BEFORE THE

CALIFORNIA STATE WATER RESOURCES CONTROL BOARD

CALIFORNIA WATERFIX WATER RIGHT CHANGE PETITION HEARING	)))

JOE SERNA, JR. BUILDING

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

COASTAL HEARING ROOM

1001 I STREET

SECOND FLOOR

SACRAMENTO, CALIFORNIA

Thursday, October 20, 2016

9:00 A.M.

Part I-B

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Reported by: Megan Alvarez, RPR, CSR No. 12470
Certified Shorthand Reporter

APPEARANCES

CALIFORNIA WATER RESOURCES BOARD

Division of Water Rights

Board Members Present:

Tam Doduc, Co-Hearing Officer
Felicia Marcus, Chair & Co-Hearing Officer
Dorene D'Adamo, Board Member

Staff Present:

Diane Riddle, Environmental Program Manager
Dana Heinrich, Senior Staff Attorney

Part I-B

For Petitioners:

California Department of Water Resources:

James (Tripp) Mizell, Esq.
Thomas M. Berliner, Esq.

The U.S. Department of the Interior:

Amy L. Aufdemberge, Esq.

INTERESTED PARTIES:

State Water Contractors:

Stefanie Morris, Esq.

California Water Research:

Deirdre Des Jardins, Esq.

San Luis & Delta-Mendota Water Authority:

Daniel O'Hanlon, Esq.

INTERESTED PARTIES (Continued):

Westlands Water District:

Philip A. Williams, Esq.

Save the California Delta Alliance; Janet & Michael McCleary; Frank Morgan; and Captain Morgan's Delta Adventures, LLC:

Michael Brodsky, Esq.

The Sacramento Valley Group:

David Aladjem, Esq.

North Delta Water Agency & Member Districts:

Kevin O'Brien, Esq.

For The City of Roseville, Sacramento Suburban Water District, San Juan Water District, The City of Folsom:

Alan Lilly, Esq.
Ryan Bezerra, Esq.

For Brett G. Baker, Local Agencies of the North Delta, Bogle Vineyards/Delta Watershed Landowner Coalition, Diablo Vineyards and Brad Lange/Delta Watershed Landowner Coalition, Stillwater Orchards/Delta Watershed Landowner Coalition, Islands, Inc., SAVE OUR SANDHILL CRANES and Friends of Stone Lakes National Wildlife Refuge, City of Antioch:

Osha Meserve, Esq.

Central Delta Water Agency, South Delta Water Agency (Delta Agencies), Lafayette Ranch, Heritage Lands Inc., Mark Bachetti Farms and Rudy Mussi Investments L.P.:

John Herrick, Esq.
Dean Ruiz, Esq.

INTERESTED PARTIES (Continued):

Biggs-West Gridley Water District (BWGWD), Glenn-Colusa Irrigation District (GCID):

Andrew M. Hitchings, Esq.

The Placer County Water Agency:

Dan Kelly, Esq.

California Sportfishing Protection Alliance (CSPA), California Water Impact Network (C-WIN), and AquAlliance:

Michael Jackson, Esq.

I N D E X

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(NO EXHIBITS WERE MARKED)

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OCTOBER 20, 2016 - THURSDAY 9:00 A.M.

P R O C E E D I N G S

V O L U M E 2 0

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CO-HEARING OFFICER DODUC: Good morning, everyone. Please take your seats. It's 9:00 o'clock, and we are resuming the water hearing on the water right change petition for the California WaterFix project. Welcome back to everyone.

The subject petition request to add two points at points of diversion of water to water rights of the petitioner, the Department of Water Resources and the U.S. Bureau of Reclamation, needed for the WaterFix project.

I am State Water Board member and Board Hearing Officer Tam Doduc. To my right is both chair and Co-Hearing Officer Felicia Marcus. To the chair's right is Board Member DeDe D'Adamo. To my left are Senior Staff Attorney Dana Heinrich and Environmental Program Manager Diane Riddle. We have other staff assisting us today.

Our usual standard announcement before we begin. Please take a look around now and identify the exits closest to you. Should an alarm sound, we will evacuate this room immediately. Take valuables with you

and take the stairs, not the elevators, down to the first floor, exit the building, and we will meet in our relocation site across the street in the park.

If you cannot use the stairs, please flag one of the staff and we will be directing you into a protected area inside a stairwell.

As a special welcome back treat today, we have the Great California ShakeOut, in which we will be participating at 10:20 this morning. You might have seen the flyers coming into this building. During this exercise, we will practice how to protect ourselves in the event of an earthquake.

We will likely be on a break during that time, because that's around our usual break time. But we urge you to participate in the drill on your own, which should only take a few minutes.

The safe response for an earthquake is to drop, cover, and hold on. Drop to the floor on your hands and knees -- I really want this to be Webcast -- preferably below the seats, cover your head and neck with one arm and hand, and take cover under a sturdy desk or table, if one is handy, and hold on firmly until the shaking stops.

If no table is near by, drop to the floor near an interior wall and cover your head and neck with your

arms and hands. Stay away from windows and mirrors.

Do not leave a building during the earthquake. If you have mobility impairments and cannot move, just go ahead and protect your head and neck with a pillow -- I don't see any handy -- or your arms if you are able.

Okay. We will be observing all of you during that process.

CO-HEARING OFFICER MARCUS: We'll be under the table.

CO-HEARING OFFICER DODUC: Second announcement: This is being Webcast, as usual. Both the audio and the video are being recorded. Please speak clearly into the microphone and begin by stating your name and affiliation.

The court reporter is present today and will be preparing a transcript of this entire hearing. The transcripts will be posted on our Web site as soon as possible after the completion of Part I-B.

If you would like to receive this transcript sooner, please make arrangements with the court reporting service.

The transcripts from Part I-A have already been posted on the Website.

And as most of you know by now, the most important of the announcement of the day is please take

a moment to turn off or mute your cell phone or any and all noise-making devices. Even if you think it is already off or muted, please take a moment and double-check.

Okay. Before we get started, a brief recap is in order. As the parties are aware, we're conducting this hearing in parts. Generally, Part I of the hearing focuses on the potential impacts of the changes requested in the petition on humans uses of water. And Part II will focus on the potential impact of the changes on fish, wildlife, and other instream beneficial users of water.

Part I is further divided into two parts, Part I-A and I-B. At the end of September, we concluded Part I-A of the hearing after -- at the end of September, we concluded Part I-A of the hearing. And today we will begin Part I-B.

Let me take a moment right now and say thank you to all of you who participated in Part I-A.

At the beginning of these proceedings, I stressed the importance that this be conducted and completed in a way that is -- that demonstrates efficiency, transparency, and integrity.

And -- I heard a noise.

And all of you who participated in Part I-A, I

want to commend you on your conduct and participation in that portion. You tremendously helped us down the path toward achieving the goals that I mentioned earlier.

Now we're getting ready to move into Part I-B, and I would expect that it will be even more complicated in I-B given the number of parties that are engaged in the cases in chief, given, from what I can tell from the testimony, the breadth of issues and topics that will be covered, given what I would expect to be more a heightened level of intensity, and given that what is at stake for many of the parties.

So as we proceed into I-B, given the good experience of I-A under our belt, I'm going to ask all of you to take it even a notch higher, to step up even more and put even more effort into coordinating amongst the parties on your cases in chief and in your cross-examination to work on organizing your witnesses, as you've done so well, and in ensuring that you maximize the use of your time during this hearing to effectively convey the information that you need to convey, to add value to the record, and help all of us better understand the complex matters that you are presenting before us.

I would also ask that you take this time to also further focus on the scope of what is before us.

There are a lot of different opinions with respect to what is before us. There are a lot of different perspective, a lot of concerns. And while they're all legitimate and important, the board has a very narrow focus in terms of what is before us in terms of what decision that we need to make. So I would encourage you, as you present your cases in I-B to be even more focused on what is before us.

And, finally, I would encourage you to be even more judicious and careful in terms of the motions and the requests that you file in writing to us, especially when it comes so repeated motions and requests upon which we have already ruled. They are certainly important. We will certainly take them into consideration.

But even more important, I believe, is for us to focus on what you're presenting to us during I-B. This amended amount of evidence and information and facts that you're presenting under I-B is what we want to focus our time and energy on rather than looking at revisiting rulings that we have already issued.

So I would encourage you to continue what you've done in I-A. You've done a tremendous job of that. Raise it up a notch even more and help us go forth in I-B in a way that remains specific with our

goal of achieving efficiency and transparency and ultimately ensuring the integrity of the decision that the board makes.

Thank you for that aside from the hearing officer. I will go back to the script.

And so in I-B, we will look to the parties to present their testimony and exhibits and to the petitioners and other parties to conduct cross-examination of these witnesses.

Only parties who submitted a notice of intent to appear in Part I in accordance with the hearing notice and on subsequent rulings may participate in this evidentiary portion of the hearing.

All right. So let's get to the order of proceeding in Part I-B.

This hearing is being held in accordance with the October 30th, 2015, notice of petition and notice of public hearing and prehearing conference and subsequent revised notices and rulings.

Our most recent ruling dated October 7th addressed objections to written testimony submitted for Part I-B of the hearing on the grounds that the testimony is not relevant to the key issues noticed for Part I of the hearing and several other outstanding procedural issues concerning the participation of some

of the parties in Part I-B.

We directed certain parties to revise their testimony to eliminate the subject areas outside of the scope of Part I and to submit revised written testimony, along with a revised exhibit identification index, no later than noon on October 17th.

We also advised the parties that the remaining objections to testimony and exhibits submitted for Part I-B of the hearing will be addressed after the respective parties have the opportunity to respond to the objections and present their cases in chief.

Our October 7th ruling did not address a motion to dismiss the WaterFix petition filed by The Pacific Coast Federation of Fishermen's Associations and The Institute for Fisheries Resources.

The motion raises many issues we have already addressed in previous rulings. As we have informed the parties before, we discourage duplicative motions and may not acknowledge or respond to repetitive arguments.

Accordingly, we do not intend to respond to many of the legal arguments made in this motion. To the extent that the motion raises issues concerning the admissibility or reliability of the evidence that has been submitted by petitioners, those issues will be addressed in our forthcoming ruling on the admissibility

of petitioners' exhibits.

PCFFA's and IFR's arguments that petitioners have not met their burden of proof should be advanced in their closing brief at the appropriate time and will be addressed in our final order on the merits.

Since we issued our last ruling, we have also received a suggestion from the Sacramento Valley water users that we hold a scheduling conference on October 28th for the purposes of establishing dates when witnesses will be expected to be available.

While we appreciate the suggestion, we do not believe a scheduling conference will be helpful. Many parties have notified us that their witnesses are unavailable on certain days. Given the number of parties and witnesses participating in this part of the hearing, it is impossible to set a schedule in advance or to accommodate all of the witnesses' various scheduling conflicts.

Instead, we will expect the parties and their witnesses to be available in the established order unless we approved a deviation. It will be incumbent on the parties to organize their own cases in chief and to coordinate with other parties to the extent necessary to accommodate their witnesses' scheduling conflicts.

The parties should notify us and other parties

as far as in advance as possible of any proposed scheduling changes.

At the beginning of each party's case in chief, the party may present an opening statement. Opening statements should briefly summarize the party's position and what the party's evidence is intended to establish.

As with petitioners in Part I-A, we have allowed the parties a total of 20 minutes each to present both an opening statement and any policy statements. Consistent with that time limit, we ask and trust that those parties who have presented policy statements in Part I-A or who will present policy statements immediately before opening statement in Part I-B to reduce the amount of time that they spend on their opening statements accordingly.

As explained earlier, we will also accept written policy statements.

After each party's opening statement, we will hear oral testimony from the party's witnesses.

Witnesses should begin by testifying -- by identifying their written testimony as their own and affirm that it is true and correct. Witnesses should summarize the key points in their written testimony and should not read their written testimony into the record.

Pursuant to the hearing notice, the oral summary of written direct testimony is limited to 20 minutes per witness and a total of one hour per party subject to an extension for good cause.

Many parties have estimated on their notice of intent to appear that presentation of their direct testimony will take longer than the amount of time allowed. Notwithstanding these estimates, we expect to parties to adhere to the time limits unless we approve an extension.

We are aware that several parties have submitted written requests for additional time. These requests will be reviewed and addressed individually before the parties in question present their case in chief.

Direct testimony will be followed by cross-examination by the other parties and then, if necessary, followed by questions from board members and the hearing team staff.

Some parties intend to present witnesses in panels. In that case, parties will cross-examine one panel at a time following each panel's direct testimony.

Please note that in accordance to the rules governing statewide board hearings, the scope of cross-examination is not limited to the scope of a

witness's direct testimony.

Each party will be limited to one hour of cross-examination per witness or panel of witnesses. I will allow additional time for cross-examination if there is good cause demonstrated in an offer of proof. We expect, however, that all parties will be efficient in their cross-examination.

After completion of direct testimony and cross-examination for each panel, redirect testimony and recross-examination limited to the scope of the redirect testimony may be permitted. Time limits will be determined at that time.

All right. The parties will present their case in chief in the order provided in the chart sent out yesterday. I believe you have a chart that is entitled "Draft Order of Presentation for Part I-B." There are additional copies.

The parties will conduct cross-examination and any recross-examination in the same order.

Unless any party objects, I will skip reading the list of parties who are presenting direct testimony. I ask, however, that parties speak up now if there are any errors on the list of names.

Did everyone have a chance to review the draft order of presentation for Part I-B? Are there any

concerns at this time?

MR. BEZERRA: Ryan Bezerra, Bartkiewicz, Kronick & Shanahan, for the Cities of Folsom, Roseville; Sacramento Suburban Water District; and San Juan Water District.

I just would like to take a little bit of time to review it. The amended one came in late last night. I didn't have a chance to review it. So I would like to have a couple minutes to take a look.

CO-HEARING OFFICER DODUC: Okay. I see a lot of people grabbing sheets. I'm assuming everybody needs a little more time.

Mr. Brodsky?

MR. BRODSKY: The names of the witnesses are correct. I take it that the order that you have on witnesses, we can choose that.

CO-HEARING OFFICER DODUC: That's correct.

MR. BRODSKY: Quick procedural question on closing briefs. It was unclear to me before this whether or not closing briefs were going to be called for, so I take it that we are going to have closing briefs?

CO-HEARING OFFICER DODUC: I expect we will.

MR. BRODSKY: And then would there be closing briefs at the end of Part I and then another one at the

end of Part II, or just one at the very end? Maybe that's something you want to think about.

CO-HEARING OFFICER DODUC: We will definitely think about it and let you know.

MR. BRODSKY: Typically, when you have an opening statement, then you have a bookend, a closing brief. And we have two opening statements, one for Part I and one for Part II. That's something to think about for the future. Thank you.

CO-HEARING OFFICER DODUC: Thank you, Mr. Brodsky.

Let's do this: Let's give everyone a chance to review the draft order presentation and e-mail the -- the hearing team, e-mail if there are any concerns associated with it.

Ms. Heinrich, is there a problem with that? Do we need anything on the record right now regarding this?

Okay. Let's do that.

So by the end of -- actually, since we're starting with Group 7, and I believe Group 7 is ready, let's give everyone until noon tomorrow to e-mail to the hearing team -- e-mail any problems or changes to the order of presentation.

All right. Again, we encourage all parties to

be efficient in presenting their oral testimony and conducting their cross-examination.

Except where Hearing Officer Marcus or I approve a variation, we will follow the procedure set forth in the board regulations, the hearing notice, and our previous rulings.

After all cases in chiefs are completed, the parties will be permitted to present rebuttal testimony or exhibits that are responsive to either the petitioners' case in chief in Part I-A or the remaining parties' cases in chief presented in Part I-B.

Before rebuttal, we will rule on any evidentiary objections to the parties' testimony or exhibits so that it is clear what exhibits have been accepted into evidence.

We will inform the parties at a later point in time if we decide to impose any additional procedural requirements to the presentation of rebuttal testimony or exhibits.

I think that finishes my procedural script.

Are there any remaining procedural issues that we need to discuss before we get to the presentation by Group 7?

Yes, Mr. Berliner?

MR. BERLINER: Good morning. Tom Berliner on

behalf of the Department of Water Resources.

On Monday, the parties were to submit their revised testimony distinguishing between Part I and Part II. In our view that there are a number of parties that fell short on that endeavor, and it seems it would be appropriate at some point in the very near future so that we know what's going to be included on Part I, that we come to agreement on what is out and what is in.

We have some concerns that a number of parties left quite a bit of Part II information in their Part I testimony, and we'd like, perhaps, the hearing officer to set a date where we could have a discussion about that. Or if you want something in writing, or how would you like to handle that?

CO-HEARING OFFICER DODUC: Thank you for bringing that up, Mr. Berliner.

We are in process of the reviewing resubmitted exhibits and testimony. And if anyone wishes to -- to put into the record any concerns or comments with respect to that, please do so. Let's set a deadline of noon on next Friday.

I'm looking at Ms. Heinrich and staff because we'll need time to review that ourselves.

So noon next Friday?

MR. BERLINER: Week from this Friday?

CO-HEARING OFFICER DODUC: Week from this Friday.

MR. BERLINER: Thank you very much.

CO-HEARING OFFICER DODUC: Any other procedural matters?

All right. As Group 7 comes up, I understand that you've asked for 30 minutes each for your first three witnesses, and you are granted that request.

Mr. Lilly, will you be presenting your opening statement first?

MR. LILLY: Yes.

CO-HEARING OFFICER DODUC: I will wait to administer the oath until after you're done.

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OPENING STATEMENT

MR. LILLY: Hearing Office Doduc, Hearing Officer Marcus, Board Member D'Adamo, State Board staff, good morning. My name is Alan Lilly. And I represent the Cities of Folsom and Roseville, San Juan Water District, Sacramento Suburban Water District, and Yuba County Water Agency.

These agencies are part of the larger Sacramento Valley water users group which has been denominated as Group 7 and includes over 40 different water purveyors in the Sacramento Valley.

This morning, we are presenting Panel 1 for Group 7, and we have certainly taken the hearing officer's admonitions to heart and are trying to organize the testimony. I can assure you, even though we have seven panels, it's much more efficient than if we had 40 different parties each presenting a case, much more efficient.

And Panel 1 includes the testimony of Walter Bourez and Dan Easton of MBK Engineers, and both of them are here this morning.

Now, during Part I-A of the hearing, the petitioners presented various exhibits and testimony which they argue shows that the California WaterFix Project will not injure any legal users of water. Their argument was primarily based on the results of their CalSim II and DSM2 modeling work.

And one of the primarily model results was that if the California water project is built and begins operate, the upstream CVP and SWP reservoirs would continue to be operated in the same manner as they have in the past.

Petitioners presented modeling results from which they argued -- excuse me -- that they argued was a boundary analysis. And then they presented exceedance plots showing that, under almost all conditions and at

almost all exceedance probabilities, the end-of-September storage in Shasta, Oroville, and Folsom Reservoirs would actually be higher under each of the four Cal WaterFix scenarios that they modeled then under the no-action alternative.

As we pointed out during cross-examination, this result is counterintuitive because one would expect that if the twin tunnels were constructed and in operation, the DWR and the Bureau of Reclamation could -- would release additional water from storage from their upstream reservoirs, convey that water through the tunnels for Delta exports, so that the end-of-September storage in these reservoirs actually would be lower with the CalWaterFix Project than under the no-action alternative.

And this is what the exhibits and testimony of Mr. Bourez and Mr. Easton that they're presenting today will show. Their exhibits and testimony will show that the fundamental problem with petitioners' modeling is that it is not a true boundary analysis.

Specifically, while the four scenarios in petitioners most recent modeling that they presented for this hearing cover a range of potential Delta outflows, they do not cover a range of potential operations of the CVP and SWP reservoirs, even though DWR and reclamations

could, while complying with all applicable regulatory requirements and their proposed requirements, in fact, operate these reservoirs in a significantly different manner than the manner in which petitioners have presented in their modeled operations of these reservoirs.

Now, specifically, Mr. Bourez' and Mr. Easton's exhibits and testimony will explain the following four types of defects in the petitioners' modeling that basically show that it's not a true boundary analysis.

First, the petitioners' modeling does not consider the additional conveyance capacity that would be made available by the twin tunnels, even though it is likely that if these tunnels are built and begin operations, that DWR and reclamation would, in fact, use them and the additional conveyance capacity that would be provided by them to, under certain circumstances, release additional water from upstream reservoir storage and convey it through the tunnels for Delta exports.

Second, petitioners' modeling includes limits on the models used in joint point of diversion. And I know you have heard some about joint point of diversion. And Mr. Bourez and Mr. Easton will explain that in more

detail; that it's basically the situations where the Bureau of Reclamation can use otherwise unused State Water Project Delta export capacity.

And we -- their testimony will show that the modeling submitted by petitioners incorrectly limits the amount of water that reclamation could convey under the joint points of diversion if the tunnels were in place.

Third, contrary to some statements by petitioners' witnesses, petitioners' modeling actually does make some changes in the operations assumptions for the CVP and SWP reservoirs and, specifically, the San Luis rule curve, and they will explain that in more detail.

And they will explain that these changes actually artificially and incorrectly limit the amount of water that is modeled as being released from the upstream reservoirs and conveyed through the Delta for Delta exports.

And then fourth, petitioners' -- the testimony will show that petitioners' modeling incorrectly constrains diversions of excess Delta outflows where the constraints go beyond the limit actually stated in the CalWaterFix biological assessment that they have relied on for their project description.

So Mr. Bourez' and Mr. Easton's testimony will

show that when these modeling defects are corrected, several of the petitioners' modeling results have actually changed very significantly. I won't go into all the details, but I will say here that the model Delta exports by the CVP and SWP could be almost three times as high as petitioners' modeling shows.

And, secondly, while petitioners' modeling shows that the average end-of-September carryover storage in the upstream CVP and SWP reservoirs would increase by approximately 100,000 acre feet, the corrected model made by Mr. Bourez and Mr. Easton shows that the most reasonable and most likely scenario is that the upstream carryover storage, end-of-September storage actually decrease.

(Reporter request for clarification.)

MR. LILLY: Excuse me. I'm getting a little buzz here, so I'm trying to live with it. I apologize. I don't think it's me; I think it's the system. I don't have crackles in my voice normally.

Anyway, what I was saying was while the petitioners' model results show that the annual carryover storage in upstream CVP and SWP reservoirs would increase by approximately 100,000 acre feet, MBK's corrected modeling shows that this upstream storage actually would decrease by approximately 300,000 acre

feet, so a change in the opposite direction and by a significant amount.

And, finally, that Mr. Bourez' and Mr. Easton's testimony will show that this lower upstream reservoir carryover storage could significantly impact CVP and SWP operations and, as a result, could have significant impacts on legal users of water.

So that's -- that summarizes my opening statement for Panel 1. And with that, we're ready to proceed with our testimony.

CO-HEARING OFFICER DODUC: All right. If the witness will please stand and raise your right hand.

WALTER BOUREZ; DAN EASTON,

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

CO-HEARING OFFICER DODUC: Thank you.

Mr. Lilly, you may begin.

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DIRECT EXAMINATION

MR. LILLY: And we have gone over this testimony to try to get a time estimate. Our current rough estimate is it will take about two hours. We understand what the board's normal practice is. We'll see where we are after one hour and we will tell you

where we are. And we do have slides, so it will be pretty clear where we are and how much more we plan to do.

As I said before, we are giving it on behalf of the 40 different parties.

CO-HEARING OFFICER DODUC: Thank you.

And having looked at the exhibits provided by this panel, I fully expect you will need that time.

MR. LILLY: All right. We'll get started, then.

First, let's start with you, Mr. Bourez. Please state your name and spell your last name for the record.

WITNESS BOUREZ: Walter Bourez, B-O-U-R-E-Z.

MR. LILLY: And have you taken the oath for this hearing today?

WITNESS BOUREZ: Yes, I have.

MR. LILLY: Mr. Easton, please state your name and spell your last name for the record. You have to be right up next to the microphone and turn it on.

WITNESS EASTON: Dan Easton, E-A-S-T-O-N.

MR. LILLY: And have you taken the oath for the hearing this morning?

WITNESS EASTON: Yes, I have.

MR. LILLY: Now, Mr. Bourez, please examine

Exhibit SVWU-100. And I'll ask you: Is this an accurate statement of your written testimony for this hearing?

WITNESS BOUREZ: Yes, it is.

MR. LILLY: And is Exhibit SVWU-101 an accurate statement of your professional education and experience?

WITNESS BOUREZ: Yes.

MR. LILLY: Referring to Exhibits SVWU 102, 103, and 104, were these exhibits prepared by you and people working with you?

WITNESS BOUREZ: Yes.

MR. LILLY: Does Exhibit SVWU-102 contain your technical comments on the Bay Delta Conservation Program hydrological modeling?

WITNESS BOUREZ: Yes.

MR. LILLY: And does Exhibit SVWU-103 contain your technical comments on the partially recirculated draft EIR and supplemental draft EIS for the California WaterFix Project?

WITNESS BOUREZ: Yes, it does.

MR. LILLY: Does Exhibit SVWU-104 contain your technical comments on the Bureau of Reclamation's draft environmental impact statement for long-term operations of the CVP and SWP?

WITNESS BOUREZ: Yes.

MR. LILLY: Now, Mr. Easton, turning to you, is Exhibit SVWU-105 an accurate statement of your written testimony for this hearing?

WITNESS EASTON: Yes, it is.

MR. LILLY: And is Exhibit SVWU-106 an accurate statement of your professional education and experience?

WITNESS EASTON: Yes, it is.

MR. LILLY: Shifting back to you, Mr. Bourez, referring to Exhibits SVWU-107, -108, and -109, were these exhibits prepared by you and people working with you?

WITNESS BOUREZ: Yes.

MR. LILLY: Is Exhibit SVWU-107 the report that you and Mr. Easton prepared describing your review of the hydrological modeling that petitioners prepared for the CalWaterFix biological assessment and your follow-up modeling work?

WITNESS BOUREZ: Yes, it does.

MR. LILLY: And is Exhibit SVWU-108 a report on the example that you and Mr. Easton prepared describing the potential effects of California WaterFix on upstream reservoir storage?

WITNESS BOUREZ: Yes.

MR. LILLY: And then is Exhibit SVWU-109 the report that you and Mr. Easton prepared describing your evaluation of the boundary analysis modeling that the petitioners submitted for this hearing?

WITNESS BOUREZ: Yes.

MR. LILLY: And now I'll shift and spend some time and I'll ask Mr. Baker to put on the screen Exhibit SVWU-110.

Mr. Bourez, does that exhibit contain the slides that you and Mr. Easton prepared for this hearing?

WITNESS BOUREZ: Yes, it does.

MR. LILLY: Now, using those slides, please summarize your testimony.

WITNESS BOUREZ: Okay. I'd like to move to Slide 2. This slide shows an overview of our testimony we're presenting today.

First we're going to present our review of the California WaterFix boundary analysis and then -- and that was performed by the petitioners. That's their modeling.

Next we're going to go through some MBK modeling where we prepared a two-year example of how we believe the CVP/SWP system will operate with the California WaterFix and in the no-action alternative.

And next we're going to go through our previous technical records. We're not going to spend a lot of time going through our previous documents.

So the first one is Dan and I worked on review of the ECP modeling in 2012, 2013 and completed our report in 2014. And we're going to summarize that very briefly.

Next are our technical comments on the recirculated draft environmental document and review of that modeling. We submitted comments, and we are just going to summarize those briefly. And we've also got comments on the long-term operations of the CVP and SWP environmental impact statement.

There are some comments there regarding climate change and other parameters that is common with the California WaterFix model that we use for the biological assessment. And those comments are relevant to modeling submitted by petitioners for this hearing.

Lastly, we're going to present our review of the California WaterFix biological assessment modeling. And we spent more time on this than we have the rest of the modeling because it was our understanding that this modeling was going to be used for case in chief by the petitioners for this hearing. So we reviewed that in detail. And we've also performed independent modeling

with the assumptions in the California WaterFix biological assessment.

There's a lot of information we're presenting to this panel today. Just our basic themes are that was modeling performed for the WaterFix for BDCP did not provide sufficient information for us to understand how the California WaterFix would affect CVP/SWP operations and water users.

Next, the boundary analysis does not bound the range of potential operations that we can see with the California WaterFix.

The California WaterFix modeling assumes -- has some unrealistic assumptions of project operations. And within the existing regulatory requirements and within the described California WaterFix project, there is a myriad of ways to operate the CVP/SWP system.

Dan and I have performed independent modeling, and that modeling could be considered one of the boundary analysis or part of the boundary analysis. It is a way that the project can operate, and there's nothing within the descriptions or current regulatory requirements that would prevent that operation from occurring.

Another key theme here is that the project operations, the assumptions for the operation of

CVP/SWP, is not defined enough with the project to understand what the effects might be.

The key parameters here are the spring outflow requirement in the preferred alternative. The biological assessment describes that outflow as an exceedance probability, while it was modeled as an export constraint.

And we'll demonstrate, as we go through our presentation today, that you get very different effects of the entire CVP/SWP system with those two assumptions.

Another key thing here with the California WaterFix modeling is that any change within the CVP/SWP system has a ripple effect through the entire system. This is a highly integrated system. And we've seen those effects through the past couple years of operation, in 2014 and 2015, when we had reductions in outflow through a temporary urgency change petition, and that had a ripple effect through the whole system. And there was caps put on Keswick release to the Sacramento River.

And that -- those restrictions on Keswick release had an effect on Oroville, where Oroville released more water. Folsom was ground down more. Exports were reduced, and outflow was reduced.

So one change in the system has a ripple

effect through the entire system.

And parameters in the California WaterFix modeling really set up the WaterFix, the tunnels, to operate more as isolated facility rather than a fully integrated facility. And it tends to dampen the effects of the WaterFix systemwide.

The reality is that the California WaterFix tunnels would be operated in an integral part of the entire system, and it should be analyzed in that manner.

Now we're going to talk about our review of the boundary analysis. And on Slide 4 -- the boundary analysis consisted of essentially four model runs. Boundary 1, the H3 scenario, H4 scenario, and Boundary 2.

We're including Alternative 4A in our comparison, the review of the boundary analysis, because it is the preferred alternative, and we want to make sure that it's compared to the other boundaries.

And it was our understanding from a March 11th letter from reclamation and DWR to Ms. Doduc and Ms. Marcus that that was going to be the case in chief. And that's where we spent the majority of our efforts reviewing the model.

This chart is average annual Delta outflow for each of these boundary analysis compared to the

no-action alternative.

So when you look at Boundary 1, there's a decrease in average annual Delta outflow of 1,260,000 acre feet. When you look at Boundary 2, there's an increase in Delta outflow of basically 1.1 million acre feet.

The H3 scenario shows a reduction in Delta outflow of a half a million acre feet, while the preferred alternative is roughly quarter million acre feet of reduced outflow. And that's the preferred alternative.

The H4 alternative, the Delta outflow is essentially equal to the no-action alternative. There's very little change on an average annual basis.

MR. LILLY: For the record, we're now on Slide 5.

WITNESS BOUREZ: And this is directly out of our Exhibit SVWU-109, our conclusions for the boundary analysis.

Based on the review of the U.S. DWR modeling files and results, the boundary analysis fails in its purported purpose of bounding the range of potential effects of the California WaterFix. The boundary analysis alters Delta outflow and export restriction that currently apply to the South Delta diversion and

create a range of Delta outflows compared to the no-action alternative.

The boundary analysis does not evaluate a range of potential operations of the CVP and SWP with the WaterFix or the additional capacity to convey water across the Delta that would be provided by the North Delta diversion even though this additional export conveyance capacity is a primarily purpose of the California WaterFix.

The boundary analysis fails to meet its purported purpose because it does not consider the additional capacity and flexibility it would provide to the operation of the CVP and SWP.

Really, with the boundary analysis, you only look at the change in outflow and export constraints. You're not looking at the full range of potential operations and moving more stored water when it's available and it's in excess of what's required in upstream reservoirs and there's conveyance capacity. It's likely that that storage could be moved to CVP and SWP south of the Delta in those wetter type of years. And that's one additional boundary that can be explored, and we'll demonstrate that with our modeling results.

I'm now on Slide 6. These findings in the boundary analysis applies to all of the modeling

scenarios, including the preferred alternative. USBR/DWR boundary analysis alternatives do not consider the additional capacity that would be made available with the North Delta diversion when making allocations to CVP/SWP south of Delta contractors.

The petitioners' modeling boundary analysis alternatives include artificial constraints and limits on the use of joint points of diversion.

The petitioners' boundary analysis alternatives change reservoir balancing criteria so that less water is -- less stored water is modeled as being conveyed from North Delta reservoirs to San Luis during the summer months.

Another important component of CalSim is it does not address effects to many types of water users. It's designed only to affect project water users.

I want to get into some specifics about the CalSim operation and the use of the export estimate, and this is an input to CalSim.

And the way that it's used in the CalSim is similar to what's done in actual operations. During the springtime in March/April/May, CVP/SWP operators are looking at water supply available and then allocating that water supply to environmental purposes and to contractors.

So, in March, they look at forecasted inflows, they look at how much water is available in various CVP and SWP reservoirs, and they plan operations for the year.

And I know this has been a focus in 2014 and 2015. A lot of folks were involved with that process.

Well, CalSim goes through the same type of process. It starts in March, it updates the forecasts in April, and finalizes that forecast of operation and allocations in May.

So in May, for example, it will assess the water supply for the entire CVP/SWP system and make allocations.

For south of Delta allocations, it has two basic components for water supply south of Delta. One is how much water is in San Luis Reservoir on May 1st, and the second is how much water will be exported from May 1st through August. That second component, the export estimate, is input to CalSim.

CO-HEARING OFFICER DODUC: Hold that thought, Mr. Bourez.

Mr. Berliner?

MR. BERLINER: I apologize for interrupting. It's common practice to let a witness go through their entire testimony. However, this is in fact an instance

in Mr. Bourez' testimony where he's supposed to be summarizing, yet he's introducing new evidence that's not included in his testimony.

The first example is the chart that was shown. While it's in one of the exhibits, it's not in his direct testimony.

The current explanations that he's given are not found in his direct testimony. He's expanding on this PowerPoint slide which is included in the package and which is directly out of the testimony.

But it was our understanding that when a witness comes, their job is to testify, summarizing the written testimony that they've given.

This was not supposed to be a hunting expedition where we were expected to plow through piles of exhibits wondering which part of those exhibits the witness is going to testify about. The exhibits were supposed to support the written testimony.

We were quite surprised that Mr. Bourez' testimony was as short as it is. I think the fact that he's got a nine-page testimony and planning to testify for two hours speaks directly to the fact that the testimony was merely conclusions with no supporting documentation or text within the testimony that would have allowed us to understand what he's testifying to as

of this point.

CO-HEARING OFFICER DODUC: Mr. Lilly?

MR. LILLY: Well, I think that was the key.

Mr. Berliner said there's no supporting documentation. That's just not true. There's a lot of supporting documentation, and it's Exhibits SVWU 107, -108, and -109. And they are part of his testimony. He said on direct, at the beginning of this today, that those were reports that he prepared and were prepared by him and Mr. Easton.

So his testimony is not just Exhibit 101; it includes those as well. And everything he is saying so far is summarizing points that are made in those exhibits. And, you know, they had plenty of time to review those. I don't think -- and also, his summary testimony, 101, clearly cross-references 107, 108, and 109.

So it's perfectly appropriate for him to include in his summary today matters that are contained in 107, 108, and 109. And that is what he's doing.

CO-HEARING OFFICER DODUC: Thank you, Mr. Lilly.

Mr. Berliner, your objection is overruled.

I actually was going to compliment Mr. Bourez on the fact that I appreciated his written -- his

outline testimony a lot; that it was clear, was succinct, and did refer back to these other documents that provide the substantive technical issues to which he's testifying.

So I recognize Mr. Lilly's argument, and overrule Mr. Berliner's objection.

MR. BERLINER: Thank you.

CO-HEARING OFFICER DODUC: Please proceed, Mr. Bourez.

MR. LILLY: For the record, we're still on Slide 7.

WITNESS BOUREZ: So getting back to the export estimate, which is a fundamental -- which is a fundamental input to CalSim. There's really two components to making south of Delta allocations. One is how much water is in San Luis Reservoir; two, is how much water will be exported from the current month -- I'm using May as an example -- to the end of August.

You add those together, and you get the amount of water that can be allocated to CVP and SWP south of Delta respectively.

Slide 7 through 11 address this export estimate and the use of the export estimate within CalSim with and without the California WaterFix.

MR. LILLY: So we're clear, I think you

actually mean Slide 8 through 11.

WITNESS BOUREZ: Correct.

Slide 8 has a lot of detail. And it's got the export estimates for the BA no-action alternative, Boundary 1, H3, H4, and Boundary 2.

And keep in mind that this export estimate is the only parameter that's used for how much water will be exported from the current month. For example, I'm using May through the end of August. That is input to the model.

And with the Boundary 1, Boundary 2, as well as the preferred alternative which is not listed here, that export estimate is set to the same as the no-action alternative. In other words, we're expecting no increased exports from May through August with the tunnels when making allocations to CVP south of Delta.

Now, with the alternative H4, it's assumed that the amounts of exports from May through the end of August will be less than the no-action alternative. And with Boundary 2, it's assumed to be significantly less than the no-action alternative.

Slide 9 now shows the same information for the State Water Project allocations. And, again, the Boundary 1, H3, and Alternative 4A, the preferred alternative, the export estimates are set equal to the

no-action alternative. While H4 and Boundary 2, the export estimates are less.

Now, these are used as a primary estimate for what's being allocated to CVP and SWP south of the Delta.

It's unreasonable to assume that no additional water, whether it's surplus in May and June or stored water releases, will be calculated or entered into the allocations for CVP/SWP south of the Delta.

And as you'll see in the modeling results, the May and June exports tend to increase, yet the allocation logic doesn't recognize that.

On Slide 10, this is output from the petitioners' modeling. And what we did is we have a two-year example that shows details of how an export estimate affects State Water Project operations.

This top chart is Oroville storage from February of 1975 and -- from their modeling to December of '76 of their modeling.

I do want to point out that these exhibits weren't submitted by the petitioners. They did post their modeling on their Web site. We extracted their modeling and took this out of their modeling files.

So on the primary Y axis on the top chart, that is Oroville storage in thousands of acre feet. And

the dashed black line on top is flood control limit. The blue line is Oroville storage with the California WaterFix. And the red dotted line is Oroville storage in a no-action alternative.

The green bars are shown on the secondary Y axis, and those are the difference between the with and without California WaterFix storage in Oroville.

The bottom chart shows Banks exports with and without the tunnels.

On the primary X axis -- or Y axis, the Banks exports and CFS.

On the secondary Y axis is the change in exports in thousands of acre feet. Those are the green bars.

Then you can see in March, April, and May, there's increased exports and there's no change in Oroville storage.

And this is what the petitioners' model shows. There's a lot of surplus in the system. And the model is showing diversion of that surplus water, which we agree with.

The thing that the export estimate affects is July, August, and September.

And you can see that the no-action alternative has almost capacity at Banks export as 6680 CFS, while

the with project, the exports are significantly reduced.

By the time you get between July and December, there's roughly 975,000 acre feet reduction in Banks exports. And that ends up in Oroville storage, and it gets close to spilling.

This is a result of the export estimate where the model -- the input to the model said you have less export capabilities, don't allocate that water. So that water is not released from Oroville.

And we believe this is an unrealistic assumption and -- and really provides no information on how the projects may actually operate. It's unreasonable to assume that, with the tunnels, that you're going to ignore that capacity and move less stored water.

And when you look at the exceedance probability plots for H4 scenario, you can see that quite often Oroville is higher. And that's, to a large degree, a result of this export estimate.

Now, that example in 1975 --

MR. LILLY: Slide 11.

WITNESS BOUREZ: -- occurs in many years in this simulation.

And this chart is an annual bar chart for the entire 1922 to 2003 simulation per CalSim. And what

these bars represent is a metric of potential south of Delta water supply.

So what we did is we looked at the July, August, and September, available capacity with the tunnels, and we took the less of that Oroville storage above 1.5 million acre feet at the end of September.

So, Oroville's carryover storage was above 1.5 million acre feet. That's available to convey south of Delta. And we took the minimum of that again and the export capacity.

So in 1975, the example we showed, there's a 49 percent Table A allocation SWP south of Delta while the storage in Oroville increased. It's reasonable to assume that they would increase allocations and move that stored water.

So this happens in quite a number of years within the simulation.

On Slide 12, this is a very similar-type plot for the CVP. And because the CVP has more storage upstream, this effect occurs more often.

So that the metric for these bars are the combination of Shasta and Folsom storage above 3 million acre feet. So that's in excess of the RPAs with some buffer, and we're not considering the water supply in Trinity Reservoir.

So if you take the amount of water in Shasta and Folsom above 3 million acre feet and assume that's available to convey to south of Delta, you take the minimum of that amount of storage, any available capacity, we can see that there's quite often significant amount of water that can be moved from north of Delta to south of Delta.

In 1975, the allocation to CVP south of Delta is 50 percent. But if you look at 1957 where the agricultural contract allocation percentage arrow is pointing, there's a 13 percent CVP south of Delta allocation and more than 3.7 million acre feet in the combination of Shasta and Folsom. Yet the model is not moving that water and allocating it south of Delta.

We don't believe that's reasonable. In actual operations, it's likely that that water would be conveyed to increase south of Delta allocations.

Now, on Slide 13, this is, again, the petitioners' modeling for the boundary analysis.

And the top chart is one I've already shown, the average annual change in Delta outflow relative to the no-action alternative for each of these model simulations.

The bottom chart is also from the petitioners' model, and this is the average monthly change between

the alternatives and the no-action alternative.

For example, the top line is for Boundary 2 analysis. And in October, the Boundary 2 analysis has an average annual Delta outflow of 2,000 CFS greater than the no-action alternative. While the Boundary 1 analysis has roughly 2,000 CFS less outflow than the no-action alternative.

We compared these for each of the boundary analysis scenarios. And while the annual chart seems fairly linear and explainable, the patterns of outflow with the -- when you look at the monthly, is hard to figure out what the strategy is with these changes in outflow.

We can see that in April/May, all except for Alternative 4, the outflow is -- spring outflow is lower than the no-action alternative. And you can see that September, Boundary 1 is lower because Fall X2 is not included in that scenario. However, the Boundary 2 August Delta outflow and the high flows during the wintertime is something that you'll see and, again, explained as we move through some more of these charts.

I'm now on Slide 14. And the top chart shows the change in Banks pumping between those alternatives and the no-action alternative. And you can see in the top chart in Banks pumping that in August and September,

Banks exports are decreased. This is because of the assumptions in each of the alternatives because of the operation criteria that's assumed in the model runs with project.

Looking at Jones pumping, there's increases in every alternative in April, May, and June.

Again, if this is bounding the potential operations of project, you can always expect CVP exports to increase in April, May, and June.

I also want to look at May and June where the export estimates are input to the model show that there is no increase for allocation or a decrease while the model results show increases. So that water gets exported but is not allocated in the model. And we believe that's an unrealistic assumption. If the model is going to export the water, we would expect it would be allocated to the contractors south of the Delta who need that water.

The next two charts are for SWP storage.

MR. LILLY: Slide 15 now.

WITNESS BOUREZ: The top chart shows changes in Oroville storage.

The bottom chart shows changes in SWP San Luis storage.

Oroville storage is almost -- is higher in

almost every alternative throughout the year with the exception of the H4 alternative.

September storage is higher because of the balancing between Oroville and SWP San Luis is changed in the with-project modeling compared to the no-action alternative modeling.

You'll notice that in the SWP San Luis, the May through September storage in San Luis is almost always higher, and that's because we're moving additional water in May and June that's not allocated. That water sits in San Luis and is not allocated. We believe that's an unrealistic assumption. And that does have a ripple effect through the entire CVP/SWP operation.

The other thing that's interesting about the Oroville plot, you see the Boundary 1 and Boundary 2, storage in Oroville is higher than all other alternatives? It doesn't really be -- appears to be a boundary of Oroville operations.

Now, looking at Slide 16, the top plot is average monthly change in Shasta storage relative to the no action. And the bottom chart is an average monthly change in Keswick release to the Sacramento River.

You can notice a drawdown in May and June and all the alternatives in Shasta. This is driven by the

operational parameters in the with-project case that doesn't exist in the no-action alternative.

You can also see that the end of September storage is always higher than the no-action alternative. And this, again, is driven by the operational rules input to the model.

When you look at the Keswick release, it's always higher December through June. And, again, June -- the parameters in the model tend to pull Shasta storage down in June and convey that to south of Delta.

Also notice the decrease of always more than a thousand CFS in November in all of the alternatives. Again, with the boundary analysis, we're showing that there will always a decrease in Keswick release in November. And we believe these assumptions are not truly how the project will operate.

Now we're on Slide 17. The top chart is Oroville storage, end-of-month storage, similar to what the Shasta/Keswick plots were.

MR. LILLY: Folsom.

WITNESS BOUREZ: Thank you. Folsom and Nimbus.

So you can see that every alternative, May and June storage is pulled down relative to the no-action alternative.

If this is truly a boundary analysis, then we can expect that the WaterFix will result in Folsom being drawn down below no-action alternative in every May and June and typically stay lower through September where the releases are reduced and storage tends to recover.

And you can see in the Nimbus release how the increase in June -- and that's for releases to the Delta for exports.

One thing that we really couldn't figure out is Boundary 2, the pattern of release change in July and August. We can't find a rational explanation for that. And it really doesn't help with the operation of the American River and the flow management that they're trying to accomplish there.

On Slide 18, this plot shows the differences in CVP San Luis between the action alternatives and the no-action alternative.

Storage from April through September is always higher with the project. And, again, this is because water is being conveyed and not allocated. This is driven by the export estimates.

You can also notice that September, San Luis storage is decreased. And that's a rule curve that's designed to keep more water in upstream reservoirs in Shasta and Folsom.

Again, we don't believe this is a realistic assumption. Keeping San Luis higher affects Delta operations. If it's real high and you go into a year with high storage, you're going to export less surplus out of the system and potentially less stored water.

Now, I'd like to turn to MBK modeling. And what Dan and I did was tried to illustrate with this two-year modeling example how we believe the California WaterFix will affect upstream storage and water users. And for this example, we took the preferred alternative --

MR. LILLY: For the record, we're on Slide 20 now.

WITNESS BOUREZ: So for this example, we took the preferred alternative, Alternative 4A, as we modeled it for the biological assessment document. And we modeled a no-action alternative and the WaterFix for two years. And we started -- we picked two years, 1993 and 1994, because it was a wet year followed by a critical year.

So I'm on Slide 21 now. I want to explain these charts and some detail. And these details are important to understand because when you look at the exceedance plots and average summary results, it's important to understand the operations that make up

those annual results and average results.

So this example starts in December of 1992, and it operates through September of 1994, again, a wet year followed by a critical year.

The top chart is combined CVP and SWP exports. And in January of 1993, you can see exports go from the red line up to the blue line. That's an increase in combined exports.

And the bottom chart is Delta outflow. And similar to the top chart, the primary Y axis is Delta flows in CFS. The blue line is the with-project condition, the red line is the no-action condition, and the green bars are the difference between those two. And these are in thousands of acre feet.

So when you look at the -- the January -- we're exporting roughly 438,000 acre feet more in the with-project case, and Delta outflow goes down by a corresponding amount.

This is the big gulp. And this is the operation that petitioner has presented. And we agree that taking that surplus makes sense, and we agree with that operation.

The thing that their modeling doesn't do is show the movement of stored water. When you get to June, there's still surplus in the system, and that

surplus is coming out. But when you get to July, August, and September, in their modeling -- you could see on the top chart, the red dots -- that's at maximum existing export capacity.

They would move more, likely, if they had additional capacity, because there's high storage in this year. Shasta started out full. The reservoirs were full. They ended up fairly high. And we would expect that with the project and the additional export capacity, the additional water would be moved.

And we're showing that roughly 130,000 acre feet gets moved in May and corresponding amounts in August and September.

MR. LILLY: Mr. Bourez, just to clarify, does this chart, in fact, show results of MBK modeling?

WITNESS BOUREZ: Yes.

MR. LILLY: Not petitioners' modeling?

WITNESS EASTON: This is MBK modeling.

MR. LILLY: And I just want to clarify too. He said the increase in export was in May. The increase in exports were in July through September. That's what he intended.

WITNESS BOUREZ: I also want to point out when you look at Delta outflow from about August of 1993 through September of 1994, there is little change in

Delta outflow during that period.

CO-HEARING OFFICER DODUC: Mr. Bourez, I'm going to ask you to stop right there because it's almost time for our drill.

And so let's go ahead and take our 15-minute break until 10:30.

(Off the record at 10:16 a.m. and back on the record at 10:30 a.m.)

CO-HEARING OFFICER DODUC: Please take your seats, everyone. It is 10:30. We're resuming.

Mr. Bourez, please continue.

MR. LILLY: Mr. Bourez, just to clarify, are we still on Slide 21?

WITNESS BOUREZ: Yes, we're on Slide 21.

MR. LILLY: I know you jumped pretty quickly from your discussing your graphs which were based on petitioners' modeling work, but now, perhaps, they're based on MBK's corrected modeling work, and I would just like you to clarify. Is Slide 21, in fact, does it show output based on MBK's corrected modeling work?

WITNESS BOUREZ: Yes, this is MBK's modeling work.

MR. LILLY: Okay. So please proceed with your summary.

WITNESS BOUREZ: I'm going to step back and

explain this to you again so that everybody didn't forget about it over break.

This modeling is based on MBK modeling of two-year example of how we think the WaterFix would affect project operations.

In this two-year example, being a wet year and critical year, we're showing that more water is moved in a critical year and how it might affect a critical year.

In this example in January of 1993, there's a lot of surplus flows in the system. And you can see the Delta chart where in the no-action alternative, there's roughly 65,000 CFS average outflow for that month. And it's reduced roughly to 59,000 CFS outflow, and there's about a 400,000 acre foot increase in Delta exports.

And this movement of surplus is also in the petitioners' modeling, and we agree that that is what would happen with the California WaterFix.

What the petitioners' modeling does not show is the movement of stored water during the summer period, which is July, August, and September.

MR. LILLY: Slow down just a little bit.

WITNESS BOUREZ: In the top chart, when you look at CVP/SWP combined exports during that period, the red line with the red dots indicates exports in the no-action alternative, and those are at maximum capacity

in the no-action alternative.

The blue dots, with the increased conveyance capacity that the tunnels provide, it's reasonable to assume that additional stored water will be conveyed during that period.

Keep in mind that the reservoirs were full in that 1993 period and they ended up at reasonably high storage levels at the end of 1993.

Now I'm going to go to Slide 22. And the top chart is combined CVP and SWP storage, so this is combined storage at Trinity, Shasta, Oroville, and Folsom. And the bottom chart is the same chart that was on the previous page.

So you could see in the January through about June that the storage in the with-project case is the same as the no-action alternative. While we're exporting Delta surplus, there's no change in upstream storage.

However, when you get to the July, August, and September period, when we're exporting more water, you can see in the top chart that we're pulling storage down. And by the time you get to September, we're 457,000 acre feet lower in storage.

The model adjusts so that you when get into the November/December time period, the combined decrease

in storage in upstream reservoirs is 370,000 acre feet, roughly.

I also want to point out in this chart when you look at exports, that in July of 1994, I want to point out a reduction in combined exports in the with-project case relative to the no-action. And I'm going to explain what that is in subsequent slides.

And we believe that this operation, with high storage and additional capacity, it's reasonable to assume that we're just going to move that storage. And with that capacity, while in the no-action condition, we were export-constrained and they couldn't move it. So we ended up with higher storage at the end of the year in the no-action.

Now I'm going to get into a few specifics regarding the individual reservoirs.

MR. LILLY: Now, on Slide 23.

WITNESS BOUREZ: And on Slide 23, the top chart is combined Shasta and Trinity storage. And, roughly, between those two reservoirs, we're about 200,000 acre feet lower in storage going into a critical year. And the balance between Shasta and Trinity can be different in the model. Whether that's in Shasta or Trinity for temperature management, they use both of those reservoirs in order to meet temperature compliance

in the upper Sacramento River.

So what happens when you move more water in a wet year and you go into a critical year with lower storage? Very similar to what happened in 2014 and 2015. There's nothing you can do to get that water back in Shasta, and it could affect cold water pool. And then we might get constraints on the operation of the system and protect that cold water pool. And that's what we saw in 2014 and 2015 when that happened, is that we were affecting water users because of the -- the bureau had difficulty meeting the RPAs.

Now looking at Slide 24, there's two charts: One for changes in Folsom storage and one for Oroville storage. You can see that both of these reservoirs are full at the beginning of 1993; but when you look at July of 1994, storage tends to recover.

And in a previous slide, I pointed out an export reduction. Reducing exports is the primary mechanism for recovering storage in upstream reservoirs. So we move more water to the export area in 1993 and we move less than 1994.

And that's what we would expect to occur. And I think that the project proponents may expect that occur; that if they move more water south of Delta in one year and if they overheat it, they can just back off

in a subsequent year when it gets dry.

The problem is in springtime, when we're trying to manage cold water, you can't reduce exports to recover that cold water. And that can result in effects to other water users as we saw in 2014/2015.

So on Slide 25, we show project allocations in 1993 and 1994. And they go up in 1993, and they go down in 1994. They don't go down as much as they went up in 1993, so there's additional yield that's created as a result of this operation.

Some things that CalSim doesn't do is it doesn't curtail diversion to non-CVP/SWP water rights. CalSim does not alter water supply for Sac-Coma Contractors, Feather River Surface Area Contractors, CVP San Joaquin River Exchange Contractors, or refuges. That's really -- the model is designed not to change those deliveries that are based on settlement contract criteria.

CalSim also does not impose Term 91 curtailments. Therefore, when you -- to determine what the effects are on those water users, you really have to take a look at the CalSim model results and process those results. And we have done that for Term 91. You can calculate supplemental water from CalSim output. And we have done that, and we'll show you the results.

But it doesn't show you what a reduction in storage in the springtime may do to Exchange Contractors or Sac River Contractors.

I'd like to pull up Sac Valley -- or SVWU-108 exhibit, page 9. It's the last page. And that last paragraph, the last sentence -- I'm just going to read the last sentence here, but this is a description of what we believe would happen: "It would be more difficult to meet the RPA standards and also make adequate water available to Sac River Settlement Contractors as required in their contract."

This is where we see the problems occur where there's nothing you could do to cut exports in order to avoid this.

MR. LILLY: Just to clarify, when you say, "It would be more difficult" you mean with the project operations that you believe are reasonable to occur under CalWaterFix?

WITNESS BOUREZ: Yes. Thank you for that clarification.

If you draw down storage more because of the California WaterFix in a wetter year and you go into a drier year with less water, it would be more difficult to meet the RFA requirements.

I'd ask you to back to the PowerPoint

presentation, please.

Now I'm on Slide 26. And for Slide 26 through 31, I'm just going to point out very briefly some key points from these reports that we've submitted.

On Slide 27, Dan Easton and I spent significant time reviewing the BDCP modeling that was performed for the BDCP and the draft environmental document. And we developed a report of June 20th, 2014, and that's SVWU Exhibit 102.

We also developed technical comments on the BDCP/California WaterFix Recirculated EIR/EIS and -- in October 28th of 2015, and that is Exhibit SVWU-103.

And we developed technical comments on the long-term operations of the CVP and SWP draft environmental impact statement, September 29th, 2015. And that is Exhibit SVWU-140.

MR. LILLY: I think you mean 104.

WITNESS BOUREZ: Thank you. 104.

BDCP identified previous issues with the modeling associated with BDCP and the EIR/EIS.

Many of these issues have not been addressed, and that is why this material can't be relied upon in determining the effects of the California WaterFix, and that's why they're included in our testimony.

I'm briefly going to touch on these next few

slides because there's so much detail here, we could spend all day going through them. So it's all in our written testimony. But I'm just going to pick one here.

MR. LILLY: Just to be clear, we're on Slide 28 now.

WITNESS BOUREZ: The BDCP modeling contains numerous coding and data issues that significantly eschew the analysis and conflict with actual realtime operational objectives and constraints.

There's a lot of detail behind that. Some of these were addressed in the recirculated document but many of them have not been.

Now, I'm looking at Slide 29. And these are a summary of the comments we submitted for the recirculated draft document.

What we found is that the project description of the proposed project was insufficient for review of the modeling analysis. We also found that the project description was inconsistent with the environmental document modeling analysis.

And, again, issues regarding the modeling that we refuse to comment about for the BDCP and the draft document still remain unaddressed in the draft environmental document.

I'm now on Slide 30. With the comments we

submitted on the long-term operations, EIS really focused on climate change and the no-action alternative.

And although climate change and implementation of climate change without adaptation measures affects the no-action alternative and California WaterFix alternative modeling, I would like to focus on our key findings regarding operations with the California WaterFix that exist with and without climate change and not focus on the adequacy of the modeling with climate change. Let's just focus on what the effects of the tunnels are rather than the baseline itself.

Given that comment, I'm going to skip Slide 31. And now I'm on Slide 32.

This is where Dan Easton and I spent a majority of our review effort reviewing the modeling performed for the biological assessment and the preferred alternative. So our key findings are on Slide 33.

The first key finding is that DWR/USBR BA modeling does not consider the additional capacity that would be made available by the North Delta diversion when modeling allocations to South Delta CVP and SWP Contractors. And this goes back to that export estimate that we spent quite a bit of time describing already today.

The next key point is that the petitioners' modeling included artificial limits on the use on joint point of diversion which we'll describe in greater detail in subsequent slides.

Third, the DWR/USBR BA modeling changes the north of Delta, south of Delta reservoir balancing criteria so that less water is modeled as being conveyed from north of Delta reservoirs to San Luis during summer months. And we'll describe that as well.

Again, the CalSim II does not address the effects to water rights and water right holders. You have to really process the model output in order to determine what those effects might be. It would be a significant task to code CalSim to be able to do that.

On No. 5, the model constrains -- the petitioners' model constrains both diversions of excess Delta outflows beyond limits described in the biological assessment. And we'll spend quite a bit of time demonstrating that.

On Slide 34 is a description of which modeling scenarios Dan Easton and I performed for our independent analysis. First is a no-action alternative. We made improvements to those which we'll discuss.

We modeled Alternative 4A. And we did this based on the modeling performed for the biological

assessment where spring outflow criteria was met through export constraints. And then we modeled Alternative 4A, assuming spring outflow imposes a minimum required Delta outflow requirement. And that is a very different operation than imposing export constraints because as the imposed -- the criteria as an outflow requirement, then the projects can decide whether to release stored water or cut exports in order to meet that. It's added flexibility.

On Slide 35, we briefly summarize the changes that we've made to the no-action alternative.

So we started with the California WaterFix no-action alternative and over several months of review, and we made numerous improvements to the model to better reflect the way the California WaterFix would operate and the no-action alternative would operate. Those are documented in SVWU-107.

We also made additional changes to model how the California WaterFix would be operated. Those are also documented in 107.

Then we remodeled the outflow requirement -- spring outflow as an outflow requirement. We made six additional changes to the model which are also documented in SVWU-107.

Slide 36 is a summary of annual average

differences between these different modeling scenarios.

So the first column is the description of the parameters. So the top one is change in total Delta exports.

The second column is the USBR/DWR BA modeling, and this is the preferred alternative. And what this column represents is their with-project Alternative 4A minus the no-action alternative. So with -- with the project in place, exports go up by 226,000 acre feet on an average annual basis.

The next column --

MR. LILLY: To be clear, that's under the petitioners' modeling; is that correct?

WITNESS BOUREZ: That's correct.

The next column is MBK modeling. This is the independent modeling that Dan Easton and I performed. And we, again, compared Alternative 4A to our no-action alternative, and we have Delta exports increasing by 491,000 acre feet.

The third column of numbers shows the difference between our modeling, the MBK modeling, and the petitioners' modeling. So our exports are 265,000 acre feet greater than the petitioners' modeling.

The last two columns show average annual

modeling results of the MBK modeling when we model the spring outflow criteria at outflow criteria rather than export constraints. And when we do that, we compare alternatives, we get an increased average annual export of 661,000 acre feet. That's nearly three times what the petitioners' modeling is showing.

An example of the differences in these models, we've included exports, changes in carryover storage, and average changes in CVP and SWP deliveries.

When you look at the second-to-the-bottom row, changes in CVP deliveries, the petitioners' modeling shows a reduction in CVP supplies of 11,000 acre feet on an average annual basis. Our modeling shows an increase of 177,000 acre feet with the tunnels in place. It's a pretty big difference between these model runs.

On Slide 37, we have some additional information and details on Delta outflow and changes in Delta outflow. These charts show average annual changes in Delta outflow by water year type and average monthly changes by water year type.

The top two plots are the petitioners' modeling of Alternative 4A in the no-action alternative, the difference between the two, and the bottom two charts show our Alternative 4A relative to the no-action alternative.

Their modeling shows an decrease in Delta outflow of 240,000 acre feet, which we've seen in the boundary analysis charts as well as the annual average table on our previous slide. Our modeling showing a reduction in Delta outflow of 464,000 acre feet. And this is partly because we are operating storage and allocating water.

The next chart, on Slide 38, shows the combined Jones and Banks export changes. So it's combined Jones and Banks with Alternative 4A relative to the no-action alternative.

In the USBR/DWR modeling, the increased exports are 226,000 acre feet. And in the MBK modeling, increases in exports are 491,000 acre feet.

Under this alternative, we model Delta -- the spring Delta outflow criteria as an export constraint. So you can see that in April and May, both the DWR modeling and the MBK modeling show no increases in Delta exports, while the MBK shows increased Delta exports from June through September -- and that's due to movement of stored water -- while the petitioners' modeling shows the decrease is in September.

And that's rule curve-driven modeling assumptions. We'll describe rule curve here in just a minute.

On Slide 39, we're showing the differences in JPOD. And I'm going to take some time here to explain what JPOD is or joint point of diversion.

In the petitioners' model, they're showing an increase in joint point of diversion use of 15,000 acre feet, while the MBK model shows an annual average increase of joint point of diversion of 128,000 acre feet.

So joint point of diversion with the projects is the ability to use each other's export facilities to convey their water. For example, if the CVP isn't using all of their export capacity at the Jones pumping plant and the state is using all of their export capacity, then the state can move additional water at Jones.

Conversely, if the state is not using all of their export capacity and the CVP is using all of their export capacity at Jones, then the CVP can use unused capacity at Banks to convey CVP water. And that's typically what happens.

So what's happening in the petitioners' modeling is that they have limited the use of joint point of diversion. And joint point of diversion is -- we're assuming it's South Delta plus North Delta diversion capacity.

When you look at the constraints on joint

point of diversion, an example of this would be if the state is moving 3,000 CFS through Banks pumping plant and 4,000 CFS through North Delta diversion for a combined export capacity -- or exports of 7,000 CFS, their modeling limits the use of joint point to South Delta diversion capacity at 6680.

Under this scenario, with the state moving 3,000 for South Delta, 4,000 for North Delta diversion, for a total of 7,000, with 3,000 CFS unused capacity at Bank. But their modeling limits the use of joint point to 6680, so that 3,000 CFS cannot be used by the CVP in the modeling.

And we believe it's reasonable to assume that if the state is not using that export capacity, that the CVP can use it, whether it's North Delta or South Delta diversion.

And this is the reason that, in our modeling, you see that July, August, and September, the increased used of joint point is much higher in our modeling because we remove that artificial limitation. So if there's enough storage upstream, the CVP would use unused capacity.

Also note that in the critical years, when storage is low, the CVP is not using that capacity because there's not enough storage upstream to convey.

So I've discussed operational criteria and reservoir balancing several times in reference to the boundary analysis.

And here on Slide 40, I'm going to characterize what the San Luis rule curve does and how the model uses the San Luis rule curve and the changes and why the changes affect operations.

CO-HEARING OFFICER DODUC: Before you proceed, Mr. Bourez, let's state for the record that we've -- you finished the first hour. And we've now put a second hour on the clock for you.

WITNESS BOUREZ: Thank you.

The way the model uses the San Luis rule curve is that the rule curve is set in San Luis and upstream CVP reservoirs or SWP will release as much water as needed to meet that rule curve level in San Luis. The only thing that will prevent it from meeting that rule curve is if there's a limitation on the conveyance capacity.

So if you set the rule curve at a certain level, upstream reservoirs will release as much water as needed to meet that rule curve unless there's a conveyance capacity or upstream reservoirs run out of water.

So when you increase that rule curve, there

will be -- the model will try to release more water and shift the balance between north of Delta storage to south of Delta storage. If you decrease that rule curve, then the model will release less water from upstream reservoirs to San Luis Reservoir.

So this criteria in San Luis governs the amount of stored water that is conveyed from north of Delta to south of Delta.

These charts on Slide 40 are average monthly rule curve in the no-action alternative and Alternative 4A. The red line in these plots -- and I'm looking at the CVP San Luis storage plot. The red line is the no-action alternative, and the blue line is with project with Alternative 4A.

MR. LILLY: Mr. Bourez, just so that all of us who haven't been working on this for three years can you stay up to speed here, Slide 40 is showing model assumptions from the petitioners' model work; is that correct?

WITNESS BOUREZ: That's correct.

MR. LILLY: Thank you.

WITNESS BOUREZ: The green bars are the difference between the red line and the blue line and that's shown on the secondary Y axis.

So starting in March, the with-project

San Luis rule curve is 170,000 acre feet higher than the no-action alternative. And in June, it's 152,000 acre feet higher. This is the primary reason that Folsom and Shasta are being drawn down in June, is to meet this rule curve.

Then you'll notice that the rule curve in the with-project case is lower in July, August, and September. This is the reason that Shasta and Folsom tend to be higher at the end of September is because the model is changing the balance in with-project relative to the no-action for end-of-September storage.

Then you'll notice October, November, and December, the rule curve in the with-project case is set at 90,000 acre feet, which is the minimum target for CVP San Luis.

Now, looking at the State Water Project San Luis rule curve, you'll notice that the with-project case is higher from January through April, and then May through September, it's lower.

The September rule curve for State San Luis is 270,000 acre feet with project relative to without project.

And this has a profound influence on the balance between Oroville and State San Luis. When you look at the difference in modeling as we'll see in

subsequent Slides, Oroville, on average, is 89,000 acre feet higher with the California WaterFix and this alternative relative to the no-action alternative, and that is driven by this rule curve.

MR. LILLY: So then, Mr. Bourez, before you go on to the next slide, let's just clarify.

Even though these rule curves apply to San Luis, do they, in fact -- do the changes in the rule curve between the no-action alternative and the proposed actual Alternative 4A, in fact, result in changes in upstream reservoir operations criteria in the modeling assumptions?

WITNESS BOUREZ: Yes, they do.

This the primary driver for moving stored water from north of Delta to south of Delta.

You know, we try to determine the rationale for this change in rule curve with project relative to without project, and we couldn't think of a rational reason for this change.

Now, looking at Slide 41, I know there's a lot of detail on this slide. And the -- this is Shasta storage, changes in Shasta storage in end-of-September carryover in Shasta storage. Those top two plots are petitioners' modeling. The bottom two plots are MBK modeling. And you've seen a lot of exceedance

probability plots in this hearing with end-of-September carryover storage.

So the plot on the left-hand side of this chart is carryover storage for the DWR Alternative 4A and the DWR/USBR modeling for the no-action alternative. There's an average annual increase in their modeling of 25,000 acre feet carryover in Shasta storage.

The plot on the right-hand side is the average monthly difference between those modeling runs by water year type.

So you can see in June, on average above-normal years in Shasta, their modeling shows a reduction of about 45,000 acre feet on average in above-normal years. And if you average all years, Shasta is roughly 11,000 acre feet lower. And when you get to September, their average storage is higher.

In the MBK modeling, which is the bottom two plots, you can see that our average annual carryover in Shasta is about 111,000 acre feet lower in Alternative 4A relative to the no-action alternative.

The primary driver is this movement of stored water in a higher storage condition. So if we had storage, say, above the RPA levels and we had capacity to move that water, our modeling conveys that water from north of Delta to south of Delta. And that's why

storage is lower most of the time.

I want to point out that we did not try to convey that water when we were below the RPA levels in Shasta. The only time that would be lower during that time would be a carryover from moving water in a wetter year and then going into those drier years with a little less water.

And that is our primary concern, that that movement of that stored water in the wetter years -- which is permissible in the project, there's nothing that prevents that from occurring. And it makes sense to operate the projects more efficiently to move that water in wetter years. But then when you get to those drier years -- going into those drier years with less water, there's a potential effect to project operations and to water users.

The next plot is very similar to the Shasta plot, but this is for Folsom.

MR. LILLY: For the record, we're on Slide 42 now.

WITNESS BOUREZ: Thank you, Alan.

Looking at Folsom, the petitioners' model shows a decreased -- average annual decrease in Folsom storage of about 11,000 acre feet end of September. Ours shows a reduction of 37,000 acre feet.

When you look at the average monthly differences, you could see Folsom, in the petitioners' model, on average is 22,000 acre feet lower in June. And then it tends to recover by the end of September, but not fully.

In our modeling, we put Folsom down -- if we're above 400,000 acre feet, we're pulling Folsom down and conveying that water and delivering that water. Folsom is about a million acre foot reservoir. The average annual inflow to Folsom is 2.7 million acre feet, so it has a relatively high probability of refill.

So it's likely, with that high probability of refill, that our Folsom high, it will get pulled down and that water will be delivered. It's an efficient use of the reservoir. However, there are those effects that happen in the drier years because Folsom is lower going into the dry years.

The next plot on Slide 43 is a summary of Oroville storage. And you look at the exceedance probability plot and their storage on average of 89,000 acre feet higher in the with-project case relative to without-project case. And this is primarily driven by the San Luis rule curve we demonstrated.

You can see that's above normal in wetter years in June. Oroville is drawn down and that water is

delivered. And then -- I mean, it's exported and not delivered. And then in September, the rule curve backs off the release from Oroville and reduces San Luis storage.

Our modeling shows Oroville 74,000 acre feet lower in the wetter years, but roughly 65 percent of the time, or 35 percent of the time when Oroville's lower, we're not reducing the storage. And we believe this is a more realistic operation of Oroville; that it would be used if there's additional capacity to move that water rather than put additional capacity in the system and then move less water. It just doesn't make sense to us.

Slide 44 is a summary of average annual CVP deliveries with and without project. It's a difference between Alternative 4A in the no-action alternative --

(Reporter clarification.)

WITNESS BOUREZ: I apologize.

The top table is average annual differences in CVP deliveries in the Alternative 4A relative to the no-action alternative for the petitioners' modeling.

The bottom table is the average annual CVP delivery changes in the MBK modeling. And there's a lot of category of deliveries for this CVP.

What I've showed you in the annual summary table -- it's the third column, last column in this

table -- is a decrease of 11,000 acre feet average annual delivery to the CVP in the petitioners' modeling, while we're showing an increase of 177,000 acre feet in our modeling.

Slide 45. This is a summary of CVP AG Service Contractor allocation, or CVP north of Delta and CVP south of Delta. And two plots on the right are what I'm going to talk about.

The blue line in that chart, in the top chart, is CVP north of Delta AG Service Contractor allocations, and the red line is CVP south of Delta AG Service Contractor allocation.

This is an exceedance probability plot, so the exceedances are on the X axis and the percent allocation is on the Y axis.

And in our no-action alternative, roughly 60 percent of the time CVP north of Delta gets 100 percent allocation, while south of Delta gets full allocation about 15 percent of the time.

Now, one of the operating policies that the bureau has is to allocate the same percent allocations to all CVP AG Service contracts and all M&I water service contracts.

As I was saying, reclamation will provide the same allocation to CVP water service contractors unless

there's a conveyance limitation. And with the conveyance limitations that currently exist, CVP south of Delta water service contractors usually get less allocation than CVP north of Delta water service contractors.

With the tunnels, that conveyance limitation is significantly reduced, so that the bureau will likely allocate the same amount of allocation north of Delta to south of Delta.

And you can see in these plots that, in the drier years, we more often get equal allocations north and south of the Delta, and in wetter years, we get more equal allocations. That red line and the blue line tend to get closer together with the WaterFix.

So this is a reduction to the CVP north of Delta AG Service Contractors and an increase of south of Delta service contractors.

I want to point out that the petitioners' modeling doesn't show this effect. We believe this is reasonable to occur if the WaterFix is built.

On Slide 46, we have an annual average summary of SWP contractor deliveries. And on our annual summary table, we show that in all years in the DWR modeling, the average annual increases, SWP delivery was 216,000 acre feet. In our modeling, the average annual

increase is 270,000 acre feet. So there is an increase in our modeling.

Their modeling didn't use Oroville as much as their no-action alternative. And we're using Oroville more than the no-action alternative, and that's increasing allocations to SWP.

Slide 47 has bar charts of the frequency of occurrence of Term 91 curtailment. The top chart is USBR/DWR chart modeling and the bottom chart is MBK modeling. These are average monthly Term 91 curtailments for each of these alternatives. Actually, it's the frequency of occurrence of Term 91 curtailments.

So the Y axis is the percent of time Term 91 would be in effect in the no-action alternative, which is blue, and the with-project case, which is the orange bar.

For the period of April through September, the DWR/USBR modeling shows Term 91 would be in effect less often.

In the MBK modeling, we're showing that Term 91 would be in effect more often than the no-action alternative. And this is because, in our molding, we're using stored water and we're exporting more. We would assume that Term 91 would be in effect more often.

Both models tend to agree with the trend in October and that's requirements of the model for South Delta deliveries -- I mean, south of Delta export constraints and Rio Vista flow requirements and caused the system to be in surplus more often.

This is the likely outcome of the California WaterFix when you're using more water, more storage withdrawals, more supplemental water in the system.

MR. LILLY: Mr. Bourez, before you go on to Slide 48, I'd ask Mr. Baker if he could put up again just for a moment Slide 34 just so you can explain that you're now shifting from the MBK Alternative 4A to the MBK Alternate 4A-DO. I think it would be useful for everyone if you explain the difference between these two different modeling scenarios done by MBK. And then you could shift back to Slide 47.

WITNESS BOUREZ: Sure.

In the MBK modeling we showed you, we modeled the spring outflow criteria as an export constraint in the same way that the petitioners modeled the spring outflow criteria.

In our MBK Alternative 4A-DO, we modeled spring outflow criteria as outflow requirement.

MR. LILLY: Okay. Go to Slide 28. Explain how you did that latter modeling.

WITNESS BOUREZ: The spring outflow criteria described in the BA is a March through May average flow. So it's average flow over that three-month period. And these values are from the California WaterFix BA Table 3.3-1.

And this outflow was described as an exceedance probability. For example, the top chart shows an exceedance on the X axis, and on the Y axis, it's Delta outflow and CFS. And the green circles on that top chart are the outflow criteria, the spring outflow criteria, specified in the biological assessment.

So when you look at the 90 percent exceedance, the criteria said you will exceed Delta outflow, average March through May Delta outflow of 10,000 CFS 90 percent of the time.

Then when you look at the 20 percent exceedance, the criteria says you'll exceed Delta outflow of 44,500 CFS 20 percent of the time.

When you model that as an export constraint, you don't get to export the water that's above 444,500 CFS. That's one of the primary changes.

So when you look at the bottom chart, the MBK modeling, the green circles are the criteria in Tables 3.3-1. The black dots within those circles are

the petitioners' no-action alternative.

Then the solid blue line is the outflow -- the average March through May outflow in our alternative run. And you can see that we pretty close to matching the criteria in our model run.

The dotted blue line, however, is if you model that outflow criteria as an outflow criteria, the flow that's above 44,500 CFS can be exported. And that's a surplus Delta outflow. And you can see at the height of that chart where it's close to 70,000 CFS outflow. That's average for March through May. That's a very high outflow. That has been reduced to about 65,000 CFS on average. And that 5,000 CFS looks pretty close on that plot. But in terms of the outflow, that's a significant amount of potential exports.

The other thing that happens when you model this as an outflow rather than an export constraint is that the projects can decide whether to release stored water to meet that outflow or cut exports. And there's times that it makes sense that if you have really high storage in the spring, you may want to release that water and export it. But there's a chance that you might refill or you might end up with really high storage at the end of the year and not have an opportunity to move that later in the year.

So that added flexibility of deciding whether you're going to release that water from storage or cut exports is an important flexibility that's not captured when you measure -- when you impose that spring outflow as an export requirement.

The next plot is similar to what you've seen where I compared the MBK modeling and the DWR modeling for Alternative 4A. But a key difference here is that instead of a decrease in outflow of 241,000 acre feet, we have a decrease of 622,000 acre feet.

When you look at the timing of that outflow in April and May in above-normal and wet years, we're reducing that outflow. And keep in mind that during that time, outflow is above 44,500 CFS. It's a pretty high outflow. And we're really capturing the big gulp. And that water, typically, isn't coming out of storage during those times. And it makes sense to do that.

But there are times when that water comes out of storage as well. And if that water comes out of storage during that time, you're going into the next year maybe a little bit lower in storage, so that March through May outflow might be a little less because the reservoirs could be refilling during that time.

So it changes that exceedance probability, and it's really difficult to meet an outflow as an

exceedance probability.

Slide 50 shows the same information but for the combined Jones plus Banks exports. As we've shown in the DWR/USBR modeling exports are increased by 226,000 acre feet, while our modeling shows that exports increase about three times that, 661,000 acre feet.

I also want to point out the timing. If you look at April and May, in the petitioners' modeling, April and May exports do not increase. However, April and May, in the MBK modeling, show large increases in wet and above-normal years. Again, that's the flow that's above 44,500 CFS. But in some of the other years the below normal, maybe drier years, that's a movement of stored water. And we believe that's a more realistic operation for that criteria.

Again, here's a summary of -- annual average summary that we've described earlier.

And I do want to point out that, you know, this modeling is really a team effort. And our MBK team spent a significant amount of time reviewing this modeling over the past six months, and we've been looking at this for several years.

And I just want to remind everyone that the CVP and the SWP is a truly integrated system. If you change one part of the system, it's going to change the

whole system. If you add conveyance or take away conveyance or add outflow, take away outflow, put caps on Keswick, it affects all of the system as a whole.

And the way that the petitioners' model shows the restrictions or limits the use of joint point doesn't recognize the additional water that's being exported in its allocations and other constraints. It's not really being modeled as an integrated part of the CVP/SWP system. There's a lot more flexibility in the operations than that modeling is showing, and that flexibility can lead to effects to other users of water. There is additional risk associated with that.

With that, I'd like to conclude our testimony.

MR. LILLY: Let me just ask one clarifying question before you conclude.

You've taken us on a whirlwind tour through a lot of detail and we appreciate that, but I would like to just clarify, Mr. Bourez. Does the MBK modeling, both the Alternative 4A and the Alternative 4A-DO, does it assume compliance with all applicable regulatory requirements?

WITNESS BOUREZ: Yes. That's a very good point. It does.

There's nothing -- there's no criteria that we're violating in terms of 1641 or the biological

opinions. There's also nothing in the WaterFix description, project description, that prevents the use of stored water or prevents this type of operation.

We believe this operation in the balance of storage makes more sense and is more likely the way the projects will be operated than limiting that use of stored water.

So, again, you can consider our modeling as part of the boundary analysis. We're not saying this is exactly the way the project will be operated, but there's nothing to prevent the use of that stored water. And lot of times use of that stored water makes sense, but there is that risk.

MR. LILLY: Just to clarify also, petitioners did propose some North Delta diversion bypass flow criteria and some changes in the South Delta export criteria. And I just wanted you to clarify.

Does your modeling assume compliance with those criteria that have been proposed by petitioners?

WITNESS BOUREZ: Yes, it does. We used exactly their bypass requirements and export restrictions.

MR. LILLY: To summarize, your modeling will comply with all regulatory requirements and all operating assumptions or proposals that have been made

by petitioners?

WITNESS BOUREZ: Yes, it does.

MR. LILLY: I interrupted you. Please complete your summary, then. Maybe you already have.

WITNESS BOUREZ: Yeah.

When you look at the boundary analysis, it's clear to us that there's -- boundary analysis really just looks at outflow and export constraints. It doesn't look at the flexibility that this facility would provide in terms of meeting different salinity requirements in the Delta or operating the entire project in a more integrated fashion. It tends to dampen that effect of integrated operations.

MR. LILLY: So, thank you, Mr. Bourez.

That completes our -- we finished in an hour and a half. And we appreciate the hearing officers giving us the extra time. That does complete Mr. Bourez' summary of his direct testimony.

And Mr. Easton and Mr. Bourez are now available for cross-examination.

CO-HEARING OFFICER DODUC: Thank you very much for that succinct testimony.

With concurrence from the chair, I would like to take our lunch break now. There's a lot to absorb and a lot to go over before Mr. Mizell begins his

cross-examination.

So, let's take a break until 12:30.

(Whereupon the luncheon recess was taken at 11:26 a.m.)

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OCTOBER 20, 2016 AFTERNOON SESSION 12:30 P.M.

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CO-HEARING OFFICER DODUC: All right. Good afternoon, everyone. It's now 12:30.

We will resume the hearing with cross-examination of Panel 1, Group 7, by Group 1, Department of Water Resources.

Mr. Mizell? Mr. Berliner, are you ready?

MR. BERLINER: Yes, we are.

CO-HEARING OFFICER DODUC: For future reference for all other parties, please set up during the break.

MR. BERLINER: Good afternoon.

My name is Tom Berliner, representing Department of Water Resources. I'm here with Tripp Mizell, also representing the department, and Erik Reyes who is an engineer with the department.

I'll be doing the bulk of the questions.

Good afternoon, Mr. Easton. My name is Tom Berliner. Would you mind if I called you Dan?

(Brief pause.)

MR. LILLY: Excuse me.

Mr. Berliner can ask whatever questions he wants. I think these proceedings really do deserve the formality of calling people by Mr. So-and-So rather than

just by first name. That's just my request.

CO-HEARING OFFICER DODUC: I'm sorry. Haven't I been calling people by their last names?

MR. LILLY: You've been great, but Mr. Berliner just asked if he could call Mr. Easton "Dan."

CO-HEARING OFFICER DODUC: I didn't hear that.

MR. BERLINER: I'm happy to accommodate Mr. Lilly.

CO-HEARING OFFICER DODUC: Let's stick with more formalities, please. Otherwise we will get all confused.

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CROSS-EXAMINATION

MR. BERLINER: Mr. Bourez, good afternoon. Thank you for your testimony earlier.

CO-HEARING OFFICER DODUC: I think the microphone needs to be closer to you.

MR. BERLINER: Is this better?

Thank you. If I get too far, give me a heads-up. Thank you.

Since we have a panel, I'd like to start with getting some just definitions right just for convenience. Since there are both of you, I will assume, unless I ask one of you directly, that whichever

of you has the best answer to the question, that you will answer accordingly.

Do we have agreement on that?

WITNESS BOUREZ: Yes.

WITNESS EASTON: Yes.

MR. BERLINER: Thank you.

And a number of your documents are labeled "MBK." I might refer to those, perhaps, as "your document" or "your exhibit."

Do we understand that's referring to the MBK documents or studies or whatever you happen to refer to?

WITNESS EASTON: We'll let you know if we don't understand.

MR. BERLINER: Great. Thank you very much.

CO-HEARING OFFICER DODUC: Mr. Berliner, so I am I clear, all the documents that you'll be referring to actually will have SVWU-some number, correct?

MR. BERLINER: That's correct.

CO-HEARING OFFICER DODUC: Okay.

MR. BERLINER: And we do have some additional DWR exhibits that we'll be using, and they're all labeled as "DWR."

CO-HEARING OFFICER DODUC: I was confused. When you referenced MBK documents, you're still referring to SVWU?

MR. BERLINER: Yes. But within the documents that are referred to itself, there are indications that it's an MBK-prepared document. So I was referring in that context. But, yes, they are all SVWU exhibits.

CO-HEARING OFFICER DODUC: Thank you.

MR. BERLINER: Mr. Bourez, did you personally prepare your testimony that you gave today?

WITNESS BOUREZ: Yes, I did.

MR. BERLINER: Did other people consult with you in that preparation?

WITNESS BOUREZ: No. They reviewed it when I was done.

MR. BERLINER: And, Mr. Easton, same question for you.

WITNESS EASTON: I prepared it myself.

MR. BERLINER: And it's my understanding -- please correct me if I'm wrong -- that you both had input into various of the exhibits that you cited today?

WITNESS BOUREZ: Yes.

WITNESS EASTON: Yes.

MR. BERLINER: And, Mr. Easton, specifically which exhibits did you have input into?

WITNESS EASTON: I was largely responsible for doing modeling in support of the MBK modeling that we modeled, the proposed project Alternative 4A and the

Alternative 4A-DO. I prepared modeling.

I also analyzed the studies along with Mr. Bourez.

And then I assisted with Mr. Bourez in putting together a lot of the graphics and the text in really all of the exhibits that -- except for his own testimony. My own testimony. I'm talking about the technical documents.

DIANE RIDDLE: Sorry. Can you get a little bit closer to the microphone?

WITNESS EASTON: Did everybody hear what I just said?

MR. BERLINER: I heard you. Thank you very much.

Mr. Bourez, same question to you.

WITNESS BOUREZ: Yes. I was the primary author on all of these, with the exceptions of the comments on the long-term operations, the EIR/EIS. Lee Berkefeld of MBK and I coauthored that report.

MR. BERLINER: Thank you very much.

WITNESS EASTON: Just to clarify, I'm on the report that he's talking about there. I did not have anything to do with that. I was thinking of there's three specific technical documents that we had provided that I had involvement on.

MR. BERLINER: Thank you for that clarification.

Mr. Bourez, in your testimony today, you outlined an approach as to how the WaterFix might be operated in the future. Do you agree with that?

WITNESS BOUREZ: We provided a two-year example, which is an example of how the California WaterFix could operate and convey more stored water and what the effects may be. And we presented two examples of the preferred alternative and how they may be operated.

MR. BERLINER: And you used the word "may." So is it my understanding, then, that this is just a possible operation and not necessarily the operation that will occur?

WITNESS BOUREZ: That's a really good question. I would say that all of the modeling will not match exactly how the project will operate in realtime. But the operational regimes and philosophies, balancing reservoirs, those types of operations are possible.

MR. BERLINER: And it's also possible that, based on the representations that you made, that they may not be operated that way; is that correct?

WITNESS BOUREZ: That's correct. It's up to the operators in realtime to determine how the project

will be operated.

MR. BERLINER: So when you, for instance, indicated that, in your view, more water might be moved from north and south, decreasing reservoir storage, that would depend how the operators chose to operate in that particular year; isn't that correct?

WITNESS BOUREZ: Yes. All the modeling you could say that same thing about.

MR. BERLINER: So really what we're trying to get a handle on here, whether it's your modeling or the modeling that was presented by DWR and reclamation, is to understand possible future scenarios, correct?

MR. LILLY: And excuse me. I don't want to interrupt unnecessarily, but I do have to object. The question is "what we're trying to get a handle on" is really ambiguous.

Does that mean Mr. Berliner is trying to understand what Mr. Bourez testified to or is he asking what the State Water Board's ultimate decision is going to be? Because depending on how "what we're going to get a handle on" is interpreted, the answers could be very different.

CO-HEARING OFFICER DODUC: Mr. Berliner?

MR. BERLINER: Well, I'm not trying to leapfrog over to the State Board's decision. I'm just

trying to understand that between presentation -- maybe I'll just rephrase the question. That might be the easier.

CO-HEARING OFFICER DODUC: Thank you.

MR. BERLINER: Mr. Bourez, what your effort and the Department's efforts was aimed at was trying to gain an understanding as to how WaterFix might be operated in the future under various scenarios, correct?

WITNESS BOUREZ: Let me make sure I understand your question. What we did is our best estimation of how we believe the California WaterFix would operate and would be implemented in realtime operations based on our experience and modeling and our understanding of operations.

So we believe that the modeling that we put together is a more realistic depiction of how the projects CVP/SWP may operate with the WaterFix.

MR. BERLINER: And, for example, you indicated that there are times when there's available capacity in the joint point of diversion. Do you recall that testimony?

WITNESS BOUREZ: Yes.

MR. BERLINER: And isn't it true today that there are times where there's available capacity in joint point that's not utilized even though it could be?

WITNESS BOUREZ: Can you define "could be"?

MR. BERLINER: Yes. If there's available capacity and there's no regulatory constraint, so that the department or reclamation could choose to use joint point but they don't make use of available capacity.

WITNESS BOUREZ: Well, that -- you're not giving me enough information. If there's ample storage upstream and it's not being used, that's different than having low storage upstream and that joint capacity not being used.

So are you referring to the fact that there's a lot of storage upstream or no storage upstream?

MR. BERLINER: A lot of storage upstream.

WITNESS BOUREZ: When there has been a lot of storage upstream, if there's not restrictions on releases like there has been this year, there has been use of joint point in the past.

MR. BERLINER: And have there been instances where joint point was available, there was adequate storage upstream, and joint point was not used?

WITNESS BOUREZ: I'm not sure.

MR. BERLINER: Just to be clear, if you don't know, that's fine. I'm not expecting you to know every answer to every question.

To both witnesses: Do either of you

understand how the DSM2 model operates?

WITNESS BOUREZ: I have -- I am not a DSM2 modeler. I have reviewed output from DSM2 and provided input to DSM2. And I have an understanding of -- about the hydrodynamics. But I can't say I'm an expert to DSM2, and we did not testify on DSM2.

MR. BERLINER: Have you used DSM2 in your work?

WITNESS BOUREZ: I have not used DSM2. Colleagues that I work with have used it.

MR. BERLINER: Would that be colleagues at MBK?

WITNESS BOUREZ: Yes.

MR. BERLINER: Mr. Easton, the same question for you.

WITNESS EASTON: I have never used DSM2.

MR. BERLINER: Thank you.

Do either of you -- well, Mr. Bourez, do you understand how CalSim operates in conjunction with the DSM2?

WITNESS BOUREZ: I understand when output -- from CalSim are input to DSM2 and that procedure, but I have not run DSM2.

MR. BERLINER: Do both of you use CalSim regularly in your work?

WITNESS BOUREZ: Yes.

WITNESS EASTON: Yes.

MR. BERLINER: And have you both used CalSim historically in the past to assist with water projects that you're developing on behalf of other parties?

WITNESS BOUREZ: Yes.

WITNESS EASTON: Yes.

MR. BERLINER: And has the model proved sufficient for your needs in those instances?

WITNESS BOUREZ: Not always. In times that it wasn't sufficient to analyze the -- or answer the questions at hand, we've had -- made model improvements and altered the model so that it would be applicable to the question at hand.

MR. BERLINER: Is that typically true for every project, that you might have to do some tailoring to fit whatever it is you're trying to analyze?

WITNESS BOUREZ: Almost every project, yes.

WITNESS EASTON: Yeah. And, I mean, environmental documentation, we regularly review the modeling and make a determination as to whether the model is giving us reasonable results or not.

And if it's not giving us reasonable results, we need to explain why and make a modification to the model --

MR. LILLY: Slow down.

WITNESS EASTON: -- make a modification to the model and document it, of course, in order to get a reasonable result. The whole point of this is to generate something as realistic as you can.

MR. BERLINER: And are there both discretionary and nondiscretionary assumptions in the model?

WITNESS BOUREZ: Can you define what would be a discretionary and nondiscretionary decision in the model?

MR. BERLINER: Sure. I'm actually using it in the way that you were using it in Exhibit 107. So if it would be helpful, perhaps we could refer to pages 6 and 7 of 107.

I'll refer you for convenience to the bottom paragraph on page 6 where it says: "There are both discretionary and nondiscretionary operating criteria used to operate the CVP and the SWP in the CalSim II model."

MR. LILLY: Could we just have a pause for a minute? I think Mr. Baker is trying to get this exhibit up on the screen. I think it would help the hearing officers if we had this.

We knew he was fast. Thank you very much.

Mr. Baker. We now have page 6 of Exhibit SVWU-107 up on the screen.

MR. BERLINER: Referring to that same page, to paraphrase, nondiscretionary operating criteria would be regulatory -- available to be regulatory requirements.

WITNESS BOUREZ: That's correct. Requirements from the State Water Board are nondiscretionary in the model.

The discretionary project operators do have some flexibility in operations regarding the balance of stored water, whether they store more water in San Luis or keep that upstream, the balance between Shasta/Folsom, the balance between Trinity and Shasta, the balance between Oroville and State San Luis.

All of these have regulatory constraints which are nondiscretionary, like RPA levels and so on.

But there are the discretionary actions on how much water to allocate and what the allocations are discretionary by the project operators.

MR. BERLINER: One of the items listed in your example is flood control requirements, correct?

WITNESS BOUREZ: Yes.

MR. BERLINER: What about settlement contracts, state and federal settlement contracts?

WITNESS BOUREZ: What do you mean, "What about

them?"

MR. MIZELL: Would those be discretionary or nondiscretionary within the model?

WITNESS BOUREZ: Those are nondiscretionary within the model itself.

MR. BERLINER: In other words, the model is forced to meet those contractual requirements, correct?

WITNESS BOUREZ: I need to qualify my answer, but the model is designed to meet those contracts unless the model runs out of water.

And what's happened in the petitioners' modeling is Shasta ran out of water in several years, and then it cut off -- it reduced the release from Keswick and that violated the instream flow requirement at Keswick. And then it subsequently -- it shorted Sac Settlement Contractors.

So it will meet them unless the model runs out of water.

WITNESS EASTON: And let's be clear that what he was talking about is petitioners' model, not our model.

MR. BERLINER: If you could stay a little closer to microphone.

WITNESS EASTON: I just wanted to be clear that what he was talking about right there in terms of

shortage of settlement contractors was in the petitioners' modeling, not in our modeling.

MR. BERLINER: And we're talking about a modeling outcome, correct, not an actual operational outcome?

WITNESS BOUREZ: That is correct. We're talking about the way the models work.

MR. BERLINER: And so we're not suggesting that the contracts had been violated in the past or would be violated in the future?

MR. LILLY: Objection. As to the past, the question is reasonable. As to the future, it's an incomplete hypothetical and really requires a lot of unnecessary and inappropriate speculation.

MR. BERLINER: I'll limit it to the past. That's fine.

CO-HEARING OFFICER DODUC: Hold on a second.

Mr. Bezerra?

MR. BEZERRA: This may be more of a question for clarification. It's in the vague and ambiguous objection. We're talking about settlement contracts. There's a variety of different kinds of settlement contracts.

CO-HEARING OFFICER DODUC: You're objecting to Mr. Lilly's objection because it's vague?

MR. BEZERRA: No, no. I would never do that.

It's a vague and ambiguous objection to the question. I think it just requires clarification more than anything else. It sounds like we're talking about the Sac River settlement contract.

CO-HEARING OFFICER DODUC: Please rephrase.

MR. BERLINER: I was referring to both the Sacramento and Feather River settlement contracts.

CO-HEARING OFFICER DODUC: What was your question again?

MR. BERLINER: As to whether they are treated as nondiscretionary by CalSim.

WITNESS EASTON: So when you talk about the Feather River settlement contractors, would that include the delivery of their rice decomp water?

MR. BERLINER: Well, I'm only referring to the settlement contracts as written that are in -- in the Sacramento Valley water users exhibit list.

WITNESS BOUREZ: They are nondiscretionary in the model. The allocations are based on inflow to Shasta and inflow to Oroville. And those are fixed in the model, and the model doesn't have the discretion to short those allocations.

MR. BERLINER: And you just mentioned they're based on inflow. So they're not based on end-of-season

reservoir storage, correct?

WITNESS BOUREZ: They're based -- the Sac settlement contractors are based on Shasta inflow.

The problem that we have with storage is that if the Bureau of Reclamation cannot meet the RPA levels and temperature target, then there is difficulty in meeting those contracts, as we've seen in the past couple of years.

MR. BERLINER: Have those contracts not been met in the last couple of years?

WITNESS BOUREZ: I can't say -- I'm not a lawyer. I can't say whether the contract terms have been met or not. I know that with the Cobart [phonetic] pool management issues and the inability to meet the RPA due to low storage conditions and drought, that there was significant effort to delay diversions and enter into transfers to protect that cold water. And whether the contract terms are met, that's outside my area of expertise.

MR. BERLINER: Are you aware of any --

CO-HEARING OFFICER DODUC: Hold on, Mr. Berliner.

Ms. Des Jardins?

MS. DES JARDINS: I wanted to object to this line of questioning because it pertains to current

contracts. And the petitioners did not provide modeling that pertains to current contracts and, in fact, testified that --

CO-HEARING OFFICER DODUC: We cannot hear you.

MS. DES JARDINS: The petitioners provided modeling for future conditions. This is about current contracts. Petitioners' witnesses testified that the future conditions couldn't be compared to current conditions.

So it needs to be very clear about whether they're talking about MBK Engineers' modeling or the petitioners' modeling, which they have stated is only for future conditions, sea level rise, climate change, future demands, et cetera.

Thank you.

CO-HEARING OFFICER DODUC: Mr. Berliner, my understanding of your questioning was you were trying to ascertain at least these witnesses' understanding of how the settlement deliveries are being modeled?

MR. BERLINER: That's correct.

CO-HEARING OFFICER DODUC: All right. Overruled. Please answer.

MR. BERLINER: And, Hearing Officer, I have a request. During Ms. Des Jardins' objection, Mr. Lilly and Mr. Bourez were consulting.

And while I don't mind Mr. Lilly sitting there, I think it's inappropriate if they're consulting in the middle of questioning actively here in the room.

MR. LILLY: I think it's the exact same thing that Mr. Mizell and Mr. Berliner did with their witnesses on cross-ex, so I don't think --

CO-HEARING OFFICER DODUC: All right. Gentlemen, enough. As long as it's not disruptive to the conduct of the hearing, let's just move on.

Mr. Bourez, do you even remember the question now?

WITNESS BOUREZ: I'm going to ask Tom.

CO-HEARING OFFICER DODUC: Mr. Berliner?

MR. BERLINER: I'm going to ask if the court reporter would mind to reread the question.

(Record read as follows:

"QUESTION: Have those contracts not been met in the last couple of years?")

CO-HEARING OFFICER DODUC: And I believe his answer was that he did not know.

MR. BERLINER: I'd like to stick with Exhibit 107 and ask Mr. Baker, if you could go to PDF page 149, which is exhibit page number 41.

CO-HEARING OFFICER DODUC: Thank you, Mr. Berliner. I was hoping someone would bring up this

page.

MR. BERLINER: We're trying.

At the top of this page, it indicates that it's Section B, revisions made to the CalSim II DWR/USBR biological alternative, Alternative 4A, to formulate the MBK Alternative 4A.

Do you see that?

WITNESS BOUREZ: Yes.

WITNESS EASTON: Yes.

MR. BERLINER: As to the --

CO-HEARING OFFICER DODUC: Hold on, Mr. Berliner.

Mr. Baker, could you please go to width to just make it bigger.

There we go. Thank you.

MR. BERLINER: This is a somewhat long page to try to get on one screen, so maybe we can start at the top. And I'll ask either Mr. Easton or Mr. Bourez to indicate on this list -- and just indicate when you need to have it scrolled down -- as to which items on here are discretionary modeling assumptions.

WITNESS BOUREZ: First off, the climate change, that doesn't fall into discretionary or nondiscretionary. That's input hydrology to the model. So I'm not sure how to answer that question regarding

climate change. It was our discretion to not use climate change in our modeling.

WITNESS EASTON: I'll handle the next one, updated Delta Cross Channel.

The updated Delta Cross Channel version of slough flow equations, that really should be part of climate change. It's the -- there was different flow equations for different climate models. So that would fall under the same example of climate change that Walter just said.

MR. BERLINER: What about the navigation control point?

WITNESS BOUREZ: The navigation control point in the version of the CalSim that is used by the petitioner, the navigation control point flow is tied to north of Delta CVP AG allocations. And in actual operations, that AG allocations do not govern the navigation control point flow requirement.

So we performed an evaluation of historical flows in the Sacramento River at Wilkins Slough and related that to Shasta storage. And we changed that requirement so that it wouldn't change based on AG allocations, because we would get inappropriate responses from the model.

MR. BERLINER: And what about the

Knights Landing Ridge Cut gate operation?

WITNESS EASTON: This is similar to the navigation control point in that -- well, Knights Landing Ridge Cut gate operation, the model that the petitioners put forth, you get odd gate operations where Keswick is releasing water at times in order to bring Wilkins Slough flow up to exactly 15,000 CFS in order to open up that Knights Landing Ridge Cut gate operation.

So this was a fix to the model to come up with a more realistic operation.

MR. BERLINER: By the way, do these necessarily have or have not water supply implications to them?

WITNESS EASTON: So this is something that's been brought up several times by the petitioners.

(Reporter request for clarification.)

WITNESS EASTON: I apologize. As you can tell, this isn't my full-time job.

This is something that has been brought up by the petitioners in their visit. This is a comparative analysis. And when you have one model doing one thing because of essentially a mistake in the model, the other one isn't making a mistake, you get an odd comparison.

Like you can get, for instance, the Knights

Landing Ridge Cut operation, in the alternative, you could have it where it's releasing 15,000 CFS to bring Wilkins Slough simply to open a gate. But in the no-action alternative, it isn't. You get this odd comparison where Shasta is losing water. This is actually to improve that comparative analysis.

MR. BERLINER: Was that a discretionary determination on your part?

WITNESS EASTON: It was discretionary in the fact that we wanted to produce a more realistic result.

MR. BERLINER: And was the same true for the navigation control point?

WITNESS EASTON: Yes.

MR. BERLINER: And what about the Delta salinity standard logic for negative carriage water conditions?

WITNESS EASTON: So in the CalSim models produced by -- put forward by the petitioners -- and this is true in a lot of the CalSim runs. This is something we've been modifying in a lot of the analysis that we've been doing in projects just recently.

Negative carriage, essentially, is a condition within the Delta where, rather than costing water or requiring more outflow in order to export water, it's the more you export, you actually get -- have to have

less outflow going out. That's my simplistic example.

The problem is, is the priority structure that we have in the model, at times, we release too much water from upstream storage to support this negative carriage operation, and so we put in a fix to prevent that. This all falls back to trying to get to a more realistic operation.

MR. BERLINER: And what about the San Luis rule curve?

WITNESS EASTON: This is certainly discretionary. I mean, it's -- but it's the same thing. We are making a change to the model with the old San Luis rule curve logic. We were, at times, seeing an improper balance between north of Delta storage and San Luis storage. And so we came up with a new set of logic in order to improve that and come up with what we believe is a more realistic operation.

WITNESS BOUREZ: Add to that, in actual operations, there is no San Luis rule curve. The operators don't use that.

They actually operate based on the water supply north of the Delta and balancing that water supply and allocation south of the Delta. And San Luis is operated to balance supply and demand south of the Delta. It's a very different operation.

San Luis rule curve is a modeling gimmick to balance north of Delta with south of Delta.

So what we tried to put into the models was something that would try to mimic the actual balance that's done in realtime operations, you know, a little bit better.

And this is a change that we actually developed under contract with the Bureau of Reclamation. And for at least one of the projects -- two of the projects that we're doing for Bureau of Reclamation, we used this logic to get a better depiction of San Luis. And this was for the San Luis Low Point Improvement Project.

So this is logic that tries to balance and get closer to actual operations rather than the rule curves that have historically been in CalSim.

MR. BERLINER: And yet I notice that while you were working with reclamation on this for the other project you referenced, they elected not to include the change to the rule curve in the modeling for the WaterFix, correct?

WITNESS BOUREZ: That's correct.

MR. BERLINER: And you also have referenced health and safety pumping at Jones. Are you viewing that as discretionary or nondiscretionary?

WITNESS BOUREZ: We made that change based on the pumping levels that occurred in 2014 and 2015.

Historically, the model assumed 1500 CFS as public health and safety. And that was to run one unit at Jones and at Banks.

And what's happened in the past two years is that public health and safety, those levels have gone below that. So we set it to the levels that we've seen in 2014/2015 operations.

MR. BERLINER: And was that 300 CFS?

WITNESS BOUREZ: That's correct.

MR. BERLINER: But it could be 1500 CFS, for example?

MR. LILLY: I object. I don't know what the hypothetical is, what assumption when he says, "It could be."

MR. BERLINER: I'm just picking up on Mr. Bourez' comment earlier that they -- that MBK reduced it from 1500 to 300.

MR. LILLY: And excuse me. My objection is when he says, "It could be," it's not clear whether he means actual operations could be a minimum of 1500 versus 300 or whether he means a model assumption could be 1500 versus 300. So the question is ambiguous as to what "it" means.

CO-HEARING OFFICER DODUC: Mr. Berliner?

MR. BERLINER: Could public health and safety levels be 1500 or 300?

WITNESS BOUREZ: In the model, we had 300 at each pumping plant, so it's 600.

MR. BERLINER: 600.

WITNESS BOUREZ: And we did that based on 2014 and 2015 operations, knowing that we could go below 1500 CFS because that's what was done historically. It's our discretion to match what's actually going on in real operations.

MR. BERLINER: So this was an exercise of your discretion in working on the model?

WITNESS BOUREZ: Yes.

MR. BERLINER: Okay. Thank you.

And the implementation of the Spring Head-Old River barriers, was that discretionary or nondiscretionary?

WITNESS EASTON: This was a reoperation of the Spring Head-Old River barriers, which I believe was the closure of the barriers in April and May. That sprung from it. It's a foreseeable part of -- what we see as a foreseeable part of the no-action alternative. And that's why we included it. And this was something -- we've been including this in some recent projects, and

that's -- that's why it was stuck in there.

And I would say that is one of those assumptions where I don't expect that to -- like, if we could have gone the other direction, it wouldn't have changed our conclusions. That's not what's causing the results that we're getting, the conclusions so...

MR. BERLINER: Okay. Thank you.

And the changed CVP and SWP allocation logic, could you walk through each of those?

WITNESS BOUREZ: Yes. There's a theoretical procedure in CalSim called WSI-DI that you run the model iteratively and it trains the curve to make allocations. We've updated that curve. And that's what this bullet refers to.

The second one, the second bullet, refers to export estimates. And we've spent a lot of time in our direct testimony explaining what the export estimates are. We developed the procedures so that the export estimates are more commensurate with the actual exports so that when we export more water, we actually allocate that water. So it better matches the model results.

The other change that we made is within CVP north of Delta AG service and M&I service allocations. CalSim, through the WSI-DI process, it actually considers systemwide water supply to make allocations to

north of Delta AG service. And when you look at that systemwide water supply, you're considering the San Joaquin, the Delta, the entire system, where, really, an actual operations allocations to those contractors are dependent upon more of a local supply.

So we performed a review of storage conditions that have happened historically and allocations and revised that logic because the older versions to CalSim, and the one that's being used by the petitioners under allocate north of Delta CVP AG and M&I.

And we found with storage changes, we expected to see a change in those allocations. But since they were so low to begin with, those storage changes didn't affect them, and we didn't feel that was appropriate.

So we have a lot of the documentation on this in our exhibit. So that's an adjustment that we made.

WITNESS EASTON: And there's actually, on the page prior to the one we have up there, there's actually a nice plot that shows historical operations of, you know, how -- what north of Delta allocations look like. And then it shows, with the changes we made to our model, how that's improved the allocations.

And when you look at Figure 32, this is a plot that we -- Walter put together.

WITNESS BOUREZ: Figure 32 is historical CVP

AG allocations, and it compares those allocations to Shasta carryover storage. And those numbers in the circles are the water years in which those allocations were made.

And, essentially, 59 percent of the time, we're at 100 percent allocation. And you could see that -- you can see that in storages, carryover storage is above 2 million acre feet from 2 1/2 million acre feet. We're typically at 100 percent allocation to those CVP AG service contract deliveries.

Now, if you please go to Figure 33. This compares the MBK no-action alternative and the USBR/DWR no-action alternative and biological assessment.

And you can see that, in the MBK modeling, we're -- roughly 56 percent of the time, we're at 100 percent allocation. While the USBR/DWR modeling, roughly 22 percent of the time, we're at 100 percent allocation.

And if you look at the green dots, there's times where Shasta carryover is close to 3.4 million acre feet. And we have a 55 percent allocation to Sac River Water Service Contract deliveries.

So what we did is we refined that logic so we got something closer.

The other thing that's interesting about this

plot, if you look at the low Shasta storage, we have Shasta storage below a million acre feet and 5 percent allocation to Tehama-Colusa Canal Water Authority.

And we don't believe that reclamation would allocate that water, particularly when you're at 550, Shasta's at dead pool. Those allocations are most certainly to be zero. So we just refined that logic to what we thought was more realistic.

MR. BERLINER: I just want to get back to the question I asked you which is whether those were discretionary. So I take it the answer is yes?

WITNESS BOUREZ: It's a model improvement. It is our discretion to get better results.

MR. BERLINER: So the answer is yes, it's discretionary, correct?

WITNESS BOUREZ: Yes.

MR. BERLINER: Thank you.

Another question before we leave that plot: Were the projects operating under the biological opinions during this time period that's set forth?

WITNESS BOUREZ: Mr. Berliner, I think you're referring to Figure 32?

MR. BERLINER: Yes.

WITNESS BOUREZ: There's some years in here that are prebiological opinion.

Now, I'd ask you to clarify which biological opinion because there was a '92 NMFS biological opinion for winter run and that occurred in 1992.

MR. BERLINER: I'll be specific.

The 2009 biological opinion, the Snell opinion, and the spring run opinion.

WITNESS BOUREZ: So I'd answer that by saying all the years in those red circles that are post-2008 and 2009 were subject to those opinions.

MR. BERLINER: Okay. And almost all these circles are prior to that, correct?

WITNESS BOUREZ: I didn't count which ones were post and which were prior.

MR. BERLINER: Let's move on. Let's go back to the -- page 41. Again, my question on this page is: You mentioned which these are discretionary, and which are nondiscretionary?

MR. LILLY: I'm going to object that the question is ambiguous. And I think this has been going on for a while.

Discretionary and nondiscretionary, I think we're talking about two different things here. One is discretion of the CVP and SWP to decide how to operate. And the other, that Mr. Berliner has confused, is MBK's discretion in how they decided to refine the model.

Those are very different discretions.

So I object to the extent that the questions are not clear which type of discretion Mr. Berliner is referring to.

CO-HEARING OFFICER DODUC: Mr. Berliner, please clarify.

MR. BERLINER: My questions go to within the project itself, not as to how MBK chose to model. My view is MBK can choose to model it any way they want.

But within the model that MBK came up with, there are certain discretionary and nondiscretionary actions. And my question is: Within the model, which are discretionary and which are not?

CO-HEARING OFFICER DODUC: All right.

MR. BERLINER: I thought we had pretty good clarification. Regulations, for example, were nondiscretionary. Flood control were nondiscretionary. The settlement contracts were nondiscretionary. So I thought we were speaking the same language.

MR. LILLY: I don't think we were. And I think it's very important that he continue to clarify whether he means discretions in operations versus discretions in modeling.

CO-HEARING OFFICER DODUC: All right. Thank you, Mr. Lilly.

Mr. Berliner, I'm curious. Help me understand the importance of discretionary versus nondiscretionary. Because frankly, my perspective, I just want to better understand why they make these changes. And the fact that they made the changes using their discretion as modeler, or what they view as the operational discretion, really doesn't matter to me. I want to understand why these changes were made.

So help me understand the distinction that you're trying to create between discretion and nondiscretion.

MR. BERLINER: So when the projects have to be modeled and operated, there are various measures that are required or not required.

And whether you -- how you choose to exercise the discretionary measures, for instance, how much you choose to keep in Shasta Oroville, how much you choose to send to San Luis Reservoir, those have huge implications on project operations, water supply, biological impacts, et cetera.

So those types of discretionary actions -- for instance, we talked about the San Luis rule curve -- those are actions that will have a direct impact on some aspect of water movement and upstream storage, for example.

CO-HEARING OFFICER DODUC: All right. Let's do this, then, because as an engineer I was getting excited about all the details.

Let me ask the witnesses: In your opinion, these parameters that you are changing, in your opinion, are these parameters discretionary as to the way that you've defined "discretionary" in your Exhibit 107, page 6, between discretionary and nondiscretionary, on behalf of the operation of these projects?

WITNESS BOUREZ: We are, I think, mixing what's discretionary operation of the model versus what our discretion is in terms of creating a model that we believe is -- creates the best depiction of what the effects of the water -- no-action alternative.

CO-HEARING OFFICER DODUC: I understand that you are applying your discretion with respect to this modeling.

I'm trying to channel Mr. Berliner by asking you, in your opinion, these parameters that you are changing, do you have any knowledge as to whether or not they are nondiscretionary from a regulatory perspective?

WITNESS BOUREZ: I believe that none of them are nondiscretionary -- or nondiscretionary from -- we're meeting all the requirements. There's no discretion in our modeling whether we're meeting all the

requirements or not.

What we tried to do was to make the discretionary decision in the model more accurate and better balanced. A lot of this work that we've done is to get a better depiction of those balances and discretionary operations and have those become more realistic.

So they are discretionary operations within the model, and we've improved that logic to get a better operation.

CO-HEARING OFFICER DODUC: They are discretionary within the model.

Do you know or have an opinion as to whether or not they are discretionary in real operation, based on legal requirements?

WITNESS BOUREZ: It's hard for me to answer that because I don't know -- I can't say whether something is discretionary in a legal requirement. That's really not within --

CO-HEARING OFFICER DODUC: All right.

WITNESS BOUREZ: There are changes that we've made to the model that, in actual operations, would be a discretionary decision.

MR. BERLINER: And that's really the point that I'm trying to get at.

So I think the next one is a good example of that.

CO-HEARING OFFICER DODUC: All right.

MR. BERLINER: The next bullet is the changes in timing and priority for to Cross Valley Canal Wheeling.

So, I'll ask the simple question, and we can go from there. Understanding you changed timing and priority of Cross Valley Canal wheeling to allow for what you contend is more effective use of JPOD, is the use of Cross Valley Canal wheeling a discretionary action or a nondiscretionary action on the part of the agencies?

And I'm just referring to DWR and reclamation, rather than saying them every time.

WITNESS BOUREZ: If I could just take a moment to find -- we have in SVWU exhibit. I think it's on page 53.

MR. LILLY: He's still on Exhibit SVWU-107. It's just numbered page 53.

MR. BERLINER: PDF 61.

WITNESS BOUREZ: I know we have a comparison of the USBR/DWR joint point of diversion and Cross Valley wheeling.

And if you look at Figure 45, this shows the

change in Cross Valley wheeling and the MBK alternative relative to our no-action alternative.

And I believe we have somewhere in here -- and I'd have to find it -- the same type of plot for the DWR/USBR modeling.

WITNESS EASTON: If you were to look at the DWR/USBR modeling, the change you would see is that large reductions in Cross Valley Canal wheeling in November. Because, typically, in the no-action alternative, you have to wait until November before you have capacity to move Cross Valley Canal wheeling water. Not in every year, but when there's lot of water delivered, it's not unusual.

But then in the petitioners' modeling, what they show when they put the tunnels in is the Cross Valley Canal wheeling largely shifts to July, and it's concentrated in July because the capacity is there.

WITNESS BOUREZ: If I may bring up Figure 10 in this exhibit, on page 16, it will show change in a petitioners' Cross Valley wheeling. And you'll notice that in the petitioners' modeling, they changed -- also changed the timing on Cross Valley wheeling and where July went up and November went down.

And if you'll notice in the boundary analysis slides that we showed, that the release from Shasta

decreased significantly in November. And that's primarily due to this Cross Valley Canal wheeling change in their modeling.

So both the models find different capacity for moving that discretionary Cross Valley wheeling.

WITNESS EASTON: So our change, timing priority Cross Valley wheeling, we, in our assumptions, assumed that the Cross Valley Canal contractors would be amenable to this change, because it's actually a win-win situation for them. By allowing joint point of diversion to occur at the same time, it allows all south of Delta --

(Reporter request for clarification.)

WITNESS EASTON: I'm sorry.

It allows -- from the modeling we've done, we can see that it allows increases of south of Delta access contract allocations which include CVC contractors.

MR. BERLINER: So to summarize the CVC contract, you changed the priority within that to move it up or back in time as compared to how the agency's modeled it in their model, correct?

WITNESS BOUREZ: Both their modeling and our modeling show similar shifts of timing.

MR. BERLINER: This would be a discretionary

action, correct?

WITNESS BOUREZ: Yes, in both versions of the model.

MR. BERLINER: And in your modeling, did you assume that you would get permission from the CVC contractors to make that change?

WITNESS BOUREZ: Actually, in all of this modeling that's done, whether it's our modeling, the petitioners' modeling, I don't know that -- we're assuming that we have permission to change allocations up or down. I mean, it's -- no, we didn't get their permission to change that timing.

MR. BERLINER: But you're just making an assumption that it would -- that would be how it would be operated, correct?

WITNESS EASTON: It would be an effective way to operate the project.

MR. BERLINER: Thank you.

I want to go back to page 41, again, if we could.

At the beginning, when we were talking about climate change, you indicated that you left climate change out of your model. Did you view that as having the discretion to not include climate change in the modeling? I'm referring to your discretion.

WITNESS BOUREZ: It was our discretion not to include it.

MR. BERLINER: And you understand that the agency did include climate change in their modeling, correct?

WITNESS BOUREZ: Correct.

MR. BERLINER: I think we're on the sharing logic for the north of Delta facility. Maybe we can speed this up a little bit.

Is that discretionary or nondiscretionary?

WITNESS BOUREZ: It hasn't been determined whether it's discretionary and nondiscretionary. It's undefined. I haven't seen that defined in the project description. I haven't seen it defined in the modeling.

MR. LILLY: Slow down.

MR. BERLINER: Next one, late summer and fall storage balance between San Luis Reservoir and north of Delta reservoirs. I think we discussed that earlier as being discretionary, correct?

WITNESS BOUREZ: That's correct.

MR. BERLINER: And the allowance of joint point wheeling above the Banks permitted capacity. In your testimony, is it correct that you went above the currently permitted levels for use of joint point?

MR. LILLY: Excuse me. I object. "Currently

permitted levels," I assume he means at the South Delta diversion. But the question is ambiguous as to whether that would also apply to the North Delta diversion for which there are not any currently permitted levels.

CO-HEARING OFFICER DODUC: Mr. Berliner?

MR. BERLINER: We're talking about South Delta joint point that currently exists, where there is a Corps of Engineers condition.

WITNESS BOUREZ: Let me clarify this. We do not go -- in our modeling, we do not export water above the south of Delta permitted capacity.

However, the limitation that exists in the petitioners' modeling would limit use of North Delta diversion to get Banks over 6680 for joint point use.

So it restricts the North -- the use of North Delta diversion for joint point based on South Delta diversion permit capacity.

So, again, let me give the example. If you're pumping at Banks 3,000 CFS from the South Delta and 4,000 from the North Delta diversion, there would be no joint point use on the CVP side because you're over 6680 even though you're less than 3,000 or 3,000 only at Banks.

So it's an artificial limitation to joint point. And whether the CVP would use North Delta or

South Delta, it still couldn't because Banks is already over 6680.

MR. BERLINER: Are you assuming that the Corps of Engineers will change that permit restriction because of the North Delta facility?

MR. LILLY: And I'm going to object. The permit restriction does not apply to the North Delta. So it's not a question of whether they'll change it; it's a question of whether they would apply a South Delta diversion limit to an entirely new facility at the North Delta. And there's no indication they would ever do that.

CO-HEARING OFFICER DODUC: Mr. Berliner, where are you going with this?

MR. BERLINER: There's currently a pumping restriction at the South Delta of 6680.

CO-HEARING OFFICER DODUC: South.

MR. BERLINER: The MBK model assumes that more water could be moved above that current level because of the existence of the North Delta diversion.

CO-HEARING OFFICER DODUC: That's correct.

MR. BERLINER: My question was: Are -- is MBK, in their model, assuming that because of the existence of the North Delta facility, that the Corps of Engineers permit at the South Delta will no longer

constrain the amount of water that could be moved south through Clifton Court?

CO-HEARING OFFICER DODUC: The current permit is specific to the south. I don't understand your question.

MR. BERLINER: All the water will end up in Clifton Court, both north and south. It will then be moved south from there.

My question is: There's a limit of 6680 currently. Is MBK assuming that that limit will not apply in order to take advantage of additional capacity made available by the North Delta diversion?

CO-HEARING OFFICER DODUC: Okay. I understand.

MS. DES JARDINS: I do have an objection.

CO-HEARING OFFICER DODUC: Mr. Bourez, please answer that last question.

WITNESS BOUREZ: Even without joint point, Banks is going up to 10,300 CFS through the combined North Delta and South Delta diversion.

The Corps criteria out -- only pertains to water going into Clifton Court, not from Clifton Court pumped at Banks. If that were the case, you could never go above 6680 with the tunnels. And all the modeling with the California WaterFix goes above 6680.

WITNESS EASTON: Our only point is that one type of pumping that isn't allowed to go above 6680 in the California WaterFix modeling is joint point of conversion. SWP, as long they can go above 6680, lower Yuba River Corridor transfers in the petitioners' modeling can be moved when pumping is above 6680. Cross Valley Canal wheeling can.

For some reason, they constrained joint point alone. I think it was a mistake. I don't think it was something done purposely.

MR. BERLINER: Is MBK currently under contract with DWR and reclamation?

WITNESS BOUREZ: Yeah. We have several contracts with DWR and Bureau of Reclamation.

MR. BERLINER: And do these contracts relate to the CalSim model?

WITNESS BOUREZ: I'm sorry. I need to clarify. We are subs to other prime consultants under contract with reclamation, and we do have a direct contract with DWR. And, yes, we're under contract to work on CalSim and run CalSim for the agencies, both the Bureau of Reclamation and Department of Water Resources.

MR. BERLINER: And do you regularly meet and confer with them over CalSim modeling work that you're doing?

WITNESS BOUREZ: It depends on the work that we're doing. If we're doing confidential work, then we keep that work confidential within those agencies that are hiring us to do that work.

We do regularly talk to modelers as we're -- I like to say that the modeling community is a pretty tight-knit group, and we share a lot of ideas to improve the modeling continuously. So we do talk about model improvements, and I think that's good for the modeling community to help each other.

MR. BERLINER: And do you participate in the California Water and Environmental Modeling Forum?

WITNESS BOUREZ: Yes.

MR. BERLINER: And would you characterize your relationship with the modelers and staff of the agencies as being professional?

WITNESS BOUREZ: Yes.

MR. BERLINER: Collegial?

WITNESS BOUREZ: Yes.

MR. BERLINER: Does MBK share with the agencies updates that MBK makes to the CalSim modeling?

WITNESS BOUREZ: Yes, we do. And we talk about them.

For the California WaterFix, this was not shared prior to us posting our modeling on the FTP site

on September 1st and our documentation of those changes.

But prior to that, when we did our modeling review in 2012 and 2013 of the BDCP, we had regular meetings with DWR and reclamation, both the modelers and operators, to review the changes and got consensus on many of those changes. And a lot of those changes are now in the petitioners' version of the model.

MR. BERLINER: Okay. Thank you.

Are you familiar with decisions made by the so-called five agencies regarding how the California WaterFix would be modeled?

WITNESS BOUREZ: We have not been in those discussions.

MR. BERLINER: Are you aware that the National Marine Fishery Service, U.S. Fish and Wildlife Service, California Department of Fish and Wildlife, reclamation, and DWR participated together to make decisions as to how the WaterFix would be modeled?

WITNESS BOUREZ: I'm not sure what decisions were made and how the modeling assumptions were developed.

MR. BERLINER: Okay. Is it -- strike that.

Are you aware that there is a process internal to DWR where the operators sign off on modeling assumptions before any major planning studies are done?

WITNESS BOUREZ: I can't say I know what discussions occur internal to DWR regarding the interaction between operators and planners.

MR. BERLINER: Are you aware of that process, though?

WITNESS BOUREZ: I would guess that they talk. I do not know the degree to which they communicate or review the modeling.

MR. BERLINER: And you indicated earlier that some of the recommendations that you made were included in an update to CalSim, correct?

WITNESS BOUREZ: That's correct.

MR. BERLINER: And were some of the recommendations you made not included?

WITNESS BOUREZ: Some of them were not included.

MR. BERLINER: And then, Dan -- or I'm sorry. Mr. Easton, you've been working regularly with DWR in the CalSim model; is that correct?

WITNESS EASTON: Yes.

MR. BERLINER: Did you formerly work for DWR?

WITNESS EASTON: Yes, I did.

MR. BERLINER: When was that?

WITNESS EASTON: I started in 2000, and I think my last day was the end of 2006.

MR. BERLINER: And what were your responsibilities at that time?

WITNESS EASTON: I was a CalSim model developer. And I was also involved in running applications of the model. Particularly I did a lot of planning studies for Delta Wetlands -- Delta Wetlands Project.

MR. BERLINER: And when you were working for DWR and working on CalSim modeling, did reclamation also participate in those efforts?

WITNESS EASTON: Yes, they did.

MR. BERLINER: And would you characterize DWR and reclamation as being essentially the custodians for the CalSim model?

MR. LILLY: Objection. Unclear as to time frame. Does he mean during 2000 to 2006 when Mr. Easton worked for DWR or some other time frame?

MR. BERLINER: 2006 is fine.

WITNESS EASTON: So to repeat your question, you're asking me is DWR the custodians of -- DWR and reclamation the custodians of CalSim?

MR. BERLINER: Yes.

WITNESS EASTON: And what -- I mean, when you say "custodians," what do you mean by that?

MR. BERLINER: Are they, in essence, in charge

of the model? Responsible for updating the model? For new developments, not exclusively but primarily? I understand there's a community. We talked about that, but are they primarily responsible?

WITNESS EASTON: I mean, there is a community of modelers that help develop the models. I mean, they're consultants. DWR and reclamation, we rely on DWR and reclamation for coming out -- like DWR produces their delivery capability report. And that is often -- when they do that, that's kind of them giving the stamp of approval on a particular study. And we take that and we modify it as we see fit for the studies that we're going to do.

MR. BERLINER: Okay. And, Mr. Easton, regarding the CalSim model that we're currently dealing with, the 2015 version, and California WaterFix, did the agency apply the standard CalSim modeling practices for the allocation logic?

WITNESS BOUREZ: Could you define what the "standard allocation logic" is?

MR. BERLINER: Let me refer you to page 39 of this same exhibit, which would be PDF 3.

In the second paragraph, you use the phrase "standard CalSim modeling practice."

WITNESS EASTON: Yes.

MR. BERLINER: I'm using it in that context.

WITNESS EASTON: Okay.

Well, so could you repeat the question, again?

MR. BERLINER: Sure. Did the agency apply the standard CalSim modeling practice for the allocation logic for CalSim 2015 in the California WaterFix?

WITNESS EASTON: You're talking about did the petitioners, in their modeling, provide -- apply the standard practice?

MR. BERLINER: Right.

WITNESS EASTON: There's nothing that they did that I would say is outside the bounds of what standard practice is.

WITNESS BOUREZ: I'd like to add to that. Really, the standard practice, there's several other standard practices other than what we're referring to as the WSI-DI curve. That's a procedure that's controversial. There's been other standard ways of making project allocations, and we have another one that we're using. We've used the WSI-DI one. It's applicable to a project.

But with the California WaterFix, the changes to the system fall without -- outside the accuracy of that standard procedure.

CO-HEARING OFFICER DODUC: Hold on.

Ms. Morris?

MS. MORRIS: Stephanie Morris, State Water Contractors.

Move to strike the last response from Mr. Bourez. Outside the scope of the question. In fact, I've been trying to be very patient.

CO-HEARING OFFICER DODUC: You are to be commended.

MS. MORRIS: Thank you.

These questions are pretty short answers, and we're getting a lot of responses that I think are beyond the scope of question. And I understand that sometimes there are required explanations beyond a "yes" or "no," but I'm afraid we're going to use up a lot of the time, and it's not the most efficient use of time when the questions are not being answered directly.

CO-HEARING OFFICER DODUC: Thank you, Ms. Morris, but I will be the judge of that. And I have found the answers to be informative.

So let's go ahead and continue.

WITNESS EASTON: If I could just --

MR. BERLINER: Talk into the mic slowly and clearly.

WITNESS EASTON: It is common to use WSI-DI procedure and the export estimate procedure for

allocations, but it does not mean that the standard practice is always -- gives you a realistic result.

MR. BERLINER: Okay. Let's try something else here.

Mr. Easton, do you agree that a reasonable representation of DWR and reclamation's current commonly applied discretionary modeling assumptions are those that are used in the coordinated long-term operations of the CVP and SWP EIS?

WITNESS EASTON: I need that question repeated again.

MR. BERLINER: Do you agree that a reasonable representation of DWR and reclamation's current commonly applied discretionary modeling assumptions are those that are used in the coordinated long-term operations of the CVP and SWP EIS?

WITNESS EASTON: I have not reviewed that study in great detail, the long-term operations.

MR. BERLINER: Same question for you, Mr. Bourez.

WITNESS BOUREZ: My review of the long-term operations, EIS -- and we wrote comments and that's one of our exhibits. The standard practice resulted in simulations that drove storage to dead pool and overallocated the system and violated standards.

Therefore, I don't believe that the standard procedure or practice for allocating water supplies through the WSI-DI standard practice is acceptable in the long-term operations EIR/EIS.

CO-HEARING OFFICER DODUC: Mr. Berliner, how much more time do you need and what additional topic areas will you be exploring?

MR. BERLINER: I should have covered that at the beginning. I apologize for that.

The areas that I'm intending to cover include the following: Climate change, South Delta allocations, upstream storage, joint point. We already covered definitional issues, water deliveries. A little bit more on modeling assumptions and quite a bit more on modeling approach.

CO-HEARING OFFICER DODUC: How much time do you request?

MR. BERLINER: I believe four hours total.

CO-HEARING OFFICER DODUC: Okay.

MR. BERLINER: And I fully appreciate we should check in an hour and see how we're doing. And I would -- I'm trying to ask questions that are "yes" or "no," but I appreciate that the experts want to expound.

I'll try to indicate if I'm looking for a "yes" or "no" or more. Perhaps that will speed it up.

CO-HEARING OFFICER DODUC: All right. Let's do this: Let's go ahead and take a short break. And we will resume at 2:00 o'clock.

And I'm looking at the court reporter. I know that you need a 15-minute break. Let's compromise and take two 10-minute breaks this afternoon because it will be a long.

THE REPORTER: Thank you.

CO-HEARING OFFICER DODUC: We'll resume at 2:00 o'clock.

(Off the record at 1:48 p.m. and back on the record at 1:59 p.m.)

CO-HEARING OFFICER DODUC: We need Mr. Mizell and Mr. Berliner up here.

It's 2:00 o'clock. We'll try to take another break around 3:30 or so.

Mr. Berliner, I am not promising you four hours, but I will allow you to continue to the extent that your cross-examination is productive to these proceedings.

MR. BERLINER: Thank you very much.

Just to finish out the last question that we were on, I asked about the long-term operations of the CVP/SWP EIS.

I'm going to have the same questions regarding

the DWR 2015 delivery capability report. My question is: Do you agree that a reasonable representation of DWR and reclamation's current commonly applied discretionary modeling assumptions are those used in DWR's 2015 delivery capability report?

WITNESS BOUREZ: We took the most recent version of CalSim, which it's my understanding that the biological assessment for the California WaterFix and the 2015 delivery capability report are similar in their modeling, but maybe the WaterFix maybe had some updates, and I can't remember which ones those were.

We felt that it was not an adequate representation for analyzing the effects of the California WaterFix. That is why we put so much effort into updating and revising the model.

MR. BERLINER: Do you have the same answer regarding --

CO-HEARING OFFICER DODUC: Mr. Berliner, your microphone again.

MR. BERLINER: Would you have the same answer, then, with regard to the WaterFix biological assessment modeling?

MR. LILLY: Again, I object that the question is unclear. I think he has to ask the question again.

CO-HEARING OFFICER DODUC: I think that would

be helpful, Mr. Berliner.

MR. BERLINER: Sure.

CO-HEARING OFFICER DODUC: I'm sorry.

MR. BERLINER: Let me ask a slightly different question.

To your knowledge, did the biological assessment use the same water allocation methodology as the long-term operations EIS and the 2015 delivery capability report?

WITNESS BOUREZ: I have not reviewed the models in detail to know for sure whether it used exactly the same or whether it was adjusted. I can only assume that they used the same procedure.

MR. BERLINER: Mr. Easton, the question for you that I had asked Mr. Bourez earlier about the practices at DWR, and this relates to the time that you were employed at the Department: Was it common practice to have the operators sign off on planning studies that were going to be done by the modeling staff?

WITNESS EASTON: If it was, I wasn't aware of it.

MR. BERLINER: And for definitional purposes, the MBK modeling used some other terms for what the petition characterizes as the 4A H3-plus alternative.

Is the MBK-referenced Alternative 4A -- and

when MBK used Alternative 4A, is that a reference to the Alternative 4A H3-plus?

WITNESS BOUREZ: Yes, it is.

MR. BERLINER: And MBK also used the reference to Alternative 4A-DO. Is that a reference to the interpretation of what DWR refers to as Alternative 4A H3-plus?

WITNESS BOUREZ: The MBK Alternative 4A-DO is similar to that model run. The difference is the DO model, the spring outflow criteria as a Delta outflow, DO, Delta outflow, criteria rather than an export constraint. So it models the biological assessment description of the spring outflow criteria rather than as an export constraint.

MR. BERLINER: Thank you.

In your modeling for the WaterFix, I believe you indicated that the Sacramento River settlement contracts and the Feather River settlement contracts were treated as nondiscretionary; is that correct?

WITNESS BOUREZ: That's correct.

MR. BERLINER: And did I also understand that you're familiar with the shortage provisions in those contracts?

WITNESS BOUREZ: Yes, I am.

MR. BERLINER: And is it your understanding of

the contract that, for instance, the Feather River settlement contracts, can only be reduced in their water supplies for drought conditions?

WITNESS BOUREZ: I'm not a true expert on the Feather River service area contracts.

They can be shorted, depending on the inflow to Oroville, but their fall water is only allocated based on availability in Oroville.

MR. BERLINER: So are you familiar -- sorry. Strike that.

I take it, then, you are not familiar with how drought is defined under the Feather River settlement contracts?

WITNESS BOUREZ: I've reviewed the contracts. I don't remember all of the details.

MR. BERLINER: Are you familiar that, in order to have a finding of a drought condition, that requires low unimpaired runoff?

WITNESS BOUREZ: I'm not sure what you mean by "low unimpaired runoff."

MR. BERLINER: Fair enough.

Are you -- is it your understanding that there is a provision within those contracts that defines what low unimpaired runoff is?

WITNESS BOUREZ: There's, I believe,

provisions in the contract that have levels of unimpaired flow which will result in the Feather River service area contractors getting a lower allocation.

MR. BERLINER: And do you understand that to be runoff into Lake Oroville?

WITNESS BOUREZ: I think it's more than the runoff into Lake Oroville. I think there's Kelly Ridge. And I -- I've got to look at what -- how they define unimpaired flow for the Feather River to know exactly. I can't remember.

MR. BERLINER: You can't recall exactly. That's fine.

Is it generally your understanding, however, that the Feather River settlement contracts define drought and shortage conditions in the same manner throughout their -- consistently through the contracts? In other words, they're not contract-specific?

WITNESS BOUREZ: I'm not sure.

MR. BERLINER: Okay.

Mr. Easton, same question.

WITNESS EASTON: I am also not sure.

MR. BERLINER: Do either of you have a greater understanding of the Sacramento settlement contracts?

WITNESS BOUREZ: I have a greater level of understanding of the Sac River settlement contracts than

I do the Feather River service area contracts.

MR. BERLINER: Are you familiar with how the Shasta critical year is defined under the Sacramento settlement contracts?

WITNESS BOUREZ: Yes, I am.

MR. BERLINER: And is it consistent with your understanding that it has to do with inflow into Shasta?

WITNESS BOUREZ: Yes.

MR. BERLINER: And do you happen to know what the criteria are?

WITNESS BOUREZ: If the unimpaired inflow is below 4.2 million acre feet, I believe that the Sac River settlement contractors will get 75 percent of their contract allocation.

And it's more complicated than that, because there could be back-to-back years where, if the unimpaired inflow is below 4 million, I think it accumulates. And I can't remember exactly what those numbers are.

MR. BERLINER: Did you mean 3.2 million or 4.2 million?

WITNESS BOUREZ: Pardon me. 3.2. Excuse me. Thank you.

MR. BERLINER: Thank you.

And is it your understanding that critical

year is defined consistently through the Sacramento settlement contracts? In other words, there's not a different provision in each contract?

WITNESS BOUREZ: I don't believe there is.

MR. BERLINER: In other words, it's consistent all the way through?

WITNESS BOUREZ: Yes, I believe so.

MR. BERLINER: To your knowledge, have the -- has reclamation ever failed to satisfy contract obligations for water delivery under the Sacramento River settlement contracts?

WITNESS BOUREZ: I can't give you a legal opinion whether contracts have been satisfied or not.

MR. BERLINER: We have some exhibits that we prepared ourselves.

Can I have DWR 542, please? Top of the list.

Would it be helpful for you to have a hard copy?

WITNESS BOUREZ: Yes, it would.

MR. BERLINER: Mr. Reyes, if you could also give a copy to the Court. Thank you.

Refer you first to the bar charts on the left side of these slides. These are representations of MBK's modeling results. And at the bottom, you will see the sources, three that are listed. Are those familiar

to you?

WITNESS BOUREZ: Yes, they are.

MR. BERLINER: DWR obtained the data from the folders that are identified there. And these folders were obtained from the CalSim files provided by MBK.

And just for clarification, we just briefly discussed before the difference between what's indicated on the chart, MBK 4A and MBK 4A-DO.

Mr. Bourez, do you see that?

WITNESS BOUREZ: Yes, I do.

MR. BERLINER: Thank you.

Do the bar charts on the left side appear to accurately represent the data in the CalSim files MBK provided as part of this process?

WITNESS BOUREZ: I can't verify the calculations, but I'm assuming that they were done correctly.

MR. BERLINER: Assuming that they were done correctly, do you believe them to be accurate representations?

MR. LILLY: Objection. It's unclear whether he means accurate -- whether these bar graphs are accurate representations of MBK's modeling or whether he means is MBK's modeling accurate representations of what would happen with the CalWaterFix project. And those

are very different things?

CO-HEARING OFFICER DODUC: Mr. Berliner?

MR. BERLINER: I'm happy to clarify.

CO-HEARING OFFICER DODUC: Actually, if I could ask Mr. Baker: Could we expand even larger and then focus on the left chart for now without distorting the focus?

Thank you.

MR. BERLINER: Do the bar charts on the left side appear to accurately represent the data in the CalSim II files that MBK provided as part of this process?

WITNESS BOUREZ: They appear to be correct, but I can't verify that without running the calculations. But, again, I'd have to assume that the output was processed correctly.

MR. BERLINER: And referring to the bar chart on the right-hand side, these are a duplication of DWR 545 errata at page 34.

Would it appear to you that the modeling of the MBK CVP settlement contract deliveries and the agency's modeling of the CVP contract deliveries show substantially the same results? In other words, comparing the bar chart on the left with the bar chart on the right?

WITNESS BOUREZ: The model is designed to meet these deliveries. That's a hardcoded input to the model. So if they were different, I would expect that that hardcoded input and allocation was changed. This is nondiscretionary in the model. So, by definition, they have to be the same.

MR. BERLINER: Okay. Great. Thank you.

WITNESS EASTON: And the -- the only place I see a difference I would question would be for the critical years. And we're not talking a big difference, but I'm sure that for the critical period -- critical years for, I guess it would be all of them, just slightly less on the -- that's just because of the -- in the petitioners' modeling, the reservoir runs out of water, and so I imagine that's what been causing these shortages.

WITNESS BOUREZ: Let me clarify what Dan just said.

The model is designed to meet these deliveries and not short them unless the model runs out of water.

So in the petitioners' model, Shasta goes to dead storage, and then the model can't meet the Keswick minimum instream flow requirement. And so that's below the standards of 3250 -- 3,250 CFS minimum instream flow requirement below Keswick.

And then the Sacramento settlement contractor deliveries get cut. In our modeling, that does not occur.

MR. BERLINER: So to summarize, these two charts are substantially similar, but there are differences, correct?

WITNESS BOUREZ: Correct.

MR. BERLINER: And just to be clear, in your model, this does not include the impact of climate change, correct?

WITNESS BOUREZ: That's correct.

MR. BERLINER: Would that make a difference as to values at the bottom of the chart as to what might be the delivery capabilities in those years?

WITNESS BOUREZ: I'm not sure. It depends on how climate change has been operated, whether the contract criteria for determining Shasta critical years has been adjusted, and whether that has changed or not.

The critical years and their modeling could occur in different years and at different frequency than in the MBK modeling.

MR. BERLINER: To be clear, the MBK modeling does not include climate change?

WITNESS BOUREZ: That's correct. Does not.

MR. BERLINER: I'd like to refer to DWR

Exhibit 543. I'm referring to the left-hand chart.

Mr. Baker, if you could blow that up.

MR. LILLY: And could we get paper copies of these, too? Some of us have old tired eyes that don't read well at long distance.

Thank you.

MR. BERLINER: Well, under that description, none of the board members get handed a copy.

MR. LILLY: I think I'm older than the board members, Mr. Berliner.

MR. BERLINER: You and I both.

These slides show CVP north of Delta refuge deliveries.

Is that another feature that's hardwired into the model?

WITNESS BOUREZ: Yes, it is. The refuge deliveries in CalSim are set on the same criteria as the Sac settlement contracts.

MR. BERLINER: So would your response, then, as comparing the two charts and the outcome, assuming that it's been done accurately, be the same as for the north of Delta deliveries, contractor deliveries?

WITNESS BOUREZ: Yes, with the exception of when Shasta runs out of water. The same issue exists with the -- the refuge deliveries as the Sac settlement

contract deliveries. So they can be shorted if Shasta hits dead pool, which does happen in the petitioners' modeling.

MR. BERLINER: Understood. And if we could go to DWR-544. And we'll give you a hard copy of that as well.

MR. LILLY: Thank you.

MR. BERLINER: This concerns San Joaquin Exchange contractor deliveries. Are the exchange contractor deliveries hardwired in?

WITNESS BOUREZ: Yes, they are.

And there's a difference between the exchange contractors and the Sac settlement contractors. So the way the model -- CalSim runs an out-of-water. When Shasta hits dead storage, it will, again, reduce releases at Keswick below minimum requirements. It will then cut the Sacramento settlement contractors. But by the time you get down to the Delta, the exchange contractors are always met.

So in CalSim, the exchange contractors and south of Delta refuge actually has a higher priority in CalSim than the Sac settlement contractors.

MR. BERLINER: And do the results of both the MBK modeling and agency WaterFix modeling show substantially the same impacts, comparing left-hand

graphs to right-hand graphs?

WITNESS BOUREZ: They'd better, because it's hardcoded in the model, so yes.

MR. BERLINER: Would your answer be the same with respect to the Feather River settlement contractors as well?

WITNESS BOUREZ: They are the -- the Feather River service area contractors' allocations are set on the model input. And the operation of Oroville is different in CalSim. So it does not short their irrigation season contract deliveries because Oroville is designed not to run out of water in the models.

MR. BERLINER: So you would expect that the -- if I put up that chart, the left-hand and right-hand charts are going to show essentially the same impacts, right?

WITNESS BOUREZ: It depends on how you calculate that, because the fall water deliveries will be different between the two model runs.

MR. BERLINER: Why don't we put that up. Exhibit 545, please. Trying to save time.

MR. LILLY: Co-Hearing Officer Doduc, I think it might be faster if they just distributed all of these at once so we don't have to keep pausing. It might reduce the four hours.

CO-HEARING OFFICER DODUC: Do you have more?

MR. BERLINER: We have more exhibits, but this is the last question on these particular ones.

CO-HEARING OFFICER DODUC: All right. Thank you.

MR. BERLINER: So this is the State Water Project Feather River service contracts.

And if you look at the right-hand chart, you'll see that, in the critical year, there shows a little bit of difference between the no-action alternative and the other alternatives.

But, substantially speaking, do they show essentially comparing the left-hand chart to the right-hand chart?

WITNESS BOUREZ: No. These are radically different charts. The scales on the left-hand chart goes to 200, and the scales on the right-hand chart goes to 900.

I think that you're comparing different data here. So I'm not sure what this comparison really is.

MR. BERLINER: Sorry. Hang on a second. We're going to have to come back to this. I apologize. You made a good point. Let me come back to that.

Okay. Let me refer to the next exhibit of 547. This is an excerpt from Sac Valley Water Users

Exhibit 108. And this is the example of the potential outcome for years 1992 -- September '92 to September '94 for the California WaterFix.

Referring you to Figure 5. Do I read that correctly, that it shows end-of-September storage for Shasta in 1994 would be about 2.2 million acre feet?

WITNESS BOUREZ: Yeah. That looks about right.

MR. BERLINER: And isn't 2.2 million acre feet for end-of-September storage performance measure that's in the NMFS frame run BiOp?

WITNESS BOUREZ: There is a 2.2 carryover target in the NMFS biological opinion that I'm aware of.

MR. BERLINER: Based on your familiarity with the BiOp, doesn't it anticipate that the 22.2 million acre feet performance measure would be only be met in 87 percent of the years?

WITNESS BOUREZ: I couldn't tell you the statistic.

MR. BERLINER: Do you recall that it has a provision in it that does not require the 2.2 million to be met -- 2.2 million end-of-season storage to be met in every year?

WITNESS BOUREZ: I understand that it's -- there is a provision that it's not to be met every year.

When it's dry, you just can't meet it.

MR. BERLINER: In your modeling, wasn't 1994 a critically dry year?

WITNESS BOUREZ: It's a critical year.

MR. BERLINER: Critical year, yes.

Doesn't it show that 2.2 million acre foot performance measure would be met?

WITNESS BOUREZ: It shows that 2.2 is met.

MR. BERLINER: And do you understand the purpose of the 2.2 million minimum acre foot performance criteria to be in order to protect cold water pool in Shasta?

WITNESS BOUREZ: That's my understanding.

MR. BERLINER: And can you explain how the MBK model ensured compliance with this performance measure for the 2.2 million acre feet?

WITNESS BOUREZ: Are you talking in this example or are you talking about in our modeling?

MR. BERLINER: In the model. This is just an example of the allocation model, correct?

WITNESS BOUREZ: That's correct.

Let's be clear of what we're talking about. We ran the model for a two-year period, starting in -- in 1993 and going through 1994 to illustrate a wet year/dry year in detail of how we think the

California WaterFix, if you move more water in a wet year, what could affect a dry year.

When you're talking about the 82-year simulation, which is the standard way of running CalSim, then there is no hardcoded trigger in the model to protect a 2.2 million acre foot storage target at end of September. That's achieved by adjusting the model operations and rules to achieve that balance.

MR. BERLINER: And is that how you did it in the MBK model as well?

WITNESS BOUREZ: Yes.

MR. BERLINER: And so, in essence, did you toggle back and forth between reservoir storage, exports, deliveries to south of Delta in order to achieve the 2.2 million acre feet.

WITNESS BOUREZ: I'm not sure what you mean "toggle back and forth."

What we did is develop rules to achieve a balance. And we reviewed essentially every year in our simulation to make sure that it was a reasonable balance of storage versus deliveries. And we achieved that balance the best we could.

MR. BERLINER: Would you agree it would be a reasonable approach for modeling compliance with the performance criteria to operate Shasta to achieve the

end-of-September storage similar to the no-action alternative?

MR. LILLY: Incomplete hypothetical. I assume he means with the tunnels, but there could be a whole bunch of other assumptions or parameters that are relevant to that question.

MR. BERLINER: With the tunnels.

WITNESS BOUREZ: With the tunnels, I would expect that when you have high storage and a lot of capacity, that you would move more storage because the risk or the probability of spilling that water is very high.

And as you see here in 1993, we had full storage in virtually all the project reservoirs in 1993.

And then when we get to the end of September of 1993, you can see that Shasta is still above 3 million acre feet -- after -- after we moved 200,000 acre feet -- or 257,000 acre feet. We believe that's a reasonable use of storage in Shasta in that wet year. Because the probability of it spilling with the flood control limit of 3.25 million acre feet -- if you're at 3.25 million at the end of September, the probability of spilling is very high.

So we think it's a reasonable use that -- of water. And we would expect that in those higher storage

conditions, the with-tunnel model run would have lower storage than the no-action.

MR. BERLINER: But in either case, using your example, wasn't the 2.2 million acre foot performance requirement met at the end of September 1994?

WITNESS BOUREZ: Yes.

MR. BERLINER: That was despite moving that additional water?

WITNESS BOUREZ: It's about 60,000 acre feet lower at the end of 1994 in this model run.

And in those years, you know, that would be about a thousand CFS, say, for the month of July. And in a critical year, in 2014 and 2015, we really pushed to get a thousand CFS more out of Shasta. And it was deemed to be an impact to the fishery, so it didn't happen.

So I would think that's a very significant reduction in storage between the no-action and the project, particularly when you look at the combined Shasta and Trinity storage being approximately 200,000 acre feet lower at the beginning of the season, being April.

MR. BERLINER: Nevertheless, despite your argument that for 1995, in your example, you might have -- continuing that next year, which, of course, you

wouldn't know in 1994, would you?

WITNESS BOUREZ: You would not.

MR. BERLINER: No. And yet at the end of September, you've protected the reservoir by meeting 2.2 million acre feet, correct?

WITNESS BOUREZ: The 2.2 million acre feet was met in the modeling, yes.

MR. BERLINER: I want to make sure I understand the response that you gave.

You're not advocating that in case -- using your example, the next year was a dry year similar to the 2014/'15 scenario that you keep even more water in Shasta above the 2.2 million acre feet?

WITNESS BOUREZ: I'm not sure I'm understanding your question.

In any year -- in this two-year example, if 1994 was wet, we would have conveyed that water in 1993, and we would have refilled storage in 1994 if it was a wet year. And we would have created additional yield. And that's why those reservoirs there, to create that yield and operate. And that's an efficient use of the reservoirs.

You can't know in 1993 what the next year will be, whether it will be a critical year or a wet year.

But in 1993, there was a lot of storage and

there was capacity to move that water that was made available by the tunnels. It's reasonable to assume that you would move that water under those conditions. I don't know why you wouldn't.

MR. BERLINER: I'm not quarreling with you. I'm trying to respond -- pick up on the point that you made that during our 2014/2015 drought, we were looking for cold water wherever we could find it.

And you made an argument that -- I forget how many acre feet you cited -- you indicated it was under 100,000 acre feet that we were looking for, and I don't remember the exact number you used.

WITNESS BOUREZ: I can clarify if you'd like, Mr. Berliner.

In this two-year example, in a combination of Trinity and Shasta storage were roughly 200,000 acre feet lower because we moved that water in the previous year, in the wet year.

So during that time, in April, if we're low in Shasta, there will be cold water pool or likely to be cold water pool management issues.

MR. BERLINER: Are you talking about for the current year or for the next year?

WITNESS BOUREZ: For the next year.

So let me make sure we're on the same page

here. This is an important point. 1993 was a wet year. We ended up, at the end of September, with over 3 million acre feet in Shasta.

We had conveyance capacity in this model example, and so Shasta ended up closer to 3 million acre feet in carryover storage.

Then we went into a critical year. And we remained lower in storage going into the critical year in the springtime. That's where we see we have a problem of 200,000 acre feet lower when Shasta had a very -- a critical year.

MR. BERLINER: And if you are in -- if you are in 1993, you don't know what the hydrology is going to be for 1994, correct?

WITNESS BOUREZ: That's correct.

MR. BERLINER: So it was reasonable, in your view, to move the water in 1993?

WITNESS BOUREZ: Yes.

MR. BERLINER: And in 1994, when the NMFS criteria was met for September storage at 2.2 million acre feet, are you advocating that more water should have been retained in Shasta or was it reasonable to end Shasta at 2.2 million acre feet in 1994?

WITNESS BOUREZ: I think it's reasonable to assume that the reservoir would be about 2 million 2.

And when you look at the -- at the temperature management for a season, the releases and operation in those critical years are basically to get through that critical year and not drain the reservoir, of course, because what happens if 1995 is a critical year.

You do the best you can within that critical year to protect the fishery to the extent that you can. And that's what the model is designed to do.

MR. BERLINER: So, in your example, was the operation of Shasta in 1994 a reasonable operation?

MR. LILLY: The question's ambiguous whether he means the operation under the NAA or under the old 4A example.

MR. BERLINER: Under either one.

WITNESS BOUREZ: I think they're reasonable assuming that drought.

MR. BERLINER: Just a second. I apologize.

If we could refer to Exhibit 547. And if you could scroll down. Scroll to the last page, please.

Mr. Bourez, you testified as to this table earlier.

WITNESS BOUREZ: Yes.

MR. BERLINER: This is an excerpt from Sacramento Valley Water Users Exhibit 108, Table 1.

You show differences in deliveries to the

water service contractors. Are you familiar with the water service contractors contracts?

WITNESS BOUREZ: I have looked at them. I can't say I have them memorized.

MR. BERLINER: To the best of your knowledge, are the differences in deliveries that are shown on Table 1 allowed under the contracts for the CVP contractors?

WITNESS BOUREZ: To the extent of my knowledge, yes.

MR. BERLINER: And are the differences in deliveries to the State Water Contractor Table 8, contractors allowed under their contracts?

WITNESS BOUREZ: Yes, I believe so.

MR. BERLINER: If you look under 1993, you see highlighted in yellow the 90 percent water allocation.

Do you see that?

WITNESS BOUREZ: Yes, I do.

MR. BERLINER: For the record, that is, under 1994 California WaterFix CVP south of Delta agricultural contractors.

Isn't it true that the 90 percent allocation assumes the reclamation -- strike that.

Did -- you prepared this table, correct?

WITNESS BOUREZ: Correct.

MR. BERLINER: And this is based on -- which model did you base that?

WITNESS BOUREZ: This is MBK modeling for the two-year example that we did.

MR. BERLINER: For the 90 percent allocation, based on the MBK model, isn't it true that allocation assumes that reclamation would rely on Stage 2 joint point wheeling in setting its water supply allocations?

WITNESS BOUREZ: I can't recall if it needed that conveyance capacity in the modeling or not. I'd have to look at it.

MR. BERLINER: Could we get Sac Valley Water Users 108 at page 8, please?

MS. McCUE: Do you mean page 8?

MR. BERLINER: If I have the wrong page number --

WITNESS BOUREZ: Which exhibit?

MR. BERLINER: Sorry. Pages 8 and 9 -- sorry. I said 108.

If you could take a look at it, Mr. Bourez, the two last sentences.

WITNESS BOUREZ: Yes.

MR. BERLINER: So my question to you was: Did you rely on Stage 2 joint point of diversion wheeling in setting the water supply allocation at 90 percent?

WITNESS BOUREZ: Yes, we must have.

And I'd also like to refer you to -- in the same exhibit, on page 3, Figure 1. And this will help answer your question better, Mr. Berliner.

MR. BERLINER: I haven't asked another question yet.

WITNESS BOUREZ: Well, this is the same question regarding joint point use. And when -- and I want to point out that in July, August, and September, that combined exports are 14,000 CFS approximately. And that can't happen without joint point. So I just want to do a better job answering your question that we did assume joint point.

MR. BERLINER: Thank you.

And to your knowledge, under reclamation's operations today, do they regularly utilize Stage 2 joint point wheeling when making their water supply allocation decisions?

WITNESS BOUREZ: I'm sorry. I don't know what Stage 2 o wheeling is. If you could define that, I'd appreciate it.

MR. BERLINER: Are you familiar under joint point that there are -- that there's availability for the use of joint point, commonly referred to as Stage 1 and Stage 2?

WITNESS BOUREZ: I'm not familiar with Stage 1 and Stage 2.

MR. BERLINER: In the interest of time, let me come back to that, and I can pull a reference for you.

Let's go to Sacramento Valley Water Users 110 at page 47, please.

This is frequency of Term 91 curtailment. Top graph is the agency's model and the bottom graph is the DWR model, correct?

WITNESS BOUREZ: The bottom chart is MBK modeling and the top chart is agency modeling.

MR. BERLINER: Did I say it the other way? Sorry?

And doesn't the top chart, the agency's modeling, show that there be a reduction in the imposition of Term 91 in some months?

WITNESS BOUREZ: Yes, it shows that.

MR. BERLINER: And in the same figure, doesn't it show that the imposition of Term 91 under the WaterFix would be about the same as the no-action alternative in all other months?

MR. LILLY: Excuse me. I object. The question "all other months" is ambiguous since he hasn't said which months are not all other months.

MR. BERLINER: Those would be the months that

do not show a reduction in the imposition of Term 91.

MR. LILLY: It might really be better if he said the months. I think it would be clearer.

CO-HEARING OFFICER DODUC: I think, Mr. Lilly, he does not need to -- I think we understood the question. If Mr. Bourez does not understand the question, he may ask for clarification.

WITNESS BOUREZ: Mr. Berliner, if I can, are you referring to the DWR USBR modeling?

MR. BERLINER: Correct.

WITNESS BOUREZ: I see reductions in April, May, and June and maybe one occurring in July where there's reduction, but I also see reductions in October. I don't see any in March.

MR. BERLINER: August is about the same, correct?

WITNESS BOUREZ: In this modeling, yes. It's about the same.

MR. BERLINER: September is pretty close, correct?

WITNESS BOUREZ: Yes.

MR. BERLINER: November's relatively close, correct?

WITNESS BOUREZ: It's close. It looks like it occurred in one more year.

MR. BERLINER: December's about the same, correct?

WITNESS BOUREZ: Yes. Yes.

MR. BERLINER: Isn't it true that the intent in Term 91 is to protect project storage supplies when the Delta's in balanced conditions?

WITNESS BOUREZ: Yes.

MR. BERLINER: MBK came up -- in the bottom chart, MBK came up with different modeling results, correct?

MR. LILLY: I'm just going to object. I think that's really insulting to say they came up with it. I mean, they did a professional analysis. So I object to that characterization.

CO-HEARING OFFICER DODUC: Mr. Lilly, I appreciate your sensitivity, but I believe Mr. Berliner was not intending to be offensive. So let's go ahead and proceed.

Mr. Bourez, hopefully you did not take offense. Just answer the question.

WITNESS BOUREZ: I need to explain a little more about the background how we calculated Term 91.

As I testified earlier, CalSim does not calculate Term 91 and does not calculate supplemental water. What we did is we created a spreadsheet

calculation that is the same as what the USBR and State Water Board posed for supplemental water calculations.

And we confirmed that our calculations are the same as what the agency and the State Board is using. We took that logic and we applied that to CalSim. And when we applied that to the DWR/reclamation modeling, this is the frequency of Term 91 that we come up with.

And we did the same exact calculation for the MBK modeling.

Now, the MBK modeling uses stored water more often. Delta surplus occurs at a lower frequency. And based on that calculation of supplemental water, we found that Term 91 occurs more frequently in our modeling, and we believe that to be a more correct depiction of what we would expect.

MR. BERLINER: And is that because you more aggressively moved water out of upstream storage to export?

WITNESS BOUREZ: I don't know if the word "aggressive" is appropriate, but we moved water when there was storage above what is required to satisfy all requirements.

And because we did that, there's increased storage releases and that would cause supplemental water to be in the system more often.

MR. BERLINER: And could we have Sacramento Valley Water Users 110, page 13, please?

CO-HEARING OFFICER DODUC: What is that?

MR. LILLY: Should we jump under our desks?

CO-HEARING OFFICER DODUC: Let's take a break until we resolve this matter.

All right. Let's go off the record.

(Off the record at 2:52 p.m. And back on the record at 2:59 p.m.)

CO-HEARING OFFICER DODUC: And back on the record at 3:00 p.m. All right. Please take your seats. Hopefully that buzzing noise will not return.

While the witnesses are returning, Mr. Lilly, you've lost your witnesses.

Mr. Berliner, just to check in, if I'm trying to follow your listing of topics, are you on JPOD now?

MR. BERLINER: Yes.

CO-HEARING OFFICER DODUC: Where are you in terms of the topics you outlined?

MR. BERLINER: We are covering joint point, and I will be finishing that up. This is on the record?

THE REPORTER: On the record.

MR. BERLINER: Yes, we're on joint point.

CO-HEARING OFFICER DODUC: Okay. Very well.

MR. BERLINER: Finishing that.

CO-HEARING OFFICER DODUC: It would be helpful when you transition from one topic area to another you let us know.

MR. BERLINER: Okay.

CO-HEARING OFFICER DODUC: We've lost Mr. Bourez. Oh, here he comes.

So everyone knows, witnesses get first shot at the bathrooms.

All right. Mr. Berliner, please continue.

MR. BERLINER: Thank you.

Mr. Baker, could you please pull up Water Board Exhibit 21 which is Decision D-1641 and go to page 115. And if you could blow it up, please.

Mr. Bourez, I was asking you about the difference between Stage 1 and Stage 2.

And if you could scroll up, Mr. Baker.

On this page, it indicates that, under No. 1, the first-stage use of joint point is used to serve the Cross Valley Canal Contractors plus all others and to make up export reductions taken to benefit fish.

Under the second stage, use of joint point is for any authorized purpose under the state and federal permits up to the limits specified in the Corps of Engineer permit, which is the -- which is a reference to the permit that we talked about earlier at

Clifton Court.

Does that help refresh your memory as to Stage 1 and Stage 2?

WITNESS BOUREZ: Yes, a bit. I'd have to study it to really get a full understanding again. It's been a long time since I read this.

MR. BERLINER: So my question to you to orient you as you're taking a look at this was whether reclamation, to your knowledge, regularly utilizes Stage 2 joint point wheeling when making its water supply allocation decisions.

WITNESS BOUREZ: If the use of joint point includes the North Delta diversion and follows the Corps permit for the South Delta diversion and the use of the North Delta diversion allows for that joint point, then I think you should use it for allocating water south of the Delta.

MR. BERLINER: So your answer then would be, yes, you should use joint point Stage 2 under the WaterFix scenario for allocations south of the Delta; is that correct?

MR. LILLY: I'm sorry. I have to object here. But this is really confusing the present with the future. I mean, D-1641 are stages for Delta operations with current facilities and are not stages for

operations with CalWaterFix. And we don't know how the Water Board would carry over joint point, if at all, to the North Delta diversion.

CO-HEARING OFFICER DODUC: Mr. Berliner?

MR. LILLY: So I think the question is confusing as to whether you're talking about current conditions or with CalWaterFix in place.

CO-HEARING OFFICER DODUC: Mr. Berliner?

MR. BERLINER: Well, my question originally concerned current utilization of joint point. And Mr. Bourez responded in the context of the modeling for the future. So I was trying to tailor my next question to be responsive to that. However, let's start again.

To your knowledge, does reclamation regularly utilize Stage 2 joint point wheeling when making its current water supply allocation decisions?

CO-HEARING OFFICER DODUC: That's a "yes" or "no" answer.

WITNESS BOUREZ: I don't know what they consider for their making their allocations in actual operations.

MR. BERLINER: And to your knowledge, as part of the petition on WaterFix, have the agencies requested a change to D-1641?

WITNESS BOUREZ: I don't recall.

MR. BERLINER: I'll represent to you they haven't, which would mean that this provision would still be applicable to the extent the Water Board were to apply Decision 1641 to WaterFix.

MR. LILLY: And I'm going to object. We've been through this before. I have to say it again. Whether or not it would be applicable to the North Delta diversion is not something that we can just assume the witness did.

So I object. It's an improper question.

CO-HEARING OFFICER DODUC: Noted. It's in the record.

Please move on, Mr. Berliner.

MR. BERLINER: I'd like to go to the Sacramento Valley Water Users Exhibit 110, page 13.

CO-HEARING OFFICER DODUC: You need to get closer to the microphone.

MR. BERLINER: Sorry.

This is the California WaterFix boundary analysis, Delta outflow.

I want to make -- just -- talk about tired eyes. There's a typo that I just want to correct for the record.

On the top chart there's Boundary 1 and then -- in blue, and in the green is H3. And then the

red is 4A and then the purple is labeled H4-3. That should be H4.

WITNESS BOUREZ: The label is H4. The change is the 3,000 acre feet on an average annual basis.

MR. BERLINER: Thanks. I was concerned that was a typo. Thank you very much.

These figures report changes in annual and monthly outflow, correct?

WITNESS BOUREZ: They're differences in average monthly outflow between alternatives and the no-action.

MR. BERLINER: Isn't it true that DWR's operational scenario for Alternative 4A H3 includes all outflow regulations including X2 that are contained in D-1641 and the biological opinions?

WITNESS BOUREZ: I believe it does.

MR. BERLINER: And isn't it also true that Alternative H3-plus and Alternative H4 require additional spring outflow as compared to D-1641?

WITNESS BOUREZ: In the H4 scenario, there's a spring outflow. In the Alternative 4A, the spring outflow is modeled as an export constraint in April and May.

MR. BERLINER: In order to achieve outflow, though, correct?

WITNESS BOUREZ: I believe so.

MR. BERLINER: Isn't it true that in the September to November -- that the September to November outflow is the same under all the operational scenarios except for Boundary 1 because Boundary 1 does not include fall X2?

WITNESS BOUREZ: The September through November flow is different, and average monthly is different in all the scenarios.

The September average change in our difference in outflow in H3, H4, and Alternative 4A is the only one that's the same during that period.

MR. BERLINER: I should probably have used the word "outflow criteria." Apologize for that. Let me rephrase the question.

Isn't it true that the September to November outflow criteria is the same under all the operational scenarios except for Boundary 1 because Boundary 1 doesn't include fall X2?

WITNESS BOUREZ: That's my understanding.

MR. BERLINER: And if we could go to page 63 of 107, PDF page 71.

WITNESS EASTON: Did you say Exhibit 107?

MR. BERLINER: 107, page 63.

Mr. Bourez, you're familiar with the project

description in the BA, correct?

WITNESS BOUREZ: Yes, I've read it.

MR. BERLINER: Doesn't the project description in the BA state that the IE ratio will be used to constrain the April and May outflow?

WITNESS BOUREZ: To my knowledge, the spring outflow criteria expressed in Table 3.3-1 in the BA as an exceedance curve where the outflow levels will be met at a certain frequency of time. It was modeled as a export curtailment using the San Joaquin IE ratio.

MR. BERLINER: In order to achieve the same outcome then, correct?

WITNESS BOUREZ: I'm sorry. Same outcome as what?

MR. BERLINER: As using the IE ratio.

WITNESS BOUREZ: If you could define what you mean by the "same outcome," I'm not sure what you mean by that.

MR. BERLINER: You indicated that the modeling was using an export constraint, correct?

WITNESS BOUREZ: The USBR/DWR modeling for biological assessment used the San Joaquin IE ratio to curtail exports during April and May to meet the spring outflow requirement.

CO-HEARING OFFICER DODUC: Let's go ahead and

give him another hour.

MR. BERLINER: And isn't that -- and isn't the application of the IE ratio in order to achieve an outflow constraint?

MR. LILLY: I don't think there was a question there. I would ask for a question before Mr. Bourez answers.

MR. BERLINER: I'm sorry?

CO-HEARING OFFICER DODUC: I think we were waiting for the question.

MR. BERLINER: All right. Let me try again. I apologize.

Is the IE ratio equivalent to an export curtailment in its effect?

WITNESS BOUREZ: The IE -- San Joaquin IE ratio does constraint exports, yes.

MR. BERLINER: And isn't it true that biological assessment applies the IE ratio in order to constrain the April and May outflow consistent with the BA project description?

WITNESS BOUREZ: I don't believe that applying the San Joaquin IE ratio to export curtailments does meet the description of the outflow criteria specified in Table 3.3-1.

MR. BERLINER: Could we go to DWR-551, please?

If you could scroll down to the next page.

I've highlighted some language here which states under the modeling assumptions that this is to meet the March to May Delta outflow targets. And the criteria states that the 2011 NMFS BiOp Action 4.2.1, which is the San Joaquin IE ratio, will be utilized to constrain the April and May total Delta exports under the preferred alternative to meet the March to May Delta outflow target per the current operational practices (National Marine Fishery Services 2009).

Do you see that?

WITNESS EASTON: I would like to quickly add something. Actually, not quickly. I'm going to try to add it slowly.

So there is a paragraph in this document -- I can't tell you exactly where it is -- but it makes it clear that the petitioners are reserving the right, even though they use the IE in the modeling, to meet the outflow criteria. When I say "using IE to meet the outflow criteria," it's -- there is no outflow criteria that they're meeting -- there is no outflow criteria that they're meeting in a specific year. They're just constraining exports. And over the 82-year simulation, by constraining exports in that way, the outflows happen to meet the outflow criteria they've established in this

table.

Now, there's a paragraph in this document where they have specifically reserved the right to meet this outflow criteria in -- by other means, either purchasing water or they reserve the right for the operators to -- to meet it as they see fit, as I recall in reading this document.

DIANE RIDDLE: Are you referencing Footnote 21? Do you mean the footnote to that statement?

WITNESS EASTON: I don't know that it's the footnote. No, there was an paragraph.

And the reason I bring this up is we actually had a meeting with some of the petitioners' modelers at one point where they were describing the BA simulations to us.

And, honestly, when we went into the meeting, just as Mr. Berliner is implying, is that the IE constraint was an actual proposed action. It became clear in that meeting, though, that that -- that was the way they did it in the modeling, but that isn't the way it was going to be done in realtime operations.

The IE was one way, but they could determine what the outflow would have been with the IE and then have a -- you know, purchase water to meet it or they

could make releases from upstream storage.

So the -- I was confused myself when I saw this table, too, but that was straightened out for us.

CO-HEARING OFFICER DODUC: So let's get back to Mr. Berliner's question.

MR. BERLINER: So my final question then is: Are you contending that the BA is inconsistent with the project description?

MR. LILLY: Objection. The question's unclear. The project description of what? If he means the BA project description, it can't be inconsistent with itself. And if he means some other project description, he has to tell us what other project description he means.

MR. BERLINER: No, I'm referring to the BA.

MR. LILLY: I'll object. How can the BA be inconsistent with the BA? The question's nonsensical.

CO-HEARING OFFICER DODUC: Mr. Berliner, I'm trying to follow your train of logic.

You led Mr. Bourez through your questioning to state at least his opinion that the modeling of the IE ratio, in his opinion, does not correctly capture the BiOp outflow requirements. Did I understand that correctly, Mr. Bourez?

WITNESS BOUREZ: Yes. And I would --

CO-HEARING OFFICER DODUC: Yes, stop there.

So what is your -- then next line of questioning, Mr. Berliner?

MR. BERLINER: So there was a contention that the project description was inconsistent with the BA. In other words, there was --

CO-HEARING OFFICER DODUC: I --

MR. BERLINER: -- internal inconsistency.

CO-HEARING OFFICER DODUC: Did you make such a assertion, Mr. Bourez?

WITNESS BOUREZ: The modeling is inconsistent certainly with the draft BA. And this is only one page of the BA. And I would have to look at the rest of this description as we went through this in quite a bit of detail.

And the Delta outflow or the spring outflow criteria was expressed as an exceedance probability. And it had a table of flows in the draft BA that I believe was removed from the final BA.

But I -- I would agree with Mr. Easton in that there is language in the BA that gave the project discretion whether to release water, purchase water, or curtail exports in order to meet the outflow requirement.

CO-HEARING OFFICER DODUC: So you're not

making any assertion that the project description does not comply with the BA?

WITNESS BOUREZ: That's correct.

CO-HEARING OFFICER DODUC: All right.

May we move on, Mr. Berliner?

MR. BERLINER: Yes, please.

And just to close out on this, in the MBK modeling, did you assume that the additional outflow would be met primarily with reservoir releases or as Mr. Easton just mentioned; that it could be a mixture of unregulated flow, export reductions, storage releases, purchases?

WITNESS BOUREZ: So we modeled the preferred alternative, Alternative 4A, in two ways: One, as a export curtailment based on the San Joaquin IE ratio which is consistent with the way the petitioners modeled it.

We then do the exceedance probability table that was in the draft BA in Table 3.3-1, and we took that exceedance probability table and we imposed that in CalSim as an outflow requirement. And when you impose that as an outflow requirement, the model has a discretion on whether to release stored water or cut exports in order to meet that requirement. So it has the discretion.

CO-HEARING OFFICER DODUC: But you only -- you only considered those two options, reduce export -- I mean, the two options: Storage or reduce exports?

WITNESS BOUREZ: Really, that's the only two options you have.

CO-HEARING OFFICER DODUC: Those are the only two options you considered?

WITNESS BOUREZ: Correct.

MR. BERLINER: Thank you.

Change subjects a little bit.

I'd like to refer to, again, Sacramento Valley Water Users Exhibit 107 and page 41.

Scroll down a little further.

CO-HEARING OFFICER DODUC: Mr. Berliner, I'm having trouble following your topic areas.

What topic are we on now?

MR. BERLINER: Modeling assumptions.

CO-HEARING OFFICER DODUC: All right. And then modeling approach will be your last topic area after this?

MR. BERLINER: Well, this is a pretty long subject.

CO-HEARING OFFICER DODUC: But I'm trying to keep your topic areas in line.

MR. BERLINER: Yeah. I will -- I have to say

they're -- this is a very large subject. There are a number of things that fall under this. I tried to be descriptive without being too granular.

I'm sorry, Mr. Baker. Could you scroll up a little bit?

We discussed earlier changes to discretionary versus -- or I'm sorry. We -- strike that.

We discussed earlier discretionary and nondiscretionary assumptions within the model, correct?

WITNESS BOUREZ: Yes.

MR. BERLINER: Does this page identify changes to discretionary assumptions that the MBK made to the no-action alternative and the H3-plus alternative?

WITNESS BOUREZ: I want to be clear what you mean by discretionary and nondiscretionary in terms of these model changes. Please clarify that.

MR. BERLINER: So I'm not talking about your discretion as to how you choose to do your modeling. I'm talking about your actions that are discretionary. For instance, regulations were nondiscretionary?

WITNESS BOUREZ: We did not change any of the nondiscretionary actions in the model.

In terms of meeting contract obligations and standards, biological opinions, we're meeting that in all of our modeling, and we did not change that. We did

change the representation of how those are met and refined, how we meet those requirements to improve the way the model operates.

MR. BERLINER: So the list that's here, these eight bullets represent discretionary assumptions in the model that you made changes to, correct?

WITNESS BOUREZ: The term "discretionary" is confusing me. It was our discretion to improve the model and its representation. And virtually the operations of the models, whether it's the petitioner model or our model, is up to the discretion of the modeler.

So the petitioners had discretion on how they balanced the system and what changes they used to balance the system. We have those as well. And we input, to the best of our ability, those discretionary decisions to improve the operations to the best we could, and we feel that's more realistic.

CO-HEARING OFFICER DODUC: While still meeting all the nondiscretionary requirements of the operations?

WITNESS BOUREZ: Yes, that's correct.

MR. BERLINER: The phrase "standard CalSim modeling practice" which you used in Exhibit 107, could you tell me what you meant by that? And I could refer you to page 39, if that's helpful.

CO-HEARING OFFICER DODUC: Please go there.

WITNESS BOUREZ: To answer this question, I'd like to refer to Sac Valley Water Users Exhibit 110, page 10. Page 10, Slide 10.

This is an example of standard CalSim operating criteria. What the standard operating criteria did in this example for the H4 scenario is --

WITNESS EASTON: I want to make it clear that we are looking at the results of the petitioners' modeling.

WITNESS BOUREZ: In this standard operation of CalSim in the petitioners' modeling, in this -- this is what we extracted from their model. We took a two-year operation of their model.

And what we saw in this example is that when we had high Delta surplus, the model exported the big gulp. But then when it got to June, July, August, September, the model looked at the standard input for the export estimate and it was lower than the no-action alternative.

Therefore, it did not export that water and left it in Oroville, and Oroville ended up a million acre feet higher as a result.

So if you're saying this is standard operating practice, which it is, it results in an operation that

we don't believe is reasonable or realistic.

It's unrealistic to assume that if you increase the Delta export capacity with the tunnels that you're going to actually move less stored water.

So when you say "standard operating practice," every CalSim model run needs adjustment so that you depict the operations and the best manner that you can. And we don't believe that this standard operating practice that was applied to a lot of the California WaterFix modeling that the petitioners submitted is realistic but is using the standard operating procedure.

So you've got to be careful on how you adjust these model runs. You can't run it because it's a standard and expect that the results are reasonable.

MR. BERLINER: In other words, then, when you did your modeling, you changed these standard modeling practices to achieve what you felt was a more reasonable result, correct?

WITNESS BOUREZ: That's correct.

MR. BERLINER: And did you evaluate which of the modeling assumptions that you changed had the greatest impact on the results of -- on water supply results relative to the WaterFix modeling?

WITNESS BOUREZ: I can't say that we measured which one was more significant than not. But the ones

that we listed in our conclusion -- being the export estimate, the use of joint point of diversion, the San Luis rule curve -- are three that have a very significant influence on the operation of the projects and allocations -- water supply allocations.

MR. BERLINER: Compared to the other actions that we discussed earlier that were on that rather long list, are the other actions relatively immaterial on water supply impacts compared to the ones you just identified?

WITNESS BOUREZ: I have to add some specificity to your question, Mr. Berliner, because it depends on whose water supply you're referring to.

Overall water supply, these are the most important ones. However, if you're a CVP north of Delta AG service contract water user, then other adjustments to the allocation logic for CVP north of Delta is probably the most important one.

So if we were to take the petitioners' modeling and make these three changes, I would expect that our modeling results would be much closer together. But they still wouldn't be identical until we made some of these other changes.

MR. BERLINER: As far as impacts on storage levels and south of Delta export operations, will you

agree that the San Luis rule curve and the water supply allocations would be the assumptions with the greatest impacts?

WITNESS BOUREZ: It's difficult to say. The export estimate and SWP CVP rule curve logic would have a significant effect on the operations.

I think that, in combination with removing limits on joint point of diversion, would make a big difference to the model runs. I can't tell you how much exactly. We have not analyzed that.

MR. BERLINER: Go to DWR Exhibit 549, please.

So we took a shot at it, and we have some exhibits to hand out.

So what we're going to hand out in this exhibit is a comparison of the MBK modeling assumptions and WaterFix modeling assumptions. And the exercise was to determine which of the changed modeling assumption was responsible for the largest change in modeling results. So there are essentially three figures here.

And, Mr. Baker, if you could just scroll down to show that there's three different figures here. Figure 1, Figure 2, and next page has Figure 3.

If you could scroll back up.

Figure 1 is a replication -- as you'll see, there's an asterisk on the bottom indicating the source,

which is Figure 6 in Sacramento Valley Water Users Exhibit 107.

And, Mr. Baker, if you could scroll down to Figure 3.

Figure 3 is a replication of Figure 41 in Exhibit 107.

And if you could scroll up to Figure 2, please.

And I'll give you a minute to take a look. I wanted to orient for purposes of the record.

Figure 2 reflects the difference between the MBK no-action alternative and the MBK Alternative 4A H3-plus by then rolling back the following WaterFix assumptions, which would be climate change, the rule curve logic, and the allocation logic.

Do you follow that so far?

WITNESS BOUREZ: I'm not sure.

MR. BERLINER: I can go through. I agree, it's confusing.

WITNESS BOUREZ: I'm not sure what that Figure 2 is. It doesn't look like MBK modeling.

CO-HEARING OFFICER DODUC: Mr. Berliner, it will be helpful to me if you walk more slowly through this --

MR. BERLINER: Yes. I'm going to do that.

WITNESS EASTON: Sorry. Are you saying that you have modified our modeling and produced results?

MR. BERLINER: In order to produce Figure 2.

CO-HEARING OFFICER DODUC: Explain that modification to me.

Mr. Kelly, hold on.

(Cell phone ringing.)

MR. KELLY: I'm going to object to this exhibit and these graphs on lack of foundation. We don't know that they actually accurately depict anything MBK did. I don't know who prepared them. I don't know what modifications were made. And so there's been no foundation with respect to any of the work that went into this exhibit.

MR. BERLINER: As has been consistent with prior practice, we will lay the foundation on our rebuttal.

CO-HEARING OFFICER DODUC: Thank you.

Now, explain again to me the modification you made.

MR. BERLINER: Let's start with Figure 1.

Figure 1 is a replication of the Sacramento Valley Water Users, Figure 6, in Exhibit 107. It's simply a replication of that figure.

CO-HEARING OFFICER DODUC: Okay.

MR. BERLINER: By the same token, Figure 3 is a replication of Figure 41 in Exhibit 107.

CO-HEARING OFFICER DODUC: Scroll down to Figure 3, please. Okay.

MR. BERLINER: And the sources are indicated, as you'll see above the graph referring to the MBK no-action alternative.

CO-HEARING OFFICER DODUC: Okay.

MR. BERLINER: So in order to compare Figures 1 and Figure 3, Figure 2 does that.

So what Figure 2 is, is to reflect the difference between the MBK no-action alternative and the MBK Alternative H3-plus. And then we -- in order to figure out which had -- which discretionary measures that we've been discussing had the biggest impacts -- in other words, in order to sum the differences -- we took out climate change, we took out the rule curve -- the change to the rule curve logic, and we took out the change to the allocation logic.

WITNESS BOUREZ: So this is CalSim's modeling result?

MR. BERLINER: Correct.

WITNESS BOUREZ: There's a myriad of things --

MR. LILLY: He hasn't asked a question.

MR. BERLINER: Not asking.

CO-HEARING OFFICER DODUC: Okay. Go on, Mr. Berliner.

MR. BERLINER: I believe that by comparing Figure 1 -- Figure 2 to Figure 1, it's impossible -- it's possible to determine the relative effect of the three assumptions of climate change, rule curve, and allocation logic is the point of the exercise.

CO-HEARING OFFICER DODUC: Mr. Lilly?

MR. LILLY: I still haven't heard a question. I'm waiting for the question before I object. I don't want Mr. Bourez to start answering until we actually have a question.

CO-HEARING OFFICER DODUC: All right.

MR. LILLY: This isn't working.

CO-HEARING OFFICER DODUC: Hold on, Mr. Berliner.

MR. BERLINER: Yes, thank you.

So my first question is: Do you agree that this comparison between the MBK modeling assumptions and the WaterFix modeling assumptions is a reasonable approach for assessing the relative impact of each of these changed assumptions?

MR. LILLY: Now I'm going to object.

This is a whole different order of magnitude, different than anything we did where we said we would

make a foundation later.

What we did with our exhibits was we took the petitioners' modeling output and we prepared figures that were simply the numbers from their modeling output.

What they apparently have done here is make some significant changes to the actual modeling and then prepared this Figure 2 based on their changes in the modeling.

And it's really not appropriate for them to ask Mr. Bourez anything about the changes that their modelers made to the MBK modeling. They certainly can offer their testimony on rebuttal if they think it's appropriate, and we'll consider it at that time.

But this is inappropriate to ask him questions about the modeling that they did without anything for him to know exactly what was done.

CO-HEARING OFFICER DODUC: Mr. Berliner, he makes a good point.

MR. BERLINER: This is not new modeling. This is withdrawing from the MBK model these three assumptions. So it's basically math.

CO-HEARING OFFICER DODUC: Let's do it -- let's go with this approach, because I appreciate the question you're trying to get at, which is: What is the, you know, the changes that were made? What were

the most impactful? How does it influence the outcome?

I appreciate that line of questioning.

I would suggest, Mr. Berliner, and I will allow you to ask this, but I would suggest that you ask your questions based on your analysis, but don't ask for Mr. Bourez legitimizing your analysis, if that makes sense.

You performed an analysis that shows certain changes in certain impacts. Ask him about those changes without asking whether or not this is the way he would go about doing the analysis.

That was probably as clear as mud.

MR. BERLINER: Well, my approach is a little different. Let me try something and see if that works.

CO-HEARING OFFICER DODUC: Hold on.

Mr. Jackson?

MR. JACKSON: Michael Jackson. In the first part of the hearing, we got some instructions on surprise testimony. This is not mine. But it seems likes this would be good time to clarify what the board means by "surprise testimony."

The rebuttal would be an appropriate place for this kind of cross. I just wanted to know -- I mean, obviously, Mr. Bourez and other experts may very well find themselves in this position where they get hit with

something new after the close of the -- of the testimony and I wanted to sort of make that consistent.

CO-HEARING OFFICER DODUC: Thank you, Mr. Jackson.

Quickly, Ms. Des Jardins.

MS. DES JARDINS: I disagree with Mr. Berliner's assessment that it's just simple math.

CO-HEARING OFFICER DODUC: Thank you.

MS. DES JARDINS: I believe it belongs in rebuttal.

CO-HEARING OFFICER DODUC: Thank you.

I will remind everyone that when petitioners put out their witnesses, other parties were allowed to take the modeling, prepare their own analysis and charts, and use that as a basis for their cross-examination.

I will give petitioners the same courtesy with respect to their cross-examination.

Mr. Berliner, please try again.

MR. BERLINER: I will. Thank you.

Mr. Bourez, if you wanted to calculate the difference between the MBK no-action alternative and the MBK Alternative 4A 3H modeling, what would you do?

WITNESS BOUREZ: If I wanted to calculate the difference?

MR. BERLINER: Yes. The relative effect -- let me be more specific. The relative effect of the three assumptions on water supply.

WITNESS BOUREZ: So I'm going to restate your question, Mr. Berliner, to make sure I understand it, because this is very confusing.

What you're asking is if I were to take out those three assumptions, what would be the difference in the operations of the project and the results of the modeling?

MR. BERLINER: Correct.

WITNESS BOUREZ: I would have to perform a detailed evaluation and look at the models in detail to ensure that the difference between those two model runs is a true depiction and accurate depiction of the action that I'm taking by removing those.

That's a complex modeling exercise. It's nothing that is -- it's not simple math.

MR. BERLINER: Let me cut you off. I can tell I'm not going to get an answer to my question.

So in the interest of saving time -- and I'm not saying you're being evasive. I just know I'm not going to get an answer that I'm looking for.

So let me just ask you this more generally speaking: Based on your familiarity with your work,

will you agree that the San Luis rule curve and the water supply allocations are the modeling assumptions that work together to have the largest effect on storage levels north of the Delta and south of Delta export operations?

WITNESS BOUREZ: Those, in combination with joint point of diversion assumptions, are probably the three factors that have the largest influence on the model results.

MR. BERLINER: And could you put a percentage or an approximate percentage of impact on that?

WITNESS BOUREZ: No, I can't. I have not performed the analysis.

MR. BERLINER: Okay. Again, referring to the phrase "standard CalSim modeling practice," is it the agency standard, CalSim modeling practice, to use an algorithm to generate water supply allocations?

WITNESS BOUREZ: All models are algorithms, so in that context, yes.

MR. BERLINER: And do the agencies use -- in CalSim, do the agencies use the same algorithm for all 82 years of the hydrologic record?

WITNESS BOUREZ: I believe they do.

MR. BERLINER: And doesn't the agencies' CalSim logic for making these water supply allocations

consider many of the same factors that project operators would consider, such as storage levels and hydrology forecasts?

WITNESS BOUREZ: I believe that the WSI-DI procedure that's embedded in CalSim is very different than actual operations. And in actual operations, there really is no San Luis rule curve.

So these are modeling gimmicks to try to mimic what operations do, and at times they can do a reasonable job. And they do require significant adjustment and refinement to produce a model run that's acceptable.

MR. BERLINER: So would it be fair to say that the modelers consider, though, many of the same factors as the operators, even though they may not be under identical circumstance and the operators may consider other factors as well?

WITNESS BOUREZ: The factors that the models consider are a fraction of what is available in actual operations. And it's very simplified and it's codified where operators have extensive experience and they have far more information to base their decisions on than we feed to the models.

MR. BERLINER: Now, MBK was hired to investigate a means to improve the San Luis rule curve,

correct?

WITNESS BOUREZ: That's correct.

MR. BERLINER: And that's in the context of the CalSim, just to be clear, correct?

WITNESS BOUREZ: That's correct.

MR. BERLINER: And as part of the work that MBK did for reclamation, did you also propose changes to the allocation logic?

WITNESS EASTON: Yes, we did. And the reason was, is that the export estimates -- and, actually, these are something that we have gone over that was part of the petitioners' modeling -- the export estimates are often very inaccurate and it can, at times, lead to unrealistic allocations.

And so what we had proposed was an iterative process to come up with more accurate export estimates for purposes of making an allocation.

MR. BERLINER: And, Mr. Easton, thank you.

So regarding these export estimates, are they the same as were used in the BA modeling?

WITNESS BOUREZ: No, they're not.

MR. BERLINER: How are the two approaches different?

WITNESS BOUREZ: The approach that we've implemented in CalSim for the BA modeling is a process

where the allocation forecasts get much closer -- the export estimates get much closer to the model results. So that when you're making allocations to south of Delta, the allocations that are made, the forecasted allocations, are much closer to what's actually being exported.

And the reason this is very important is when you increase the capacity, the export capacity, you have to recognize that increased ability to export when you're making allocations. Without doing that, you have the results that you see in the petitioners' models where the water could be exported and it just sits in San Luis and didn't get allocated. So that causes San Luis operations to be unrealistic and stay high and not allocate that water. And that has a ripple effect through the entire system.

MR. BERLINER: So the WaterFix used one set of numbers for the entire 82 years, correct?

WITNESS BOUREZ: There's two sets with the CVP and three sets of the tables for the SWP, and they're all dependent on how much San Joaquin River flow occurs.

So if it's a wetter San Joaquin River, then the export estimate will be higher. And that's because the San Joaquin River contributes to Old and Middle River flow. So if there's a higher Old and Middle River

flow, then --

(Reporter request for clarification.)

WITNESS BOUREZ: San Joaquin River contributes to Old and Middle River flow.

Therefore, exports, when Old and Middle River flow criteria control will be higher and so will exports during times when San Joaquin River IE ratio controls.

So there's three sets of tables for the SWP and two for the CVP.

MR. BERLINER: And that's -- that is the same method that the agencies use, correct?

WITNESS BOUREZ: That's correct.

MR. BERLINER: Did MBK use a modeling approach where you used separate numbers for each individual year?

WITNESS BOUREZ: Yes.

MR. BERLINER: And could you explain what you did -- and I know this is complicated. Took me a long time to understand this.

Could you try to do it short and in plain English?

MR. LILLY: And slow down.

WITNESS BOUREZ: It's actually fairly easy. It's not complicated.

When you look at the tables for export

estimates, every hydrologic year is very different. San Joaquin flows are different. Hydrology is different. And to use one export estimate or two export estimates to represent all the years means that you're going to have a lot of years where that export estimate is significantly different than what's being exported. And when there's those differences, the allocations are going to be off.

So what we did is we developed a procedure where we run the model and determine -- it's actually an iterative process where we run the model and we determine what the exports are and we change the export estimate to be commensurate with the exports.

WITNESS EASTON: I want to add to what Mr. Bourez is saying.

He is exactly right to say what you call an iterative process. You can call it a trial-and-error process. But the whole point is for every year -- and I want to make this clear -- we reviewed the allocations for the no-action alternative -- we reviewed allocations every year to make a determination, is this how -- is this a reasonable way to operate the project.

And if we made the determination that it wasn't -- and Walter had shown you a very good example with the petitioners' modeling in 1975 where that was

not a reasonable allocation. In a time like that, we would do a trial-and-error process to make a determination as to what a reasonable allocation would be, taking into account carryover targets, available export capacity, San Luis carryover, making sure we wouldn't short South Delta contractors.

It was a very laborious process; but by doing that, I really believe that we got a more realistic result than you would with their -- the standard methodology.

WITNESS BOUREZ: And let me add to that, too, the reason that we chose this approach is because, as I mentioned, operators have a lot more information at their disposal to make these decisions.

So when you're in May, the water supply that you have available is pretty well known. Yet CalSim, with these export estimates being one number, could really misrepresent how much water is available and could be exported.

And because of that big difference that we saw, and you see in the petitioners' modeling, we felt that was an unrealistic operation. We refined that operation to come up with something we believe is more realistic and better reflects how the California WaterFix would operate.

MR. BERLINER: So you looked at a given year -- and I'm going to ask your indulgence if I try to -- I'm not asking you to agree with me; I'm just going to ask you if I've got it accurate.

You looked at a given year, and you said in order to optimize the amount of water that might be moved from north of Delta to south of Delta, you compared what the result was under the WaterFix model, and said, "Gee, there was a lot of water left upstream in that particular year. Let's go back and make an adjustment to that year in order to not leave as much water stranded up north and move it down south where it could be used for exports," correct?

WITNESS BOUREZ: Not exactly correct. You've got the general idea.

But we did not optimize the use or release of stored water. What we did is we looked at the upstream storage levels in springtime and said -- and made an assessment because we didn't -- you can't look all the way through and know what next year is and know what's going to happen throughout the entire year.

But in May, you have forecast volumes that go through July. There's forecasts that are made that are fairly accurate.

So we looked at how much was in storage and

how much of that storage in the spring do we think we could release for south of Delta while still meeting the upstream carryover requirements and RPA levels. So we made an assessment in springtime how much water can we release for south of Delta.

And you'll notice in our results, in the drier critical years when storage is lower, we don't move water. We move that water when storage is high in springtime.

So that's the process we went through. It wasn't to optimize the amount of stored water that was to be conveyed; it was to assess how much water is available upstream and determine how much of that can we convey while meeting the requirements in upstream.

MR. BERLINER: And you did this over the 82-year hydrologic history; is that correct?

WITNESS BOUREZ: That's correct.

WITNESS EASTON: And, I mean, we looked at the allocations, and there were years where the standard practice, WSI-DI -- and we had more detailed export estimates -- where the allocation, we look at that and we think that looks reasonable.

It's really -- it's really just -- we saw allocations that did not look reasonable. It's more important to get the result right than to hold yourself

to a standard practice.

MR. BERLINER: This was exercised in hindsight, correct?

WITNESS BOUREZ: No. This was -- when we're running the model, we assessed it in the springtime just as operators do. We assess how much water supply is available, and we make our allocations at that time.

You can't look too far ahead in modeling. You know, if we were to look ahead, we would never have an impact in a dry year from moving stored water in a wetter year because we would know next year is dry, we shouldn't move it.

So what we did is look at the given year and try to come up with a reasonable operation given the conditions in that year.

MR. BERLINER: The years you looked at, though, were the 82-year history, correct?

WITNESS BOUREZ: We looked at the full 82 years of CalSim, yes.

MR. BERLINER: If you're applying your approach in the future, how do you operationalize that?

Let's say we're talking WaterFix is built and we're now in the year 2030 and it's operating and you're in January. How do you operationalize that?

WITNESS BOUREZ: That's a great question.

In actual operations, they're going to look out the window, how much water do we have in the reservoirs, what's our forecast, what's our snow melt, and what's our snow pack, and they're going to make an allocation and an operational forecast based on conditions that they have at that time.

Then when they get to February, they will update that, and they'll update that all the way through May, when they make a final allocation. And they -- like I say, in operations, they actually have a lot more information than we're feeding to CalSim.

So the procedure that we put into our modeling mimics the procedures in a way that the operators walk through their decision process.

And it's a lot more work to run the model -- it takes us a couple of weeks to do one model run -- rather than plug the model in and run with the standard operating procedures.

MR. BERLINER: So if we're in 2030, understood operators have a lot of data, far more than the modelers have. The modelers, as I understand it, are not looking to get it precisely right in 2030 -- I'm sorry. The modelers are not looking to get it precisely right. The operators, of course, are trying to maximize whatever they can under the given circumstances based on a myriad

of the considerations they have to make, correct?

WITNESS BOUREZ: Yes.

MR. BERLINER: So the modelers are looking ahead for forecasts, correct?

WITNESS BOUREZ: Yes, they use forecasts.

MR. LILLY: Excuse me. I think that may have been unclear. Did you mean the modelers or the operators? I think you meant the operators.

MR. BERLINER: No, I meant the modelers.

When you said the modelers were forecasting, the operators were basically operating in realtime, correct?

WITNESS EASTON: When you said "forecasting," because you brought up for 2030, are you saying forecasting to what we're going to operate in 2030? Is that what you're saying?

MR. BERLINER: I'm sorry. Maybe I've confused the record here a little bit. Let me start over.

If we're in 2030 and we're talking about operators, they have a great deal of information available to them, and they're looking to make the best use of the water in the reservoirs to the extent they can maximize exports, meet all the regulations, et cetera, right?

WITNESS BOUREZ: Correct.

MR. BERLINER: If you're a modeler, when you're looking forward towards 2030 and you're modeling future conditions -- you're in not 2030, you're modeling future conditions -- you don't have all that information, correct?

WITNESS BOUREZ: I'm a little confused. We're not modeling -- operators don't look at 2030 right now.

So are you assuming that you're in January, say, of 2030 and you're looking at that year?

MR. BERLINER: For my first question, yes. If you're the operator, you're in January, you have to make various decisions rolling along January, February, March, April consistent with what you just discussed in terms of allocations, correct?

WITNESS BOUREZ: Correct.

MR. BERLINER: So the job of the operator is different than the job of the modeler, correct?

WITNESS BOUREZ: Uh-huh. Correct.

MR. BERLINER: All right. In order for your model to be useful to the operator in 2030, what will the operator do to make use of your model?

MR. LILLY: I'm going to object. This question is nonsensical.

They've already said the CalSim period of record is 82 years in the past. And, therefore, to talk

about modeling of 2030 doesn't make any sense. And I can assure you -- and I think we all know -- you know, operators aren't going to look back and say, "Well, this was how it was modeled in 2016" to determine how they'll operate in 2030. They'll operate in 2030 based on the hydrology in 2030.

So the question is ambiguous and, to some extent, very confusing as to saying how the operators in 2030 would rely on the modeling done today. So I object on that basis.

CO-HEARING OFFICER DODUC: Mr. Berliner, I'm confused, too, as to the relevancy of this line of questioning.

MR. BERLINER: Well, I'm trying to get the relevancy of the modeling that MBK did.

So let me ask another question.

Do you run the model and then update the exports and then run it again?

WITNESS EASTON: When you say "update the exports," are you talking about, like, the simulated exports? Are you talking about the export estimates used in the allocation process?

MR. BERLINER: The estimates.

WITNESS BOUREZ: Yes, we updated the estimate. And if I may give a little bit of background on this.

CalSim's WSI-DI procedure is based on iterating the model itself. You have to iterate the model in order to train that WSI-DI curve.

This is just another iteration that refines that allocation procedure to a more precise level so that the export estimates come closer to the actual exports in the model so that you get an appropriate allocation.

MR. BERLINER: So do you have to run 82 sets of numbers in order to come up with a figure for a different -- for a given year?

WITNESS BOUREZ: No. We did not run the model -- well, we may have run it 150 times, maybe even a couple of hundred times, to get the modeling correct.

But we did not run each year individually. We made adjustments to the model simulation and ran it again. So it would be making generalized type of adjustments to the export estimates.

WITNESS EASTON: And I would like to add to that that -- so there's two components we're talking about here. There are the export estimates, and then there is the fine-tuning of allocations that we made beyond the export estimates. And that's what we were talking about, the trial-and-error process.

So the export estimates were, in our process,

were refined early on. And this is done exactly as Mr. Bourez was saying where we run the model, we look at the export estimates, compare them to actual exports. And if they were way off, we realize, well, that isn't really good information for allocation and so we would adjust them.

We got a study. And then we did another thorough review of every year of allocations, and we made a determination that the logic that we had, the WSI-DI combined with the export allocation logic, really wasn't -- there were obvious times where the allocation could have been better to -- and this goes for both the no-action alternative and for the project proposal.

And a perfect example with the no-action alternative is we saw that with the North Delta diversion -- or not North Delta diversion. Sorry about that. With the North Delta AG service contractors, we knew that they were being severely underallocated and we could -- and we knew that was interfering with our ability to get a realistic result.

And so we could run a model where we could start to be getting -- and wherever we had a question of whether it was a reasonable allocation or not, we could run the model to that year. The tool allows you to stop the model at that year, and then you could try different

allocations to see how that played out until you got to a reasonable carryover and a reasonable export. And that's what -- that's how we were running the model.

MR. BERLINER: So if I'm in my -- back to my 2030 year, the operator can't do this trial and error, trial and error over and over again, right?

WITNESS BOUREZ: The operators can't go back in time. However, the operators have far more information than we're feeding into CalSim.

And what we do is try to get the model to be commensurate with the amount of information and knowledge that the operators have when making that allocation.

When you look at May 1st, we have a pretty darn good idea of what our water supply is going to be each year. That's what we're basing these allocations on.

And CalSim, with the standard procedure, it doesn't recognize the water supply situation in May very well, nor does it recognize the forecasted exports very well, as we've demonstrated with this export forecast.

What we try to do is incorporate into the model at least a commensurate level of detail that the operators have to make those allocations.

MR. BERLINER: Aren't you, in essence,

exercising perfect foresight by doing that?

WITNESS BOUREZ: No, we're not.

WITNESS EASTON: If we get back to the -- you say operators can't do trial and error like that.

I can't speak for operators, but it is my understanding that they do run operations forecasts models, and it would be my understanding that they would do trial and error to determine a reasonable allocation.

You got to remember that they're doing this on -- for their final allocation at the beginning of May where they have a very -- the forecast that they have are -- what would be the right word for it?

WITNESS BOUREZ: They have -- there's a high degree of certainty in the water supply in May.

And Dan's right -- Mr. Easton is right. We actually have our own versions of the operations models, and we run countless scenarios to simulate from May through the end of September.

And so you do iterate those models to try to come up with an iteration or an operation or a forecast.

So I mean, we can go into a lot more detail here, but we aren't looking ahead. If we were looking ahead, we would know what the next year is and we would have a carryover storage that would protect us against the drought. And if we knew next year was going to be

wet, we would pull the reservoirs down much harder. To me, that's looking ahead.

Looking from May to September is a forecast that's performed with a fairly high degree of certainty knowing what the water supply is.

WITNESS EASTON: And we feel what we did is a closer approximation of that realtime forecast than what you get from WSI-DI or the export as to the findings in standard procedure for CalSim.

MR. BERLINER: Where you found a difference between the WaterFix modeling and your modeling, my understanding is that you went back and essentially -- you used a phrase that I can't remember off the top of my head -- but a user-defined value that you put in.

In other words, my language, if there was a substantial difference between your model and the WaterFix model, you went back and fixed the number in order to make it to get -- take more out of storage, get more into exports, do what had to be done in order to make better use of the water, if you will, not trying to provide a value on that.

WITNESS BOUREZ: I'm not quite sure what you're asking. And you said that we change the model to match the WaterFix model. If you could just narrow your question down a little bit, it would be really helpful.

MR. BERLINER: I'm going to try, and then it would be good time for a break after that.

I was trying to understand your approach. It struck me that you -- that as you're an operator going in January and February and March, you don't have a great deal of information; you have an ever-increasing amount of information.

And you said, "Okay. By May, we have a whole lot of information based on all of our collective hydrologic experience. Generally speaking, there aren't too many surprises after May 1st, but we all know there's big surprises in January, February, and March."

Under your modeling approach, it appears as if you have fixed that uncertainty by creating a substantially higher level of forecasting. In other words, your degree of predictability is far higher than what the agencies are using; is that fair?

MR. LILLY: Again, the question is ambiguous. I'm not sure -- again, timing is very important here and I don't know if he's referring to degree of predictability in January and February or on to May. And I think it's a very important distinction, so he should break up the question.

MR. BERLINER: We're talking about January/February.

WITNESS BOUREZ: The model does not forecast in January/February. The first month it forecasts is March, and then it updates it in April, and then it updates it in May.

MR. BERLINER: And it's based on information you have in December, January, and February, correct?

WITNESS BOUREZ: It's based on the information you have at the time of the forecast. So if it's May, you have everything up through May 1st, including storage and forecasts.

MR. BERLINER: And if it's March, you have January, February, correct, plus prior months?

WITNESS BOUREZ: Correct.

MR. BERLINER: Maybe now is as good a time for a break as any.

CO-HEARING OFFICER DODUC: Let's do that.

Before we break, Mr. Berliner, Mr. Baker has graciously given you another hour, even though I hadn't make that determination yet.

What additional -- by my list, are you done with model assumption or approach? Or how much more time -- can we wrap this up in terms of your cross-examination today?

MR. BERLINER: I would say that I will run over to tomorrow morning.

CO-HEARING OFFICER DODUC: And you're still focusing just on model assumptions and model approach?

MR. BERLINER: If you give me just a minute to flip through my notes.

CO-HEARING OFFICER DODUC: Why don't you do that during the break.

We'll resume at 4:30.

MR. BERLINER: Be happy to.

(Off the record at 4:20 p.m. and back on the record at 4:30 p.m.)

CO-HEARING OFFICER DODUC: All right, everyone. Microphone. Are we all back?

I see they're lined up. Hold on, everyone.

It's 4:30. We're resuming.

CO-HEARING OFFICER DODUC: Microphones. Are we all back? I see they're lined up. Hold on everyone. It's 4:30, we're resuming.

Mr. Hitchings?

MR. HITCHINGS: Hearing Officer Doduc, Andrew Hitchings for GCID and Biggs-West Gridley Water District.

We were hoping we might be able to have a few minutes at the end of the session today to just get some time estimates on who intends to cross and time estimates of cross so we can help with planning our

remaining panels. I think that would be helpful for the board and folks in the audience and a lot of witnesses that are traveling very far to come here next week.

CO-HEARING OFFICER DODUC: All right.

MR. HITCHINGS: Thank you.

CO-HEARING OFFICER DODUC: Is that it? All five of you needed to stand for that?

MR. BERLINER: Actually, Hearing Officer Doduc, we would concur with that proposal. I think that would be far more efficient, especially because we have some parties where we have witnesses that are testifying on behalf of multiple parties. Not like these witnesses that are testifying once, but there are some witnesses that are testifying three or four different times.

So there's a little -- we don't really want to have to cross-examine the same witness four times. Some of it's redundant. So, yeah, if we could spend a few minutes -- maybe I could go for 15 minutes and then we could spend a few minutes straightening that out.

CO-HEARING OFFICER DODUC: Okay.

MR. BERLINER: That would be really helpful.

CO-HEARING OFFICER DODUC: First convince me that you should get more time.

MR. BERLINER: I don't have that much left, as motivating as that might be. I have a couple of quick

ones to finish up on this topic that we're almost done with. And actually, looking at that, I had a question on the joint point that we've taken care of, so I don't need to address those. And I've got some on Cross Channel Gate operations and things like that climate change, and then some very generalized questions just about modeling in general, and then I'm done. But I don't think I'll finish all that in the next 15 minutes.

But I won't need much time in morning.

CO-HEARING OFFICER DODUC: Let's finish up at least this particular line of questioning in the next 15 minutes so that we can have a little conference on procedures and process.

Mr. Berliner?

MR. BERLINER: Thank you.

CO-HEARING OFFICER DODUC: I'll just remind everyone that we do have a hard stop at 5:00 o'clock when all the audio equipment shuts down.

MR. BERLINER: This modeling approach we've been discussing, did you present this approach to the agencies?

WITNESS EASTON: As you had mentioned before, we had been hired by reclamation to -- to talk about improvements to San Luis operations, and with that

came --

MR. BERLINER: Just go like that.

WITNESS EASTON: I'm sorry.

MR. BERLINER: Thank you.

WITNESS EASTON: We had -- and in that we talked about that there needed to be revisions to the export estimates because we were getting unreasonable allocations because of the export estimates and what we just discussed where the -- where we did further refinements that we had just discussed that had not been discussed with the agencies. I mean, I have -- I'll leave it at that.

MR. BERLINER: Did you discuss with them this generalized approach that you're proposing here as opposed to the specific approach that you're proposing?

MR. LILLY: I object. The question "generalized approach" is very unclear and ambiguous. We've talked about a whole bunch of different specific model changes.

CO-HEARING OFFICER DODUC: Mr. Berliner?

MR. BERLINER: Did you discuss the concept of using this iterative approach with the agencies?

WITNESS BOUREZ: Yes, we did.

MR. BERLINER: Do you know when you did that?

WITNESS BOUREZ: I'm guessing here -- the

older, I get the least I remember about time. A year and a half to two years ago. I'm guessing.

MR. BERLINER: What was the response of the agencies to your proposal?

WITNESS BOUREZ: Dan was at some meetings that I was not at.

My recollection is when I first presented the San Luis rule curve and operational changes, folks were just grasping the concept and trying to understand it. And we have applied this for an EIR/EIS for the Bureau of Reclamation -- in fact, two different environmental documents for the Bureau of Reclamation using this logic -- and they have not had a problem with it that we know of.

But maybe Dan can speak to meetings that he's had regarding this procedure.

MR. BERLINER: Mr. Easton?

WITNESS EASTON: I want to be clear that we're talking about the same thing. Are we talking about updating export estimates, or are we talking about the procedure, the trial-and-error process for refining allocations?

MR. BERLINER: The trial-and-error process.

WITNESS EASTON: I have not discussed that with the agencies. And -- is that...

MR. BERLINER: And did you have meetings with them where you discussed alternative ways of updating the export allocations?

WITNESS EASTON: Did I have additional meetings for discussing the export estimates advising us for estimates for the...

I recall one meeting where I handed off draft documentation and gave a -- gave a presentation on the methodology for improving the export estimates along with some other suggestions for improvements to San Luis operations.

MR. BERLINER: And did it involve this type of an iterative approach?

WITNESS EASTON: Well, the improvements to the export estimates is an iterative approach, like WSI-DI is an iterative approach.

So is that your question?

MR. BERLINER: At these meetings, did you discuss gaining a higher level of forecasting capability using your trial-and-error approach?

MR. LILLY: I'm going to -- misstates the testimony. I don't think that what he called the trial-and-error approach was related to getting a better forecasting capability. I think that misstates the testimony.

MR. BERLINER: I wasn't trying to repeat the question. I'm asking it as a question.

WITNESS EASTON: So the trial-and-error approach is really a -- this isn't an approach that you just hand off to somebody. This is really applying your expert opinion as to whether the model is giving you a reasonable allocation or not.

The trial-and-error approach is to ensure that the model is providing your reasonable allocation given the conditions, carryover conditions, available export capacity, and -- and other terms.

MR. BERLINER: What's the difference between an estimate and a forecast?

WITNESS EASTON: Well, I'm not sure what you're talking about.

MR. BERLINER: Well, you seem to make a distinction between an estimate and a forecast. Maybe I misunderstood you.

Are you drawing a distinction between the two?

WITNESS EASTON: I didn't draw --

WITNESS BOUREZ: I think there's been -- a forecast is an estimate. I think he may have used the words interchangeably.

MR. BERLINER: If another modeler not from MBK was to take your model, would they come up with the same

results that you came up with?

MR. LILLY: I have to object. That calls for speculation. And mainly, there are just a whole bunch of questions regarding what model assumptions the other modeler would use.

CO-HEARING OFFICER DODUC: Agreed.

Mr. Berliner?

MR. BERLINER: Well, that's kind of the point. If MBK is developing a model and expects the agencies, the DWR and reclamation to use the model, they need to be able to run it and come up with the same result.

CO-HEARING OFFICER DODUC: If they use the same assumptions?

MR. BERLINER: Correct. And if they apply the trial-and-error method in the same way.

And there's a great deal of judgment, as I understand it, in applying the trial-and-error method.

So my question is: If you were to hand your model to reclamation or DWR and say, "Okay. You run it," will they come up with the same answers?

WITNESS BOUREZ: I don't think any model that a modeler develops could be handed to another modeler and come up with the same answers.

I could take the model that the agencies submitted for this process, and I could run it without

this iterative process and come up with very, very different answers.

So it depends on the modeler themself and their expertise and their knowledge of the system and their knowledge of the model to be able to get an acceptable model simulation.

MR. BERLINER: Thank you.

Different subject.

CO-HEARING OFFICER DODUC: Mr. Berliner, if you're about to change subjects, I suggest we stop your cross-examine for today.

MR. LILLY: Okay. Could we have just coverage -- I think it's reasonable; he's almost done with four hours -- for him to tell us what topics he plans to cover tomorrow and how long it plans to take?

CO-HEARING OFFICER DODUC: I was about to go there.

MR. LILLY: Thank you. I didn't mean to preempt you.

CO-HEARING OFFICER DODUC: Mr. Berliner?

MR. BERLINER: Very general modeling questions, sort of nonspecific, which are very brief. Climate change.

CO-HEARING OFFICER DODUC: What particular with respect to climate change? Considering they did

not include climate change in their analysis.

MR. BERLINER: That's correct. And I wanted to explore a little bit what the effect of having removed climate change is since they removed it or didn't -- I shouldn't say removed it -- didn't include it.

CO-HEARING OFFICER DODUC: Okay.

MR. BERLINER: Cross Channel Gate operations.

CO-HEARING OFFICER DODUC: And what do you intend to make clear about that?

MR. BERLINER: Exercise of judgment.

I've got a cleanup question on joint point.

CO-HEARING OFFICER DODUC: That is right, you mentioned it.

MR. BERLINER: That should be it.

CO-HEARING OFFICER DODUC: And were you estimating half an hour?

MR. BERLINER: Probably less. Probably less than half an hour.

CO-HEARING OFFICER DODUC: Let me go next, then, to Ms. Aufdemberge.

Are you planning to conduct cross-examination and for how long?

MS. AUFDEMBERGE: Yes, we have very short. 15, 20 minutes.

CO-HEARING OFFICER DODUC: Ms. Morris or Ms. Sheehan, State Water Contractors?

MR. MIZELL: Tripp Mizell, DWR. I have a note from Mr. Morris. She indicated a request for one and a half hours with the caveat that she will be looking at her questions for efficiencies that she can get so that she's not duplicating what we discussed today.

CO-HEARING OFFICER DODUC: All right.

Group No. 4?

MR. O'HANLON: Daniel O'Hanlon for the San Luis & Delta-Mendota Water Authority. I would expect maybe 15, 20 minutes of questions.

CO-HEARING OFFICER DODUC: Mr. Williams or other representatives of Group 5 is not here, so we don't know if they will be cross-examining or not.

6?

8? 9? 10?

Mr. Aladjem. You're Group 10.

MR. ALADJEM: No cross.

CO-HEARING OFFICER DODUC: 11? Who has yet to show? 12. 13. 14.

15. No for 15. Thank you.

16. 17.

18. I'm sure Mr. O'Laughlin will be here.

19. Ms. Meserve was here earlier today, but I

don't see her now.

20 is also Ms. Meserve.

21. Mr. Ruiz was here, but I don't see him now.

22. 23. 24.

Okay. Who remains here whom I haven't called who plans to conduct cross-examination?

Ms. Des Jardins.

All right. Well, there are those who are not here who may show up tomorrow to conduct cross-examination, but we have a pretty good idea this panel will be here at least through tomorrow. Okay.

And then Panel 2, which is just Mr. Marc Van Camp; is that correct?

MR. LILLY: I'm not sure. It's going to be a different attorney. But my understanding is Mr. Van Camp will be ready tomorrow for Panel 2.

CO-HEARING OFFICER DODUC: Okay. Anything else before we adjourn for the day? All right.

MR. BEZERRA: Very briefly. We're still on casual Fridays, I assume?

CO-HEARING OFFICER DODUC: Yes, we are. We'll see you tomorrow at 9:00 o'clock.

(Whereupon, the hearing was closed at 4:47 p.m.)

CERTIFICATE OF REPORTER

I, Megan Alvarez, a Certified Shorthand Reporter, hereby certify that the foregoing proceedings were taken in shorthand by me at the time and place therein stated, and that the said proceedings were thereafter reduced to typewriting, by computer, under my direction and supervision;

I further certify that I am not of counsel or attorney for either or any of the parties to the said proceedings, nor in any way interested in the event of this cause, and that I am not related to any of the parties thereto.

DATED: _____, 2016

_____
MEGAN F. ALVAREZ, RPR
Certified Shorthand Reporter
License No. 12470