle project that is the
 13 subject of this application, is United Water
 14 intending to serve the M3 Eagle project?
 15 A. No, we are not.
 16 Q. What kind of growth has United Water
 17 experienced in recent years in its demand for
 18 water, its hookups, or some other reasonable
 19 metric that you use?
 20 A. I do know that in the last ten years,
 21 we've added, approximately, 26,000 customer
 22 connections. And in the last 30 years, I
 23 believe, it's in the range of 45,000 to 50,000
 24 additional customer connections.
 25 Q. In the last three years?

1 A. 30 years. Excuse me.
 2 Q. Oh, 30 years. Sorry.
 3 A. Yeah.
 4 Q. You've listened to Mr. Holt's
 5 testimony; did you?
 6 A. Most of it, yes.
 7 Q. Did you listen to his discussion of the
 8 amounts of water demand projected for the M3
 9 Eagle project?
 10 A. Yeah, I did.
 11 Q. Do you have an opinion about the
 12 reasonableness of his projections for water use
 13 per unit developed -- in that development or
 14 otherwise?
 15 A. Based on my discussions with the
 16 engineers, the planning engineers at United
 17 Water, I think they are right in the range, maybe
 18 a little bit lower, actually, than what -- than
 19 we would use for planning.
 20 Q. Okay. You mentioned that you are a
 21 Registered Professional Geologist; correct?
 22 A. Correct.
 23 Q. Have you kept abreast of research
 24 related to North Ada County hydrogeology and
 25 geology geological conceptual models and the

1 like?
 2 A. Yes, I have.
 3 Q. I would like you to refer in the binder
 4 there to Exhibit 19, if you would. Exhibit 19,
 5 I'll represent to you, contains a number of
 6 subheadings A through H or so.
 7 And I would just like you to look at
 8 those, and see if you can tell me whether you are
 9 familiar with any of those publications?
 10 A. Am I looking for 19? Oh, there it is
 11 (indicating).
 12 Q. Have you found Exhibit 19, Mr. Dittus?
 13 A. No, I haven't. I'm having trouble.
 14 Exhibit 19 --
 15 MR. FEREDAY: Mr. Hearing Officer, if
 16 it's okay, I'll have my associate help him?
 17 THE HEARING OFFICER: Yes.
 18 MR. FEREDAY: Thank you.
 19 THE WITNESS: Yes, I have.
 20 Q. (BY MR. FEREDAY) Mr. Dittus, I'm not
 21 asking you to testify about any of these, but I
 22 would just want to know whether these are
 23 familiar to you. Have you seen these, read
 24 these?
 25 A. Yes, I'm generally familiar with these,

1 and the information.
 2 Q. How do you relate United Water's well
 3 construction in the Eagle area, in the Eagle
 4 portion of your service area, to the area's
 5 geology?
 6 A. Our wells in our Floating Feather
 7 service level in the Eagle area, and in the west,
 8 northwest part of our service area, pump water
 9 from the aquifer that's been described as the
 10 Pierce Gulch Sand Aquifer deltaic deposits.
 11 Q. Do you agree that that is an accurate
 12 description of the aquifer that you are producing
 13 from, that appears in, for instance, Hydro
 14 Logic's reports?
 15 A. I do agree.
 16 Q. How many wells do you have in this area
 17 that penetrate and pump from the Pierce Gulch
 18 Sand Aquifer, which I may sometimes refer to as
 19 the PGSA? How many wells?
 20 A. Approximately, six, or thereabouts.
 21 Q. Have you also reviewed the studies that
 22 have been completed for M3 Eagle?
 23 A. I have.
 24 Q. Have you, for example, reviewed the
 25 aquifer test that -- aquifer test report that

1 Hydro Logic produced for the Spring Valley 7 well
2 test?

3 A. I -- I believe that came out in 2009,
4 and that's one of the ones I did review, yes.

5 Q. How about the geochemist report that
6 was produced by Glanzman and Squires?

7 A. Yes, I reviewed that.

8 Q. What do you recognize about the PGSA,
9 based on your experience, and your understanding
10 of the geology in the area? What can you tell us
11 about it?

12 A. It's -- it's a highly productive
13 supply. My -- I concur that the extent of the
14 Pierce Gulch Sand Aquifer does extend between
15 United Water's wells. And --

16 Q. Do you agree that the PGSA is
17 continuous from west Boise, at least, west Boise
18 to the Eagle area, where your wells are located?

19 A. I do think that's well supported based
20 on the sediments that were encountered in our
21 wells based on the other information, such as the
22 well log, the geophysical log expression of the
23 Pierce Gulch Sand Aquifer. I think it's that
24 extensive.

25 Q. Do you feel that it is reasonable

1 to -- that the conclusions made by Hydro Logic,
2 that the aquifer extends up under the M3 area, is
3 a reasonable conclusion?

4 A. I do.

5 Q. What about recharge to the PGSA? What
6 is your view, as a hydrogeologist working in this
7 field, as to recharge sources to the PGSA area?

8 A. Well, I -- I -- definitely it's my
9 opinion that it's significantly recharged just
10 based on the production from the aquifer, from
11 the wells that I am aware of. And I think it's
12 likely that there is a combination of recharge
13 sources there. It might -- it -- it's likely
14 that there is some leakage from, you know,
15 through overlying low permeability units.

16 There is -- there is probably recharge
17 from shallower aquifers in some areas
18 where -- where the confining confinement of the
19 aquifer is lower. As -- the aquifer has a dip to
20 it. The geometry of the aquifer may be a very
21 important factor in where the recharge comes
22 from. And if that's the case, it may be coming
23 from the up-dip side of the aquifer in the west
24 Boise, Garden City region.

25 Q. In general, does the aquifer dip

1 upwards to the east or southeast; is
2 that -- would that be accurate?

3 A. The aquifer dips towards -- generally,
4 towards the southwest as it's -- as it's been
5 defined.

6 Q. And by dip, do you mean dips down?

7 A. Right.

8 Q. Okay.

9 A. Right.

10 Q. Do you have an opinion of whether the
11 PGSA is tributary, at least in part, to the
12 Payette Basin?

13 A. I -- I think that that's fairly well
14 supported. I think that that's the case, based
15 on the aquifer geometry, and the measured ground
16 water levels.

17 Q. In your opinion, do you think that the
18 water that M3 proposes to pump for its project
19 will be drawing from the same aquifer from which
20 United Water's wells produce in this area?

21 A. I do.

22 Q. And again, that's the PGSA; is that
23 right?

24 A. Correct.

25 Q. Is United Water concerned about the

1 drawdown effect on United Water's wells from
2 pumping at M3 Eagle?

3 A. We're -- we're concerned. We -- we
4 just felt like the production and water level
5 information that we have for our wells was
6 sufficient to -- to -- largely sufficient to
7 mitigate those concerns.

8 Q. In reaching that conclusion, did you do
9 any further reading, or evaluation, or how did
10 you -- how did you come by that conclusion?

11 A. Well, we -- we -- over the last few
12 years, we've been looking at the information that
13 we have to come -- to come to this conclusion.

14 M3, before they filed their
15 application, notified us that they were going to
16 seek a water right, and saw us, I believe, as a
17 potential protestant, because we're at -- because
18 we're -- we have wells in the area. And
19 they -- they kept us updated on the conceptual
20 model. And as the reports were produced, we also
21 received those, and reviewed those.

22 Q. Has M3 been forthcoming to United Water
23 with regard to what it's producing and learning
24 about the aquifer, providing reports, and other
25 information to you?

1 A. Yes, they have to -- to United Water
 2 and to the Department, I believe, and those are
 3 public record.
 4 Q. Are you familiar with the M3 Eagle
 5 application in this case?
 6 A. Yes, I am.
 7 Q. And United Water did not protest that
 8 application as you've just testified. I guess, I
 9 just want to make sure I understand why you
 10 didn't lodge a protest?
 11 A. We didn't -- we didn't protest.
 12 Q. And the reason for that? Just if you
 13 could summarize that for us.
 14 A. We -- we don't see the aquifer as -- in
 15 any kind of danger of being over drafted. We
 16 believe there is sufficient water for the
 17 application.
 18 Q. I would like you to refer to Exhibit
 19 63, which is a map.
 20 MR. FEREDAY: And for the convenience
 21 of the Hearing Officer, perhaps we could get that
 22 up on the screen as well.
 23 Q. (BY MR. FEREDAY) Are you familiar with
 24 this map, Mr. Dittus?
 25 A. Yes, I am.

1 Q. Does it accurately show the location of
 2 United Water Idaho's wells in this North Ada
 3 area?
 4 A. Yes, it does.
 5 Q. And to the extent you know, does it
 6 also accurately show the locations of other
 7 nearby wells, such as those that have been
 8 drilled by M3?
 9 A. It appears that it does. Not all the
 10 nearby wells, but, yes, it looks accurate.
 11 Q. When you say, "not all the nearby
 12 wells," do you mean that not all of them are on
 13 there?
 14 A. Right. Right.
 15 MR. FEREDAY: We offer Exhibit 63.
 16 THE HEARING OFFICER: Mr. Thornton?
 17 MR. THORNTON: No objections.
 18 THE HEARING OFFICER: Mr. Smith, any
 19 objection?
 20 MR. SMITH: No objection. I can't see
 21 the map. No objection.
 22 THE HEARING OFFICER: We may need to
 23 turn the lights down a little bit but -- maybe at
 24 least on that end.
 25 MR. FEREDAY: Mr. Hearing Officer, if I

1 could just make a comment here. I believe we
 2 have provided a copy to Mr. Smith, and the other
 3 protestants. And if he doesn't have one, we
 4 could make another one available to him at the
 5 break.
 6 MR. SMITH: We're sharing.
 7 THE HEARING OFFICER: Okay. You are
 8 okay, then, Mr. Smith, with its admission?
 9 MR. SMITH: Yes, Mr. Hearing Officer.
 10 THE HEARING OFFICER: Mr. Edwards?
 11 MR. EDWARDS: I have no objection.
 12 THE HEARING OFFICER: Okay. It's
 13 received into evidence.
 14 (Exhibit 63 admitted into evidence.)
 15 Q. (BY MR. FEREDAY) Could you -- could
 16 you please refer now to Exhibit 43, Figure 1,
 17 which has now been admitted into evidence? I
 18 believe it's a little bit more precise map with
 19 regard to the location of United Water's wells.
 20 And I want you to help us understand which wells
 21 you are talking about, and where they are.
 22 A. (Witness complying.)
 23 Q. Are you on Exhibit 43, Figure 1,
 24 Mr. Dittus?
 25 A. Yes, I am.

1 Q. I see on that, several wells, such as
 2 Floating Feather, Redwood Creek, HP, Swift,
 3 Goddard. I believe, Island Woods is on there as
 4 well; correct?
 5 A. Right, two -- two wells at Island
 6 Woods.
 7 Q. Okay. Are these wells: Floating
 8 Feather, Redwood Creek, HP, Swift, Goddard, and
 9 the Island Woods wells, are those United Water
 10 wells?
 11 A. They are.
 12 Q. Are they completed into the PGSA?
 13 A. Yes, they are.
 14 Q. Are any of these designated monitoring
 15 wells, as opposed to production wells?
 16 A. There are three monitoring wells shown
 17 on the map, three United Water monitoring wells.
 18 Actually, if I could correct that. Two United
 19 Water monitoring wells, that the
 20 monitoring -- the well that's labeled UWID State
 21 Street test well, that is now Water Resources
 22 well. But United Water originally completed
 23 that, and then donated it to the Treasure Valley
 24 Hydrologic Project.
 25 At the State and Linder site, there

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1 is -- there is two monitoring wells at that
2 location.
3 Q. So the State and Linder, and State
4 Street, or if you prepare, TVHP well, those two
5 are not production wells; correct?
6 A. Correct, they are small diameter size
7 piezometer tubes that measure the pressure in the
8 aquifer.
9 Q. But the six that you previously
10 mentioned, those are production wells?
11 A. Right, they are.
12 Q. Are these monitoring wells also
13 completed in the PGSA, Mr. Dittus?
14 A. The -- they -- they have piezometer
15 tubes into the Pierce Gulch Sand Aquifer.
16 Actually, I think most of the tubes are.
17 They -- these -- for instance, the State Street
18 test well has four separate zones that it's
19 monitoring. And the two monitor wells at State
20 and Linder also monitor four -- four different
21 levels in the aquifer.
22 Q. But they are into the PGSA at State and
23 Linder?
24 A. Correct, three -- three of the -- three
25 of the four are, I believe.

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1 MR. FEREDAY: Could we go off the
2 record for just a second?
3 THE HEARING OFFICER: Yes.
4 (Discussion held off the record.)
5 THE HEARING OFFICER: We are recording,
6 again.
7 Mr. Fereday.
8 Q. (BY MR. FEREDAY) Mr. Dittus, the six
9 United Water production wells in this North Ada,
10 Eagle area, together pump how much water?
11 A. These wells accumulatively pump about
12 four-and-a-half or -- well, about 4,500 acre-feet
13 per year.
14 Q. 4,500 acre-feet per year?
15 A. Correct.
16 Q. From the PGSA; correct?
17 A. Correct.
18 Q. How long have these wells been
19 operating?
20 A. The Swift well is the oldest well of
21 this -- of this group, and it began operating in
22 the late 1970s. I believe, all the other ones
23 have been producing since the mid 1990s or
24 earlier.
25 Q. So is there -- what would you say is

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1 the average age of these wells that they've been
2 pumping?
3 A. 15-plus years, something.
4 Q. Okay.
5 A. Can I make one correction to one of my
6 previous statements?
7 Q. Certainly.
8 A. I see there is -- there is the Gary
9 Lane test well on there. And I -- before I had
10 only identified State Street, and State and
11 Linder as monitoring wells. Gary Lane well is
12 also a monitoring well. It's not completed into
13 the Pierce Gulch Sand.
14 Q. Okay. I would like you to refer to
15 Exhibit 45, Figure 15.
16 A. (Witness complying.) Okay. I found
17 that.
18 Q. Okay. I see this, that this is a
19 graph, or a chart for Redwood Creek well and
20 Floating Feather well. Do you recognize that?
21 A. I do.
22 Q. Could -- what can you tell us about
23 this figure, and the data that is portrayed here?
24 A. This -- this data are manual water
25 level measurements in two of United Water's

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1 production wells in the Eagle area. And --
2 Q. Did you take those measurements?
3 A. I -- I did.
4 THE HEARING OFFICER: Okay. Let me
5 find that, Mr. Fereday.
6 MR. FEREDAY: Okay.
7 THE HEARING OFFICER: It's Exhibit 45?
8 MR. FEREDAY: 45, Figure 15.
9 THE HEARING OFFICER: Oh, I was too far
10 back. Okay. There it is. Okay. Thank you.
11 Q. (BY MR. FEREDAY) Have you seen this
12 Figure 15 before, Mr. Dittus?
13 A. I have.
14 Q. Do you believe it to accurately portray
15 the data that you provided for it?
16 A. I do. In addition to the manual water
17 level measurements in these wells, the figure
18 also shows annual production information in
19 millions of gallons for the wells, or for the
20 Floating Feather well, it looks like.
21 Q. With regard to the Floating Feather
22 well, is that a high-volume well, would you say?
23 A. It is.
24 Q. How much does the Floating Feather well
25 produce?

1 A. It -- it produces typically over half a
 2 billion gallons per year.
 3 Q. It's 500 million gallons per year; are
 4 you saying?
 5 A. Correct.
 6 Q. How long has it been producing that
 7 kind of volume?
 8 A. Approximately, nine years. It -- it
 9 came online, I believe, in the beginning of 1996,
 10 and it produced 130 million the first year it
 11 came into production. The pump was -- was
 12 upgraded in 2005 to a larger pump size.
 13 Q. 500 million gallons is -- do you know
 14 how many acre-feet that would be on an annual
 15 basis, roughly?
 16 A. I believe it's somewhere between
 17 one-and-a-half and -- and -- or, actually, no, I
 18 don't have -- I would need a calculator to do
 19 that.
 20 Q. Okay. This production is year round
 21 from this well?
 22 A. It produces -- well, the
 23 500 -- the -- these -- these numbers are the
 24 average production, or that's the total
 25 production for the year. The well runs on a

1 variable frequency drive. So the motor
 2 can -- can run up to 100 percent. And when it
 3 does that, it's producing close to 3,000 gallons
 4 per minute. So --
 5 Q. How often does it pump at around 3,000
 6 gallons per minute; would you say?
 7 A. During the summertime, it -- you know,
 8 it -- during the months of July and August,
 9 through those months, it doesn't turn off, and
 10 it -- you know, the majority of the time, it's
 11 producing close to that rate.
 12 Q. Do you know how much the Floating
 13 Feather well is producing today?
 14 A. Not -- not exactly today. I would, you
 15 know, based on looking at the
 16 production -- instantaneous production from
 17 earlier this week, it was producing 2,200 gallons
 18 per minute. So it's sort of in a -- I believe,
 19 it's in a ramp-up cycle right now.
 20 Q. With regard to Figure 15, can you tell
 21 us what this tells you with regard to water
 22 levels at Redwood Creek and Floating Feather over
 23 the period of -- that's depicted on the figure?
 24 A. They -- the hydrograph part of this
 25 figure shows that recent water levels -- for

1 instance, the one in late 2008, is very similar
 2 to the original level, and it's actually higher
 3 than some of the -- some of the intermediate
 4 levels.
 5 The Floating Feather well has a below
 6 ground water level. And the Redwood Creek is
 7 a -- has an artesian water level.
 8 Q. Figure 15 states near the -- near
 9 the -- in the notes at the bottom, and I'll quote
 10 it. "United Water production wells show
 11 relatively stable water levels since they were
 12 constructed. Both wells show a rise in water
 13 levels from 2002 to 2008 in spite of generally
 14 increasing levels of production."
 15 Do you agree with this statement?
 16 A. I do.
 17 Q. Okay.
 18 A. I think the -- the main point of this
 19 figure is that the current water levels are very
 20 comparable to the original water level. The
 21 Floating Feather well rarely turns off.
 22 The -- some of the -- some of the water
 23 levels -- intermediate water levels, for example,
 24 in the Floating Feather well, while they
 25 were -- while they were taken when the well was

1 not pumping, they may not be -- they may not -- I
 2 don't think it's accurate to characterize those
 3 as fully recovered water levels.
 4 Q. And why is that?
 5 A. Because they were taken in between
 6 pumping periods, and they may not be fully
 7 recovered water levels.
 8 Q. Okay. So they would tend to show an
 9 even lower level than a recovered water level
 10 would show? Is that --
 11 A. That --
 12 Q. -- is that what you are saying?
 13 A. That's what I'm saying.
 14 Q. Is Floating Feather -- the Floating
 15 Feather well unique with respect to being a large
 16 producing well completed in the PGSA?
 17 A. It's -- it's one of the high producers,
 18 but I wouldn't characterize it as unique. We
 19 have other wells that -- that produce comparable
 20 amounts.
 21 The Hewlett-Packard well, the HP well,
 22 also produces -- it produces, approximately, the
 23 same annual volume as the Floating Feather well.
 24 Q. You mentioned that the Floating Feather
 25 well runs nearly full-time. Is this a reason why

1 there are only a few data points, relatively
 2 speaking, for measurement?
 3 A. That's -- that's why there is few
 4 manual measurements, correct.
 5 Q. Before United Water acquired the
 6 Floating Feather -- or built the Floating Feather
 7 well, do you know whether there was pumping from
 8 that site through some other well?
 9 A. There was.
 10 Q. What was that?
 11 A. Prior to construction of the Floating
 12 Feather well, there was an existing irrigation
 13 well that was very near the site of the Floating
 14 Feather well. It was on the same property, maybe
 15 within -- within 50 feet from the -- from the
 16 Floating Feather well.
 17 Q. Was that irrigation well also completed
 18 in the PGSA?
 19 A. That's -- that's correct. It was -- it
 20 was completed at, approximately, the same
 21 interval as the Floating Feather well.
 22 Q. Was it a large volume production well,
 23 or do you know?
 24 A. I don't know the -- the production
 25 numbers from that well. But I do know that based

1 on its construction, it would have to have been a
 2 significant producer, and it was an irrigation
 3 well.
 4 Q. With regard to the HP well that you've
 5 mentioned already, it also pumps nearly
 6 full-time; does it? Is that what you testified
 7 to or --
 8 A. That's true, yeah. It's also run on a
 9 variable frequency drive. So I -- the wells that
 10 we operate that we installed the variable
 11 frequency drives on, that's the purpose. So they
 12 can respond to system pressure, so that they
 13 won't turn on and off. They'll ramp down and
 14 ramp up. But they -- they typically run much
 15 more than a -- than a well that doesn't have a
 16 VFD installed.
 17 Q. "VFD" being variable frequency drive;
 18 correct?
 19 A. Correct.
 20 Q. Do you know how much volume the HP well
 21 has produced in any recent year, roughly?
 22 A. It -- it produces in the range, I
 23 think, a little bit more than 500 million gallons
 24 per year. That's --
 25 Q. Are you aware of any drawdown problems

1 related to the HP well?
 2 A. No, I'm not.
 3 Q. Has United Water received any
 4 complaints from the Department, or from any well
 5 owner, with regard to drawdowns resulting from
 6 your pumping in this area?
 7 A. No, we haven't.
 8 Q. Are you familiar with areas in Ada
 9 County where there is a predominance of domestic
 10 wells?
 11 A. I'm familiar with some areas where
 12 there are many domestic wells.
 13 Q. Where would those be, generally?
 14 A. One -- one such area would be in the
 15 southern part of United Water's Boise service
 16 area, which was relatively recently incorporated.
 17 There is -- there is many domestic wells in that
 18 area. And then outside the service area to the
 19 west of our service area, there are many domestic
 20 wells. And I know in the -- in the vicinity of
 21 the Floating Feather service level, there are
 22 many domestic wells, as well.
 23 Q. Do you recognize the Eagle area as
 24 having a large number of domestic wells?
 25 A. Yes, I do.

1 Q. Have you measured or monitored any
 2 domestic wells in the Eagle area?
 3 A. I have. Or, actually, we -- I have,
 4 and we have some monitored for us.
 5 Q. I would like you to refer to Exhibit
 6 12, Figure 51. I believe it's on page 133 of
 7 that exhibit.
 8 A. (Witness complying.)
 9 Q. I'll remind you, I know you've
 10 testified about reviewing HLI's reports. But
 11 I'll remind you, that this Exhibit 12 is a
 12 document entitled, "Re-Analysis of 16 Aquifer
 13 Tests."
 14 First of all, are you -- are you
 15 generally familiar with that --
 16 A. I am.
 17 Q. -- with this document?
 18 A. I am.
 19 Q. Did you receive it from M3?
 20 A. Yes, we did.
 21 Q. I would like you to refer to Figure 51.
 22 A. (Witness complying.)
 23 Q. And explain to us, what this is.
 24 A. Do you have a page number to help me
 25 find it?

1 Q. I'm sorry. 133.
 2 A. (Witness complying.) Okay. I have it.
 3 Q. Was this a figure -- this hydrograph,
 4 the information in it, was it produced in
 5 response to a water right application of some
 6 kind, or what was its background?
 7 A. These -- these -- this hydrograph shows
 8 two domestic wells that were monitored for United
 9 Water as a condition of getting it -- the -- one
 10 of the water rights for the Floating Feather
 11 well. And the wells were monitored for several
 12 years in the mid 1990s.
 13 Q. I note that these are denoted, the
 14 Miller well and the Vail well. Is the
 15 Vail and -- were Vail and Miller objectors or
 16 concerned well owners in the area --
 17 A. I --
 18 Q. -- with respect to the Floating Feather
 19 application?
 20 A. I believe they were protestants.
 21 Q. Okay. And how far away from Floating
 22 Feather are the Vail and Miller domestic wells?
 23 A. These -- these wells are within a few
 24 hundred feet, and they are located to the south
 25 of the -- of the Floating Feather well.

1 Q. Are the Miller and Vail wells completed
 2 into the PGSA; do you know?
 3 A. They are -- they are not based on the
 4 lithology at the Floating Feather site, and based
 5 on the depth of these wells. They are
 6 not -- they are above it, completed above it.
 7 Q. Based on this hydrograph, do the Miller
 8 and Vail wells show any impact, in your opinion,
 9 from the Floating Feather well pumping over the
 10 measurement period?
 11 A. I -- I don't think that there is an
 12 apparent impact from pumping to Floating Feather
 13 well. It came online in early 1996. I believe
 14 the month of April is -- is when it first
 15 produced water, and -- and I don't -- I don't
 16 believe that there is any -- that there is any
 17 discernible impact from pumping.
 18 Q. Was the Floating Feather well pumping
 19 more or less continuously, as you've described it
 20 as used, during this period?
 21 A. I -- I don't -- I don't know if it was
 22 pumping continuously during this period. But I
 23 do know that it produced a significant amount of
 24 water during this period.
 25 Q. This hydrograph -- or these two

1 hydrographs are curious to me. I am interested
 2 in the fact that -- let's take the Miller well.
 3 The upper graph shows high water levels in the
 4 summertime, August, let's say, the August period
 5 in each -- in each case. Why -- why would -- why
 6 would that be? Do you have an opinion?
 7 A. Well, it -- the data points were
 8 collected in -- generally, in the spring, and
 9 then in the very early fall, or late summer. And
 10 the Floating Feather well would have been
 11 producing its highest rates during the
 12 summertime, immediately preceding these late
 13 summer, early fall measurements.
 14 And those are the highest water levels
 15 observed in the domestic wells. And so I would
 16 attribute the high -- water level highs to being
 17 elevated in comparison to the water level lows
 18 for the same well as responding to irrigation.
 19 Q. Okay.
 20 MR. SMITH: Could you state that
 21 answer, again? I didn't hear all of it over
 22 the --
 23 THE WITNESS: I said, the water level
 24 highs on these hydrographs were collected -- were
 25 measured towards the end of the irrigation

1 season. So I think the most logical explanation
 2 was that these water levels were responding to
 3 that irrigation in the area.
 4 Q. (BY MR. FEREDAY) And, Mr. Dittus, when
 5 you say, "responding to irrigation in the area,"
 6 do you mean they are responding to flood
 7 irrigation that might be providing leakage into
 8 the zone into which those wells are completed?
 9 A. Correct.
 10 Q. Could you describe United Water's
 11 experience with monitoring ground water in the
 12 North Ada County, other than the Miller and Vail
 13 experience? And with regard to -- and
 14 particularly, with regard to what you've
 15 testified earlier about your State and Linder
 16 monitoring wells. Could you describe what you do
 17 there?
 18 A. That -- well, the two monitoring wells
 19 at State and Linder are -- I measure those with
 20 a -- with a stand pipe, and measure the artesian
 21 head there. And that's been ongoing since the
 22 wells were constructed in about 1998.
 23 We have allowed the City of Eagle at
 24 one time to install pressure recorders on the
 25 wells. We allowed Hydro Logic to install

1 pressure recorders when they did their aquifer
2 tests, the SVR 7 aquifer tests.

3 Q. Is the State and Linder test well then,
4 a significant and accurate monitoring site for
5 you; do you feel?

6 A. I feel -- I feel it's one of the better
7 monitoring sites in the area, definitely, because
8 it was, specifically, constructed for that
9 purpose. It's -- you know, we documented the
10 sealing of the well. We know exactly the
11 completion intervals. It's not a pumping well.
12 And so I feel it's a very good monitoring point.

13 Q. Were you involved in the construction
14 of the State and Linder test well?

15 A. Yes, I was.

16 Q. You mentioned that the State and Linder
17 test well has artesian heads. Could you describe
18 for us, what you mean by this?

19 A. The piezometers that measure the
20 pressure in the Pierce Gulch Sand Aquifer
21 interval of the test well have above ground water
22 levels at that location. And they are in the
23 range of 10 or -- 10 or 12 feet, typically, above
24 ground level.

25 Q. You mentioned that this well was built

1 in 1998. And you have monitored it since then?

2 A. Correct.

3 Q. The above ground heads, I would like
4 you to explain with reference to Figure 18 of
5 Exhibit 45, if you could. It's just a few pages
6 on -- oh, I'm sorry. It's Exhibit 45, Figure 18.

7 A. (Witness complying.) Okay. I found
8 that.

9 Q. Okay. You did take these measurements;
10 correct?

11 A. The -- I took all the measurements, all
12 the hand measurements after the year 2000. The
13 continuous recorder data that's at the -- the
14 later time was collected by Hydro Logic. There
15 is -- there is also some measurements that the
16 City of Eagle collected in between that time.
17 Before, approximately, 2000, that would have
18 been -- those measurements were collected by
19 either myself or another geologist that we had
20 working at United Water back at that time.

21 Q. Okay.

22 A. And the other -- this other
23 precipitation data, I don't -- I didn't collect
24 that.

25 Q. Okay. The precipitation data on

1 the --

2 A. On the bottom I see this precip- --

3 Q. On the bottom half of Figure 18, you
4 did not collect; right?

5 A. Yeah.

6 Q. Do you believe the data on the upper
7 half of this graph to be accurate, Mr. Dittus?

8 A. It is.

9 Q. What about the spike in the
10 continuously monitored data that spikes downward
11 sometime, it looks like, the middle of 2008?
12 What do you interpret that to be?

13 A. Umm --

14 Q. Let me ask you -- let me ask you
15 another question. Are you aware of the SVR 7
16 aquifer test that M3 Eagle carried out through
17 Hydro Logic?

18 A. Yes, I am.

19 Q. Do you know generally when that was
20 done?

21 A. That -- that was done in the spring of
22 2008, I believe.

23 Q. Do you know whether that spike has any
24 relationship to that aquifer test, or is it just
25 something you are not sure of?

1 A. I don't -- I don't believe that
2 the -- that that test had an impact of this
3 magnitude that far away.

4 Q. Okay.

5 A. This shows a drawdown from
6 approximately 12 feet down to approximately four
7 feet above ground.

8 Q. Do you know of any other pump test in
9 the more immediate vicinity of State and Linder
10 that may have occurred during that period?

11 A. Not that I can recall.

12 Q. Okay. What can you conclude,
13 Mr. Dittus, about the state of the Pierce Gulch
14 Sand Aquifer, based on the hydrograph shown on
15 Figure 18 of Exhibit 45?

16 A. Well, these -- there are some
17 fluctuations in the pressurize levels at this
18 monitoring well. The heads that have been
19 measured have all remained artesian. Some of
20 those fluctuations may be due to local pumping or
21 a seasonal fluctuation.

22 But overall, they indicate that
23 from -- you know, prior to the year 2000 up to
24 almost the present time, to the end of the data
25 that we have here, water levels have remained

1 relatively stable.
 2 Q. Would you refer, please, to Exhibit 44,
 3 Figure 48?
 4 A. (Witness complying.)
 5 Q. I note that Figure 48 of that Exhibit
 6 44 is entitled, "Water Levels in United Water
 7 State and Linder Test Well No. 1 Showing No Net
 8 Decline Over 10 Year Period."
 9 First of all, do you consider that a
 10 fair characterization of that chart?
 11 A. I do.
 12 Q. With regard to these two graphs, do you
 13 know which one -- whether they were both
 14 completed in the PGSA?
 15 A. I'm only seeing on Figure 46. Is that
 16 where we're looking at?
 17 Q. Figure 48.
 18 A. Sorry. (Witness complying.)
 19 Okay. Could you ask the question,
 20 again?
 21 Q. I guess, first of all, you stated you
 22 agreed with the title of this, that water levels
 23 in United Water, State and Linder test well No.
 24 1, show no net decline over a ten year period.
 25 You stated that was a fair characterization of

1 this chart?
 2 A. Yes, that's a fair characterization.
 3 Q. With regard to the lower half, the
 4 hydrograph in the lower half of that figure, do
 5 you know whether that's completed into the PGSA?
 6 A. Yes, these -- these -- the bottom data
 7 points that range between 10 and 15 feet, those
 8 three piezometer tubes are completed into the
 9 Pierce Gulch Sand.
 10 Q. I think you mentioned earlier the
 11 phrase, "increasing potential with depth." Can
 12 you explain what that means?
 13 A. Well, at a site like this, it means
 14 that the deeper that you drill and complete a
 15 well, the higher the pressure will be in
 16 that -- in that well.
 17 Q. So to summarize, if you could, what
 18 does the State and Linder monitoring show us with
 19 regard to the PGSA, in your opinion?
 20 A. It shows that the area water levels in
 21 the vicinity of this well have been stable since
 22 January of 1999 through, you know, the middle of
 23 2008. That the wells have artesian pressures,
 24 which -- which are nice for having low pump
 25 lifts. They generally show stability at this

1 area.
 2 Q. Do you know whether the hand
 3 measurements of aquifer surface levels have been
 4 corrected for barometric effects --
 5 A. On --
 6 Q. -- in these --
 7 A. On these datas?
 8 Q. -- in these datas?
 9 A. No, they haven't.
 10 Q. Okay. Do you know whether the data
 11 logger data are corrected for barometric effects,
 12 generally?
 13 A. They would be, I believe. Yes.
 14 Q. Okay. What is the significance of
 15 above ground artesian heads that you see in this
 16 area, Mr. Dittus?
 17 A. Well, one -- one observation, I think,
 18 would be that the heads have remained artesian,
 19 and have remained stable during a time when the
 20 general production from the area withdrawals have
 21 increased. And I think that indicates that there
 22 is recharge to resupply the aquifer from the
 23 pumping.
 24 Q. What does it tell you about the nature
 25 of the aquifer itself, geologically?

1 A. Well, this would be a confined aquifer.
 2 Q. Would you say that it would be a
 3 confined portion of the aquifer as well? Could
 4 it be unconfined in other areas, and confined
 5 here?
 6 A. That's -- that's what I believe to be
 7 the case, based on -- I think, that's well
 8 documented based on correlating the well logs,
 9 and correlating the water levels, and looking at
 10 the -- at the mapping of the aquifer.
 11 Q. Mr. Dittus, you testified about the
 12 Miller and Vail wells being in the shallower
 13 aquifer, not part of the PGSA.
 14 Do you know whether other domestic
 15 wells in the Eagle area, also are in shallow,
 16 non-PGSA aquifers?
 17 A. I'm sure there are many, many wells in
 18 the overlying, you know, productive sediments
 19 that are tapped by domestic wells. And there are
 20 likely some domestic wells that are also
 21 completed into the Pierce Gulch Sand. It
 22 would -- it would depend on how the well driller
 23 constructed the well, and --
 24 Q. Okay. And returning to the Floating
 25 Feather well for a moment. I think you testified

1 that that's your largest producing well in this
2 immediate area. What is the water level below
3 ground in the Floating Feather well?

4 A. It's approximately 40 feet below
5 ground.

6 Q. And what is the drawdown in the
7 Floating Feather well as it is -- as it is
8 pumped?

9 A. Well, that -- that ranges, obviously,
10 depending on the pumping rate. So at that site,
11 the drawdown can vary significantly, depending on
12 the way the well is being operated. The maximum
13 drawdown is in the range of about 70 feet, and
14 that -- that occurs in the summertime, throughout
15 the summertime.

16 Q. And that would be when Floating Feather
17 is pumping somewhere around 3,000 gallons per
18 minute?

19 A. Correct.

20 Q. And what would be the drawdown out in
21 the aquifer a distance away from this well; do
22 you know?

23 A. I don't -- I don't know an exact number
24 what -- what type of drawdown effects the well
25 would have. But realize that the water level

1 measured in the well is going to be significantly
2 lower than the water level immediately outside
3 the well in the aquifer, just because there is
4 a -- there is a head loss to get the water to
5 move through the constructed part of the well.
6 And that typically accounts for a significant
7 portion of the drawdown that's measured within
8 the well.

9 Q. The measurements you take then of the
10 Floating Feather well water level, of course, are
11 inside the casing; correct?

12 A. Correct.

13 Q. And is it a fair characterization of
14 what you just testified, that a drawdown in the
15 casing is going to be greater than the drawdown
16 you'll experience out in the aquifer outside the
17 casing?

18 A. Correct.

19 Q. What about the pumping level in the
20 Floating Feather well as it's producing, let's
21 say, through the months of July and August, at or
22 near its full capacity, do you see a steady
23 decline of some kind in that well?

24 A. Actually, at that site, we see the
25 water level responding to the flow rate. And

1 it's not apparent that there is a decline
2 that -- that, say, you know, occurs through July
3 and August.

4 The pumping level in the well when
5 the -- when the pumping rate is decreased at
6 times of lower pressure, say, from 3,000 gallons
7 a minute at -- decreasing to 2,600 gallons a
8 minute, the water level responds and comes up in
9 the -- in the months of August and July.

10 Q. Would you say that the Floating Feather
11 well's water level responds much to irrigation
12 pumping during that same summer period?

13 A. Not -- not significantly, as far as I'm
14 aware.

15 Q. So you said that the well levels -- the
16 water levels in that well tend to respond mostly
17 to that well's own pumping?

18 A. As far as I'm aware. And, you know,
19 the -- as I said, the well -- this well rarely
20 turns off. And it -- it essentially doesn't turn
21 off in the summer months.

22 Q. Okay. What can you infer from the
23 water levels and production data you've measured
24 in United Water's wells in this area, with regard
25 to recharge to the Pierce Gulch Sand Aquifer?

1 A. I would -- I would infer that, you
2 know, based on the production from the wells, and
3 the fact that the information that we have shows
4 that the wells either are slightly above, or at
5 their original water levels, or else in some
6 cases in west Boise, have established a new
7 equilibrium level, that's not significantly
8 different than the original level, that there is
9 sufficient recharge for their -- for their
10 withdrawals.

11 Q. Are you familiar with the City of
12 Eagle's Brookwood well?

13 A. I am.

14 Q. And could you tell us where that's
15 located relative to the Floating Feather well?

16 A. It is -- I believe
17 approximately -- it's located at Eagle Road and
18 Floating Feather Road. And I believe that's
19 about half a mile or so from the Floating Feather
20 well. It's located to the east. But it's pretty
21 much, due east. And it's completed in a -- at a
22 comparable depth to the Floating Feather well.

23 Q. So it, too, pumps from the PGSA;
24 correct?

25 A. Correct.

1 Q. And what do you see in the Floating
 2 Feather well, or any of your other monitoring
 3 wells, with regard to the Brookwood's pumping?
 4 A. Well, we haven't -- we haven't -- we
 5 haven't seen an effect from pumping of that well.
 6 Q. Do you have experience, Mr. Dittus,
 7 with analytical models for estimating pumping
 8 impacts, such as, using the Theis equation to
 9 evaluate and project potential drawdowns in an
 10 aquifer? Do you have experience using that?
 11 A. I do.
 12 Q. Have you read the staff's memo in this
 13 case, dated March 2nd? I believe it's Exhibit
 14 50, if you would like to refer to it.
 15 A. Yes, I reviewed the staff's memo.
 16 Q. With regard to Figure 3, on page 22, of
 17 the staff's memo, have you looked at that figure?
 18 And could you tell us what this purports to be?
 19 A. This is a topographic contour of water
 20 levels in the Pierce Gulch Sand Aquifer, based on
 21 a model that the staff constructed to -- in an
 22 attempt to try to predict drawdown from pumping a
 23 well located on M3's property.
 24 Q. Do you know how much pumping was
 25 projected there? Does it -- does it -- doesn't

1 it say, after 50 years of pumping at 10 cfs;
 2 isn't that correct --
 3 A. That --
 4 Q. -- in the text there?
 5 A. That's -- that's -- those are the
 6 parameters that were input, yes.
 7 Q. Does the drawdown predicted by the
 8 staff's Theis approach, if that's what it is,
 9 does that accurately predict, in your opinion,
 10 aquifer drawdown from pumping wells in this
 11 valley, based on your experience?
 12 A. My experience has been that it's a way
 13 to -- to -- it's a way to calculate a drawdown
 14 based on the reasonable parameters of the aquifer
 15 that you input. But it typically over estimates,
 16 gives you a conservative drawdown with respect to
 17 the impact. So it will typically over -- over
 18 estimate a drawdown.
 19 Q. So the Theis equation, are you saying,
 20 will typically over estimate drawdown, at least
 21 in your experience, for wells in the Boise Valley
 22 or Treasure Valley?
 23 A. That's -- that's been my experience.
 24 It's a model. And there are assumptions to that
 25 model. And where those assumptions deviate

1 from -- from the -- you know, the real aquifer,
 2 those can typically lead to an over estimation of
 3 the drawdown impacts.
 4 Q. Is there anything about the Theis
 5 equation that helps us to understand why it might
 6 over estimate, in your view, drawdowns in many
 7 cases?
 8 A. Well, the assumptions for using the
 9 equation, for using that -- that -- that
 10 analytical model, would be -- one of them would
 11 be, there is no recharge assumed. The aquifer is
 12 considered to extend in all -- in all directions,
 13 infinitely. In this case, the model used another
 14 well to simulate a no flow boundary. And that's
 15 this line on the top of Figure 3 in the exhibit.
 16 But so there -- there is -- there is
 17 significant differences between reality, usually,
 18 and the model that result in the Theis equation
 19 over estimating the amount of drawdown.
 20 Q. As a hydrogeologist for United Water,
 21 would you rely on a Theis prediction to project
 22 the amount of drawdown that a new United Water
 23 Idaho well might have on the surrounding aquifer,
 24 or would you rely on other things as well?
 25 A. I wouldn't rely on that model to give

1 me an accurate number -- an accurate amount of
 2 drawdown at a given distance at a certain time.
 3 But it would be a way to look at, say, you know,
 4 the potential maximum impacts typically, unless
 5 you have other information regarding, you know,
 6 the existence of hydraulic barriers or -- or
 7 positive recharge boundaries, that type of thing.
 8 Q. Would you please refer to page 20 of
 9 the same exhibit. It's Exhibit 50.
 10 A. (Witness complying.)
 11 Q. Do you see there, the staff statement
 12 that, quote, "Water levels in the PGSA near M3
 13 are declining," and the quote, "Current aquifer
 14 discharge rates exceed current recharge rates"?
 15 Do you see those statements there?
 16 A. Are those in the bulleted items on page
 17 20?
 18 Q. Correct. It's right above item 4.
 19 A. Oh, okay. I don't -- I don't consider
 20 that an accurate representation of the
 21 hydrographs that I've seen when they are all
 22 taken together, based on the response to the
 23 staff memo that I've seen.
 24 Q. Okay. With regard to the Theis
 25 drawdown that the staff -- that we were just

1 talking about a minute ago, that the staff
 2 projected. Those drawdowns were just in the
 3 PGSA; isn't that correct, on --
 4 A. Correct.
 5 Q. Would you agree with the statement
 6 that, the PGSA receives -- does receive recharge?
 7 I believe you testified earlier, that you thought
 8 it did. Is that still your view, even in light
 9 of what the staff has said?
 10 A. I think -- I think that's -- must be
 11 the case based on the way that wells respond.
 12 Q. Mr. Dittus, do you have experience
 13 preparing and filing water right applications?
 14 A. I do.
 15 Q. For ground water rights?
 16 A. Correct.
 17 Q. Have you prepared and filed any
 18 yourself?
 19 A. I have.
 20 Q. Have you reviewed water right
 21 applications --
 22 A. Yes, I have.
 23 Q. -- by others?
 24 A. Yes.
 25 Q. When you propose to drill a new well

1 for a 2,000 gallon per minute water right, has it
 2 been your experience that you do hydrogeologic
 3 modeling?
 4 A. No.
 5 Q. What about geochemical studies?
 6 A. No.
 7 Q. What about conducting geologic analyses
 8 of the basin in which the water right would be
 9 located?
 10 A. No.
 11 Q. What about studies of the aquifers
 12 transmissivity and storativity? Do you do those
 13 before you file a water right application?
 14 A. No.
 15 Q. Do you carry out aquifer tests in
 16 conjunction with an application you would
 17 typically file?
 18 A. Not typically.
 19 Q. What about the installation of
 20 monitoring wells? Do you typically do that?
 21 A. We haven't installed a monitoring well
 22 in -- as a -- in order to get a water right
 23 permit, or as part of the application process.
 24 We have agreed to monitor wells in the past as
 25 a -- as a settlement condition for a protest --

1 Q. That would be --
 2 A. -- but not --
 3 Q. -- for example, the Miller and Vail
 4 situation; correct?
 5 A. Yes, and some others.
 6 Q. What about seismic or magnetometer
 7 studies to explore the deep subsurface? Do you
 8 do that when you file a water right application?
 9 A. No.
 10 Q. Have you ever had to explain to the
 11 Department the exact mechanisms of recharge to
 12 the ground water source that you plan to drill?
 13 A. No, we haven't.
 14 Q. What about the locations where you
 15 believe the aquifer discharges in the basin?
 16 Have you had to do that?
 17 A. No, we haven't.
 18 Q. Mr. Dittus, have you ever seen the
 19 amount and quality of hydrogeologic work in
 20 support of an application that is comparable to
 21 what M3 Eagle has produced here?
 22 A. I have not.
 23 Q. How have you kept yourself informed
 24 about the studies and other work that M3 Eagle
 25 has done over the past three years in this

1 matter?
 2 A. As I said, prior to M3 filing their
 3 application, they approached us and presented
 4 their preliminary update of the conceptual model
 5 in this area. I have reviewed the reports that
 6 Hydro Logic has produced. There has been
 7 discussion of the project at the North Ada County
 8 technical advisory group. And those are the ways
 9 I've kept myself informed.
 10 Q. Do you have any criticisms of the major
 11 conclusions of the hydrogeologic studies and
 12 reports and tests that M3 Eagle has done?
 13 A. No, I don't have any criticisms of
 14 their conclusions.
 15 Q. What have you found to be the quality
 16 and thoroughness of Hydro Logic's reports in this
 17 matter, and the reports of the other consultants?
 18 A. I -- I think they are -- they are
 19 thorough. They are -- they are rigorous, and I
 20 feel that they've increased the understanding of
 21 our aquifer system significantly.
 22 Q. Is there anything in this work that
 23 suggests to you that M3 Eagle's well pumping will
 24 have adverse effects on United Water's water
 25 rights?

1 A. No, there isn't.
 2 Q. What about your opinion of Mr. Squires,
 3 who, of course, has been a primary investigator
 4 for M3 Eagle? Have you worked with Mr. Squires
 5 in the past?
 6 A. I have. I've known Mr. Squires for
 7 over 15 years. I think he's very ethical, quite
 8 competent, and -- and accept the major
 9 conclusions of the work.
 10 Q. Do you have an opinion about the
 11 availability of water to serve the M3 Eagle
 12 development?
 13 A. I believe there is sufficient water
 14 to -- to appropriate.
 15 MR. FEREDAY: Could we take a break at
 16 this point? I think I'm just about done.
 17 THE HEARING OFFICER: Yep. Let's take
 18 a ten minute break. We're off the record.
 19 (A recess was had.)
 20 THE HEARING OFFICER: Okay. We're
 21 recording, again.
 22 Mr. Fereday.
 23 Q. (BY MR. FEREDAY) Mr. Dittus, in your
 24 testimony, you have used the term "artesian" and
 25 "artesian pressure." Do you recall that?

1 A. I do.
 2 Q. And do you agree that the artesian
 3 conditions in an aquifer refer to the fact that
 4 water will rise from the point where it is first
 5 encountered in the well bore if it is under
 6 artesian pressure?
 7 A. I do.
 8 Q. Do you agree with the following
 9 definition, which I will represent to you is
 10 taken from Department rules or proposed rules.
 11 Artesian water is -- and this is the quote, "any
 12 water that is confined in an aquifer under
 13 pressure so that the water will rise in the well
 14 casing or drilled hole above the elevation where
 15 it was first encountered. This term includes
 16 water of flowing and nonflowing wells."
 17 Do you agree with this?
 18 A. I agree.
 19 Q. Do you understand, Mr. Dittus, that in
 20 the folklore, people often refer to an artesian
 21 well, if the well is actually flowing at the
 22 surface?
 23 A. Right. Right, that's correct.
 24 Q. Even though the well might be artesian,
 25 even though its water level is 50, or 100, or

1 many hundred feet below ground; correct?
 2 A. Yes.
 3 Q. Okay. Mr. Dittus, has M3 Eagle ever
 4 spoken to United Water regarding United Water
 5 operating the M3 Eagle municipal water system?
 6 A. Not that I'm aware of.
 7 Q. Has M3 Eagle ever approached or
 8 discussed with United Water, to your knowledge,
 9 the concept of in any way connecting to, or
 10 interconnecting with the M3 Eagle water system?
 11 A. No.
 12 Q. Will United Water Idaho benefit
 13 financially if the M3 Eagle water right
 14 application is granted?
 15 A. No.
 16 MR. FEREDAY: That's all the questions
 17 we have.
 18 THE HEARING OFFICER: Okay. Thank you,
 19 Mr. Fereday.
 20 Cross-examination, Mr. Thornton?
 21 CROSS-EXAMINATION
 22 QUESTIONS BY MR. THORNTON:
 23 Q. Mr. Dittus, how are you doing?
 24 A. Good, Mr. Thornton.
 25 Q. Good. Mr. Dittus, are you here today

1 as an official spokesperson for United Water?
 2 A. I'm here as a hydrogeologist employed
 3 by United Water.
 4 Q. So are you their official spokesperson
 5 today?
 6 A. I guess -- I guess I would be.
 7 Q. So is your testimony the official
 8 position of the United Water Corporation?
 9 A. Yes, it is.
 10 Q. Okay. And could you tell me who the
 11 legal counsel is for United Water?
 12 A. The legal counsel?
 13 Q. Yeah, the legal counsel.
 14 A. We -- we have different -- I mean,
 15 Givens Pursley is one firm that has represented
 16 us. McDeavitt & Miller has represented us.
 17 Different -- different -- different firms have
 18 represented us.
 19 Q. And are you a spokesperson for either
 20 Eagle Water Company or the City of Eagle Water
 21 Company?
 22 A. No.
 23 Q. Okay. And then are you familiar with
 24 all of United Water wells in the Treasure Valley
 25 area?

1 A. I am more familiar with some than with
 2 others. But I would say that that's a generally
 3 correct statement.
 4 Q. So are you familiar with the United
 5 Water wells, let's say, north of the Boise River?
 6 A. Yes.
 7 Q. Okay. All right. And, Mr. Dittus,
 8 we've heard your testimony today that talks quite
 9 a bit about the Pierce Gulch Sand Aquifer, the
 10 PGSA. And then one year ago when NACGUA filed
 11 its protest, and United -- and until about
 12 September or October of 2008, we never heard of
 13 this terminology.
 14 MR. FEREDAY: Objection. There is no
 15 question here. And it's apparently testimony.
 16 THE HEARING OFFICER: That is a --
 17 MR. THORNTON: Okay.
 18 THE HEARING OFFICER: -- reasonable
 19 objection, Mr. Thornton.
 20 MR. THORNTON: Okay. Okay. I'll
 21 withdraw that.
 22 THE HEARING OFFICER: If you --
 23 MR. THORNTON: I'll withdraw the
 24 statement.
 25 THE HEARING OFFICER: Okay.

1 Q. (BY MR. THORNTON) So prior to M3's
 2 application for a water right, and Hydro Logic's
 3 subsequent work on the aquifer in the North Ada
 4 County area, did you, or any other people that
 5 you worked with in your profession, refer to this
 6 aquifer as the PGSA, or was it something else?
 7 A. Well, I -- I think the -- the Pierce
 8 Gulch Sand units that units the deltaic deposits
 9 that researchers have been mapping and the
 10 ongoing description of those is -- is not
 11 something that's -- that's just a few years old.
 12 I think that dates back to many more years.
 13 And calling it the Pierce Gulch Sand
 14 Aquifer is just a way of saying that these are
 15 the units that have been correlated and that
 16 supply the wells that -- that produce
 17 from -- from these deposits that are -- that are
 18 saturated, or, you know, that -- the storage
 19 units for the water supply.
 20 So does that answer the question?
 21 Q. Yes, that's fine. Thank you.
 22 Mr. Dittus, could you describe the
 23 three dimensional boundaries of the presumed
 24 Pierce Gulch Aquifer?
 25 A. It's -- it's been documented to be

1 bounded on the bottom of the aquifer by low
 2 permeability silts and muds that preceded the
 3 sands in age. As the lake levels were lowering,
 4 and the deltas were growing.
 5 It's bounded hydraulically on the -- on
 6 the northeast side, despite the fact that it
 7 doesn't exist, it -- it -- the depth of the
 8 aquifer below land surface rises to the
 9 northeast. And that is the portion that has been
 10 shown to be where the Pierce Gulch Sands have
 11 been shown to be undefined.
 12 The northwestern extent of it, I don't
 13 think has been fully defined. And I don't know
 14 what bounds there would be extending, you know,
 15 towards the Payette River valley. And I also
 16 don't know that the southwest portion has been
 17 defined. I don't know the extent of it in that
 18 direction. It hasn't been looked at to the -- to
 19 the degree that it has been in the Eagle area.
 20 Q. So do you know the depth of the Pierce
 21 Gulch Sand Aquifer?
 22 A. Well, it's a range of depths, depending
 23 on where you're -- where you are talking about.
 24 In west Boise, it's typically shallower. For
 25 instance, the United Water Idaho Swift well, the

1 top of the unit that's been identified as Pierce
 2 Gulch Sand deposits is in the range of a -- you
 3 know, 130 feet or so. And it can be lower than
 4 that as you move out toward the west.
 5 THE HEARING OFFICER: Could I ask both
 6 of you to speak up a little bit?
 7 THE WITNESS: Okay.
 8 MR. THORNTON: You bet.
 9 THE WITNESS: Okay.
 10 THE WITNESS: There is a bit of a hum
 11 coming from the machine.
 12 MR. FEREDAY: We can turn it off.
 13 THE HEARING OFFICER: Yeah, it's more
 14 conversational than it --
 15 THE WITNESS: Okay.
 16 THE HEARING OFFICER: And we need to
 17 broadcast.
 18 MR. THORNTON: Okay.
 19 THE HEARING OFFICER: Thank you.
 20 Q. (BY MR. THORNTON) And in the
 21 description that you've just provided, could you
 22 identify what your source of information is?
 23 A. The source of information for the
 24 existence of the Pierce Gulch Sand Aquifer is the
 25 ongoing geologic mapping and correlation of well

1 drillers reports, correlation of the geophysical
2 logs that -- that show the existence of these
3 deposits as -- as presented in papers by Dr. Wood
4 and others.

5 And the -- the -- calling it the Pierce
6 Gulch Sand Aquifer, I believe, is a relatively
7 newer occurrence, then just identifying that
8 they're are these deltaic deposits, and that they
9 exist over, you know, the areas of investigation.

10 Q. And then in your earlier testimony, you
11 stated that, you think, the ground water flows
12 from Garden City area to the Payette River; is
13 that true?

14 A. The -- I believe I stated the Pierce
15 Gulch Aquifer has been identified in, you know,
16 from the west Boise, Garden City area. And I
17 accept the way that it has been mapped and
18 described in over that extent, and the ground
19 water generally flows to the west.

20 And then based on the information that
21 is available, and based on the aquifer geometry,
22 it definitely appears that it's moving -- as you
23 go west of the M3 property, it begins to go
24 towards the north.

25 Q. Sir, are you aware of any statistical

1 or sensitivity analysis of Hydro Logic's data to
2 support this assumption?

3 A. I -- I'm not -- I don't recall any of
4 that type of analysis. The analysis, I believe,
5 is based on the water level elevations, and the
6 wells that are available show the grading is in
7 that direction.

8 Q. In your earlier testimony, I believe,
9 that you also stated that the part -- a portion
10 of the recharge of the Pierce Gulch Sand Aquifer
11 is from the overlying shallower aquifers; is that
12 true?

13 A. I -- I believe that what I said was,
14 that that is one of the likely -- I was just
15 talking to the fact that the aquifer does seem to
16 be recharged by the fact that the well -- that
17 wells recover when -- when -- they don't act
18 like -- the wells don't respond the way that
19 wells in a closed system respond, such as some of
20 the other aquifers in the foothills that have
21 been documented to be bounded, and not receive
22 recharge. And, you know, based on where they are
23 located, you wouldn't expect them to be
24 recharged.

25 The wells in the Pierce Gulch Sand

1 Aquifer don't respond that way. And so then it
2 must be receiving recharge. And so I was listing
3 my opinion about potential sources.

4 Q. And so --

5 A. And then when -- and -- and obtaining
6 water through low permeability, confining units
7 is one potential way the aquifer could
8 be -- could be recharged. But I don't know if
9 that's a major, or, you know, overwhelming way
10 that the aquifer receives its recharge.

11 Q. Okay. Fine. And I believe you also
12 stated in your testimony, that United Water is
13 not aware of any domestic wells that have gone
14 dry, we'll say, in the Eagle area, or in the
15 Treasure Valley?

16 MR. FEREDAY: Objection.

17 THE WITNESS: I don't --

18 MR. FEREDAY: I don't believe that was
19 his testimony. But if he knows, I guess, he can
20 go ahead and answer.

21 THE HEARING OFFICER: Yes. Overruled.
22 Let's see how he responds.

23 THE WITNESS: I'm not aware of domestic
24 wells that have gone dry. Does that -- if you
25 are talking about wells where the water level

1 just disappears there?

2 Q. (BY MR. THORNTON) Yes.

3 A. I know that in the southeast Boise
4 area, which is a ground water management area,
5 several entities monitor water levels there. And
6 United Water worked with the Department, and
7 supplied information to have that declared a
8 ground water management area, because water
9 levels in domestic wells in that area were
10 declining -- actually, all the water levels in
11 that area were declining. And they -- that area
12 has been a ground water management area for 15
13 years or so.

14 Q. Okay.

15 A. So I am aware of some areas where there
16 are water level problems due to withdrawals that
17 cause that.

18 Q. And then does United Water, as a matter
19 of business, collect data on domestic wells that
20 have gone dry; monitored domestic wells?

21 A. No, we -- not as a matter of business.
22 We -- we monitor domestic wells for various
23 purposes. You know, one example would be, we
24 operate some supply wells as injection wells
25 during part of the year to -- as a way to -- to

1 use the aquifer to store water of better quality.
2 And one of the things that usually
3 happens during the permitting process is, we
4 review domestic wells in the area, and I contact
5 the owners. And those domestic wells then will
6 get -- will be specified on the injection well
7 permit. And that's a way to monitor the impact
8 from injection.

9 I have monitored some domestic wells,
10 and sampled some domestic wells in a
11 noncontiguous system, where we might have very
12 much information about water quality as a way to
13 see what the water levels are, and what the water
14 quality is. But not -- there is not -- there is
15 not just a blanket. You know, we will monitor
16 different domestic wells as, typically, there is
17 a reason for it.

18 Q. So the -- so does United Water
19 periodically look at Department of Water
20 Resources ground water, or applications for
21 re-drilling to determine if there appears to be
22 any ground water declines in the areas in the
23 Treasure Valley?

24 A. Well, our -- our primary focus would be
25 in and around our service territory. I -- I

1 don't think -- I haven't looked at re-drill
2 applications for domestic wells.

3 Q. Okay. All right. If we can go to
4 Exhibit No. 45?

5 A. (Witness complying.)

6 Q. And on Figure 15 that we talked about
7 earlier.

8 A. Yeah. Okay.

9 Q. And are you at that level?

10 A. Yes, I am.

11 Q. Okay. So at the bottom of Figure 15,
12 it states that, "United Water production wells
13 show relatively stable water levels since they
14 were constructed." It goes on to state, "Shows
15 the rise in water levels from 2002 to 2008 in
16 spite of increasing levels of production."

17 Then it goes on to state that, "Both
18 wells have too few data points for statistically
19 valid trend analysis. But qualitatively the
20 water levels appear to be rising over the past
21 five to six years."

22 What's your view in using this data
23 when there is not enough data points to show any
24 statistical rigor for identifying an increase in
25 water levels?

1 A. Well, I think it's -- I think it's
2 useful data. So I think it's definitely
3 something we can use to -- to look at what the
4 water levels in the aquifer have been doing, at
5 least at these points in time.

6 And as I said in my earlier testimony,
7 I think that the main thing that I take away
8 from -- from this information is the fact that,
9 when you have a recent water level that is very
10 comparable to the original water level in the
11 well, from United Water's point of view, we look
12 at that. And we say, that that indicates that
13 the aquifer is, you know, maintaining aquifer
14 pressures.

15 As far as the water levels, you know,
16 saying that the water levels are rising,
17 that's -- that's what it qualitatively appears
18 from this data. But I believe I also said
19 earlier, that some of these lower water levels
20 may not have recovered, just because they
21 were -- these measures -- these measurements were
22 taken when the well was not pumping. And the
23 amount of time that the -- that the water levels
24 were allowed to recover would be different
25 between these different measurement periods,

1 between, you know, for the individual data
2 points.

3 So I -- I wouldn't say that this -- you
4 know, I think that's -- that's one observation
5 that you can say the data appears to look like
6 the water level is rising. But, you know, as I
7 said, the important thing, I think, is that the
8 water levels are very comparable to the original
9 level.

10 Q. Thanks. If you could go to Exhibit 12?

11 A. (Witness complying.)

12 Q. And Figure 51 on page 133.

13 A. (Witness complying.) Okay. Got that.

14 Q. Figure 51, page 133. What are the
15 depths of the Miller and the Vail wells at? I
16 think you stated that earlier, but if you could
17 restate that, their approximate levels.

18 A. The -- and I might -- I might get these
19 switched. But I know one of them is about 97
20 feet, according to the drillers report. And then
21 the other one is approximately 120 feet,
22 according to the drillers report.

23 Q. Okay. All right. And then could you
24 just describe -- or what is the -- for the Miller
25 well, that trendline, is that showing a declining

1 or increasing water table?
 2 A. Well, the trendline, I think, is just
 3 something that was force fit through these data
 4 points. When I -- it's showing -- it's -- a
 5 trendline is showing a downward gradient or a
 6 downward trend in the upper hydrograph.
 7 Q. Okay. And what is the trendline doing
 8 for the Vail, just to be fair?
 9 A. It's doing -- it's doing the opposite.
 10 And I believe the Vail well is the 120 foot deep
 11 well. And the Miller well, I believe, is the
 12 shallower well.
 13 Q. And then I -- in your background, I
 14 imagine that you are fairly familiar with
 15 statistical analysis?
 16 A. No, I'm not fairly familiar with it.
 17 Q. Okay.
 18 A. I'm not -- I'm not very familiar with
 19 it.
 20 Q. All right. Then for the R squared
 21 values that you see in there for the trend? R
 22 squared equals 5.8 for the Miller.
 23 A. Okay.
 24 Q. And are R squared equals 4.2 for the
 25 Vail. Can you describe what that means?

1 A. No, I can't describe what that means.
 2 Q. Okay. And then on this -- on this
 3 particular Figure 51, it displays time period
 4 from '95 to -- April '95 to April '98; is that
 5 correct?
 6 A. That's correct.
 7 Q. And do you have any information on
 8 those wells that take it from '98 to 2008?
 9 A. Nope, we -- these were monitored for a
 10 specified period based on a previous agreement.
 11 And so the answer is, no.
 12 Q. Okay. In that past decade, from 1998
 13 until the present time, has the area in Eagle and
 14 north Eagle grown a large amount in terms of
 15 their demand for ground water, based on your
 16 earlier testimony?
 17 A. Based on the production from our wells
 18 in the area, I would say, that's a fair
 19 characterization.
 20 Q. Okay. All right. And then just
 21 earlier in your testimony here -- let me make
 22 sure I'm not putting words in your mouth -- I
 23 believe you said that a potential source, you
 24 don't know how much of recharge for the Pierce
 25 Gulch Sand Aquifer is from the overlying

1 aquifers, the shallower aquifers; is that true?
 2 A. That's true.
 3 Q. So is it possible, in your opinion,
 4 that pumping at the Pierce Gulch Sand Aquifer at
 5 a greater depth could over time, have an effect
 6 on water levels in the shallower aquifers?
 7 A. I think that's very possible that it
 8 could have an effect. Whether that effect would
 9 be -- would be discernible from -- you know, from
 10 the effect -- the apparent effect of re- -- of
 11 recharge -- apparent recharge from irrigation.
 12 Which at this location, it looks like it's in the
 13 range of five to ten feet, I would be -- I would
 14 be skeptical that you could discern that, but
 15 it's conceivable that you could.
 16 Q. Okay.
 17 A. If that was the -- if that was the
 18 primary recharge mechanism, which I don't know if
 19 it is.
 20 Q. Thank you. So if we could have you go
 21 to Exhibit 50?
 22 A. 50?
 23 Q. Let's see. IDWR staff memo.
 24 A. (Witness complying.)
 25 Q. And earlier you were asked questions

1 and provided testimony regarding the Theis
 2 equation, the use of the Theis equation.
 3 A. Correct.
 4 Q. Okay. And I believe you identified
 5 that this -- the use of this equation
 6 overestimates drawdown?
 7 A. In my experience, that's been the case.
 8 Q. Okay. Could you then identify what is
 9 your specific experience with this type of
 10 equation, and your source of data to show why
 11 it's not accurate?
 12 A. My specific experience? We -- I have
 13 done -- used the -- used this method in -- when
 14 we apply for a water right, to come up with a
 15 conservative estimate for drawdown at a certain
 16 distance, which is typically a protestant's well
 17 at a certain time, which is typically long
 18 enough, say, you know, in the scale of years, so
 19 that -- so that the effects would be, you know,
 20 experienced from a pumping well.
 21 And in -- in some cases from the
 22 pumping tests, if you have a pumping test of a
 23 new supply well that evidences a negative
 24 boundary, you wouldn't use the Theis equation,
 25 because that would -- that invalidates the

1 assumptions. And in the other cases, it
 2 typically over estimates the amount of drawdown
 3 that -- because you just don't see that when you
 4 go look at the well. You don't see that effect.
 5 One example would be we -- United Water
 6 monitored a well near Nampa from a protestant,
 7 and the Theis equation showed that there would be
 8 some measurable drawdown based on reasonable
 9 transmissivity and storativity values. And, of
 10 course, there wasn't at that depth. But
 11 that's -- that's just the kind of the thing that
 12 you see.
 13 But it's an exercise that you go
 14 through that gives you some information about,
 15 you know, what the -- what the maximum drawdown
 16 would be predicted by the Theis equation. But in
 17 my experience, it's always been less.
 18 Q. Okay. So can you actually give us
 19 any -- refer us to any reports from United Water,
 20 the actual date of the wells, and the time
 21 periods that the monitoring occurred, and the
 22 estimates that came out of the Theis equation,
 23 and what was finally there? Do you actually have
 24 the reports that you can provide?
 25 A. I think -- I don't remember specific

1 names. But, I mean, we would have some well
 2 completion reports, that type of thing, I would
 3 think.
 4 Q. So do you actually have a report that
 5 says, this is the estimate of drawdown. This is
 6 what we monitored in year one, year two, year
 7 three, year five?
 8 A. No, we don't -- we wouldn't have that.
 9 Q. Okay. So -- and then, Mr. Dittus, what
 10 is your general characterization of the depths of
 11 most private wells in the North Ada County area?
 12 A. My general characterization?
 13 Q. Yeah.
 14 A. Typically, there is six-inch diameter
 15 wells, I believe, drilled down probably,
 16 depending on -- on whether they are in the
 17 foothills, or whether they are in the Eagle area,
 18 probably ranging between, you know, 60 feet and
 19 300 or 400 feet.
 20 Q. Okay.
 21 A. And typically completed with air rotary
 22 drilling method, I would think. Maybe some older
 23 cable tool wells.
 24 Q. Okay. And then, again, what is your
 25 general characterization of the depth of the

1 Pierce Gulch Sand Aquifer in the North Ada County
 2 area, or the upper and lower limits of the Pierce
 3 Gulch Sand Aquifer?
 4 A. The depth below ground?
 5 Q. Yeah.
 6 A. Probably in -- well, the range would be
 7 the Floating Feather well, for instance,
 8 encounters the Pierce Gulch Sand at about 180
 9 feet below ground. M3 encounters the Pierce
 10 Gulch Sand Aquifer at a significantly deeper
 11 depth below ground. And that's just because of
 12 the land surface elevation differences.
 13 Q. Okay. Right. So -- and I believe you
 14 stated -- let me ask you this: Is it reasonable
 15 to expect that if pumping in the Pierce Gulch
 16 Sand Aquifer at greater depths, may have some
 17 effect on the shallower aquifers; the water table
 18 in the shallower aquifers?
 19 A. It -- it may have some effect. I -- I
 20 think that that's conceivable.
 21 MR. THORNTON: Okay. Let me just look
 22 here. I think I'm close to done.
 23 (Pause in the proceeding.)
 24 MR. THORNTON: I know you are hoping
 25 I'll ask you more questions.

1 (Pause in the proceeding.)
 2 MR. THORNTON: I think that's it,
 3 Mr. Hearing Officer.
 4 THE HEARING OFFICER: Thank you,
 5 Mr. Thornton.
 6 THE HEARING OFFICER: Mr. Smith?
 7 MR. SMITH: Thank you, sir.
 8 CROSS-EXAMINATION
 9 QUESTIONS BY MR. SMITH:
 10 Q. Mr. Dittus, I believe you stated that
 11 you have two surface water plants in Boise?
 12 A. Yes.
 13 Q. In west Boise area, did you say?
 14 A. That's correct.
 15 Q. And where are those located?
 16 A. One of them is located upstream of the
 17 Boise River near -- near the Micron complex, and
 18 the water is lifted from a pump station on
 19 the -- on the Boise River up to that water
 20 treatment plant.
 21 The other one is located in east Boise
 22 on the river near -- fairly near Municipal Park.
 23 That water is -- the water from those two surface
 24 water treatment plants that supply the east Boise
 25 area.

1 Q. Is United Water now looking for other
 2 surface water rights, if you know?
 3 A. I believe -- I -- I don't know
 4 specifically, but I believe we are -- we
 5 are -- you know, we -- we have permits under
 6 development for flood flows. We have -- we have
 7 an engineer that works with canal companies to
 8 rent shares. Sometimes we rent shares from the
 9 water bank.
 10 I'm not -- I'm not as involved -- I'm
 11 not really involved with the surface water right
 12 aspect of our water rights portfolio.
 13 Q. But you are aware that some of that is
 14 taking place?
 15 A. I believe -- I believe some of -- some
 16 of that would be --
 17 (Tape recorder beeping.)
 18 THE HEARING OFFICER: Okay. Just a
 19 minute. Let's change the tape.
 20 (Discussion held off the record.)
 21 THE HEARING OFFICER: Okay. We are
 22 recording again. I'm sorry for the interruption.
 23 Mr. Dittus, do you recall the question?
 24 THE WITNESS: I think I answered. Did
 25 I answer the last question?

1 MR. SMITH: I believe you did.
 2 Q. (BY MR. SMITH) Are these plants -- or
 3 were they constructed in the 1990s, because of
 4 ground water management drop levels in southeast
 5 Boise?
 6 A. The -- I wouldn't characterize it
 7 specifically that way. And what -- and one of
 8 the plants was constructed in the mid to late
 9 '80s.
 10 Q. Yes.
 11 A. And then the other one was constructed,
 12 I believe, about five years ago.
 13 Q. Has United Water located any surface
 14 water rights at this time, to your knowledge?
 15 A. The water treatment plants are
 16 producing water under water rights that are owned
 17 or rented by United Water.
 18 THE HEARING OFFICER: Okay. Mr. Smith,
 19 would you also speak up?
 20 MR. SMITH: Yes, sir.
 21 THE HEARING OFFICER: Thank you.
 22 Q. (BY MR. SMITH) What is United Water's
 23 total system capacity, if you know?
 24 A. The -- the -- the maximum daily
 25 production in the summer is in the range of 85

1 million gallons per day.
 2 Q. 85 million?
 3 A. Correct. We have -- we have produced
 4 more than that in the past, you know, up to the
 5 low 90s.
 6 Q. That was during high peak summertime?
 7 A. Correct.
 8 Q. Okay. How much of that capacity comes
 9 from surface water, if you know?
 10 A. It's -- it's approximately 20 percent
 11 from surface water.
 12 Q. 20 percent. How many wells do you have
 13 in the Lexington Hills area?
 14 A. We -- we don't own any wells in
 15 Lexington Hills. Those wells belong to the City
 16 of Eagle. And United Water did operate those
 17 wells for several years. We operated their water
 18 system.
 19 Q. Okay. But now Eagle City has taken
 20 those over?
 21 A. Yes. My understanding is, they want to
 22 have their own water supply owned and operated.
 23 And so we no longer have a contract to operate
 24 their system.
 25 Q. Do you know what the capacity of those

1 wells is -- or are?
 2 A. Those, I don't know the exact numbers.
 3 I believe they were in the range of 500 gallons
 4 per minute.
 5 Q. What's the depth of those wells, if you
 6 know?
 7 A. Those -- those wells are, I believe, in
 8 the 300 to 400 foot depth range. And I'm just
 9 going from memory.
 10 Q. So for the most part, would those be
 11 deeper than the small domestic wells that you
 12 mentioned?
 13 A. For the small domestic wells completed
 14 in the -- in shallower --
 15 Could you restate the question for me?
 16 Q. Well, I was asking you if these 400, or
 17 plus 400 foot wells that United Water has, are
 18 deeper than the average domestic wells?
 19 A. I believe that our supply wells, which
 20 the Lexington Hills wells are not our wells, but
 21 I believe that most of the domestic wells are
 22 completed shallower than the United Water wells
 23 in the area.
 24 Q. So if there is a drawdown effect, it
 25 would affect the domestic wells first?

1 A. No, I don't think -- I don't think that
 2 is the case. The -- the other wells in the
 3 Pierce Gulch Sand Aquifer are going to -- are
 4 going to be more hydraulically connected, I
 5 believe, than the shallower wells. That's what
 6 we saw from, you know, the Vail and Miller
 7 domestic wells that are near the Floating Feather
 8 well.

9 They -- there doesn't appear to be the
 10 types of water level change from pumping in the
 11 domestic wells, that you would experience in a
 12 well in the Pierce Gulch Sand Aquifer.
 13 Otherwise, those domestic wells would have, you
 14 know, pumping levels significantly below the
 15 levels that they had before the Floating Feather
 16 well went in.

17 Q. And that Floating Feather well, that's
 18 the one there -- near the Eagle Middle School?

19 A. Right, correct.

20 Q. And the one at Floating Feather and
 21 Eagle Road, that's the Brookwood well?

22 A. Correct.

23 Q. Do you know when it went online?

24 A. I believe it was -- it was pump tested
 25 in early 2007. And I'm not aware exactly of how

1 much after that it was outfitted. But I know the
 2 pump house has been there for -- you know, I'm
 3 recalling, you know, a year or more.

4 Q. You don't know whether it went online
 5 in 2008 or not?

6 A. I don't know the exact date of when it
 7 went online.

8 Q. And I believe you said, you had six
 9 wells in the Eagle area that were United Water
 10 wells?

11 A. Well, I think some of the wells that
 12 were on the map that we were talking about would
 13 be more characterized in the west Boise area than
 14 the Eagle area. For example, the Goddard well,
 15 the HP well that we talked about, those are in
 16 west Boise. There are --

17 Q. So Floating Feather?

18 A. Floating Feather is definitely in the
 19 Eagle area. Redwood Creek is to the west of
 20 that. It's in the Eagle area. The Island Woods
 21 wells are, you know, in the south Eagle area.

22 Q. And Floating Feather and Redwood Creek
 23 would both be in the north Eagle area, northwest
 24 Eagle?

25 A. Yeah, I would characterize them in the

1 Eagle area. They are -- they're -- well, you are
 2 aware of where they are located.

3 Q. I believe you said there was a
 4 combination of recharge, and that the shallow
 5 aquifers helped in that recharge?

6 A. Well, I was -- I was talking -- I was
 7 speaking to my opinion that the aquifer there
 8 is -- has significant recharge based on the fact
 9 that the Floating Feather well, and the other
 10 wells that are completed into this -- into this
 11 sand -- sand deposits that have been mapped,
 12 produced significant volumes of water.

13 But they -- in the case of the Floating
 14 Feather well, for example, when the well turns
 15 off, the water levels recover. And I -- and
 16 I -- that indicates to me, that there is
 17 significant recharge to that aquifer.

18 And I was just talking about the
 19 potential -- the potential sources of recharge.
 20 And I'm not saying that one was more important
 21 than the other one, because I don't have
 22 information, or knowledge on the relative ratios
 23 that the different recharge mechanisms might
 24 contribute.

25 Q. Do you know, or do any of the

1 hydrologists -- do any of the hydrologists know
 2 what that recharge is?

3 A. I don't --

4 MR. FEREDAY: Objection to the extent
 5 that he's being asked to testify as to what other
 6 hydrogeologists --

7 MR. SMITH: I'll rephrase the question.

8 Q. (BY MR. SMITH) Do you know what that
 9 rate of recharge is to the PGSA?

10 A. I don't -- I don't know a number to
 11 the -- you know, off the top of my head. There
 12 have been estimates made in, for example, the
 13 modeling report that -- that M3 commissioned,
 14 that would have that information.

15 And those -- that model would be a
 16 model -- a construct that would try and
 17 incorporate the -- you know, the most accurate
 18 information that's known about the conceptual
 19 model of the aquifer system.

20 Q. But don't those conceptual models also
 21 have a lot of assumptions and speculation?

22 A. There are some assumptions. And I
 23 wouldn't characterize -- I don't know if
 24 speculation would be the way that I would
 25 characterize it. I mean, there are some things

1 that are unknown. And in order to make the model
2 represent reality, there are some -- there are
3 some -- some properties that have -- that are not
4 known specifically for measurements that you have
5 to -- that you have to assign values to.

6 Q. And you indicated, you think the
7 recharge -- or the discharge is into the Payette
8 valley. Do we know where the discharge is?

9 A. Where the -- the -- no, I don't -- I
10 don't know exactly where the discharge is. I'm
11 speaking about flow in the aquifer in that
12 direction based on the way the aquifer has been
13 mapped, and the way that -- and the existing
14 information about the gradients within that
15 aquifer indicates that the water is moving
16 towards that direction.

17 Q. More north and northwest?

18 A. I would have to look at the -- at
19 the -- at the map, again, with the water level
20 contours. But I would say, northwest.

21 Q. All right. Are you familiar with
22 Dr. Wood?

23 A. Yes, I know -- I know Dr. Wood.

24 Q. Are you aware that he concluded that
25 the discharge would be somewhere in the Payette

1 bluff area along the Payette River?

2 A. I don't specifically recall that, no.

3 Q. Have you ever been in that area?

4 A. I have. Not -- not extensively, but...

5 Q. Have you seen any springs or artesian
6 flow in that area?

7 A. No, I haven't. I don't -- I don't know
8 that that's the way the discharge would
9 necessarily express itself. You would have
10 to -- you would have to look at the, you know,
11 the water levels, and it could be flowing into
12 the -- into the basin field stream sediments, and
13 it might -- and it could be discharging that way.
14 The --

15 Q. Could it also discharge under the
16 Payette River floor?

17 A. That's -- that's conceivable, I
18 suppose.

19 Q. I believe you said, United Water had
20 some concerns about M3's water application and
21 their pumping?

22 A. Well, we are concerned when -- when
23 there is a significant water right that is, you
24 know, in the vicinity of some of our pumping
25 wells. But we're always concerned -- we have

1 many concerns in many other areas that -- that
2 have -- that have hydrogeologic conditions that
3 make us much more worried.

4 For example, the Ten Mile ridge area
5 south of Boise is an area where you have warm
6 water at a relatively shallow depth below the
7 water table. And the water table itself is at a
8 deep depth. And there is a limited amount of
9 drawdown you can have at that location. So we
10 look at water right applications, and evaluate if
11 we think we need to protest. In this case, we --
12 you know, I would say, we were concerned -- we
13 are concerned about, you know, several
14 applications.

15 Q. You don't see any damage to the
16 aquifer, though?

17 A. To -- from what?

18 Q. From the M3 pumping.

19 A. I -- our concern is that we are able to
20 obtain our water rights from our wells. And
21 based on what I know about the way that our wells
22 have been operating, and based on the information
23 that M3 has produced and supplied to us, we
24 decided not to protest. We -- we -- it's my
25 opinion that we are going to continue to be able

1 to obtain our water rights from our wells.

2 Q. Would it be your opinion that it could
3 take a year or more, maybe several years for
4 drawdown in the aquifers -- smaller aquifers to
5 show up?

6 A. I -- it could take more than a year, I
7 suppose.

8 Q. I believe you said the Floating Feather
9 pump was upgraded in 2005?

10 A. That's correct.

11 Q. Would you call that a high capacity
12 well?

13 A. I would.

14 Q. Would you call the M3, thousand feet
15 deep well, high capacity wells?

16 A. I don't -- you mean, the wells that
17 would be completed after the application is
18 approved?

19 Q. Correct.

20 A. I believe that they would be based on
21 the -- you know, the pumping rates that have been
22 observed in the -- in the existing smaller
23 diameter wells that are, you know, capable of
24 close to a thousand gallons a minute we know from
25 the tests that they have done.

1 So I would -- I would think that the
 2 wells, that they eventually might end up
 3 completing would be -- I would call them high
 4 capacity wells, because, I believe, they would be
 5 at least a thousand gallons a minute.
 6 Q. Okay. Let's go back to the middle
 7 school well, the Floating Feather well. I
 8 believe you said that had been an irrigation
 9 well, a producing irrigation well before it
 10 became the Floating Feather United Water well?
 11 A. At that site there was an irrigation
 12 well. But that well -- the existing irrigation
 13 well was abandoned by poking holes in the casing,
 14 and pressure driving it to seal it. Because it
 15 wasn't completed to municipal well standards with
 16 respect to well sealing to the material of the
 17 well. That -- so it's -- it's not the same well.
 18 It's a different well.
 19 Q. But it was not operating?
 20 A. It --
 21 Q. You don't have any flow from it?
 22 A. I don't -- I don't -- I don't have
 23 information with me that that, you know,
 24 documents how much it produced. But I do know
 25 that it was an irrigation well. It had a

1 valid -- had an existing water right, and it
 2 irrigated the Eagle Middle Crandalmire property
 3 that's -- that's there and all around where the
 4 school is now built.
 5 Q. Did he also have water rights out of
 6 the Farmers union --
 7 A. I don't --
 8 Q. -- or do you know?
 9 A. I don't know. I don't know.
 10 Q. Are you familiar with the domestic
 11 wells in the Downey Downs Subdivision?
 12 A. No, I'm not.
 13 Q. You don't know anything about any of
 14 those going dry?
 15 A. No, I don't.
 16 Q. So I believe you said the water level
 17 was stable in the Floating Feather well area?
 18 A. In the Pierce Gulch Sand Aquifer, we've
 19 documented that, yes. I believe that's -- that's
 20 established.
 21 Q. But if wells were going dry in the
 22 Downey Downs Subdivision, would that not indicate
 23 that the water level wasn't stable there, if you
 24 have an opinion?
 25 A. I'm not aware of where the Downey Downs

1 Subdivision is. But the water level declines
 2 that you would expect to see from pumping of a
 3 well would typically be apparent in that pumping
 4 well to the highest -- to the highest degree of
 5 the wells that we would be responding. It's the
 6 pumping center.
 7 Q. Is there a general decline in the water
 8 levels in the wells north of the Eagle area?
 9 A. Not that I'm aware of.
 10 Q. And I believe you mentioned the water
 11 level had risen in the Floating Feather well
 12 after the irrigation season?
 13 A. No, that was -- that was what I infer
 14 from the hydrographs of the domestic wells.
 15 They -- the measurements were taken in the
 16 spring, and then in the late summer, early fall,
 17 and they were higher after the irrigation season.
 18 The -- this October measurements were higher than
 19 the measurements in the spring, previous spring.
 20 Q. Wouldn't you expect those water levels
 21 to rise after the irrigation has ended?
 22 A. I would expect them to rise during the
 23 time they were receiving -- you know, if they are
 24 receiving input from irrigation. I mean, that's
 25 what I -- that's what I infer from the hydrograph

1 data. So I guess the answer would be, yes.
 2 Q. Let's go to the Linder and State Street
 3 monitoring well. You say that's not a producing
 4 well?
 5 A. Correct.
 6 Q. Does its location near the river affect
 7 the stable levels that you've gotten from it?
 8 A. It has water levels that are well above
 9 the river level. And so I don't -- I don't think
 10 that there -- that the river flows would impact
 11 the stability of the water level measurements
 12 that we see.
 13 I think the main thing that the State
 14 and Linder well is showing is that the artesian
 15 pressures in the Pierce Gulch Sand Aquifer,
 16 whether flowing or not flowing, this just happens
 17 to be a flowing well, if it's uncapped, the water
 18 levels above ground, those have not changed.
 19 That's -- that's what the hydrograph -- the main
 20 point of the hydrograph shows me.
 21 Q. And I believe you view the inference in
 22 response to one of Mr. Fereday's questions about
 23 the Floating Feather well, that the recharge is
 24 sufficient. Is that for just that well, or the
 25 whole PGSA?

1 A. That -- I was -- I was speaking to the
2 fact that the water level in the Floating Feather
3 well hasn't declined since the well was
4 completed. So there must be sufficient recharge
5 for that to occur, at least.

6 And that's -- you know, that type of
7 information from -- from our experience is -- is
8 one of the reasons that we -- that I -- that it's
9 my opinion, that there is additional water
10 available in that aquifer to be appropriated.

11 Q. Is that only an inference?

12 A. It's an -- it's an opinion. It's my
13 opinion.

14 Q. After the Brookwood well went online,
15 are you aware that some wells went dry around the
16 Beacon Light area?

17 A. No, I'm not aware of that.

18 Q. You don't know anything about the
19 Lawton or Steiner wells --

20 A. No.

21 Q. -- going dry?

22 A. Do you -- what -- can you please define
23 what "going dry" means?

24 Q. Well, either having to be deepened or
25 the pumps lowered.

1 A. I'm not aware of -- I'm not familiar
2 with those wells.

3 Q. Okay. And I think you mentioned
4 something about over estimating the drawdowns?

5 A. I -- if you are -- if you are referring
6 to my opinion about the drawdowns that are
7 predicted from using the Theis equation, applying
8 that?

9 Q. The Theis equation; correct.

10 A. Yes, in my experience, they over
11 predict the drawdowns that actually occur,
12 because that's a model that doesn't represent the
13 reality that we have here in most --

14 Q. And you are saying that?

15 A. -- in most --

16 Q. I'm sorry.

17 A. -- in most cases.

18 Q. And you say that equation or method
19 assumes no recharge at all?

20 A. Correct.

21 Q. So your conclusion is that the IDWR
22 staff memo is not accurate in that respect?

23 A. I am not -- I'm not saying that -- I
24 don't believe that the staff was saying that they
25 had developed a model that is -- that's more

1 accurate than any other model. I think they were
2 going through an exercise in much the same way
3 that I was describing the way that, you know, I
4 might go through the exercise, of looking at what
5 might be the impacts.

6 But then following that, there
7 needs -- there -- there is typically a
8 discussion, which I believe the staff did, and
9 they contended that their model -- they, while
10 not including recharge, did, you know, of course,
11 because of the method that -- analytical method
12 they used, assumed an aquifer of infinite aerial
13 extent, which I think everyone agrees is not the
14 case.

15 And so I -- I don't -- I don't think
16 that they were saying that the numbers that they
17 got were -- were numbered -- were -- with -- as
18 far as with respect to drawdown, were numbers
19 that -- that they were, you know, firm about.

20 I don't think I'm mischaracterizing
21 that. I think -- I think it was one estimate.
22 One way to get an estimate of the potential
23 impacts just of the Pierce Gulch Sand Aquifer.

24 Q. When IDWR considers a water right,
25 wouldn't it be safer to over estimate the

1 drawdown, rather than underestimate it?

2 A. I don't -- I don't know that I have an
3 opinion on that.

4 Q. Well, are you aware of what's happened
5 in the Snake River Plain?

6 A. Yes. Yes, I'm generally aware that
7 there is water calls in the area because of water
8 level declines.

9 Q. Would you say that was because the
10 aquifer was over allocated?

11 MR. FEREDAY: Objection. Beyond the
12 scope.

13 THE HEARING OFFICER: Sustained.

14 MR. SMITH: All right.

15 Q. (BY MR. SMITH) The north Eagle area,
16 would you say, there is a lot of faults in that
17 area that affect the underground water?

18 A. There -- there has been, to my
19 knowledge, the primary fault system, the
20 west-Boise Eagle fault is -- is the only one that
21 I'm aware of that affects the flow of the water.
22 Just based on the fact that it -- it just
23 supposes nonaquifer sediments with aquifer
24 sediments.

25 Q. Could those faults also affect the

1 sustainability of an aquifer under heavy pumping,
2 or do you know?

3 A. I'm not aware -- I'm not aware of any
4 information that shows the hydraulic defect of
5 those faults, so I don't -- I don't have an
6 opinion on that.

7 Q. All right. If the recharge is partly
8 from the shallow aquifers, did not deep pipe
9 capacity wells effect that recharge?

10 MR. FEREDAY: Objection. I'm sorry.
11 I -- maybe if you can restate the question,
12 I'll --

13 MR. SMITH: Yeah.

14 MR. FEREDAY: -- better understand what
15 you are getting at, but I think it was beyond the
16 scope. But maybe you could just restate it.

17 Q. (BY MR. SMITH) Well, let me ask it
18 this way: Will not deeper height capacity wells
19 cause the recharge of the shallower aquifers to
20 be less?

21 A. No, I don't think so.

22 Q. So if they are helping recharge the
23 deeper aquifer, it wouldn't affect that?

24 A. Well, I -- I think I understand where
25 you are going. I think the recharge to the

1 shallow aquifer would be the recharge to the
2 shallow aquifer. And if it is the case that
3 pumping from a deeper aquifer, such as the Pierce
4 Gulch Sand Aquifer, would induce recharge from
5 the shallow aquifer, then it would -- then it
6 would be -- it would be just inducing recharge
7 from the aquifer. And in that respect, the -- I
8 understand what you are saying, and -- and, yes.

9 Q. Are you aware of all of the domestic
10 wells in Ballantyne, Homer Road, north Eagle
11 Road, the Beacon Light area?

12 A. I know there is -- there is many, many
13 domestic wells in the Eagle area.

14 Q. Are you aware that some 40 of those
15 have gone dry?

16 A. I'm -- I'm not aware of any specific
17 wells that have -- that have experienced
18 problems.

19 Q. Would you say a well is virtually gone
20 dry if the static level of the water is only
21 about two or four feet above the pump?

22 A. It depends on the pump setting, I would
23 say. If you are talking --

24 Q. It might be possible to lower the pump.
25 It might also require drilling a deeper well;

1 would it not?

2 A. If that's -- that's -- if that's the
3 case.

4 Q. Now, I believe you said the six-inch
5 wells range from only, I think you said, 60 to
6 400 feet deep?

7 A. That was -- that was my general
8 understanding of -- of, you know, a depth range.
9 I don't -- I don't -- they -- you know, it's
10 conceivable that some are shallower. And
11 I -- I -- I don't know if any are deeper than 400
12 feet. But I don't know in that area, that you
13 would need to go deeper than 400 feet to obtain
14 water. So that's the -- my basis for giving that
15 depth range estimate.

16 Q. And you did notice a downward trend on
17 the Miller well?

18 A. The statistical fit of a straight line
19 through the data points down, if you look at
20 the -- that figure of the Vail, Miller
21 hydrographs, the measurements on October during
22 the measurements -- measurement period from '96
23 through '98, those are actually trending upward.

24 So the highest water level was measured
25 at the -- at the end of -- at the end of the

1 monitoring requirement.

2 Q. Are you familiar with the Owsley and
3 Vincent staff report?

4 A. I did -- I read that, yes.

5 Q. Are you aware that their estimate was
6 at 10 cfs, not 23 cfs?

7 A. Well, as far as in their analytical
8 model, is that what we're --

9 Q. Correct.

10 A. Yes, they -- I believe they didn't use
11 the 23 cfs, because they were looking at the
12 long-term pumping effects for estimating the
13 long-term pumping effects. And the 23 cfs would
14 be the capacity if -- if -- if all -- if at full
15 build out, if the wells were all pumping, I
16 believe, that's the plan, M3's proposed plan.
17 But the value that, I believe, the staff used was
18 representative of the average -- an average cfs.
19 So that's -- that's my understanding of why that
20 flow rate was chosen.

21 Q. Do you recall what their estimated
22 drawdown was at the Floating Feather, Highway 16
23 well at 10 cfs?

24 A. The which well?

25 Q. The drawdown, I believe, it's the

1 Floating Feather Highway 16 well, or in the area.
2 A. I would have to look at the figure to
3 re-remind myself about what it would be. Where
4 was that, again?

5 MR. FEREDAY: I believe that's Exhibit
6 50, Figure 3, page 22.

7 THE WITNESS: (Witness complying.)

8 Q. (BY MR. SMITH) Yeah, it's Figure 3 on
9 page 22.

10 A. Okay. Well, I don't see the -- Highway
11 16 and Floating Feather Road. I don't -- I don't
12 see the exact location, because the roads aren't
13 on this figure. But I do see the water level
14 contours. I see a 15-foot contour just barely on
15 the map. I see a 20-foot contour. And a 35-foot
16 contour right around the simulated pumping center
17 on the M3 property. Okay. There (indicating) is
18 16. There (indicating) is Highway --

19 Q. Would it -- excuse me.

20 A. -- 44. Would it be somewhere between
21 20 and 25 feet is the location you are talking
22 about? Is that --

23 Q. 22 feet; would that be accurate?

24 A. I'm not seeing the exact location of
25 Floating Feather Road on here. But if you -- I

1 see Highway 16.

2 Q. All right. Let's go to the hot summer
3 month, a few days a year that 23 cfs is being
4 pumped. Would that not substantially increase
5 that drawdown in that same area?

6 A. I don't -- I don't know. I -- it --

7 Q. Would it seem logical that it would?

8 A. Well, there would -- there would be
9 more drawdown in the Pierce Gulch Sand Aquifer
10 when the wells -- when the wells would be pumping
11 more. And there would be less when the wells
12 would be pumping less. And this is -- this is
13 representing an average drawdown, which is the 10
14 cfs average at -- after full development in the
15 Pierce Gulch Sand Aquifer.

16 I don't -- I don't know that -- I don't
17 know to what degree other wells completed above
18 or potentially below the aquifer would -- how
19 they would respond to pumping. And this is, in
20 itself, is just an estimate. But, yes,
21 basically, higher pumping rates have higher
22 drawdowns in the aquifers that they impact.

23 Q. Well, in fact, we don't know what the
24 drawdown would be; do we?

25 A. In -- with respect to?

1 Q. To the 23 cfs, even for only a few days
2 out of the month.

3 A. Well, we have -- we have -- I
4 don't -- I don't myself, don't know what the
5 drawdown would be. I don't know if others have
6 projected that based on -- based on, you know,
7 the aquifer parameters that have been calculated.

8 You know, they are estimates. 23 cfs
9 hasn't been -- hasn't been pumped from the
10 pumping center. So I would say that -- that you
11 are probably correct in that statement.

12 MR. SMITH: All right. Thank you. I
13 believe that's all I have.

14 THE HEARING OFFICER: Okay.
15 Mr. Edwards, questions?

16 MR. EDWARDS: No.

17 THE HEARING OFFICER: Redirect,
18 Mr. Fereday?

19 MR. FEREDAY: I guess we're right at
20 noon. If you want to take a break, I probably
21 have 15, 20 minutes at the most.

22 THE HEARING OFFICER: Okay. Do you
23 think this is a reasonable time for a break? It
24 is noon.

25 MR. FEREDAY: Yes.

1 THE HEARING OFFICER: Okay. Let's come
2 back at five after 1:00.

3 (A lunch recess was had.)

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

6 Mr. Fereday, redirect.

7 REDIRECT EXAMINATION

8 QUESTIONS BY MR. FEREDAY:

9 Q. Mr. Dittus, you were asked several
10 questions about the Miller and Vail well, and the
11 figure that went with those wells near the
12 Floating Feather well. Do you recall that?

13 A. Yes, I do.

14 Q. Do you know whether United Water ever
15 provided any well deepening, well improvement, or
16 any other kind of mitigation or payment to either
17 Miller or Vail as a result of your monitoring?

18 MR. THORNTON: Objection; beyond the
19 scope of cross-examination.

20 THE HEARING OFFICER: Overruled.

21 THE WITNESS: I know that we have not
22 provided any of those.

23 Q. (BY MR. FEREDAY) Has either Miller or
24 Vail ever contacted you, since that monitoring
25 was done, with regard to their wells or water

1 levels in their wells?
 2 A. They have not.
 3 Q. Do you know whether they have ever
 4 complained to the Department of Water Resources
 5 about water levels? Do you know?
 6 A. I don't. I don't know.
 7 Q. Mr. Dittus, you were asked, especially
 8 by Mr. Smith, a number of questions about wells
 9 having allegedly gone dry. Do you recall that?
 10 A. I do recall that.
 11 Q. Do you know whether any wells have gone
 12 dry in the Eagle area?
 13 A. I'm -- I'm not aware of any wells that
 14 have gone dry.
 15 Q. Do ground water wells have a life? Do
 16 they cease operating after a certain period of
 17 time, or do they go on forever? What's your view
 18 on that?
 19 A. Wells are -- you know, they are like
 20 other kinds of infrastructure, like a bridge, or
 21 something that ages. And as it ages, it
 22 typically becomes less efficient. Sometimes they
 23 can fail. With respect to a well, there can be
 24 collapse problems, sand and fill problems. They
 25 can develop holes in the casing, and start

1 producing sand. So they -- they do age.
 2 Q. And when they do age and exhibit those
 3 problems, do they sometimes fail to produce
 4 water?
 5 A. That -- that can be one of the results
 6 of the general aging process of a well.
 7 Q. And they can fail to produce water even
 8 though there is plenty of water in the aquifer
 9 there? That is to say, that the pump is below
 10 the general aquifer level in the area, but they
 11 still can fail to produce water; is that a
 12 possibility?
 13 A. That's -- that's a definite
 14 possibility, yes.
 15 Q. Have you had experience with this
 16 happening?
 17 A. I -- I have. We have wells that have
 18 declined in efficiency to the point where their
 19 production is severely limited just because of
 20 the inability of water to enter the well for the
 21 same amount of drawdown.
 22 Q. Even though there is plenty of water in
 23 the aquifer?
 24 A. Correct. In other words, the hydraulic
 25 efficiency of the well, the head losses,

1 the -- as the water moves into the well, can
 2 increase over time. And so for the same amount
 3 of drawdown, you can get in the same well a
 4 decreasing quantity of water. Sometimes to the
 5 point that the pump will break suction, or that's
 6 a -- some to the point where there won't be
 7 enough suction head over the pump intake, and the
 8 pump will cavitate, and it will appear
 9 that -- that -- well, the -- you just won't be
 10 able to produce water from the well.
 11 Q. And would it be possible that a
 12 layperson might describe that well, as a well
 13 that has gone dry?
 14 A. It's -- it's possible, yes. If you
 15 don't -- if you don't have a measurement of
 16 the -- of the water level in the well when the
 17 well is not pumping to compare that to, you know,
 18 the -- you know, the water level when the well is
 19 pumping that can --
 20 So in other words, it could be a well
 21 construction problem as opposed to an actual
 22 decline in the water level in the well.
 23 Q. If a well produces sand along with the
 24 water, is that an indication that there may be
 25 problems with the well, or that the well's life

1 may be shorter than otherwise would be the case?
 2 A. Well, I know definitely it affects
 3 pumps, and I think it's possible that it can
 4 affect the well, too. I mean, some domestic
 5 wells, maybe most of them are completed without
 6 well screen. And in some cases they can, because
 7 of lowering of the pressure during pumping, that
 8 can cause sand to come up inside the pipe, and
 9 that's going to decrease the efficiency of the
 10 well. And that's one possibility that could
 11 cause the well to respond as if it's not -- as if
 12 it's not getting enough water from the aquifer.
 13 Q. Mr. Smith asked you several questions,
 14 and Mr. Thornton did as well, about the use of
 15 the Theis equation in the staff's report at
 16 Figure 3; Exhibit 50, Figure 3. Do you recall
 17 that?
 18 A. Yes, I do.
 19 Q. The drawdown curves drawn on that
 20 Figure 3 are intended to depict drawdowns in the
 21 Pierce Gulch Sand Aquifer; isn't that right?
 22 A. Yes, that's correct.
 23 Q. And not in any other aquifer, such as
 24 in an overlying aquifer?
 25 A. That's correct.

1 Q. In your colloquy with Mr. Smith about
2 depths of domestic wells, you indicated that you
3 are aware generally, I believe your testimony
4 was, of various depths of domestic wells in the
5 Eagle area. Do you recall that?

6 A. I do.

7 Q. Now, when you talk of a depth of a
8 domestic well, you are talking about the depth
9 from land surface. Is that -- or is that -- is
10 that correct?

11 A. That's correct.

12 Q. And the land surface, of course, in
13 north Eagle varies quite a bit; does it not, up
14 into the foothills?

15 A. It does.

16 Q. So if one is up in the foothills aways,
17 one might have to drill, 200, 300, 400 feet
18 before he got to the same water table that could
19 be reached by someone at 90 feet down below. Is
20 that a reasonable hypothetical?

21 A. If you are very high up in the
22 foothills, I would say, you might have to drill
23 that far.

24 Q. Okay. You were asked questions also
25 about faulting. Do you see in any of your -- in

1 any of the six production wells that you've
2 described, or in your tested wells, for that
3 matter, in the Eagle area, do you see any effect
4 on these wells that you would attribute to
5 faulting?

6 A. Not -- we don't see evidence of
7 negative boundaries in our wells in the Eagle
8 area when they are pumping.

9 Q. Okay.

10 A. I have not observed that.

11 Q. Do you see any kind of boundary
12 effects; negative or positive?

13 A. Well, the water levels in the wells
14 during the summertime, for instance, in the
15 Floating Feather well, they show a stabilization,
16 and so they -- that indicates that they are
17 obtaining sufficient water to not continue to
18 drawdown. That's the deviation from -- from a
19 drawdown curve that we observe in those -- in the
20 Floating Feather well and other wells in that
21 area.

22 Q. If you could refer to Figure 1 of
23 Exhibit 19 B with regard to faulting. I would
24 like to ask you a few questions. I believe you
25 testified about your understanding of the

1 location of some faults.

2 A. (Witness complying.)

3 Q. Mr. Dittus, have you seen that map
4 before?

5 A. I have.

6 Q. And can you tell us what it depicts?

7 A. This shows the M3 property. It shows
8 some lines of cross section, generally, going
9 down, dip in the Pierce Gulch Sand Aquifer. And
10 it shows some faults that were identified in the
11 magnetometer survey.

12 Q. Are the faults, the lines that have
13 shading around them, that trend generally from
14 the southeast to the northwest?

15 A. Yes, they are.

16 Q. Could you locate for us where the
17 Floating Feather well is on this map?

18 And just to -- yeah, maybe with your
19 pointer would be good?

20 A. I believe it's this (indicating), right
21 there (indicating).

22 Q. So the Floating Feather well lies
23 between the fault denoted in blue on the right,
24 and perhaps the extension of the short fault that
25 is shown there on the left; would that be --

1 A. If -- if the fault on the left extended
2 to the southeast, then, yes, it would.

3 Q. Do you know whether the fault -- that
4 fault on the left would extend to the southeast?

5 A. I don't know how far it would extend,
6 if it does extend, no.

7 MR. FEREDAY: I think that's all the
8 questions we have on redirect, Mr. Hearing
9 Officer.

10 THE HEARING OFFICER: Okay.

11 Recross, Mr. Thornton.

12 RE-CROSS-EXAMINATION
13 QUESTIONS BY MR. THORNTON:

14 Q. Mr. Dittus, did you testify earlier
15 this morning that the Pierce Gulch Sand Aquifer
16 on the northwest and southwest extensor are still
17 undefined?

18 A. Yes, I -- that's -- I said that was
19 my -- my belief, yes.

20 Q. Okay. Thanks. As a spokesperson for
21 United Water, are the projections for use of
22 ground water in the Treasure Valley looking to be
23 a large increase, modest increase, staying
24 stable?

25 MR. FEREDAY: Objection. I think

1 that's beyond the scope of --
 2 THE WITNESS: Yeah, I --
 3 MR. FEREDAY: -- of redirect.
 4 THE WITNESS: I don't think they
 5 are --
 6 THE HEARING OFFICER: Just a minute.
 7 Mr. Thornton, argument?
 8 MR. THORNTON: I wanted to verify,
 9 based on earlier questions with Mr. Dittus, about
 10 the projections that United Water had for
 11 increased use in the area.
 12 THE HEARING OFFICER: Well, this is
 13 beyond the scope. I'll allow a little bit of
 14 latitude. So overruled, at least right now.
 15 Mr. Thornton, I want to give you
 16 significant information in the area. But they
 17 were not part of Mr. Fereday's questions, and
 18 otherwise, we'll be here a long time.
 19 MR. THORNTON: I can withdraw that
 20 question. That's fine.
 21 THE HEARING OFFICER: Whatever you
 22 choose.
 23 MR. THORNTON: I'll withdraw it.
 24 That's fine.
 25 Mr. Hearing Officer, maybe outside the

1 scope, I don't fully understand what that means.
 2 So let me know if it --
 3 THE HEARING OFFICER: Well, let me just
 4 explain to the protestants. And perhaps we
 5 had -- I thought we had this discussion. But the
 6 way in which the questioning is narrowed, so that
 7 we don't re-ask questions and cover ground that
 8 we've already covered.
 9 Is that your cross-examination
 10 initially needs to be within the scope of what
 11 Mr. Fereday asks. So within the subject matters
 12 that he asks questions about, then your questions
 13 need to be related to those. And then his
 14 redirect needs to be within that narrower
 15 boundary of the questions that you ask on
 16 cross-examination. So his could or could not be
 17 within that scope. And if it's outside, then you
 18 could object.
 19 And then the same is true for your
 20 recross. So theoretically, every one of those
 21 sets of questions should be circumscribed by a
 22 narrower boundary of subject matters. If that
 23 makes sense?
 24 MR. THORNTON: Okay. It does. And so
 25 if I overstep, I apologize ahead of time.

1 THE HEARING OFFICER: Okay.
 2 MR. THORNTON: So, thanks.
 3 Q. (BY MR. THORNTON) Did you earlier
 4 testify that United Water did not protest M3
 5 water right application?
 6 A. I did.
 7 Q. Okay. Could this partially be due to
 8 United Water highlighting a concern for the
 9 ground water resources, thus causing some
 10 heightened concern, either with the Department of
 11 Water Resource or the general public --
 12 MR. FEREDAY: Objection the same --
 13 sorry.
 14 Q. (BY MR. THORNTON) -- when United Water
 15 asked in the future for more water rights?
 16 MR. FEREDAY: Objection.
 17 THE HEARING OFFICER: Okay.
 18 MR. FEREDAY: -- the same basis.
 19 THE HEARING OFFICER: Okay. I'll allow
 20 some latitude, again, but I don't want it to go
 21 too far.
 22 THE WITNESS: That -- that is not the
 23 reason that we didn't protest the water right.
 24 Q. (BY MR. THORNTON) Okay. If you could
 25 refer to Exhibit No. 50, Appendix A, the IDWR

1 staff memorandum.
 2 MR. THORNTON: And, hopefully, with
 3 this I'm not over stepping the boundaries here,
 4 Mr. Hearing Officer.
 5 Q. (BY MR. THORNTON) If you go to
 6 Exhibit A, under 50.
 7 A. (Witness complying.) Okay. The staff
 8 memorandum?
 9 Q. Yes. And then there is an Exhibit A in
 10 the back.
 11 A. (Witness complying.) Is there a page
 12 number that you could --
 13 Q. I -- you know, I actually don't think
 14 it will have -- it's towards the back. It will
 15 have a separate cover sheet --
 16 A. Okay.
 17 Q. -- saying Appendix A.
 18 A. Is it the March 2nd, 2009?
 19 Q. Yes, it is.
 20 A. Okay. Well, it's -- (Witness
 21 complying.) Okay.
 22 Q. And did you state earlier in your
 23 testimony, that you had read and were familiar
 24 with this report?
 25 A. I've read it, yes.

1 Q. Okay. And can you explain in Appendix
 2 A, all the declines in ground water level from
 3 the wells represented there, suggesting a decline
 4 in ground water table? Can you describe why that
 5 may not be occurring?
 6 MR. FEREDAY: Objection; the same
 7 basis.
 8 THE HEARING OFFICER: Yeah, I think
 9 I'll sustain that objection. Mr. Thornton, we
 10 really didn't talk about these particular
 11 declines in the --
 12 MR. THORNTON: Okay.
 13 THE HEARING OFFICER: -- cross
 14 examine -- or the redirect. And I think we would
 15 spend a lot of time here.
 16 MR. THORNTON: Okay.
 17 THE HEARING OFFICER: My sense is that,
 18 there will be an opportunity to have these
 19 explained through other witnesses.
 20 MR. THORNTON: Okay.
 21 THE HEARING OFFICER: Okay.
 22 MR. THORNTON: So I'll withdraw that.
 23 Okay.
 24 Q. (BY MR. THORNTON) Did you just
 25 testify, when asked by Mr. Smith in regards to

1 IDWR's -- or excuse me -- Hydro Logic's drawdown,
 2 calling it depression curves in their reports,
 3 that you did not actually know the amount of
 4 drawdown?
 5 A. Which drawdown curves, and in which
 6 reports?
 7 Q. Yeah, and it was a poorly phrased
 8 question. And I apologize.
 9 MR. FEREDAY: Objection. It refers to
 10 Mr. Smith's questions not mine.
 11 THE HEARING OFFICER: Yeah, but it is
 12 the subject matter that was discussed in
 13 redirect, where we referred, I think, back to the
 14 Figure 3, page 22 of the Department's report,
 15 Exhibit 50.
 16 MR. THORNTON: Correct.
 17 THE HEARING OFFICER: I think that's
 18 where the question is heading.
 19 THE WITNESS: (Witness complying.) Oh,
 20 this is not Hydro Logic's.
 21 Q. (BY MR. THORNTON) Right. And that's,
 22 actually, this figure, I think, this figure just
 23 after that, that's Hydro Logic's.
 24 A. Okay. No, I don't think I testified to
 25 the Hydro Logic's drawdowns.

1 Q. Okay.
 2 A. I don't recall that.
 3 Q. Okay. Then we don't need to have that
 4 marked.
 5 Did you state in your prior testimony,
 6 that as a spokesperson for United Water, that you
 7 had no opinion regarding the appropriateness for
 8 generally underestimating the amount of ground
 9 water sustainability when applying for an
 10 application for permit?
 11 MR. FEREDAY: Objection; the same
 12 basis.
 13 THE HEARING OFFICER: Sustained.
 14 I don't understand the question,
 15 Mr. Thornton. Even beyond that, I don't
 16 understand what the question is.
 17 MR. THORNTON: Okay.
 18 THE HEARING OFFICER: It needs to be
 19 within the scope of the question.
 20 MR. THORNTON: And I do believe
 21 Mr. Fereday is right. It was based on a question
 22 that Mr. Smith had, so...
 23 THE HEARING OFFICER: Okay.
 24 MR. THORNTON: So withdraw the
 25 question.

1 THE HEARING OFFICER: Well, I sustained
 2 the objection.
 3 MR. FEREDAY: Sustained it. Okay.
 4 THE HEARING OFFICER: Yeah.
 5 Q. (BY MR. THORNTON) In Mr. Fereday's
 6 question to you, did you identify that there were
 7 wells that had failed even with water in the
 8 aquifer? That pumps were below the aquifer water
 9 table?
 10 A. Definitely.
 11 Q. Okay. And do you have specific
 12 information, as to which of those wells are, that
 13 you could provide us?
 14 A. From my -- from United Water's wells?
 15 Q. Yes.
 16 A. Yes, I do. We have -- we have -- we
 17 have several recent cases where that has
 18 occurred.
 19 Q. Thank you. And then I believe you
 20 also -- did you recently state that most domestic
 21 wells are completed without a well screen?
 22 A. I said I believe that what I -- what
 23 I -- my opinion is that many domestic wells are
 24 completed without a well screen. I believe many
 25 domestic wells are open bottom pipes. But I do

1 know that there are domestic wells that have well
2 screens, and they might be a significant number.

3 For instance, the wells that were
4 monitors with respect to the Floating Feather
5 application, I believe one of those had a well
6 screen in it. It's common to -- it's not unheard
7 of to put a well screen in a domestic well.

8 Q. So I believe I heard you just state,
9 that it is not uncommon to put well screens in
10 domestic wells?

11 A. That's correct. It's not uncommon. I
12 don't know if it's in the majority of the cases.

13 MR. THORNTON: That's all the questions
14 I have, Mr. Hearing Officer.

15 THE HEARING OFFICER: Okay. Thank you.
16 Mr. Smith?

17 MR. SMITH: Thank you, sir.

18 RECROSS-EXAMINATION
19 QUESTIONS BY MR. SMITH:

20 Q. Can you explain to us what you mean by
21 head lock -- what you mean by head lock?

22 Head loss, is that what you said? Head
23 loss, not lock?

24 A. Right. I never heard of head lock,
25 but...

1 MR. JASON SMITH: It's a wrestling
2 move, I believe.

3 THE WITNESS: Head loss, yes.

4 Q. (BY MR. SMITH) So it's head loss that
5 causes the pump to break suction?

6 A. Well, the pump -- the pump will -- will
7 create a vacuum bubble in the pump impellers when
8 the pressure in the impellers is less than -- is
9 less than a certain threshold, a vapor pressure
10 of water, I believe it is.

11 So it's -- so it's not actually sucking
12 an air bubble down from above. But it to -- to
13 the appearance of a person at the surface looking
14 at a well pump breaking suction, it looks just
15 like it's just spitting -- spitting air with the
16 water.

17 That's -- that's -- I don't think I was
18 speaking about head loss in that respect. Only
19 in that it -- that when a well becomes
20 inefficient, there -- there is a greater head
21 loss as the water goes from the outside of the
22 well to the inside of the well. But the aquifer
23 itself is -- it may not necessarily be the
24 problem in that situation.

25 Q. Would you not say, that declining water

1 levels are also a primary cause of well failures?

2 A. I would say, they are not a primary
3 cause of well failures in my experience in United
4 Water service area, the -- or, you know, other
5 areas that I'm aware of. I think it's in more
6 cases than not, the problem is with the well
7 itself, at least that's been our experience.

8 Q. And would you attribute that to failure
9 of the well drillers?

10 A. No, not necessarily. I would attribute
11 it to the fact that it's typically a piece of
12 steel casing submerged in water for decades. And
13 I've -- I've run many video surveys in wells, and
14 they begin to degrade relatively rapidly, you
15 know, forming -- forming, you know, rust, grinds,
16 and there is corrosion, and barnacles on
17 it -- you know -- you know, basically a
18 degradation of the well casing is something
19 that -- that's quite common to see.

20 So it -- it can be either one. But in
21 my -- in my opinion, it's -- and in my
22 experience, it's more likely that the problem is
23 with the well construction.

24 Q. Let's go to this fault that's the far
25 left fault, I believe, Mr. Fereday called it on

1 the map up there. That's a very short fault. Do
2 you know why that is?

3 A. I believe it's based on the boundaries
4 of the survey that was done to define it, and so
5 it wasn't -- I believe it wasn't extended,
6 because it's not known how far it extends.

7 Q. So we don't know how far to the
8 northwest it goes, or how far to the southeast it
9 goes?

10 A. I'm not -- I'm not aware of, to what
11 extent, it extends past the definition there on
12 the map.

13 Q. Would a much longer fault have a big
14 effect on that?

15 A. I don't think so.

16 MR. FEREDAY: Objection. The question
17 was vague. Would a much longer fault have a big
18 effect on that? I don't -- I guess I would
19 appreciate if the question could be rephrased. I
20 don't understand what the question was.

21 THE HEARING OFFICER: Mr. Smith, would
22 you like --

23 MR. SMITH: I thought he had already
24 answered.

25 THE HEARING OFFICER: Well, and I -- he

1 did, and I won't force it.
 2 So if there is an objection,
 3 Mr. Fereday, I'll overrule it.
 4 MR. FEREDAY: Okay.
 5 Q. (BY MR. SMITH) Let's go to Exhibit 50,
 6 Figure 3.
 7 A. Is there a page you can give me, Mr.
 8 Smith?
 9 Q. 22.
 10 A. 22. Oh, right there (indicating).
 11 Okay. Okay. I have that.
 12 Q. Yeah, page 22. I believe you said, you
 13 believed that the Theis method overstates the
 14 actual drawdowns in the PGSA?
 15 A. In my opinion, the Theis method
 16 typically over estimates the drawdown in the
 17 aquifer.
 18 Q. Would not production of the -- on the
 19 M3 property in the hot summer months of 23 cfs
 20 cause greater drawdowns? Okay. I'd represent
 21 that 23 --
 22 THE HEARING OFFICER: Okay. I want
 23 to -- I want to interject here, Mr. Smith,
 24 because I think we covered this line of
 25 questioning before. There was -- there were

1 significant -- a significant number of questions
 2 on the issue --
 3 MR. SMITH: Very well.
 4 THE HEARING OFFICER: -- of 23 cfs --
 5 MR. SMITH: I'll withdraw the question.
 6 THE HEARING OFFICER: -- that I don't
 7 think Mr. Fereday asked questions about.
 8 MR. SMITH: That's all the recross I
 9 have.
 10 THE HEARING OFFICER: Okay.
 11 Mr. Edwards?
 12 MR. EDWARDS: No questions.
 13 THE HEARING OFFICER: Okay.
 14 Mr. Dittus, I have a couple narrow questions for
 15 you, I hope.
 16 EXAMINATION
 17 QUESTIONS BY THE HEARING OFFICER:
 18 Q. You are familiar with the study that
 19 was conducted some years ago entitled, or called
 20 the "Treasure Valley Hydrologic Project"?
 21 A. Yes, I am.
 22 Q. Are you familiar with some of the
 23 documents that were produced as a result of that
 24 study?
 25 A. I am.

1 Q. And as part of that study and others,
 2 are you familiar with the characterization,
 3 general characterization of aquifers in the
 4 Treasure Valley in the various groups, depending
 5 on their depths?
 6 A. Yes.
 7 Q. And is that -- is the grouping of
 8 shallow intermediate, or medium, and deep
 9 aquifers, one that you've heard, or are familiar
 10 with?
 11 A. Yes, it is.
 12 Q. And can you tell me where -- which of
 13 those zones the Sand Pierce -- or the Pierce
 14 Gulch Sand Aquifer is located within?
 15 A. The -- it would be for -- I forget. I
 16 don't recall exactly how many layers they -- that
 17 the Treasure Valley hydrologic project model
 18 used. I know it was looking at a more coarser,
 19 general characterization of the ground water flow
 20 through -- you know, from -- all the way from one
 21 end of the valley to the other. So I believe it
 22 would be in layer two, probably.
 23 It -- I -- I don't think you can line
 24 up the layers, or the actual Pierce Gulch Sand
 25 Aquifer, with one specific layer in the Treasure

1 Valley Hydrologic Project model.
 2 Q. Okay. I wanted to ask you some
 3 specific questions about the monitoring well at
 4 State and Linder owned by United Water.
 5 How is that well constructed?
 6 A. The drilling method was a direct rotary
 7 mud drilling method. And I believe that we may
 8 have used weighted drilling fluid, because of the
 9 artesian heads there. But it was -- it had
 10 a -- it had a -- it was an eight-inch diameter
 11 drilled hole, both the wells were. And two-inch
 12 piezometer tubes were installed into one of the
 13 wells. One --
 14 The other well has an actual steel
 15 casing that goes down to about, I think, it's in
 16 the range of 500 to 600 feet, and measures the
 17 pressure at that depth. And then has another
 18 monitoring tube going down to a deeper, much
 19 higher potential, a much higher head aquifer.
 20 And so -- and there was -- there was a filter
 21 pack installed around the two-inch monitoring
 22 tubes. They have slotted screens on the bottom
 23 of them.
 24 Q. Now, I want to come to -- which of the
 25 wells, I guess, have we been referring to in this

1 examination of your examination?
 2 A. Of the State and Linder?
 3 Q. Yes.
 4 A. The well that has the shallower two
 5 completion intervals, which I believe are in the
 6 range of 250 feet to 400 feet that -- that --
 7 more like that depth range.
 8 Q. So you are referring to the well with
 9 the multiple piezometer tubes placed in them?
 10 A. Yes, correct, the two two-inch tubes.
 11 Q. Okay. And I want to refer specifically
 12 to -- to the two piezometer tubes that were
 13 installed in that well at the lower depths.
 14 A. In that well?
 15 Q. Yes.
 16 A. Uh-huh.
 17 Q. Are you aware of the construction or
 18 the placement of those two particular piezometers
 19 and the well log that was filed related to the
 20 construction?
 21 A. I'm familiar with -- generally,
 22 familiar with the construction, yes.
 23 Q. And what did -- would it be your
 24 testimony -- well, let me ask.
 25 What do you know about the separation

1 of those, and the distance between those two
 2 piezometers?
 3 A. I know they are -- there is not an
 4 impermeable seal between the two completion
 5 zones. One of the shallowest of the piezometer
 6 tubes is measuring the pressure in the upper part
 7 of the aquifer. And it is -- it is, essentially,
 8 you know, a continuous sand unit with a few very
 9 thin layers that could -- could hydraulically
 10 separate the tubes.
 11 And that's -- that's why there isn't a
 12 seal between those two tubes. But the one's
 13 measuring near the top, and the one's measuring
 14 near the bottom.
 15 Q. So is it your testimony that those two
 16 piezometer tubes are measuring pressure within
 17 the same aquifer unit?
 18 A. One is measuring near the top, and one
 19 is measuring near the bottom. They -- the
 20 pressures are very similar, although they are not
 21 identical.
 22 Q. And are those pressures being measured
 23 in the Pierce Gulch Sand Aquifer?
 24 A. Yes. Yes, they are.
 25 Q. Okay. It's a very small thing. But I

1 want to refer to Exhibit 45, Figure 18. And I
 2 don't have that in front of me.
 3 A. (Witness complying.)
 4 Q. And if you'll look at this hydrograph,
 5 Mr. Dittus, I think you testified about the
 6 hydrograph portion of this from about 2007,
 7 through perhaps, the end of 2008, or at least to
 8 the end of the graph itself; is that correct?
 9 A. I believe that's correct.
 10 Q. Okay. And in particular, I think you
 11 were asked about the apparent one drop in -- and
 12 this would be, apparently, artesian pressure that
 13 would be somewhere in 2008 --
 14 A. Yes.
 15 Q. -- a significant drop?
 16 A. Mm-hmm.
 17 Q. And you attributed that drop to what?
 18 A. I don't -- I -- I believe, I didn't
 19 know the well that caused that influence in that
 20 well. It wasn't the SVR 7 aquifer test.
 21 Q. Okay. And you said, it was not then?
 22 A. No, it was not, no.
 23 Q. Now when you said SV --
 24 A. Sorry. This monitor -- this was a
 25 monitoring well for an aquifer test that M3

1 commissioned. And it did not show a response
 2 like this during the test.
 3 Q. Okay. I thought perhaps in your
 4 testimony, you had referred to a pump test that
 5 was conducted by the City of Eagle?
 6 A. Oh, I think that might have been -- I
 7 referred to the City of Eagle when they did a
 8 pumping test in, I believe, it was June of 2006.
 9 And they contacted United Water, and asked if
 10 they could install pressure transducers on the
 11 well. And we -- we said -- we gave them
 12 permission to do that.
 13 And so I guess what I was saying was
 14 that there was -- this is not all the monitoring
 15 data for this well, but it did -- it would -- it
 16 would fit right in with the range that you see
 17 here.
 18 Q. Okay. Fine. And perhaps, I
 19 misunderstood your testimony. I thought you were
 20 referring to that pump test as having -- done by
 21 the City of Eagle as having been done in 2008.
 22 That was not true; was it?
 23 A. No, I don't know what caused that.
 24 THE HEARING OFFICER: All right,
 25 thanks. That's all the questions.

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1 Mr. Fereday, redirect?
2 MR. FEREDAY: Yes.
3 REDIRECT EXAMINATION
4 QUESTIONS BY MR. FEREDAY:
5 Q. Mr. Dittus, you testified earlier, I
6 believe, in response to some questions I had
7 about the PGSA, that it is a dipping aquifer. Do
8 you recall that?
9 A. Yes, I do.
10 Q. And in your response just a few minutes
11 ago to the Hearing Officer with regard to which
12 layers of the Treasure Valley hydrologic
13 conceptual model the PGSA might occupy, you gave
14 a response. Do you recall that?
15 A. Yes, I do.
16 Q. Do you believe that your testimony
17 earlier about the dipping nature of this aquifer
18 is relevant to the Hearing Officer's question?
19 A. That's not completely relevant, because
20 the -- I think the Treasure Valley Hydrologic
21 Project model is a much -- it's looking at a
22 larger -- the complete flow regime. And it
23 was -- it didn't incorporate the type of detail
24 that we -- and in mapping of the Treasure
25 Valley -- or of the Pierce Gulch Sand Aquifer,

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1 that we -- that we have in the current conceptual
2 model that's been defined by the researchers.
3 Q. Did the Treasure Valley Hydrologic
4 Project conceptual model involve dipping model
5 layers or horizontal layers?
6 A. I believe it was horizontal layers.
7 MR. FEREDAY: Okay. No further
8 questions.
9 THE HEARING OFFICER: Okay.
10 Mr. Thornton?
11 MR. THORNTON: No questions.
12 THE HEARING OFFICER: Mr. Smith?
13 MR. SMITH: No questions.
14 THE HEARING OFFICER: Mr. Edwards?
15 MR. EDWARDS: No questions.
16 THE HEARING OFFICER: Thank you,
17 Mr. Dittus.
18 THE WITNESS: Thank you.
19 (Witness excused.)
20 THE HEARING OFFICER: Mr. Fereday, your
21 next witness.
22 MR. FEREDAY: We would like to call
23 Sean Vincent, please.
24 THE WITNESS: Mr. Vincent, come forward
25 please.

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1 Let me swear Mr. Vincent, and then
2 let's have a discussion.
3 SEAN VINCENT,
4 first duly sworn to tell the truth relating to
5 said cause, testified as follows:
6 THE HEARING OFFICER: Now, Mr. Fereday,
7 you indicated initially that Mr. Vincent would be
8 called as an adverse witness. I don't know
9 whether you still consider him to be such and --
10 MR. FEREDAY: Yes, we do.
11 THE HEARING OFFICER: Okay. Just for
12 the -- just for the protestants, when an adverse
13 witness is called, and the intent is that they be
14 treated as an adverse witness, counsel then has
15 the ability to examine that person anticipating
16 that the answers will be -- may not be friendly.
17 And consequently, the examination may assume the
18 form of cross-examination, or something much more
19 similar to it. So the questions can be much more
20 leading, to elicit from the witness the answers
21 that counsel is trying to get. So you've got to
22 be patient through that process.
23 Now, the other side of that is, and
24 Mr. Fereday, because this witness is being called
25 as an adverse witness, but has no protection from

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1 counsel, I guess it's my responsibility to assume
2 that role. But my guess is, based on my prior
3 experience with you, that that won't be a
4 problem.
5 MR. FEREDAY: Thank you, sir.
6 THE HEARING OFFICER: All right.
7 DIRECT EXAMINATION
8 QUESTIONS BY MR. FEREDAY:
9 Q. Please state your name and give your
10 business address, please.
11 A. Sean Vincent with the Department of
12 Water Resources. Three -- what is the address?
13 320 --
14 THE HEARING OFFICER: 322.
15 THE WITNESS: 322 East Front Street.
16 THE HEARING OFFICER: He remembered his
17 name.
18 THE WITNESS: I never mail anything
19 here.
20 Q. (BY MR. FEREDAY) Is that not our
21 location as we speak, sir?
22 A. Yes, that's our location.
23 Q. Mr. Vincent, what's your position with
24 the Department?
25 A. I'm the section manager with the

1 hydrology section.
 2 Q. How long have you served in that
 3 position?
 4 A. It will be four years in July.
 5 Q. What did you do before then,
 6 professionally?
 7 A. I worked as a practicing
 8 hydrogeologist, primarily with Morrison Knudsen,
 9 later Washington Group International. Primarily
 10 environment, we also did mine dewatering studies,
 11 and some numerical modeling, and that sort of
 12 thing.
 13 Q. How many years were you in that
 14 position?
 15 A. Approximately, 15 years.
 16 Q. And before that?
 17 A. I was in graduate school at the
 18 University of Idaho.
 19 Q. Okay. What degrees do you hold?
 20 A. I have a BS and BA in geology from the
 21 University of Kansas, 1985; an MS in hydrology
 22 with ground water emphasis, 1989.
 23 Q. What experience do you have with
 24 Treasure Valley geology, Mr. Vincent?
 25 A. I have worked on the Eagle water right

1 application, looked at that matter and aquifer
 2 test that was presented in support of that
 3 application.
 4 Q. Excuse me. Was that the City of
 5 Eagle's --
 6 A. City of Eagle, yes.
 7 Q. -- application?
 8 A. That's right.
 9 Q. Was that the application that the City
 10 of Eagle filed two or three years ago?
 11 A. Yes. Yes.
 12 Q. Okay.
 13 A. I've been involved with the M3 matter,
 14 of course. I'm serving on the North Ada County
 15 hydrogeologic characterization project technical
 16 working group.
 17 Q. By the way, with regard to that
 18 technical working group, I've heard it called the
 19 TAC, the Technical Advisory Committee, or the
 20 NACTAC. Can we agree that if we refer to it as
 21 the "TAC," or "Technical Advisory Committee," we
 22 know what we're talking about there?
 23 A. That's fine.
 24 Q. With regard to North Ada?
 25 A. Right.

1 Q. Okay. What other experience do you
 2 have with hydro- -- excuse me -- with
 3 geology -- geological evaluations in the Treasure
 4 Valley?
 5 A. While at Morrison Knudsen, we did some
 6 studies of the Boise Rail Shop, and the
 7 characterization of the hydrogeologic setting
 8 there. They had a dense non-acquiesce phase
 9 liquid problem associated with chlorinated
 10 solvents that they used there.
 11 Q. Mr. Vincent, could I ask you to speak
 12 up just a little bit?
 13 MR. FEREDAY: Maybe, Michael, we ought
 14 to do is turn this off, until we need it.
 15 MR. LAWRENCE: Sure.
 16 Q. (BY MR. FEREDAY) I would appreciate you
 17 speaking up a little bit.
 18 So could you repeat that answer,
 19 please? You worked in southeast Boise for the
 20 locomotive shop?
 21 A. Yes. When I was at Morrison Knudsen,
 22 MK had a rail shop located in southeast Boise
 23 with a contamination problem contaminating ground
 24 water. And we did some characterization work out
 25 there trying to characterize the nature and

1 extent of the contaminate plume there.
 2 Q. Which aquifer was involved there in
 3 southeast Boise?
 4 A. That was the upper most shallow aquifer
 5 in that -- in that area. It was up on the Bench.
 6 Q. Do you know what that aquifer is
 7 called?
 8 A. I do not.
 9 Q. Are you familiar with work that has
 10 gone on in southeast Boise pertaining to the
 11 ground water management area in that location?
 12 A. Yes.
 13 Q. And what's your familiarity based on
 14 there?
 15 A. Well, I guess I have sort of passing
 16 knowledge of it, just because of my involvement
 17 with the Department over the last four years.
 18 In -- staff are involved in water level
 19 monitoring in southeast Boise. Those folks are
 20 under my direction. We also took a tour out to
 21 the Micron facility, and we discussed the
 22 situation out there with water levels as part of
 23 that tour.
 24 Q. Who led that tour?
 25 A. Some -- I -- Micron personnel. I can't

1 recall --
 2 Q. Okay.
 3 A. -- who it was, specifically.
 4 Q. Okay. Have you personally carried out
 5 any geologic studies in the Treasure Valley?
 6 A. I've -- I've done some water level
 7 analysis. Geologic analysis, it wasn't direct.
 8 We looked, obviously, at the geologic information
 9 that we had available in order to do that. And,
 10 again, that was for the rail shop.
 11 Q. What geologic information did you look
 12 at, then; do you recall?
 13 A. Drillers logs, and there was some
 14 characterization work that had been done by Rich
 15 Reed, who was with the locomotive shop.
 16 Q. Was he a geologist; do you know?
 17 A. Yes.
 18 Q. Did he produce a published report out
 19 there; do you recall?
 20 A. It's -- it's been a long time. I don't
 21 recall.
 22 Q. I understand. Did you -- did you rely
 23 on any of the literature then that relates to the
 24 regional geology?
 25 A. Again, it's been a long time. I don't

1 recall.
 2 Q. Okay. I take it from your answers so
 3 far, Mr. Vincent, that you have not done any
 4 geologic mapping yourself in the Treasure Valley?
 5 A. I have not.
 6 Q. What about geologic structural
 7 analysis?
 8 A. I have not.
 9 Q. What about, to turn now to, the hydro
 10 part of the geology. How about hydraulic testing
 11 in aquifers in the Treasure Valley? Have you
 12 done any of that?
 13 A. There was an aquifer test conducted at
 14 the rail shop. And I was not actively
 15 participating in that. I believe we looked at
 16 the data. Again, it's been a long time. We did
 17 do a water level analysis in which we looked at
 18 water levels as a function of depth, and we're
 19 looking for hydraulic communication. We did
 20 barometric pressure corrections, that sort of
 21 thing.
 22 Q. Do you recall how many wells you
 23 measured in that effort?
 24 A. I didn't measure wells, personally. I
 25 looked at the data.

1 Q. Do you know how those wells were
 2 measured? Were they measured by hand, using a
 3 tape? Were they -- did they use some electronic
 4 device; do you recall?
 5 A. I think it was a combination. I'm sure
 6 that some of the wells were fitted with pressure
 7 transducers.
 8 Q. But you don't know how many wells were
 9 involved in that effort?
 10 A. I don't recall.
 11 Q. Do you know whether there was an actual
 12 pumping well involved in that effort with regard
 13 to stressing the aquifer so that you could see
 14 how these other wells responded?
 15 A. The analysis that I was referring to
 16 was looking for similarities in static water
 17 level fluctuations.
 18 Q. So in that effort out there in
 19 southeast Boise, there was no actual pump test,
 20 no hydraulic test, in the sense of a pumping well
 21 measuring its effects on surrounding wells;
 22 correct?
 23 A. I'm trying to recall. I thought there
 24 was also a pumping test.
 25 Q. Okay.

1 A. But I wasn't involved directly in that
 2 analysis.
 3 Q. Okay. And you didn't design a pumping
 4 test; did you?
 5 A. No.
 6 Q. Have you ever designed a pump test?
 7 A. Yes.
 8 Q. When did do that?
 9 A. I've designed a lot of pumping tests
 10 over the years. Primarily, I guess, for the
 11 mining group at Morrison Knudsen, where we were
 12 looking to design mine dewatering wells, and I
 13 designed a number of tests for that purpose, as
 14 well as tests for characterizing sites,
 15 contaminated sites from an environmental
 16 characterization point of view.
 17 Q. Were those tests designed, Mr. Vincent,
 18 to determine aquifer characteristics in terms of
 19 transmissivity, storativity, amount of, and rate
 20 of water in movement of aquifers?
 21 A. The primary purpose of those tests was
 22 to define aquifer properties, transmissivity, and
 23 storage, as well as aquifer boundary conditions.
 24 Q. And how many aquifer tests have you
 25 designed and carried out, would you say?

1 A. That's a good question.
2 Q. And by the way, before you answer that,
3 maybe you can just tell me. Were they all done
4 in your prior work for MK before you came to the
5 Department?

6 A. Yes.

7 Q. Okay. So how many, would you say?

8 A. Well, we also did slug tests, which are
9 much more smaller scaled tests, for low
10 permeability characterization. And I did
11 literally tens, maybe a hundred. I don't know.
12 For -- in terms of aquifer tests, in the field,
13 less than ten. But I did analysis of data that
14 was collected by others on many more occasions.

15 Q. When you speak of a "slug test," what
16 is that? I'm not familiar with that term.

17 A. That is a hydraulic test for the
18 purpose of determining hydraulic connectivity.
19 It's fairly limited in scope. It's only
20 generally used for determining hydraulic
21 connectivity, fairly low permeability materials.

22 And it's -- it's a test method
23 involving a slug. It's a volume -- and a slug of
24 known displacement. You would introduce that
25 into a well, or remove it from a well. There is

1 both rising head and falling head slug tests.
2 And the rate of response -- the water level
3 response is monitored. And that is used to
4 develop an estimate of hydraulic connectivity.

5 Q. So would it be accurate to say, that a
6 slug test would be designed around pumping, let's
7 just pick a number, 100,000 gallons out of a well
8 as quickly as you could, and then evaluating what
9 the effects of that were in surrounding wells?
10 Would that be a good description of it?

11 A. Actually, wells that would be suited
12 for characterization using slug tests would
13 probably not be capable of producing large
14 volumes of water, so...

15 Q. Well, I was just picking a number --

16 A. But --

17 Q. -- any number. But it would be a
18 defined volume of water, you would pump out as
19 rapidly as possible; is that right, and then see
20 what happens?

21 A. You can do it by pumping, or by
22 inserting or removing a block, a cylinder of
23 known volume, also.

24 Q. A cylinder of water, or sediments, or
25 aquifer material?

1 A. A solid block of material that has
2 known volume would be introduced into a well.
3 The well -- the water level in the well would be
4 allowed to equilibrate. And then you would pull
5 the block out, and monitor the water level
6 response.

7 Q. So that would not involve pumping at
8 all in that case?

9 A. That's correct.

10 Q. Would you recommend a slug test for
11 evaluating any property of the Pierce Gulch Sand
12 Aquifer, as you understand it?

13 A. No.

14 Q. How many of the aquifer tests that
15 you've designed and carried out, were actual
16 tests where you were pumping ground water, in
17 evaluating the effects of that pumping?

18 A. All the tests that I described earlier
19 that were not slug tests, I was referring to
20 generally constant rate pumping tests.
21 Occasionally, they were step drawdown tests. And
22 usually, those would be done before a constant
23 rate test, although sometimes in lieu of a
24 constant rate test. And then we also did packer
25 tests, which is another variety of aquifer tests

1 that's well suited to fractured rock.

2 Q. Would the packer test be a good test to
3 use for evaluating the PGSA?

4 A. No.

5 Q. What about the -- what did you call
6 it -- the step down?

7 A. The step drawdown test?

8 Q. Yes.

9 A. Let me back up. The packer test could
10 be used provided the sediments were well
11 lithofied. But I'm not aware that that's the
12 case here with the PGSA.

13 The step drawdown test could be used as
14 a quick and dirty way of determining -- of coming
15 up with a transmissivity, which is, you know, one
16 of the aquifer properties that we'd be interested
17 in. But it wouldn't be used to evaluate aquifer
18 boundary conditions.

19 Q. Okay. In the aquifer tests that you
20 conducted, how many of them do you think used the
21 technique that would be appropriate for
22 evaluating an aquifer, such as the PGSA?

23 A. All the aquifer testing that I did for
24 the mining group would fall into that category.
25 They were all constant rate aquifer tests, with

1 the exception of the step drawdown tests that
2 were occasionally run beforehand, primarily just
3 to determine what the sustainable pumping rate
4 might be.

5 Q. In those aquifer tests, you were
6 running a pump 24 hours at a time for what; two,
7 three, four, five days? Is that an accurate
8 description of what you would do?

9 A. We ran longer term tests, ten days, on
10 that order. The mining group, some of the tests
11 that I looked at the data from, were 30 day
12 tests. So --

13 Q. Were these -- go ahead.

14 A. Typically, on the order of ten days
15 might be a good test.

16 Q. These tests were not designed by you,
17 though; correct?

18 A. Some were, yeah.

19 Q. Some were. And when -- when these
20 tests were carried out, were you on site to
21 observe how they were carried out?

22 A. Unfortunately, yes.

23 Q. Sometimes it goes long into the night;
24 correct?

25 A. And the next day and the next night.

1 Q. With regard to the aquifer tests that
2 you've done, wouldn't you agree, that at some
3 point an aquifer test ceases to deliver
4 additional meaningful data that you are near a
5 constant output parameter that doesn't change
6 much? Would you agree with that?

7 A. It depends on the hydrogeologic
8 setting. If you have an infinite aquifer, and
9 you -- all indications are that the boundaries
10 are well removed from the center of pumping. And
11 the response is such that there is no indication
12 of a boundary effect, then, you know, a straight
13 line extrapolation sometimes would be a
14 reasonable assumption.

15 But typically, especially for the
16 mining group, we're looking to really
17 characterize the water resource, and understand
18 how to -- how to dewater it. And it's a -- you
19 know, it's a dollar sort of thing here. We have
20 to figure out, what is the minimum number of
21 wells that's going to do the job, and what's
22 going to be the really long-term impact of
23 pumping. Because we're extrapolating from a test
24 that's of a reasonably short duration into, you
25 know, a dewatering project that might last years,

1 literally.

2 And so the thing that we would look at
3 there would be, what's going on at the end of the
4 test? Are we seeing some sort of a boundary
5 condition at the end of the test? If there was
6 an indication that there was a hydraulic boundary
7 at the end of the test, we would continue the
8 test.

9 Q. Is it your experience that hydraulic
10 boundaries show up very late in a test?

11 A. Not -- they can -- they can show up at
12 any time.

13 Q. Where were these hydraulic tests
14 carried out? Were they carried out in Idaho?

15 A. Most of the aquifer testing I did was
16 in Texas in the lignite country down in the
17 San Antonio area of Texas. We -- I did aquifer
18 testing in Missouri all -- with MK, you travel a
19 lot. So it was not generally in Idaho, though.
20 You are right.

21 Q. Have you done any in Idaho?

22 A. Again, I seem to recall reviewing a
23 test I thought that was done at the rail shop.
24 But as far as actually carrying out a test
25 myself, being in the field, I don't recall ever

1 doing that.

2 Q. With regard to the tests in the lignite
3 area in Texas, were those aquifers there
4 comparable to the Pierce Gulch Sand Aquifer in
5 any --

6 A. They were --

7 Q. -- geologically similar?

8 A. -- fluvial lacustrine deposits. So
9 there were some similarities there, sands, and
10 lower permeability sediments, layer deposits. So
11 I would say, that there is some similarities
12 there.

13 Q. Do you agree that the Pierce Gulch Sand
14 Aquifer has -- or the Pierce -- let's say, the
15 Pierce Gulch Sands, were deposited both through
16 lacustrine and fluvial processes?

17 A. Yes.

18 Q. Mr. Vincent, have you designed any
19 wells in the Treasure Valley?

20 A. I don't believe I have.

21 Q. Have you inspected any drill cuttings
22 from any well in the Treasure Valley?

23 A. Not -- I don't think so.

24 Q. Have you authored or coauthored any
25 peer reviewed scientific analysis of any geology

1 in the Treasure Valley?
 2 A. I have not. Outside of just the work
 3 that I've done with the Department.
 4 Q. Okay. And the work you've done with
 5 the Department, by and large has not involved a
 6 peer review process; has it?
 7 A. We have a peer review process, yeah.
 8 The staff memo, for example, was reviewed by the
 9 authors, Rick Raymondi, my boss, reviewed it. So
 10 there is a peer review process there.
 11 Q. And by the "staff memo," you are
 12 referring to what's been identified as Exhibit 50
 13 here, your March 2nd, 2009 memo?
 14 A. That's correct.
 15 Q. Okay. Did you seek any peer review of
 16 that document from outside the Department?
 17 A. No.
 18 Q. I would like to ask you some questions
 19 about faulting. You probably are not surprised
 20 at that.
 21 Are you familiar with the types of
 22 geologic faults that we see in, I guess, in the
 23 west, such as normal faults, thrust faults,
 24 strike/slip faults?
 25 A. Yes.

1 Q. Normal faults are also known as
 2 extensional faults; aren't they?
 3 A. Yes.
 4 Q. Which refers to a process of some type
 5 of pulling apart; correct?
 6 A. Right.
 7 Q. As opposed to a thrust fault, which
 8 would involve geologic formations colliding in
 9 some way, or pushing together and slipping?
 10 A. That's correct.
 11 Q. Are you familiar with the types of
 12 faults that are present in the Boise River
 13 valley?
 14 A. Yes.
 15 Q. And what kind are they in this -- are
 16 they normal? Are they thrust faults? What kind
 17 of faults are they?
 18 A. Normal faults.
 19 Q. Normal faults. Now, you appear to be
 20 very focused in your memo on the question of
 21 faulting in this North Ada County area. Could
 22 you explain to us why that is?
 23 A. Yeah, I guess when we look at the
 24 sustainability of a resource, which is the big
 25 question in my mind, the -- the number one thing

1 for me is, we need hydraulic connection to a
 2 source of recharge. And anything that might
 3 limit that hydraulic connection is a concern to
 4 me. As a reviewer of the water right
 5 application, that's why there was the focus on
 6 faults.
 7 Q. Uh-huh.
 8 A. Depositional environments would be
 9 another issue that could cause there to be
 10 limited hydraulic communication. Of course, the
 11 whole issue of, you know, where is the recharge,
 12 and how much do we have? That's intertwined in
 13 that same single issue.
 14 Q. Mr. Vincent, with regard to ground
 15 water applications that come before the
 16 Department, this is the first time, isn't it,
 17 that you've ever raised the question of source of
 18 recharge as a -- as a potential requirement in
 19 seeking that application? Or have there been
 20 other instances? Is this normal with you?
 21 A. Well, I was involved in a hearing a
 22 couple of weeks ago, where we were concerned
 23 about recharge in east Ada County.
 24 Q. Which hearing was that?
 25 A. That was the Neavitt hearing for the

1 Elk Creek Canyon development, proposed
 2 development.
 3 Q. And that's out by Mountain Home?
 4 A. Umm --
 5 Q. Mountain Home desert it's called?
 6 A. Mayfield area, yeah, north of the
 7 freeway.
 8 Q. And are there any other examples where
 9 you've raised recharge as an issue, other than
 10 this M3 case?
 11 A. I don't recall.
 12 Q. Have you done any mapping of geologic
 13 faults in the Treasure Valley? And I take it
 14 from your earlier answer, that you haven't?
 15 A. I have not done any mapping.
 16 Q. Have you mapped faults anywhere; in
 17 Texas, or any other place?
 18 A. I attempted to map faults in Colorado.
 19 I gave it up.
 20 Q. With regard to the faulting described
 21 that you refer to, at least, in the North Ada
 22 County area, have you observed any of these
 23 faults yourself?
 24 A. Yes.
 25 Q. Which ones have you observed?

1 A. We took a field trip with Hydro Logic
 2 personnel and Dr. Spence Wood, and we observed
 3 faulting of the sediment layers. I believe what
 4 we looked at was the west-Boise Eagle fault. And
 5 we also looked at an out crop up along Freezeout
 6 Hill, which I believe there was some offset up
 7 there.
 8 Q. The west-Boise Eagle fault, you saw
 9 that where? You were shown that where? Where
 10 were you on the ground where you were shown that;
 11 do you know?
 12 A. That, I think -- I'm not sure it was
 13 the west-Boise Eagle fault. I believe we saw
 14 some examples of faulting along in the Stewart
 15 Gulch area. And I'm not sure what those faults
 16 were, or had been named, if they've been named.
 17 Q. Now, the faults over in Stewart Gulch,
 18 it's not your testimony, is it, that those have
 19 anything to do with this water right application?
 20 A. No. However, they are basin margin
 21 faults, and that is a concern for this water
 22 right application.
 23 Q. And it's a concern, because you feel
 24 that the Pierce Gulch Sand Aquifer extends into
 25 Stewart Gulch, and might be bounded there by a

1 fault; is that -- would that be accurate?
 2 A. No, it's a concern, because M3's
 3 property is on the north margin of the Boise
 4 Basin. And there is faulting along the margin of
 5 the basin. And so that -- that possibility, and
 6 the possibility that faulting has some sort of
 7 control on ground water flow, is the -- is the
 8 concern with the faults.
 9 Q. Have you ever gone to North Ada County,
 10 in the foothills, or other areas relevant to the
 11 M3 application, on your own to look at faults, or
 12 search them out? Or was it just this one time
 13 with Hydro Logic?
 14 A. Well, you know, some of the faults
 15 don't have a surface expression. So it would be
 16 difficult to see them.
 17 Q. But I asked you whether you've ever
 18 gone to look on your own?
 19 A. I have gone back to Stewart Gulch, and
 20 looked at the sediments in Stewart Gulch.
 21 Q. Now, the sediments in Stewart Gulch
 22 show slight faulting; wouldn't you agree? Slight
 23 traces of faulting?
 24 A. Well, the fact is, you see outcrops of
 25 the Pierce Gulch up -- elevated quite high above

1 their -- their elevation down in the valley. So
 2 that's evidence of quite a bit of displacement, I
 3 think.
 4 Q. It's your testimony, that the
 5 appearance of the Pierce Gulch Sands at a higher
 6 elevation than the valley floor is evidence of
 7 displacement rather than deposition?
 8 A. Yes.
 9 Q. So you -- it's your belief as a
 10 geologist, that the reason that we see Pierce
 11 Gulch Sands in the foothills at a higher
 12 elevation than they are encountered in the
 13 aquifer, is due to faulting not deposition?
 14 A. Yes, that's the explanation that was
 15 given me.
 16 Q. And that was given you by whom?
 17 A. That was my understanding from the
 18 field trip, talking to Dr. Wood and Mr. Ed
 19 Squires.
 20 Q. Okay. Do you recall the fault trace
 21 that is visible on Freezeout Hill? You mentioned
 22 Freezeout earlier.
 23 A. I don't recall much about it, actually.
 24 Q. Okay. Do you remember stopping there
 25 with Mr. Squires and Dr. Wood on that field trip?

1 A. I do.
 2 Q. Do you remember ever noticing that
 3 fault ever before that trip?
 4 A. No, I don't.
 5 Q. Do you know whether that fault on
 6 Freezeout has been mapped, or described by anyone
 7 in writing, in some sort of a report?
 8 A. I believe Dr. Wood makes reference to
 9 it in one of his publications; one or more.
 10 Q. Okay. And that, again, is a normal or
 11 extensional fault; correct?
 12 A. I believe so.
 13 Q. Is it your opinion that the fault that
 14 you observed on Freezeout Hill would serve as a
 15 no flow boundary at that location?
 16 A. I -- I don't know. There is -- I don't
 17 know what the depth to ground water is there.
 18 What we were looking at was unsaturated
 19 sediments, and I don't know the location of the
 20 fault, or the depth to water, or -- I don't know.
 21 Q. The offset indicated on Freezeout Hill
 22 does not tell you, does it, whether there is a
 23 sand layer offset against an impervious layer;
 24 correct?
 25 A. The amount of offset doesn't tell you

1 that, no.
 2 Q. And the fault at that location, at
 3 least as far as you can see on Freezeout, shows
 4 sand faulted against sand; doesn't it?
 5 A. Yes, that's the way I recall it.
 6 Q. But this means, does it not, that if
 7 those sands were saturated, despite their being
 8 offset, water would still flow through that
 9 section; correct?
 10 A. It is possible to have faults where
 11 there is no effect on -- or essentially, no
 12 effect on ground water flow.
 13 Q. Well, isn't it a fact that if you
 14 have -- let's hypothesize, a 300 foot thick sand
 15 section, that is an aquifer. And if it is offset
 16 to the tune of, let's say, 50 feet, isn't it a
 17 fact that there would be ground water flow still
 18 through that -- through that section despite the
 19 existence of that normal fault?
 20 A. Provided there wasn't gouge, provided,
 21 you know, there was reasonable flow without the
 22 fault, yeah, most likely there would be
 23 appreciable flow still through that.
 24 Q. With regard to gouge, you've not seen
 25 any evidence, have you, that there is any gouge

1 in any of the faults that you've observed either,
 2 as you say, in either Stewart Gulch or on
 3 Freezeout?
 4 A. I'm not aware of any.
 5 Q. Is it a fact that faults often actually
 6 form conduits for water flow? That is, they
 7 create water flow, rather than block it?
 8 A. They can serve that hydrologic
 9 function, yes.
 10 Q. In your staff memo at page 11, you
 11 state -- and I'll -- go ahead and look at it, if
 12 you'd like. You state that, quote, "Several
 13 lines of evidence suggest that the aquifer may be
 14 bounded by faults."
 15 Could you describe for us what those
 16 lines of evidence are?
 17 A. Well, I think if you read through the
 18 staff memo, there are several, more or less,
 19 independent lines of evidence that are -- that
 20 are offered. Nonconclusive, mind you, but
 21 suggestive that -- that it's a possibility
 22 that -- that faulting is playing a role in ground
 23 water flow.
 24 We have the different patterns of water
 25 level fluctuation on the opposite sides of

1 the -- Wood identified fault, the one, in the
 2 southwest part of M3's property that is
 3 northwest, southeast oriented. That's not
 4 conclusive evidence by any means. But that is a
 5 line of evidence suggesting that something is
 6 different on one side as compared to the other.
 7 In addition, there are two aquifer
 8 tests in close proximity to that fault. And for
 9 whatever reason, in both cases, Hydro Logic
 10 elected to analyze those aquifer tests using the
 11 package of AQTESOLV, which is the computer-aided
 12 program for the analysis of aquifer test data.
 13 That wasn't my decision. They felt it
 14 appropriate to use that package. I think that
 15 means something.
 16 Certainly, the geophysics suggests that
 17 there is a fault at depth. Whether or not it
 18 extends in -- in across of Pierce Gulch, I don't
 19 know. But I think it was a concern of Hydro
 20 Logic's, insofar as they decided to run a
 21 magnetometer survey and a seismic survey, both.
 22 There was obviously some concern.
 23 I mean, given the fact that we're
 24 looking to characterize the Pierce Gulch Sand
 25 Aquifer, not the deep bedrock, I think it's

1 somewhat disingenuous to say, all we're trying to
 2 do is characterize the deep bedrock. Why would
 3 you do that? Why would you spend money to
 4 characterize the deep bedrock if there was no
 5 potential for impact on the Pierce Gulch Sand
 6 Aquifer, and that's the target aquifer?
 7 Q. Okay. So these -- these four items are
 8 the lines of evidence to which you refer?
 9 A. Let me stop for a second, and think if
 10 there was perhaps another one.
 11 During the aquifer testing -- and
 12 again, this was somewhat inconclusive in both
 13 tests. But there was never observed
 14 response -- what Hydro Logic determined to be
 15 observable response that they could positively
 16 attribute to the pumping of the test well on the
 17 opposite side of the fault. That applies to both
 18 the clean irrigational test and SVR 7 test.
 19 Q. And those are -- so those are the lines
 20 of evidence; those five? And I believe that last
 21 one is the same as your first one. Different
 22 patterns of water flow, you felt existed on
 23 either side of this fault, this inferred fault?
 24 A. Different patterns of water level
 25 fluctuations.

1 Q. Okay.

2 A. So we see different -- different

3 responses, different static water levels of

4 patterns on opposite sides of the fault.

5 Q. Now, are any of these lines of

6 evidence, lines of evidence that you developed

7 through your own research? Or is it just your

8 observations of the work of Hydro Logic and

9 others?

10 A. Those are our observations of the work

11 that was done by Hydro Logic.

12 Q. Let's look at Exhibit 50, page 9.

13 MR. FEREDAY: And it might be useful to

14 get a map back up on the screen for the Hearing

15 Officer.

16 (Mr. Lawrence complying.)

17 Q. (BY MR. FEREDAY) Mr. Vincent --

18 A. I -- I might also mention?

19 Q. Yes.

20 A. There are a couple of other little

21 pieces, maybe not distinct. But in the SVR 7

22 test, at the end of the test, there was -- as

23 we've pointed out in our staff memorandum, there

24 was a definite increase in slope that was

25 observed in the Big Gulch stock well.

1 And it appeared to be a greater

2 deflection than perhaps it really was. Because

3 as we come to find out, the correction -- the

4 water level trend correction had been misapplied,

5 and there was a negative versus positive sign

6 that got mixed up in HLI's correction.

7 But after the correction, the new trend

8 still shows a deflection. And that's kind of

9 going back to what I was talking about before.

10 That for me, as somebody who has been involved in

11 characterizing water resources with the goal of

12 assessing the long-term performance of an

13 aquifer, I would have liked to have seen that

14 test continued to -- to try to see what was going

15 on with that. It's a little inconclusive, I

16 guess, I'd say at this point.

17 In addition, the recovery, it looked

18 initially like there was a -- oh, I guess that

19 was the plus, minus sign. But in both cases

20 there was some correction that needed to be done

21 with the water levels.

22 But the recovery data,

23 there -- it -- it wasn't that the water level

24 didn't recover during the period of monitoring,

25 but rather that the slope of the line didn't come

1 back to a zero intercept, which is what you would

2 expect in a -- in a more or less infinite

3 aquifer. The slope of the line was some positive

4 residual amount. And that was the concern for

5 us, so...

6 Q. So is it your testimony then, that the

7 Big Gulch stock well's response to the SVR 7

8 aquifer test, which was a nine-day test, was

9 anomalous? That it did not plot appropriately on

10 a drawdown line -- curve?

11 A. Can you define "appropriate"?

12 Q. Well, "appropriate" in terms of it

13 being -- not being bounded by some sort of a

14 fault, which is what we're talking about here?

15 Or did it show the existence of a fault?

16 A. What I would say is that, the

17 deflection during drawdown in the Big Gulch stock

18 well, at the end of the test, is consistent with

19 the possibility that the cone of depression had

20 intercepted a -- some sort of a barrier boundary.

21 And also, if -- and less definitively, there

22 appeared to be an issue with the recovery, too.

23 Q. So is it your opinion that the SVR 7

24 test as evaluated by means of the drawdown in the

25 Big Gulch stock well, shows the existence of a

1 fault-induced boundary somewhere

2 between -- somewhere in the vicinity of the Big

3 Gulch stock well; is that your testimony? Is

4 that your opinion?

5 A. Can you restate that question?

6 Q. Is it your opinion that the response of

7 the Big Gulch stock well in the SVR 7 aquifer

8 test, shows the existence of the fault-induced

9 boundary somewhere affecting the Big Gulch well?

10 A. I would say that the response to

11 pumping that was observed in the Big Gulch stock

12 well, is consistent with the -- a negative

13 boundary condition. I wouldn't say that it's

14 definitive, necessarily. But it is consistent

15 with a negative boundary condition.

16 And the fact that we had it on -- in

17 the aquifer test on the other side of the fault,

18 or we appeared to have it, or Hydro Logic at one

19 point thought that it had occurred, it was their

20 decision to make the analysis using the fault

21 package. They obviously thought they had some

22 sort of an effect.

23 And the fact that it was on the other

24 side, sort of eliminates the possibility that it

25 could have been the west-Boise Eagle fault that

1 was being intercepted by the cone of depression.
 2 Q. Mr. Vincent, perhaps the Hearing
 3 Officer is a bit confused about where these
 4 faults are that you are asserting, and where the
 5 Big Gulch stock well is, and how this all works
 6 out.
 7 Could you please, using your pointer,
 8 describe where the Big Gulch stock well is, where
 9 the SVR 7 is on this exhibit that's up on the
 10 screen?
 11 A. (Witness complying.) Are the wells
 12 labeled on there?
 13 Q. It's Exhibit 19, Figure 1. Could
 14 you -- in the first place, let me ask you a few
 15 questions here.
 16 You see the outline of the M3 property
 17 there, do you not, with a -- with a leg coming
 18 down to the southwest that I -- can we refer to
 19 that as the panhandle?
 20 A. Yes.
 21 Q. There in the panhandle, there is a
 22 short fault, is there not, that I think
 23 Mr. Dittus testified about; correct?
 24 A. That's correct.
 25 Q. And is that fault, is the fault that

1 was detected in a magnetometer survey that was
 2 carried out on behalf of M3; isn't that correct?
 3 A. That's correct.
 4 Q. And that's an inferred fault; isn't it?
 5 A. It's based on interpretation of data.
 6 It's inferred at depth certain -- it's
 7 inferred -- yes, it's inferred.
 8 Q. And it's inferred in the bedrock,
 9 correct? At several thousand feet below surface;
 10 correct?
 11 A. Yes.
 12 Q. Well, below the aquifer; correct?
 13 A. That's correct.
 14 Q. And we don't know, do we, whether that
 15 fault extends to the surface, and in any way
 16 affects water flow in the Pierce Gulch Sand
 17 Aquifer? We don't know that; do we?
 18 A. We don't know that for a fact, no.
 19 Q. Now, the aquifer -- or excuse me -- the
 20 faults over on the right side, the blue one and
 21 the rose-colored one above it. Do you see those
 22 there?
 23 A. Yes.
 24 Q. What are those faults? Or that one
 25 fault perhaps, if it's one?

1 A. That's the west-Boise Eagle fault.
 2 Q. Is it your testimony that the
 3 west-Boise Eagle fault does not form an aquifer
 4 boundary for the PGSA, or do you know?
 5 A. On M3 there is a feature -- I'll call
 6 it a -- because the aquifer is dipping, it's the
 7 up dip limit of the PGSA that occurs to the west
 8 of the west-Boise Eagle fault on M3 property. To
 9 the south --
 10 Q. Can you point with your pointer up
 11 there on the map, and show the Hearing Officer
 12 where that is? And --
 13 A. Perhaps --
 14 Q. -- show us where you are talking about;
 15 where the PGSA goes up dip and daylight?
 16 A. It's identified on a number of
 17 Hydro Logic figures. Perhaps, we should
 18 reference one of those, Mr. Fereday?
 19 Q. Pardon me?
 20 A. We could use a figure from one of the
 21 Hydro Logic reports to better identify that.
 22 MR. FEREDAY: Let's do. Let's go off
 23 the record for -- if we could, Mr. Hearing
 24 Officer, just a moment.
 25 THE HEARING OFFICER: Okay.

1 MR. FEREDAY: Maybe it's time for a
 2 break.
 3 THE HEARING OFFICER: It's getting
 4 close. Is this a good time?
 5 MR. FEREDAY: I --
 6 THE HEARING OFFICER: Fine with me.
 7 MR. FEREDAY: I would say, it's a good
 8 time.
 9 THE HEARING OFFICER: All right. It's
 10 20 to the hour. So let's come back at five to
 11 the hour. Let's take 15 minutes for the
 12 afternoon.
 13 (A recess was had.)
 14 THE HEARING OFFICER: We're recording.
 15 Mr. Fereday.
 16 Q. (BY MR. FEREDAY) Mr. Vincent, I would
 17 like to, after the break here, go back over a few
 18 things that we just discussed.
 19 First of all, just -- just so we're
 20 clear here with regard to the potentially
 21 truncating faults of the PGSA in the M3 vicinity.
 22 Is it accurate to say, that your view is that
 23 there are two potential faults that are involved
 24 here, the west-Boise Eagle fault on the
 25 northeast, and what we'll call the panhandle

1 fault on the southwest; is that fair?
 2 A. We don't know in truth where all the
 3 faults are along the basin margin. And, in fact,
 4 I think that's self-evident. I mean, the fact
 5 that Dr. Wood located this fault along the
 6 panhandle, that was previously unidentified.
 7 My thought is that there is a -- there
 8 is zones of faulting. And I would consider the
 9 basin margin a zone, rather than a -- than
 10 a -- thinking of it in terms of discreet faults
 11 that occur. And once you've identified them, you
 12 are done. I think there may be other faults,
 13 that we don't know where they are yet.
 14 Q. But for purposes of your opinion, can
 15 you identify any other faults that would -- that
 16 would be evidence by any pump test, or any other
 17 data, other than these two; the west-Boise Eagle
 18 fault, and what we've dubbed the panhandle fault?
 19 A. If I could refer to --
 20 Q. Now, this is a fairly simple question.
 21 I'm just asking whether you have any data for any
 22 other that would -- that would truncate -- that
 23 you think might truncate the PGSA?
 24 A. I don't have any information that
 25 suggests that on M3 property . But there are

1 other faults as identified in the map that
 2 accompanies Dr. Wood's magnetometer survey
 3 report.
 4 Q. And that's Exhibit 19 B, Figure 1;
 5 correct?
 6 A. Yes.
 7 Q. But with regard to those that might
 8 affect the PGSA in the vicinity of, or on the M3
 9 property, we're just talking about these two;
 10 isn't that right?
 11 A. On M3, that's correct.
 12 Q. Okay.
 13 A. I believe there is indications of
 14 other -- I don't know whether they are
 15 faults -- but negative hydraulic boundaries that
 16 transect the PGSA.
 17 Q. But again, you have no professional
 18 opinion as to whether any other such faults
 19 exist; isn't that right?
 20 A. As I said, I believe there is evidence
 21 of other negative hydraulic boundaries that
 22 transects the PGSA away from the M3 property.
 23 Q. Okay. Well, it -- I would like to hear
 24 what those are, and what your opinion is based
 25 on?

1 A. Okay. In a 1992 report authored by
 2 Mr. Ed Squires, Dr. Spence Wood, and Dr. Jim
 3 Osiensky, there was a description of the Goddard
 4 No. 2 well. And the Goddard No. 2 well is
 5 in -- I'll call it the Garden City area. And
 6 indications in the response to our staff
 7 memorandum, the indication is that that is a PGSA
 8 well. And --
 9 Q. Do you agree that that's a PGSA well,
 10 or do you know?
 11 A. I don't know. I don't know.
 12 Q. Have you ever done any evaluation of
 13 the Goddard well yourself?
 14 A. I have not.
 15 Q. Have you looked at any geophysical
 16 evaluations of wells near the Goddard well?
 17 A. No.
 18 Q. But this 1992 report, and it's authored
 19 by Squires, Wood, and Osiensky, shows us what?
 20 And could you please refer to a page?
 21 A. I don't have it in front of me. But I
 22 do recall that there is an aquifer test plot for
 23 the Goddard well, which as I said, was identified
 24 as a PGSA well in the response to our staff
 25 memorandum. And that aquifer test plot includes

1 an arrow, and a label, and it says, negative
 2 hydraulic boundary. That's not necessarily a
 3 fault, mind you, but it is an impedance to ground
 4 water flow in a PGSA well.
 5 Q. And the hydraulic boundary shown in
 6 that Goddard well drawdown plot, could be a
 7 pumping well, could it not; another well?
 8 A. I don't know that I would suspect that.
 9 Q. You don't suspect that?
 10 A. No.
 11 Q. Do you think it's impossible that that
 12 could be the case?
 13 A. No, it could be -- it could be another
 14 pumping well. That's possible.
 15 Q. Okay.
 16 A. That's one of, I think, five different
 17 possibilities that are suggested on the figure as
 18 the cause of -- or the possible cause of the
 19 negative hydraulic boundary.
 20 Q. Mr. Vincent, I'm handing you what, I
 21 believe, is what you've just described. And if
 22 you would take a look at that, and identify that,
 23 please?
 24 A. (Witness complying.) This report --
 25 Q. Is that that '92 study?

1 A. It is the '92 study. It's entitled,
2 "Hydrogeologic Framework of the Boise Aquifer
3 System, Ada County, Idaho."

4 Q. Is this a document that you submitted
5 subsequent to your staff memo?

6 A. Yes, we hadn't reviewed this as part of
7 our staff memorandum.

8 MR. FEREDAY: Okay. I would like to
9 mark this as the next exhibit.

10 THE HEARING OFFICER: Okay. Do know
11 what number in the order of what you have marked,
12 Mr. Fereday?

13 MR. LAWRENCE: 67 would be an
14 appropriate number.

15 MR. FEREDAY: We'll mark it as M3
16 Exhibit 67.

17 MR. SMITH: 6-7?

18 MR. FEREDAY: Correct.
19 (Exhibit 67 marked.)

20 THE HEARING OFFICER: Do the
21 protestants have copies of this documents?

22 MR. THORNTON: We do.

23 THE HEARING OFFICER: I think there
24 were copies made of this, it was my
25 understanding.

1 Mr. Vincent, could you give me that for
2 a minute?

3 (Witness complying.)

4 Q. (BY MR. FEREDAY) And while we're at
5 it, Mr. Vincent, I'll show you the other two
6 documents, that I believe you have submitted.
7 Would you identify these, please?

8 A. These actually were submitted by my
9 colleague. The first one is "Hydrogeologic
10 Framework of the Boise Valley of Southwest
11 Idaho," authored by Dr. Spence Wood, April 21,
12 1997. And the second one is dated October 17,
13 2007. It's a memorandum from Hydro Logic, Ed
14 Squires to Mr. John Westro, with the
15 western- -- who is the western regional manager
16 of IDWR.

17 Q. Have you reviewed the 1997 Wood report
18 since your staff memo?

19 A. The 1997?

20 Q. The one you just identified.

21 A. I have -- I have -- I have not. I
22 believe that Mr. Dennis Owsley has undertaken a
23 review.

24 Q. And was it Mr. Owsley who suggested
25 this be submitted as further support for your

1 memo?

2 A. Yes.

3 Q. And how about the 1992 report by the
4 three authors? Did you suggest that as further
5 support, or did Mr. Owsley, or someone else?

6 A. We were both aware of the study, and
7 both had copies of it on our bookshelf, and
8 thought that it was pertinent to the subject.

9 Q. Primarily, because of the Goddard well
10 information?

11 A. I think the study area is between M3,
12 and the postulated recharge area upstream from
13 Capitol area -- or Capitol bridge, rather. And
14 we were interested in assessing the hydrogeology
15 within that area to evaluate the connection of
16 the PGSA at M3 to the postulated recharge area.

17 Q. But you evaluated that after you
18 produced your staff memorandum; correct, in
19 connection with this case?

20 A. I think we were both familiar with, and
21 had already read that report.

22 Q. Did you cite it in your staff
23 memorandum, Exhibit 50?

24 A. No, we did not.

25 Q. The same goes for Wood, 1997, and 2007

1 HLI memo; correct?

2 A. That's correct.

3 MR. FEREDAY: We would like to mark
4 these other two as Exhibit 68, the 1997 Wood
5 report; and 69, the 2007 HLI report. And we
6 offer all three in evidence.

7 THE HEARING OFFICER: So the HLI
8 report, this would be a letter to John Westro,
9 would be 69? And the document by Spence Wood
10 would be 68, Mr. Fereday?

11 MR. FEREDAY: That's correct.

12 (Exhibits 68 and 69 marked and admitted
13 into evidence.)

14 THE HEARING OFFICER: We're ready,
15 Mr. Fereday.

16 MR. FEREDAY: Okay.

17 Q. (BY MR. FEREDAY) Mr. Vincent, I would
18 like to go back to where we were before the
19 break.

20 Now, we've gone over some ground that
21 maybe we needed to be covered a little bit more.
22 And you also, I believe, had an additional thing
23 to say about the Pierce Gulch stock well, and its
24 response to the SRV 7 aquifer test, the nine day
25 test.

1 Could you describe what that further
2 comment is?

3 A. Yes, thank you. I just wanted to
4 correct my testimony. I believe I said something
5 about a zero intercept. And what I was trying to
6 say, this is a very technical matter only. But
7 the trend of the residual drawdown plot, if you
8 were to extend that to a T or T prime value of
9 one. It -- the concern was that the intercept
10 was nonzero. It was a positive value.

11 I believe I stated that incorrectly in
12 my previous testimony. I just wanted to get that
13 straight for the record.

14 Q. And it was incorrect, in what sense?
15 That it was a negative boundary?

16 A. I believe I was talking as if it was
17 the zero intercept that was positive, which
18 is -- doesn't make sense.

19 Q. Okay. I would like to have you refer
20 to Exhibit 42, Figure 1, I believe.

21 MR. THORNTON: Which exhibit is that?
22 I'm sorry.

23 MR. FEREDAY: That's the application.

24 Q. (BY MR. FEREDAY) Actually, Exhibit 42,
25 under Tab A 4, Figure 6. It looks similar to

1 what you see up here on the screen.

2 A. (Witness complying.) Tab A?

3 Q. (BY MR. FEREDAY) Tab A 4.

4 A. Thank you.

5 Q. Mr. Vincent, is it your testimony -- to
6 get back to a question I asked earlier. Is it
7 your testimony, your opinion, that the west-Boise
8 Eagle fault truncates the Pierce Gulch Sand
9 Aquifer on the M3 property?

10 A. Based upon the information that's been
11 provided to us, the Pierce Gulch Sand is -- it's
12 the Willow Creek aquifer -- it's the underlying
13 Willow Creek aquifer that's truncated by the
14 west-Boise Eagle fault.

15 Q. Do you see on Figure No. 6, this green
16 line that goes to the west, northwest and becomes
17 dashed?

18 A. Yes.

19 Q. Do you understand what that line is?
20 Could you describe it for us?

21 A. I believe that's the contact between
22 the Pierce Gulch Sand Aquifer bottom structure
23 and the top of the underlying mud stone. So it's
24 that intersection with land surface or surficial
25 sediments in -- at least.

1 Q. Is that the area where the Pierce Gulch
2 Sand Aquifer becomes more and more unconfined,
3 and ultimately, unsaturated?

4 A. Yes, as you -- it would be to the
5 southwest of that, where you would start to get
6 unconfined conditions in that aquifer,
7 provided -- I'm not sure what the sediments
8 overlying are. But in theory, yes.

9 Q. You would get unconfined conditions as
10 you proceed to the southwest; is that your --

11 A. As you proceed to the northeast and
12 approach that line.

13 Q. Okay.

14 A. That represents the base of the PGSA.

15 Q. Does that represent a boundary, in your
16 opinion, in the PGSA, in the aquifer?

17 A. It appears to, yes. It's the -- it's
18 the end of the aquifer more or less.

19 Q. So the aquifer would have a boundary at
20 that location; would you agree?

21 A. Assuming that the underlying sediments
22 are of lower permeability, yes.

23 Q. Now, with regard to Dr. Wood's work
24 that detected an inferred fault down in the
25 panhandle based on magnetometer data, do you

1 recognize that that has the sediment section over
2 the top of that deep basement where the fault was
3 of at least 3,000 feet?

4 A. I do.

5 Q. And you don't have any evidence, do
6 you, that that fault propagates up into the
7 sediments that would comprise the PGSA; do you?

8 A. I do not, other than -- well, other
9 indirect lines of evidence, I suppose.

10 Q. I would like to turn to your point
11 about doing magnetometer and seismic studies.
12 You seem to be critical of M3 and Hydro Logic for
13 having carried out seismic and magnetometer
14 studies on this site. Is that a -- is that a
15 fair assessment of what you said?

16 A. I hope that wasn't what was implied. I
17 think it's good to collect that sort of
18 information. I think what I was intending was
19 that there was concern with the shallow
20 subsurface. And the intent of the seismic survey
21 was to see what was going on in the -- in the
22 sediments, in specifically, at depths less than a
23 thousand feet.

24 Q. What about -- what about the
25 magnetometer study? Do you recognize that that

1 was to find what the basement rocks were shaping
2 up to be?

3 A. Insofar as it apparently is only
4 sensitive to what's going on in the basement,
5 then obviously, yes. But I think -- I -- my
6 interpretation is that there is -- there was
7 concern on the part of the investigators, that
8 perhaps the faulting, not only transected the
9 basement rocks, but perhaps there was offset in
10 the shallow sediments as well, which would
11 include the PGSA.

12 Q. Are you an expert in evaluating
13 magnetometer data?

14 A. No, I'm not.

15 Q. What about seismic data?

16 A. I am not.

17 Q. With regard to M3's position here,
18 don't you agree that it would make sense for M3,
19 with a water right of this size, to carry out all
20 types of studies that might reasonably provide
21 some data as to this site, such as magnetometer
22 and seismic?

23 A. Yes. And I think -- I applaud them for
24 their efforts, and I think it's useful
25 information, although the seismic study proved

1 inconclusive.

2 Q. The seismic study proved inconclusive,
3 isn't it a fact, because seismic often has
4 trouble dealing with sediments, and really seeing
5 into sediments as opposed to bedrock; isn't that
6 right?

7 I know you said you are not an expert.
8 But do you know that, in fact?

9 A. Yeah. And we were also told by those
10 who are experts at the BSU's Center for
11 Subsurface Geological -- CGISS -- I can't
12 remember the acronym there -- but the experts
13 think we might be able to see the sediments with
14 a larger source. And that's why we're proposing
15 to do a larger source seismic survey this summer,
16 actually, in both North Ada and east Ada.

17 Q. But you don't fault M3, do you, or feel
18 that HLI has been disingenuous by doing these
19 studies, even though they may not have shown
20 anything in terms of offset in the sediments;
21 right?

22 A. No, I applaud their efforts.

23 Q. With regard to the two day Kling test,
24 the Kling well is well down in the panhandle;
25 correct?

1 A. That's correct.

2 Q. And the Kling well would be southwest
3 of this inferred fault line in the panhandle;
4 correct?

5 A. That's correct.

6 Q. Did you do any simulations or any
7 calculations of your own with regard to the Kling
8 aquifer test, or did you just look at the data
9 that was provide by the workers at HLI?

10 A. We just reviewed their -- their work.

11 Q. So you didn't do any calculations to
12 determine whether the cone of depression from
13 that test would have propagated to the upper
14 gulch wells in that time frame; did you?

15 A. We did not for the Kling well. We did
16 for SVR 7.

17 Q. Do you know whether, based on the
18 transmissivity data that was -- that has been
19 arrived for this aquifer, whether the cone of
20 depression would be measurable at the site of the
21 upper gulch wells, nearly 10,000 feet away after
22 that two day test from Kling, or do you have an
23 opinion about that?

24 A. I -- I'd have to look at the geometry
25 again. I'm not exactly sure that the locations

1 of the various wells. But it occurs to me, that
2 during a two day test perhaps, the cone of
3 depression did not have an opportunity to expand
4 a distance that far. Yeah.

5 Q. In the drawdown plot of the pumping
6 well in the two day Kling test, did you see any
7 evidence of a negative hydraulic boundary? And I
8 would ask you to refer to Exhibit 12, Figure 81.

9 Exhibit 12 is the re-analysis of 16
10 aquifer tests that was carried out by HLI. Do
11 you recall that document?

12 A. Yeah.

13 Q. Did you read that document, by the way?

14 A. Yes. And there are a large number of
15 data plots. There were 16 different aquifer
16 tests, and many wells for each, so...

17 Figure 81, you said?

18 Q. Correct.

19 A. What page?

20 Q. Page 220.

21 A. (Witness complying.)

22 Q. Mr. Vincent, have you found Figure 81?

23 A. I have.

24 Q. In that drawdown plot, you recognize
25 that that's the drawdown plot for the pumping

1 well itself; correct?
 2 A. Correct.
 3 Q. And you agree, don't you, that a
 4 pumping well if it -- if it encounters a negative
 5 or no flow boundary, will show that no flow
 6 boundary in its plot; will it not?
 7 A. Yes. More -- yeah.
 8 Q. Do you see any evidence in this plot of
 9 a negative or a no flow hydraulic boundary?
 10 A. I don't on that plot, no.
 11 Q. How about positive boundaries? Do you
 12 see any of those?
 13 A. It looks to be a pretty straight line.
 14 Once a time has past, once you get past, say,
 15 eight minutes in the test.
 16 Q. At about a minute and seven or eight,
 17 we see a more positive deflection; do we not?
 18 A. We do, yes.
 19 Q. Does that suggest to you that there
 20 would be a no flow boundary at that point?
 21 A. I'll tell you, I didn't undertake an
 22 extensive analysis here. I didn't analyze 16
 23 different aquifer tests, and look at all the
 24 plots, and all the monitor well monitors here.
 25 And I look at Figure 86, for example,

1 or page 225, and I -- and I --
 2 Q. And before we get to page 86 -- or
 3 Figure 86, and I promise you, I'll take you there
 4 in a minute.
 5 A. Okay.
 6 Q. I would like just like to finish up
 7 with 81.
 8 A. Okay.
 9 Q. Isn't it -- isn't it a fairly basic
 10 precept that what we're seeing there at that
 11 first deflection, is a positive aquifer response,
 12 not a negative one?
 13 A. Well, I think initially, you get a big
 14 drawdown in the well when you are basically
 15 evacuating the well bore. And then from there,
 16 you have, you know, maybe a trend to look at. I
 17 would want to look at, you know, the size of the
 18 well, and look at well bore storage, and look at
 19 U assumption. And there is a whole -- a whole
 20 bunch of things you need to look at before you
 21 can make definitive determinations here.
 22 But something that happens in the first
 23 couple minutes of the test, is generally not a
 24 good indication of what's going on.
 25 Q. How about out at the far bottom end of

1 this -- of this plot, do you see any -- any
 2 indication of a trend there? Have you attempted
 3 to draw a line, or figure out anything about that
 4 trend? Does that look positive or negative to
 5 you?
 6 A. As I said, once you get past, say,
 7 eight minutes, somewhere in there, from then on
 8 it looks like a very linear trend.
 9 Q. In the very next figure, Figure 82, it
 10 shows drawdown curves. This also shows no
 11 evidence, does it, of a no flow boundary, that
 12 you can tell? Do you see any evidence of
 13 negative boundaries in either 81 or 82,
 14 Mr. Vincent?
 15 A. Again --
 16 Q. Such as would be caused by a fault that
 17 truncates the aquifer and causes it to be no
 18 flow?
 19 A. Again, it was not my conclusion that
 20 there was a negative hydraulic boundary here.
 21 That was the conclusion that was presumably
 22 reached by Hydro Logic. I haven't had a chance
 23 to look at this. Late in the test, there are
 24 some bends in the data.
 25 As I recall, they talked about how the

1 different zones behaved differently. But the
 2 composite looked fairly linear. And, indeed,
 3 that seems to be the case.
 4 THE HEARING OFFICER: Could we go off
 5 the record just for a minute --
 6 MR. FEREDAY: Yes.
 7 THE HEARING OFFICER: -- Mr. Fereday?
 8 I don't want to interfere with how the
 9 evidence is coming in, but let me just --
 10 (Discussion held off the record.)
 11 THE HEARING OFFICER: We are recording
 12 again, Mr. Fereday.
 13 Q. (BY MR. FEREDAY) Mr. Vincent, you are
 14 aware that Hydro Logic, on behalf of M3, did two
 15 aquifer pump tests as part of their work in this
 16 matter; correct?
 17 A. That's correct.
 18 Q. They did a two-day test; correct, based
 19 on the old Kling irrigation well?
 20 A. That's correct.
 21 Q. And the Kling irrigation well, which is
 22 shown here on Figure 80, which is part of Exhibit
 23 12, is down there in that southern extreme of the
 24 panhandle; correct.
 25 A. That's correct.

1 Q. And it would sit fairly close to, and
2 just southwest of the dashed line there, that is
3 that inferred fault, that we've been discussing
4 in the panhandle; correct?
5 A. Correct.
6 Q. M3 Eagle also did another pump test,
7 did they not, involving the SVR 7 well, which was
8 shown up there near the -- out of the panhandle
9 into the main part of the property; correct?
10 A. Correct.
11 Q. And that was a nine day aquifer test,
12 pumping at 900 gallons a minute; correct?
13 A. Correct.
14 Q. And you've had the results from both of
15 those tests for quite some time now; haven't you?
16 A. The Kling irrigation test for much
17 longer, yes.
18 Q. And the SVR 7 test was done in early
19 2009; isn't that correct?
20 MR. JASON SMITH: '08.
21 Q. (BY MR. FEREDAY) Or excuse me. 2008?
22 A. The test was done then. We didn't get
23 the report until January 23rd of 2009, the full
24 report, with the analysis.
25 Q. I don't want to belabor this point

1 right now, Mr. Vincent. But we may return to it
2 at a later time.
3 But with regard to my questions about
4 that Figure 81, I'm just asking you, regardless
5 of what you -- what you know about the document
6 in which this appears, which this is a very thick
7 document, a very thick study.
8 As a hydrogeologist, are you saying
9 that you are unable to say, whether there is a
10 negative boundary showing on this, such as a
11 boundary from the Kling pumping well, that would
12 show up from a truncating fault?
13 A. Not on that plot, I do not see that.
14 Q. Did you or your staff in working on
15 your memo, run any geophysical surveys of any
16 bore holes?
17 A. No.
18 Q. Have you received any formal training
19 in geophysics?
20 A. Not formal, but I've undergone
21 self-study. I have standard references on
22 interpretation of bore hole geophysics.
23 Q. Do you consider yourself an expert,
24 Mr. Vincent, in geophysical log interpretation?
25 A. I do not.

1 Q. In preparing your staff memorandum, did
2 you rely on materials provided by Dr. Dale
3 Ralston, that have been filed in this case, and
4 that are in evidence?
5 A. No, we merely included his findings as
6 part of our staff memorandum as requested by the
7 Hearing Officer. We didn't -- we didn't
8 undertake any sort of analysis of his -- of his
9 work, or rely upon his work in any way.
10 Q. Have you discussed any of the topics
11 addressed in your staff memo with Dr. Ralston?
12 A. Absolutely, not.
13 Q. Have you discussed the M3 project, or
14 any other thing having to do with M3 with
15 Dr. Ralston?
16 A. No.
17 Q. Is Dr. Ralston on the NAC TAC, the
18 Technical Advisory Committee; do you know?
19 A. No, he's not.
20 Q. So he has not attended any of the NAC
21 TAC meetings, to your knowledge?
22 A. He has not.
23 Q. Do you know whether in preparing his
24 memos, Dr. Ralston did any independent analysis,
25 or went out and collected any data on his own?

1 A. It didn't -- it didn't appear so.
2 Q. Do you know whether Dr. Ralston has
3 done any geophysical study in the North Ada area?
4 A. I'm not aware of that.
5 Q. Who, inside the Department, did you
6 discuss the subject matter of the March 2nd staff
7 memo with?
8 A. It would be limited to hydrogeologists,
9 and my staff, and my immediate supervisor Rick
10 Raymondi.
11 Q. Did you receive any instructions inside
12 the Department with regard to this memo?
13 A. Other than the requests from the
14 Hearing Officer, no.
15 Q. And the Hearing Officer simply asked
16 you to look at the data out there, and prepare a
17 memo?
18 A. It was a formal request; written.
19 Q. Have you provided comments of -- to
20 this extent, or that were this extensive on any
21 other water right application, that you know of?
22 A. No.
23 Q. How thick do you think the Pierce Gulch
24 Sand Aquifer is in this M3 area? Did you -- do
25 you recall that?

1 A. It's conceptualized as being
2 approximately 300 feet, I believe.
3 Q. So would it be your testimony then,
4 that you would need offset in a fault of at least
5 that much to create a no flow boundary; would
6 that be right?
7 A. It depends. There are low permeability
8 layers within the sand unit. I don't know what
9 the section looks like exactly along the fault.
10 I don't know --
11 Q. Have you looked at --
12 A. I don't --
13 Q. Excuse me.
14 A. I don't know that it would take 300
15 feet to cause a serious reduction in flow, but
16 that would make it more probable.
17 Q. I would like you to refer to Exhibit
18 23, which is Hydro Logic's ground water contour
19 evaluation.
20 A. (Witness complying.)
21 Q. Have you got it there?
22 A. Figure 1?
23 Q. Yes.
24 A. Yes.
25 Q. Do you know what that is? And could

1 you describe it to the Hearing Officer, please?
2 A. This is a potentiometric surface map,
3 which depicts the elevation of the potentiometric
4 surface within the Pierce Gulch Sand Aquifer in
5 the vicinity of M.3, and includes some inferred
6 flow directions based upon those contours, as
7 indicated by arrows, which point to the direction
8 of flow that's thought to be occurring.
9 Q. Do you --
10 A. It's for 2007.
11 Q. Okay. Do you -- Mr. Vincent, do you
12 have any -- any data to contradict the location
13 of any of those ground water contours, other
14 than, let's say, the dotted ones that are
15 inferred?
16 A. It -- you know, I'm probably not the
17 best person to answer that question. I haven't
18 really involved myself as much with the water
19 level data as Dennis Owsley. I'm not aware of
20 anything that necessarily refutes it.
21 I'm comfortable in saying that, I think
22 it's plausible that ground water flow could be
23 from the M3 property towards the Payette drainage
24 at some point. I don't know that I have anything
25 that suggests that that's impossible. I don't

1 pretend to know.
2 Q. But you don't know of anything that
3 would contradict that conclusion that it flows to
4 the west, northwest; would you?
5 A. I don't. But again, I haven't really
6 been involved in the water level monitoring in
7 that area, and I don't really have firsthand
8 knowledge. So I'm not the best person to ask
9 about that.
10 Q. But you signed the memo; correct,
11 that --
12 A. I --
13 Q. -- that we're talking about?
14 MR. SMITH: Objection; argumentative.
15 THE HEARING OFFICER: Overruled.
16 THE WITNESS: I was a co-author, yes.
17 Q. (BY MR. FEREDAY) You have not measured
18 any water levels in this area; have you?
19 A. Again, I have not.
20 Q. Do any of these contours suggest to
21 you, as a hydrogeologist, that there is a no flow
22 boundary impeding ground water flow through this
23 area in the PGSA?
24 A. Those contours as shown don't
25 necessarily suggest that. I guess I go back to

1 what our memo stated about ground water flow in
2 the vicinity of M3. I believe we said that it
3 looked, based on available data that was
4 presented to us, that the flow was primarily west
5 on M3 property, and then it turned northwest.
6 And I suppose, depending on where you
7 make the turn, you know, a fault -- a southwest,
8 north -- or southeast, northwest oriented fault
9 could cause that -- that turn. Certainly, if the
10 flow is through the postulated fault, then that
11 would suggest that it's not a significant barrier
12 to flow.
13 But I don't know that we have a lot of
14 control on ground water flow direction right
15 there. And I think the fact that we have this
16 northwest component makes it sort of
17 inconclusive, as far as the role of the fault.
18 Q. When you say, you don't have much
19 control on ground water flow in that area, what
20 do you mean?
21 A. I mean that, once you get between M3
22 property and the inferred flow direction towards
23 Letha and the Payette, there aren't a lot of
24 control points. And that's what we stated in our
25 staff memorandum.

1 Q. And this question of flow to the
 2 northwest, what difference does that make,
 3 Mr. Vincent, in -- with regard to this water
 4 right application, in your opinion?
 5 A. That --
 6 Q. Does it make any difference to aquifer
 7 productivity or drawdowns? What does it -- what
 8 difference does it make?
 9 A. That's a good question. I think that
 10 it's important, insofar, as understanding the
 11 aquifer system. In order to be able to predict
 12 it accurately, I think it's necessary to know
 13 where aquifer recharge occurs, and where aquifer
 14 discharge occurs. And it -- it lends support to
 15 the numerical modeling if you -- if you know
 16 that.
 17 But I would agree with your
 18 observation, that it's a bit of a red herring in
 19 terms of what the actual hydrologic impacts are.
 20 I think the actual hydrologic impacts are going
 21 to be superposed on the potentiometric surface
 22 that exists right now.
 23 And so it doesn't really matter whether
 24 it flows to the Payette Basin or if it's already
 25 left the Boise Basin. You are going to still

1 you, that Mr. Dittus has these data and these
 2 records dating back many years, with regard to
 3 the stability of the aquifer in that area? What
 4 does that tell you with regard to your -- the
 5 question you've been asked here, which is to
 6 evaluate the likelihood of impacts from the M3
 7 pumping?
 8 A. I suppose it lends support to the idea
 9 that some amount of additional appropriation
 10 might not cause significant impacts at least at
 11 that location.
 12 I'd point out, that we're in a
 13 different location. And that what we're talking
 14 about, is not an insignificant amount of water in
 15 relation to the amount of water that is pumped
 16 out of the Floating Feather well. So I think
 17 that needs to be considered as part of the
 18 picture.
 19 Q. You are saying that it's a greater
 20 amount of water that is pumped out of the
 21 Floating Feather well? Is that the problem?
 22 A. My understanding from listening to
 23 Mr. Dittus' testimony this morning was
 24 that -- and I don't know exactly which wells he
 25 was referring to, but I remember the number 4,500

1 have drawdown spreading radially away from the
 2 pumping center, unless there is some sort of a
 3 hydraulic barrier to -- to stop it.
 4 And I think that the modeling that was
 5 done by M3, and our calculations that were done
 6 with the Theis solution, they all show that.
 7 It -- that it -- the drawdowns, the impacts,
 8 radiate away from the pumping center, both up
 9 gradient and down gradient.
 10 Q. Did you hear Mr. Dittus testify this
 11 morning about his experience with the Floating
 12 Feather well, and other wells in the United Water
 13 portfolio in this area?
 14 A. I did.
 15 Q. Did you hear that Mr. Dittus saw no
 16 evidence of any negative hydrologic boundary from
 17 the pumping of the Floating Feather well?
 18 A. Yes, I did. I did.
 19 Q. Do you have -- do you have any reason
 20 to dispute what Mr. Dittus has said about the
 21 stability of water levels in the Floating Feather
 22 and other wells?
 23 A. I don't have any firsthand evidence,
 24 no.
 25 Q. As a hydrogeologist, what does it tell

1 acre-feet per year. And the estimated average
 2 withdrawal that M3 is applying for is 6,535. So
 3 that's more than a doubling of the rate of
 4 withdrawal. And it is, as I mentioned, in a
 5 different location.
 6 Q. You are saying that 6,500 is more than
 7 a doubling of 4,000 acre-feet --
 8 A. It --
 9 Q. -- from the United Water wells?
 10 A. It represents a doubling I -- 4,500 is
 11 100 percent. We're talking about being now 200.
 12 Q. Half again -- half again larger; would
 13 that be right? Or half -- roughly, half again
 14 larger? It wouldn't be a doubling of 4,500;
 15 would it?
 16 A. The total.
 17 Q. Wouldn't that be 9,000?
 18 A. The total -- the cumulative withdrawal
 19 will be now more than that 10,000 acre-feet.
 20 Whereas, the total withdrawal right now, is 4,500
 21 acre-feet per year.
 22 Q. Oh, you are speaking of the aquifer
 23 overall in this whole area?
 24 A. And that's what we're --
 25 Q. I see.

1 A. -- assigned to look at.
 2 Q. I see. Now, if the Pierce Gulch Sand
 3 Aquifer were affected by faults, at least in the
 4 Floating Feather area, that would truncated the
 5 aquifer, they would have shown up in the Floating
 6 Feather well, though; isn't that right?
 7 A. Yes, you would -- you would think.
 8 And, in fact, the reanalysis performed by HLI has
 9 a discussion. I don't know that they saw
 10 significant impacts. I think they put in a
 11 boundary in their analysis.
 12 There is a -- there is a known boundary
 13 in the vicinity of the Floating Feather well.
 14 It's not isolating, but it is a known boundary.
 15 Q. And what boundary is that?
 16 A. That's the west-Boise Eagle fault.
 17 Q. And based on Mr. Dittus' testimony, can
 18 you -- can you give an opinion that that well is
 19 showing an effect from that boundary?
 20 A. I would assume after some period of
 21 time, yes, that impact -- that boundary would
 22 be -- would be felt. That doesn't mean that it
 23 would necessarily cause water level declines all
 24 by itself. But it would cause an accelerated
 25 rate of water level decline.

1 Q. You say, it would. But it hasn't shown
 2 up yet; has it?
 3 A. I believe it probably has.
 4 Q. But do you know of any evidence in the
 5 data we have, such as the hydrographs that he
 6 spoke to this morning, that would show the
 7 existence of that boundary?
 8 A. I -- it's --
 9 Q. I'm asking you about the data that he
 10 showed.
 11 A. It --
 12 Q. Does it show it to you as a
 13 hydrogeologist?
 14 A. The data that he showed isn't an
 15 aquifer test. I think that if pumping of the
 16 subject well was treated as an aquifer test, that
 17 if you allowed that well to recover, and then you
 18 began to pump it. Eventually the cone of
 19 depression would extend, and hit that barrier
 20 boundary, and that you would likely see an
 21 increase in the rate of drawdown, unless recharge
 22 was sufficient to -- to cause it to cease
 23 proper -- you know, the cone of depression to
 24 cease growing. And eventually, the fact that it
 25 stabilizes, I -- suggests that there is some

1 recharge source somewhere.
 2 Q. So you would agree, that there is a
 3 recharge source coming to the Floating Feather
 4 well?
 5 A. Based on the information that
 6 Mr. Dittus presented, if the water level is
 7 stable, and it's been pumped for a long time, I
 8 would agree.
 9 Q. With regard to the lack of a pumping
 10 test at Floating Feather, which was what you were
 11 just stating, isn't it a fact that the Floating
 12 Feather well's own pumping, since it was begun in
 13 something like 1996, provides its own observable
 14 aquifer test, given the fact that it has been
 15 monitored all these years? At least at that
 16 pumping note itself; isn't that -- isn't that a
 17 fair statement?
 18 A. Certainly, there is a trend of pumping
 19 water level data that can be followed.
 20 Q. I would like you to refer to Exhibit
 21 29, which is another ground water contour map,
 22 dated 1991. Do you see that?
 23 A. (Witness complying.)
 24 Q. And I would just like to ask you
 25 whether you, in preparing your memo, evaluated

1 this map?
 2 A. (Witness complying.) I re- -- I've
 3 seen this map before, yes.
 4 Q. Okay. And this map shows, does it not,
 5 some degree of flow -- ground water flow up
 6 through that M3 area moving to the west, and also
 7 slightly to the north; isn't that correct?
 8 A. Yeah, the -- that's what's suggested by
 9 those -- by that pattern of water level contours,
 10 yes.
 11 Q. And this dates from 1991; correct?
 12 A. That's what it says.
 13 Q. Do you have any evidence to contradict
 14 what Mr. Newton found back in 1991?
 15 A. I don't. But again, I haven't focused
 16 on water level data.
 17 Q. And in this contour plot, do you see
 18 any evidence of a no flow boundary?
 19 A. Well, the flow direction leaving M3,
 20 those arrows, are parallel to the strike of the
 21 fault. So that doesn't suggest that the fault
 22 doesn't have an effect on ground water flow.
 23 Perhaps --
 24 Q. But the contours continue on right
 25 through where the faults are; correct? Where

1 your inferred --
 2 A. I see.
 3 Q. -- panhandle fault is?
 4 A. There isn't a water level discontinuity
 5 suggested by those contours I see.
 6 Q. Yeah. But what about on Exhibit 31,
 7 just a couple pages further on, Lindholm 1980.
 8 Similar -- similar questions, similar contours.
 9 Do you have any reason to disagree with those
 10 contours, and the continuity of ground water flow
 11 there?
 12 A. I don't. I would point out, that these
 13 are -- these are really broad brush regional
 14 contours that were developed for the entire
 15 Eastern and Western Snake Plain. So this is a
 16 very regionalized picture of what's going on.
 17 Q. But they were based on actual well
 18 data; correct?
 19 A. Yeah, but --
 20 Q. Actual water level contours?
 21 A. -- not necessarily in the Pierce Gulch
 22 Sand Aquifer.
 23 Q. Do you know what other aquifer they
 24 would be in?
 25 A. There are other aquifers at depth

1 beneath the Pierce Gulch Sand. The Willow -- the
 2 Terteling Springs formation has been identified
 3 as an aquifer. Yeah, I don't -- I don't know.
 4 There is contours that extend east of the known
 5 lateral extent of the Pierce Gulch Sand.
 6 Q. We can talk about those aquifers in a
 7 minute. But I would just like to confirm, that
 8 you don't see in this plot, any discontinuity of
 9 flow; do you?
 10 A. Discontinuity of flow, I -- I don't see
 11 that.
 12 Q. Okay. About what about Dr. Ralston's
 13 flow map, Exhibit 47, Figure 9? Could you take a
 14 look at that?
 15 A. (Witness complying.)
 16 Q. And I'll represent to you, that this is
 17 a contour map that Dr. Ralston did of the Pierce
 18 Gulch Sand Aquifer based on some selected wells
 19 in the Pierce Gulch Sand Aquifer in the vicinity
 20 of M3.
 21 Do you see his inferred contours there
 22 that, I believe, are dashed red lines?
 23 A. Yes.
 24 Q. And those trend, do they not, generally
 25 to the west, northwest in the M3 area? Do you

1 have any reason to disagree with Dr. Ralston in
 2 that regard?
 3 A. No, I would just point out that the
 4 flow direction, again, is a little bit different
 5 than in the other maps. I don't have any reason
 6 to suspect that one is better than the other
 7 regional sort of picture.
 8 Q. Dr. Ralston based his on three ground
 9 water con- -- ground water levels; isn't that
 10 correct? Or do you know?
 11 A. I don't know.
 12 Q. Okay. I would like you to refer to
 13 Exhibit 140, Figure 1, please?
 14 A. (Witness complying.)
 15 Q. And I'll represent to you, that this is
 16 part of a study done by SPF Water Engineers.
 17 MR. HEAD: What's the reference,
 18 Mr. Fereday?
 19 MR. FEREDAY: Exhibit 140, Figure 1.
 20 Q. (BY MR. FEREDAY) Mr. Vincent, just so
 21 that we can maybe have a perimeter on ground
 22 water flows across contour lines. If we focus
 23 first, on the far right of this map, the light
 24 colored contours.
 25 Would you agree with me that in the

1 upper part there, the ground water flow is
 2 directly down off the mountain front going to
 3 the -- basically to the west, perpendicular to
 4 those contour lines?
 5 A. Assuming it's isotropic conditions,
 6 yes, the indicated flow direction is generally
 7 perpendicular to the flow lines? And that's
 8 what's indicated.
 9 Q. Are you familiar with the nature of the
 10 sediments through which those flows would occur
 11 up there in the -- on the front? Do you know
 12 what the geology is there?
 13 A. It's complicated on the front. And,
 14 you know, we're kind of mixing some different
 15 aquifers here when we construct a contour map
 16 like that.
 17 Q. Well, I'm just asking you what you know
 18 about this contour map. I understand, we're not
 19 talking about the Pierce Gulch Sand Aquifer up on
 20 the front.
 21 But I would just like you to answer my
 22 questions with regard to how you see ground water
 23 flowing, whether you have any reason to disagree
 24 with this map?
 25 A. I -- I haven't reviewed these data. I

1 have --
 2 Q. Ground water flows from high head to
 3 low head; does it not?
 4 A. Yes.
 5 Q. And it will plot on a map once you find
 6 potentiometric surface in wells; correct?
 7 A. You can make a plot, yes.
 8 Q. And isn't that what this map shows?
 9 A. Yes, it's a -- contouring is a process
 10 that involves interpolating between points. And
 11 that's what this is, a contour map.
 12 Q. And if there is a conduit between
 13 points on a -- in an aquifer, say, such as a sand
 14 unit, ground water will flow from high gradient
 15 to low gradient through that sand unit; correct?
 16 A. Yeah, generally.
 17 Q. And over on the right side of this map,
 18 we're talking about low permeability volcanics
 19 and granitics; aren't we?
 20 A. That's right.
 21 Q. And over on the left side, where the
 22 contours are spaced farther apart, we're talking
 23 about more sedimentary basins; aren't we?
 24 A. Yeah.
 25 Q. Where the head moves at a lower

1 gradient across and through those sediments;
 2 correct?
 3 A. The water moves.
 4 Q. The water moves.
 5 A. Through the sediments.
 6 Q. Right.
 7 A. Yes.
 8 Q. And would you agree that it moves
 9 normal to these contour lines here, such as 2,400
 10 line, it would be moving at some points to the
 11 south, and to some points to the north? But
 12 generally trending to the west, northwest; is
 13 that a fair assessment?
 14 A. It -- this contour map suggests that,
 15 yes, it moves --
 16 Q. In that direction?
 17 A. Yes.
 18 Q. And again, you don't have any evidence,
 19 do you, to suggest that -- that water would flow
 20 in some other direction other than what SPF
 21 found?
 22 A. Again, I'm not the person to ask about
 23 that. Dennis Owsley, who is heading up the North
 24 Ada investigation, has a lot better handle on the
 25 water levels in -- in that area.

1 Q. Okay. Are you familiar with the
 2 geologic section shown in the wells and outcrops
 3 between M3 and the area around Letha in the
 4 Payette valley?
 5 A. No.
 6 Q. You've never been over there, or looked
 7 at it as a geologist?
 8 A. From -- you know, I've seen surface
 9 exposures at Freezeout Hill, and looked at the
 10 ground. But the subsurface, I haven't -- I
 11 haven't seen that.
 12 Q. I would like to shift gears a little
 13 bit here, Mr. Vincent, and talk a little bit
 14 about ground water chemistry.
 15 In your staff memo, you suggest that
 16 there should be an isotope study done, or that
 17 might make some sense. Would that be a fair
 18 characterization?
 19 A. Yeah, I think we -- we thought that
 20 would be an appropriate thing to do, yes.
 21 Q. Do you consider yourself an expert in
 22 geochemistry or ground water chemistry analysis?
 23 A. No.
 24 Q. So was it your idea to include the
 25 suggestion for an isotope study?

1 A. I don't recall whether that was my idea
 2 or Dennis', but I think we both agreed that that
 3 would be a good idea.
 4 Q. And you agreed to that, even though you
 5 are not an expert in this area?
 6 A. That's correct.
 7 Q. What is your personal experience, using
 8 ground water chemistry to differentiate ground
 9 water between aquifers, or otherwise evaluate
 10 ground water?
 11 A. Mostly academic. I haven't done a lot
 12 of water chemistry -- inorganic water chemistry
 13 analyses myself.
 14 Q. How about organic chemistry ground
 15 water analysis?
 16 A. Well, I've looked at a lot of
 17 contaminate problems that involve organic
 18 chemicals, yes.
 19 Q. Have you -- I take it, you haven't
 20 published any reports, or done any peer review
 21 studies yourself about ground water chemistry;
 22 correct?
 23 A. Not inorganic, no. And --
 24 Q. Have you ever used ground water
 25 chemistry to evaluate continuity between aquifers

1 or aquifer units?
 2 A. No.
 3 Q. Did you evaluate Dr. -- or
 4 Mr. Glanzman's report that was done in
 5 conjunction with Hydro Logic in this matter?
 6 A. Yes, we did.
 7 Q. And what's your opinion about that
 8 report?
 9 A. My opinion about that report is that it
 10 raises some issues with regard to the
 11 hydrogeologic conceptual model that HLI has made
 12 as the basis for their numerical model.
 13 Q. And what are those issues?
 14 A. The issue, as explained in the staff
 15 memorandum, one of the issues, is that the water
 16 beneath M3 is thought to be sourced almost
 17 exclusively from ancestral Boise River water.
 18 That concept that we have very old water doesn't
 19 jibe with the concept that the aquifer is
 20 strongly recharged, and very transmissive, and
 21 flows whether there is pumping or not, from
 22 southeast Boise somewhere to the Payette.
 23 Q. Is it your opinion that by using the
 24 term "ancestral water," the intent was that it
 25 was to be deemed "very old water," to use your

1 words?
 2 A. The terminology that's used elsewhere
 3 in that memo is actually "geologically
 4 ancestral." And, yes, that would be very old.
 5 It would be at least thousand of years, I think,
 6 most people would interpret that to mean.
 7 Q. And how many thousands? Do you have a
 8 number?
 9 A. It's an imprecise term. But we're
 10 talking geologic time, not -- not the time frames
 11 that you and I would normally think in.
 12 Q. Geologic time, do you mean, millions of
 13 years?
 14 A. I don't -- I don't know, but it
 15 suggests that the water would be very old.
 16 Q. Would "very old," in your opinion be
 17 older than, let's say, 4,000 years, 5,000 years?
 18 A. It would be old enough that I would be
 19 curious to find out. And I would like to run an
 20 isotopic study, and I think that was our
 21 recommendation.
 22 Q. Do you believe that an Isotopic study
 23 of PGSA ground water would deliver definitive
 24 information about the age of this water?
 25 A. I would have to defer to the experts on

1 that matter. We have been talking with the USGS.
 2 I believe we've got a proposal from them to do an
 3 isotopic study of ground water in North Ada
 4 County.
 5 Q. And who, at the USGS, have you
 6 discussed this with?
 7 A. Jim Bartolino.
 8 Q. Is he a geochemist?
 9 A. I believe that he is, or he would be
 10 working with a geochemist. I'm not 100 percent
 11 sure what his involvement would be in that. But
 12 I'm sure that the USGS would have an expert
 13 geochemist involved in that activity.
 14 Q. Do you know whether the isotopic study
 15 that you are thinking of, or perhaps that
 16 Mr. Bartolino is thinking of, would be a carbon
 17 14 isotope study based on radionuclides by -- of
 18 carbon 14, or would it be a stabilize isotope
 19 study, such as a deuterium or Oxygen-18 study?
 20 A. You know, I don't know exactly what's
 21 been proposed. Certainly, whatever is done needs
 22 to provide for age dates within the -- within the
 23 range of -- of what we have. So it may be a
 24 combination of different isotopic ratios that
 25 would be looked at.

1 And again, I don't -- I don't profess
 2 to be an expert on this. I -- all I can tell you
 3 is, I read the Glanzman, Squires report, and it
 4 raised some concern to me that -- that we
 5 have -- that we have geologically ancestral water
 6 being produced from an aquifer that is, by all
 7 counts, very transmissive, and basically passes
 8 water through at a high rate of speed.
 9 Q. With regard to that last comment, as to
 10 the very transmissive aquifer, do you have any
 11 reason, based on the data you've seen, to
 12 question that transmissivity?
 13 A. The data that I've seen shows that it's
 14 transmissive in the vicinity of M3, certainly.
 15 What the PGSA --
 16 Q. That it's transmissive -- highly
 17 transmissive?
 18 MR. SMITH: Let the witness finish his
 19 answer.
 20 MR. FEREDAY: Well, I've asked
 21 him -- I've asked him a question, and he's not
 22 answering.
 23 THE HEARING OFFICER: Okay. Mr. Smith,
 24 that's my job, not yours. Thank you.
 25 THE WITNESS: Let's use numbers. I

1 think the transmissivities that are on the order
 2 of 100,000 gallons per day per foot.
 3 200-and-some odd thousand gallons per day per
 4 foot was determined to be an average
 5 transmissivity in the aquifer in the area of M3.
 6 By most counts, that's a transmissive
 7 aquifer. Certainly, very productive. By the
 8 standards of the Eastern Snake Plain, maybe not
 9 so much. It's a relative term. Again, it -- the
 10 term, it's imprecise.
 11 Q. (BY MR. FEREDAY) But for the Treasure
 12 Valley, it's a fairly transmissive and productive
 13 aquifer; wouldn't you agree?
 14 A. And we wrote to that in our memo, yes.
 15 Q. With regard to your concern about the
 16 age of this water and recharge, is it your
 17 opinion that water that -- let's just pick a
 18 number -- that's 10,000 year old -- 10,000 years
 19 old, must have been recharged 10,000 years ago.
 20 And that if it's pumped out today, it will take
 21 10,000 years before that aquifer will recover
 22 back to where it was?
 23 What is it that you're -- that you're
 24 getting at here? What is your theory on
 25 recharge --

1 A. It's --
 2 Q. -- age?
 3 A. It's an issue of residents time. How
 4 long does the water stay in the aquifer? And
 5 it's -- the issue is for me, I look at the
 6 numerical model. The numbers are all there. We
 7 have a transmissivity. We have a hydraulic
 8 gradient. We have a porosity that can be
 9 estimated.
 10 We know how long it would take the
 11 water to go from Point A down gradient to Point
 12 B. And that number is much smaller number than
 13 the age that -- well, there is no precise age.
 14 But it's not geologically ancestral time frame
 15 that we're talking about. It's, as pointed out
 16 in the staff memorandum, on the order of -- I
 17 don't know. It depends on the assumed
 18 properties, but say, 50 years, maybe 100 years.
 19 It's less than a thousand years by a fair amount,
 20 which is not geologically ancestral.
 21 Q. Do you rely on any other evidence for
 22 your assumption that this water is geologically
 23 ancestral? Or do you put a number on it in any
 24 way based on some other evidence?
 25 A. It's really not my job. I was asked to

1 look at the submitted information, and to comment
 2 on that. And I'm noting to the Hearing Officer,
 3 that there is a -- there is a discrepancy here.
 4 There seems to be a bust here.
 5 So I don't know what it is. And I
 6 don't profess to know. But I do know that these
 7 two things seem to be inconsistent. That that
 8 is -- that we have a strongly recharged very
 9 transmissive aquifer, with no restrictions to
 10 flow. And yet, we have geologically ancestral
 11 water. Those two things -- something
 12 is -- something has not been explained to me.
 13 Q. Do you recognize that head and pressure
 14 can propagate through an aquifer much quicker
 15 than geologic time?
 16 A. Head and pressure can -- yes.
 17 Q. Do you agree that ground water levels
 18 in the valley increased during the 20th century
 19 due to incidental recharge from flood irrigation?
 20 A. Yes.
 21 Q. Do you know how much the ground water
 22 levels were increased during that time?
 23 A. I -- I don't recall
 24 that -- that -- those numbers. And, of course,
 25 that's a site specific sort of thing. It would

1 vary by location, proximity to canals, and that
 2 sort of thing. But definitely, affirmative.
 3 Q. Do you agree that trilinear diagrams,
 4 such as were presented in the Glanzman, Squires
 5 report, are an appropriate way to evaluate ground
 6 water chemistry?
 7 A. Yeah, I think that's a pretty standard
 8 method for categorizing ground waters.
 9 Q. Hypothetically, what would you expect
 10 to see on a trilinear diagram of ground water
 11 from a coarse grain fluvial aquifer that receives
 12 recharge only from precip -- precipitation on to
 13 the aquifer itself?
 14 A. Are you wanting me to identify in which
 15 corner of the plot it's going to -- to likely
 16 occur?
 17 Q. I would just like to know what you
 18 would expect to see, or do you know?
 19 A. I -- I -- I don't know. I haven't done
 20 a trilinear plot in a while. I have no reason to
 21 doubt that the -- that the work that was done by
 22 Glanzman and Squires is a fair characterization.
 23 Q. Okay. Did you participate in the
 24 effort to evaluate ground water levels in the
 25 PGSA, or was that left to Mr. Owsley or

1 Mr. McVay?
 2 A. That assignment was given to Mr. Mike
 3 McVay.
 4 Q. Did you instruct him in any way as to
 5 what his assignment was, or what you expected?
 6 A. It was fairly open ended. I -- I let
 7 him do the analysis.
 8 Q. Did you check his analysis after it was
 9 completed?
 10 A. I -- I looked at the memorandum that he
 11 prepared. It was -- I think my name was on the
 12 distribution. Otherwise, I did not -- I did not
 13 hand check the values that were used in any way.
 14 Q. Was the method used in Mr. McVay's
 15 analysis, an appropriate scientific method, in
 16 your opinion?
 17 A. I think that Mr. McVay's analysis was
 18 unbiased. And as he indicated, it was not
 19 statistically rigorous. I think that his intent
 20 was to -- to look at water level trends removed
 21 from seasonal fluctuations. And in order to do
 22 that, he chose a time frame that was before the
 23 irrigation season, in an attempt to also
 24 eliminate that other variable.
 25 I think it is scientific to try to

1 eliminate variables. And that was the intent of
 2 his analysis.
 3 Q. Why, in your opinion, would it be
 4 appropriate to take measurements prior to the
 5 irrigation season?
 6 A. Because, again, we're trying to
 7 eliminate variables. And if you superimpose on
 8 the potentiometric surface, the impacts caused by
 9 pumping, you've thrown another variable into the
 10 mix that can complicate the analysis. It
 11 just --
 12 Q. Don't you agree, though, that many of
 13 Mr. McVay's water level measurements were taken
 14 after the irrigation season had begun?
 15 MR. SMITH: I would object to this line
 16 of questioning, Judge. He's trying to use one
 17 witness to impeach another one.
 18 THE HEARING OFFICER: Overruled.
 19 THE WITNESS: Could you restate the
 20 question?
 21 Q. (BY MR. FEREDAY) Wouldn't you agree
 22 that many of the water level measurements taken
 23 by Mr. McVay were taken during the irrigation
 24 season?
 25 A. That -- that perhaps was an unintended

1 result based on availability of data. I'm
 2 not -- I don't recall the exact time frames for
 3 each of the values. But unfortunately, there
 4 weren't -- we didn't have the exact same date in
 5 each of the wells. And that's just sort of the
 6 nature of the beast.
 7 But I think he -- I think -- I think
 8 his attempt was genuinely unbiased. And he was
 9 trying to eliminate variables. And I think
 10 that's what you need to try to do.
 11 Q. What kind of variables was he trying to
 12 eliminate?
 13 A. Impacts caused by pumping, and seasonal
 14 fluctuations. I think I already answered that,
 15 but...
 16 Q. Did you help him select the wells that
 17 he measured?
 18 A. No. But I think in his memo, he
 19 explained that those wells were just wells in
 20 the -- in the regular monitoring, the IDWR
 21 monitoring network that were in the vicinity.
 22 Q. Have you had a hand in selecting wells
 23 for monitoring in the IDWR monitoring network for
 24 the NAC?
 25 A. I haven't. Actually, that's been left

1 to Dennis Owsley.
 2 Q. Do you have any knowledge of the
 3 construction of any of those wells?
 4 A. I don't.
 5 Q. Do you know whether all of those wells
 6 were even in the Pierce Gulch Sand Aquifer?
 7 A. I know that they were not. And -- and
 8 Mr. McVay wrote to that in his memo.
 9 Q. Was it -- is it your view, though, that
 10 the water level analysis conducted by Mr. McVay
 11 should be used to evaluate water levels in the
 12 Pierce Gulch Sand Aquifer?
 13 A. I think it's a worthwhile analysis that
 14 yielded results that, perhaps not conclusive, but
 15 certainly something that needs to be considered.
 16 Q. Do you know why the effort did not
 17 include other wells, such as the TVHP well No. 1,
 18 the State and Linder well, or any of United
 19 Water's wells?
 20 A. I think --
 21 MR. SMITH: Can I have the same
 22 objection shown for the record, please?
 23 THE HEARING OFFICER: Which is?
 24 MR. SMITH: That he's using this
 25 witness to try to impeach another.

1 THE HEARING OFFICER: Well, often
 2 that's what witnesses are for. Overruled.
 3 THE WITNESS: I'm going to let
 4 Mr. McVay answer that.
 5 Q. (BY MR. FEREDAY) Okay. Can you tell
 6 us, Mr. Vincent, about the NAC effort, the NAC
 7 studies that are going to be coming up, and what
 8 your -- what your office is planning to do?
 9 A. Yeah, we have several activities on tap
 10 for this year. We have an analysis of our
 11 modeling needs, sort of a big picture thing, that
 12 are not just for North Ada County, but also would
 13 include the Treasure Valley and into east Ada
 14 County. We're also charged with characterizing
 15 the Mountain Home plateau. So we're going to
 16 look at that collectively, and see what we need
 17 in terms of a ground water flow model. Whether
 18 perhaps there is -- we can revamp the Treasure
 19 Valley hydrologic model to meet our needs.
 20 In any event, I don't presuppose an
 21 answer. But we've contracted with Dr. Donna
 22 Cosgrove to perform that evaluation of the
 23 existing models.
 24 In addition, we have Dr. Lee Liberty
 25 with CGISS on tap to do seismic work in both

1 North Ada and east Ada. Hopefully, M3 will
 2 cooperate, and allow us to have access to their
 3 property. Like I discussed earlier, we want to
 4 use a bigger source. The thinking is that we
 5 would, perhaps, get meaningful data if we had a
 6 bigger size resource.
 7 Q. You mentioned that some of the effort
 8 has now moved to east Ada. That's out on the
 9 Orchard plateau, if you will, or the Mountain
 10 Home desert; correct?
 11 A. Correct.
 12 Q. So how much is your budget for studying
 13 the North Ada County area now?
 14 A. Dennis has the budget. I think I would
 15 defer to him. I know that our budget was,
 16 unfortunately, reduced. But our efforts on both
 17 North Ada and east Ada, the funding for that is
 18 still in place. And so we've made some
 19 cutbacks -- I'll let him answer that. I
 20 don't -- I don't recall what the exact number is.
 21 In addition, we have the isotopic
 22 study. There are some stream gauging that we're
 23 considering. The water level monitoring, that
 24 work is being expanded, and we're installing
 25 transducers in additional wells.

1 Again, he would be the better person
 2 actually to talk about the entire scope, so...
 3 Q. With regard to the modeling that
 4 Ms. Cosgrove is being asked to do, is she being
 5 asked to provide, or prepare a model that will
 6 tell you -- is designed to tell you more about
 7 the Pierce Gulch Sand Aquifer than has already
 8 been displayed?
 9 A. No. Actually, she's sort of -- she's
 10 not charged with doing any modeling. She's
 11 charged with looking at the modeling that has
 12 been done to date, and to evaluate whether or not
 13 that might be useful for our purposes.
 14 One of the primary things we're looking
 15 at is -- is answering questions for the
 16 comprehensive aquifer management planning
 17 program, which is our -- which is our charge from
 18 the Legislature. And we're supposed to
 19 characterize North Ada County as part of
 20 that -- that overall characterization program.
 21 And so we need to provide data for the
 22 water planning bureau in order that they can take
 23 a look at -- at what might happen with the water
 24 resource looking, say, 50 years into the future.
 25 Q. Mr. Vincent, is it your understanding

1 that the Comprehensive Aquifer Management Plan
 2 and the funding for it, is intended to be used in
 3 evaluating water right applications, such as
 4 this? And that these applications need to be
 5 held up pending the outcome of those efforts?
 6 A. No, that's not a -- that's not a
 7 primary goal for this.
 8 Q. Is it a secondary goal, to hold up
 9 applications like this?
 10 A. No, it's not a goal to hold up
 11 applications.
 12 Q. So is it your view, that given the
 13 evidence is there to show, by a preponderance
 14 that there is adequate water for a project like
 15 this, that it can go forward despite the pendency
 16 of North Ada studies?
 17 A. I don't think --
 18 THE HEARING OFFICER: I will be active
 19 on this one, Mr. Fereday. I think this borders
 20 on asking Mr. Vincent a legal conclusion about
 21 what we're doing in water allocation side of
 22 things.
 23 THE WITNESS: And --
 24 THE HEARING OFFICER: He doesn't work
 25 there.

1 THE WITNESS: And that would be my
 2 response. I don't concern myself with those
 3 matters.
 4 MR. FEREDAY: Can we go off the record
 5 for just a moment?
 6 (Discussion held off the record.)
 7 THE HEARING OFFICER: We're recording
 8 again.
 9 Q. (BY MR. FEREDAY) Mr. Vincent, at the
 10 beginning of your testimony, you referred to the
 11 two aquifer tests that M3 Eagle conducted. And
 12 you referred to Hydro Logic's choice of using
 13 AQTESOLV in evaluating those tests. Do you
 14 recall that?
 15 A. Yes.
 16 Q. Could you explain what you -- what you
 17 meant by your concern there? And I'll remind
 18 you, that this was one of your lines of evidence,
 19 to suggest that the aquifer may be limited, to
 20 the extent that maybe this water right should not
 21 be granted. Do you --
 22 A. Yeah.
 23 Q. -- recall that?
 24 A. Yeah. Yes, it wasn't the use of
 25 Aquasol. Aquasol is a full-feature aquifer data

1 test analysis program. It has a number of
 2 different built-in analytical models for helping
 3 to evaluate aquifer test data.
 4 One of those is a fault package, which
 5 allows you to -- to compare your data with what
 6 would be the response if you had a negative
 7 hydraulic boundary. And --
 8 THE CLERK: Oh, the tape has ended.
 9 Sorry.
 10 MR. FEREDAY: Are we off the record now
 11 waiting for the tape?
 12 THE HEARING OFFICER: Yes, we are.
 13 (Discussion held off the record.)
 14 THE HEARING OFFICER: We are recording
 15 again. I don't recall what -- at what point we
 16 were.
 17 (The reporter read back the following
 18 requested testimony. "A. Yeah. Yes, it wasn't
 19 the use of Aquasol. Aquasol is a full-feature
 20 aquifer data test analysis program. It has a
 21 number of different built-in analytical models
 22 for helping to evaluate aquifer test data.
 23 One of those is a fault package, which
 24 allows you to -- to compare your data with what
 25 would be the response if you had a negative

1 hydraulic boundary. And --")
 2 THE WITNESS: And in these tests, the
 3 Kling irrigation well, and the SVR 7 test, there
 4 was a decision made by HLI data analyst to use
 5 the fault package to evaluate the test data. And
 6 that suggests to me, that they thought it
 7 appropriate to look at the response if there was
 8 a fault.
 9 And so if you look at a plot -- I just
 10 happen to have this open in Exhibit 12, Figure
 11 88, page 227. There is a little notation that
 12 says, that the best fit -- "best fit with no flow
 13 boundary, 1,500 feet to northeast of pumping
 14 well."
 15 And I suspect that the Kling irrigation
 16 well is probably 1,500 feet away from the fault
 17 that was delineated with the magnetometer survey.
 18 I know that it's northeast. And so this suggests
 19 to me strongly, that the analysts thought it was
 20 appropriate to use the fault, and to evaluate the
 21 test data, with the hydraulic effect of the fault
 22 as part of the analysis.
 23 Q. (BY MR. FEREDAY) In other words, to
 24 assume that there is a fault with a no flow
 25 boundary, and to put that constraint into

1 that -- into that model run; is that correct?
 2 A. Yes, the type curve that was generated,
 3 the curve -- the hydraulic response, which the
 4 data were fitted to, had that fault feature
 5 embedded into the response. So you -- it's
 6 a -- it's a curve matching procedure, which
 7 involves comparing the observed water level
 8 response in a well to the theoretical water level
 9 response.
 10 And what this tells me, is that the
 11 best fit was -- was made when the observed
 12 response was compared to the theoretical response
 13 if you had a no flow boundary.
 14 Q. Did you inquire of HLI, or its
 15 analysts, as to what they intended by using that?
 16 A. I think what they are trying to do --
 17 Q. No, I just asked you whether you asked
 18 them?
 19 A. I did not.
 20 Q. Okay. And so you don't really know
 21 what their intent was, do you, for using that
 22 particular tool; do you?
 23 A. The tool is to allow determination of
 24 aquifer properties --
 25 Q. I'm just asking --

1 A. I do know.
 2 Q. -- you what you know.
 3 A. I do know that they were attempting to
 4 get aquifer properties from this test.
 5 Q. But you don't know exactly what their
 6 purpose was; do you?
 7 MR. SMITH: Objection; asked and
 8 answered.
 9 Q. (BY MR. FEREDAY) I'm just asking --
 10 THE HEARING OFFICER: Overruled.
 11 Q. (BY MR. FEREDAY) I'm just asking for
 12 you to answer that yes or no whether you know, or
 13 whether you are inferring that from your own
 14 assumptions?
 15 A. The purpose of the analysis was to come
 16 up with these hydraulic properties. And the best
 17 fit -- the best fit -- in other words, they were
 18 most comfortable -- they had the least deviation
 19 between the observed and theoretical response,
 20 according to this notation, when they included
 21 the fault in their analysis.
 22 MR. FEREDAY: Mr. Hearing Officer, I
 23 think we'll end with this witness at this time.
 24 But we would like to recall him at some future
 25 time, because we didn't get into a lot of things,

1 position.
 2 And then with all that evidence in,
 3 then I think it's much easier to elicit and
 4 distinguish, and either add credibility or
 5 discredit, as the case may be. I think it's a
 6 much better way to bring the evidence in.
 7 So I guess that's my preference. And I
 8 guess I would suggest we keep that in mind, as we
 9 anticipate calling other Department witnesses.
 10 And I don't know who may want to -- I
 11 know, at least Mr. Owsley and Mr. Vincent would
 12 narrate testimony. And I assume, based on what's
 13 been presented here, that Mr. McVay would as
 14 well. So we would have all three of them here.
 15 MR. FEREDAY: Okay.
 16 THE HEARING OFFICER: Okay?
 17 MR. SMITH: We would also like to
 18 reserve the right to re-call this witness.
 19 Although we didn't call him, but we haven't had a
 20 chance to question the witness.
 21 THE HEARING OFFICER: You'd Have every
 22 opportunity to do that after the witness
 23 testifies. And so I guess that's my hope is the
 24 way we'll proceeding.
 25 Do we want to launch into

1 in deference to your comments --
 2 THE HEARING OFFICER: Sure.
 3 MR. FEREDAY: -- that we would like to,
 4 especially with regard to aquifer testing.
 5 THE HEARING OFFICER: Okay.
 6 MR. FEREDAY: And as you've heard, he
 7 has deferred to other members of the staff for
 8 other subjects, and we would like to call them in
 9 the future as well.
 10 THE HEARING OFFICER: Okay. Well, my
 11 intent is, and I think I said this at the outset
 12 of the hearing, I would allow you to call the
 13 witnesses as adverse witnesses, if you chose to
 14 do that. But following the presentation of your
 15 case in chief, then I would have them placed on
 16 the stand, be under oath, and testify, and
 17 narrate testimony. I suppose I could go out and
 18 find a Deputy AG to come in -- come in and do the
 19 examination. But I don't necessarily want to do
 20 that. And then they would be subject to
 21 cross-examination after that narration.
 22 Then I think we have the evidence in
 23 from those people, who produced the information
 24 within the reports that's in the files of the
 25 Department. And then we had a statement of their

1 cross-examination, or should we pull it off, or
 2 should we just pull the plug right now? It's
 3 about ten minutes before 5:00.
 4 MR. THORNTON: It's my opinion, it
 5 would be to pull the plug. We've got quite a few
 6 questions. And we'll just barely get into it,
 7 and lose continuity.
 8 THE HEARING OFFICER: It's probably a
 9 good time. So let's recess. And we'll start at
 10 9:00 tomorrow morning.
 11 (Hearing adjourned at 4:51 p.m.)
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REPORTER'S CERTIFICATE

I, COLLEEN P. KLINE, CSR No. 345, 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;

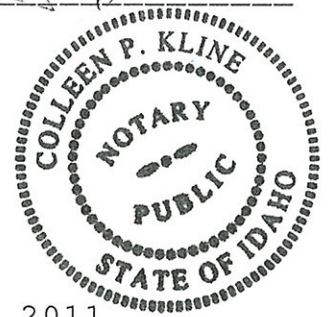
That the foregoing is a true and correct record of all testimony given, to the best of my ability;

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 5th day of May, 2009.

Colleen P. Kline

COLLEEN P. KLINE, CSR
Notary Public
P.O. Box 2636
Boise, Idaho 83701-2636



My commission expires September 17, 2011

A				
abandoned 587:13	556:3 572:11	576:12 624:19	analysis 560:1,4,4	apologize 612:25
ability 633:15	573:1 636:14,24	631:11 636:10	564:19 567:15	616:8
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