the green shading, are those springs that may have permanent water level impacts also?

A. No. The green are on the valley floor. And you'll see because the model simulates ceasing of pumping from the well field area in Kobeh Valley with the exception of pumping that we've assigned to Bobcat Ranch and 3 F Ranch continue on throughout the entire course of the model runs.

But since we've turned the pumping off as you'll notice the columns on the right-hand side as you go further in the time, those resources effectively fully recover at least to within one foot.

Q. And then directing your attention to spring ID 637, do you see that?

A. Yes.

Q. And that was water right number 4768?

A. Okay.

Q. And I pulled those documents on the State Engineer's web site. And that's that permit that was filed originally in December of 1917. Did you look at those water rights that you listed there?

A. I don't recall reviewing the details of that permit. I will note though that all of these sources are basically for, if you go to the spring table you'll note that all of them are for stock water supply and/or their federally reserved rights from the BLM. I would assume that those

rights would be addressed through the EIS and through the mitigation measures that are agreed upon between the mine and BLM. So the remainder of the rights to have to the springs are stock water sources.

Q. And the only measurement at least on this document or this table on that spring was taken in August of 2006?

A. Let me, if I may, I'm going to pull the spring plate two. And yeah, I did want to confirm that I was correct on this. All the springs basically in that vicinity around Mount Hope there, they have continued to be monitored by the mine on a quarterly basis. So there is -- And I think it's their intent to continue that type of monitoring. I don't know the details of the current monitoring plan or what might be arrived at. But there is continuing monitoring going on in that spring to document conditions?

Q. So you may have other information in your possession that shows a spring flow different than what's listed here?

A. I don't here with me, but the mine has been collecting that data.

Q. And then there is one other spring --

A. You know what, I should further state on that, I do know, however, that all the springs around Mount Hope in general that they're all characterized as seasonal springs

with the exception of the zinc habit which is an artificial discharge out of an old one added on the southeast side of Mount Hope. But all the spring resources right in the immediate vicinity of Mount Hope have been characterized as basically as seasonal type springs. Nothing of regional significance.

Q. And then going to spring ID 604 also in the blue highlighting.

A. Okay.

Q. Do you know if you have any other spring measurement data on that?

A. We also have that flagged as being within the mine's monitoring network, existing monitoring network.

Q. And that's located in Diamond Valley, is that correct, a spring that's going to dry up possibly?

A. Possibly. But again, it depends on the site specific conditions then.

Q. And then directing your attention to figure one in Exhibit 408 and --

A. Yes.

Q. Table 4.4-2 in Exhibit 39, volume one.

A. 4.4.2?

Q. Yes.

A. I have that table.

Q. That's your locations of your simulated pumping

well?

A. Table 4.4.2 is for the base case pumping.

Q. And --

MS. JOSEPH-TAYLOR: We've been disconnected in the other room. Sorry, folks.

MS. PETERSON: Is it okay to go?

HEARING OFFICER WILSON: We're good. Go ahead.

Q. (By Ms. Peterson) So could you please explain on figure one which are the five wells that have not been drilled yet, your production wells that have not been drilled.

A. Yes. In the green are the proposed locations based on 2010, June 2010 filings for the state. The locations that have not been drilled to date or explored to date are 227 POP-3 and 226 on the south end. And in the central part of the well field POO-1 and 224 have not been explored to date.

Q. And 224 you said also; right?

A. That's correct.

Q. Okay. And then I looked at your percent total well field production on Table 4.4-2.

A. Okay.

Q. And I total that of the total production based on the number of wells that have drilled, I guess the information for 44 percent of the proposed production?

A. I believe that's approximately correct.

Q. And so 56 percent of your production supply, those wells have not been drilled yet; is that correct?

A. That's correct. In round numbers about half, half the number and about half the supply is simulated in the model as some locations we have not drilled test wells at to date.

Q. And so all these wells I guess basically in the central and southern portion of your proposed well field you don't have any data for yet; is that correct?

A. For the south as well to -- well, for the south at a location we're going to be pumping from is location 222, yes.

Q. I'm sorry. What did you say?

A. Out at the location we're proposing for the well field, the furthest south that we have test well location is site 222. So the remining seven sites we have not drilled or explored.

Q. And the proposal is under the monitoring plan that this information gained from all the drilling of these production wells would not be input in to the model and the model wouldn't be updated until three years after production of pumping starts? Based on your understanding of the monitoring plan testified to by Mr. Rogers.

A. Yeah. And I actually haven't read the most

current version of that monitoring plan. And I do know that in speaking to Mr. Rogers there's been discussions about at least doing audits much earlier on in the process. But I don't know specifically what is in writing and I really don't even have the details of what specifically is being discussed now as far as moving toward a final monitoring plan.

Q. Are you also aware that there are water right applications sought to be approved in this proceeding for points of diversion that are not these ten production wells?

A. In order for us to drill exploration sites we had to file an application to change water to the locations that we wanted to drill and potentially build a well. So I do believe there's a number of those applications that supported our drilling and efforts are still outstanding, they're still listed as active application. So my knowledge though, this represents the locations that the mine is proposing to the extent that there are still pending applications on our exploration sites which we had to file in order to gain permission to drill there. It is not the intent to proceed with pumping water in this location.

Q. And there is about, in your current pending applications there are about 24 points of diversion, 24 wells that are listed for all the applications sought to be approved in this proceeding. Are you aware of that?

A. As Mr. Childress indicated, we've done a lot of

drilling out there so we had to file a lot of applications at various points. Like Mr. Childress testified, there is about 40 wells that have been drilled in the region. So the 12 that you see on this picture, the ten in the well field, the two construction water supply wells off to the right-hand side off to the east, that to my knowledge is where the mine is proposing to pump in Kobeh Valley and no where else to my knowledge.

Q. Okay. Well, let me just tell you that Application 73548 proposes -- which is proposed to be approved in this proceeding has a point of diversion as well number eight. Do you see that over on the right-hand side of your figure?

A. Oh, yeah, right. And those -- Okay, the 12 locations to the south. Actually I think there's 13. There's one to the north. Those are points of diversion that correspond to the original applications filed for new appropriation of water in Kobeh Valley. It's my understanding that we filed in June 2010 applications to change those on to the ten production well sites so --

Q. I have that the last application for this well that hasn't been changed by anything else is 73548.

A. There may be some applications that need to be cleaned up in the process here. There's been a series of filings and change applications and for various purposes

including exploration including the original set of appropriations. But again, the intent of the mine is they want their water rights allocated to the ten primary production wells and there's also some construction water appropriations at the two TSF wells off to the east. But that to my knowledge is what the mine is seeking from the state.

Q. So Application 73549 going in to Well 9, 73550 going in to Well 11, 77526 going in to Well 223, which is not even listed on this figure, 77553 which is going in to Well 2XF-2 which I believe Mr. Childress testified is over on the other side of Whistler Mountain, 77171 going in to 214 which is the carbonate well, and 76483 and 76486 which are going in to Well 203 are not needed by the company at this time?

A. The only ones that I know about is those associated with the test wells. So we mentioned that Test Well 214, Test Well 203 and some other test well locations. I do know that those applications were filed specifically for the purpose of us being able to drill an eight-inch well. I really don't know how the water rights applications have been arranged down in the wells one through 13. I do know that goes to the original application they appropriate but I don't know anything else beyond that so I can't offer you any clarity on those particular water rights.

Q. And do you know if wells, the applications that

are proposed to be put in to Well 206?

MR. DE LIPKAU: Objection. The witness says he knows nothing further on any particular well and any particular permit or application.

HEARING OFFICER WILSON: Well, I'll let you ask the question and see if he knows or not. Go ahead, Mr. Smith.

MS. PETERSON: Oh, I didn't finish my question. Well, are you going to present a witness on all your water right applications?

HEARING OFFICER WILSON: There's no further witnesses, is that correct, Mr. De Lipkau, for direct?

MR. DE LIPKAU: I'll answer the question. We introduced an exhibit which was objected to by counsel which was upheld by the hearing officer which was based upon public record to explain where the water goes and in to what well. We do not intend to present any witness to describe that because it's public record. Nothing is simpler. No witness can sit there without all the files in front of him and tell anybody where a portion of this application went and where a portion of that certificated permit went. It's just beyond anybody's memory. We tried to simplify it. It was objected to. So I think it's a done deal.

MS. PETERSON: You know, it was objected to because there was going to be no witness that was going to be

able to testify to it because they didn't want to put Mr. Zimmerman on and that was the witness that was going to testify to it. So I think you need to characterize the record correctly.

HEARING OFFICER WILSON: Don't talk to Mr. de Lipkau please.

MS. PETERSON: Sorry.

HEARING OFFICER WILSON: I'll let you ask the questions of Mr. Smith if he knows. He may not know. He's indicated he may not have knowledge of all the water rights. To the best of his knowledge if he knows he can answer the questions. If he doesn't know, I'm sure he'll say "I don't know." Go ahead and ask your question.

MS. PETERSON: Thank you.

Q. (By Ms. Peterson) Looking at Table 4.4-2, Well 206, do you see that?

A. Yes.

Q. And the percent total well field production for that well is proposed to be five percent?

A. In the base case that's correct.

Q. 350 gallons per minute?

A. Yes.

Q. And my records show that Application 79934 through 79939 are all points of diversion, applications with points of diversion on Well 206. Do you happen to know what

the diversion rate or the acre-feet requested by those applications are for this well?

A. I do not. But what I do know is that this distribution was provided to our legal counsel when they were developing the change applications filed in June of 2010. So I have to trust that there's sufficient diversion rate on each of these wells to support the level of pumping we simulated. But I don't know anything about the cumulative total diversions on any of the water rights.

MS. PETERSON: It might be a good time for a five-minute break so I can determine how much more I have to do and you don't all have to look at me while I'm looking at my notes.

HEARING OFFICER WILSON: That's fine. We've been going about an hour. Let's make it a short break. Let's try to get back at 3:40 please.

MS. PETERSON: Thank you.

(Recess was taken)

HEARING OFFICER WILSON: Continue with cross-examination of Mr. Smith.

MS. PETERSON: Thank you.

Q. (By Ms. Peterson) Mr. Smith, based upon your prior testimony I gathered that your impression is that the difference of opinion regarding the five-foot drawdown versus the ten-foot drawdown contour is what you consider to be an

issue between the BLM and Eureka County. Did I hear your testimony correctly?

A. Ultimately as it's been portrayed in this report and reported out, we had to rely upon direction of the BLM on that matter.

Q. Do you have any objection to using the five-foot drawdown contour for the State Engineer's purposes?

MR. DE LIPKAU: Excuse me. I'm going to object. The Court remanded the matter for the State Engineer to hear and review the model submitted to the BLM, period. That is what we've done. That's a hypothetical question.

MS. PETERSON: My question is a hypothetical question?

HEARING OFFICER WILSON: Could you read that back.

(Question was read back)

HEARING OFFICER WILSON: Go ahead and answer it.

MR. DE LIPKAU: Excuse me. I haven't had my objection ruled upon.

HEARING OFFICER WILSON: The objection is overruled. Please answer the question, Mr. Smith.

THE WITNESS: The State Engineer has the full understanding and the capabilities to run this model, has the full ability to pass judgment on the drawdown predictions out of the model. If the state sees fit that they want to review

the model predictions at different thresholds, five feet or whatever threshold you may be interested in looking at, please, it's a tool, you can use it to your discretion.

Q. (By Ms. Peterson) Does the State Engineer have this version of this model? Because I know you said it was proprietary?

A. They do. You have to buy MODFLOW SURFACT. And to my knowledge the state does have that code and they have all the same files that have been provided to everybody to be able to fully run and review the model.

Q. So you have made in I guess putting the ten-foot contour in to the model you have made no professional judgment about whether that's adequate to determine impacts or potential impacts; is that correct?

A. First off, I don't put the contour in to the model. Can you maybe rephrase your question.

Q. In having the ten-foot contour in the model, that's not based on your professional judgment; is that correct?

A. The ten foot contour is just processing of the output from the model.

Q. The determination to show --

A. Again, we have depicted that threshold at the direction of the BLM.

Q. Not based on any professional judgment that you

yourself have made?

A. Well, if I personally would have disagreed with that threshold then certainly I would have had the opportunity to voice my opinions during the process. I am personally fine with using ten feet as a threshold. Again, hopefully I've qualified how the model should be used. And really when we start to project out to that level of drawdown there are uncertainties in any model and it depends on really how it's being used for the purpose of the BLM and their report and what they want to report it out, I think the ten-foot level is sufficient. It doesn't mean that there is going to be a void of responsibility or actions taken outside of that ten-foot threshold. It's just a matter for reporting out levels of drawdown.

Q. Wasn't the contour for the pit model in the last hearing at a five-foot level contour?

A. At the State Engineer's, yeah, in 2008 I utilized a five-foot threshold and that was subsequently requested to be changed for the EIS process.

Q. Appendix E, do you have that in front of you?

A. Appendix E was that?

Q. E as in Edward.

A. Yes.

Q. It's the spring inventory?

A. Yes. This is spring -- Not inventory. Well, the

spring database.

Q. Okay. I was just reading from the top. It says spring inventory.

A. Right. And on the title, spring database to accompany spring inventory map.

Q. So just so I understand this, is every spring ID'd here on the left-hand side a spring that you found on the ground?

A. Absolutely not.

Q. Okay.

A. These are from various data sets, the primary data set being the national hydrogeography database published by the USGS. And that information to my understanding is compiled from mapped springs on a seven and a half minute topographic scale.

Q. And so there's certain springs identified on this exhibit that you do have data for; correct?

A. That's correct.

Q. And I see on all of these there is one date sampled for all these springs?

A. The database includes a flow measurement at a particular date but it does not include an inventory of all measurements made over time or from all sources.

Q. So just on the first page are you indicating that you could have other data for this spring other than in 2007?

A. For some springs that are in the act of monitoring that, yes.

Q. And those are the springs basically around the pit; is that correct?

A. That is some of the springs. There is also, and this was testified to to some degree in 2008, there's been regional spring inventories made early in the process to collect baseline data. In fact, I believe that's where a lot of this information is derived from. That included canvassing and visiting over 200 spring sites to document baseline conditions. That was repeated by the mine, I believe, for one or two events.

Q. Well, I guess I could just only find data, one data point, I guess, from 2006 and 2007 for all of these. And so I didn't know if for some reason why this wasn't updated, if you had additional information.

A. Boy, there's a lot of additional information out there on many different aspects of this project. We've compiled what we felt was representative data for the document to define the springs. Every spring, every spring has a variable inflow. This was not an effort that was intended to document all the variabilities within this database. It was not an effort of that sort.

Q. So I'm turning to page 187 of Exhibit 39, top paragraph, last sentence of that first paragraph, "Eureka

Moly has collected baseline spring flow measurements throughout the area of projected maximum extent of projected drawdown, appendix E."

A. Yes.

Q. Do you see that statement?

A. Yes.

Q. Is appendix E supposed to show baseline spring flow measurements as opposed to just a one-time data point?

A. Again, it's not that data set. It's basically identifying where we have made measurements. It's reporting out a measurement. It's not intended to report out every measurement that's being made or has been made. However, I would say that if -- well, yeah, it just wasn't intended to do that. It wasn't intended to go to that degree.

Q. To be a baseline?

A. It was intended to document where we have collected baseline data, where we have collected data. It wasn't intended to be a comprehensive archive of all spring flow measurements. That was not the intent.

Q. And are these, all these springs within the production maximum extent of the ten-foot drawdown in appendix E?

A. Oh, absolutely not. There's I think close to 1100 sites from the various databases compiled throughout the study area which is much more extensive than the ten-foot

drawdown threshold.

Q. So I mean it's confusing to me that you represent that this is, to me it represents that these are baseline spring flow measurements throughout the area of the projected maximum of a ten-foot drawdown and then you reference appendix E. And you're telling me, I think you're telling me that this data is not in this appendix E?

A. Well, again, the intent was to show where we had data. It was not intended to show all the data that is available.

Q. And then the report discusses the northern shift of your proposed well field?

A. A scenario with a northern pumping distribution.

Q. And that increases the carbonate percentage to 17 percent?

A. It does. And in that scenario we have increased pumping to 12 percent of the total from 206.

Q. And when was Well 206 pump tested?

A. In the summer possibly in to the fall of 2008.

Q. And that was for 31 days?

A. That's correct.

Q. And that well had a very slow recovery?

A. That's my recollection.

Q. Is it still recovering today?

A. Oh, I have no idea.

Q. And then Exhibit 40 was Mr. Childress' report?

A. Yes.

Q. And the information from Exhibit 40 was put in to Exhibit 39; is that correct?

A. No. There is a summary of some of that information is included in Exhibit 39, a summary of some of the data. But obviously much more detail and much more extensive data is presented on the well field testing program in Exhibit 40 than is summarized in Exhibit 39.

Q. Have you read Exhibit 40?

A. I have.

Q. And I could not find the opinions that Mr. Childress expressed today in Exhibit 40. Do you know if those opinions are in Exhibit 40?

A. Exhibit 40 is meant to be a data reporting document and interpretation. And it also provides interpretation of aquifer testing.

Q. And then turning to calibration statistics?

A. Okay.

Q. I know the range on the observed head in this model is 1,962 feet; is that correct?

A. That's correct.

Q. And would you agree that the observed range and head in the last model in Exhibit 116 was 1,736 feet?

A. Oh, I have not looked at that value. That could

be the case. We drilled additional wells at Mount Hope and those are some of the highest altitude wells that we have in our data set, over 7,000 feet in altitude.

Q. What's the elevation of Mount Hope?

A. I don't know the exact elevation.

Q. And I know in your opinion you expressed earlier the reasons you thought that there was no flow between Roberts Mountains and I guess the production wells in that area; is that correct? You testified to was based upon the springs were at the top of the mountain. Do you recall that testimony?

A. No, not phrased in that manner.

Q. Did you know that there were flooded cells still in the model prior to seeing Ms. Oberholtzer's report?

A. Absolutely, absolutely. In fact, we paid close attention to that and that was presented in an earlier draft of this report. It was reported to the group. Stakeholder being probably in 2009 at some point. At that point there was no further discussion. And honestly I thought everybody was satisfied with the -- how we had addressed that issue. There's absolutely no technical issues with flooded cells in the model now that need to be addressed.

MS. PETERSON: No further questions.

HEARING OFFICER WILSON: Thank you. Ms. Ure.

MS. URE: Yes. Thank you.

CROSS-EXAMINATION

By Ms. Ure:

Q. Good afternoon. My name is Therese Ure and I'm representing protestant Ken Benson. And I just have a few questions. First of all, can you give me your definition of what a transitional storage is?

A. Transitional storage occurs when you pump in a well. It is the depletion of water out of an aquifer matrix within the cone of depression created by the well.

Q. Okay. Let's see. On Exhibit 408 and then page two, at the bottom it says, paragraph two, "The shift of pumping distribution geographically to the south in Kobeh Valley and in to the alluvial aquifer system rather than the carbonate rock aquifers at the base of Mount Roberts, Roberts Mountain results in less projected drawdown." Is that shift to the south talking about just south of the well field or are you talking about Bobcat Ranch?

A. No. This is working -- This is a shift that maintains the ten points of diversion for the well fill but redistributes the rate of pumping more to the south, the southern most wells versus the base case that was simulated.

Q. Okay. We went over Table 4.4.8 through 4.4.9 and is it fair to say that approximately 32 of the line items, so whether it's a spring or a well there's 32 listed that have a water right number associated with them approximately?

A. Let me just count them quickly for us. I have 25, however, I have noted that one of those is an error in location and should not be included in the list. And I've also indicated that four of the remaining 24 are now owned by Kobeh Valley Ranch, LLC. And by the way, those four are Permits Number 9440, 9441, 9442 and 9552. So that leaves a remaining 20 water rights that we've identified within that ten-foot predicted drawdown.

Q. Okay. So like the springs and the wells listed in Table 4.4.8 and 4.4.10 might be a duplicate of what's on the water right list?

A. Well, not all of those sites have water right permits. And where they do, we have noted those on 4.4.8 and 4.4.10 in the second column from the right.

Q. So if we were to add all three tables together with those water right certificates we would have a total number of water rights that are affected in the ten-foot drawdown area?

A. Well, you should find, you should be able to cross-reference these tables so that if it's listed as having a water right on Table 4.4-10 in column three then you should also find that water right cross-reference listed on Table 4.4-9.

Q. Okay. But just to confirm then, those, all of these on these charts are within the ten-foot drawdown area

and that may have permanent impact?

A. That's correct.

Q. Ms. Peterson briefly asked you about the 31-day pump test that was completed on Well 206. Do you recall that?

A. Yes.

Q. Is it true that this pump test was at a rate of 1400 to 1500 gallons per minute?

A. That's my recollection.

Q. And then you stated that you didn't know if that well had fully recovered. Do you know if it was fully recovered after one year?

A. I do not know. I only know that it was very slow to recover immediately after we conducted the pumping test.

Q. Okay. I'm going to stick with Well 206 here for a minute. On Table 4.4-2.

A. Okay.

Q. This table states that the simulated rate for Well 206 is 350 gallons per minute; correct?

A. That's correct.

Q. And then the percentage of the total well field that's proposed for that well is five percent; is that correct?

A. That's correct.

Q. Are you aware that the water rights applications

for Well 206 are requesting 10,000 gallons per minute?

A. I'm not aware of the duties for each of the permits. I'm not aware of the water right issues.

Q. And I don't recall, when did you say those, the last round of amendments happened to the mine's water right applications?

A. There was a set of change applications filed, I believe, in June of 2010 to reallocate water rights for the project to the ten well field points of diversion.

Q. And was this five percent out of Well 206 and the 350 gallons per minute determined before those amendments?

A. Yes, it was.

Q. So it's the mine's intention is to only withdraw 350 gallons per minute out of Well 206; correct?

A. Under the base case of course the mine would like some flexibility based on observations of performance and drawdown, et cetera, but the base case now is intended to produce about five percent over the long run from that well.

Q. So assuming that the water right applications are for 10,000 gallons per minute out of Well 206, it's the -- the mine has no intention of fully developing those water rights, would that be fair to say?

A. The mine is not intending to pump that point of diversion at that kind of rate. That I do know.

MS. URE: Okay. I have no further questions.

HEARING OFFICER WILSON: Thank you.

Redirect?

MR. DE LIPKAU: No redirect.

HEARING OFFICER WILSON: I believe staff has some questions.

EXAMINATION

By Mr. Felling:

Q. On your page 36 and page 38 of Exhibit 39 --

A. Was that 36, Mr. Felling?

Q. That will work. There's a statement to the effect that there is greater precipitation in these basins under recent studies than suggested by the Reconnaissance study and that that suggests that there are generally greater quantities of water in the overall hydrogeologic system. Are you implying that there is more recharge because there's more precipitation?

A. Well, it's possible.

Q. And are you implying that there is more discharge than has been estimated?

A. That is possible also.

Q. And what is that amount?

A. I do not know. That would require a more detailed type of studies analysis, which I know have been ongoing for several years now by the USGS. I actually try to measure the ET rates, more accurately map the vegetation

types and arrive at hopefully more accurate number of discharge.

Q. Have they done so to date? Have they revised their discharge or recharge estimates?

A. Not to my knowledge.

Q. Okay. Can you have more recharge without having more discharge?

A. Not in most circumstances.

Q. Okay. On page 119 there's a statement that limits -- And that would be the second full paragraph that says the maximum ET rate is constrained to 4.75 feet per year. And where does that apply?

A. The maximum ET rate is a value that we have to input in to MODFLOW as part of the module. It defines a relationship of ET discharge as a function of depth to groundwater. So the maximum ET rate is a value that we associate with zero depth to water.

Q. And are you aware of any -- Are you aware of a situation where that's a reasonable estimate for ET in Diamond Valley or Kobeh Valley?

A. Well, ET max is not -- should not be confused with actual ET. Again, it's an input parameter in to a model. If you recall in the 2008 hearing we discussed their relationship with depth how MODFLOW requires a maximum ET rate to be defined and then a depth, extinction depth to

where there's zero rate. And that finds a linear relationship with depth that the model will apply in each cell to extract water out.

So if you recall in 2008, the model I was giving more latitude to that number. I normally treated that as a calibration parameter to where I will adjust that up or down so that I'm getting some geographic max to the flux. I've been more concerned about calibrating the fluxes.

But this is an item to where we had to work through this issue with the period of years and I concur that it's a reasonable assumption to anchor that, to constrain that to the potential evapotranspiration.

Very rarely in the model do you have the water level actually right at the surface for the model. Usually it's somewhere, somewhere in depth. Somewhere the actual rate is coming out somewhere down in depth on that curve. Does that make sense?

Q. I'm aware of the need to have a maximum and that it's part of the calibration process. What I'm concerned with is that maximum amount should be based on reality. 57 inches is a lot of ET. Are you familiar with our consumptive use report for northern Nevada?

A. Yes.

Q. In that report we have a shallow open water ET rate of just three and a half feet?

A. Uh-huh.

Q. And you have an estimate that's significantly greater than that for basically shallow open water. And I realize you use that as an anchor for a linear relationship. But do you know of any places in Diamond Valley where you might actually have physically that amount of ET?

A. I don't think ET max is a real number on the ground. Again, it's defining a function that we have to establish in the module. It's not, I don't believe it's representing an actual spot or location or occurrence on the ground. It's really just defining that linear relationship with declining ET with depth.

Q. Why shouldn't it be a real number?

A. Well, the problem you run in to is -- I'll have to draw an example here. In the model we have a defined number of acres for all of our phreatophytes based on Reconnaissance value. And we have under that average ET rates. That might be about a ten-third defensible foot say for shrubs. And where that is occurring is it's some average depth to water. If you were to pick any spot on the ground say where USGS might establish a micrometeorological measurement station, it's going to be higher or lower.

But what we're trying to do in the model is get an average rate coming out of the model has to be fairly similar to that average rate defined in the Recon report or

what I've established for the total volume. So we have an area that correlates to the areas mapped by the Recon. We have an average value coming out of the model. Using those two functions I mentioned, the ET depth and the max, we have an average value coming out of the model that is very similar to the average value for the USGS report.

We have to -- in every model that I've worked on we've had to always use ET max rate that's greater. And part of the -- I think part of the difficulty and the problem with this is I don't think it's in reality an exact linear function. It's actually some type of curve function. But MODFLOW is a model. It's a simplification process. We have to assume just a linear relationship to depth. In reality, it's probably some type of log function with depth or, you know, it's trying to fit a linear condition to probably a non-linear process.

Q. Do you know how many flooded cells would be in any of these ET areas?

A. Very few, very few. We could look on the map that Ms. Oberholtzer produced. I could tell you that in Kobeh Valley we can look at the flooding, there's only a few cells that would reside in the ET area and they're not flooded by greater than ten feet. So the potentiometric flood in those cells is very close to the last service.

Q. Okay. In your transient simulation how much did

you simulate in pumping in Diamond Valley in let's call it acre-feet per acre? In your transient simulation you simulate pumping in Diamond Valley?

A. Well, the conversion I think if I'm understanding the question. The conversion we used is 2.5 feet of consumptive water use per irrigated acre.

Q. And in using that 2.5 feet through time in your transient calibration some time in the mid-1980s the transient calibration essentially didn't work anymore, is that -- You significantly overestimated drawdown from about the mid-80s to the present. Is that accurate?

A. Yeah. But let's be clear there, it's the water level trends we were trying to match were not -- were irregular during that time frame. We were trying to match water levels that were not behaving in a steady declining matter.

Q. Right. So that's a -- that should have been a red flag to you. Was it?

A. Well, yes. I actually spent many, many hours looking at this because I wanted to come up with a clever solution to explain this. But if you start to, you know, just do some back-of-the-envelope computations, to have curtailed pumping over say five, ten-year period, even by maybe five or ten feet, the loss over that ag area, which we see that phenomena is regionally occurring, that's a huge

volume of water. And then I can start to play with adjusting pumping rates, putting in large volumes of water, assuming your 1983 had an excessive volume of recharge. But the volumes of water we're talking about are large. You can totally turn pumping off for that time period --

Q. Okay.

A. -- and create a pretty good match, but we know that didn't occur either.

Q. Okay. When they originally were pumping in Diamond Valley they flood irrigated; is that correct?

A. I'm not aware of that. I'm not aware of that.

Q. Well, if I were to represent to you that when they started irrigating in Diamond Valley they didn't have pivots would you accept that?

A. What time frame?

Q. Originally in the 1960s?

A. In the 1960s? That could be the case. The aerial photography that I have looked at and we've utilized did not go back that far.

Q. And when one flood irrigates or even irrigates with a pivot there's a variable amount of water that gets past the root zone and gets back in to the aquifer; is that right?

A. Yes, yes.

Q. But if the aquifer -- if the water table is down

some depth won't there be a delay in the amount of time it would take for that water to get to the aquifer?

A. Yes. Over time the depth to water was at one point less than a hundred feet but it has declined to greater than a hundred feet overtime. So there is some timing there.

Q. So did you consider how much water could be stored in the unsaturated zone and the time it might take for that water to actually get back to the water table?

A. I did not consider that aspect, no, I did not consider that.

Q. When you have a calibration failure, which is essentially what we see in Diamond Valley, there has to be some explanation that's not mathematical, I should say. It's a conceptual shortcoming. Would you agree there?

A. Well, I don't agree in calling this a failure. I think there are errors. And if you look at the statistics from the gradient calibration, I still think we're doing a reasonable job of calibrating conditions. We are over projecting some, but the greater uncertainty is the assumptions we apply going forward in time, what the real pumping rates will be.

Q. In looking at your hydrographs and you have a selection here but certainly not all of them, would you agree that there's a large part of Diamond Valley where drawdown is overestimated by 20 to 30 feet over the calibration period?

A. Well, let's -- Let me actually look at the hydrographs. There are some that are that magnitude. But there's actually quite a few that are a better fit than that. I believe we present 14 locations.

MS. PETERSON: Could you just identify for the record what you're looking at.

THE WITNESS: Yes. I'm sorry. I'm looking at Figure 4.1-33. And there's that particular -- for that particular occasion it's about 25 -- Excuse me. The model actually is overpredicting about 25 feet for the year 2000. And Figure 4.1-34 the model is actually underpredicting the actual elevation by about 30 feet. So there is one counteracting example right there.

The next one, hydrograph 4.1-35.

Q. (By Mr. Felling) Mr. Smith, if I can just interrupt you briefly.

A. Okay.

Q. Do you have all of the calibration wells in this report?

A. These are all the transient calibration wells that we utilized, all the timed series.

Q. All Diamond Valley is printed in this report?

A. No. These are 14 wells that we selected throughout the agricultural area.

Q. But it's not all of them?

A. No. There's another set of data that takes snapshots in time. So this is the -- This is what we call the timed series data point that we established in the model. So there's 14 of those. And they tended to have fairly complete historic records. We were looking for sites that had some good running trends of data.

But there's another body of transient data also that's just snapshots in time, all the models that were measured during those snapshots in time. So I don't know --

Q. Would you say that there's either a change in the pumping rate or there's an additional source of water later in the calibration period than there is early in the calibration period?

A. Well, I would say that it's possible.

Q. What other explanation might there be?

A. Well, again -- Well, there's a lot of variables. It could be that there is additional recharge that came in in some wet time frames. It could be a lot of issues suggested. It could be water recharging down through the vetos zone. It could be that, honestly the data for pumping starts with the NWR pumping inventory. I really don't know the accuracy on that data set. Our sums of 2.5 consumptive use, I think that's pretty accurate. It matches well with the publication of this year.

The water level measurements, there's a lot of

different things you can look at and consider on the water level measurement data. We discussed one of them, the spring versus a mix of summer and spring measurements.

There's a number of things that I actually have looked at, you know, in an attempt to approve. Still, I will contend though that we've done a reasonably good job in Diamond Valley, certainly well enough to accomplish what we're trying to do is to have a reasonable representation of the flow system in Diamond Valley also. And I think we've achieved that. It's certainly not perfect.

Q. You discussed a number of springs at the south end of the playa, 16 springs, but I don't know where they all are but you showed them on one of your figures and we don't need to find that figure. But you mentioned that they were dried up springs. And from the agricultural pumping in Diamond Valley is that accurate?

A. That's my interpretation.

Q. And how much did the water table decline at those springs at the south end of the playa?

A. I would have to defer to the model. But my recollection is perhaps on the order of probably ranging anywhere from ten -- probably ten feet or possibly greater.

Q. Do you say the model is accurate in the south end of the playa?

A. I believe it's doing a reasonably accurate job in

the conditions.

Q. Are you familiar with the two of those USGS wells at the south end of the playa that have a very long period of record?

A. I don't recall looking at that data.

Q. You didn't use them in your calibration and I was wondering, I was wondering why you wouldn't have used these two USGS wells that have a 60-year period of record in your calibration.

A. Did we use those as point data rather than transient calibration data?

Q. No. For the transient simulation.

A. Let me just to make sure I'm clear on this also. I would like to see -- The transient targets are shown on 4.1-30. And can you tell me if those wells are situated on that trigger?

Q. I can tell you that they're not in the data set.

A. Mr. Felling, the reason I'm questioning that is because our data set is built off of downloads from NWIS, National Well Information System, along with compiling data from NDWR. But I do see that we have points along the southern end of the playa, however, they are not our timed series calibration points, but we do have calibration, transient calibration targets along the south end of the playa.

Q. Okay. If I were to -- How do I want to say this? If I were to state to you that based on existing data both in your database and on the website that the water level decline at the south end of the playa is less than five feet over the entire period of record --

A. Okay.

Q. -- would you disagree?

A. Well, first off let's look at what the model said because it might actually be very similar to that.

Q. It's not similar to the model.

A. Okay.

Q. That's the issue.

A. Okay.

Q. And really where I'm going here, Mr. Smith, is that with really less than five feet of water level decline, many, many, many springs have dried up?

A. Uh-huh.

Q. Do you think that that is unusual?

A. Again, I think that was a water table condition on the south end. So no, every foot that we take down that water table condition is going to have an effect. But I would point out though that at Thompson Ranch, which is further to the north, I've measured the depth to water in that spring flow as six feet below the ground. So right away I know that the physical drawdown at that location further to

the north has been greater than five feet.

Q. I don't argue that.

So I guess the next thing I want to address is the ten-foot contour. And I won't go to so much to is ten feet important, but it has something to do with your, with the reliability of the ten-foot contour in general. And you addressed this briefly in cross by Ms. Peterson. How much confidence do you have as a modeler in this ten-foot contour 50 years in the future at some place in bedrock or alluvium or anywhere at some -- at the perimeter of the operation?

A. Well, certainly the confidence level is not great. It's not high. There's a lot of assumption in the model that, furthermore we don't have any transient calibration, long term transient calibration in Kobeh Valley to help refine the model, until we gain higher confidence in the local area where we do the testing but in particularly up in the mountain block areas. So I have assigned different potential levels of confidence to different areas of the graphic. But certainly that will improve overtime as we can observe.

Q. So would you say you're confident or moderately confident or not too confident?

A. Let's say moderately confident.

Q. We're almost done. I would like you to refer to figures, the figures that deal with hydraulic conductivity

and the model domain from 4.1-9 and forward.

A. Yes.

Q. My first question is that high conductivity zone 15 at the north, at the northern edge of Whistler Mountain where you have conductivity in the first four layers of 45 feet per day, and I was wondering what is the basis for that?

A. Well, that was representing a concept, which early on in the process we had hypothesized that if there was any fault related weaknesses through the Whistler Range, other than what we've already examined around Devil's Gate, where might those be.

And what we did is projected fault structures on the north end of Lone Mountain up toward the Whistler Mountain. In the area of that zone 15 there's a saddle there. And so it was our hypothesis that if there are some fault-related conduits through the predominantly vinini clastic rocks at that depth, that might be a location to represent those. So I wanted to accommodate that possibility. We to date don't have any evidence on the ground that that actually exists.

Q. Okay. On Figure 4.1-13 and 14 and 15 and 16, you have that conductivity zone 80 that runs along the projection of the northern Nevada riff?

A. Yes.

Q. Do you have any data south of the Roberts

Mountains to support those low conductivity volumes ?

A. We have data to support the presence of those dikes at depth along that edge of the Roberts -- excuse me -- that edge of Kobeh Valley. And specifically that would be the regional magnetic data which was presented, I believe, as Figure 9 in Exhibit 40.

Q. I recall it.

A. Okay.

Q. Has there been any actually physical testing to ensure that or to see if those dikes actually are present all the way to the top of bedrock?

A. No, no. And this is -- We're trying to represent the concept in the model that I do believe exists. But in fact, the real classic example is in the Roberts Mountains zone 61 is the classic outcropping of those dikes cited throughout the literature. There's also an outcropping of those dikes for the two north and Cortez Range. And there's a showing I believe on Figure 8 of Exhibit 40 also. Those are really referenced in the literature as being classic surface exposures of those dikes.

Q. Are there any major dikes exposed at all in the carbonates in Lone Mountain or to the south?

A. Not to my knowledge. Although Tim, Bush and Plume in 2006 I believe referenced some possible occurrence in Fish Springs Range. I have not observed those personally.

Q. In your model you have extremely low hydraulic properties for the Whistler Mountain along its entire length. Are there any data, physical data, to support those very low hydraulic conductivity estimates?

A. Well, only our interpretation of the geology and subsurface, which we interpret to be at least for the upper two to 3,000 feet vinini clastic rocks which I have observed if the field. There's shells and court side clastic rocks, you would expect hydraulically quite tight. And I have also observed granite at Whistler Mountain. And again, these are all subsurface interpretations.

I would say that we have drilled up in the Sofa Spring Range a few test wells. They are reported in Exhibit 40. We were trying to get some traction zones to see if we could develop some modest amount of water supply, which we failed. We did not encounter any high flow properties.

And I do believe we also measured hydraulic properties from those wells. I think there are two -- I believe there are two wells that we drilled in that range.

Q. So is it true then that these, the really low hydraulic conductivities in the model both along the northern Nevada riff zone and in the Whistler Range and below the Whistler Range, they -- those low hydraulic properties prevent the progression of the drawdown cone from Kobeh Valley to Diamond Valley?

A. Yes. Although another big factor is the salt ridge as we've referred to it, and that is the same matrix dike material or the flow material we believe. That we have drilled and also tested with pumping to be hydraulically -- or I should say not pumping test but falling head test if I recall in the vasault material and also found to be hydraulically tight. Actually that vasault directed to the east of the central and northern part of the well field has a very significant effect on the curtailment of the drawdown towards the east.

Q. If I recall you had a horizontal flow barrier in that vicinity between the pumping center and well, I guess it was the northeast horizontal flow barrier in the previous model?

A. Yes.

Q. What happened to it in this model?

A. It is a fault that we mapped. There was a subtle water level difference on either side. But the final calibrated value on that fault ended up with a conductance that was very similar to the hydraulic properties of the materials the fault was in. So I concluded that it was not improving the fit of the data to have that fault in there and I removed it.

MR. FELLING: Thanks. No more questions.

HEARING OFFICER WILSON: Any other questions of

staff?

THE STATE ENGINEER: I don't have any.

HEARING OFFICER WILSON: All right. Thank you, Mr. Smith. You can step down.

Mr. De Lipkau, I believe we talked about Exhibit 39 which has not been admitted yet, which is the volumes one and two of the model.

MR. DE LIPKAU: And we'd like to move for the admission of Exhibit 39.

HEARING OFFICER WILSON: Any objections to the admission of Exhibit 39?

MS. PETERSON: No objection.

MS. URE: No objection.

HEARING OFFICER WILSON: Thank you. Exhibit 39 will be admitted.

You also spoke about Exhibit 408.

MR. DE LIPKAU: I'd like that admitted.

HEARING OFFICER WILSON: Is there any objection to Exhibit 408?

MS. PETERSON: No objection.

MS. URE: None.

HEARING OFFICER WILSON: Exhibit 408 will be admitted.

MR. DE LIPKAU: I would also like to move for the admission of 406, which was discussed as Ruling 4848.

HEARING OFFICER WILSON: Any objection?

MS. PETERSON: No objection.

MS. URE: No objection.

HEARING OFFICER WILSON: Okay. Exhibit 406 will be admitted. I have that as everything, Mr. De Lipkau, unless you have something else on your list.

MR. DE LIPKAU: No, sir. That's it.

HEARING OFFICER WILSON: Okay. Am I correct was that the last witness?

MR. DE LIPKAU: Yes.

HEARING OFFICER WILSON: On direct?

MR. DE LIPKAU: Yes, on direct.

HEARING OFFICER WILSON: It's about ten to five, probably too soon to start anything new.

MR. HICKENBOTTOM: Too late.

HEARING OFFICER WILSON: I do have to mention that we need everything, all your personal items out of the room. The people that were doing the lighting out in the hall, they will be doing this room in the morning and then there is also a hearing in here from another agency. So we can't leave any of our personal items here. We have to take everything out, bring it back on Thursday. And I'd like to get started Thursday at 8:30 a.m.

MS. PETERSON: I think that's a good idea.

HEARING OFFICER WILSON: All right. With that

we'll be off the record.

(Hearing concluded at 4:48 p.m.)

CERTIFICATE OF SERVICE

Pursuant to NRAP Rule 25(1)(c), I hereby certify that I am an employee of ALLISON, MacKENZIE, PAVLAKIS, WRIGHT & FAGAN, LTD., Attorneys at Law, and that on this date, I caused a CD-ROM version of same to be served to all parties to this action by:

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DATED this 21st day of December, 2012.

/s/ Nancy Fontenot

I would like to -- There is one item that did come to light in our examination of the data and I'll point to Figure 4.1-43. This is a possible explanation for a portion of the apparent leveling of water levels during that time frame. We don't think it's a full explanation but --

Q. Mr. Smith, when you say water levels, are you speaking about Diamond Valley now?

A. That's right. The water level that we're trying to calibrate to historic water levels that have been declining over time in Diamond Valley.

Q. Caused by Diamond Valley pumping?

A. That's correct, that's correct, historically. So Figure 4.1-43 is a plot of water level elevation on the Y over time showing our calibration period. You will note that the yellow measurements are summer and fall measurements taken during agricultural pumping. And the blue measurements are measurements made in the spring time essentially prior to agricultural pumping. So if you look at each of these hydrographs you will see that there is, we have measurements in the same year, spring versus fall, there is a level of decline of water levels due to localized agricultural pumping during that year. We don't have a lot of data to compare with, but you will note that all of our measurements from the mid-90s forward are spring time measurement whereas prior to that they were a mix of fall and spring measurements. So

that could be, indeed, part of the reason there is an apparent shift in the data. It could be just because we're now consistently measuring spring rather than fall or summer time measurements. But again, we don't think that's the full explanation.

HEARING OFFICER WILSON: Mr. Smith, before you go further, Mr. De Lipkau, how much more do you have on direct?

MR. DE LIPKAU: What do you think? Half an hour?

THE WITNESS: Probably.

MR. DE LIPKAU: Half an hour.

HEARING OFFICER WILSON: Okay. Let's take a break here. We've been going about an hour and a half. I don't want to go too much further. Let's be back at 11:10.

(Recess was taken)

HEARING OFFICER WILSON: Continue with Mr. Smith's direct testimony.

Q. (By Mr. de Lipkau) Mr. Smith, before the break I believe you were discussing Figure 4.1-43.

A. That's correct.

Q. Would you -- Have you completed your discussion on that figure?

A. Yes.

Q. Would you please move on then.

A. Well, that really concludes my summary of changes, major changes between the 2008 and 2010 models.

Q. All right. So is it a true statement that your prior testimony included the difference between the 2008 model introduced here and the 2010 model set forth as Exhibit 39?

A. Yes.

Q. And you have further discussed, I believe, the input items in to the 2010 model; is that correct?

A. That's correct.

Q. All right. So have you run the model?

A. That's correct.

Q. Approximately how many times have you run the model?

A. This model I have run well over a thousand times. It sounds like a lot, but it is definitely factually accurate. It's been through many iterations of automated calibration where I will load perhaps a dozen or two dozen different permeatations of variables and run them through the model to try and identify the calibration parameters. That has been done many, many, many times, so well over a thousand times.

Q. Okay. You discussed earlier the phrase or expression "flooded cells."

A. Yes.

Q. Do we have flooded cells in the model?

A. There are a few cells in layer one where that

condition exists.

Q. All right. Are the number of flooded cells in your opinion within acceptable modeling standards?

A. Yes.

Q. What format did you use to run the model?

A. The model code is MODFLOW and the particular version of MODFLOW is SURFACT.

Q. Is MODFLOW SURFACT proprietary?

A. That version of MODFLOW is proprietary.

Q. Can it be acquired?

A. Yes, yes, it can.

Q. And did you in fact acquire MODFLOW SURFACT for the purpose of running the model?

A. Yes, I did.

Q. Okay. How does one actually run the model? Would you please describe.

A. Well, I've given an overview of building the model and calibrating the model which includes calibrating the period running the model up to close to current conditions. So now if we wanted to use the model to do predictive runs for running that model, continuing that model run forward in time in what we call transient model scenarios or predictive scenarios.

Q. What does transient mean?

A. Transient is time dependent.

Q. Okay.

A. So we have done so. That's the purpose of this model is to try to project in to the future what the impacts of pumping, or maybe not impacts, I should say what the future drawdown will be as a result of pumping.

Q. Let me stop you right there. Is a numerical model then as you just described one of several means of determining the impact caused by pumping?

A. The model provides us a tool from which we can assess drawdown. Drawdown we can associate with a potential impact.

Q. Over distance and over time?

A. That's correct. How the results of the forward simulations are presented is significantly different in the 2010 version of the model report versus what was presented in 2008. There is --

Q. Let's discuss the impacts as set forth by the model as you've previously testified. Are you prepared to do that?

A. The drawdown?

Q. Yes.

A. Predicted drawdown?

Q. Right.

A. Yes. So the drawdown is predicted in several different scenarios. The first scenario which is documented

is a scenario of predicted drawdown for current conditions, current being year 2009 for this study.

Q. And what exhibit or figure is that?

A. And there are results of predicted drawdown are shown in Figure 4.4-4. So in this figure the colored areas represent predicted drawdown on a gray shaded relief topographic map. There are two colored areas. The most prominent is Diamond Valley. It's predicting levels of drawdown under current conditions due to the historic pumping in Diamond Valley.

The other colored area is in southwestern Kobeh Valley in the vicinity of Bobcat Ranch. Bobcat Ranch has also had historic pumping for agriculture since the mid-1960s.

Under this scenario I'd like to refer to Table 4.4-4. There will be a series of tables that I will refer to that are a summary of the flows between basins, flows being discharged by evapotranspiration out of the different basins and accounting basically of the major flows in the model area. The model area, I should mention, includes all of Kobeh Valley, Diamond Valley, Antelope Valley and the south central portion of Pine Valley.

So under current conditions is a column that's numbered two. And you'll see that contrast with the pre-development or steady state predicted flows in column

one. And possibly of most interest to the state would be row two, which is the predicted flow subsurface flow from Kobeh Valley to Diamond Valley.

And column one under steady state calibration it's predicted at 1,583 acre-feet annually. This is, I believe, around 200 acre-feet a year, greater than the previous steady state calibrated model.

Q. When you say previous that would be 2008?

A. From 2008. Under current conditions you'll note that that predicted interbasin flow is increased to 2,001 acre-feet. That is solely due to a steep in the gradient between Kobeh Valley and Diamond Valley.

The interbasin flow that's simulated in the model occurs geographically in a couple different areas. One area is down near Devil's Gate. And I'd like to find the table so I can get some exact numbers for the record.

Table 4.1-13 is an accounting of the interbasin flows including a breakdown of the flow components predicted by the model between Kobeh Valley and Diamond Valley. So the predicted shallow flow to Devil's Gate that's through the alluvium, the alluvial thickness is approximately a hundred feet in Devil's Gate and that's predicted at 34 acre-feet annually. That's very close to the Reconnaissance value that was estimated at or below 40 acre-feet annually. We've also in the model have a representation of potential conduit

through Devil's Gate through the underlying carbonate rocks. And that flow is simulated at 156 acre-feet annually. So the combined total is 190 acre-feet annually through Devil's Gate.

The remainder of the flow is occurring both deep in the model and north of Whistler Mountain. The model geology that's represented between the two basins at depth, and this is several thousand feet, probably below 3,000 feet of depth and deeper is simulated to be carbonate rocks of moderate permeability and that provides a hydraulic connection between the basins that simulate in the model.

Q. Is it a true statement then that the model predicts a flow of groundwater from Kobeh to Diamond Valley?

A. That's correct.

So the next model, transient model simulation that we run, and this was structured in the format as requested by the BLM and their third party consultant is a no action alternative. So this scenario is run from current conditions, which was year 2009, forward in time for the predicted mine life of 44 years. So it runs through calendar year 2055.

What this shows, looking at Figure 4.4-6, is continued drawdown in Diamond Valley. That's because we have assumed that the agricultural pumping and consumption of groundwater by agriculture remains the same as current

conditions throughout the mine life. So it remains the same. And that is approximately 55,000 acre-feet annually of consumption of groundwater.

Q. Excuse me, Mr. Smith. No action means no pumping by the mine?

A. No action by the mine.

Q. But continued pumping at the Bobcat Ranch?

A. That's right. We have also included continued pumping at both the 3 F Ranch and the Bobcat Ranch. These pumping centers were added in this part due to the pending applications with the state to continue agriculture and pumping out those ranches.

So approximately we're predicting another hundred feet of drawdown in Diamond Valley to occur over that time span of approximately 45 years.

Q. Does that mean a hundred feet from where the water level is now?

A. From current conditions. Figure 4.4-9 provides yet another scenario that we've run. It is called cumulative action scenario. This is a model scenario where we add to the no action alternative the proposed mine pumping for the duration of the project.

And at this time I should refer to Figure 1.1-2. This is a map that shows the layout of the proposed Kobeh Valley central well field. The blue points on this map are

the proposed production wells. These correspond to the ten pending applications, ten points of diversion that are defined by the change applications filed in June of this year.

Q. Am I correct in stating that the point of diversion as set forth on Figure 1.1-2 were inserted in to the model and result in the figures set forth on 4.4-9?

A. That's correct. Our simulated pumping at those points of diversion results in the predicted drawdown.

Q. And does Figure 4.4-9 include the continued 55,000 gallons per -- acre-feet per year in Diamond Valley over the same period of time, being 44, 45 years?

A. That's correct. It includes continued groundwater consumption at approximately 55,000 acre-feet annually in Diamond Valley.

Q. Thank you.

A. One quick note on Figure 11-2. There are two blue dots on the right-hand side of the map. They are, they straddle what's labeled as U'Ans-Eame Creek. It's spelled U apostrophe a-n-s dash e-a-m-e creek. And those two points represent construction water supply wells that have also been simulated in the model.

Q. And how long will those construction wells operate?

A. It's predicted that they were run over an

18-month time frame. The model stress periods or time steps if you want to call them that are annual. So what we did is calculate the total volume of water over the 18-month period and then input that as a total pumped over the 12 months for the one-year stress period on the model. But there is that construction water source occurs in the year prior to production from the well fill. But for accuracy we wanted to include that short term stress in the model.

So just briefly to convey the simulation results shown in Figure 4.4-9, drawdown in the well field is contoured at ten-foot intervals. The maximum is a 110 foot contour. The -- This has been discussed already in the testimony of Mr. Rogers. But we report out the results in all cases at a ten-foot threshold.

In Diamond Valley we have a cumulative drawdown in time which is predicted to be -- this figure is at year 44, the last year at the end of the proposed mine life. And drawdown, cumulative drawdown in Diamond Valley is predicted to have exceeded 200 feet by that time and predicted cumulative drawdown in the Bobcat Ranch area is about 40 feet.

Q. Mr. Smith, you mentioned ten-foot drawdown. Why did we use -- Why did you use ten feet?

A. Well, first and foremost that's what was requested from us by the BLM. And the model is a tool. It's

not any type of exact calculator for drawdown. It's meant to be used as a tool for us to approximate potential drawdown on a regional basis to the regional flow system. So whether you choose to want to view the threshold of drawdown at five feet or ten feet, 20 feet, whatever you choose to want to view those results, it still can only be used as a tool to help you understand potentially what is the extent of the degree of drawdown. It is not a definitive tool that is going to say that you're going to have 5.4 feet of drawdown at point X and Y. It's not developed and intended to be used in that way.

The next set of figures starting with Figure 4.4-12 conveys the predicted drawdown for the proposed action alternative. This has been developed in a more robust manner as compared with the 2008 model. It is not a stand-alone model scenario. Rather it is the subtraction of the output results. So we subtract from the cumulative action the no action model results and what is derived out of that is a clean picture of exactly what are the predicted drawdown results for the proposed action on the mine? The mine is all the outside influences that commingle and produce the regional drawdown in the cumulative action.

So Figure 4.4-12 is taking us at snapshots in time year 2020 to approximately nine years in to mining and pumping. Pumping rate, I should mention is 11,300 acre-feet

annually for the duration of pit dewatering that amount is reduced by the amount of dewatering water that would be generated a portion to meet that demand. It is at most, I believe, seven percent of the total water supply at the peak estimated time for dewatering.

After dewatering ceases after year 32 then the entire 11,300 acre-feet is derived from the oil field for the proposed life.

You can see in comparison on the right-hand side is Figure 4.4-12 is year 2030, 19 years forward in time. And you can see how the model predicts the growth and expansion of predicted drawdown.

The next figure, Figure 4.4-13 is taking us again forward in time to the year 2040 on the left and then the final year of pumping for the Mount Hope project is represented at year 2055. And that shows the growth and expansion over time of the predicted drawdown.

So as one would expect, this is an evolving cone of depression. It's a dynamic condition. But I think it also helps us understand and we want to use the model result and the prediction to help us build a monitoring plan. This is giving us some guidance as to what to expect at different time shots, snapshots in time. And of course I would think that you would be interested in wanting to document response from well field pumping early in time and then also have

sufficient monitoring to offer safeguards and a better understanding for the long term effects of drawdown.

Q. Mr. Smith, in your opinion how frequently should this model, Exhibit 39, be updated or improved upon?

A. Well, I definitely advocate doing audits fairly frequently. That doesn't mean that you're going to necessarily modify or update the model. But it is simply looking at the observed conditions and measurements in the field over time, comparing those with the model and passing some judgment. Is the model sufficiently predicting the observation, then that's great. Then there isn't any update really needed. You know, if we get to a point where you do an audit and you feel like there's areas that could be improved then you can take that up too.

Q. Would the model plus updates be useful in a monitoring program?

A. Yes. And it is being required by the BLM as part of their monitoring plan. They want the tool to stay active and up to date so that they could also as the project progresses in time they have a tool to be able to project out potential levels of drawdown and again from those levels of drawdown make inference about potential impacts to the sources.

Q. Basically to keep the model up to date, is that a correct expression?

A. Yes. Table 4.4-2 summarizes the pumping distribution in the well field. This does not include the short term construction supply water. These rates are held continuous throughout the duration of the mine project with the exception of the minor offsets due to dewatering water supply.

They are based at -- Five of the ten locations that are now the proposed points of diversion, we have test wells, five of which we do not at this time. And we feel like we've put together a distribution of pumping that both, one, is conservative, in regards to our understanding where we've tested the aquifer, and further conservative where we have yet to drill test wells.

Q. Mr. Smith, could you tell us the approximate percent or volume that will be taken from the carbonate wells and from the alluvial wells?

A. Yes. What we call our base case pumping scenario derives five percent for a continuous flow rate of 350 gallons a minute from our test Well 206 in carbonate rock.

Q. I'm going to stop you right there. Are you saying that you intend to pump Well 206 at the approximate rate of 350 gallons a minute?

A. We would like for the mine to have the opportunity to pump this well to a limited degree. Operationally we would envision that Well 206 could easily be

a production well that could generate three or 4,000 gallons a minute without any problem. The transmissivities are quite high.

The problem, as Mr. Childress explained, is in a compartmentalized block of carbonate aquifer. So we can't sustain those flow rates over the long term. But if you're thinking about operating a well fill it's really great to have a well like that in your arson of wells. Because if you have to take a couple wells off line for maintenance or whatever reason, you have a back-up water source there that can easily offset production from two, three wells. So we could have easily developed a model scenario where we just struck all the carbonated pumping. But we don't feel like it's warranted to be that extreme at this point. We have certainly reduced that dependence on that source a lot. But that's our base case is leaving five percent of the total well fill supply which equates to 7,000 GPM is the total at 206 and also where we encountered deep carbonate rocks at location 220.

And Mr. Childress and Mr. Felling were referring to that location, that carbonate rock material was encountered at 960 feet in depth in that test hole and based on pumping tests we feel that that also can be a reasonable supply of water. But by no means is the mine water source dependent on the carbonate rock aquifer at this point. 90

percent in our base case is proposed from alluvial basin.

Q. Mr. Smith, does Exhibit 39 depict or attempt to estimate the volume of phreatophyte capture?

A. Yes. Since we have been briefly over the different scenarios, if we can refer to Table 4.4-7, which is a summary of the same major water parameters reported in the other tables I've referenced. If you refer to column that's numbered three for the proposed action alternative, that shows the difference in ET between the no action scenario and the proposed action. And we show that the predicted decrease in the evapotranspiration in Kobeh Valley is 4,015 acre-feet annually at mine year 44. So there is a progressive capture of phreatophyte ET as the drawdown and pumping progresses at the well field.

Q. So on year one the phreatophyte capture is virtually zero and then at year 44 the phreatophyte capture is slightly over 4,000 acre-feet annually; is that correct?

A. That's correct.

Q. And then as the mine shuts down and the cone of depression decreases, phreatophyte capture would be decreased?

A. It starts to recover. The total volume starts to recover. However, we recall that we still maintain pumping at Bobcat Ranch and 3 F in our scenarios. So it does not recover the current conditions but reaches an equilibrium of

pumping in Bobcat and 3 F.

The consumptive water use is approximately 3,500, I believe, for those two ranches in our model scenario. So ET re-equilibrates at approximately 3500 acre-feet less than current conditions. And that is a lot of predicted evapotranspiration in Kobeh Valley is shown in Figure 4.4-18.

Also of note is the second row on Table 4.4-7. It's the predicted groundwater outflow from Kobeh Valley to Diamond Valley. And you will notice that in column three it's actually a positive number, positive 15. So by implementing the project we have increased the subsurface flow from Kobeh Valley to Diamond Valley by 15 acre-feet. That's as a net. I need to explain that number a little bit.

What is happening in the regional model is there's a, the pit is also populating at the boundary between two basins. So over time what the model simulates is approximately 40 acre-feet of Kobeh Valley water coming in to the pit. So it crosses, it physically crosses that line that we've drawn as being Kobeh and Diamond Valley basin. So you have 40 feet that's induced in by the pit.

Now, counteracting that not fully is the slight reduction in the underflow, subsurface flow between the basins. And that amount is simulated to be reduced by 25 acre-feet by mine year 44 as compared with no action. So you add -- subtract the two. So you have 40 coming in minus 25

capture still leaves you with a net positive increase of 15 acre-feet. And that's explained in the text if you catch the right sense.

Q. Mr. Smith, in running the model, Exhibit 39, did you determine or calculate a volume that would be captured over time of groundwater that otherwise would flow or might flow from Kobeh to Diamond?

A. As an estimate of the cumulative amount of capture through the entire mine life is approximately 550 acre-feet. That's a cumulative amount of flow every year added up for the entire 44-year mine life.

Q. All right. Let's start with the X and Y axis. The X axis is 44 years, is it not?

A. Correct.

Q. And at the end of 44 years are you saying the amount of capture would be approximately 25 feet?

A. 25 acre-feet.

Q. And that's on the Y axis?

A. That's correct.

Q. And is the progression lineal?

A. It's approximately linear. That's a reasonable assumption.

Q. So the total volume then of water captured as depicted in the model over the 44-year life of the mine would be 550 acre-feet; is that correct?

A. That's correct.

Q. And you are aware that KVR or Eureka Moly owns many times more acre-feet than 550?

A. That's correct. And the duties of course on an annual basis, not a cumulative total.

Q. All right. So let's summarize where we are then on operation of the well field and the effect thereon as determined by Exhibit 39 on Diamond Valley.

A. Based on the model there is no measurable drawdown occurring in Diamond Valley as a result of pumping in Kobeh Valley by the mine.

Q. All right. Now I'm going to ask you the same question. What is the effect of the pumping as set forth in Exhibit 39 on Roberts Mountain, the south side?

A. I'd like to refer to Figure 4.4-15. Another aspect of reporting that has changed is not only are we reporting the extent of drawdown again reported at a ten-foot threshold at mine year 44 but we also have examined that in the post-mining condition. So in the Roberts Mountains area, southern Roberts Mountains, the model does predict an encroachment at the ten-foot threshold up in to the Roberts Mountains and it does predict that at approximately mine year, post mine year 30 that maximum extent is realized after which there's a contraction of the projected extended drawdown.

The degree of drawdown is visually shown in Figure 4.4-13 for mine year 44. So this also, this picture of predicted drawdown looks different than the model that was used in 2008. The encroachment, predicted encroachment of drawdown in to the Roberts Mountains was much greater than the previous version of the model.

There are several reasons why it's not as extensive in this version. One of them is the fault barrier that we've now had represented in the model. We've calibrated that conductivity to water levels and our transient pumping tests. Another reason is there's less stress on the carbonate aquifer in the proposed base case scenario. It's reduced from I believe what was a 25 percent carbonate, 75 percent alluvial scenario in 2008. And then also the geologic structure of confinements that now that we have simulated vinini formation underlying the alluvium for the central and northern part of the well field. All of these changes to the model have a cumulative result, resulted in less predicted drawdown to the Roberts Mountains.

Q. In your opinion then would the pumping as contemplated as derived by the model adversely affect the surface sources on Roberts Mountain?

A. My opinion is that I don't believe those sources are going to be impacted. But I'm not deriving that solely from the model. The model is giving us a prediction of

potential drawdown up in to the Roberts Mountains.

I think we hopefully all understand that there's a lot of simplification that's involved with building a model like this on a regional scale.

But the other variable that needs to be considered is what are the sources of flow to Roberts Creek, where geographically are they being derived, from what sources. So we understand that there's the snow melt and the runoff. We don't believe there's any predicted impact from groundwater pumping to the seasonal runoff, surface sources.

Q. And why is that?

A. It's purely dependant on precipitation, snow pack, climatic conditions, all of which generate runoff coming through the system. It's not dependent in any degree on groundwater, especially on regional groundwater flow.

Q. And what's the difference in elevations between the pumping water level and the top of Roberts Mountain approximately?

A. Well, the top of Roberts Mountain is over 10,000 feet in elevation and the well field is approximately 61 or 62. So there's close to 4,000 feet of total elevation difference.

Now, the other component of this that we need to be very aware is the base flow which is spring supporting. That has some type of groundwater connection. Now, and

Mr. Katzer testified to conditions on Roberts Creek. But what we observed is the base flow in Roberts Creek is not derived from lower in that groundwater flow system. It's designed from quite high up in the mountain block system. And the mine has been doing based on monitoring and it continues to do so on several of those spring sources that are higher up in the mountain block.

So for groundwater pumping in the well field to actually affect base flow in Roberts Creek, that means drawdown is going to have to propagate from the well field up fairly high in elevation in to the Roberts Mountain block. And I think, number one, I think that the likelihood of that happening is remote. We don't have the tools, nobody has the ability to say anything absolutely in that regard. But I think it's remote.

And I also believe firmly that it can be carefully monitored over time. And already the mine has five wells on the carbonate aquifer and further along the structures that we understand possibly to be connected there are five existing monitoring wells to the north of Well 206 already collecting baseline data. The mine has in my mind been doing an exemplary job in getting out on the ground and collecting data and expending data to get a monitoring network in the ground.

There's still monitoring plans that have to be

approved by the two different agencies and this can be carefully considered and reviewed.

But in the event that there is actual observed drawdown happening that's encroaching at rates or degrees that we're uncomfortable with, that the state is uncomfortable with, certainly there can be mitigation measures taken, many of which could include shifting, pumping around the well field as an easy example.

Q. Mr. Smith, I'm going to ask you the same question on what does the model predict regarding the effect if any upon the surface sources on the north side of Roberts Mountain being within the Pine Creek range?

A. For clarification are we talking about Pete Hanson?

Q. Pete Hanson Creek dam and the various tributaries.

A. Well, the numeric flow model if you want to scrutinize it has a very small threshold of drawdown. Effectively it's predicting drawdown over the entire model. There's a certain point where we will continue to extrapolate out very minor drawdown, but that's just the nature of the numeric flow model. The drawdown in Pete Hanson Creek is very small. The drawdown is very small. I don't know the exact number but it's well below our ten-foot threshold that we have in the results. So I don't think there's any real

possibility affecting that water shed.

MR. DE LIPKAU: Mr. Hearing Officer, I think we're at a good point to stop right now if that is your pleasure.

HEARING OFFICER WILSON: Do you have more on direct?

MR. DE LIPKAU: Yes.

HEARING OFFICER WILSON: Let's stop until -- Let's go until 1:15.

(Lunch recess was taken)

TUESDAY, DECEMBER 7, 2010, 1:15 P.M.

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HEARING OFFICER WILSON: We're continuing with the direct examination of Dwight Smith. Go ahead.

MR. DE LIPKAU: Thank you.

Q. (By Mr. de Lipkau) Mr. Smith, you're of course still under oath. Could you please explain in Exhibit 39 in a little more detail the north, south shift in well field pumping within Kobeh Valley.

A. Yes.

Q. Refer to the exhibit please.

A. On Figure 4.4-21 there are two modifications from the base case pumping distribution that we tested to help put some bounds on the potential pumping distribution and they didn't predict a drawdown. The north and south shift pumping distributions are summarized in Table 4.4-11.

So basically what we've done in these two scenarios is we've either skewed the shift, the pumping distribution towards the north in the well field towards Well 206 or shifted that pumping and weighed a little more heavily to the south. The production wells have not been drilled for this project.

Q. Excuse me. The wells what?

A. The production wells, we have test wells at five of the ten locations. So we wanted to also present a little

bit of latitude as far as we don't have an exact pumping distribution. We won't know that until production wells are drilled and tested. So this is meant to capture in bracket some of that uncertainty as to how much actually might be pumped for each individual point.

And then the next table, Table 4.4-12, is an overview of the effects to the water budget as a result of those different shifts.

Q. Are you finished describing that?

A. I think that's it.

Q. Earlier you were asked some questions about the effect of pumping upon the north side of Roberts Mountain, were you not?

A. Correct.

Q. All right. I would like to hone in or center on Henderson Creek. Would you please describe the effect of pumping if any upon Henderson Creek.

A. Well, first off, it's my opinion that it is unlikely that we're going to have detrimental impacts to the flows of Henderson Creek as a result of pumping for the Mount Hope project.

Q. Please explain why.

A. I'd like to refer to Figure 4.4-16. The simulated drawdown that occurs in the Henderson Creek water shed is a result of the pit dewatering and subsequent

formation of the Pit Lake. And in Figure 4.4-16 we try to capture how that cone of influence expands out over time. So it's, as is detailed in the report, perhaps not well described yet, but the hydraulic conditions are hydraulically very tight at Mount Hope. The ore value itself is the result of an intrusive indigenous body. It's intruded up in to many clastic rocks. So it's hydraulically tight. And I think that's understood by when conveyed the levels of dewatering that are anticipated out in this project.

Q. Could you speak up a little bit.

MS. JOSEPH-TAYLOR: By tight you mean water doesn't move through easily?

THE WITNESS: Hydraulically tight. Water will not flow easily through these rock types. So there is a cone of influence or of drawdown in the original water table that's predicted around the pit by the regional flow model. However, while there is predicted drawdown, we need to be very careful and qualify that that does not -- I'm not saying because there is predicted drawdown that there is an absolute impact that we have defined in this modeling exercise. The model is not meant to be utilized in that manner.

If you want to start looking in to more detail and specifics of say a particular spring that's within the defined, the simulated drawdown area, you need to start -- and consider could this spring be impacted, it really becomes

a very site specific condition and there's going to be concern. The model is what we have to predict the drawdown but there's a lot more that goes in to it.

And I guess I would like to point to Figure 4.4-20 and I'll point out a few examples. And I believe for reference also it would be convenient to have plate two. So on Figure 4.4-20 which shows the extent of the predicted water level, regional water level drawdown at a ten-foot threshold you'll make note that to the north of Mount Hope you'll see six blue circles. They are labeled for the spring ID numbers. 580, 583, 592 and then a closely grouped set of spring sites with ID numbers 606, 609 and 610. And those also show up on the plate two which is a spring inventory map that we've compiled for the study area including some multiple sources of information from the USGS springs that are designated on topo maps and other spring sources including Mount Hope spring inventory which is quite extensive.

So what is not conveyed very well with this type of scale is I'll take the example of 592 first. It appears to be plotting very near to the south fork of Henderson Creek.

Q. Excuse me, Mr. Smith. What is the approximate elevation of the subject spring, 519 -- 592?

A. It's difficult for me to read the elevation. I'm

not for sure. Probably 65 --

Q. Let me ask another question. Approximately how many feet higher is the subject well than the pumping water?

A. This particular spring, 592, is fairly low in the Henderson Creek drainage. So it is at a probably slightly above elevation but it's not one of the high altitude base springs that I would also like to touch on. This is a lower altitude spring of property near the south fork, 592. It's one of three springs identified in Mr. Buqo's rebuttal document. This spring has been monitored quarterly by General Moly starting in 2007. It is a seasonal seep. On the tables you'll see reference to nine gallons a minute for that spring as a maximum. I believe that is an error. I reviewed that data, quarterly data, through the third quarter of 2010. The highest value I saw was .9 gallons a minute so I believe there's a typo in the database. But regardless, that spring we've documented goes dry in quarter three and quarter four of each year. Seasonal seep. So because you see a point plotted within say this ten-foot threshold of predicted drawdown doesn't necessarily mean that we're going to be impacting the spring as a regional groundwater. I very much view that as being a seasonal shallow source of water that in my estimate I don't think we're going to affect that spring. It doesn't have a regional groundwater connection.

I would say the same for springs 580 and 583.

Although we do not have those in our monitoring network, I have not observed perennial flow from these. And by the way, 580 is approximately three-quarters of a mile upstream of the main, the south Henderson Creek channel. 583 is approximately a quarter mile off the channel. 593 is approximately one half mile off the channel.

So we need to be very careful when we use those model predictive results. We need to consider carefully what the resource is. In the EIS we have developed system data that they differentiate from shallow seeps or major regional springs. They all show up at a point on the map equally. And of course there are obviously differences in these sources.

On the first spring set, 606, 609 and 610, very interesting. These are higher in altitude on a hill that's adjacent to Mount Hope. It's our own distinct topographic future. And what we find in those springs are collecting monitoring data on I believe all three of those springs. And they are contact springs.

Q. What does that mean?

A. Contact spring is a spring that is a water source that's emerging along a geologic contact of differing hydraulic conductivities. And specifically what is happening in these cases is there's a limestone, the hill itself that I've referenced is a limestone knob and it's sitting on top

of vinini and volcanic rocks. And very interesting in geology it's interpreted to be a slide block but it's huge. It's a hill. And so here the hydrogeologic condition that's in effect is there's recharge to that limestone. The water infiltrates, percolates down. The water moves horizontally on this contact and discharges right on the lithologic contact between the limestone and the vinini on the faults.

Q. Excuse me, Mr. Smith. A spring of that nature would not be adversely affected or impacted by groundwater above it, would it?

A. Again, I did not view this spring to be connected to the regional groundwater flow system. It's a localized condition that I firmly believe is not going to be impacted over the course of the mine or after. It's its own small localized system.

MR. FELLING: I'm sorry. What spring is it that you're talking about?

THE WITNESS: These six. Excuse me. The three that I was just referencing: 606, 609 and 610.

So we move further very high up in to the mountain block to actually find the real base flow springs for south Henderson Creek. They are topographically very high and Mr. Katzer described these. They are -- And I will add that Mr. Bugenig in his memo had an area circled as being the source area. He has circled one spring but it's not the

primary source in the south fork. There is actually a spring complex that's about one mile further upgradient that's the primary source. It's deceptive on the ground. And when I was first up there I thought that the location that Mr. Bugenig was referring to was also the source. It's located on or near site 592 but the real springs that are the source of the base flow are higher up and they're in the inset below the box on plate two and they're spring sites 589, 591, 594 and 596. And currently we're collecting quarterly data on I believe one or perhaps two of those springs in that complex.

Q. (By Mr. de Lipkau) Do those springs go all year?

A. They do.

Q. And you say source springs meaning source to the creek?

A. Source to base flow in south Henderson Creek.

Q. Okay.

A. So those resources are high in water shed or high in the water shed deriving their recharge locally from very high altitude up in to the top of the Roberts Mountains. So again, now, if we were to extrapolate out predicted model drawdown to the regional flow system, you're obviously well beyond the ten-foot threshold, perhaps you're within or beyond the five-foot threshold. I don't know. But regardless, I think the probability is very low of pumping

from the pit and subsequent formation of the Pit Lake affecting those high altitude springs. You know, I can't say anything with absolute certainty and I think the conditions need to be monitored and confirmed. But I think over time what we're going to see is these lower altitude springs which are very mixed seasonal type seeps or localized flow systems. I don't think they're going to be affected. Higher up in the water shed I think they're too far removed for us to see any impact.

Q. Would you please move on to Vinini.

A. Vinini Creek to the north of Henderson, now, not too much to say there. We're again pretty far beyond the ten-foot threshold on model. Certainly we would predict a few feet of drawdown in that water shed, but I don't think there's going to be an impact.

And Vinini Creek, by the way, as Terry Katzer described, is intermittent. Much of the mountain block portion of Vinini Creek goes dry in the summer and the real resources are also very high up in the water shed. So I don't see any impact occurring to those resources.

Q. So is it your conclusion then that the proposed or contemplated -- Is it your conclusion therefore that the pumping of the contemplated volume of water will have no impact upon the surface flows of Vinini Creek?

A. I think the probability is extremely low of that

happening.

Q. All right. One more question on Henderson Creek and that is do the spring flows of Vinini Creek reach the Henderson Creek, pardon me, reach the irrigated lands?

A. No. Based on my observation I believe Mr. Katzer also reported the same is Henderson Creek once you get to the basin out in front is ephemeral. There's not sufficient base flow in these springs to produce a continuous flow all the way down to the meadows on Garden Valley. So there's ephemeral reach in there that goes dry. The real resource that makes it down to those meadows is runoff. It's surface water. It's snow melt. It's precipitation runoff. And that's when you do have continuous flow all the way down to those meadows and that's where there's resource action.

Q. Okay. Thank you. Let's move on to Exhibit 408. Would you quickly review that document.

A. Yes. This is yet another pumping scenario that we run in the same model, the current 2010 model. And the distribution of pumping is basically the points of diversion that were being heard in the 2008 hearing. So what we tried to --

Q. Let me interrupt you here to clarify. Are you saying that Exhibit 408 has -- 408, isn't it?

A. Yes.

Q. 408 has inserted the points of diversion heard by

this body in October 2008 in to the 2010 updated model?

A. That's correct.

Q. And what were the results?

A. The results are depicted on Figure 2 of Exhibit 408. There's a side-by-side comparison with the 11,300 acre-feet coming from the 2008 points of diversion contrasted with our currently proposed points of diversion which are consistent with the June 2010 filings by Mount Hope. So you do see some similarities, but the biggest difference is you do see more pronounced drawdown in to Roberts Mountains. There is points of diversion placing higher stress on the carbonate rock aquifer. There's some points that were subsequently drilled and tested and we can't get a lot of water from. We can still simulate what we can get from those locations in this scenario. But I think there's an obvious improvement with the current set of pending applications that are before the State Engineer.

MR. DE LIPKAU: Okay. Do you have a copy of the protest to Application 79911? Could I please have the number of the exhibit please?

HEARING OFFICER WILSON: It is -- Protest 79911 is Exhibit 518.

Q. (By Mr. De Lipkau) Have you seen that document before?

A. Yes, yes, I have.

Q. Would you please look at protest item number six at the bottom of page two.

A. Okay.

Q. In your opinion will the contemplated pumping adversely affect or impact the surface waters of Pete Hanson Creek and its tributaries adjudication?

A. In my opinion, no, highly not.

Q. I'd like you to quickly review protest item number one. Do you agree that the annual recharge to Kobeh Valley is in the magnitude of 16,000 acre-feet annually?

A. That's the available estimate we have.

Q. Do you believe that the extraction of 11,300 acre-feet annually will cause minding of the groundwater aquifer?

A. Not minding as stated.

Q. What is minding of groundwater?

A. Well, in my mind, minding implies that there's an overdraft condition. And I guess I'll point to the example of Diamond Valley.

Q. Are you saying Diamond Valley is a groundwater basin being mined?

A. At present.

Q. Will Kobeh Valley be mined by the extraction of 11,300 acre-feet annually?

A. No. That consumptive rate of water or duty of

water is within the defined perennial yield for the basin. So we're not overexploiting available resources in the basin.

Q. Please review protest item number two.

A. Okay.

Q. Could you please comment upon protest item number two.

A. Well, my opinion is we're not going to have any measurable effect on Diamond Valley whatsoever. Protest item number two is pointing to several different things. It's first USGS opinion currently insufficient to determine interbasin flows. The Eureka County Devil's Gate GID, the GID wells are within the agricultural area which is experiencing several feet on the average of drawdown each year. But again, I don't think we have evidence even at the degree of interbasin flow that we've simulated in the model that there's going to be any measurable drawdown induced in Diamond Valley by pumping in Kobeh Valley.

Q. Thank you. Could you please turn to Exhibit 502. Have you reviewed Exhibit 502?

A. I have.

Q. And basically what is Exhibit 502?

A. It's the technical memorandum produced by Dale Bugenig dated November 24th 2010 and it's entitled hydrogeology numeric flow model Mount Hope project, Eureka County, Nevada.

Q. To whom is it addressed?

A. To the board of Eureka County commissioners.

Q. Do you have any comments to Exhibit 502?

A. Well, we haven't heard Mr. Bugenig's testimony yet, but I want to take the opportunity to make some comments on this document up front. On page three under discussion, the first bold item is missing points of diversion. And I do want to make clear for the record that plate one in Exhibit 39 shows existing active points of diversion for water rights throughout the study area. You'll notice the date of that database is January of 2010. Many of our databases were updated this last winter before we had a major reissuance of the draft model and report in April. So these water rights -- And subsequent to that, the refinements to the report had been fairly minor, editorial. The model was not modified. The databases were not changed. There was text edits, table edits and figure edits.

So just for clarity, both the database that's included in the appendix and figures, all exhibits that report water rights are current as of January 6th of 2010. And we did not -- we do not want to modify or add or update any of this work. We want it produced to the State Engineer the exact same material that's being used in the EIS.

Q. Okay.

A. Mr. Bugenig goes on to report what he interprets

as bias injected in to the modeling report.

Q. What page is this?

A. This is also on page three.

Q. Okay.

A. I obviously disagree with the use of the word "bias." And of course if there was this opinion there is ample opportunity throughout the stakeholder and review process to work those out.

But I do note that some of what he's included, for example, under apparent bias from his perspective is the use of the ten-foot predicted drawdown. I don't view that as a bias. That's just what we were asked to produce as far as a level of threshold of predicted drawdown. So that was discussed amongst the stakeholders rigorously at times and again that was not our decision and the State Engineer and staff can use whatever threshold they think is useful, what we've produced in this report.

Q. And again, the report was approved by the BLM?

A. That's correct. I need to note that on page nine there is a Figure DCB1 and overlaid on Exhibit 39, Figure ES5 is the five -- is the five-foot predicted drawdown contour. However, it's important to note that that is a cumulative pumping scenario five-foot drawdown superimposed on the proposed action ten foot. So in all honestly, if you want to accurately understand the proposed projected five-foot

contour, you need to process the data. So we have the five-foot threshold that is important to understand that to the south Bobcat Ranch is continue to pump and contributes to the extent of that five-foot drawdown. Diamond Valley is simulated to continue pumping in time. That produces also some of the five-foot drawdown you see extending up in to Pine Valley. So you have commingled results in that cumulative scenario.

Q. Cumulative results meaning?

A. We have commingled pumping influences together which produce the interpreted level of drawdown.

Q. Which gives an added drawdown?

A. Right. If you're wanting to understand the five-foot drawdown predicted by the model just by the mine and its proposed pumping actions, this figure does not convey that.

Q. All right. Thank you.

A. On page 15 figure, again this is a, some editorial notes added to our Figure ES5. And on the right-hand side of that figure it omits any reference to Henderson Creek as a perennial stream. There was no reference to any perennial streams on segment. There are major drainage ways, drainage courses noted for reference but there's not perennial or ephemeral reaches defined on this work anywhere.

Q. Are you saying that the particular reach of Henderson Creek is not perennial where highlighted?

A. It actually is perennial down to about the right-hand extent of the oval that's been added. And then beyond that it's an ephemeral reach and down to the intermittent stream through Garden Valley.

Q. So Henderson Creek is not perennial from the high sources all the way down to the pasture?

A. That's correct.

Q. All right.

A. Well, and the note on the top center says omits or misplots springs that are a source of flow to Henderson Creek in this area. Springs that contribute to flow of the creek are covered by the creek. Again, those springs that are circled are the springs that we discussed earlier, 580, 583 and 592. And I do not believe -- We're for certain that one of them is not a source of flow to Henderson Creek. I do not believe the other two are sources either.

Maybe just following on that thought quickly on page 17, also a figure that has had some editorial editing, there's a circle to the left of the oval that says --

Q. That's the blue circle?

A. I don't have a color version. It says perennial springs here are source of flow to south fork of Henderson Creek. There is a spring in that location. Let me just

reference it by number. Where the circle is on page 17 exhibit is at approximately our spring site 593. So again, as I had mentioned earlier, I do believe there is a spring at that location. There's some nice quick easy willows. But that is not the primary base flow source on the south fork of Henderson Creek. It's further up. It's about a mile further upgradient with a spring complex that I referenced earlier that's higher mountain block.

And honestly it takes a lot of work on the ground to figure this out. I mean originally I thought that that was one of the main sources for base flow also until Mr. Katzer corrected me and we went for a little hike. Actually it's a pretty rigorous mile-long hike. And you can continue to follow that flow past that spring all the way up to the high water shed. And again, we are monitoring that flow at least one of those sources up in that high water shed.

Q. Would you look at the second paragraph, page 18, please.

A. Yes.

Q. Could you please comment upon that.

A. Well, I think Mr. Bugenig appears to be citing something else other than our report, some reference about flow from Kobeh to Diamond Valley about equivalent to a strong garden hose. Obviously that's not in any of our

technical documents. We're trying to report flow rates in quantities without any type of comparisons. I don't think we tried to trivialize the contributions at all. In fact, I think our flow model is predicting and supporting a greater communication connection in the basin than as has been reported by any investigators in the past. So I don't think we've tried to trivialize anything here.

Now, the degree of capture predicted by the model is quite small. It's quite small. And it is what it is. It's just the data is the numbers coming out of being produced by the model.

Paragraph three, just following that on page 18, not quite understanding the comment there. It seems to be suggesting that the geology as we represent in Whistler Peak is advantageous for Kobeh Valley not producing effects on Diamond Valley and vice versa for Diamond Valley producing effects on Kobeh Valley. I don't understand that. Darcy's law works equally in either direction. There's no flow orientation preference that we can impose on the model. Hydraulic communication as we simulated it is what it is.

At the bottom of page 18, construction water supply wells. For clarification, they are included in the model. Mr. Bugenig suggests they are not. But they are included. They are, as we've discussed earlier, that the two locations between the well field and the facilities in Kobeh

Valley.

Mr. Bugenig goes on to -- This is information that you'll see also in the May 28th, I think the May 2010 memorandum produced on review of our drafts for EIS. And we do acknowledge there's a shift in our calibration fit in Diamond Valley when we're trying to match historic pumping for the particular, for the time frame 1985 until 1995 approximately. And Dale's graphic here the --

Q. You mean Mr. Bugenig?

A. Mr. Bugenig's graphic on the bottom Figure CB3.

Q. Okay.

A. Is insightful and it's basically showing from my perspective, and we've discussed this amongst all the stakeholders, technical reviewers. It really to our eye and the BLM and the third party eyes it suggests a shift in the step function in that data. It's not a gradual progressive misfit or something that -- it's really a step-type function that I've tried to explain that we don't fully recognize the physical process that have resulted in that step function.

He kind of concludes to some degree on page 21, second paragraph, that the model overpredicts the effects of Diamond Valley pumping in adjacent basins and the model impacts arising from the mine pumping will be a portion or greater. I disagree because we basically -- whether the pumping in Diamond Valley is below or above historic, it's

all factored out when we subtract the no action. How good are our estimates going in to the future? We don't know for certain if pumping in Diamond Valley is going to be curtailed in the future. Who knows if it could increase. There are 132,000 acre-feet of permitted rights in Diamond Valley. So there's a lot of uncertainty there. We've just held to the conditions.

But regardless of what the assumption is or what condition is being simulated in Diamond Valley, it's subtracted out so we get a good clean picture on the mine's effects only, the proposed action effects.

Discussion under the bullet for Kobeh Valley, the first paragraph under that subsection there is a third sentence. It says, "Analysis of the test pump data was accomplished by both analytical means and by using MODFLOW." That is not correct in my view. We have not analyzed the aquifer test and data using MODFLOW. We simply utilized the data that we have collected, input those data as targets in our model to see how well we could match that data. And so it's not a means for us to analyze the data. It's simply data that we can feed in to the model to further test the calibration and refine the calibration.

Mr. Bugenig goes on to kind of conclude on page 24 in that subsection that he disagrees with the degree of fit. Again, we could have discussed this more. We've

discussed it briefly in the stakeholders meeting, this data has been before the stakeholders for several generations of the report.

Q. Excuse me. Are you saying the discrepancies as found on page 24 --

A. Oh, I'm sorry. Yeah. It's pointing to a couple of the plots, again we have plots for six pumping tests where we've done short term transient testing in the model. And one thing we really struggle with is the grid resolution in the model to try to undertake this aquifer test data, especially this short term data, it's very sensitive to the distance from the pumping well. In every case we have at least one well that's within about 100 feet of the pumping well. Our grid spacing is 1,000 feet. It represents both properties of 23 acres plus or minus space. So there's a limitation as to how well we can even approach fitting this data.

I thought we did a reasonable job. And by the way, it was also approved by BLM and their third party consultant that we have done a reasonable job in this regard.

I did not give -- In going through this exercise, I did not give latitude towards the storage coefficients. I wanted to use the values we've estimated from our aquifer testing. Very little latitude to the hydraulic conductivity that came out of the testing and I gave a little bit because

we're dealing with zones and I mentioned the cell side. Well, the zones are multiple zones lumped together to boot. Multiple cells. Sometimes hundreds of cells lumped together to find a zone. And that zone has one unique property.

So again, I don't think this was expressed in our peer review efforts but I do know that the level of fit that we were able to achieve in the model, which by the way -- so it really only left with the latitude of making subtle adjustments to how we were redistributing those zones and representing the different hydrogeologic structures in the model.

So that was really the latitude I had and I had to work back and forth between the steady state model and the short term transient test model to find a reasonable solution in both model formats. So I think we've done a decent job in that regard.

On page 24 there's mention of a discrepancy to the southern central Kobeh Valley properties. Mr. Bugenig goes on to explain some verbally reported observations from an artesian well. It was actually an exploration bore hole that was drilled. But there are no aquifer properties that have been derived. Again, the subsection discrepancies with southern central valley aquifer properties. I was aware of this data. In fact the gentleman, the geologist that was out drilling it contacted me several years ago when this hole was

being drilled. We tried to actually get some real data out of it. We had reports that there was a pretty good artesian flow initially when they drilled it. So to my knowledge it wasn't open for very long.

Again, we didn't actually get any data other than hearsay reports. And I'm certainly not going to accept somebody's report of a thousand GPM or 200 as any type of physical data that I can constrain or add to my model databases. It's just hearsay from my perspective.

Q. Do you agree the contents on page 25 consider entitled water monitoring mitigation?

A. Yeah. I think in general I do not, I do not recall having any political thoughts about that section. We recognize that we are going to have to generate some response plans to be accepted by both the BLM and the State Engineer's office.

Q. And those are of course currently underway?

A. That's correct.

Q. Okay.

A. I have no further comments on that document.

Q. Would you please look to page 29 under monitoring and mitigation.

A. Yes. My only comment there is I don't really think it's my place to suggest how the State Engineer might structure or require the monitoring and mitigation plan be

developed. I think that's between the State Engineer and the staff and the mine to work out. I'm certainly very happy to provide, you know, whatever technical tools to help make decisions that are needed for model runs or whatever might be desired.

Q. Okay. Let's now go to 503. Please review that.

A. Yes. This is the technical memorandum prepared by Carol Oberholtzer dated November 24th 2010.

Q. Okay. And would you please comment upon that document.

A. Item number one, projected extent of the template drawdown. Again, I don't think we need to reiterate there. Ms. Oberholtzer also sounds her opinion as has done in the past that they feel a five-foot threshold is more appropriate use of this model. Again, this has really been, for this document this has really been an argument between the county and the BLM.

Q. When you say this document you mean the model?

A. Exhibit 39. We reproduced what we were asked to produce.

Q. Okay. In cooperation and in conjunction with Eureka County agents or employees?

A. Certainly their input and desires were not ignored in any case and they were imbedded and discussed. Not our final word on this matter though.

Item two, potential impact to accrued rights of Henderson Creek. Again, I don't think there's an impact to the decreed rights. I think the decreed rights are really surface water runoff. There's no groundwater to the decreed rights that are being used for irrigation.

Item three, impacts to the Vinini or Henderson Creek water shed from the project baseline pumping. Well, I think there's a lot of discussion about five foot versus ten foot in this section. We've already covered that.

The figures produced, figures two and three on pages five and six are, I believe figure five is probably used in a cumulative action. I think both of these are using cumulative action and not the proposed action. So you're seeing combined effects of Diamond Valley and the mine.

Item four on page nine, use of large total head change values. And I would like to refer back to Mr. Rumba's testimony in 2008. We actually hadn't seen, I don't think we saw this comment in the EIS process recently. I think we've seen it in the past. We believe that it's appropriate to report out calibration statistics in several different manners but one manner is to report normalization by the range in values.

We did, as a result of the county comment, divide that out by hydrographic basin area. We thought that was useful.

I think you'll note the tables that describe the calibration statistics, the statistics are tighter, are better fit for Kobeh Valley and Diamond Valley, which is also some connecting that's really at the heart of what we're trying to examine rather than Antelope Valley and Pine Valley.

But again, we feel and it was the concurrence of the BLM and the third party contractor that reporting out of calibration statistics was standard, was a standard way for reporting these.

And furthermore, that the level of calibration achieved by both regional model and the local model was acceptable and within an expected level for this type of -- these types of models.

Item five, sensitivity analysis. Again, comments were not ignored. The county has wanted to see a different format for sensitivity analysis. The format that we've used where we apply equal percentages to all the different types of parameters was accepted by the BLM. And so we did not go any further with reporting the sensitivity analysis. We think it provides a clear enough picture that a person, an experienced hydrogeologist and the model would be able to satisfy themselves if they understand the parameter sensitivities.

And I want to back up. On the sensitivity

analysis under item number one on page two, however, Ms. Oberholtzer is wanting to suggest that there be some predictive uncertainty type analysis accompanying this modeling effort. Those were dismissed by the BLM and the third party reviewer. And basically the reason is it's really not industry standard to try to do predictive uncertainty. It's a very, very time consuming and rigorous undertaking to do predictive uncertainty. And the reason I say that is because what this type of process would involve is recalibrating different scenarios of a model. And we have to recalibrate enough different scenarios to be able to say we have some significant goal behind how you quantify the uncertainty.

To calibrate this model is a major undertaking. It requires inverse techniques. It requires working between transient models and steady state models. It requires interaction between the local model and the regional model. And even to undertake just one alternative scenario is a very large undertaking and to undertake say perhaps 20 or 30 as a minimum and have some statistical foundation to a predictive uncertainty analysis, well, if the county would like to buy me a super computer and maybe add three or four modelers to my staff, I'll report back next year.

It's really -- It's great to talk about this stuff and you see it reported in the literature. It's very

difficult to undertake this type of, in a defensible manner to undertake a predictive uncertainty analysis. So very quickly the other reviewing agencies dismissed going down this path. It wasn't contemplated at all that we needed to go down this path for this effort.

Item six, evapotranspiration simulation. Ms. Oberholtzer examined some specific locations within the model. And it's a regional flow model. There's going to be pluses and minuses throughout the model domain. There's going to be areas where the model levels are running high and areas where it's running low. So particularly where she chose to look there was not the expected evapotranspiration coming out of the model domain as she would have contemplated. It's just part of the approximation aspect of the model. It's not exact. And if you start to dial in to any specific location or point in the model there's going to be errors plus or minus.

Again, the total phreatophyte discharge is, for Kobeh Valley is around 16,000 acre-feet. That's what we were striving to achieve. The ratio, there's a property we refer to already with the evapotranspiration is about one-third salt grass to two-thirds brush phreatophytes in the current calibrated steady state model.

Under the figure six on page 11, Ms. Oberholtzer has plotted the ET over time and projected that out to 500

years. She points out that it does not recover and questions why. Well, the reason is because we have continued agricultural pumping in Kobeh Valley. So you see on the curve, on the plot, it's elapsed time on the X, evapotranspiration rate increasing on the Y. There is evapotranspiration. That's when the well filed is pumping. There's then a recovery curve, but it recovers to a level that is approximately 13,000 acre-feet rather than 16. That's because we've continued approximately 3,000 or 3500 acre-feet of agricultural pumping at Bobcat Ranch and 3 F.

Q. Mr. Smith, do you know whether or not evapotranspiration is the beneficial use in Nevada?

A. Not to my knowledge.

Q. Okay. Flooded cells.

A. Flooded cells, I believe we've already offered testimony in this. I will note that Mr. Oberholtzer goes through a computation suggesting 77,000 acre-feet sitting on top of land surface. As I explained again, flooded cell is modeling terminology. It only means that in our model that the cell in layer one is now functioning as a confined flow condition and there's a potentiometric head equal to the feet which you can convert to pressure if you'd like, operating on that cell. It does not change the water balance of that cell at all. It does not, it is not simulating the representing pooled water on top of the land surface. That's not how

MODFLOW works with the layer types that we established.

Item eight is drains. Ms. Oberholtzer indicates that there is no flux in return or coming out of layer three at row 117, column 32. There is -- That is the location of the Bartine Ranch for wells submitting the model. And she's incorrect. I confirmed it. I verified it. There is 630 acre-feet coming out of the drain in cell -- in layer number three at that location. We can easily confirm that. There is a flux coming out of that cell as is all of the drain cells we've used for springs with those wells and I think we've described how that's routed back in this case.

Item number nine, HFB, hydrologic flow boundary. Actually HFB stands for horizontal flow barrier, for clarification. It's MODFLOW module or package that we can utilize. I'm actually not clear what the exercise was in nine so I don't know how to respond to that.

Item number ten, conclusion. Second sentence it starts off with ignoring early comments do not assist the parties. Absolutely no comments were ignored. I think that Ms. Oberholtzer is aware of this. We've vented and discussed every major aspect that they've commented on in forums and included the other stakeholders. There are differences. The five-foot versus the ten-foot threshold, the calibration statistics and whether our model is sufficiently calibrated.

You know, we have at the end of the day met the

satisfaction of the BLM and the third party reviewer. We certainly tried to accommodate Eureka County's comment when we could. There was a lot of definements and suggestions incorporated and certainly it was very beneficial working through the model with them and I believe they mind my criticism. But no comments were ignored of any sort. And they were carefully thought through. And it's just some of the comments we did not accommodate or it was found by the review team not to be appropriate to go down the path that the county was suggesting.

MR. DE LIPKAU: I think I have no further questions of Mr. Smith at this time.

HEARING OFFICER WILSON: Let's take a break before we move to cross-examination. Try to come back at 2:35.

(Recess was taken)

HEARING OFFICER WILSON: Let's continue on with cross-examination of Mr. Dwight Smith. Go ahead.

MS. PETERSON: Thank you.

CROSS-EXAMINATION

By Ms. Peterson:

Q. Mr. Smith. I'm Karen Peterson representing Eureka County. And do you have Exhibit 39 in front of you?

A. I do.

Q. Both volumes?

A. Yes.

Q. Could you please turn to page 188 of volume one. Do you have that?

A. I do.

Q. And under the section 4.4.4.5, discussion of predicted impacts?

A. Yes.

Q. Do you see that there? And at the very beginning you have some bullets points, potential impact to water resources due to proposed pumping of non-water for the Mount Hope project include and you've got diminished flow from springs and diminished flow in perennial screen. Do you see those bullet points right there?

A. I do.

Q. And going on further in the text you explain the bullet points; is that correct?

A. I believe that's correct.

Q. So going to the last paragraph on that page --

MR. DE LIPKAU: Excuse me. What page?

MS. PETERSON: 188.

MR. DE LIPKAU: Thank you.

MS. PETERSON: Uh-huh.

Q. (By Ms. Peterson) First of all, you point out that there's a table that lists the projected magnitude of the water table drawdown; correct?

A. Yes.

Q. And then you state that the occurrence of springs within the predicted area then act as primarily within the Roberts Mountains; is that correct?

A. Correct.

Q. And then you say there's uncertainty regarding hydraulic connection; correct?

A. That's correct.

Q. And then maybe read starting the last sentence there on page 188 going to 189. Read that out loud please.

A. "However, the model offers the best available tool from any predictions and it suggests a potential to impact spring flows in Roberts Creek and Henderson Creek water sheds."

Q. And then there's another table that -- And we're going to get to the table so I'm not trying to skip over it. But I also want to then direct your attention on that same page, 189, to the second full paragraph, springs located in lower altitude in the Roberts Mountains?

A. Yes.

Q. Do you see that? And could you read -- Well, could you read it to yourself just to speed it along, speed things along.

A. Yes.

Q. And that's the paragraph that I cited in my

opening statement; is that correct?

A. I don't recall.

Q. Well, if you don't recall, "The springs located in the lower altitude in the Roberts Mountains are more likely to be impacted --

HEARING OFFICER WILSON: Could you slow down please. It's way too fast.

Q. (By Ms. Peterson) "Well fields resulting in larger predicted drawdown of these locations."

A. Yes.

Q. That's what it states. And you talk about Mud Spring and Lone Mountain Spring; is that correct?

A. That's correct.

Q. And that flow will likely cease at those two, at Mud Spring and Lone Mountain Spring as a result of pumping; is that correct?

A. That's correct.

Q. And then going down to the last paragraph on that page you indicate that Roberts Creek and Henderson Creek are perennial streams?

A. Correct.

Q. And they're within the proposed action composite ten-foot drawdown?

A. Correct.

Q. And then there's also a discussion after that

about the base flows in Roberts Creek and Henderson Creek may depend in part on springs that may be connected to the regional groundwater system?

A. That's correct.

Q. In hearing your testimony earlier on direct examination, your earlier testimony seemed to contradict these statements in this report?

A. I don't agree.

Q. You don't agree? Well, for one, I believe you testified that Henderson Creek was not a perennial stream?

A. No, that's not correct. I've testified that Henderson Creek was perennial only in the mountain block portion. At the base of the mountain block it becomes ephemeral and also I think I mentioned through Garden Valley it's an intermittent stream.

Q. But I believe you also testified that it was not a perennial stream within the composite ten-foot drawdown area?

A. I do not recall saying that.

Q. Would you agree with the statement here in your report at the bottom of page 189 that Roberts Creek and Henderson Creek are the only perennial streams within the predicted proposed action composite ten-foot drawdown contour?

A. I do agree with that. You have to keep in mind

that only portions of these streams, it's the mountain block portions are defined as perennial. And at certain points in the mountain front they become ephemeral. There's not sufficient flow or in the case of Roberts Creek, flow is diverted and impounded for irrigation at the mountain front.

At the base of Henderson Creek there's not sufficient base flow in the springs to create perennial conditions beyond the mountain front beyond the base of the mountain.

Q. But doesn't this statement say that Henderson Creek is a perennial stream within the predicted proposed action ten-foot drawdown contour?

A. That's correct. That portion of Henderson Creek is perennial.

Q. Within the drawdown contour?

A. Within our predicted ten-foot threshold drawdown.

Q. And I believe you testified that springs that were in the lower altitude in the Roberts Mountains you believed were seasonal?

A. I believe that statement was in reference to the springs in the lower portion of the Henderson Creek water shed. And I believe I referred to spring sites 592, 580 and 583.

Q. So your statement with regard to the springs in the lower altitude of Roberts Mountains, the statement that's

contained here on page 189.

A. I'm sorry. Can you direct me to the paragraph.

Q. It's that second full paragraph. Springs located in lower altitude in the Roberts Mountains.

A. Yes. We referred to, specifically to spring sites. And I'm not referring to springs in this particular paragraph. I'm not referring to the spring sites that we've referenced in Henderson Creek.

Q. So none of your testimony today would -- I guess your testimony today on the stand is that this paragraph on page 189 is still accurate; is that correct? Is that still your opinion?

A. Yes. I do believe, however, you have to very much pay attention to the qualifying statements in each of these paragraphs. I say, for example, starting at the bottom paragraph of page 188, potential to impact to spring resources. I'm not again suggesting that the model can definitively say that there is an impact. It's giving us an idea for potential for drawdown and regional flow system. And then I go on to explain that there's certainties in hydraulic connection. Things that I've already touched on, in here and in my direct.

In the second paragraph on page 189, impacts resulting from groundwater, this is the third sentence, impacts resulting from groundwater pumping and dewatering

will probably be minimal in springs that are not directly connected to the regional groundwater flow system. And I would further say minimal or non-existent in some cases. I don't know how much more you would like me to elaborate.

Q. Well, let me ask you this, the BLM process is to evaluate impacts; is that correct?

A. It's to evaluate potential impacts, potential impacts.

Q. And the State Engineer maybe has a different regulatory role but he also needs to look at potential impacts; is that correct?

A. He needs to consider those also.

Q. And your report lays out some potential impacts, but I gathered from your testimony today that you disagreed with some of the potential impacts that are laid out in this report; is that correct?

A. No, that's not correct. This being an EIS document, we have to go through and identify hopefully any and all potential impacts. And here's the bullet list of how it relates to water resources. Here are the potential impacts that could result from pumping the Mount Hope project. We have to identify those. And that's our attempt here is to identify potential impacts. There are numerous site specific circumstances that I've cited that at the end of the day you're going to have to rely on the monitoring

program. There are uncertainties. And yes, there may be some impacts. We can't accurately state or definitively state by any means at this point that there will absolutely be impacts.

I will say that there are two exceptions that I feel because of proximity to the well fill that's Mud Spring and Lone Mountain Spring, nothing is definitive, but at the same time I think it's pretty likely that those stock water resources will require mitigation. I think those stock water sources would potentially cease to flow. I think we'll see that effect fairly clearly and fairly soon in the pumping. I don't want to suggest that those impacts can't be fully mitigated.

Q. So you agree with the opinion from Mr. Katzer yesterday regarding impacts from the mine's proposed pumping to certain existing rights?

A. He was I think referencing these same references in his testimony.

Q. And you agree with that?

A. Yes, I concur with Terry's testimony.

Q. So did you, the other alternative methods that you and Mr. Childress and Mr. Katzer talked about for determining impacts --

A. Yes.

Q. -- the other methods, have those been relayed to

the BLM?

A. The type of analysis we have used has been the numeric flow model. That has been what we've used to make these types of analysis. For a project of this scale and magnitude it's becoming accepted practice in the EIS arena to access these using numeric flow model. But there certainly are -- We did utilize Theis type analysis to some degree and looking at pumping distribution.

Mr. Terry Katzer and others, Mr. Buqo in his original testimony certainly gave due consideration to are we going to be pumping within the perennial yield, is there sufficient resource in general to support a magnitude of pumping suggested by the project. And that was really the protest of their assessment.

And I think the answer in my opinion is pretty clearly yes, yes, there is sufficient resource in this valley to support this level of development.

Q. And I guess following up on that comment, you testified earlier that the perennial yield in the basin is 16,000?

A. That's the currently accepted level.

Q. And Mount Hope's proposed pumping is 11,300?

A. That's correct.

Q. And the ET discharge in Kobeh Valley is approximately I think you said 15,000 in your report?

A. Well, the model is calibrated very near to 16,000 also.

Q. For the ET phreatophytes?

A. Yes.

Q. And at the end of the mine life you will be capturing 4,000 acre-feet per year of the phreatophytes?

A. 4,015 is at the mine year 44 projections.

Q. So while the mine is pumping that 15,000 or 16,000 minus your 4,000, that discharge will also be occurring; is that correct?

A. I'm sorry. I didn't quite follow that.

Q. Well, do you -- were you here for Mr. Katzer's testimony?

A. Yes.

Q. And he agreed with me that the mine may be pumping and that's a point of discharge in the basin, right, the mine pumping?

A. It will become a point of discharge.

Q. And then the ET is still a discharge, right, from the basin?

A. It will be. It's a transitional process. Mr. Katzer testified as to transitional storage concepts. That concept applies to every basin in Nevada, every basin in Nevada for every, actually every well anywhere that's been pumped there's transitional storage. It's just a matter of

physics. You have to withdraw a certain amount of storage even in equilibrium condition.

You know, I think you pointed out also you referred back to Diamond Valley. Under current conditions, the entire history of Diamond Valley agricultural has been supported off of transitional storage. Even today the model simulates only one quarter of the production pumping from Diamond Valley is coming from evapotranspiration capture. Three quarters of the annual production in Diamond Valley is still occurring from transitional storage. So it's just a physical reality. I don't know what else to say about it.

Q. Right. But I mean you're drawing from -- You're pumping, whether you're pumping I guess it's from transitional storage is taking 11,300 acre-feet out of the basin; correct? The discharge is still occurring even I guess at the end your mine life which is the most phreatophytic discharge that you're going to capture if you take 16,000, right, you said was what you put in the model for the discharge?

A. I believe that's what the calibrated outflow is for the model. Calibrated evapotranspiration discharge from the model is approximately 16,000.

Q. Well, and you're going to capture four of that at the end; right?

A. That's correct.

Q. Okay. So 12,000 of ET discharge is still going to be occurring at the end of mine pumping; is that correct?

A. Yes, that's correct.

Q. And then there's already 1100 according to the last ruling, 5966, there's already 1100 permitted acre-feet of water rights in Kobeh Valley?

A. I haven't looked at that number.

Q. Well, I just got it from the ruling. So let's assume that still is the case.

A. Sure.

Q. I mean that comes up to total discharge from the basin of 24,400?

A. During a transitional period, again, it's unavoidable. It's pure physics, pure groundwater hydrology. You have to change gradients and that requires withdraw of some storage water, transitional storage. It occurs in every basin. It occurs for every well. It occurs in every basin.

Q. You'll agree that if my math is correct that's the total discharge?

A. That sounds correct for that year.

Q. So let's go to tables -- Well, let me get one more item from your text, page 190, third full paragraph. Is the text notes at the very end that there will be significant drawdown as projected for a well at the Roberts Creek Ranch. Do you see that statement?

A. Yes, I do.

Q. And you agree with that?

A. I do. That well is basically within our well field area. The well is 350 feet deep. If you look at the predicted drawdown it is perhaps 60 or 70 feet. That well, we have not found any water rights associated with that well. And furthermore, it's been reported to us that that is not a domestic well. The domestic supply has been reported to us as being a spring source in the Roberts Mountains that's piped down. So I haven't dug any further. I don't know if there was a water right on that well for perhaps supplemental underground. I don't know the purpose of that well. It is situated next to the pastures that are irrigated. And it, depending on how that well was utilized, it may be able to accommodate 60 or 70 feet of drawdown or it may need to be deepened. I really don't know how that well was utilized at this point.

Q. And then moving to Table 4.4.8.

A. Yes.

Q. Maybe what you should do is explain what Tables 4.4.8, 4.4.9 and 4.4.10 are.

A. Yes. From our databases we have databases presented as appendicies. One database is wells within the studied area. This has been primarily derived from the state's well database. We also have a database for water

rights. Again it was last updated in January of 2010. We also have a database for springs that combines springs from various different published data sets and sources.

So for the area within the predicted ten-foot drawdown cone of influence we have then reported out all the wells, water rights and springs from those data sets that is within that ten-foot threshold predicted drawdown.

Q. And what's the difference between 4.4.8, 4.4.9 and -- Were you done? I'm sorry.

A. 4.4.8 is reporting the amount of wells within that particular ten-foot drawdown. 4.4.9 is predicting water rights within the projected ten-foot drawdown. 4.4-10 is the projected springs from our spring database within the projected ten-foot extended drawdown.

Q. And do you agree that there could be other water rights that maybe you're not aware of or you haven't picked up from the State Engineer's database that could possibly be included in these tables?

A. That is certainly possible. We relied upon the data dump from the state's offices. I will point out already that I've discovered one error. And four of the water rights here actually owned by Kobeh Valley Ranch, LLC that are already on that list. Three of those have been updated in your records subsequently. One has yet to be updated. But the error, which I guess should be corrected in the state's

database, is for Permit Number V01953. It's a vested stream surface water claim on Meadow Canyon Creek. It's reported out of the NWR database as Township 20 north, Range 50 east, Section 3. However, if you refer to the supporting map, which is filed through that claim, the point of diversion is Township 23 north, Range 50 east, Section 30. And that places that right considerably outside the ten-foot threshold. So that is an error that we did not discover until after this report was made.

Q. And then 4.4.8, Table 4.4.8?

A. Yes.

Q. Well site number 310.

A. Yes.

Q. The site name is Roberts Creek?

A. Yes.

Q. And is that the well that's referred to in the text?

A. That's correct. That is the well, it's in a small well house adjacent to the pasture on the entrance road to the Roberts Creek Ranch situated on the base of Roberts Creek. It's reported from the well log 350 feet in depth, static water level of 149 feet and our model predicted drawdown at the end of year 44 is 69 feet. And again, to my knowledge this is not a domestic well and I'm not sure how this well is utilized today.

Q. What's the difference between Table 4.4.8 and 4.4.9?

A. 4.4.8 is the wells, the wells that not owned by Eureka Moly, General Moly within that ten-foot predicted drawdown. 4.4.9 is the water rights as of the January 2010 data dump.

Q. And then 4.4.10?

A. Yes. And again, that is from our composite spring database which is completed, which is presented as an appendix to our report. So that's our database on springs reported out within the ten-foot predicted drawdown.

Q. And then on the bottom, the blue shading?

A. Yes.

Q. Could you please explain what the blue shading is?

A. Yes. For clarity we've tried to identify the blue shading is, indicates springs near the proposed pit area. Because we have effectively two pumping centers by the mine and two cones of depression, if you will, one is around the pit and one is associated with the well field in Kobeh Valley, so we differentiated those by color shading green.

Q. In the blue highlighting, I mean I don't think you finished what the highlighting means. Maybe permanent water level impacts?

A. That's true. Oh, I'm sorry. That's right.

Around the pit area, the drawdown, there's a permanent drawdown because we're going to end up after mining Pit Lake, Pit Lake is going to also consume water as I mentioned estimated at I believe approximately 100 gallons per minute over the long run. So it's going to be a sink. It's going to be a hydraulic sink. Water from all around the pit in the vicinity is going to flow towards the pit and it's going to evaporate out of the Pit Lake. So since there is no rebound or recovery, those water levels will remain suppressed in close proximity to the pit.

Q. And some of the springs have a measurement date in one of the columns?

A. Yes. Yes. And the dates are mostly looking at they're 2006. This was mostly from some preliminary Recon efforts. Our more rigorous baseline documentation efforts began in 2007 and the mine continues those baseline efforts today.

Q. But is it fair to say, I guess reading this chart, that the basis of the flow measurement is the date measured is this one time measurement right here? Is that how I read this chart?

A. That's correct. I should point out that I believe for spring site 592 reporting data 5-10 2006, nine gallons a minute I believe should be .9 based on my review of the data set for that site. That is one of our active

monitoring sites. But these are, yeah, these are instantaneous one-time measurements.

Q. And if you don't have a water right permit number there listed under that column what does that mean?

A. That means we have not identified any water right associated with those springs. As I mentioned, our spring data set is very large. I believe it contains over a thousand points for the steady area. And many of the springs that populate this database are springs that were identified on the USGS seven and a half minute topo quads and we can get that information electronically now through USGS sources.

So our attempt here is to compile a spring database that has just all published sources of springs. And of course we have springs designated on a seven and a half topo it doesn't tell you much about the spring, how much flow, it doesn't have any associated other information with it. It's just a point on the map.

Q. But does it -- if you can't find a water right associated with it does it mean that you don't know who owns it?

A. No. It just means that there's no water right identified in the state -- from the state database that we can associate with that location. In most circumstances I think there are many springs throughout the area and throughout Nevada that don't have any water rights issued on

them. And then of course there's a hand full of springs that do have water rights that are usually used for stock watering purposes. But there's certainly many, many springs that don't have water rights.

Q. And then going back to your testimony, I thought you testified that spring 592 was low in the Henderson Creek drainage?

A. Well, low from my perspective. But it is in the mountain block environment but it's lower in the mountain block than other spring resources.

Q. And it is a spring identified in blue here on Table 4.4.10?

A. That's correct.

Q. That would be permanent -- There would be permanent water level impact associated to that spring?

A. I wouldn't say that. I would say that the model predicts a permanent drawdown in that area that approaches ten to 11 feet. Again, as I've testified, number one, there's an uncertainty attached with that model prediction. We'll have to monitor that over the long run. But even if there is a regional water table drawdown at that level I don't think a spring like 592, which is a seasonal seep, has any connection at all with the regional groundwater flow system. So there's no hydraulic connection so there's no impact to a resource.

Q. You know what, I'm just reading what your language says right here. Blue highlighting indicates springs near the proposed pit area that may have permanent water level impacts?

A. That's right. Please leave the "may" in that sentence. And every site has to be looked at very -- every site has unique characteristics that needs to be carefully considered. Every site is different. But the may is correct because we have to identify every spring resource within that area and we have to consider that as a maybe.

Q. And some of the other springs that you identified in your earlier testimony were 580 and 583, which are also shown in blue; is that correct?

A. Yes, that's correct.

Q. And also 606, 609 and 610?

A. That's correct.

Q. And those also show blue, may have permanent water level impacts?

A. Right. Same reply there that it's the regional water predicts some regional water table drawdown in those vicinities, but again, I don't want to imply that there's going to necessarily be an impact there. I think those springs, if I can discuss 606, 609 and 610, are representing contact spring source, it's a localized flow system from a precipitation on a limestone knob that's infiltrating and

then migrating out along that contact. I don't associate that with the regional flow system. That's a local flow system. I can't say anything in absolute measure, but I don't think those resources are going to be impacted even if there is a regional water level drawdown there. That magnitude I don't think they're connected to a regional flow system.

Q. And those are all in Pine Valley?

A. That's correct.

Q. According to the chart?

A. Yes.

Q. And then going down to spring 721?

A. Yes.

Q. That's in green?

A. Yes.

Q. Which indicates it's a spring in the valley?

A. Yes, that's correct.

Q. And that's the Etcheverry Mud Spring permit that's referenced on page 189 of your text?

A. That's correct.

Q. And that's the permit that I read from in my opening statement?

A. I don't recall it.

Q. You'll take my word for it?

A. Sure.

Q. And in the text that also indicates that that spring would have a permanent impact?

A. Well, not permanent because it does recover over time. Well, it recovers to within one foot of pre-pumping water levels. But that spring might be helpful to refer to Figure 4.4-20. I know we don't have the well field superimposed on this figure. But that spring is in very close proximity to a proposed production well site. I visited that spring and I actually recall finding a metal casing in the middle of that. I don't know if that's a spring that's just been augmented by drilling a well in the middle of it. I'm not quite sure the conspiracies. But very low flow supports a small pooled area of water that I've seen wild horses and occasionally cattle using as a source of stock water.

But I do, I think there's a high probability that that spring will cease the flow of it is -- see the flow as a direct result of pump-out from the well.

Q. It will cease the flow as a result of direct pumping from the well field?

A. I believe it would.

Q. Based on the -- In the text it says based on predicted drawdowns of 40 to 50 feet?

A. Yes, yes.

Q. So in the exhibit, Table 4.4.10, are the green,

IN THE SUPREME COURT OF THE STATE OF NEVADA

EUREKA COUNTY, A POLITICAL SUBDIVISION OF THE STATE OF NEVADA; KENNETH F. BENSON, INDIVIDUALLY; DIAMOND CATTLE COMPANY, LLC, A NEVADA LIMITED LIABILITY COMPANY; AND MICHEL AND MARGARET ANN ETCHEVERRY FAMILY, LP, A NEVADA REGISTERED FOREIGN LIMITED PARTNERSHIP,

Appellants,

vs.

THE STATE OF NEVADA STATE ENGINEER; THE STATE OF NEVADA DIVISION OF WATER RESOURCES; AND KOBEH VALLEY RANCH, LLC, A NEVADA LIMITED LIABILITY COMPANY,

Respondents.

_____/

Case No. 61324

District Court Case Nos. CV 1108-15; CV 1108-156; CV 1108-157; CV 1112-164; CV 1112-165; CV 1202-170

JOINT APPENDIX
Volume 3

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CHRONOLOGICAL APPENDIX TO APPEAL FROM JUDGMENT

DOCUMENT	DATE	VOL	JA NO.
Petition for Judicial Review	08/08/2011	1	01-06
Notice of Verified Petition for Writ of Prohibition, Complaint and Petition for Judicial Review	08/10/2011	1	07- 08
Verified Petition for Writ of Prohibition, Complaint and Petition for Judicial Review	08/10/2011	1	09-59
Summons and Proof of Service, Kobeh Valley Ranch, LLC	08/11/2011	1	60-62
Summons and Proof of Service, Jason King	08/11/2011	1	63-65
Affidavit of Service by Certified Mail	08/11/2011	1	66-68
Notice of Petition for Judicial Review	08/11/2011	1	69-117
Summons and Proof of Service, Kobeh Valley Ranch, LLC	08/15/2011	1	118-120
Summons and Proof of Service, Jason King	08/15/2011	1	121-123
Summons and Proof of Service, The State of Nevada	08/17/2011	1	124-128
First Additional Summons and Proof of Service, State Engineer, Division of Water Resources	08/17/2011	1	129-133
Order Allowing Intervention of Kobeh Valley Ranch, LLC, to Intervene as a Respondent	09/14/2011	1	134-135

DOCUMENT	DATE	VOL	JA NO.
Partial Motion to Dismiss, Notice of Intent to Defend	09/14/2011	1	136-140
Order Allowing Intervention of Kobeh Valley Ranch, LLC, as a Party Respondent	09/26/2011	1	141-142
Answer to Verified Petition for Writ of Prohibition, Complaint and Petition for Judicial Review by Kobeh Valley Ranch, LLC	09/28/2011	1	143-149
Answer to Petition for Judicial Review by Kobeh Valley Ranch, LLC	09/29/2011	1	150-154
Answer to Petition for Judicial Review by Kobeh Valley Ranch, LLC	09/29/2011	1	155-160
Order Directing the Consolidation of Action CV1108-156 and Action No. CV1108-157 with Action CV1108-155	10/26/2011	1	161-162
Summary of Record on Appeal	10/27/2011	2-26	163-5026
Request for and Points and Authorities in Support of Issuance of Writ of Prohibition and in Opposition to Motion to Dismiss	11/10/2011	27	5027-5052
Order Setting Briefing Schedule	12/02/2011	27	5053-5055
Reply in Support of Partial Motion to Dismiss and Opposition to Request for Writ of Prohibition	12/15/2011	27	5056-5061

DOCUMENT	DATE	VOL	JA NO.
Kobeh Valley Ranch's Reply to Conley/Morrison's Request for and Points and Authorities in Support of Issuance of Writ of Prohibition and in Opposition to Motion to Dismiss	12/15/2011	27	5062-5083
Kobeh Valley Ranch's Joinder in the State of Nevada and Jason King's Partial Motion to Dismiss	12/15/2011	27	5084-5086
Petition for Judicial Review	12/29/2011	27	5087-5091
Petition for Judicial Review	12/30/2011	27	5092-5097
Summons and Proof of Service, The State of Nevada	01/11/2012	27	5098-5100
First Additional Summons and Proof of Service, State Engineer, Division of Water Resources	01/11/2012	27	5101-5103
First Amended Petition for Judicial Review	01/12/2012	27	5104-5111
Opening Brief of Conley Land & Livestock, LLC and Lloyd Morrison	01/13/2012	27	5112-5133
Petitioners Kenneth F. Benson, Diamond Cattle Company, LLC, and Michel and Margaret Ann Etcheverry Family LP's Opening Brief	01/13/2012	27	5134-5177
Eureka County's Opening Brief	01/13/2012	27	5178-5243
Eureka County's Summary of Record on Appeal - CV1112-0164	01/13/2012	28	5244-5420
Eureka County's Supplemental Summary of Record on Appeal - CV1108-155	01/13/2012	29-30	5421-5701

DOCUMENT	DATE	VOL	JA NO.
Order Granting Extension	01/26/2012	31	5702-5703
Answer to Petition for Judicial Review	01/30/2012	31	5704-5710
Answer to First Amended Petition for Judicial Review	01/30/2012	31	5711-5717
Supplemental Petition for Judicial Review	01/31/2012	31	5718-5720
Petition for Judicial Review	02/01/2012	31	5721-5727
Summary of Record on Appeal	02/03/2012	31	5728-5733
Record on Appeal, Vol. I, Bates Stamped Pages 1-216	02/03/2012	31	5734-5950
Record on Appeal, Vol. II, Bates Stamped Pages 217-421	02/03/2012	32	5951-6156
Record on Appeal, Vol. III, Bates Stamped Pages 422-661	02/03/2012	33	6157-6397
Answer to Petition to Judicial Review	02/23/2012	34	6398-6403
Answering Brief	02/24/2012	34	6404-6447
Respondent Kobeh Valley Ranch, LLC's Answering Brief	02/24/2012	34	6448-6518
Reply Brief of Conley Land & Livestock, LLC and Lloyd Morrison	03/28/2012	34	6519-6541
Petitioners Kenneth F. Benson, Diamond Cattle Company, LLC, and Michel and Margaret Ann Etcheverry Family LP's Reply Brief	03/28/2012	34	6542-6565
Eureka County's Reply Brief	03/28/2012	34	6566-6638

DOCUMENT	DATE	VOL	JA NO.
Transcript for Petition for Judicial Review	04/03/2012	35	6639-6779
Corrected Answering Brief	04/05/2012	35	6780-6822
Findings of Fact, Conclusions of Law, and Order Denying Petitions for Judicial Review	06/13/2012	36	6823-6881
Notice of Entry of Findings of Fact, Conclusions of Law, and Order Denying Petitions for Judicial Review	06/18/2012	36	6882-6944
Notice of Appeal	07/10/2012	36	6945-6949
Petitioners Benson, Diamond Cattle Co., and Etcheverry Family LP's Notice of Appeal	07/12/2012	36	6950-6951
Excerpts from Transcript of Proceedings	10/13/2008	36	6952-6964

ALPHABETICAL APPENDIX TO APPEAL FROM JUDGMENT

DOCUMENT	DATE	VOL	JA NO.
Affidavit of Service by Certified Mail	08/11/2011	1	66-68
Answer to Verified Petition for Writ of Prohibition, Complaint and Petition for Judicial Review by Kobeh Valley Ranch, LLC	09/28/2011	1	143-149
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Answer to Petition for Judicial Review	01/30/2012	31	5704-5710
Answer to First Amended Petition for Judicial Review	01/30/2012	31	5711-5717
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Corrected Answering Brief	04/05/2012	35	6780-6822
Eureka County's Supplemental Summary of Record on Appeal - CV1108-155	01/13/2012	29-30	5421-5701
Eureka County's Summary of Record on Appeal - CV1112-0164	01/13/2012	28	5244-5420
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Notice of Entry of Findings of Fact, Conclusions of Law, and Order Denying Petitions for Judicial Review	06/18/2012	36	6882-6944
Notice of Appeal	07/10/2012	36	6945-6949
Opening Brief of Conley Land & Livestock, LLC and Lloyd Morrison	01/13/2012	27	5112-5133

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Petition for Judicial Review	12/30/2011	27	5092-5097
Petition for Judicial Review	02/01/2012	31	5721-5727
Petitioners Kenneth F. Benson, Diamond Cattle Company, LLC, and Michel and Margaret Ann Etcheverry Family LP's Opening Brief	01/13/2012	27	5134-5177
Petitioners Kenneth F. Benson, Diamond Cattle Company, LLC, and Michel and Margaret Ann Etcheverry Family LP's Reply Brief	03/28/2012	34	6542-6565
Petitioners Benson, Diamond Cattle Co., and Etcheverry Family LP's Notice of Appeal	07/12/2012	36	6950-6951

DOCUMENT	DATE	VOL	JA NO.
Record on Appeal, Vol. II, Bates Stamped Pages 217-421	02/03/2012	32	5951-6156
Record on Appeal, Vol. I, Bates Stamped Pages 1-216	02/03/2012	31	5734-5950
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Summons and Proof of Service, Jason King	08/15/2011	1	121-123
Summons and Proof of Service, Kobeh Valley Ranch, LLC	08/15/2011	1	118-120

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Supplemental Petition for Judicial Review	01/31/2012	31	5718-5720
Transcript for Petition for Judicial Review	04/03/2012	35	6639-6779
Verified Petition for Writ of Prohibition, Complaint and Petition for Judicial Review	08/10/2011	1	09-59

CERTIFICATE OF APPENDIX (NRAP 30(g)(1)

In compliance with NRAP 30(g)(1) I hereby certify that this Appendix consists of true and correct copies of the papers in the District Court file.

DATED: December 21, 2012.

/s/ KAREN A. PETERSON

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STATE OF NEVADA

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

DIVISION OF WATER RESOURCES

BEFORE TIM WILSON, HEARING OFFICER

IN RE:

Applications 72695, 72696, 72697, 72698, 73545, 73546, 73547, 73548, 73549, 73550, 73551, 73552, 74587, 75988, 75989, 75990, 75991, 75992, 75993, 75994, 75995, 75996, 75997, 75998, 75999, 76000, 76001, 76002, 76003, 76004, 76005, 76006, 76007, 76008, 76009, 76483, 76484, 76485, 76486, 76744, 76745, 76746, 76802, 76803, 76804, 76805, 76989, 76990, 77171, 77174, 77175, 77525, 77526, 77527, 77553, 78424, 79911, 79912, 79913, 79914, 79915, 79916, 79917, 79918, 79919, 79920, 79921, 79922, 79923, 79924, 79925, 79926, 79927, 79928, 79929, 79930, 79931, 79932, 79933, 79934, 79935, 79936, 79937, 79938, 79939, 79940, 79941 and 79942

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TRANSCRIPT OF PROCEEDINGS

PUBLIC HEARING/VOLUME II, pages 220-415

TUESDAY, DECEMBER 7, 2010

CARSON CITY, NEVADA

REPORTED BY:

CAPITOL REPORTERS
Certified Shorthand Reporters
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Nevada CCR #625
1201 N. Stewart Street Ste. 130
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I N D E X

TUESDAY, DECEMBER 7, 2010, 8:30 A.M.

---oOo---

HEARING OFFICER WILSON: This is the continuation of our hearing from yesterday. We left off, I believe, with the applicant's case, Dwight Smith; is that correct?

MR. DE LIPKAU: No. My first witness will be Mr. Jack Childress.

HEARING OFFICER WILSON: Jack Childress.

MR. DE LIPKAU: Before I call Mr. Childress I have a procedural request I'm going to make and that is the State Engineer should allow the applicant to call rebuttal witnesses if necessary because in accordance with Ruling 4848 the protestant has the burden of proof and inasmuch as the applicant has gone first we must anticipate what the protestants will attempt to do.

MS. JOSEPH-TAYLOR: Mr. De Lipkau, you're really hard to hear. Could you speak up.

MR. DE LIPKAU: Yes, I will. And in the interest of fairness and due process, we would like the right to call rebuttal witnesses if necessary. The rebuttal witnesses will be short. They certainly will not be made in an attempt to lengthen or unduly burden this hearing. We'll be very, very quick on that point. We have made a reasonable and diligent effort to anticipate what the protestants will do and say in our case in chief, but of course we cannot anticipate

everything. So with that request we would like the right to call rebuttal witnesses if necessary.

HEARING OFFICER WILSON: Would you like to respond?

MS. PETERSON: I did respond yesterday, I thought.

HEARING OFFICER WILSON: You did. I'm just giving you additional opportunity.

MS. PETERSON: Thank you. I appreciate that. The notice clearly states when everybody was supposed to submit their evidence and their documentary exchanges and that the applicant's case would be presented in the first two days and the protestant's case would be presented in the last two days. And it's the same procedure that we followed last time except the parties are flipped and we did not -- we would have loved to have presented rebuttal testimony in the last go-around but we were not afforded the opportunity to present rebuttal testimony in the last go-around. So since you haven't ordered it, it shouldn't be ordered at this point in the proceeding.

MS. JOSEPH-TAYLOR: The State Engineer has given me the opportunity to respond to this a little. Mr. de Lipkau, you're picking an old ruling, the Yucca Mountain ruling, where it says generally the protestants go first. That procedure has changed dramatically since that ruling has

came out. The applicant goes first in many cases now. And there are other instances where the State Engineer says the protestant has the burden to prove their case but the applicant also has burden of proof.

So you're making this issue out of going first and you're not alone. It happens in many of these hearings, these big hearings, these more complex hearings. And the State Engineer has said he would like to wait and see if we even need rebuttal evidence.

But Ms. Peterson is right, in other cases we haven't done it. Our process is to give a full and fair hearing. We have this dual exchange but you're picking on one ruling that isn't the standard anymore.

MR. DE LIPKAU: When you say a full and fair hearing, if a witness for one side directly contradicts a witness from the other side, the parties, either party, should have the right to say no, here's what I said or the distance is X and not Y. In fairness we have to anticipate.

If we were to compare this to a trial, the plaintiff always goes first. The plaintiff cannot discuss the defendant's witnesses or evidence prior to they being introduced by a defendant. And what we've done, quite obvious, we have had to discuss defendants, pardon me, protestants' exhibits before they're introduced. It makes it very, very awkward and it is totally different than a regular

trial.

MS. JOSEPH-TAYLOR: We understand that, Mr. de Lipkau. And the hearing rules provide for that and the hearing rules provide for flexibility. It's your model that's the biggest thing at issue here. And how can we even under their cross-examination until we've heard your model evidence.

MR. DE LIPKAU: Right.

MS. JOSEPH-TAYLOR: And the hearing rules provide the State Engineer with great flexibility. The hearing rules provide for rebuttal if necessary. But the State Engineer does not want to make that decision now. So we understand your motion. It stands. But let's wait and see until we get there.

But you're wrong on the burden of proof issue. And it's in other rulings. Both sides have burden of proof.

MR. DE LIPKAU: I couldn't agree more.

MS. JOSEPH-TAYLOR: Okay.

MR. DE LIPKAU: But the point is the protestant goes first.

MS. JOSEPH-TAYLOR: Not always.

MR. DE LIPKAU: I know that. And I know the history behind it because I was there. The point I'm trying to make is we don't want to call unnecessary witnesses in anticipation of something that might not occur. It will

waste time. And if we can call that rebuttal witness for five minutes, the problem is resolved, rather than two hours of testimony which is unnecessary. That's the point I'm making.

MS. JOSEPH-TAYLOR: And the State Engineer has said he's going to wait and see if they're even necessary after we're done with the cases.

HEARING OFFICER WILSON: All right. Let's call your next witness.

MR. DE LIPKAU: Mr. Jack Childress.

(Witness was sworn in)

JACK CHILDRESS

Called as a witness on behalf of the Applicant, having been first duly sworn, Was examined and testified as follows:

DIRECT EXAMINATION

By Mr. de Lipkau:

Q. Would you please state your name and spell your last name please.

A. Jack M. Childress. Last name is spelled C-h-i-l-d-r-e-s-s.

Q. What is your business address?

A. 11045 Donner Pass Road in Truckee, California.

Q. What is your educational background?

A. I have a Bachelor of science in geology from Montana State University and graduate courses from the University of Montana.

Q. In what curricular?

A. Geology.

Q. What is your occupation?

A. I'm a hydrogeologist.

Q. How long have you been a hydrogeologist?

A. Approximately eight years.

Q. With whom are you employed?

A. Interflow Hydrology.

Q. How long have you been with that entity?

A. Four years.

Q. What did you do prior to that?

A. I was a hydrogeologist for the State of South Carolina

Q. Do you have any registrations?

A. I'm a licensed professional geologist in the State of California.

Q. What are your current duties or tasks with your current employer?

A. I'm a senior hydrogeologist at Interflow Hydrology.

Q. And have you been a hydrogeologist during the

entire four-year period you worked with Mr. Smith?

A. That is correct.

Q. Have you performed any hydrologic duties or services for KVR, the applicant in today's hearing?

A. Yes, I have.

Q. Would you please describe the duties? When did they commence?

A. Approximately three and a half years ago is when I became involved in the project. I've been involved in almost every aspect from well field exploration to compiling geologic data.

Q. Sorry to interrupt. When you say the project do you mean --

A. The entire Mount Hope project.

Q. The subject of this hearing?

A. That's correct. I'll continue. I've been responsible for compiling data sets that are model input files such as well data sets, springs data sets, the geology that goes in to the model helping to develop a conceptual model as well as analyzing aquifer test data.

Q. With whom did you work in completing these duties?

A. I worked with my employer, Dwight Smith, Terry Katzer, the late Tom Buqo, Dave Hawkins.

Q. And who is Mr. Hawkins?

A. Mr. Hawkins is a private hydrogeologic consultant that works with General Moly. He is based out of the Tucson area.

Q. I see.

A. I'll continue. I've also worked with many of the mine staff and staff from Montgomery and Associates as well as staff from the Bureau of Land Management and a third party contractor who approved this report.

Q. When you say this report?

A. I'm talking about Exhibit 40.

Q. Okay. We'll get to that in a moment. Approximately how many days have you spent on this endeavor?

A. Over the last three and a half years I would estimate about 250 days.

Q. And of those 250 days how many were spent in the field?

A. I would estimate approximately 30 days between some geologic mapping, some stream gauging, well and aquifer test oversight and site visits.

Q. And what was the purpose of your employment or duties?

A. With regards to Exhibit 40 or --

Q. Yes.

A. The primary duties are to compile data from the well field area everything that was presented up to Exhibit

115 of the 2008 hearing. That was the Buqo report. And to provide input from the well field to the numerical model.

Q. At this time I'd like to introduce Exhibit 40. It is entitled Kobeh Valley well field data summary report. Have you reviewed Exhibit 115 presented at the 2000 -- the October 2008 hearing?

A. I have.

Q. Would it be a correct characterization that Exhibit 40 in front of you now is a continuation or update of the prior Exhibit 115 report prepared by Mr. Buqo?

A. I would say that is correct. It basically incorporates about two more years of exploration efforts in the well field area.

Q. So it's a continuation?

A. It is a continuation.

Q. Are you in any way criticizing or refuting anything found within Mr. Buqo's report, Exhibit 115?

A. No. That is not my intent.

Q. Okay. So is it a true characterization then that your intent is to update the Buqo report?

A. That is exactly my intent.

Q. Okay. Could you tell us the difference between Exhibit 40 and old Exhibit 115?

A. Sure. I'm going to be referring to figures in Exhibit 40. And if everybody wants to bookmark these as we

go along it may help the process. I'm going to be looking at Figure 10, 42, 43, 45, 46 and 20. Start with Figure 10. It's labeled test and monitoring well locations in Kobeh Valley. At the time that Exhibit 115 was presented in 2008 there were approximately ten or 12 wells described.

As of this report, Exhibit 40, we present data from approximately 40 wells. So we've definitely increased the database of knowledge in the well field area. In particular we've expanded our knowledge of the basin fill aquifer. And that's exemplified in Well 228, Well 229 and Well 222.

In addition, at the time of the Buqo report, that's Exhibit 115, from 2008, when that report was prepared they were just finishing a 31-day aquifer test at a well called 206. And there's information in the Buqo report that outlines that test. Since that time we have tested 12 additional wells for a total of 13 wells in the well field.

Q. Excuse me. Would these be referred to as aquifer tests?

A. That is correct.

Q. Okay.

A. So since the Buqo report we've got approximately 41 days of aquifer testing that is not presented in the Buqo report. So 12 additional wells.

In addition to just installing wells we've

increased our knowledge of the geology of the southern Roberts Mountains in Kobeh Valley. And at this time I'll look at Figure 42.

Figure 42 is a generalized geologic map of the central Kobeh well field area. It's meant to be kind of a simplistic-looking map. We've got a much more complex version of this map in Exhibit 39 that will appear later.

And as you look at the Figure 42 you'll notice we have different colors representing different rock types. The shades of blue are the carbonate rocks. There's quite a few different formations that are in the carbonate package. We have what appears as a brown or purple shade to the west of these carbonate rocks and that is predominantly the Vinini formation and it's a dark shale and soot stone.

Further west we have a well labeled EW 1 and that's near the Old Gold Bar Mine. And of course further to the east we have red symbols shown. Those are volcanic rocks. The dark lines on the map are known faults. And the red lines on the map are faults that we interpret to be hydraulic barriers, barriers to groundwater flow, meaning that water has a very difficult time moving across those barriers.

Q. Would you please indicate where this barrier is?

A. There are several shown on the map. There are a series of southeast to northwest trending faults near what's

labeled as Roberts Creek Road on the map in the southeastern portion. Surrounding both sides of a long red symbol that is of the salt ridge. We have a prominent southwest to northeast trending fault system that is the basin bounding fault for the southern end of the Roberts Mountains. That fault is between Wells 213 and the lower Roberts Creek monitor well which is abbreviated LRCMW on the map.

If we continue to look at this map, we see that there are three lines of sections labeled AA prime through CC prime. And they are generally west to east sections. These correspond to the subsurface cross-sections in Figure 43. And I'm going to refer to that figure now.

So through compiling the geology of the area existing maps, doing our own mapping and doing some subsurface drilling and taking all the information from our test and monitor wells, we've been able to develop a series of cross-sections.

THE STATE ENGINEER: I don't have 43, Mr. Childress.

THE WITNESS: I'll give you my copy. That looks like a reproduction error. Ross, may I borrow yours?

HEARING OFFICER WILSON: I'd like to make sure everybody has it. Let's be off the record.

(Discussion held off the record)

HEARING OFFICER WILSON: Go ahead, Mr. Childress.

THE WITNESS: Again, we're looking at Figure 43. There's three cross-sections shown, AA prime through CC prime. Working from the top of the page down. We're going from north to south.

The general structure of northern Kobeh Valley again on the west side of what was Figure 42 and is shown as AA prime is we have what's called Gold Bar Horst. A horst, h-o-r-s-t, is a comparatively uplifted block of rock. And to the east of it up the Gold Bar Horst we have a comparatively down draw block that's in an area that's labeled the range front fault zone. We have to the east of that range front fault zone a central horst, another uplifted block. And then we have another drop in structure of the down draw area.

And then along Roberts Creek Road we have a carbonate block that has been comparatively uplifted. We have many wells that are drilled in that carbonate block that are numbered 205, 206, 214, 213, 215 and further to the north the northern -- the lower, pardon me, and middle Roberts Creek monitor wells.

When the Buqo report came out we had assumed based on Figure 42 and noting all of the carbonate rocks up in the mountain block that the floor of the basin we thought at the time was probably carbonate rock. Through drilling Wells 209, 220, 229, 223 and 208 we know that the floor of the basin is probably almost exclusively vinini.

One thing of note --

Q. (By Mr. de Lipkau) Excuse me, Mr. Childress. What does predominantly vinini mean?

A. It means we haven't found any carbonate so I'm assuming it's all vinini.

Q. Are you saying that subsequent to the Exhibit 115 Buqo report that the -- that at that time the carbonate aquifer was overestimated?

A. That may be the case. Through the additional drilling we've revised our conceptual model of the hydrogeology. No longer do we believe that there are carbonate rocks underneath the basin. They're at great depth.

Q. Right. Please continue.

A. One thing of particular note, and this may help explain some of the red lines drawn on the east side of Figure 2, those red lines being hydraulic barriers, what we infer to be hydraulic barriers, is the eastern portion of BB prime. We have this elongated ridge of salt that we've creatively called the salt ridge that has been down dropped several hundred feet by several faults to the east. And we believe that that creates a fairly significant barrier to groundwater flow.

Underlying that salt flow, we actually did a series of diamond drills on 203 and 204, the material beneath

the salt is extremely indurated and stiff conglomerate.

Q. What does that mean?

A. That means that -- Just that. It's very stiff and it's very hard. It's a rock as opposed to sediment. What that material appears to be it has a very fine grain matrix but it has many, many cobbles that are imbedded in it and what we believe that is in the salt above, this is a rift valley and it looks like there was a great deal of faulting right before the inception of the dikes that are associated with the northern Nevada rift. We had flood salts from those dikes that came down in this valley and they were subsequently faulted.

So in addition to this geology, we have been able to get some precision surveys on all the well head elevations that we have and that gives us good control on the groundwater elevations.

I'm going to be referring to Figures 45 and 46. And we have quite a few wells that are in the basin fill aquifer and quite a few wells that are in what we would call hard rock aquifer. Does everybody have Figure 45 and 46?

HEARING OFFICER WILSON: Are we all there? It looks like we're good to go.

THE WITNESS: So at the top of Figure 45 we have the well name, the depth, the water and the elevation of the water table.

Q. (By Mr. de Lipkau) Let's make sure we all know where the well is that you are currently discussing.

A. I'm not discussing any current well.

Q. Okay. Let us know when you get to it.

A. Okay. And the bottom half of Figure 45 would be the water level contours. It's the elevation of the water table from those wells.

One thing of particular note on this figure would be the water level difference between 213, 214, 215, 206 and 205 which all have water levels almost within a foot or two of each other. And the wells to the north of the faults shown in the figure, the south, southwest to northeast running fault.

Q. Would you please just tell us where that fault is?

A. That fault is shown very close to Well 213. To the north of that fault in both the lower and middle Roberts Creek monitor wells, those are two different wells, we have water level elevations that are over 300 feet different and to the south of the fault. And again, I'll note that if we do look back at I believe it's Figure 43, BB prime, CC prime, and noting the carbonate block that appears as blue shades on the eastern part of these cross-sections, Wells 205, 206, 213, 214, 215 all appear in this carbonate rock. And again, it's important to note that their water levels are extremely

similar. And to me that always indicates some degree of compartmentalization and that those wells are well connected.

Q. Mr. Childress, I want to go back to Figure 45 and I want you to carefully describe where the fault is that you just described.

A. Sure.

Q. Is it on the upper or lower portion?

A. In both halves of this figure, 45, the fault appears basically in the center of each subfigure. It is shown at Well 213 and extending to the northeast. That same fault appears on Figure 42 that we discussed earlier.

Q. Excuse me. Is the fault the red line on both charts starting with I'll call it the dot for RWX213M?

A. Yes. It's just to the north. If we were to zoom in it's actually just to the north of 213M and extending to the northeast and to the southwest.

What's shown on Figure 45 as far as the fault configuration is slightly different than on 42.

Q. Okay.

A. The reason for that is this is a USGS --

Q. This you mean 45?

A. Thank you. The red line shown on Figure 45 is a shake file from the USGS showing quarternary fault, fault or faults that have believed to have ruptured in the last 1.4 million years.

So because we've got this fault between 213M and lower and middle Roberts Creek monitor wells that creates 330 feet of difference we have a fairly firm belief that that's a barrier to groundwater flow.

I'm going to refer to Figure 20 at this time. As I mentioned earlier --

MR. FELLING: What page is that?

THE WITNESS: I'm sorry. What?

MR. FELLING: What page is that on?

THE WITNESS: 52, 54.

HEARING OFFICER WILSON: Okay. We're there.

MR. DE LIPKAU: It's on page 55 of Exhibit 40.

THE WITNESS: Okay. We're looking at Figure 20. And it shows drawdown in Wells 205, 206, 213, 214 and 215 from an 11-day aquifer test of a well named 214-T. What we need to note on this figure is that the rate of change of drawdown basically the slope is fairly identical for Wells 214-M, 215-M and to a large extent 206 and 205. The slope of drawdown for 213-M, which is shown with the purple symbols there, is nearly twice that of all the other wells. The reason for that is because it's closer, almost sitting right near what we refer to as a negative boundary condition. There's not enough water coming in to counteract the drawdown effects from the pumping test. So it's literally drawing down twice as fast as any other well. And it's actually, you

know, much farther away than say 215-M in the pumping well.

One thing of note is that we did not see any drawdown during this test at the lower Roberts Creek monitor well. The lower Roberts Creek monitor well and the middle Roberts Creek monitor well are on the same order of magnitude distance away from the pumping well as say 205 and 206 where we did see drawdown.

And what that tells us is that we cannot propagate drawdown across that fault. And that's further corroborated by the fact that 213 drew down faster than any other well comparatively given that rate.

So in summary, the main difference between this report and Exhibit 115, the 2008 hearing, would be a much expanded well coverage in the well field, well defined geology, well surveys where we've got good control and water elevation and we've identified a major range front boundary between the Roberts Mountains and our well field area.

Q. Your opinion would pumping in the requested sites as set forth in the application cross the boundary or cause an effect across the boundary?

A. Ross, I think it would be impossible. We tried.

Q. So in conclusion then what is, in your opinion, what is the effect of pumping at the desired points of diversion upon the surface waters of Roberts Mountain?

A. I think it would be absolutely unmeasurable.

Q. Using the same exhibits, have you formed an opinion as to the effect of pumping at the desired points of diversion upon the well fields in Diamond Valley?

A. I'm going to have to agree with Mr. Katzer on that point that given the large water level disparity as shown in Figure 46, where we've got a 6,000 foot contour near the Devil's Gate and we know we have water levels that are anywhere between 70 and a hundred feet lower east of the Devil's Gate and considering the fact that we've had a 50 or 60-year pumping test for many decades above the perennial yield in Diamond Valley and have not seen than effect in Kobeh Valley, I find it extremely hard to believe that by pumping below the perennial yield in Kobeh Valley can have any effect on Diamond Valley.

Q. And that is your conclusion?

A. That is my conclusion.

Q. Would you like to go back to the executive summary of Exhibit 40 found on page eight. Would you quickly proceed through and summarize the executive summary?

A. Do you want me to read?

Q. I don't want you to read it. I'd like you to make certain that your prior testimony includes everything in the executive summary.

A. Okay. So the executive summary would be basically a summary of what this report is about and what we

accomplished with this report. We reviewed the existing geology and the hydrogeologic conditions of Kobeh Valley. We made interpretations on the existing geology and we would find those through drilling.

Prior to drilling we conducted field Reconnaissance as well as remote sensing to determine likely drilling locations. In the appendices of this report there contain geophysical data. It's basically subsurface data on the physical properties of the rocks below parts of the well field.

Also in the appendices of this report we have wire line geophysical data. We conducted an extensive drilling program. We conducted 13 aquifer tests. This would also be inclusive of what was presented in the Buqo report. And we have made an analyses of the aquifer response from the pumping test and we've developed geologic cross-sections in back of the well field area.

Q. Are you aware of AQTEsolv?

A. I am.

Q. Would you briefly describe AQTEsolv in exhibit, appendix B of Exhibit 39.

THE COURT REPORTER: Can you spell that for me please?

MR. DE LIPKAU: Can you spell it?

THE WITNESS: It's spelled capital A, capital Q,

capital T, capital E, s-o-l-v in lower case.

MS. JOSEPH-TAYLOR: No wonder Ross wouldn't spell it.

THE WITNESS: I'm going to be describing appendix B.

Q. (By Mr. De Lipkau) And Exhibit 39.

A. The first part of appendix B has water level data from the 206 test and then there are some what are called falling head tests or slug tests and then we move on to long term aquifer tests that we have analyzed.

Basically AQTEsolv is a program, it's a tool in the program that helps you derive hydraulic properties that transmissivity storage coefficient and so on from data that's generated from wells that are monitored during an aquifer test.

What you're basically trying to do is to match a set of type curves of known hydraulic properties. Those hydraulic properties define the shape of the curve to your field data. When you have minimized the difference between your field data and that type curve you can have good confidence that the hydraulic properties that define that type curve define the hydrogeologic conditions that your well has.

Q. And is the AQTEsolv method utilized in Exhibit 39?

A. I believe it appears in appendix E -- B.

Q. Appendix B.

A. Okay. Would you mind if I reviewed it?

Q. No. Absolutely not.

A. Okay. I'm familiar with this.

Q. Now, would it be a true statement that AQTEsolv requires the influent of known pumping tests and known transmissivity and storativity coefficients?

A. That is correct. What is shown in appendix B is once you have satisfactory bits of a known type curve and you're very confident about those coefficients that you derived, you can ask of AQTEsolv now tell me what it's going to be like in ten, 20, 30, 40 years near that location if I continue to pump at whatever rate you choose to input.

I believe appendix B takes the hydraulic properties derived from the AQTEsolv analyses that we're doing and it projects them over a long period of time and takes them in to account interference from other wells. It also takes in to account other assuming we have certain deficiencies in well design, in other words what if our pumping well is X percent efficient. And it tries to, it tries to project drawdown throughout the well field. And in doing so we say is it possible given what we've found in the well field to physically produce the amount of water that's needed for the Mount Hope project.

Q. And what is the conclusion by running the various factors we've previously discussed in to AQTEsolv?

A. I haven't reviewed this in a long time. But I believe what we've done is to say that we basically have no problem finding the water that we need. We do propose, I believe, two additional wells in this appendix.

Q. Another witness will get in to that issue in more detail. In conclusion, Mr. Childress, are you -- is it your conclusion that the pumping of the annual 11,300 acre-feet annually will have an undetectable or non-detectable effect upon the surface waters of Roberts Mountain?

A. I believe that is true for the case of the Roberts Mountains.

Q. Okay. And would you also state your opinion as to the effect of pumping the desired 11,300 acre-feet annually upon the well field of Diamond Valley?

A. I believe I've already done that and the answer is the same that I don't think there will be an effect or if there is, it's going to be extremely small.

MR. DE LIPKAU: That's all the questions I have at this time.

HEARING OFFICER WILSON: Thank you. Let's take a short break before we go on to cross and come back at 9:25 please.

(Recess was taken)

HEARING OFFICER WILSON: The State Engineer has asked me to go ahead and -- Oh, let me get us off mute for our audience in the supplemental room.

Let me start over. We talked during the break and the State Engineer has asked me to read a statement on the rebuttal motion of Mr. de Lipkau. And we have considered the motion to allow rebuttal and the objections of the protestants or in the alternative request for counter-rebuttal and we would like to adhere to the prehearing order and are reluctant to deviate from that order. However, we are also mindful of the requirements of due process. Therefore, we will place the burden on the parties to demonstrate a need for rebuttal testimony or counter-rebuttal to satisfy the requirements of due process.

MR. DE LIPKAU: Thank you very much.

HEARING OFFICER WILSON: I'd like to proceed with the cross of Mr. Childress.

MS. PETERSON: Thank you.

CROSS-EXAMINATION

By Ms. Peterson:

Q. Mr. Childress, I'm Karen Peterson and I'm the attorney for Eureka County.

A. Hello.

Q. Hi. Do you have Exhibit 42 in front of you?

A. No, I don't.

Q. No, not Exhibit 42. I'm sorry. Exhibit 40, Figure 42.

A. I do.

Q. And I have been trying to locate where Well TXF-2 is.

A. It's not shown on the map.

Q. Okay. Where is that well?

A. I would refer you to Figure 10. TXF-2 is located in the Whistler Mountains on the east side of Figure 2 on Figure 10.

Q. And are you aware that some of the water right applications that the applicant is proposing to be approved in this proceeding have a point of diversion for that well, TXF-2?

A. I'm not familiar with any of the water rights outside of my scope. Perhaps Mr. Smith can address those issues.

Q. Okay. And I guess then turning to Figure 42. Are you aware that Application 7717 was sought to be approved in this proceeding as a point of diversion for Well 214?

A. I'm not aware of any water rights.

Q. And is 214 in the carbonate or close to the carbonate based on your Figure 42?

A. It is completed in the carbonate rock.

Q. And then you had a series of conclusions in your

testimony consisting of the flow in to Roberts Mountains. Do you recall that testimony?

A. I do.

Q. And are your conclusions consistent with the model that, the model results?

A. This is field data and fact. Perhaps you should ask that question the other way around, is the model consistent with this. So I'm going to give that one to Mr. Smith.

Q. And are you aware -- Well, are you an author of Exhibit 39?

A. I wrote much of Exhibit 39. Mr. Smith handled the ins and outs of the model. But as far as the geology section and the chemistry section, I would be the author.

Q. Are you aware that the model shows flow from between Roberts Mountains and the well field?

A. Any questions related to the model I would send to Mr. Smith.

Q. You talked a lot about data from the northern part of your well field, proposed well field; is that correct?

A. I did.

Q. But you haven't drilled any of the wells yet in the southern portion of the proposed well field, have you?

A. If we refer to Figure 10, what's shown on here is

there's a purple symbol, the Kobeh Valley well field area. And we stated before, and I don't remember what page it is, but this is a very, very generalized area where we have looked before or were originally exploring for water. The main production wells will be along the corridor. And so yes, we certainly have explored south of the extreme northern part, particularly Wells 222 and 223.

The southern part of that area was explored previously by KV 11 201 and KV 05. We have no intent of going any further south of that to my knowledge.

Q. Do you even know what the wells are that are planned for the well field production? Because they're not shown on Figure 10.

A. It's not the intent of Figure 10. The intent of Figure 10 is to show where test and monitor wells are. It's my understanding that any additional wells would be along the corridor that's shown on the figure.

Q. Right. But you don't know what their numbers are and you don't know where they're located. Is that fair?

A. Sure.

Q. Are you aware of -- And so those questions would be better directed to Mr. Smith?

A. They would. And I believe they're addressed by Exhibit 39, not Exhibit 40.

Q. Right. Well, are you aware of the ten proposed

production wells that only five of them have been drilled?

A. That looks like a question for Exhibit 39.

Q. Okay. Then let me get one more question about Exhibit 39 off the table here. Are you -- You talked about a spring survey and I know that that is appendix E to Exhibit 39. Should I ask questions about that to you or to Mr. Smith?

A. I would give those to Mr. Smith. I'm providing testimony on Exhibit 40 predominantly.

Q. Okay. Are you aware of the results of mineral exploration drilling in Kobeh Valley northwest of Lone Mountain where there were artesian flows of greater than a thousand gallons per minute encountered in carbonate rocks?

A. I've heard hearsay but I don't know that those numbers have actually been physically quantified, i.e., how were they measured, how long do they flow at those rates. It's not uncommon for deep drilling to have artesian flows that are very high for a short period of time that flow drops off overtime. That's something that's seen in a lot of deep drilling and even in petroleum drilling. It's not something that's surprising.

Q. High flowing carbonate rocks northwest of Lone Mountain is not surprising to you?

A. No.

MS. PETERSON: I don't have any further

questions.

HEARING OFFICER WILSON: Ms. Ure, go ahead.

CROSS-EXAMINATION

By Ms. Ure:

Q. Good morning, Mr. Childress.

A. Good morning.

Q. I just have a couple of questions for you. On page 48 you complete an analysis of Well 206?

A. Give me just one moment, please. I do.

Q. Do you know what the drawdown -- Okay. Assuming that the 14,000 gallons per minute were to be continuously pumped for 44 years, do you know what the drawdown amount would be?

MR. DE LIPKAU: I'm going to have to object to that question. I think the volume pumped is 7,000 gallons per minute.

HEARING OFFICER WILSON: Did you check your question? Do you know the number?

MS. PETERSON: I wasn't listening. I'm sorry.

HEARING OFFICER WILSON: His objection was he thinks she misstated the number I believe is Mr. de Lipkau's objection.

MR. DE LIPKAU: Please read the question back.

HEARING OFFICER WILSON: Could you go ahead and go back to Ms. Ure's question.

(Question was read back)

MS. URE: Okay. I'd like to change that to 1400. Sorry.

THE WITNESS: No.

Q. (By Ms. Ure) Okay. And then going back to Figure 42, besides completing your cross-section analysis of the geology for AA prime, BB prime, et cetera, did you perform any actual pump tests dealing with the Roberts Creek horst fault to test the trans -- to test the water movement between Kobeh Valley and the further most eastern edge of Kobeh Valley ?

A. I'm going to answer this the best way that I can. That horst had been previously tested in the 206 test, okay. We did not see any drawdown in the very closely positioned Well 204 and 203. After 31 days of pumping at 1400 gallons a minute which is compelling evidence that you can't propagate drawdown to the east.

MS. URE: Okay. No further questions.

HEARING OFFICER WILSON: Thank you. Redirect.

MR. DE LIPKAU: No questions.

HEARING OFFICER WILSON: Questions of staff?

EXAMINATION

By Mr. Felling:

Q. Good morning, Mr. Childress. A few questions. You had stated earlier that in the well field that it was

underlain by vinini and not carbonate; is that correct?

A. We do believe that in the very first generation of the model we looked at the geologic map which would be Figure 42. And you know that kind of carbonate rocks in the central portion of the northern part of that figure. And we thought that most of the area south of that would also be underlain by carbonate rocks. From Well 209, 208, which is not shown on Figure 42, 220, 229 and 223 we've continued to hit vinini and have not found any carbonate rock west of the Roberts Creek Road.

Q. On your Figure 43 you show that Well 220 did hit carbonate?

A. Yes. There is, if you walk out in to that area, the area around Well 220 and even where 208 is shown, there is a highly solidified jasper alterated ridge of carbonate rock. And by all accounts, when you look around you think if I drill here we're going to go through miles and miles of carbonate. It turns out that that is only about 20 feet thick and it's probably a tectonic slide. We did penetrate carbonate rocks at, I believe, 960 feet at Well 220. But by no means is -- The basin is -- Well, when I describe the basin being floored by vinini I'm talking about the central part of the basin perhaps like under Well 228. Does that answer your question?

Q. In part. So Well 220 did hit carbonate and

vinini at 900 feet?

A. 960 feet, I believe.

Q. And that's within the well corridor; is that right?

A. That is true.

Q. So those wells, you could choose to drill a well in to the carbonate at that location with the permits that are in front of us; is that correct, the applications?

A. You could, yes.

Q. The other real question I have goes to the pumping test that you did with well, was it 214-T?

A. Yes. That was one of the tests, yes. That would be Figure 20.

Q. How about if we look at Figure 45. And how long did you pump that in the pumping test?

A. That carbonate block had been previously pumped by Well 206 for 31 days. Well 214-T I believe was pumped for 11 days. And we saw multiple boundaries in the 206-T test.

Q. Now, you have a -- you've shown us that there's a head difference of about 30 feet between the well that's labeled LRCMW and a whole suite of wells to the south in Roberts Creek; is that correct?

A. No, sir. I believe that's 330 feet.

Q. Okay. And how deep was that well drilled, LR -- What do you call that?

A. Lower Roberts Creek monitor well.

Q. Lower Roberts Creek monitor well. How deep was that drilled?

A. I'm going to refer to the appendicies. It should be the first page of appendix B. That was drilled to 478 feet. If I recall, the reason to drill further was not deemed necessary because it was already producing quite a bit of water.

Q. Well, where was the water table in that?

A. The lower Roberts Creek monitor well?

Q. Yes.

A. Depth to water is 89 feet and it looks like they started producing water between 225 and 245 feet. The well did not produce water prior to that. All of our drilling was done within, so if it was producing water we would have seen it.

Q. So your pumping from Well 214 which is some distance a half mile to the south more or less, and you saw boundary effects, in the lower Roberts Creek monitor well you saw boundary effect?

A. No, sir, we saw no drawdown in the lower Roberts Creek. We saw boundary effects in 213, which is adjacent to the fault.

Q. Okay. So you've gone from that observation to a conclusion that pumping couldn't, couldn't affect any surface

water in all of the Roberts Mountains. We have lots of evidence and testimony that the Roberts Mountain is compartmentalized with many, many compartments probably vertically and stratographically. And I'm just wondering how you can take a pumping test just in Roberts Creek and apply those results to the entire Roberts Mountains?

A. Okay. We know running along the southern end of the southern Roberts Mountains we have a major basin bounding falls there. On one side of the fault our water levels are 330 feet lower, so that basically means that that fault is acting as a hydraulic barrier of boundary to groundwater flow.

In the natural system, water is having an extremely hard time moving from the lower Roberts Creek monitor well and the middle Roberts Creek monitor well, an upgradient location to a downgradient location. Water is damming up behind the fault, okay.

We pumped Well 214. Most of the wells have very similar drawdown trends except for 213 which was drawing down at a much steeper rate than all the other wells because it was more affected by that boundary. If we can't produce drawdown on one side of the fault from pumping during that pumping test I just don't see how we can affect springs that are a thousand, 2,000 feet higher than these wells.

What we're going to be doing, Rick, is basically

dewatering the carbonate block that houses 205, 206, 213, 214 and 215. Water levels are going to drop in that block. And I would review the 206 pumping test where we saw multiple boundary conditions where we pumped it a very long time and we were more likely to see those boundary conditions. It's defining that carbonate block as compartmentalized as is the surface geology.

Q. I don't see a lot of wells outside of Roberts Creek particularly to the west to support that that structure is a barrier to flow over the entire southern boundary of the Roberts Mountains.

A. Certainly we don't have as many wells in that location. I think the basic configuration of the southern Roberts Mountains implies that that fault continues to the west. We've got vinini which underlies that portion of the basin which is several thousand feet, pardon me, which may be a thousand feet lower than the vinini above it in the mountain block. So we know that there's a fault there.

Q. Well, my point here is that you've taken the results from a relatively short term pumping test in one fixed location, although -- and there's been several tests and you have numerous results, but we're going to go from there to 13,000 acre-feet of pumping for 40 plus years and --

A. Not from that carbonate block we're not.

Q. From the area directly to the south; is that

correct?

A. Throughout the well field area, right.

Q. And my -- And our concern is is it valid to make that leap from this series of pumping tests to the long term impact throughout the whole region? I see a number of wells in Roberts Creek and the area to the west there's essentially none and in the area to the east I see a couple. And that's in Figure 45. And there may be more wells, but that's all I really see.

A. I want to make you aware that on Figure 45 we're only showing hard rock well. 46 would show the basin fill wells. So that may fill in some of the blanks for you as far as where wells are and where they are not.

MR. FELLING: I don't have anymore questions. Thanks.

THE STATE ENGINEER: I don't have any.

HEARING OFFICER WILSON: Thank you, Mr. Childress. You may step down.

Do you want to offer any exhibits that Mr. Childress addressed?

MR. DE LIPKAU: Yes. We'd like to offer Exhibit 40 and 411.

HEARING OFFICER WILSON: Let's start with Exhibit 411. I believe that's your resume. Any objection to the resume of Jack Childress?

MS. URE: I have none.

MS. PETERSON: No.

HEARING OFFICER WILSON: Exhibit 411 will be admitted.

Exhibit 40 is the well field data summary report, March 8th 2010. Any objection to that report?

MS. PETERSON: No objection.

MS. URE: No.

HEARING OFFICER WILSON: Hearing no objection, Exhibit 40 will be admitted.

I believe Mr. Smith is next. Go ahead and be sworn.

(Witness was sworn in)

DWIGHT SMITH

Called as a witness on behalf of the Applicant, having been first duly sworn, Was examined and testified as follows:

DIRECT EXAMINATION

By Mr. de Lipkau:

Q. Would you please state your name.

A. Dwight Smith.

Q. What is your business address?

A. It's the same as Jack Childress. Interflow

Hydrology in Truckee, California.

Q. Would you please state the address for the record.

A. 11045 Donner Pass Road, Suite 2-A, Truckee, California.

Q. Have you ever appeared before the Nevada State Engineer as an expert witness before?

A. Yes, I have.

MR. DE LIPKAU: At this time I'd like to have the State Engineer qualify Dwight Smith as an expert in the field of hydrogeology or hydrology in the same fashion as the State Engineer did at the October 2008 hearing.

HEARING OFFICER WILSON: Will there be any objection to Mr. Smith being qualified as, and I believe in a previous hearing I've written down that we qualified him in groundwater hydrology and groundwater modeling. Hydrogeology.

MS. PETERSON: So could you clarify again.

HEARING OFFICER WILSON: Hydrogeology and groundwater modeling. Is that sufficient, Mr. De Lipkau?

MR. DE LIPKAU: That would be sufficient.

MS. PETERSON: Are you offering him today for groundwater modeling?

MR. DE LIPKAU: And as a hydrologist. In the same fashion as he was introduced and allowed to testify as

an expert in those two fields in October of 2008.

MS. PETERSON: Are those the two fields in 2008?

HEARING OFFICER WILSON: The two fields were hydrogeology and groundwater modeling.

MS. PETERSON: There's no objection.

MS. URE: No objection.

MR. DE LIPKAU: Thank you.

HEARING OFFICER WILSON: You'll be so qualified, Mr. Smith.

Q. (By Mr. de Lipkau) Mr. Smith, you have before you a certain report prepared for Eureka model; is that correct?

A. That's correct.

Q. How long have you been working on the Eureka model project?

A. Since February of 2007.

Q. It's been four years now?

A. That's correct.

Q. And during that four-year period -- pardon me -- three and a half year period what have been your duties?

A. I have been one of the lead hydrogeologists and part of a rather large team of hydrogeologists and water resource specialists. I have had direct responsibilities for the regional flow model development and have also had input to, technical input to just about all facets of data

collection and evaluation efforts associated with water development for the project.

Q. During that more than three-and-a-half-year period of time approximately what percent of your time has been spent on the Mount Hope project?

A. For me personally it has been over 50 percent of my time consistently over the two-and-a-half-year period.

Q. Okay. You testified at the October 2008 hearing, did you not?

A. Yes.

Q. Did you review your testimony?

A. I did.

Q. And would you like to make any changes to that testimony?

A. No changes. However, there will be a number of updates to that testimony presented today.

Q. What have you done by way of your professional services since October of 2008 until completion of what we'll refer to as the 2010 model?

A. Well, one of the main efforts has been working through the supporting technical documents for the environmental impact statement that's being developed for the project. So there has been a number of different supporting studies. Mr. Childress testified as to the updated exploration drilling. There's been other studies,

hydrogeologic studies around the pit area, baseline surveys of spring streams, many other studies.

But primarily I've been involved with working through the technical supporting documents for the EIS for the water resources developing portions of --

Q. When you say EIS what does that mean?

A. The environmental impact statement.

Q. And with what agency will that be filed?

A. The BLM.

Q. The BLM is of course the permitting agency as required by applicable federal law?

A. As Mr. Rogers testified to.

Q. We want to make certain that we use acronyms we know what we're talking about, okay.

A. Yes.

Q. All right. So would you please continue. What have you done since 2008 for development of Exhibit 39?

A. Mr. Rogers presented a table that went through the review process that we've been working our way through on this modeling effort. And it's been through multiple iterations. If I recall Mr. Rogers' table, there had been six iterations, formal submittals of this work throughout the past.

Q. What does an iriditation --

A. Excuse me.

Q. You used the word iriditation?

A. Iteration.

Q. Iteration. What does that word mean?

A. We started with actually the first report that we developed describing the numeric flow model and hydrogeologic frame work was actually in October of 2007. It was prior to the State Engineer's document in June of 2008. That body of work has been submitted to the BLM, Bureau of Land Management, and the cooperating agencies, primarily Eureka County for review and comment.

We then compiled comment, reviewed all comments carefully and worked through how we're going to address comments both from the BLM and from the third party consultant, from Eureka County as a stakeholder. And we worked through how we're going to address those comments and produce an updated draft of the report. So I mention numerous iterations, it's been through this phase of submitting a draft document, getting all of the feedback from the reviewing agencies and then addressing those in an updated version of the model and the report.

Q. What goes in to a model?

A. Well, numeric flow model is basically a mathematical representation of a flow system. So by definition it's always an approximation and it's always a simplification of actual conditions that exist in the

environment. But our attempt is to try to mathematically represent the flow system.

Q. Okay. Is a numerical flow model the only means of determining the effect caused by groundwater pumping?

A. What we can derive out of a mathematical model is a prediction of drawdown. You then have to if you're going to associate drawdown impacts a lot of time there's additional steps that need to be taken to understand the drawdown has an impact and I think we'll have more discussion on that.

There are certainly other estimates, more methods for estimating drawdowns over time in the different locations. There's analytical type models for equations such as was discussed briefly by Mr. Childress using a Theis type solution.

And there are also I would call methodologies that are more water budget and perennial yield hydrogeologic frame recordings.

Q. Would that be more like the Terry Katzer method?

A. That's correct.

Q. Or the Andy and Tom Buqo method?

A. Yes. They both viewed prepared professional judgements on sustainability of water resource development and potential impacts based on their assessment of both hydrogeologic frame work and the water budget and perennial

yield.

Q. Okay. You touched upon earlier that certain meetings were held between you and others regarding creation of the numerical model. I've just handed you Exhibit 33 discussed yesterday by Mr. Pat Rogers. Have you seen Exhibit 33 before?

A. Yes, I have.

Q. Could you please briefly go through and describe the meetings and who was at such meetings in preparation of Exhibit 39?

A. You're referring to meetings specifically?

Q. Meetings or contacts or exchange of data.

A. There is a -- Well, actually the exchange of data takes us back to Table A and that's the actual formal submittals of both the model and the written documentation. And then there's also a listing there of the formal response back. We received written response back from each of the agencies, the BLM, Eureka County and the third party consultant preparing the EIS.

Q. Let's stop right there. What parties as you just named were involved or added to or subtracted from Exhibit 39? The county? You have Eureka County was present at these meetings?

A. I was referring to Table A which was formal submittals of data.

Q. Right.

A. Table B goes through a summary of meetings that have taken place to discuss updates to the model, how we may handle various comments as a group and those are summarized starting in March 3rd of 2009 through May 26th of 2010 and there are six meetings there.

You'll note also that one of these meetings looks like it's to the NEPA stakeholder committee also. So we did occasionally provide updates to that group.

Q. What does NEPA mean?

A. National Environmental Policy Act. It's what governs the environmental compliance, the BLM.

Q. You said NEPA committee. What is the NEPA committee?

A. I believe Mr. Rogers testified some to that. But it's a -- And I don't know how that committee is established. But it's representing the local stakeholders so that they have a voice and input to the NEPA process.

Q. I believe you testified earlier that the BLM took part in these meetings.

A. You'll note that four of the six were to BLM and stakeholders.

Q. Was Eureka County or its representatives present?

A. Yes. To my recollection they were present at, the technical consultants were present at these meetings.

Q. All right. You mentioned earlier the outside BLM consultant; is that correct?

A. That's correct. For this project, Enviro-Sciences is responsible for drafting the environmental -- the EIS document on behalf of BLM. They have a subconsultant, Hydrologic Consultants, Inc. They've had an acquisition and name change but that's their older name. Consulting firm out of Denver. And in particular, Dr. Dan Stone was the technical reviewer throughout the duration of the EIS submittal and comment period.

Q. Would it be a correct statement that Exhibit 39 was a compilation of thoughts and ideas by all of the members you just discussed?

A. That is true. There are comments from all parties incorporated in to this current body of work.

Q. Okay. In your opinion was Eureka County fully apprised of the progress of Exhibit 39?

A. In my opinion, yes.

Q. Did Eureka County submit written comments?

A. Yes, they do to each of our formal submittals and request for review.

Q. Are all or a portion of Eureka County's comments adopted and included within Exhibit 39?

A. All comments were carefully considered. Not all comments are incorporated in this document. And you'll see

in the county's review and in their submittals that they still have -- we still have some differences but these have been vented through the review process with the stakeholders.

On many occasions it was not our decision on whether to accept or reject a comment. We really had to look to the BLM and they relied heavily upon their third party consultant, Dr. Dan Stone, for advice. And I will try to shed some clarity on that when I go through their memorandum regarding our current effort.

Q. And subsequent to submittal, the BLM did in fact improve the model, Exhibit 39?

A. That's correct.

Q. And that's Exhibit 36. I'd now like to direct your attention to Exhibit 402. Do you see -- Have you seen Exhibit 402 before?

A. Yes, I have.

Q. When is it dated?

A. May 28th 2010.

Q. By whom was it authored?

A. By Carol Oberholtzer and Dale Bugenig.

Q. Okay. We will state that Exhibit 402 speaks for itself. Have you ever -- You have appeared before the State Engineer's hearing panel such as this many times before, have you not?

A. This is my 11th occasion to testify before the

State Engineer.

MS. JOSEPH-TAYLOR: You look so excited.

Q. (By Mr. de Lipkau) And during those 11 appearances have you always relied upon a numerical flow model?

A. No, I have not.

Q. Have you ever used the analytical method as previously testified to by Mr. Katzer?

A. Mr. Katzer being a water budget perennial yield hydrogeologic frame work concept, yes, we have utilized that on some occasions.

Q. Have you ever utilized the method utilized by Tom Buqo?

A. Yes. And that would be more of an analytical solution to projecting drawdown over time such as the Theis method, and yes, I have.

Q. Have you ever used the AQTEsolv method?

A. I have some, but Mr. Childress is my expert in running that software.

Q. And you of course have appeared before the State Engineer with numerical flow models?

A. That's correct.

Q. So these are -- What you have just testified then, there are at least four methods of determining the effect of groundwater pumping; is that correct?

A. That's correct, based on the different approaches that you've just described.

Q. Could a flow model correctly be depicted as a predictive tool?

A. That's correct.

Q. Isn't it true that a numerical flow model is only one of many tools available to determine effect of groundwater pumping?

A. Yes. As we just outlined, there are other approaches to describing that.

Q. Let's open Exhibit 39, would you, please. Are there changes between the 2010 numerical model and the 2008 numerical model?

A. Yes, there are a number of changes, all of which I view as being improvements to the model.

Q. What are the improvements? Besides more data please describe the more data.

A. I'll try to touch just on some of the primary changes that you'll note if you were to compare the Exhibit 116, 2008 document of the numerical flow modeling versus Exhibit 39 before us today. And those are outlined in chapter four. This report you'll notice is significantly revised as far as format over Exhibit 116.

However, I would like to note that chapters five through 11 in Exhibit 116 basically constitute now chapter

three. And you'll find much of the same information with some additional updated information on spring flow measurements or aquifer properties for material types. But otherwise, chapter three contains similar information.

Q. I'm sorry to interrupt. But for the record you refer to Exhibit 115 and 115 was the flow model introduced at the 2008 hearing?

A. 116 is what I meant.

Q. 116. At the 2008 hearing?

A. That's correct.

Q. All right. Please continue.

A. Okay. So chapter four now encompasses both the regional model documentation and what we call the local model documentation. The local model is an imbedded finer detail model around the pit. And if you recall in the 2008 hearing those were separate documents. Dr. Mark Thomasson with Montgomery and Associates provided some testimony on the local model.

These efforts have been combined in to one document collaboratively. A lot of work interactively with the Montgomery Group down in Tucson because there's a lot of inputs and outputs that are common now between the two models.

Chapter 41 goes through the developments and calibration of the regional flow model. Mr. Childress gave

an overview of the additional hydrogeologic work and the additional geological interpretations in the well fill. That effort -- Those efforts provide a substantial amount of new information and data which was incorporated in to the regional flow model in increments. But primarily the winter of last year there was some major updates in the well field area as a result of additional data collection.

Q. My thought in this additional well field data, how did that improve upon if that's the correct word in Exhibit 39. What's it based on?

A. The improvements?

Q. Yes.

A. Okay. I'll kind of go through some of the major areas where we've been able to better constrain the regional flow model. So when I say improve the model I feel like we've either improved the calibration or the fit of the model or we're able to now better constrain the hydrologic properties that were assigned to the model where we have test data. So there are two areas in the regional flow model where we have improved understanding of the hydrogeologic parameters based on ACTEsolv and also more detailed geologic mapping. One of those areas is in the well fill area and the other is at Mount Hope.

So Mr. Childress mentioned that now we believe the globin structure along lower Robbins Creek where a lot of

our wells are situated is floored in, with vinini clastic, sedimentary rocks rather than limestone rocks. That is one change.

There has been a lot of subtle refinements to the geology represented in the well field area to strive to more accurately represent the transmissivity that we documented during testing, storage coefficients that we were able to establish during testing. We have additional water level targets. We consider all the system to be in steady state. So this additional drilling and --

Q. Excuse me. What does steady state mean?

A. Steady state means that there are no, currently no influences, measurable influences of pumping being detected and affecting waters levels in the well field area.

Q. Please continue.

A. Mr. Childress referenced the fault at the base of the Roberts Mountains, that we think our data supports pretty firmly. There is a fault barrier conditioned there. We now have that represented the model. I'll describe that in a little more detail. It's not an impermeable fault but it is a low permeability barrier to flow.

Another aspect that we were able to gain in the well field area is we have six tests, three in alluvial basin-filled deposits and three in carbonate rock environment that lasts in duration from five to 31 days. We made what I

will call transient tests in the model and used the responses observed in that testing to further refine the calibration of the reading the model. There are also some clarifications there because the bed size in the regional model at its finest is 1,000 foot square. And we have some limitations there just in representing the very subtle complexities of the system. But in large we wanted to be able to capture the drawdown effects that we observed in the testing. And we have reasonably replicated those in the model.

I'm going to refer to just a few figures for clarity. The six tests that are provided some hydraulic constraints to the aquifer properties --

Q. Excuse me, Mr. Smith. Would you please refer to the page or figure number to which you are referring.

A. Yes, yes, I will. Those six locations are shown on Figure 3.6-1.

Q. Which volume?

A. This is all from Exhibit 39.

MS. JOSEPH-TAYLOR: Volume one or volume two?

THE WITNESS: All the figures are in volume two. All the text and tables are in volume one.

While we utilized aquifer testing characteristics wherever we had data available, the six wells that are all of this, 214-T, 216-T, 229-T, 222-T, 220-T and 228-T provide an important constraint in the well field area and also allowed

us to do some transit testing in the model area.

I'd like to refer to Figure 4.1-6 in Exhibit 39. In the center of this figure cutting diagonally in a northeast to southwest direction through the M in the Mount Hope label, you'll note what is labeled as a hydrologic flow barrier. It's a fault that Mr. Childress has referenced in his testimony from Exhibit 40. That fault obviously is important and when it comes to predicting long term drawdown and the extent of potential drawdown that could propagate in to the Roberts Mountains.

In the vicinity of Mount Hope, if you were to carefully compare the hydro -- the hydraulic conductivity distribution in the model from the 2008 version to the current version you'll notice refinements in that area.

And I would like to point to Figure 4.2-3 on Exhibit 39. Mr. Childress gave an overview of the drilling and testing work done in the well field area where currently there has been a very extensive drilling and testing program undertaken in the pit area also. And that included deep drilling to get hydraulic properties at the base elevation of the pit 3,000 feet in depth. It's included aquifer testing with additional observation wells drilled to support aquifer testing around the pit area. It's included updated potentiometric water levels, updated geologic mapping, updated geologic cross-sections. There's been a lot of work

which is summarized.

But just so you understand the magnitude of the effort that's been going on, it's been equally impressive up at the pit to generate actual data to help us constrain our modeling effort.

The difference, the regional model derives information from the local model. The dewatering and then evaporation rates coming off the pit lake derived from the local model. And those are input in to the regional model and the calibrated hydraulic properties in the local model area. Also there is -- there has been significant efforts for the regional model reasonably represent the local model hydraulic conductivities. And I say reasonable, the local model has 100 times the horizontal resolution of the regional model.

Q. What does that mean?

A. The local model grid sides in the pit area is 100 feet square, whereas it's a thousand feet square in the regional model.

Q. Okay.

A. So you can never exactly replicate the degree of detail done on the local model, but there's steps to do that as well as we can. The pit dewatering rates -- Oh, I should mention also in reference to Figure 42-25, that is a plot of simulated versus observed water levels for the local model

and the calibration on that model is now quite good. It's certainly improved over the version that was presented to the State Engineer in 2008.

Q. Could you please describe this pump test or exhibit with a little more detail.

A. This is a plot of simulated water levels on the Y and observed or measured water levels on the X. These are considered steady state or static water levels. These are the calibration targets for water levels for the local model. When I say calibration, the model is -- can be viewed as a regional stacking of blocks or cells and we adjust the hydraulic properties in every cell in the model and we also adjust the inputs of flow and the parameters that control the outfits. So our attempt is then what constrains this process and matching as best we can water levels distributed throughout the model.

So this is -- One of the ways we judge the ability of a model to reasonably replicate the physical system or trying to model. And ideally you would have every point falling on a perfect 45 degree line. But you can see the degree of offset is mild. And I consider that to be a very good fit to the actual data.

Q. Does that mean the model is calibrated properly or accurately?

A. It means to me that the model is sufficiently

calibrated to be used now as a tool to go forward with making predictions.

Q. Okay. Please continue.

A. Likewise, the local model also we had aquifer testing data in attempts to match the short term transient data. So dual step calibration in both of these model efforts where we used the transient testing data also to help further constrain calibration.

I want to draw your attention to the, if I can find it, the simulated dewatering rates now for the pit. Here we go. So the updated predictions of dewatering rates for the 32-year active mining --

Q. Would you please tell us the exhibit number or figure.

A. Sorry. It is shown is Figure 4.5-7. And the projected -- Oh, excuse me. I stepped ahead. I stepped ahead there. Sorry about that. We'll continue with this. So there's two parts to, probably of interest to the state as far as results out of the local model. One is the dewatering rates. And I haven't pulled up the right figure for that. But the values are up to a maximum of 460 gallons per minute. And actually I recall now that's shown on a table, I believe. Table 4.5-1 lists the predicted dewatering rates derived in the updated local model. And these are average annual flow rates. Flow rates could vary as the mine pit progresses and

fractions are encountered. It's envisioned still to be a sump operation. The maximum annual average inflows is estimated at 460 gallons a minutes. That compares with an estimated average annual maximum of 709 gallons a minute in the 2008 model. So our dewatering rates with the refinements and additional data collection efforts have decreased some. These rates are represented in the regional flow model.

Q. Let me stop you right there, Mr. Smith. Does your testimony include the inflow of Diamond Valley water during pumping or during mining or was it at the completion of mining?

A. The rates presented in table, let me find it again here, 451, those rates are -- represent inflow from all around the pit including Diamond Valley and Kobeh Valley. The pit is situated on the crest of the water shed divide. Approximately 80 percent of the pit is in the Diamond Valley hydrographic basin. Approximately 20 percent is in Kobeh Valley. So of the 460 gallon per minute rate depicted as a maximum annual, just ballpark, we would assign round numbers, three-quarters or 80 percent of that inflow from Diamond Valley hydrographic basin, 20 percent from Kobeh. That's a ballpark estimate.

Q. And you are aware that the applicant has more than that volume of water transferred to or previously permitted to the Diamond Valley side; is that correct?

A. That's correct. After mining of ore in the pit ceases, pumping of water in the pit will cease and a pit lake will start to develop.

Figure 4.5-7, one of the traces here it looks orange or red to me, it's a solid line, is the predicted groundwater inflow to the pit over time. And on the left-hand side is the rate in gallons per minute. The X axis on the bottom is the elapsed time in years. And you can see that it does take a long time, hundreds of years, to reach an equilibrated system around the Pit Lake. The predicted groundwater inflow rate is approximately 100 gallons per minute. This compares with a steady state strict inflow rate at Pit Lake calibration of 185 gallons a minute in the 2008 model. So again, it's a reduced number.

Q. And again there are adequate water rights to cover the approximately 100 gallons per minute inflow after cessation of mining?

A. That's correct. So these values are also input in to the regional flow model as part of the update.

A few other areas where there's been changes of note, how springs are stimulated in the model has been updated some, in part, I believe, to Mr. Felling's comments in our hearing in 2008 but also in part to other offered from the BLM and third party consultant and Eureka County.

Five of the regional springs are springs where we

have historic measurements of flow over time are now represented using head dependent flow boundary. It's a drain cell is what we call it in the MODFLOW. Those would be a Tonkin Spring, Shipley Spring, Thompson Spring.

Q. Excuse me. What exhibit are you referring to?

A. I'm sorry. I'm looking at now at Figure 3.4-8.

Q. Okay.

A. The Figure 3.4-8 doesn't show all the springs I'm going to list. But let's keep that open for a minute if we may. All the springs that I'm mentioning, however, are illustrated on Figure 4.1-6. So Tonkin Spring, Shipley Hot Spring, Thompson Spring, Hot Spring Hill and Kobeh Valley and the Bartine Ranch flowing wells are now representing using head dependent flux or boundary conditions.

So basically what that means is the potentiometric -- These springs are represented as a drain cell placed at depth between layers three down to six. So anywhere from several hundred to a thousand feet in depth in the model. And the amount of water that's taken out of that drain cell is dependent on the potentiometric head. And we adjust the conductance in that cell so we have a reasonable match with the steady state flow that we've reserved at these springs.

And for -- That gives us the -- That gives us an improved predictive capability to look at potential impacts

to flow derived from those springs.

Also you'll note on Figure 3.4-8 another area where we've added representation of spring to the model is on the south end of the Diamond Valley playa. And from a seven and a half minute topographic map published in the 1980 or early '80s time frame there are over 50 map springs on the south end of the playa.

From our observation in the field, these springs have effectively dried up. It was very wet conditions down around Sulfur Springs and there was maps of meadows and tooles in that area, flowing artesian wells, a number of those are noted with the blue, multi-shaded blue-colored symbols. Those would be sources that cease to flow today as does Thompson Spring on the west side of Diamond Valley has ceased to flow since we believe the 1990s. And I personally observed water level at the main spring flow at 6.1 feet below the rim in 2007 I believe at Thompson Spring. So that we felt was a condition of daylighting of the water table, very shallow water table conditions. We felt like that should be represented in the model. That did to some degree alleviate flooding cell conditions on the south end of the playa, which was the topic of discussion in the last hearing. We'll talk a little bit more about flooded cell issues. All of the spring flows are routed back to layer one.

Q. Are what?

A. Are routed, the flows are routed from the layer that we have removed them from, anywhere from layers three to six back up to layer one.

Q. One is the top?

A. Yeah. There are eight layers in the numeric flow model. Layer one is the land surface down to approximately 50 feet in depth or greater. So it's representing the shallowest water table conditions.

So all the spring flow routed back up to layer one and the same quantities or approximately full quantity to what they're being simulated to be produced from depth. That allows them the ability to then feed ET, evapotranspiration, at the surface. We're trying to have a complete accounting of the water cycle that we're trying to represent in the model.

There are two exceptions. And at Tonkin Spring we decided that routing that water back to layer one was not appropriate because we have allocated that discharge from Tonkin Spring, which is the major source of water to the main creek. We have allocated that as recharge as the flow in to Denay Creek progresses down and out in to the valley floor. So we thought it would be inappropriate to reroute that back there to layer one when the counting that source is recharge further down in the system.

And as I've described near the playa, those drain

cells actually represent the water table conditions from layer one.

Q. Excuse me. When you say playa, where on Figure 3.4-8?

A. The playa is the light-colored surface in the upper right-hand corner of Figure 3.4-8.

Q. Okay. Thank you.

A. So that is spring modifications and improvements that were made to the model.

On recharge distribution, there's been some refinements to recharge distribution in the model and also some refinements to mountain block hydraulic conductivities in response to trying to minimize the condition of flooded cells in the mountain blocks. And flooded cell for clarity is when the water level in my layer one cell when the predicted water level is above the top of the cell, it's loose terminology but we call that a flooded cell. Now, that does not mean that there is actual pooled water on top of the cell, because the type of layer, layering that we've used converts to a confined cell when the water level reaches the top of the cell. So when the water level is below the top of the cell, the flow equations are unconfined. When the water level exceeds the top of the cell, it is simply representing an artesian or confined condition. That's all that it's representing.

There are "flooded cells" in every model, in all layers of the model because they're confined conditions representing in all layers of the model. At some locations, for example, Well 152 north of the pit has an artesian head of, well, a minimum of 25 PSI, 70 feet. So actually what I'm trying to match in or model in both of our models is conditioned where layer one is flooded and the potentiometric head is actually above land surface. That is a real condition on the ground we're trying to represent.

In other location that's a similar condition we're trying to represent where the water table is at or near the surface and we have a lot of datelining of the water table at the surface that could be a similar condition.

But this version of the model early on we adopted some calibration to try to minimize flooded cells where we really didn't have data to suggest that they do or do not exist in the mountain blocks per se.

So the version we have before you today hasn't absolutely resolved eliminated all flood cells. But it is down to less than one percent of the total number of cells in layer one. There are approximately 112,000 active cells in this model. That's the building blocks. Layer one has approximately 14,000 active cells. I believe Ms. Oberholtzer pointed out that the current calibrated model has 127 flooded cells in layer one. The fact is we feel like we've made a

good improvement in that area.

In regards to evapotranspiration, ET, there were some refinements early on after the State Engineer's hearing in 2008. We basically concurred and adopted maximum ET rates and extinguishing depths for ET that had been reviewed and conveyed to us by Mr. Walker.

And so the model today has rates that are constrained and are below the potential evapotranspiration and the extinction depths are 40 feet for shrubs, ten feet for salt grass community meadows, five feet for playa.

Q. For what?

A. For the playa. I believe that's a fair characterization of the major changes that have -- that you'll observe in this version of the model. There have been a lot of finer refinements and iterations and calibrations. The current calibrated model is improved over the version presented in 2008.

Let me refer to a table in this regard. Table 4.1-10, summary of steady state regional model calibration statistics. Part of our reporting now is we break out calibration statistics by hydrographic basin.

MR. FELLING: Excuse me. What page is that on?

THE WITNESS: Oh, this is back in the tables, so no page number. But it's Table 4.1-10. So it's section four, chapter four table.

So these are similar reporting of calibration statistics for the model. And I'll just refer to the very, under the second column from the right entire model domain, calibration statistic to the last two residual standard deviation divided by the range is at 2.1 percent and the previous model it was around 2.8 or 2.9 percent. And absolute residual meaning for the range is 1.5 percent, whereas if I recall correctly it was about two percent in the previous model. So calibration has also been improved.

And I'd like to refer to a plot of the calibration. So a similar plot is represented in Figure 41-25 similar to that presented in for the local model with simulated water levels on the Y axis and observed on the X axis. And again, we feel like we've achieved a pretty good match, a good match.

In the steady state model we have approximately 180 calibration targets for water level.

Another aspect of the model which was also reviewed was the transient calibration for Diamond Valley. I can't say that we really have improved the calibration in Diamond Valley. We certainly have spent a considerable amount of time looking in to the transient conditions in Diamond Valley. Of note, which was described, I believe, in the 2008 hearing is there was a period from the mid-80s to the mid-90s where two data that we have suggests relative

reduction or absence of drawdown for a period of time which does not correlate with our records of pumping for the basin which are derived from your office crop inventory data.

We know that we had some very wet years especially in 1983 and we attempted to couple a recharge in Diamond Valley to hydrogeologic conditions, various different functions and precipitation, but it did not improve the fit of the model. We could perhaps alleviate some of the, some of that condition, but overall we weren't improving the fit and the reason is because there were other periods within that span of record that we calibrated to, 1956 to 2006, that were quite wet but we didn't see a mild or similar response. Equally there were some very dry conditions but we didn't see an equal or opposite type response in water levels. So absent a real definable tangible explanation for water levels, the actual water level data during that time frame, we basically fell short of trying to improve the model to simulate that.

I think first we would have to understand the physical process better and then from that point try to replicate the model. We were trying to test different hypothetical solutions there. And at the end of the day it was not improving the fit of the model. •So we left the recharge as a constant rate throughout that transient simulation period.