

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25

BEFORE THE  
CALIFORNIA STATE WATER RESOURCES CONTROL BOARD  
  
CALIFORNIA WATERFIX WATER )  
RIGHT CHANGE PETITION )  
HEARING )  
  
JOE SERNA, JR. BUILDING  
CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY  
COASTAL HEARING ROOM  
1001 I STREET  
SECOND FLOOR  
SACRAMENTO, CALIFORNIA  
  
PART 1A  
  
Tuesday, August 23, 2016  
9:00 A.M.  
  
Volume 13  
Pages 1 - 295  
  
Reported By: Candace Yount, CSR No. 2737, RMR, CCRR  
Certified Realtime Reporter  
  
Computerized Transcription By Eclipse  
California Reporting, LLC - (510) 224-4476  
www.CaliforniaReporting.com

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25

APPEARANCES

CALIFORNIA WATER RESOURCES BOARD

Division of Water Rights

Board Members Present:

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

Staff Present:

Diane Riddle, Environmental Program Manager  
Dana Heinrich, Senior Staff Attorney  
Kyle Ochendusko, Senior Water Resources Control Engineer

PART I

For Petitioners:

California Department of Water Resources:

James (Tripp) Mizell  
Thomas M. Berliner

The U.S. Department of the Interior:

Amy L. Aufdemberge, Esq.

INTERESTED PARTIES:

For North Delta Water Agency & Member Districts:

Meredith Nikkel

For Local Agencies of the North Delta; The Environmental  
Justice Coalition for Water; Islands, Inc.; Bogle  
Vineyards/Delta Watershed Landowner Coalition; Diablo  
Vineyards and Brad Lange/Delta Watershed Landowner  
Coalition; Stillwater Orchards/Delta Watershed Landowner  
Coalition; Daniel Wilson; Brett G. Baker; SAVE OUR  
SANDHILL CRANES; and Friends of Stone Lakes National  
Wildlife Refuge:

Osha Meserve

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25

INTERESTED PARTIES (Continued):

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

John Herrick, Esq.

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

Michael Jackson

For Clifton Court, L.P.:

Suzanne Womack

For Friant North Authority:

Greg Adams

For State Water Contractors:

Stefanie Morris

For San Luis & Delta Mendota Water Authority:

Daniel J. O'Hanlon

For Westlands Water District:

Philip A. Williams

For The City of Roseville, Sacramento Suburban Water  
District, San Juan Water District, The City of Folsom,  
Yuba County Water Agency and The City of Roseville:

Alan Lilly

For The Placer County Water Agency:

Daniel Kelly

For The Sacramento Valley Group:

David Aladjem

1		I N D E X	
2	PETITIONERS' WITNESSES		PAGE
3	BEDNARSKI, JOHN		
	BUCHHOLZ, GWEN		
4	VALLES, SERGIO		
	PIRABAROOBAN, PRADA		
5			
	Cross-Examination by Ms. Nikkel		4
6	Cross-Examination by Ms. Meserve		19
	Cross-Examination by Mr. Herrick		27
7	Cross-Examination by Ms. Womack		31
8	MUNÉVAR, ARMIN		
	NADER-TEHRANI, PARVIZ		
9			
	Direct Examination by Mr. Mizell		41
10			
	REYES, ERIK		
11	SMITH, TARA		
	ANDERSON, JAMIE		
12	BUCHHOLZ, GWEN		
	BRYAN, MICHAEL		
13	WHITE, KRISTIN		
14	Direct Examination by Mr. Mizell		120
	Cross-Examination by Mr. O'Hanlon		123
15	Cross-Examination by Mr. Lilly		140
	Cross-Examination by Mr. Kelly		261
16	Cross-Examination by Mr. Aladjem		270
17	///		
18	///		
19	///		
20	///		
21	///		
22	///		
23	///		
24	///		
25	///		

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25

I N D E X

E X H I B I T S

LOCAL AGENCIES OF THE NORTH DELTA; THE ENVIRONMENTAL JUSTICE COALITION FOR WATER; ISLANDS, INC.; BOGLE VINEYARDS/DELTA WATERSHED LANDOWNER COALITION; DIABLO VINEYARDS AND BRAD LANGE/DELTA WATERSHED LANDOWNER COALITION; STILLWATER ORCHARDS/DELTA WATERSHED LANDOWNER COALITION; DANIEL WILSON; BRETT G. BAKER; SAVE OUR SANDHILL CRANES; AND FRIENDS OF STONE LAKES NATIONAL WILDLIFE REFUGE:

EXHIBITS	DESCRIPTION	IDEN EVID
2	Conceptual Engineering Report July 2015	23

THE CITY OF ROSEVILLE, SACRAMENTO SUBURBAN WATER DISTRICT, SAN JUAN WATER DISTRICT, THE CITY OF FOLSOM, YUBA COUNTY WATER AGENCY AND THE CITY OF ROSEVILLE:

EXHIBITS	DESCRIPTION	IDEN EVID
1	SWRCB-10, Page 98; SWRCB-11, Page 165; SWRCB-84, Page 595 and SWRCB-84, Page 596	170
8	Written testimony of Armin Munévar	143
9	Bay Delta Conservation Plan/California WaterFix RDEIR/SDEIS Appendix C, Supplemental Modeling Requested by the State Water Resources Control Board Related to Increased Delta Outflows	179
11	Excerpt of SWRCB-104, 3.7.2, Proposed Future Drought Procedures	253

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25

I N D E X

E X H I B I T S (Continued)

THE CITY OF ROSEVILLE, SACRAMENTO SUBURBAN WATER DISTRICT, SAN JUAN WATER DISTRICT, THE CITY OF FOLSOM, YUBA COUNTY WATER AGENCY AND THE CITY OF ROSEVILLE:

EXHIBITS	DESCRIPTION	IDEN EVID
12	End-of-July, End-of-August, End-of-September, End-of-October, End-of-November, and End-of-December Exceedance Plots for Folsom Reservoir	226
13	Folsom Reservoir Storage in 1931, 1932, 1939 & 1990; American River flow at Nimbus in 1931, 1932, 1939 & 1990	233

1 Tuesday, August 23, 2016 9:00 a.m.

2 PROCEEDINGS

3 ---000---

4 CO-HEARING OFFICER DODUC: (Banging gavel.)

5 Good morning everyone. It is 9 o'clock.

6 Welcome back.

7 We are here today again for the California  
8 WaterFix hearing.

9 I am Board member Tam Doduc. To my right is  
10 Board Chair Felicia Marcus, and to her right is Board  
11 member Dee Dee D'Adamo. To my left are staff Dana  
12 Heinrich and Kyle Ochenduszkko. I believe Miss Riddle  
13 will be joining us but she'll be sitting over there  
14 (indicating).

15 MR. OCHENDUSZKO: That's right.

16 CO-HEARING OFFICER DODUC: A couple quick  
17 announcements, as always, before we begin.

18 Identify the exits closest to you. In the  
19 event of an alarm, please evacuate, taking the stairs  
20 down to the first floor, and exit over to the park. If  
21 you are not able to take the stairs, you'll be directed  
22 into a protected vestibule.

23 Second announcement is that this hearing is  
24 being recorded and Webcasted. So please always speak  
25 into the microphone and begin by identifying yourself and

1 who you represent.

2 We have a court reporter here today, and the  
3 transcript will be made as soon as possible after the  
4 completion of Part I or is it IA? I'm forgetting my  
5 script now.

6 MR. OCHENDUSZKO: IA.

7 CO-HEARING OFFICER DODUC: IA. Okay.

8 If you need it earlier, please make  
9 arrangements with her directly.

10 And I want to thank that you have already put  
11 your devices -- I see you, Mr. Herrick -- on silent or  
12 vibrate. But please take a moment right now to check and  
13 make sure that it is in a non-annoying feature.

14 And was there any other announcements I needed  
15 to make?

16 With that, we are -- Welcome back to those of  
17 you who are on the Engineering Panel, and we now welcome  
18 Mr. Pirabarooban.

19 And if you could please stand and raise your  
20 right hand.

21 (Witness sworn.)

22 WITNESS PIRABAROOBAN: Yes, I do.

23 CO-HEARING OFFICER DODUC: Thank you. Please  
24 be seated.

25 ///



1

2

JOHN BEDNARSKI, GWEN BUCHHOLZ,

3

SERGIO VALLES and PRADA PIRABAROOBAN,

4

called as witnesses for the Petitioners, having been duly

5

sworn, were examined and testified as follows:

6

CO-HEARING OFFICER DODUC: What I will do is,

7

going from the list of parties that did conduct

8

cross-examination of the Engineering Panel, I will ask if

9

you have questions for Mr. Pirabaroban.

10

Those of you who either were not here or did

11

not conduct cross-examination of the Engineering Panel I

12

will assume to have no questions for this additional

13

witness.

14

With that, Group 7. Are you here and do you

15

have cross-examination?

16

MR. MIZELL: Hearing Officer Doduc, this is

17

Tripp Mizell.

18

If I may, we have a rather light audience this

19

morning. Is there any expectation that we are going to

20

need the modeling witnesses prior to, say, noon?

21

CO-HEARING OFFICER DODUC: I would assume so.

22

MR. MIZELL: Okay.

23

CO-HEARING OFFICER DODUC: And I'll -- We'll

24

take a short break if that isn't the case to give you a

25

little bit more time.

1 MR. MIZELL: Thank you.

2 CO-HEARING OFFICER DODUC: All right. Thank  
3 you for that check-in.

4 Group Number 7 . . . not here.

5 Group Number 9. You do not look like  
6 Mr. O'Brien.

7 MS. NIKKEL: I'm not.

8 Good morning. Meredith Nikkel with Downey  
9 Brand. I'm here on behalf of North Delta Water Agency.

10 CO-HEARING OFFICER DODUC: And I do not have  
11 your name on my list of people representing Group 9.

12 Could you spell your name --

13 MS. NIKKEL: Okay.

14 CO-HEARING OFFICER DODUC: -- for the record.

15 MS. NIKKEL: Okay. Sorry. Downey Brand  
16 represents, and I'm an attorney there so I think we're  
17 okay in terms of representation, but I'd be happy to  
18 spell my name for the record.

19 My first name is Meredith, M-E-R-E-D-I-T-H;  
20 last name Nikkel, N-I-K-K-E-L.

21 CO-HEARING OFFICER DODUC: All right.  
22 Please --

23 MS. NIKKEL: Thank you.

24 CROSS-EXAMINATION BY

25 MS. NIKKEL: Good morning. Thank you for

1 joining us, Mr. Pirabarooban. I appreciate your time  
2 here this morning.

3 We just had a few additional questions for you.

4 And if I could have staff pull up the Exhibit  
5 DWR-217.

6 (Document displayed on screen.)

7 MS. NIKKEL: Mr. Pirabarooban, are you familiar  
8 with this exhibit?

9 WITNESS PIRABAROOBAN: Yes.

10 CO-HEARING OFFICER DODUC: Who just made that  
11 noise?

12 Okay. Phones are now on silent. Thank you.

13 MS. NIKKEL: And were you involved in the  
14 preparation of this exhibit?

15 WITNESS PIRABAROOBAN: Yes.

16 MS. NIKKEL: So did you have principal  
17 responsibility for identifying the Points of Diversion  
18 that are reflected on this exhibit?

19 WITNESS PIRABAROOBAN: I worked with a couple  
20 of other Engineers, so I would -- I would say so.

21 MS. NIKKEL: So, can you explain to me how the  
22 Points of Diversion identified on this exhibit were  
23 identified?

24 WITNESS PIRABAROOBAN: Well, we did this work  
25 in two steps.

1           First, we went out to the field and located the  
2 existing diversions that are within the proposed intake  
3 site footprint and to get coordinates for those existing  
4 diversions, and then came back to office and put in the  
5 locations for those existing diversions, and then we  
6 access the eWRIMS -- Electronic Water Resources  
7 Information Management System -- that is available on the  
8 Board website.

9           Actually, there are two applications. One is  
10 the mapping application and the other one provides the  
11 foot hole. So we first utilized the mapping application  
12 to look for the diversions, you know, that are within the  
13 intake footprint and compared those locations with the  
14 one that we produced, and the ones that are not available  
15 in the database, we labeled them as not in the SWRCB  
16 database.

17           MS. NIKKEL: Thank you.

18           I want to go back to the first step that you  
19 described, the field inspections, going out and actually  
20 looking in the field.

21           Were you personally involved in that -- that  
22 investigation?

23           WITNESS PIRABAROOBAN: Yes. In fact, I visited  
24 the site three times.

25           MS. NIKKEL: Which site?

1                   WITNESS PIRABAROOBAN: All these three proposed  
2 intake sites.

3                   MS. NIKKEL: So were you involved in  
4 identifying those as three -- as those three Points of  
5 Diversion?

6                   WITNESS PIRABAROOBAN: When you say  
7 "identifying," you mean locating on the field?

8                   MS. NIKKEL: Yeah. Did -- I guess what I'm  
9 trying to ask is, did -- did somebody else identify them,  
10 locate them, and then you went later and inspected them,  
11 or were you involved in the first field inspection going  
12 out to see if there were any diversions and then you  
13 identified and located these?

14                   WITNESS PIRABAROOBAN: No. I -- I -- I was  
15 involved from the beginning.

16                   MS. NIKKEL: Personally involved?

17                   WITNESS PIRABAROOBAN: Yes.

18                   MS. NIKKEL: Okay. And have you contacted any  
19 of the -- the users of these Points of Diversion, the  
20 three that were not located in the eWRIMS database?

21                   WITNESS PIRABAROOBAN: Well, because we  
22 couldn't find another code, so we don't know who are the  
23 owners.

24                   But, as indicated in Mr. Bednarski's  
25 testimony -- I believe that's DWR-57 -- that's the next

1 step we plan to do as we do the design.

2 MS. NIKKEL: But as you sit here today, you --  
3 neither you nor anybody at DWR has pursuing contacting  
4 any users of these three Points of Diversion; is that  
5 right?

6 WITNESS PIRABAROOBAN: To my knowledge, that's  
7 the correct answer, yeah.

8 MS. NIKKEL: Thank you.

9 Did -- I want -- I want to turn now to the  
10 scope of your investigation. I understand that the --  
11 the actual things that you did, the task that you  
12 performed in conducting the investigation.

13 When you set out to conduct this investigation,  
14 how wide was your scope, geographically speaking?

15 WITNESS PIRABAROOBAN: We mainly focused the  
16 areas that have already been identified as the footprint  
17 for the proposed intakes. That's on the east bank of  
18 Sacramento River.

19 MS. NIKKEL: Okay. Can you -- So there's a --  
20 This is going to be a little bit difficult so bear with  
21 me.

22 So by "footprint," can you describe on  
23 Exhibit 217 what you mean by the footprint area.

24 WITNESS PIRABAROOBAN: So if you take, for  
25 example, Intake 2, that kind of square shape, that one

1 plus the, you know, tailings on upstream and north --  
2 upstream and downstream is pretty much, you know, the  
3 area identified there.

4 MS. NIKKEL: So the thin black line.

5 WITNESS PIRABAROOBAN: Thin black line, yeah.

6 MS. NIKKEL: Can you zoom back out, please.

7 (Document displayed on screen.)

8 MS. NIKKEL: So, was there any -- any effort  
9 taken to search for Points of Diversion, either in the  
10 field or on the eWRIMS database outside of the black  
11 boundary area identified on Exhibit 217?

12 WITNESS PIRABAROOBAN: Well, we were --  
13 Personally, I'm involved with design and construction,  
14 and based on our experience, we feel these are the ones  
15 that would be impacted from, you know, the construction  
16 activities. And that's why we, you know, focused our  
17 investigations to these ones that are identified within  
18 the footprint.

19 MS. NIKKEL: So you're saying you're not aware  
20 of any effort that DWR has taken to search for Points of  
21 Diversion outside of this area?

22 WITNESS PIRABAROOBAN: I'm not aware of that.

23 MS. NIKKEL: Is there anybody else we could ask  
24 if there was a further search done, or are you the person  
25 that would have the most knowledge about this type of

1 investigation for Points of Diversion?

2 WITNESS PIRABAROOBAN: We have an expert to  
3 testify here regarding water rights. I don't know if she  
4 has done any of that type, but that's the only person I  
5 can point to at this point.

6 MS. NIKKEL: Okay. So it's possible that  
7 somebody in the Water Rights Panel will have conducted a  
8 search that's outside the scope of just the footprint  
9 area that you've identified; is that right?

10 WITNESS PIRABAROOBAN: They may have but I have  
11 no way of confirming that.

12 MS. NIKKEL: Okay. Thank you.

13 Do you or anyone else on the panel know if  
14 anybody at the Bureau of Reclamation conducted a similar  
15 search to the one that you described?

16 WITNESS PIRABAROOBAN: I do not know.

17 MS. NIKKEL: Anybody on the panel know?

18 WITNESS VALLES: I do not know.

19 WITNESS BEDNARSKI: No.

20 WITNESS BUCHHOLZ: No.

21 MS. NIKKEL: Does anybody on the panel have  
22 knowledge of who at D -- at DWR/Reclamation would be the  
23 person to ask about any investigation around Points of  
24 Diversion around the footprint of the Proposed Project?

25 WITNESS BEDNARSKI: No.



1 WITNESS PIRABAROOBAN: I don't know.

2 WITNESS VALLES: Same here.

3 WITNESS BUCHHOLZ: No.

4 MS. NIKKEL: Okay. And one last question on  
5 this topic.

6 Does anybody on the -- Did anybody on the panel  
7 conduct a search for Points of Diversion located between  
8 the proposed new Point of Diversion and the existing  
9 South Delta Point of Diversion?

10 WITNESS BEDNARSKI: Are you referring to prior  
11 to the start of these hearings? Or just in general?

12 MS. NIKKEL: In general.

13 WITNESS BEDNARSKI: I believe since the  
14 testimony started, we investigated some more -- down in  
15 the south end down near the Jones and Banks Pumping  
16 Plant.

17 I think there were also questions we received  
18 on the Engineering Panel about diversions down on the  
19 Moore property, I believe it was.

20 So we looked down there and we -- we found some  
21 but they were, you know, outside of our Project  
22 footprint, so that's probably why they weren't picked up  
23 the first time through.

24 MS. NIKKEL: And was that search done by your  
25 Engineering Team?

1                   WITNESS BEDNARSKI: I believe it was the DWR  
2 Property Acquisition Team, Mr. Allan Davis.

3                   MS. NIKKEL: Okay. And that was as a result of  
4 some questioning during the hearing.

5                   WITNESS BEDNARSKI: That's correct.

6                   MS. NIKKEL: And do you know the nature of the  
7 results of that investigation?

8                   WITNESS BEDNARSKI: I saw a plot. There were,  
9 you know, five or six, I believe -- I don't recall the  
10 exact number -- that were located down in that portion of  
11 the Project site.

12                   MS. NIKKEL: And would you say it was -- the  
13 scope of that was limited to the construction of new  
14 facilities in the South Delta area that -- that was the  
15 limit of that search?

16                   WITNESS BEDNARSKI: That's correct.

17                   MS. NIKKEL: Is anybody else on the panel aware  
18 of any other search by DWR or Reclamation for Points of  
19 Diversion located between the existing South Delta Point  
20 of Diversion and the proposed North Delta Points of  
21 Diversion?

22                   WITNESS VALLES: I'm not sure.

23                   WITNESS BUCHHOLZ: No.

24                   MS. NIKKEL: Okay.

25                   CO-HEARING OFFICER DODUC: Before you proceed

1 on your next topic of question, let's make a correction  
2 here.

3 You do not have 60 minutes to conduct  
4 cross-examination, because Mr. Pirabarooban is a quarter  
5 of the panel. We'll start all the cross-examination at  
6 15 minutes.

7 MS. NIKKEL: Okay. Thank you for that  
8 clarification.

9 So, turning to the -- to the legend of  
10 Exhibit 217.

11 You've identified two types of diversions:  
12 Those diversions that are permanently impacted and those  
13 diversions that are temporarily impacted.

14 I've read elsewhere in the testimony and heard  
15 from witnesses the word "affected," that these diversions  
16 will be affected.

17 In your mind, is the word "affected" and  
18 "impacted" the same?

19 WITNESS PIRABAROOBAN: Yes.

20 MS. NIKKEL: And is it fair to say that, when  
21 you use the term "affected" or "impacted," that the --  
22 the Points of Diversion will be adversely impacted?

23 WITNESS PIRABAROOBAN: No, I didn't say that.

24 MS. NIKKEL: So can you characterize what type  
25 of effect would happen to these? Would it be negative

1 effect or positive effect?

2 WITNESS PIRABAROOBAN: That's going to be  
3 interruption or -- In other words, they won't be able to  
4 utilize the existing systems during the construction, and  
5 we will be working with the landowners to provide the  
6 water supply of same quantity and quality during  
7 construction.

8 MS. NIKKEL: So, are you saying that your --  
9 your -- your focus here in characterizing the impact for  
10 these Points of Diversion was only on the effects of  
11 construction?

12 WITNESS PIRABAROOBAN: That is correct.

13 MS. NIKKEL: And did you or anybody else on the  
14 panel or at DWR conduct an analysis of whether these  
15 Points of Diversion will be affected by the operation of  
16 the Proposed Project?

17 WITNESS PIRABAROOBAN: I'm not aware of that,  
18 but the Modeling Group might be able to provide answer  
19 for your question. But, personally, I'm not aware of  
20 that.

21 MS. NIKKEL: And just looking at the five  
22 Points of Diversion that are colored yellow on  
23 Exhibit 217 that are identified as diversions being  
24 permanently impacted, is it correct that these five  
25 diversions would be rendered permanently inoperable by

1 the construction of the Proposed Project?

2 WITNESS PIRABAROOBAN: At the current location?

3 Yes. Because those are located within the construction  
4 footprint and they would have to be relocated or, you  
5 know, we'll have to add up to one of the issues that  
6 Mr. Bednarski has highlighted in his testimony to quality  
7 of water.

8 MS. NIKKEL: And so, based on the scope of your  
9 investigation, and the nature of the investigation into  
10 these Points of Diversion, as you sit here today, you  
11 don't know whether the operation of the Project will  
12 affect or impact these Points of Diversion; is that  
13 correct?

14 WITNESS PIRABAROOBAN: That is correct. On --

15 MS. NIKKEL: And, as far as you're aware or  
16 anybody else is aware on the panel, there's nobody in the  
17 Engineering Team who knows the answer to that question  
18 but perhaps the Modeling Team might be able to answer  
19 that question; is that correct?

20 WITNESS PIRABAROOBAN: That is correct.

21 And I'd like to get clarification from you.  
22 When you say "operation," what do you mean by  
23 "operation"?

24 MS. NIKKEL: So, after -- after completion of  
25 the construction of the Project, when the proposed

1 intakes are diverting water from these new intakes and  
2 exporting that water to the south part of the Delta,  
3 that's what I mean by "operation."

4 WITNESS PIRABAROOBAN: Well, in Mr. Bednarski's  
5 testimony, we -- the Department has made the commitment  
6 to make these water users whole, and that's how I see it,  
7 so --

8 MS. NIKKEL: So that would include any adverse  
9 impacts that result from the operation of the Project?

10 WITNESS PIRABAROOBAN: Well, I'm not quite  
11 understanding what you mean by "adverse impacts."

12 We are saying the ones that are identified in  
13 green, they are going to be affected during construction,  
14 but, you know, the Department is making an attempt to  
15 provide water supply during that time. And once the  
16 construction is over, they would be able to continue to  
17 use those diversions.

18 MS. NIKKEL: So, my understanding is that  
19 your -- your -- DWR's commitment is limited to the Points  
20 of Diversion identified on Exhibit 217; is that correct?

21 WITNESS BEDNARSKI: I don't -- I don't think  
22 that is quite true. We testified as to the ones that  
23 fell within the footprint of our structures, and those  
24 are the ones that my testimony address.

25 MS. NIKKEL: And that's --

1 WITNESS BEDNARSKI: So --

2 MS. NIKKEL: -- that's the --

3 WITNESS BEDNARSKI: -- I just want to make  
4 sure --

5 MS. NIKKEL: -- commitment that I'm talking  
6 about is --

7 WITNESS BEDNARSKI: -- that -- Yes. So our  
8 commitment is to these ones that have been identified in  
9 my testimony and our exhibits.

10 MS. NIKKEL: And, to your knowledge, has DWR  
11 made a similar commitment to other Points of Diversion  
12 that would be adversely impacted by the Proposed Project?

13 WITNESS BEDNARSKI: I'm --  
14 (Timer rings.)

15 WITNESS BEDNARSKI: I'm not aware. Our focus  
16 was on the ones located near these intake structures.

17 MS. NIKKEL: Okay. Thank you.

18 WITNESS BEDNARSKI: Yes.

19 CO-HEARING OFFICER DODUC: Thank you.

20 Group Number 10.

21 Okay. That person is heading out the door, so  
22 that's not Number 10.

23 Group Number 15 . . . not here.

24 19, Miss Meserve, do you have questions?

25 MS. MESERVE: Yes.

1           Good morning. Osha Meserve for Local Agencies  
2 of the North Delta, Bogle, and the other Group 19  
3 participants.

4           Could you please put up -- Actually, first,  
5 just from DWR errata Slide 25. That's the -- It's the --  
6 It shows how the Project would operate.

7           I have a couple of questions about the constant  
8 low-level pumping that didn't get answered earlier on in  
9 the Engineering Panel and I just want to see if there's  
10 any information on that topic.

11           MS. McCUE: Can you repeat the number?

12           MS. MESERVE: It's DWR-5 errata, Slide 25.

13           MR. MIZELL: I believe that the topics that  
14 were deferred to Mr. Pirabaroban were seismic, flood,  
15 and the geotechnical borings.

16           I don't believe that low-level pumping was  
17 deferred to Prada.

18           CO-HEARING OFFICER DODUC: Miss Meserve.

19           MS. MESERVE: Thank you.

20           Well, the question came up and we questioned  
21 Mr. Bednarski regarding if the pumps were capable of  
22 being shut down altogether and whether there would ever  
23 be a time when there would be low-level pumping below  
24 5,000 and what the construction maintenance -- or, I'm  
25 sorry -- the maintenance schedule for the tunnels would



1 be.

2 And so I -- I wanted to bring up whether --  
3 Mr. Bednarski was not sure on the questions, and so I am  
4 trying to see if there's additional information about  
5 that topic because it pertains to the signs of the  
6 diversions in the tunnels.

7 CO-HEARING OFFICER DODUC: Mr. Pirabarooban,  
8 you've -- Do you have -- I mean, is your special area  
9 specific to the question that Ms. Meserve is imploring?

10 WITNESS PIRABAROOBAN: No.

11 CO-HEARING OFFICER DODUC: We are not opening  
12 up the entire panel for additional cross-examination.

13 This was just to bring Mr. Pirabarooban back  
14 because he was not available to -- to be here earlier to  
15 address the specific questions that were referred to him  
16 during the cross-examination of this panel.

17 MS. MESERVE: Okay. Could I just ask a  
18 question to clarify that he doesn't know anything, then  
19 I'll just move on.

20 CO-HEARING OFFICER DODUC: All right. Let's do  
21 that.

22 MS. MESERVE: Thank you.

23 CROSS-EXAMINATION BY

24 MS. MESERVE: Mr. Pirabarooban, do you know  
25 anything -- Do you have any information regarding when

1 the low-level pumping would start or stop?

2 WITNESS PIRABAROOBAN: I do not have that  
3 specific information.

4 MS. MESERVE: And do you have any information  
5 regarding the maintenance schedule for the tunnel once  
6 operational, or anything like that?

7 CO-HEARING OFFICER DODUC: Again, we're going  
8 to focus on just the topics in which Mr. Pirabaroban was  
9 brought back for, and we're not going to re-cover  
10 grounds.

11 MS. MESERVE: He said that he has worked as  
12 Project Coordinator providing guidance and technical  
13 direction on engineering issues related to obtaining  
14 Permits.

15 So, I mean, his testimony is quite broad,  
16 actually, in terms of the support he provided to the  
17 Engineering Team, so -- Again, I'm not going to take up a  
18 lot of time on this, but I believe he's represented that  
19 he understands and has assisted in engineering of this  
20 Project.

21 CO-HEARING OFFICER DODUC: All right. Let's  
22 try -- Let's try that again.

23 MS. MESERVE: Okay. So, do you have any  
24 information about the -- what would be the planned  
25 maintenance schedule for the tunnels, if they were

1 operational, in terms of when low-level pumping would  
2 begin or be shut down?

3 WITNESS PIRABAROOBAN: My understanding is,  
4 that level of details we will develop during the Final  
5 Design. And I have read in one of the documents -- I  
6 don't recollect what document that we are looking at.  
7 Or, particularly, it's done at -- once ten years or so  
8 for the tunnels.

9 MS. MESERVE: So, you don't have additional  
10 information for us today about the -- what's shown on the  
11 graph there in terms of when low-level pumping begins or  
12 ends with respect to maintenance.

13 WITNESS BEDNARSKI: No, I do not.

14 MS. MESERVE: Okay. Could you please bring  
15 up -- I've marked it in the submitted folder as Land 2.  
16 It's Sheet 33 from Volume 2 of the Conceptual Engineering  
17 Report from July of 2015.

18 (Document displayed on screen.)

19 MS. MESERVE: And Mr. Pirabarooban -- I'm so  
20 sorry.

21 WITNESS PIRABAROOBAN: No, that's okay.

22 MS. MESERVE: Would you please tell me: Are  
23 you familiar with the Conceptual Engineering Report from  
24 July of 2015?

25 WITNESS PIRABAROOBAN: Yes, I'm familiar with

1 that report.

2 MS. MESERVE: Are you aware of any -- Is there  
3 a newer Engineering Report besides the July of 2015 that  
4 your team is utilizing?

5 WITNESS PIRABAROOBAN: For the Project  
6 California WaterFix, we are relying on the 2015 July CER.

7 MS. MESERVE: And I would note that Volume 1  
8 has been submitted into evidence.

9 Do you know whether -- why Volumes 2 and 3 are  
10 not submitted as part of the Engineering Team's  
11 testimony?

12 WITNESS PIRABAROOBAN: I believe Volume 2 is  
13 also submitted as part of the exhibits, and Volume 3 is a  
14 mapbook and it's included as part of the EIR/EIS  
15 documents.

16 MS. MESERVE: Okay. Okay. So this is from, I  
17 believe, Volume 2, which I couldn't find in an exhibit so  
18 I just put it up here. And I'll submit it as -- I'll  
19 call it Land's 2.

20 ///

21 ///

22 ///

23 ///

24 ///

25 ///

1 (Local Agencies of the North Delta;  
2 The Environmental Justice Coalition  
3 for Water; Islands, Inc.; Bogle  
4 Vineyards/Delta Watershed Landowner  
5 Coalition; Diablo Vineyards and Brad  
6 Lange/Delta Watershed Landowner  
7 Coalition; Stillwater Orchards/Delta  
8 Watershed Landowner Coalition;  
9 Daniel Wilson; Brett G. Baker; SAVE  
10 OUR SANDHILL CRANES; and Friends of  
11 Stone Lakes National Wildlife Refuge  
12 Exhibit 2 marked for identification)

13 MS. MESERVE: And I have a question regarding  
14 the black sort of railroad track which is shown there,  
15 which is tunneling from the intakes to the forebay.

16 Are you aware whether there are any  
17 above-ground disturbances associated with those black  
18 lines that run from the intakes down to the forebay shown  
19 on the far right?

20 WITNESS PIRABAROOBAN: Shaft locations, yeah,  
21 would be surface disturbance.

22 MS. MESERVE: Are the shaft locations shown on  
23 this diagram?

24 WITNESS PIRABAROOBAN: I cannot see that --

25 MS. MESERVE: Maybe it could be zoomed in a

1 tiny bit.

2 WITNESS PIRABAROOBAN: If you look at Intake 2,  
3 if you zoom in Intake 2, the first one.

4 (Document zoomed in.)

5 WITNESS PIRABAROOBAN: Okay. There's -- I  
6 think that's Intake No. 3. You see a label there?

7 MS. MESERVE: Um-hmm. So, are there any shafts  
8 in addition to the ones marked there that would be, say,  
9 between Intake 3 and where it hooks up back with the  
10 Intermediate Forebay to the south?

11 WITNESS PIRABAROOBAN: They are not the  
12 reduction shafts. Those -- There would be . . . access  
13 points in between the reception and drive shaft to  
14 provide ventilation as well as for maintenance purpose if  
15 we have a problem in the tunnel boring mission. We may  
16 have to get access to the tunnel boring mission to do  
17 maintenance.

18 MS. MESERVE: Okay. So, is your testimony that  
19 there may be additional surface disturbance besides the  
20 shafts shown that are marked here as "driveshaft" on --  
21 on this figure?

22 WITNESS PIRABAROOBAN: Yeah. Those have been  
23 clearly described in the Recirculated Draft EIR and  
24 Supplemental Draft EIS in Appendix 3C, construction  
25 assumptions.

1 MS. MESERVE: Okay. So, if I look at  
2 Appendix 3C, I will see all the places which DWR believes  
3 there will be a surface impact in addition to what's  
4 shown here.

5 WITNESS PIRABAROOBAN: Yeah. They have been  
6 described in Appendix 3C.

7 MS. MESERVE: I will refer to that.

8 Is -- Is all of the black dotted line here  
9 underground besides the shafts, or would there be any cut  
10 and fill associated with this route that's shown in  
11 black?

12 WITNESS PIRABAROOBAN: Oh, those are tunnel  
13 alignments.

14 MS. MESERVE: Okay. Zooming out a bit, please.

15 (Document zoomed out.)

16 MS. MESERVE: And looking to the right. See  
17 where it says R equals 2,000 and there's a turn in the  
18 route there on the far right?

19 Would that require any surface disturbance in  
20 order to make a turn with a machine such as that?

21 WITNESS PIRABAROOBAN: I don't think so, no.

22 MS. MESERVE: Okay. Following up on the prior  
23 questioning.

24 Are you aware of any surveying of water  
25 delivery or wells or any water rights in this particular

1 area shown on this figure with respect to DWR's planning  
2 for this Project?

3 WITNESS PIRABAROOBAN: Could you ask one by  
4 one --

5 MS. MESERVE: Certainly.

6 WITNESS PIRABAROOBAN: -- combined?

7 MS. MESERVE: For the areas other than the  
8 footprint of each of the intakes shown here, has there  
9 been any surveying of water rights or water delivery  
10 systems in order to plan for this Project?

11 MR. BERLINER: Objection: Asked and answered.

12 CO-HEARING OFFICER DODUC: How is your question  
13 different than previous questions?

14 MS. MESERVE: It's fine. I'm just trying to  
15 clarify using the figure, really. That's all I'm doing,  
16 so we can move on. Thank you.

17 Okay. That's all my questions. Thank you.

18 CO-HEARING OFFICER DODUC: Thank you,  
19 Miss Meserve.

20 Group Number 21.

21 Okay.

22 MR. HERRICK: Oh, I'm sorry.

23 CO-HEARING OFFICER DODUC: There you are,  
24 Mr. Herrick.

25 MR. HERRICK: I forgot my number.



1 Thank you, Hearing Officers and Board members.  
2 John Herrick for South Delta Water Agency and  
3 other parties.

4 I just have a couple quick questions.  
5 Ms. Nikkel covered a number of things that I want to  
6 touch upon.

7 CROSS-EXAMINATION BY

8 MR. HERRICK: Mr. Pirabarooban. Sorry.

9 The -- The diversion locations that are within  
10 the footprint of the new intakes, you just talked about  
11 how they might be supplied with a different source of  
12 water; is that correct? Or a different method of  
13 receiving water?

14 WITNESS PIRABAROOBAN: Yeah. I think  
15 Mr. Bednarski's testimony includes two or three different  
16 options that we could work with land owners to deploy the  
17 water.

18 MR. HERRICK: Has there been any engineering  
19 done with respect to potential change in Points of  
20 Diversion, in other words, moving the diversion points to  
21 another location, either downstream or upstream of the  
22 intakes?

23 WITNESS PIRABAROOBAN: When you say  
24 "engineering," are you asking about the design?

25 MR. HERRICK: Yes.

1                   WITNESS PIRABAROOBAN: We haven't done anything  
2 but, you know, that's our plan to do as far as our next  
3 engineering phase.

4                   MR. HERRICK: And have you taken into  
5 consideration the permitting necessary for that, as in  
6 State Board permitting?

7                   WITNESS PIRABAROOBAN: That's kind of beyond my  
8 expertise to see whether permits would be needed or not.

9                   But in Mr. Bednarski's testimony, the  
10 Department has made to provide landowners with permitting  
11 if necessary.

12                   MR. HERRICK: Do you know whether or not  
13 such -- such a new intake might require a screening  
14 mechanism required by Department of Fish and Wildlife?

15                   WITNESS PIRABAROOBAN: I do not know.

16                   MR. HERRICK: Thank you.

17                   Mr. Pirabarooban, are you the right person to  
18 talk about the engineering associated with the Contra  
19 Costa Water District settlement relating to this matter?

20                   MR. MIZELL: I'm going to object.

21                   The Contra Costa Water District settlement is  
22 not something that was deferred to the witness in the  
23 original testimony of the Engineering Panel.

24                   CO-HEARING OFFICER DODUC: Where are you going  
25 with this, Mr. Herrick? Did you --

1 MR. HERRICK: I just wanted --

2 CO-HEARING OFFICER DODUC: -- just want to know  
3 if he has that information?

4 MR. HERRICK: Well, I want to know if one level  
5 of engineering might have been done for methods of  
6 getting water to Contra Costa under this settlement?

7 CO-HEARING OFFICER DODUC: Very well. Please  
8 answer, to --

9 MR. HERRICK: I mean --

10 CO-HEARING OFFICER DODUC: -- the best that you  
11 know.

12 MR. HERRICK: -- that basically is the  
13 question. That basically is the question.

14 Has there been engineering done associated with  
15 the Contra Costa Water District settlement as in  
16 providing them with water, if necessary?

17 WITNESS PIRABAROOBAN: I understand DWR is  
18 moving on some conceptual level of engineering for  
19 those . . . the mitigation measures that I believe are in  
20 the Settlement Agreement.

21 MR. HERRICK: So, is it premature to -- for  
22 there to be any identification of route or facilities  
23 yet?

24 WITNESS PIRABAROOBAN: There are folks working  
25 on that.

1 MR. HERRICK: Okay. That's all I have.

2 CO-HEARING OFFICER DODUC: Thank you,

3 Mr. Herrick.

4 24?

5 25? Mr. Emlen? Okay.

6 31, Mr. Jackson.

7 MR. JACKSON: No questions.

8 CO-HEARING OFFICER DODUC: All right.

9 MR. JACKSON: Thank you.

10 CO-HEARING OFFICER DODUC: 32, Restore the

11 Delta? No questions.

12 33? I don't see Mr. Minton here. Okay.

13 37. I don't see Miss Des Jardins here.

14 38. Well, Mr. Eichenberg e-mailed that his

15 train broke down in Richmond. He should be here by

16 10:00. He has some questions for the Engineering Panel.

17 Okay. Well . . .

18 Number 39? I don't see Miss Daly here.

19 Number 40, Mr. Porgans is not here.

20 41, Miss Suard is not here.

21 42. Oh, did not have cross-examination.

22 43, Miss Womack.

23 And while it is always good to see your smiling

24 face, Miss Womack, I will remind you again that we are

25 not opening cross-examination for the entire panel.

1 We're just going to focus on questions regarding geology,  
2 seismology, and water rights, well, at least identified  
3 as one of those diversion points to which have been  
4 deferred to Mr. Pirabarooban.

5 MS. WOMACK: Thank you. Suzanne Womack,  
6 Clifton Court L.P.

7 Could I have DWR-2-9 up so we can see the map?

8 MR. BAKER: We're going to pull up the errata  
9 2-E.

10 MS. WOMACK: Okay.

11 CO-HEARING OFFICER DODUC: Mr. Mizell --

12 MS. WOMACK: I just want --

13 CO-HEARING OFFICER DODUC: -- is your Modeling  
14 Panel on the way?

15 MR. MIZELL: They're on the way. I believe  
16 that the direct testifiers will all be here shortly, but  
17 it may be until 10:30 before some of the  
18 cross-examination witnesses can arrive.

19 CO-HEARING OFFICER DODUC: All right. Thank  
20 you.

21 (Document displayed on screen.)

22 CROSS-EXAMINATION BY

23 MS. WOMACK: So, Mr. Pirabarooban, did you work  
24 on the -- any of the plan for the South Clifton Court  
25 Forebay design?

1                   WITNESS PIRABAROOBAN: I was part of the  
2 Engineering Team.

3                   MS. WOMACK: Okay. Thank you.

4                   So, how is it seismically different, the south  
5 embankment, than what -- what -- is there -- than what  
6 previously exists?

7                   WITNESS PIRABAROOBAN: I'm not quite following  
8 your question. When you say there is . . .

9                   MS. WOMACK: Well, have you made seismic  
10 changes for the embankments? Is there a change in this  
11 new Clifton Court Forebay part of the design? I'm not an  
12 engineer, so --

13                   WITNESS PIRABAROOBAN: No, no.

14                   Well, when we -- The current proposal is to  
15 build a new embankment to accommodate the expansion  
16 proposed on the South Side.

17                   MS. WOMACK: Yes.

18                   WITNESS PIRABAROOBAN: And -- And those are to  
19 re-build embankments inside the existing Clifton Court  
20 Forebay and --

21                   MS. WOMACK: So --

22                   WITNESS PIRABAROOBAN: -- when we do that, we  
23 will confirm the additional safety of the dam's design  
24 criteria for seismic requirements.

25                   MS. WOMACK: Okay. So will the embankments be

1 wider? I'm just trying to get in my head what it's going  
2 to look like.

3 WITNESS PIRABAROOBAN: I do not expect they  
4 will be wider, but I expect the foundation solids will be  
5 improved.

6 MS. WOMACK: Okay. Thank you.

7 Let's see. So, do you know why the South  
8 Clifton Court Forebay for -- I think it's for 4(a) -- why  
9 they moved that wall in, the reason -- the engineering  
10 reason for that?

11 MR. MIZELL: Objection: Vague.

12 The witness is not -- Or the record's not going  
13 to show what the questioner means by "that wall."

14 MS. WOMACK: Oh, I'm sorry.

15 MR. MIZELL: So if we could spell it out.

16 MS. WOMACK: So I have to -- Let's see. So  
17 that's the south wall of the New South Clifton Court  
18 Forebay.

19 So, in -- on the model -- Well, there's the --  
20 July 2013, the -- the South Clifton Court Forebay is  
21 different shaped. And on the July 2015, the embankment  
22 has been moved in.

23 I don't know how else to say that but . . .

24 WITNESS PIRABAROOBAN: Well, I understand. I  
25 believe the reasoning is to provide room to re-locate the

1 existing power lines, if needed.

2 MS. WOMACK: Yes, because I have power lines  
3 through my property.

4 Let's see.

5 Now, during construction, my water intakes will  
6 not be affected, is what I've heard.

7 I mean, I'm -- I'm outside the footprint of  
8 the -- of the waterway, so that -- this is -- So I'm --  
9 I'm not going to be affected, is -- Because I've been  
10 told that I'm not going to be affected for water.

11 I'm not on the list of people affected up  
12 north.

13 Down south, I have to -- there has to be --

14 CO-HEARING OFFICER DODUC: What is your  
15 question, Miss Womack?

16 MS. WOMACK: Am -- Am I going to be affected  
17 during construction --

18 CO-HEARING OFFICER DODUC: Mr. Pirabaroban.

19 MS. WOMACK: -- while I remain --

20 CO-HEARING OFFICER DODUC: All right.

21 Mr. Pirabaroban, do you know whether this location will  
22 be impacted during construction?

23 WITNESS PIRABAROOBAN: I'm not intimately  
24 familiar with the diversions that Miss Womack has just  
25 mentioned, but the Department has made the commitment,



1 through Mr. Bednarski's testimony, that not only the ones  
2 that have been identified in this testimony, even the  
3 ones that have yet to be identified, will be handled the  
4 same way as we have proposals for the ones that have  
5 already been identified.

6 CO-HEARING OFFICER DODUC: So, sitting here  
7 today, you do not know whether they'll be impacted, but  
8 you are aware that the Department has committed to work  
9 with Miss Womack, if necessary, if there is potential  
10 impact to her during construction.

11 WITNESS PIRABAROOBAN: That is correct.

12 CO-HEARING OFFICER DODUC: Thank you.

13 MS. WOMACK: I -- I'm -- My one concern is --

14 CO-HEARING OFFICER DODUC: No. This is --

15 MS. WOMACK: Well, no.

16 CO-HEARING OFFICER DODUC: Miss Womack, I need  
17 you to address questions to him.

18 MS. WOMACK: Yes.

19 CO-HEARING OFFICER DODUC: This is not the time  
20 to provide testimony to --

21 MS. WOMACK: Oh, I'm trying not to.

22 CO-HEARING OFFICER DODUC: -- on the claims.

23 MS. WOMACK: Okay.

24 CO-HEARING OFFICER DODUC: So just ask the  
25 question.

1 MS. WOMACK: So, do you know how my drainage  
2 will be affected?

3 CO-HEARING OFFICER DODUC: He has said he does  
4 not know sitting here today how it will be met.

5 MS. WOMACK: Okay. Okay. It -- Yeah.  
6 Because . . .

7 So I've got an unknown effect.

8 I -- You know, I think that's about -- Let's  
9 see.

10 So we don't -- we don't know how I'm going to  
11 be affected.

12 Okay. Well, listen, thank you so much.

13 WITNESS PIRABAROOBAN: Thank you.

14 CO-HEARING OFFICER DODUC: Thank you.

15 Mr. -- Well, that was the last of our  
16 cross-examiners for this -- this panel.

17 Mr. Eichenberg is not able to be here, and he  
18 really should have planned to be here earlier, given his  
19 intent to conduct cross-examination.

20 What I will suggest that he does is, we intend  
21 to -- As I notified you, Mr. Mizell, we may be calling  
22 your witnesses back at the end of Part IA to address  
23 questions from the Board and from staff.

24 What I will allow Mr. Eichenberg to do is  
25 submit his question for Mr. Pirabarooban to us, and if we

1 believe it's appropriate to address, we will ask those  
2 questions at that time.

3 So, in that case, this panel has completed your  
4 work for now. Thank you very much.

5 And we will take a short break for your  
6 Modeling Panel to get here unless they're here already.

7 MS. WOMACK: Let me check.

8 CO-HEARING OFFICER DODUC: This will be for  
9 your direct.

10 MR. MIZELL: Right. We're currently waiting  
11 for one more direct witness to appear.

12 CO-HEARING OFFICER DODUC: All right. So let's  
13 take a -- What -- How much time you think you --  
14 10-minute break?

15 MR. MIZELL: Start with fen.

16 CO-HEARING OFFICER DODUC: All right.  
17 10-minute break, and we'll convene at 9:55.

18 Miss Meserve.

19 MS. MESERVE: I was going to --

20 CO-HEARING OFFICER DODUC: Your microphone is  
21 not on.

22 MS. MESERVE: I was going to use the time --

23 CO-HEARING OFFICER DODUC: Your microphone is  
24 not on.

25 MS. MESERVE: I was going to use the time,

1 while DWR convenes its next panel, to make a request, if  
2 that would be appropriate.

3 CO-HEARING OFFICER DODUC: All right.

4 MS. MESERVE: We had asked -- Protestants --  
5 Osha Meserve for Group 19 Protestants.

6 We had asked for a delay in the due date of our  
7 case in chief due to the schedules jamming together, the  
8 cross.

9 I wanted to come back and ask you to consider,  
10 if you would, perhaps vacating the hearings on next week  
11 leading up to the due date in order that we may  
12 participate fully in the cross-examination.

13 I think, over the course of the proceedings,  
14 the Modeling Panel has been identified as probably having  
15 the most, if not -- you know, some of the most important  
16 information that Protestants are seeking.

17 And, so, because so many of us are small  
18 organizations working to develop our testimony, we do  
19 want to participate in cross, and it does help with  
20 efficiency when we can listen to everybody else's  
21 questions and hopefully not ask the same questions.  
22 However --

23 CO-HEARING OFFICER DODUC: Which you do,  
24 anyway, but -- That's not a comment from the Hearing  
25 Officer.

1 MS. MESERVE: I'm very sorry.

2 So, anyway, I would request that you consider  
3 whether there would be an opportunity to take a break  
4 from the cross-examination for at least a couple days  
5 leading up to the case in chief so that we are not  
6 required to be here if we want to represent our clients  
7 and be able to participate in the Modeling Panel, which I  
8 believe will continue probably on past the due date of  
9 our case in chief.

10 So I would just ask that you would consider the  
11 scheduling and whether any more minor adjustments besides  
12 a change in due date would help reduce the pressures to  
13 the Protestants.

14 Thank you.

15 CO-HEARING OFFICER DODUC: We'll take it under  
16 advisement.

17 But for now, anyone wish to comment on that?

18 MS. MESERVE: And somebody's stuff is up here,  
19 by the way.

20 CO-HEARING OFFICER DODUC: Thank you.

21 With that, we'll take a 10-minute break and  
22 resume at 9:55.

23 (Recess taken at 9:46 a.m.)

24 (Proceedings resumed at 9:55 a.m.)

25 CO-HEARING OFFICER DODUC: (Banging gavel.)

1 All right. Mr. Mizell, if you could bring up  
2 your Modeling Panel, at least the ones participating in  
3 your direct.

4 MR. MIZELL: We have one witness who is --  
5 who's still about a block, half block away. He's on his  
6 way over from DWR.

7 CO-HEARING OFFICER DODUC: All right. We'll  
8 resume at 10 o'clock.

9 (Recess taken at 9:57 a.m.)

10 (Proceedings resumed at 10:00 a.m.)

11 CO-HEARING OFFICER DODUC: (Banging gavel.)

12 All right. It's 10 o'clock. We're back in  
13 session.

14 Mr. Mizell, if you could have your main  
15 witnesses up for the Modeling Panel.

16 If you could turn your name plates around.  
17 Thank you.

18 At this time, I will ask you to stand and  
19 please raise your right hand.

20 (Witnesses sworn.)

21 ARMIN MUNÉVAR and PARVIZ NADER-TEHRANI,  
22 called as witnesses for the Petitioners, having been  
23 first duly sworn, were examined and testified as follows:

24 CO-HEARING OFFICER DODUC: Thank you. Be  
25 seated.

1 Mr. Mizell, you may begin.

2 MR. MIZELL: Thank you very much.

3 So, the two witnesses you have before you right  
4 now are the witnesses who will be presenting direct  
5 testimony on modeling aspects of the California WaterFix.

6 We have a panel of cross-examination witnesses.  
7 We expect the direct testimony to run about two and a  
8 half hours, I believe, is what our estimate is.

9 So, for simplicity sake, I was asking the rest  
10 of the cross-examination panel to hold off until after  
11 lunch, I'm guessing, at which time we can have the full  
12 panel.

13 CO-HEARING OFFICER DODUC: That's fine. All  
14 right.

15 DIRECT EXAMINATION BY

16 MR. MIZELL: Mr. Nader-Tehrani, is DWR-26 a  
17 correct copy of your Statement of Qualifications?

18 WITNESS NADER-TEHRANI: Yes.

19 MR. MIZELL: And is DWR-66 a correct copy of  
20 your written testimony?

21 WITNESS NADER-TEHRANI: Yes.

22 MR. MIZELL: Mr. Munévar, is your -- is DWR-30  
23 a correct copy of your Statement of Qualifications?

24 WITNESS MUNÉVAR: Yes, it is.

25 CO-HEARING OFFICER DODUC: Your microphone.

1 MR. MIZELL: Microphone.

2 WITNESS MUNÉVAR: Yes, it is.

3 MR. MIZELL: And is DWR-71 a correct copy of  
4 your direct testimony?

5 WITNESS MUNÉVAR: Yes, it is.

6 MR. MIZELL: Thank you very much.

7 I believe we'll begin with Mr. Munévar.

8 MR. OCHENDUSZKO: Just for the witnesses who  
9 have shown up, you really have to get close in to the  
10 microphone, so don't be shy.

11 WITNESS MUNÉVAR: I promise we won't be shy.

12 Well, good morning. Thank you.

13 I'm going to lead off the overview of the  
14 testimony for the Modeling Panel, and Dr. Parviz  
15 Nader-Tehrani will -- will follow me as a second portion  
16 of the -- of the presentation of testimony.

17 (Document displayed on screen.)

18 My name is Armin Munévar and I've been working  
19 with -- with DWR and Bureau of Reclamation since 2007 on  
20 the California WaterFix modeling aspects.

21 I understand we don't have the clicker here, so  
22 I'll just ask for next slide for -- as we move through.

23 (Document displayed on screen.)

24 WITNESS MUNÉVAR: The presentation on the  
25 modeling will cover the -- the primary models that are



1 used in evaluating the changes and system components  
2 associated with the California WaterFix. Those two main  
3 models are CalSim II model, and we'll discuss the details  
4 of it, and the DSM-2 model.

5 I'll then talk about the California WaterFix  
6 scenarios and the associated assumptions; discuss the  
7 modeling results as they relate to deliveries and --  
8 deliveries, exports and storage conditions.

9 And then my portion of the -- of the direct  
10 testimony will transition and Dr. Nader-Tehrani will lead  
11 the Delta salinity water level modeling results, and I  
12 believe each of us will summarize the findings from --  
13 from our respective testimony.

14 Next slide, please.

15 (Document displayed on screen.)

16 WITNESS MUNÉVAR: So, before we begin and start  
17 talking about details of individual models, I wanted to  
18 really set the stage in terms of what we talk about in  
19 terms of our models, how are they used, and how are they  
20 useful?

21 Mathematical models, like the ones we're going  
22 to discuss today, are -- are really descriptions of -- of  
23 an object, or a phenomenon, or a resource, or a  
24 management of resource that has important characteristics  
25 with the real object or phenomenon. They are, by their

1 nature, models, though. They are simplifications of  
2 those -- those real -- real systems.

3 So keep that in mind as we go through.

4 The next slide, please.

5 (Document displayed on screen.)

6 WITNESS MUNÉVAR: So as we look at what is  
7 that -- that real system that we're trying to  
8 characterize, we have a very intense -- here in the  
9 Central Valley, a very intensely integrated hydrologic  
10 system with snowpack in the -- in high elevation, runoff  
11 into reservoirs, management of those reservoirs, stream  
12 flows, diversions for agricultural and municipal water  
13 users, return flows, flows that reach the Delta, motion  
14 connectivity within salinity gradients.

15 All of that is -- is the real system that we're  
16 trying to emulate in -- in the modeling.

17 Next slide.

18 (Document displayed on screen.)

19 WITNESS MUNÉVAR: And overlaying that intensely  
20 integrated hydrologic system is a -- is a very intensely  
21 intertidal water system as well, both from State and  
22 Federal water projects as shown on this figure, as well  
23 as local projects that -- that integrate and interplay  
24 with the management of water resources in the Central  
25 Valley.

1           Next slide, please.

2           (Document displayed on screen.)

3           WITNESS MUNÉVAR: So the modeling approach that  
4 we're going to discuss today is going to cover the two  
5 main models, the CalSim II model and the DSM-2 model.

6           The CalSim II model is operating over an  
7 82-year timeframe on a monthly time-step. And you can  
8 think of it as, it's the accounting model for -- for  
9 water resources from the upper end of the watershed to  
10 the lowest points in the watershed.

11           It produces river flows, reservoir storage,  
12 diversions and deliveries.

13           And as -- as we approach the Delta, the  
14 bound -- the -- the results from the CalSim model become  
15 input into our next more-detailed description of model,  
16 which is DSM-2, which then takes those -- those monthly  
17 flows, monthly diversions, and simulate Delta  
18 hydrodynamics on a 15-minute time-step, channel flows,  
19 velocities and stage.

20           And another component of the DSM-2 model is the  
21 DSM-2 Qual which overlays the DSM-2 hydrocomponent and  
22 simulates the water qualities, so we're looking at  
23 salinity in terms of electrical conductivity and  
24 chloride.

25           We move from a very -- very coarse monthly

1 time-step model to a very detailed 15-minute time-step  
2 model in trying to capture the tidal hydrodynamics within  
3 the Delta.

4 Next slide, please.

5 (Document displayed on screen.)

6 WITNESS MUNÉVAR: So a brief overview of the  
7 two models that we'll be talking about today.

8 CalSim II. CalSim II simulates long-term  
9 operational scenarios. The best of SWP and CVP  
10 incorporates the Coordinated Operations Agreement, which  
11 is a share of -- which delineates the share of  
12 obligations between the Central Valley Project and the  
13 State Water Project.

14 Like I mentioned, it operates on a monthly  
15 time-step. And, really, it's a model that can be used  
16 for various conditions in terms of looking at different  
17 levels of development, different aspects of climate  
18 change or hydrology, various facilities or different  
19 regulations.

20 It represents the best-available tool for  
21 long-term planning of SWP/CVP system. It's been used in  
22 numerous Biological Opinions.

23 DWR uses it as part of their Delivery  
24 Capability Report. And DWR has agreements with this  
25 Board to apply the modeling and -- for various purposes.

1           As with both models that we'll talk about  
2   today, the models are most appropriately used as -- for  
3   comparative purposes, so not as predictive -- as  
4   predictive outcomes.

5           Now, you've heard from the -- from the  
6   Operations Panel the amount of flexibility and real-time  
7   decision-making that goes on within the real-time  
8   operations.

9           You can think of the CalSim II model as  
10   essentially trying to develop rules that mimic that  
11   operation but over a very long time frame and a range of  
12   hydrology.

13           So it is a -- it is a planning tool to be used  
14   in comparative mode and shouldn't be used to -- to  
15   replicate historic conditions.

16           Next slide, please.

17           (Document displayed on screen.)

18           WITNESS MUNÉVAR: And I hope the Board -- I  
19   don't expect you to be able to read this, but the point  
20   of putting this slide up here was just to give you an  
21   indication of how detailed the CalSim II model is.

22           There is roughly 400 nodes within the CalSim II  
23   model. Each one of those nodes simulates either a flow  
24   through a junction, a diversion, a storage. And on many  
25   of those notes, there are rules that dictate the -- the

1 timing of diversions, the amount to store, the amount to  
2 release.

3 It represents hydrology and operations from  
4 essentially the Trinity -- Trinity Lake and Shasta  
5 Reservoirs in the most upper portion of the system to the  
6 terminal reservoirs of the State Water Project.

7 It is -- It is a complex network so I mentioned  
8 hundred of nodes, and each one of those nodes represents  
9 essentially a mass balance point where -- where we're  
10 characterizing inflow, outflow and operational criteria  
11 or diversions.

12 Next slide, please.

13 (Document displayed on screen.)

14 WITNESS MUNÉVAR: The DSM-2 model, on the other  
15 hand, is simulating the 15-minute hydrodynamics and water  
16 quality components. It's looking at tides, and tidal  
17 flows, water levels and water quality. And so, by  
18 necessity, it requires a shorter time-step in order to  
19 characterize the tidal hydrodynamics.

20 The CalSim II model was developed jointly by  
21 DWR and the Bureau of Reclamation. And DWR is the  
22 primary lead developer on the Delta simulation model.

23 Next slide, please.

24 (Document displayed on screen.)

25 WITNESS MUNÉVAR: And, unfortunately, there are

1 a few animations. You might want to click -- click  
2 through a few, if you could.

3 (Advancing through graphics.)

4 WITNESS MUNÉVAR: So this -- this graphic here  
5 represents the network for the DSM-2 model in the Delta.  
6 Each one of the orange dots represents a node, and then  
7 there are channels between the nodes.

8 The blues are the boundaries that come from  
9 CalSim II, so we're looking at flows -- flows on the  
10 Sacramento, flows on the San Joaquin, tributary flows  
11 from the east side streams, flows to the Yolo bypass, and  
12 then diversions, diversions that are removed from the  
13 system, and those essentially become the inputs to -- to  
14 the DSM-2 model.

15 And if you click one more time.

16 (Advancing through graphics.)

17 WITNESS MUNÉVAR: Maybe one more time.

18 (Advancing through graphics.)

19 WITNESS MUNÉVAR: We also have Delta Island  
20 consumptive use for agricultural diversions or return  
21 flows within the Delta itself.

22 And then the tidal boundaries are shown by  
23 the -- the squiggly line here to represent the tide  
24 conditions which become the -- the westerly forcing for  
25 the DSM-2 model.

1 All right. The CalSim II model has an input  
2 hydrology in demand, so over the course of the 82-year  
3 hydrology that it simulates, its current simulation is  
4 from 1922 to 2003 on a monthly time scale. It has input  
5 hydrology and demands associated with -- with all of the  
6 various water right holders or contractors.

7 It doesn't represent the historic conditions.  
8 So while we look at 1922 to 2003, it reflects the  
9 hydrology and the climate that existed over that period  
10 and matches that on top of current -- current land use  
11 and -- and projected demand conditions.

12 It represents the system and CVP/SWP and other  
13 operations, and the primary simulated parameters are --  
14 are river flows, storage conditions, and diversions and  
15 exports.

16 Next slide, please.

17 (Document displayed on screen.)

18 WITNESS MUNÉVAR: The main Delta constraints  
19 that are included within the CalSim II model are the Old  
20 and Middle River flows, which are either set for  
21 biological bases but, in -- within the model become  
22 limitations on the amount of water that can be diverted  
23 from South Delta, minimum required Delta outflows,  
24 which -- which dictate the amount of flow that must flow  
25 out the Delta, including the X2 requirements during



1 February through June, export-inflow ratios limiting the  
2 amount of export from South Delta, Delta salinity  
3 objectives, San Joaquin inflow/export ratios, not to be  
4 confused with the export/inflow ratio, cross channel gate  
5 operations, Rio Vista flows, and Head of Old River Gate.

6 So all of these are included within the  
7 CalSim II model as representations of the operations and  
8 the required flow parameters associated with operation of  
9 SWP and the CVP.

10 Next slide, please.

11 (Document displayed on screen.)

12 WITNESS MUNÉVAR: The D-1641 water quality  
13 objectives.

14 While CalSim is a -- is a monthly model and  
15 water quality objectives require an understanding of the  
16 hydrodynamics in the water quality movement and salinity  
17 movement within the Delta, there's a unique aspect of the  
18 CalSim II model which includes an artificial neural  
19 network, which is essentially a submodel that is included  
20 within CalSim that attempts to emulate the flow salinity  
21 relationships that are understood and predicted by DSM-2.

22 So they correlate Delta inflow, Delta  
23 diversions, cross channel gate operations, and tidal  
24 energy to electrical conductivity at various locations in  
25 the Delta.

1           And those -- those projected salinity values  
2           then drive the type of operation that could exist that  
3           would still meet the -- the D-1641 salinity objectives.

4           Next slide, please.

5           (Document displayed on screen.)

6           WITNESS MUNÉVAR: Now, within the CalSim II  
7           model, there are a number of D-1641 objectives that are  
8           included within the artificial neural networks. They're  
9           the flow salinity relationships.

10           For the M&I and industrial use locations, we  
11           have Old River at Rock Slough and Banks and Jones Pumping  
12           Plants. For the agricultural beneficial uses, we have  
13           Sacramento River at -- at Emmaton and San Joaquin --  
14           San Joaquin River at Jersey Point. And then for Fish and  
15           Wildlife beneficial uses, we have Sacramento River at  
16           Collinsville.

17           Based on a history of discussions with  
18           Operators, the understanding is that if we are meeting  
19           the salinity at these locations, it's very likely that  
20           we'll be meeting salinity at all locations within the  
21           Delta. These are locations that Operators use to drive  
22           their operations.

23           Next slide, please.

24           (Document displayed on screen.)

25           WITNESS MUNÉVAR: As I mentioned, the use of

1 both models is most appropriate as a comparative -- in a  
2 comparative analysis.

3 So this cartoon here is meant to reflect how  
4 we -- how we utilize the model for California WaterFix  
5 and the most appropriate use of these models.

6 We -- There's always a base case, which  
7 represents a best representation of -- of the -- of the  
8 conditions that would exist in the absence of the action,  
9 or the facility that was to be evaluated.

10 Then we essentially prepare another simulation  
11 that has only those change -- it adopts all those  
12 conditions that are part of the base case and only makes  
13 the changes for the actions that we're actually trying to  
14 evaluate.

15 So the comparison between what we're calling  
16 the model scenario in the base case represents the -- the  
17 anticipated range of impacts associated with those  
18 actions.

19 Okay. Next slide, please.

20 (Document displayed on screen.)

21 WITNESS MUNÉVAR: So, for the -- the  
22 presentation here today and within my testimony, there is  
23 a -- a range of modeling scenarios that were prepared.

24 There's a No-Action Alternative which  
25 represents the conditions in the absence of the -- of the

1 California WaterFix.

2 Then there's California WaterFix, what we're  
3 calling initial operational range scenarios. I think  
4 most of the panelists have already discussed that but  
5 these are the H3 and H4 op -- initial operating range.

6 And then in order to inform the -- the Board in  
7 terms of understanding the -- the broader range and its  
8 effect on -- on uses of water or users of water, the  
9 boundary scenario, Boundary 1 and Boundary 2 have been  
10 developed.

11 Just as a reminder, Boundary 1 and --  
12 Boundary 1 represents a lower outflow condition and  
13 Boundary 2 represents a higher outflow condition.

14 The next slide, please.

15 (Document displayed on screen.)

16 WITNESS MUNÉVAR: I believe this -- this chart  
17 was also presented in at least one other panel  
18 presentation.

19 But as a reminder, as we go through the  
20 model -- modeling and modeling results, these are the  
21 main criteria that are changing associated with the  
22 scenarios that we're going to present today.

23 We have the No-Action Alternative, so the rose  
24 represent the -- the scenarios that we're presenting here  
25 today, and then the columns represent the main features

1 or -- both operational and physical, that are -- that are  
2 associated with each of the scenarios.

3 So if we work kind of across starting with the  
4 No-Action. So the No-Action does not have the North  
5 Delta through the 9,000 cfs North Delta Diversion.

6 It does include Fall X2. It has outflow  
7 requirements per D-1641. It has the -- the Biological  
8 Opinion criteria for the San Joaquin River inflow/export  
9 ratio. It has Old and Middle River flow requirements per  
10 the Biological Opinions. And it has the -- the temporary  
11 barrier installed in the fall months in association with  
12 the Head of Old River.

13 If we work our way down the rows, so  
14 Boundary 1, which represents our lower outflow scenario.  
15 It has -- It's all -- Boundary 1, H3, H4 and Boundary 2  
16 all have the 9,000 cfs diversion and they have the  
17 identical operating criteria associated with them.

18 Boundary 1 excludes the Fall X2 to reflect that  
19 outer range. It has outflow per D-1641, and it -- all of  
20 the alternative, Boundary 1, H3, H4 and Boundary 2,  
21 remove the San Joaquin inflow/export ratio and replace it  
22 in most of the scenarios with more restrictive Old and  
23 Middle River flow requirements.

24 And all of the California WaterFix scenarios  
25 have a permanent gate at the Head of Old River.

1 Boundary 1 operates consistent with the temporary barrier  
2 in the fall.

3 H3 -- So H3 and H4 are the proposed initial  
4 operation range. They all have the North Delta  
5 Diversion. They all include the Fall X2, part of the  
6 Biological Opinions. H3 has outflow requirements per  
7 D-1641. H4 has outflow requirements per D-1641 but then  
8 has -- in addition, has increased outflow during March  
9 through May.

10 And both H3 and H4 have more restrictive Old  
11 and Middle River requirements in the South Delta that --  
12 that limit the amount of South Delta exports that can  
13 occur.

14 And then, finally, both H3 and H4 have the  
15 permanent operable gate, operating both in fall, Winter  
16 and -- and spring. And during the spring period -- We'll  
17 get into this a little bit more on a subsequent slide.  
18 But during spring period, there's a partial operation of  
19 the Old -- of the gates and that they're essentially  
20 leaky gates at that point, so some water's flowing  
21 into -- into Old River as well as maintaining on the  
22 San Joaquin River.

23 And then Boundary 2, which represents our high  
24 outflow scenario, again, has the North Delta Diversion,  
25 it has Fall X2, it has substantially higher outflow goals

1 in all months, so not just the spring. And then it has  
2 more restrictive Old Middle River flow requirements  
3 throughout the year. And the Head of Old River Gate,  
4 it's same -- it's the same gate that's in there but is  
5 operated during spring as a -- as a full closure in this  
6 modeling scenario.

7 Okay. Next slide, please.

8 (Document displayed on screen.)

9 WITNESS MUNÉVAR: Okay. So I'm going to  
10 provide a little bit more detail on the -- the main  
11 operating criteria associated with -- with each of these  
12 scenarios and the sub -- set of slides.

13 Next slide, please.

14 (Document displayed on screen.)

15 WITNESS MUNÉVAR: So the No-Action, again,  
16 represents a continuation of -- of policy and management  
17 direction. It includes the implementation of the water  
18 operation components of the -- of the RPAs, 2008 and  
19 2009, for -- for smelt and the NBS Biological Opinion.

20 Next slide.

21 (Document displayed on screen.)

22 WITNESS MUNÉVAR: It includes a future level of  
23 development, and what we're presenting today is around --  
24 a period around 2025-2030.

25 It considers climate change at that same

1     timeframe. So we have sea-level rise on the order of 15  
2     centimeters, or six inches. We have changes in -- in  
3     precipitation and temperature that affect the watershed  
4     runoff conditions.

5             They do not include the San Joaquin River  
6     Restoration flows. And in large part, that was because  
7     of the lack of clarity on the recaptured component of the  
8     San Joaquin River flows.

9             And the No-Action also includes a -- a modified  
10    Fremont Weir notch which allows more frequent integration  
11    of the Fremont Weir, of the -- the old bypass at the  
12    Fremont Weir.

13            Thank you.

14            So, the common -- The first thing I'm going to  
15    go through is some common features associated with  
16    California WaterFix scenarios. Each of them includes the  
17    dual conveyance, so they have existing South Delta  
18    Diversion and pumps. They have the proposed North Delta  
19    Diversions using the same criteria.

20            The new facilities are the three new intakes,  
21    each of 3,000 cfs for a total of 9,000 cfs total North  
22    Delta Diversion capacity, and they have the permanent and  
23    operable Head of Old River gate.

24            Next slide, please.

25            (Document displayed on screen.)



1           WITNESS MUNÉVAR: So, additional operational  
2 requirements that are common across the -- the scenarios,  
3 the California WaterFix scenarios, are the bypass flows  
4 and sweeping velocity requirements associated with the --  
5 the North Delta Diversion, the additional Old and Middle  
6 River flow requirements that limit CVP and SWP  
7 diversions.

8           And there's an extension or addition of January  
9 through August Rio Vista minimum flow requirements that  
10 have been adopted in all of the California WaterFix  
11 scenarios.

12           Okay. So, in terms of . . .

13           In terms of the more restrictive South Delta  
14 operations, in many of the scenarios, we have Old and  
15 Middle River flow restrictions that -- that extend  
16 earlier in the year in pretty much all of the scenarios.

17           We have more restrictive Old and Middle River  
18 requirements in the normal and wet years, during October  
19 through June. And the April through June period, we have  
20 Vernalis-based, Old and Middle River-based requirements.  
21 So the Old and Middle River requirements are based on the  
22 amount of flow in Vernal -- in the San Joaquin and  
23 Vernalis during April and May.

24           And, then, during October through June, we have  
25 the Head of Old River gate operations that are more

1 restrictive.

2 Next slide, please.

3 (Document displayed on screen.)

4 WITNESS MUNÉVAR: Looking at the North Delta  
5 Diversion, we have bypass flow requirements. These  
6 govern the amount of flow that is required to remain in  
7 the river downstream of the intakes.

8 There's a -- a range of -- of criteria  
9 associated with the initial pulse-off protection. So  
10 this is a criteria to -- to allow the first pulse flow  
11 that may be an attractive element for fisheries to allow  
12 that to bypass. There are low-level pumping at intake  
13 during that pulse period.

14 And then following the pulse protection, there  
15 are what we called post-pulse operations which extend all  
16 the way through June. And there are three levels of  
17 post-pulse protections that incrementally adjust for  
18 Level 1, Level 2, Level 3, depending upon the hydrology  
19 of the year.

20 So, as the year becomes wetter and wetter, we  
21 would move from the Level 1, which is the most protected  
22 from a fishery standpoint, to Level 2 to Level 3.

23 So they're -- they're -- We call them  
24 progressive curves, but they're -- they're moving off.  
25 As the year becomes wetter and wetter, the amount of

1 bypasses that is required is less for the same of flow.

2           Okay. And then, finally, we have approach and  
3 sweeping velocity requirements at the North Delta fishery  
4 screens.

5           Okay. The next slide.

6           (Document displayed on screen.)

7           WITNESS MUNÉVAR: So moving off of all the  
8 words that were on the slide and trying to get to -- to a  
9 graphic that reflects these rules.

10           This -- This graphic is entitled "Sacramento  
11 River Proposed December through April North Delta Bypass  
12 Flow Rules."

13           We could do a similar one for May, we could do  
14 a similar one for June. There's just -- They're slightly  
15 different values.

16           But during the September through April period,  
17 the graphic that's -- that's shown here, the black dashed  
18 line -- Well, let me start with the axes.

19           The X-Axis represents the Sacramento River flow  
20 upstream of the proposed North Delta Diversions.

21           The Y-Axis represents the amount of bypass flow  
22 that would be required at that flow upstream of the  
23 diversion.

24           The dashed black line represents essentially no  
25 diversion, where you're bypassing a hundred percent of

1 the flow. So that's -- that's provided for -- as a  
2 reference point for you.

3 The constant low-level pumping is presented as  
4 the yellow line that -- that starts to parallel that,  
5 that no-diversion dashed line.

6 And then we have three different colored lines  
7 here: Blue representing the Level 1 bypass criteria; the  
8 red line representing the Level 2 bypass criteria; and  
9 the green representing the Level 3 bypass criteria.

10 So, in this graphic here, we've presented the  
11 amount of bypass flow, assuming we were at Level 3, so  
12 assuming we had 15,000 cfs of flow upstream of the  
13 intakes.

14 Reading off of this curve, which is really just  
15 a graphical representation of the tables you've seen  
16 before, 12,000 cfs would be required to bypass -- bypass  
17 the North Delta facilities, in which case 3,000 cfs is  
18 the maximum allowable diversion.

19 As you can see from the blue lines and the red  
20 lines, if we were in Level 1 or Level 2, the diversion  
21 would be even less than that amount, that 15,000 cfs.

22 And then as we have flow out above the 30,000  
23 cfs, even in the Level 1, there's full 9,000 cfs of  
24 diversion could be -- could be taken at that point.

25 Okay. So that was meant to -- to help you

1 dissect the complex tables that describe these rules.

2           The next two slides present an example of this  
3 operation for two different years, two different types of  
4 years.

5           So the next slide.

6           (Document displayed on screen.)

7           WITNESS MUNÉVAR: This next slide is an  
8 illustrative example for 1987, which was a very -- was a  
9 dry year, and I'll walk through this one slowing as well.

10           So, we're showing October through September on  
11 the X-Axis with time, and then the heavy black line  
12 represents the Sacramento River at Freeport. So, again,  
13 this is flow upstream of the intakes.

14           The red line represents the bypass requirement  
15 associated with those tables.

16           The green line represents the simulated  
17 diversion.

18           And then the blue line represents the actual  
19 bypass flow, so the total flow at Freeport minus the  
20 diversion. So there's a requirement and an actual flow.

21           And then as you -- And then the shading reads  
22 off of the far right vertical axis, which is just  
23 letting -- which is indicating what level of pumping is  
24 operable under various timeframes.

25           And so -- So you can see it's -- it's set at one

1 for the -- if we start in October. We're -- We set it  
2 ourselves at Level -- Level 1 pumping.

3 There is a pulse flow that occurs somewhere in  
4 the first -- looks like in the first week of February is  
5 the -- the first pulse that's there. And that pulse is  
6 protected in that pumping is not raised, even though the  
7 flows have increased.

8 So the bypass criteria in and of themselves  
9 would allow a larger diversion than in that -- in that  
10 early February time period.

11 Then after that pulse, initial pulse, has  
12 passed, then we -- then the flows continue to -- to be  
13 large -- high flows through the next several weeks, it  
14 looks like. And diversions are responding based on a  
15 Level~1 criteria. That's what the green line,  
16 representing the diversion, is responding to the  
17 hydrograph of the -- the Sacramento River at Freeport.

18 And, then, as you can see after those two  
19 storms -- or the storms that look like they petered out  
20 around the end of March, and then we went back to  
21 relatively dry conditions. We have low -- low diversions  
22 throughout the rest of the year.

23 Then when we get into the July timeframe, you  
24 can see the red line, which represents the bypass -- the  
25 required bypass drops because we're outside of the main

1 period of fishery concerns, so we're down to the 5,000  
2 cfs bypass criteria.

3 And you can see in the October and November  
4 period that was at 7,000 cfs.

5 Okay. Next slide, please.

6 (Document displayed on screen.)

7 WITNESS MUNÉVAR: So we're going to contrast  
8 now 1993 with that 1987, so it's, again, the same -- same  
9 line, same legends, for a very different hydrologic  
10 condition. This was a -- It was an above-normal year but  
11 I -- but it was really quite wet on the lower part of the  
12 Sacramento.

13 You can see we've had -- we have pulse flows  
14 there that are in excess of 70,000 cfs when we get into  
15 the -- into the -- into the March timeframe.

16 So it's the same -- the same sets of -- of  
17 operations here. But you can see we quickly moved --  
18 After the initial pulse which, again, is protective, that  
19 pulse is -- looks like it's mid -- around mid-December  
20 that pulse occurred. And that first pulse, again, is  
21 protected. There's no increase in the -- in the pumping  
22 rates during that initial pulse.

23 Then it becomes very wet for a -- for a number  
24 of weeks. And we move from the Level 1 pumping in the --  
25 in the January timeframe, moved into Level 2 criteria in

1 the February timeframe. And looks like, by the end -- by  
2 the end of February, we have moved -- moved into Level 3  
3 pumping.

4 So -- So this is hopefully helpful in -- in  
5 explaining how the operating criteria moved from Level 1,  
6 Level 2, Level 3.

7 You can see the diversions went to 9,000 cfs  
8 and were sustained there for -- for one to two months.

9 And then other criteria came into play where we  
10 reduced the diversion. We had already filled storage in  
11 San Luis. So while additional diversion could have  
12 occurred, there was not diversion because we were full in  
13 the San Luis Reservoir.

14 And then we moved into the -- into the July  
15 and -- July timeframe, where we're now moving mostly  
16 stored water to the North Delta intake.

17 Okay. The next -- the next slide -- so now  
18 transitioning --

19 Next slide, please.

20 (Document displayed on screen.)

21 WITNESS MUNÉVAR: -- transitioning to the Delta  
22 outflow assumptions.

23 So what I -- The previous slides on the North  
24 Delta Diversion, that set of criteria is -- is identical  
25 in all of the California WaterFix scenarios.



1           The Delta outflow assumptions, however, are --  
2 are different between the scenarios.

3           The No-Action and the -- the H3 scenario have  
4 the numbers that are shown in the table on the left, so  
5 they're D-1641 requirements and the Biological Opinions.

6           That shaded region February through June, those  
7 numbers are superseded by the X2 criteria, so they're --  
8 it's very difficult to partake in X2 on this table, but  
9 that's what the shading represents, that X2 criteria is  
10 included.

11           And then the green shading in that table  
12 represents the Fall X2 as part of the Biological Opinion,  
13 so outflow for Fall X2.

14           Okay. The Boundary 1 scenario is the same as  
15 that table on the -- on the left with the exception of  
16 the Fall X2 is not included. So the green shaded areas  
17 do not have the -- the outflow requirements that are  
18 listed in -- in the table on the left.

19           And then -- And then Boundary 2 scenario, which  
20 is shown on the right, has -- You can see the numbers are  
21 substantially higher with significantly higher outflows  
22 throughout the -- throughout the year and across the year  
23 types, up to 44 or 45/100ths cfs in -- in wet springs but  
24 also significant increases in the -- in the fall as well.

25           And the H4 scenario has the same requirements

1 as the -- as the table on the left, the No-Action and the  
2 H3, except it -- except during the March through May  
3 period, and it has higher outflow conditions that are --  
4 that are listed in one of the exhibits we will walk  
5 through.

6 And those outflow condition -- Those outflows  
7 are March through May as a -- as -- based on an  
8 exceedance criteria, so they're targeting higher --  
9 higher flows in March through May period.

10 Okay. Next slide, please.

11 (Document displayed on screen.)

12 WITNESS MUNÉVAR: I'm looking at the Old and  
13 Middle River flow requirements, so Scenarios H3 and H4 of  
14 the California WaterFix have the -- the criteria that's  
15 shown on the -- on the left. These are flows no more  
16 negative than the numbers shown here in this table.

17 There's also Fish and Wildlife Service, RPA,  
18 which sets the Old and Middle River requirements. So  
19 we've done in the modeling, is, it's either the RPA or  
20 the numbers in this table, whichever is more restrictive.  
21 That becomes the -- the governing rule in our modeling.

22 Then on the right is Boundary 2, which, as you  
23 can see, has -- has extended the Old and Middle River  
24 flow criteria all the way through the summer. It has  
25 more restrictive or more criteria in the fall, and the

1 spring-based criteria is substantially more -- more  
2 restrictive during March -- March through June period.

3 In both the -- In April, May and June of both  
4 tables, there -- there are Old and Middle River flow  
5 requirements that are based on the analysis that  
6 triggered off of the hydrology on the San Joaquin side.

7 Okay. And then the Boundary 1 has the same  
8 operations as the No-Action.

9 Next slide, please.

10 (Document displayed on screen.)

11 WITNESS MUNÉVAR: Okay. Kind of in partnership  
12 with Old and Middle River requirements, when you think  
13 about it in terms of geographic and the -- and its effect  
14 on flows, we have the Head of -- Head of Old River Gate  
15 assumptions, and on the left here are Scenarios H3 and 4,  
16 what -- and they're permanent operable gates.

17 What's indicated in the table when it's in/out  
18 mean -- is that they're modeled or simulated to be  
19 operable 50 percent of the time during that month. And  
20 when they're indicated as out, it just meant that the  
21 gates are open, and when that's -- when it's in entirely,  
22 it's meant the gates are closed.

23 You can see in Boundary 2 during the March,  
24 April, May and June period, the gates are closed for that  
25 entire period as simulating a model.

1           And then Boundary 1 has the same operations  
2 associated with the -- with the No-Action.

3           Next slide, please.

4           (Document displayed on screen.)

5           WITNESS MUNÉVAR: Okay. I know those tables  
6 are -- They take some time to understand, but I wanted to  
7 give you a little bit more detail than what's been  
8 provided thus far.

9           So, for each of the -- the modeling scenarios,  
10 the No-Action and the four California WaterFix scenarios,  
11 we've -- we've developed CalSim -- CalSim II modeling  
12 runs for the 82-year time period. And in the following  
13 slides, I'll present a summary of the results.

14          Next slide.

15          (Document displayed on screen.)

16          WITNESS MUNÉVAR: We'll start with -- with  
17 deliveries to North- and South-of-Delta water users.

18          We'll then move to Delta Diversions from the  
19 SWP and CVP, looking at both the existing South Delta  
20 Diversion and the North Delta Diversion.

21          And then we'll look at end-of-September storage  
22 for SWP and CVP Reservoirs.

23          Okay. Next slide, please.

24          (Document displayed on screen.)

25          WITNESS MUNÉVAR: So, starting with the

1 North-of-Delta deliveries --

2 And you can advance one more.

3 (Document displayed on screen.)

4 WITNESS MUNÉVAR: The charts that follow will  
5 all have the same look, so I'll orient you on the first  
6 one here.

7 They're all -- There are five different bars  
8 indicated, and on the -- the left side of bars are the  
9 long-term average deliveries to -- in this case, this is  
10 the Sacramento -- CVP Sacramento settlement contractor  
11 deliveries.

12 The next set is separated out by wet year types  
13 using the 40-30-30 index, then above normal, below  
14 normal, dry and critical. And the values on the table  
15 below are just the same values that apply.

16 So that -- The dark -- The black bar here  
17 represents the No-Action; the next one to the left  
18 represents Boundary 1; then we have H3 followed by H4;  
19 and, then, finally, the Boundary 2 is the far right bar  
20 in each one of these.

21 Okay. So looking at Sacramento -- soon-to-be  
22 Sacramento Settlement Contractors, in these -- in these  
23 modeling simulations, there are essentially identical  
24 deliveries across all of the WaterFix scenarios as  
25 compared to the -- to the No-Action.

1           There's less than 1 percent change in the  
2 critical year types. In all other year types, there's --  
3 there's no change.

4           Next slide.

5           (Document displayed on screen.)

6           WITNESS MUNÉVAR: I'm going to go through  
7 different -- different water users or contractors here.

8           Similarly here, now we're going at the North --  
9 CVP North-of-Delta refuge water, water supply deliveries.

10          And we see a similar result here in that we  
11 have essentially identical deliveries to -- to these  
12 contractors in -- in the No-Action and the WaterFix  
13 scenarios.

14          Again, we have some small change in the  
15 critical year types. It's less than 1 percent.

16          Now, all of these contractors that I'm showing  
17 right now are -- are given priority in terms of -- of  
18 water delivery, so we would not expect to see a change in  
19 their -- in their deliveries as part of the -- the  
20 operation.

21          The next -- Next slide, please.

22          (Document displayed on screen.)

23          WITNESS MUNÉVAR: Next -- This one here's  
24 showing the CVP Exchange Contractor deliveries.

25          We essentially have no changes between the

1 No-Action and the WaterFix scenarios.

2 Next slide.

3 (Document displayed on screen.)

4 WITNESS MUNÉVAR: It shows CVP South-of-Delta  
5 Refuge water supply deliveries, and these are Level 2  
6 demands.

7 We have essentially some identical numbers. In  
8 critical years, we have less than half a percent  
9 difference under the H4 scenario.

10 The next slide, please.

11 (Document displayed on screen.)

12 WITNESS MUNÉVAR: So the -- Now, as we move to  
13 water Service Contractors, we don't see the same result  
14 because there's -- the water supply and the conditions  
15 are -- they're -- the deliveries to these contractors are  
16 very sensitive to the -- to the facilities operation and  
17 the hydrology in the system.

18 So we see quite a bit of difference here.

19 We -- In -- In all year types in Boundary 1, H3 and H4,  
20 we see increases in deliveries to CVP North Delta Ag  
21 Water Service Contractors.

22 Under the Boundary 2 scenario, we show -- we  
23 show some decreases in dry and critical years. And  
24 they're less than five percent in those dry and critical  
25 years under the Boundary 2 scenario.

1           Okay. Next slide.

2           (Document displayed on screen.)

3           WITNESS MUNÉVAR: The next slide is now showing  
4 CVP North Delta M&I Water Service Contractor deliveries.  
5 And similar to the -- to the ag water service deliveries  
6 for North of Delta, we're seeing increase in all water  
7 year types with the California WaterFix scenarios B1, H3  
8 and H4 and a -- a relatively -- a small decrease in  
9 the -- in the dry year deliveries under Boundary 2  
10 scenario of about 1 percent.

11          Next slide, please.

12          (Document displayed on screen.)

13          WITNESS MUNÉVAR: Moving to the SWP, we're  
14 looking now at the Feather River -- the State Water  
15 Project Feather River Service Area Contractor deliveries.  
16          And in . . . In all of the California WaterFix  
17 scenarios, we have either equal or -- or higher delivery  
18 to Feather River Service Area Contractors.

19          And the increases in -- in critical years are  
20 less than five percent.

21          Next slide, please.

22          (Document displayed on screen.)

23          WITNESS MUNÉVAR: So the largest demand on the  
24 system, both SWP and CVP, is associated with the  
25 South-of-Delta Water Service Contractor deliveries.



1 And -- And -- And they're -- The deliveries and  
2 allocations to these particular contractors is extremely  
3 sensitive to the -- the requirements that are put on the  
4 system and facilities that are -- that are operating.

5 So that's why we see a really large variability  
6 associated with the -- the deliveries to these  
7 contractors. We've combined SWP and CVP South-of-Delta  
8 Contractor deliveries.

9 Under the B1 -- the Boundary 1 scenario, which,  
10 again, had the lower outflow, less restriction on the  
11 operation, we have deliveries that are on the order of  
12 1.1 million acre-feet higher than the No-Action. That's  
13 a long-term average, so we're looking at the first set of  
14 bars.

15 The Boundary 2, which is the darker gray there,  
16 represents about 1.1 million acre-feet lower than  
17 No-Action as long-term average.

18 The scenario H4 is -- is almost the same as  
19 No-Action as -- as a long-term average.

20 And then the scenario -- the WaterFix scenario  
21 H3 represents about 450,000 acre-feet increase above  
22 No-Action.

23 Okay. Next slide, please.

24 (Document displayed on screen.)

25 WITNESS MUNÉVAR: So -- So that -- that's a

1 summary of the -- of the delivery numbers that we're --  
2 that are part of the modeling.

3 I'm transitioning now to the diversions, so I'm  
4 looking at SWP and CVP Diversions from Jones and Banks.

5 Go to the next slide.

6 (Document displayed on screen.)

7 WITNESS MUNÉVAR: So this one is plotted --  
8 again, these are the same scenarios -- plotted as an  
9 exceedance. So think of the far left as being the -- of  
10 the 82 years of hydrology, there are 82 points plotted  
11 here -- we can't see the points, but there are 82 points.  
12 The lowest diversion or export point would be the one to  
13 the far left, and the year that had the highest amount of  
14 export would be to the far right.

15 The black line that is in the middle there  
16 represents the No-Action. And so this is giving you a  
17 sample of how the exports vary across the whole range of  
18 hydrology.

19 So we had exports of 2 million up to . . .  
20 upwards of 6 million at the far end under the No-Action.

21 You can see that Boundary 1 and Boundary 2,  
22 they reflect the envelope around the -- the No-Action,  
23 the whiter envelope, with the Boundary 1 being -- Sorry.  
24 Boundary 1 being higher than the No-Action in Boundary 2  
25 because of the restrictions and outflow being

1 substantially lower than the No-Action.

2 And then you can see the California WaterFix H3  
3 and H4 scenarios are on either side of the -- the  
4 No-Action exports until we get to the really high -- the  
5 wetter years, which is the far right of -- of this chart.

6 I think other -- Another thing to point out on  
7 this chart is the -- is the relatively small or no change  
8 that occurs on the far left side of the plot, so  
9 representing those drier conditions.

10 So, really, one aspect of the WaterFix was  
11 really to take advantage of wetter flow periods and  
12 wetter years and not to have increased diversions in --  
13 in many of those dry years or drier years.

14 Next slide, please.

15 (Document displayed on screen.)

16 WITNESS MUNÉVAR: So, just to give you a feel  
17 of -- of how the export -- the distribution of exports  
18 occurs.

19 So we're going at diversions for both of the  
20 existing South Delta, which is shown in the maroon, and  
21 then the blue stacked on top is the North Delta  
22 Diversion.

23 So we looked at total exports on the previous  
24 chart, and now we're trying to -- trying to show where --  
25 where the exports are coming from.

1            Obviously, under the No-Action, we don't have  
2 North Delta facilities. It's all from the south. That's  
3 our existing operation or existing location.

4            The Boundary 1 has -- has almost a 50-50 split  
5 between South Delta and North Delta Diversion locations.

6            Kind of look to the -- Boundary 2, if we go to  
7 the far right, has about a 60 -- 60 percent of the  
8 diversion occurring from the north, about 40 percent of  
9 the diversion occurring from the south with a lower  
10 overall export.

11           And then H3 and H4 are -- Just -- Just slightly  
12 over 50 percent of the diversions are occurring from the  
13 north, about 50 -- 53, 54 percent as compared to the --  
14 to the south.

15           So one of the primary focuses of -- of the  
16 WaterFix operations -- and the modeling bears this out --  
17 is that we're -- we're reducing our diversion from the  
18 south. We have lots of OMR and export restrictions that  
19 limit that.

20           And then we have increased flexibility to take  
21 water from the North Delta Diversion which takes pressure  
22 off of the -- needing to export from the south so that  
23 lower diversions overall.

24           And you can see H3 and H4 essentially span --  
25 span the range of almost no change from No-Action as a

1 total -- total diversion to a -- to a slight -- to an  
2 increase of about 450, 500,000 under H3.

3 Okay. Next slide.

4 (Document displayed on screen.)

5 WITNESS MUNÉVAR: I'm going to transition to  
6 look at the end-of-September storage. That's the main  
7 SWP and CVP Reservoirs.

8 We can switch to the next slide.

9 (Document displayed on screen.)

10 WITNESS MUNÉVAR: So the first -- What we're  
11 going to walk from Shasta -- Shasta, Oroville, Folsom and  
12 Trinity in the next subsequent slides.

13 Again, they're plotted as an exceedance, so  
14 the -- so the lowest storage years are on the left, the  
15 highest storage years are on the right. In general,  
16 drier years are on the left and wetter years are on the  
17 right.

18 You can see the -- First off, the WaterFix  
19 scenarios are -- are similar or higher end-of-September  
20 storage than in the -- than in the No-Action. In many  
21 cases, they're very -- the lines are essentially on top  
22 of each other.

23 We have a low storage condition that exists  
24 in -- in -- in Shasta in this -- in this modeling. That  
25 is -- is a reflection of the -- the multiple requirements

1 we have on -- on Shasta to provide benefits for -- for  
2 in-stream flows, for -- for temperature, for -- for  
3 exports for Delta requirements. And during those roughly  
4 10 to 15 percent -- for 10 percent of the years where  
5 we're below -- below 1.9, we have -- we have an inability  
6 to meet all of the obligations that are on -- on Shasta.

7 Now, that's a condition that exists in the  
8 No-Action. We have purposely not tried to -- to put  
9 actions into the No-Action to -- to correct that. So  
10 we're really comparing the California WaterFix to the  
11 No-Action.

12 As you heard from the Operations Panel, they  
13 have additional discretion on what types of temperature  
14 releases they provide; that, in some years, they may be  
15 able to work around the conditions that we're showing  
16 here. In others -- In others, they may not, particularly  
17 underneath these scenarios, which all have climate change  
18 and sea-level rise embedded into them. It's adding more  
19 stress to the system.

20 But the California WaterFix scenarios are all  
21 equal or higher storage -- end-of-September storage in  
22 Shasta.

23 Next slide.

24 (Document displayed on screen.)

25 WITNESS MUNÉVAR: The next slide shows Oroville

1 storage. And -- And all of the WaterFix scenarios have  
2 equal or higher storage in Oroville.

3 We see a larger difference in the -- across the  
4 scenarios here, largely because the flexibility that we  
5 add to -- to the -- as part of the North Delta Diversion,  
6 the operations of SWP at Oroville are less constrained  
7 than -- than at Shasta, which are very constrained, which  
8 oftentimes cannot take advantage of the flexibility  
9 that's added to the system. But Oroville's operations  
10 can take advantage of it so we see an increase in  
11 storage.

12 The next slide --

13 (Document displayed on screen.)

14 WITNESS MUNÉVAR: -- shows Folsom Reservoir.

15 We have -- Here, we have similar or higher  
16 storages for -- in the California WaterFix scenarios for  
17 storage levels that are, say, 500,000 acre-feet and  
18 lower.

19 We have -- Under the Boundary 1 scenario, we  
20 have higher storage across the entire range of  
21 conditions.

22 Under the H3, H4 and the Boundary 2 scenarios,  
23 we -- for storage levels that are above 500,000  
24 acre-feet, we have a slight increase -- slight decrease  
25 in storage, end-of-September storage, at Folsom.

1           Okay. Then, finally, the last slide is --

2           (Document displayed on screen.)

3           WITNESS MUNÉVAR: -- is Trinity Lake  
4 end-of-September storage where we -- we have, again,  
5 similar -- similar end-of-September storage for Trinity  
6 Lake.

7           Finally, I'll move to the summary on the next  
8 set of slides here.

9           (Document displayed on screen.)

10          WITNESS MUNÉVAR: So we've developed -- Using  
11 the CalSim II model -- These are all results from the  
12 CalSim II modeling.

13          We've developed, using the -- the -- the latest  
14 operations as part of the California WaterFix comparing  
15 to the No-Action, summary findings for deliveries are  
16 that we don't see substantial deliveries to CVP Exchange  
17 or Settlement Contractors, or Refuge deliveries as part  
18 of this -- these scenarios are presented.

19          Similar outcome for FRSA, the Feather River  
20 Settlement Contractors. We see an increase in the  
21 deliveries to CVP North-of-Delta contractors, both ag and  
22 M&I in some scenarios, but small decreases in dry and  
23 critical year types of development Boundary 2 scenario.

24          And, again, the -- the significant changes that  
25 we see to SWP and CVP water surface contractors south of



1 the Delta, they're really tied to the operational  
2 assumptions that we put in: Higher outflow/reduced  
3 export drives the -- drives the outcomes there.

4 We have an increase of 34 percent under the  
5 least restrictive scenario and then a reduction of  
6 33 percent under the most restrictive scenario.

7 Next slide.

8 (Document displayed on screen.)

9 WITNESS MUNÉVAR: In terms of diversions, we  
10 looked at the results and the Boundary 1 and Boundary 2  
11 essentially show a -- substantial changes in -- in the  
12 diversions, depending upon those -- those assumptions  
13 from basically a 1.2 million acre-feet per year increase  
14 under the Boundary 1, to a 1.1 million acre-feet decrease  
15 under Boundary 2, so a very wide range there.

16 Again, the WaterFix scenarios, H3 and H4, which  
17 are proposed initial operational range, range from  
18 essentially no change from the No-Action to approximately  
19 a 10 percent increase under H3 compared to the No-Action.

20 Next slide now.

21 (Document displayed on screen.)

22 WITNESS MUNÉVAR: This is my last one.

23 This is a summary on the carryover storage.

24 We -- We found no substantial differences to reservoir --  
25 end-of-September reservoir storage. We have small

1 changes that occur at high storage levels. But for the  
2 lower levels that we're primarily concerned with in terms  
3 of operations and protection of carryover, we're not  
4 seeing a -- an increase in the occurrence or the  
5 magnitude of that under the California WaterFix scenario.

6 And, with that, I will conclude my portion of  
7 the presentation.

8 And I don't know how you want to proceed,  
9 whether you want a break or march through.

10 WITNESS PIRABAROOBAN: I would say I would need  
11 about an hour or an hour and 10 minutes for the remaining  
12 portion.

13 CO-HEARING OFFICER DODUC: All right.  
14 Mr. Berliner?

15 MR. BERLINER: Would it be helpful just to give  
16 people five minutes to stretch?

17 CO-HEARING OFFICER DODUC: All right. Let's  
18 take a five-minute break. We'll resume at 11:10.

19 (Recess taken at 11:05 a.m.)

20 (Proceedings resumed at 11:10 a.m.)

21 CO-HEARING OFFICER DODUC: (Banging gavel.)

22 All right. It is 11:10 and we are resuming.

23 And we shall take our lunch break after this  
24 portion of the direct.

25 Please proceed.

1                   WITNESS PIRABAROOBAN: Okay. Let me put on my  
2 glasses first and I'm ready.

3                   Good morning. My name is Parviz Nader-Tehrani.  
4 I'm the Supervising Engineer from the Department of Water  
5 Resources.

6                   Can you hear me okay?

7                   CO-HEARING OFFICER DODUC: Yes.

8                   WITNESS PIRABAROOBAN: Can we move to the next  
9 slide.

10                  (Document displayed on screen.)

11                  WITNESS PIRABAROOBAN: Okay. So the remaining  
12 portion of this testimony is -- We will be focusing on  
13 the Delta, mainly looking at the Delta water quality and  
14 the water levels, different, you know, places in the  
15 Delta.

16                  The tool that -- The model -- modeling tool  
17 that was used for this portion of the testimony is DSM-2,  
18 Delta simulation model. It has been used since the late  
19 1990s, and is used in support of many projects and  
20 programs and, in addition, it has been used in past Board  
21 hearings.

22                  The -- As Mr. Munévar mentioned, CalSim uses 82  
23 years of simulation, and the results I'm going to show  
24 you today is based on 16 years of simulation starting  
25 from 1976 to 1991. This same 16-year period has been

1 used since the late '90s, you know, in support of the  
2 usual format that's been used.

3 The 16-year period basically has a similar mix  
4 of water years as included in the main 82 years.

5 The main reason is, DSM-2 is a -- is a, you  
6 know, 15-minute time-step. There's just a lot of  
7 information. And we feel that you would reach a similar  
8 conclusion when you -- when you look at the results of,  
9 you know, 16 years of simulation.

10 So moving on to the next slide, please.

11 (Document displayed on screen.)

12 WITNESS PIRABAROOBAN: So in terms of water  
13 quality, I'm going to be showing you results for monthly  
14 average, EC, electrical conductivity at selected Delta  
15 locations.

16 I'm also going to be sharing information about  
17 chloride concentration in select Delta locations, and  
18 then I'll be talking about the D-1641 water quality  
19 compliance portion of the water quality analysis.

20 So next slide, please.

21 (Document displayed on screen.)

22 WITNESS PIRABAROOBAN: So the first location  
23 I'm showing you is Emmaton, and I'm going to be spending  
24 some time in going over the information that's presented  
25 in this slide.

1           So, this case, I'm showing results based on  
2           electrical conductivity based on the DSM-2 simulations.

3           The vertical axis is EC, and I just want to  
4           make sure the units -- make sure that you know that the  
5           units that are used here are microsiemens -- micromhos --  
6           microsiemens per centimeter. In other words, micromhos.  
7           It's about a thousand times higher than the units that  
8           are using the D-1641 specifications. So the 2,000 EC in  
9           terms of micromhos would be equivalent to 2.0.

10           What you're looking at here are -- This is 16  
11           years' long-term monthly average results, starting at the  
12           horizontal axis, or the different months, starting from  
13           October going to September.

14           Each month, you will see five bar graphs, and  
15           each graph -- each bar graph represents a -- 16 years of  
16           monthly average results, starting from the first bar  
17           graph shown in black, represented by the No-Action  
18           Alternative; the next one is Boundary 1; then H3, H4; and  
19           the last bar to the right, shown in the darker gray, is  
20           the Boundary 2.

21           At this location, there is the D-1641 standards  
22           apply April 1st to August 15th. This graph by itself  
23           does not indicate or imply whether there is an exceedance  
24           of monthly objectives or not.

25           So, what you're looking at is just a comparison

1 of water quality for the different operational scenarios  
2 that -- that -- that were introduced by Mr. Munévar.

3 And because of the fact that the -- in all --  
4 in all five operational scenarios are subject to the same  
5 D-1641 objectives. So it's no surprise that you see very  
6 similar water quality results for those months.

7 Kind of, it is somewhat intuitive that a --  
8 a -- an operational scenario that has a higher Delta  
9 outflow, you would expect lower EC, lower salinity, and  
10 a -- and a -- and an alternative -- an operational  
11 scenario that has a lower Delta outflow you would expect  
12 a higher salinity.

13 I also want to kind of point out that, in  
14 modeling Boundary 1 -- I think Mr. Munévar mentioned that  
15 the Fall X2 was excluded, and that has a kind of a big  
16 influence on the water quality. And that's in -- that's  
17 kind of the reason why you're seeing those -- and part of  
18 the reason as to why the salinities are higher in  
19 September, October, November. All X2s -- It's an  
20 operational scenario -- constraint of -- that -- that  
21 applies to wet and above-normal years.

22 So that's kind of one -- at least one of the  
23 reasons why the salinity is very different for those  
24 months.

25 So, looking at, you know, April to August

1 period, we'll see very similar water quality EC results  
2 for April to June, with a July -- Before I -- There's one  
3 more point I was going to mention.

4 You will see in all the water quality results  
5 that the H3 and H4 are -- provide very similar water  
6 quality.

7 You will also see that, in general, H3/H4 in  
8 salinity would fall somewhere in between Boundary 1 and  
9 Boundary 2. However, there are some exceptions, and I'll  
10 be going over some of the exceptions why -- why that  
11 would be.

12 So back focusing on the month of July, what you  
13 see is, for Boundary 1, H3 and H4, there is a, you know,  
14 increase of EC about 18 to 19 percent for July and  
15 August.

16 For Boundary 2 operational scenario, we'll see  
17 a -- an increase of about 5 percent for July relative to  
18 the No-Action alternative and a reduction of about  
19 19 percent for the month of August.

20 Moving on, next slide, please.

21 (Document displayed on screen.)

22 WITNESS PIRABAROOBAN: Now we're looking at  
23 Jersey Point. Similar to Emmaton, there is a water  
24 quality objective. D-1641 applies April 1st to  
25 August 15th.

1           Here, for the months of April to June, you see  
2 very similar water quality for all operational scenarios.  
3 In the month of July and August, for Boundary 1, H3 and  
4 H4, we'll see a reduction in EC between 19 to 34 percent.

5           For Boundary 2, you see a reduction of  
6 about . . . about 5 to 41 percent for July and -- July  
7 and August.

8           I think I've written that incorrectly. There's  
9 actually a bigger -- bigger reduction for the month of  
10 July and August. I think that the number I mentioned is  
11 incorrect. It's 34 to 41 percent reduction for the month  
12 of July and August for Boundary 2.

13           Okay. Moving on, please.

14           (Document displayed on screen.)

15           WITNESS PIRABAROOBAN: All right. This -- The  
16 next location we're looking at is San Joaquin River at  
17 San Andreas Landing.

18           You see somewhat similar results as a -- in  
19 Jersey Point with a reduction of about 10 to 15 percent  
20 for July, and a reduction of about 7 to 26 percent for  
21 the month of August reduction in EC.

22           Next slide, please.

23           (Document displayed on screen.)

24           WITNESS PIRABAROOBAN: The next location is  
25 looking at Mokelumne River at Terminous.



1           Here, we see very little difference in the EC  
2 results. This is -- This is a location which is far  
3 enough upstream where it doesn't see any significant  
4 salinity intrusion from the ocean and, as a result, would  
5 receive the water quality results to be very similar, in  
6 fact, year-round very similar.

7           Next slide.

8           (Document displayed on screen.)

9           WITNESS PIRABAROOBAN: Now, we're moving to  
10 South Delta. And so in this -- This is the location Old  
11 River at Tracy Road.

12           The water quality objectives here is actually  
13 year-round with a number to be about -- with a water  
14 quality objective of 700 EC, .7 applied April 1st to end  
15 of August, and it's 1,000 for the -- all other months.

16           And, here, what you see is that for -- for  
17 Boundary 1, H3 and H4, the water quality results are very  
18 similar to No-Action.

19           For Boundary 2, you see actually an increase of  
20 EC for the months of March, April and May. And it is --  
21 It is my belief that the increase you're seeing is a  
22 result of the Head of Old River Gate operation. So,  
23 these are months where typically San Joaquin River has  
24 had a better water quality.

25           In modeling Boundary 2, it was assumed that

1 Head of Old River Gate is completely closed for -- for  
2 those months. And what you see here is a direct result  
3 of a complete closure of the Head of Old River Gate.

4 The other scenario, there's a partial closure,  
5 which means partially open, and -- or completely open.  
6 So, you don't see a big difference between H3 and H4 and  
7 Boundary 1, but you see a big difference for Boundary 2.

8 Okay. Moving on, next location.

9 (Document displayed on screen.)

10 WITNESS PIRABAROOBAN: This -- This is on  
11 San Joaquin River at Brandt Bridge, similar, and the same  
12 water quality objective applies at this location.

13 At this location, we see very similar water  
14 quality, so the Head of Old River Gate, obviously,  
15 doesn't seem to have a major influence at this location.

16 Next slide.

17 (Document displayed on screen.)

18 WITNESS PIRABAROOBAN: So, so far, what I've  
19 shown you here is results on -- based on EC. Now we're  
20 looking at chloride.

21 This is -- So, the focus up to now has been the  
22 agriculture D-1641 water quality objectives. Now we're  
23 moving to the urban portion.

24 So this is Contra Costa Canal. The D-1641  
25 standard at this location is 250 milligram per liter

1 daily average concentration of chloride. That applies  
2 year-round.

3 I want to point out one thing before I actually  
4 discuss the model results. We don't actually simulate  
5 chloride. What we use -- There -- There are different  
6 ways that we can analyze chloride.

7 What I've used in this test -- for this -- for  
8 purpose of this testimony is, we used EC-to-chloride  
9 conversions, and there's a reference that's cited in my  
10 testimony. So that's what I've used in coming up with  
11 estimates of chloride concentration.

12 So, what you see here is -- You can see that  
13 the water quality results are somewhat mixed when you  
14 compare the different operational scenarios.

15 Let's start with Boundary 1. In Boundary 1, we  
16 see higher chloride concentration October to March, and  
17 lower or similar for other months, but -- And, in fact,  
18 you will see Boundary 1 has the lowest chloride  
19 concentration among all operational scenarios for the  
20 months of April and May.

21 H3 and H4 are better -- show results that are  
22 better or similar, at lower chloride concentration, or  
23 similar for all months except the month of June.

24 And Boundary 2 shows better or similar for all  
25 months, except February through April and June.

1           But, you know, it's interesting to see now that  
2 Boundary 2 actually shows the highest chloride  
3 concentration among all operational scenarios for the  
4 month of March and April.

5           So, here's where I was getting at the  
6 exception. You expect a higher outflow resulting in  
7 lower EC or lower chloride, and vice versa. So, we don't  
8 see that here.

9           So, in terms of what factors affect Contra  
10 Costa chloride or EC at Contra Costa Canal are two  
11 different factors: One is the Delta outflow, we've  
12 already talked about that; the other part is -- is the --  
13 the OMR and all of the exports that affects OMR.

14           When the Delta water qualities is -- is good,  
15 and the EC and chloride are enduring high Delta outflow,  
16 a higher South Delta export actually improved water  
17 quality at this location.

18           So what that means: Because Boundary 2  
19 restricts the South Delta operation, it -- it -- it does  
20 not bring the same amount of fresh water at this location  
21 as -- as the other operational scenarios.

22           So, in fact, it's kind of a -- a -- an  
23 exception here that, for the month of February and March,  
24 you see H3 and H4 resulting in actually better water  
25 quality than Boundary -- either Boundary 1 or Boundary 2.

1           So -- And it represents a better mix of Delta  
2 outflow and -- and the South Delta export OMR, you know,  
3 combination of those two parameters.

4           Next slide, please.

5           (Document displayed on screen.)

6           WITNESS PIRABAROOBAN: Next location shows  
7 chloride concentration at the Old River at Clifton Court.

8           You see -- What you see here is basically a  
9 similar pattern as the Contra Costa Canal.

10           So I'm not going to go over the numbers, but  
11 basically you see a somewhat lower concentration overall  
12 among all operational scenarios, but it has a very  
13 similar pattern, lower variations among all the  
14 operational constraints.

15           At this location, there is still a -- the same  
16 standard water quality, chloride concentration standard  
17 applies, which is 250-milligram based on daily average  
18 concentration of chloride year-round.

19           Next location, please.

20           (Document displayed on screen.)

21           WITNESS PIRABAROOBAN: This is Barker Slough,  
22 North Bay Aqueduct. You see chloride concentrations that  
23 are very low among -- similar among Fall operational  
24 scenarios. This is a location that's, again, far enough  
25 upstream that it doesn't see effect of the ocean

1 salinity.

2 So, therefore, changes in Delta outflow or  
3 South Delta exports doesn't seem to have an effect on the  
4 quality in this location.

5 Next slide, please.

6 (Document displayed on screen.)

7 WITNESS PIRABAROOBAN: So, up to now, I've --  
8 I've just shown you the results and, you know, the  
9 changes in water quality.

10 Now I'm just going to focus on how do the  
11 models actually show, in terms of, you know, whether they  
12 are meeting their water quality objectives or not.

13 If you've read my testimony, you may have seen  
14 that, yes, the models actually show that, at times, there  
15 are exceedances above the water quality objectives.

16 What I'm trying to point out here is an  
17 explanation for why the models are showing, you know,  
18 those objectives.

19 So, kind of a -- an old -- You know, kind of a  
20 review of things you might have heard already, but I just  
21 wanted to bring them up again.

22 So start -- starting at CalSim II. So, the  
23 Delta flows for regulatory and operational cri --  
24 criteria are assumed in a monthly time-step. That was  
25 pointed out earlier.

1           And CalSim II is actually the model that  
2           simulates the compliance with the Delta salinity  
3           objectives, and it uses what we call ANN, Artificial  
4           Neural Network, to achieve salinity objectives based on  
5           monthly average Delta flow salinity relationships.

6           Then we move -- Once we move to DSM-2, we use  
7           the -- the flow outflow from CalSim, and to simulate the  
8           Delta hydrodynamics on salinity based on 15-minute  
9           time-step. And, also, the monthly CalSim flows are  
10          converted to daily flows using historical patterns.

11          It is the DSM-2 model output that was actually  
12          used to evaluate compliance with the D-1641.

13          So next slide.

14          (Document displayed on screen.)

15          WITNESS PIRABAROOBAN: This slide is there to  
16          represent an example, in this case 1987, it's a dry year.

17          What's shown by the shade of blue is the actual  
18          water quality objective at this location corresponding --  
19          and this is for -- slide represents Emmaton.

20          At Emmaton, the water quality objective is for  
21          .45 EC for the month of April -- for -- starting from  
22          April 1st to June 15. And starting from June 16, the  
23          water quality objective goes up to 1.62 EC from June 16  
24          to August 15.

25          Now, here's where we have an issue. CalSim is

1 a monthly model. So let's focus in the month of June.

2 We need a single number in CalSim as to what  
3 the water quality objective is for the month of June.  
4 The problem, the issue here, is, we have two different  
5 standard apply to the two different portions of the  
6 month.

7 If we use .45 for the entire month, then what  
8 would happen is that we expect that CalSim would  
9 overestimate the flows that are required based on monthly  
10 average to meet the water quality objective.

11 If we use the higher number, the 1.62, we -- we  
12 expect that we would underestimate the flows that are  
13 required to meet the objective.

14 So, in order to get the monthly volumes  
15 correct, we realize there's -- there is a number in  
16 between those two that will have to be used. So, in  
17 fact, a number was used. What you see as the red dashed  
18 line represent what was actually used in the model, in  
19 CalSim, which is 1.06 for the month of June.

20 There's a similar issue for the month of  
21 August. The standard applies only for the first half of  
22 August, and the second half of August, there's basically  
23 no stagger that applies.

24 So, once again, if you use the 1.62 EC for the  
25 entire month of August, we would have expected to



1 overestimate the amount of monthly flows that are  
2 required to meet the objective, so, therefore --  
3 Therefore, a higher number was used in the CalSim  
4 simulations.

5 Next slide, please.

6 (Document displayed on screen.)

7 WITNESS PIRABAROOBAN: So here we see the same  
8 year and month. And what you're seeing here is actually  
9 the results of the DSM-2 model quality.

10 There are five lines showing here: Boundary 1,  
11 Boundary 2, No-Action, H3, H4, the black line  
12 representing the No-Action.

13 So if -- if the lines go above the shade of  
14 blue, that would technically constitute an exceedance.  
15 So, what you see here -- Let's focus on the month of  
16 June. That's the issue I was describing earlier.

17 You see the model -- the DSM-2 model is  
18 predicting salinities that appear to exceed the standard,  
19 which was .45 EC.

20 But you may recall that the standard we  
21 actually gave to CalSim was 1.06, which was -- So, as far  
22 as CalSim is concerned, it did its job correctly but  
23 because of the issue with the inconsistency with the  
24 model, especially the time-step, we see what we see here.

25 This is what we refer to as a modeling

1 artifact. It is one of the issues that kind of  
2 represents itself as an exceedance. But this is  
3 something that I think, as Mr. Leahigh pointed out in  
4 his -- in testimony, that the Operators would have the  
5 day-to-day, you know, tools that they can make  
6 adjustments to prevent those exceedances.

7 And, you know, he represented a statistic that  
8 showed the level of success we've had in the past in  
9 meeting the water quality objective.

10 Next slide, please.

11 (Document displayed on screen.)

12 WITNESS PIRABAROOBAN: So, this one slide  
13 represent the entire 16 years of simulation. This --  
14 This slide applies to Emmaton. It is an exceedance  
15 graph.

16 So the red dashed line that's at zero, ideally  
17 all lines, you know, should be below that in order to  
18 have no exceedance.

19 So, we see that somewhere around 85 to 90  
20 percent of the time, you know, this -- By the way, the  
21 horizontal line is representing the probability of  
22 meeting water quality objectives. So we expect that it  
23 will be 100 percent.

24 But because of the issue that I just pointed  
25 out, you know, one of the issues I pointed out, we -- we

1 are seeing exceedances that are shown by the model.

2 And the main thing also I want to point out  
3 here is that the No-Action Alternative is showing the  
4 same behavior and subject to the similar modeling  
5 artifact as the other operational constraint.

6 Next slide, please.

7 (Document displayed on screen.)

8 WITNESS PIRABAROOBAN: This is the same  
9 information of the probability of meeting the D-1641  
10 water quality objective at Jersey Point.

11 Once again, you see there are times where the  
12 model is actually showing exceedance. At this location,  
13 actually, No-Action shows a higher rate of exceedance  
14 compared to other operational scenarios.

15 At this location, I think you saw earlier that  
16 all operational scenarios tend to improve the EC at this  
17 location, which explains itself in -- in -- in why  
18 those -- the probability of exceedance for all  
19 operational con -- scenarios are higher than the  
20 No-Action.

21 Next slide.

22 (Document displayed on screen.)

23 WITNESS PIRABAROOBAN: This location represents  
24 the Mokelumne River at Terminous. The zero line is way  
25 above. All 16 years of simulation shows that the water

1 quality at this location is well below the water quality  
2 objectives.

3 So next slide.

4 (Document displayed on screen.)

5 WITNESS PIRABAROOBAN: This one here is the EC  
6 objective at San Andreas Landing, with the exception of,  
7 the only one that actually shows exceedance above the  
8 water quality objective in this location is the  
9 No-Action. All other operational scenarios are showing  
10 100 percent achieving the water quality objective.

11 Next slide, please.

12 (Document displayed on screen.)

13 WITNESS PIRABAROOBAN: This slide represents  
14 the water quality objective based on chloride  
15 concentration, the 250-milligram per liter daily average  
16 concentration at Contra Costa Canal.

17 And you see that there are times that the model  
18 is showing those -- those exceedances. In fact, H3, H4  
19 and Boundary 2 show a higher probability of meeting the  
20 D-1641 water quality objectives. In fact, Boundary 2  
21 appears to be meeting the water quality objective for the  
22 entire 16 -- 16 years of simulation.

23 Next slide, please.

24 (Document displayed on screen.)

25 WITNESS PIRABAROOBAN: There is a second water

1 quality objective at Contra Costa Canal requiring daily  
2 average concentration of 150-milligram per liter chloride  
3 concentration for a certain number of days in the year,  
4 and the -- the number of -- required number of days vary  
5 depending on the water year time.

6 So what you see in the shade of blue is the  
7 required number of days in a year that -- that is certain  
8 water quality; in this case, 150-milligram per liter  
9 average concen -- daily average concentration.

10 And, so, in this case, ideally, all lines have  
11 to be above the shade of blue to get -- resulting in a  
12 higher number of days meeting the same water quality  
13 objective.

14 So, what -- what you see here is that, you  
15 know, Boundary 2 appeared to meet the required number of  
16 days for the entire period of simulation. All other  
17 operational scenarios, including the No-Action, appeared  
18 to meet the water quality objective for every year except  
19 1977, which was an extreme dry year.

20 You may recall, in 1977, there were some -- a  
21 number of barriers that were installed at different  
22 locations in the Delta to reduce ocean salinity  
23 intrusion. Those barriers were not included in the  
24 models -- in the model.

25 Next slide.

1 (Document displayed on screen.)

2 WITNESS PIRABAROOBAN: So, I hope I was able to  
3 convey that most of the D-1641 water quality objective  
4 exceedances that are shown in the model are mainly due to  
5 the difference in the model assumptions.

6 We don't believe that California WaterFix  
7 operational scenarios reduce our ability to meet the  
8 water quality objectives that -- that are shown here.

9 Next slide.

10 (Document displayed on screen.)

11 WITNESS PIRABAROOBAN: Now, the remaining  
12 portion of this testimony is focusing on the Delta water  
13 levels.

14 And the -- I -- I am -- I intend to do that by  
15 showing you a probability of exceedance for a daily  
16 minimum water levels at a number of locations within the  
17 Delta.

18 And, just intuitively, we expect that the  
19 largest reductions in water levels to be in and around  
20 the proposed intakes. And we expect those reductions to  
21 get smaller as you get farther and farther away from the  
22 proposed -- the three North Delta -- proposed North Delta  
23 Diversions.

24 Next slide, please.

25 (Document displayed on screen.)

1                   WITNESS PIRABAROOBAN: So, here is a map of the  
2 Delta, and there are five locations shown in the -- the  
3 yellow circles.

4                   I am -- I will show the water level results at  
5 these five locations: Starting from the top is the  
6 location on Sacramento River right below the -- the --  
7 downstream from the three proposed intakes; moving down  
8 we see Sacramento River below Georgiana Slough; and we  
9 have Terminous, Rio Vista and then I have -- I'm also  
10 showing a location in the South Delta, Old River, Tracy  
11 Road.

12                   Next slide, please.

13                   (Document displayed on screen.)

14                   WITNESS PIRABAROOBAN: So this, I will -- I  
15 need to explain a number of things.

16                   What I have a challenge with, is, I have 16  
17 years of simulation water levels; there's a tide. And so  
18 how to condense all that information into a sim -- simple  
19 plan, and this is what I've attempted to do here.

20                   So, this is based on a probability of  
21 exceedance.

22                   So we have 16 years of simulation. What I've  
23 done is, for each day of simulation, I've taken the  
24 lowest daily water level.

25                   So, 16 years times 365, that's about 5,500

1 datapoints for each operational scenario. And by lining  
2 them up, I plotted this exceedance curve.

3 So, as an example -- First of all, you -- you  
4 expect to see five lines here but you actually -- only  
5 two lines are really visible.

6 The black line represent the No-Action  
7 Alternative; and the other -- the lines below appear to  
8 kind of co-in -- you know, overlap one another. So we  
9 don't expect the water levels to be very different  
10 depending on the different operational scenarios.

11 So, as an example, when you look at 20 percent  
12 probability of exceedance, let's go up to the 20 percent  
13 line and -- and look at very -- intersects -- The black  
14 line represents the No-Action. So that's about, let's  
15 say, 3 feet.

16 What does that mean? That means only  
17 20 percent of the time do we expect the minimum daily  
18 water level at -- at this particular location, which is  
19 immediately downstream of the three proposed intakes, to  
20 be 3 feet or higher.

21 So the points on the left of the diagram --  
22 those are higher minimum daily water levels -- represent  
23 the higher flow periods. And the points on -- on the  
24 right side of the diagram here would -- would correspond  
25 to the low flow periods.



1           So, now, let's look at the difference, the  
2 difference between the black line and I'll -- the other  
3 line.

4           The gap you see between those two is a -- the  
5 expected reduction in the minimum daily water level. So  
6 you can see the gap on the datapoints corresponding to  
7 the high flow periods appear to be higher, the  
8 difference. And the -- And the two kind of get narrower  
9 and narrower as you get to the -- to the -- the low flow  
10 periods.

11           So, to kind of illustrate the point: The  
12 difference corresponding to the high-flow periods, the  
13 reduction is about 1 to 1.2 -- that's a reduction in the  
14 minimum daily water level -- as opposed to about half a  
15 foot on the right hand during low-flow periods.

16           So why do we see a higher reduction during  
17 high-flow periods? That -- You know, we expect that,  
18 during high-flow periods, the three proposed intakes  
19 would be -- the higher probability that you would use  
20 them closer to the capacity and they're 3,000 cfs each,  
21 so 9,000.

22           During low-flow periods, we -- we see that the  
23 probability of, you know, using the -- the in -- the  
24 green intakes closer to the capacities, is very low.

25           So I think that the -- the results makes sense,

1 that you expect a higher reduction during high flows,  
2 lower reduction during low flows.

3           During high flows, I will imagine that there is  
4 really no concern of environmental levels as actually  
5 flood period, and that's not really a great concern.

6           Couple of points I want to point out here.  
7 I've looked at the results for Boundary 1 compared to  
8 No-Action. And what I found is that, in the entire 16  
9 years of simulation, there's 73 days when the water  
10 level -- the minimum daily water level dropped below the  
11 lowest water level corresponding to No-Action. 73 days  
12 in the 16 years.

13           That roughly translates into five days in a  
14 year where the water level -- minimum water level goes  
15 below that of the No-Action Alternative.

16           The other factor to consider here is, during  
17 low-flow periods, the -- the tidal amplitude, which is  
18 the difference between the low and the high, is between 2  
19 to 4 feet.

20           Those -- What I'm -- What I'm showing you here  
21 is the minimum daily water level. But the fact is that  
22 those minimum daily water levels only occur during a  
23 small portion of the day. The -- The -- For the rest of  
24 the day, the water level expect to be quite a bit higher.

25           Next slide, please.

1 (Document displayed on screen.)

2 WITNESS PIRABAROOBAN: We're now -- So, the  
3 first -- the previous plot I showed you was the -- right  
4 immediately downstream of the intakes. That is the  
5 location we expected to see the -- the -- the highest  
6 reduction in water levels.

7 So this is a location that's farther away from  
8 the intakes and we expect a lower reduction in water  
9 level, and that's what we see here.

10 Corresponding to the high flows, we see about  
11 9/10ths of a foot reduction. During low flow, we see --  
12 we see about 3/10ths of a foot reduction in water levels  
13 in the minimum daily water.

14 Next slide, please.

15 (Document displayed on screen.)

16 WITNESS PIRABAROOBAN: Now we're looking at  
17 Rio Vista.

18 By the time we get to Rio Vista, we see all the  
19 lines merged together. And these -- the -- the  
20 California WaterFix does not seem to affect the water  
21 level at Rio Vista.

22 This is a -- This is a location that is highly  
23 affected by the tides and the flows have little influence  
24 on the water level at this location, so this is why we  
25 see all the operational scenarios kind of lined up right

1 above each other.

2 Next slide.

3 (Document displayed on screen.)

4 WITNESS PIRABAROOBAN: Looking at Old -- This  
5 is South Delta, Old River at Tracy Road.

6 Once again, we see the -- the -- all the lines  
7 are pretty much on top of each other and there is very  
8 little change in water level at this location.

9 Next slide, please.

10 (Document displayed on screen.)

11 WITNESS PIRABAROOBAN: This is the last  
12 location I have for the water level analysis. That's at  
13 Mokelumne River at Terminous. And at this location, we  
14 see very little effect in water levels.

15 Next slide, please.

16 (Document displayed on screen.)

17 WITNESS PIRABAROOBAN: So, now a summary of  
18 what I've shown you.

19 I've -- What I've tried to show you is a model  
20 analysis of EC and chloride. And what I hope I was able  
21 to convey is that water quality results are mixed. There  
22 are seasonal variations.

23 We do see small overall increase in EC at  
24 Emmaton.

25 DSM-2 does show, at times, that there are

1 exceedances for all the water -- water quality as -- I  
2 mean, for all operational scenarios, including the  
3 No-Action. And -- But it is my belief that most of these  
4 exceedances are due to the difference in the assumptions  
5 between the models, in the CalSim and DSM-2.

6 Last side, please.

7 (Document displayed on screen.)

8 WITNESS PIRABAROOBAN: In terms of water  
9 levels, the largest reduction we see occur -- in water  
10 levels occur near -- near the three proposed North Delta  
11 Diversions.

12 The largest reduction in model levels occur  
13 during high-flow events. The maximum water level  
14 reduction of about half a foot occur during the low-flow  
15 events near the -- the North Delta Diversions but those  
16 low Delta water levels occur only for a short period the  
17 entire cycle. And the locations that are far from the  
18 North Delta Diversion show negligible reduction in water  
19 level.

20 I believe that's the end.

21 CO-HEARING OFFICER DODUC: Anything else?

22 Mr. Mizell? Mr. Berliner?

23 MR. MIZELL: No, Hearing Officer Doduc. That  
24 concludes the direct testimony for these two witnesses.

25 CO-HEARING OFFICER DODUC: All right. Thank

1 you.

2 Did you have questions?

3 MR. ADAMS: Yes. I just wanted to --

4 CO-HEARING OFFICER DODUC: Please identify --

5 MR. ADAMS: I'm sorry.

6 CO-HEARING OFFICER DODUC: -- yourself.

7 MR. ADAMS: Sorry. Greg Adams on behalf of

8 Friant Water Authority.

9 I just wanted to formally join in the request  
10 Miss Meserve made earlier this morning regarding  
11 postponing the hearing dates for next week.

12 (Cell phone rings.)

13 MR. ADAMS: As we've through today, I mean,  
14 just the way this case proceeds, it's --

15 CO-HEARING OFFICER DODUC: Who is making that  
16 noise?

17 THE REPORTER: (Raising hand.)

18 If you'd give me a second.

19 CO-HEARING OFFICER DODUC: Yes. Let's give her  
20 a second.

21 THE REPORTER: I'm usually so good.

22 Okay. It's not only silent, it's off.

23 CO-HEARING OFFICER DODUC: All right.

24 THE REPORTER: Sorry.

25 MR. ADAMS: As we've seen this morning, it's

1 important -- it's difficult to know how quickly or how  
2 slowly things are going to proceed during this case, so  
3 it's important for parties to have representatives here  
4 at all times, or at least close to all times, to be able  
5 to monitor -- feel prepared for when cross-examination  
6 may happen on their behalf.

7           And, so, it makes it difficult during next  
8 week, in particular, leading up to our -- the  
9 September 1st deadline, particularly those of us who  
10 travel from out of state or even from out of Sacramento  
11 to be accomplished that and monitor the proceedings as  
12 well as to be here in time if cross-examination is  
13 necessary.

14           So I just wanted to join in that request and  
15 for those reasons.

16           CO-HEARING OFFICER DODUC: Well, let me --  
17 Since you're up here, let me get some clarification.

18           The deadline for September 1st is to submit  
19 your case in chief for Part IB, for which you've had 10  
20 months since the public notice and three months since you  
21 received Petitioners' exhibits.

22           MR. ADAMS: I agree. I think things have -- as  
23 this case has proceeded -- For example, I --

24           CO-HEARING OFFICER DODUC: I -- Let me  
25 continue, then.

1           I appreciate that there's been a great deal of  
2 information presented and come out during  
3 cross-examination.

4           To the extent that those additional areas need  
5 to be explored, I would expect Part IB parties to explore  
6 that on rebuttal, not necessarily in your case in chief.

7           MR. ADAMS: Well, just to -- to address those  
8 points.

9           First, when the Petitioners presented their  
10 case in chief, although they disclosed the Petition  
11 earlier, really, we didn't get their full case in chief  
12 until May -- or May 31st is when they disclosed that.

13           In timing -- In reviewing the many documents we  
14 had to prepare for, first of all, filing objections to --  
15 to those -- to that case in chief, and then, in addition  
16 to that, moving in to preparing for cross-examination.

17           So, although we've had a lot of time, and we've  
18 been making progress on that -- and we will do what it  
19 takes to be done on September 1st -- I just think the  
20 difficulty is, that lead-up time has necessitated  
21 preparation for cross-examination, and I don't think  
22 there's a substantial prejudice to this proceeding to  
23 letting two -- not hearing -- having hearings on two days  
24 next week to help us finish the compilation, the  
25 last-minute preparation of getting everything together.



1           As things change, as exhibits are introduced  
2 here that we no longer need to introduce as exhibits on  
3 our -- on our own case in chief, we're moving and adding  
4 exhibits. It just takes additional time.

5           So I -- I don't think there'll be substantial  
6 prejudice because we have additional dates in September  
7 to continue on with this hearing, but it will allow  
8 Protestants to finish and have a completely-prepared case  
9 in chief on -- on September 1st.

10           CO-HEARING OFFICER DODUC: So, the request for  
11 suspension of the days next week is so that you may  
12 complete your case in chief.

13           MR. ADAMS: Well, so we can com -- complete  
14 the -- finalize the documents, finish everything, submit  
15 it, and get it -- and get it into place.

16           Obviously, there's things that are going to  
17 come up during the course of this week that would have to  
18 be discussed during rebuttal. I don't -- I don't think  
19 we -- I recognize that, and many --

20           CO-HEARING OFFICER DODUC: As well as things  
21 that came up during the previous four weeks.

22           MR. ADAMS: That's correct as well. But the  
23 stuff that came up during the previous four weeks are  
24 directly relevant to the injury that the -- the  
25 Protestants ever suffered.

1           And there's much stuff that we've been trying  
2   to get through the course of cross-examination, or that,  
3   you know, other cross-examiners have added, which I think  
4   helps present in a consolidated place up front in the  
5   beginning in our case of injury, I think that's more  
6   efficient for the Board to hear that at the beginning  
7   rather than waiting for rebuttal, to the extent that  
8   information has already been provided.

9           CO-HEARING OFFICER DODUC: All right. Well,  
10   thank you.

11           We'll take that under advisement but, in the  
12   meantime, I would caution you all of you to operate under  
13   the assumption that the current schedule stands.

14           MR. ADAMS: Of course.

15           CO-HEARING OFFICER DODUC: Thank you.

16           MR. ADAMS: Thank you.

17           CO-HEARING OFFICER DODUC: With that, we'll  
18   take our lunch break and we will reconvene at 1 p.m.

19           (Luncheon recess was taken at 11:55 a.m.)

20

21

22

23

24

25

1 Tuesday, August 23, 2016 1:00 p.m.

2 PROCEEDINGS

3 ---000---

4 CO-HEARING OFFICER DODUC: (Banging gavel.)

5 All right. It is 1 o'clock. Welcome back.

6 And I would ask the other witnesses of this  
7 panel, who were not previously here to take the oath, to  
8 please stand.

9 Please raise your right hand.

10 (Witnesses sworn.)

11 ERIK REYES, TARA SMITH, JAMIE ANDERSON.

12 GWEN BUCHHOLZ, MICHAEL BRYAN, and KRISTIN WHITE.

13 called as witnesses for the Petitioners, having been  
14 first duly sworn, were examined and testified as follows:

15 CO-HEARING OFFICER DODUC: Thank you. Please  
16 be seated.

17 Before we begin with the cross-examination of  
18 this panel, a couple things:

19 As I have emphasized before but will again ask  
20 you to be succinct and efficient in your  
21 cross-examination.

22 I've observed from previous panels'  
23 cross-examination, there tends to be a great deal of  
24 leading up to questions, a great deal of foundational --  
25 very basic foundational setting.

1           There is no need for that. You may assume that  
2 the witnesses as well as the Board members and staff are  
3 familiar with the basic background.

4           So, get to your cross-examination as quickly as  
5 possible. Try to avoid -- Actually, not "try." Just do  
6 it: Avoid providing testimony and facts.

7           And then another thing that I've noticed is, if  
8 you have a question for the witness . . .

9           Let me rephrase that.

10           There's this gotcha game that's not very  
11 productive in terms of asking a witness a question to  
12 which they don't have the answer, and then you put up the  
13 answer and say, "Oh, by the way, I have the answer. Let  
14 me ask questions about this."

15           If you have such information, just put it up  
16 and ask the question and let's not, you know, lead the  
17 witnesses around.

18           I mean, we're all here for the same purpose,  
19 which is to better understand this Project proposal, and  
20 it's not a matter of playing, you know, gotcha -- you  
21 know, got you, with the witnesses.

22           And then my request to witnesses: Please  
23 answer to the best of your ability. Your -- Your counsel  
24 may object at times, and that's certainly, you know,  
25 within their -- their right to do so.

1           To the extent that you do not know, say you do  
2 not know. Keep your questions -- your answers as  
3 succinct and directly on point as possible.

4           And, again, it is -- You know, your -- your  
5 purpose in being here is to help everybody, including all  
6 of us, better understand what's being proposed.

7           So, to the extent that you can be helpful in  
8 addressing on point the questions that are being asked,  
9 the better it will be for all of us involved.

10           And with that, let me also give you a better  
11 incentive.

12           With respect to the request made this morning  
13 regarding suspending the two days of hearings for next  
14 week so that some other Protestants could better work on  
15 their case in chief, on which they've had 10 months to do  
16 so, including three months after receiving exhibits, my  
17 incentive to you is to see how well we complete the  
18 cross-examination of this panel.

19           If we complete cross-examination by the end of  
20 this week, then, yes, we will those two days off the  
21 calendar. If we're not able to be that efficient, then  
22 we may re-visit this on Friday.

23           But, again, incentive is: Be efficient in your  
24 cross-examination. Do not duplicate. Get directly to  
25 the point of your cross-examination.

1           If necessary, we'll backtrack and lay a bit of  
2 foundation. But be more efficient and you may be  
3 rewarded with two days off next week; all right?

4           With that, we will begin cross-examination.

5           First of all, Group Number 3.

6           MR. MIZELL: If it pleases the Board, should I  
7 introduce the remaining Panel Members --

8           CO-HEARING OFFICER DODUC: Oh, I'm sorry.

9           MR. MIZELL: -- and introduce their documents  
10 at this time?

11          CO-HEARING OFFICER DODUC: Mr. Mizell, please  
12 do so.

13          MR. MIZELL: Okay. Well, thank you very much.

14          The two direct testifiers are still before you,  
15 and we're adding to them a number of cross-examination  
16 witnesses.

17          Starting immediately to my -- to Amy  
18 Aufdemberge's right is Mr. Erik Reyes, as well as  
19 Miss Gwen Buchholz who appeared before you previously,  
20 Miss Kristin White, who is a Reclamation witness,  
21 followed by Miss Tara Smith, Miss Jamie Anderson, and  
22 Mr. Michael Bryan.

23                                 DIRECT EXAMINATION BY

24          MR. MIZELL: So, Mr. Reyes, is DWR Exhibit 27 a  
25 correct copy of your Statement of Qualifications?

1 WITNESS REYES: Yes, it is.

2 MR. MIZELL: And is DWR 67 a correct copy of  
3 your written testimony?

4 WITNESS REYES: Yes, it is.

5 MR. MIZELL: Miss Smith, is DWR Exhibit 28 a  
6 correct copy of your Statement of Qualifications?

7 WITNESS SMITH: Yes, it is.

8 MR. MIZELL: And is DWR Exhibit 70 a correct  
9 copy of your written testimony?

10 WITNESS SMITH: Yes, it is.

11 MR. MIZELL: Miss Anderson, is DWR Exhibit 29 a  
12 correct copy of your Statement of Qualifications?

13 WITNESS ANDERSON: Yes, it is.

14 MR. MIZELL: And is DWR Exhibit 69 a correct  
15 copy of your written testimony?

16 WITNESS ANDERSON: Yes, it is.

17 MR. MIZELL: Mr. Bryan, is DWR Exhibit 33 a  
18 correct copy of your Statement of Qualifications?

19 WITNESS BRYAN: Yes, it is.

20 MR. MIZELL: And is DWR Exhibit 73 a correct  
21 copy of your written testimony?

22 WITNESS BRYAN: Yes, it is.

23 MR. MIZELL: Thank you.

24 And Miss Buchholz has already attested to her  
25 Statement of Qualifications and written testimony

1 previously.

2 CO-HEARING OFFICER DODUC: All right.

3 Miss Aufdemberge.

4 MS. AUFDEMBERGE: Yeah, let me cover her  
5 testimony, please.

6 Kristin, is DOI-1 a correct copy of your  
7 Statement of Qualifications?

8 WITNESS WHITE: Yes, it is.

9 MS. AUFDEMBERGE: And is DOI-6 a correct copy  
10 of your testimony?

11 WITNESS WHITE: Yes, it is.

12 CO-HEARING OFFICER DODUC: All right. All  
13 done, Mr. Mizell?

14 MR. MIZELL: Yes, I am. Thank you.

15 CO-HEARING OFFICER DODUC: All right. Group 3,  
16 do you have questions?

17 MS. MORRIS: Stefanie Morris, State Water  
18 Contractors.

19 We have no cross-examination for this panel.

20 CO-HEARING OFFICER DODUC: Group Number 4.

21 MR. O'HANLON: Yes, I do.

22 Good afternoon, Members of the Board, staff and  
23 members of the panel. My name is Daniel O'Hanlon. I  
24 represent the San Luis and Delta-Mendota Water Authority.

25 ///



1 CROSS-EXAMINATION BY

2 MR. O'HANLON: I'd like to start with a few  
3 questions for Mr. Munévar regarding water supply.

4 And I'd ask that DWR-5 Errata be put on the  
5 screens.

6 (Document displayed on screen.)

7 MR. O'HANLON: Specifically Page 44.

8 (Document displayed on screen.)

9 MR. O'HANLON: Mr. Munévar, this slide is  
10 titled "Long-Term Average Annual Total North and South  
11 Delta Combined CVP/SWP Diversions."

12 To clarify, do the totals in this chart include  
13 borders of the North Bay Aqueduct?

14 WITNESS MUNÉVAR: They do not. There are  
15 diversions at the North Delta Diversion and the -- the  
16 diversion south of Clifton Court.

17 MR. O'HANLON: All right. And -- And do these  
18 totals include diversion -- excuse me -- diversions in  
19 the Contra Costa Canal?

20 WITNESS MUNÉVAR: They do not, no.

21 MR. O'HANLON: Could I see Page 43, the  
22 previous slide.

23 (Document displayed on screen.)

24 MR. O'HANLON: All right. This slide refers to  
25 total diversions at Jones and Banks Pumping Plants.

1           That title might suggest it is limited to  
2 diversions from channels in the South Delta.

3           To clarify, for operating scenarios other than  
4 the No-Action Alternative, do these graphs include  
5 diversions at the proposed North Delta Diversion  
6 facility?

7           WITNESS MUNÉVAR: These graphs include both  
8 the -- the diversions for the North Delta and the South  
9 Delta. They are total -- total diversions by SWP and  
10 CVP.

11          MR. O'HANLON: As you explained in your direct  
12 testimony, the horizontal axis here is labeled  
13 "Exceedance Probability," and it goes from 100 percent on  
14 the -- on the left to 0 percent on the right; correct?

15          WITNESS MUNÉVAR: That's correct.

16          MR. O'HANLON: All right. Can you explain what  
17 is meant by "Exceedance Probability" as used in this  
18 graph?

19          WITNESS MUNÉVAR: Simply, there are 80 -- 82  
20 years of results -- of annual results. Each one of them  
21 is plotted from -- from low to high. And "Exceedance  
22 Probability" means that in 100 percent of the years, it  
23 exceeded that low value and the -- and the far right  
24 value was the maximum value for the entire 82-year  
25 period.

1           MR. O'HANLON: All right. And what does  
2 presenting information this way help us to understand  
3 that perhaps the long-term averages would not?

4           WITNESS MUNÉVAR: The long-term averages will  
5 average out, by -- by nature, the lows and the highs, and  
6 they'll reflect more of the -- the mid-range associated  
7 with these -- these exports.

8           So they allow you to look at the variability  
9 across a wide range of hydrologic conditions, drought,  
10 and as well as above-average years.

11          MR. O'HANLON: I'd like you to focus on the  
12 line for H4 and the line for the No-Action Alternative,  
13 and that comparison.

14          What does that comparison tell you about the  
15 effect of H4 on diversions as compared to the No-Action  
16 Alternative?

17          WITNESS MUNÉVAR: What it shows is that, for  
18 the driest years -- so taking roughly the 15th -- from  
19 the hundredth percentile, say, to about the 85th  
20 percentile, there's very little change.

21          And then for years between, say, the 80th  
22 percentile and about the 30th percentile, it shows a -- a  
23 reduction in H4 as compared to the No-Action.

24          And then for the wettest years, which are  
25 represented by the 20 percent down to the 0 percent, it

1 shows an increase in exports as compared with No-Action.

2 MR. O'HANLON: So, using that comparison, then,  
3 with -- for a substantial portion of the years, maybe  
4 roughly 50 -- 50 percent of the hydrology, diversions  
5 under H4 will be lower than the No-Action Alternative; is  
6 that correct?

7 WITNESS MUNÉVAR: Using the 50th percentile,  
8 which -- median value, it represents it as lower than the  
9 No-Action; correct?

10 MR. O'HANLON: And -- And for that range, from  
11 roughly 80 percent to 30 percent, the diversions under H4  
12 will be lower than the No-Action Alternative; is that  
13 correct?

14 WITNESS MUNÉVAR: That's correct. That's what  
15 the plot shows.

16 MR. O'HANLON: Could I please have Page 41 of  
17 DWR-5 Errata.

18 (Document displayed on screen.)

19 MR. O'HANLON: Now, this slide is labeled  
20 annual combined . . . deliveries to South-of-Delta CVP --  
21 excuse me -- Water Service Contractors both for the State  
22 Project and the Federal Project; is that correct?

23 WITNESS MUNÉVAR: Correct, that's what it  
24 shows.

25 MR. O'HANLON: And do these totals include

1 deliveries to CVP contractors who receive water from the  
2 Friant Division?

3 WITNESS MUNÉVAR: They do not.

4 MR. O'HANLON: And do these totals include  
5 deliveries to CVP contractors who receive water from New  
6 Melones?

7 WITNESS MUNÉVAR: They do not.

8 MR. O'HANLON: I'd like to ask you a few  
9 questions about modeling, more general questions about  
10 modeling.

11 In your written testimony and, again, in your  
12 direct testimony this morning, you indicated that  
13 CalSim II should be used for comparative purposes and not  
14 for predictive purposes; is that correct?

15 WITNESS MUNÉVAR: Correct.

16 MR. O'HANLON: And can you explain what you  
17 mean by using it for comparative purposes as opposed to  
18 predictive purposes.

19 CO-HEARING OFFICER DODUC: Succinctly, since we  
20 covered this.

21 WITNESS MUNÉVAR: Yes.

22 To use it for a predictive purpose would be to  
23 believe in the absolute value of that result. And what  
24 we are promoting is the use of the models as a  
25 comparative between a simulation without the action and a

1 simulation with the action to compare the changes that  
2 occur between -- with implementation of the action.

3 MR. O'HANLON: Okay. Let's --

4 WITNESS MUNÉVAR: That's a comparative result.

5 MR. O'HANLON: Thank you.

6 Let's take a specific number on this slide. It  
7 indicates that the long-term average of deliveries would  
8 be -- under H3 scenario would be 3,772,000 acre-feet; is  
9 that correct?

10 WITNESS MUNÉVAR: Yeah. I'm having a little  
11 trouble seeing it, so, if you don't mind waiting for me  
12 to --

13 MR. O'HANLON: Take your time. That's fine.

14 WITNESS MUNÉVAR: Okay. I'm there. H3  
15 long-term average, 3772.

16 MR. O'HANLON: I'm sorry. Under Scenario H3,  
17 it shows a number -- this slide shows a number -- on  
18 Page 41 shows a number of 3,772,000 acre-feet; is that  
19 correct?

20 WITNESS MUNÉVAR: Correct, yes.

21 MR. O'HANLON: All right. And if that number  
22 is not a prediction of what the long-term average  
23 deliveries will be, how should we understand that number?

24 WITNESS MUNÉVAR: So, we should understand that  
25 number in comparison to the No-Action, which is shown

1 here as 3,000,326 -- or 3,326,000 acre-feet. So a  
2 comparison of that H3 to the No-Action is -- is an  
3 appropriate use of the model to compare the relative  
4 change in the direction of that alternative.

5 MR. O'HANLON: In your written testimony, and  
6 again this morning, you used the term "operational  
7 criteria"; correct?

8 WITNESS MUNÉVAR: Correct. I believe so.

9 MR. O'HANLON: What do you mean by "operational  
10 criteria"?

11 WITNESS MUNÉVAR: Well, I'm not exactly  
12 recalling how I used it this -- earlier before lunch, but  
13 I'll -- I'll --

14 MR. O'HANLON: That's fine. If you want to  
15 limit your answer to your written testimony, that's fine.

16 WITNESS MUNÉVAR: Okay. Operational criteria  
17 are the -- the criteria that operate individual  
18 facilities as well as collectively operating the SWP and  
19 CVP system. So they involve, like, the North Delta  
20 bypass criteria. I call that one an operational  
21 criteria.

22 MR. O'HANLON: Okay. And would the  
23 requirements of D-1641 be another example of operational  
24 criteria for the Projects?

25 WITNESS MUNÉVAR: I would term the operation

1 towards D-1641 as an operational criteria. I call D-1641  
2 the objectives of which we're operating before this.

3 MR. O'HANLON: Okay. And do the scenarios H3  
4 and H4 include some new operational criteria?

5 WITNESS MUNÉVAR: They include -- H3 includes  
6 new operational criteria for the facilities that I  
7 identified -- north Delta facilities, the South Delta  
8 OMR -- similarly with H4.

9 MR. O'HANLON: Now, your modeling is based on a  
10 set of modeling assumptions; correct?

11 WITNESS MUNÉVAR: Correct.

12 MR. O'HANLON: How do you decide what  
13 assumptions to make -- How did you decide what  
14 assumptions to make when modeling the WaterFix Project?

15 WITNESS MUNÉVAR: Modeling -- Modeling in  
16 general has been -- this model has been used for a dozen  
17 years or -- or so, the pre -- predecessor of it. So a  
18 number of assumptions are constantly updated in terms of  
19 the baseline, the No-Action.

20 The operational assumptions directly associated  
21 with the WaterFix were determined by an Interagency Team  
22 represented by the DWR, Reclamation and Fish and  
23 Wildlife, both the State and Federal fish agencies.

24 MR. O'HANLON: And is there a distinction  
25 between modeling assumptions and operational criteria?



1 WITNESS MUNÉVAR: Yes, there is.

2 MR. O'HANLON: What is that distinction?

3 WITNESS MUNÉVAR: Oftentimes, we have to  
4 develop modeling assumptions to implement a relatively  
5 complex operational criteria into a model -- into a model  
6 run.

7 MR. O'HANLON: All right. And could some of  
8 the assumptions you made for modeling purposes differ  
9 from how Reclamation and DWR would actually end up  
10 operating the Projects?

11 WITNESS MUNÉVAR: Yes, I believe so. And I  
12 think that was the point of my testimony, in particular,  
13 for using an in-comparative -- comparative approaches.

14 MR. O'HANLON: All right. I'd like to ask you  
15 a couple questions about the WaterFix Project and  
16 diversion of surplus flows versus diversion of stored  
17 water.

18 WITNESS MUNÉVAR: (Nodding head.)

19 MR. O'HANLON: The modeling results indicate  
20 that any increase in exports with the WaterFix Project  
21 will largely come from surplus flows at the Delta and  
22 relatively little from water released from storage?

23 WITNESS MUNÉVAR: Well, I think, for the  
24 modeling scenarios, we have a range here. Some result in  
25 higher exports and some do not.

1 MR. O'HANLON: All right.

2 WITNESS MUNÉVAR: So, with -- with that caveat,  
3 the -- by and large, the diversions that are occurring at  
4 the North Delta during the springtime are excess flows.

5 During the summertime, they could be -- they  
6 could be stored water releases, just as we today have  
7 stored water releases being exported at the south.

8 MR. O'HANLON: And none of the op -- proposed  
9 operational criteria or existing operational criteria  
10 would preclude diversion of stored water at the new North  
11 Delta Diversion facility; correct?

12 WITNESS MUNÉVAR: Only to the extent that the  
13 bypass flows are -- are limiting the ability to divert,  
14 as well as any other downstream operations, such as  
15 meeting Emmaton salinity standard may not enable the  
16 diversion even under a stored water flow condition.

17 MR. O'HANLON: So the practical effect of those  
18 other criteria would prevent diversion at the North Delta  
19 Diversion, but there's no express limitations to  
20 diversion in surplus flows at the North Delta facility;  
21 correct?

22 WITNESS MUNÉVAR: I think that was compound, as  
23 far as I understand it.

24 So, let me try to take -- take it in two, or do  
25 you --

1 MR. O'HANLON: That's fine.

2 WITNESS MUNÉVAR: The practical limitations  
3 are, the Delta's operated as a -- as a system, as the  
4 Operators testified in the previous panel, and they're  
5 looking at multiple standards.

6 If those standards were not controlling,  
7 then -- and there were stored water releases, and the  
8 North Delta bypass flows were -- were achieved, then  
9 there is nothing precluding the diversion of water at the  
10 North Delta facility as opposed to the South Delta  
11 facility.

12 MR. O'HANLON: All right. Thank you.

13 And now I have a few general questions about  
14 modeling and use of modeling.

15 And Mr. Munévar, you're free to answer or other  
16 members of the panel, if they want to contribute, are  
17 free to answer as well.

18 The first question is, how do you validate a  
19 model?

20 WITNESS MUNÉVAR: I'll jump in on that.

21 Through -- When people talk about calibration  
22 and validation, they're often talking physically-based  
23 models, when you can achieve -- test the physics of it  
24 and how well the physics is represented against the  
25 stored.

1           CalSim, in particular, is a model that is  
2     simulating the hydrology and system operations for a  
3     condition that has not yet existed.

4           We've got 1922 to '80 -- to 2003 hydrology. We  
5     have operations for -- for Biological Opinions, and we  
6     have operations for -- for new facilities that have  
7     yet -- yet to be implemented. So validating a model is  
8     quite difficult to model, like -- like CalSim.

9           There has been an historical validation run  
10    that was prepared -- I forget the year, but it was in  
11    '87 to '92 or '93 period, I believe -- in which the  
12    CalSim inputs were forced to be historic -- direct  
13    historic imports and the operation assumptions -- and  
14    operation assumptions that were included suggested  
15    that -- that results were well within 2 to 3 percent, if  
16    I recall correctly. The numbers are in my -- my actual  
17    testimony.

18           So, the model has been, I'd say,  
19    pseudo-validated for a historic period, but I think a  
20    validation of a model, where we're testing out  
21    operational assumptions, is quite different than what you  
22    might do for a physical -- physically-based model.

23           MR. O'HANLON: Do any of the other Panel  
24    Members want to add to Mr. Munévar's answer?

25           WITNESS NADER-TEHRANI: With respect to DSM-2

1 as in contrast to CalSim/DSM-2, these are  
2 physically-based models.

3 And when you use DSM-2, the mode of historical  
4 simulation, you can expect to be able to, thus, simulate  
5 water -- water levels, flows, and water quality at  
6 different locations in the Delta.

7 So there has been a number of efforts in the  
8 past in calibration and validation of the model where we  
9 compared actual models in simulations to actual results.

10 If you need the specifics about the different  
11 calibration/validation periods, Miss Tara -- Miss Tara  
12 Smith can -- can -- can elaborate more if needed.

13 MR. O'HANLON: No. I think that's sufficient.  
14 Thank you.

15 Now, Mr. Munévar, in -- And when you're doing  
16 your modeling, do you get inputs -- input from the  
17 Project Operators and other knowledgeable people about  
18 what the model is trying to represent?

19 WITNESS MUNÉVAR: Yeah. I think the typical  
20 modeling process in particular for a -- a Project of this  
21 size is, the No-Action tends to have a considerable  
22 amount of input from -- from what -- what are the  
23 assumptions that go in as well as how are the operations  
24 that reflect that No-Action.

25 And then the Operators, again, were engaged in

1 terms of how they might operate with the -- with the  
2 facility in place. And I believe they testified to that  
3 in the previous panel.

4 MR. O'HANLON: And -- And do you make  
5 adjustments to the model based on that input?

6 WITNESS MUNÉVAR: We do.

7 I mean, just to be clear, we have -- we have  
8 rules that try to emulate Operator decisions. And to the  
9 extent that our rules can be adjusted to reflect the --  
10 the basis of those -- of their decisions, we -- we do  
11 make those adjustments.

12 MR. O'HANLON: I have no further questions.

13 CO-HEARING OFFICER DODUC: Thank you --

14 MR. O'HANLON: Thank you.

15 CO-HEARING OFFICER DODUC: -- Mr. O'Hanlon.

16 Group Number 5, Mr. Williams?

17 MS. McCUE: Before we move on, can I just  
18 clarify:

19 I think Miss Aufdemberge identified Kristin  
20 White's list of qualifications as DOI-1, and it should be  
21 DOI-2; is that correct?

22 MS. AUFDEMBERGE: I'm sorry. You're absolutely  
23 right.

24 MS. McCUE: Okay. Thank you.

25 CO-HEARING OFFICER DODUC: Thank you,

1 Miss McCue.

2 Mr. Williams.

3 MR. WILLIAMS: Philip Williams for Westlands.

4 No questions. Thank you.

5 CO-HEARING OFFICER DODUC: Number 6 . . . is  
6 not here.

7 And I see Number 7 is ready to go.

8 And I was advised by Mr. Ferguson, Sacramento  
9 County Water Agency, that he would like to conduct his  
10 cross-examination along with Group Number 15, East Bay  
11 Municipal Utility District.

12 You've been abandoned.

13 MR. LILLY: That's okay.

14 So, I'm Allan Lilly here for the Sacramento  
15 Valley Water Users and, then, specifically for the Cities  
16 of Folsom and Roseville, San Juan Water District and  
17 Sacramento Suburban Water District.

18 And before I get started, I just wanted to  
19 explain and have my colleagues here explain: We have on  
20 behalf of Sacramento Water Users, which are -- is a --  
21 It's a group of 40 different entities that have all filed  
22 Protests here.

23 We have coordinated -- We will certainly take a  
24 lot less than 40 hours, but we will probably take more  
25 than one hour per person, and mine is estimated to be

1 about two hours to begin with, and then the others will  
2 follow with somewhat shorter questioning because of our  
3 coordination.

4 So I don't know if you want any more details  
5 about that now or if you want us to just get started.

6 CO-HEARING OFFICER DODUC: Just get started.  
7 And I will trust you, Mr. Lilly, to be as efficient as  
8 possible.

9 MR. LILLY: Okay.

10 CO-HEARING OFFICER DODUC: And I know that you  
11 can be very efficient.

12 MR. LILLY: I will do my best.

13 So, I have some exhibits which I've already  
14 given electronic copies to Mr. Baker and I'm distributing  
15 paper copies to all of you and the witnesses and the  
16 attorneys.

17 CO-HEARING OFFICER DODUC: So, Mr. Lilly --  
18 (Documents distributed.)

19 CO-HEARING OFFICER DODUC: Well, I'll let you  
20 do that before you answer my question.

21 But I think it -- It might be very helpful,  
22 especially since you are having to do a fairly extensive  
23 cross-examination, it sounds like:

24 Could you run down the main points -- or main  
25 questioning area that you will be covering for me?



1           MR. LILLY: Yes. I'm going to start with  
2 questions about modeling assumptions.

3           CO-HEARING OFFICER DODUC: Okay.

4           MR. LILLY: And that, of course, has a lot of  
5 details.

6           But then the next area will be real-time  
7 operational adjustments that may deviate from model  
8 assumptions.

9           And then I'm going to ask about the boundary  
10 analysis in particular.

11          CO-HEARING OFFICER DODUC: Okay.

12          MR. LILLY: And then I'm going to get into the  
13 modeling results.

14          CO-HEARING OFFICER DODUC: Okay.

15          MR. LILLY: And then . . .

16          Excuse me. I wasn't expecting to have to  
17 provide a summary.

18          And then the last area is specific questions  
19 regarding dry conditions and -- and, you know, basically  
20 drought conditions and the -- how well the modeling  
21 reflects drought conditions.

22          CO-HEARING OFFICER DODUC: All right.

23          MR. LILLY: So that's a brief summary if that's  
24 acceptable for now.

25          CO-HEARING OFFICER DODUC: Thank you.

1           Actually, that is very helpful.

2           And I would ask other cross-examiners to do the  
3 same.

4           And I will ask those of you who are waiting to  
5 cross-examine to take note of these points and take note  
6 of the areas that Mr. Lilly is covering. It sounds like  
7 he's going to be covering extensively these areas. So we  
8 will not be repeating grounds that he is covering for all  
9 of you.

10           With that, Mr. Lilly, please begin.

11                           CROSS-EXAMINATION BY

12           MR. LILLY: Okay. And I believe most of my  
13 questions are for you, Mr. Munévar.

14           Good afternoon. Again, my name is Allan Lilly,  
15 and I'm here for the Sacramento Valley Water Users and  
16 then specifically for the Cities of Folsom and Roseville,  
17 San Juan Water District and Sac Suburban Water District.

18           CO-HEARING OFFICER DODUC: Hold on, Mr. Lilly.

19           Yes, Mr. Jackson.

20           MR. JACKSON: Yes. You may have heard a kind  
21 of a gasp from the back of the room. I'll -- And I'll  
22 reflect some of it.

23           First of all, we all have different cases, and  
24 we're talking about injury to different clients.

25           CO-HEARING OFFICER DODUC: Mr. -- mr. Jackson,

1 I understand, and you've had some great similar questions  
2 before.

3 And perhaps I wasn't clear enough. To the  
4 extent that Mr. Lilly is covering foundational questions  
5 in his cross-examination, I don't expect that to be  
6 repeated.

7 However, if there's nuances that are -- you  
8 know, that are unique or that would -- that portrays your  
9 client's perspective, definitely you're -- you are  
10 allowed to bring that up.

11 But it sounds like, to the extent that there  
12 are basic fundamental questions regarding, for example,  
13 modeling operation -- modeling assumptions and just the  
14 basic stuff, we don't need to go over it again.

15 MR. JACKSON: Well -- And just one more  
16 question, if you could humor me for a moment.

17 CO-HEARING OFFICER DODUC: Always, Mr. Jackson.

18 MR. JACKSON: Thank you. And you're usually  
19 very good at humoring me.

20 The -- The main question is -- I mean -- And  
21 it's not just Mr. Lilly or the ones who will follow. It  
22 was the starting questions from Mr. O'Hanlon.

23 I'm perfectly satisfied with the answers to  
24 those questions and would not repeat them, as long as I'm  
25 clear that those answers will remain in this record all

1 the way through Part II or IV.

2 CO-HEARING OFFICER DODUC: Yes.

3 MR. JACKSON: Thank you.

4 MR. LILLY: May I proceed?

5 CO-HEARING OFFICER DODUC: I don't know. May  
6 you?

7 MR. LILLY: I will.

8 CO-HEARING OFFICER DODUC: Please, Mr. Lilly.

9 MR. LILLY: So, Mr. Munévar, the second exhibit  
10 in the pile that I just gave you are paper copies. And  
11 you can either look on paper or on the screen, whichever  
12 is easier for you. It's kind of a generational thing, I  
13 think.

14 WITNESS MUNÉVAR: I'm somewhere in between.

15 MR. LILLY: I'm not sure which generation  
16 you're in.

17 But I've marked your written testimony, which  
18 is Exhibit DWR-71, as Exhibit BKS-8. And the reason I  
19 did that, I just highlighted it just to make it easier  
20 for you to spot the particular text that I'm asking  
21 questions about.

22 ///

23 ///

24 ///

25 ///

1 (The City of Roseville, Sacramento  
2 Suburban Water District, San Juan  
3 Water District, The City of Folsom,  
4 Yuba County Water Agency and The  
5 City of Roseville Exhibit 8 marked  
6 for identification)

7 MR. LILLY: So that's -- If you can look at  
8 BKS-8, or if you can put that on the screen, that's the  
9 way I planned to proceed.

10 (Document displayed on screen.)

11 MR. LILLY: And I'll start -- If you could just  
12 flip to Page 3 --

13 (Document displayed on screen.)

14 MR. LILLY: -- where I've highlighted Lines 13  
15 to 14, which states (reading):

16 "The models incorporate a set of base  
17 assumptions."

18 Do you see that?

19 WITNESS MUNÉVAR: Page 13 and 14?

20 MR. LILLY: No. Excuse me. Page 3, Lines 13  
21 to 14.

22 WITNESS MUNÉVAR: Got it.

23 MR. LILLY: Okay. So, what are the base  
24 assumptions that you're describing here?

25 WITNESS MUNÉVAR: The base assumptions are

1 essentially what we're calling the No-Action assumptions.

2 MR. LILLY: Okay. Can you just describe the  
3 types of parameters that are base assumptions, then?

4 WITNESS MUNÉVAR: So, that would be the  
5 Biological Opinions, the D-1641, the -- the demands that  
6 are on the system, the allocation process to meet those  
7 senior demands. Those would be the base assumptions.  
8 Reservoir, flood control diagrams, et cetera.

9 MR. LILLY: And I assume things like reservoir  
10 outlet capacities and things like -- and all the other  
11 things applicable to operations.

12 WITNESS MUNÉVAR: Correct.

13 MR. LILLY: All right. And are these base  
14 assumptions described in any of the exhibits that the  
15 Petitioners have filed for this hearing?

16 WITNESS MUNÉVAR: I believe they are described  
17 in the -- I'll defer to some of my colleagues if they  
18 know the location better -- but in the -- the Draft  
19 EIR/EIS.

20 As part of my presentation of testimony, we  
21 were looking at the key things that changed from the base  
22 assumption.

23 I believe they're also described in the -- in  
24 the Draft and Final Biological Assessment that I believe  
25 were provided as exhibits.

1           MR. LILLY: Okay. Are those the main documents  
2 that you are aware of that describe these base  
3 assumptions?

4           WITNESS MUNÉVAR: Those are the main documents  
5 for the California WaterFix that describe the base  
6 assumptions.

7           MR. LILLY: Okay. And I -- There have also  
8 been various computer files related to the CalSim II  
9 modeling that have been posted.

10           Do those files also contain the base  
11 assumptions?

12           WITNESS MUNÉVAR: So, the -- Yeah. So let  
13 me -- Let me answer it two ways.

14           So, there's a documentation of the base  
15 assumptions which -- which I identified to where they  
16 were in the Biological Assessments.

17           And then the computer files have -- Essentially  
18 all of the assumptions that are included in the modeling  
19 are built into those computer files. They're readably  
20 viewable and most of them are documented within the Codes  
21 themselves.

22           MR. LILLY: Okay. So -- But if -- if -- if you  
23 go into the computer files, you have to be able to read  
24 the computer codes to be able to understand them; is that  
25 correct?

1                   WITNESS MUNÉVAR: There's documentation within  
2 the files that are -- do not require you to be a Coder or  
3 a Modeler to review, but -- but they're not consolidated  
4 in one location.

5                   MR. LILLY: Okay. It's not in what you  
6 might -- It's not in the same type of format as in the  
7 EIR, EIS or the Biological Assessments; is that correct?

8                   WITNESS MUNÉVAR: Yeah, I think that's correct.  
9                   And if any of my panelists want to jump in,  
10 they know the location better.

11                   WITNESS BUCHHOLZ: They're in Appendix 5A of  
12 the EIR/EIS and Appendix 5A of the Biological Assessment.

13                   MR. LILLY: Okay. Thank you.

14                   All right. So returning to Page 14 of your  
15 testimony.

16                   And I've highlighted Lines 19 through 20, which  
17 state (reading):

18                   "Each of the scenarios is briefly described  
19 below and key assumption differences are summarized  
20 in Exhibit DWR-515."

21                   Do you see that?

22                   WITNESS MUNÉVAR: Yes.

23                   MR. LILLY: Are there any modeling assumptions  
24 besides those listed in Exhibit DWR-515 that vary among  
25 the five different scenarios that you've described in



1 your testimony?

2 WITNESS MUNÉVAR: Those are the main modeling  
3 assumptions that -- that vary.

4 But let me -- let me be clear that the modeling  
5 is not, we change one set of assumptions, press a button,  
6 and look for results.

7 We -- We put in the criteria. We -- We run  
8 those simulations. Many times, the allocation has to be  
9 reduced because we -- because we cannot provide enough  
10 water with a particular criteria.

11 So there are modeling adjustments that have to  
12 occur by experienced Modelers to get the allocations and  
13 the -- the operations correct.

14 MR. LILLY: Okay. And is there any document  
15 that describes those modeling adjustments that show the  
16 variations in your assumptions between scenarios beyond  
17 those described in Exhibit DWR-515?

18 WITNESS MUNÉVAR: I'm not aware that they're  
19 described in Appendix 5A.

20 Yeah, I'm -- I'll leave it at that. I'm not  
21 aware that they are.

22 MR. LILLY: Okay. And the -- the Hearing  
23 Notice referred to -- as are directing the Petitioners to  
24 submit exhibits describing the logic of the CalSim II  
25 modeling.

1           Are there been any exhibits that have been  
2 submitted for this hearing that describe the CalSim II  
3 hearing (sic) logic?

4           Excuse me. The CalSim II modeling logic.

5           WITNESS MUNÉVAR: I think the -- the -- There's  
6 summary descriptions in that Appendix 5A. There is a --  
7 a detailed document that DWR has on their website that  
8 was -- is somewhat dated but has the benchmark studies,  
9 which describes the detailed logic of the model.

10          MR. LILLY: Okay. But that -- So that's not an  
11 exhibit for this hearing, but that's something a  
12 technical person could address through DWR's website?

13          WITNESS MUNÉVAR: Right.

14          WITNESS BUCHHOLZ: And -- And it's one of the  
15 references in Appendix 5A.

16          WITNESS MUNÉVAR: Yes.

17          MR. LILLY: Now, going to the results of your  
18 modeling work.

19                 Beyond the details that are described in  
20 Petitioners' exhibits, have the results of your modeling  
21 work for this hearing been made available to the parties?

22          WITNESS MUNÉVAR: To my knowledge, in the  
23 end-of-May, all of the modeling inputs and outputs were  
24 provided, I believe, through -- through the Board's  
25 website for all the modeling inputs and outputs, so

1 that -- that includes the results.

2 MR. LILLY: Okay. So, again, if somebody wants  
3 to look at that, they'd have to go into the -- the files  
4 that were posted on the State Board's website and -- and  
5 download the necessary information from those files?

6 WITNESS MUNÉVAR: That's correct.

7 CO-HEARING OFFICER DODUC: Could you pull the  
8 microphone closer to you?

9 WITNESS MUNÉVAR: (Nodding head.)

10 MR. LILLY: Now, if -- if you can go forward to  
11 Exhibit BKS-2 and shifting back to Page 2.

12 WITNESS MUNÉVAR: I'm sorry. I'm not tracking  
13 what BKS-2 is.

14 MR. LILLY: It's the marked copy of your  
15 testimony.

16 WITNESS MUNÉVAR: Okay. Thank you.

17 Oh. Did you mean BKS-8?

18 MR. LILLY: Excuse me. That's why there's  
19 confusion. I meant BKS-8, Page 2.

20 Thank you, Mr. Munévar, for clarifying.

21 So, do you have Page 2 of that up in front of  
22 you?

23 (Document displayed on screen.)

24 WITNESS MUNÉVAR: Yes.

25 MR. LILLY: All right. And I'm -- And I'm

1 going to read the highlighted text on Lines 26 to 27,  
2 which says (reading):

3 "These scenarios are evaluated considering  
4 climate change and sea-level rise effects at about  
5 year 2025."

6 Do you see that?

7 WITNESS MUNÉVAR: Yes.

8 MR. LILLY: What were the modeling assumptions,  
9 if you could describe -- not in all detail but so that we  
10 can all understand, that were made regarding climate  
11 change through 2025?

12 WITNESS MUNÉVAR: So, there are two areas where  
13 climate change was incorporated. One was in the  
14 atmospheric, the meteorological conditions, so  
15 precipitation and temperature.

16 And then the second -- And those affect the  
17 amount of -- the amount and the form of precipitation on  
18 the watershed, the timing of runoff, et cetera.

19 The other aspect of it is the sea-level rise  
20 component, which I -- which I described as 15 centimeters  
21 of sea-level rise.

22 MR. LILLY: And are those assumptions regarding  
23 climate change and sea-level rise through 2025 the same  
24 for all five model scenarios?

25 WITNESS MUNÉVAR: They are.

1           MR. LILLY: Okay. And did the modeling  
2 assumptions regarding climate change -- Or I'll just ask  
3 the question.

4           What assumptions did the modeling make  
5 regarding climate change related to Folsom Reservoir  
6 inflows?

7           WITNESS MUNÉVAR: Well, not specific --  
8 specific for Folsom but also more generally, the climate  
9 change assumptions were -- were to adjust the historical  
10 inflow sequences at each of the major inflow points,  
11 including inflow into Folsom.

12          MR. LILLY: All right. And are you aware that  
13 there are several reservoirs in the watershed of the  
14 American River upstream of Folsom Reservoir?

15          WITNESS MUNÉVAR: I am.

16          MR. LILLY: And would any -- Did the modeling  
17 make any changes in the assumed operations in those  
18 upstream reservoirs to account for climate change?

19          WITNESS MUNÉVAR: No. The adjustments were to  
20 the inflow at Folsom. The CalSim II model does not  
21 simulate the upstream operations.

22          MR. LILLY: Now, regarding the different  
23 components of the five different scenarios, I think you  
24 may have answered a couple of questions -- answer --  
25 answered this issue in response to a couple of questions

1 from Mr. O'Hanlon but I have a little more detail.

2 Who made the fi -- Who had the final authority  
3 to decide what components would be included in each of  
4 these five model scenarios?

5 WITNESS MUNÉVAR: Well, the H3 and H4 were --  
6 were being developed through the -- through the  
7 California WaterFix, so those were the proposed initial  
8 operational range.

9 Then, through discussion with the -- the Team,  
10 it was decided that the Boundary 1 and Boundary 2 should  
11 be included to provide a broader range for this hearing  
12 specifically.

13 MR. LILLY: And then who is -- Who were members  
14 of the Team?

15 WITNESS MUNÉVAR: DWR management. I don't  
16 know -- I believe it was just DWR. I don't believe it  
17 was the fishery agencies as part of that.

18 MR. LILLY: So did you basically take your  
19 directions from the DWR management regarding what  
20 assumptions to make for these different scenarios?

21 WITNESS MUNÉVAR: Yes, in general.  
22 Specifically, Boundary 1 and Boundary 2, because they  
23 were prepared for this -- for this hearing.

24 The H3 and H4 have a long history of evolving  
25 discussions and assumptions, so that would be a

1 broader -- broader set of input into H3 and H4.

2 MR. LILLY: And -- And who is involved  
3 besides -- Who was involved besides DWR in that broader  
4 set of input?

5 WITNESS MUNÉVAR: Gwen, do you want to take  
6 this?

7 WITNESS BUCHHOLZ: H3 and H4 were part of the  
8 Draft EIR/EIS, and at that time, our lead agencies were  
9 DWR, Reclamation, U.S. Fish and Wildlife Service and  
10 National Marine Fisheries Service.

11 MR. LILLY: So those were the main agencies  
12 that --

13 WITNESS BUCHHOLZ: Yes.

14 MR. LILLY: -- developed --

15 WITNESS BUCHHOLZ: Because they were the lead  
16 agencies for the EIR -- Draft EIR/EIS.

17 MR. LILLY: All right. So shifting back to  
18 you, Mr. Munévar.

19 Were you involved in determining how the  
20 upstream reservoirs would be simulated or assume -- or  
21 assumed to operate under each of these scenarios?

22 And by "upstream reservoirs," I mean the  
23 upstream State Water Project and Central Valley Project  
24 Reservoirs.

25 WITNESS MUNÉVAR: The criteria were put into

1 place with the assumptions that were indicated here. And  
2 the operational results are -- are what you see with the  
3 caveat, is that we, through expert modeling and looking  
4 at -- at how those results play out, we have to make some  
5 adjustments. And, yes, I was involved in making some of  
6 those adjustments.

7 MR. LILLY: Okay. And I'm not clear, but when  
8 you say "here," what do you mean by it's shown here?

9 WITNESS MUNÉVAR: As shown in -- Sorry. I  
10 wasn't very clear.

11 As shown in -- in my testimony and in the --  
12 the summary of my testimony.

13 MR. LILLY: Okay. So the -- the -- the  
14 exhibits that show the assumptions for upstream reservoir  
15 operations are your testimony and the summary of your  
16 testimony?

17 Are there any other documents that show the  
18 modeling assumptions for upstream reservoir operations?

19 WITNESS MUNÉVAR: Well, I think, as I indicated  
20 before -- and Gwen chimed in -- the Appendix 5A has --  
21 has detailed assumptions. The operational criteria are  
22 described into that -- in that appendix.

23 MR. LILLY: Okay. So those are the documents  
24 that describe these as operating assumptions?

25 WITNESS MUNÉVAR: Yes.



1           MR. LILLY: And are the assumptions about the  
2 operations of the upstream CVP and SWP Reservoirs the  
3 same for all five of the scenarios described in your  
4 testimony?

5           WITNESS MUNÉVAR: The operational criteria are  
6 the same. I'm -- I'm making a distinction between  
7 criteria and . . .

8           So, we are meeting the same in-stream flows,  
9 the same deliveries, the same obligations in the Delta  
10 that drive those upstream operations.

11          MR. LILLY: So -- So, when you say "upstream  
12 criteria," are you referring basically to the regulatory  
13 requirements that apply to those reservoirs?

14          WITNESS MUNÉVAR: Regulatory or -- or  
15 operational basis assumptions that we've inferred from  
16 the Operators, yes.

17          MR. LILLY: Okay. Well, that's -- that's where  
18 we have trouble, is, what are these operational basis  
19 assumptions beyond regulatory requirements?

20          WITNESS MUNÉVAR: I'll give you one example,  
21 which I don't know if it will be helpful, is that the  
22 temperature operations at Shasta in particular.

23                 We do not have a temperature model within  
24 CalSim. So, oftentimes, we are looking at -- at flows  
25 that result from CalSim and determine whether they're --

1       whether they are sufficient or whether we've pulled too  
2       hard on -- on the chest without having a temperature  
3       model.

4                 In real-time operations, they would make  
5       real-time decisions based on the actual temperature of  
6       cold water pool in the fisheries.

7                 MR. LILLY: I guess that does sort of relate  
8       back to a regulatory requirement.

9                 But I'm just wondering if you can tell us: Are  
10       there any operational assumptions that are not related to  
11       regulatory requirements that you used for your modeling  
12       of the upstream CVP/SWP Reservoirs?

13                WITNESS MUNÉVAR: I guess another one that  
14       would be not necessarily for the upstream but for the  
15       system as a whole is a balance of -- of how much the  
16       timing and when water could be moved to the South of  
17       Delta, to the San Luis Reservoir. So there's a balance  
18       of -- of north and south.

19                MR. LILLY: Okay. And -- And please describe  
20       how the model makes those determinations of what you call  
21       the balance between north and south.

22                WITNESS MUNÉVAR: In general, the modeling  
23       is -- is meeting its -- its regulatory requirements.  
24       It's then determining whether in flood control or not.

25                And if water could be moved from north to

1 south, it's adjusted through a -- a Rule Curve in  
2 San Luis, which sets how much water or the desired amount  
3 of water to move from north to south.

4 MR. LILLY: It's -- So is the San Luis Rule  
5 Curve, then, the primary driver to determine this  
6 north-to-south movement -- movement of stored water?

7 WITNESS MUNÉVAR: I -- I would say it's not the  
8 primary driver. In many cases, releases from upstream  
9 reservoirs are required for other -- for things other  
10 than moving water to San Luis.

11 MR. LILLY: Okay. I'm sorry. I should have  
12 clarified.

13 I understand there are many regulatory  
14 requirements that apply to this system. But beyond those  
15 regulatory requirements, is the San Luis Rule Curve the  
16 prime -- the next primary driver that determines when  
17 water is modeled as being moved from the upstream  
18 reservoirs down to San Luis?

19 WITNESS MUNÉVAR: You can -- You can think of  
20 it as a -- as a desired movement, but the restrictions  
21 within the Delta may limit that substantially, in  
22 particular in the Boundary -- Boundary 2 scenario as  
23 we've indicated here.

24 MR. LILLY: Okay. Again, the assumed  
25 regulatory restrictions may limit the application of the

1 San Luis Rule Curve; is that correct?

2 WITNESS MUNÉVAR: That's correct.

3 MR. LILLY: All right. And just for the  
4 civilians here among us, maybe you could describe in a  
5 little bit of detail what the San Luis Rule Curve  
6 includes.

7 WITNESS MUNÉVAR: The San Luis Rule Curve is --  
8 is really an Operator decision on -- on when and how much  
9 water could be moved south of the Delta in order to meet  
10 South-of-Delta demands that occur peaking in the summer.

11 So when you have low allocations, you don't  
12 need a very high San Luis storage coming into, say, May  
13 or June in order to meet summertime demands.

14 If you have a high allocation, being a wet  
15 year, and allocated a large amount to South-of-Delta  
16 contractors, then you need to have a sufficient amount of  
17 storage to meet those demands in the summer period.

18 MR. LILLY: So -- So, is the Rule Curve a curve  
19 with a Y-Axis and an X-Axis or is it more in the form of  
20 a table? If you can just help us understand what the  
21 Rule Curve really means.

22 WITNESS MUNÉVAR: It's -- No, it's not as  
23 simple as a -- as a table with a Y-Axis. It's -- It's  
24 an -- an assessment of when there is an opportunity to  
25 move water to San Luis given the number of the

1 constraints in the system and then a target of volume to  
2 move that water to San Luis to meet summertime demands.

3 MR. LILLY: All right. And does the San Luis  
4 Rule Curve vary among the five different scenarios  
5 described in your testimony?

6 WITNESS MUNÉVAR: The operation for San Luis  
7 varies, yes.

8 And if I can expand on that, because I think  
9 it's an important point.

10 Every time we add a new regulatory -- new  
11 facility, a new operation, it changes the behavior in  
12 which the -- the Operators might move water across the  
13 Delta.

14 When we had the Biological Opinions, they  
15 substantially changed the timing in which we moved water  
16 across the Delta.

17 MR. LILLY: All right. And I -- And so I'm --  
18 I'm confused there. Maybe you could clarify.

19 I understand that because of the regulatory  
20 requirements, and the variations in regulatory  
21 requirements, particularly variations in Delta outflow  
22 requirements among these five scenarios, they can --  
23 those variations can affect implementation of the  
24 San Luis Rule Curve.

25 But my question was: Do the actual rules in

1 the Rule Curve vary among the five scenarios?

2 WITNESS MUNÉVAR: Yes, so perhaps I didn't  
3 explain well.

4 MR. LILLY: Please.

5 WITNESS MUNÉVAR: They -- They vary -- It's not  
6 just the implementation. If you know, for example, in  
7 Boundary 2 that you're extremely restrictive in March,  
8 April, May in low San Joaquin flow years, then if you  
9 want to meet allocation south of the Delta, that water  
10 needs to be moved earlier or more aggressively later.

11 So it's not just a curve that you always try to  
12 meet and we -- and we just are constrained by the  
13 operations we put on it. It is a dynamic process.

14 MR. LILLY: Okay. So that -- It sounds like  
15 it, in fact, does vary among the five different  
16 scenarios.

17 WITNESS MUNÉVAR: It does. The -- That's what  
18 I think I -- I think I said that.

19 MR. LILLY: Okay. And do any of -- of the  
20 exhibits that Petitioners have submitted for this hearing  
21 describe any of these variations in the San Luis Rule  
22 Curve?

23 WITNESS MUNÉVAR: Not that I'm aware of, not in  
24 the exhibits I provided.

25 MR. LILLY: So -- And -- So how, if it -- if an

1 interested party wanted to find out about these  
2 variations in the San Luis Rule Curve, how could one find  
3 that information?

4 WITNESS MUNÉVAR: Well, I think the full set of  
5 modeling inputs and outputs have been provided, which  
6 describe the Rule Curve and the line associated with it.

7 MR. LILLY: So that would be the source to  
8 determine the variations in the San Luis Rule Curve?

9 WITNESS MUNÉVAR: Yes.

10 MR. LILLY: Now, do -- do the -- Excuse me.

11 Does the model work that you've described in  
12 your testimony have Rule Curves for any of the upstream  
13 CVP or SWP Reservoirs?

14 WITNESS MUNÉVAR: Yes. All -- All of the  
15 reservoirs have -- have Rule Curves which are serving  
16 different -- slightly different purposes.

17 MR. LILLY: All right. And I don't want to get  
18 too bogged here because I might test the Hearing  
19 Officer's patience.

20 But do those Rule Curves for the upstream  
21 reservoirs also vary among the five different scenarios?

22 WITNESS MUNÉVAR: I don't believe so. I  
23 believe they are the same across all five scenarios.

24 MR. LILLY: All right. And -- And to determine  
25 that one, is the best source for an interested party to

1 determine that to go to this modeling information that  
2 you said is posted?

3 WITNESS MUNÉVAR: Correct.

4 MR. LILLY: All right. Are there any other  
5 rules regarding reservoir operations -- I should -- Let  
6 me state that again.

7 Are there any other rules regarding the  
8 operations at the CVP and SWP Reservoirs besides the  
9 Reservoir Rule Curves that vary among these five  
10 scenarios?

11 WITNESS MUNÉVAR: Yeah. I think, collectively,  
12 the Rule Curve and what we call the allocation logic vary  
13 across the scenarios.

14 MR. LILLY: And -- And is there anything else?

15 Again, I understand that the regulatory  
16 requirements vary among the scenarios, but anything else  
17 besides the Rule Curves and the allocation logic that  
18 varies among these five scenarios?

19 WITNESS MUNÉVAR: The only other one I would  
20 add would be in the -- In the H4, there is a -- a  
21 requirement or a -- an objective for Oroville releases  
22 for the higher outflow that's part of H4 in the wetter  
23 half of years.

24 MR. LILLY: Okay. And I believe that's at  
25 least partly summarized in your -- your -- in Exhibit



1 DWR-515?

2 WITNESS MUNÉVAR: It is.

3 MR. LILLY: All right. So, just comparing --  
4 Going back to the San Luis Rule Curve for a minute.

5 Just comparing the San Luis Rule Curve for the  
6 No-Action Alternative with the San Luis Rule Curves for  
7 the four different Cal WaterFix scenarios, was there any  
8 variation made in that San Luis Rule Curve between the  
9 No-Action Alternative and the other four scenarios to  
10 reflect the fact that there would be the new diversion  
11 capacity of the North Delta Diversion with the Cal  
12 WaterFix Project?

13 WITNESS MUNÉVAR: I think, like I testified  
14 before, anytime there's a -- a substantial change to the  
15 system, whether it's regulatory, physical, the -- it  
16 increases or decreases the flexibility of operations.

17 And to the extent it increases flexibility of  
18 operations, the Rule Curve could be -- could be adjusted.  
19 To the extent it decreases flexibility in the Rule Curve,  
20 it may need to be adjusted as well.

21 MR. LILLY: So do you know if there was  
22 specific adjustments made in the San Luis Rule Curve to  
23 reflect the presence of the North Delta Diversion under  
24 the four Cal WaterFix scenarios?

25 WITNESS MUNÉVAR: Well, in particular for

1 Boundary 1, I know there were adjustments because of the  
2 difficulty moving water during certain time periods.

3 MR. LILLY: Okay. And are you aware of  
4 adjustments to account for the North Delta Diversion  
5 under the H3, H4, Boundary 2 scenarios?

6 WITNESS MUNÉVAR: I -- I believe there are, but  
7 I -- I can't say -- I can't say exactly right now, but I  
8 believe there are.

9 MR. LILLY: Okay. But that's the sort of thing  
10 one would have to go into the modeling files that you've  
11 described to find out?

12 WITNESS MUNÉVAR: Right.

13 MR. LILLY: Okay. Now, if you can forward --  
14 or back to Exhibit BKS-8, which is your testimony with my  
15 highlights, and shift to Page 18.

16 (Document displayed on screen.)

17 At the -- At the bottom on Line -- Starting on  
18 Line 27, the highlighted text reads (reading):

19 "CalSim II simulates storage in the major SWP  
20 and CVP Reservoirs as a function of in-stream flow  
21 requirements, upstream water rights, water service  
22 contractor allocations, Delta flow and salinity  
23 requirements, Reservoir Rule Curves, South-of-Delta  
24 storage levels, and other operational  
25 considerations."

1 Do we -- Do you see that?

2 WITNESS MUNÉVAR: Yes.

3 MR. LILLY: Okay. I'm not going to ask you  
4 again about the Rule Curves. You obviously already  
5 explained about that.

6 But what are the other operational  
7 considerations that you're talking about here?

8 WITNESS MUNÉVAR: I think this -- this  
9 statement is just describing what CalSim simulates. I  
10 think that's the -- The beginning of the sentence, it  
11 says, "CalSim simulates storage as a function of" all  
12 these other requirements or considerations.

13 MR. LILLY: Okay. Well, so can you tell us --  
14 I mean, everything before that is certainly a lot of  
15 different parameters, including the applicable regulatory  
16 requirements and operations.

17 And I'm just wondering if you have -- if you  
18 can tell us what the other operational considerations  
19 are.

20 WITNESS MUNÉVAR: Oh, you're referring to --  
21 Are you referring to Line 2 on Page 18?

22 MR. LILLY: Yes. Where it says, "and other  
23 operational considerations."

24 WITNESS MUNÉVAR: Well, I think this could  
25 refer to -- to the ability to -- the flexibility of the

1 system to move water at certain times.

2 So, for example, using the Boundary 2 again.  
3 The Boundary 2 has a very restrictive South Delta export  
4 during springtime, and that would come into play.

5 MR. LILLY: Okay. So -- So these could be some  
6 operational considerations besides those specifically  
7 driven by the Rule Curve?

8 WITNESS MUNÉVAR: In all likelihood, they're --  
9 they're the adjustments that we're making to allocations  
10 in Rule Curves simultaneously.

11 MR. LILLY: Okay. But are you aware of  
12 anything else that could be varied under this phrase  
13 "operational considerations"?

14 WITNESS MUNÉVAR: I'm not aware at this point,  
15 but I'll reserve the right to be aware.

16 MR. LILLY: Is that because the modeling is  
17 really detailed and there's a lot of different things in  
18 it?

19 WITNESS MUNÉVAR: There's a list -- There's a  
20 pretty substantial list already.

21 MR. LILLY: All right.

22 WITNESS WHITE: This is Kristin White with the  
23 Bureau of Reclamation.

24 Another possibility would be minimum of flows  
25 for water levels, not necessarily limiting instream

1 flows, but they need to keep a certain amount of water in  
2 the reservoir -- I mean, sorry, in the rivers, so that  
3 the other water rights -- riparian water rights users can  
4 pull water out. That would be another example.

5 MR. LILLY: Okay. And -- And if you could just  
6 elaborate on that.

7 How is that consideration reflected in the  
8 modeling?

9 WITNESS WHITE: I think the modeling -- CalSim  
10 referred to it as a -- as another type of minimum flow,  
11 but it's not an instream flow requirement the way you  
12 might think of one for a -- a Biological Opinion  
13 requirement or another -- or a D-1641 requirement.

14 It would be an operational constraint that, in  
15 real-time, could be coordinating, figuring out how much  
16 water we need to be releasing in order to allow those  
17 diversions to occur.

18 But the model needs to make some sort of  
19 assumptions for that.

20 MR. LILLY: Okay. Again, to find out those  
21 assumptions, we have to go into the -- the modeling files  
22 to see how that parameter might vary among the different  
23 scenarios?

24 WITNESS WHITE: I'm not sure if -- I'm thinking  
25 one like the Wilkins Slough -- or the navigational

1 control points. And that distinction might be --

2 MS. RIDDLE: Miss White, can you speak a little  
3 closer to the microphone. These microphones don't do  
4 well picking up your voice when it's too far away.

5 WITNESS WHITE: I'm sorry. I will try.

6 MS. HEINRICH: If you could pull it closer,  
7 too, rather than angling toward it.

8 WITNESS MUNÉVAR: All right. First time with  
9 these microphones.

10 I believe that some of them may be in the  
11 Appendix 5A, but I would defer to Gwen to see if  
12 she . . .

13 WITNESS BUCHHOLZ: The Wilkins Slough  
14 assumptions are in Appendix 5A, and they vary across the  
15 alternatives.

16 MR. LILLY: Okay. Are you aware of any of the  
17 other assumptions of these -- I don't want to say the  
18 wrong words, but what Miss White referred to as other  
19 instream flow parameters, are you aware of any other ones  
20 being documented anywhere besides just in the model  
21 files?

22 WITNESS BUCHHOLZ: There's -- There's quite a  
23 few. And, basically, we're looking at Appendix 5A,  
24 Section B of the Draft EIR/EIS and the same kind of  
25 situation comes up in Appendix 5A for the Biological

1 Assessment filter in 4(a).

2 MR. LILLY: Okay.

3 WITNESS BUCHHOLZ: And it goes on for quite a  
4 few pages.

5 MR. LILLY: So now Mr. Munévar, just coming  
6 back to your testimony, the next sentence there on  
7 Page 19 says (reading):

8 "CalSim II modeling attempts to maintain  
9 minimum end-of-year storage levels in each major  
10 reservoir based on Operator input."

11 Do you see that?

12 WITNESS MUNÉVAR: Yes.

13 MR. LILLY: Now, does op -- Does the term  
14 "Operator input" include anything other than what you've  
15 described so far, regarding the modeling assumptions for  
16 Reservoir Rule Curves and other reservoir operating  
17 parameters?

18 WITNESS MUNÉVAR: I think the Reservoir Rule  
19 Curves are -- are and have been developed based on  
20 Operator input, in particular for upstream reservoirs.

21 So I think, as Mr. Milligan testified last  
22 week -- I think it was last week -- that when he -- when  
23 you're at a certain storage level in March-April, he's  
24 targeting a specific end-of-year target, and those are  
25 what the Rule Curves essentially describe.

1           MR. LILLY: Okay. So, are you familiar with  
2 the Bio -- the Biological Opinion that the National  
3 Marine Fisheries Service issued in 2009 for CVP/SWP  
4 operations?

5           WITNESS MUNÉVAR: I don't.  
6           (The City of Roseville, Sacramento  
7 Suburban Water District, San Juan  
8 Water District, The City of Folsom,  
9 Yuba County Water Agency and The  
10 City of Roseville Exhibit 1 marked  
11 for identification)

12          MR. LILLY: And I'll -- I'll ask the staff to  
13 put up Exhibit BKS-1, Pages 3 to 4, and I also did give  
14 you a copy of Exhibit BKS-1.

15           (Document displayed on screen.)

16          MR. LILLY: And we've gone over this before.

17           I'm not going to read out loud again the  
18 highlighted text, which has the highlighted -- the title  
19 Action Roman Numeral I and then .2.2.C, and this is the  
20 criteria that applies when the end-of-September storage  
21 is at or below 1.9 million acre-feet.

22           Mr. Milligan testified in some detail about  
23 this.

24           But if you can just take a look at that  
25 highlighted text on Page 3 and then also the highlighted



1 text regarding Term 5 on Page 4 of Exhibit BKS-1, and  
2 just let us know when you've finished reading that.

3 WITNESS MUNÉVAR: Okay.

4 MR. LILLY: Okay. Are you familiar with this  
5 text?

6 WITNESS MUNÉVAR: I am generally.

7 MR. LILLY: All right. And does the modeling  
8 that you've described in your testimony have any  
9 assumptions or conditions to implement this term of this  
10 2009 NBS Biological Opinion?

11 WITNESS MUNÉVAR: Early on in the development,  
12 essentially, of the No-Action -- or preceding of the  
13 No-Action -- there was -- many years before the  
14 No-Action, so this was at the time just after 2009 --  
15 there was an attempt to meet that 1.9 -- I believe it's  
16 10 percent -- all but 10 percent of the years.

17 The conditions that exist in the -- in the  
18 modeling, in the hydrology, and with climate change, do  
19 not allow that storage level to be achieved without  
20 making other assumptions that would reduce the amount of  
21 obligations on -- on Shasta.

22 MR. LILLY: Okay. So that doesn't really  
23 answer my question.

24 How does the CalSim modeling, then, implement  
25 this term?

1                   WITNESS MUNÉVAR: So, the -- I'll -- Yeah. I'm  
2                   sorry I wasn't quite clear.

3                   The -- The operation assumptions are  
4                   essentially to not move any stored water during  
5                   conditions in which we are falling below the 1.9.

6                   So if we are low storage in Shasta, our Rule  
7                   Curve in San Luis, which is the driver for movement of  
8                   any water above the requirements, would be -- would be  
9                   low, such that we were not moving stored water.

10                  The model itself does not have a criteria that  
11                  says, "Thou shall meet 1.9." That's not a -- It's not a  
12                  threshold within the modeling.

13                  MR. LILLY: All right. And then this -- this  
14                  term in the Biological Opinion talks about (reading):

15                  ". . . Reclamation and DWR shall, as an overall  
16                  strategy, first, increase releases from Oroville or  
17                  Folsom."

18                  And then (reading):

19                  ". . . Reclamation shall increase releases from  
20                  Keswick as a last resort."

21                  Do you see that?

22                  WITNESS MUNÉVAR: Which --

23                  MR. LILLY: That's in the highlighted text on  
24                  that last -- of Page 4 of Exhibit BKS-1.

25                  WITNESS NO. 1: Okay. Yes, I see it.

1           MR. LILLY: So my -- my question is, does the  
2 modeling have any specific assumptions or conditions to  
3 implement this preference for use of Oroville or Folsom  
4 releases over Keswick releases, which are basically  
5 Shasta releases?

6           WITNESS MUNÉVAR: Well, I think in several  
7 areas.

8           So there, with the Rule Curve set, adjust both  
9 Folsom and Shasta, if Shasta were at low storage and  
10 Folsom on was at high, it would prioritize a release from  
11 Folsom over -- over Shasta.

12           I think, also, the -- the exports as driven by  
13 the Rule Curve would be at these levels -- at these low  
14 levels as well, so that we're not moving stored water.

15           MR. LILLY: All right. And -- And those  
16 adjustments that you've just mentioned in the Shasta and  
17 Folsom Rule Curves, do those vary among the five  
18 different scenarios you described, the No-Action  
19 scenar -- alternative scenario and then the four  
20 Cal WaterFix scenarios?

21           WITNESS MUNÉVAR: I don't believe the upstream  
22 Rule Curves are adjusted between the scenarios.

23           MR. LILLY: Okay. Now, shifting over to the  
24 Coordinated Operations Agreement, which is referred to as  
25 COA, are you familiar with that?

1 WITNESS MUNÉVAR: I am.

2 MR. LILLY: Okay. And we can pull up a copy of  
3 it if we need to, but you probably are familiar with the  
4 general provision in there about the CVP being  
5 responsible for 75 percent of total reservoir storage  
6 releases that are necessary for Sacramento Valley  
7 in-basin use -- uses and the State Water Project's being  
8 responsible for 25 percent.

9 Are you generally familiar with that  
10 requirement?

11 WITNESS MUNÉVAR: Yes, I am.

12 MR. LILLY: Okay. Now, if you can shift over  
13 to Exhibit -- and I'll ask Mr. Baker to put it up on the  
14 screen. It's Exhibit DWR-515, Page 3.

15 (Document displayed on screen.)

16 MR. LILLY: And -- And I'm going to just ask  
17 you some questions about the column that says H4 at the  
18 top.

19 And -- And if you need to, you know, Mr. Baker,  
20 I'm sure, would be happy to flip back to the previous  
21 page.

22 But these are the boxes for Delta outflow  
23 requirements, and I just have some questions regarding  
24 the text here at the end of this box.

25 The second-to-last sentence reads (reading):

1            "This outflow requirement" -- again, this is  
2            for the H4 scenario -- "is met first by curtailing  
3            Delta exports at Banks and Jones Pumping Plants by  
4            an amount needed to meet the outflow target, such  
5            that the minimum exports are at least 1,500 cfs."

6            Do you see that?

7            WITNESS MUNÉVAR: Yes, I do.

8            MR. LILLY: Are -- Do you know if Reclamation  
9            and DWR are proposing any terms and conditions for their  
10           Water Right Permits that would, in fact, require them to  
11           meet an increased spring outflow requirement like this  
12           first -- by first -- by curtailing exports?

13           WITNESS MUNÉVAR: I'm not aware of -- of the  
14           Water Right Permit.

15           MR. LILLY: Okay.

16           WITNESS MUNÉVAR: It's outside of my realm of  
17           expertise.

18           MR. LILLY: So, this is a modeling assumption  
19           that may or may not be reflected in a proposed Water  
20           Right Permit term; is that correct?

21           WITNESS MUNÉVAR: It is a modeling assumption.

22           MR. LILLY: Okay. And beyond that, I'm -- it's  
23           something you don't know about how it would be.

24           WITNESS MUNÉVAR: I don't.

25           MR. LILLY: I appreciate the clarification.

1                   Now, if you can -- Just the sentence before  
2 that reads (reading):

3                   "This additional spring outflow is not  
4 considered as an 'in-basin use' for CVP . . .  
5 Coordinated Operations."

6                   Do you see that?

7                   WITNESS MUNÉVAR: Yes.

8                   MR. LILLY: And then the very last sentence  
9 says (reading):

10                   "In wetter years (less than 50 percent  
11 exceedance), if the outflow target is not achieved  
12 by export curtailments, then the additional flow  
13 needed to meet the outflow target is released from  
14 the Oroville Reservoir as long as its projected  
15 end-of-May storage is at or above 2 million  
16 acre-feet."

17                   Do you see that?

18                   WITNESS MUNÉVAR: Yes.

19                   MR. LILLY: So, what is your understanding as  
20 to whether or not the -- any such additional reservoir  
21 releases for implementing this Delta outflow requirement,  
22 would those be subject to the COA 75 percent/25 percent  
23 rules?

24                   WITNESS MUNÉVAR: Well, I think this criteria  
25 in particular, so it identifies exports as -- export

1 reductions as being the first and primary operational  
2 adjustment to meet it.

3 And then in those wetter years, it is  
4 suggesting that -- that Oroville releases would augment,  
5 if needed, to meet that outflow.

6 That implementation would be inconsistent with  
7 the current understanding of COA.

8 MR. LILLY: Okay. And while -- while we're on  
9 COA here, how does the model -- And if you need to  
10 distinguish among the scenarios, please do so.

11 How does it allocate export curtailments  
12 between the CVP and the SWP when such curtailments are  
13 necessary to implement this increased Delta outflow  
14 requirement?

15 WITNESS MUNÉVAR: So, this is the only -- This  
16 scenario is the -- Well, this one and Boundary 2 are the  
17 only two that have the export curtailments for -- for a  
18 higher spring outflow.

19 They're -- They're partially driven by -- by  
20 COA assumptions right now so that they are -- the total  
21 export that is reduced is that needed -- that needed to  
22 meet the outflow requirement.

23 If that is -- If that satisfies the outflow  
24 requirement, then, in H4, it would go upstream to -- to  
25 Oroville releases. And under Boundary 2, it would not go

1 upstream, so there are no releases from upstream  
2 reservoirs in the spring for Boundary 2.

3 MR. LILLY: Okay. And that's -- That actually  
4 just -- That did raise another question. I'm sorry. I'm  
5 still on H4. You kind of jumped ahead to Boundary 2 but  
6 that's okay.

7 But regarding H4, that last sentence says that  
8 the additional flow to model basically assumes that  
9 additional water would be released from Oroville storage  
10 as long as it's projected and the May storage is at or  
11 above 2 million feet.

12 So what does the model do to implement outflow  
13 requirement if the projected Oroville storage is less  
14 than 2 million acre-feet?

15 WITNESS MUNÉVAR: Well, if it's projected to be  
16 less than 2 million acre-feet, then there are no storage  
17 releases, or there are releases only to the extent that  
18 you couldn't get to 2 million acre-feet.

19 MR. LILLY: Okay. So how is the Delta outflow  
20 requirement then -- model is being implemented if you  
21 can't meet it through export curtailments and you can't  
22 meet it through reservoir releases?

23 WITNESS MUNÉVAR: Then it's not achieved.

24 MR. LILLY: Okay. So now I'll ask --

25 WITNESS MUNÉVAR: Just as -- Just as a point of



1 clarification, this is an additional spring outflow.

2 This is not a D-1641 objective.

3 MR. LILLY: All right. But basically that H4  
4 additional outflow would not be achievable in those  
5 conditions.

6 WITNESS MUNÉVAR: If both of those conditions  
7 were true, yeah.

8 (The City of Roseville, Sacramento  
9 Suburban Water District, San Juan  
10 Water District, The City of Folsom,  
11 Yuba County Water Agency and The  
12 City of Roseville Exhibit 9 marked  
13 for identification)

14 MR. LILLY: Okay. So now I'm going to ask you  
15 to go to -- or ask Mr. Baker to put up, and for to refer  
16 to -- Exhibit BKS-9.

17 (Document displayed on screen.)

18 MR. LILLY: And actually I did -- I just  
19 noticed. I checked my notes. I have one more question  
20 regarding what we just talked about regarding H4 if you  
21 can be patient with me.

22 You said that in the cases where the -- the  
23 Oroville storage is over 2 million acre-feet projecting  
24 end of May, that the additional H4 outflow would be met  
25 by Oroville storage release; is that correct?

1                   WITNESS MUNÉVAR: In -- As it says here, in the  
2 wetter years -- So in the 50th percentile wetter side of  
3 that.

4                   And, just to clarify, your point was stored  
5 water releases, so releases. It couldn't be releasing  
6 inflow.

7                   MR. LILLY: Okay. Excuse me. Stored water,  
8 yes. Thank you.

9                   And I think you said that would not be  
10 consistent with the current COA requirements.

11                   So my question is, if you were to model it  
12 consistent with the COA requirements, would there, in  
13 fact, have to be additional releases from Shasta or  
14 Folsom Reservoir to implement that requirement under  
15 those conditions?

16                   WITNESS MUNÉVAR: Well, I think the export  
17 aspect of this could be implemented consistent with COA.

18                   MR. LILLY: Right.

19                   WITNESS MUNÉVAR: The upstream release  
20 requirement, only being a State Water Project obligation,  
21 would be inconsistent with our current understanding of  
22 COA.

23                   MR. LILLY: So, in fact, if -- if the current  
24 understanding of COA continued into -- into the future,  
25 then rather than all those releases coming from Oroville,

1 some of them would have to come from Folsom or Shasta; is  
2 that correct?

3 WITNESS MUNÉVAR: I think the likelihood of --  
4 The development of this was to avoid any additional  
5 releases from Folsom and Shasta. And that is why the  
6 assumption was developed for Oroville to be the only  
7 upstream release component.

8 So I -- While you could say a direct  
9 interpretation of COA would put a release on to the CVP  
10 through Shasta and Folsom, I think the reality is that --  
11 that any additional obligation on the -- on Shasta would  
12 not likely to meet the fishery objectives of both  
13 upstream cold water pool and -- and outflow release.

14 MR. LILLY: Okay. So the burden might actually  
15 then shift over more to Folsom, then.

16 WITNESS MUNÉVAR: I think that would be a  
17 similar concern.

18 MR. LILLY: Okay. Well, but if the Board  
19 imposed the H4 outflow requirements as a regulatory  
20 requirement, the water has to come from somewhere;  
21 doesn't it?

22 WITNESS MUNÉVAR: So, this is a modeling  
23 assumption that -- that was attempting to meet an outflow  
24 requirement and maintain a fishery-responsive upstream  
25 flow requirement.

1 MR. LILLY: All right. So, there might be  
2 problems implementing it in real world.

3 Okay. Let -- Let's go forward to BK -- Exhibit  
4 BKS-9.

5 (Document displayed on screen.)

6 MR. LILLY: And, for the record, this exhibit  
7 contains three pages, and excerpts from Exhibit SWRCB-3,  
8 which is Appendix C to the RDEIR/SDEIS from the  
9 Cal WaterFix.

10 I'll ask you, Mr. Munévar, to look at the third  
11 page of Exhibit BKS-9, where I've highlighted a modeling  
12 objective -- modeling assumption -- excuse me -- for --  
13 to supplemental modeling described in this appendix.

14 WITNESS MUNÉVAR: Could you point me to -- Is  
15 that after my testimony or --

16 MR. LILLY: This is in the next exhibit --

17 WITNESS MUNÉVAR: Okay.

18 MR. LILLY: -- yeah.

19 WITNESS MUNÉVAR: Yes. Got it. Thank you.

20 MR. LILLY: Do you have that in front of you  
21 now?

22 WITNESS MUNÉVAR: I do.

23 MR. LILLY: Okay. I'm just going to ask you  
24 about the modeling assumption for the supplemental  
25 modeling described in this appendix, the assumption that

1 reads (reading):

2 "During July, August and September of Critical  
3 years, and in all other months of other water year  
4 types, only Delta export curtailments were applied  
5 (i.e., there were no upstream releases to meet the  
6 outflow objectives)."

7 Do you see that?

8 WITNESS MUNÉVAR: I do.

9 MR. LILLY: Now, does the Boundary 2 scenario  
10 that's described in your testimony have this assumption  
11 that, during July, August and September of critical  
12 years, only Delta export curtailments and not upstream  
13 releases would be used to meet the outflow requirements?

14 WITNESS MUNÉVAR: I believe during -- I'm  
15 trying to find the location that Boundary 2 is different  
16 than what you have highlighted here on this --

17 MR. LILLY: I understand. This was  
18 Alternative 8 and there's some differences, so if I'm --  
19 if it's confusing, this is all I have as far as  
20 documentation of this assumption.

21 If you -- My question obviously concerns the  
22 Boundary 2 scenario since that's what you're testifying  
23 about, and I'm -- I'm just wondering if you do know, to  
24 your knowledge, if this is, in fact, a correct modeling  
25 assumption for the Boundary 2 scenario.

1 WITNESS MUNÉVAR: No, that's not correct.

2 MR. LILLY: Okay. And so please clarify.

3 What is the assumption for the Boundary 2  
4 scenario for July, August and September of critical  
5 years?

6 And, again, it's for implementing Delta  
7 outflows.

8 WITNESS MUNÉVAR: Okay. So I -- In DWR-515,  
9 Page 3, it indicates the assumptions, so I stand  
10 corrected.

11 So the -- In non-critical years, we are  
12 allowing upstream releases under Boundary 2, but in  
13 critical years, we are not allowing upstream releases.

14 MR. LILLY: Okay. So this is -- this -- What  
15 this highlights is, in fact, consistent with the  
16 assumption for the Boundary 2 scenario.

17 WITNESS MUNÉVAR: Yes.

18 MR. LILLY: All right. And do you know if  
19 Reclamation or DWR are proposing any water right terms or  
20 conditions that would require that increased Delta  
21 outflow requirements associated with the California  
22 WaterFix Project be met only by Delta export curtailments  
23 during July, August and September of critical years?

24 WITNESS MUNÉVAR: I'm not aware of it.

25 MR. LILLY: You don't know one way or the

1 other?

2 WITNESS MUNÉVAR: I don't, no.

3 MR. LILLY: All right. And while -- Let's --  
4 Let's shift back. It's probably fairer to you to refer  
5 to Exhibit DWR-515, Page 3, as you pointed out.

6 Now, that last sentence says that (reading):

7 "Outflow goals during July through September of  
8 non-Critical water year types, upstream reservoir  
9 releases are permitted to meet the additional  
10 outflow goals."

11 Do you see that?

12 WITNESS MUNÉVAR: Yes.

13 MR. LILLY: Now, for the modeling of the  
14 Boundary 2 scenario, are reservoir release -- upstream  
15 reservoir releases permitted to meet additional Delta  
16 outflow goals during any months besides July through  
17 September?

18 WITNESS MUNÉVAR: For Boundary 2, no. Only  
19 during non-critical years, July, August and September --

20 MR. LILLY: Okay.

21 WITNESS MUNÉVAR: -- are upstream releases  
22 required -- or permitted.

23 MR. LILLY: And while we're talking about those  
24 upstream reservoir releases, how does the model for the  
25 Boundary 2 scenario allocate the responsibility for those

1 releases between the CVP and the SWP?

2 WITNESS MUNÉVAR: For the Boundary 2 scenario,  
3 it implements it per -- per COA as an in-basin use.

4 MR. LILLY: That would be a 75 percent CVP,  
5 25 percent SWP obligation?

6 WITNESS MUNÉVAR: Correct.

7 MR. LILLY: Right.

8 Now, if I can ask Mr. Baker to put up DWR-4-E.  
9 This is the -- the slides from the Operations Panel, the  
10 errata version.

11 (Document displayed on screen.)

12 MR. LILLY: And I'd ask you to shift to  
13 Page 35.

14 (Document displayed on screen.)

15 MR. LILLY: Now, this slide is titled "South  
16 Delta Operational Constraints" and the second big bullet  
17 says, "Proposed Cal WaterFix North Delta Diversions."  
18 And then the second line says (reading):

19 "Increase opportunity to use existing water  
20 rights."

21 And then the last bullet says (reading):

22 "Re-diversion of stored water during Balanced  
23 Conditions."

24 Do you see that?

25 WITNESS MUNÉVAR: Yes.



1           MR. LILLY: And have -- have you ever seen this  
2 slide before? I realize it's not your testimony but as  
3 far as the testimony from the DWR Operations Panel.

4           WITNESS MUNÉVAR: I -- I may have.

5           MR. LILLY: All right. Well, my question for  
6 you is: Does the modeling you've described in your  
7 testimony contain examples or cases where there is, in  
8 fact, a re-diversion of stored water during balanced  
9 conditions becau -- through the North Delta Diversions as  
10 summarized in this slide?

11          WITNESS MUNÉVAR: Yes. I -- I think there's  
12 probably many examples in the modeling that implement  
13 this.

14          So this is a -- I think what this slide is  
15 indicating is a re-diversion of stored water at the North  
16 Delta Diversion location as opposed to a re-diversion at  
17 the South Delta location as might be done now.

18          MR. LILLY: Okay. Well, I understand that,  
19 that the model clearly is going to have diversions in the  
20 North Delta Diversion, which clearly do not occur in the  
21 No-Action Alternative because there is no North Delta  
22 Diversion under the No-Action Alternative.

23          But my -- my question's a little more detailed  
24 than that. And that is, this bullet refers to increased  
25 opportunity to use existing water rights.

1           And my question for you is: Do the modeling --  
2   the model Cal WaterFix scenarios reflect examples of this  
3   increased opportunity to use existing water rights?

4           WITNESS MUNÉVAR: I'm -- I'm sure they do in --  
5   in the modeling. There would be increased opportunity to  
6   use stored -- re-diversion rights because of the  
7   flexibility added by the California WaterFix.

8           I don't have a specific year and month in mind,  
9   but -- but I'm certain there's -- there's a -- a number  
10   of opportunities there in the modeling identifying this.

11          MR. LILLY: Okay. Well -- And so I guess my --  
12   I understand you may not have a specific year right in  
13   front of us, but can you tell us -- Can you provide any  
14   details on how the Cal WaterFix model scenarios, in fact,  
15   model these increased opportunities to use the existing  
16   water rights for the re-diversion of stored water?

17          WITNESS MUNÉVAR: So, we can take a  
18   hypothetical when, under No-Action, for example, we're  
19   releasing -- releasing stored water to meet a particular  
20   obligation somewhere else in the system, temperature, for  
21   example, water released for temperature or for in-stream  
22   flow.

23          And under the No-Action, the Old and Middle  
24   River strengths may limit the -- the re-diversion of that  
25   water in the Delta.

1           To the extent that the California WaterFix  
2 enables that diversion through the North Delta, that  
3 would -- that would be an example.

4           MR. LILLY: Okay. And are you -- Does the  
5 model have scenarios where more -- additional water is  
6 released from storage from the upstream reservoirs where  
7 it's not necessary to meet one of these downstream  
8 regulatory requirements like the one you just used in  
9 your example?

10           WITNESS MUNÉVAR: I think the -- the storage  
11 results indicate that we are not moving more stored water  
12 in that we're -- end-of-September storages are equal or  
13 hire.

14           MR. LILLY: Okay. And does the model have some  
15 restrictions that prevent the scenarios where there would  
16 be, in fact, movement of additional stored water for  
17 Delta export purposes?

18           WITNESS MUNÉVAR: I think the -- There's not a  
19 restriction that says release only stored water that was  
20 released in the No-Action.

21           But the -- the rules in the -- in the model are  
22 to achieve upstream storage that is similar or -- or  
23 better than No-Action such that we're limiting the stored  
24 water releases so that we can maintain storage as high as  
25 possible throughout those dry years.

1 MR. LILLY: Okay.

2 WITNESS MUNÉVAR: So it's more of an  
3 operational modeling implementation that restrict  
4 restriction.

5 MR. LILLY: All right. And I'm going to ask  
6 the question again. I think I know the answer.

7 But do you know there are any proposed DWR or  
8 Reclamation Water Right Permit conditions that would  
9 require that type of reservoir operations that you just  
10 described?

11 WITNESS MUNÉVAR: I'm not aware.

12 MR. MIZELL: And I'm going to object to the  
13 repeated questions on the terms and conditions being  
14 proposed. We had a long discourse about this in the last  
15 panel, and I'll just leave it as a standing objection.

16 MR. LILLY: And, Miss Doduc, if Mr. Mizell is  
17 willing to stipulate that this witness does not know  
18 about any of the proposed DWR/Reclamation permit  
19 conditions, then I will not keep asking the question.  
20 But so far, I have no choice but to ask the question to  
21 make sure the record is clear about that.

22 CO-HEARING OFFICER DODUC: Mr. Mizell.

23 MR. MIZELL: I'm willing to stipulate that the  
24 Department does not propose conditions -- terms and  
25 conditions for this Project at this time.

1           MR. LILLY: I'm sorry. I didn't hear what he  
2           said.

3           MR. MIZELL: I can't predict what's in any of  
4           the witnesses' own spheres of knowledge. I can simply  
5           state that the Department has not presented at this time  
6           any terms and conditions for this Project.

7           MR. LILLY: Okay. Thank you. That should make  
8           things go a little faster.

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

11          MR. LILLY: All right. So, Mr. --

12          CO-HEARING OFFICER DODUC: Hopefully, everyone  
13          took note of that.

14          MR. LILLY: Does -- Maybe we should just  
15          clarify.

16          Does this stipulation also apply to  
17          Reclamation?

18          CO-HEARING OFFICER DODUC: Ah. Thank you.  
19          Miss Aufdemberge?

20          MS. AUFDEMBERGE: Yes, it does.

21          MR. LILLY: Thank you for the clarification.

22          CO-HEARING OFFICER DODUC: For the record.

23          Mr. Lilly, you are about to run out your first  
24          hour, and by my tracking, you're still on your first line  
25          of questioning?

1           MR. LILLY: That is correct. I'm just about to  
2 wrap up the modeling assumption questions, and if I could  
3 that, that would probably be a logical time for a break.

4           CO-HEARING OFFICER DODUC: It is what I was  
5 about to suggest. Thank you.

6           Proceed, Mr. Lilly.

7           MR. LILLY: All right. Mr. Munévar, just while  
8 we're on the questioning of the modeling of the  
9 increased -- or the new diversion capacity that would be  
10 provided by the North Delta Diversion, did -- does the  
11 model have any adjustments in the San Luis Rule Curve to  
12 reflect that additional North Delta Diversion capacity?

13          WITNESS MUNÉVAR: There's -- There's no  
14 adjustment to reflect the capacity. There -- There may  
15 be adjustment to reflect the -- reflect the increased  
16 flexibility that that operation occur -- provides.

17          MR. LILLY: All right.

18          WITNESS MUNÉVAR: It's not as if an input to  
19 the Rule Curve is -- is how much can be diverted at the  
20 North Delta facility.

21          MR. LILLY: Now, if we can just go back to  
22 Exhibit BKS-8. That's the highlighted version of your  
23 testimony, and Page 11.

24          (Document displayed on screen.)

25          (Timer rings.)

1 MR. LILLY: This says that (reading):

2 "Although there are detailed model" --

3 Excuse me, Your Honor. I'm going to be  
4 starting on Line 13. It says (reading):

5 "Although there are detailed model inputs and  
6 assumptions, the CalSim . . . results may differ  
7 from real-time operations given that not all of the  
8 regulatory requirements" -- and there's some  
9 listed -- "or real-time operational adjustments to  
10 Shasta operations are modeled in CalSim II."

11 Then the next sentence reads (reading):

12 "The upstream reservoir releases in real-time  
13 are determined based on many factors such as  
14 available cold water pool within the reservoirs,  
15 In-Basin use including Delta flow requirements,  
16 forecasted hydrology, and unforeseen demands, among  
17 other factors."

18 Do you see that?

19 WITNESS MUNÉVAR: I do.

20 MR. LILLY: So what are the examples of the  
21 "other factors" that you're talking about here?

22 WITNESS MUNÉVAR: Well, I think other factors  
23 could be conditions that are occurring in the Delta,  
24 storm patterns and changes in barometric pressure that  
25 cause a -- cause a need to increase outflow or to manage

1 salinity at a particular location that would not have  
2 otherwise been controlled.

3 MR. LILLY: And is another example of -- of an  
4 "other factor" like that if you had a levee break in the  
5 Delta during the summer and there was a flooding on the  
6 Delta Island that could require additional releases to  
7 stored water to maintain the water quality requirements?

8 WITNESS MUNÉVAR: Yeah, absolutely.

9 MR. LILLY: So, does -- does your modeling take  
10 into account any of these other factors, like what we've  
11 just talked about?

12 WITNESS MUNÉVAR: You know, I'm just reminding  
13 the -- the Board here.

14 We've had 82-year monthly simulation.  
15 Barometric pressure, levee failures, things like that are  
16 not things that we can capture in the model. We're  
17 looking at -- at long-term trends in operation.

18 MR. LILLY: Okay. So that's probably -- that's  
19 good -- That's probably a logical time for a break if the  
20 Hearing Officer agrees.

21 CO-HEARING OFFICER DODUC: All right. Let's go  
22 ahead and take our 15-minute break. I'll give you an  
23 extra two minutes.

24 We'll reconvene at 2:50.

25 (Recess taken at 2:33 p.m.)



1 (Proceedings resumed at 2:50 p.m.)

2 CO-HEARING OFFICER DODUC: (Banging gavel.)

3 All right. Thank you. It is 2:50 and we are  
4 back in session.

5 Mr. Lilly, please continue.

6 MR. LILLY: Thank you.

7 So, Mr. Munévar, if you can flip to Page 2 of  
8 Exhibit BKS-8, which is your testimony with my highlights  
9 added.

10 (Document displayed on screen.)

11 MR. LILLY: And, in particular, Line 19.

12 Do you have that handy?

13 WITNESS MUNÉVAR: I do.

14 MR. LILLY: All right. So I'll read at  
15 Line 19. It starts (reading):

16 "To ensure that any operations considered  
17 within this change petition proceeding have been  
18 evaluated with regard to effects on legal users of  
19 water, the modeling uses a boundary analysis;  
20 specifically, Boundary 1 and Boundary 2,  
21 representing the outer range of regulatory and  
22 operational conditions within which the CWF could  
23 conceivably operate in the future."

24 Do you see that?

25 WITNESS MUNÉVAR: Yes.

1 MR. LILLY: So what do you mean by the term  
2 "boundary analysis"?

3 WITNESS MUNÉVAR: Well, I think that's been  
4 described on the other panels.

5 But for -- And it's the same meaning here. For  
6 boundary, it's the proposed initial operation range as  
7 described as between H3 and H4. And Boundary 1 and 2 are  
8 to look at -- at ranges outside of H3 and 4 and identify  
9 for this Board whether there are any substantial changes  
10 to our legal uses of the water.

11 So, I don't know if I can describe it any --

12 MR. LILLY: Okay.

13 WITNESS MUNÉVAR: -- better than that.

14 MR. LILLY: No, that's fine.

15 But when you talk about ranges, we need to take  
16 what is varying in the range.

17 And my understanding from both the other panels  
18 and your written testimony is that what varies between  
19 the Boundary 1 and Boundary 2 scenario is Delta outflow  
20 requirements, and some Delta salinity, and -- and  
21 internal flow requirements; is that correct?

22 WITNESS MUNÉVAR: Delta outflow, Old and Middle  
23 River, Head of Old River Gate. There's a number of  
24 assumptions.

25 But -- But what's meant in terms of the

1 boundary is the -- the extent at which there was total --  
2 lower outflow under Boundary 1 and higher outflow under  
3 Boundary 2.

4 MR. LILLY: All right.

5 WITNESS MUNÉVAR: The mechanism in which you  
6 get there I don't think was necessarily indicated in  
7 Boundary 1 and 2.

8 MR. LILLY: All right. Well, your testimony  
9 also refers to operational conditions.

10 So what operational conditions vary between  
11 Boundary 1 and Boundary 2? You make the distinction  
12 here, "regulatory and operational conditions," and I'm  
13 wondering, separate from the regulatory conditions, which  
14 I think you've explained in a fair amount of detail, are  
15 there any additional operational conditions that vary  
16 between Boundary 1 and Boundary 2?

17 WITNESS MUNÉVAR: Well, I guess I wouldn't call  
18 the Delta outflow in Boundary 2 a regulatory condition.  
19 I would call that an operational condition.

20 MR. LILLY: Okay. So, are -- Do -- Are there  
21 any operational conditions regarding the CVP and SWP  
22 outside of these Delta operational parameters and  
23 regulatory conditions you've talked about that vary  
24 between Boundary 1 and Boundary 2?

25 WITNESS MUNÉVAR: I think the main ones have

1 been highlighted in -- in 515, so the -- the Fall -- the  
2 Fall X2, the -- the Head of Old River Gate, the Old and  
3 Middle River flow conditions, the Delta outflow in the  
4 spring.

5 So the way you operate to that from an SWP and  
6 CVP system may be -- may be different as you impose  
7 different requirements on the system.

8 MR. LILLY: Okay. And now your -- the next  
9 sentence says, on Page 2 of Exhibit BKS-8, starting at  
10 Line 23, says (reading):

11 "In addition, modeling results using the  
12 initial operational range of the CWF, as represented  
13 through scenarios 3 -- H3 and H3 (sic), are shown."

14 Do you see that?

15 WITNESS MUNÉVAR: I do. H3 --

16 MR. LILLY: And --

17 WITNESS MUNÉVAR: -- and H4.

18 MR. LILLY: Excuse me. H3 and H4.

19 So, again, is -- I have the same question:

20 What are the regulatory and operational  
21 conditions that vary between H3 and H4?

22 WITNESS MUNÉVAR: I think the primary one  
23 that's indicated on 515, again, is the -- the outflow,  
24 the spring outflow criteria. That's the primary one that  
25 differs between H3 and H4.

1           MR. LILLY: So, in this -- In the variations  
2 between these four different Cal WaterFix scenarios, are  
3 there any significant variations in the CVP and SWP  
4 operations as would be facilitated by the New North Delta  
5 Diversion facility?

6           WITNESS MUNÉVAR: I'm not sure I understand  
7 your question.

8           MR. LILLY: Well, I -- I guess what I'm getting  
9 at, and with the New North Delta Water -- Diversion in  
10 place, Mr. Leahigh has said there would be additional  
11 operational flexibility.

12           And I'm just wondering whether this boundary  
13 analysis includes the -- the entire range of possible CVP  
14 and SWP operations.

15           Separate from just changing the Delta  
16 parameters, are there other operational parameters that  
17 vary in this boundary analysis?

18           WITNESS MUNÉVAR: I think the operational  
19 response to those criteria varies, and that's what we've  
20 seen in the results. There's -- Boundary 1 has more  
21 flexibility, Boundary 2 has less flexibility, and we see  
22 that through the operational response.

23           MR. LILLY: Okay. Well, we've -- we've talked  
24 earlier about the fact that, with the Cal WaterFix in  
25 place, there -- there would be increased opportunities to

1 move water from upstream storage in CVP and SWP  
2 Reservoirs through the Delta -- and exported from the  
3 Delta down to San Luis.

4 Do you recall that testimony, at least in  
5 general terms?

6 WITNESS MUNÉVAR: I do, but I believe we said  
7 that, primarily, it would be excess water that's be --  
8 being diverted to the North Delta, although there would  
9 also be stored water.

10 MR. LILLY: All right. And my question is:  
11 Does the boundary analysis include the full range of  
12 operations of those different opportunities to move the  
13 stored water through the Delta and into Delta exports?

14 WITNESS MUNÉVAR: I don't think --

15 MR. BERLINER: Objection regarding full range  
16 of operations. That's quite an ambiguous phrase.  
17 Perhaps if you could narrow it.

18 MR. LILLY: I don't think that's too ambiguous  
19 at all.

20 I mean, for -- If they said it's bracketing the  
21 full range, I think I'm entitled to ask about the full  
22 range.

23 CO-HEARING OFFICER DODUC: I agree. Please  
24 answer.

25 WITNESS MUNÉVAR: Well, the full range from my

1       standpoint, is -- it's the range that's -- that's  
2       declared through Boundary 1 and 2.

3                You could certainly concoct another scenario  
4       that would be a broader range. So I have hard time  
5       responding to the full range because we might come up  
6       with other ones.

7                MR. LILLY: Well, the -- my point is not  
8       whether or not the range is as broad as it possibly could  
9       be.

10               My question is: Does this boundary analysis  
11       include variations in all of the different parameters  
12       regarding CVP and SW op -- SWP operations that could be  
13       varied?

14               WITNESS MUNÉVAR: I think it does a fair  
15       representation of characterizing the main operational  
16       parameters that drive the CVP and CVP (sic) response.

17               MR. LILLY: Okay. But is it fair to say that  
18       there could be variations in the movement of water from  
19       upstream reservoir storage through the Delta to San Luis  
20       that are not encompassed within this boundary analysis?

21               WITNESS MUNÉVAR: We've not analyzed it, so I  
22       can't -- I can't say.

23               I mean, to the extent that they can  
24       characterize it as Boundary 1 and Boundary 2, like I  
25       said, you could concoct another scenario that might be

1 different than those in Boundary 1 and 2.

2 MR. LILLY: Okay. And if there is a different  
3 scenario, then that would not be within the scope of your  
4 boundary analysis; is that correct?

5 WITNESS MUNÉVAR: Not in the scope of the  
6 boundary analysis that we're presenting for the model.

7 MR. LILLY: All right. So, now, if you could  
8 shift over to Exhibit DWR-51 -- 514, and I'll ask  
9 Mr. Baker to put that on the screen.

10 Now -- Oh, excuse me. While he's putting that  
11 up, I'm just going to ask you generally:

12 Do the -- And if you need to, please look at  
13 this. I know you talked about this exhibit in your  
14 direct testimony.

15 But do -- The -- Pages 5 through 18 of this  
16 exhibit, in fact, contain figures and tables that  
17 summarize the model outputs for the five scenarios  
18 discussed in your testimony?

19 WITNESS MUNÉVAR: They do for the -- for the  
20 deliveries, diversions and storage that I presented in my  
21 testimony.

22 MR. LILLY: All right. And are there test --  
23 Have Petitioners filed any other exhibits for this  
24 hearing that contain or describe any of the results of  
25 your modeling work?



1           WITNESS MUNÉVAR: I believe I've testified  
2 that, in May, the -- all the entire model input and  
3 output was provided.

4           The . . . The modeling is also presented in  
5 the Draft and Final BAs, which is a -- which is a  
6 scenario between H3 and H4.

7           MR. LILLY: Okay. So does that -- does that  
8 encompass the documents that are before the Board that  
9 describe the modeling results?

10          WITNESS MUNÉVAR: I believe so, but I'll defer  
11 to others on the panel if they know others.

12          WITNESS BUCHHOLZ: And the Draft EIR/EIS, which  
13 has the original H3/H4.

14          MR. LILLY: Thank you for the clarification.

15                 So, if you can turn to Page 15 of Exhibit  
16 DWR-514.

17                 (Document displayed on screen.)

18          MR. LILLY: And I think you testified on direct  
19 this is the exceedance curve for end-of-September storage  
20 for Shasta Reservoir; is that correct?

21          WITNESS MUNÉVAR: Correct.

22          MR. LILLY: And then the next two pages have  
23 the exceedance curves for end-of-September storage for  
24 Oroville and Folsom Reservoirs; is that correct?

25          WITNESS MUNÉVAR: Correct.

1           MR. LILLY: So, did the modeling that you did  
2 produce end-of-month reservoir storage levels for Shasta,  
3 Oroville and Folsom for any other months besides  
4 September?

5           WITNESS MUNÉVAR: That produces for every month  
6 of the -- of the year.

7           MR. LILLY: Okay. But you don't -- You did not  
8 submit any figures as exhibits for this hearing that have  
9 the other months; is that correct?

10          WITNESS MUNÉVAR: We did not.

11          MR. LILLY: And do any of your exhibits that  
12 you've submitted for this hearing show the -- similar  
13 monthly Exceedance Plots for San Luis Reservoir?

14          WITNESS MUNÉVAR: Not in the exhibits that I've  
15 provided here.

16          MR. LILLY: Okay. So, again, to get that data,  
17 one would have to go to the model outputs that you've  
18 described; is that correct?

19          WITNESS MUNÉVAR: Correct. I think the -- the  
20 purpose of this testimony was to provide end-of-September  
21 storage as an indicator for potential harmed water users;  
22 that the other months, while they may be important for  
23 fisheries or temperature operations, were not the primary  
24 output for -- for water users.

25          MR. LILLY: All right. And maybe that's the

1 same answer, then, for the next question, is:

2 Are there any model output exhibits regarding  
3 flows in the American River and the Feather River or the  
4 Sacramento River that you filed for this hearing?

5 WITNESS MUNÉVAR: That would be the same  
6 response, that they're in the entire input and output  
7 that was provided.

8 MR. LILLY: Okay. Now, are you aware that  
9 there are several municipal water suppliers that receive  
10 water directly from Folsom Reservoir through an intake at  
11 Folsom Dam and then they deliver that water to their  
12 customers?

13 WITNESS MUNÉVAR: I am.

14 MR. LILLY: And do you know approximately how  
15 many people receive water from these municipal water  
16 suppliers?

17 WITNESS MUNÉVAR: I -- I don't.

18 MR. LILLY: Is it fair to say about 500,000  
19 people?

20 MR. BERLINER: Objection: He's indicated he  
21 doesn't know.

22 MR. LILLY: Oh. Let me rephrase. I wasn't  
23 quite done with my question.

24 CO-HEARING OFFICER DODUC: All right. Ask your  
25 question, Mr. Lilly.

1           MR. LILLY: Is it fair to say about 500,000  
2 people, or do you have any idea?

3           MR. BERLINER: Same objection.

4           CO-HEARING OFFICER DODUC: He did say he didn't  
5 know.

6           MR. LILLY: I didn't hear him say that. Maybe  
7 the objection came at the same time.

8           Do you know?

9           WITNESS MUNÉVAR: I -- I don't know.

10          MR. LILLY: All right. At what volume of  
11 storage in Folsom Reservoir would the intake on Folsom  
12 Dam for these municipal suppliers go dry?

13          WITNESS MUNÉVAR: I'm going to ask Kristin  
14 White to respond to that as CVP --

15          MR. LILLY: Okay. Thank you.

16          WITNESS WHITE: I don't know the exact  
17 elevation in storages, but I think it's somewhere between  
18 about 130, maybe . . . maybe 120 and 150,000 acre-feet.

19          MR. LILLY: Okay. That's -- That's be --  
20 roughly between 120 and 150,000 acre-feet of storage in  
21 Folsom Reservoir?

22          WITNESS WHITE: Storage. And I -- I don't know  
23 the elevation that correlates to.

24          MR. LILLY: Storage volume is fine for our  
25 purposes. Thank you.

1           So -- And maybe I'll just shift to you,  
2 Miss White, for a couple minutes since we're on this  
3 topic.

4           What would happen to the water supplies for  
5 these municipal water suppliers if Folsom Reservoir  
6 storage were to drop to that level?

7           WITNESS WHITE: At that time -- At that time,  
8 Reclamation would need to consider options to continue  
9 uninterrupted water service or water supply.

10           I think in -- And I wasn't on this Project, but  
11 I think in 2015 and possibly in 2014, there was a  
12 consideration of emergency pumping -- a barge to pump  
13 water so that water supply could be continued.

14           I don't think there's a permanent plan in place  
15 or permanent facility yet but I would think something  
16 along those lines would occur if we got to that low  
17 storage level again.

18           MR. LILLY: Okay. And are -- Miss White, while  
19 we're on Folsom Reservoir and low levels, I'll ask you --  
20 and, Mr. Munévar, please chime in if I'm shifting  
21 incorrectly to Miss White.

22           But are there releases of water from Folsom  
23 Reservoir that are necessary to maintain flows for  
24 spawning of fall-run Chinook Salmon and steelhead in the  
25 Lower American River.

1           WITNESS WHITE: In general, yes. My expertise  
2 is not in biology, so I don't know.

3           Yes, there are minimum flow requirements that  
4 are, in general, dictated by the management standard,  
5 which was also required in our Biological Opinion.

6           MR. LILLY: Yes, and -- and please understand:  
7 I'm not trying to ask you biology questions. I'm really  
8 asking you questions that affect the modeling work you've  
9 done, so -- And if you think I've gone too much into  
10 biology, just let me know, but . . .

11           For what months are these Lower American River  
12 flows for spawning necessary?

13           MR. MIZELL: Objection to the use of the term  
14 "necessary." The rest of the question I have no problem  
15 with.

16           MR. LILLY: Okay. During what months does the  
17 modeling assume that flows for spawning for these fish  
18 are necessary?

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

21           WITNESS WHITE: I am really not sure. It  
22 varies by species. I know fall-run are not listed but  
23 their -- their critical habitat is of concern and they  
24 have different -- different months than steelhead.

25           This is really outside my area of expertise

1 as -- as an engineer.

2 MR. LILLY: Okay.

3 CO-HEARING OFFICER DODUC: Go back to modeling,  
4 Mr. Lilly.

5 MR. LILLY: Yeah. I was just asking you  
6 whether you were aware -- Maybe I'll just ask the  
7 question, that's basically:

8 Does the modeling have any assumptions  
9 regarding flows necessary for Lower American River flows  
10 for these fish species?

11 WITNESS WHITE: Yes, it does.

12 MR. LILLY: And for what months does the  
13 modeling have such flows?

14 WITNESS WHITE: Well, in general, there's a  
15 minimum flow in all months.

16 Which months specifically are tied to spawning  
17 for specific species, I do not recall, but there's a  
18 minimum flow for every month.

19 MR. LILLY: All right. So, now, let's shift to  
20 Page --

21 CO-HEARING OFFICER DODUC: And as you do that,  
22 Mr. Lilly, can I remind you again of my request to get  
23 directly to the question.

24 I think we could have skipped some of the  
25 preliminary questions that you asked of them, to all

1 these objections, if we'd just gone straight to that  
2 questioning.

3 MR. LILLY: And I apologize for not phrasing it  
4 properly to begin with. I will try to do better in the  
5 future.

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

8 MR. LILLY: If we could move to Page 17 of  
9 Exhibit DWR-514.

10 And I'll continue with the questions for  
11 Miss White at this time.

12 This is the Exceedance Plot for Folsom  
13 Reservoir end-of-September storage that Mr. Munévar  
14 discussed in his direct testimony.

15 And this one, I don't know whether it's -- it's  
16 to ask Miss -- Mr. Munévar or Miss White, so you'll have  
17 to tell me which one of you is the better person to  
18 answer -- or more qualified person to answer this.

19 But it looks like this plot shows a flat line  
20 at about 90,000 acre-feet of storage in the dryest  
21 5 percent of exceedance years; is that correct?

22 WITNESS WHITE: That's correct in this graph.

23 MR. LILLY: And why is it that there's this  
24 flat line at 90,000 acre-feet of storage in Folsom  
25 Reservoir?



1           WITNESS WHITE: So, CalSim makes a general  
2 assumption of what we commonly refer to as dead pool,  
3 although that's a very misleading term. It's just a  
4 minimum reservoir assumption where CalSim assumes that --  
5 that operations will not cause the reservoir to go below  
6 that point. And for Folsom Reservoir, CalSim has assumed  
7 that -- that value to be 90,000 acre-feet.

8           So, in times when all the minimum requirements  
9 cannot be met, such as under these cli -- the climate  
10 change conditions which are included in all these  
11 scenarios, that's -- the model's only choice is to go to  
12 the minimum reservoir storage and then continue to pass  
13 whatever inflow is coming into the reservoir.

14          MR. LILLY: So if -- if, in fact, we were in a  
15 year when Folsom Reservoir dropped to 90,000 acre-feet at  
16 the end of September, then what would happen to the  
17 supplies for these municipal water suppliers that depend  
18 on Folsom Reservoir during the subsequent months of  
19 October, November and December? Basically, it's always  
20 got a significant new inflow in the Folsom Reservoir.

21          WITNESS WHITE: I think this is a slightly  
22 complex question because it starts to mix CalSim versus  
23 actual real-time drought operations.

24          And as we saw in the most recent drought, our  
25 real-time drought operations are -- are day-to-day

1 operational changes that have actions that are not  
2 long-term planning actions.

3 CalSim is a long-term planning tool. So any --  
4 any assumption that's put in CalSim is something that we  
5 assume can -- can be appropriate for all -- all  
6 conditions, or all similar hydrologic conditions.

7 MR. LILLY: So, is it fair to say, then, that  
8 the CalSim doesn't really do a very accurate job -- very  
9 good job of accurately modeling what would happen under  
10 these extremely dry conditions?

11 WITNESS WHITE: I would say it does a fairly  
12 good job of pointing out where -- where problems may  
13 exist in extremely dry conditions.

14 MR. LILLY: Okay.

15 WITNESS WHITE: Additional actions might --  
16 might occur.

17 MR. LILLY: Okay. So, it does a good job of  
18 pointing out where problems would occur but not  
19 necessarily describing what would be done to address  
20 those problems? Is that a fair characterization?

21 WITNESS WHITE: I would say it certainly  
22 doesn't predict what the TUCPs might be, for example, in  
23 the future. Those -- CalSim assumes the inflow D-1641  
24 requirements, so, from that standpoint, I could -- I  
25 could agree.

1           MR. LILLY: Okay. And it also, then, doesn't  
2 probably do a very good job of predicting what the  
3 deliveries to those municipal water suppliers would have  
4 to be under those conditions; does it?

5           WITNESS WHITE: I don't know that I would agree  
6 with that.

7           As I stated before, Reclamation has considered  
8 other options for continuing water service to those  
9 contractors, so I don't know that not reflecting  
10 real-time drought is the same as not reflecting whether  
11 or not we would have been successful in delivering water.

12          MR. LILLY: Okay. But if the storage were  
13 90,000 acre-feet, then I think you said that there would  
14 have to be temporary pumping measures put in place; is  
15 that correct?

16          WITNESS WHITE: Or some surrogate -- some other  
17 Project, whether they were by that point a permanent  
18 facility or -- or a change in infrastructure or  
19 something.

20          MR. LILLY: And does the modeling do any  
21 calculations regarding the amounts of deliveries that  
22 would occur to these municipal water suppliers under  
23 what -- under such conditions?

24          WITNESS WHITE: I don't think the models assume  
25 that there is a temporary barge or pumping system all the

1 way down to zero, but -- but they do assume that we have  
2 the ability to -- to deliver water to our water Service  
3 Contractors down to 90,000 acre-feet.

4 MR. LILLY: Right. And my question is, if you  
5 get down to 90,000 acre-feet, do the model outputs show  
6 what the amounts of water would be that would be  
7 delivered to these municipal water suppliers after that  
8 period?

9 I think it's -- according to if it's a yes or  
10 no -- I think it's a yes-or-no question.

11 WITNESS MUNÉVAR: The model assumes that we're  
12 delivering water as long as -- as long as water can be  
13 met for -- for Folsom deliveries and meet the 90,000  
14 acre-feet.

15 MR. LILLY: Okay. So let me try one more time.

16 So if the reservoir has dropped down to 90,000  
17 acre-feet, do the model outputs show the amounts of water  
18 that then would be delivered after that point to these  
19 municipal water suppliers?

20 WITNESS MUNÉVAR: They do.

21 MR. LILLY: Where -- Where are those outputs  
22 shown, because they're -- Just tell me: Where are those  
23 outputs shown?

24 WITNESS MUNÉVAR: The model has -- has  
25 literally 50 to a hundred different locations of which

1 deliveries to various water users are shown in the model.

2 MR. LILLY: Okay. So we would have --

3 WITNESS MUNÉVAR: They've been summarized in --  
4 in the exhibits that I've been presented here.

5 MR. LILLY: All right. So we would have to go  
6 to that detail to find out what the modeling shows for  
7 deliveries under those conditions.

8 WITNESS MUNÉVAR: If we were looking for one  
9 specific user.

10 MR. LILLY: Now, I'm going to just shift back  
11 to the Folsom -- excuse me -- to the Shasta Reservoir  
12 Exceedance Plot, which is on Page 15 of Exhibit DWR-514.

13 And these questions are probably similar for  
14 Mr. Munévar and we can probably go through them fairly  
15 quickly.

16 But these plots seem to show a flat line for  
17 the driest roughly 5 percent of years at about 500,000  
18 acre-feet of storage in Shasta; is that correct?

19 WITNESS MUNÉVAR: Right, 550,000 acre-feet.

20 MR. LILLY: Okay. And what is the significance  
21 of that 550,000 acre-feet in the modeling?

22 WITNESS MUNÉVAR: I think it's similar to what  
23 Kristin just talked about in terms of a -- a dead pool  
24 condition that's assumed for -- for Shasta.

25 MR. LILLY: So, then, would there be similar

1 issues -- Or are there similar issues regarding how the  
2 modeling treats how actual operations would occur if  
3 Shasta Reservoir were to drop down to this minimum pool  
4 level?

5 WITNESS MUNÉVAR: I think the issues are  
6 similar. I would want to point out that the -- the  
7 No-Action in the WaterFix scenarios, though, show very  
8 little difference between them. And under these  
9 conditions, there is likely -- there would be likely  
10 needed more flexible adaptation, either in operations  
11 or -- or other areas in order to achieve storage levels  
12 at higher than this.

13 We specifically did not include those other  
14 actions of the No-Action because it becomes an action in  
15 and of itself.

16 MR. LILLY: Okay. So, is it fair to say that  
17 the -- what actually might happen under either the  
18 No-Action Alternative scenario or any of the Cal WaterFix  
19 scenarios under these these extreme dry conditions might  
20 deviate significantly from the modeling from those  
21 conditions?

22 WITNESS MUNÉVAR: I -- I can't . . .

23 I can't think of what -- what sort of  
24 adaptations might occur. There's many different methods  
25 in which you could attempt to achieve high storage levels

1 during these dry conditions, but they're policies beyond  
2 the Modeling Panel here.

3 MR. LILLY: Okay. So is it -- I'll just ask  
4 the question one more time.

5 So is it fair to say the modeling may not  
6 accurately show how the Projects actually would be  
7 operated under such conditions?

8 WITNESS MUNÉVAR: Yeah. Again, I have to say  
9 they -- they model the conditions that are -- are  
10 anticipated to continue in the future in the absence of  
11 additional action.

12 MR. LILLY: And additional actions are things  
13 like TUCPs?

14 WITNESS MUNÉVAR: Yes, and others. So they do  
15 not model those additional actions as a -- as a long-term  
16 planning model.

17 MR. LILLY: Okay. What -- And what -- Just so  
18 we're clear, when you say additional things besides TUCP,  
19 what other sorts of things are you talking about in your  
20 answer?

21 WITNESS WHITE: I think this could also include  
22 temporary modifications to any other requirements, such  
23 as adjustments to the RPA as they were implemented years  
24 before, adjustments to how we meet any -- any of our  
25 other requirements.

1           MR. LILLY: All right. So, I'll -- I'll just  
2 wrap up this line of questioning by asking you,  
3 Mr. Munévar:

4           Please refer to Page 12 of your testimony.  
5 That's -- The highlighted version is BKS-8.

6           (Document displayed on screen.)

7           MR. LILLY: And I'm referring to Line 15, which  
8 I'll just read. It says (reading):

9           "When system-wide storage levels are at or near  
10 dead pool, also described as stressed water supply  
11 conditions, the CalSim II model results should only  
12 be an indicator of stressed water supply conditions  
13 and should not necessarily be understood to reflect  
14 actually what would occur in the future under a  
15 given scenario."

16           Is that an accurate summary of your testimony  
17 on this point?

18           WITNESS MUNÉVAR: Yes. I think that actually  
19 conveys what I was trying to convey.

20           MR. LILLY: All right. Thank you. That's -- I  
21 appreciate the clarification.

22           CO-HEARING OFFICER DODUC: Couldn't we have  
23 gotten there sooner, Mr. Lilly?

24           MR. LILLY: Excuse me?

25           CO-HEARING OFFICER DODUC: Couldn't we have



1 gotten here sooner? Just -- Just pointing it out.

2 MR. LILLY: Sometimes we don't know where we're  
3 going until we get the answers.

4 Now, please refer -- I'm going to shift to  
5 Delta outflow targets.

6 If you could -- If Mr. Baker to put up Exhibit  
7 DWR-114.

8 (Document displayed on screen.)

9 MR. LILLY: Have -- Have you seen this graph  
10 before? It's been up quite for a few days before this  
11 during this hearing. I don't know whether you've  
12 personally seen it.

13 WITNESS MUNÉVAR: You're referring to me, yes?

14 MR. LILLY: Yes, Mr. Munévar. Excuse me.

15 WITNESS MUNÉVAR: Yes, I've seen this graph.

16 MR. LILLY: All right. And there's a little  
17 bit of a gap between Boundary 2 and Alternative 8, and I  
18 would appreciate if you could just tell us what modeling  
19 assumptions are different between Alternative 8 and  
20 Boundary 2.

21 WITNESS MUNÉVAR: Without having all the  
22 specific in front of me, I can just list a few of them.

23 But Alternative 8 had -- had higher outflows  
24 that were achieved not necessarily through just expert  
25 restrictions at substantially higher outflows.

1           Boundary 2 is using primarily export  
2 restrictions to achieve lesser but similar types of  
3 outflows.

4           That's the primary -- the primary difference as  
5 I recall.

6           MR. LILLY: Okay. And now if you could just  
7 shift to your -- the highlight of your testimony, BKS-8,  
8 at Page 15.

9           And specifically at Lines 15 and 16, it says  
10 (reading):

11           "Conversely, Boundary 2 reflects a condition of  
12 significantly increased Delta outflow targets and  
13 increased restrictions on South Delta exports as  
14 compared to the NAA."

15           Do you see that?

16           WITNESS MUNÉVAR: I do.

17           MR. LILLY: So -- and I think you've described  
18 the significantly-increased Delta outflow targets.

19           Do you -- Do you have anything more to add on  
20 that, or is that basically what is described in your  
21 Exhibit DWR-515?

22           WITNESS MUNÉVAR: Yeah. I don't know that I  
23 have anything more to . . .

24           MR. LILLY: All right. And then the -- the  
25 next sentence reads, starting at Line 16 (reading):

1           "The assumptions for this scenario were guided  
2           by SWRCB staff. In this scenario, Delta outflow  
3           targets are significantly increased throughout the  
4           year, but particularly during winter and spring."

5           Do you see that?

6           WITNESS MUNÉVAR: Yes.

7           MR. LILLY: So did -- Maybe you can just tell  
8           me:

9           What guidance did State Board staff give you  
10          for the assumptions for this scenario?

11          WITNESS MUNÉVAR: I can give you general --  
12          general comments only because I've been working primarily  
13          with staff of mine in conducting this.

14          But, really, working from Alternative 8 and  
15          looking at the storage impacts that were part of  
16          Alternative 8, and trying to determine whether we could  
17          achieve similar outflow levels without having the storage  
18          impacts that were indicated in Alternative 8.

19          MR. LILLY: Okay. Now, if you can just look at  
20          Exhibit DWR-514, which is the model output, on Page 13.

21          (Document displayed on screen.)

22          MR. LILLY: I think you testified before, this  
23          shows the difference in South-of-Delta CVP Service  
24          Contractors and SWP Deliveries?

25          WITNESS MUNÉVAR: Correct.

1           MR. LILLY:  So -- And I think you testified on  
2   direct:

3           This figure shows that for the Boundary 2  
4   scenario, there would be the lowest deliveries to these  
5   contractors; is that correct?

6           WITNESS MUNÉVAR:  That's correct.

7           MR. LILLY:  And now if you can just flip to  
8   where -- Or you may even just remember it.

9           The Exceedance Plots for end-of-September  
10   storage for Shasta, Folsom and -- and Oroville  
11   Reservoirs, so generally the highest end-of-September  
12   storage levels for the Boundary 2 scenarios; is that  
13   correct?

14          If you --

15          WITNESS MUNÉVAR:  That's my recollection.

16          MR. LILLY:  -- need to, Mr. Baker will be more  
17   than happy to flip to Pages 15, 16 and 17.

18          WITNESS MUNÉVAR:  I think we're fine.

19          MR. LILLY:  Okay.  So is that -- is that fair  
20   that generally the Exceedance Plot for the Boundary 2  
21   scenario has the highest end-of-September storage levels  
22   for these reservoirs?

23          WITNESS MUNÉVAR:  Yes.

24          MR. LILLY:  So . . .  You know, I'll just --  
25   I'm not quite sure how to phrase this.

1           But rather than having the model restrict  
2 exports so that these deliveries to the South-of-Delta  
3 contractors are the lowest under the Boundary 2 scenario,  
4 couldn't the model have assumed some of this additional  
5 stored water was, in fact, moved through the Delta and  
6 delivered to these South-of-Delta contractors?

7           WITNESS MUNÉVAR: I think the results you're  
8 seeing in the higher storage is a direct indication of  
9 the -- of the lack or lower flexibility in the Boundary 2  
10 due to the export restrictions.

11          MR. LILLY: Oh. Well, let's talk about that,  
12 then.

13          Would the export restrictions apply in the  
14 North Delta Diversion?

15          WITNESS MUNÉVAR: These are requirements on  
16 outflow, which would certainly limit the -- the -- the  
17 North Delta Diversion as well as the South. There were  
18 significant restrictions on the South Delta Diversions as  
19 well.

20          MR. LILLY: I'm -- I'm sorry. I'm not getting  
21 that.

22          How do Delta outflow requirements limit North  
23 Delta Diversions? Couldn't the Projects just release  
24 additional stored water so they could meet both Delta  
25 outflow requirements and make additional North Delta

1 Diversions.

2 MR. BERLINER: Objection: Compound question.

3 CO-HEARING OFFICER DODUC: Actually, I  
4 understood that question.

5 Do you understand that question? Do you need  
6 it --

7 WITNESS MUNÉVAR: Could you repeat it, please?

8 MR. LILLY: Sure.

9 I -- You said -- I think you just testified --  
10 but correct me if I'm wrong -- that the higher Delta  
11 outflow requirements on the Boundary 2 scenario would  
12 restrict North Delta Diversions; is that correct?

13 WITNESS MUNÉVAR: It could restrict total  
14 diversions --

15 MR. LILLY: Well --

16 WITNESS MUNÉVAR: -- either North or South,  
17 yes.

18 MR. LILLY: So -- And I'm -- I'm just not  
19 getting that.

20 How do higher Delta outflow requirements  
21 restrict North Delta Diversions?

22 WITNESS MUNÉVAR: I think I just indicated they  
23 restrict total diversions. And the higher outflow  
24 requirement means there's less water -- more water has  
25 been allocated for outflow and less towards available

1 water for diversion.

2 MR. LILLY: Okay. I understand that.

3 But if there's additional water in storage in  
4 the upstream CVP and SWP Reservoirs, as shown in your --  
5 the Exceedance Plots for the Boundary 2 scenario,  
6 couldn't the Project Operators release some of that water  
7 from storage, have it flow down to the North Delta  
8 Diversion, and then exported there in -- so -- for  
9 deliveries to South-of-Delta contractors?

10 WITNESS MUNÉVAR: There could be conditions in  
11 which that would occur, but that would be subject to all  
12 the other requirements within the Delta at the same time.

13 MR. LILLY: Okay. But it could occur while  
14 still complying with the Delta requirements assumed for  
15 the Boundary 2 scenario; correct?

16 WITNESS MUNÉVAR: To the extent we have  
17 additional storage that could be released and achieve all  
18 the other outflow -- in-Delta and outflow objectives,  
19 that's a possibility, but that's not what the model is  
20 showing.

21 MR. LILLY: It's not what the model is showing  
22 with the assumptions you have made for reservoir  
23 operations; is that correct?

24 WITNESS MUNÉVAR: It's not what the model is  
25 showing for the assumptions that are included for the

1 entire system operations.

2 MR. LILLY: All right. And referring to State  
3 Board staff direction, you mentioned State Board staff  
4 gave direction regarding the modeling of this higher  
5 Delta outflow scenario.

6 Did State Board staff give any directions  
7 regarding restrictions on use of the North Delta  
8 Diversion under this scenario?

9 WITNESS MUNÉVAR: I don't -- I don't know.

10 MR. LILLY: Okay. I'm going to now shift over  
11 to -- Well, excuse me, continuing on my model results --  
12 some of the modeling results that are not discussed in  
13 your testimony.

14 (The City of Roseville, Sacramento  
15 Suburban Water District, San Juan  
16 Water District, The City of Folsom,  
17 Yuba County Water Agency and The  
18 City of Roseville Exhibit 12 marked  
19 for identification)

20 MR. LILLY: So, if you could examine Exhibit  
21 BKS-12.

22 And I'm going to state for the record that this  
23 exhibit contains Exceedance Plots for Folsom Reservoir  
24 storage at the ends of July, August, September, October,  
25 November, and December for the five scenarios that have



1     been described in Mr. Munévar's testimony, and that one  
2     of our consultants at HDR downloaded the Cal WaterFix  
3     model outputs that Mr. Munévar has described and been  
4     posted to the State Water Board's website and used the  
5     data to prepare these plots.

6             So I would like to ask Mr. Munévar questions  
7     about this. This is the only way I could get this data  
8     in front of him. I believe it's an appropriate line of  
9     questioning.

10            CO-HEARING OFFICER DODUC: And, yes, you did  
11     lay the foundation very well. Thank you, Mr. Lilly.

12            Proceed.

13            MR. LILLY: So, Mr. Munévar, just to help you  
14     get oriented, please take a minute.

15            The third page of Exhibit BKS-12 shows  
16     end-of-September Folsom Reservoir storage plots for  
17     September.

18            And you can compare that to Exhibit DWR-514,  
19     Page 17, which also shows end-of-September Folsom  
20     Reservoir storage plots.

21            The only difference is, they go the opposite  
22     way at the X-Axis. So they go from zero to 100 percent  
23     while your exhibit goes from 100 percent down to zero.

24            But please just take a minute to confirm that  
25     these should -- these outputs should be the same for

1 end-of-September.

2 WITNESS MUNÉVAR: They appear to be the same.

3 MR. LILLY: Okay.

4 WITNESS MUNÉVAR: And colors are different as  
5 well, so . . .

6 MR. LILLY: All right. So, now, going to the  
7 first page of Exhibit BKS-12, this is the modeled output  
8 for end-of-July Folsom Reservoir storage.

9 And I -- I realize you have to -- may have to  
10 get out a magnifying glass, but I'd like you to look down  
11 at the Exceedance Plots down in the range of the dryest  
12 5 percent of years between the 95 percent and 100 percent  
13 Exceedance Plots.

14 Do you see those?

15 WITNESS MUNÉVAR: I do.

16 MR. LILLY: And is it -- is it fair to say that  
17 the red line -- the red curve for the Boundary 2 scenario  
18 drops down before the model scenario for the No-Action  
19 Alternative, which is the black line?

20 WITNESS MUNÉVAR: It's pretty hard to read but  
21 I -- that's what it appears to indicate.

22 MR. LILLY: So -- In fact, according to this  
23 output, there at least are some years during these very  
24 dry conditions where the end-of-July storage would be  
25 somewhat lower -- somewhat significantly lower under the

1 Boundary 2 scenario at the end of July than under the  
2 No-Action Alternative; is that correct?

3 WITNESS MUNÉVAR: Based on this plot, it would  
4 appear that they could be lower.

5 MR. LILLY: All right. Now, let's shift  
6 forward to Page 2 of Exhibit BKS-12 and this is the  
7 end-of-August plots.

8 (Document displayed on screen.)

9 MR. LILLY: Now, again, we care about dry years  
10 in this business, so I'm going to ask you to focus on the  
11 ref -- rough plots in the 90 to 95 percent exceedance  
12 range and ask you a similar question.

13 Does, in fact, the red curve from the  
14 Boundary 2 scenario drop down to the 90,000 acre-foot  
15 storage level sooner than the black curve for the  
16 No-Action Alternative?

17 WITNESS MUNÉVAR: Yeah, it appears to, like one  
18 year, maybe one additional year.

19 MR. LILLY: It could be one or perhaps maybe  
20 two years of the model year record, that there's that  
21 lower end-of-August Folsom Reservoir storage?

22 WITNESS MUNÉVAR: Yeah. It might be one --

23 MR. LILLY: Okay. Now --

24 WITNESS MUNÉVAR: -- just judging by the graph.

25 MR. LILLY: Okay. Now, what would be the

1 effects on the municipal water suppliers that receive  
2 water from Folsom Reservoir during the rest of the year  
3 if the end-of-August storage were at 90,000 acre-feet  
4 rather than 180,000 acre-feet?

5 WITNESS MUNÉVAR: Well, I think -- I think this  
6 is a similar response to -- that Kristin White gave in  
7 terms of when we're in conditions like this, it's likely  
8 there's additional flexibility. And even in Boundary 2,  
9 I would imagine there would be additional flexibility  
10 that could be incorporated.

11 MR. LILLY: By "additional flexibility," do you  
12 mean --

13 WITNESS MUNÉVAR: Real operations.

14 MR. LILLY: So there would -- there might have  
15 to have measures taken, like TUCPs, that are not  
16 reflected in the modeling assumptions? Is that what you  
17 mean by "additional flexibility"?

18 WITNESS MUNÉVAR: Or -- Or operational  
19 flexibility in different ways of achieving the outflows.

20 MR. LILLY: Oh, like the temporary pumps, or  
21 something like that?

22 Or just tell me what you mean by "additional  
23 flexibility." That's simple.

24 WITNESS MUNÉVAR: It could be that they're  
25 doing additional flexibility curtailing exports rather

1 than upstream releases in July through September.

2           There could be relaxation of some of their flow  
3 requirements that allow them to work through a difficult  
4 year like this -- like these several years.

5           MR. LILLY: Oh, okay. So they might take some  
6 actions regarding op -- CVP operations that are not  
7 reflected in the model assumptions for these conditions;  
8 is that correct?

9           WITNESS MUNÉVAR: I would imagine in many of  
10 these years, they are -- they are taking additional --  
11 additional actions.

12           MR. LILLY: Beyond those that are reflected by  
13 the modeling assumptions; is that correct?

14           WITNESS MUNÉVAR: Beyond those that are  
15 included in the long-term model. Again, we're going on a  
16 comparison between the No-Action and the -- and the  
17 WaterFix. We're not trying to use the model in a  
18 predictive sense.

19           MR. LILLY: Oh, yes. But this -- this  
20 comparison shows that, at least in one year, the  
21 end-of-August Folsom Reservoir storage would be  
22 significantly lower under the Boundary 2 scenario than  
23 under the No-Action Alternative; that's -- is that  
24 correct?

25           WITNESS MUNÉVAR: That's correct.

1 I would imagine the Operators, if they are  
2 projecting a condition such as this, either the  
3 No-Action, or in Boundary 1, or any of the other  
4 alternatives, they are looking for additional flexibility  
5 in their operations.

6 MR. LILLY: And -- And looking for additional  
7 flexibility.

8 Please just describe, just so we're all clear:  
9 What do you mean by that?

10 WITNESS MUNÉVAR: Well, I think as I mentioned  
11 there, it could be a different way of achieving a flow  
12 standard, a temperature, maybe relaxation of a -- of a  
13 water quality.

14 I think the Operators would have a lot more  
15 flexibility than what we've included in our model of  
16 their day-to-day operations.

17 MR. LILLY: Okay. And -- But they might have  
18 to get regulatory approvals to carry out such  
19 flexibility; is that correct?

20 WITNESS MUNÉVAR: They may.

21 WITNESS WHITE: I think they can also include  
22 working with the other water users in the basin. I mean,  
23 we've got a significant amount of source facilities  
24 upstream.

25 So as we saw -- we've seen in past dry years,

1 having conversations about different schedules and -- and  
2 how we work with all the other agencies, I think is also  
3 a possibility during extreme drought times.

4 MR. LILLY: So -- But those -- That sort of  
5 arrangement is not reflected in the modeling outputs; is  
6 that correct?

7 WITNESS WHITE: No. There's no long-term  
8 agreements in place that Reclamation has that -- that  
9 will be reflected in the modeling. Those would all be  
10 year-to-year evaluating the specific scenario in front of  
11 us.

12 (The City of Roseville, Sacramento  
13 Suburban Water District, San Juan  
14 Water District, The City of Folsom,  
15 Yuba County Water Agency and The  
16 City of Roseville Exhibit 13 marked  
17 for identification)

18 MR. LILLY: Okay. Let's move on to Exhibit  
19 BKS-13.

20 (Document displayed on screen.)

21 MR. LILLY: And I -- I will state for the  
22 record, this is -- this is the only other exhibit we have  
23 in this category, but we had our consultants at HDR  
24 prepare these exhibits using the model outputs from  
25 CalSim that were posted to the State Board's website.

1                   And these are not Exceedance Plots, but these  
2                   show that Folsom Reservoir storage and American River  
3                   flows at Nimbus, which is basically the Lower American  
4                   River, for selected years at the model record.

5                   And I'm going to ask the witness some questions  
6                   about these. And, actually, witnesses. It could be for  
7                   Miss White or for Mr. Munévar.

8                   CO-HEARING OFFICER DODUC: Hopefully --

9                   MR. LILLY: So please --

10                  CO-HEARING OFFICER DODUC: Hopefully, these  
11                  questions will not be about operational flexibilities,  
12                  because I think they've already addressed that, that  
13                  those flexibilities are not reflected in the modeling.

14                  MR. LILLY: No. I -- And what I'm trying to do  
15                  is hone in on the comparison between the different model  
16                  scenarios, because Mr. Munévar's testified that's the  
17                  appropriate use of this model. So I'm trying to respect  
18                  that use of the model.

19                  CO-HEARING OFFICER DODUC: Okay.

20                  MR. MIZELL: Object to the relevance.

21                  The first three boxes, they go to years in 1931  
22                  to some other time in the 1930s, and I'd like to know why  
23                  they're relevant.

24                  CO-HEARING OFFICER DODUC: Is that 30 or that's  
25                  the end of the month?



1 Oh, it is 1931, yeah.

2 Mr. Lilly?

3 MR. LILLY: These are the part of the model  
4 period of record. This is model output. These are not  
5 actual operations for these years. I think that's the  
6 whole point of this panel, is to talk about model output.

7 CO-HEARING OFFICER DODUC: All right. Proceed.

8 MR. BERLINER: Excuse me. Further question.

9 While -- While Mr. Lilly stated --

10 CO-HEARING OFFICER DODUC: Closer.

11 MR. BERLINER: Tom Berliner.

12 While Mr. Lilly stated generally where this  
13 information came from, could we get a little bit better  
14 explanation as to what actual data was used so that the  
15 witness can respond appropriately.

16 CO-HEARING OFFICER DODUC: Mr. Lilly.

17 MR. LILLY: I -- I think -- Again, this -- I  
18 don't know -- I think this is really their problem, not  
19 mine, because they posted all this voluminous model data  
20 without submitting it as exhibits.

21 I think the best thing -- the best way to  
22 adjust this: We can treat these as hypothetical  
23 questions, assuming that these model outputs, in fact,  
24 reflect the data that they have posted to the website.

25 And it's certainly acceptable to me if we set a

1 date where Mr. Munévar can come back and say, "I have now  
2 review the model output and I think that there are some  
3 error in any of these figures.

4 I mean, our -- our consultant certainly did the  
5 best he could to try to repair these figures. And on his  
6 direct, he will authenticate these figures, but I can't  
7 do that until Part IB.

8 So I think I've done all I can. I'm certainly  
9 willing to defer to the Hearing Officer for how we should  
10 proceed.

11 CO-HEARING OFFICER DODUC: All right. Well,  
12 we'll take up your concern to -- We'll take notice of  
13 your concern, Mr. Berliner, but I will allow Mr. Lilly to  
14 proceed.

15 MR. BERLINER: So, just to be clear, we're  
16 going to handle these as hypotheticals at this point; is  
17 that right?

18 MR. LILLY: I -- I -- I think what they should  
19 be handled as is they are assumed to be accurate until  
20 proven otherwise. And we will -- We will authenticate  
21 through our direct testimony of our witness.

22 But if Mr. Munévar finds some discrepancy, and  
23 we can set a date to discuss that. We're more than happy  
24 to. Or he could even meet with our technical expert to  
25 go through that.

1           But I think it should be treated as accurate  
2 until proven otherwise.

3           CO-HEARING OFFICER DODUC: I will accept that.

4           Move on, Mr. Lilly.

5           MR. LILLY: Thank you.

6           So, now, moving to the first page of BKS-13,  
7 the top figure shows end-of-months Folsom Reservoir  
8 storage for the model year 1931, and the bottom figure  
9 shows American River flow. It says "at Nimbus" but  
10 that's basically Lower American River for these model  
11 years.

12           So do you see these figures?

13           WITNESS MUNÉVAR: I do.

14           MR. LILLY: All right. So my question is:  
15 This figure shows that, for the -- Let me just make sure  
16 I have this right.

17           You said -- I'm just going to focus on the top  
18 figure for the end-of-August storage. It says  
19 August '31.

20           And if I'm reading the line right, the black  
21 line is for the No-Action Alternative, and this shows  
22 end-of-August Folsom storage at about 175,000 acre-feet;  
23 is that correct?

24           WITNESS MUNÉVAR: That's -- That's what the  
25 graph shows.

1           MR. LILLY: All right. And for the other four  
2 scenarios, the model end-of-August storage is about  
3 90,000 acre-feet; is that correct?

4           WITNESS MUNÉVAR: It appears to be. I can't  
5 tell where all the lines are, but it appears at least for  
6 the red and the . . . I guess, the blue lines, the  
7 Boundary 1 and 2.

8           MR. LILLY: Okay. And it might help to look at  
9 the lower figure which shows the flows.

10           And for the August flows, is it correct that  
11 this -- this lower plot shows flows in the range of  
12 approximately 3500 cubic feet per second for the four  
13 Cal WaterFix scenarios and about 2,000 cubic feet per  
14 second for the No-Action Alternative scenarios; is that  
15 correct?

16           WITNESS MUNÉVAR: Correct.

17           MR. LILLY: So -- And, obviously, the higher  
18 river flows lead to the lower end-of-month storage; is  
19 that correct?

20           WITNESS MUNÉVAR: That -- That appears to be  
21 correct, yes.

22           MR. LILLY: All right. So, do you know why the  
23 model flows for August 1931 are so much higher for the  
24 four Cal WaterFix scenarios as compared for the No-Action  
25 Alternative scenario?

1           WITNESS MUNÉVAR: Just seeing this plot today a  
2 few minutes ago, I do not know why.

3           MR. LILLY: All right. Now -- And I --

4           WITNESS MUNÉVAR: I suspect this is a -- I  
5 suspect this is a -- a call from the Delta for water  
6 quality issues.

7           MR. LILLY: So, I'm just going to ask you to --  
8 ask Mr. Baker to put up for a moment Exhibit DWR-1  
9 errata, Page 11.

10          MR. OCHENDUSZKO: So, Mr. Lilly, there are  
11 currently three versions of DWR-1 right now and we have  
12 DWR-1E corrected version which was corrected on  
13 August 12th, 2016.

14          MR. LILLY: Okay. I have a problem with one --  
15 Well, I have the last one that was posted. Let's look at  
16 that one. I think they're probably all the same for this  
17 slide. I'm looking for Slide 11.

18          MR. OCHENDUSZKO: We're happy to flip-flop to  
19 another version, if -- if need be.

20          MR. LILLY: All right.

21                 (Document displayed on screen.)

22          MR. LILLY: Okay. That's actually -- Oh, yeah,  
23 we're getting there.

24                 Okay. This is -- It's the slide at the top  
25 that's headed "What isn't changing." And on the left --

1 on the left box, it says, "Upstream operations of  
2 SWP/CVP."

3 Do you see that, Mr. Munévar?

4 WITNESS MUNÉVAR: I do.

5 MR. LILLY: Have you seen this slide before?

6 WITNESS MUNÉVAR: I have. And I believe that,  
7 at least on the one time I had seen it presented, there  
8 was a statement that said that upstream operation  
9 criteria are not changing.

10 MR. LILLY: Okay. And, in fact, what we've  
11 just discussed for the model output for August 1931 shows  
12 that actual operations of upstream reservoirs could, in  
13 fact, change significantly between the No-Action  
14 Alternative and the Cal WaterFix scenarios; is that  
15 correct?

16 WITNESS MUNÉVAR: I think we've also shown that  
17 in our exhibits, where it's the potential for upstream  
18 operational changes while the criteria remain the same.

19 MR. LILLY: Okay. But that isn't my question.

20 My question is that upstream operations, at  
21 least in some of the model periods of record, can change  
22 significantly between the No-Action Alternative and the  
23 Cal WaterFix scenarios; is that right?

24 WITNESS MUNÉVAR: I think it's possible from  
25 looking at an individual month of an individual year.

1           MR. LILLY: All right. So let's go forward to  
2 1932 and, believe me, I'm not going to use -- talk about  
3 every year of record.

4           But let's look at the second page in Exhibit  
5 BKS-13.

6           And I'll try to ask this question just as  
7 quickly -- these questions just as quickly as I can.

8           But is it fair to say that for all of the model  
9 scenarios, the end-of-May Folsom Reservoir storage is  
10 just under 1 million acre-feet?

11          WITNESS MUNÉVAR: Yes. In the top of the  
12 exhibit, yes.

13          MR. LILLY: Okay. And then shifting over to  
14 the end of December, the No-Action Alternative shows  
15 Folsom Reservoir storage at about 500,000 acre-feet; is  
16 that correct?

17          WITNESS MUNÉVAR: Yes, that's what the figure  
18 shows.

19          MR. LILLY: All right. And for the H3 and H4  
20 scenarios, the end-of-September -- end-of-December Folsom  
21 Reservoir storage is about 350,000 acre-feet?

22          WITNESS MUNÉVAR: That sounds -- That sounds  
23 about right.

24          MR. LILLY: And for the Boundary 2 scenario,  
25 it's about 300,000 acre-feet?

1                   WITNESS MUNÉVAR: Yeah. I'm reading numbers  
2 off the graph the same as you are.

3                   MR. LILLY: All right. Well, you -- you're  
4 probably better at it than I am. I appreciate your  
5 following with me.

6                   So is it fair to say that for this year, for  
7 the modeling -- the modeling scenarios, the  
8 end-of-December Folsom Reservoir storage is approximately  
9 150 to 200,000 acre-feet lower under the Cal WaterFix  
10 scenarios as compared to the No-Action Alternative?

11                  WITNESS MUNÉVAR: Yeah, that's what it appears  
12 to show.

13                  MR. LILLY: All right. So let's go forward to  
14 the next page, which is model year 1933.

15                  And I'll just caution you and everyone else:  
16 The Y-Axis on this chart only goes up to 450,000 where,  
17 for the previous years, it went up to basically a million  
18 acre-feet. So we're -- we're in the lower conditions  
19 here and the Y-Axis has been scaled accordingly.

20                  So now if you can look at the lower figure on  
21 this page, which shows the American River flows, is it  
22 fair to say that for all of the modeled flows for January  
23 and February, they're about the same under all of the  
24 scenarios?

25                  WITNESS MUNÉVAR: It appears they're the same



1 for January and then they differ in February.

2 MR. LILLY: Okay. I thought they were -- At  
3 least at the -- at the line for 2/33, it looks like  
4 they're still all the same.

5 WITNESS MUNÉVAR: I don't know if these are  
6 beginning-of-month dates or end-of-month dates.

7 MR. LILLY: Okay. All right. Well -- So --  
8 But then going on, for the next entry, for 3/33, is it  
9 correct that the -- the Cal WaterFix action scenarios all  
10 show about 500 cubic feet per second, where the No-Action  
11 Alternative shows about 1500 cubic feet per second?

12 WITNESS MUNÉVAR: Yeah, that's what it appears  
13 to show.

14 MR. LILLY: And I understand you're not a  
15 biologist, but what is your understanding as a Modeler  
16 about whether or not those flows of 500 cubic feet per  
17 second could have effect on the spawning of steelhead in  
18 the river, if you have an understanding?

19 MR. MIZELL: Objection.

20 CO-HEARING OFFICER DODUC: Answer to the best  
21 of your ability. If you don't know, say, "I don't know."

22 WITNESS MUNÉVAR: Yeah, I don't know.

23 MR. LILLY: All right. Let's just go forward  
24 to the next page of Exhibit BKS-13, which is the output  
25 for 1939. And I'm just going to ask about July of 1939.

1           The model output appears to show flows in the  
2 Lower American River in the range of 3500 to 5,000 cubic  
3 feet per second for the No-Action Alternative and the  
4 Boundary 1, H3 and H4 scenarios.

5           Do you see that?

6           WITNESS MUNÉVAR: I see a little more than 3500  
7 for No-Action and then flows H3 and H4 appear to be  
8 higher than that.

9           MR. LILLY: And for the Boundary 2 scenario,  
10 the flows in July are about -- looks like about 1200  
11 cubic feet per second?

12          WITNESS MUNÉVAR: Correct.

13          MR. LILLY: So -- And, of course, for the upper  
14 figure, that shows -- that corresponds, there would be  
15 higher storage under the Boundary 2 scenario from July on  
16 related to those lower flows in July; is that correct?

17          WITNESS MUNÉVAR: To the extent that it's not  
18 adjusted in subsequent months.

19          MR. LILLY: Okay. I appreciate the  
20 clarification.

21          So, why does the model have this very large  
22 difference in the flows in July 1939 between the  
23 Boundary 2 scenario and the other two scenarios?

24          WITNESS WHITE: Can I ask a clarifying  
25 question?

1           I think most of the Modelers have 1929 to 1934  
2     in our heads as a pretty extreme drought, but I'm not  
3     familiar with whether '39 was a wet or dry year.

4           Is that . . .

5           MR. LILLY: I'm not sure it matters. I think  
6     we're -- The questions are relevant for all model years  
7     of output for the comparison of the different scenarios.

8           WITNESS WHITE: I think if you're asking us to  
9     comment on why the model might have done something, it  
10    matters whether it's a year when -- when we would have  
11    been in the excess flow condition that we identified for  
12    California WaterFix or not.

13           CO-HEARING OFFICER DODUC: That's a good point,  
14    Mr. Lilly.

15           MR. LILLY: Well, it's just -- If Mr. Munévar  
16    knows, fine. If he doesn't know, he doesn't know it.  
17    That's all I'm asking.

18           CO-HEARING OFFICER DODUC: Mr. Munévar?

19           MR. BERLINER: I think this might -- We  
20    probably could use a little help.

21           Mr. Lilly offered to have us meet with their  
22    person who put these together. I think it would be  
23    useful if we could take up on that to get some background  
24    on this data. It's pretty unclear here, clearly not  
25    what's --

1 MR. LILLY: Oh, I -- I disagree.

2 CO-HEARING OFFICER DODUC: Mr. Lilly, you may  
3 do that on your own time.

4 MR. BERLINER: Yeah. Oh, yes.

5 CO-HEARING OFFICER DODUC: Please answer the  
6 questions that we can move on.

7 MR. MIZELL: I'd like to object to being vague  
8 and ambiguous at this point, given the experts have asked  
9 for more information and Mr. Lilly is not forthcoming.

10 CO-HEARING OFFICER DODUC: That's been --  
11 Don't -- Don't be offended, Mr. Lilly. Just -- Just --  
12 Just calm down.

13 I will note the objection but, again,  
14 Mr. Munévar, answer to the best of your ability.

15 WITNESS MUNÉVAR: I'm going to have to ask you  
16 to repeat the question.

17 MR. LILLY: Fair -- Fair enough.

18 My -- My question is: Do you understand why  
19 your modeling work has an output for July 1939 that has  
20 significantly Lower American River flows for  
21 Alternative 2 -- for the Boundary 2 scenario compared to  
22 the other scenarios?

23 CO-HEARING OFFICER DODUC: Assuming that these  
24 tables are correct.

25 WITNESS MUNÉVAR: So assuming they're correct,

1 and I can only work on a -- on a hypothetical right now,  
2 but I think this would -- this would not be un --  
3 unsurprising; that, as you go through a simulation, you  
4 have different Delta salinity conditions.

5 And if in one particular scenario you had an  
6 Emmaton salinity control or a Jersey Point salinity  
7 control, then that might trigger an additional -- a  
8 higher release from Folsom to help meet the Delta  
9 standard, whereas in another scenario, you may have --  
10 have gone through that scenario and not triggered the  
11 salinity release.

12 MR. LILLY: And the reason I'm confused about  
13 that is, the Boundary 2 scenario has the most stringent  
14 Delta outflow requirements and the highest -- excuse  
15 me -- the highest Delta outflow requirements and the most  
16 stringent salinity requirements and yet we're showing a  
17 significantly lower flow here, and I'm just wondering if  
18 you can explain why that would be.

19 (Timer rings.)

20 WITNESS MUNÉVAR: Well, I think you have to  
21 look at it as a whole. Collectively, it also has the  
22 Head of Old River Gate that is closed. And that could be  
23 contributing to less water in the -- in the South Delta.  
24 I don't know what this particular one is.

25 WITNESS REYES: Also -- I'm Erik Reyes from

1 DWR.

2           You -- You just stated there was a more  
3 stringent salinity requirement. I don't think that's  
4 reflective of the models. I think they're the same  
5 salinity requirements throughout the model. It's the  
6 outflow that's different for that location.

7           MR. LILLY: All right.

8           CO-HEARING OFFICER DODUC: Mr. --

9           MR. LILLY: So --

10          CO-HEARING OFFICER DODUC: Mr. Lilly, you've  
11 now finished up your two hours.

12          What additional questions do you have?

13          MR. LILLY: I'm going to shift -- finish with  
14 the modeling output and shift to my last area, which  
15 we've -- we've touched on, but I have some additional  
16 questions, and that's regarding the dry year water  
17 conditions.

18          I think that leads into that, not related to  
19 the model output, but just related in general to how --  
20 the ability of the modeling to reflect the dry year  
21 conditions.

22          CO-HEARING OFFICER DODUC: 10 minutes?

23          MR. LILLY: I'll try, but it may take -- it may  
24 take a few more, but I'll try for 15, anyway.

25          But you'll give me 10 and we'll see where we

1 are.

2 CO-HEARING OFFICER DODUC: I'll give you 10.

3 MR. LILLY: So, Mr. --

4 CO-HEARING OFFICER DODUC: Hold on, Mr. Lilly.

5 UNIDENTIFIED SPEAKER: Is this on? Can you

6 hear me okay?

7 CO-HEARING OFFICER DODUC: Um-hmm.

8 UNIDENTIFIED SPEAKER: There was an implication  
9 that there might be some meeting between these experts  
10 and Mr. Lilly's experts, and I would like to object at  
11 this time to any ex-parte communication.

12 I think any such communication should happen on  
13 the record before this Board in order to discuss anything  
14 about the evidence that's being presented here.

15 CO-HEARING OFFICER DODUC: No. That's not how  
16 ex-parte works.

17 Miss Heinrich, would you like to explain to  
18 your colleague?

19 MS. HEINRICH: The ex-parte rules governing  
20 adjudicative proceedings before the State Water Board  
21 apply to communications to the decision-makers, not  
22 between the parties.

23 UNIDENTIFIED SPEAKER: Okay. So this -- this  
24 would be not evidence in the record that's before this  
25 Board, just between the parties?

1 MS. HEINRICH: That's right.

2 CO-HEARING OFFICER DODUC: Proceed, Mr. Lilly.

3 MR. LILLY: So -- And just so we're clear:

4 Do you know what kind of year -- that is, in  
5 dry, critical and below normal -- 1931 was?

6 WITNESS MUNÉVAR: I know it's -- it's within a  
7 sequence of dry and critical years. I don't know that  
8 year off the top of my head.

9 MR. LILLY: Okay. And '32 and '33 were also in  
10 that same sequence?

11 WITNESS MUNÉVAR: Yes.

12 MR. LILLY: Okay.

13 WITNESS MUNÉVAR: '32, yeah, and '33.

14 MR. LILLY: All right. So let's move on to --  
15 We'll actually move back to BKS-8, Page 12, and we'll  
16 move onto a different topic.

17 (Document displayed on screen.)

18 MR. LILLY: On Page -- Line 15 through 18 -- We  
19 covered this paragraph before, and I just had some  
20 followup questions that I did not cover before about the  
21 term "stressed water supply conditions."

22 What do you mean by the term "stressed water  
23 supply conditions"?

24 WITNESS MUNÉVAR: The -- The indication in this  
25 text is where reservoir storage and inflows to the



1 reservoir are insufficient to meet required releases  
2 for -- for D-1641 objectives or -- or delivery to -- to  
3 senior water right holders.

4 MR. LILLY: So, if we look at the Exceedance  
5 Plots on Exhibit DWR-514 -- And we've talked about them.  
6 You can put them up or refer to them if you need to.

7 Can you translate "stressed water supply  
8 conditions" into which percent exceedances those occur  
9 under?

10 WITNESS MUNÉVAR: I'm looking at Page 17 of  
11 514, so we're looking at Folsom end-of-September.

12 That would be roughly the 95th percentile  
13 there.

14 MR. LILLY: Okay. Basically, where we have the  
15 end-of-September storage of 90,000 acre-feet?

16 WITNESS MUNÉVAR: Correct.

17 MR. LILLY: Now, we've -- we've talked  
18 briefly -- or you've talked and Miss White have talked  
19 about the potential need to file TUCPs.

20 Have you made any estimates of how often DWR  
21 and Reclamation would need to file TUCPs if the  
22 Cal~WaterFix Project were in place and we had a repeat of  
23 the 82-year period of modeling record?

24 WITNESS MUNÉVAR: No, we've not done estimates.  
25 And I think what this graph in particular is showing is

1 that there's no significant increase in the -- those  
2 stressed water conditions with the California WaterFix.

3 WITNESS WHITE: And I just want to add that  
4 the -- the graphs that you're seeing include climate  
5 change and sea-level rise, so a repeat of the 82-year  
6 period of records are reflected in this modeling.

7 MR. LILLY: Okay. Well, let's -- So that's --  
8 So maybe that's an important clarification.

9 So if we had the 82-year period of model record  
10 with sea-level rise and climate change, do you have any  
11 estimate of what percentage of years TUCPs would be  
12 required?

13 WITNESS WHITE: Is that for me?

14 MR. LILLY: Yes.

15 WITNESS WHITE: I -- I do not. It would depend  
16 on a whole lot of things that are beyond my pay grade.

17 MR. LILLY: Okay. Now -- So, I'll ask the  
18 question for Mr. Munévar, but Miss White, feel free to  
19 answer if you think it's appropriate.

20 Can you describe any reasonable criteria for  
21 estimating -- any hydrologic criteria for estimating when  
22 TUCPs would be required with the California WaterFix  
23 Project in place?

24 WITNESS MUNÉVAR: I think that, like I stated,  
25 the -- these stressed water conditions are not unique to

1 the California WaterFix. They are present in the  
2 No-Action as frequently as the California WaterFix.

3 MR. LILLY: Okay. That doesn't really answer  
4 my question, though.

5 My question is: Do you have any estimate of  
6 how often, what percentage of occurrence, TUCPs would be  
7 necessary with the Cal~WaterFix Project or, for that  
8 matter, the No-Action Alternative in place?

9 WITNESS MUNÉVAR: Right. Well, you asked about  
10 the California WaterFix. That's why I responded that  
11 way.

12 But -- And, again, I would say TUCPs are -- are  
13 not necessarily the only action that could be provided.  
14 So I would rephrase that and say, in these years, roughly  
15 5 percent of the years that we're we're showing,  
16 additional flexibility or adaptation needs to be  
17 implemented in the system. Whether that's TUCPs or other  
18 mechanisms, I don't -- I don't know what that is.

19 (The City of Roseville, Sacramento  
20 Suburban Water District, San Juan  
21 Water District, The City of Folsom,  
22 Yuba County Water Agency and The  
23 City of Roseville Exhibit 11 marked  
24 for identification)

25 MR. LILLY: All right. Let's move on to

1 Exhibit BKS-11, which is an excerpt of one page from  
2 Exhibit SWRCB-104, and it's Page 3-222.

3 And please take a minute to read this. I  
4 assume you've seen this before.

5 But this is Section 3.7.2 of the Biological  
6 Assessment that the Bureau of Reclamation prepared. It  
7 was dated July of 2016, I believe, released in early  
8 August.

9 And I'll just ask you, after you've read that,  
10 if you've seen this page of this Biological Assessment  
11 before.

12 WITNESS MUNÉVAR: (Examining document.)

13 I -- I have seen this page but I have not --  
14 not dwelled on it.

15 MR. LILLY: All right. Well -- And just -- And  
16 if you need to, please take a moment to read it.

17 But my question is whether reading this  
18 description of proposed future drought measures or  
19 drought procedures, whether that changes your testimony  
20 in any way that you've already given about the types of  
21 actions that DWR and Reclamation might need to do in  
22 response to drought conditions with the California  
23 WaterFix Project in place.

24 WITNESS MUNÉVAR: So I -- Well, I think what  
25 it's indicating here is that there will be contingency

1 plans developed in real-time.

2 MR. LILLY: Okay. And, again, as we've said  
3 before, so those may deviate from the modeling work that  
4 you have done. In real-time, there might have to be  
5 deviations from the modeling.

6 WITNESS MUNÉVAR: Yeah. I think I've said that  
7 multiple times now.

8 MR. LILLY: All right. So -- And I just want  
9 to ask you one last -- just a few more questions.

10 But I think we've heard that -- you say that  
11 the modeling period of record is 1922 to 2003; is that  
12 correct?

13 WITNESS MUNÉVAR: Correct. Water year 1922 to  
14 2003.

15 MR. LILLY: So -- And that's -- So that's the  
16 82 years of model record.

17 My -- My question is: Are the necessary data  
18 available so that this database of this period of record  
19 could be updated to include 2004 through 2015?

20 WITNESS MUNÉVAR: I'll answer two ways.

21 The -- The modeling -- -- or the hydrology that  
22 has been input to the modeling is constantly updated and  
23 evolving, so 2003 was an update of -- through 1998.

24 So certainly there won't be an update that will  
25 extend through 2010 -- 2014-15 or something like that.

1           The data is -- is available from the hydrology  
2     standpoint, but there's also adjustments to the hydrology  
3     to reflect the land use and future conditions associated  
4     with 2030 conditions, so that -- that does not exist at  
5     this point.

6           MR. LILLY: Okay. So that would be for a new  
7     generation of CalSim, because the assumptions for 2030  
8     land use would apply to all of the models of record; is  
9     that correct?

10          WITNESS MUNÉVAR: They -- They would, but they  
11     have -- Individual years are adjusted to reflect the --  
12     the land use conditions -- the future land use  
13     conditions.

14          MR. LILLY: Okay.

15          WITNESS WHITE: It's not just the land use.  
16     It's how the land use interacts with the updated  
17     hydrology.

18          MR. LILLY: All right. So -- But -- All right.  
19     I assume there's no question to hydrologic data as far as  
20     the -- what -- how much rainfall and snowfall occurred  
21     during 1934 to 2015. That data is all available;  
22     correct?

23          WITNESS MUNÉVAR: The historical data is, but  
24     the -- CalSim works on a -- You start with historical  
25     data, you unimpair it for the conditions that have

1 occurred, then you re-impair for future conditions. And  
2 that process has not been developed for an updated  
3 hydrology.

4 MR. LILLY: All right. If it were -- If the  
5 modeling period of record were extended to include 2012  
6 to 2015 period of record, then that would give us all  
7 significant information regarding how the modeling shows  
8 that the Cal WaterFix scenarios would perform during  
9 this last four years of extraordinary drought; is that  
10 correct?

11 WITNESS MUNÉVAR: Certainly, having more recent  
12 information would allow you to make an assessment for  
13 more recent conditions.

14 But we have conditions in 82 years that are --  
15 that are similar in the drought lengths in severity to  
16 the -- the recent droughts.

17 MR. LILLY: Oh. Did you not hear Mr. Leahigh  
18 testify that the 2015 period of drought was exceptional  
19 and more -- more dry, more serious, than the previous  
20 years of record?

21 (Timer rings.)

22 WITNESS MUNÉVAR: I did. And then if you  
23 recall that chart, also, the next five years that were  
24 as -- the next most severe were all in the '30s.

25 MR. LILLY: Okay. But having that 2015 in the

1 model period of record would, in fact, show us how these  
2 scenarios would perform under these exceptionally dry  
3 conditions.

4 WITNESS MUNÉVAR: I think the more conditions  
5 that reflect the variability of climate and hydrology are  
6 always helpful through the modeling.

7 But I don't think that the modeling needs those  
8 years to be useful in characterizing the -- the impacts  
9 of the California WaterFix.

10 CO-HEARING OFFICER DODUC: Mr. Lilly, please --

11 MR. LILLY: One more question. I really mean  
12 it.

13 If Mr. Baker could put back up DWR-114.

14 I'm sorry. I just missed this before.

15 (Document displayed on screen.)

16 MR. LILLY: So, Mr. Munévar, where does the  
17 No-Action Alternative fit on the spectrum shown in this  
18 figure?

19 WITNESS MUNÉVAR: I -- I -- I don't know. I  
20 don't know. It's not one of the WaterFix scenarios and  
21 that is what this is attempting to show, is comparing the  
22 alternatives, not the -- not the No-Action.

23 MR. LILLY: Okay. But in -- But, in fact,  
24 there are Delta outflow parameters. You could -- You  
25 made assumptions for the No-Action alternatives, so it



1 could be plotted on this spectrum somewhere; couldn't it?

2 MR. BERLINER: Objection: Hypothetical.

3 CO-HEARING OFFICER DODUC: All right.

4 MR. MIZELL: Asked and answered.

5 CO-HEARING OFFICER DODUC: Can you answer,

6 Mr. Munévar?

7 WITNESS MUNÉVAR: Yeah.

8 CO-HEARING OFFICER DODUC: If not --

9 WITNESS MUNÉVAR: Yeah. I think this is a --  
10 this is a graphical representation to illustrate the  
11 scenarios, not an exact measure of outflow.

12 CO-HEARING OFFICER DODUC: You snuck in an  
13 extra question there, Mr. Lilly.

14 MR. LILLY: And -- And I'm done. I'm not going  
15 to wear out my welcome with the Hearing Officer.

16 But thank you very much for allowing the  
17 additional time.

18 CO-HEARING OFFICER DODUC: No, thank you.

19 Mr. Lilly, I have to say, thank you, congratulations --  
20 you did not bore me once during that.

21 (Laughter)

22 CO-HEARING OFFICER DODUC: -- two hours and 10  
23 minutes.

24 MR. LILLY: Well, I appreciate that.

25 And, Mr. Munévar and Miss White, thank you very

1 much for your attention to my questions and your careful  
2 consideration.

3 And for the other members of the panel, I'm  
4 sorry. I didn't have time to ask you all questions.

5 CO-HEARING OFFICER DODUC: Let me do a quick  
6 check-in. Mr. Aladjem or Mr. Kelly, which one of you  
7 are -- is up next?

8 How do you -- Are you anticipating that most of  
9 your questions will go into -- to Mr. Munévar because, if  
10 so, I'd like to give him a five-minute break.

11 MR. KELLY: Yeah. Is this on?

12 Yeah, I expect them to go -- Actually I don't  
13 know what they're going to go to. I think, given  
14 Mr. Lilly's comprehensive coverage, I can get done inside  
15 of 10 minutes.

16 CO-HEARING OFFICER DODUC: Oh, perfect. Mr.  
17 Munévar, are you --

18 WITNESS MUNÉVAR: I'm ready to go.

19 CO-HEARING OFFICER DODUC: -- good to go in 10  
20 minutes?

21 WITNESS MUNÉVAR: Till 6 o'clock.

22 CO-HEARING OFFICER DODUC: Well, no. We -- We  
23 shut down by 5:00, so you'll be free by then.

24 MR. BERLINER: Would it be okay if they all  
25 just took a second to stand up and stretch?

1 CO-HEARING OFFICER DODUC: Yes, please. Stand  
2 up, stretch.

3 Uh-oh. I'm losing people.

4 All right. We are taking a five-minute break.

5 (Recess taken at 4:07 p.m.)

6 (Proceedings resumed at 4:10 p.m.)

7 CO-HEARING OFFICER DODUC: (Banging gavel.)

8 All right. It is 4:10. Let's go ahead and  
9 resume, please.

10 Mr. Kelly, you are up.

11 MR. KELLY: Thank you, Chair Doduc.

12 CO-HEARING OFFICER DODUC: And Mr. Kelly has  
13 said he can do this in 10 minutes.

14 MR. KELLY: I -- I hope to. I'm going to shoot  
15 for five but we'll -- Give me 10.

16 CO-HEARING OFFICER DODUC: All right.

17 CROSS-EXAMINATION BY

18 MR. KELLY: Mr. Munévar, I think it was you  
19 that testified earlier that the modeling -- that the  
20 No-Action Alternative specifically complies with all  
21 regulatory requirements, including the Biological  
22 Opinions that exist; is that correct?

23 WITNESS MUNÉVAR: I think I testified that it  
24 has the Biological Opinion requirements in, but I think I  
25 also testified for Shasta, it did not have an ability to

1 meet the 1.9 criteria.

2 MR. KELLY: How about other -- Okay. Let's --  
3 Well, okay.

4 Can we pull up SWRCB-83, Page 18 of that,  
5 please.

6 (Document displayed on screen.)

7 MR. KELLY: And I'm talking specifically about  
8 the end-of-September carryover storage targets that are  
9 contained in this RPA on the screen.

10 Do you know whether or not the the No-Action  
11 Alternative modeling complies with that RPA?

12 WITNESS MUNÉVAR: Yeah, I think that's the --  
13 the same response I had before, that -- that the modeling  
14 indicates that, under certain conditions, it cannot  
15 comply with that, with the criteria that are listed here.

16 MR. KELLY: And so if there was testimony from  
17 Petitioners' witnesses earlier in this proceeding that  
18 the model complied with that RPA, that testimony would be  
19 incorrect, in your opinion?

20 WITNESS WHITE: I'm going to clarify that this  
21 RPA is a measurement on a 10-year period, not on the  
22 CalSim result period of record.

23 MR. KELLY: Okay.

24 WITNESS MUNÉVAR: So, the question -- Can you  
25 repeat the question again?

1           MR. KELLY:  If -- If -- If witnesses on behalf  
2   have DWR and Reclamation testified earlier in this  
3   proceeding that the No-Action Alternative complied with  
4   that RPA, would that testimony be correct or incorrect?

5           WITNESS MUNÉVAR:  You know, without looking at  
6   the specific percentages and the numbers here, I don't  
7   know if I -- if it's wise for me to make that statement.

8           MR. KELLY:  Okay.  Can we pull up PCWA-003,  
9   please.

10           If I was going to determine whether or not the  
11   No-Action Alternative would comply with that RPA, what  
12   would I need to do?

13           (Document displayed on screen.)

14           WITNESS MUNÉVAR:  Looking at end-of-September  
15   storage, you'd plot an exceedance of end-of-September  
16   storage and look at the percent -- percent of exceedance  
17   and the storage values associated with that.

18           MR. KELLY:  Okay.  So, I'm going to use  
19   PCWA-003 for demonstrative purposes.

20           And what our consultant did at HDR was download  
21   the State Water Board posted modeling results that I  
22   understand DWR or somebody at your office provided to the  
23   State Water Board, and extracted the end-of-September  
24   storage figures for Shasta.

25           Those are plotted on the solid blue line you

1 see on the screen.

2 Do you see that?

3 WITNESS MUNÉVAR: I do.

4 MR. KELLY: And then what we did was, we put  
5 the 3.2 million acre-feet horizontal line across the top  
6 right at about 3.2 million acre-feet.

7 Do you see that?

8 WITNESS MUNÉVAR: Yeah.

9 MR. KELLY: And so if I wanted to determine  
10 whether or not the carryover storage at the end of  
11 September complied with that 40 percent exceedance in the  
12 RPA, in any given 10 years along that horizontal line, I  
13 should see 40 percent of the storage figures falling  
14 above that line; correct?

15 MR. BERLINER: I'd just point here: Are we  
16 treating this as a hypothetical because we don't have any  
17 foundation for this other than we know your consultant  
18 prepared it so . . .

19 CO-HEARING OFFICER DODUC: We're going to treat  
20 it the same way we treat Mr. Lilly's graphics.

21 MR. KELLY: Yeah. And I'm using it for  
22 demonstrative purposes. I just want to understand if  
23 I've done this the correct way.

24 And we'll authenticate this in our case in  
25 chief as well.

1                   So -- So, to determine whether or not the  
2   3.2 million acre-feet was being met in 40 percent of  
3   years, in any given 10-year window, I should see four of  
4   those dots above that 3.2 million acre-feet; is that  
5   correct?

6                   WITNESS MUNÉVAR: I think you'd plot this as an  
7   exceedance rather than an individual year, because a  
8   10-year window implies, when you're in a -- in a drought  
9   period, you could never achieve -- achieve that criteria.

10                  MR. KELLY: So we put -- The 40 percent  
11   exceedance line is on the right-hand axis. And then we  
12   also took a 10-year running average and plotted that in  
13   the -- the red line that falls along the bottom.

14                  Is that kind of what you're talking about,  
15   looking at exceedances and looking at 10-year running  
16   averages of the carryover?

17                  WITNESS MUNÉVAR: This is -- This is probably  
18   not the way I would do -- I would do the analysis, but  
19   I -- To be clear, I would go back and refer to the  
20   specific language in the -- the previous exhibit you  
21   showed in order to do the calculation consistent with the  
22   RPA.

23                  MR. KELLY: Okay. Let's go back to SWRCB-83,  
24   please.

25                  (Document displayed on screen.)

1           MR. KELLY: For the 40 percent of years minimum  
2 end-of-September storage 3.2 million acre-feet, explain  
3 to me how you would determine whether or not the modeling  
4 was complying with that RPA -- that provision of the RPA.

5           WITNESS MUNÉVAR: So, without reading the  
6 detailed language above and the -- Kristin, feel free to  
7 chime in.

8           But my -- my approach would be to plot this --  
9 this end-of-September storage as an exceedance and look  
10 at where is the 40 percentile exceedance value.

11          WITNESS WHITE: Yeah. I struggled a little bit  
12 with the term "compliance" because we can be complying  
13 with our RPAs and with our Biological Opinion and not --  
14 We don't use CalSim to comply with Biological Opinions, I  
15 guess is my point.

16          So we certainly -- As we've seen in this  
17 drought, there were times that we worked with fishery  
18 agencies to ensure that we're still in compliance with  
19 the operations that we're proposing. And a lot of our  
20 requirements in the Biological Opinion say that we have  
21 to develop seasonal planning to be in compliance.

22          MR. KELLY: Well --

23          WITNESS WHITE: So I'm a little -- I'm not  
24 really sure how you could determine compliance with the  
25 CalSim model.



1           MR. KELLY: Well, how do you -- Are you aware  
2 that, earlier this year, that NBS sent a letter to  
3 Reclamation expressing concern that, over the past five  
4 years, Reclamation was not complying with those carryover  
5 targets in the RPA?

6           MR. BERLINER: Objection: Relevance.

7           WITNESS MUNÉVAR: I have not read that letter.

8           CO-HEARING OFFICER DODUC: Move on, Mr. Kelly.

9           MR. KELLY: So, if you -- I'm trying to  
10 understand, then, how -- how witnesses can form the  
11 basis -- or -- or -- or provide the opinion that the  
12 No-Action Alternative modeling fully complies with this  
13 RPA when I've yet to have anybody tell me how you can  
14 determine that.

15          MR. BERLINER: There's no question there.

16          MR. KELLY: Can somebody explain that to me,  
17 how that -- how somebody can form the opinion that the  
18 No-Action Alternative is fully compliant with this RPA  
19 without providing a method for determining whether that's  
20 true or not?

21          MR. BERLINER: Objection: Argumentative.

22          CO-HEARING OFFICER DODUC: Let's rephrase that.

23          MR. KELLY: Is there any method to do -- Is  
24 there anywhere I can look to determine whether the  
25 No-Action Alternative modeling complies with that RPA?

1           WITNESS MUNÉVAR: I think you could start with  
2 the storage levels.

3           But if you read this RPA, it's about achieving  
4 temperature compliance, and it has end-of-September  
5 storage as a -- as a measure of ability to achieve  
6 temperature compliance.

7           So, temperature compliance is far more complex  
8 than just an end-of-September storage level.

9           MR. KELLY: But the performance measures are  
10 end-of-September storage levels; aren't they?

11          WITNESS MUNÉVAR: That appears to be --

12          MR. BERLINER: Objection: No. It's a -- The  
13 document speaks for itself and it clearly has other --

14          MR. KELLY: Well --

15          MR. BERLINER: -- points in it.

16          MR. KELLY: -- the witness just testified that  
17 this is about temperature and not storage, and so I'm  
18 just asking him if it says there's a storage target.

19          Mr. Munévar, how can you be certain that the  
20 No-Action Alternative complies with this RPA?

21          Or are you certain? Let me ask that. Are you  
22 certain that the No-Action Alternative modeling complies  
23 with this RPA?

24          WITNESS MUNÉVAR: I'm not certain that the  
25 modeling achieves the same percentile levels that are

1 indicated here on this Action 1.2.1.

2 MR. KELLY: And, so, it can be that it does not  
3 comply about the RPA; correct?

4 MR. MIZELL: Objection: Calls for a legal  
5 conclusion; and argumentative.

6 CO-HEARING OFFICER DODUC: All right. All  
7 right. Enough. Let's move on here.

8 I think, Mr. Kelly, you've made the point that  
9 the modeling does not -- or is not able to reflect this,  
10 but Mr. Munévar and Miss White have also made the point  
11 that the modeling does not capture all the operational  
12 flexibilities that would be needed to go towards  
13 compliance with various requirements.

14 MR. KELLY: I have no more questions. Thank  
15 you.

16 CO-HEARING OFFICER DODUC: Thank you.

17 Mr. Aladjem, you are up.

18 And are you the last cross-examiner for  
19 Group 7?

20 MR. ALADJEM: Madam Chair, I believe that  
21 Mr. Hitchings will have a couple of extra questions.

22 CO-HEARING OFFICER DODUC: Okay. Time-wise, we  
23 are required -- Because the audio and recording equipment  
24 shut down at 5:00, how much time do you anticipate  
25 needing?



1           MR. ALADJEM: During that discussion, if my  
2 notes are accurate, you discussed balancing operations so  
3 as to be able to move water South-of-Delta.

4           Do you remember that discussion?

5           WITNESS MUNÉVAR: Yes.

6           MR. ALADJEM: Cutting to the chase, as the  
7 Chair has directed us:

8           If there is export capacity at either the North  
9 Delta Diversion or the South Delta Diversion and any of  
10 those exports could be made consistent with all  
11 regulatory requirements, would the San Luis Rule Curve  
12 indicate that water should generally move South-of-Delta?

13           WITNESS MUNÉVAR: So, that would depend upon  
14 the existing storage south of the Delta. And it would  
15 also depend upon what type of carriage water might be  
16 paid -- paid, if you will, water lost as you -- as you  
17 move across the Delta.

18           So, it will depend on several conditions, not  
19 just the Rule Curve.

20           MR. ALADJEM: Mr. Munévar, that's very helpful.  
21 Let's go into that a little bit.

22           If there is -- You said storage in San Luis  
23 Reservoir.

24           Would there be a threshold beyond which you  
25 would not want to move water south of the Delta? So if

1 water were above a specific level in San Luis, you would  
2 then not move water?

3 WITNESS MUNÉVAR: Well, again that would be  
4 more complex.

5 So, if the allocation were very high, you might  
6 continue to move water. If you have high storage in  
7 Shasta or Folsom, you might move water because you're  
8 essentially evacuating water for flood control. So there  
9 could be a condition in which you'd continue to move  
10 water to San Luis.

11 MR. ALADJEM: And, again, following up on  
12 Mr. Lilly's question:

13 Are those operational considerations put in  
14 writing anywhere in your testimony or in the Petitioners'  
15 testimony?

16 WITNESS MUNÉVAR: I think, as Gwen indicated,  
17 there is some description in Appendix 5A of the  
18 Biological Assessment and the original Draft EIR/EIS.

19 MR. ALADJEM: But nothing -- But nothing more  
20 specific in your testimony.

21 WITNESS MUNÉVAR: Nothing more specific in my  
22 written testimony here.

23 MR. ALADJEM: Thank you.

24 Let's move back to -- You said carriage water.

25 Oftentimes, carriage water will be 15 or

1 20 percent of the water being moved across the Delta; is  
2 that fair?

3 WITNESS MUNÉVAR: Depending on a number of  
4 conditions.

5 MR. ALADJEM: Yeah. In -- In -- In some years,  
6 it's been as high as 35 or 50 percent.

7 Would that be fair?

8 WITNESS MUNÉVAR: Yes.

9 MR. ALADJEM: Again, is there a threshold or --  
10 Let me -- Is there a threshold as to when the carriage  
11 loss is so high that you would not want to move water  
12 across the Delta in the modeling?

13 WITNESS MUNÉVAR: Again, that would depend on  
14 the need for that water.

15 So if allocations were set and -- and storage  
16 levels in San Luis had dropped such that you needed to  
17 fill San Luis to meet the allocation that was already  
18 set, then you may -- the modeling may push more water  
19 even at a high carriage water cost.

20 MR. ALADJEM: And let's take another  
21 hypothetical there, Mr. Munévar.

22 Suppose there were very low allocations and  
23 there was the ability to move water, even perhaps at a  
24 high carriage water loss, would the model move that water  
25 south of the Delta?

1                   WITNESS MUNÉVAR: Well, it would move it if --  
2 if the conditions were to drive the water from upstream  
3 storage as opposed to request the water from -- from  
4 south of the Delta.

5                   MR. ALADJEM: So if I may re-state to make sure  
6 I understand:

7                   Under those circumstances, you might move more  
8 stored water from north of the Delta to south of the  
9 Delta.

10                  WITNESS MUNÉVAR: I was referring to a  
11 condition of not necessarily stored water but maybe water  
12 that is released for other objectives. There could be  
13 stored water released for, say, a water quality  
14 constraint and from which you could still divert some --  
15 some portion of that water for exports.

16                  MR. ALADJEM: Could you elaborate on that,  
17 Mr. Munévar, and give us an example how that might occur?

18                  WITNESS MUNÉVAR: There could be a condition  
19 where, say, Emmaton salinity standards were controlling  
20 and required releases on the Sacramento River.

21                  But once those releases were provided to meet  
22 the Emmaton salinity standard, it could -- that water  
23 could serve dual purpose and be re-exported or  
24 re-diverted.

25                  MR. ALADJEM: And that type of operation is



1 captured in your modeling?

2 WITNESS MUNÉVAR: It is.

3 MR. ALADJEM: Does the modeling that you  
4 perform assume any increased ability to convey stored  
5 water when making South-of-Delta allocations; that is,  
6 the WaterFix alternatives as compared to the No-Action  
7 Alternative?

8 WITNESS MUNÉVAR: That sounds similar to the  
9 previous question.

10 Those conditions may -- may occur where there  
11 are opportunities to move increased stored water, but  
12 the -- the carryover storage plots that we presented  
13 indicate that there's not likely a net increase in stored  
14 water releases.

15 MR. ALADJEM: Thank you.

16 Let me turn to the allocation logic and models  
17 which you again mentioned with Mr. Lilly.

18 If I understood your testimony this morning,  
19 the model first delivers water to the Sacramento River  
20 Exchange Contract -- Sacramento River Settlement  
21 Contractors, the San Joaquin River Exchange Contractors,  
22 Refuge's and Feather River Settlement Contractors, before  
23 any other deliveries; is that right?

24 WITNESS MUNÉVAR: And before that in-stream  
25 flows, Delta water quality requirements, fishery --

1 fishery requirements.

2 MR. ALADJEM: Thank you for the correction. I  
3 appreciate that.

4 And then, because the model is meeting the  
5 senior water right obligations and the in-stream flow to  
6 other environmental and regulatory constraints, only then  
7 does water get delivered to Central Valley Project, Water  
8 Service Contractors, and State Water Project Contractors;  
9 is that correct?

10 WITNESS MUNÉVAR: I think that's -- that's  
11 generally correct, but the allocation decisions are more  
12 complex than release water and see what's left over.  
13 They're made in real-time, and they're forecasted before  
14 you know how much water is actually available.

15 So those allocations are made early in the  
16 year, February, March, April, and you don't know whether  
17 you're in a very dry year until you get into June, July.

18 MR. ALADJEM: I understand. I appreciate the  
19 correction there.

20 But, as a general matter, what you're doing is  
21 to meet the upstream demands first, upstream senior  
22 demands, and the environmental requirements, and then, in  
23 the way you just described, allocating remaining water  
24 based upon year type and demands, et cetera.

25 WITNESS MUNÉVAR: Based on storage, based on

1 the ability to move water across the Delta, if it's the  
2 South-of-Delta demands, based on the San Luis conditions.

3 So, all those considerations come into play.

4 MR. ALADJEM: Okay. Is there a priority for --  
5 Or -- excuse me -- Let me rephrase this.

6 What is the priority as between the CVP and SWP  
7 for the use of the North Delta Diversion and the same  
8 question as to South Delta Diversion?

9 WITNESS MUNÉVAR: So, those priorities are --  
10 are split according to the Coordinated Operation  
11 Agreement.

12 So the -- the splits are determined by the  
13 accounting under the Coordinated Operations Agreement,  
14 and that's what determines the total export capability,  
15 and facility constraints constrain that further.

16 MR. ALADJEM: And then is there a -- There is a  
17 priority for M&I deliveries over agricultural deliveries;  
18 is that right?

19 WITNESS MUNÉVAR: So, that will depend on the  
20 Project. So the CVP -- And, Kristin, feel free to jump  
21 in. Go ahead.

22 Well, there's a -- there's a a prioritization,  
23 an allocation process that's part of the CVP allocation.

24 The State Water Project has a different  
25 allocation process in which the M&I and ag users are --

1 are allocated the same proportion.

2 WITNESS WHITE: Just for clarification: Were  
3 you asking about the model allocation logic or the CVP  
4 allocation process?

5 MR. ALADJEM: I appreciate that clarification.

6 Let me turn now, from some followup to  
7 Mr. Lilly's cross, to upstream storage.

8 Mr. Munévar, in your testimony, you described  
9 the exceedance curves for storage in the three main CVP  
10 and SWP Reservoirs, Folsom, Oroville and Shasta; is that  
11 right?

12 WITNESS MUNÉVAR: Correct. And Trinity as  
13 well.

14 MR. ALADJEM: Pardon me?

15 WITNESS MUNÉVAR: And Trinity as well.

16 MR. ALADJEM: Yes.

17 In preparing your testimony, did you actually  
18 look at the end-of-month storage for months other than  
19 September?

20 WITNESS MUNÉVAR: Yes. As we review the  
21 modeling, we look at virtually every month.  
22 End-of-September was selected as an indicator for -- for  
23 this stressed water supply condition and the -- the  
24 ability to deliver water to legal uses of water.

25 MR. ALADJEM: And if I understood your

1 discussion with Mr. Lilly, stressed water supplies is  
2 really the dryest 5 percent of years.

3 Was that -- Is that fair?

4 WITNESS MUNÉVAR: I think that would -- For  
5 that particular plot, I believe we were looking at Folsom  
6 at the time, and it was roughly 5 percent. That will  
7 vary depending on which reservoir, what hydrology, what  
8 climate assumptions.

9 MR. ALADJEM: If I recall the discussion  
10 correctly, you discussed both Folsom and Shasta with  
11 Mr. Lilly, and you viewed what we're talking about, dead  
12 pool storage as being stressed conditions. And if memory  
13 serves correct, it was about the dryest 5 percent of  
14 years.

15 Would distressed conditions on either Folsom or  
16 Shasta, or Oroville extend beyond those driest 5 percent  
17 of years. I'm trying to understand what you mean by  
18 "stressed conditions."

19 WITNESS MUNÉVAR: What I was indicating as  
20 stressed conditions are those years in which we reached  
21 what we call dead pool in the modeling.

22 MR. ALADJEM: Okay.

23 WITNESS MUNÉVAR: And those are conditions  
24 where you would want the flexible operations to manage  
25 above -- above that dead pool.

1 WITNESS WHITE: Just to clarify --

2 MR. ALADJEM: Excuse me.

3 WITNESS WHITE: Sorry.

4 Just to clarify, there are other challenges at  
5 times and we're not just at dead pools. I think we heard  
6 in other testimony there are other signals that were  
7 starting to go into a stress period where we're going to  
8 have concern.

9 But I think Mr. Munévar's testimony is really  
10 just about the modeling stressed being when we can't meet  
11 all the competing demands.

12 MR. ALADJEM: Yeah. We were all trying to  
13 focus on the modeling years post-operations.

14 Mr. Munévar, did I hear you correctly saying  
15 that one of the operational criteria that's built into  
16 the modeling is to keep upstream storage as high as  
17 possible, and I believe you said higher than the  
18 No-Action Alternative.

19 WITNESS MUNÉVAR: No, I don't -- I don't think  
20 I said that.

21 MR. ALADJEM: Okay. That's why I'm checking.

22 Was there any direction to you as a Modeler as  
23 to how to manage upstream storage -- and let's focus on  
24 Shasta for a moment -- as to what storage levels should  
25 be in Shasta, other than the obvious regulatory

1 constraints in the Biological Opinions and elsewhere.

2 WITNESS MUNÉVAR: I think in -- Maybe you're  
3 referring to the discussion on Boundary 2 in which -- in  
4 which the operational assumptions that are included in  
5 Boundary 2 were set to -- to not have additional calls on  
6 Shasta to make conditions worse.

7 So, now I'm forgetting your question. Can you  
8 try one more time?

9 MR. ALADJEM: Let me try it one more time.

10 Obviously, there are regulatory requirements at  
11 Shasta, and, obviously, the modeling would operate to  
12 meet those regulatory requirements.

13 So far so good?

14 WITNESS MUNÉVAR: Yeah.

15 MR. ALADJEM: In terms of the operational  
16 criteria which you've mentioned, which Miss Pierre  
17 mentioned in her testimony, were there any other  
18 operational criteria that were given to you to have  
19 storage at Shasta above the levels in the No-Action  
20 Alternative?

21 WITNESS MUNÉVAR: There's -- There was no  
22 specific operational criteria to drive that.

23 I think that was a desired outcome, though, for  
24 all of the Biological Assessment, to demonstrate that the  
25 WaterFix could provide additional flexibility upstream.

1                   MR. ALADJEM: Okay. So, let me continue with  
2 that.

3                   Having additional storage end-of-September  
4 provides additional flexibility to WaterFix operations;  
5 correct?

6                   WITNESS MUNÉVAR: That's not what I said.

7                   Additional flexibility to the operations of the  
8 CVP, which are already stressed in the No-Action, not --  
9 not WaterFix.

10                  MR. ALADJEM: Okay. So -- But -- But one of  
11 the purposes of the WaterFix Project is to provide  
12 additional operational flexibility; is that not correct?

13                  WITNESS MUNÉVAR: One of the goals is to create  
14 additional operational flexibility. I don't know if the  
15 desired goal was to create upstream operational  
16 flexibility or export operational flexibility, but that  
17 may be semantics.

18                  MR. ALADJEM: Okay. Thank you.

19                  So, if I heard you correctly just now, one of  
20 the goals was to create additional upstream storage at  
21 Shasta to provide CVP flexibility.

22                  I'm just trying to make sure I get that right.

23                  WITNESS MUNÉVAR: No, that's not correct.

24                  I think what I said is, the goal was -- for the  
25 overall WaterFix was to achieve at least No-Action or



1 better conditions at Shasta such that we were not showing  
2 any harm from the Biological Assessment standpoint, not  
3 for CVP operational flexibility necessarily.

4 MR. ALADJEM: Okay. So this additional storage  
5 at Shasta is intended to provide benefits for fish and  
6 wildlife, not CVP operational flexibility.

7 I just want to make sure I'm getting that.

8 WITNESS MUNÉVAR: Or -- Or demonstrate no --  
9 no --

10 MR. ALADJEM: No -- No harm.

11 WITNESS MUNÉVAR: Yeah.

12 MR. ALADJEM: Thank you for that.

13 Mr. Baker, if you could put up SVWU Number 2,  
14 please, here.

15 Madam Chair, we've had this discussion several  
16 times this afternoon. I will represent to you that MBK  
17 Engineers was doing work for us under the direction of  
18 Mr. Bourez, took the data that was made available by the  
19 Department of Water Resources and has prepared these  
20 plots.

21 They will be part of his testimony in part of  
22 the case in chief. We would like to use them here on  
23 cross.

24 MR. BERLINER: Same rule applies.

25 CO-HEARING OFFICER DODUC: Yeah. Same -- Same

1 ruling and --

2 MR. ALADJEM: It's the same --

3 CO-HEARING OFFICER DODUC: Same set of scenario  
4 as with Mr. Kelly and Mr. Lilly's charts.

5 MR. ALADJEM: Thank you.

6 Mr. Munévar, I want to direct you to this first  
7 page here.

8 And you're -- you're familiar with Exceedance  
9 Plots obviously.

10 And this is -- I'll just represent to you --  
11 the same end-of-September Shasta Reservoir storage as in  
12 your testimony except that the axis goes the other way.

13 I want to give you a couple moments and satisfy  
14 yourself that that is the case.

15 WITNESS MUNÉVAR: Well, it appears as though  
16 only one -- only 4(a) is. I'm not sure what operational  
17 scenario is shown here. It says, "BA Alternative 4(a)."  
18 That does not appear to be the H3 or H4 that we are  
19 presenting.

20 MR. ALADJEM: Okay.

21 WITNESS MUNÉVAR: Unless this is mislabeled.

22 MR. ALADJEM: We will have to have that  
23 discussion with Mr. Bourez.

24 But if you'll -- I want to direct your  
25 attention here to the wetter years, the 10 to 30 percent

1 exceedance.

2           You'll see that Boundary 1 is well above the  
3 No-Action Alternative line; is that correct?

4           WITNESS MUNÉVAR: Looking at the high storage  
5 years, Boundary 1, yes, has higher storage in the 20  
6 percentile level there.

7           MR. ALADJEM: And then, in most of the years,  
8 say, from the, you know, 15 percent to 70, 75 percent  
9 exceedance, Boundary 2 is also well above the No-Action  
10 Alternative BA analysis.

11           WITNESS MUNÉVAR: Is that a question?

12           MR. ALADJEM: That's a question, yes.

13           WITNESS MUNÉVAR: Yes.

14           MR. ALADJEM: And then building on what -- our  
15 discussion of a few moments ago, the fact that you have  
16 additional storage here at Shasta at end-of-September, if  
17 I understood you correctly, was to demonstrate that  
18 WaterFix would not interfere or harm the ability to meet  
19 the environmental objectives.

20           Is that fair?

21           MR. MIZELL: Asked and answered.

22           MR. ALADJEM: I'm asking him to confirm that  
23 this graph shows what he just said.

24           CO-HEARING OFFICER DODUC: Yes. Please answer.

25           WITNESS MUNÉVAR: That's not what I said.

1           I said the -- the desire was to have storage  
2 levels that were at or above No-Action, but that was --  
3 that was not for operational flexibility. It was for --  
4 for demonstrating that the California WaterFix could be  
5 operated in a manner that would not have impacts to  
6 upstream storage.

7           MR. ALADJEM: I'll accept that as an answer,  
8 Mr. Munévar.

9           WITNESS MUNÉVAR: Thank you.

10          MR. ALADJEM: Now, the water -- Whether we're  
11 talking Boundary 1 or Boundary 2, there's additional  
12 water in many years over and above the water that would  
13 be in storage in the No-Action Alternative.

14          Did you model what would happen to that water  
15 over time?

16          WITNESS MUNÉVAR: Yes, we did. The -- The  
17 modeling is a continuous simulation for the 82 years.

18          MR. ALADJEM: Okay. Mr. Baker, could we go to  
19 the next slide.

20          (Document displayed on screen.)

21          MR. ALADJEM: This is the same type of slide.  
22 It's October. And, again, you will see that -- I believe  
23 it is -- Boundary 1 is well in excess of the No-Action  
24 Alternative, and Boundary 2, again, continues over the  
25 No-Action Alternative.

1           If I understood you correctly, Mr. Munévar, you  
2 did model what happened to that water.

3           Could you tell me, as you sit here, where that  
4 water went, how it was used.

5           WITNESS MUNÉVAR: I can tell you the general  
6 criteria.

7           So, when -- when storage levels were higher, it  
8 enabled us to perhaps meet water quality objectives  
9 from -- from Shasta rather than Folsom.

10           It perhaps enabled higher allocation in  
11 those -- in those years, which is what we -- what we show  
12 in -- particularly in Boundary 1.

13           And some of that is used as carryover storage  
14 to protect against the subsequent years.

15           MR. ALADJEM: And, so, Mr. Munévar, let me ask  
16 you a hypothetical.

17           Let's suppose during the fall period, the two  
18 Projects are meeting all of the regulatory criteria, all  
19 the regulatory constraints, and there is export capacity  
20 on either the North Delta Diversion or the South Delta  
21 Diversion. And going back to your answer earlier, there  
22 is room in San Luis, and the carriage water losses are  
23 not too great, whatever that might be.

24           Did your modeling contemplate moving this  
25 additional water over and above what would be their

1 No-Action Alternative South-of-Delta?

2 WITNESS MUNÉVAR: I think the answer is -- is  
3 yes. It's a continuous simulation. We don't have a --  
4 We don't run the simulation with a No-Action and then try  
5 to do something different than the No-Action for that --  
6 each month of that year. We run the simulation and it's  
7 continuous.

8 So, if there was water that could have been  
9 moved south of the Delta or allocated and moved to the  
10 fall, like you had mentioned, as long as salinity  
11 standards were met, Rock Slough particularly in the fall  
12 would be controlling, then that water could be moved.

13 MR. ALADJEM: And where, in all of the  
14 Exceedance Plots and the other charts you showed this  
15 morning, would we be able to pull out this amount of  
16 water that we moved in the fall?

17 WITNESS MUNÉVAR: That would be a very specific  
18 model output and analysis to pull out specifically how  
19 much water was moved in the fall for what purposes.

20 That does -- That does not exist in the  
21 exhibits we've provided.

22 MR. ALADJEM: So, I'm going to take that as an  
23 answer that you cannot, as you sit here, tell us how much  
24 water would be moved during the fall.

25 WITNESS MUNÉVAR: You can look at how much

1 water was moved out of Shasta or released from Keswick in  
2 the fall. That is possible to do. I don't have the  
3 numbers here to say how much.

4 MR. ALADJEM: Okay. Okay. Let's see here.

5 Let me move to a different line of questioning.

6 And Chair Doduc, I think I have maybe 10  
7 minutes left. I'll try to finish.

8 Mr. Munévar, you're familiar with Joint Point  
9 of Diversion and the joint operations of the two  
10 Projects; right?

11 WITNESS MUNÉVAR: I am.

12 MR. ALADJEM: Am I correct in thinking that  
13 the -- or understanding that the JPOD is not -- Joint  
14 Point of Diversion -- is not in the Boundary 1 analysis?

15 WITNESS MUNÉVAR: I -- I don't recall offhand.  
16 Maybe one of my panelists can help me on the Point of  
17 Diversion inclusion.

18 I think, at this -- at this moment in time, we  
19 don't know.

20 MR. ALADJEM: I see Miss White looking to --

21 WITNESS WHITE: I don't recall that being  
22 removed. Anyone that can back me up?

23 WITNESS MUNÉVAR: I think those assumptions are  
24 documented in Appendix 5A, as it does have Joint Point of  
25 Diversion as a line item in that Assumptions Table.

1           MR. ALADJEM: Well, let's assume for the sake  
2 of discussion that the use of the Joint Point of  
3 Diversion is at least limited, if not curtailed, under  
4 Boundary 1, just as a hypothetical.

5           What would be the effect of that on CVP  
6 deliveries?

7           WITNESS MUNÉVAR: Well, it depends on how much  
8 is curtailed.

9           MR. ALADJEM: Sorry? Didn't catch that.

10          WITNESS MUNÉVAR: It would depend on how much  
11 it's curtailed.

12          MR. ALADJEM: Okay. Given where you -- what  
13 you recall of the joint point, let me move on.

14          We spoke earlier, Mr. Munévar, about  
15 operational flexibility for the two Projects from  
16 WaterFix.

17          Did you hear Mr. Leahigh's testimony about  
18 operational flexibility?

19          WITNESS MUNÉVAR: I -- I heard only portions of  
20 it.

21          MR. ALADJEM: How would you understand the term  
22 "operational flexibility" as it has been used, beginning  
23 with Director Cowin and Mr. Leahigh, in terms of the two  
24 Projects and the operation of WaterFix?

25          WITNESS MUNÉVAR: Well, I can't speak for



1 Director Cowin or John Leahigh, but I -- but I think John  
2 Leahigh and my terminology would be more consistent in  
3 that we're looking for opportunities to move water during  
4 periods of excess and high flow conditions such that we  
5 do not have conflicting demands on the system during  
6 drier conditions, and that operational flexibility should  
7 be good for water users, fisheries, and other -- other  
8 aspects of the system.

9 MR. ALADJEM: Let me break that apart,  
10 Mr. Munévar. That was very helpful.

11 When you say that that was -- should be useful  
12 for water users and fish, could you explain a little bit  
13 more what you mean.

14 WITNESS MUNÉVAR: Well, I think being able to  
15 divert water at very high flows when the biological  
16 implications of those diversions are less is a very  
17 helpful thing for both fisheries and water users in  
18 reducing conflicts on the system.

19 MR. ALADJEM: Okay. How is operational  
20 flexibility, as you just defined it, built into the  
21 model?

22 WITNESS MUNÉVAR: There's not an operational  
23 flexibility term. It's the --

24 MR. ALADJEM: I understand. That's why I'm  
25 asking the question.

1                   WITNESS MUNÉVAR: It's the facilities and the  
2 operations associated with facilities that create the  
3 operation flexibility.

4                   So the model responds to the new -- the new  
5 ability to divert water at different times, at different  
6 quantities, and at different points with -- within the  
7 Delta, and that operational flexibility is expressed as  
8 a -- as a -- as a result of the modeling, not as an  
9 input.

10                  MR. ALADJEM: I believe you've answered this  
11 question before.

12                  I just want to make sure that you said that  
13 priority for the use of the North Delta Diversion would  
14 be under the COA?

15                  WITNESS MUNÉVAR: Priority for total exports is  
16 as per the COA, yes.

17                  MR. ALADJEM: And I, again, want to clarify  
18 here.

19                  I believe you said earlier that most of the  
20 water that would be exported through the North Delta  
21 Diversion would be from excess flows; is that correct?

22                  WITNESS MUNÉVAR: I haven't done the analysis  
23 of how -- exactly what that proportion of excess versus  
24 storage is, but I would expect that most of the diversion  
25 is occurring in the winter and spring periods and that is

1 our conditions of excess flows.

2 MR. ALADJEM: But if there were diversions  
3 taking place during the summertime, for instance, you  
4 would expect that would be stored water and not excess  
5 flows.

6 WITNESS MUNÉVAR: Correct.

7 Yeah, it could be stored water that was  
8 released for temperature, so just to correct on that. It  
9 could be stored water that's released for temperature  
10 obligations or in-stream flow obligations upstream that  
11 could be recaptured, or it could be water released for  
12 Delta requirements.

13 MR. ALADJEM: Okay. One last question,  
14 Mr. Munévar.

15 We've been talking about the interface here of  
16 modeling and operations.

17 And we talked about exporting stored water,  
18 perhaps during the fall.

19 Did you -- Did your modeling analyze the  
20 potential effects of that on carryover storage over the  
21 period of record?

22 WITNESS MUNÉVAR: Yeah. I think, like I --  
23 like I mentioned before, it's continuous simulation, so  
24 if water's moved in the fall, the subsequent year has  
25 lower storage, and that would be -- that would be a

1 carryover effect, and you would see that in the outputs.

2 MR. ALADJEM: Madam Chair, no further  
3 questions.

4 CO-HEARING OFFICER DODUC: Thank you,  
5 Mr. Aladjem.

6 Mr. Hitchings, given the time, how much time do  
7 you think you need? I don't want to cut off your -- your  
8 cross-examination.

9 MR. HITCHINGS: Yeah. I was going to suggest  
10 that I may have about 10 minutes, but if I have a chance  
11 to reflect over my notes and avoid duplication, it could  
12 be less, and if it's okay and pleases the Board, maybe  
13 start tomorrow with that.

14 CO-HEARING OFFICER DODUC: It very much pleases  
15 the Board.

16 (Laughter.)

17 MR. HITCHINGS: Okay. Thank you.

18 CO-HEARING OFFICER DODUC: With that, we will  
19 resume at 9 o'clock tomorrow and, remember, we are  
20 unfortunately back in the big room, Byron Sher.

21 (Proceedings adjourned at 4:53 p.m.)

22

23

24

25

1 State of California )  
2 County of Sacramento )

3

4 I, Candace L. Yount, Certified Shorthand Reporter  
5 for the State of California, County of Sacramento, do  
6 hereby certify:

7 That I was present at the time of the above  
8 proceedings;

9 That I took down in machine shorthand notes all  
10 proceedings had and testimony given;

11 That I thereafter transcribed said shorthand notes  
12 with the aid of a computer;

13 That the above and foregoing is a full, true, and  
14 correct transcription of said shorthand notes, and a  
15 full, true and correct transcript of all proceedings had  
16 and testimony taken;

17 That I am not a party to the action or related to a  
18 party or counsel;

19 That I have no financial or other interest in the  
20 outcome of the action.

21

22 Dated: August 30, 2016

23

24

25

---

Candace L. Yount, CSR No. 2737

