BEFORE THE

CALIFORNIA STATE WATER RESOURCES CONTROL BOARD

CALIFORNIA WATERFIX WATER)
RIGHT CHANGE PETITION HEARING)

REGIONAL WATER QUALITY CONTROL BOARD

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

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RANCHO CORDOVA, CALIFORNIA

PART 2 REBUTTAL

Monday, August 13, 2018

9:30 a.m.

Volume 40

Pages 1 - 233

Reported By: Candace Yount, CSR No. 2737, RMR, CCRR
(a.m. session)
Deborah Fuqua, CSR No. 12948
(p.m. session)

Utilizing Computer-Aided Transcription

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:

Andrew Deeringer, Senior Staff Attorney
Conny Mitterhofer, Supervising Water Resource Control Engineer
Jean McCue, Water Resource Control Engineer

PART 2 REBUTTAL

For Petitioners:

California Department of Water Resources:

James (Tripp) Mizell
Thomas M. Berliner
Jolie-Anne Ansley

The U.S. Department of the Interior:

Amy L. Aufdemberge, Esq.

APPEARANCES (Continued)

FOR PROTESTANTS AND INTERESTED PARTIES:

For Natural Resources Defense Council, The Bay Institute, and Defenders of Wildlife:

Doug Obegi

For Sacramento Valley Group, Tehama-Colusa Canal Authority & water service contractors in its service area and North Delta Water Agency:

Meredith Nikkel

For The Environmental Justice Coalition for Water, Islands, Inc., 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, Brett G. Baker and Daniel Wilson:

Osha Meserve

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Monday, August 13, 2018 9:30 a.m.

PROCEEDINGS

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CO-HEARING OFFICER DODUC: All right. Good morning, everyone. Welcome back to this Water Right Change Petition hearing for the California WaterFix Project.

I am Tam Doduc, broadcasting from Rancho Cordova today. To my right is Board Chair and Co-Hearing Officer Felicia Marcus. To the Chair's right is Board Member Dee Dee D'Adamo. To my left are Andrew Deeringer, Conny Mitterhofer and Jean McCue.

We're being assisted by other staff today.

We are in a different location, so please take a minute and do identify the exit closest to you. In the event of an emergency, we will evacuate, and since we're on the first floor, there is no stairs to worry about. Please exit and we will meet up in the parking lot, or across the street if necessary.

In any case, second announcement is: Please take a moment and -- Oh, I'm sorry.

Please make sure the microphone is on.

I like to jump to my favorite announcement as soon as possible.

And there is actually a red light instead of a

green light on this system, so please make sure that is on, and please speak into the microphone. Begin by identifying your name and affiliation for the court reporter.

Thirdly, since we have all been away for the weekend, please take a moment and make sure that all your noise-making devices are on silent, vibrate, do not disturb.

This room does not look packed so this should not be a problem, but I will advise you that apparently if too many people access the public Wi-Fi in this room, it actually would slow down and potentially crash the Webcast.

So, for the sake of our viewing audience, again, I don't see a whole bunch of people, so that hopefully is not a problem, but if you have another avenue to access your Internet or e-mails without using the Wi-Fi, it might be a good precaution.

Any housekeeping matter before we begin today?

All right. Oh, Mr. Herrick is walking outside. All right.

(Laughter.)

CO-HEARING OFFICER DODUC: Mr. Obegi, if you could move your -- Actually, no, don't move it because the court reporter may not be able to see it.

Anyway, welcome, Mr. Obegi.

MR. OBEGI: Thank you.

CO-HEARING OFFICER DODUC: We're here for your cross-examination of this panel.

MR. OBEGI: Thank you.

I'm going to begin with questions of Dr. Wilder regarding upstream water temperatures.

And then I have a few questions for Miss Parker regarding the Revised NMFS Shasta RPA and the Reclamation's compliance with regulatory standards.

And then I have a couple questions for Mr. Reyes regarding modeling and OMR criteria.

And I think we'll finish the first hour, hopefully, with a few amount of questions for Mr. Chilmakuri.

(Continued on next page, nothing omitted.)

Rick Wilder,

Nancy Parker,

Erik Reyes,

Chandra Chilmakuri,

Sergio Valles,

Marin Greenwood,

Corey Phillis

and

Kristin White,

called as witnesses by the Petitioners, having previously been duly sworn, were examined and testified further as follows:

CROSS-EXAMINATION BY

MR. OBEGI: Dr. Wilder, on Page 8 of your rebuttal testimony, do you recall the statement that, quote (reading):

". . . Temperature-related mortality of eggs is negligible to overall survival of the winter-run Chinook Salmon population and would not constitute an unreasonable effect to winter-run Chinook Salmon."

WITNESS WILDER: Yeah, I do remember that. It's in the context of the specific calculation that I made.

So if I can just revise that statement by saying that it's expressed this way, temperature-related mortality, et cetera, as you said.

MR. OBEGI: Mr. Hunt or Miss Raisis, would you please pull up State Water Board 104, which is the Biological Assessment, Appendix 5.C, and it's Page 83 of the .pdf file.

(Exhibit displayed on screen.)

MR. OBEGI: If you could scroll down to the lower right corner, I believe it will show the temperatures for the month of September, and it's got temperatures by water year-type.

If you'd give me a moment, my screen over here doesn't seem to be working, so I'm going to pull it up on my computer as well.

(Pause in proceedings.)

MR. OBEGI: Dr. Wilder, do you see that? The critical temperatures for the month of September under both the No-Action Alternative and the Proposed Action?

WITNESS WILDER: I'm sorry. Can we -- Can I see where this is?

MR. OBEGI: Yeah.

Could you scroll out, Mr. Hunt and show the full page?

(Scrolling out.)

MR. OBEGI: This is Table 5.C.7-4 which shows Sacramento River above Clear Creek Confluence Monthly Temperatures.

WITNESS WILDER: Okay. Thank you.

MR. OBEGI: And then you see it's by water year-type.

And if you scroll over --

(Scrolling over.)

MR. OBEGI: -- it's reporting that the average temperature in the month of September would be 62.4 degrees under No-Action and 62.3 degrees under the Proposed Action; is that correct?

Do you see that?

It's the bottom right line in the bottom right corner there.

WITNESS WILDER: Yes. For September, and I believe that's critical years, I see 62.4 for NAA and 62.3 for the Proposed Action, the PA.

MR. OBEGI: Do you believe that these types of water temperatures would cause -- would be likely to cause temperature-related mortality of winter-run Chinook Salmon?

(Pause in proceedings.)

WITNESS WILDER: Yes, it's possible.

MR. OBEGI: And, then, turning to the month of

October, which is in the upper left corner of this table --

(Scrolling over.)

MR. OBEGI: -- for critical years, you see where it shows temperatures of 61.3 degrees under the No-Action Alternative and 60.9 degrees under the Proposed Action?

WITNESS WILDER: Yes.

MR. OBEGI: And do you believe that that -- those types of water temperatures would cause -- would be likely to cause temperature-related mortality of winter-run Chinook Salmon?

WITNESS WILDER: Again, yes, it's possible.

MR. OBEGI: Do you believe it's likely?

WITNESS WILDER: It's -- It's possible and likely.

MR. OBEGI: Does it exceed the temperature thresholds that NMFS has determined are protective of winter-run Chinook Salmon?

WITNESS WILDER: Yes, under the NAA and the PA, it does.

MR. OBEGI: And do you recall what those temperature thresholds would be under NMFS -- that NMFS has determined are protective?

WITNESS WILDER: It depends on which --

whether that's recent or in the past, but approximately 56 degrees Fahrenheit was the -- was the value.

MR. OBEGI: And that was the -- the standard prior to the 2017 Revised Draft Shasta RPA; isn't that correct?

WITNESS WILDER: Yes, that's correct.

MR. OBEGI: And the more recent Draft RPA identified a lower water temperature that would be protective of winter-run Chinook Salmon?

WITNESS WILDER: Yes. The Draft Proposed RPA modification shows a lower value, approximately 3 degrees, I believe, lower.

MR. OBEGI: And so this would be several degrees higher than either the older temperature threshold or the lower more protective temperature threshold that NMFS is identifying; correct?

CO-HEARING OFFICER DODUC: Hold on --

MR. BERLINER: Objection.

CO-HEARING OFFICER DODUC: -- please.

MR. BERLINER: Objection: Vague in terms of use of the -- of the initial part of the sentence line, "and so this would be several degrees." There's no references as to what we're talking about so I'd ask Mr. Wood (sic) if he could be more specific, please.

CO-HEARING OFFICER DODUC: Are we -- I'm

sorry.

Are we still on the 61.3 and 60.9?

MR. OBEGI: Sure.

MR. BERLINER: Thanks.

WITNESS WILDER: Sorry. Could you repeat that question? There was one . . .

MR. OBEGI: I believe the question was: And isn't it true that these temperatures shown for the month of September are several degrees higher than the temperature thresholds that NMFS has identified as protective?

CO-HEARING OFFICER DODUC: And so you're going back to September now, not October.

MR. OBEGI: We can stick with October.

WITNESS WILDER: So, yes, under both the NAA and the PA, they are a couple degrees higher.

MR. OBEGI: And this table shows that those kinds of temperatures would occur in approximately 15 percent of years that have been identified as critical water year-types?

WITNESS WILDER: I'm not sure exactly what you mean.

But the temperatures are 61.3 and 60.9 under the NAA and the PA, which is in critical years, which are 15 percent of -- of modeled years in the -- in the

period of record here.

MR. OBEGI: So in 15 percent of the years, the temperatures would exceed the protective thresholds that NMFS has identified.

Yes?

WITNESS WILDER: The -- The model outputs here are for 15 percent of the years showing exceedance of the NMFS -- the temperatures in the Draft Proposed RPA.

MR. OBEGI: And, Mr. Hunt, would you please pull up State Water Board 106, which is the NMFS WaterFix Biological Opinion, and turn to Page 908 of the .pdf.

(Pause in proceedings.)

MR. OBEGI: Not in the appendix, but if you scroll up just a little bit.

(Scrolling on website.)

MR. OBEGI: That's it.

(Exhibit displayed on screen.)

MR. OBEGI: And Page 908.

(Exhibit displayed on screen.)

MR. OBEGI: Yes.

So this is a table showing the summary of environmental baseline and cumulative effects plus WaterFix on winter-run Chinook Salmon.

And if you look at the magnitude of the

overall effect, doesn't it show that, quote -- that upstream water temperatures have a, quote (reading):

"High-temperature effects place a high magnitude stress on the species and accounts for a large amount of mortality."

Did you consider this --

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

MR. BERLINER: I'm sorry. I'm a little lost. Could Mr. Obegi direct us as to where on the chart you're looking?

MR. OBEGI: Certainly.

So the first row that's Numbered 2.5.1.2.1, and on the far right side, NMFS is summarizing the magnitude of the effects -- of the overall effects the Proposed Action plus baseline plus cumulative effects.

CO-HEARING OFFICER DODUC: Hold on a second. Miss Nikkel.

MS. NIKKEL: Good morning. Meredith Nikkel on behalf of the Sacramento Valley Group of Protestants.

I'd like to lodge an objection that the line of questioning that Mr. Obegi is going through seems to be outside the scope of Dr. Wilder's rebuttal testimony as well as really outside the scope of the key issues

for this hearing, because it has to do with effects in the NAA that Dr. Wilder has identified, as well as baseline effects and cumulative effects that are not relevant to the Project and the impacts of the Project itself.

CO-HEARING OFFICER DODUC: Mr. Obegi.

MR. OBEGI: I believe the Hearing Officers have repeatedly ruled that the baseline conditions and the reasonable protection of fish and wildlife under those baseline conditions are an issue at this hearing.

Miss -- Dr. Wilder's testimony repeatedly talks about the effects of water temperatures on Salmon, including winter-run Chinook Salmon, both the assertion I quoted before, as well as a statement on Page 2 and on Page 7, that CWF would provide reasonable protection of upstream life stages of Salmonids.

He's opened this line of questioning and I think it's fair to pursue it.

CO-HEARING OFFICER DODUC: Mr. Mizell.

MR. MIZELL: Yeah. I'd like to direct the Board to the fact that Dr. Wilder's testimony goes to the differential between the No-Action Alternative and the California WaterFix. His rebuttal testimony does not go to baseline conditions.

So the appropriate column to focus in this

table would be the magnitude of the BA effect, not the baseline and cumulative effects.

So we would concur with Miss Nikkel's objection.

CO-HEARING OFFICER DODUC: Sustained.

MR. OBEGI: I'd like to request reconsideration.

In order to understand whether the effects of the Proposed Action cause an unreasonable effect on fish and wildlife, you have to know whether the baseline conditions cause an unreasonable effect on fish and wildlife. You can't look at it in isolation without understanding those baseline conditions.

And the Hearing Officers have repeatedly ruled that the questions -- that questions regarding the baseline conditions are at issue at this hearing, and his testimony is not so limited on Page 2 and on Page 7.

CO-HEARING OFFICER DODUC: Can we see his testimony?

(Pause in proceedings.)

MR. OBEGI: It's 1229.

(Exhibit displayed on screen.)

CO-HEARING OFFICER DODUC: Page number, Mr. Obegi?

MR. OBEGI: On Page 2, Line 6 is just a blanket statement that (reading):

"CWF will provide reasonable protection of upstream life stages of Salmonids."

Summarizing his opinion.

The same header on Page 7, Line 9.

(Pause in proceedings.)

CO-HEARING OFFICER DODUC: What I'm struggling with here, Mr. Obegi, is -- and we had some discussions of this when Mr. Bezerra and others were conducting cross-examination -- is, I'm trying to keep the scope narrow so that we do not revisit everything that should have already been discussed as part of cross-examination during the case in chief.

And so while it is -- it is -- there are general statements in rebuttal testimony, it does not mean that that automatically opens the door to go back and revisit previous discussion issues.

So, I put the onus on Mr. Bezerra and now you to show a clear demonstration of linkage between the line of questioning and the specific rebuttal testimony of Dr. Wilder, which is why I'm looking for these passages.

So you are referring to general statements.

MR. OBEGI: Correct. The general statements in his testimony.

CO-HEARING OFFICER DODUC: All right. Why don't we --

MR. MIZELL: If --

CO-HEARING OFFICER DODUC: I'm sorry.

MR. MIZELL: If I might respond.

CO-HEARING OFFICER DODUC: Mr. Mizell.

MR. MIZELL: The header is as Mr. Obegi just read it. However, if you look at the content of the section under that header, for instance, Page 8, focus you on Lines 9 through --

CO-HEARING OFFICER DODUC: Are you on Page 8? I'm sorry.

(Exhibit displayed on screen.)

MR. MIZELL: Nine on Page 8.

CO-HEARING OFFICER DODUC: Are we going on somewhere?

MR. MIZELL: Lines 9 through 11, you can see this is one example, but it's quite clear that Dr. Wilder's testimony --

CO-HEARING OFFICER DODUC: Is focused on the difference.

MR. MIZELL: -- is focused on the difference, exactly.

CO-HEARING OFFICER DODUC: Anything else to add?

Why don't we take this under consideration and discuss it very briefly.

We should be back no later than five minutes from now.

(Recess taken at 9:47 a.m.)

(Proceedings resumed at 9:52 a.m.:)

CO-HEARING OFFICER DODUC: All right. We are back. Thank you for bearing with us.

After discussion, the objection is sustained.

We recognize, Mr. Obegi, that existing conditions and analysis of existing condition is important, that it's not just the difference that should be considered.

However, conducting cross-examination of rebuttal testimony just on the basis of the header in the testimony is not appropriate. It's outside the scope.

If you want to focus on the actual arguments made under -- in the rebuttal testimony itself, then that would be appropriate.

MR. OBEGI: Thank you.

Mr. Hunt, would you please turn to Page 8 of Dr. Wilder's testimony.

(Exhibit displayed on screen.)

MR. OBEGI: And on Lines 1 through, really, this whole page.

Dr. Wilder, are you presenting results under both the No-Action Alternative and the Proposed Action, the Salmonid results of egg-related mortality of -- excuse me -- of temperature-dependent mortality of winter-run Chinook Salmon eggs?

WITNESS WILDER: Yes, that's correct, so that I could do a differential analysis.

MR. OBEGI: So you are looking at both the temperature-dependent -- the temperature-related mortality under the No-Action Alternative here.

WITNESS WILDER: Only with respect to the difference between the No-Action Alternative and the Proposed Action.

MR. OBEGI: But in order to get at that difference, you then have to look at what the absolute value results were; correct?

MR. MIZELL: Objection: Asked and answered.

CO-HEARING OFFICER DODUC: Answer again, please.

WITNESS WILDER: I need to look at the values so that I can calculate the difference, yes.

MR. OBEGI: And are these Salmonid results

similar to the results that are seen in other temperature models?

MR. BERLINER: Objection: Relevance.

CO-HEARING OFFICER DODUC: Mr. Obegi.

MR. OBEGI: I'm attempting to show that the results presented here are inconsistent with the results that NMFS has concluded in its Biological Opinion and then ask whether his opinion is -- whether he considered the NMFS Biological Opinion in preparing his rebuttal testimony.

CO-HEARING OFFICER DODUC: Sounds relevant, Mr. Berliner.

MR. BERLINER: Well, I think that's -- If he wants to ask that question, I think that's fine. That's a little different question.

MR. OBEGI: I thought I was laying the foundation.

CO-HEARING OFFICER DODUC: All right.

So, do you want to answer the direct question that --

WITNESS WILDER: Sure.

CO-HEARING OFFICER DODUC: -- Mr. Obegi just asked you, Dr. Wilder?

WITNESS WILDER: Yes. There are -- There is some variation in the results that we see in the

various temperature analyses we conduct, which is why we rely on a weight of evidence approach.

MR. OBEGI: And, so, here -- and, so, when NMFS concluded that there was significant temperature-dependent mortality on winter-run Chinook Salmon, did you consider that in preparing your testimony?

WITNESS WILDER: Can you show me where they say there's significant temperature-related mortality?

MR. OBEGI: I would be happy to.

Would you -- Mr. Hunt, would you please pull up . . . State Water Board Exhibit 106 and turning to Page 908 of the .pdf.

(Exhibit displayed on screen.)

MR. OBEGI: And looking at the far right column, doesn't it show that NMFS concluded that (reading):

". . . Temperature effects place a high magnitude stress on the species and accounts for a large amount of mortality."

WITNESS WILDER: This -- This isn't the column that -- that I analyzed.

Excuse me. This is not the effect shown in this column that I analyzed for my analysis.

MR. OBEGI: And now that you've seen this conclusion from NMFS, does that change your conclusions regarding the effects of WaterFix?

CO-HEARING OFFICER DODUC: Mr. Mizell.

MR. MIZELL: Objection: Beyond the scope of his rebuttal testimony.

CO-HEARING OFFICER DODUC: Mr. Obegi, he has testified he didn't con -- Oh, he didn't conduct this analysis.

MR. OBEGI: And he -- I believe he testified that he didn't consider this -- this analysis, and I'm now asking whether this analysis changes his conclusion in his rebuttal testimony.

CO-HEARING OFFICER DODUC: And, Dr. Wilder, are you familiar enough to answer that question?

WITNESS WILDER: Again, I focused on -- if you go over a couple columns -- the magnitude of the PA effect, which shows low to no effect, which is consistent with my conclusions.

MR. OBEGI: So your conclusions only looked at the comparison between the No-Action Alternative and the Proposed Action?

WITNESS WILDER: Yes, that's correct.

MR. OBEGI: And that's true throughout your rebuttal testimony?

(Pause in proceedings.)

WITNESS WILDER: Yes, it is.

MR. OBEGI: And, so, to the extent that the No-Action Alternative does not provide reasonable protection of fish and wildlife, that would change your opinion regarding whether the Proposed Action provides reasonable protection of fish and wildlife; correct?

MR. MIZELL: Objection: Misstates the witness' testimony.

CO-HEARING OFFICER DODUC: Let's unpack that, Mr. Obegi.

MR. OBEGI: Dr. Wilder, you've -- you've testified in rebuttal testimony that -- that the Proposed Action would provide reasonable protection for upstream life stages of Salmonids; correct?

WITNESS WILDER: Yes, that's correct.

MR. OBEGI: And that's based on a comparison to -- between the Proposed Action and the No-Action Alternative.

WITNESS WILDER: That's correct.

MR. OBEGI: So, then, is it your testimony that the No-Action Alternative also provides reasonable protection of fish and wildlife?

MR. MIZELL: Again, objection: Goes beyond the scope of his rebuttal testimony.

At this point, the questioning is attempting to get Dr. Wilder to opine on existing conditions that's not within his rebuttal testimony. And we have a panel coming up on Panel 3 where we provide Biologists who will discuss existing conditions.

CO-HEARING OFFICER DODUC: Sustained.

MR. OBEGI: All right. I'm done with this witness.

I'd like to ask a couple questions of Miss Parker.

Are you aware that Reclamation agreed earlier to use the adaptive management provisions to revise the Shasta RPA element of the 2009 NMFS Biological Opinion?

MS. AUFDEMBERGE: Objection: Outside the scope of her rebuttal testimony.

CO-HEARING OFFICER DODUC: I'm sorry. What was the question again?

MR. OBEGI: The question was if she was aware that Reclamation has previously agreed to use the adaptive management provisions to revise the Shasta RPA in the 2009 Biological Opinion.

CO-HEARING OFFICER DODUC: And why is that outside the scope of her testimony?

MS. AUFDEMBERGE: She doesn't talk about other instances when there might be an opportunity to use the

adaptive management provisions in the Biological Opinion. She only talks about this specific Draft RPA.

MR. OBEGI: If I could turn to Page 1 (sic) of her testimony, in the second paragraph, it says, quote (reading):

> "Reclamation has not agreed with NMFS that the 2009 Biological Opinion RPA for Shasta can or should be revised as set forth in the NMFS DPA through the adaptive management provisions in the BO."

CO-HEARING OFFICER DODUC: Overruled.

WITNESS PARKER: I'm sorry. Could you direct me to the paragraph that you're reading from?

MR. OBEGI: Yes. It's in the -- If we could pull up Miss Parker's testimony, which is DOI --

WITNESS PARKER: 43.

MR. OBEGI: -- 43.

(Exhibit displayed on screen.)

MR. OBEGI: And scroll down to the next page.

(Scrolling through document.)

MR. OBEGI: In the second paragraph, the third sentence, beginning with the words "Reclamation has not agreed."

(Pause in proceedings.)

WITNESS PARKER: So I -- I think the statement here gets at, we have not agreed with NMFS that the 2009 Biological Opinion RPA for Shasta should be revised as set forth in the Draft Proposed Amendment through the adaptive management provisions in the Biological Opinion.

That doesn't mean that other adaptive management provisions would not be applicable should Reclamation be consulting with National Marine Fisheries on this matter.

MR. OBEGI: So, is it your testimony that in 2 -- in the year 2016, Reclamation did not agree to use the adaptive management provisions to revise the Shasta RPA?

MS. AUFDEMBERGE: Objection: Again, she has a factual sentence in here about Reclamation not agreeing about the specific Draft Amended RPA for 2017. It's not an open door to talk about other instances of adaptive management in the Biological Opinion.

CO-HEARING OFFICER DODUC: Mr. Obegi.

MR. OBEGI: I'm asking about the same, not a different, element or different instance of adaptive management.

I'm trying to get at the distinction between whether Reclamation does not agree with the specifics

of the Draft Reasonable and Prudent Alternative, or whether they never agreed to modify the Reasonable and Prudent Alternative through the adaptive management provisions.

CO-HEARING OFFICER DODUC: Ah. Overruled.

WITNESS PARKER: Sorry. If my testimony was not clear, I was specifically referring to the 2017 Draft Proposed Amendment to the Shasta RPA and stating that Reclamation had not agreed with NMFS to accept that draft -- 2017 Draft Proposed Amendment through the adaptive management process. I'm not familiar with any 2016 processes.

MR. OBEGI: So you're not familiar with the process that led to the 2017 Draft RPA?

WITNESS PARKER: Not intimately, no. I'm a River Systems Modeler not, a Biologist or a policy person.

MR. OBEGI: And has Reclamation agreed that it will not implement the Draft -- 2017 Draft Reasonable and Prudent Alternative?

WITNESS PARKER: Can you say that question one more time?

MR. OBEGI: Has Reclamation determined that it will not accept and implement the 2017 revised Draft Shasta RPA?

WITNESS PARKER: To my understanding, Reclamation is not currently operating to meet that Draft Proposed Amendment with the concurrence of National Marine Fisheries Service.

MR. OBEGI: And are you aware that the NMFS WaterFix Biological Opinion assumes that the -- something like the 2017 Revised Draft Shasta RPA will be implemented?

MR. BERLINER: Objection: Relevance.

We're -- This is speculation at this point and it goes beyond the witness' testimony.

CO-HEARING OFFICER DODUC: Mr. Obegi.

MR. OBEGI: The witness' -- The witness testified at length regarding the feasibility of meeting the Shasta -- Revised Draft Shasta RPA and I'm trying to understand what -- whether Reclamation is not going to implement it as they have done with other regulatory standards.

She also raises in her testimony compliance with regulatory standards, which is something I plan to follow up on.

CO-HEARING OFFICER DODUC: Overruled.

WITNESS PARKER: I'm sorry. Could you repeat the question one more time?

MR. OBEGI: Sure.

Are you aware that the NMFS WaterFix Biological Opinion assumes that something like the 2017 Revised Draft Shasta RPA will be implemented?

MS. AUFDEMBERGE: Objection: Vague. "Something like."

CO-HEARING OFFICER DODUC: Strike "something like" and answer that question, Miss Parker.

WITNESS PARKER: I am not familiar with that section of the NMFS Biological Opinion for the WaterFix.

MR. OBEGI: Thank you.

CO-HEARING OFFICER DODUC: Mr. Obegi, I'm wondering if perhaps Miss White could answer these questions.

MR. OBEGI: I'm happy to defer to her if she's able to.

WITNESS WHITE: I'm not familiar with the specific language that says that in the NMFS Biological Opinion.

MR. OBEGI: So let's turn to the modeling results.

In your rebuttal testimony, you present some results of modeling to implementation of the 2017 Revised Draft Shasta RPA; is that correct?

WITNESS PARKER: I present the results of some

analysis. I -- Some people might not call it modeling, but I performed the analysis.

MR. OBEGI: Okay. What were the assumptions in that analysis regarding CVP water allocations and deliveries?

WITNESS PARKER: So, there was a couple different sections of my analysis.

For the perspective of Spring Fill, I did not use any assumptions for CVP allocation at all. That was a purely hydrological exercise using historical hydrology and an assumed minimal release from Shasta.

So, for the May-through-September perspective, I used results from the Petitioners' No-Action Alternative modeling, and there is a range of CVP allocations impli -- implied in that analysis that are results of that analysis.

MR. OBEGI: And that was for the September carryover storage analysis?

WITNESS PARKER: Yes.

MR. OBEGI: And so you did assume the historical CVP allocations in that historical analysis.

WITNESS PARKER: No, not historical. These are results from the No-Action Alternative that calculate for a given water supply and given a consistent level of demand throughout the -- throughout

California, what the allocations would be for certain assumptions of water supply and regulatory criteria. So it does not coincide with historical.

MR. OBEGI: I think I understand that.

Did it -- Did your analysis make the water deliveries to CVP Contractors prior to trying to meet the carryover storage targets?

WITNESS PARKER: So, my analysis just used the results of the model. It did not change anything about those results.

So, for example, if you start in May of any given year, and the results in my table were for 27 specific years but there's 82 altogether. An allocation is calculated by the model for CVP -- an allocation -- A CVP allocation is calculated by the model.

What my analysis looked at was, where the spring criteria was met and the fall criteria was not, what were the reasons for missing that criteria and looking at what controlled CVP operations during the summer months.

And then there was one column of my analysis that indicated a potential . . . minimal -- the -- a -- a seasonal effect on delivery. Would that carryover storage criteria have been met?

Does that make sense?

MR. OBEGI: I think I understand.

Just to make sure I understand:

So, to the extent that the storage targets -- meeting the storage targets would be -- would follow after the deliveries were made in the model.

WITNESS PARKER: So, yes. If you start in May and you operate the system through September, in CalSim, we do make CVP deliveries.

So, during that operation, May, June, July, August, September, deliveries have been made to a range of CVP water users, both senior water rights and CVP Service Contractors throughout the -- the system.

However, by however much the end-of-September criteria was missed is one seasonal look at the impact to delivery, assuming that we would not . . . that we would continue to meet regulatory criteria if the entire balance of the responsibility for meeting that September criteria fell on delivery in that May-through-September period, that one column in my table would express by how much delivery would need to be cut.

MR. OBEGI: Can we pull up your testimony, just so we're looking at it as we walk through this? Because I have to admit I find this rather confusing.

(Exhibit displayed on screen.)

WITNESS PARKER: I'd be happy to explain.

MR. OBEGI: So I think if we turn to the . . . I'll get the right page for you.

WITNESS PARKER: It's Table 3 on Page 12.

MR. OBEGI: Um-hmm.

(Exhibit displayed on screen.)

MR. OBEGI: So, part of my confusion when I look at this table is, you're showing how much you missed the spring -- missed the September target by.

Is that how much the deliveries by the CVP would have to be reduced to meet the storage target?

WITNESS PARKER: I would say that deliveries would have to be reduced by as -- at least that amount, because in order to miss those deliveries, there are other deliveries that happened prior to May and throughout the rest of the season, specifically M&I deliveries or refuge deliveries, that aren't contained within that.

So, if an overall allocation needs to target that reduction, then more deliveries, the size of those would need to be foregone.

MR. OBEGI: Potentially.

WITNESS PARKER: And I -- And I addressed that specifically in my written testimony as well.

MR. OBEGI: So if other CVP deliveries were reduced, you would have higher storage in the fall than what is shown when you say "missed the September target by."

WITNESS PARKER: Um . . . Possibly, yes.

MR. OBEGI: Thank you.

And in your testimony, you assert that . . . Strike that.

In this table, you show that you -- that the September carryover storage target would be missed in many of these years that were analyzed.

Was carryover storage higher with the Shasta -- the 2017 Shasta RPA than it was without it in many of those years?

WITNESS PARKER: I did not specifically model the draft Proposed Amended Shasta RPA.

In -- This study is the -- is Petitioners' No-Action Alternative.

I want to point out that these results are only a summary of when the spring criteria was met and the fall criteria was not.

And as I pointed out in my testimony, these are largely above-normal and wet years. The model struggles -- or the system struggles far more in below-normal, dry and critical years when the spring

criteria is -- is not met, and there would be way more substantial -- far more substantial impacts to delivery of trying to meet September carryover in those years beyond what we're seeing in this table.

But, then, to answer your specific question, the model does not have within it any carryover storage targets at all.

We're not modeling the Draft Shasta RPA. I'm just picking information about a simulated operation of the CVP and examining that for the operational reality of trying to meet that criteria.

MR. OBEGI: Thank you.

And you -- You do assert in your testimony that this could -- implement -- implementation of the 2017 Revised Shasta RPA Draft could impact water deliveries to senior water rights holders?

WITNESS PARKER: Yes.

MR. OBEGI: Does that include the Sacramento River Settlement Contractors?

WITNESS PARKER: Yes.

MR. OBEGI: Is it likely that it would impact the water supply for those Settlement Contractors?

WITNESS PARKER: Yes.

MR. OBEGI: And would it change the timing of diversions by the Sacramento River Settlement

Contractors?

WITNESS PARKER: I have not analyzed that. I don't know.

MR. OBEGI: Okay.

(Pause in proceedings.)

MR. OBEGI: Is it your opinion that carryover storage in Shasta Reservoir currently -- Or -- Strike that.

As you've described, you're just looking at modeling of the No-Action Alternative; correct?

WITNESS PARKER: Yes.

MR. OBEGI: Is it your opinion that carryover storage in Shasta Dam is adequate under the No-Action Alternative?

MS. AUFDEMBERGE: Objection: Beyond the scope of Miss Parker's testimony.

MR. OBEGI: She just testified that she's presenting the results of modeling of the No-Action Alternative and asserting that it is infeasible to do so.

And I'm trying to understand whether increasing storage -- I'm trying to understand whether the existing No-Action Alternative model results that she's presented provide adequate carryover storage.

CO-HEARING OFFICER DODUC: Overruled.

WITNESS PARKER: So, the No-Action Alternative is not a reflection of how Reclamation and DWR currently operate. It is a model of how the Projects would meet the full obligations of the regulatory criteria.

It is not a historical operations perspective of how we have operated storage facilities to meet biological and regulatory and water supply obligations.

So, no, it does not reflect how Reclamation actually operates. We discussed this at length, that the criteria -- or that Recla -- the model shows reservoirs drawn to dead pool in order to meet regulatory criteria, and Reclamation has not operated like that under the current regulatory environment.

MR. OBEGI: And does . . . Has Reclamation or -- Has Reclamation modeled the effects of actually -- of the historical operations?

WITNESS PARKER: Yes, we have.

MR. OBEGI: And that would include things like weakening or waiving Delta outflow requirements?

MR. MIZELL: Objection: We're going down a line of questioning about modeling that was not presented in her testimony.

MR. OBEGI: She just raised this issue by asserting that the No-Action Alternative is not how

Reclamation operates. And I believe that that raises significant questions about the modeling underpinning the entire of -- entirety of her rebuttal testimony.

CO-HEARING OFFICER DODUC: Miss Parker, please explain again the basis for your statement that the No-Action Alternative is not reflective of current operations.

WITNESS PARKER: Yeah. I'm sorry. I can understand why that's alarming.

So, there -- The -- The specific exact criteria for D-1641 for OMR or the San Joaquin River, i.e., inflow-to-export criteria, criteria such as that, those are explicitly represented in the model, and the model very faithfully adheres to that. And I should include COA as well.

So, all of those regulatory criteria are -- are . . . the -- the highest priorities in the model.

In addition to that, there are water supply obligations. We have demands to a range of different kind of Contractors. And if Reclamation allocations -- So, if water supply is not sufficient to have any allocation to CVP Service Contractors, those are zeroed out. That's fine.

But -- But there is no provision in the model to reduce allocations to senior water right holders, to

Settlement Contractors, or to Exchange Contractors, or to Refuge Centers.

So, in order to meet all of those hard-and-fast criteria that -- that are the responsibility of the Project, and especially under a climate change scenario which includes some sea-level rise, if there is not enough water to meet all of those criteria, it has to come from somewhere, and it comes out of storage.

And if, in order to do that, we reduce reservoir storage below where we have historically operated, that is simply an indicator in model results that the water supply situation is highly stressed. And that's what we've talked about a number of different times.

In recent historical operations, there have been extraordinary measures taken in -- under extraordinary water supply conditions that have -- you know, where there have been TUCPs, reductions to senior water rights and other measures I may not be aware of as well.

So, that would be an historical perspective on -- on operations or on modeling, whereas for a consistent approach to a number of studies, most studies that have been performed have used the full

obligation perspective, not the historical operations perspective.

Does that make sense?

CO-HEARING OFFICER DODUC: And that, in your opinion -- or your testimony, accounts for the difference in the modeling and in practice.

WITNESS PARKER: Well, so Mr. Obegi's question was, does the No-Action Alternative reflect how Reclamation would operate storage, or something to that effect.

And so, no, we do not pull Shasta to 550, we don't pull Shasta (sic) to 90, we don't pull Trinity to 40. Those are dead pool assumptions.

And once we get to those levels in CalSim, we actually have shortages for meeting senior water rights first and then -- and then it would come out of regulations.

But -- So, Mr. Obegi's question was, does the No-Action represent historical operations or how Reclamation currently operates? So, in that context, the answer is no.

But for water years other than dire critical conditions, it's reasonably reflective of a water supply reliability depiction of model operations between the State Water Project and the CVP.

CO-HEARING OFFICER DODUC: Thank you.

I know you've gone through it several times, but it's always helpful to hear again.

MR. BERLINER: If I could just interject.

I think the witness misspoke at one point in talking about volumes of drawdown at the various reservoirs.

And the witness referred twice to Shasta and once to, I think, Trinity and indicated drawdown. And I believe the witness intended to refer to Folsom.

WITNESS PARKER: I apologize.

Shasta dead pool in the model is 550, Folsom dead pool in the model is 90, and Trinity dead pool in the model is 240.

CO-HEARING OFFICER DODUC: It's good to know that even the experts can get those things confused.

MR. OBEGI: I feel slightly better about myself now.

(Laughter.)

MR. OBEGI: So, in a -- in a future drought, as you've said, the No-Action Alternative is not how Reclamation would operate.

Would Reclamation propose to relax or waive Delta outflow or other water quality standards?

MR. MIZELL: Objection.

MS. AUFDEMBERGE: Objection: At this point, we are going further and further afield from her rebuttal testimony.

What Mr. Obegi is trying to get at is the existing condition for storage, much like the existing condition for fish. And we're overlooking the main point of Miss Parker's testimony, and that is that there is no meaningful difference in storage at Shasta caused by the WaterFix.

CO-HEARING OFFICER DODUC: Is that --

MR. OBEGI: I can --

CO-HEARING OFFICER DODUC: Who else is going to -- Oh. No other microphone is on.

All right. Mr. Obegi.

MR. OBEGI: Withdraw the question.

CO-HEARING OFFICER DODUC: Okay.

MR. OBEGI: I'd like to turn to -- on Page 1 in the third paragraph of your testimony --

(Exhibit displayed on screen.)

MR. OBEGI: -- you assert that, quote (reading):

"Furthermore, Reclamation operates CVP facilities in a fully integrated manner, and flexibility is key to achieving the multiple purposes of the

CVP, including it's regulatory obligations."

Do you see that -- that line in your testimony?

WITNESS PARKER: I do.

MR. OBEGI: Is it your understanding that Reclamation has fully met its regulatory obligations in recent years?

MS. AUFDEMBERGE: Objection: Beyond the scope of this testimony.

That is not the point of this sentence.

CO-HEARING OFFICER DODUC: I'm sorry. Could you point me to the sentence again?

MR. OBEGI: It's on Page 1. Scroll down below the bullet points. The sentence beginning with the word "furthermore."

CO-HEARING OFFICER DODUC: All right. And your question, Mr. Obegi, is?

MR. OBEGI: Whether Reclamation has fully met its regulatory obligations in recent years.

MS. AUFDEMBERGE: Miss Parker's testimony is about -- in a response to Protestant proposals for storage and release restrictions on single CVP reservoirs. And this sentence goes to that, not to compliance in any shape or form, which I might add

would also be -- call for a legal conclusion.

CO-HEARING OFFICER DODUC: Well, the statement does say "achieving for multiple purposes, including regulatory obligations."

MR. BERLINER: If I could be -- could join in that objection as well.

The sentence speaks in terms of the flexibility of the Project to meet multiple purposes, one of which is regulatory obligations.

CO-HEARING OFFICER DODUC: Correct.

MR. BERLINER: There are others.

It does not speak to whether or not there's been compliance with regulatory obligations, which is an entirely different subject.

CO-HEARING OFFICER DODUC: All right.

MR. OBEGI: I believe the history of whether they have achieved regulatory obligations is relevant to the testimony of whether they will achieve regulatory obligations in the future.

CO-HEARING OFFICER DODUC: It is, and it has been discussed previously in case in chief as well as cross-examination.

I think this is another example of taking us back to something that does not need to be revisited based on one limited statement in her rebuttal

testimony.

So the objection is sustained.

MR. OBEGI: All right. We will move on.

I believe I'm done with Miss Parker, then.

(Pause in proceedings.)

MR. OBEGI: I have a couple questions for Mr. Chilmakuri.

Could we just pull up his testimony, which is DWR-1217.

(Exhibit displayed on screen.)

MR. MIZELL: And I realize that Dr. Chilmakuri's name plate is facing away from Mr. Obegi, so he is a doctor. I know he's not very picky about it, but --

MR. OBEGI: My apologies. Yes, I've worked with him before and I've never been able to pronounce his last name and now I stand corrected, twice.

So, is it correct that, in your -- that you testified that permit conditions relating to the Delta Cross Channel Gates are unnecessary because Cross Channel Gate operations are expected to be consistent with current operations?

WITNESS CHILAMKURI: Yes, that's correct.

MR. OBEGI: Does WaterFix require that Delta Cross Channel Gate operations be consistent with

current operations in all months in all water year-types?

CO-HEARING OFFICER DODUC: What do you mean by "does WaterFix require"?

MR. OBEGI: I mean, is there a . . . operational requirement as part of WaterFix that would actually require this to occur rather than expecting that it would occur?

CO-HEARING OFFICER DODUC: Okay.

MR. MIZELL: And I'll object as being beyond the scope of Dr. Chilmakuri's testimony and, frankly, beyond the scope of the hearing.

The California WaterFix does not propose any changes to the Delta Cross Channel Gate operations. So, the fact that it is absent from the Proposed Project would place it well beyond the scope of Dr. Chilmakuri's as to whether or not the Delta Cross Channel Gates are required to be operated in any given manner. It's not part of the Project Description.

CO-HEARING OFFICER DODUC: Where are you going with this, Mr. Obegi?

MR. OBEGI: Two places:

One, I want to understand whether there's any assurance that it actually will -- that DCC Gate operations will be implemented as modeled and as

summarized in this rebuttal testimony.

And, then, second, he does make an assertion that I believe that needs to be stricken regarding whether the existing regulations adequately address the DCC Gate closure needs.

CO-HEARING OFFICER DODUC: Overruled, Mr. Mizell.

WITNESS CHILAMKURI: So, probably the best thing to look at would be DWR-1143 Second Revision.

And if you look at our -- the Part 1 of that table under the Adoptive Project Criteria, it clearly states that the Delta Cross Channel operations would continue to meet the existing regulations, which is both D-1641 and the NMFS Biological Opinion.

MR. OBEGI: And is it your understanding that the Cross Channel Gates fully comply with the requirements of D-1641 during the recent drought?

CO-HEARING OFFICER DODUC: Is there . . .

MR. BERLINER: Yes, there is an objection.

CO-HEARING OFFICER DODUC: And the objection is, Mr. Berliner?

MR. BERLINER: The objections are multiple: One --

CO-HEARING OFFICER DODUC: Give me one.

MR. BERLINER: Calls for a legal conclusion;

it's beyond the scope of his testimony.

CO-HEARING OFFICER DODUC: Sustained.

MR. OBEGI: In your testimony, you state (reading):

"In my opinion the existing regulations adequately address the DCC Gate closure needs . . ."

I believe that's on Page 6, Lines 10 to 12.

Do you recall that statement?

WITNESS CHILAMKURI: Actually, it's Line 8, but, yes. Yes, I see that.

(Exhibit displayed on screen.)

MR. OBEGI: What's the scientific basis for that conclusion?

WITNESS CHILAMKURI: It's -- I -- I was basing that statement on the fact that WaterFix would be required to continue to meet the existing regulations.

The real-time operations decision-making process that govern the DCC Gate operations are not proposed to change under WaterFix, and . . .

Therefore, it is my opinion that the existing criteria is sufficient enough if those criteria are simple for one -- for whatever purpose they were put together or asked -- the product's being asked to comply with.

So, I'm just saying that they -- if they were adequate under No-Action, they are going to be adequate under WaterFix. That's what I'm trying to say there.

MR. OBEGI: And I'd like to move to strike that line.

I don't believe that the witness has the appropriate biological expertise and foundation to make that statement -- make that conclusion.

CO-HEARING OFFICER DODUC: Response?

MR. BERLINER: Yes. I believe that goes to the weight of the witness' testimony.

CO-HEARING OFFICER DODUC: All right. It goes to weight.

MR. OBEGI: Okay. That's it for Dr. Chilmakuri.

And turning to Mr. Reyes to retread a little bit of ground.

As a housekeeping matter, first, I believe that DWR-1293 is a PowerPoint presentation of Mr. Reyes' testimony, and the testimony was stricken.

I'm not aware that the PowerPoint was stricken, but I believe it should be, and so I'd hereby move that it would be stricken from the evidentiary record since the testimony was disallowed as not responsive.

CO-HEARING OFFICER DODUC: We'll make a note of that for when Petitioners move their exhibits into the record.

MR. OBEGI: Thank you.

Can we please pull up, Mr. Hunt, DWR-1143 Revised 2.

(Exhibit displayed on screen.)

MR. OBEGI: And I would like to ask you some questions about the modeling criteria, particularly Old and Middle River flows.

But before we get there . . .

At the bottom of this page --

(Exhibit displayed on screen.)

MR. OBEGI: -- it says that . . . DWR disputes, quote (reading):

". . . That all modeling assumptions are appropriate as operating criteria."

Do you see that at the bottom of Page 1 of this exhibit?

WITNESS REYES: Yes, I do.

MR. OBEGI: Is it -- Do you have a firm understanding of which criteria are modeling assumptions and which are operating criteria?

WITNESS REYES: I think Mr. Chilamkuri is going to answer.

WITNESS CHILAMKURI: Do you have a specific question, Mr. Obegi?

MR. OBEGI: I do have a couple.

Is unlimited pulse protection at the North Delta diversions an operating criteria for WaterFix?

WITNESS CHILAMKURI: Yes.

MR. OBEGI: And what are the OMR Operational Criteria for WaterFix?

WITNESS CHILAMKURI: If we go to Page 4 of this exhibit.

(Exhibit displayed on screen.)

WITNESS CHILAMKURI: The Operations Criteria that were adopted were -- and proposed here as part of the operation are stated in bottom row of the table. So that's the operations criteria.

MR. OBEGI: And what about Footnote 29?

WITNESS CHILAMKURI: Yes, that's within that.

MR. OBEGI: That's within the Operational Criteria?

WITNESS CHILAMKURI: Yes, it is part of the Operations Criteria.

MR. OBEGI: Is it possible to achieve a three-day running average OMR of 0 cfs or more positive in February of a wet year and at the same time achieve an OMR of -5,000 on a 14-day average?

(Pause in proceedings.)

WITNESS CHILAMKURI: It depends, I guess. I'm not sure. I need more information.

And that you're asking me to look at a three-day average and compare to a 14-day average. So I would need more information on that.

MR. OBEGI: So, for the entire month of February, could you achieve -- could you achieve -5,000 OMR on a 14-day average and at the same time for the entire month achieve 0 cfs OMR on a three-day running average?

CO-HEARING OFFICER DODUC: I believe Miss White has something to say.

WITNESS WHITE: So, I can't do math in my head that quickly.

But I would like to add that Mr. Obe -- Mr. Obegi said "wet year," and OMR is driven on the San Joaquin River flows. So you could have a wet year and have a lot of water coming off the San Joaquin that's not necessarily affecting OMR much at all.

If the San Joaquin's running dry, then OMR can be heavily affected because when the San~Joaquin's running wet, even if the Sacramento's running dry, then OMR can be much more positive.

Hopefully that clarifies.

MR. OBEGI: It actually doesn't clarify for me, because I'm still struggling with understanding the inconsistency, as I understand it, between the criteria in the table and the criteria in Footnote 29.

And it's not clear to me whether the -- an OMR criteria of 0 cfs for the month of February in a wet year is actually an Operating Cri -- Operational Criteria or just a modeling assumption.

WITNESS CHILAMKURI: And, as I stated, it is the Operations Criteria, and Footnote 29 is part of the Operations Criteria.

And what the -- the way I read Footnote 29 -- and I think that we went over this last week, but . . .

All it's saying is that the initial Operating Criteria and the triggers for the Operating Criteria would be subject to adaptive management.

And wherever that adaptive management would lead, the ultimate criteria would be within -1250 to -5,000 cfs range.

It doesn't go on to actually say that the criteria stated in the Part 1 to -- would be exactly -5,000 or -- which is what your question was implying for February, and it doesn't say that, in my opinion.

MR. OBEGI: Is 0 cfs within the range of -1250 to -5,000?

WITNESS CHILAMKURI: It's not. However, if you look through . . .

One of the -- For the Old and Middle River restrictions, one of the offramps that are -- that's offered is a -- had minimum health and safety pumping.

MR. OBEGI: Um-hmm.

WITNESS CHILAMKURI: And when you're exporting at that level, you would -- you would not be . . . at 0 cfs necessarily.

But to answer your question: Yes, 0 cfs is not within -1250 to -1,000 -- -5,000 range.

MR. OBEGI: So I'm -- I'm a little confused. Maybe we can do this by month.

In February of a wet year, what is the most negative OMR that would be allowed under the WaterFix Operational Criteria?

WITNESS CHILAMKURI: As I understand right now, it is -- Right now, it looks like the 0 cfs in the wet years.

MR. OBEGI: And then what would Footnote 29 criteria mean?

WITNESS CHILAMKURI: It means that the number is subject to adaptive management.

MR. OBEGI: And so there's no assurance that it would actually -- that the minus -- that the 0 cfs

OMR in a wet year would be implemented in the future.

WITNESS CHILAMKURI: We are several years away from it. And all it's saying is that the information -- the criteria we have in the table would be subject to adaptive management.

MR. OBEGI: And that adaptive management would be a more negative range than what is identified in the table itself.

WITNESS CHILAMKURI: I wouldn't say it's more negative given that offramp I just explained.

And even if we are operating to a 0 cfs, there is an offramp in the model -- or -- in the model -- actually, in the criterion that's allowed -- the health and safety level of pumping is allowed under the criteria.

So the effect of OMR would still be more negative than 0 cfs. That's what I'm trying to say, is that, yes, the actual number absolutely is out of the range.

But if you look at what the operations would be, it all depends on what the conditions are and whether we are at the health and safety. So OMR may not actually be at 0 cfs. It may be more like -1250.

MR. OBEGI: Although that's -- It's -- Isn't it rare in a wet year that you would be pumping at

health and safety levels?

WITNESS CHILAMKURI: Probably, yeah.

MR. OBEGI: And so it's more likely that it would be zero unless the adaptive management provisions kicked in?

WITNESS CHILAMKURI: Yes.

MR. OBEGI: And if the unlimited pulse protection was triggered, would this OMR criteria still apply of 0 cfs in February of a wet year?

WITNESS CHILAMKURI: I don't recall that there is any dependency on one another -- one another. I mean, there's a dependency between implementing unlimited pulse protection versus this criteria.

MR. OBEGI: So the Footnote 29 criteria would not necessarily apply if unlimited pulse protection was implemented in February of a wet year?

MR. MIZELL: Objection: Misstates the witness' answer.

CO-HEARING OFFICER DODUC: I was actually trying to understand as well.

So . . .

WITNESS CHILAMKURI: His previous question was whether if the unlimited pulse protection criteria for the OMR provision --

CO-HEARING OFFICER DODUC: And the answer was

it's not independent -- interdependent.

WITNESS CHILAMKURI: Correct.

CO-HEARING OFFICER DODUC: So, this followup question, Mr. Obegi?

MR. OBEGI: So, if unlimited pulse protection were triggered, it would still require a 0 cfs OMR in February of a wet year.

CO-HEARING OFFICER DODUC: Maybe, maybe not.

WITNESS CHILAMKURI: Yeah. Unless -- I mean, that would be the requirement unless the adaptive management lands on a different value.

MR. OBEGI: And the adaptive management range is identical to the current Biological Opinions; isn't it?

WITNESS CHILAMKURI: I believe so. That's the -- Those numbers are the bookends -- would bookend the current Biological Opinion.

However, the actual values on any -- in any given month would be -- would be -- could be anywhere within that range, depending on the fish conditions and marine conditions like the turbidity, and temperature in the Delta, which are all factors which drive to the actual OMR requirement under current Biological Opinions.

MR. OBEGI: And does the modeling for

WaterFix, does it model the OMR range identified in Footnote 29?

WITNESS CHILAMKURI: Again, we -- The way we model the current Biological Opinions is described in the modeling appendix for the Biological Assessment.

And, in general, they are dependent on the triggers, such as the turbidity conditions or temperature conditions in the Delta.

And as described in the Biological Opinions, the -- the modeling assumptions try to emulate the decision-making process that occurs in the real-time, although on a monthly level.

MR. OBEGI: I'm a bit confused. I want to just make sure I understand.

Under the -- That's correct under the No-Action Alternative.

Under the Proposed Action, are the OMR criteria that are modeled those in the footnote or those in the table itself?

WITNESS CHILAMKURI: Those in the table.

MR. OBEGI: Thank you. That's what I thought.

And I would like to also move to strike DWR-1292. It is another exhibit supporting Mr. Reyes' testimony. It's described as a Technical Memorandum.

And since his testimony has been stricken, I

believe the supporting memorandum should be stricken as well.

CO-HEARING OFFICER DODUC: We'll note that for when Petitioners move exhibits into the record.

MR. OBEGI: Thank you.

And that's -- I believe that's it for these witnesses. And the only questions I have left are for Dr. Greenwood.

CO-HEARING OFFICER DODUC: All right. Why don't we take our break now and ask Dr. Greenwood to switch places with one of the other witnesses.

And we will return close to 11 o'clock.

Make that 11:00.

(Recess taken at 10:44 a.m.)

(Proceedings resumed at 10:59 a.m.:)

CO-HEARING OFFICER DODUC: All right. We are back in session.

Mr. Obegi, your questions now for Dr. Greenwood.

MR. OBEGI: Thank you.

Dr. Greenwood, good morning.

WITNESS GREENWOOD: Good morning.

MR. OBEGI: I would like to ask you a couple of questions about your testimony. To begin with, your testimony that WaterFix provides reasonable protection

for Longfin Smelt.

Is it correct that the -- I believe in your testimony you state that the WaterFix Final EIS/EIR evaluated the effects of Delta outflows on Longfin Smelt abundance?

WITNESS GREENWOOD: Could you show me the specific place you're referring to?

MR. OBEGI: Sure, if you'd give me a moment here.

(Pause in proceedings.)

MR. OBEGI: If you turn to -- Mr. Hunt already has 1221 up. And if we turn to . . . Let's see.

(Pause in proceedings.)

MR. OBEGI: Page 20, Lines 20 to 24.

(Exhibit displayed on screen.)

WITNESS GREENWOOD: And what was the question again, please?

MR. OBEGI: Just so I understand:

The Final EIS/EIR evaluated the effects of Delta outflows on Longfin Smelt abundance?

WITNESS GREENWOOD: It used the X2 abundant -- X2 Abundance Index aggression method, yes.

MR. OBEGI: And do you believe that the Final EIS/EIR used the -- used appropriate scientific methods?

WITNESS GREENWOOD: I felt that that was an appropriate method to assess that, yes.

MR. OBEGI: And did the Final EIS/EIR evaluate changes to Longfin Smelt abundance based on Napa River flows?

WITNESS GREENWOOD: I don't believe that it did.

MR. OBEGI: And the WaterFix ITP also did not use Napa -- did not evaluate the effects of Napa River flows on Longfin Smelt abundance; is that correct?

WITNESS GREENWOOD: I'm -- I'm not recalling that it did, although I haven't read the -- You're talking about the actual ITP itself?

Can you repeat the question, please.

MR. OBEGI: Yeah. Did the final WaterFix ITP evaluate the effects of Napa River flows on Longfin Smelt abundance?

MR. MIZELL: I'm going to object to the line of questioning regarding Napa River flows.

I'd ask for a reference that Mr. Obegi can cite to in the rebuttal testimony. I don't believe that we go into Napa River flows at all in -- in Dr. Greenwood's testimony.

In addition to now question the -- the fairness of the Final EIR/EIS or the ITP, neither of

those are included within Dr. Greenwood's testimony for the purpose of claiming that they are . . .

In terms of defending the environmental document, Dr. Greenwood's testimony goes to the analysis and how he used it in his testimony.

CO-HEARING OFFICER DODUC: Mr. Obegi.

I'm sorry. Were you done, Mr. Mizell?

MR. MIZELL: I was. Thank you.

MR. OBEGI: He replete -- He repeatedly refer to the analyses that were done in both the ITP and the Final EIS/EIR, not just on Page 20, but also as a basis for his opinion on Page 21, discussing the analysis in the CWF ITP based on the X2 Abundance Regression method, Page 21 starting on Line 20.

CO-HEARING OFFICER DODUC: So you are questioning his basis for the opinion that's in his rebuttal testimony.

MR. OBEGI: That's correct.

CO-HEARING OFFICER DODUC: All right.

MR. MIZELL: I would point out, though, that his testimony is based on Delta outflow, not Russian River (sic) flows.

So to the extent that Mr. Obegi is questioning him about Russian River (sic) flows -- Oh, Napa River flows.

CO-HEARING OFFICER DODUC: Napa.

MR. MIZELL: Sorry. Napa River flows.

Wine country witnesses.

CO-HEARING OFFICER DODUC: So make the linkage for me, Mr. Obegi.

MR. OBEGI: There's a separate DWR witness who has asserted the effects of Napa River flows and exhibits that were offered into -- that are being offered on DWR's Exhibit List.

And given that Dr. Greenwood is the witness who testified about what was in the ITP and the Final EIS/EIR, this seems appropriate just to confirm that those analyses were not used in the EIS/EIR.

CO-HEARING OFFICER DODUC: And those analyses were submitted --

MR. OBEGI: In surrebuttal.

CO-HEARING OFFICER DODUC: -- in surrebuttal --

MR. OBEGI: Sorry. In --

CO-HEARING OFFICER DODUC: -- in rebuttal. Okay.

MR. OBEGI: Yes.

MR. MIZELL: By a different witness, though.

CO-HEARING OFFICER DODUC: Yes.

Overruled.

WITNESS GREENWOOD: So, I think the question was regarding the ITP. I'm not sure if you meant an analysis in relation to Napa River flows.

We do -- We mentioned a different matter called "technique" in the ITP application, rather than the ITP, that considers Napa River flows as well as . . . I guess it's . . . the Eight-River Index.

We mentioned that in a discussion of there being another analysis, potential modeling tool, that wasn't used because the -- the best explanatory variables, to my recollection, were ones that wouldn't be affected by California WaterFix.

So we do -- we do mention an analysis that has Napa River flows but it wasn't used quantitatively in the analysis, just a qualitative consideration.

MR. OBEGI: Thank you.

And the analyses that -- that are referred to in your rebuttal testimony conclude that higher winter/spring outflow would increase the abundance of Longfin Smelt?

WITNESS GREENWOOD: Well, there's a -- there's a correlation, an inverse correlation, between X2 and the Index for Abundance of Longfin Smelt. So . . . there's obviously different factors.

But with that correlation, the predictions are

that abundance could be higher for a -- for -- the Abundance Index needs to be higher for a lower X2, but there is appreciable uncertainty around these estimates, so . . .

Hopefully, that's clear.

(Pause in proceedings.)

MR. OBEGI: And the -- the ITP includes as an operating criteria a Delta outflow requirement; is that correct?

WITNESS GREENWOOD: I believe so, yes.

MR. OBEGI: And is it your opinion that the science used in your rebuttal testimony shows that increased winter/spring outflow is likely to increase the abundance of Longfin Smelt?

WITNESS GREENWOOD: I think there's -- I think there's uncertainty in the potential effects of outflow. And I think I mentioned in my original testimony that the potential effects of outflow are something that would be studied and adaptively managed and analyzed going forward.

So, I think you used the word "likely." I don't know about the word likely, but, you know, I think it's recognized that there's -- there's uncertainty in these things and there needs to be more -- more study of them.

MR. OBEGI: But that -- But the model that you refer to in your rebuttal testimony would show that increased outflow results -- or reduced X2 results in -- likely results in higher abundance.

WITNESS GREENWOOD: Sorry. Are you speaking to the X2 Abundance Index Regression method?

MR. OBEGI: Yes.

WITNESS GREENWOOD: And can you repeat the question again.

MR. OBEGI: The models used -- The model -- The X2 abundance model used in your rebuttal testimony would indicate that a lower X2 would likely result in a higher Longfin Smelt abundance?

WITNESS GREENWOOD: I think I -- I mean, this is similar to the question from before.

My answer will be similar in terms of the . . . applying the Model X2 gives a range of outcomes in terms of the Abundance Index. So we're not talking about predictions of abundance, we're looking at Abundance Index response from applying a progression relationship.

And there's quite a wide range on those estimates. If you were to choose, for example, the median estimate, then that median estimate would be higher at lower X2.

MR. OBEGI: And is that conclusion consistent with the -- with your reanalysis of the Rosenfield and Nobriga model?

(Pause in proceedings.)

WITNESS GREENWOOD: Can you repeat that question? Sorry.

MR. OBEGI: Maybe I can rephrase it to make it a little bit easier.

In your testimony, you present results of a reanalysis of the Rosenfield and Nobriga model.

And doesn't that -- Is it correct that that model would show a higher abundance of Longfin Smelt at higher winter/spring outflows?

WITNESS GREENWOOD: Abundance Index -- again, we're talking about Abundance Indices from a modeling technique -- are predicted when they have a broad spread on the predicted outcomes.

So . . . I think you would have -- That -- That technique is . . .

The way that the outflow is represented in that model through principal components analysis can -- can make it challenging to be able to say, for -- for given outflows that are being provided, what the exact outcome could be.

But, in general, I think if you were to look

at, for example, the median, you know, you -- for -- For more outflow generally, the predictive index would be -- tend to be higher with more outflow but, again, with a large spread around, for example, a median estimate.

MR. OBEGI: Thank you.

And starting --

CO-HEARING OFFICER DODUC: I'm sorry. Before you continue .

Do you still anticipate needing another hour?

MR. OBEGI: I suspect it'll be closer to 45 minutes --

CO-HEARING OFFICER DODUC: Okay.

MR. OBEGI: -- but we'll see how fast we go.

CO-HEARING OFFICER DODUC: All right.

MR. OBEGI: Thank you.

And I'd like to ask you a couple questions about DWR-1352, which is the Supplemental memo that -- that you prepared with Dr. Phillis regarding that Longfin Smelt analysis.

(Exhibit displayed on screen.)

MR. OBEGI: And this is -- using this model, this -- using your version of the Nobriga and Rosenfield model to compare Longfin Smelt midwater Trawl Abundance Indexes; correct?

WITNESS GREENWOOD: For -- For different operational scenarios, yes, we -- we reproduced the Nobriga-Rosenfield model.

MR. OBEGI: And you also used this -- in this memo -- present evidence of an extinction risk; is that correct?

WITNESS GREENWOOD: It's -- We use the terminology from the published Nobriga and Rosenfield Population Dynamics Model paper, which is quasi-extirpation, which was an index -- a Fall Midwater Trawl Index probably less than one point. Less than one. Sorry.

MR. OBEGI: Um-hmm.

And what was the initial Fall Midwater Trawl Abundance Index number that you used in your analysis?

WITNESS GREENWOOD: (Examining document.)

We used 798, which was the median index from 1967 to 2013 and I think consistent with Nobriga and Rosenfield.

MR. OBEGI: And that Fall Midwater Trawl Index, is -- is that higher than the most recent Fall Midwater Trawl Abundance Index for Longfin Smelt?

WITNESS GREENWOOD: Based on my recollection, that value's higher, yes.

MR. OBEGI: And would it be correct to say,

then, that your modeling -- this -- the model results presented here do not show the likelihood of quasi-extirpation at current Abundance Indices?

WITNESS GREENWOOD: The analysis that we're getting is a comparative analysis of different scenarios to address Dr. Rosenfield's initial comment, which was the reason for the rebuttal testimony, that using -- in his opinion, using the Nobriga-Rosenfield model would be a more appropriate way of looking at this type of analysis compared to X2 Abundance Index Regression which was used.

MR. OBEGI: But you --

WITNESS GREENWOOD: So --

MR. OBEGI: Go ahead.

WITNESS GREENWOOD: Our focus is on comparison of the different model scenarios.

MR. OBEGI: But you do present it as a quasi-extirpation risk; correct?

WITNESS GREENWOOD: For comparing different scenarios. It's a different -- It's a different, I guess, means of looking at the differences between the different scenarios rather than an absolute prediction.

MR. OBEGI: So it's not a prediction of extinction risk based on current Population Abundance Index?

WITNESS GREENWOOD: We didn't use current Indices of Abundance.

MR. OBEGI: So it's -- Then it is not an estimate of the current extinction risk; is that correct?

WITNESS GREENWOOD: It's not intended to be.

MR. OBEGI: And given that the Abundance Index is significantly lower today than the Fall Midwater Trawl Abundance Index that you used in this table, isn't it likely that the extinction risk -- or the quasi-extirpation risk is higher than the results presented in this model today?

MR. MIZELL: I'm going to object.

We've now gone beyond the testimony of Dr. Greenwood in the use of the Rosenfield-Nobriga model.

The intent of his testimony, he has already stated, and that was simply to rebut the statements by Rosenfield in his case in chief for Part 2.

To now extend that into what could the Rosenbriga (sic) -- no -- Rosenfield-Nobriga model produce under a different set of circumstances would -- would not only have been inappropriate rebuttal, because it wouldn't address Dr. Rosenfield's case in chief, but it also is not part of Dr. Greenwood's

rebuttal testimony.

CO-HEARING OFFICER DODUC: Mr. Obegi.

MR. OBEGI: The testimony creates the inference that it is a -- that the extinction risk for the species, and in order to evaluate the reasonable protection of fish and wildlife, it seems valuable to look at both the current levels of abundance as well as the historical abundant -- median abundance that he used here.

CO-HEARING OFFICER DODUC: I believe Dr. Greenwood's rebuttal is based on a comparison, so objection is sustained.

MR. OBEGI: Can we turn to Page -- .pdf Page 7 of this exhibit.

(Exhibit displayed on screen.)

MR. OBEGI: And Table 1 below is showing the -- Am I correct, Dr. Greenwood, that this is showing the Median Index of predicted Abundance Indices under different scenarios?

WITNESS GREENWOOD: These are means of the Median Indices by water year-type as well as an overall all-in year, meaning of the indices, fall Midwinter Trawl Indexes that are predictions from the model.

MR. OBEGI: And so the median -- The mean of the median indices are lower than the value that you

seeded the model with in the below normal, dry, and critical years?

(Pause in proceedings.)

MR. OBEGI: Is that correct?

WITNESS GREENWOOD: I'm just verifying.

The model . . .

(Pause in proceedings.)

WITNESS GREENWOOD: So the median -- The initial values that are exceeded were 798 I think we previously mentioned. So, whichever -- whichever values you see in Columns 2, 3 and 4, the table below 798, are less than the value of the model seeded with.

So that, to me, is not what we normally use, as I mentioned, but it is dry and critical years.

MR. OBEGI: Thank you. I stand corrected.

And the results are higher in the wetter and above-normal years than they are in the drier year types because outflow is higher?

WITNESS GREENWOOD: That's presumably the case, yeah. From this model, this is what we predict, given the model.

MR. OBEGI: Thank you.

That's the only difference between those years; correct?

WITNESS GREENWOOD: From the perspective of

this model.

MR. OBEGI: Thank you.

Let's go back to your testimony, if we can, DWR-1221.

(Exhibit displayed on screen.)

MR. OBEGI: And can we turn to Page 27.

(Exhibit displayed on screen.)

MR. OBEGI: And in your rebuttal testimony, you present estimates of mean relative abundance for Bay Shrimp under different scenarios; is that correct?

WITNESS GREENWOOD: Yes, Table 4.

MR. OBEGI: And Table 5 is the same for Eurytemora affinis?

WITNESS GREENWOOD: It's the same style of summary, yes.

MR. OBEGI: And in these analyses, you're modeling the effects of Delta outflow on the relative abundance of these zoo plankton species?

WITNESS GREENWOOD: These are -- These are X2 relative abundance relationships.

MR. OBEGI: But X2 is calculated as a function of Delta outflow; is that correct?

WITNESS GREENWOOD: The X2 values are from the CalSim model.

MR. OBEGI: And from the CalSim model as a

function of Delta outflows?

WITNESS GREENWOOD: I would have to defer to Dr. Chilmakuri for the specifics on how X2 comes out of the CalSim model.

WITNESS CHILAMKURI: Outflow is one factor, yes.

MR. OBEGI: What other factors are considered?

WITNESS CHILAMKURI: Previous months' X2 conditions.

MR. OBEGI: Thank you.

And is it correct, Dr. Greenwood, that this analysis shows that higher March-to-May Delta outflow would increase -- would likely increase the abundance of Bay Shrimp?

WITNESS GREENWOOD: I mean, this is a similar answer to what I gave before for Longfin Smelt.

This is -- This is applying an X2 to Abundance Index -- relative abundance relationship. So, again, if we look at -- if you look at the means, we can see those types of -- that type of relationship.

But I think it's important to acknowledge that there's a fair amount of spread around those estimates.

MR. OBEGI: But your -- your written testimony doesn't include that; right? It says this is the mean of relative abundance that is predicted.

Well, the written testimony, I guess, is to some extent simplifying given that I'm trying to address using a similar technique as has been used elsewhere. Dr. Rosenfield's comment regarding reductions in fresh water flows under CWF H3+.

So this is just trying to illustrate that within -- within the context of this type of analysis that I don't see evidence for that.

MR. OBEGI: You don't see evidence for a change betw -- significant change between the No-Action and CWF.

WITNESS GREENWOOD: I don't see, correct. In my opinion, those differences are small.

MR. OBEGI: But this analysis -- This analysis would show that abundance would be predicted to be higher under higher -- under lower X2 values.

WITNESS GREENWOOD: The basic relationship for each of these analyses is predicted abundance being higher with lower X2, again, with uncertainty around those estimates.

MR. OBEGI: And you think that these methods are scientifically defensible?

(Pause in proceedings.)

WITNESS GREENWOOD: I think that they're -- they're generally reasonable methods, recognizing that

they shouldn't be taken as absolute predictions of what could occur.

But they're -- They have utility, I think, in comparing between these different scenarios and, as such, we try to apply them in our analyses for what you see here.

MR. OBEGI: And so if there was a scenario that high -- had higher outflow, you would see a mean predicted abundance that would be higher and that relative comparison would likewise be scientifically defensible?

MR. MIZELL: Objection: Incomplete hypothetical; calls for speculation.

CO-HEARING OFFICER DODUC: Overruled.

It seems like a logical line of sequence.

WITNESS GREENWOOD: Can you -- Can you repeat the question and what you mean specifically outflowing these months that's being applied for this -- for these analyses.

MR. OBEGI: Could the -- Could the court reporter please repeat the question back so I don't mangle it.

(Record read.)

WITNESS GREENWOOD: And so I was just seeking clarification. You're talking about outflow in these

given months?

MR. OBEGI: Correct.

WITNESS GREENWOOD: So the basis -- On the basis of -- On the basis of this type of analysis, it would -- the mean prediction would be higher with lower X2 but, again, with variation around the mean estimate.

MR. OBEGI: Okay. And that would be a scientifically defensible analysis, in your opinion.

WITNESS GREENWOOD: This is, I think, a useful analysis for this type of comparison of scenarios.

MR. OBEGI: And scientifically credible?

WITNESS GREENWOOD: This type of analysis has been used before.

MR. OBEGI: And is it your opinion that it is scientifically defensible?

MR. MIZELL: Object as asked and answered.

CO-HEARING OFFICER DODUC: Actually, asked but not answered directly.

MR. MIZELL: And I'd raise an objection as to incomplete hypothetical again.

If Mr. Obegi is asking Dr. Greenwood to defend the scientific credibility of a study that Dr. Greenwood has not seen, which would inevitably need a deeper analysis than the facts that have been given to Dr. Greenwood, it's an incomplete hypothetical to

try and then compel Dr. Greenwood to conclude on.

CO-HEARING OFFICER DODUC: It was a hypothetical scenario to which Dr. Greenwood has already agreed in terms of the results.

And the only question that remains now is whether or not, as a scientist, Dr. Greenwood would view that method as acceptable, and either you do or you don't.

WITNESS GREENWOOD: I think the method is generally acceptable, recognizing that, as I've stated a few times, there is -- there can be appreciable uncertainty around mean estimates, so . . .

MR. OBEGI: Thank you.

And then turning to pages -- to Page 29 of your testimony.

(Exhibit displayed on screen.)

MR. OBEGI: If you will scroll down a little bit --

(Scrolling down through document.)

MR. OBEGI: Sorry. Scroll up a little bit.

(Scrolling up through document.)

MR. OBEGI: So -- Sorry.

You refer to scenarios for White Sturgeon and updated these analyses on Table 6 through 9.

So I think it's the next page.

(Exhibit displayed on screen.)

MR. OBEGI: Again, it could be the page after that.

(Exhibit displayed on screen.)

MR. OBEGI: So, for White Sturgeon here, you present two analyses that look at different time periods for a regression between X2 and predicted abundance; is that correct?

WITNESS GREENWOOD: Yes.

MR. OBEGI: And these are similar to the analyses that were presented in the Final EIS/EIR?

(Pause in proceedings.)

CO-HEARING OFFICER DODUC: Mr. Mizell.

MR. MIZELL: If -- After Dr. Greenwood's next answer, if I could have a moment for a very brief housekeeping matter.

CO-HEARING OFFICER DODUC: Okay.

WITNESS GREENWOOD: I'm not actually recalling the analysis in the EIR.

MR. OBEGI: Okay. That's fine.

CO-HEARING OFFICER DODUC: All right. Mr. Mizell, your housekeeping item.

MR. MIZELL: Mr. Reyes has an appointment that he would like to keep over the lunch period -- lunch period. I'm back in school -- sorry -- over the lunch

had your, and he would need to leave now.

If Mr. Obegi does not anticipate any questions for Mr. Reyes prior to lunch, would it be permissible for him to --

CO-HEARING OFFICER DODUC: Yes. My understanding is all your questions are for Dr. Greenwood.

MR. OBEGI: That's correct.

MR. MIZELL: Thank you.

Mr. Reyes will be available after lunch.

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

MR. OBEGI: Dr. Greenwood, in these analyses presented in Table 8 and Table 9, higher outflow during different months, April and May in Table 8 and in March through July in Table 9, result in higher predicted abundance of White Sturgeon; correct?

WITNESS GREENWOOD: So, again, these are regression relationships between an index of White Sturgeon Juvenile year class strength and outflow.

So, from the -- from the relationship that's applied, there is a positive correlation between these indices and outflow in those different average mean periods, again, with variability around the index periods.

MR. OBEGI: And it is -- Is it your opinion that this methodology is scientifically credible?

WITNESS GREENWOOD: The -- I think the -- the method is reasonable. I think it's similar to what I stated before, that it's, I think, a useful way of preparing different scenarios like this, and recognizing that there is -- there is more than just these mean estimates. There is variability around those mean estimates.

MR. OBEGI: Um-hmm. And in Table 8, it appears to indicate that abundance would be slightly lower under CWF than under the No-Action Alternative.

Is that how you interpret the table?

WITNESS GREENWOOD: Can you tell me what you're looking at?

MR. OBEGI: Well, in -- in the wet years, there's a 4 percent reduction of a . . . Abundance Index of -6. And in the other years, the changes in abundance are either 0 or 1.

And so it seemed, on average, looking at this table as a whole, abundance would be similar and slightly lower under CWF than under the No-Action Alternative.

MR. BERLINER: I'm going to object:

I believe the witness has stated several times

over these are estimates for general guidance purposes. They're not precise. And Mr. Obegi seems to keep wanting to drive him towards precision associated with these.

So, I'm no scientist, but if I see a number that's -6, it might be any other number.

CO-HEARING OFFICER DODUC: Mr. Berliner, the caveat about uncertainty is well established, well known.

Mr. Obegi is, at least as I understand the question, just asking him to affirm what's in his testimony.

Though I have to wonder, Mr. Obegi, hopefully you're moving beyond this and not just asking him to reiterate what's already on paper.

MR. OBEGI: Correct.

I'm -- In his testimony, he says that they're about the same, and it looks to me like they're slightly lower.

And I'm going to move quickly off of this topic once we -- we finish up on this table.

MR. MIZELL: So I'd object to the characterization of the results in the table as being incomplete. Mr. Obegi left out the last line which indicates a 21 percent increase.

CO-HEARING OFFICER DODUC: Well, I think he wisely focused on the numbers and not the percentage, wisely for his argument, anyway.

His question was, 0, 1, 0, 0, -6, and that's what's on the paper.

So let's move on, Mr. Obegi.

MR. OBEGI: Certainly.

You also testified regarding Salmon survival through the Delta on Page 3, Lines 18 to 22.

(Exhibit displayed on screen.)

MR. OBEGI: Does the modeling in the NMFS Biological Opinion show that through-Delta survival of Juvenile Salmon is likely to be equal or greater to the baseline?

WITNESS GREENWOOD: Which modeling, please?

MR. OBEGI: Does the Perry Survival Model show that?

WITNESS GREENWOOD: Mmm. I'd have to look at the specific results again.

I think, in general, this analysis suggested, just based on the modeling, that the survival -- that the modeling results indicated predicted survival that could be lower under CWF H3+, only considering what's in the models.

MR. OBEGI: Are you aware of any modeling that

shows -- that demonstrates that WaterFix is likely to result in Juvenile through-Delta survival that is equal or greater to the baseline?

WITNESS GREENWOOD: I don't think the modeling has captured the different elements that are -- all of the different elements that are within CWF H3+.

MR. OBEGI: So is that a "no"?

WITNESS GREENWOOD: I think there are -- there are some analyses that we have that -- that suggest similar through-Delta survival, depending on, for example, the run of Salmon that's being looked at.

So I wouldn't say that there are none. I think, based on my recollection, there are some.

MR. OBEGI: From the Sacramento River?

WITNESS GREENWOOD: Yes.

MR. OBEGI: For winter-run Chinook Salmon?

WITNESS GREENWOOD: I don't recall specifically for winter-run Chinook Salmon.

MR. OBEGI: And for spring-run Chinook Salmon from the Sacramento River?

WITNESS GREENWOOD: I would need to look again at some of the analyses included. In the BA, for example.

MR. OBEGI: And you assert in this testimony that these biological criterion provides reasonable

protection; is that correct?

On Lines 20 to 21.

WITNESS GREENWOOD: That's what -- That's what -- what it says.

MR. OBEGI: And is it your opinion that baseline rates of Juvenile Salmon survival through the Delta are reasonably protective of Salmon?

MR. MIZELL: Objection: Goes beyond the scope of Dr. Greenwood's testimony.

The statement clearly is comparative analysis in relying upon the existence of condition in the ITP as the scientific basis for protective criteria but in a comparative manner.

CO-HEARING OFFICER DODUC: And what was your question, Mr. Obegi?

MR. OBEGI: If the baseline rates of Juvenile Salmon survival, as referenced in his testimony, are reasonably protective.

CO-HEARING OFFICER DODUC: Objection sustained.

MR. OBEGI: Then I'd like to move to strike this conclusion. If we can't test the underlying basis for his conclusion of a comparative analysis, it's not clear how he's formulating that opinion.

CO-HEARING OFFICER DODUC: Response?

MR. MIZELL: I would say that we have been testing the basis of his comparative cri -- his comparative conclusion here in that whether or not it's based on a criteria to have CWF H3+ operations be equal or greater to the baseline.

Mr. Obegi can ask the appropriate witness on Panel 3 as to what he considers to be protective in the No-Action Alternative.

But for Dr. Greenwood's testimony, he has the biological expertise to look at the difference between a No-Action Alternative case and H3+ case -- and this has those numbers -- and provide an opinion as to whether or not the change is reasonably protective.

CO-HEARING OFFICER DODUC: All right. We'll take it into --

Yes, Miss Des Jardins?

MS. DES JARDINS: I would like to join Mr. Obegi's Motion to Strike.

And I would like to note that the standard of reasonable protection is speaking about a very specific standard. I believe there have been arguments made in the hearing that it's an absolute and not a relative standard.

To the extent that there are statements about reasonable protection and not about just the changes,

there would be no changes over existing conditions. It's -- If we can't test those statements, then they should be stricken.

Thank you.

CO-HEARING OFFICER DODUC: The test, as I . . .

Yes.

The test that I'm trying to determine here is whether or not this is based solely on Dr. Greenwood's rebuttal testimony, or if this is reverting back to previous testimony that was made as part of his case in chief, which would be outside the bounds of his rebuttal testimony.

So, Dr. Greenwood, your conclusion as specified in Line -- what is it -- 20 through 22, are you just reiterating your case in chief and other testimony, or is this a new analysis, a new conclusion based on your rebuttal analysis and rebuttal testimony?

WITNESS GREENWOOD: It's really a trade, yes.

(Pause in proceedings.)

CO-HEARING OFFICER DODUC: All right. There was a motion made. We will consider it in weighing this particular paragraph in Dr. Greenwood's testimony.

MR. OBEGI: A point of clarification:

Counsel for DWR seemed to imply that the

witness was not qualified to answer questions about the reasonable protection under the baseline conditions, and I -- I wasn't sure if I misunderstood that or --

MR. MIZELL: Yes. My intent was not to discuss the qualifications of Dr. Greenwood to answer questions on biology.

It was my intent to discuss the scope of Dr. Greenwood's analysis as conducted for his rebuttal testimony under -- for which he's being cross-examined.

CO-HEARING OFFICER DODUC: All right. We're moving on.

MR. OBEGI: So, I had a couple questions regarding Delta outflows and Delta Smelt rearing habitats as referenced on Page 29, Lines 11 to 15.

(Exhibit displayed on screen.)

MR. OBEGI: And, here, you -- you assert that the various Delta outflow Change Petition conditions proposed by Dr. Rosenfield, you do not believe them to be necessary; is that correct?

WITNESS GREENWOOD: That's what I state, yes.

MR. OBEGI: Mr. Hunt, would you please pull up -- hold on one second -- NRDC-202.

(Exhibit displayed on screen.)

MR. OBEGI: And I have a written copy for the witness and others if they would like one.

Dr. Greenwood, would you prefer a written copy or is the screen okay?

WITNESS GREENWOOD: The screen's good.

MR. OBEGI: Okay. Can we scroll down on Page 2.

(Exhibit displayed on screen.)

MR. OBEGI: Are you aware of this --

Sorry. Can we move up on the top of Page 1.

(Exhibit displayed on screen.)

MR. OBEGI: Have you seen this document before, Dr. Greenwood?

WITNESS GREENWOOD: I may have. I'm just not recalling it very well at the moment.

MR. OBEGI: And I will make an offer of proof that this was obtained from the U.S. Fish and Wildlife Service as part of the Administrative Record in our litigation challenging their Biological Opinion.

If we scroll down to Page 2.

(Exhibit displayed on screen.)

MR. OBEGI: The memorandum from the Secretary of the Interior to the President of the United States discusses the downward trajectory of endangered Delta Smelt.

And, then, in that second paragraph that begins, "To maximize Salmon protections," the next

sentence says (reading):

"With respect to Smelt -- Delta Smelt, FWS asked Reclamation to acquire hundreds of thousands of acre-feet of water to release to increase environmental flows through the Delta in the hope of boosting Delta Smelt populations."

Are you aware that -- that the Fish and Wildlife Service has identified a need for additional Delta outflow in the summer months, as this memo indicates?

WITNESS GREENWOOD: I'm sorry. I don't see specific reference to --

Oh, I see. Sorry. I see summer.

(Pause in proceedings.)

WITNESS GREENWOOD: Yeah. I'm not sure of the specific reference that this is describing.

I think, in general, that summer -- summer period is something that I mentioned in my previous testimony as well, where I noted that the Biological Opinion for WaterFix from Fish and Wildlife Service had mentioned summer as a -- as a period of interest.

And I also mention here, kind of reiterating my previous testimony, that this is something of

interest, I think, in the Delta Smelt Resiliency Strategy during the summer.

So, I don't really know these details that you're asking about, but I know that there are related things that are thinking about summer period and flow for Delta Smelt.

MR. OBEGI: And did you consider this -- this information in preparing your testimony?

WITNESS GREENWOOD: Sorry. This particular thing that we're looking at --

MR. OBEGI: Yes.

WITNESS GREENWOOD: -- this exhibit?

MR. OBEGI: This exhibit.

WITNESS GREENWOOD: Not this -- Not this specific exhibit.

MR. OBEGI: And if we could scroll down just a little bit further --

(Scrolling through document.)

MR. OBEGI: -- it discusses the Delta Smelt Resiliency Strategy and identifies a need to provide, quote (reading):

". . . Substantial additional environmental flows in spring/summer of 2017 and 2018 . . ."

And further down asserts that (reading):

"The reinitiation process will likely lead to new or Amended Biological Opinions that will increase protections for these species."

Does this information change your opinion regarding summer outflows for Delta Smelt and what is required for reasonable protection?

WITNESS GREENWOOD: Sorry. Which -- Which specific opinion?

I think -- All I would say is generally that -- that potential need for more outflow was something that was acknowledged in my original testimony, and I kind of reiterate that a little bit here in my rebuttal testimony.

So, I recognize that that potential -- the need to potentially consider summer outflow is something that's -- that's -- that exists.

And so I think, through, as I mentioned here WaterFix adaptive management, you know, could incorporate some of the knowledge that might be gained by something like the Delta Smelt Resiliency Strategy where summer outflow effects on Delta Smelt habitat, you know, could be investigated further.

MR. OBEGI: And on that point of using the Resiliency Strategy to learn and better understand the

effects of outflow, was additional outflow provided in 2017 and 2018 for Delta Smelt?

WITNESS GREENWOOD: I'm not -- I'm not sure if it was.

MR. OBEGI: So you're not aware if there's any additional information that would be available to assess that.

WITNESS GREENWOOD: I -- I don't know.

MR. OBEGI: Would it surprise you to find out that it was not provided?

MR. BERLINER: Objection: We're well beyond the witness' testimony at this point.

CO-HEARING OFFICER DODUC: Sustained.

MR. OBEGI: Can we please pull up NRC-208 (sic).

(Exhibit displayed on screen.)

MR. OBEGI: And this is a June 1st, 2016, memorandum from the Fish and Wildlife Service to the Bureau of Reclamation.

And if you scroll down a little bit --

(Scrolling through document.)

MR. OBEGI: -- it asserts that, quote (reading):

". . . We remain concerned about maintaining adequate habitat conditions

for Juvenile Delta Smelt rearing in the West Delta through the later spring and summer."

And identifies the need to maintain X2 (reading):

". . . No more eastward than 81 kilometers through the end of the water year -- end of the water . . ."

Are you aware of this determination by the Fish and Wildlife Service?

MR. BERLINER: Excuse me.

Mr. Obegi, do you have hard copies of these documents?

MR. OBEGI: I do.

MR. BERLINER: I think it would helpful for the witness to see them. Since they're short documents, it would helpful for the witness to be able to see them, unless he has familiarity with these.

CO-HEARING OFFICER DODUC: I believe Mr. Obegi made that offer and Dr. Greenwood said he was fine with the screen, but let's go ahead and get you the hard copies.

MR. BERLINER: Yeah. I'm overruling my witness here about providing hard copies of the document.

(Pause in proceedings.)

CO-HEARING OFFICER DODUC: Are you familiar with this document, Dr. Greenwood? Have you seen it before?

WITNESS GREENWOOD: No, I haven't. I haven't seen it before.

MR. OBEGI: Do you agree with the opinion that maintaining X2 no more eastward than 81 kilometers through the summer is critical to maintaining habi -- adequate habitat quality for Delta Smelt?

(Pause in proceedings.)

WITNESS GREENWOOD: It would depend on how "relatively good habitat" is being defined, I guess.

MR. OBEGI: How would you define it?

(Pause in proceedings.)

WITNESS GREENWOOD: Well, I'm -- I'm saying that I don't necessarily know what was being meant by this, so . . .

MR. OBEGI: And so this wouldn't change your opinion?

CO-HEARING OFFICER DODUC: Not if he doesn't know what's meant by it, Mr. Obegi.

MR. OBEGI: Thank you.

My last line of questioning for this witness is with respect to -- make sure I've got it --

real-time operations.

And you discuss real-time operations in your testimony on Pages 15 to 17, as well as on Page 2.

So can we pull up your testimony, which is DWR-1221.

(Exhibit displayed on screen.)

MR. OBEGI: And if we go to Page 2.

(Exhibit displayed on screen.)

MR. OBEGI: And on Line 13 (reading):

". . . Reasonable protection includes . . . real-time operational adjustments . . ."

What's the basis for your opinion that real-time operational adjustments provide reasonable protection for fish?

CO-HEARING OFFICER DODUC: Can you be more specific, Mr. Obegi. This is a very broad sentence in the opening paragraph.

MR. OBEGI: It's a very broad sentence and I'm trying to understand what he considered in making this broad statement.

MR. MIZELL: To the extent that Mr. Obegi would like Dr. Greenwood to explain the testimony that this is an introductory paragraph to that is found on Pages 15 through the top of 17.

MR. OBEGI: So let's turn to Page 15.

(Exhibit displayed on screen.)

MR. OBEGI: And scrolling down.

(Scrolling through document.)

MR. OBEGI: You assert that the (reading):

". . . Monitoring is a good indicator of relative abundance . . ."

Is that correct?

WITNESS GREENWOOD: Could you point me specifically to what you're referring to?

MR. OBEGI: Line 23.

WITNESS GREENWOOD: This was specifically rebutting Mr. Shutes' opinion that rotary screw traps may be unreliable for smolt-sized Salmon.

Here, I'm stating, in my opinion, that rotary screw trap monitoring is a good indicator of relative abundance.

MR. OBEGI: And do you believe that the -- that the agencies are likely to implement operational changes in response to this kind of monitoring?

WITNESS GREENWOOD: I think it's . . .

It's one of the factors that they would be considering, based on my understanding.

MR. OBEGI: And are water supply considerations part of the factors that the agencies

would consider regarding real-time operations under WaterFix?

WITNESS GREENWOOD: I can't -- I can't really comment.

MR. OBEGI: Can we please pull up State Water Board Exhibit 104, Chapter 3, and .pdf Page 99.

(Exhibit displayed on screen.)

MR. OBEGI: And scroll down a little bit.

(Scrolling through document.)

MR. OBEGI: And do you see the sentence that says (reading):

> "Real-time operations will also be used to adjust operations to further limit effects on listed species and maximize water supply benefits."

It's the fourth sentence from the bottom.

WITNESS GREENWOOD: I see that sentence.

MR. OBEGI: So, is it your understanding that water supply considerations would be part of real-time operations?

WITNESS GREENWOOD: This suggests that they would be.

MR. OBEGI: And did you consider that in -- consider that fact in your testimony?

MR. MIZELL: I'm going to object as to the

extent to which Mr. Obegi wishes to go into the real-time Operations Criteria beyond the specific criteria of real-time operations discussed by Dr. Greenwood, that would be beyond the scope of his rebuttal testimony.

If Mr. Obegi can point to a linkage within Dr. Greenwood's testimony talking about the specific type of real-time operations, I'm happy to withdraw my objection.

CO-HEARING OFFICER DODUC: How deeply are you intending to exploring this, Mr. Obegi.

I can understand you wanting to determine what Dr. Greenwood did or did not consider when he discussed real-time operational adjustments in response to fish presence.

But if you're going to question him extensively about, for example, export consideration in real-time operations, that would be outside the scope.

MR. OBEGI: There's a statement in his testimony on Page 16 that the real-time pulse protective criteria are required to be implemented as part of the Permitting Conditions of Approval.

And it goes to the heart of his rebuttal testimony that real-time operations provide reasonable protection because the monitoring will be improved and

the measures will be implemented.

And in order to know whether the measures will be implemented, we need to know whether measures have been implemented in the recent past. That is clearly relevant.

CO-HEARING OFFICER DODUC: To the extent that he is aware of them.

MR. OBEGI: Correct.

CO-HEARING OFFICER DODUC: And to the extent that you do not go beyond his expertise in terms of those real-time operations. He's not an operations person.

MR. OBEGI: Absolutely.

CO-HEARING OFFICER DODUC: All right. I'll allow you.

Overruled, Mr. Mizell.

WITNESS CHILAMKURI: Mr. Obegi, do you mind pulling up the Final BA -- Final Biological Assessment, which is actually DWR-1142. This -- There's a Revised BA in 2017. We just want to make sure the language is not changed.

MR. OBEGI: I would not object.

(Exhibit displayed on screen.)

MR. OBEGI: Chapter 3.

(Exhibit displayed on screen.)

MR. OBEGI: I believe it was Page 99, although it may take awhile to find it with the red-lined version.

(Exhibit displayed on screen.)

WITNESS CHILAMKURI: A couple more pages.

(Scrolling through document.)

CO-HEARING OFFICER DODUC: What page are we looking for?

MR. OBEGI: I believe it's -- Try 3-96.

CO-HEARING OFFICER DODUC: We're on 3-86.

(Exhibit displayed on screen.)

WITNESS CHILAMKURI: Further down, actually. It's probably --

MR. OBEGI: There's quite a bit of red line.

WITNESS CHILAMKURI: Yeah.

(Scrolling through document.)

WITNESS CHILAMKURI: Keep going.

(Scrolling through document.)

WITNESS CHILAMKURI: Keep going down.

(Scrolling through document.)

WITNESS CHILAMKURI: Right there, yes.

A little bit further down, just a paragraph.

(Exhibit displayed on screen.)

WITNESS CHILAMKURI: Yeah. Okay. Looks like it did not change. Thank you.

MR. OBEGI: Thank you.

CO-HEARING OFFICER DODUC: Now I've forgotten where you were, Mr. Obegi.

What was your question?

MR. OBEGI: My -- I don't think there was a question pending. We were talking about whether the water supply considerations . . .

Here's a question:

Does this language mean that, at times, real-time operations would not be implemented to protect fish because of water supply considerations?

WITNESS CHILAMKURI: I'll try to answer that.

No, it does not mean that. All it's saying is to indicate that there is enough flexibility having this new diversion facility that, if there are concerns at the South Delta intakes, then exports would occur at North Delta intakes and back and forth.

It's a -- It's a flexibility -- It's offering -- It's talking about a flexibility issue that the Project brings.

MR. OBEGI: So water supply would not be considered in making real-time operations?

WITNESS CHILAMKURI: That's not what I said. I'm just saying that the statement in making these decisions, I was giving you a specific example of what

this statement is indicating about.

And as it's stated there, yes, water supply will be a part of consideration but, at the same time, that fish protection is a consideration as well.

MR. OBEGI: Mr. Hunt, would you please pull up the exhibit that's been marked as NRDC-203.

(Exhibit displayed on screen.)

MR. OBEGI: And I have printed copies of an excerpt and the full document.

If we could hand them to the witness and to counsel.

Thank you.

(Counsel confers with Miss McCue.)

MR. OBEGI: And this is a 2016 memorandum . . .

One of them is just a -- Give the witness the full package, yeah. The other one's just a short excerpt because I'm only just asking about the first couple pages.

(Pause in proceedings.)

MR. OBEGI: And if you will -- Do you recall this document, Dr. Greenwood?

WITNESS GREENWOOD: I may have seen it. I'm not quite recalling right now looking at it.

MR. OBEGI: And can we pull up Page 2 --

(Exhibit displayed on screen.)

MR. OBEGI: -- under the "Summation of Effects."

(Exhibit displayed on screen.)

MR. OBEGI: In this memorandum from NMFS, which is the informal sufficiency review of the January working draft of the Biological Assessment, doesn't it state that, quote (reading):

"The species determinations in Chapter 7 rely too heavily on real-time operations . . ."

WITNESS GREENWOOD: That's what that sentence -- part of that sentence says.

MR. OBEGI: Do you agree with that conclusion?

WITNESS GREENWOOD: This is a memo from a couple of years ago on a -- what seems to have been a -- I don't know whether this is draft or what it is.

Seems to be talking about a working draft of the BA, so it's challenging to formulate an opinion.

MR. OBEGI: Then turning to the next page, do you see --

WITNESS CHILAMKURI: Sorry. I just want to add one thing.

Maybe this is where you're going.

If you go to the next page --

(Exhibit displayed on screen.)

WITNESS CHILAMKURI: -- NMFS recognizes need for auxiliary analyses under real-time operations.

And if you look at the NMFS Biological Opinion, they state that the -- those -- based on those auxiliary analysis, the modeling objective is sufficient for their opinions.

MR. OBEGI: And I actually want to go up a little bit higher where, at the very bottom of Page 2 to the top of Page 3, it says (reading):

> "The potential for negative effects -- negative effect is discounted by reliance on very uncertain outcomes of predator control, success of real-time operations (which has not been very protective in recent years) . . ."

And goes on.

Do you agree with NMFS' conclusion that real-time operations have not been very protective in the years prior to this 2016 memorandum?

WITNESS GREENWOOD: It's difficult to say what they're specifically meaning by that or what they're referring to.

I don't know what they're -- I don't know what they're referring to there.

WITNESS CHILAMKURI: And, also, as we just looked at, DWR-1142, there were significant changes to the real-time operations decisions in regards to BA.

MR. OBEGI: Dr. Greenwood, you also testified that you disagree with the bypass flow recommended by Dr. Rosenfield.

Is it your opinion that a 35,000 cfs bypass flow at the North Delta diversion would not be more protective of migrating Salmon than the unlimited pulse protection proposed at the North Delta diversion?

(Pause in proceedings.)

WITNESS GREENWOOD: Could you repeat that question, please?

MR. OBEGI: Do you agree that a 35,000 cfs bypass flow at the North Delta diversion would be more protective of migrating Salmon than the unlimited pulse protection at the North Delta diversion?

WITNESS GREENWOOD: I haven't done a specific analysis so it would be hard to say. It would be hard to say just based on being asked, "is this compared to this," more protective.

MR. OBEGI: Am I correct that, under the unlimited pulse protection, if Salmon are detected upstream of the North Delta diversions, that 35,000 cfs bypass flow is required?

WITNESS GREENWOOD: I'm -- I would have to defer to Dr. Chilmakuri on the specifics on that.

WITNESS CHILAMKURI: I don't recall that.

MR. OBEGI: And you also testified with respect to the monitoring that it would adequately detect the pulse of Salmon.

How many Salmon would be required to be caught in the monitoring to trigger the bypass flow under the unlimited pulse protection?

WITNESS GREENWOOD: Well, there are -- I think there are some criteria that are mentioned in the ITP for that. But it's recognized the . . . the North Delta diversion's Technical Team will have to address whether -- you know, what's initially proposed will, I guess, be adequate for that purpose, for the real-time operations.

So they may be able to consider different triggers in terms of number of fish as well as whether there's additional monitoring locations, for example, that are required.

So, I could -- we could look in the ITP to see what the specific number is, but we just have to recognize that that's something that, through the work of the North Delta diversion Technical Team, could be adjusted.

MR. OBEGI: And if that number is greater than one, there would be times that there are Salmon migrating and the bypass flow under unlimited pulse protection would not be implemented; correct?

WITNESS GREENWOOD: It's hard -- I guess it's hard to say definitively on that.

(Pause in proceedings.)

MR. OBEGI: In general, as a hypothetical, assume that the unlimited pulse protection requires 35,000 cfs bypass flow if fish are detected at the upstream rotary screw traps.

Assuming that hypothetical, would a 35,000 cfs bypass flow at all times be more protective of Salmon than a bypass flow of 35,000 cfs that is only triggered when sufficient number of Salmon are detected in monitoring?

(Pause in proceedings.)

WITNESS GREENWOOD: I think it -- It's challenging to be able to say thinking about the hypothetical.

MR. OBEGI: Why is it challenging? What -- What particularly are you struggling with?

WITNESS GREENWOOD: Well, there's -- there's different elements.

If you could -- If you could repeat it.

MR. OBEGI: Assume that the unlimited pulse protection requires a 35,000 cfs bypass flow at the North Delta diversion when Salmon are detected in monitoring in the rotary screw traps.

Would a 35,000 cfs bypass flow that is not dependent on monitoring be more protective than one -- than a 35,000 cfs bypass flow under unlimited pulse protection that only is triggered when sufficient numbers of Salmon are caught in the rotary screw traps?

WITNESS GREENWOOD: It's challenging to say because flow isn't the only consideration, I think, as far as what could affect Salmon survival.

I think the basis for the 35,000 cfs, I think it comes from flow survival relationships, but those have uncertainty around them. So it's -- It's difficult to say based just on that.

MR. OBEGI: But that is the basis for the unlimited pulse protection; correct?

WITNESS GREENWOOD: I believe so.

WITNESS CHILAMKURI: Actually, I just want to -- I don't think 35,000 cfs bypass flow requirement is -- that's part of unlimited pulse protection.

It is -- For the unlimited pulse protection, as I understand, if the -- if there are a certain number of fish detected in an upstream fish trawl, then

the North-of-Delta diversions would need to be reduced to very low-level pumping, which is about 900 cfs -- which can be up to 900 cfs. It would be really sensitive of the Sacramento River flow about 5,000 cfs.

That is the -- If the unlimited flow pulse protection is restricted, that is an action that's required. It's not -- I don't recall that there is a 35,000 cfs bypass flow in there.

MR. OBEGI: You don't recall that the exports are allowed to increase once flows are above 35,000 cfs?

WITNESS CHILAMKURI: That's not under the . . .

So, let's -- let's -- So let's say -- I think this was discussed in the prior testimony.

But the North Delta diversions are -- The bypass flow requirements, they vary over the season, going from very restrictive to more than -- a little less restrictive for the season as the conditions get wetter from September through June -- actually from October through June period.

And the unlimited pulse protection is a real-time action which is dependent on the fish that are caught at the upstream trawls as an indicator of fish migrating downstream, and that action could occur

at any point of time in the season.

And during -- If the -- If such an action occurs when the diversions are somewhere between Level 1, 2 and 3, what the BiOps says -- and which I don't exactly remember the specifics -- is that if -- if the exports are already at the Level 1 or higher, then -- and if the export North Delta diversions have to be cut down because of the unlimited pulse protection trigger, then they can only go back up after the 35,000 cfs requirement is met, I think.

Again, I don't remember exactly the whole description of when those exports go up, but that's the context where it's happening.

But the action the WaterFix would take is to reduce the amount of the diversion to, as I said, 6 percentage of the Sacramento River flow, about 5,000 cfs or up to the maximum of 500 cfs when such an action is triggered, such as unlimited pulse protection.

(Pause in proceedings.)

MR. OBEGI: Dr. Greenwood, you also testify regarding real-time operations of OMR flows using the Smelt Working Group on Pages 25, Line 7 to 11.

(Exhibit displayed on screen.)

MR. OBEGI: Are you aware that the Fish and Wildlife Service has rejected the advice of the Smelt

Working Group multiple times in recent years?

CO-HEARING OFFICER DODUC: Mr. Berliner.

MR. BERLINER: Objection: This seems to go beyond the scope of his testimony.

CO-HEARING OFFICER DODUC: Mr. Obegi.

MR. OBEGI: His testimony asserts that these factors, such as fish distribution, would continue to be considered as part of the real-time operations group such as the Smelt Working Group, and it's part of the basis for his conclusion that WaterFix provides reasonable protection of fish and wildlife.

CO-HEARING OFFICER DODUC: Dr. Greenwood, please answer.

WITNESS GREENWOOD: I'm not sure -- I'm not sure if it's . . .

I guess as far as rejection, I don't know if the -- If it's rejection or if it's consideration, but then, you know, they do a different action. I'm not sure.

You know, I'm just giving some -- I'm giving as an example here in my testimony that you pulled from the Smelt Working Group, but then there's Water Operations Management Team and others, you know, that have contributed to this.

So I think I'm had a similar question from

Mr. Jackson last week, and I indicated that the take limits haven't been exceeded, which suggests, you know, that the operations have been protective in that regard.

MR. OBEGI: I have a couple of exhibits I'd just like to walk through very briefly.

Mr. Hunt, can you pull up NRDC-205.

(Exhibit displayed on screen.)

MR. OBEGI: And this is a December 21st, 2016, Fish and Wildlife Service response to the Smelt Working Group recommendation.

(Pause in proceedings.)

MR. OBEGI: And it indicates that the Smelt Working Group recommended Action 1 be implemented as soon as possible, and Fish and Wildlife Service declined to require that because of less water supply impact.

If you look at the last paragraph -- the beginning of the last paragraph.

(Exhibit displayed on screen.)

MR. OBEGI: And then if you'd pull up NRDC-206.

CO-HEARING OFFICER DODUC: Hold on.

And -- I'm sorry -- your question to Dr. Greenwood is?

MR. OBEGI: I'd like to -- We can walk it through.

Did you consider the fact that Action 1 was not implemented in 2016 and has not been implemented in certain years because of water supply considerations in making your -- in testifying that real-time operations provides reasonable protection of fish and wildlife?

MR. BERLINER: Objection: I think insofar as Mr. Obegi is characterizing NRDC-205, in the last paragraph, his characterization is contrary, I believe, to what it says here.

As I understand it, Action 1 -- service at Action 1 -- the service -- Here.

The service does not believe that Action 1 is currently necessary in response to last week's storm, is what it says.

CO-HEARING OFFICER DODUC: So let's see if we can shortcut this.

Dr. Greenwood, are you familiar with this document?

WITNESS GREENWOOD: I don't recall having -- I mean, I may have -- I may have seen it at one time. I don't recall specifically seeing it.

CO-HEARING OFFICER DODUC: So are you, sitting here today, able to testify as to whether or not you

considered this factor in your rebuttal testimony?

WITNESS GREENWOOD: Yeah, I think I'm -- I'm just generally speaking to the work of different real-time operation groups.

And considerations such as are laid out here, which, while the Fish and Wildlife Service isn't . . . they're not the same as the Smelt Working Group, but there's considerations of what I would consider kind of real-time factors.

So, just broadly speaking, that kind of speaks to me to what's written in my testimony as far as on a weekly basis trying to consider what conditions are in real-time.

So I haven't -- I'm not familiar with these specifically.

CO-HEARING OFFICER DODUC: Okay. I'm guessing, Mr. Obegi, that you are going to be showing Dr. Greenwood various documents with various findings and asking whether he considered it in his analysis in order to lay the foundation for potentially closing briefs that you will be arguing.

Is that the plan?

MR. OBEGI: That is.

CO-HEARING OFFICER DODUC: Let's move quickly through it, and Miss -- Dr. Greenwood, answer the

question only of: Are you familiar with this document? Are you familiar with your analysis? Did you consider it in preparing your rebuttal testimony?

MR. OBEGI: So, that question with respect to NRDC-206, which is a Fish and Wildlife Service determination from the prior year, dated January 14th, 2016.

WITNESS GREENWOOD: I didn't specifically consider this document in forming my opinion.

MR. OBEGI: And then the very last one is NRDC-207, which is a February 5th, 2013, determination from the Fish and Wildlife Service.

(Exhibit displayed on screen.)

MR. OBEGI: Which --

WITNESS GREENWOOD: Again --

MR. OBEGI: Go ahead.

WITNESS GREENWOOD: Sorry. Please ask the question.

MR. OBEGI: Did you consider this determination from the Fish and Wildlife Service where they did not implement the Smelt Working Group recommendation while also raising concerns about exceeding the Incidental Take Limit?

WITNESS GREENWOOD: I didn't specifically consider this document.

But as I mentioned, again, to my knowledge, Incidental Take Limits have not been exceeded.

MR. OBEGI: Would it surprise you to find out that the Incidental Take Limit for Delta Smelt has been increased above and beyond what was identified in the Biological Opinion in recent years?

WITNESS GREENWOOD: I believe I'm generally aware of that, although my recollection was that there was a specific rationale for that.

MR. OBEGI: And in light of these documented instances of the Fish and Wildlife Service not implementing the recommendations of the Smelt Working Group, do you still believe that real-time operations provide reasonable protection of fish and wildlife?

WITNESS GREENWOOD: I do, because, as I mentioned, there's -- The Smelt Working Group is one component within a broader, as I understand it, framework.

So, looking at some of these documents you've provided examples of, I mean, the -- these are considerations, as an example, Fish and Wildlife Services is considering these various factors in their ruminations, so . . .

That, to me, is -- remains consistent with my opinion.

MR. OBEGI: Nothing further.

CO-HEARING OFFICER DODUC: With 12 seconds remaining.

(Laughter.)

CO-HEARING OFFICER DODUC: Thank you for that impeccable timing.

Let's do a quick time check before we break for lunch.

Miss Des Jardins, Miss Meserve. I don't see Miss Meserve.

CO-HEARING OFFICER MARCUS: There she is.

CO-HEARING OFFICER DODUC: Oh, there she is.

At this time, what is your estimates for cross-examination of this panel?

Keeping in mind that many, many questions have been asked of them since you initially provided your estimate.

MS. DES JARDINS: I do have questions that have not been asked, and I would still need, I would estimate, about two hours.

CO-HEARING OFFICER DODUC: And your questions will be directed at which witnesses?

MS. DES JARDINS: Greenwood, Wilder, and Reyes, and Parker, and Kristin White, and Dr. Chilmakuri.

CO-HEARING OFFICER DODUC: Miss Meserve.

MS. MESERVE: Good morning.

Yes. I think I still --

CO-HEARING OFFICER DODUC: Afternoon now, unfortunately.

LEFT2: Sorry.

I think it's still about an hour. I -- It's -- So -- And it's many of the same witnesses that was first mentioned by Miss Des Jardins.

CO-HEARING OFFICER DODUC: Any questions for Mr. Valles, Dr. Phillis?

MS. MESERVE: Yeah, I did have a couple questions for Mr. Valles.

CO-HEARING OFFICER DODUC: Perhaps we could do that before we adjourn for lunch, if it's just a couple questions, so that Mr. Valles does not need to return.

And Mr. Mizell, Mr. Berliner, Miss Aufdemberge, I am thinking we will not get to your second panel -- I'm sorry -- your third panel today because, by my count, that's at least three hours or so of cross-examination, and we will be returning about 1:30.

MR. MIZELL: Thank you.

MS. MESERVE: Yeah. Sure, I can get those questions.

I wanted to -- Related to moving on from DWR's panels, and just do a quick time check for when the first Protestant panels would be up. Would that be okay to do that now or --

CO-HEARING OFFICER DODUC: I don't know. Depends on cross-examination; won't it?

MS. MESERVE: Yeah. And what I'm looking at is, it looks like Sac Valley Water Users have a panel Grasslands has a panel, then we have a maybe a short presentation from San Joaquin Tributaries, and then we roll into the Adaptive Management testimony that LAND and others are presenting.

I've got a witness up in Oregon. He needs 24 hours' notice. I'm kind of thinking maybe Thursday for that panel.

I also wanted to give DWR a heads-up that we're talking with South and Central Delta Water Agency about their witnesses, Tom Burke and Jeffrey Michael, and potentially putting them first, if that would be okay, in order to get my witness time to get down from Oregon.

So --

CO-HEARING OFFICER DODUC: Why don't you guys talk to each other and get a proposal to us?

LEFT2: Sure. Okay. Thanks.

CO-HEARING OFFICER DODUC: All right. And if you only have a few questions for -- I apologize, I'm probably mispronouncing your last name -- let's do that so you don't have to return after lunch.

Unless Miss Des Jardins has now decided that she has questions for you as well.

MS. DES JARDINS: I just -- Some of my questions for Miss Parker and Miss White and Mr. Reyes might also need some answers from Mr. Valles.

He doesn't have specific testimony, so I -- I didn't have specific questions directed at him. But he does say that he would be --

CO-HEARING OFFICER DODUC: All right. In that case, you're stuck with us.

Why don't we go ahead and take our lunch break. We will return at 1:30.

(Lunch recess at 12:30 p.m.)

* * *

AFTERNOON SESSION

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(Whereupon, the proceedings resumed at 1:30 p.m.)

CO-HEARING OFFICER DODUC: All right. Everyone, please take a seat. We are back in session now with examination by Ms. Des Jardins. She has indicated that she's directing her first sets of questions to Dr. Greenwood and Dr. Wilder.

MS. DES JARDINS: Thank you.

CROSS-EXAMINATION BY MS. DES JARDINS

Could you bring up Exhibit DWR-1229, please, the testimony of Richard Wilder.

CO-HEARING OFFICER DODUC: And as that is coming up, do you have any specific area of focus that you have for Dr. Wilder?

MS. DES JARDINS: Yeah. There's two questions. One is Old River carryover storage requirements, and the other is about the physical modeling, linking the physical modeling efforts to the biological --

CO-HEARING OFFICER DODUC: All right.

MS. DES JARDINS: But first --

CO-HEARING OFFICER DODUC: These are questions addressed to Dr. Wilder?

MS. DES JARDINS: Yes.

CO-HEARING OFFICER DODUC: All right. Let's do that.

MS. DES JARDINS: But first, based on the decision prior, for the record, I'd like to move to strike the references in Dr. Wilder's testimony to reasonable protection. And that's just for the record. Page 2 at Line 1 to 2 states, "CWF is reasonably protective of American River Chinook salmon and steelhead, and based on that, reasonable protection is an absolute standard." And we're not able to do cross on the adequacy of existing standards because it was covered in Part 1. I'd like to move to strike that. And, again, at 10 to 11, it says it as well.

And then on Page 7, at Line 9 to 11, I'd like to move to strike where it says, "DCWF will provide reasonable protection of upstream life stages of salmonids." Again, I'd like to strike it on the basis that it's an absolute standard and -- and that -- and we're not able to do cross on it.

And again on Page 11, at Line 16 to 19, I'd like to strike -- scroll down. It's at 16 to 19.

CO-HEARING OFFICER DODUC: All right. Ms. Des Jardins, rather than going through the entire list and taking up your valuable and limited

cross-examination time, why don't you submit that in writing.

MS. DES JARDINS: Okay.

CO-HEARING OFFICER DODUC: And please do that by noon on Wednesday.

And petitioners, you may have until noon on Friday to respond.

MS. DES JARDINS: And I would like to add that I also have similar motions to strike for Marin Greenwood's references to reasonable protections.

CO-HEARING OFFICER DODUC: Fine. Submit all that in writing.

MS. DES JARDINS: Okay. Thank you. Okay.

So let's -- Page 11 at Line 5.

MS. MITTERHOFER: Ms. Des Jardins, if I could just interrupt you for a second.

We got a request from the AV room that you please speak into the microphone. We can't really hear you. Thank you.

MS. DES JARDINS: Apologies.

So on Page 11, at Line 5, we view reference carryover requirements in Oroville Reservoir.

And scroll down a little.

Did -- did you look at -- you state there that you believe permit terms are unnecessary because CWF is

reasonably protective and describe your case-in-chief testimony. You also say they're impacts unrelated to CWF.

Did you look at the actual storage levels in Oroville Reservoir in -- in determining whether they're reasonably protective, or is this just based on your case-in-chief testimony?

WITNESS WILDER: I'm sorry. Can you --

MS. DES JARDINS: I'm sorry.

WITNESS WILDER: -- define what you mean by "look at"?

MS. DES JARDINS: Well, you say you think that the carryover requirements for Oroville are unnecessary because CWF is reasonably protective of upstream aquatic resources.

Did you look at actual storage levels in Oroville Reservoir in determining this, that are projected under the CWF H3+ model?

WITNESS WILDER: Just to make sure, you're talking about CWF H3+ modeling compared to the No Action?

MS. DES JARDINS: No. I'm talking about the actual projected storage levels.

WITNESS WILDER: Like, in real life?

MS. DES JARDINS: That are in the modeling in

Exhibit --

Let's bring up -- can we bring up SVWU-406.

And I believe Page 11 is the Oroville Reservoir modeling and Oroville storage, and it shows multiple months below 1,000 cfs in your deadpool, correct?

WITNESS WILDER: You mean in general, or are you looking at specific months?

MS. DES JARDINS: I'm looking at specific months: 1933, July, August, September; 1934, October, November, December; 1940, October, November, December; 1950, November and December; 1960, November, December, January.

Do you see -- I could go on, but do you see that there are multiple months in this operational simulation where storage levels are below 1,000 acre-feet?

MR. MIZELL: I'd like to object. The question that Ms. Des Jardins just asked doesn't have the appropriate foundation laid, that Dr. Wilder looked at this modeling data. I don't believe we ever got an answer to that question. Ms. Des Jardins just moved on to the actual model.

Maybe we need to backtrack to one of her previously asked questions to establish if Dr. Wilder

relied upon this modeling data in making his analysis.

CO-HEARING OFFICER DODUC: Yes.

MS. DES JARDINS: Okay. Dr. Wilder, did you actually ever look at projected storage levels at Oroville Reservoir in the CWF H3+ model in making this determination?

WITNESS WILDER: So the way the analysis was conducted was -- looking at Oroville was primarily in the FEIR/EIS in which we looked at H3 and H4. We made a linkage later that CWF -- or, excuse me -- BA H3+ is within the range of H3 and H4, and then we also made the claim that -- the linkage between CWF H3+ and BA H3+. And therefore, my opinions were based on that series of linkages between CWF H3+ and H3 and H4 because CWF H3+ had not been available at the time of the Biological Assessment.

MS. DES JARDINS: Dr. -- Dr. Wilder, in -- you're not testifying about H3 and H4 operations in your current -- in your rebuttal testimony, though, are you?

WITNESS WILDER: That's correct. I'm testifying for CWF H3+.

MS. DES JARDINS: And so you just have this linkage to a series of previous modeling, but you never actually looked at the model results for CWF H3+ for

the projected storage levels in making that determination?

WITNESS WILDER: Yeah, that's correct. I looked at H3 and H4 and made the linkage between those two and in -- and BA H3+ and CWF H3+.

CO-HEARING OFFICER DODUC: Hold on, Ms. Des Jardins.

Dr. Chilmakuri?

WITNESS CHILMAKURI: Yeah, I just want to make sure which modeling we are talking about because I think Dr. Wilder is specifically talking about the biological modeling and whereas Ms. Des Jardins has been focusing on CalSim storage modeling. And I believe we made the clarification, Dr. Wilder will be specifically responding to those.

CO-HEARING OFFICER DODUC: Thank you.

MS. DES JARDINS: Dr. Wilder, did you look -- in making this determination, did you look at storage levels in H3 and H4, projected storage levels, and testimony on projected storage levels in H3 and H4 in Part 1?

WITNESS WILDER: I'm assuming you're talking about Oroville --

MR. MIZELL: I'm going to enter an objection. AS to the question going to what he testified to in

Part 1, that's beyond the scope of cross-examination for rebuttal.

MS. DES JARDINS: He just said that it's based on H3 and H4. And just the question is -- so the question there is did you look at projected storage levels within that range -- within that range in making this determination of operations?

MR. MIZELL: In which case, objection, asked and answered.

CO-HEARING OFFICER DODUC: Help me, Dr. Wilder. When you say in your testimony on Page 11, Lines 16 through 18, that these opinions -- your opinion that the proposed terms are unnecessary and that includes carryover requirements in Oroville Reservoir is based on your Exhibit DWR-1013, without getting into a lot of detail, was that analysis based -- did that analysis include a review of modeled carryover storage in Oroville Reservoir?

WITNESS WILDER: Yes, it did.

MS. DES JARDINS: And what was your conclusion about the modeled carryover storage in Oroville Reservoir based on that review?

WITNESS WILDER: I believe it's stated down below, that CWF is reasonably protective of upstream aquatic resources.

MS. DES JARDINS: That's the modeling I asked about.

What was your -- what was your conclusion about H3 and H4 based on that review that you state that you did? Because you've already testified that your review was tied to this previous modeling. What was your conclusion about carryover storage levels in H3 and H4 as part of that review?

MR. MIZELL: Objection, asked and answered.

WITNESS WILDER: The answer is the same.

MS. DES JARDINS: That you concluded that they were reasonably -- that H3 and H4 were reasonably protective?

WITNESS WILDER: Yeah. Let me explain a little more. I mean, it's based -- my conclusions are based on more than just looking at carryover storage. It includes a suite of biological analyses that we did. But taken together, my conclusion or my opinion is that it's reasonably protective of the upstream aquatic resources.

MS. DES JARDINS: So in looking at those criteria, you're looking at Biological Opinion criteria?

CO-HEARING OFFICER DODUC: What criteria --

MS. DES JARDINS: Yeah, what criteria for

Oroville are you considering that is included in that opinion?

WITNESS WILDER: Just to make sure, can you define "criteria" here? I know it has a lot of specifics.

MS. DES JARDINS: What carryover criteria for Oroville are you considering? Is there -- are you considering some carryover storage criteria for Oroville that are in some regulation? And if so, where is that?

WITNESS WILDER: I myself did not evaluate anything with criteria. I was looking at the biological effects.

Perhaps modelers could say a little bit more about the criteria used. But I do know that the criteria did not differ between the NAA and H3 and H4 in this case.

MS. DES JARDINS: So you didn't -- there are biological effects if the reservoir is drawn down to near deadpool, aren't there?

WITNESS WILDER: Yes, I think so under some conditions, many conditions.

MS. DES JARDINS: Would the effects include reduced reservoir releases and reduced stream flow downstream of the reservoir, potentially?

CO-HEARING OFFICER DODUC: Mr. Berliner.

MR. BERLINER: Objection. I mean, if this is a hypothetical question as to whether it could reduce, that's one thing, but based on how this sentence is phrased, it's an incomplete hypothetical.

CO-HEARING OFFICER DODUC: Help me understand, Ms. Des Jardins, your line of questioning and what you're trying to establish.

MS. DES JARDINS: Basically, I'm just trying to explore what he looked at in determining that carryover requirements, existing carryover requirements in Oroville Reservoir were reasonably protective. And to the extent he says that he just looked at biological effects, I was asking if there were biological effects of the reservoir being drawn down to near deadpool and, by extension, if he considered those.

MR. BERLINER: He answered that it could, depending on the circumstances.

MS. DES JARDINS: Oh, he didn't get a chance to answer that question because there was an objection.

CO-HEARING OFFICER DODUC: Hold on. Hold on.

MR. BERLINER: That was a previous question. You had asked it earlier; he responded. So if you're asking it again, then the objection is asked and answered.

CO-HEARING OFFICER DODUC: I think you've established what he looked at.

Is there any additional detail you can offer, Mr. Wilder, as to how you came to the opinion that carryover in Oroville is sufficient to be reasonably protective of upstream aquatic resources?

WITNESS WILDER: Yeah, and my response kind of goes to what we've been talking about all along, which is that I did a comparative analysis that looked at the No Action and the project alternative, and if there were little to no difference between those two, then I concluded that it was reasonably protective of the aquatic species in Oroville -- or in the Feather River in this case.

MS. DES JARDINS: I would like to strike the part of the response that refers to reasonable protection because I'm not able, given the limitations on cross-examination, to explore why the current conditions are not reasonably protective.

CO-HEARING OFFICER DODUC: So noted.

MS. DES JARDINS: So you also state that -- this is a similar line of questioning -- but the Trinity River proposed mitigation measures are unnecessary. And this is for similar reasons to that. The exact same reasons are stated as were stated for

Oroville; is that correct?

WITNESS WILDER: Yes, that's correct.

MS. DES JARDINS: And so the same line of analysis was done for Trinity River being protective of -- as was done for Oroville; is that correct?

WITNESS WILDER: Yes, that's correct. Again, we looked at the No Action Alternative versus the project alternative. In this case, it would have been H3 and H4 as well.

I also might add that we have a whole panel coming up that can address the issues of existing conditions and being reasonably protective.

MS. DES JARDINS: To the -- so I would like to go to Ms. Parker's testimony on Trinity River flows. And I believe it's Figure 14 on Page 23 of Ms. Parker's testimony. And excuse me for jumping around, but this is related, too.

So, Ms. Parker, the Trinity storage exceedance figures show monthly flow in cfs on the Y axis.

Isn't that -- didn't you mean to -- that to be acre-feet or thousands of acre-feet?

WITNESS PARKER: Yes, I did. I corrected that when I gave my oral testimony.

MS. DES JARDINS: Okay. Thank you.

So on -- on Page 10 of your testimony, your

rebuttal addresses the impact of the end-of-September exceedance, which was questioned by Mr. Stokely. And you -- you attribute this impact as specific storage results in water years in 1931 and 1933.

But is your entire argument here just that the model isn't accurately capturing -- in showing these deadpool conditions, that the model isn't accurately capturing project operations? Or is there something further for those water years?

WITNESS PARKER: My intent was to reiterate messages that we had shared before, that results for the modeling in extremely low water supply conditions are not indicative; they're not meant to be indicative of a proposed project operation in either the No Action Alternative or the WaterFix scenario. And that these being the two storage conditions that caused Mr. Stokely's concern, my point was that they're not reflective of a proposed project operation and, therefore, they -- no term or condition is necessary to overcome them.

MS. DES JARDINS: Ms. Parker, given the uncertainty in the modeling of storage operations, doesn't -- doesn't this indicate that there's a great deal of uncertainty about what -- what storage conditions, period, would be projected for those kinds

of inflow conditions?

WITNESS PARKER: I don't think that my testimony included any mention of uncertainty in storage conditions, so I'm not sure what you're referring to.

MS. DES JARDINS: Well, if you're saying that specific model decisions are not representative of a proposed project operation, doesn't that mean that the model has a fairly large amount of uncertainty about its projections of storage levels?

WITNESS PARKER: But that's really only the case in extremely dry, prolonged periods of low water supply conditions.

MS. DES JARDINS: But doesn't this mean that you essentially don't -- you know, let's go back to -- doesn't this mean that you essentially don't have knowledge in the model about what the project storage conditions would be?

WITNESS PARKER: The modeling depicts differences between the No Action Alternative and the WaterFix proposed action. Those conditions do not change. That was the point of my testimony is to highlight the fact that CVP North of Delta storage conditions are not affected by the proposed action. They're not affected at high levels of storage, and

they're not affected at extremely low levels of storage.

So perhaps the inference you're trying to make that the water -- if you're trying to make an inference that the WaterFix would affect CVP storage operations in extremely critical years, I disagree with that assessment.

MS. DES JARDINS: But this is more -- your actual testimony says these specific storage -- you refer to specific storage results. And I guess -- so there's a further limitation you're making on your testimony here that -- that this is really related to the difference in the two operations and it's not related to whether existing Trinity carryover standards are reasonably protective.

Would that be correct?

CO-HEARING OFFICER DODUC: Mr. Mizell? I did see your red light go on.

MR. MIZELL: Yes. I appreciate the recognition. I will withhold my objection.

MS. DES JARDINS: Okay. I would still like to go back to Richard Wilder's testimony on Page 11.

CO-HEARING OFFICER DODUC: Do you really, really want to answer, Ms. Parker?

MS. DES JARDINS: So, Richard Wilder, so your

assumption that Trinity River proposed mitigation measures are not needed is based on this relative analysis?

MR. MIZELL: Objection, asked and answered.

CO-HEARING OFFICER DODUC: Well, she asked about Shasta. Now she's asking about Trinity.

MS. DES JARDINS: Yeah, I did ask about Trinity, but he did -- so --

CO-HEARING OFFICER DODUC: You just agreed with Mr. Mizell? Okay. Objection sustained.

MS. DES JARDINS: Okay. Sorry. Thrown off, completely off stride, the witness struggles -- cross-examiner struggles to recover. Okay.

So Trinity -- okay. So just to circle back, I would like to ask you about the Trinity River proposed mitigation measures, and they relied on the modeling analysis that I just explored with Nancy Parker.

And based on that fairly detailed discussion, is it fair to characterize that your conclusion that Trinity River proposed mitigation measures are not necessary is based solely on this relevant comparison?

WITNESS WILDER: Yes, that's correct. That was my analysis, and my opinions are based on it.

MS. DES JARDINS: Okay. Thank you.

So the next thing I'd like to go to -- we're

in Greenwood Exhibit DWR-1221, and Page 3 at Lines 6 to 8. So you mention here that 5,000 cfs downstream bypass flow would mean in the river -- would mean that sweeping velocity would have to be in a downstream direction.

So it -- it appears in your testimony that you're saying that a bypass flow of 5,000 cfs would mean that sweeping velocity was always in a downstream direction? Would that be correct?

WITNESS GREENWOOD: That doesn't say that sweeping velocity is always in a downstream direction. It's just in association with bypass flow of at least 5,000 cfs.

MS. DES JARDINS: If -- 5,000 cfs flow, if you have at least 5,000 cfs flow, it says -- which would mean that sweeping velocity would have to be in a downstream direction.

WITNESS GREENWOOD: 5,000 cfs downstream flow would mean sweeping velocity in a downstream direction.

MS. DES JARDINS: The 5,000 cfs flow is proposed to be required as a daily average, is it not?

WITNESS CHILMAKURI: Yes, as I explained last week, the bypass requirements are intended to be a daily or a three-day -- I don't know an exact level of average, but there's an average requirement.

MS. DES JARDINS: So that's -- so tidally averaged, 5,000 cfs bypass flow.

So, Dr. Greenwood, fish don't move on tidally -- if fish are in the screen and there's -- and the sweeping -- instantaneous sweeping velocity goes negative, the fish are carried back upstream, correct?

WITNESS GREENWOOD: Can you repeat the question, please?

MS. DES JARDINS: Well, did you consider -- let me just say, did you consider tidal effects in your conclusion that sweeping velocity would have to be in a downstream direction?

WITNESS GREENWOOD: So the -- I think I mentioned that as well in my -- in my previous testimony, regarding sweeping velocity in relation to approach velocity as well from the NMFS Biological Opinion. So with -- the sweeping velocity would have to be at least double the approach velocity. So that would be downstream -- so, for example, 0.4 feet per second, not 0.2 feet per second approach velocity.

MS. DES JARDINS: So do you know -- so your understanding is that the NMFS BiOp requires a minimum of four-tenths of a feet per second instantaneous downstream velocity; is that correct?

WITNESS GREENWOOD: The incidental take limit

in the NMFS Biological Opinion is the Department of Fish and Wildlife standard which is at least double the approach velocity.

So approach velocity of 0.2 feet per second, which is what's proposed under -- for the NDD, the North Delta diversions, would mean at least 0.4-feet-per-second sweeping velocity.

MS. DES JARDINS: Do you know at what bypass flow the 0.4-feet-per-second downstream velocity would always be achieved?

WITNESS CHILMAKURI: I can try that. It would vary depending on the intake, but roughly, again, in the modeling when we simulated the North Delta Diversions, we -- we -- I mean, we used the velocity simulated in DSM-2 to determine whether or not we were meeting 0.4-feet-per-second sweeping velocities on a 15-minute time step, which is to say that we looked at it instantaneously and determined whether or not the diversion can occur.

And as -- again, I cannot put a number, exact flow number. It would change depending on the cross-section where you are measuring that. But 0.4-feet-per-second velocity would be achieved at roughly around 5- to 7,000 cfs in that stretch of the river.

MS. DES JARDINS: Do you -- is that based on -- solely on the DSM-2 model?

WITNESS CHILMAKURI: Correct.

MS. DES JARDINS: And you haven't yet done any of the field studies that would validate the -- that model?

WITNESS CHILMAKURI: If you're asking if DSM-2 is calibrated, it is calibrated.

Now, there are -- as part of the pre-construction studies that are proposed for the WaterFix, there is a study which requires the much more detailed field study of -- and a 2D and a 3D modeling exercise to further study the conditions, tidal dynamic conditions in that reach of the river.

So DSM-2 is calibrated; the model we used has been calibrated. But I'm just saying that there is further study that is proposed to be conducted prior to final design.

MS. DES JARDINS: Isn't -- do you have any idea, when DSM-2 was calibrated, what the error in velocity at that reach in the river is in the DSM-2 model?

WITNESS CHILMAKURI: The DSM-2 model was calibrated for water levels and flows. I don't recall whether we specifically looked at the velocities.

MS. DES JARDINS: The -- so you -- so you really don't know what error rate would be in the -- the DSM-2 projections of -- of velocities achieved with certain bypass flows?

MR. MIZELL: Objection. There are a couple of objections. I've been trying to see where Ms. Des Jardins's going, not to object too early, but I do believe now we're stepping into a model calibration validation and critiquing of the results of the model, which was covered quite extensively in Parts 1 and in Part 2 case in chief.

Dr. Chilmakuri's testimony does not go into the validation of the results of the model. To the extent that Ms. Des Jardins can tie this to Dr. Chilmakuri's rebuttal testimony, certainly I can withdraw my objection.

The second objection I have to the exact question pending is argumentative. Dr. Chilmakuri answered the question. She's asking him -- well, she's asking an argumentative question.

CO-HEARING OFFICER DODUC: So let's tackle the first one.

Ms. Des Jardins, let's link this back, please, to his rebuttal testimony.

MS. DES JARDINS: Dr. Chilmakuri was the one

who just stated on cross-examination during rebuttal that they had determined with DSM-2 that a flow of about 5,000 to 7,000 cfs was sufficient to meet 4/10ths-of-a-feet-per-second downstream velocity. And on a question about what the error was in that projection of the model, he was the one who said that the model was calibrated. And so I was just trying to follow up on his own testimony.

I -- while there were questions on calibration in Part 1, they weren't on this specific application of DSM-2 to velocities at the fish screens, which is a Part 2 issue.

It's not possible for protestants to ask a question about fish screens in Part 1 because that wasn't -- about fish screens and about the DSM-2 projections of velocities of fish screens because that wasn't within the scope of Part 1.

So I -- I disagree with his position that this question could have been asked in Part 1. It's just a very specific question which is within the normal standards for use of model results for what's, I think, a key biological result.

CO-HEARING OFFICER DODUC: As long as the calibration question is specific only to the upstream sweeping velocity that is discussed in Dr. Chilmakuri's

testimony.

WITNESS CHILMAKURI: Dr. Greenwood's, but. . .

CO-HEARING OFFICER DODUC: Dr. Greenwood's, sorry.

MS. DES JARDINS: Dr. Greenwood's, which Dr. Chilmakuri testified -- and let me wind back.

So the -- so, again, you testified that the DSM-2 model was calibrated for flows and water levels but not for velocities?

WITNESS CHILMAKURI: Correct.

MS. DES JARDINS: And so given that it's not calibrated for velocities, you don't have a good idea about what the error would be if you had, at this flow -- at this downstream flow, we think we have 4/10ths of a feet per second?

So given that lack of calibration, you don't have a good idea of that?

WITNESS CHILMAKURI: I guess I disagree with you that, just because we did not verify velocities with observed data, that the model is not calibrated. Just because the water level, flows, velocities, they are all connected. Especially when we calibrate flow and water levels, we would expect the velocities to fall in line because of data.

However, the reason we couldn't calibrate is

because we didn't have enough data to actually calibrate the velocities. That is the main reason. But there is extensive documentation of -- for the calibration, how the calibration is conducted, and it was included as part of the Biological Assessment.

MS. DES JARDINS: So that's why you would need a more detailed field study?

WITNESS CHILMAKURI: Correct, and that's exactly what I was trying to describe. Before the final design becomes detailed, there is actually a defined pre-construction study to actually conduct biometric surveys and conduct additional numerical modeling to help inform the final design.

MS. DES JARDINS: Thank you.

WITNESS CHILMAKURI: But one thing I would like to clarify. Earlier, while you were arguing against an objection, you stated that -- something to the effect of "he used DSM-2 to model to say 0.4 feet per second is equaling to 5- to 7,000 cfs."

I just want to make sure your analysis are clear.

I was just responding to her question there. We did not use those general measures of 5- to 7,000 in any of our work. In the modeling, we used the modeling output of 0.4, whether -- but the velocity output from

DSM-2 is as the model is simulated to see whether the velocities are actually at 0.4 feet per second or higher to say when the diversion was occurring.

We didn't use those flow measures. I was just responding to her question specifically.

MS. DES JARDINS: Okay. Having beaten that question to death, let's go on to the next, which is I'd like to go to food web productivity on Page 25 at Line 20 to 22.

And believe it's -- Dr. Greenwood, right? Yes. You reference -- you state that -- you state that zooplankton is more abundant in the San Joaquin River southern side of the Delta, and you cite a paper by orsi and Mecum from 1986 on zooplankton distribution and abundance in the Delta, correct?

WITNESS GREENWOOD: I gave that as a citation, yes.

MS. DES JARDINS: That study was before the pelagic organism decline, correct?

WITNESS GREENWOOD: It was. I've seen subsequent studies that show similar patterns.

MS. DES JARDINS: So isn't it -- but isn't it true that there's also been -- there have been shifts in zooplankton populations since the pelagic organism decline?

WITNESS GREENWOOD: How do you mean, "shifts"?

MS. DES JARDINS: Aren't there -- isn't there a shift to smaller zooplankton, for example, and a shift in the species that are in the estuary?

WITNESS GREENWOOD: I'm not recalling specific shifts that you're suggesting in relation to pelagic organism decline. Specifically, was there particular studies that you were referencing or --

MS. DES JARDINS: Like, DWR-577 is Lehman's study, for example.

WITNESS GREENWOOD: Could we have a look at that one?

MS. DES JARDINS: Do you recall this paper?

WITNESS GREENWOOD: I think I've seen that paper, yes.

MS. DES JARDINS: So without -- I mean, how did you take into account more recent studies on -- of this shift in phytoplankton and the shift in zooplankton in the food web in the Delta?

WITNESS GREENWOOD: I gave -- we started this off by talking about Orsi and Mecum in 1986.

MS. DES JARDINS: Yes.

WITNESS GREENWOOD: I was giving a sample, a paper showing zooplankton density greater on San Joaquin --

(Reporter interruption)

MS. DES JARDINS: Okay.

WITNESS GREENWOOD: I gave Orsi and Mecum in 1986 as an example of a paper showing greater phyto- -- zooplankton density on the San Joaquin River side of the Delta. And that paper, as you pointed out, was before the time suggested for the beginning of the pelagic organism decline.

As I mentioned, there are other papers that I'm aware of showing a pattern similar to that, although there may have been changes in plankton assemblages.

But the basic point is that -- that I'm trying to get at with this, what I'm rebutting here, is with that greater density on the San Joaquin River side that, with changes in the South of Delta hydrodynamics in the summertime because of less South of Delta pumping, that there may be the potential, for example, to -- there may be greater potential for food web productivity from that lower San Joaquin area to move downstream out of the Delta. I mean, that's the overall rebuttal opinion I'm providing, so. . .

CO-HEARING OFFICER DODUC: I understand -- hold on.

I understand that's your testimony,

Dr. Greenwood. I thought what Ms. Des Jardins was asking was whether and, if so, how you incorporated more recent studies than the one that you cited to your testimony.

WITNESS GREENWOOD: Well, I gave that study, the older study, as an example of a study that shows that general pattern. I think if we look at more recent studies that that pattern is still the case, and there may have been some changes and differences in assemblages, for example.

CO-HEARING OFFICER DODUC: So did --

WITNESS GREENWOOD: That pattern --

CO-HEARING OFFICER DODUC: Did you look at more recent studies, and did that indeed show the case?

WITNESS GREENWOOD: I have seen -- yeah, I've seen studies that show that general pattern. I just didn't have the cite up here.

MS. DES JARDINS: So, Dr. Greenwood, your opinion is limited to the distribution of total zooplankton and not to looking at the composition; is that correct?

WITNESS GREENWOOD: I cite some specific examples. This is in response to Dr. Rosenfeld's concern regarding the potential for WaterFix to reduce plankton. So I'm giving some -- some examples here of

different, I guess, zooplankton species. So it's considering those different examples.

CO-HEARING OFFICER DODUC: So your answer to Ms. Des Jardins' question is --

WITNESS GREENWOOD: Can you repeat the question? Sorry.

MS. DES JARDINS: Well, you stated that your opinion is limited to refuting -- attempting to refute Dr. Rosenfeld's opinion that exports could reduce the amount, the total amount of zooplankton in the estuary; is that correct? Or did you look at the composition somewhere?

WITNESS GREENWOOD: Well, he was -- he made a general statement. I don't recall now specifically if he was -- I think he might have said phytoplankton, zooplankton. So I cross-referenced an analysis that we already had, which was specifically in relation to phytoplankton, and then I introduced the Orsi and Mecum paper in relation to zooplankton as an example.

Then I also then go on to speak of the hydrodynamics with a particular example for -- one example of Delta smelt prey, zooplankton prey, so --

MS. DES JARDINS: I'd like to move to strike that as non-responsive.

CO-HEARING OFFICER DODUC: I agree. This is

not very productive. It seems to me like you guys are just talking past each other.

Ms. Des Jardins, what is the point you're trying to make here?

MS. DES JARDINS: Just --

CO-HEARING OFFICER DODUC: I'm assuming here, Ms. Des Jardins, that you have a point you would like us to get. So I want to be able to understand that point. So what is it? What is it that we're missing that you are seeing?

MS. DES JARDINS: Randy Baxter testified in Part 2 that, with the pelagic organism decline, there was a shift in the composition of zooplankton in the estuary and that it was less nutritious and that this is one of the causes of the pelagic organism decline.

And I was attempting to -- with a great deal of -- to clarify whether Dr. Wilder's opinion extended to anything beyond the total amount of zooplankton.

CO-HEARING OFFICER DODUC: Okay.

Answer that question, Dr. Greenwood, directly, succinctly.

WITNESS GREENWOOD: I would say I'm generally responding.

CO-HEARING OFFICER DODUC: So, the answer?

WITNESS GREENWOOD: I'm generally -- I'm

generally rebutting. So Dr. Rosenfeld had -- can you repeat the question? I'm sorry.

CO-HEARING OFFICER DODUC: Ms. Des Jardins, given the lack of whatever, let's just move on. And I would expect that that's a point you would be arguing in your closing brief.

MS. DES JARDINS: Yeah.

WITNESS GREENWOOD: Can I just -- I think -- thinking back on -- I think my point is general and doesn't depend on the composition of the assemblage and how it may have changed over time.

CO-HEARING OFFICER DODUC: Okay.

MS. DES JARDINS: Okay. Well, let's move to potamocorbula, and let's hope that I have a little more luck. So I'd like to go back to DWR-1221 and Page 32 at 15 to 16. Sorry. DWR-1221 is his testimony.

So again, you state here on 15 to 16 that you believe that potamocorbula amurensis distribution and abundance would not be greatly affected by CWF H3+, correct?

WITNESS GREENWOOD: Yes, I stated that.

MS. DES JARDINS: Doesn't potamocorbula move up estuary and down estuary with salinity?

WITNESS GREENWOOD: I don't know if it moves up and down with salinity, but as I understand it --

where it can recruit to maybe a function of outflow which would correlate with salinity. But I think it may be more of a function of differing outflow.

MS. DES JARDINS: Are you aware of the study published by Peterson and Vayssieres that came to that conclusion?

WITNESS GREENWOOD: Which? Can you say the name again, please.

MS. DES JARDINS: Peterson and Vayssieres. It was one of the pelagic organism decline studies that was published that came out of the pelagic organism decline.

WITNESS GREENWOOD: I'm not recalling it.

MS. DES JARDINS: Okay. I'm just looking at -- I don't think Restore the Delta has it in their exhibits.

Are you aware that potamocorbula expanded during the pelagic organism decline?

WITNESS GREENWOOD: I'm not necessarily aware of that. I don't recall a specific reference that states that.

MS. DES JARDINS. And so you're not familiar with the changes in the benthic composition due to the pelagic organism decline?

CO-HEARING OFFICER DODUC: Before you answer

that, I -- help me understand here, Ms. Des Jardins.

Dr. Greenwood's testimony on Page 32 in this section is focused only on outflows, and he's rebutting Mr. Stroshane's testimony solely on the basis, that I can see, of outflows.

MS. DES JARDINS: Well, the pelagic organism decline was tied to outflows by Randy Baxter in his testimony. So it's not just salinity. But I was asking him about the shift in benthic, which means bottom, composition of species and evidence that specifically has to do with potamocorbula distribution and abundance.

CO-HEARING OFFICER DODUC: You're talking to an engineer here.

MS. DES JARDINS: Oh, right.

CO-HEARING OFFICER DODUC: By the way, I'm highly impressed that you can pronounce all these names. So perhaps you could dumb it down for the engineer.

MS. DES JARDINS: Okay. I apologize.

CO-HEARING OFFICER DODUC: How does his testimony on outflow now translates into the area that you are exploring?

MS. DES JARDINS: Well, to the extent -- isn't it true that, to the extent that potamocorbula is

affected -- has been affected by water project operations, I'm wondering why he states that the distribution abundance wouldn't be affected by project operations.

CO-HEARING OFFICER DODUC: Because he's -- I'm just reading his testimony. Because he's comparing Delta outflow with CWF H3+ and says it's similar or slightly less or greater than the NAA. I think that's the crux, but that's the only thing I see on this paragraph to which he's --

MS. DES JARDINS: That was exactly the testimony that I had hoped to elicit.

CO-HEARING OFFICER DODUC: But it's there. It's there in writing.

MS. DES JARDINS: All right. All right. So I can -- then let's continue.

CO-HEARING OFFICER DODUC: What am I missing? Ms. Des Jardins, if I'm missing something, I would like to understand it. I just don't want you to waste your valuable time just reiterating what I can read, what we can all read in the testimony.

Is there any particular --

MS. DES JARDINS: This again relates to whether the project is sufficiently protective of a food web. But if you think the written testimony is

sufficient for briefing on --

CO-HEARING OFFICER DODUC: I am not saying anything about how sufficient Dr. Greenwood's testimony is.

MS. DES JARDINS: Yeah. So that was -- that was what I wanted to explore a little more.

CO-HEARING OFFICER DODUC: And I'm remarking because you are closing in -- I mean, you're basically almost done with the first half hour -- I mean, the first hour that you requested, and I'm wondering what additional questioning do you have.

MS. DES JARDINS: This would mostly wrap up questions for Mr. Greenwood. I have one more set of questions, and then I have some questions on the modeling.

CO-HEARING OFFICER DODUC: Okay. Why don't you finish that, and we'll take a short break while -- oh, is Mr. Reyes back? Yes, he is. And we'll do a shift in chairs.

MS. DES JARDINS: Okay. Well, let's just -- we can probably skip the rest of the potamocorbula.

CO-HEARING OFFICER DODUC: I'm still very impressed that you can say that.

MS. DES JARDINS: Eight years of looking at this, and you learn some words.

So let's go to -- so I'd like to go to -- in Page 24 at Line 18. Dr. Greenwood, Line 18, you state if -- Mr. Cannon discusses risks from continued operation of the South Delta diversions, and you state that it's incorrect that South Delta export rules are to be unchanged; is that correct?

WITNESS GREENWOOD: That's what I stated, yes.

MS. DES JARDINS: And there's a fairly specific discussion in DWR-1143 of the ways in which South Delta exports would be changed.

Can we pull up Exhibit DWR-1143 Rev 2. Go to Page 4. Zoom in a little.

So this mentions some specific criteria. There's a number of criteria that are going to be dependant on -- in April and May and June that will be dependant on gauged flows at Vernalis; is that correct?

WITNESS CHILMAKURI: I'll try to answer that. Yes, the OMR requirements in April and May and June are dependant on Vernalis flow.

MS. DES JARDINS: And, Dr. Chilmakuri, is the frequency of meeting flows at Vernalis in the modeling subject to change?

MR. MIZELL: Objection. At no point does the rebuttal testimony of the petitioners go into the frequency of meeting Vernalis. These criteria are a

function of Vernalis, but that does not open up the San Joaquin system to cross-examination.

CO-HEARING OFFICER DODUC: Sustained.

MS. DES JARDINS: I would like to raise an objection to not being able to cross-examine on a condition where the Bureau of Reclamation has stated and everyone in this room is aware that they have stated that they won't meet the D1641 standards at Vernalis and it is assumed in the modeling. And to the extent there is biologically significant effects and DWR-1143 refers to that criteria, I would like to be able to ask cross-examination questions about it.

CO-HEARING OFFICER DODUC: Ms. Aufdemberge?

MS. AUFDEMBERGE: I --

CO-HEARING OFFICER DODUC: Would you like some time to think about it?

MR. MIZELL: If I might weigh in. Regardless of Ms. Des Jardins' focusing in upon whether or not the Bureau is going to meet the Vernalis flow standards, that does not change the scope of rebuttal testimony.

MS. DES JARDINS: This wasn't a question on DWR-1143, which is a table of adopted project criteria.

And we can go up to Page 1 of the criteria of this exhibit.

CO-HEARING OFFICER DODUC: Before you do,

Mr. Mizell, it is correct that she's not asking a question on rebuttal testimony; she's asking a question about 1143.

MR. MIZELL: And 1143 also does not describe the degree to which Reclamation may or may not meet the Vernalis flow standards or make any commitments to that point.

CO-HEARING OFFICER DODUC: We'll scratch that part.

Mr. Jackson, do you have a hopeful clarification, second or something?

MR. JACKSON: Well, I was -- I'm just going to point out that the amount of times that questions are answered in the testimony that to have do with flows from Vernalis providing more turbidity, more zooplankton, more -- basically richer water, will only be true if we ignore the fact that the federal government has taken the position in the water quality hearings that they're not going to meet the Vernalis standard and offered to sue the Board over that.

CO-HEARING OFFICER DODUC: Hold on.

Ms. Des Jardins, you started this.

I'm sorry. Were you finished, Mr. Jackson?

MR. JACKSON: Yes.

MS. DES JARDINS: Regardless of the Phase 2

update, there is a letter from Reclamation to the Board dated February 2017 in which they state that they will no longer comply with the D1641 standards at Vernalis, not only the Biological Opinions.

And this exhibit specifically describes -- specifies -- cites the hearing ruling, describes operating criteria, the most recent and accurate description in which operating criteria should not include operating criteria that are no longer to be -- proposed to be included as part of the project.

To the extent it seems fairly clear at this point that that is an example of a criteria that may no longer be proposed to be included as part of the project and simply -- I mean, it's something that needs to be in the record to the extent that we're trying to examine where -- where modeling assumptions and actual operational criteria and what those are -- you know, what the linkage is.

And this was an example where the South Delta operations are biologically significant. There is an opinion. The Vernalis flows are clearly linked to OMR criteria.

All I attempted to do is to have something in the record one way or the other about whether this modeling assumption is actually now going to be part of

the proposed project. And to the extent that they're asserting that it is and it's contradicted by this letter they sent to the Board, it's something that we should be allowed to bring up if only as impeachment.

MS. AUFDEMBERGE: So this is --

CO-HEARING OFFICER DODUC: Hold on. Hold on. I want to make sure Ms. Des Jardins is finished.

MS. DES JARDINS: Yeah. Thank you.

CO-HEARING OFFICER DODUC: All right. Now, Ms. Aufdemberge.

MS. AUFDEMBERGE: So this is extensively in the record in Part 1, and the testimony has been consistent throughout Part 1 and Part 2 that the San Joaquin system -- whatever the inflow from the San Joaquin, if you change it for the No Action, you also change it for the Cal WaterFix project. So there is no difference between the with and without project vis-a-vis the San Joaquin.

CO-HEARING OFFICER DODUC: I see frantic scribblings to my left and right. So I think we're going to take a break to consider that.

But before we do, any other arguments, Mr. Mizell?

MR. MIZELL: Yes. I'd I like to make sure that the record is clear and the Hearing Officers are

aware. 1143 does not contain the Vernalis flow standard. It contains South Delta export conditions which are dependent upon them, not the same.

CO-HEARING OFFICER DODUC: Understood. Understood.

MR. MIZELL: Thank you.

CO-HEARING OFFICER DODUC: Anyone else?

MS. DES JARDINS: I also wanted to say --

CO-HEARING OFFICER DODUC: Actually, you know what, Ms. Des Jardins? I will give you the last word, but now let's hear from Ms. Meserve.

MS. MESERVE: I think at the beginning of this panel, I came and I talked about how we need to be able to ask about what's in 1143 Second Revised and what's not in 1143 Second Revised. And Ms. Aufdemberge just referred to Part 1.

I think the letter that Ms. Des Jardins is talking about is actually just from a couple months ago. And so this could be seen as new information in addition to whatever was the situation back in Part 1.

So it's very important to us that -- you know, we've been told throughout this hearing that all existing standards will be followed, and then it appears there's a rather large deviation from that occurring that has some history to it and is sort of

heating up, and we think that's pretty important for that to be part of this record. And to be not able to ask these witnesses questions about that, we think, deprives us of a fair hearing.

CO-HEARING OFFICER DODUC: Mr. Jackson and then Ms. White and then Ms. Des Jardins, and then we are taking a break.

MR. JACKSON: At the risk of inflaming the discussion.

CO-HEARING OFFICER DODUC: You would never do that, would you, Mr. Jackson?

MR. JACKSON: I would not knowingly, but then sometimes unknowingly I do that.

The main question -- there is another question here, which is that the Bureau, I guess, is still a petitioner in this case asking the State Water Resources Control Board for approval, a discretionary approval of a project.

At the same time, they are sending letters in regard to water flow indicating an -- and everything that flow carries indicating that they are not presently sure that they're going to meet this State Board's orders in terms of beneficial uses in the Delta.

So I think it's important for the public

interest argument that this information, these letters which were received by the State Board a number of -- starting a number of years ago, I guess, and -- that ought to be in the record. And we ought to be allowed to investigate what the present position is so we know how to write the brief.

CO-HEARING OFFICER DODUC: Ms. White.

WITNESS WHITE: I just wanted to clarify for the Board. There seemed to be some inference that the letter that was mentioned is inconsistent with the modeling that was done, although the modeling is consistent between the No Action and the WaterFix. But the model is also consistent with that letter. We did not model meeting all Table 3 pulse flows, which I think was testified to at quite length in Part 1. So those -- not only is there no different between the two, but they're actually consistent with the letter.

CO-HEARING OFFICER DODUC: Final words, Ms. Des Jardins.

MS. DES JARDINS: I looked up the cross-examination on -- in Part 1, and I did not see that -- that -- the San Joaquin Tributaries Authority did attempt to bring up that the Table 3 standards would not be met but only the National Marine Fisheries BiOp requirements, which are different. And they were

not allowed to pursue that line of questioning.

And it's something that, given the volume -- number of protestants in the hearing and the sheer amount of cross-examination, escaped my notice until I discovered the February 2017 letter.

I would like to say that, as far as the match between modeling assumptions and operational criteria, that that is something that this Exhibit DWR-1143 proposes to go to directly. It does not include any Decision 1641 criteria. And I'd like to point out that it specifically says, you know, it's -- the exhibit must clearly identify each proposed operating criteria for the WaterFix project.

So are we left -- if they're not in this exhibit, are we left to assume then that they're not part of the project? They're not part of the operational criteria? And --

CO-HEARING OFFICER DODUC: Wrap it up, Ms. Des Jardins.

MS. DES JARDINS: Yeah. And so this is just very specific. And if we're not allowed to cross-examine on this, I would like to request an issue sanction that petitioners be precluded from claiming that DWR establishes in any way that the modeling assumptions represent the proposed operational criteria

because we aren't able to explore it fully.

CO-HEARING OFFICER DODUC: All right. Before we break, with all this back-and-forth, I have now forgotten. What was the question that you wanted to ask?

MS. DES JARDINS: I just wanted to ask if the frequency of meeting flows, of changing frequency of meeting flows at Vernalis changes.

CO-HEARING OFFICER DODUC: Hold on. You were on -- you were on DWR-1143 Second Revision.

MS. DES JARDINS: Of the South Delta standards.

CO-HEARING OFFICER DODUC: Page 4, the South Delta standards.

MS. DES JARDINS: Yeah. And that it specifically mentions Vernalis. And then the other question would be --

CO-HEARING OFFICER DODUC: I'm sorry. Then your first question was?

MS. DES JARDINS: My first -- well, my question with the -- it was related to the South Delta standards. So allowable OMR flows depend on gauged flow measured at Vernalis in April and May and June.

CO-HEARING OFFICER DODUC: And your question is?

MS. DES JARDINS: My question is there were -- the frequency of meeting allowable OMR flows.

CO-HEARING OFFICER DODUC: I'm sorry. Let me understand. Frequency past, present, projected future?

MS. DES JARDINS: Frequency in the modeling. The CWF H3+ depends on the frequency of meeting the flow measured at Vernalis.

And my second question was going to be about the modeling assumptions, meeting flows at Vernalis and if they matched the actual proposed operational criteria of the project. I didn't get a chance to get to the follow-up question.

CO-HEARING OFFICER DODUC: All right. Why don't we take our afternoon break. We will return at 3:10.

(Recess taken)

CO-HEARING OFFICER DODUC: All right. We're back -- if Mr. Keeling and Ms. Taber have finished their conversation.

All right. We're back. Ms. Des Jardins, where we left off is you with a question to I believe it was Dr. Chilmakuri, okay, regarding 1143. If we can go back there, please.

Okay. Here it is. So, Ms. Des Jardins, the South Delta operation parameters and the OMR criteria

is dependant on flow measure at Vernalis. You wanted to ask a question, as I understand it, regarding compliance with the Vernalis standard.

How do you make the linkage between the standard of flow at Vernalis to the OMR flow standards or criteria that was reflected here?

MS. DES JARDINS: Actually, more generally, it -- the argument was based on -- and I did cite it -- the exhibit must clearly identify each proposed operating criterion for the WaterFix project. It's on Page 1 of Exhibit --

CO-HEARING OFFICER DODUC: Yes. And stop right there. On this particular page, on this particular table, the parameter being described specifically is OMR operations, OMR flows.

MS. DES JARDINS: Which depend on -- which are dependant on flow measured at Vernalis.

CO-HEARING OFFICER DODUC: So flow measured at Vernalis determines OMR flows.

MS. DES JARDINS: Yes. And then more generally -- so there's a modeling assumption about the requirements of operational criteria, the modeling assumptions about flows at Vernalis which then affect OMR flows because of this relationship.

And the question is then, you know, does the

modeling assumption represent the actual proposed operating criteria?

CO-HEARING OFFICER DODUC: I'm trying to be mindful of -- as we all should be -- the scope of allowable cross-examination for rebuttal. And that allowable scope is you have to either tie it to direct -- not direct -- to rebuttal testimony, yes, direct rebuttal testimony or to 1143.

And I don't -- unless you can offer a proof, I don't see compliance with Vernalis flow standard as being part of 1143.

MS. DES JARDINS: That's correct. And Exhibit DWR-1143 did not include a large number of modeling assumptions, including Decision 1641 terms. It appears not to have followed the clear direction which is cited on Page 1, that the exhibit must clearly identify each proposed operating criterion for the project and identifying operating assumptions that are included that are not being proposed as operating criteria.

So somewhere, the modeling assumption of flows at Vernalis should be in this document, and it's not. And that was why I said, in the alternative, I would just ask for an issue sanction if petitioners can't claim that DWR-1143 shows that the modeling assumptions match the proposed operating criteria because there

isn't sufficient information for us to do that.

And if we can't do cross-examination about why those criteria weren't included or what -- what -- whether they would be met -- because if this exhibit had followed the clear directions of the Hearing Officers, each modeling assumption would be included, including the Vernalis flows. And it would have a citation and where -- whether it was proposed to be part of the project or not, and we could do cross on that.

But it didn't follow that direction. And there's a very large number of operational -- of modeling assumptions that aren't included in this table.

CO-HEARING OFFICER DODUC: Does anyone wish to respond to that? Mr. Mizell.

MR. MIZELL: So as you mentioned, Hearing Officer Doduc, 1143 was intended to start with the proposed project criteria and then to describe how they are reflected in the modeling assumptions and then, from that, to describe how they are or are not reflected in permit conditions from the fisheries agencies.

Ms. Des Jardins is reversing the direction of the exercise that is depicted in here in 1143, starting

with modeling assumptions. The CWF-adopted project criteria, as specified in Column 2 of this table, is a complete list of the proposed operating criteria for the California WaterFix.

Ms. Des Jardins may take issue that it does not include operating criteria for the entirety of the State Water Project or the entirety of the Central Valley Project, but that is not necessary for us to fully describe the California WaterFix. So what this exhibit is is a complete list of operating criteria for the California WaterFix.

To the extent that there are modeling assumptions that go beyond the proposed operating criteria because the model -- because the models are system models, they necessarily include operational components of projects that are not part of the California WaterFix. Those assumptions in the model are not contained in this table because they are not reflective of the California WaterFix.

If we go to Part -- or I guess it's Section 1 of this exhibit, that point is actually made in the write-up there that not all modeling assumptions are appropriate to be operating criteria for the California WaterFix.

So I believe that the assertions by

Ms. Des Jardins are misplaced and this is a complete exhibit. And the fact that it omits the D1641 Vernalis flow standards is precisely because the Vernalis flow standards are not a component of the California WaterFix as we've proposed it. They're not operating criteria proposed under California WaterFix.

They remain conditions of D1641, and the Department is not disputing that fact.

CO-HEARING OFFICER DODUC: Based on that, Ms. Des Jardins, I am sustaining the objection with respect to questions regarding compliance at Vernalis flow -- compliance with Vernalis flow standards because it is outside of the scope of Part 2 Rebuttal. It's not -- unless you can somehow link it to direct rebuttal testimony or specifically to 1143, the project criteria as proposed by petitioners, it is outside the scope of rebuttal.

As to Mr. Jackson and others' comments about compliance and compliance with perhaps processes outside the scope of this hearing, certainly that is something of note, and we will take it under consideration.

It is just not appropriate, given the limited scope of this rebuttal phase, unless you can somehow, I will repeat, link it to rebuttal testimony or to

DWR-1143.

Mr. Jackson.

MR. JACKSON: Thank you, Madam Chair, for the opportunity.

April-May, the one, two, three, four, five dot in the adopted project criteria says that -- I mean I'll just read it.

"Allowable OMR flows depend on gauged flow measured at Vernalis and will be determined by a linear relationship." If in fact there is no water -- there's no more than 1200 cfs, which I think is the maximum number that has been proposed by one of the petitioners in this case, in the -- for beneficial uses in the South Delta and for OMR flows under D1641, if it is -- if allowable OMR flows depended on gauged flow, we're going to have OMR flows under the WaterFix that are substantially higher than they would be if this project is not approved.

And so if I were writing the brief or -- I would want to know what the, number one, the reason that the federal government is threatening the State of California with not obeying D1641 and all of the ramifications from that decision before I gave them a permit for 50 years.

CO-HEARING OFFICER DODUC: Mr. Jackson, I

acknowledge your point. I stand by the ruling that it is outside the scope of rebuttal. We will consider what to do with that.

MR. JACKSON. Okay. I think it's a huge public interest question.

CO-HEARING OFFICER DODUC: I understand that that is your concern. I'm not agreeing or disagreeing I'm just saying it is outside of the scope of rebuttal.

All right. We now turn back to Ms. Des Jardins.

And I believe your questions are now directed to Mr. Reyes. And what additional topics do you have?

MS. DES JARDINS: Well, I wanted to ask him a little bit more about DWR-1143. Those are most of my questions for Reyes. And I had some questions for Nancy Parker, which I'm not sure I'm going to be able to get to.

So I wanted to ask you about -- so first I wanted to circle back with Marin Greenwood.

So Dr. Greenwood, your opinion about South Delta flows depends on the allowable OMR flows in this table, correct?

WITNESS GREENWOOD: Just to clarify, you're talking about the opinion --

MS. DES JARDINS: That allowable OMR -- that

South Delta operations would be different than existing South Delta operations.

WITNESS GREENWOOD: Yes. Mr. Cannon had said existing rules governing South Delta diversions are to be unchanged. I was basically just pointing to DWR-1143 as an example showing the differences.

MS. DES JARDINS: And one of these differences is that allowable OMR flows depend on gauge flow measured at Vernalis, correct?

WITNESS GREENWOOD: I'll refer to Dr. Chilmakuri

WITNESS CHILMAKURI: Yes.

MS. DES JARDINS: Okay. So I also -- speaking of South Delta operations, I'd like to go to Page 4, Footnote 36. And Footnote 36 says the PA operations include a preference for South Delta pumping in July through September months.

So this doesn't -- Mr. Reyes, this doesn't have its own line. But this is clearly listed as the modeling assumption in the Final EIR/EIS. And I'm wondering, like, where -- is this -- is this part of the proposed operating criteria for the project? Is that what you're representing here?

WITNESS REYES: Yes, it's Footnote 36. If you look up in the Part 1 of that table, it's referring to

July, August, September operations where there aren't specific OMR constraints. But you know, this is a part of the proposed operations that the operators will have discretion to use essentially, like it says, to provide for unlimited flushing flows to manage water quality in the South Delta.

MS. DES JARDINS: So you say the operators will have discretion to use.

WITNESS REYES: Yeah, so it's a preference, but it doesn't mean that there's some rule that they will do it at all times, you know.

They have -- the operators need to manage the water quality objectives of 1641 and whatever criteria that they must adhere to. So if they need to improve water quality in that area and they feel that some limited pumping in the South Delta would improve water quality for that area, then they would do so.

MS. DES JARDINS: But there's no regulatory or other requirement that they -- they do prefer -- prefer South Delta pumping in July through September; would that be correct? I'm just trying to clarify if there's any requirements for that operational criteria.

WITNESS REYES: No, there's no requirements for that.

MS. DES JARDINS: Okay. So -- let's see.

Actually, I think -- I did want to ask a little about the 50/50 split of -- that is a modeling assumption of export capacity. So that's not included in this table. Is that not a proposed operational criteria for the project?

WITNESS CHILMAKURI: Could you be a little bit more specific, Ms. Des Jardins? Which 50/50 split?

MS. DES JARDINS: One of the modeling assumptions, and it's documented in the Final EIR, is that the export capacity for the State Water Project and the Central Valley Project is shared 50/50.

WITNESS CHILMAKURI: Could you please bring it up?

CO-HEARING OFFICER DODUC: Is this the floating point that we discussed in detail previously?

MS. DES JARDINS: This particular requirement was not brought up in the cross-examination on the floating point.

CO-HEARING OFFICER DODUC: Okay. Let's see where you go with it.

MS. DES JARDINS: So I'd like to bring up Table B-18 from the final -- Exhibit SWRCB-102, Chapter 5A, Appendix 5A-B. Appendix 5A-B, Page 5A-B, 160. It would be -- no, scroll up. Scroll up, please.

It's above the -- keep scrolling up. Down a

little. On Page -- no. Just Chapter 5, just a second.

Okay. Yes, Chapter 5, please. There, stop. Okay. And it's Final EIR/EIS Appendix 5A CalSim and DSM-2 modeling simulations and assumptions, Appendix Section B, that one. There you go. And then let's go to 5A-B,160. It will be Page 160.

And then you're going to need to zoom in a little. Go over to the side. And it's going to be -- scroll down a little. It's under "Coordinated Operations." And under "Sharing of total allowable export capacity," states, "Equal sharing of export capacity" this is -- this is a modeling assumption that's in all of the modeling for the Final EIR/EIS and I believe is also in the modeling for CWF H3+. Wouldn't that be correct?

MR. MIZELL: I'm going to lodge an objection. To the degree that Ms. Des Jardins can indicate what portion of DWR-1143 she is asking the question for, which part of DWR-1143 she's looking to dig into, I don't see the connection to the table that we're looking at now.

MS. DES JARDINS: Yeah, this isn't covered in there. If necessary, I can pull up -- there was PCWA-73, which I had on this stick, which -- Page 386.

CO-HEARING OFFICER DODUC: I'm sorry. I think

what Mr. Mizell is asking for, which I'm asking for, is for you to link that back to either rebuttal testimony or 1143.

MS. DES JARDINS: I would -- I can change it -- link it to the Supplemental EIR to the discussion of flow if I'm not allowed to cross on --

CO-HEARING OFFICER DODUC: Actually, you know what?

MS. DES JARDINS: -- DWR-1143.

CO-HEARING OFFICER DODUC: Yes, I asked about the floating. Why is this different than the floating approach, which is not an approach, which we went over in detail previously?

MS. DES JARDINS: I would like to go to Exhibit PCWA-73. And I have it on the stick, if it's not there. That is Appendix 3A. There it is. And Page 386. And scroll down to the -- it's the footnote at the bottom.

CO-HEARING OFFICER DODUC: Yes?

MS. DES JARDINS: There is some confusion on the modeling assumptions using --

CO-HEARING OFFICER DODUC: Yes, yes. We've seen this footnote.

MS. DES JARDINS: Float approach.

So I'm just trying to understand, given --

does the CWF H3+ assume the 50 percent/50 percent sharing export capacity, and, if so, how does that relate to this float analysis?

CO-HEARING OFFICER DODUC: Mr. Bezerra.

MR. BEZERRA: Thank you. I'd like to support Ms. Des Jardins here. I -- the float approach, as was discussed at length the other day, apparently is not any given assumption. It's not modeling logic.

What I understand is happening here is Ms. Des Jardins believes that there are modeling assumptions and modeling logic that are explained in the Final EIR that produced this result, this float approach, that, to the best of my knowledge, have not been explored and in particular relate directly to 1143 because the purpose of 1143 was to separate out what are regulatory requirements that are driving the modeling versus other aspects of the modeling that may be affecting the results.

So I think Ms. Des Jardins is going to an important issue here to identify and ask questions about the modeling logic that produced a float approach that reflects discretion in how the project's being operated with WaterFix in place. So it does tell you something about the reliability of the model results to understand what modeling logic is generating this

approach that apparently is not any particular specific decision by the modelers to produce.

There is some modeling logic that produces this, and that's what Ms. Des Jardins is trying to get, I believe.

MS. DES JARDINS: I'm just trying to understand the relation between the -- this assertion and the 50 percent export sharing.

CO-HEARING OFFICER DODUC: What is the relationship between this float approach and the 50/50 sharing? Can anyone answer?

WITNESS CHILMAKURI: It may be helpful if we can go back to that exhibit where we were looking at the assumption.

WITNESS REYES: I think it was SWRCB-108 or something.

MS. DES JARDINS: SWRCB-102, Appendix 5A-B, Page 5A-B, 160.

WITNESS CHILIMAKURI: Actually, I think you have one open already.

MS. DES JARDINS: There it is.

WITNESS CHILIMAKURI: There you go. Okay. This assumption is specifically talking about the South Delta export capacity sharing under -- when the export capacity is controlled by the -- any of the Decision

1641 or the Fish and Wildlife Service Biological Opinion import restrictions, such as the D1641 export-inflow ratio or the Old and Middle River flow requirements.

So this assumption is specific to that, those kind of situations.

MS. DES JARDINS: Now, excuse me. That was for the existing conditions. Let's scroll over, please. Keep scrolling over. Oh, yes. It does say it's the same.

So the assumption in all of the modeling for Final EIR/EIS was the same as the No Action Alternative. Is the CWF H3+ assumption the same as the No Action Alternative?

WITNESS CHILMAKURI: Yes, for this particular assumption, yes.

MS. DES JARDINS: And the -- let's go back a little.

The allowable export capacity is 10,000 -- defined as 10,000 -- it's defined also in here as 10,300 for Banks and 4,600 for Jones; is that correct?

WITNESS CHILMAKURI: Again, can you please scroll to that location.

MS. DES JARDINS: That would be -- just a minute. It's 5A-B, 157.

I've got this up on my laptop, too, so I can look for it.

WITNESS CHILIMAKURI: Okay. I see it again. Could you repeat your question, please?

MS. DES JARDINS: So the export capacity that you're sharing is the physical capacity of 10,300 cfs at Banks and 4,600, cfs at Jones; is that correct?

WITNESS CHILMAKURI: No. It's -- what -- the assumption we just reviewed is talking about the times when the CVP and SWP are unable to use their maximum permitted capacities and their actual export capacity is controlled by one of the other criteria that I just described. That's when the capacity is split 50/50.

MS. DES JARDINS: Okay. And so the rest of the time, it's controlled -- let's scroll over and look at what it is for the modeling assumptions. Scroll over a little bit more. So 10,300 cfs for Banks and the same as the No Action Alternative, which is 4,600 cfs for Jones, that was in all the Final EIR/EIS, and you have the same modeling assumptions about the export capacities.

But -- so in doing the float analysis, you have no assumptions about how that export capacity -- what assumptions do you have about how that export capacity is divided up in the model?

WITNESS CHILMAKURI: Again, as I said last week, for the North Delta Diversion, there is no assumption with respect to which project gets to use the capacity. For South Delta, as shown in this table, the assumptions are consistent with the No Action Alternative.

MS. DES JARDINS: Then how do you derive the North Delta Diversion exports if -- for CVP and SWP if you don't have a sharing assumption?

WITNESS CHILMAKURI: That's a function of other restrictions on the system, and talking about regulatory requirements that are South of Delta demands everything, including the Coordinated Operations Agreement. And all those collectively determine who gets to use the capacity in the model.

MS. DES JARDINS: So the Coordinated Operating Agreement, one of the assumptions is that unstored flows will be split 55 percent 45 percent; isn't that correct?

WITNESS CHILMAKURI: Yes.

MS. DES JARDINS: And yet, when you discuss the float assumption, you state that that isn't the correct assumption for the North Delta Diversions.

WITNESS CHILMAKURI: And your question is?

MS. DES JARDINS: How -- how can the -- if the

existing modeling assumes 55 percent and 45 percent split of unstored flows, how can your modeling be analyzing a two-thirds split for the State Water Project as you assert in that line of the Final EIR -- of the Supplemental EIR/EIS on Page 386?

WITNESS CHILIMAKURI: As this says, the 55/45 limited to unstored water for export, that's a very few -- not few but very specific conditions. What the person out there is talking about, South Delta, is a broad average for the simulation period.

MS. DES JARDINS: But under balanced conditions, under the Coordinated Operating Agreement, doesn't Reclamation provide 75 percent of the storage withdrawals?

MR. BERLINER: Objection.

CO-HEARING OFFICER DODUC: Mr. Berliner.

MR. BERLINER: Beyond the scope.

CO-HEARING OFFICER DODUC: All right.

MS. DES JARDINS: And just -- to the extent he's saying it's a broad average, there is excess and balanced conditions in the Delta. And that's -- and he's saying so the average over both excess and balanced conditions is 67 percent for North Delta. So I was just trying to clarify because it appears that they would then be diverting Reclamation storage

releases.

MR. MIZELL: There's no question pending.

MS. DES JARDINS: I did ask if, in balanced conditions Reclamation is releasing 75 percent of the storage releases, how does that lead to 67 percent?

MR. BERLINER: That's well beyond the scope of rebuttal testimony for this Supplement or 1143. That's been a standing condition for eons.

CO-HEARING OFFICER DODUC: And has that changed in any proposed modeling?

MR. BERLINER: No.

MS. DES JARDINS: But there was testimony that the Coordinated Operating Agreement is being renegotiated; was there not?

MR. BERLINER: Objection, that's beyond the scope as well and in a different proceeding.

MS. DES JARDINS: No, it was in this proceeding. It was in cross-examination.

CO-HEARING OFFICER DODUC: Hold on. Was it part of his rebuttal testimony?

MS. DES JARDINS: No, it's just with respect to whether the -- he said that the float alternative, when averaged over, I guess, excess and balanced conditions provides for two thirds of -- two thirds diversion, and then -- and then he also said that the

Coordinated Operating Agreement is not subject to change. And respectfully, there is testimony in the record that it impeaches that assertion.

CO-HEARING OFFICER DODUC: Did you say it was not subject to change?

WITNESS CHILMAKURI: No, I didn't. I said it did not change within our model here.

CO-HEARING OFFICER DODUC: As you modeled it.

MS. DES JARDINS: As you modeled it. Okay. So now, for clarification. . .

CO-HEARING OFFICER DODUC: Your question is?

MS. DES JARDINS: Again, with respect to the float analysis, you just asserted that first there's the 55 percent/45 percent split for unstored flow. And then, during balanced conditions, under the column Reclamation -- in the column modeling Reclamation releases 75 percent of the flow.

CO-HEARING OFFICER DODUC: Is that correct?

MS. DES JARDINS: Isn't that correct?

WITNESS WHITE: Could I adjust a little bit of clarification?

CO-HEARING OFFICER DODUC: Yes.

WITNESS WHITE: The "75 percent" refers to in-basin use, not just storage releases.

MS. DES JARDINS: Doesn't Reclamation release

75 percent of the storage releases for in-basin use under the Coordinated Operating Agreement?

WITNESS WHITE: For in-basin use. That doesn't equate to Reclamation releases 75 percent of all storage releases.

MS. DES JARDINS: Oh, yeah, absolutely. Correct. 75 percent of all storage releases for in-basin use.

CO-HEARING OFFICER DODUC: So, moving on.

MS. DES JARDINS: Okay. So how -- so Ms. Parker, would that not imply that there are specific storage releases -- during balanced conditions there are very specific storage releases tied to exports from the North Delta Diversions, and they would be either from State Water Project or Central Valley Project reservoirs -- under the COA accounting?

WITNESS PARKER: That's not correct. I'm going to take my stab at explaining the float versus the 50/50.

So like John -- like Dr. Chilmakuri explained, if the projects are operating under restricted export limits due to either a 1641 criteria or Biological Opinion criteria, we share export capacity 50/50. That is one topic in and of itself.

On the float issue -- so let me try to explain

this. The North Delta Diversion has absolutely no idea whose water is going into it.

The South Delta, when you look at it as a whole, doesn't distinguish who gets which kind of water. You could have all the North Delta Diversion going to Jones in one time step and all of it going to Banks in another time step. The model totally does not care -- at all.

Out of 82 years times 12 months, when you look at all of the diversions of both the North and the South collectively and you look at who happened to get North Delta Diversion water, it just so happened to be 45/55. And sadly, that coincides with one type of COA split, too.

So don't confuse the two. They're not -- it wasn't an intentional outcome. It wasn't intended to reflect COA. It's -- so what is it, 33/67? Sorry. I misspoke.

So that's the -- and I think the 45/55 was total exports or something. So that's the source of the consternation over the float. It's not intentional. There's no specific accounting of the North Delta Diversions or of the South Delta Diversions, but total exports do get shared 50/50 when certain D1641 or BO criteria are controlling.

Okay. So your specific question, Ms. Des Jardins, though, got to does -- in the modeling, do CVP North of Delta storage facilities release water specifically to go into the North Delta Diversion -- I think that was your question -- and the answer is no.

MS. DES JARDINS: Okay. So basically you're saying the float occurs from splitting -- from how the North Delta -- exports from the North Delta Diversion -- exports from the North Delta Diversions and exports from the South Delta Diversions can kind of float about which project gets which exports from which facilities; would that be a correct characterization?

WITNESS PARKER: Good job.

MS. DES JARDINS: Okay. I would like to go to Exhibit SVWU-46, Page 46, which is a copy of the South Delta Diversions. The modeling, Page 46, please.

46.

So in some months, the diversions from the South Delta are very low, Ms. Parker. And in those months, if Reclamation had to primarily get their water from South Delta Diversions, they might be limited.

And so I'm trying to understand how having a limit that two thirds of the exports from the North Delta Diversions in all months would go to the State

Water Project would not constrain the exports that Reclamation was able to make while still meeting the South Delta Diversions.

CO-HEARING OFFICER DODUC: Mr. Berliner.

MR. BERLINER: Objection, misstates the witness's testimony.

CO-HEARING OFFICER DODUC: Agreed.

MS. DES JARDINS: Okay. Well, Ms. Parker, how would Reclamation be able to meet their export delivery targets and stay within -- while staying within these modeled South Delta Diversions?

MS. AUFDEMBERGE: I just want to object. We're beyond the scope of Ms. Parker's rebuttal testimony.

MS. DES JARDINS: She stated that the float was changing how the split happened between South Delta and North Delta. And I'm just -- if there's a limit of two thirds on the North Delta Diversions, as asserted, can be with the modeling, how is Reclamation able to meet their targets?

CO-HEARING OFFICER DODUC: No, there isn't a limit.

MS. DES JARDINS: There isn't a limit? So these South Delta Diversion numbers might change? That's what I wanted to -- to -- under the float.

That's what I wanted to discover.

MS. AUFDEMBERGE: Ms. Parker has been generous in helping everybody understand some of these issues, but this is beyond the scope of her rebuttal testimony.

CO-HEARING OFFICER DODUC: Actually, I'm trying to understand, Ms. Des Jardins, your question. So let's put aside all the extra terminology you're using.

Just what is the point of the question?

MS. DES JARDINS: The question here, because the fundamental assertion --

CO-HEARING OFFICER DODUC: No, no, no. Listen. Let's not even -- let's not even go -- looking at that data, this data that you pulled up.

MS. DES JARDINS: This data shows the South Delta Diversions under the CWF H3+ model for all months, and by month -- month by month in acre-feet.

CO-HEARING OFFICER DODUC: Okay. Is that correct?

MS. DES JARDINS: And the question --

CO-HEARING OFFICER DODUC: Is that correct?

MS. DES JARDINS: And the question is if the floating analysis --

CO-HEARING OFFICER DODUC: Hold on. Hold on. Hold on.

MS. DES JARDINS: Okay. Sorry.

CO-HEARING OFFICER DODUC: Is that correct?

WITNESS PARKER: What variable is this?

MS. DES JARDINS: Scroll up. I'm sorry, 47. Go to the next page. One more. There it is.

Yeah. And, in fact, it's zero in many months.

CO-HEARING OFFICER DODUC: So what is the question?

MS. DES JARDINS: So the question here is let's assume that this modeling does capture that you can -- you can shift -- so on the months where it's zero, that Reclamation can only use a third of the North Delta exports.

CO-HEARING OFFICER DODUC: And on what basis do you make that assumption?

MS. DES JARDINS: Because of the way -- because they said that this modeling captured the assumption that Reclamation only used the North Delta Diversions a third of the time. That was what the float -- it said that the float analysis [sic].

So I'm wondering how does Reclamation get their exports in the months where the South Delta exports are zero during modeling?

MS. AUFDEMBERGE: Objection, beyond the scope of Ms. Parker's rebuttal testimony.

MS. DES JARDINS: This is with respect to the Supplemental EIR.

CO-HEARING OFFICER DODUC: Ms. Parker, can you shed any light?

WITNESS PARKER: I'd be happy to.

CO-HEARING OFFICER DODUC: Please.

WITNESS PARKER: The 63/67 split [sic] was an overall arrange of all months in all years. That is not to say that, if all exports were being taken through the North Delta Diversion and not through the South Delta Diversion, that Reclamation would be limited to 33 percent or that DWR would be limited to 67 percent for that matter.

In any month, Reclamation could be getting 90 percent, and DWR could be getting 10 percent. But taken as a whole over the entire 984 months in the period of record, the overall average ended up being about 33/67.

MS. DES JARDINS: Thank you very much. And I thank the Hearing Officers for their patience and clarifying this.

And that concludes my cross-examination.

CO-HEARING OFFICER DODUC: Thank you.

Ms. Des Jardins, actually, thank you. It was not always smooth but productive cross-examination.

Ms. Meserve, we do have a hard stop at 5:00. I don't know if that means you need to find a good time to break in your cross-examination or if you can do so in an hour. But we do have that hard stop.

MR. MIZELL: Hearing Officer Doduc, if I might, I've been operating under the estimates we've been given for cross-examination. I do have a witness who has a plane ticket that leaves tomorrow. If Ms. Meserve could focus her questions for Dr. Greenwood at the beginning of her cross-examination, that would allow us to keep him on his schedule given the timing we're facing.

CO-HEARING OFFICER DODUC: Thank you. And it will be helpful if Dr. Greenwood would answer directly and concisely.

MS. MESERVE: Yes, can I start with Dr. Greenwood.

CO-HEARING OFFICER DODUC: Thank you. Ms. Meserve.

MS. MESERVE: So -- let me -- I wasn't planning on starting with him.

Okay. So I've got questions for Dr. Greenwood on the fish issues, within the scope of his testimony. And then I've got questions about 1143 and the SEIR.

And so I have a couple of questions, as I

mentioned, for Mr. Valles and a couple questions for the Reclamation witnesses and for Mr. Reyes.

So should I just start with Dr. Greenwood and try to get him out of here?

CO-HEARING OFFICER DODUC: Please.

MS. MESERVE: Okay.

CROSS-EXAMINATION BY MS. MESERVE

MS. MESERVE: So maybe we could start with putting up that testimony, if we could, please. So that's going to be DWR-1221 and at Page 6.

And on Line 10, Dr. Greenwood, you include a quote from Dr. Rosenfeld describing take at the NDD as a result of entrainment, impingement/screen contact, and predation.

And the question is do you consider all three of these mechanisms of take of listed fish to be a concern at the North Delta intakes that are proposed?

WITNESS GREENWOOD: I think these are potential mechanisms that could occur if they -- yes?

THE REPORTER: I can't hear either one of you, so if you could both please speak up, I'd appreciate it.

MS. MESERVE: Sorry. Okay.

CO-HEARING OFFICER DODUC: I'm sorry. Did Dr. Greenwood finish his answer?

MS. MESERVE: I think so. He agreed that all three are mechanisms of take.

MS. AUFDEMBERGE: I believe he said potential.

MS. MESERVE: Potential take. Okay.

So then on Lines 6 of Page 7, the following page refers to adaptive management. And my question is, if there are population level effects, do you have an opinion of how adaptive management could be used to address those types of effects?

WITNESS GREENWOOD: This is specifically referring to smelts or --

MS. MESERVE: Scroll up a little bit. It's Delta smelt and longfin smelt I believe is what you're discussing in this paragraph.

WITNESS GREENWOOD: And the question was whether if I had an opinion regarding --

MS. MESERVE: Population level effects.

WITNESS GREENWOOD: Population level effects. And was that -- can you repeat the question, please?

MS. MESERVE: Sure. If there was a population leave effect, do you have an opinion about how adaptive management could be used to address those types of effects?

WITNESS GREENWOOD: I think it would need to be -- I think it would need to be consideration of what

the potential mechanism is that's being indicated in terms of suggesting a population level effect.

MS. MESERVE: But you don't have any specific ideas about how to address population level effects with adaptive management?

WITNESS GREENWOOD: Like I said, it would depend on what mechanism it is that's being suggested for the population level effect.

So the sentence is talking about the need, through the post-construction study aids, to have life cycle models to assess what the population level effects are, what the mechanisms are.

So the adaptive management that would follow would presumably reflect what the modeling was indicating -- was indicating that the population level effect mechanism was.

MS. MESERVE: You just mentioned modeling. Wouldn't we also be looking at data from the actual operation of the facility?

WITNESS GREENWOOD: The data would be -- the way I see it, the data would be something that's incorporated into this life cycle model framework so that the life cycle model is required in order to be able to capture the different potential mechanisms.

And therefore, presumably, data would be

informing the life cycle modeling in order to make the assessment of whether there's population level effects.

MS. MESERVE: Sitting here today, can you opine on whether those management techniques could be effective to address population level effects?

WITNESS GREENWOOD: It would be challenging to opine on that, just recognizing I think that that is the requirement under ITP, that that -- that it needs to be done, a life cycle model framework needs to be -- the life cycle model needs to be done in order to be able to assess the effects, those potential effects.

MS. MESERVE: And then looking at Line 8 of that same page, scroll down just a tiny bit. You've referred to other entrainment monitoring to allow a detection of larval smelts. Do you have a specific example in mind about other entrainment monitoring that might be done?

WITNESS GREENWOOD: Well, this -- I think this is -- this is referring to that entrainment monitoring has been done in other locations. So I'm saying this small mesh sampling nets, in my opinion, would be used. And that's because that's been what was done -- that's what has been done in other locations in the Delta to my knowledge.

MS. MESERVE: And you're not aware of any

other methods to try to do the monitoring on larval smelt?

WITNESS GREENWOOD: Well, your question was specific to entrainment monitoring, but there is -- there are other sampling programs and things that have been looking at larval smelts. But I think your initial question was regarding entrainment.

MS. MESERVE: Now, going down to Lines 15 and 16, you refer to the analysis of entrainment potential for the smaller life stages being included in the effects analysis.

Was impingement screen contact and predation also included in the effects analysis?

WITNESS GREENWOOD: We have analyzed those things in various places, yes.

MS. MESERVE: So when you refer to entrainment potential, you're actually not limiting it to entrainment?

The reason I'm asking is, as I pointed out at the beginning of my questions, there's these three mechanisms for take, but I noticed in your testimony you continually referred to only entrainment, just one of the three.

WITNESS GREENWOOD: Well, this here -- I'm trying to rebut specific things that are being

mentioned. So this is in specific rebuttal to Mr. Stroshane opining that there isn't a description of what happens to these smaller life species.

So I'm indicating that we did look at entrainment, which is the principal mechanism that I think would be of concern for these smaller life species. So I'm focusing on entrainment because, as I see it, it's directly related to my rebuttal.

MS. MESERVE: And then looking down at Line 20 through 23, you refer to a statement by Mr. Baxter regarding the presence of spawning Delta smelt and longfin smelt at the DCC. But this is about ten miles downstream of the proposed North Delta Diversions; isn't it?

WITNESS GREENWOOD: Yeah, approximately 10 miles downstream.

MS. MESERVE: And then if we could go to Page 14 of your testimony, Lines 10 through 12. You discuss the Georgiana Slough. Isn't Georgiana Slough just south of the DCC?

WITNESS GREENWOOD: Just south, yes.

MS. MESERVE: But in this instance here, you characterize that area as appreciably farther downstream, indicating that it's not relevant of the NDDs; isn't that correct?

WITNESS GREENWOOD: Well, in relation to this specific -- in relation to this specific point, I guess what I'm saying, circling back to what you were previously asking about Mr. Baxter, you know, he was talking about the Delta Cross Channel, which is about ten river miles downstream of the NDD.

And, you know, the point I'm making in that paragraph is that Mr. Baxter said that he didn't expect that there would be many smelt in the area of DCC, of the Delta Cross Channel, or upstream of it generally. So I'm just talk pointing to that to talk about the NDD, and that kind of agrees with my opinion that there wouldn't be expected to be too many smelt near the NDD.

And so now we're on to a different issue here regarding similarity or not between Georgiana Slough area or DCC area and the NDD. So the -- they're not really -- they're not really kind of comparable in that way that you were suggesting.

MS. MESERVE: So the distance from the proposed North Delta Diversions you consider to be less relevant in one instance than the other?

WITNESS GREENWOOD: I think -- I think that my citations to them in each case, I think, are appropriate in terms of the context that they're taken in.

MS. MESERVE: And you are aware, however, that Delta smelt are considered to be in the presence of the proposed North Delta Diversions potentially year round for adults, according to the FEIR?

WITNESS GREENWOOD: I'm not sure where that statement is in the FEIR.

MS. MESERVE: We could go to that page, but you -- the operational criteria assumes that you are going to be operating the proposed North Delta Diversions in a manner that would be protective of Delta smelt, correct?

WITNESS GREENWOOD: The approach velocity on the screens is 0.2 feet per second, which is the Delta smelt criteria.

MS. MESERVE: Right. So it's assumed that Delta smelt could be in the vicinity of the proposed North Delta Diversions?

WITNESS GREENWOOD: They could be, but I don't recall there being a specific reference to them being near them necessarily year round, as you mentioned, in the FEIR.

MS. MESERVE: I'll provide an offer of proof. It's on Page 11A-35. But I'll continue on in an effort to get you on the plane.

On Page 12 of your testimony, Lines 18 through

19, you refer to predatory fish relocation. Are you aware of any successful predatory fish relocation projects?

WITNESS GREENWOOD: I am. I think I provided examples, at least reference in my rebuttal testimony later on. Page 17 -- Page 17, Lines 12 to 16, I provide reference to the BA acknowledging uncertainty in the effectiveness of predatory fish relocation. But also that section in the BA I refer to the provided citations to peer reviewed studies that describe increases in juvenile survival following predator reduction.

MS. MESERVE: But that might be different than predator relocation?

WITNESS GREENWOOD: Predator reduction or predator relocation, I guess the point was that it was a reduction in predators from given location.

MS. MESERVE: Going to Page 13 of your testimony, Lines 8 through 9, you discuss the GCID and Red Bluff intakes as being similar the proposed North Delta Diversions. Isn't one major difference between proposed North Delta Diversions and those two other intakes be that those are in the northern part of the Sacramento River and outside of the tidal environment?

WITNESS GREENWOOD: They are in the -- they

are upstream of the tidal environment.

MS. MESERVE: So doesn't the existence of the change in tides cause a more complex analysis than -- and more of a problem for trying to create the sweeping velocities?

WITNESS GREENWOOD: I'm not -- I'm not sure that I would characterize it that way necessarily. I think there will be potentially more considerations regarding sweeping velocity.

MS. MESERVE: Would it be more difficult to design a fish screen in a tidal environment than in a non-tidal environment?

WITNESS GREENWOOD: I'm -- I don't know. I'm not an engineer.

MS. MESERVE: So are you not very familiar with the design of the GCID and Red Bluff projects then?

WITNESS VALLES: I can answer that. It doesn't -- for an engineer, it doesn't matter. We just need criteria -- 0.2 feet per second, approach velocity, 3,000 cfs per intake; that's all we need.

And whether it's tidal, non-tidal really doesn't matter to us from a design perspective.

MS. MESERVE: But if the tide is coming in, then you're not as likely to able to meet the approach

velocity continuously as you would in a non-tidal environment, would you?

WITNESS VALLES: That's an -- that's an operational issue, when they turn the intakes on or when they turn them off, that's the only difference. In terms of whether it can take 0.2 feet per second, it doesn't really matter. It's -- it's -- the design is the design. We're designing it for 0.2 feet per second.

MS. MESERVE: So you're speaking of design, not operations then?

WITNESS VALLES: That's correct.

MS. MESERVE: So you don't have an opinion as to maintaining that velocity during operations?

WITNESS VALLES: Yeah. Like I said, that's an operational issue. And it's -- it's for planners and schedulers and the joint operations center to determine when those pumps are turned on and turned off.

We, as engineers, are providing capability, and that's all we're providing.

MS. MESERVE: As we've discussed in the past, however, there is no plan to turn the pumps off, is there?

MR. MIZELL: I'm going to object as misstating testimony.

MS. MESERVE: The witness has stated that there would be a pump-turning-off mechanism. And I believe, in previous cross-examination and testimony, it's been very clear that there is no operational criteria that turns the pumps off completely.

WITNESS VALLES: No. Pumps will be turned off at times because it depends on the elevation of the river. There are times that -- where just pure gravity will flow the water all the way down to Clifton Court. And then, when there's -- when the river's, like, at certain lower elevation, the water will flow by gravity, and then the pumps will be needed to lift the water out of the tunnel.

MS. MESERVE: So what about shutting off the screen completely? There's no criteria in DWR-1143 Revised or elsewhere that ever discusses shutting off the diversions completely, is there?

WITNESS VALLES: There will always be some limited flow going through the screens. I think it's 300 cfs per intake. And Chandra can probably chime in on that.

WITNESS CHILMAKURI: So if the river flows upstream of the intakes fall below 5,000 cfs, then the diversions would have to be shut off. That's the criteria.

MS. MESERVE: The 5,000.

And shut off completely, not the 300 per diversion?

WITNESS CHILMAKURI: Correct.

MS. MESERVE: Going back to Dr. Greenwood, on Page 15, Line 24 refers to ascertaining when the pulses of fish are occurring. By "pulses of fish" in this phrase, you're only referring to listed salmon, aren't you?

WITNESS GREENWOOD: That's -- those are the species that are currently within the definition of pulse, pulses, pulse protection.

MS. MESERVE. So only salmon are subject to pulse protection, correct?

WITNESS GREENWOOD: Winter-run and spring-run are the ones that are listed.

MS. MESERVE: And not fall-run?

WITNESS GREENWOOD: Fall-run aren't included in the pulse protection measure.

MS. MESERVE: And then Page 15, Lines 25 to 26, you're discussing the effectiveness of screw trap monitoring. Isn't it true that the transcript excerpt that you cite was only referring to effectiveness for salmon, not other fish species?

WITNESS GREENWOOD: I don't recall.

MS. MESERVE: So you cited it, but you don't know what it says?

MR. MIZELL: Misstates the witness's testimony, argumentative.

CO-HEARING OFFICER DODUC: Sustained.

MS. MESERVE: On Page 18, Lines 15 through 16, the testimony discusses temporal overlap of unlisted and listed salmonids means that the operational criteria focused on the latter will also be protective of the former.

Isn't it true that the ITP only has bypass flow criteria to minimize impacts to covered species from December to June? We could go to that page, if you'd like.

WITNESS CHILIMAKURI: There are bypass flows, year round. If you're asking -- if you're talking about the Level 1, 2, 3, the variation, that's focused on the December to June. But there are bypass flows year round.

MS. MESERVE: Of the 5,000 or 7,000 cfs?

WITNESS CHILMAKURI: The July to September is 5,000 cfs. October-November 7,000, unless there's pulse detected, in which case there would be pulse protection action that would be triggered. And from December to June, we walked through the tables and

DWR-1143 last week.

MS. MESERVE: And Dr. Greenwood how would unlisted salmonids be protected from July through November, as you claim, if the pulse flows aren't required during that time period and are not monitoring at the Knight's Landing or elsewhere?

WITNESS CHILIMAKURI: I just want to clarify. I just explained that -- and actually, in October and November, the pulse protection is active. So if there is a pulse detected, the North Delta Diversion would need to be reduced to low levels for pumping. In July to September, the bypass flow requirement is 5,000 cfs, and the only other criteria for North Delta Diversions that's controlling is the sweeping and approach velocities.

MS. MESERVE: So there wouldn't be a minimization of impacts to unlisted salmonids July through September, correct, from pulse flow protections?

WITNESS GREENWOOD: Well, I think this goes back to this overlap with different -- different time periods so fall-run being mostly abundant in winter-spring.

MS. MESERVE: But according to the Final EIR, the adult fall-run and late fall-run Chinook can be

present year round, can't they?

WITNESS GREENWOOD: Adult -- sorry, could you show specifically where you're referring to in the FEIR?

MS. MESERVE: The citation I have is Page 11-A, 103 of the Final EIR.

WITNESS GREENWOOD: I would have to see it, really, to respond.

MS. MESERVE: 103. Table shows it somewhat.

So you're saying within the Delta, for instance, on that top row, you've got medium to high abundance all the way from June, all the way through December.

WITNESS GREENWOOD: You had said year round, so that was what was --

MS. MESERVE: Mm-hmm.

WITNESS GREENWOOD: -- confusing to me. So could you restate the question, please?

MS. MESERVE: Isn't it true that -- let's just limit it to what's here in this. I think when I said year round, I was referring as well to the juvenile.

But just looking at that chart here, isn't it showing that, in the June-through-December time period, you could expect to see fall-run in the project area?

WITNESS GREENWOOD: Are you talking about any

particular life stage or --

MS. MESERVE: Well, I'm looking at the row that shows adult.

WITNESS GREENWOOD: Okay. So this shows them being most abundant potentially July to November.

MS. MESERVE: Right. And we just went over the fact that there aren't pulse flow protections provided for listed fish for July through September, so that's why I'm asking you, back to your overlap point, I don't see the overlap. Do you?

WITNESS GREENWOOD: The consideration that I was really speaking to was more of juveniles. We do have a -- we do have analyses assessing for adults potential effects. We used DSM-2 modeling to look at fingerprints, the percentage of water coming from the Sacramento River. And although it's reduced because of North Delta Diversions, reduction is not on a level where we consider that to be a significant effect, which I take to be indicative of reasonable protection.

MS. MESERVE: That was my question, okay.

Now, looking at the -- I think on that same page of your testimony, Page 18, you discuss also the white sturgeon. Isn't it true that the white sturgeon may be in the vicinity of the proposed North Delta diversions all year round?

WITNESS GREENWOOD: I believe potentially, so, yes.

MS. MESERVE: So those wouldn't have overlapping protections with the listed salmon, would they?

WITNESS GREENWOOD: Well, I think the particular life stage is important. So as I understand it, small juveniles, larvae, would be more likely to occur in the springtime moving downstream. And so that's -- that is overlap with that period, actually, with the period of what we were talking about for listed.

MS. MESERVE: Could we go back, please, to the Final EIR that you had up, Page 162 -- I'm sorry, 178, actually, which is I think the white sturgeon.

I believe that the Final EIR states that the juvenile would be all year round in the project area; isn't that true?

WITNESS GREENWOOD: Yes, juveniles could be. But what I was trying to explain was, with this migration downstream of these smallest, I guess, larvae, for example, that does coincide with the spring period that we were talking about.

MS. MESERVE: And do you believe that white sturgeon are -- are they well studied?

WITNESS GREENWOOD: I think there's -- there's more study, obviously, that could be done. But there are -- there has been study of, yes.

MS. MESERVE: And then just following up on the green sturgeon, isn't it true that they also may be present in the vicinity of the North Delta Diversions all year round?

WITNESS GREENWOOD: It could be.

MS. MESERVE: And is it true that, in your analysis in this testimony, you don't provide any details besides a reference to the Final EIR about why you don't think there will be unreasonable impacts on these two sturgeon species?

WITNESS GREENWOOD: I believe I actually -- I actually included a specific analysis that we discussed earlier with Mr. Obegi that was part of my considerations as well. So it's not just referring back to the FEIR but in the outflow effects section, beginning Page 28, and then in Fish 41, Tables 8 and 9, I have some specific analysis for white sturgeon. So it's not limited just to the consideration of the FEIR.

MS. MESERVE: On Page 19, back to your testimony, Line 4, you mention entrainment of the larva and small juveniles. Same question about impingement and predation. Wouldn't you also be concerned about

that?

WITNESS GREENWOOD: Those are also potential mechanisms.

MS. MESERVE: And then Page 19 also, Line 22, you mention the Sacramento hitch being too large to be entrained. What about impingement and predation?

WITNESS GREENWOOD: That's -- it's possible that those could occur.

MS. MESERVE: Let's see. Then on Page 19, Line 18, you mentioned the constraining of the North Delta operations because of the outflow criteria. Isn't it true that Footnote 38 of DWR-1143 Second Revised refers to possible changes to the spring outflow criteria?

We could put that up, if you need a copy. That's going to be DWR-1143 Second Revised, Footnote 38. I believe it's a ways in.

WITNESS CHILMAKURI: We talked about this footnote last week. It's just saying that, if there is a -- if the adaptive management program suggests that there is another way to achieve the longfin abundance, then outflows would be operated to 1641.

MS. MESERVE: Right. But Dr. Greenwood, the adaptive management referenced in Footnote 38 is only in reference to the longfin smelt, right, not the

species you're discussing on Page 19, the prickly sculpin.

WITNESS GREENWOOD: Yes, I provided the spring outflow criteria as one example of constraint occurring in spring. But that's not the only constraint, spring operations.

MS. MESERVE: But just to be clear, the adaptive management Plan doesn't include consideration of the prickly sculpin, does it?

WITNESS GREENWOOD: It's not mentioned as a species in that context.

MS. MESERVE: So changes to spring outflow could be made under adaptive management that would not consider effects on prickly sculpin, correct?

WITNESS GREENWOOD: That species isn't mentioned currently as one that would be considered.

MS. MESERVE: And then with respect to the Sacramento hitch mentioned on Page 19 as well, did you consider the demographic effects on the hitch, if hitch in the vicinity of the North Delta Diversions are killed?

WITNESS GREENWOOD: I -- it was my opinion that the effects would be limited, but I didn't explicitly consider the demographic effect.

MS. MESERVE: Then on Page 20 of your

testimony, Line 12 to 13, you refer to protection of striped bass coming potentially from the spring outflow criteria as well.

Isn't it true that the Footnote 38 and the adaptive management plan do not consider the needs of striped bass?

WITNESS GREENWOOD: Also, that species isn't specifically mentioned in the context you stated.

MS. MESERVE: So spring outflow could be changed without any consideration of the impact on striped bass, couldn't it?

WITNESS GREENWOOD: They're not mentioned as a species that would be considered in that context.

MS. MESERVE: So the protection you mention on Lines 12 and 13 would only apply as long as spring outflow was continued, correct?

WITNESS GREENWOOD: Again, I was generally speaking to operations within the spring period being constrained and using the longfin smelt outflow criteria as one example. But there are other operational constraints.

MS. MESERVE: Is it appropriate to refer to spring outflow as a constraint if it may be changed without any consideration of every other species besides longfin smelt?

MR. BERLINER: Objection, calls for speculation. This is well beyond the scope of his testimony as to what agencies might decide in the future.

CO-HEARING OFFICER DODUC: Dr. Chilmakuri?

WITNESS CHILMAKURI: I just wanted to add that Dr. Greenwood has been mentioning spring outflow criteria as an export restriction in here. And there are other criteria that control exports. That's what he's saying -- trying to say there.

CO-HEARING OFFICER DODUC: I'm sorry. What was it?

WITNESS CHILMAKURI: There are other criteria that restrict exports in spring months. That's what Dr. Greenwood is testifying. So, for example, the Old and Middle River flows, flow restrictions and the bypass flows.

MS. MESERVE: But he doesn't mention those in his testimony, does he?

WITNESS CHILIMAKURI: But the criteria in the context of the entrainment is specific to export restrictions. That's what he -- that's why he -- he just explained to you that spring outflow criteria is an example, but there are other criteria that also protect.

CO-HEARING OFFICER DODUC: Is the -- it's only the criteria that he is responding to in this particular part of his rebuttal testimony?

WITNESS CHILMAKURI: Yes.

CO-HEARING OFFICER DODUC: Okay.

MS. MESERVE: On Page 27 and 28 of your testimony, Dr. Greenwood, you discuss sediments in a memo that you think overestimates the amount of sediment removal. Isn't it true that the Final EIR states that there would be an 11 percent reduction in sediment?

WITNESS GREENWOOD: Based on the modeling estimates, that was -- that's -- sounds approximately correct based on my recollection, yes.

MS. MESERVE: And isn't it true that there is not yet a sediment reintroduction plan?

WITNESS GREENWOOD: No. It's required to be developed under the ITP.

MS. MESERVE: Isn't it true that the efficacy of a sediment reintroduction plan is unknown at this time?

MR. BERLINER: Objection. This is a plan being prepared in the future. How can we know the efficacy of a plan that's not yet in existence?

CO-HEARING OFFICER DODUC: What is your

objection? That sounds like an argument rather than an objection.

MR. BERLINER: It's speculation on the part of the witness as to the nature of a study or a plan that has not yet been developed.

CO-HEARING OFFICER DODUC: All right. Sustained.

MS. MESERVE: The witness is opining that the sediment reintroduction plan will address these issues and that the condition of approval suggested by Dr. Rosenfeld is unnecessary. So it is the witness himself who has claimed that the sediment reintroduction plan will address this issue.

CO-HEARING OFFICER DODUC: Yes, but he can't go into details of a plan that hasn't been developed yet.

MS. MESERVE: Then how can he opine that it will function as intended?

CO-HEARING OFFICER DODUC: And that's an argument that you can make in your opposing brief.

MS. MESERVE: Excellent.

Going to Page 36, then, of your testimony, on Line 4, what is the basis of your expectation that adaptive management would only consider changes to South Delta criteria for operations that remain

protective of juvenile salmonids?

WITNESS GREENWOOD: Well, given that they're needing to consider the potential effects to the examples I give here, which are listed fish, San Joaquin River steelhead and spring-run Chinook salmon from the San Joaquin, I give us examples that are on the same migration pathways in the interior Delta as the Mokelumne River juvenile salmonids, which is the -- that's the context of this particular opinion.

MS. MESERVE: So this opinion only refers to listed salmonids then?

WITNESS GREENWOOD: Well, that's -- those are the examples that I give there. That's -- that would be -- that would be the main focus in this context for the adaptive management process.

MS. MESERVE: Are you aware of any component of the adaptive management plan that would attempt to be productive of unlisted fish?

WITNESS GREENWOOD: I'm -- I don't recall all aspects of the adaptive management program in general. The -- the adaptive management would be focused on the species or their habitat which, given that, as I'm saying here, the habitat is often shared with the unlisted fish, there may not be a focus on the unlisted fish, but given that the listed fish habitat is often

shared with the unlisted fish habitat, even if unlisted fish are not called out specifically doesn't mean that there's not protection.

MS. MESERVE: But you're not aware of any portion of the adaptive management plan that discusses protecting unlisted fish, are you?

CO-HEARING OFFICER DODUC: It's been a few days, Ms. Meserve. How is this different than what Mr. Jackson was cross-examining him on?

MS. MESERVE: I'm honestly sure, but that was my last question for Dr. Greenwood. I did listen to Mr. Jackson.

CO-HEARING OFFICER DODUC: All right. If it's the last question, Dr. Greenwood.

Oh, I'm sorry, was there an objection somewhere?

MR. BERLINER: No.

CO-HEARING OFFICER DODUC: Okay.

WITNESS GREENWOOD: Could you repeat it so I can get it?

MS. MESERVE: Well, that's what I'm saying, that -- yeah, the question was just are you aware of anything in the adaptive management plan that discusses attempting to manage adaptively for unlisted fish?

WITNESS GREENWOOD: I don't recall anything

specific.

MS. MESERVE: So that is my questions for Dr. Greenwood. Shall I continue?

CO-HEARING OFFICER DODUC: Actually, let's ask so that we don't have to bring back any witnesses unnecessarily. Who else will you be having questions for? That was a very grammatically incorrect sentence.

MS. MESERVE: So I had a couple of questions for Mr. Valles. And then I had a couple of questions for the DOI witnesses. And some of the questions go to Reyes or Dr. Chilmakuri. So with the way that the witnesses have been answering, crosshatched a little bit, I probably could ask a couple of the engineering questions I have, if you want to keep going.

CO-HEARING OFFICER DODUC: What about Dr. Wilder and Dr. -- I can't see your name.

MS. MESERVE: I do not have questions for Dr. Wilder.

CO-HEARING OFFICER DODUC: Or Dr. Phillis?

MS. MESERVE: Or Dr. Phillis.

CO-HEARING OFFICER DODUC: Do you have redirect for Dr. Wilder, Dr. Phillis, or Dr. Greenwood?

MR. MIZELL: At this time, no.

CO-HEARING OFFICER DODUC: All right. And --

MS. MESERVE: I think I would be asking for a

little more time beyond the hour. It took a little bit longer to get through my Dr. Greenwood questions.

CO-HEARING OFFICER DODUC: Is there a discrete, small set of questions you can get through in about ten minutes?

MS. MESERVE: I shall try, yes.

CO-HEARING OFFICER DODUC: All right. Are there any housekeeping matters?

(No response)

CO-HEARING OFFICER DODUC: If not, we will allow Ms. Meserve to continue.

And I'll take a moment to thank Dr. Wilder, Dr. Greenwood, and Dr. Phillis.

MS. MESERVE: This testimony -- sorry. This question is for Mr. Valles.

In Mr. -- Dr. Greenwood's testimony he refers to discussions with you regarding the need for frequent adjustments of flow control baffles. That's on Page 11, Line 12 of Dr. Greenwood's testimony.

Do you, Mr. Valles, have any experience with flow control baffles on a 3,000 cfs or larger diversion?

WITNESS VALLES: I don't personally have experience other than what we saw at Red Bluff and how they adjusted their baffles. And it was a fairly

straightforward process where a diver would go into the water, measure the flow; the baffles would be adjusted and then set, just physically set. And so I've seen that, and it seems very mechanical; it's a not a difficult thing.

MS. MESERVE: That's a 2,000 cfs diversion in the Upper Sacramento River?

WITNESS VALLES: That's a 2500 cfs diversion.

MS. MESERVE: So each time the baffles would need to be adjusted, a diver would need to go in the water to do that?

WITNESS VALLES: They typically do it like once a year. And it could be done once a season, so every three months. It's how often the -- the NMFS wants to review the flows in the system. Initially, they'll probably do it quite frequently. But then once they get the flows that they need, they'll come up with a -- a process or routine through which to set them. And they could be once every three months or so.

MS. MESERVE: And would you refer to those type of baffles adjusted by a diver as being dynamic?

WITNESS VALLES: NMFS ideally would love to have dynamic baffles. But in a marine environment, not practical. It requires stepper motors, electronic systems, flow control devices to measure the flow

constantly. And every time a boat drives by, it would send a pressure wave that would cause these things to kind of flutter. So in discussions with NMFS, they backed off on that.

MS. MESERVE: So dynamic baffles are not planned for these diversions.

WITNESS VALLES: That's correct

MS. MESERVE: And so small adjustments would not be able to be made, say, during the course of a tidal shift, for instance?

WITNESS VALLES: No. Like I said, it will be set once, based on diver input, once. And it could be as frequent as they want, but it would require a diver to go in there and measure the flow.

MS. MESERVE: And then also to change the setting? It's to measure the flow and change the settings? Is that --

WITNESS VALLES: To measure the flow and then from the top, they can possibly make the adjustments, meaning up at the deck. They can turn the screw or turn the mechanical device that will adjust the baffles.

MS. MESERVE: So do you consider that to be real-time operations?

WITNESS VALLES: I -- that's not -- I'm not

aware of that, if that's considered real-time.

MS. MESERVE: And then I was looking at the SEIR. If we could go to the figure which is SWRCB-113, and that's Figure 3-01. That's the figure that shows the differences in between the proposed -- the approved project and the currently proposed. That's going to be 3-1. Thanks.

So, Mr. Valles, I was wondering with showing this layout, why this layout of the project does not include any facilities for delivery of water to Contra Costa Water District via East Bay MUD's Freeport intake or a new tunnel connection to CCWD as agreed in the settlement agreement.

WITNESS VALLES: That's not a question I'm aware of. I know that there's some sort of an agreement, but we weren't directed to put that in, into the SEIR.

MS. MESERVE: So if those facilities were to be built later, that may be subject to some separate review process?

WITNESS VALLES: I don't know. I'm just an engineer.

MS. MESERVE: And then, if you look at the approved project and the proposed project, you can see that the tunnel going from the intake proposed near

Hood moves closer to Stone Lakes and, in particular, south Stone Lakes.

And if you'll forgive me, I did ask Mr. Bednarski this question. But since we have another engineer here, I'm going to ask it again.

Are you aware, Mr. Valles, of any consideration of the effect on the hydrology of south Stone Lakes by moving that tunnel closer to that water feature?

CO-HEARING OFFICER DODUC: Mr. Mizell.

MR. MIZELL: Yes, I'll object as asked and answered of Mr. Bednarski, who was the witness provided to describe the change in the footprint, and it is within the Supplemental EIR. Mr. Valles is here to support Dr. Greenwood in the testimony regarding the intake screen design. So --

CO-HEARING OFFICER DODUC: Unless that change affects the intake and the screen design.

WITNESS VALLES: It doesn't change it.

MS. MESERVE: All right. Those are the questions that I had for Mr. Valles. So if this would be a good stopping point for you, that would be okay.

CO-HEARING OFFICER DODUC: You have no other questions for him?

MS. MESERVE: Nope.

CO-HEARING OFFICER DODUC: So I'll leave it to you as well, in terms of which witnesses you will bring back tomorrow for purposes of redirect.

MS. MESERVE: I do have further questions, though, right?

CO-HEARING OFFICER DODUC: Yes, but Dr. Wilder, Dr. Greenwood, Dr. Phillis, and Mr. Valles are the ones that you do not have cross-examination questions for?

MS. MESERVE: (Nods head affirmatively)

CO-HEARING OFFICER DODUC: All right. With that, we are back in Coastal tomorrow at 9:30.

Mr. Bezerra.

MR. BEZERRA: Yes. Just in terms of witness scheduling, given that our panel follows DWR and Reclamation's Panel 3, I don't know if Mr. Mizell or Ms. Aufdemberge have any idea if they're planning to do any redirect at this point because, if there's any of redirect, then there will be possibly a fair amount of recross, and that could change the timing. So I'm just wondering if there's any redirect anticipated at this point.

CO-HEARING OFFICER DODUC: And, if so, what topics might you be exploring because redirect is pending approval of the Hearing Officers.

MR. MIZELL: Yes. In order to curry favor with everybody in the hearing, I don't plan to have any redirect at this time.

CO-HEARING OFFICER DODUC: All right. So since we're on time today, Mr. Mizell, please remind me the estimated time you expect for direct testimony of your Panel 3.

MR. MIZELL: We would request one hour, please.

CO-HEARING OFFICER DODUC: One hour. All right.

I'm sorry. Ms. Meserve, you have about, I don't know, eight minutes left. How much additional time do you anticipate needing for cross of this panel?

MS. MESERVE: I think I could do it in 30 minutes.

CO-HEARING OFFICER DODUC: Okay. So that means, unless there's further redirect that is unanticipated at this time, then we should get through with cross-examination of this panel and direct of the Panel 3 before our lunch break.

So at this time, Mr. Bezerra, and especially those in Group 7 who are planning on conducting cross, you should be prepared to move perhaps as early as late morning. And everyone else should get ready for

presenting their time estimates of cross of Panel 3. And based upon that, we'll have a better idea in terms of presentation of rebuttal witnesses for other parties. All right?

Thank you. See you back at the building 9:30 tomorrow.

And a shout out to the Central Valley Regional Board staff who has helped us in the hearing for today, thank you.

(Whereupon, the proceedings recessed at 4:57 p.m.)

STATE OF CALIFORNIA)
) ss.
COUNTY OF MARIN)

I, DEBORAH FUQUA, a Certified Shorthand Reporter of the State of California, do hereby certify that the foregoing proceedings (Pages 121 through 231) were reported by me, a disinterested person, and thereafter transcribed under my direction into typewriting and which typewriting is a true and correct transcription of said proceedings.

I further certify that I am not of counsel or attorney for either or any of the parties in the foregoing proceeding and caption named, nor in any way interested in the outcome of the cause named in said caption.

Dated the 20th day of August, 2018.

DEBORAH FUQUA

CSR NO. 12948

State of California)
)
County of Sacramento)

I, Candace L. Yount, Certified Shorthand Reporter for the State of California, County of Sacramento, do hereby certify:

That I was present at the time of the above proceedings;

That I took down in machine shorthand notes all proceedings had and testimony given;

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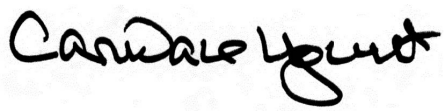

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