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STATE OF CALIFORNIA
STATE WATER RESOURCES CONTROL BOARD

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PUBLIC HEARING

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REGARDING WATER RIGHT APPLICATIONS FOR THE
DELTA WETLANDS PROJECT

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PROPOSED BY DELTA WETLANDS PROPERTIES

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FOR WATER STORAGE ON WEBB TRACT, BACON ISLAND,

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BOULDIN ISLAND, AND HOLLAND TRACT

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IN CONTRA COSTA AND SAN JOAQUIN COUNTIES

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TRANSCRIPT NOT SEQUENTIALLY NUMBERED

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HELD AT

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901 P STREET

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SACRAMENTO, CALIFORNIA

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THURSDAY, JULY 31, 1997

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9:00 A.M.

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Reported by:

ESTHER F. WIATRE

24

CSR NO. 1564

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01

APPEARANCES

02

03

BOARD MEMBERS:

04

JAMES STUBCHAER, HEARING OFFICER

04

JOHN CAFFREY

05

MARC DEL PIERO

05

MARY JANE FORSTER

06

JOHN BROWN

06

07

STAFF MEMBERS:

07

08

JAMES CANADAY

08

JAMES SUTTON

09

DAVID CORNELIUS

09

10

COUNSEL:

10

11 BARBARA LEIDIGH
11
12
12 DELTA WETLANDS PROPERTIES (APPLICANT):
13
13 ELLISON & SCHNEIDER
14 2015 H Street
14 Sacramento, California 95814
15 BY: ANNE J. SCHNEIDER, ESQ.
15 BARBARA BRENNER, ESQ.
16 and
16 JOSEPH NELSON, ESQ.
17
17 CENTRAL DELTA WATER AGENCY; RECLAMATION DISTRICTS 38, 2027,
18 2036, 2038, and 2072; M & T, Inc.; CCRC Farms, LLC; and Palm
18 Tract Farms:
19
19 NOMELLINI, GRILLI & McDANIEL
20 235 East Weber Avenue
20 Stockton, California 95201
21 BY: DANTE JOHN NOMELLINI, ESQ.
21
22 NORTH DELTA WATER AGENCY:
22
23 DOWNEY BRAND SEYMOUR & ROHWER
23 555 Capitol Mall, 10th Floor
24 Sacramento, California 95814
24 BY: DAVID R. E. ALADJEM, ESQ.
25
25
0003
01 APPEARANCES
01
02 PACIFIC GAS & ELECTRIC:
02
03 RICHARD MOSS, ESQ.
03 P.O. Box 7442
04 San Francisco, California 94120
04
05 CALIFORNIA URBAN WATER AGENCIES:
05
06 JAMES ROBERTS, ESQ.
06 357 South Grand Avenue
07 Los Angeles, California 90071
07
08 CONTRA COSTA WATER DISTRICT:
08
09 BOLD, POLISNER, MADDOW, NELSON & JUDSON
09 500 Ygnacio Valley Road, Suite 325
10 Walnut Creek, California 94596
10 BY: ROBERT B. MADDOW, ESQ.
11
11 EAST BAY MUNICIPAL UTILITY DISTRICT:
12
12 FRED S. ETHERIDGE, ESQ.
13 375 Eleventh Street
13 Oakland, California 94607

14
14 DIABLO WATER DISTRICT:
15
15 FREDERICK BOLD, ESQ
16 1201 California Street
16 San Francisco, California 94109
17
17 CITY OF STOCKTON:
18
18 McDONOUGH HOLLAND & ALLEN
19 555 Capitol Mall, Suite 950
19 Sacramento, California 95814
20 BY: VIRGINIA A. CAHILL, ESQ.
20
21 BUREAU OF RECLAMATION:
21
22 OFFICE OF REGIONAL SOLICITOR
22 PACIFIC SOUTHWEST REGION
23 2800 Cottage Way
23 Sacramento, California 95825
24 BY: JIM TURNER
24
25
25
0004
01 APPEARANCES
01
02 DEPARTMENT OF WATER RESOURCES:
02
03 KATHY CROTHERS
03 1416 Ninth Street
04 Sacramento, California 95814
04
05 STATE WATER CONTRACTORS:
05
06 KRONICK MOSKOVITZ TIEDEMANN & GIRARD
06 400 Capitol Mall, 27th Floor
07 Sacramento, California 95814
07 BY: CLIFFORD W. SCHULZ, ESQ.
08 and
08 MARY DIGNAN, ESQ.
09
09 DEPARTMENT OF FISH AND GAME:
10
10 NANCEE MURRAY, ESQ.
11 1416 Ninth Street, 12th Floor
11 Sacramento, California 95814
12
12 BAY INSTITUTE OF SAN FRANCISCO:
13
13 GARY BOBKER
14 625 Grand Avenue, Suite 250
14 San Rafael, California 94901
15
15 CALIFORNIA SPORTFISHING PROTECTION ALLIANCE/COMMITTEE TO
16 SAVE THE MOKELUMNE:
16

17 MICHAEL B. JACKSON, ESQ.
17 446 West Main Street
18 Quincy, California 95971
18

19 PETER M. MARGIOTTA:

19
20 PETER. M. MARGIOTTA
20 122 Castle Crest Road
21 Walnut Creek, California 94595
21

22 AMADOR COUNTY:

22
23 BARTKIEWICZ, KRONICK & SHANAHAN
23 1011 Twenty-Second Street, Suite 100
24 Sacramento, California 95816
24 BY: ALAN B. LILLY, ESQ.
25
25

0005

01 APPEARANCES

01

02 DEPARTMENT OF TRANSPORTATION:

02

03 DEPARTMENT OF TRANSPORTATION
03 DISTRICT 10
04 1976 East Charter Way
04 Stockton, California 95201
05 BY: DANA COWELL
05

06 KYSER SHIMASAKI:

06

07 KYSER SHIMASAKI
07 4412 Mala Creek Circle
08 Stockton, California 95207
08

09 NATIONAL HERITAGE INSTITUTE:

09

10 DAVID FULLERTON
10 114 Sansome Street
11 San Francisco, California
11

12 KEVIN WOLF:

12

13 KEVIN WOLF
13 724 N Street
14 Davis, California 95616
14

15 ---oOo---

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22		
23		
23		
24		
24		
25		
25		
0006		
01	INDEX	
01		
02		PAGE
02		
03	OPENING OF HEARING	8
03		
04	AFTERNOON SESSION	99
04		
05	DELTA WETLANDS PROPERTIES:	
05		
06	PANEL:	
06		
07	DAVID FORKEL	
07	EDWIN HULTGREN	
08	ROBERT KORSLIN	
08	DAVID VOGEL	
09	KEITH MARINE	
09		
10	CONTINUED REBUTTAL EXAMINATION:	12
10		
11	CROSS-EXAMINATION BY:	
11		
12	BY MR. NOMELLINI	164
12	BY MR. MADDOW	167
13	BY MS. CROTHERS	177
13	BY MS. MURRAY	185
14	BY STAFF	192
14		
15	CENTRAL DELTA WATER AGENCY:	
15		
16	CHRISTOPHER NEUDECK	
16		
17	REBUTTAL TESTIMONY	69
17		
18	CALIFORNIA URBAN WATER AGENCY:	
18		
19	PANEL:	
19		
20	RICHARD LOSEE	
20	STUART KRASNER	
21		
21	REBUTTAL TESTIMONY	89
22		
22		

23
23
24
24
25
25

0007

01

INDEX

01

02

PAGE

02

03

CONTRA COSTA WATER DISTRICT:

03

04

PANEL:

04

05

GREGORY GARTRELL

05

RICHARD DENTON

06

K.T. SHUM

06

07

REBUTTAL TESTIMONY

116

07

08

CROSS-EXAMINATION OF DR. DENTON;

08

09

BY DELTA WETLANDS PROPERTIES

09

BY MS. BRENNER

193

10

BY STAFF

202

10

11

DEPARTMENT OF FISH AND GAME:

11

12

PANEL:

12

13

FRANK WERNETTE

13

DEBORAH McKEE

14

DALE SWEETNAM

14

ALICE RICH

15

JIM STARR

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REBUTTAL TESTIMONY

144

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SACRAMENTO, CALIFORNIA

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THURSDAY, JULY 31, 1997

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HEARING OFFICER STUBCHAER: We will resume the Delta
Wetlands' water rights hearing. Before we continue with the
rebuttal, I will have some discussion of our procedure. I
understand there were some problems with certain witnesses

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06

07

08 being available on August 19th and 20th.

09 Delta Wetlands and Contra Costa Water District, and I
10 think we can make accommodations of those.

11 Are there any other parties who have problems with the
12 recross examination of the rebuttal testimony on August 19th
13 and 20th?

14 I see none.

15 I understand Mr. Forkel will not be available on those
16 dates, so the thought was that perhaps he could be crossed
17 today.

18 MS. SCHNEIDER: If possible, we would like to do that,
19 although he may have to come back anyway. He would, of
20 course, prefer not to.

21 HEARING OFFICER STUBCHAER: Mr. Denton I understand is
22 going to be away.

23 MR. MADDOW: Dr. Denton will be one of our rebuttal
24 witnesses, but he will be away in August. What we have
25 arranged is that perhaps he could be cross-examined at the

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01 conclusion of all the rebuttal presentations by all parties.

02 HEARING OFFICER STUBCHAER: Yes. Then with regard to
03 your request, Mr. Maddow, that Delta Wetlands give you the
04 written rebuttal testimony, I don't think that would be fair
05 for just one party to do that. I think that one way to do
06 this in the future, just from my non legal perspective,
07 would be for everybody to exchange written rebuttal
08 testimony before any rebuttal begins so that nobody can
09 rebut other's rebuttal testimony of their rebuttal
10 testimony.

11 But the advantage of deferring the recross examination
12 to August is that an expedited transcript of rebuttal
13 should be available for you to prepare your recross
14 examination.

15 MR. MADDOW: Thank you, Mr. Stubchaer.

16 When the Board announced the arrangements that you were
17 suggesting yesterday, we agreed that that is entirely
18 appropriate. I withdraw the request for the written
19 statements, and we did make the arrangements for an
20 expedited transcript.

21 Thank you.

22 MS. SCHNEIDER: Thank you, Mr. Stubchaer. We were able
23 to provide a couple of witnesses' rebuttal testimony in
24 writing, and I will be making a motion to do that today, to
25 expedite the completion of our rebuttal case.

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01 HEARING OFFICER STUBCHAER: I understand. Those are
02 witnesses who have not yet testified?

03 MS. SCHNEIDER: That's correct.

04 HEARING OFFICER STUBCHAER: That is fine.

05 One other announcement. The CUWA Exhibit 12, which
06 shows the division of the wetland in the three parts for the
07 Fischer Delta Model, is available. You can pick up copies
08 at the front table during the break, if you wish.

09 Anything else, staff, before we proceed?

10 All right, Ms. Schneider.

11 MS. BRENNER: Before we continue with our rebuttal, I
12 would like to request that an additional exhibit be

13 submitted into the record. It is Jones & Stokes' modeling
14 efforts, which is on disk now, that staff requested that
15 these modeling, that the modeling exhibits be submitted, and
16 we now have them available. I would also like to know what
17 other parties would like copies. Its is 65 megabytes?
18 DR. BROWN: 65 megabytes of data files, and the
19 assessment models, basically all the information used for
20 the Jones & Stokes' analysis
21 HEARING OFFICER STUBCHAER: That is a lot of floppies.
22 DR. BROWN: One C&D Rom.
23 HEARING OFFICER STUBCHAER: Which other parties would
24 like a copy?
25 We have Mr. Nomellini, CUWA, PG&E, Contra Costa, Fish
0011
01 and Game, and Department of Water Resources.
02 MS. BRENNER: Five? Six?
03 HEARING OFFICER STUBCHAER: And of course, the hearing
04 officer would like one, too.
05 MR. CORNELIUS: How about documentation? Is it on
06 there or is a help menu, or what? Documentation for the use
07 of it?
08 DR. BROWN: There is Read Me File that tells you
09 briefly what is in each of the spreadsheet files. You'll
10 pretty much have to explore within each file. It is not
11 totally documented, but it is there.
12 HEARING OFFICER STUBCHAER: Is Lotus required to run
13 the model?
14 DR. BROWN: Yes, these are all Lotus files.
15 HEARING OFFICER STUBCHAER: So everybody knows that.
16 If you switched to Excel, you are out of luck. Excel won't
17 do an adequate job on Lotus files.
18 Are there a lot of macros?
19 DR. BROWN: There is some macro.
20 MS. BRENNER: We would like to request that be
21 submitted as Delta Wetlands' Exhibit 63. I know the next in
22 order is 62, but I have that designated for a different
23 exhibit already.
24 MR. SUTTON: You are quick.
25 MS. BRENNER: I would like to request that it be
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01 entered into evidence.
02 HEARING OFFICER STUBCHAER: Are there any objections?
03 Seeing none, it is accepted.
04 MR. MADDOW: I wasn't quite certain whether we are
05 going to receive that today or sent to us in some way? Just
06 what?
07 DR. BROWN: They might be able to get it by today.
08 MS. BRENNER: I think it would be easier if we could
09 just send it to you. I could arrange to get ahold of them
10 tomorrow, and we can Fed Ex them. Anybody that wants these,
11 please give me your Fed Ex.
12 MR. MADDOW: Thank you very much.
13 MS. MURRAY: Fish and Game, they should be sent to Jim
14 Starr.
15 HEARING OFFICER STUBCHAER: We can't hear you.
16 THE COURT REPORTER: I got it.
17 ---oOo--

18 CONTINUED REBUTTAL EXAMINATION
19 BY DELTA WETLANDS PROPERTIES
20 BY MS. SCHNEIDER
21 MS. SCHNEIDER: We would like to begin with Mr. Forkel
22 and then Mr. Korslin this morning.
23 HEARING OFFICER STUBCHAER: Do we have a new witness?
24 MS. SCHNEIDER: Yes, that is Mr. Korslin.
25 HEARING OFFICER STUBCHAER: Did he take --

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01 MS. SCHNEIDER: He did yesterday.
02 So, to begin with Mr. Forkel.
03 Starting off with yield issues. In your opinion, does
04 the Delta project yield calculations of 154,000 acre-feet
05 per year include replacement of evaporative losses?
06 MR. FORKEL: Yes. The project yield calculations that
07 were performed by Jones & Stokes for the draft and ESA and
08 CESA analysis have always included the ability to replace
09 evaporative losses for periods of surplus availability. So,
10 during wetter years when the Delta is often still in excess
11 conditions during the summer months, the project will be
12 replacing evaporative losses.
13 MS. SCHNEIDER: Will the Fish and Game topping off
14 proposal provide additional yield for the Delta Wetlands
15 Project?
16 MR. FORKEL: No. The Fish and Game topping off
17 proposal will not add any additional yield to the project.
18 The replacement of evaporative losses, as I just said, has
19 already been included in the yield modeling. So, when the
20 Fish and Game proposal says that they can replace
21 evaporative losses, we have already included that in the
22 modeling.
23 The reservoirs would either already be full, so you
24 couldn't have any additional topping off, or the reservoirs
25 would be empty and we wouldn't be able to top anything off.

0014

01 The Fish and Game criteria includes a 50,000 acre-foot
02 minimum, or the Delta would be in balanced conditions.
03 MS. SCHNEIDER: Moving to the topic of CUWA's water
04 quality proposed terms. Do the CEQA suggested water quality
05 terms for salinity and dissolved organic carbon affect the
06 operational flexibility of the Delta Wetlands Project?
07 MR. FORKEL: Yes. The CUWA term would render the Delta
08 Wetlands Project operationally infeasible. The water
09 quality benefits of the Delta Wetlands Project are realized
10 because of the land changes, land use changes that will
11 eliminate agricultural discharges, and the impact of the
12 reservoirs' discharges during the remainder, or during the
13 few months that we would discharge, will be less than
14 significant and will, more often than not, represent an
15 annual average benefit.
16 What the CUWA term does is ignore the year round
17 benefits of the project's operation and focus only on the
18 isolated differential between the reservoir water quality
19 and the immediate channel ambient levels. When the Delta
20 Wetlands' reservoir water quality is even just slightly
21 above ambient channel levels at the time of discharge, the
22 CUWA term would be triggered and this will ultimately kill

23 the Delta Wetlands Project.

24 MS. SCHNEIDER: Again, from the standpoint of
25 operational feasibility, does the Fish and Game Biological

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01 Opinion affect the operational feasibility of the Delta
02 Wetlands Project?

03 MR. FORKEL: Yes. The Fish and Game Biological Opinion
04 measures threaten the operational feasibility of the project
05 in several ways.

06 Several of the measures will significantly affect the
07 operations to such a magnitude that the project would become
08 operationally infeasible. The measures that primarily cause
09 concern are RPM Number 1.0, which states no diversions
10 during March. Diversions during March are very valuable to
11 the Delta Wetlands Project operations. Although we do not
12 generally divert much water in March, the water that we get
13 is extremely valuable. We are generally already full during
14 March, or there is no water available. But when the water
15 is diverted, it's our last chance to pick up water.

16 In the last drought condition we had two miracle
17 Marches. This would provide important new water during a
18 time of critical need. But there is never water in our
19 70-year hydrology after March. So once diversions are
20 prohibited from March, April, May, we are not likely to pick
21 up any additional water. There are no miracle Julys.

22 HEARING OFFICER STUBCHAER: Here.

23 MR. FORKEL: Here.

24 Also, the March operations are protected by the Final
25 Operations Criteria. There are very strict limitations

0016

01 during this period of time. And we never take much water
02 relative to the hydrology. Reviewing the 70 years of
03 hydrology, we picked up water five times in March. So over
04 70 years there were five miracle Marches. It wasn't very
05 large diversions. They ranged from about 700 to 1,100 cfs
06 and average around 900.

07 During this time, outflow in March was extremely high,
08 ranging from 24,000 to 43,000 cfs and it averaged around
09 36,000 cfs. So March is very important for the project. It
10 picks up that critical dry or drought water that comes from
11 a miracle March.

12 Another measure that is very important is RPM Number 2,
13 the environmental storage. This measure is a clear taking
14 of Delta Wetlands' property without compensation. It is a
15 significant hit to the project yield, and it creates some
16 operational constraints that we are very concerned about
17 that the project may not be able to do.

18 The footnotes on Page 43 of the Biological Opinion
19 provide the Department of Fish and Game with the complete
20 discretion as to the timing of these discharges. But it
21 requires Delta Wetlands to contractually guarantee that the
22 state and federal projects would not export this water.
23 This type of contractual guarantee is giving us cause for
24 concern.

25 There are additional conservation measures, 2.1, 2.2,

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01 2.3, and 2.4, that are associated with water quality

02 criteria. 2.1 prohibits Delta Wetlands' discharges based
03 upon a temperature criteria. This temperature criteria
04 would be an operational nightmare for the project. It
05 requires that Delta Wetlands' discharges for export to be
06 limited from September to June, based upon a criteria that
07 is normally within one degree and is often reduced down to a
08 zero degree tolerance.

09 Now, the historical temperature in the Delta you see
10 frequently under natural variability during this time of
11 five degrees, and often as high as ten degrees. This means
12 that the project would be starting and stopping based upon
13 the natural variability in the channels.

14 On an incoming tide, arrival of fog, anything, could
15 trigger the channels' temperatures to move, and this would
16 cause the Delta Wetlands to have to stop. Attaching such
17 tight temperature requirements to the project will almost
18 certainly make it operationally infeasible by itself.

19 The other water quality variables have a similar tight
20 constraint. These are dissolved oxygen, pH, and turbidity.
21 Like temperature, these are associated with a great deal of
22 natural variability and could often trigger the Delta
23 Wetlands' operations to start and stop throughout the day.

24 Additional conservation measure 5.1 prohibits
25 diversions -- I mean, prohibits diversions to storage in
0018 June and July.

02 As I've talked about earlier, the June and July are
03 extremely important times for the project because it allows
04 us to replace evaporative losses, especially during some of
05 the wetter years when the Delta Wetlands Project is filed
06 and held the water over the spring months and we get into
07 the summer. During wetter years, there are still often
08 available surplus water during this time, and it allows us
09 to replace this evaporative water.

10 Also, the Fish and Game measure seems to be
11 inconsistent with its previous topping off measure where it
12 did allow diversions during June and July to top off the
13 reservoirs. There seems to be some inconsistency here.

14 The next measure in the Biological Opinion is
15 additional conservation measure 5.2. This limits Delta
16 Wetlands' diversion as a function of San Joaquin River
17 inflows. The Fish and Game San Joaquin diversion limits are
18 extremely restrictive, and they'll affect the project
19 operations.

20 The San Joaquin River inflows are often very low during
21 the late fall and early winter when the Delta is otherwise
22 in excess conditions. This was recognized and included in
23 the federal biological opinions, but they recognize the
24 limitation and included a 15- or 30-day criteria to allow
25 the fishery agencies a powerful adaptive management tool to
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01 invoke the San Joaquin River limit when it was important,
02 but still allowed the Delta Wetlands some flexibility to
03 operate the rest of the time.

04 Now, since the reservoirs would generally fill in about
05 a month, the 15 days was picked as a criteria that would
06 limit the diversions during half of the time of our normal

07 diversion period. And then, when the Delta smelt index was
08 greater than 239, that limitation is expanded to 30 days.

09 This San Joaquin River limit, like the cross channel
10 closure for fisheries, like our Delta smelt monitoring plan
11 and like the fall midwater trawl index, provide a powerful
12 collection of adaptive management tools for the Delta
13 Wetlands Project which are being threatened by the Fish and
14 Game Biological Opinion.

15 MS. SCHNEIDER: Some of these measures can be modeled
16 and some can't, in terms of determining yield. In your
17 view, how does the Fish and Game Biological Opinion affect
18 the average annual yield of the Delta Wetlands Project?

19 MR. FORKEL: The average annual yield of the project
20 was analyzed in Jones & Stokes' March 25th memo that is
21 Exhibit DW-5. They were only able to model a portion of the
22 Fish and Game measures, but their estimate of average annual
23 yield at this time was 106,000 acre-feet. This was a 48,000
24 acre-feet reduction in our annual yield and doesn't even
25 include all of the measures. And as I have just said, a lot

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01 of these measures are going to create operational problems
02 that could, although they are unquantifiable, provide
03 additional yield hits and perhaps could take the yield of
04 the project down close to zero.

05 MS. SCHNEIDER: You have heard testimony about the
06 percentage of yield that the Fish and Game measures would
07 result in.

08 Can you give us an estimate of the percentage yield
09 impact?

10 MR. FORKEL: I think if you look at the 106 to 154,
11 that is a 30 percent reduction in yield.

12 MS. SCHNEIDER: I want to turn to an item that relates
13 to PG&E's case and their direct testimony. They provided us
14 with copies of easements.

15 Mr. Forkel, have you reviewed the copies of easements
16 that were provided by PG&E to us during the course of this
17 hearing?

18 MR. FORKEL: Yes, I have.

19 MS. SCHNEIDER: Did any of the easements include a
20 prohibition against construction or operation of a reservoir
21 on Webb Tract?

22 MR. FORKEL: No, none of the easements prohibited
23 construction or operation of the reservoir on Webb Tract.

24 MS. SCHNEIDER: Finally, would you comment briefly on
25 why Delta Wetlands Project does not have an identified buyer

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01 at this time?

02 MR. FORKEL: The Delta Wetlands Project team has had
03 preliminary discussions with several potential buyers
04 throughout our planning process. A common theme among the
05 potential buyers has been the requirement to understand
06 permit terms and conditions so they have a complete
07 understanding of what the Delta Wetlands Project can do.

08 Our further marketing efforts will require that the
09 project either have a permit or a clear understanding of the
10 terms and conditions associated with a permit. I think this
11 position was confirmed during cross-examination of the

12 Department of Water Resources when you heard Mr. Ed Huntley
13 say that the Department of Water Resources has not -- he
14 said that any discussion with Delta Wetlands would be
15 premature at this time.

16 For the project to proceed further with any sort of
17 effective marketing program, we need to have a water rights
18 permit and a clear understanding of the terms and conditions
19 so that we can insure the project will have an adequate
20 yield and can produce water at a competitive unit price.

21 MS. SCHNEIDER: Thank you, Mr. Forkel.

22 Our next witness is Mr. Korslin.

23 HEARING OFFICER STUBCHAER: Excuse, Ms. Schneider, did
24 you say that you have his testimony in writing?

25 MS. SCHNEIDER: No, I don't. I have several other
0022 witnesses' testimony, but I need Mr. Forkel and Mr. Korslin
02 to testify orally.

03 HEARING OFFICER STUBCHAER: Okay.

04 MS. SCHNEIDER: Mr. Korslin, can you please state your
05 name for the record?

06 MR. KORSLIN: It's Robert J. Korslin.

07 MS. SCHNEIDER: Would you briefly describe your
08 education and work experience?

09 MR. KORSLIN: I received a Bachelor's degree in
10 construction administration and a Masters in real estate
11 finance in investment analysis from the University of
12 Wisconsin at Madison.

13 I worked for three years for Northwestern Mutual
14 Insurance Company in their real estate investment office.
15 And I have spent the last eight years working for Kemper
16 Insurance in various real estate subsidiaries that they
17 have.

18 From 1989 to 1992, I was vice president of their
19 Chicago office. From '92 to '95, I was the chief financial
20 officer of Kemper Real Estate Management Company in
21 Lafayette, California.

22 And from 1995 to the present, I have been a senior vice
23 president and principal of ZKS Real Estate Partners, which
24 is an entity that has been formed to manage Kemper's real
25 estate assets.

0023
01 In my eight years at Kemper I have been involved in the
02 sales of approximately \$3,000,000,000 worth of real estate
03 properties and businesses. I secured approximately
04 \$400,000,000 worth of third party financing for our
05 projects, and I have originated or extended approximately a
06 billion and a half dollars of real estate investments for
07 Kemper related entities.

08 MS. SCHNEIDER: Would you describe your involvement
09 with the Delta Wetlands Project?

10 MR. KORSLIN: I represented the Kemper interests as
11 the financial partners in this project as both the owner and
12 the lender for the last eight years.

13 MS. SCHNEIDER: Could you describe the ownership
14 structure of Delta Wetlands?

15 MR. KORSLIN: Yes. Delta Wetlands is a partnership
16 between Delta Wetlands, Inc., which is a California

17 corporation and KLMLP. KLMLP is a partnership of various
18 Kemper Corporation subsidiaries and Lumbermen's Mutual
19 Casualty Company. The Delta Wetlands' partnership is
20 financed by a loan from Kemper Industrial Life Insurance
21 Company and Lumbermen's Mutual Casualty Company.

22 MS. SCHNEIDER: Does Delta Wetlands have any other
23 significant source of funding?

24 MR. KORSLIN: No.

25 MS. SCHNEIDER: Do you believe that Delta Wetlands
0024 could be financed by a third party?

01 MR. KORSLIN: No. Given, the unique nature of this
02 project, the continued permitting delays, and the reduction
03 in yield that we have been experiencing over the life of the
04 project, I don't believe that any alternative source of
05 financing could be found for Delta Wetlands.

06 MS. SCHNEIDER: Could you describe the process by which
07 Kemper and Lumbermen's approve additional funding for the
08 Delta Wetlands Project?

09 MR. KORSLIN: Yes. Each lender has either a real
10 estate investment committee or an individual who is
11 authorized to make new or extend existing real estate
12 investments for the various entities. For the existing
13 management agreements, ZKS, which is the company that I work
14 for, is authorized to act as an agent for the lenders in
15 their dealings with Delta Wetlands.

16 So, when additional funding is required, Delta Wetlands
17 will submit a proposed budget and a loan extension request
18 to ZKS, and ZKS will review, make any changes that might be
19 required and then use that to submit a formal request to the
20 lenders.

21 If the lenders are satisfied that they have enough
22 information and that the continued investment is justified
23 and economically feasible, they will continue to fund the
24 project.
25

0025 MS. SCHNEIDER: Do Kemper and Lumbermen's place any
01 conditions on their continued funding of Delta Wetlands?

02 MR. KORSLIN: Yes. Kemper and Lumbermen's hold regular
03 meetings with Delta Wetlands and ZKS to review the continued
04 progress of the permitting and economic feasibility of the
05 project.
06

07 Kemper and Lumbermen's can withhold further funding if
08 they believe that the project is either not making progress
09 or is becoming, has become economically infeasible. In a
10 meeting that we had last year, Kemper and Lumbermen's
11 determined that an average annual yield of this project of
12 approximately 160,000 acre-feet, calculated on a monthly
13 basis, would be an index number that they would use to,
14 basically, say that they will not go below this amount,
15 approximately this amount, and then continue funding the
16 project.

17 This analysis is consistent with the Federal 404
18 alternatives analysis that was completed the year before.

19 MS. SCHNEIDER: How does average annual yield affect
20 feasibility from your perspective of the Delta Wetlands
21 Project?

22 MR. KORSLIN: Kemper and Lumbermen's have determined
23 that their Delta Wetlands' investment should be underwritten
24 with the assumption that the economic feasibility of the
25 project is going to be primarily determined by its ability

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01 to produce average annum yield. And that is the way that
02 the project has been modeled and operated, really, since we
03 began.

04 Basic economic principles will tell us that the
05 marginal unit price of Delta Wetlands' water will rise as
06 the yield goes down because there are certain fixed costs
07 associated with the project that existing costs that are in
08 and cost to build it that will not change. For each
09 acre-foot of yield that is lost, the remaining yield becomes
10 much more expensive.

11 When we began this project ten years ago, it was a
12 four-island project. We expected a yield of approximately
13 235,000 acre-feet, and we expected to have a permit within
14 three to five years. Six years later, in 1993, we agreed
15 that it would make sense to go to a two-island project in
16 order to mitigate for a number of terrestrial items and
17 devote two islands, 9,000 acres, to a habitat management
18 plan.

19 At this point, in 1993, we believe that this was a good
20 faith effort and was made in an effort to move the
21 permitting process along. We thought that the yield
22 reduction, which at the time we believed would go to about
23 200,000 acre-feet, was justified because of this. When we
24 got the Draft EIR out in 1995, the yield was approximately
25 184,000 acre-feet.

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01 Each of these times when we went back to the investment
02 committee, we felt we had a pretty good story of why we
03 needed to continue and why this still an economically
04 feasible project.

05 When we were fairly certain this spring that we would
06 be able to make a deal with the agencies that would require
07 a further yield reduction to this 154,000 acre-feet number,
08 where we are now, we went back to Kemper and Lumbermen's
09 again. And their directive to us at this time was that this
10 was the last yield reduction that they would agree to.

11 I myself had attended many of the meetings that we had
12 with the fishery agencies over a two-year period and 40
13 meetings, and I believe that they acted, based on Fish and
14 Game's active participation at these meetings as well as the
15 meetings that had gone on for the previous eight years, that
16 their Biological Opinion would be relatively, if not
17 entirely, conforming with the federal opinions.

18 I had no idea that the Department of Fish and Game
19 would wait until, basically, two weeks before the hearing to
20 issue the Biological Opinion that cuts our yield from
21 154,000 acre-feet to 106, which is approximately, as Dave
22 said, a 30-percent reduction. In order to make additional
23 improvements for fishery indexes, which I believe to be
24 relatively minor.

25 For instance, we talked a lot about these entrainment

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01 indexes the last few days. I don't claim to understand
02 everything that is related to them. But if you look at the
03 Delta smelt entrainment index under the federal Biological
04 Opinion, it is 26.63. Under the proposed Department of Fish
05 and Game opinion, it is 26.51. That is a .12 improvement;
06 divided by 26.63 is a .45 percent improvement in this index
07 at a cost of 31 percent of the water. So, really, it's a --
08 the percentage change in the yield is almost 70 times the
09 percentage improvement in the index.

10 MS. SCHNEIDER: Let's go back to the process that
11 Kemper and Lumbermen's use in their evaluation of the
12 project feasibility.

13 What factors, other than average annual yield, did
14 Kemper and Lumbermen's consider in determining the minimal
15 acceptable average annual yield?

16 MR. KORSLIN: Well, Kemper and Lumbermen's considered
17 also their expected value of the water, the expected cost to
18 complete the permitting and construction of Delta Wetlands
19 and the relative risk that is related to the permitting
20 construction and sales process.

21 MS. SCHNEIDER: How does each of those factors impact
22 feasibility analysis?

23 MR. KORSLIN: In a particular real estate development,
24 investors are able to rely on past experience in other
25 comparable projects to more precisely determine how such

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01 factors as construction costs, expected sales, and probable
02 permitting costs, would impact their decision of economic
03 feasibility.

04 Delta Wetlands is really the first project of its kind,
05 and certainly it's the first project of its kind for these
06 investors. They have to rely solely on their judgment,
07 based on their experience with this project.

08 Since average annual yield is something that we have
09 been calculating since the beginning of this project and is
10 considered by them to be the most important measurable
11 objective factor that affects the economic feasibility of
12 Delta Wetlands, they have chosen to specifically highlight
13 this factor as a condition of their further funding.

14 MS. SCHNEIDER: Thank you.

15 That concludes my questions for Mr. Korslin.

16 Mr. Hultgren is heretoday.

17 Mr. Hultgren's testimony has been prepared and is in
18 written form. We were able to finalize it so that it can be
19 submitted as written rebuttal testimony. I would like to
20 ask him to identify his testimony. It is labeled Rebuttal
21 Testimony of Edwin M. Hultgren, and it would be Delta
22 Wetlands' Exhibit 62, and we would introduce that in
23 evidence at this time as that exhibit. We have copies for
24 the staff and for parties.

25 But first, would you identify what we would like

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01 labeled Exhibit 62 as a true and correct copy of your
02 written rebuttal testimony?

03 MR. HULTGREN: Yes.

04 MS. SCHNEIDER: Will you be available in August to
05 answer any cross-examination questions related to this

06 rebuttal testimony?

07 MR. HULTGREN: Yes.

08 HEARING OFFICER STUBCHAER: Very good.

09 MS. SCHNEIDER: We also have written rebuttal testimony
10 of Mr. Warren Shaul that we would like to introduce as Delta
11 Wetlands 64. We are having a copying problem, so we will
12 have that here in a few minutes, and we also have copies for
13 the staff when the copying problem is fixed and for all the
14 parties.

15 Mr. Shaul, we have determined from Jones & Stokes, will
16 be available in August to be cross-examined on that written
17 rebuttal testimony. He will, at that time, be able to
18 identify it as his written rebuttal testimony.

19 HEARING OFFICER STUBCHAER: All right.

20 MS. SCHNEIDER: As you know, although you have
21 subpoenaed him at our request, he has not been available
22 this week, and will be available at the August hearing
23 dates.

24 HEARING OFFICER STUBCHAER: That procedure sounds
25 reasonable.

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01 MS. SCHNEIDER: Thank you. This panel can move, and
02 our last two rebuttal witnesses are Mr. Marine and Mr.
03 Vogel.

04 HEARING OFFICER STUBCHAER: Off the record.

05 (Discussion held off the record.)

06 HEARING OFFICER STUBCHAER: Back on the record.

07 MS. SCHNEIDER: Our last two rebuttal witnesses are Mr.
08 David Vogel and Mr. Keith Marine. Some of the questions
09 they will answer together, but mostly they are separate.

10 Have you reviewed the California Department of Fish and
11 Game June 16, 1997 Biological Opinion with respect to the
12 Delta Wetlands Project?

13 MR. MARINE: Yes.

14 MR. VOGEL: Yes.

15 MS. SCHNEIDER: Have you reviewed the testimony of Fish
16 and Game representatives submitted to the Board in support
17 of the Fish and Game Biological Opinion on June --

18 MR. VOGEL: Yes.

19 MR. MARINE: Yes.

20 MS. SCHNEIDER: Have you formulated an overall
21 professional opinion and conclusion regarding Fish and
22 Game's Biological Opinion and the agency's supporting
23 testimony related to that opinion?

24 MR. VOGEL: Yes.

25 MR. MARINE: Yes.

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01 MS. SCHNEIDER: Would you briefly tell us what your
02 general conclusions are?

03 MR. VOGEL: Yes. I am Dave Vogel, and I'll start off.

04 There are three particular broad areas where we had
05 some concerns with the exhibits and testimony provided by
06 Fish and Game. First, I would like to point out that Fish
07 and Game Biological Opinion and supporting testimonies
08 concerning potential effects of the Delta Wetlands Project
09 on fish are quite difficult to analyze because they are
10 largely composed of qualitative, ambiguous statements

11 presented without any supporting scientific rationale.

12 For example, the documents frequently used statements
13 such as, I am quoting, unacceptable levels, unacceptable
14 increases, inadequate, increases the likelihood, without any
15 description of quantitatively exactly what those statements
16 mean.

17 Second, the Department of Fish and Game did not provide
18 any description of how the agency analyzed their perceived
19 effects of the Delta Wetlands Project on fish.
20 Specifically, Fish and Game did not disclose their
21 analytical methods and techniques on how they assessed
22 effects of the project on fish.

23 Furthermore, Fish and Game did not describe criteria
24 used to determine when a significant impact may occur to a
25 listed species. It appears Fish and Game has built many of
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01 their conclusions on speculations. We find this quite
02 unusual because numerous meetings were held among Board
03 staff, the various agencies and the Board's consultants, as
04 well as the Delta Wetlands' team, over many years,
05 specifically, to avoid just such problems. For these
06 reasons, it is difficult to fully assess the technical
07 adequacies of their documents.

08 Third, and probably most important, there are numerous
09 major errors and assumptions and mischaracterizations
10 evident in the Fish and Game documents, which invalidate
11 many of the conclusions presented by the Department of Fish
12 and Game.

13 MS. SCHNEIDER: Mr. Vogel, could you please provide
14 some specific examples of the major errors or
15 mischaracterizations as to how Fish and Game assumes the
16 Delta Wetlands Project will affect fishery resources?

17 MR. VOGEL: There are several prominent examples
18 pertaining to Fish and Game's display and subsequent
19 mischaracterization of potential effects of the project on
20 fish. As an overview, Fish and Game mischaracterized the
21 potential effects on fish by not accounting for three very
22 basic, important, integral components necessary for any
23 analysis of effects of the project on fish.

24 I would like to refer to the first overhead.

25 MS. SCHNEIDER: Before you start. This is a new
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01 exhibit. We would like to introduce to evidence as Delta
02 Wetlands 65. It's heading is Considerations for Potential
03 Effects on Fish.

04 MR. VOGEL: These are the three critically important
05 components that we feel were necessary for any particular
06 entity to seriously analyze the potential effects of the
07 project on fish. Some of these, if not, I believe, actually
08 all of these we testified to during our direct testimony
09 earlier this month.

10 The first pertains to the hydrologic conditions
11 preceding and during the period of interest, potential
12 effects on fish. And what this is referring to is whether
13 or not we are in 1997 type drought or in the floods of, say,
14 1983 or 1986.

15 The second obvious factor is what the biological

16 factors are preceding and during the period of interest.
17 And here I am referring to the considerations such as it
18 would make a considerable difference in any analysis whether
19 or not important life stages of fish are present or absent
20 within the potential zone of impact of the project.

21 Third, and lastly and probably most importantly in this
22 particularly proceeding, is that it is critically important
23 to recognize what has transpired with the Delta Wetlands
24 Project preceding and during the presence of fish in the
25 vicinity of the project. For example, it may be that the

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01 project islands have already filled prior to the presence of
02 certain life phases of fish species in the vicinity of the
03 project.

04 Alternatively, there may have been prohibitions on the
05 discharge or diversions at times when important fish life
06 phases are present within the vicinity of the project.

07 We believe these considerations are absolutely
08 essential before any meaningful analysis of the effects of
09 the project on fish can be performed. We do not believe
10 that Fish and Game fully accounted for these three
11 critically important elements.

12 Now moving into some more specific issues, within the
13 Fish and Game documents there are some major discrepancies
14 relative to winter-run chinook fisheries presented within
15 the Department of Fish and Game Biological Opinion, which is
16 DFG-11. This makes it quite difficult to determine,
17 specifically, how Fish and Game assess effects on winter-run
18 salmon.

19 One example is Fish and Game's inconsistent statement
20 concerning the timing of winter chinook juvenile salmon in
21 the Delta. I will refer to the first overhead, which is
22 obtained from DFG-11, Figure 1.

23 And the exact percentages used by Fish and Game to
24 create this graph are given on Page 15 in DFG-11. In this
25 particular graphic, note that the months of September, May,

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01 and June are not shown.

02 Can we have the next overhead, please?

03 MS. SCHNEIDER: I need to introduce this into evidence
04 as Delta Wetlands Exhibit 66. It's labeled Inconsistencies
05 on DFG's Assumptions on Winter-Run Life History.

06 MR. VOGEL: These are three specific areas within a
07 single Fish and Game exhibit where we see major
08 inconsistencies pertaining to the timing of winter-run
09 salmon in the Delta. The very first graphic I showed you
10 just prior to this graphic displayed the seasonal
11 distribution of winter-run in the Delta. I believe it was a
12 similar distribution that the Board's consultants used over
13 quite a few years in their analysis of the effects on the
14 project on winter-run salmon. It is verbalized in Fish and
15 Game's Exhibit DFG-11 with the first bullet at the top, and
16 I'll read from that.

17 The evaluation of the Delta Wetlands Project
18 impacts on winter-run chinook salmon for the
19 Biological Opinion took into account their
20 occurrence in the Delta, based on their

21 distribution as depicted in Figure 1, DFG-11,
22 Page 12, which is the graphic I just
23 presented. (Reading.)
24 Again, this is consistent with what the Board's
25 consultant used in their analysis. However, if you read
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01 further into the document, you come across the next
02 conflicting statement, and next statement is on the same
03 exhibit of DFG-11, Page 15. In here, they introduce the
04 months of September through May. That is in direct conflict
05 with the earlier assumption that Fish and Game used. That
06 particular statement now says:
07 Juvenile winter-run chinook salmon are
08 present in the Delta in the vicinity of the
09 Delta Wetlands Project islands between early
10 September through May. (Reading.)
11 Now, lastly, the third conflicting statement related to
12 winter-run is again found in DFG-11, Page 4-9 where they now
13 introduce the month of June.
14 The significance of this conflicting issue is that Fish
15 and Game provides subsequent conflicting discussion within
16 their exhibits and testimony on the potential effects of the
17 Delta Wetlands Project which cannot be used in context with
18 all three potential periods of winter-run juvenile chinook
19 presence in the Delta.
20 Also, DFG-11 states that winter-run chinook fry are
21 present in the Delta from January through March. And I have
22 to point out it is biologically impossible for winter-run
23 fry to be present in the Delta in those months. The reason
24 for this is that, at that particular seasonal period, the
25 winter-run fry have grown and advanced to a much larger life
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01 phase, referred to a more larger size of the juvenile life
02 stage or, in particular, the smolt size fish in route to the
03 ocean.
04 Probably the greatest error by Fish and Game is the
05 mischaracterization of the potential Delta Wetlands
06 Project's effects on fish through misuse of statistical
07 percentage comparisons between the federal biological
08 opinions and the Department of Fish and Game Biological
09 Opinion. I have several examples of those.
10 Could we please have the next overhead?
11 This particular exhibit is from DFG-5, Table 5. As you
12 recall two days ago, we had a substantial amount of
13 discussion, I believe it was during cross-examination of the
14 Fish and Game representatives, on how Fish and Game derived
15 those extremely large percentages shown in the federal
16 Biological Opinion column. You see there, the one that is
17 most prominent is around 641 percent.
18 Now Fish and Game testified during cross-examination
19 that the primary purpose of why they provided this
20 particular exhibit to the Board and the Board staff was to
21 display the worst possible impacts of the Delta Wetlands
22 Project. Now during that cross-examination of Fish and
23 Game, we were not able to determine, and Fish and Game did
24 not disclose, the specific data on how they derived these
25 extremely high percentages.

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01 However, Fish and Game, that night, did provide us with
02 much of the data that they used in their analysis, and I've
03 been working on that data since then, late, late in evening
04 and early in the morning, and I was able to reconstruct how
05 they obtained those extremely high percentages.

06 Can we have the next exhibit, please?

07 MS. SCHNEIDER: This is an exhibit that we will
08 introduce as Delta Wetlands 67. We will introduce this as
09 Delta Wetlands 67. It is headed, entitled, Derivation of
10 Federal Biological Opinions Percentages Presented In DFG-5,
11 Table 5.

12 MR. VOGEL: I'm not going to go through each and every
13 one of these calculations. I will simply point to the most
14 obvious ones here. The others fall in line. But in
15 particular, you have observed that March has been a
16 prominent month of concern and a prominent month of
17 discussion. In particular, those were the months on a prior
18 graphic of DFG-5, Table 5, where Fish and Game displayed the
19 641 percent effect of the project on fish.

20 These data were derived from what is referred to by
21 Fish and Game as cross Delta flow parameters. Although they
22 they've used that term inappropriately, using it here
23 because they've used the cross Delta parameter, entrainment
24 index, and diversion index, apparently, in a synonymous
25 fashion. It is actually not proper to do so.

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01 So, actually, it's referred to as the entrainment index
02 in a more appropriate fashion rather than a cross Delta flow
03 parameter as was discussed elsewhere in Fish and Game's
04 testimony.

05 If you focus in on March and look at each one of these
06 boxes as Fish and Game refers to, these are the actual zones
07 within the Delta that Jones & Stokes modeled, using that
08 entrainment index or cross Delta flow parameter, and focused
09 in on the three boxes; the Lower Sacramento River,
10 entrainment index; the Lower San Joaquin; and the Mokelumne
11 river entrainment index.

12 I was able to determine which water year Fish and Game
13 used to obtain the 641 percent; and in each and every case,
14 in this instance, it was the water year 1983. The way they
15 computed this particular value is comparing the no-project
16 condition in March of 1983 with the project condition with
17 the Endangered Species Act alternative for the project,
18 compared to the base condition. Now, the base condition
19 index for the entrainment indices in March 1983 for any one
20 of these boxes, as you see, is an extremely, I have to
21 emphasize extremely, small value.

22 In fact, I actually, in a sense, have to apologize for
23 Fish and Game. I had to carry the decimal places out to
24 eight places so I could obtain those exact percentages. It
25 was quite confusing, I have to admit, because the original

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01 data I had was only the two decimal places. And I had
02 values of .00 compared with .000. So I couldn't figure out
03 where it was from. So I had to keep carrying the decimal
04 places out further and further and further until I could

05 actually get them to correspond with those exact percentages
06 out to a hundredth of a decimal place.

07 So now what we end up with is a calculated value, where
08 you divide one value into the other, and again you are
09 dividing out to, what is that, I think it is something like
10 one hundred-thousandth of a decimal. When you do so, you
11 can see you get these extremely high percentages. Now, the
12 reason this is so confusing is because Fish and Game
13 testified two days ago that the purpose in displaying this
14 particular table was to show to the Board and the Board
15 staff the worst possible impacts of the project.

16 Now, this is not the case here. I have some personal,
17 professional knowledge of March of 1983. Because when I was
18 in the Fish and Wildlife Service, we were sampling in the
19 Sacramento River during that month to monitor the
20 outmigration of salmon from the Upper Sacramento River. In
21 the Upper Sacramento River during March, we were sampling
22 river flows of around 140,000 cubic feet per second. I
23 don't have data on what the specific inflows and outflows to
24 the Delta was, but my recollection is that it was in the
25 hundredths of thousands of cubic feet per second.

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01 I have to emphasis, if there was ever a time period
02 when the Delta Wetlands Project could potentially divert
03 water with minimal impacts to fish, it would have been in
04 March of 1983.

05 Can we have the next overhead, please?

06 MS. SCHNEIDER: Before you start, this will be
07 introduced as Delta Wetlands 68, entitled Winter-Run Chinook
08 Salmon, March.

09 MR. VOGEL: This is an alternative way of displaying
10 some of the data that I thought Fish and Game would have
11 portrayed in their testimony. My understanding is that they
12 have the same data sets that I used to derive this
13 information. It was all obtained from Jones & Stokes, the
14 Board's biological consultants on this particular project.

15 You heard from Fish and Game, and I do agree with them;
16 they felt it was quite important not to just look only at
17 annual values over the 70-year period. They wanted to focus
18 on specific potential effects of the project during
19 critically important months of the year. So what I've used
20 is the information Jones & Stokes provided to Fish and Game,
21 at Fish and Game's request, of what is called the diversion
22 index. And I used March, the winter-run diversion index
23 during March, for the 70 years of record. So, you are
24 seeing 70 years of Marches in the analysis displayed in a
25 rank from the highest baseline condition to the lowest

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01 baseline condition. So, you see the highest base diversion
02 index to the left of the graphic and the lowest at the right
03 of the graphic.

04 Overlaid on top of the no-project condition, which is
05 displayed as the connected line on this graphic going from
06 upper left to lower right, also has displayed the ESA
07 alternatives compared to the CESA or the Fish and Game
08 Biological Opinion alternative.

09 Now, looking at this graphic, you would make the

10 assumption, or at least I made the assumption that Fish and
11 Game would have focused on the blimps on the graph. Those
12 are the areas where the ESA alternative has an incremental
13 increase above baseline conditions. However, when I
14 examined the data in context with the prior graphic you saw
15 in March of 1983, the one where they portrayed some of the
16 worse impacts of the project, is the far right lower
17 corner. That represents March of 1983.

18 And I also looked at the data to see what the second
19 ranking percentage would be, and it turns out that is March
20 of 1986. Fish and Game portrayed two days ago that the
21 worst possible impacts of the project would be at the far
22 right of the graph.

23 Although Fish and Game stated in their verbal testimony
24 that the diversion indices are not to be misconstrued with
25 actual fish mortality, the written testimony in the

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01 Biological Opinion frequently implies the indices, these
02 diversion indices, constitute take according to the Fish and
03 Game Endangered Species Act. The significance of this is
04 that that implies the proximal cause of death of a fish.

05 Although Fish and Game did provide some verbal
06 testimony two days ago emphasizing the fact that these
07 indices really do not constitute mortality, the written
08 testimony implies otherwise. The indices, as was discussed
09 by Fish and Game representatives two days ago, pertains to
10 the movement essentially of water particles, not fish. And
11 as any biologist knows, juvenile salmon do not behave as a
12 water particle.

13 Now, the blimps that you see there are primarily
14 attributable to the diversions of water under the Delta
15 Wetlands Project islands during filling. Although the
16 incremental increases are somewhat small in terms of the
17 diversion index, you can see the diversion index in the
18 highest blimps are about -- for the range of about one
19 percent of the total diversion index compared to what
20 baseline conditions might be. Again, those are, in theory,
21 water particles.

22 The Delta Wetlands Project would have fish screens that
23 would totally exclude young salmon from being entrained onto
24 the project island. Those fish screens -- if this project
25 is ever permitted, those fish screens are going to be quite

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01 expensive. I don't know if John Winther realizes it, but
02 he's got some expensive fish screens forthcoming. In
03 particular, the fish screens that are designed for this
04 project greatly exceed the existing criteria by the National
05 Marine Fishery Service and the Department of Fish and Game
06 for the protection of salmonids.

07 At present, that criterion is .33 feet per second
08 approach velocity, which is extremely low. However, in this
09 particular project, for various reasons, that approach
10 velocity is only going to be .2 feet per second or less. So
11 there is a tremendous amount of protection for those
12 salmonids. That, apparently, has been lost in the context
13 of many of the discussions we have heard in the recent
14 testimony.

15 The reason I bring that up is that we can't lose sight
16 of that fact. We can talk about theoretical impacts, but we
17 can't ignore the fact that the Delta Wetlands Project is
18 going to have some extremely effective fish screens that
19 would prevent the mortality supplied by Fish and Game's
20 written testimony.

21 MS. SCHNEIDER: Moving onto other mysteries of the Fish
22 and Game Biological Opinion, can you account for the
23 percentages that are presented in Fish and Game Exhibit 11
24 where Fish and Game asserts that their RPMs would reduce
25 take by up to 60 percent for winter-run diversions and 90

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01 percent for winter-run discharge effects, 60 percent for
02 Delta smelt diversion effects, and 80 percent for Delta
03 smelt discharge effects?

04 MR. VOGEL: Not entirely. Unfortunately, Fish and
05 Game did not disclose in their exhibits specifically how
06 they computed those extremely high numbers. However, I was
07 able to approximate those numbers after examining Table 5
08 in DW-5.

09 Could we have the next overhead, please?

10 This was the table that was discussed earlier this week
11 I believe; I believe on Tuesday during Fish and Game
12 presentation. And it's obtained from DW-5, Table 5. This
13 was prepared by Jones & Stokes, the Board's consultant, at
14 Fish and Game's request.

15 Note at the top of the table, there is a summary of the
16 overall reductions of the diversion indices associated with
17 measures proposed in biological assessment, the federal
18 Biological Opinions, and the Fish and Game Biological
19 Opinion. It appears to me that Fish and Game derived their
20 percentages, just described, by comparing the 70-year
21 averages for their indices with either the biological
22 assessment or the federal Biological Opinions, and not in
23 comparison to the base condition.

24 For example, if you compare the value of .85 shown
25 directly below DWBA at the heading of that column with the

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01 value of 0.33, shown directly below the heading in the
02 column DFG, you get approximately a 60-percent difference.

03 MS. SCHNEIDER: In your view, is this a meaningful
04 comparison?

05 MR. VOGEL: No, I don't believe it is. A more
06 meaningful comparison would be to compare the various
07 alternatives with the no-project condition to assess effects
08 of the various alternatives.

09 MS. SCHNEIDER: If you compare --

10 HEARING OFFICER STUBCHAER: Ms. Murray.

11 MS. MURRAY: I object to this line of questioning. Mr.
12 Wernette explained in cross-examination. I realize that Mr.
13 Vogel wasn't here during that testimony to hear Mr. Wernette
14 explanation, lengthy explanation, asked by Joe as to how he
15 got those numbers. Mr. Wernette explained that. Mr. Vogel
16 was not here, and maybe did not take to Joe Nelson. Now he
17 is saying he doesn't know how he did it. We have told --

18 MS. SCHNEIDER: We would prefer to complete our
19 rebuttal testimony, Mr. Stubchaer, without interruptions.

20 MS. MURRAY: It's just that the number of inaccuracies
21 are getting intolerable.

22 HEARING OFFICER STUBCHAER: You can develop these in
23 your recross examination.

24 MS. MURRAY: We will, but I just want to acknowledge
25 that Mr. Vogel was not here while Mr. Wernette gave his
0048 explanation, and this has already been explained on the
01 record.

02

03 HEARING OFFICER STUBCHAER: Thank you.

04 MS. SCHNEIDER: So, Mr. Vogel could you please regroup
05 a little bit and start your explanation as to whether a
06 meaningful comparison was made and what would be a
07 meaningful comparison?

08 MR. VOGEL: The way Jones & Stokes, the Board's
09 consultants, has been approaching this for quite a few years
10 is to look at the relative comparison of the various
11 alternatives to the baseline. Once that is done, you
12 compare the alternatives with the baseline and then you can
13 derive a more meaningful comparison between those
14 alternatives, rather than to compare solely the alternative
15 with an alternative without recognition of the baseline.

16 If you did so, I believe that you would see the
17 comparison percentages would be quite small when comparing
18 those alternatives with the no-project or baseline
19 condition. For example, if you compare the winter-run
20 diversion index for the DW ESA alternative, shown at the top
21 of the graphic, with a no-project alternative, you would get
22 only 3.6 percent incremental increase in the diversion
23 effects on winter-run.

24 Now when you compare the DFG alternative with the
25 no-project alternative, you get only a 1.9 percent
0049 increase. Therefore, in comparing those two alternatives,
01 you would now get only a 1.7 percent difference between
02 those two specific alternatives.

03

04 Can we have the next overhead, please?

05 MS. SCHNEIDER: This is an exhibit that would be DW-69;
06 it's headed Mokelumne River Section.

07 MR. VOGEL: These numbers -- this graphic was prepared
08 from numbers I obtained from Table 5 in DW-5, which you just
09 saw earlier. And they represent an alternative, in my
10 belief, a more appropriate way of comparison of alternatives
11 relative to the no-project condition. In this particular
12 example, I am using cross Delta flow parameter as it is
13 defined in Jones & Stokes biological assessment.

14 Specifically, it refers to the Mokelumne box of the Delta.

15 On the top of the graphic or the first graph you see at
16 top is a comparison of the incremental increases associated
17 with the ESA alternative relative to the no-project
18 condition for each month of the year. Those are displayed
19 in red on this graphic, and the no-project conditions are
20 blue. And the exhibits that we were providing aren't in
21 color, but they still, nevertheless, show those incremental
22 differences between the no-project and ESA or CESA
23 alternatives. Now, at the bottom of the graphic, using the
24 same data that I mentioned that I derived from Table 5 in

25 DW-5, you can now see what incremental increases, and this
0050 01 graphic is shown in red, are in comparison to the no-project
02 or baseline conditions.

03 If you look very closely in comparing each of those
04 graphics and compare each of the alternatives, I'll
05 challenge you to see where you can see significant
06 differences. In fact, my eyes aren't that good, but I am
07 having a tough time seeing the differences here. This would
08 be a more appropriate analysis of not in of itself, but in
09 terms of portraying the effects of the alternatives in
10 context to the significant effects, potential significant
11 effects on fish as a result of implementation of either of
12 those alternatives.

13 MS. SCHNEIDER: This week, Fish and Game provided the
14 Board and the parties with a one-page exhibit which they
15 said would describe the methods of how they computed their
16 winter-run chinook diversion entrainment index.

17 Was that one sheet useful to you to assess their
18 methods?

19 MR. VOGEL: No, unfortunately. I appreciated the
20 opportunity. I was quite pleased Fish and Game did provide
21 at least something. Up to this point we had nothing in
22 terms of any information on how they specifically analyzed
23 effects of the project. Unfortunately, the single-page
24 document you referred was incomplete and much too general to
25 be of any use to us. Furthermore, none of the critically

0051 01 important assumptions necessary to fully understand how Fish
02 and Game's methods were employed were not provided in that
03 one-page document.

04 MS. SCHNEIDER: Now that you have been provided model
05 outputs that Fish and Game used to develop their Figure 12
06 and Fish and Game 11, have you been able to assess the
07 significance of that Figure 12?

08 MR. VOGEL: Not yet, and I am frustrated by this one.
09 This is the one where we had a substantial amount of
10 discussion and figured out how to E-mail transmissions and
11 so forth. And Fish and Game staff, I commend them, I think
12 they stayed up late at night. I was, until after midnight,
13 downloading data, up early the next morning. Huge data
14 sets, huge files. I am extremely close to determining where
15 Fish and Game went wrong in that analysis. But, frankly, I
16 can't definitively say where I know they're wrong.

17 Furthermore, the information that Fish and Game used to
18 develop Figure 12 and DFG-11 is still a mystery. I was
19 able, however, to compute the actual values that they used
20 to generate that Figure 12 graphic, but I have not yet been
21 able to figure out where they obtained those values. I feel
22 quite certain that --

23 MS. MURRAY: Can I just clarify? You can get it from
24 Jones & Stokes. That is where we got all our --

25 HEARING OFFICER STUBCHAER: Ms. Murray, please.

0052 01 MS. MURRAY: I want to say, once again for the record,
02 we got all our data from Jones & Stokes.

03 HEARING OFFICER STUBCHAER: Miss Murray.

04 MR. VOGEL: It appears that Fish and Game has confused
05 model outputs for Jones & Stoke's diversion index, the cross
06 Delta flow parameter, DeltaMOVE model, and assumptions on
07 salmon distribution in the Delta. It appears they greatly
08 over estimated impacts on fish.

09 MS. SCHNEIDER: Thank you.

10 I would like to move to Mr. Marine and ask, continuing
11 in this area of discussion, whether you can provide any
12 additional specific examples of mischaracterization on how
13 Fish and Game assumes the Delta Wetlands Project will affect
14 fish?

15 MR. MARINE: Yes. Department of Fish and Game
16 presented testimony in Exhibit DFG-9 and in oral testimony
17 raising the concerns that shifts in the spawning
18 distribution of Delta smelt that occur from year to year may
19 affect the impacts of the Delta Wetlands Project on Delta
20 smelt.

21 I would like to refer back to Figure 2, my first
22 overhead, which was presented on Page 25 of DFG Exhibit 9
23 and was used to illustrate such a concern.

24 This figure depicts the larval and juvenile
25 distribution and abundance from the first three 20

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01 millimeter surveys that were performed this year. Use of
02 this figure is presented by DFG mischaracterizes the
03 potential project impacts and does not fairly acknowledge
04 the careful consideration of spawning distribution issues
05 that were addressed by the DEIR/EIS.

06 Firstly, these data are essentially for a single month,
07 the month of April 1997. The first survey was conducted
08 during the week of March 31st, and the third survey in this
09 series was conducted during the week of March 28th.

10 The DFG B0 indicates that spawning can occur over an
11 extended period of time, potentially from December through
12 July 30.

13 MR. SUTTON: Excuse me, Mr. Marine, you said the third
14 survey was done during the week of March 28. I believe you
15 meant April 28th.

16 MR. MARINE: April 28th. Thank you.

17 MR. SUTTON: Thank you.

18 MR. MARINE: Again, the DFG B0, they have stated that
19 spawning can occur over the course of the time period from
20 December through July, generally peaking, in April and May.
21 So, these data depict but a portion, a one month portion,
22 of what the entire 1997 spawning distribution might
23 ultimately show.

24 So from presentation of this brief snapshot in time,
25 DFG Exhibit 9 testimony suggests that the project may not

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01 have been adequately analyzed to address such a shift in
02 spawning distribution. The DEIR/EIS assumed 50/50
03 distribution between the Sacramento and San Joaquin sides of
04 the Delta for the spawning distribution of Delta smelt,
05 which is considered to be a very broad, geographic
06 distribution. It's also an objective for the recovery of
07 the species to see a more equitable distribution across the
08 Delta. And it approximates a worst case scenario as far as

09 the historic distribution or the known historic distribution
10 of Delta smelt spawning.

11 Given these considerations, DFG's contention, based on
12 data presented by this figure provides a very tenuous
13 criticism of the DEIR/EIS assessment, given the level of
14 consideration that was applied to this issue in their
15 analysis.

16 Another important aspect of how this data misrepresents
17 how the Delta Wetlands Project may affect Delta smelt is the
18 fact that under the final operating criteria assessed in
19 federal Biological Opinions, there would be no diversion or
20 discharge from Webb Tract and Bacon Island would be
21 restricted simply to discharge operations during this month.
22 So, there would be very restrictive protections during the
23 time period that is depicted in their Figure 2.

24 MS. SCHNEIDER: Mr. Marine, do you agree with Fish and
25 Game's contention that the temperature management criteria
0055

01 provided by the federal Biological Opinions are inadequate
02 for protection of chinook salmon and Delta smelt?

03 MR. MARINE: No, I do not.

04 MS. SCHNEIDER: Could you explain your reasons for
05 disagreement, specifically with regard to protection of the
06 chinook salmon from thermal impacts?

07 MR. MARINE: Yes. Based on my participation of the
08 numerous biological consultation meetings leading to the
09 federal Biological Opinions and my own familiarity with the
10 various research on temperature tolerances of salmonid
11 fishes, the evidence provided by the Department of Fish and
12 Game in their B0, DFG Exhibit 11, and the associated
13 testimonies in DFG Exhibits 7 and 9, do not compel me to
14 change my assessment or examination of the adequacy of the
15 temperature criteria for protecting chinook salmon provided
16 by the federal biological opinions, especially in light of
17 the more restrictive, acute thermal discharge protection
18 promoted by the Fish and Wildlife Services B0, which is
19 presented as Delta Wetlands Exhibit 1.

20 First overhead, please -- or second overhead.

21 MS. SCHNEIDER: May I introduce this exhibit, first?
22 This will be introduced as Delta Wetlands Exhibit 70. It's
23 entitled Reasons Why DFG's Argument (DFG 7) Does Not Support
24 Change of the Federal Biological Opinions Temperature
25 Management Criteria for the Delta Wetlands Project.

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01 MR. MARINE: In brief, the reasons why I believe that
02 Department of Fish and Game's argument does not
03 significantly support change of the federal biological
04 temperature criteria represented by this figure, this table.

05 Firstly, I believe that they mischaracterize the intent
06 of the proposed Delta Wetlands' temperature management
07 criteria as assessed by the federal Biological Opinions,
08 which I will elaborate on a little bit later.

09 Secondly, I believe that the foundations that they
10 developed for establishing optimal and thermally stressful
11 temperature ranges are not clearly based on the studies
12 that they present in Tables 1 through 11 in the technical
13 appendix to Exhibit DFG-7.

14 Numerous studies are provided in this exhibit and are
15 supposedly organized to identify lethal, stressful, optimal
16 temperatures ranges for the fresh water life stages of
17 chinook salmon. However, when compared to the ranges that
18 they utilized to evaluate the federal Biological Opinion
19 temperature ranges, it is not clear, specifically, how their
20 base comparative ranges were established. They don't
21 clearly derive from the table that they provided, Tables 1
22 through 11.

23 Thirdly, the Department of Fish and Game's
24 determination of optimal and thermally stressful are not
25 consistent with their own criteria for use in application of
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01 salmonid temperature times and physiological response study
02 results. An example is, and I paraphrase from DFG-7, that
03 it is imperative for comparing similar types of study, and
04 it is advised on Page A6 of DFG Exhibit 7. Many different
05 types of studies are listed in a technical appendix to DFG
06 Exhibit 7, including field observations of fish response to
07 different temperature regimes, observation and experimental
08 work that were conducted under hatchery conditions,
09 laboratory studies, studies of both acute and chronic
10 temperature exposures.

11 And it appears that the results of all types were mixed
12 and matched to derive their proposed optimal and stressful
13 temperature levels, without reconciling the differences
14 amongst these studies as they advised and cautioned in their
15 own testimony.

16 Fourthly, they mix data and studies for different life
17 stages and different stocks, which result in inappropriate
18 comparisons that lead to, what I believe are, inappropriate
19 selection of temperature criteria. For instance, a number
20 of references are made to the exacerbation of incidence of
21 disease under elevated water temperature conditions.
22 However, there is no reconciliation for direct application
23 to the specific conditions that exist in the Central Valley
24 stocks of salmon.

25 For instance, the most prevalent diseases affecting
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01 both hatchery and wild stocks of the Central Valley salmon
02 are two diseases referred to as IHM and DKB. These two
03 particular diseases are not exacerbated by elevated water
04 temperature conditions. In fact, IHM is known as Sacramento
05 River cold water disease. The prophylactic treatment for
06 this in the hatcheries is to elevate the water temperature,
07 rearing water temperatures, to above 60 degrees in the
08 hatchery.

09 Lastly, I believe that the DFG Exhibit 7 misrepresents
10 or misinterprets the data and results from several studies
11 cited in the technical appendix to exhibit Fish and Game 7.

12 I would like to, at this point, so as to not belabor my
13 oral rebuttal with detailed criticisms, I would like to
14 submit a list summarizing these criticisms in the following
15 table.

16 MS. SCHNEIDER: This table will be introduced as Delta
17 Wetlands 71. The heading on it is Misinterpreted and
18 Misapplied Studies on the Thermal Tolerance of Salmonids

19 Cited in Tables 1-11 of Exhibit DFG-7.

20 MR. MARINE: I won't describe this table in detail.

21 However, only to submit that it provides my detailed
22 criticisms of specific references that I believe were
23 misapplied, misinterpreted in that DFG technical appendix,
24 or DFG Exhibit 7 Technical Appendix.

25 I would now like to elaborate on an example of my first
0059 point, which was that I believe that the Department of Fish
01 and Game in their B0 and associated testimonies,
02 mischaracterizes the intent of the proposed Delta Wetlands'
03 temperature management criteria assessment in the federal
04 B0s.

05 Next overhead, please.

06 I would like to refer to my talking points that I first
07 presented in my direct testimony. In DFG Exhibit 7 the
08 statement is made that under the Delta Wetlands' temperature
09 management criteria, they would be allowed to raise
10 temperatures to a minimum of 66 and a maximum of 69.9; and
11 this is simply an inaccurate state.

12 The Delta Wetlands' temperature criteria proposed
13 levels of Delta T or change in water temperature
14 attributable to the Delta Wetlands' discharges within
15 specific temperature ranges that, from the specific
16 information provided in my careful review of relevant and
17 applicable scientific literature cited in my testimony,
18 Delta Wetlands 16, appear to result in no significant
19 incremental impact to both short-term and long-term survival
20 of chinook salmon. While magnitude and frequency of
21 potential temperature differences between the Delta
22 Wetlands' reservoirs and adjacent Delta channels has not
23 been specifically established, it is expected to be
24 infrequent due to the location and the dominance of

0060 meteorologic conditions on Delta Wetlands' water
01 conditions.

02 However, when necessary, the intent is to control the
03 change in water temperature to less than or equal four
04 degrees of the ambient temperature when temperatures are
05 less than 66 degrees to less than or equal to two degrees
06 Fahrenheit when water temperatures rise to a level between
07 66 and 77, and to less than or equal to one degree
08 Fahrenheit when ambient water temperatures exceed 77
09 degrees. By ambient water temperatures I simply want to
10 reiterate that those would be the background temperatures in
11 the adjacent channels outside the area of influence of
12 Delta Wetlands' discharges.

13 HEARING OFFICER STUBCHAER: This was just talking
14 points? I didn't hear a specific reference pointing? That
15 is not an exhibit?

16 MS. SCHNEIDER: That is correct, Mr. Stubchaer. It was
17 used as a talking point overhead by Mr. Marine in his oral
18 direct testimony, and he decided to just talk from it again.

19 HEARING OFFICER STUBCHAER: The transcript will reflect
20 what he said. Okay.

21 MR. MARINE: Secondly, I would like to simply state
22 that or provide an example of why I feel the foundations for
23

24 the optimal temperature ranges used by Department of Fish
25 and Game Exhibit 7 testimony are not clearly based on the

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01 study presented in Tables 1 through 11 in the technical
02 appendix.

03 For instance, the proposed optimal temperature ranges
04 on Page A7 of DFG Exhibit 7 don't always necessarily
05 correspond to the values from the table, tables labeled
06 Optimal Temperature Levels. This makes it difficult to
07 evaluate the validity of the optimal temperature ranges
08 proposed in that testimony upon which DFG bases their
09 evaluation of the NMFS B0 temperature criteria.

10 Put the next overhead up, please.

11 A example that was used in, I believe, Dr. Rich's
12 direct testimony was this figure, which is a figure from
13 Page A21 of DFG Exhibit 7, which depicts optimal, stressful,
14 and lethal temperature levels for rearing juvenile chinook
15 salmon, presumably derived from the information provided in
16 the tables in the technical appendix of that testimony.
17 Based on this proposition, the optimal temperature range for
18 this life stage is between 55 and 60 degrees Fahrenheit with
19 stress affecting growth, disease incidence and life
20 activities and ultimately lethal levels, occurring
21 progressively as the temperatures rise or fall from this
22 optimal temperature range.

23 I would like to put up the next overhead, please.

24 MS. SCHNEIDER: This overhead will be introduced as
25 Delta Wetlands Exhibit 72. It is entitled Figure 1 Daily

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01 Average Water Temperatures at the SWP and CVP South Delta
02 Diversion Facilities from 1993 to 1996.

03 MR. MARINE: This figure is simply a marked up version
04 of Figure 1 from my testimony, DW Exhibit 16. To depict the
05 optimal water temperature ranges proposed by the Department
06 of Fish and Game for both adult and juvenile chinook salmon
07 and the periodicity of occurrence for these life stages of
08 winter-run chinook.

09 The figure here shows on the bars across the top are
10 simply the presence bars that were derived from DFG's
11 Biological Opinion that show on the top. The periods of
12 presence of adult winter-run chinook salmon and blue bars
13 beneath that showing the periods presence of juvenile
14 winter-run chinook salmon in the Delta and in the stippled
15 ranges, stippled blue range, is that range of optimal water
16 temperature of juvenile chinook between 55 and 60 degrees
17 Fahrenheit, and the green stippled range, that range
18 considered optimal for adult migrating and spawning chinook
19 salmon ranging between 44 and 54 degrees Fahrenheit.

20 Looking at this figure, you can see that for each of
21 the life stages there are really only brief periods of time
22 where water temperatures in the Delta, and these
23 temperatures are from the CVP and SWP facilities to provide
24 an example of potential magnitude of temperatures during the
25 cycle of, essentially, a three-and-a-half-year-time period.

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01 Again, what this shows is that there are only brief
02 time periods during the periods of occurrence of these life

03 stages where water temperatures are within the optimal
04 ranges for these life stages under the existing natural
05 background water temperature conditions occurring in the
06 Delta. An implication of DFG proposed optimal ranges that
07 winter-run are subjected to stressful thermal conditions
08 under the existing natural no-project conditions during
09 substantial portions of their presence to the Delta, even
10 during the midwinter time period.

11 No claims by fisheries agencies have ever been made
12 before that temperature conditions in the Delta in midwinter
13 are stressful for salmon. Yet DFG's testimony would lead
14 us to believe such a contention.

15 What I believe that Dr. Rich fails to make clear in her
16 testimony is that while growth, swimming performance, and
17 other measures of physiological response may deviate from
18 optimal in response to variations in water temperature
19 regimes, such deviations do not necessarily translate into
20 decreases in survival. It is dependent on the duration of
21 the occurrence and the concurrent ecological context of the
22 event; in other words, the life stages, the particular life
23 activities that the fish may be in, whether migrating or
24 rearing, and how widespread the temperature change is
25 throughout the contiguous habitat area available to the

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01 fish.

02 HEARING OFFICER STUBCHAER: Ms. Schneider, how much
03 more?

04 MS. SCHNEIDER: I have two more brief questions, and we
05 will be finished.

06 HEARING OFFICER STUBCHAER: All right.

07 MS. SCHNEIDER: The Fish and Game Biological Opinion
08 took issue with the Fish and Wildlife Service Biological
09 Opinion provision, which requires a maximum differential of
10 7 degrees Centigrade or 12.2 degrees Fahrenheit between
11 Delta Wetlands' discharge water and receiving water
12 temperatures, and that differential is for the protection of
13 Delta smelt. Fish and Game recommended limiting the maximum
14 differential to just less or equal to 5 degrees Fahrenheit.

15 Do you agreed that such a reduction from the Fish and
16 Wildlife Service Biological Opinion objectives is necessary
17 to protect Delta smelt or chinook salmon?

18 MR. MARINE: No, I don't believe that the 5 degree
19 Fahrenheit acute temperature standard was based on the
20 supporting evidence used by Fish and Game, which they
21 introduced into evidence under cross-examination. And that
22 is just a reference to Swanson and Cech, 1995.

23 Firstly, I believe that the 5 degree Fahrenheit
24 temperature objective was a priori objective. It was an
25 objective that Fish and Game had proposed in years preceding

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01 the publication of the Swanson and Cech article in 1995.

02

03 Secondly, having worked in the laboratory that
04 developed the data summarized and discussed in the Swanson
05 and Cech study, I believe that the five degrees Centigrade
06 value was intended to provide a criterion that wasn't
07 necessarily an acute temperature protection level, but it

08 was one that was intended as more of a general level that
09 may apply over longer periods of time.

10 Because that particular value was derived from a sample
11 of 16 fish. The seven degree Centigrade value was a value
12 that was derived from acute thermal tolerance studies, which
13 are the type of study that the acute thermal standard
14 objectives are generally derived from, and that was derived
15 from a sample of 157 fish.

16 One of the other reasons that I believe that the five
17 degree C value mentioned in that study is more of an overall
18 objective, not necessarily specific to acute or chronic
19 exposures, is that because if you conducted in a study where
20 the fish were subjected to this very rapid increase in water
21 temperature, but over a period, that could be as long as
22 five to six hours. And, again, it was based on a very
23 limited sample of fish.

24 MS. SCHNEIDER: Fish and Game Biological Opinion and
25 testimony contend that the minimum DO criteria for the Delta
0066 Wetlands Project is inadequate to project chinook salmon and
01 should be increased above the Basin Plan five milligrams per
02 liter objective.

03 In your opinion, does Fish and Game testimony present
04 compelling evidence for such a change to the Basin Plan
05 objectives, specifically applicable to the Delta Wetlands
06 Project?

07 MR. MARINE: No. Again, I don't believe so. It must
08 be reiterated that the Draft EIR/EIS examined the potential
09 for DO impacts, and no significant potential is determined.
10 However, the infrequent potential for transient DO
11 depression is guarded against by the Basin Plan objective.
12 It must be remembered that this is a minimum objective, not
13 a target objective.

14 The main studies that the Department of Fish and Game
15 relies upon for this contention don't necessarily support
16 their contention that the objective must be raised above 5
17 milligrams per liter. In fact, examination of data provided
18 in those studies don't compel the change from the plan.

19 Next overhead, please.

20 MS. SCHNEIDER: This is a new exhibit to be introduced
21 as Delta Wetlands 73. It does not have a heading, but
22 indicates that it is from Herman, et al., 1962 as cited in
23 Exhibit DFG-7.

24 MR. MARINE: One of the main bases that was implied for
0067 increasing the DO objective, minimum DO objective, from five
01 to a higher level provided by DFG's testimony, is that for
02 concerns for sublethal effects at levels as low as five.
03 One of those were the effects on growth. And as far as
04 juvenile fishes are concerned, probably one of the better
05 measures of the sublethal response is effects on their
06 growth. It is certainly one of the primary activities of
07 that particular life phase.

08 These data are three graphs from a reference cited by
09 Fish and Game's testimony, Exhibit 7, which shows different
10 measurements of growth for juvenile coho salmon. This is a
11 very closely related species to chinook salmon; and in the
12

13 absence of specific information on chinook, it's probably
14 relatively applicable to chinook as well.

15 This study happens to be one that I was crossed on by
16 Ms. Murray, and you will have to ignore the open circle data
17 because those are data that were derived from tests where
18 they had a problem with the hoses feeding the aquaria in
19 which they conducted the study, because there was a toxic
20 effect that leached out of those hoses and affected the
21 results of those studies. So, I would like to have you
22 focus on the darker, closed circles as I described why I
23 believe these data don't support a deep or increase in the
24 DO objective.

25 The graphs show, on the bottom axis, increasing oxygen
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01 concentrations from left to right and increasing measures of
02 growth and food consumption from the bottom to the top on
03 the Y axes. There is a fairly consistent indication that
04 while there is some decline with decreasing dissolved oxygen
05 levels, there is definitely a threshold at some point
06 between four and five. For this reason, I believe that the
07 concerns for sublethal effects of a minimum dissolved oxygen
08 level are still protected by an objective, a minimum
09 objective of 5 milligrams per liter.

10 MS. SCHNEIDER: Thank you, Mr. Marine.

11 That concludes Delta Wetlands' rebuttal testimony.

12 HEARING OFFICER STUBCHAER: Thank you.

13 MS. SCHNEIDER: I just have one matter of business. I
14 think now would be the time to ask that these exhibits that
15 we have introduced since our oral direct testimony be
16 accepted into evidence.

17 HEARING OFFICER STUBCHAER: I would think the time
18 would be after the cross-examination.

19 MS. BRENNER: Wait until after --

20 HEARING OFFICER STUBCHAER: Yes. We are going to have
21 to break now, and after the break we will go down the
22 list. I think Central Delta Water Agency would be next.

23 Twelve-minute break.

24 (Break taken.)

25 HEARING OFFICER STUBCHAER: Back on the record.

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01 We will reconvene the hearing.

02 Mr. Nomellini, good morning.

03 ---oOo---

04 REBUTTAL TESTIMONY

05 CENTRAL DELTA WATER AGENCY

06 BY MR. NOMELLINI

07 MR. NOMELLINI: Dante John Nomellini on behalf of the
08 Central Delta Water Agency parties.

09 I am in the process of handing out, and I have already
10 provided 13 copies to your staff. I have an updated exhibit
11 identification index, which is perfect with the exception of
12 two that I will have to add. And we have copies of
13 additional Exhibits 17 through 23 attached to that
14 identification index, and some are colored photos. I have
15 some overheads, but they didn't turn out too well, so you
16 are probably going to have to look at the color photo to
17 follow the testimony.

18 The two additional exhibits, one is Table 5.2, titled
19 Results of Wind Wave Analysis. I would like to give that
20 Central Delta Water Agency Number 24. And the other table,
21 C2.0, Fastest and Mean Monthly Wind Speeds, I would like to
22 give that table Central Delta Water Agency Number 25.
23 I have with me Mr. Neudeck, who has previously been
24 sworn. Perhaps we can turn on the overhead, and we are
25 going to go through these exhibits in order. And I am going
0070 to ask Mr. Neudeck to explain what they show.
01 HEARING OFFICER STUBCHAER: Are you going to refer your
02 rebuttal to direct testimony that previously --
03 MR. NOMELLINI: Not specifically, but I can if you'd
04 like. The first group of exhibits here, with the exception
05 of Exhibit Number 21, are directed at a staff request,
06 question, pertaining to the East Bay MUD pipeline, whether
07 or not the East Bay MUD pipeline would be impacted.
08 HEARING OFFICER STUBCHAER: I think it is important to
09 make that connection. Otherwise, it would be like new
10 direct and everybody would want a chance to have another
11 round.
12 MR. NOMELLINI: That wasn't done in a lot of
13 detail. But, anyway, I will try to do that. You are going
14 to find that we are not going too far afield, and we are not
15 very lengthy.
16 This photo, Mr. Neudeck, Central Delta Water Agency
17 Number 17, what does it show?
18 MR. NEUDECK: This is showing the break closure on
19 Lower Jones Tract. You seen where the train barge and the
20 hydraulic dredge are sitting in the Middle River Channel and
21 there is a rock core that has closed the break, the initial
22 stages of the break closure on the Lower Jones Tract. You
23 are actually looking south or upstream on Middle River, and
24 the bridge in the foreground is a bridge over to Bacon
0071 Island.
01 MR. NOMELLINI: This was in 1980?
02 MR. NEUDECK: Yes, this photo was taken in 1980.
03 MR. NOMELLINI: I might add, this was a large scale
04 experiment. We would not like to have any replications.
05 Far off in the horizon, Mr. Neudeck, on 17 again, is
06 what we know as Upper Jones Tract?
07 MR. NEUDECK: Yes. As you see here in the photograph,
08 which is difficult to tell on here, but in the color
09 photograph the ground that is in the horizon there seems to
10 be a fairly horizontal line there that is not flooded is
11 Upper Jones.
12 MR. NOMELLINI: That was dry at the time?
13 MR. NEUDECK: Yes.
14 MR. NOMELLINI: The significance of this was the break
15 was closed on Middle River, at the time Upper Jones is still
16 not flooded.
17 Central Delta Water Agency 18. What does this show?
18 MR. NEUDECK: This again is a photo of Lower Jones
19 Tract and Upper Jones Tract. It is actually the dividing
20 line between, which here is showing the railroad embankment
21 which divides the two tracts. Lower Jones is the tract to
22

23 the south or downstream. Upper Jones is the tract to the
24 right or upstream. Here you can see where the railroad has
25 placed emergency riprap along the water embankment to

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01 protect against the potential wind wave erosion that was
02 planned to occur, due to the Lower Jones flooding. And the
03 activity you see on the right-hand side of the photo, the
04 grayer material, is an aggregate material along with the
05 equipment being placed as a buttress to offset the seepage
06 and instability that was occurring, that was being caused by
07 underlying seepage coming from Lower Jones into Upper
08 Jones.

09 MR. NOMELLINI: In the upper right-hand corner, are
10 those the East Bay Municipal Utility District aqueducts?

11 MR. NEUDECK: Yes. You can see the three aqueducts
12 running in upper right-hand corner of the photograph.

13 MR. NOMELLINI: Going to Central Delta Water Agency
14 Number 19.

15 MR. CANADAY: Mr. Stubchaer.

16 HEARING OFFICER STUBCHAER: Yes.

17 MR. CANADAY: Can we have 18 back up, Central Delta
18 Water Agency? That appears to be a different photograph,
19 while very similar, is a different photograph than has been
20 supplied to staff.

21 MR. NOMELLINI: It's the same. That one mark across
22 it, that was done by my copy machine when I made the
23 transparency. That is why I suggested, I announced at the
24 beginning, these transparencies with all this color didn't
25 come out of my machine very well.

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01 HEARING OFFICER STUBCHAER: Good eye, Mr. Canaday.

02 MR. NOMELLINI: You are right on it, but it is the same
03 photos, but distorted in process. I think everybody has a
04 copy of the color photos.

05 Central Delta Water Agency 19. Again, you can see the
06 wheel or whatever does that. The overhead is not worth --

07 HEARING OFFICER STUBCHAER: Rotate it 90 degrees.

08 MR. NOMELLINI: What does that show?

09 MR. NEUDECK: This depicts the break between Lower and
10 Upper, and the railroad embankment, and shows the water
11 moving in a southerly direction, now filling Upper Jones.

12 A couple key elements of this photo, which you can see
13 more so in the color, are the patterns of flow around the
14 railroad cars that fell in at the time of the break. The
15 one closest to the East Bay MUD aqueduct is a engine. You
16 can see that, but the one directly left and center of the
17 break is an engine. That is another engine further, closer
18 to the break that is in about a 50-foot hole that you cannot
19 see. And then to the right of the -- or to the lower right
20 of engine you see a box car sitting out there.

21 MR. NOMELLINI: I might point out Mr. Bowen from East
22 Bay MUD had testified to this same incident, and the
23 locomotive is blocking the flow at the pipeline.

24 Central Delta Water Agency 20. That shows, again, the
25 same break; is that correct?

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01 MR. NEUDECK: Yes. This is a little closer view of the

02 same break in the picture that was in the previous Exhibit
03 19. Here you have a little better opportunity to see the
04 extent of the break and the dimension of the profile of the
05 railroad embankment, as well as the relative height of the
06 water in comparison to the East Bay MUD pipeline.
07 MR. NOMELLINI: With regard to that, let's jump to
08 Central Delta Water Agency 22, and in terms of the elevation
09 of the East Bay MUD pipeline shown in that photograph, have
10 you arrived at an estimate of what that elevation is?
11 MR. NEUDECK: Based on this view, it is a cross-section
12 of some recent improvement plans that East Bay MUD is in the
13 process of doing some seismic upgrading. This view shows
14 that the bottom of the pipeline is approximately about a
15 minus four to a minus three elevation. That would be three
16 feet below zero tide.
17 MR. NOMELLINI: And the scale is to the right?
18 MR. NEUDECK: The scale is to right.
19 MR. NOMELLINI: It is hard to see, but the center point
20 of the scale is zero, and it goes in ten foot increments up
21 and down?
22 MR. NEUDECK: That's correct.
23 MR. NOMELLINI: The zero line is a little bit above the
24 center line of this particular pipe?
25 MR. NEUDECK: Yes, of this aqueduct three, correct.

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01 MR. NOMELLINI: This is the same datum when we start
02 talking about filling the Delta Wetlands' reservoirs plus
03 six?
04 MR. NEUDECK: Yes, it is.
05 MR. NOMELLINI: This would be the same datum?
06 MR. NEUDECK: Yes, it is the same datum, mean sea level
07 datum.
08 MR. NOMELLINI: You can see from going back to Central
09 Delta Water Agency --
10 MR. SUTTON: Excuse me, can I just ask clarification?
11 You said that is mean sea level datum?
12 MR. NEUDECK: Yes. Based NGBD 1920 or more commonly
13 known as U.S.GS data, datum that --
14 MR. SUTTON: The reason that I am asking is because
15 navigation charts and those things are listed in terms of
16 mean lower, low water tide level, which is zero. And mean
17 sea level is about a plus three.
18 MR. NEUDECK: Correct. This is actually -- better
19 referred to as U.S.GS datum. The basis is NGBD of 1929.
20 MR. SUTTON: Thank you.
21 MR. NOMELLINI: None of the engineers in the Delta area
22 use the navigational datum. If you try to correlate that
23 with these, you're always going to be at a different datum.
24 This should be the same datum that Mr. Hultgren is talking
25 about and I think everybody is talking about levees in front

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01 of you so far has been on this datum.
02 Is that correct, Chris?
03 MR. NEUDECK: That's correct.
04 MR. NOMELLINI: Going back to Central Delta Water
05 Agency Exhibit 20, it looks like the water is almost to the
06 bottom of the East Bay MUD pipeline?

07 MR. NEUDECK: That is correct.
08 MR. NOMELLINI: That would about be a minus three?
09 MR. NEUDECK: Yeah. There might be some slight
10 discrepancy here. It doesn't -- I do not have a
11 cross-section to the pipeline at this point. But if you
12 correlate what I believe the elevation of the railroad
13 embankment to be, which is about a plus eight, it is going
14 to put the water somewhere between elevation zero, to about
15 a minus two. So we are in relatively the same elevation,
16 practically speaking. The slope that is at -- under the
17 prior exhibit on the pipeline is zero. But I imagine it
18 does have some upward slope at this point. Effectively, we
19 are within a foot of zero tide at this point.
20 MR. NOMELLINI: A plus six foot elevation either
21 arising from a flood event or from a break of the Delta
22 Wetlands' reservoir would put water well up on the
23 pipelines?
24 MR. NEUDECK: Four to five points about the point we
25 are at here.

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01 MR. NOMELLINI: Let's go to the Central Delta Water
02 Agency 23. This is just another cross-section, is it not,
03 of the East Bay MUD crossing?
04 MR. NEUDECK: Yes. This is a cross-section from the
05 same plans that I referred to earlier, and it shows the
06 inverted siphon crossing under the channel, and part of the
07 improvement that East Bay MUD is making to their crossing.
08 MR. NOMELLINI: It shows a cross-section of the levee
09 at the Middle River crossing?
10 MR. NEUDECK: Yes, it does.
11 MR. NOMELLINI: The was testified to by East Bay MUD,
12 and that shows the top of that levee to be a little bit
13 above ten; is that correct?
14 MR. NEUDECK: That's correct.
15 MR. NOMELLINI: Now calling your attention to Central
16 Delta Water Agency Exhibit 21, and this, Mr. Stubchaer, is
17 an excerpt from the San Joaquin Delta Atlas that you have up
18 there on your desk.
19 This, obviously, shows the thickness of organic
20 materials and the basis for this appears to be the 1976
21 surveys that were done by Department of Water Resources. Is
22 that your understanding?
23 MR. NEUDECK: Yes. From our understanding that there
24 has not been any other thorough studies to produce such a
25 document. It is our opinion that this has been referenced

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01 off that '72 and '76 work.
02 MR. NOMELLINI: With regard to organic matters, a lot
03 of people have been talking about peat. This talks about
04 organic materials. Do you have any understanding of what
05 the percentage of organics is that would allow it to be
06 referenced on this document?
07 MR. NEUDECK: It has been cited somewhere between 25
08 and on various documents. So the range by which they call
09 organic material is the 25 to 30 percent organic would
10 constitute fitting in within the realm of organic materials
11 for the sake of this document.

12 MR. NOMELLINI: Let's look at this document and let's
13 assume that the data was produced in 1976. There would have
14 been additional oxidation and subsidence of the organics
15 since that period of time, would there not?

16 MR. NEUDECK: Yes. Over a 20-year period of time you
17 anticipate an ongoing degradation of the peats within these
18 islands or the organics.

19 MR. NOMELLINI: So the extent of organics as shown on
20 this map would be reduced to where the survey -- if the
21 survey were done today?

22 MR. NEUDECK: Yes. It is my opinion it would be
23 reduced.

24 MR. NOMELLINI: With regard to the colors on here,
25 let's look at Bacon island, and it shows that on the
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01 northern end of Bacon island there is 10- to 20-foot
02 thickness of organic material; is that correct?

03 MR. NEUDECK: That's correct.

04 MR. NOMELLINI: Have you had any experience working on
05 those levees in that particular area?

06 MR. NEUDECK: Yes. Under my earlier direct testimony,
07 I referred to areas where we have had significant settlement
08 subsidence during the construction of stability toe berms on
09 the toe of the level. This is one of the classic cases. It
10 is actually on the very point of Bacon Island where it says
11 connection slough.

12 In that vicinity there, we call it the station 300
13 site, we have been working on that levee for some-odd 20
14 years, having the same condition exist there where we are
15 trying to consolidate the underlying peats, and having
16 placed material over the years, watching it subside, coming
17 back, placing more material, watching it subside. Very slow
18 and diligent process, but we have had a highly organic
19 foundation that is not only working against us, from the
20 standpoint of trying to construct any flatter slopes or
21 higher levees, but it is also eroding away because of the
22 currents in the river there. There is some awkward currents
23 mixing right there on the water side that has caused us to
24 have a fairly vertical slope. So, we have to take that into
25 account as well.

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01 MR. NOMELLINI: Let's take the Delta Wetlands' proposal
02 where they intend to protect the inside of the levee in some
03 manner with a wave wash protection or some kind of a
04 mechanism. It was suggested that rock might be an
05 alternative that they would put on the inside of the levee.

06 If you added rock to that portion of the levee where
07 the peat foundation is fairly thick, what is going to
08 happen?

09 MR. NEUDECK: It is going to subside similar to with
10 the fill, and possibly at a higher rate, depending upon the
11 amount of rock you place.

12 MR. NOMELLINI: Would that same problem occur if you
13 tried to raise that levee?

14 MR. NEUDECK: It has occurred. We no longer represent
15 Bacon Island as a reclamation district engineer.

16 MR. NOMELLINI: And after this testimony you can just

17 forget it forever?

18 MR. NEUDECK: I probably will not represent them in the
19 future either.

20 I do still have some personal recollection of what does
21 occur. I would consider that a site out there to be an
22 extreme challenge.

23 MR. NOMELLINI: With regard to the subsidence that is
24 going to occur as you try to build this levee up, do you
25 have any estimate of the range of years that you think it
0081 might take to reach some semblance of stability or at least
02 a gradual or more gradual subsidence? I am talking about
03 the levee here.

04 MR. NEUDECK: It really depends upon the underlying
05 foundation. I think on some of these extreme areas you
06 could be looking at ten plus years. Some cases I am not
07 certain quite how long. I think the subsurface exploration
08 would tell you that. If you went through very intensive
09 monitoring, you may be able to load over a faster period of
10 time with cognizant recognition of what is going on with the
11 underlying soils.

12 Take for example, Mandeville Island, a period of which
13 that face along the western side of Mandeville is loaded
14 with rock; that was over a four-year period, and it is still
15 moving. We have loaded that slowly and diligently over time
16 to project against the wave action from Franks, and it
17 continues to subside today. So that is an ongoing
18 maintenance problem as well as a slow process to not over
19 stress the levee.

20 MR. NOMELLINI: Let's go over to Webb Tract. Central
21 Delta Water Agency Exhibit Number 21 has some different
22 colors on it from for Webb Tract, doesn't it?

23 MR. NEUDECK: Yes. It actually references depths up to
24 40 feet in organic materials on the northwest corner.

25 MR. NOMELLINI: We have a much more difficult
0082 foundational problem on Webb Tract than we have on Bacon
01 Island, based on this survey?

02 MR. NEUDECK: Yes. I think Webb has deeper peats.
03 Keep in mind, a lot of these peats that are shown on here
04 are also interior. The peat underlying these levees can be
05 deeper than what is found out in the interior of the island
06 because that is not being degraded at the same rate that you
07 will find in the open condition.

08 MR. NOMELLINI: This map is based on samples that were
09 taken outside the levee areas; is that what you are saying?

10 MR. NEUDECK: They do take some levee borings into
11 consideration, but for the most part it is depicting the
12 soil profile across the island.

13 MR. NOMELLINI: With regard to Webb Tract and the
14 conditions that exist there, you've indicated those would be
15 more difficult to deal with than Bacon Island?

16 MR. NEUDECK: Yes, by virtue of the fact that we have
17 deeper organics.

18 MR. NOMELLINI: Would that mean it would take much
19 longer to consolidate those sublevee soils?

20 MR. NEUDECK: Yes. With that much deeper peat, you are
21

22 actually doubling the depth of the organics. It's going to
23 take a significant amount of more time to consolidate those
24 underlying organic materials.

25 MR. NOMELLINI: It is because of these difficulties
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01 that you testified that, if you had to do it, you would try
02 and construct a new levee according to the dam safety
03 requirements, an interior levee like they did at Clifton
04 Court?

05 MR. NEUDECK: I certainly would feel that that would be
06 the preferred alternative. You're going to be at this
07 operation for quite sometime. As I testified in my direct
08 testimony, on Twitchell island directly northwest of that,
09 the same color exists there and depth of peat of 30 to 40
10 feet. The progress with which we set in a toe berm took
11 well over ten years to stabilize before we can construct any
12 elevation on it at all. We had put upwards in the range of
13 12 feet of fill material before we gained elevation on the
14 toe of levee. We have since constructed a setback levee,
15 and that setback levee has been in place for about 18
16 months, and it continues to move over that 12-years' worth
17 of consolidated organics below it. It is a process that is
18 very lengthy.

19 MR. NOMELLINI: Do you think Kemper Insurance has
20 enough money to go ahead and fix these levees the way they
21 should be fixed?

22 MR. NEUDECK: Of course, I don't understand Kemper's
23 financial background.

24 MR. NOMELLINI: Let's go to Central Delta Water Agency
25 24. What does that show us?

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01 MR. NEUDECK: Is this the wind wave or the --

02 MR. NOMELLINI: It is the wind wave analysis, Table
03 5.2.

04 MR. NEUDECK: Table 5.2 is a excerpt from a report that
05 was done on McDonald island for Pacific Gas & Electric.
06 Dames and Moore, consulting engineers, geotechnical
07 engineers, were consulted with to consider the upgrade of
08 McDonald Island levees. In their report, they evaluated the
09 effects of Mildred Island and its flooded condition, and
10 also evaluated the potential wave runup on the western
11 levees along Latham Slough of McDonald island.

12 This table depicts what those conditions are estimated
13 to be and gives you wave height and wave runup for the
14 conditions of the increased fetch. And what this depicts is
15 that if Mildred Island were to fail its easterly levee,
16 which in this case some of that has already occurred because
17 Mildred Island was not reclaimed, the fetch would be
18 increased and, therefore, would be impacting the McDonald
19 Island wetlands.

20 You can see as a result of that study, they show levees
21 -- they show waves in heights of four to five feet. The
22 paren numbers below those, 3 to 3.6, anticipate that part of
23 the Mildred Island levee will remain intact and there will
24 be some showing there that would break the levee up. We are
25 in the range somewhere between 3.5 up to 5 feet for wind

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01 fetches of about two miles. And the wave runup is
02 correspondingly dependent upon whether you are on a smooth
03 slope or riprap slope, somewhere between 5 and 11 feet.
04 MR. NOMELLINI: With riprap on the inside or on the
05 side of the levee against which the wave is hitting, the
06 runup would be less because of the roughness of the surface?
07 MR. NEUDECK: That's correct.
08 MR. NOMELLINI: H, is column H, which is the third from
09 the right, that is the height of the wave that is generated
10 across the particular fetch?
11 MR. NEUDECK: Across on the breach with which the wind
12 could up pick up the --
13 MR. NOMELLINI: And D is the depth of the water --
14 MR. NEUDECK: That's correct.
15 MR. NOMELLINI: -- which also affects the height of the
16 wave?
17 MR. NEUDECK: You will notice that the depth that
18 they've chosen in many cases is the depth adjacent to
19 McDonald Island levee. In some cases they are getting
20 further out, and in some of the adjoining channels the water
21 more closely depicts the wetland reservoir depths, which is
22 in the 20- to 25-foot range.
23 MR. NOMELLINI: This gives you a range of wave heights
24 and runups that we could expect to encounter on the
25 adjoining islands, depending on exact conditions around the
0086 Delta reservoir if that levee on the reservoir failed and
01 the waves were --
02 MR. NEUDECK: Right. Provided that levee were to fail
03 and was not reclaimed, the waves were allowed to continue
04 through that break and/or on road.
05 MR. NOMELLINI: Just like on Mildred?
06 MR. NEUDECK: Yes.
07 MR. NOMELLINI: Let's go back to Central Delta Water
08 Agency 21.
09 HEARING OFFICER STUBCHAER: I would like to ask a
10 question on this one, Mr. Nomellini.
11 MR. NOMELLINI: Sure.
12 HEARING OFFICER STUBCHAER: Is U the wind speed, up in
13 the top?
14 MR. NEUDECK: Yes, it is. We have an exhibit with the
15 wind speeds. They have chosen an average wind speed for the
16 purpose of depicting the wave height and wave runup. We
17 have a series of wind speeds that they evaluated.
18 HEARING OFFICER STUBCHAER: Is 107 feet per second
19 close to 80 miles per hour?
20 MR. NEUDECK: I believe it is closer to 40 miles an
21 hour.
22 HEARING OFFICER STUBCHAER: 88 feet per second is 60
23 mile an hour. I remember that.
24 MR. NEUDECK: The maximum is 70. The maximum wind
0087 speed that they evaluated was 70.
01 MR. NOMELLINI: We can give you that portion of the
02 study. Why don't we look like at Central Delta Water Agency
03 25; that is titled Fastest and Mean Monthly Wind Speeds.
04 What we are trying to do here is give that general
05

06 information to you or staff for evaluation and benefit.
07 Central Delta Water Agency 25 shows us the corresponding
08 wind speed determinations for this particular analysis, does
09 it not?
10 MR. NEUDECK: Yes, it does.
11 MR. NOMELLINI: Let's take a look at a couple of them.
12 Look at Stockton. They range from, looks like, a high of
13 46.
14 MR. NEUDECK: The averages are down here. Averages
15 are on the order of ten miles an hour. Whereas the fastest
16 wind speed is on the order of 40 miles an hour. They have a
17 50- and a 100-year period within the report that I believe
18 states a maximum of 70 miles an hour.
19 MR. NOMELLINI: With regard to the analysis on Mildred,
20 let's go back to Central Delta Water Agency 21. Show us on
21 there, if you can, where Mildred Island is.
22 MR. NEUDECK: This is Mildred Island here.
23 MR. NOMELLINI: Right to the east of Bacon, and what is
24 it, about a fifth the size of Bacon Island?
25 MR. NEUDECK: Yes, about 950 acres.
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01 MR. NOMELLINI: Bacon Island is right around 5,000?
02 MR. NEUDECK: Correct.
03 MR. NOMELLINI: And Webb Tract is also about 5,000
04 acres?
05 MR. NEUDECK: A little larger.
06 MR. NOMELLINI: Is the potential for developing long
07 fetches greater on Bacon and Webb Tract than it is on
08 Mildred?
09 MR. NEUDECK: Yes. In fact, in my direct testimony, I
10 provided an exhibit that is here before me, here on the foam
11 board, showing some of the potential wind fetches across the
12 reservoir islands. That would show there is potential up to
13 four miles worth of wind fetch around 20,000 feet.
14 MR. NOMELLINI: The purpose of these exhibits is just
15 to verify that there will be a need to raise the levees on
16 the reservoir islands to account for wind waves of some type?
17 MR. NEUDECK: Yes. The purpose of my introducing these
18 exhibits is to show an existing study that was developed
19 anticipating conditions that we have testified may occur if
20 these levees were to fail on the reservoir. It is an
21 independent study done by Dames and Moore that demonstrates
22 the data that they derived and the wind and wave run
23 calculations that they did.
24 MR. NOMELLINI: Thank you.
25 That is I all have, Mr. Stubchaer. I don't know if I
0089
01 made my 20 minutes. I'm going to get a bunch of prizes if I
02 didn't run the timer.
03 You didn't have me on your timer.
04 HEARING OFFICER STUBCHAER: Thirty minutes.
05 Thank you.
06 Mr. Moss.
07 MR. MOSS: PG&E does not have any rebuttal testimony.
08 HEARING OFFICER STUBCHAER: Mr. Roberts.
09 MR. ROBERTS: Mr. Stubchaer, CUWA has two witnesses. I
10 don't believe we can finish by lunch. We could -- first

11 witness would be about 15 minutes.

12 HEARING OFFICER STUBCHAER: That is fine. Let's do
13 that.

14 HEARING OFFICER STUBCHAER: Mr. Roberts, before you
15 begin, I want to remind everyone again that rebuttal is
16 supposed to rebut what was given on direct and
17 cross-examination and not on rebuttal testimony.

18 ---oOo---

19 REBUTTAL TESTIMONY

20 CALIFORNIA URBAN WATER AGENCY

21 BY MR. ROBERTS

22 MR. ROBERTS: We will start with Dr. Losee. Dr. Losee
23 was sworn and has testified earlier.

24 I will just ask you, Dr. Losee, have you prepared an
25 exhibit for rebuttal?

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01 DR. LOSEE: Yes, I have.

02 MR. ROBERTS: Is that CUWA Exhibit 14?

03 DR. LOSEE: Yes, it is.

04 MR. ROBERTS: Would you please summarize that exhibit
05 for us?

06 DR. LOSEE: In the direct testimony of Delta Wetlands
07 and other parties, a number of important issues regarding
08 the project's impact on TOC at municipal intakes were
09 revealed. There have been large differences in the
10 estimates of TOC loading on the Delta islands given by Delta
11 Wetlands, California Urban Water Agency, and the Department
12 of Water Resources.

13 If we can put those differences aside, those
14 disagreements aside for the moment, and look at or what I
15 would like to do is examine three new issues which have come
16 out of the testimony thus far, of the direct testimony.
17 These three issues that I would like to address are
18 groundwater seepage and pumping from intercept wells and how
19 that will add to the TOC levels in stored reservoirs; the
20 level of TOC, the TOC concentrations, at the time the
21 reservoirs are filled, so in the Delta channel waters; and,
22 lastly, the third point is the impact of reservoirs that are
23 only partially filled on TOC levels at the time of
24 discharge.

25 CUWA has been concerned with the underestimation of TOC

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01 loading by Delta Wetlands, and these new issues only add or
02 magnify our concerns with those estimations of TOC loading.
03 In the groundwater seepage issue, seepage onto the habitat
04 islands and the reservoir islands, when the reservoirs are
05 nearly empty or at least have low levels of water, will be
06 comparable to seepage under existing conditions. So the
07 seepage water will pass through the soils, through the peat,
08 the organic soils, and into the reservoir.

09 When the water passes through those soils, it is going
10 to leach some organic matter and contribute that organic
11 matter, then, to the water pooled on the islands. This has
12 not been quantified or really discussed in any significant
13 way; and it is likely that this could be a significant
14 source of TOC, total organic carbon.

15 On the other hand, when the reservoirs are full, there

16 will be seepage away from the islands, through the peat
17 soil, and this -- we have heard in Mr. Hultgren's testimony
18 that there will be interceptor wells placed around the
19 islands to capture this water and pump it back on to the
20 islands.

21 In his testimony, he said that these wells would be
22 distributed at 150 foot intervals, and that the pumping rate
23 would be 20 gallons per minute. So, given that information,
24 we did an estimation of what kind of loading those return
25 flows from those interceptor wells would provide. That is
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01 just a rough approximation, so we took round numbers. I
02 used 50,000 feet as a perimeter for an island. So that is
03 much less than what any of these islands are actually are,
04 but this is just to get a picture of what the impact could
05 be.

06 In that case there would be 335 wells around the
07 island, and 900 acre-feet per month would be the pumping.
08 If you were to assume that this would go for nine months,
09 that seems to be a storage period that has been talked
10 about. And you also assume that the organic concentration,
11 the dissolved oxygen concentration, in sediments is 20
12 milligrams per liter TOC or DOC per liter, and then further
13 dilute that organic carbon, that dissolved carbon that has
14 been leached from the sediment and pumped from the
15 interceptor wells back into the reservoirs, and if you
16 delete that down 110,000 acre-feet, so nearly a full
17 reservoir. That results in a concentration increase in that
18 reservoir of one and a half milligrams per liter.

19 If the concentration, of course, is -- if the
20 concentration of dissolved organic matter in the soils is
21 higher, then the final contribution of this source is going
22 to be higher.

23 We have seen in the EIR and several places involved in
24 testimony that -- involved with Delta Wetlands that there
25 are organic carbon concentration in the sediments, the pore
0093

01 water concentrations have ranged much higher than 20
02 milligrams per liter.

03 My second point that I would like to address is the
04 concentration in the Delta channel water at the time of
05 filling and the effect that will have on final concentration
06 at the time of discharge.

07 If I can have the first figure.

08 The first figure I am putting up here is -- this is
09 Contra Costa Exhibit 4, Figure 4, and it is a plot of
10 dissolved organic carbon concentrations at Bank, a surrogate
11 of the organic concentrations at the time of loading. This
12 information is also available in the DEIR Table C5-3,
13 simulated monthly average export DOC.

14 And you can see from these data that at the time of
15 filling, so September to February, that the DOC
16 concentration of this water exceeds 4 milligrams per liter
17 and averages somewhere in the neighborhood of maybe 6
18 milligrams per liter.

19 Further, you can see that frequently there are
20 excursions in the concentration of DOC during this filling

21 phase or diversion period that exceeds, reaches 10
22 milligrams per liter. This happens frequently. This is a
23 seven-year period, eight-year period.

24 Clearly, this degraded quality of diversion water onto
25 the island is going to have a significant -- maybe it is not
0094

01 clear to everybody, but this is going to have a significant
02 impact on the level of organic carbon in the water at time
03 of discharge.

04 The analysis done by Delta Wetlands, it was assumed
05 that the diversion water was always at 4 milligrams per
06 liter.

07 The last point that I would like to discuss is the
08 impact of partially filled reservoirs. Both the analysis of
09 -- in the analysis of TOC loading by Delta Wetlands in the
10 Draft EIR and Dr. Kavanaugh's testimony, Delta Wetlands
11 Exhibit 13, assumed the reservoirs were always filled during
12 the storage period. And that greatly reduces -- a full
13 reservoir greatly reduces the energetic inputs to the
14 sediment water interface.

15 The water movement is greatly reduced at the sediment
16 water interface in full reservoir, resulting in minimized
17 exchange of organic matter from the sediments to the water
18 column.

19 Additionally, a full reservoir minimizes the organic
20 carbon inputs in photosynthesis because there is less of
21 bottom area in the reservoir that is exposed to high light
22 levels, so less plant growth. Should be higher plant under
23 that scenario.

24 Conversely, when the reservoirs are less than full,
25 then all of these parameters that we have been discussing,
0095

01 the ejective transport of organic matter out of the
02 sediments is increased and the area of the reservoirs
03 exposed to higher light levels and, therefore, productivity
04 are increased as the reservoirs are shallower in depth.

05 So knowledge of the seasonal timing and the amount of
06 timing that the reservoirs are filled to a particular depth
07 is critical to understanding environmental functioning of
08 these reservoirs. This type of analysis was not really
09 done.

10 However, Delta Wetlands, in Exhibit 14 Attachment C,
11 provides the operations studies data for the combined
12 storage of the Delta Wetlands' reservoirs.

13 If I can have the next slide.

14 And those data can be put into a cumulative
15 distribution plot, cumulative probability plot.

16 MS. LEIDIGH: Could you identify this for the record,
17 please?

18 DR. LOSEE: That is just what I just put up. This is
19 CUWA Exhibit 14, Figure 1. And it's the data from the table
20 that I -- Attachment C. Delta Wetlands Exhibit 14,
21 Attachment C.

22 And here we have plotted the cumulative probability of
23 when the reservoirs will be -- the percent capacity of the
24 reservoirs. And on this plot we can see that if you go to
25 50 percent probability, 50 percent of the time the capacity

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01 of the reservoir will be 50 percent or less. Further, if
02 you look at this, if you go to 60 percent of the time, the
03 reservoirs will be around 80 percent or less of capacity.

04 So, this means no matter how you allocate the water
05 between the two reservoirs, one or more of these reservoirs
06 has to be less than full. It has to be shallower. And that
07 is not the condition that was analyzed for in the EIR or in
08 Dr. Kavanaugh's testimony.

09 Now, this partial filling, if we can--

10 HEARING OFFICER STUBCHAER: While that is still up
11 there, what about the 37 percent or so of the time that it
12 is empty?

13 DR. LOSEE: Excellent. If you -- there is 37 percent
14 of time in the data that was in Exhibit 14, Attachment C,
15 there was no water in the reservoirs. We have since learned
16 that, in fact, there will be some water in these
17 reservoirs. The question then is what is the impact of
18 those water levels in that one meter of water in the final
19 analysis, the amount of organic carbon that is in the water
20 at the time of release?

21 That is going to be variable depending on the time of
22 year, the length of time that the water is in that
23 condition. That would require a more sophisticated analysis
24 to derive that kind of understanding, and it's unfortunate
25 that that hasn't been performed at this time.

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01 The partial filling problem will be particularly acute
02 during those periods of drought. This is CUWA Exhibit 14,
03 Figure 2, and it is the simulated storage for the Delta
04 Wetlands' reservoirs for the years 1925 through 35. And you
05 see, we are looking at percent capacity. And there are many
06 years throughout this drought period where the reservoirs
07 would have been much less than full.

08 And this would set up those conditions which we are
09 concerned about producing increased levels of TOC. So, the
10 advective processes would be maximized and productivity
11 would be maximized. Photosynthetic carbon, production of
12 organic carbon production. This was not considered fully in
13 the Delta analyses.

14 So it is likely that the TOC loading will be given
15 greater than has been suggested by Delta Wetlands. And
16 there is a good deal of uncertainty in all of these values
17 or not in all values, but in the effect of these values, the
18 magnitude of these effects. Certainly, there will be
19 effects, and they are likely to be important.

20 Thank you.

21 MR. ROBERTS: Does that conclude your testimony, Dr.
22 Losee?

23 DR. LOSEE: Yes, it does.

24 MR. ROBERTS: Mr. Stubchaer, this might be a good time
25 to break for lunch. I don't think Mr. Krasner will be able

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01 to complete his testimony; certainly he won't before noon.

02 HEARING OFFICER STUBCHAER: All right.

03 How would people feel about a shorter lunch break
04 today? Make sure we get through the afternoon.

05 How about reconvening at 12:30? Anyone have a problem
06 with that?
07 That is what we will do.
08 (Luncheon break taken.)
09 ---oOo---

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01 AFTERNOON SESSION
02 ---oOo---

03 HEARING OFFICER STUBCHAER: We are reconvening the
04 hearing. CUWA rebuttal will continue.

05 Mr. Roberts.

06 MR. ROBERTS: Thank you, Mr. Stubchaer.

07 Our next witness will be Mr. Stuart Krasner. He was
08 sworn in and has testified earlier. And I think in the
09 interest of time, I will just ask Mr. Krasner to summarize
10 his testimony.

11 MR. KRASNER: In Delta Exhibit 13 there is information
12 provided about the disinfection by product regulations.
13 However, there were some mistakes in that information and
14 also some misinterpretations on what are the impacts of the
15 regulations on drinking water utilities. I want to briefly
16 cover some of those.

17 First, as I had shown on my direct testimony in CUWA
18 Exhibit 5C, there has been proposed Stage I and Stage II
19 standards and removal requirements for total organic carbons
20 as part of Stage I. I would like to show as a new exhibit,
21 and this is from an Agreement in Principle, and we will
22 introduce this as a new exhibit, that was signed by all the
23 negotiators involved with the DBP rule making earlier this
24 month.

25 MR. ROBERTS: Could we mark this CUWA 15, and the Board
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01 has copies and copies are being passed out to the audience.

02 MR. KRASNER: And I just wanted to turn your attention
03 to Page 4, which is my next overhead from this exhibit. The
04 first point is, I would like to call your attention to the
05 removal requirements for total organic carbon in the top
06 middle two boxes, which is where the Delta waters would lie,
07 the top middle two.

08 The removal requirements are 25 percent TOC removal
09 requirement, if your inflow TOC is less than 4 milligrams

10 per liter, and 35 percent if your total organic carbon is
11 greater than 4. And in Delta Wetlands Exhibit 13 that was
12 listed as 30 and 35 percent.

13 So there is a ten percent differential, depending on
14 whether you are above or below the 4 milligrams, not the
15 five percent.

16 The other point I would like to make on this page, and
17 why I include this for your information, is although the
18 maximum contaminant level that is being put out in the Stage
19 I of the rule is 80 micrograms per liter of trihalomethanes,
20 as I had mentioned earlier, EPA had established that their
21 significance factor was 80 percent of the MCL; and in both
22 testimonies, direct testimony provided by -- it was direct
23 testimony of Dr. Brown on the drinking water quality issues
24 and also Delta Wetlands 13, a 90 percent significance factor
25 was assigned for complying with the standard.

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01 I refer to Section 2.3 of the Agreement in Principle,
02 which I show a part of here. And briefly, part of the
03 by-product regulation is to make sure that when people
04 comply with the trihalomethane standard, they do not result
05 in having microbial protection be eroded. What the EPA has
06 established, which is under applicability, that if a public
07 waters system has trihalomethane of at least 80 percent of
08 the maximum contaminant level, 64 micrograms per liter, they
09 will be required to do a profiling and benchmarking of
10 their current disinfection practices. This will result in
11 establishing new disinfection requirements for that utility,
12 which are actually more stringent than the existing surface
13 water treatment role, which had been established a number of
14 years ago, the current disinfection requirements for surface
15 water systems.

16 This is just one of a number of places in the rule
17 making where the 80 percent number is used. And I just
18 brought this in as an example that EPA has definitely
19 established that that is the level that they feel utilities
20 need to be using towards developing reliable compliance.

21 I also -- we can, maybe, refer back to CUWA Exhibit 5C,
22 one I showed earlier.

23 In this, I just wanted to briefly show some of the
24 Stage II standards in Delta Wetlands Exhibit 13. They spoke
25 of, well, maybe, this Stage II won't happen. And, again, I

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01 just wanted to correct some mistakes on their testimony.

02 First, as I mentioned before, Congress has said in the
03 Safe Drinking Water Act reauthorization last year that EPA
04 will promulgate the Stage II standard by May 2002, and EPA
05 has developed a schedule for meeting that.

06 Also, in the Federal Register Notice for the proposed
07 rule in 1994, EPA does provide language that the 40
08 microgram per liter standard for trihalomethanes, although
09 it is a placeholder, if there is no new negotiations or no
10 new information in place, that will become the new
11 standard. So, it is a sort of a de facto standard that we
12 will end up having, unless we come up with new information.

13 I also wanted to point out that, although in Delta
14 Wetlands Exhibit 13, they referred to always looking at

15 annual averages, and in their direct testimony they talked
16 about running annual averages; this has been based upon the
17 health end points that we are trying to control being
18 cancer, where there is many years of exposure before one
19 develops cancer.

20 In the Federal Register, it does state that one of the
21 high priorities is to evaluate acute or short-term health
22 risks, specifically reproductive and developmental adverse
23 effects. And that if there is new information that comes
24 forward, a meeting shall be convened to review results of
25 these data, and those recommendations -- and this would be

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01 even prior to a second rule making effort.

02 So both the standards and compliance formulas may
03 change, and I will have, a little bit later, some more
04 information on that.

05 I would like to now go to Contra Costa Water District
06 Exhibit 4, which Dr. Losee showed earlier. I would like to
07 again pick up the note that Dr. Losee made earlier about the
08 mistakes that were made in Delta Wetlands Exhibit 13 on
09 estimating the TOC level in the reservoir effluent. As we
10 mentioned earlier, during the fill, the TOC levels may be of
11 order of 6 to 10 milligrams per liter. And in Delta
12 Wetlands 13, they indicated that potentially the TOC level
13 might go above the order of 2 milligrams per liter while the
14 water is stored on reservoir. But they had said in their
15 testimony that two plus the four, that they felt they would
16 be filling it with, would give them six. But again they
17 were using an annual average value. If they fill with 6 to
18 10 milligrams per liter, if they do indeed increase the TOC
19 by two, then that means that what they would put out in the
20 reservoir releases would be of the order of 8 to 12
21 milligrams per liter, not less.

22 Now, in my next figure, which I showed last week, CUWA
23 Exhibit 5H, I had shown previously what were the impacts on
24 what the reservoirs would have on both median and 90th
25 percentile THM levels. In Delta Wetlands Exhibit 13 there

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01 are also emphasis on average values. And the point that I
02 would like to again make with this exhibit is that we are
03 not allowed to just comply with the rule 50 percent of the
04 time, which we would see by the median value. We need to
05 comply with it a hundred percent of the time. So even if
06 the 90th percentile values don't even represent the real
07 worst case, because we have to comply a hundred percent of
08 the time.

09 So it is important to realize that, while in the base
10 condition, we are looking at THM levels, perhaps, in the
11 60s, may be starting to approach 70 micrograms per liter,
12 the project conditions can result in THM levels in 70s, 80s,
13 or more. And even if this only occurs certain times, under
14 certain conditions, we could still be out of compliance with
15 the rule making.

16 Again, one of their points in their testimony was
17 always looking at average and looking at running annual
18 averages. I would like to share some information. This
19 will be, again, some information that we have a handout on.

20 Again, I will provide you with a summary page from a report
21 that I am helping prepare for EPA, I and four other experts.

22 MR. ROBERTS: Let's mark this as CUWA 16.

23 MR. KRASNER: EPA put together five experts to advise
24 them on whether there is any data to suggest an association
25 between ingestion of disinfection by-products and adverse

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01 reproductive or developmental end points. They assembled
02 people: three epidemiologists and two exposure experts. I
03 was asked to be one of the exposure experts on the panel.

04 We reviewed the data and in the -- by the way, I should
05 mention that the full report will be presented before the
06 stakeholders in this negotiated rule making process in the
07 fall. So that the full report will come out at that time.

08 But the page I wanted to show you, on the second page,
09 which Table 2.2 from this draft report, in the bottom half
10 of the figure -- again, there is a lot of detail. So I will
11 just briefly summarize the relevant points.

12 This is a study done in California. They examined
13 three different communities that had different exposures of
14 trihalomethane levels. The significant outcome that they
15 were examining was spontaneous abortion, miscarriage. This
16 study was, actually, critically reviewed by all the experts
17 on this panel; and the thinking was this was a very well
18 done study. Some important points, if you look at the
19 exposure assessment, and we just did briefly underline a
20 point. These results were not based on a woman's exposure
21 to an annual average, a running annual average THM level.
22 The study was based upon the trihalomethane levels the woman
23 was exposed to during her first trimester. Again, they were
24 looking at a short-term health effect, and they wanted to
25 see if, during that critical time period, exposure to a high

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01 amount of trihalomethanes had a serious effect.

02 So, as an example, if a woman was exposed to high
03 trihalomethane levels, say in July, August, or September, if
04 that was her first trimester, that would be the period of
05 concern. And the general findings of the study were, one,
06 they found that when women consumed trihalomethane levels
07 greater than 74 micrograms per liter, their risk of
08 spontaneous abortion increased. In fact, it doubled.
09 Moreover, they had the opportunity to look at the three
10 communities; one of which had a fair amount of brominated
11 trihalomethanes. And that they found that when they
12 examined the relationship for bromodichloromethane, which is
13 one of the trihalomethanes formed when you have both bromide
14 and a total organic carbon in your water, the risk of
15 spontaneous abortion tripled.

16 Just to give you an idea of these levels, the women who
17 had a low exposure trihalomethanes had an eight to nine
18 percent level of spontaneous abortion. However, the women
19 exposed to greater than 74 micrograms per liter
20 trihalomethanes, which included the bromodichloromethane,
21 had a 24-percent record of spontaneous abortion. So, the
22 data suggests that both high exposure to trihalomethanes,
23 including a brominated one, caused their likelihood of
24 having a spontaneous abortion go from less than one out of

25 ten to one out of four of the women exposed to these levels

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01 of trihalomethanes.

02 Now, one of the things that was discussed at our
03 meeting with the EPA was their other evidence to support
04 this association. And the people in the EPA who do
05 toxicological studies with animal feeding studies brought
06 out their data. And they did, indeed, find certain
07 trihalomethanes, in particular the bromodichloromethane was
08 associated with what they referred to as pup viability with
09 the animals that they studied. In fact, the data that they
10 showed us was that bromodichloromethane was about ten times
11 more potent in its adverse health effect than
12 trichloroethylene and other solvents that they have studied
13 from hazardous waste sites. So, the animal feeding
14 toxicological data did go with this.

15 Clearly, we need more studies to replicate the study,
16 but our concern is, as the federal register in 1994 said, if
17 the data continues to be developed that suggests acute
18 health effects, not just long-term chronic effects, the EPA
19 will reconsider not only the standard, but the compliance
20 formula, and these kind of data would then suggest a
21 compliance formula based on not running annual average, but
22 what the woman is exposed to during her first trimester.

23 Just to bring a little more data into how total organic
24 carbon plays into the bromodichloromethane, I would like to
25 show some information from a report or a paper, I should

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01 mention, that I have published. Again, I have included just
02 the title page and one of the figures from the paper. I
03 guess we can introduce this.

04 MR. ROBERTS: This would be CUWA 17.

05 MR. KRASNER: This is a paper I published with my
06 coworkers at Metropolitan and some people that I work with
07 at Malcolm Pirnie Engineers. In the figure that I would
08 like to show, which is Figure 1 from this paper, I refer
09 your attention to the upper right figure which is the data
10 for bromodichloromethane. In the Delta Wetlands' exhibits,
11 they felt that was really bromide by itself that was really
12 resulting in increases in the brominated by-products, and
13 that total organic carbon was of less significance. What I
14 show here is different levels of total organic carbon we
15 examined from 1 milligram per liter up to 4 milligrams per
16 liter, which is on your lower axis. And then on the axis
17 sort of on an angle, I show bromide levels of a tenth of a
18 milligram up to eight-tenths.

19 These are ranges of levels we have seen in the Delta.
20 What you will see from this figure is, regardless of what
21 bromide level is in the water, as your organic carbon level
22 goes up, your formation of the bromodichloromethanes goes
23 up. Specifically, I would like to refer to the two sets of
24 bars for the experiment in total organic carbon at 3.2 and
25 4.1 milligrams per liter. This, again, goes to the

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01 testimony that was presented in the Delta Wetlands' exhibit
02 where they assigned an eight-tenths of a milligram per liter
03 TOC increase as what they thought might or might not be

04 significant.

05 At 3.2, if you add another eight-tenths, gets you up to
06 about that 4.1. And you'll see that with increases in TOC,
07 we see increases in the bromodichloromethane, which was the
08 trihalomethane identified both in the California
09 epidemiology study and in the toxicology studies as the more
10 potent chemical for causing spontaneous abortion.

11 Again, not to forget that cancer is still the end point
12 upon which we are being regulated. Again, I would like to
13 point out that in the Federal Register, under the benefits
14 section, there is extensive discussion about how the
15 regulation was set up to control, not just trihalomethanes
16 and other chlorinated by-products, but also total organic
17 carbon; and that the data suggested that that will reduce
18 cancer risks due to ingestion of chlorinated water. And
19 that was the reason why they want in the rule making to
20 control not just individual by-products, like
21 trihalomethane, but total organic carbon.

22 In terms of some comments that were made in direct
23 testimony, for example, in Delta Wetlands' testimony 13,
24 specifically, there was a comment that utilities are set up
25 to handle fluctuations in total organic carbon loading. In

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01 fact, there was some specific comments about Alameda
02 County. Are they, in fact, complying with the Stage I
03 regulations? Again, the information that was provided in
04 DW-13 did not give the entire picture, so I would like to
05 correct that information.

06 I did have a chance to talk with the engineers at
07 Alameda County. At their ozone facilities where they
08 produce lower levels of trihalomethanes, they do produce
09 levels that will be lower than the 80 micrograms per liter
10 standard. Also, they meet the total organic carbon removal
11 requirement that has been proposed. Their levels of bromate
12 are not within the level that is in the Stage I requirement.
13 So, even though they meet some of the requirements in the
14 Stage I standard, they, at this point, don't. And at their
15 chlorination plant, they definitely do not meet the 80
16 micrograms per liter trihalomethane standard and they do not
17 meet the total organic carbon removal requirement.

18 Also, in the direct testimony of Dr. Kavanaugh, he
19 indicated that the utilities are set up for these wide
20 ranges of TOC and can handle the extra coagulant or other
21 chemicals. I would like to give the examples in Southern
22 California where, because of our reservoir system, where we
23 actually get water, although it has the same level of total
24 organic carbon as in Northern California, we have lower
25 levels of turbidity. So we actually use about an order of

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01 magnitude less coagulant at our plants than Northern
02 California plants. So, for those Southern California plants
03 who would have to go to enhanced coagulation, it wouldn't be
04 a little more coagulant, it would be orders of magnitude
05 more coagulant. These plants were not constructed to feed
06 these high levels, and there are many issues in terms of
07 being able to deal with the sludge and being able to have
08 permits to dispose of that high level of sludge.

09 Moreover, as I have indicated in my direct testimony, it is
10 not just adding additional coagulants, our studies have
11 shown to meet these total organic carbon removal
12 requirements you actually have to add sulfuric acid in
13 addition to the coagulants. So that means the construction
14 of new facilities.

15 And we have actually done some analysis on how much
16 sulfuric acid it would take, and our first analysis
17 indicated we would have to have more sulfuric acid -- we
18 actually don't have enough rail spurs to bring that much
19 sulfuric aside to our to Jensen Treatment Plant, which gets
20 the water from Castaic. Even if we work something out with
21 the railroad to build some more rail spurs to bring it in,
22 when I examined the amount of sulfuric acid we studied, it
23 was greater than 50 milligrams per liter. NSF actually sets
24 a limit on how much sulfuric acid you can use in drinking
25 water, and that limit is 50 milligrams per liter.

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01 There are trace metal contaminants in the acid. If you
02 apply more acid, you will end up with a water now that has
03 too much heavy metal contaminants. So, contrary to what it
04 says in Delta Wetlands 13 testimony, we are not set up for
05 the extra coagulant level. We don't have acid feed. We
06 don't have enough rail spur to bring in the acid, and by
07 law, we can't even feed that much acid. So, there are some
08 technological limitations to what we can or cannot do.

09 And, briefly, we have done some calculations, and we
10 could be basically talking about of the order of two and a
11 half to \$5,000,000 per year of additional costs if we have
12 to meet these enhanced coagulation requirements at our
13 Jensen and Mills plants, which treats water from Lake
14 Silverwood and Castaic, in addition to ozone.

15 Again, we just wanted to correct some things that we
16 thought were in error in Delta Wetland's testimony Number
17 13.

18 Thank you.

19 MR. ROBERTS: That completes your testimony?

20 MR. KRASNER: Yes.

21 MR. ROBERTS: Thank you, Mr. Stubchaer. That completes
22 CUWA's rebuttal.

23 HEARING OFFICER STUBCHAER: Thank you, Mr. Roberts.

24 MS. BRENNER: Excuse me, Mr. Stubchaer.

25 CUWA submitted these additional exhibits in partial

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01 format. I certainly don't have access to these particular
02 exhibits. I don't know in full format -- I don't know
03 whether this particular, the last CUWA exhibit, which would
04 be 17, is a published document.

05 MR. KRASNER: Oh, yes. It has been published in a peer
06 review document, and I'd be happy to provide it. In fact,
07 actually, it's interesting. Originally, I was going to use
08 the one I published in June of '94 in the Journal, but you
09 have my copy of it, and you didn't give it back.

10 MS. BRENNER: Sorry about that.

11 MR. KRASNER: So, actually, it is the same figure that
12 is in that item.

13 MS. BRENNER: Where is this document published?

14 MR. KRASNER: It was published -- actually, if you look
15 at my --
16 MS. BRENNER: I can find out afterwards. That would be
17 helpful.
18 MR. KRASNER: It's in the reference list that I provide
19 in CUWA Exhibit 5. I list the paper that I did --
20 MS. BRENNER: What year is this?
21 MR. KRASNER: It was published in 1996.
22 MS. BRENNER: I can find it off of there.
23 MR. KRASNER: It is in that list. I would be more than
24 happy to provide it. It is the same figure that was in the
25 journal paper that you have.

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01 MS. BRENNER: How about the Attachment 3, the Agreement
02 in Principle. Is that a published document?
03 MR. KRASNER: It is available, and I can provide you
04 the full principle and agreement.
05 MS. BRENNER: I would like to have the full document.
06 MR. KRASNER: Yes.
07 HEARING OFFICER STUBCHAER: When could do you that?
08 MR. KRASNER: I have it here, so we can get it
09 Xeroxed.
10 MS. LEIDIGH: We need the same thing.
11 MS. BRENNER: If you could mail that to us tomorrow
12 morning, that would be great.
13 The last one is a panel report. This is a draft
14 report, I understand?
15 MR. KRASNER: Yes.
16 MS. BRENNER: Do you have a full copy of that?
17 MR. KRASNER: No. Unfortunately, as I mentioned, the
18 full report with our revisions won't be available till
19 sometime in the fall. So, I just included this one summary
20 page. They gave the major points.
21 MS. BRENNER: You don't have a full draft of what
22 you've given us? You have some sort of draft report that
23 you're revising, I understand, that this has been taken out
24 of. Can I get that draft report, please?
25 MR. KRASNER: It's so marked up at this point; it's not

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01 in very good form. We have been marking --
02 HEARING OFFICER STUBCHAER: Is this posted on any web
03 site any place?
04 MR. KRASNER: No. Because it was just being prepared
05 right now. We don't have a new version. I can check with
06 EPA. I would have to check about getting a better copy.
07 MS. BRENNER: I would appreciate it if I could get full
08 copies of these exhibits. If I cannot get a full copy, I am
09 going to move to strike.
10 MR. ROBERTS: Including CUWA 17?
11 MS. BRENNER: No, that is published document. I can
12 obtain that.
13 MR. ROBERTS: Mr. Stubchaer, would it be preferable for
14 us to, when we get the complete copies, substitute full
15 copies for CUWA 15 and CUWA 16?
16 HEARING OFFICER STUBCHAER: I think so.
17 MR. ROBERTS: CUWA 15 is no problem. CUWA 16 we'll
18 find out. I imagine we can get a copy of a version.

19 HEARING OFFICER STUBCHAER: The usual number of copies
20 will have to be made available to all persons.

21 Thank you, Mr. Roberts. Thank you CUWA.

22 And while the panel is here, Mr. Canaday, would you
23 like to make a request?

24 MR. CANADAY: Staff would request from all the parties
25 that, when we return or by the time we return for our

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01 cross-examination, that each party would provide us with a
02 copy of what they believe to be their updated exhibit list.
03 So that way we can double check that before we close the
04 record or leave here, and it just saves us a lot of time
05 later on when we try to review the documents.

06 HEARING OFFICER STUBCHAER: Thank you.

07 Next will be Contra Costa Water District, Mr. Maddow.

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09 REBUTTAL TESTIMONY

10 CONTRA COSTA WATER DISTRICT

11 BY MR. MADDOW

12 MR. MADDOW: Good afternoon, Mr. Stubchaer. Contra
13 Costa Water District has three rebuttal witnesses: Dr.
14 Gartrell, Dr. Denton, and Dr. Shum. Each has previously
15 been sworn and each has previously testified in these
16 proceedings. And we will start with Dr. Gartrell.

17 Dr. Gartrell, there has been testimony during the
18 direct evidence phase of this proceeding that an agency
19 review team, including representatives of Contra Costa Water
20 District, was involved in discussion and review of the Delta
21 Wetlands Project water quality impact assessment.

22 Were you a participant in that effort?

23 DR. GARTRELL: Yes.

24 MR. MADDOW: Were Contra Costa Water District's
25 concerns about water quality impacts and experiments to

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01 analyze such impacts, whether those -- were those concerns
02 expressed to that team by Contra Costa?

03 DR. GARTRELL: Yes.

04 MR. MADDOW: Were your concerns addressed by Delta
05 Wetlands?

06 DR. GARTRELL: Not entirely, no.

07 MR. MADDOW: Can you explain?

08 DR. GARTRELL: Yes. The team met, I think, starting in
09 1989 and 1990. At that time the people involved, including
10 members from CCWD, including myself, and Metropolitan Water
11 District expressed on several occasions the necessity to do
12 field studies to establish what would be going with respect
13 to TOC on the islands. There were some field studies that
14 were done. They were not done in a satisfactory manner to
15 what we had expressed, and we expressed, on a number of
16 occasions, dissatisfaction, in fact, frustration that the
17 field studies were done in a way that was incomplete and
18 made it very difficult, if not impossible, to fully evaluate
19 the characteristics of the likely impacts with respect to
20 TOC.

21 Finally, I think as already has been testified to,
22 there was always considerable disagreement over the
23 interpretation of results.

24 MR. MADDOW: Thank you, Dr. Gartrell.
25 Now, I would like you to turn your attention to an
0118 exhibit we would like to have marked as CCWD Exhibit 6.
02 Dr. Gartrell, was CCWD Exhibit 6 prepared under your
03 direction?
04 DR. GARTRELL: Yes.
05 MR. MADDOW: We would like to have copies distributed
06 to Board staff and parties, please.
07 In the interest of time, Dr. Gartrell, I would just ask
08 to summarize your rebuttal testimony, please.
09 DR. GARTRELL: Yes. Previously in the hearing, there
10 was a number of issues that were discussed by a number of
11 parties. This exhibit, rebuttal testimony, focuses on
12 developing a set of more specific terms and conditions that
13 should be incorporated in any water rights permit to protect
14 Delta and users and the District. These terms and
15 conditions would be in addition to the specific terms to
16 protect water rights that CCWD had in Exhibit 3.
17 The first involves discharges and relates to an NPDES
18 Permit and would provide that no water should be discharged
19 from the Delta Wetlands' islands until the permittee has
20 received a discharge permit from the Central Valley Regional
21 Water Quality Control Board under their National Pollution
22 Discharge Elimination System, and that all discharges from
23 the reservoir islands should comply with those permits.
24 The second is a Delta Protection Act term, which
25 includes some of the discussions that took place in the
0119 cross-examination and provides that no diversion would be
02 authorized under the permits that would deprive any water
03 user in the Delta as defined under Water Code Section 1220
04 of salinity control or inadequate supplies provided for
05 under the Delta Protection Act.
06 Deprivation of salinity control or inadequate supply
07 will include, but is not limited to, any diversion by the
08 permittee when the 14-day running average of X2 is measured
09 by and an appropriate outflow salinity relationship and the
10 nearest salinity stations in a manner accepted by the
11 Executive Officer on the State Board is greater than 71
12 kilometers, or any diversion by the permitter hereunder that
13 would directly or indirectly cause a Delta water user to
14 reduce diversions from the Delta.
15 The third term is an operation term and relates to the
16 evidence provided and the analyses that were done to
17 demonstrate the impacts of the project under water quality
18 and water supply. This would require that the permittee
19 comply with the terms and conditions of the Biological
20 Opinions and also comply with a basic assumption under which
21 those Biological Opinions were issued, that no diversion is
22 authorized except when the amount remaining within the
23 specified export/inflow ratio for that month, after all
24 their 1995 water quality control plans have been met and all
25 senior water rights have been appropriated within those
0120 Water Quality Control Plan requirements and pumping
02 capacities.

03 The third relates to the topping off on the reservoir.
04 That the diversions would be permitted under the permits
05 issued that are under consideration here for topping off on
06 the reservoir islands to replace water lost to
07 evapotranspiration and seepage. However, no diversion shall
08 be made for such purposes under the licenses, 1321 or 1572,
09 until a season of diversion and purpose of use of said
10 licenses is changed by action of this Board.

11 Finally, there is a levee stability and safety term
12 that would provide that the project not proceed until the
13 Executive Officer has a written copy of the approval plan, a
14 copy of the written approval of the plans and specifications
15 for the reservoir island levees issued by the Department of
16 Water Resources, that no water should be impounded in a
17 reservoir island until the permittee has provided the
18 Executive Officer with a certificate of approval issued by
19 the Department of Water Resources, pursuant to Water Code
20 Section 2355, signifying that the Department has found that
21 each reservoir island is safe to impound water.

22 And, finally, if the Department approves plans and
23 specifications for storage of water on reservoir island with
24 a maximum possible surface elevation of less than six feet
25 above mean sea level, the permittee shall not commence

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01 construction until the Delta Wetlands Project's Operation
02 and Criteria Plan has been revised and accepted by the
03 Executive Officer to assure that it complies with respect to
04 the terms and conditions of the permit, and that the Delta
05 Wetlands OCAP does not further require environmental
06 documentation, reconsultation under federal or California
07 Endangered Species Act or other similar review.

08 In summary, we believe these water rights, terms,
09 permits should be issued -- if a permit is issued these
10 should be included in such permits in order to reduce the
11 impact of the project to a reasonable level. And these
12 would be, again, in addition to the specific water rights
13 terms to protect the senior rights of the Los Vaqueros
14 project and the District and its customers as we presented
15 in Exhibit 3.

16 The Delta Wetlands Project would cause water quality
17 and other impacts on in-Delta users, but these terms and
18 conditions would reduce those impacts and help prevent
19 significant harm to more senior Delta water users.

20 CCWD also continues to support the conditions proposed
21 by the California Urban Water Agencies with regard to
22 protection from discharges.

23 Finally, and conclude by saying, we reiterate our
24 concern that this project is premature and believe that the
25 information that will be coming out shortly from the Draft

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01 CAL/FED programmatic EIR/EIS should be included in the
02 record, and, therefore, would recommend that the State Board
03 keep the hearing record open to receive the CAL/FED
04 programmatic EIR/EIS.

05 That concludes my testimony.

06 MR. MADDOW: Thank you, Dr. Gartrell.

07 Our next rebuttal witness is Dr. Richard Denton.

08 HEARING OFFICER STUBCHAER: Excuse me, Mr. Canaday.
09 MR. CANADAY: Mr. Stubchaer, not to be picky, and
10 normally I wouldn't be, but in the testimony by Dr.
11 Gartrell, he refers to the Executive Officer of the State
12 Board, and it should be the Executive Director. Since these
13 are going to be permit terms, we need to identify the proper
14 person.
15 DR. GARTRELL: Thank you. That would be correct, yes.
16 MR. MADDOW: I should have caught that. I apologize to
17 this Board and will make that correction.
18 Dr. Denton, did you prepare the document which we have
19 identified as CCWD Exhibit 7?
20 DR. DENTON: Yes, I did.
21 MR. MADDOW: I would like to have this document marked
22 as exhibit CCWD Exhibit 7, and copies distributed to the
23 Board and to the parties. And, Mr. Stubchaer, as we
24 discussed at the outset of today's procedures, there were
25 some scheduling issues that arose concerning two witnesses
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01 who could not be available on August 19th and 20th.
02 Dr. Denton is one of those witnesses. This morning I
03 had a discussion with Ms. Brenner, counsel for Delta
04 Wetlands, concerning scheduling matters. And recognizing
05 that Dr. Denton had written testimony that was going to be
06 submitted, and because of some scheduling difficulties today
07 concerning availability of one of Delta Wetlands' experts,
08 Dr. List, we, at the morning break, provided a copy of Dr.
09 Denton's Exhibit 7 to Dr. List so that he could review it to
10 provide his comments to Ms. Brenner in the event that we do
11 get to cross examination of Dr. Denton today. The same is
12 true of CCWD Exhibit 8, which we will get to in a few
13 moments.
14 I just wanted that to be on record, to make it clear
15 that that is the basis upon which we provided copies to Dr.
16 List. And I don't imagine that there are any other parties
17 going to be concerned about that.
18 Dr. Denton, there has been some testimony in the direct
19 evidence portion of this proceeding about the relationships
20 between salinity intrusion and the proposed diversions from
21 the Delta Wetlands Project and about the use of X2 to
22 control salinity intrusion.
23 Are you familiar with that testimony in the earlier
24 phase of this proceeding?
25 DR. DENTON: Yes, I am.
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01 MR. MADDOW: Can you then summarize your rebuttal
02 testimony in regard to those issues?
03 DR. DENTON: Yes. If you could put up the first
04 exhibit, please?
05 This is Figure 1 from CCWD Exhibit 7, and it goes
06 directly to the question: Is there a relationship between
07 salinity intrusion and diversions and how those diversions
08 relates to the location of X2; and if, therefore, X2 would
09 be appropriate to use to limit the effects of salinity
10 intrusion?
11 If the State Board were to decide to issue water rights
12 permit for the Delta Wetlands Project, the District

13 recommends the use of a 14-day running average of X2 less
14 than 71 kilometers, using the Kimmerer-Monismith equation to
15 limit those diversions. This would help protect the
16 District from salinity intrusion caused by Delta Wetlands'
17 diversions.

18 If you look at Figure 1, which is shown up here, what
19 you will see is that the data that was previously shown in
20 CCWD Exhibit 4, Figure 1 has been replotted against X2; and
21 what you find is as X2 increases, in other words, the
22 location of the estuarian habitat standard moves landward
23 from Chipps Island towards Collinsville, what you find is
24 that the salinity impacts due to salinity intrusion
25 increase.

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01 If you look at this figure, what you find is that of
02 the data that is plotted, and I didn't plot anything that
03 was less than 1 milligram per liter chloride, if you move
04 back the place or the point where salinity intrusion no
05 longer appears to become a problem from these results, it is
06 beyond Chipps Island and consistent with our requirement of
07 X2 less than 71. In choosing X2 less than 71 kilometers, we
08 also took into account the discussion in the Draft EIR/EIS
09 that the State Board may need to include a small buffer from
10 existing standards to provide additional protection. There
11 is a 3 kilometer buffer on top of the 74 kilometers that
12 applies to the Chipps Island standard. But that is also
13 consistent with this need to reduce any salinity intrusion
14 impacts.

15 One other point is to point out I haven't plotted this
16 against the previous months' value of X2. This is just
17 taking into account that it takes about a month for the
18 effect of changes in Delta outflow to have an effect or
19 response at Rock Slough. You get a similar sort of result
20 if you plot X2 for the existing one. In this way, we can
21 see that as long as X2 does not move too far inland, you can
22 avoid having any salinity intrusion impacts.

23 If you put up the next table.

24 Exhibit 7 also contains a Table 1, which just would
25 give people the opportunity to look at these data in a

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01 little more detail.

02 Mr. Stubchaer had asked questions about how this all
03 relates to diversion and X2. If you look at the data for
04 November and December of 1979, those were the two months
05 that had the highest salinities, 21.6 and 25.8.

06 MR. MADDOW: Excuse me, Dr. Denton, the Figure that is
07 on the screen is Table 2 from Exhibit 7.

08 DR. DENTON: Yes, I'm sorry; that is a typo on the
09 overhead. It should read Table 1, and it reads Table 1 in
10 the actual exhibit that was handed out.

11 MR. MADDOW: Mr. Stubchaer, I just noticed that
12 mistake; and what we will do is to go back and make a
13 careful comparison to make certain that the exhibit that we
14 are showing on the screen contains the same information as
15 is depicted in Table 1 of the Exhibit 7.

16 The concern that I have is that this shows Page 10 of
17 13, which is Table 2, I believe, Dr. Denton? And,

18 therefore, I would -- do we have an overhead of Table 1,
19 Page 9 of 13?

20 DR. DENTON: If I could clarify, this is just one table
21 in this exhibit, and in making some last minute changes to
22 page numbers, things like that, on the start of Table 1 it
23 correctly says Table 1, but on the continuation, the 2 was
24 left in there. The Table 2 on the continuation should be
25 changed to a 1. And if you are looking for that in Exhibit

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01 Number 7, it is, as Mr. Maddow says, is on Page 10 of 13.

02 MR. MADDOW: Let me just be sure we have that
03 straight.

04 There is one table; it has two pages. It is Pages 9
05 and 10 of the 13 pages. And the exhibit, which you were
06 showing on the overhead at this time is the second page of
07 Table 1, which appears as Page 10 in Exhibit 7.

08 Is that correct?

09 DR. DENTON: That is correct.

10 So, in reviewing this data, one needs to look at what
11 was happening one or even two months before any diversions
12 from Delta Wetlands, and then look for impacts that may
13 occur one or two months later from Delta Wetlands'
14 diversions. This is an example of that.

15 The other point to raise from this is that if you look
16 in the two months after the Delta Wetlands' diversions, in
17 other words, in January of 1980 and February of 1980, you
18 will see that the Delta outflows increased, in this
19 particular example, markedly. If those Delta Wetlands'
20 diversions had been delayed by two months, there would have
21 been an opportunity to take that water with a much higher
22 Delta outflow.

23 This is not, obviously, going to occur in every case.
24 But here is an example that this is not necessarily going to
25 cause a reduction in yield of the project because later in

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01 the wet season, January, February, you are more likely to
02 have much higher flows. Therefore, the ability to fill the
03 reservoir, but the ability to fill without much salinity
04 intrusion impact.

05 If you could put up the next figure.

06 The next figure I just want to put up is my testimony,
07 Exhibit 7, contains two updated plots from my original
08 testimony. This is really in response to some
09 cross-examination questions that were asked by Ms. Schneider
10 from Delta Wetlands.

11 MR. MADDOW: Dr. Denton, this is Figure 2 from Exhibit
12 7?

13 DR. DENTON: Yes.

14 MR. MADDOW: Again, the pagination problem that had to
15 do with putting this exhibit together late last night. I
16 understand that the figure that we are showing, Figure 2
17 from Exhibit 7, is Page 12 of 13 from the written version of
18 this exhibit.

19 Is that correct?

20 DR. DENTON: That is correct.

21 The reason I wanted to update this is that we received,
22 just prior to submittal of our written testimony, data from

23 Delta Wetlands that corrected a minor error, and we didn't
24 have time at that stage to replot the graphic, and
25 replotting them later, it became apparent that there was a

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01 slight change. And the change really is the number of
02 points below the line in the original testimony of my
03 testimony in CCWD Exhibit 4, the graphic, I think it was
04 Figure 12, had 14 data points below the line, showing an
05 improved water quality. The revised data has shifted the
06 salinity data up slightly, so there is now only five cases
07 where Delta Wetlands would be discharging water from the
08 islands at a lower salinity than the channel water. So I
09 just wanted to make sure that that was clarified.

10 The District continues to have concerns that this
11 project will be taking on water when it is saltier and
12 discharging it as stored water that is generally higher in
13 salinity than the receiving water.

14 I also included in my written rebuttal testimony, in
15 CCWD Exhibit 7 on Page 6, a further discussion of the
16 problems with the Delta Wetlands' testimony that states
17 there will be a net benefit to Delta water quality due to
18 the reduction in existing agricultural diversions. And this
19 error is in the assumption that the reduction in existing
20 agricultural diversions would result in net Delta outflow.

21 The actual effect, if it was, the error appears to have
22 the effect of causing a five percent reduction in salinity
23 relative to the no-project base case. If that error was
24 corrected, though, we would not expect that reduction in
25 salinity. And so, what the District recommends is that

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01 Delta Wetlands repeat these salinity simulations without
02 this particular error in it to obtain a more realistic
03 estimate of the magnitude of potentially significant
04 degradation of water quality for CCWD.

05 Also mentioned in my rebuttal testimony, Exhibit 7, is
06 just that this also affects the conclusions drawn by Dr.
07 Kavanaugh in Delta Wetlands Exhibit 13 on Page 61, in which
08 he makes the assessment that there will actually be a slight
09 improvement in bromide in Delta waters as well. This was
10 based on the results that I am rebutting here.

11 You could put up the next figure.

12 This figure, which is Figure 9 from Delta Wetlands
13 Exhibit 14B, the errata Figure 9, shows the correction from
14 an errata Dr. List testified about. This rebuttal is really
15 in response to some discussion, testimony, by Dr. Russ
16 Brown. Mr. Maddow had cross-examined Mr. Brown and wouldn't
17 go essentially to the hypothetical case as an increase of
18 Rock Slough chlorides from 50 milligrams per liter to a
19 hundred milligrams per liter chlorides.

20 And in redirect, Mr. Brown testified that in looking at
21 Figure 10 of Delta Wetlands Exhibit 14B, that he could see
22 no such change. And Figure 10 of Delta Wetlands Exhibit 14B
23 is actually an Old River pumping plant data plat. However,
24 when you look at Figure 9 from Delta Wetlands Exhibit 14B,
25 which is shown on the overhead here, this is actually for

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01 Rock Slough, which was the hypothetical example that Mr.

02 Maddow was using in cross-examination.

03 There is, in fact, the data points that is consistent
04 with that example that he had raised. And it is shown -- it
05 is actually represented by a TDS of 225 milligrams per liter
06 in the base case and 380 milligram per liter TDS with the
07 Delta Wetlands Project.

08 If those are converted from TDS to chlorides, that
09 represents a change from 58 milligrams per liter chloride to
10 143 milligrams per liter chloride. In this case, it would
11 be a 75 milligrams per liter chloride example. So, Mr.
12 Maddow was not being completely hypothetical in this case.

13 MR. MADDOW: Dr. Denton, Figure 9, from Delta Wetlands
14 Exhibit 14B, the July 2, 1997 version, is not in your
15 Exhibit 7; you are referring back to the exhibit which was
16 presented by Delta Wetlands in its direct case.

17 Is that correct?

18 DR. DENTON: Yes, I am.

19 And I had previously given an example of Figure 20 of
20 Delta Wetlands Exhibit 14B, where similar large changes in
21 chloride at Holland Tract were detected as coming out of the
22 modeling study of Delta Wetlands. The Contra Costa Water
23 District recommends that the State Board should leave the
24 hearing open until Delta Wetlands has completed revised
25 operations study that mitigate for these significant

0132 01 impacts, until such time as the parties have had an
02 opportunity to review those results.

03 MR. MADDOW: Dr. Denton, there has also been testimony
04 during the earlier phases, the direct evidence phases, and
05 the cross-examination phase of this proceeding about the
06 possible elimination of agricultural drainage from Delta
07 Wetlands' islands as to whether that would constitute a
08 benefit of the proposed Delta Wetlands Project.

09 Are you familiar with that testimony?

10 DR. DENTON: Yes, I am.

11 MR. MADDOW: Dr. Denton, did you prepare CCWD Exhibit
12 8?

13 DR. DENTON: Yes. This was prepared jointly with Dr.
14 Greg Gartrell and Dr. Shum and myself.

15 MR. MADDOW: Could we have this marked as CCWD Exhibit
16 8 and distributed to the Board and to the parties?

17 And Mr. Stubchaer, while that is being done, this is
18 the second of the two exhibits which we provided this
19 morning to Dr. List.

20 Dr. Denton, is there any portion of CCWD Exhibit 8,
21 your rebuttal testimony, that you wish to summarize?

22 DR. DENTON: Yes. The testimony rebuts the contention
23 of Delta Wetlands' testimony that reduction in agricultural
24 drainage from Delta Wetlands' islands would improve water
25 quality in the Delta in all cases. If you can show what I

0133 01 have up in Figure 3, from Contra Costa Water District
02 Exhibit 8, this example -- again, there is an overhead
03 showing slightly different figures. This is from Page 12 of
04 15 of Exhibit 8.

05 And in this particular example, what we have done is
06 plotted against the Fisher Model for agricultural drainage

07 that has previously been discussed by Dr. Shum. However,
08 what I would draw your attention to is the actual field data
09 that are plotted on the graphic, actually plotted below,
10 showing the salinity coming off the islands, which are the
11 solid squares. There is actually only four of them in this
12 case. They have come from new water investigations of
13 agricultural drainage grab samples. Those data points are
14 well below what the Fischer Model input would suggest or
15 assumed.

16 However, what is also incorrect, if you take the MWQI
17 or data from the channel itself, from a station in the
18 proximity of a drainage ditch, which you say in this
19 particular year, which 1991 is a dry year, the drainage
20 coming off the islands is very similar to the receiving
21 water of the channel. The four agricultural points which we
22 have there, we plotted all the ones available to us; three
23 of them are actually below what is in the channels. So,
24 this would be a situation where reducing agricultural
25 drainage, no matter what the volume is, would actually not

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01 result in any significant impact. In fact, you may degrade
02 slightly if you believe that the difference there is
03 significant.

04 HEARING OFFICER STUBCHAER: In a dry year like '91, how
05 much flow do you think is agricultural drainage total? Do
06 you have any idea?

07 DR. DENTON: The flow coming off the island?

08 HEARING OFFICER STUBCHAER: Receiving water.

09 DR. DENTON: We cannot tell without a guess, looking in
10 more detail at the relationship. There is a way of doing
11 that. Look at EC and chloride and decide if the
12 relationship is different than seawater intrusion and the
13 particular time of agriculture drainage. You would expect
14 there would be irrigation practices going on in that time.
15 There is agriculture drainage coming off other islands, not
16 just these particular Delta islands.

17 When I got to the next graphic, a greater amount of
18 agricultural drainage. What we would like to suggest with
19 this rebuttal testimony is that in dryer years there is
20 agricultural drainage coming off the islands. Again, we are
21 not certain what the quantity, in terms of volume, would
22 be. But salinity, if similar, we can't really say that
23 removal of agricultural drainage is actually going to
24 improve salinity in the Delta.

25 If you could put up the next graphic, which is Figure

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01 Number 5 from Contra Costa Water District Number 8 that
02 appears on Page 14 of 15.

03 The case we are looking at would be the water year
04 1993. And this is another example of what you would have
05 expected Delta Wetlands is referring to. That in wet years,
06 when there is flooding on the islands, heavy storms, that
07 water is draining off. It is leaching out the soils; and
08 when the discharge occurs -- and this graphic shows six
09 points representing agricultural drainage, the solid
10 squares.

11 In this case, all except October are significantly

12 higher. We would be -- in this situation, there would be
13 improvement if the Delta Wetlands' agricultural drainage
14 events were reduced. However, again, we don't know what the
15 volumes are. This is subject to clarification of whether
16 higher or actual volumes. But in describing the wet years
17 and dry years, we do see that effect.

18 MR. MADDOW: There has been a considerable amount of
19 testimony in the direct evidence and cross-examination
20 phases of this proceeding about water supply modeling and
21 water supply benefits of the proposed Delta Wetlands
22 Project.

23 Are you familiar with that testimony?

24 DR. DENTON: Yes, I am.

25 MR. MADDOW: Did you prepare the document identified as
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01 CCWD Exhibit 9?

02 DR. DENTON: Yes, I did.

03 MR. MADDOW: Can we have that document marked as CCWD 9
04 and distributed to the Board and the parties, please?

05 Dr. Denton, can you then summarize this final
06 information of your rebuttal testimony?

07 DR. DENTON: Yes, I will. I have attached as an
08 exhibit the talking points, which are now being shown. It
09 is actually attached to my exhibit. I put it as Page 7 of
10 7, so there wouldn't be concern. There may be change in
11 what is in the exhibit that appears on Page 7 of Exhibit 9.

12 The reason that the Contra Costa Water District is
13 concerned about rebutting the issue of yield of the Delta
14 Wetlands Project is that when deciding whether to issue
15 water rights, the State Board will need to balance the
16 potential water quality impacts of the Delta Wetlands
17 Project against the water supply benefits that could be
18 afforded by the project to meet California's future water
19 needs.

20 In making this assessment of the purported water supply
21 benefits of this project, the State Board needs to take into
22 account that these benefits may be significantly
23 overestimated in the Delta Wetlands' operations studies.

24 According to Delta Wetlands' written oral testimony in
25 this hearing, Delta Wetlands' operations studies, using
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01 DeltaSOS, were designed to maximize the diversions and
02 discharges from the islands and to look more at what the
03 environmental impacts of the project would be and the
04 effects on salinity, and so on. That obviously needed to be
05 done. However, in terms of the water supply benefits of the
06 project, we need to look at it more realistically, taking
07 into account some of the errors that we have identified from
08 the Delta Wetlands' testimony and from cross-examination.

09 The first one would be the operation studies, which at
10 this point does not fully mitigate the salinity impacts. I
11 just spoke of that with reference to Exhibit Number 7.
12 Similarly, there has been a discussion that the reservoir
13 storage may have to be reduced if permission is not given to
14 increase the maximum pool elevation to plus six feet. That
15 would reduce storage in the reservoir and could reduce the
16 yield of the project.

17 Similarly, in the calculation of 154,000 acre feet and
18 the model study for that, there was not an opportunity for
19 using the Delta Wetlands' smelt index, the fall midwinter
20 trawl being less than 239.

21 Delta has done studies with the fall midwinter trawl
22 with less than 239, and that appears on Delta Wetlands
23 Exhibit 4 on Page 5; that in cases of those particular
24 studies there was reduction in yield of 20,000 acre-feet per
25 year.

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01 There is also -- we have already testified there is an
02 over estimation of, or could be overestimation of, the
03 demand for Delta water supply, considering the price that
04 that water would be sold at and the availability of wheeling
05 and storage for Delta exports south of the Delta. If those
06 considerations were taken into account, that could further
07 reduce the yield of the project below 154,000 acre-feet.

08 The last example that we have up there, the five
09 bullets, would be that some of the operations studies or the
10 operations studies actually in some years, if you look at
11 the calendar year export sales, did actually exceed the
12 250,000 acre-feet limit on its imposition of Delta Wetlands
13 as part of the Biological Opinions. This may be a small
14 effect, but it is another error that would need to be
15 directed to get at the final calculation of yield. That
16 shows the data for the calendar year export sales, given
17 Table 1 of Exhibit Number 9.

18 MR. MADDOW: Does that conclude your rebuttal
19 testimony?

20 MR. DENTON: Just maybe to finalize that, I also want
21 to note that there has been discussions about 154,000
22 acre-feet as the average yield over any year period we
23 looked at, looked at the yield during critically dry
24 periods. In Table Number 2, in my testimony on Page 6 of
25 Exhibit 9, just reviews the yield of the Delta Wetlands

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01 Project from the operation studies during critical periods.
02 And for example, in water years 1986 through 1991, if you
03 take the average yield during that critically dry period
04 for the ESA Biological Opinion study, then the yield,
05 average yield, 154,000 acre-foot per year for that period is
06 just much, much less than the average of the 70 year period
07 of 154,000.

08 Thank you.

09 MR. MADDOW: Thank you, Dr. Denton. Are you finished?

10 DR. DENTON: Yes.

11 MR. MADDOW: The next rebuttal witness will be Dr. K.T.
12 Shum, who is doing double duties, has been sitting over
13 there doing the overhead, and will now come to the
14 microphone.

15 Dr. Shum, there has been considerable testimony during
16 the direct and cross-examination phase of this proceeding
17 about TOC loading from peat soil, particularly testimony
18 with regard to the issue of molecular diffusion.

19 Are you familiar with that testimony?

20 DR. SHUM: Yes, I am.

21 MR. MADDOW: Dr. Shum, did you prepare CCWD Exhibit 10?

22 DR. SHUM: Yes, I did.

23 MR. MADDOW: Can we have that document marked as CCWD
24 Exhibit 10 and distributed to the staff, Board and to the
25 parties, please?

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01 Dr. Shum, what was the purpose in preparing CCWD 10?

02 DR. SHUM: The purpose of this rebuttal testimony is to
03 show that Exhibit Delta Wetlands 13 underestimates the flux
04 of the soft organic carbon from the peat soils from the
05 islands into overlying water, and consequently the total
06 organic carbon concentration of stored water, especially at
07 time of discharge can be much higher than estimated in
08 DW-13. And as a result, the TOC concentrations at Contra
09 Costa and other urban intakes in the time Delta would be
10 higher than was predicted in DW-13.

11 MR. MADDOW: Can you summarize for the Board the basis
12 upon which you arrived at those conclusions?

13 DR. SHUM: Yes. The full discussion is given in CCDW
14 Exhibit 10, and the major point is summarized in this table
15 that I hastily prepared. It is not included in CCWD Exhibit
16 10, but all the information can be drawn from there.

17 This table gives the TOC loading from the peat soil in
18 DW-13 and also in the cross-examination by the Contra Costa
19 Water District on July 14th. Dr. Kavanaugh testified that
20 his estimate of the DOC flux from the peat sediments is the
21 order of one, accounting for molecular diffusion alone.
22 However, he assumes a range of between 5 and 25 milligrams
23 DOC per meters squared per day, to illustrate that the
24 actual flux he is accounting for is 5 to 25 times that of
25 molecular diffusion.

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01 At the upper limit of this flux it would give over a
02 total average of 20,000 acres an annual load of 740,000
03 kilograms per year. And I take a look at how much of this
04 annual load is relative to the total soil mass of peat
05 sediments, just in the top one foot of the surface sediment
06 in the four islands.

07 If you assume density of this peat soil of 600
08 kilograms per meters cubed, which is about 60 percent depth
09 of water, the percentage comes out to 0.0005 percent. That
10 means the annual load of 740,000 kilograms per year would
11 reduce the peat sediment in the top just one foot of the
12 20,000 acres of Delta Wetlands' islands by about one over
13 12,000, which is a pretty small amount.

14 Using the numbers proposed in Delta Wetlands Exhibit
15 13, I did an independent estimate of the molecular
16 diffusion. And assuming the data given in there, I got a
17 different number, and much higher, which is between 8.6
18 milligrams DOC per meters squared per day, and ranging up to
19 17 milligrams DOC per meters squared per day. The details
20 of how these two numbers are derived is given in appendix of
21 CCWD Exhibit 10.

22 If we assume the same factor in accounting for the
23 other transport processes, such as bioturbation, wave
24 pumping, and groundwater seepage, a factor of 5 or 25 to
25 this lower number of 8.6 milligrams DOC per meters squared

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01 per day, the annual load I got ranges from a little bit
02 over 1,000,000 kilograms per year to over 6,000,000
03 kilograms per year.

04 To put this loading into perspective, even a high of
05 6,000,000 kilograms per year would account for only 0.043
06 percent of the total soil mass in the top one-foot layer of
07 the sediment in the four Delta Wetlands' islands.

08 And the conclusion I can draw from this is that the
09 estimate of the DOC flux from the peat soil alone is
10 underestimated in DW-13, and it could realistically be much
11 higher.

12 MR. MADDOW: Mr. Stubchaer, for the record in
13 illustrating this portion of his testimony, Dr. Shum has
14 produced what is seen on the overhead as a hand drawn or
15 handwritten chart. It is not included in CCWD Exhibit 10.
16 Frankly, it was developed this morning, since this
17 proceeding has been going on today. If you would so desire,
18 we could have photocopies made of that, and we would be
19 happy to introduce it as CCWD Exhibit 11 and provide copies
20 to all?

21 HEARING OFFICER STUBCHAER: Please do.

22 MR. MADDOW: I don't have anything to hand to the staff
23 to mark right at this moment, but we will have this marked
24 and introduced and get copies to all the parties.

25 Dr. Shum, returning to your rebuttal testimony, can you
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01 tell us what you believe to be the significance of the
02 conclusions that you just described in the context of this
03 proceeding?

04 DR. SHUM: This estimate I had in CCWD Exhibit 10 shows
05 that there is a distinct possibility that the TOC flux from
06 this Delta island can be much higher than those proposed
07 in DW-13. As a result, the DOC and TOC impact at the urban
08 intakes in the Delta can be much higher. Given all these
09 uncertainties, we need to have appropriate permit conditions
10 for discharge to protect urban water supply.

11 MR. MADDOW: Dr. Shum, does that conclude your
12 testimony?

13 DR. SHUM: Yes, it does.

14 MR. MADDOW: Mr. Stubchaer, that concludes all of the
15 rebuttal testimony that Contra Costa Water District has. We
16 have identified as new exhibits CCWD 6 through and including
17 CCWD 11. It is my understanding that these can be
18 introduced at this time, and you will rule on their
19 acceptance into evidence at the conclusion of
20 cross-examination.

21 Is that correct?

22 HEARING OFFICER STUBCHAER: That is correct.

23 MR. MADDOW: Dr. Denton is available for
24 cross-examination this afternoon, should you choose allow
25 cross-examination under the arrangements which you described
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01 at the beginning of the day.

02 HEARING OFFICER STUBCHAER: If you choose to do that, I
03 hope the time allows.

04 MR. MADDOW: The other CCWD witnesses will be
05 available on August 19th and 20th.

06 Thank you.
07 HEARING OFFICER STUBCHAER: Thank you.
08 Could I have a show of hands of the parties, additional
09 parties, which are going to present rebuttal?
10 Anyone else? Fish and Game. Just Fish and Game. Okay.
11 Looks like you are up.
12 Ms. Murray.

13 ---oOo---

14 REBUTTAL TESTIMONY
15 DEPARTMENT OF FISH AND GAME
16 BY MS. MURRAY

17 MS. MURRAY: The Department of Fish and Game rebuttal
18 testimony, in the interest of time and paper was prepared
19 altogether as one exhibit, and I would mark that as DFG
20 Exhibit 19. Each of these witnesses have been sworn and
21 have appeared before. And I will have them briefly
22 summarize their portion of the DFG 19.
23 I also, at this time, have DFG Exhibit 20, which I will
24 distribute at this time. It is a declaration of James
25 Lecky, Chief of the Protective Resources Division of the

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01 National Marine Fishery Service.
02 We will start with Mr. Wernette. And to make it clear,
03 we are just going to summarize portions of the written
04 testimony rather than going through each point, in the
05 interest of time.

06 Mr. Wernette, would you please summarize those portions
07 of DFG 19 which you prepared?

08 MR. WERNETTE: I would be happy to. First, I would
09 like to start off by just quickly summarizing the general
10 area that we are going to be discussing in terms of our
11 rebuttal. There are five principal points that are covered
12 under two major concerns that our department has with
13 regards to the testimony provided by Delta. They focus on,
14 in our view, a chronic underestimate or misunderstatement of
15 the impacts associated with the Delta Wetlands Project and
16 the effects that it has on both listed and non listed
17 species.

18 Secondly, there is always a chronic overestimate of the
19 project benefits, or the benefits that are attributable to
20 the final operating criteria. Just an overestimate or over
21 exaggeration of the benefits that those operating criteria
22 have in terms of minimizing or avoiding impacts to both
23 listed and non listed fish.

24 First of all, in terms of substantial discussion about
25 the project yield, and from our standpoint project field

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01 what, in our view, represents an underestimate of potential
02 project yield. In fact, represents potential for increased
03 project operations that have not been modeled and haven't
04 been accurately assessed in terms of the impacts on fish.

05 Couple of examples, Dr. Brown's testimony in Exhibit
06 DW-10, he describes the fact that in terms of daily Delta
07 operations they would likely result in increased operations
08 and increased yield opportunities for the projects that
09 could not be simulated or weren't simulated in the
10 modeling. We used the modeling, obviously, in the

11 assessment of the impacts, but the daily operations are what
12 will be the actual effects on the Delta, and, therefore, our
13 concern.

14 In Mr. Warren Shaul's testimony at Exhibit DW-4, there
15 is also a statement about how the 15-day diversions
16 restriction that can be invoked by the Fish and Wildlife
17 agencies were essentially modeled on a 30-day basis because
18 of limitations in modeling. So, often impacts associated
19 with project operations would be much larger than actually
20 indicated by the modeling.

21 One of the other areas where impacts are
22 underestimated, in our view, were related to the
23 hydrodynamic effects that will result from the discharges
24 for export. And those effects principally are located in
25 the South Delta. Yet testimony provided here on direct by
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01 Dr. Brown in his Exhibit DW-11, there were statements about
02 the fact that there were little or no impacts associated
03 with hydrodynamics related to discharges for exports.

04 As a matter of fact, the Draft EIR/EIS provides data
05 that actually rebuts that directly by display in Tables B1-8
06 of the Draft EIR, the Board's Draft EIR, that shows actual
07 significant increase in some key places in the South Delta.
08 An illustration that we made, for instance, was an increase
09 in the flows at the head of Old River, which represents
10 increased risks of entrainment of San Joaquin salmon into
11 the South Delta. And those increases were modeled at up to
12 a 34-percent increase.

13 Another area we believe there is a misstatement or
14 understatement of impacts has to do with what we view as a
15 mischaracterization or misuse of the data and indices that
16 were actually used by Jones & Stokes as a tool in assessing
17 project impacts and evaluating alternatives for mitigation.

18 In the case of the entrainment indices, during the
19 discussions in our consultation process, there was broad
20 agreement that these indices actually provide good measures
21 of or indications of transport conditions that would change
22 transport conditions in the Delta. Transport was identified
23 as important biological element of how fish are moved
24 through the Delta, not just planktonic fish or larval fish
25 that are fairly planktonic, but also juvenile fish and how
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01 they may be affected by changes in hydrodynamics in the
02 Delta.

03 So those indices were agreed upon as good indicators of
04 how transport conditions would change; and there was
05 agreement among the parties in those discussions that
06 increased levels, or increased indices actually represented
07 decreases in survival or increases in mortality. We do not
08 know whether those measurements were actually direct in
09 terms of the one-to-one. We did not conclude that that
10 would even be possible to even know whether there was a
11 one-to-one relationship. But nevertheless, there was that
12 pattern that was agreed to.

13 Another way of misusing that information, in our view,
14 is taking those data and presenting them in 70-year
15 averages. The information by doing that ends up really

16 masking the significance of the effects that occur on an
17 annual basis and on a monthly basis. And the way those data
18 are presented by Jones & Stokes, in this case Mr. Shaul,
19 and the conclusions that were drawn from those data by Mr.
20 Vogel in his testimony in Delta Wetlands Exhibit 16 really
21 result from a mischaracterization of how that data -- what
22 that data does when you average it over 70 years as opposed
23 to looking at it on an annual basis, and even a
24 month-by-month basis.

25 With regards to overestimating the benefits of the
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01 final operating criteria, there were a couple of areas that,
02 in our view, illustrate that chronic overestimation of
03 benefits. One of them was in testimony provided by Mr.
04 Vogel; he described the benefits of selecting windows or
05 important times for fishery resources in the Delta. And in
06 fixing or establishing fixed prohibitions against diversions
07 during those times. April and May was discussed, and those
08 are the two months that are used to have fixed prohibition
09 against discharges. But the premise that he made in his
10 testimony was that this was the only important or critical
11 time for those different life stages of important fish
12 species. And we completely disagree with that, in that
13 there are definitely other months, for instance March, that
14 are as critical as the April-May period.

15 Last, in terms of the benefits attributable to the
16 environmental water, I have an overhead that we'd probably
17 like to identify as an exhibit.

18 MS. MURRAY: We have copies. This will be DFG-21.

19 MR. WERNETTE: In summary, the Final Operations
20 Criteria, as a reminder of what the final operates criteria
21 call for in terms of environmental water, they establish
22 under most conditions a ten percent dedication of water
23 between the months of December and June related to the water
24 that is being discharged from islands for export. The
25 percentages at the bottom row are actual calculations based

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01 on Delta Wetlands Exhibit 4, which provide the average
02 diversions or discharges, excuse me, that occur during these
03 months of December through June.

04 So when you look at the percent of water that is
05 discharged during these months, they range from high of four
06 percent in the month of December to lows of, actually the
07 next month, of less than one percent. The total amount of
08 water that is actually released for discharge during this
09 time is around 17 percent of the total annual discharges for
10 export. So, the potential horsepower of this mitigation
11 measure is significantly limited by the fact that it only is
12 attributable or applied to a very small fraction of Delta
13 Wetlands Project's operations.

14 As I mentioned in some of our direct testimony, when
15 you apply the habitat island releases, you end up with a
16 total discharge of 2.6 thousand acre-feet associated with
17 the project final operating criteria. But habitat island
18 discharges of over 5,000 acre-feet. You can see that that
19 results in actually a no-net requirement for releases
20 associated with the habitat island or associated with this

21 environmental water.

22 So the modeling that is shown in Delta Wetlands 4 and
23 the benefits attributed to this are overexaggerated because
24 in most years this water will not result in any increased
25 outflow for the environment.

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01 That concludes my summary.

02 MS. MURRAY: Thank you.

03 Mr. Sweetnam, will you please summarize those portions
04 of DFG 19 that you prepared?

05 MR. SWEETMAN: Yes, I will.

06 MS. MURRAY: Predictably, it will be Delta smelt.

07 MR. SWEETMAN: Delta smelt. You don't want me to do
08 water quality?

09 On Page 26 of Delta Wetlands Exhibit 15, Question 57,
10 Mr. Shaul, that no significant change in area of spawning
11 and remembering habitat for striped bass, Delta smelt, and
12 longfin smelt, if there is any change in available habitat,
13 would be very small relative to the total habitat available,
14 and, in fact, there would only be a slight increase in
15 optimal habitat in April through August because of foregone
16 agricultural diversions.

17 This statement relies on the optimal salinity habitat,
18 which was developed by Mr. Shaul. However, it is misleading
19 for Delta smelt because of the relationship between Delta
20 smelt and the optimal salinity habitat is not significant
21 and should not be used to evaluate the significance in this
22 relationship.

23 The assessment of the magnitude and frequency of the
24 impacts to Delta smelt and the evaluation of the potential
25 mitigation measures in the final operating criteria are

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01 based on the basis of this relationship and further results
02 on modeling studies. If the accuracy of the data is in
03 question, the results are also in question. In Appendix A,
04 Table 7 of the Draft EIR/EIS, the relationship between Delta
05 smelt, the fall midwater trawl index and the optimal
06 salinity habitat is presented here, where Y in this
07 relationship is the log end base of fall midwinter trawl
08 index plus one.

09 I requested the optimal salinity habitat data from Mr.
10 Shaul. Actually, he sent it to me on July 3rd. And in
11 doing the analysis, I do not come up with the same
12 results. And, in fact, if you could put up the next slide,
13 this is Figure 1 of Exhibit, I think it is, 19, we didn't
14 identify so I didn't know which exhibit we were yet, so this
15 is Exhibit 19 now.

16 This is the relationship that Mr. Shaul was discussing
17 in that figure. I have added 1994, 1995, and 1996. This is
18 the updated version of that, including those last three
19 years.

20 If you do not include the last three years, you are
21 doing the exact relationship that Mr. Shaul did, the
22 relationship -- the coefficient of determination is .28,
23 around 13 percent, and a significant level of .079 or .08.

24 If you add the last three years, you get a nice
25 shotgun effect. And this is the basis for the relationship

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01 between Delta smelt and optimal salinity habitat. It's
02 actually a little bit worse than the spawning recruit
03 relationship we had before. It is not much to go on.

04 I added Figure 2, which is actually the relationship
05 that was used to create the Delta Water Accord, updated for
06 the last three years as well. This is Figure 2.

07 MS. MURRAY: From 19.

08 MR. SWEETMAN: From DFG Exhibit 19. This is updated
09 through 1996. We are still hanging on to some significance,
10 but this is the basis of the Delta smelt relationship with
11 X2. That is what is in part used for the Water Accord.
12 As you can see, this is tenuous as well. But it's still in
13 the relative area of significance. It's definitely going
14 down with the last few years of data. And each year we add
15 to it, the relationship declines further. That was trying
16 to make my point. I was trying to put all of the relevant
17 data in here to try to give you an idea of where we are with
18 Delta smelt. We are not very far.

19 That concludes my testimony.

20 MS. MURRAY: Ms. McKee, do you have any corrections to
21 make to DFG Exhibit 19?

22 MS. McKEE: Yes, we have a couple of typo changes. On
23 Page 9 of our Exhibit 19, third paragraph from the bottom,
24 starting third bullet paragraph, starting with, quote, late
25 fall chinook. Please delete that paragraph. That was

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01 inserted in error.

02 And on Page 10 the first full bullet which starts,
03 quote, when adult numbers. The number should be 15,000
04 instead of 5,000.

05 MS. MURRAY: Any other corrections?

06 MS. McKEE: No. That is all the corrections.

07 MS. MURRAY: Please summarize your testimony that you
08 prepared.

09 MS. McKEE: During testimony Mr. Warren Shaul and Delta
10 Wetlands testified that the temperature management plan
11 restricts maximum temperature differential between discharge
12 from receiving water to 20 degrees Fahrenheit. This is
13 inconsistent with the Central Valley Regional Water Quality
14 Control Board plan for the Sacramento-San Joaquin River
15 Basin, the Basin Plan. And as a point of clarification for
16 the benefit of the audience and the Board, it is our
17 understanding that the temperature objectives for enclosed
18 space in estuaries are as specified in the Water Quality
19 Control Plan for controlled temperature in the coastal and
20 interstate waters and enclosed bays of California. Also
21 known more simply as the Thermal Plan.

22 There are also temperature objectives for the Delta in
23 the State Water Resources Control Board 1991 Water Quality
24 Control Plan for salinity. The 20-degree Fahrenheit
25 criteria which the Thermal Plan and which Mr. Shaul and

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01 Delta Wetlands referred to is only one element of this
02 Thermal Plan's water quality objectives for new discharges
03 of elevated temperature waste for the estuary. It is
04 important to understand what the remaining components of

05 those water quality objectives to place the 20-degree
06 Fahrenheit into proper context in terms of protecting fish
07 and other beneficial uses.

08 It states that an elevated waste discharge shall comply
09 with the following, and it says that the maximum temperature
10 shall not exceed the maximum receiving water by 20 degrees
11 Fahrenheit. But it also states that elevated temperature
12 waste discharge, either individually or combined with other
13 discharges, shall not create a zone defined by water
14 temperatures of more than one degree Fahrenheit above the
15 national receiving water temperature, which exceeds 25
16 percent of the cross-sectional area of a main river channel
17 at any one point.

18 It also says that no discharge shall cause a surface
19 water temperature rise greater than four degrees Fahrenheit
20 above the natural temperature of the receiving waters at any
21 time or place. And last but not most important, it says that
22 additional limitations shall be imposed when necessary to
23 assure the protection of beneficial uses in areas of special
24 biological significance.

25 While the Thermal Plan allows for a greater
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01 differential between discharge and natural receiving water
02 temperature than most people who read these different plans
03 see for the warm and cold interstate waters in the Regional
04 Board's Basin Plan, the purpose of objective is to provide
05 an equivalent level of protection by containing the elevated
06 temperatures waste to a smaller portion of the receiving
07 water channel, and thus avoid potential migration blockage
08 to fish and allowing an adequate mixing zone.

09 In comparison, the Basin Plan allows an absolute
10 maximum temperature differential of five degrees between
11 discharge and receiving water temperatures in cold and warm
12 interstate waters. It is also the Department's
13 understanding in terms of how it has been implemented, the
14 five-degree Fahrenheit differential within the Basin Plan
15 now supersedes that 20-degree Fahrenheit maximum
16 differential in the Thermal Plan. However, other provisions
17 of the State Board Thermal Plan still apply.

18 The Delta Wetlands' testimony in its temperature
19 management plan failed to point out that they are actually
20 using a more lenient discharge temperature differential
21 criteria for their maximum temperature criteria, and they're
22 taking that from the Thermal Plan, but without the remaining
23 elements within the plan's objective for containing the
24 discharge zone of influence. So, in excess, Delta Wetlands
25 has developed a temperature plan which we feel is not in

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01 compliance with the salinity control plan, the Basin Plan,
02 or the Thermal Plan to provide adequate protection for
03 temperature sensitive species.

04 I would also like to respond to some statements made in
05 terms of recovery potential to salmon races which are state
06 or federally listed candidate and species of special
07 concern.

08 Mr. Shaul, when asked how the project affects the
09 recovery of listed species, testified that there is

10 currently insufficient information to answer that question
11 and that a population model is needed to determine if the
12 project will affect meeting recovery goals.

13 Mr. Vogel and Mr. Marine testified that the Final
14 Operations Criteriaa are responsive to the conservation and
15 recovery objectives for depressed populations of Delta fish
16 species.

17 The U.S. Fish and Wildlife Service recovery plan for
18 Sacramento-San Joaquin Delta native fishes actually
19 specifies for both spring and late-full chinook salmon,
20 including survival levels for juveniles through the Delta,
21 which have been deemed necessary to achieve the restoration
22 objectives. There are several required population
23 parameters for each species necessary to find that the
24 populations are restored. But some of the key parameters
25 here, especially for the Delta, and I quote:

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01 The Sacramento spring-run chinook salmon will
02 be regarded as restored when smolt survival
03 rates between Sacramento and Chipps Island
04 approach preproject levels when the numbers
05 of adults in the tributary streams are fewer
06 than 5,000 adults. Any improvements upstream
07 or in the ocean fishery regulations will be
08 greatly negated if protections in the Delta
09 are not implemented concurrently, especially
10 during the November through January period
11 when the Deer and Mill Creek smolts migrate.
12 Therefore, the objective of this plan is to
13 restore survival rates of outmigrating smolt
14 to levels that existed before construction of
15 the CVP and the State Water Project in the
16 South Delta. When adult numbers drop below
17 5,000 smolt survival rates through the Delta,
18 the following year should be higher than
19 they would be permitted when adult numbers
20 are higher. (Reading.)

21 Now, for late-fall, the objectives are actually quite
22 similar, especially in regards to the importance of the
23 Delta. It states that:

24 Restoration goals could be achieved only if
25 there is simultaneous improvement in

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01 conditions in the spawning and rearing
02 streams in the Delta for passage of
03 juveniles and improved management of the
04 fishery to allow for increased survivorship
05 of adults. The principal means for measuring
06 the suitability of habitat conditions for
07 juvenile chinook in the Delta is to have
08 smolt survival rates, again, between
09 Sacramento and Chipps Island equivalent to
10 those prior two present configurations of the
11 state and federal water projects in the
12 Delta. When adult numbers drop to below
13 15,000 smolt survival rates through the
14 Delta, the following year should be higher,

15 again, to permit -- than would be permitted
16 when the adult numbers are higher. (Reading.)
17 For the winter-run chinook salmon the draft recovery
18 objectives for delisting - as many of you know, the plan is
19 supposed to be issued this week - require a minimum of
20 10,000 females and 10,000 males return for 13 years before
21 it can delisted. And this year's spawning run is predicted
22 at less than 1,000 males and females combined or, in other
23 words, less than 500 females. And I don't want to minimize.
24 We are thrilled. We didn't think we'd get this many this
25 year. We are just tickled. But you can tell that recovery

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01 of the species has a very long ways to go.

02 So the relevancy of this information to the issue at
03 hand is how the project will affect the recovery of these
04 three species. And there will be incremental further
05 degradation of Delta habitat conditions for all three
06 species with commensurate reduced survival through the
07 Delta. So the project is not responsive to the needs to
08 stabilize and over time restore Delta conditions so we can
09 recover the species.

10 We, therefore, disagree with Mr. Vogel's testimony that
11 the Final Operations Criteria are responsive to the
12 conservation and recovery objectives for depressed
13 populations of Delta fish species.

14 Mr. Shaul also stated that a population model is needed
15 to determine if the project will affect meeting recovery
16 goals. This information is already available in the form of
17 the extinction model, which was developed for a federal
18 recovery planning process used to develop the above
19 delisting criteria for winter-run chinook. More recently,
20 the National Marine Fishery Service also has developed a
21 stochastic life cycle model. They used that to examine how
22 incremental increases in smolt mortality affects winter-run
23 chinook salmon population dynamics.

24 We have used the model to evaluate Department of Fish
25 and Game's current striped bass management program and the

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01 effects of possible future program changes. The model
02 estimates that the current probability of extinction for
03 winter-run is 93 percent, assuming existing level of
04 mortality, which includes an estimated six percent baseline
05 predation rate, an initial winter-run chinook salmon
06 population from the last three years and a winter-run
07 population trend from the last 20.

08 It also estimates that an increase in juvenile
09 winter-run mortality by average annual level of 3.5 percent
10 increases the probability of extinction from 93 percent to
11 97 percent. So that information is available to relate back
12 to what a project such as this might do to recovery and
13 extinction probability.

14 That concludes my testimony.

15 MS. MURRAY: Thank you.

16 Dr. Rich, could you please summarize that portion of
17 DW-19 that you prepared.

18 DR. RICH: Be glad to. In the interest of time, I am
19 going to summarize six points. First, contrary to Mr.

20 Marine's testimony in response to cross-examination by Ms.
21 Murray, water temperatures studies on adult chinook salmon
22 brood stock at hatcheries are relevant with regards to
23 determining stressful temperatures on migrating adult
24 chinook salmon.

25 Second, contrary to Mr. Marine's testimony in response
0162 to cross-examination, thermal studies on early fry at
01 Coleman Hatchery are also relevant with regard to
02 determining stressful and lethal temperatures on chinook
03 salmon fry.

04 Third, contrary to testimony provided by Vogel and
05 Marine in Delta Wetlands Exhibit 16, chinook salmon, coho
06 salmon, and steelhead trout do not have higher temperature
07 preferences and tolerances than most other Pacific salmon
08 species. All of the Pacific salmonid species are temperate
09 water species and stenothermal, and, thus, do not adapt well
10 to higher temperatures and have limited adaptability to
11 variations in temperatures.

12 Four, the sources of information listed in Table 1 of
13 Exhibit Delta Wetlands 16 do not support many of the effects
14 on salmon and the temperature ranges listed.

15 Five, contrary to testimony provided by Vogel and
16 Marine and Delta Wetlands Exhibit 16, studies have shown
17 that the magnitude of acute temperature change tolerated by
18 chinook salmon without significant mortality begins at a
19 much lower temperature than 18 degrees Fahrenheit.
20 Furthermore, the magnitude of acute temperature change
21 resulting in sublethal metabolic stress or behavioral
22 deficit of chinook salmon begins at a much lower temperature
23 than 16 degrees Fahrenheit.

24 Finally, the references, Brett 1952 and Banks, et al.
0163 1971 and Brett, et al. 1982 cited by Vogel and Marine in
01 their testimony and Delta Wetlands Exhibit 16 on Page 19, do
02 not provide a basis for their statement that juvenile
03 chinook salmon fed maximal food ration demonstrate an
04 optimal temperature for growth at about 67, 68 degrees
05 Fahrenheit.

06 MS. MURRAY: Does that conclude your summary?

07 DR. RICH: Yes, it does.

08 MS. MURRAY: That concludes our rebuttal testimony.

09 HEARING OFFICER STUBCHAER: Thank you very much.

10 You saw no one else who wished to present rebuttal
11 testimony, so that will conclude the rebuttal testimony.

12 We've heard the offers of Delta Wetlands and Contra
13 Costa Water District to make Mr. Forkel, and then
14 subsequently Mr. Denton, available for cross-examination
15 today, just their portion of the rebuttal testimony.

16 How many parties wish to cross-examine Mr. Forkel?

17 Three.

18 How many wish to cross-examine Mr. Denton?

19 One.

20 Okay. Delta Wetlands, do you want to bring Mr. Forkel
21 up to the witness table?

22 Mr. Nomellini.

23 ---oOo---

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0164

01 REBUTTAL CROSS-EXAMINATION OF DELTA WETLANDS PROPERTIES

02 BY CENTRAL DELTA WATER AGENCY

03 BY MR. NOMELLINI

04 MR. NOMELLINI: Dante John Nomellini for Central Delta

05 Water Agency parties.

06 Mr. Forkel, with regard to the yield of this project,

07 what effect on yield would there be if your water level was

08 dropped from plus six to plus four?

09 MR. FORKEL: That would reduce the reservoir capacity

10 by approximately 20,000 acre-feet. So it would reduce our

11 average annual yield. I don't know how much.

12 MR. NOMELLINI: Would it be in the neighborhood --

13 would it drop you below that magic 154,000 that the Kemper

14 money guy was concerned about?

15 MR. FORKEL: There is a lot of things that are going to

16 change, or possibly change our yield. And we heard from

17 CCWD some things that are going to drop it. We heard from

18 Fish and Game some things that are going to raise it. So,

19 this is one of the items that goes in the mix. So we would

20 have to qualitatively consider that.

21 MR. NOMELLINI: But it would drop you below 154?

22 MR. FORKEL: That particular one might drop it below

23 154.

24 MR. NOMELLINI: Does that mean that the Kemper people

25 then get out of this project?

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01 MR. FORKEL: I think what you have to do is look at all

02 of the measures from the final permit terms and conditions.

03 And there are going to be certain ones that are going to

04 drop us down and there are going to be certain ones that

05 raise us up. So, what we have included in the 154 was a

06 risk evaluation associated with whether or not we could

07 store it at plus six or plus four.

08 MR. NOMELLINI: So there are other factors that will

09 raise the yield above the 154; is that you are saying?

10 MR. FORKEL: Yes.

11 MR. NOMELLINI: What are those factors?

12 MR. FORKEL: There is at least a dozen of them. They

13 have been analyzed in the EIR. Primarily, probably one of

14 the more important ones, for example, is daily operations.

15 Some of the monthly modeling smooths out some of the daily

16 operations. And that would allow the project to operate a

17 little bit more often.

18 MR. NOMELLINI: That is going to be analyzed later

19 somehow?

20 MR. FORKEL: I think that once we have our final terms

21 and conditions, we are going to do our analysis. I assume

22 there will be a final EIR that will be look at the final

23 terms and conditions.

24 MR. NOMELLINI: With regard to the -- guess that is an

25 important determination for you to see if the project is

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01 feasible?

02 MR. FORKEL: That's correct.

03 MR. NOMELLINI: It is also important to us to know

04 whether it's feasible enough for you guys to go forward to
05 do the things that you say are going to do.
06 If the Board set forth trial criteria, for example,
07 that they would include in a permit, but not issue a permit,
08 would that allow you to develop this position as to the
09 feasibility?
10 MR. FORKEL: I'm sorry, what is that again?
11 MR. NOMELLINI: If the Board withheld granting a
12 permit, but specified proposed conditions that would define
13 what you have to operate with, as conditions on the permit.
14 You need to know that in order to further evaluate the
15 feasibility, right?
16 MR. FORKEL: Right.
17 MR. NOMELLINI: You can do that without having a
18 permit, as long as you know what the conditions are going to
19 be, correct?
20 MR. FORKEL: Assuming we know what the terms and
21 conditions would be, yes.
22 MR. NOMELLINI: Last question. With regard to Kemper,
23 and I missed the other names, the people with the money, are
24 they prepared to finance these improvements without third
25 party financing?

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01 MR. FORKEL: I am here to talk about operations.
02 MR. NOMELLINI: You are not --
03 MR. FORKEL: I am not the right person.
04 MR. NOMELLINI: Thank you.
05 HEARING OFFICER STUBCHAER: Thank you, Mr. Nomellini.
06 Mr. Maddow.
07 MR. MADDOW: Thank you.

08 ---oOo---

09 REBUTTAL CROSS-EXAMINATION OF DELTA WETLANDS PROPERTIES
10 BY CONTRA COSTA WATER DISTRICT
11 BY MR. MADDOW

12 MR. MADDOW: Afternoon, Mr. Forkel. It's been a long
13 time. Try to keep this brief.

14 This morning you testified about replacement of
15 evaporation losses. I just wanted to be sure that I
16 understood your testimony.

17 Did I hear you say that during wetter periods you
18 anticipated use of the new rights which you have applied
19 for, for water to replace evaporation losses?

20 MR. FORKEL: Yes. That is correct. When the reservoir
21 islands are full, during wetter periods, there is still
22 often some surplus water available as you go into the
23 summer. And the modeling that has been done and our project
24 Final Operations Criteria includes the ability to divert
25 some of that water to replace evaporative losses.

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01 MR. MADDOW: As I understand it, there are some periods
02 of time when you would be using other rights as the source
03 of water for replacement of the evaporation; is that correct?

04 MR. FORKEL: In the current modeling we have done for
05 yield, 154, there wasn't a quantitative analysis of that.
06 In the DW-4, I believe, Jones & Stokes looked at that and
07 came up with a qualitative approach and felt there was some
08 additional water there, but we are not including it in the

09 154 yield.

10 MR. MADDOW: You testified this morning that the
11 environmental storage element, I think I have the term
12 right, environmental water storage element, perhaps is the
13 way you said it, of the Fish and Game Biological Opinion,
14 would amount to what you characterize as a taking of the
15 Delta Wetlands' property.

16 Is it your contention that the Delta Wetlands currently
17 has property which could be taken in the means which you
18 described? Do you currently have a water right which could
19 be taken by means of imposition of that kind of regulatory
20 action? Is that what you were suggesting?

21 MR. FORKEL: What I was suggesting was that the
22 environmental storage that is included in the Fish and Game
23 is different than the one that is included in the federal
24 opinions in the Final Operations Criteria, which dedicates a
25 percentage of the water that we are discharging for export

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01 as available to be exported. So they limit how much of the
02 water is available to be exported. Just like a diversion
03 side there is surplus water, and the limit what is available
04 for us to take.

05 The Fish and Game proposal takes a percentage of water
06 that we have diverted onto the island and that is what I was
07 determining as a take.

08 MR. MADDOW: So the sequence for such a taking to occur
09 would have to be that a permit is issued based upon the
10 federal limitations, and then the Department of Fish and
11 Game proposed limitations would be imposed on top of that.
12 Is that what you are saying?

13 MS. SCHNEIDER: Mr. Stubchaer, I think there is some
14 line here between asking for legal opinion and asking for
15 clarification. If he would be careful not to ask a legal
16 opinion of Mr. Forkel.

17 MR. MADDOW: I appreciate that admonition by counsel.
18 I was really only trying to get clarification of his
19 testimony this morning, Mr. Stubchaer.

20 HEARING OFFICER STUBCHAER: And as usual, we ask a
21 witness only to answer if they can, to the best of their
22 ability, and, if they can't, they can say so.

23 MR. MADDOW: Perhaps I can cut through by asking a
24 question that maybe gets right at it.

25 Is it your contention that if the water right was
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01 issued by the Board and then in some way the Department of
02 Fish and Game limitation was applied, that a taking would
03 occur?

04 MR. FORKEL: The way I understand it, as I testified to
05 this morning, was that the Fish and Game criteria requires
06 Delta Wetlands to give them a certain percentage of the
07 water that we have diverted. And that is what I interpreted
08 as a taking, and, beyond that, I think it calls for a legal
09 opinion.

10 MR. MADDOW: Fine. Thank you.

11 You just had a little dialogue with Mr. Nomellini
12 concerning limitations that could affect yield.

13 Is it your understanding that the fall midwater trawl

14 index could also constitute a limitation on the diversions
15 as described in the Delta OCAP?

16 MR. FORKEL: Yes. That is certainly one measure that
17 would affect our yield.

18 MR. MADDOW: In determining that the project could
19 yield 154,000 acre-feet, was the fall midwater trawl index
20 modeled, Mr. Forkel?

21 MR. FORKEL: The fall midwinter trawl index was not
22 included in the calculation that led to 154.

23 MR. MADDOW: So, if you were to apply the limitations
24 when the fall midwater trawl index is below 239, then the
25 analysis leading to the 154,000 acre-foot yield would no

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01 longer be accurate; is that correct?

02 MR. FORKEL: No. I think the 154 number is the index
03 that we have been using. And there are lots of different
04 measures, and we are focusing on that number because we can
05 easily quantify that. There are lots of unquantifiable
06 measures. You have identified clearly one that is going to
07 cut our yield, and there are others that go both ways.

08 MR. MADDOW: I understand. You testified this morning
09 that you have had conversations, that Delta Wetlands has had
10 conversations with potential buyers, and you talked about
11 your marketing program. I went back and looked at my notes.
12 I was a little unclear whether you were talking about
13 potential buyers of the water or potential buyers of the
14 project.

15 Can you tell which you were referring to?

16 MR. FORKEL: I would say both. We've talked to
17 potential buyers about buying the water, and there are
18 certain people that might be interested in the water or
19 might be interested in the project. So, our discussions
20 have gone both ways.

21 MR. MADDOW: Are you in a position to tell us who some
22 of those potential buyers are?

23 MR. FORKEL: No, not really at this time.

24 MR. MADDOW: Can you tell us the price for per
25 acre-foot for the water sales that have been discussed?

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01 MR. FORKEL: There is a great deal of variability at
02 this time in the process. And the best I could come up
03 initially when cross-examined on this, is to go back to some
04 initial marketing studies where I, if I remember correctly,
05 I said it's in the ballpark of 2 to \$300 an acre-foot. We
06 don't know what our yield is; we don't know what costs are.
07 We don't know when we get our permit. All of these things
08 tie into the cost of the water. So I can't be anymore
09 accurate than that.

10 MR. MADDOW: You testified this morning that one of the
11 potential project killers that you had heard about during
12 the earlier phases of the proceeding was the CUWA discharge
13 term; is that correct?

14 MR. FORKEL: Yes.

15 MR. MADDOW: Would you agree that if Delta Wetlands
16 operate in a manner in which it discharges in the months of
17 July, August, and September, that in that period of time
18 with the discharge of water from the Delta Wetlands'

19 reservoir islands would increase TOC in the Delta channel?
20 MR. FORKEL: No, I would not. I think you would have
21 to look at the modeling and you would have to compare
22 it. There are certainly years when we don't operate at
23 all, and we have no discharges. And in lieu of having
24 20,000 acres of ag discharges coming out during that period
25 of time, there would be a benefit. We have reviewed or we
0173 have provided testimony, our experts have, that showed there
01 is some potential for increases during our discharge. But
02 we were looking at running quarterly averages. You know, if
03 you have 11 months of benefit and one month of impact, you
04 need to look at the whole picture.
05 MR. MADDOW: During that one month that you just stated
06 or perhaps for the entire three months that I referred to,
07 there would be or at least could be, as you stated, TOC
08 increased in the Delta channel when Delta Wetlands is
09 discharging. Is that your testimony?
10 MR. FORKEL: I would say it is possible.
11 MR. MADDOW: You are suggesting to the Board, that if
12 there are such increases, that they should, Board should, in
13 public interest, permit those increases in TOC to occur
14 because, if you take an annual average view or a longer
15 average view, things are going to be the same or a little
16 bit better. Is that correct?
17 MR. FORKEL: I think what the analysis has shown, the
18 Draft EIR in testimony, is that there does not appear to be
19 a change. And we've reviewed the data and it appears to be
20 on an average annual basis a net benefit. In the mitigation
21 measures that have been proposed in the EIR actually address
22 the individual month discharge, and they've suggested a
23 mitigation measure to assure that during this period of time
25 there are no significant impacts associated with the loading
0174 of DOC.
01 MR. MADDOW: You've heard enough of the testimony --
02 you've heard all of the testimony, so, therefore, I am sure
03 you are aware that there is some controversy about those
04 issues, Mr. Forkel, and just acknowledging there is such
05 controversy for a moment, I want to be sure that I
06 understand the approach that Delta Wetlands is making to
07 this Board.
08 Is it your testimony that the economic feasibility
09 issues are matters that should override consideration of the
10 water quality issues, the fisheries impact issues, et
11 cetera, that have been raised by protestors.
12 MR. FORKEL: I certainly can't say which one should
13 rule out. I am just saying that from an operational
14 standpoint and project feasibility, if the measure has a
15 zero tolerance allowed during the period that we discharge
16 and it ignores the net impact associated with the project,
17 either on a monthly or annual basis, the project viewed in
18 that very limited context just won't work with those terms
19 and conditions.
20 MR. MADDOW: Trying to get at it from a slightly
21 different perspective. I was going to ask you pull back
22 from the individual trees and look at the forest for just a
23

24 moment, Mr. Forkel.
25 Protestants to Delta Wetlands' applications have
0175 suggested that the water quality impacts are adverse. And
01 if we presume for the moment that the Board in its
02 deliberations at the conclusion of this hearing should
03 concur with the protestants, are you suggesting that the
04 potential economic and water supply benefits of the project,
05 as you have proposed it, should override those water quality
06 issues?
07
08 MR. FORKEL: Kind of lost you there. Give me the
09 question again.
10 MR. MADDOW: If the Board, in its deliberations at the
11 conclusion of the hearing, agrees with the protestants
12 insofar as they have asserted there are adverse water
13 quality impacts that would result if the project goes
14 forward, if you accept that as my hypothesis for the moment,
15 then is Delta Wetlands suggesting that the potential for
16 water supply benefits of the project and the economic
17 benefits from the project would override those adverse water
18 quality impacts?
19 HEARING OFFICER STUBCHAER: Ms. Brenner.
20 MS. BRENNER: Mr. Stubchaer, I would just like to raise
21 an objection. One, the question has been asked and
22 answered. The witness attempted to answer this particular
23 question already. I believe he has given his best answer,
24 and I also believe Mr. Maddow, once again, is entering into
25 what I consider a legal issue in this particular instance.
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01 MR. MADDOW: May I respond?
02 HEARING OFFICER STUBCHAER: Yes.
03 MR. MADDOW: You have a CEQA matter before you.
04 Overriding considerations which is one of the issues that
05 the Board will have to deal with ultimately, could have to
06 deal with ultimately in that regard. And we have been
07 trying to understand the Delta Wetlands' presentation with
08 regard to that particular CEQA issue. And I was trying to
09 understand from the operational considerations that Mr.
10 Forkel has testified about in his rebuttal testimony,
11 whether the economic interests that he talked about when he
12 was describing the marketing plan, et cetera, are
13 sufficient, in his opinion, to override the water quality
14 impacts that we have talked about throughout the balance of
15 the proceeding.
16 HEARING OFFICER STUBCHAER: As I recall your question,
17 you did not say significant impacts; you just asked for
18 impacts. So from a CEQA point of view, I think that makes a
19 big difference.
20 MR. MADDOW: I did not use the word "significant." I
21 agree. I can rephrase the question to include it.
22 HEARING OFFICER STUBCHAER: Mr. Forkel, can you answer
23 the question?
24 MR. FORKEL: In my review, as a engineer, of the Draft
25 Environmental Impact Report, it says that there is no
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01 unmitigable significant impacts associated with water
02 quality. So, I would have to rely on that instead of your

03 hypothetical.

04 So, I mean, to me there is not a significant impact.
05 So, I guess, I don't I feel comfortable going beyond that in
06 answering the hypothetical question.

07 MR. MADDOW: That is fair. That is all I have, Mr.
08 Forkel, thank you very much.

09 HEARING OFFICER STUBCHAER: I don't remember who is
10 third. There were only three who raised their hands before.
11 You want to also?

12 MS. MURRAY: We were just sitting down. In confusion I
13 didn't realize that Mr. Forkel was going to be up
14 there.

15 HEARING OFFICER STUBCHAER: Ms. Crothers.

16 ---oOo---

17 REBUTTAL CROSS-EXAMINATION OF DELTA WETLANDS PROPERTIES

18 BY DEPARTMENT OF WATER RESOURCES

19 BY MS. CROTHERS

20 MS. CROTHERS: This is kind of a follow-up on Mr.
21 Maddow asked a similar question. I just wanted to clarify a
22 bit further in terms of the topping off that is proposed and
23 that you were discussing the modeling that went into in
24 determining your yield. For purposes of the topping off
25 water, is it correct that you have already included in the

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01 modeling the topping off under the use of the water that you
02 you will obtain through new appropriative rights?

03 MR. FORKEL: Yes. There is a portion of the time when
04 we top off our reservoirs with water that is available in
05 the Delta and is still in surplus condition as we get into
06 June and July and into the summer.

07 There is a portion of topping off using new
08 appropriative rights within the 154 yield that we discussed.

09 MS. CROTHERS: In the OCAP you've stated that topping
10 off would be used with prior existing water rights. Why is
11 that described that way in the OCAP?

12 MR. FORKEL: There is two issues here. The first is
13 just regular replacement of evaporative losses that will
14 occur at any time. If we fill the reservoirs in December,
15 there is going to be evaporation that is going to occur. If it
16 is a wet year, we can continue to have some diversions on
17 the reservoir throughout the rest of the year until it is
18 time to export that water or the Delta goes into balanced
19 condition and there is no longer water available.

20 So, that is what has been modeled. Separate and apart
21 from that, we have had a measure that was -- that came up
22 through our ESA, CESA consultation that was an attempt to
23 recover some additional topping off water later in the year.
24 And what we identified was the only value from topping off
25 associated with this water would be when the Delta was no

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01 longer in balanced conditions -- I mean, no longer in excess
02 conditions. Otherwise, we have already included in our
03 modeling.

04 So the only way we felt that it would be possible to
05 put water on the reservoirs during this time was with our
06 existing rights. And it hasn't been modeled yet, and I am
07 not a water rights attorney and I can't make a decision on

08 whether we can or cannot do that. But we have looked at,
09 and previously included the other replacement of evaporative
10 losses.

11 MS. CROTHERS: If there were times in the summer when
12 the Delta was in excess conditions, then you would just use
13 your new appropriative rights for topping off?

14 MR. FORKEL: Yeah, that's right. For example, last
15 year I don't know if the Delta ever went into balanced
16 conditions. I believe it was in excess the whole year. And
17 we wouldn't have been able to have a demand for our water, a
18 likely demand. So we would use our new appropriative right
19 to continue to replace evaporative losses.

20 MS. CROTHERS: So the yield estimates aren't dependent
21 on using your old water rights for making up this
22 evaporative losses?

23 MR. FORKEL: The 154 number doesn't include it, but it
24 goes in the things on either side that could affect that
25 index number, 154. So, Fish and Game feels that that is

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01 some additional water that the project could have, and there
02 are other things that could be minuses, but it is not in the
03 154.

04 MS. CROTHERS: Thank you.

05 HEARING OFFICER STUBCHAER: I want to ask a question.

06 Ms. Brenner, how extensive is your cross-examination of
07 Mr. Denton?

08 MS. BRENNER: I am not sure yet.

09 HEARING OFFICER STUBCHAER: That isn't helping me
10 decide whether we should have a break or not.

11 MS. BRENNER: I would like a break.

12 HEARING OFFICER STUBCHAER: We will take our afternoon
13 break.

14 MR. ROBERTS: Mr. Stubchaer, one more thing.
15 Apparently Dr. Losee has vacation plans for August 19th and
16 20th. Couple options. He is here today, could be
17 cross-examined. Another is Dr. Shum was a co-author of CUWA
18 Exhibit 14, and he would be available on those dates.

19 HEARING OFFICER STUBCHAER: I think we will try -- you
20 wish to cross-examine him?

21 MS. BRENNER: You know, I went into this day with the
22 idea that there was only a couple people I had to worry
23 about with regard to cross-examining. I have no idea.

24 MR. ROBERTS: Again, Dr. Shum was co-author of CUWA 14,
25 and he will be available for cross-examination on the 19th

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01 and 20th.

02 HEARING OFFICER STUBCHAER: We will think about it
03 over the break. It is true that it doesn't give
04 preparation. We thought we had worked out two and now we
05 have three.

06 We will discuss it after the break.

07 (Break taken.)

08 HEARING OFFICER STUBCHAER: We will reconvene the
09 hearing.

10 I would like to discuss Dr. Losee's situation. You
11 mentioned, Mr. Roberts, that you have a co-author of the
12 exhibit. However, it appears to be me, just by listening to

13 the testimony, that one of the authors is an expert on how
14 the organics get into the water and the events that happened
15 in the flooded island. The other expert is more on the
16 treatment and the cost and the impacts and things like that.
17 And so having just one available for cross-examination
18 really appears to be not complete.

19 MR. ROBERTS: Mr. Stubchaer, are you thinking of Mr.
20 Krasner as the expert on the treatment and the cause?

21 HEARING OFFICER STUBCHAER: No.

22 MR. ROBERTS: Dr. Shum would be the co-author.

23 HEARING OFFICER STUBCHAER: I may have it mixed up
24 then. I thought --

25 MR. ROBERTS: I believe --

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01 HEARING OFFICER STUBCHAER: You had Mr. Krasner and Dr.
02 Losee. Dr. Losee is the one with the problem?

03 MR. ROBERTS: On this particular exhibit, though, Mr.
04 Shum helped prepare it. He wasn't on the panel this
05 morning. He helped prepare it. He could answer any
06 questions involved in the three points raised in that
07 Exhibit 14.

08 HEARING OFFICER STUBCHAER: Ms. Brenner, do you have
09 any comments?

10 MS. BRENNER: I consider Dr. Losee and Dr. Shum's
11 expertise a little bit different. You know, I would like
12 the opportunity to cross-examine Dr. Losee, if that is what
13 the Delta Wetlands' team decides to do. I am not in a
14 position to waive that right at this time, without having
15 the opportunity to review his rebuttal testimony and giving
16 it some thought.

17 I just came in today with the idea of cross-examining
18 one particular person and was not focussed on rebuttal
19 testimony of Dr. Losee this afternoon or this morning. I am
20 not in a position to waive that. I would be in position to
21 discuss it at a future date, perhaps next week, after I have
22 had an opportunity to discuss it with my experts. My
23 experts weren't here today to listen to Dr. Losee's
24 testimony. I just consider Dr. Shum and Dr. Losee to have
25 different expertise.

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01 HEARING OFFICER STUBCHAER: You knew that he was going
02 to testify today?

03 MS. BRENNER: We were in a position, but we would not
04 be cross-examining until the 19th, and we would have the
05 transcript to be discussed with my experts prior to my
06 opportunity to cross.

07 HEARING OFFICER STUBCHAER: That I understand.

08 MR. ROBERTS: Dr. Losee is available --

09 HEARING OFFICER STUBCHAER: Excuse me, just a minute.
10 You said you could discuss it next week; what do you
11 mean by discuss it next week?

12 MS. BRENNER: I haven't made a final decision whether I
13 need to cross-examine him on his rebuttal testimony. I am
14 willing to try make that decision sometime before the 19th.
15 But without discussing his rebuttal testimony with my
16 experts and other people, I am not going to make the
17 decision whether I want to cross-examine him or not.

18 HEARING OFFICER STUBCHAER: So the discussion is with
19 your experts?
20 MS. BRENNER: Right.
21 MR. ROBERTS: Dr. Losee is a limnologist, but in this
22 particular exhibit there really was no limnology involved.
23 It was basically hydrology, which K. T. Shum would be
24 perfectly able to testify to.
25 MS. BRENNER: Mr. Stubchaer, I am willing to try and
0184 make an agreement, but prior to when Dr. Losee needs to
01 leave, as to whether Dr. Shum can answer all the questions I
02 may have, but I am not willing to make that decision today.
03 HEARING OFFICER STUBCHAER: I understand. I don't know
04 where that leaves Dr. Losee.
05 MS. BRENNER: I don't know when he needs to leave.
06 DR. LOSEE: The sooner I could have the information,
07 the better. The 14th is when I would be leaving.
08 MS. BRENNER: I am sure we can discuss the issue prior
09 to 14th, and I am willing to try to accommodate his vacation
10 schedule, just as I was willing to accommodate Dr. Denton's
11 vacation schedule. I am not trying to be unreasonable. I
12 am just trying to retain what I perceive are very important
13 rights in this particular hearing.
14 HEARING OFFICER STUBCHAER: Time out.
15 (Discussion held off record.)
16 HEARING OFFICER STUBCHAER: Back on the record.
17 Ms. Leidigh just suggested a possible solution. That
18 is a deposition.
19 MS. BRENNER: Sure.
20 MR. ROBERTS: That would be acceptable if they think
21 they need to question Dr. Losee and Dr. Shum doesn't fit the
22 bill.
23 HEARING OFFICER STUBCHAER: We will just add it to the
24 record. Sure.
0185 MR. ROBERTS: Thank you.
01 HEARING OFFICER STUBCHAER: Thank you, Ms. Leidigh.
02 HEARING OFFICER STUBCHAER: Now, Ms. Murray.
03 ---oOo---
04 REBUTTAL CROSS-EXAMINATION OF DELTA WETLANDS PROPERTIES
05 BY DEPARTMENT OF FISH AND GAME
06 BY MS. MURRAY
07 MS. MURRAY: I want to -- for the record, this is
08 Nancee Murray for the Department of Fish and Game.
09 I want to follow up on DWR's questioning about the
10 evaporative loss modeling.
11 If I understand you correctly, you testified that you
12 modeled some of evaporative losses, but not all; is that
13 correct?
14 MR. FORKEL: What I said was the modeling that was done
15 by Jones & Stokes included the replacement of evaporative
16 losses during periods of time when the Delta was in surplus
17 condition and there was water available. And that was
18 throughout the year, including some of the summer months.
19 MS. MURRAY: How do you explain Delta Wetlands Exhibit
20 4, a letter to Jim Munroe, December 20, 1996, Page 3? And I
21 will read it.
22

23 DW diversions to offset the reservoir
24 evaporative losses in June through October
25 are not simulated. (Reading.)

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01 I'm confused. Please explain that discrepancy.
02 MR. FORKEL: Could I review a copy of it? Page 4?
03 MS. MURRAY: Page 3, third bullet, first sentence.
04 MR. FORKEL: I guess I would have to direct you to
05 Table 2A.
06 MS. MURRAY: What exhibit?
07 MR. FORKEL: DW-4.
08 MR. NELSON: Can I clarify the record? I believe Ms.
09 Murray said this was a Delta Wetlands' letter. It is a
10 letter from Jones & Stokes Associates to Jim Munroe, not a
11 letter from Delta Wetlands to Mr. Munroe.
12 HEARING OFFICER STUBCHAER: You agree with that
13 clarification?
14 MS. MURRAY: Yes.
15 MR. FORKEL: Table 2A, it's almost at the end. If you
16 look at the July column, it shows diversions to storage and
17 there is a bunch of 65s, at 65 cfs. That shows that there
18 are some diversions, and they are to replace evaporative
19 losses. I didn't write this letter. You may want to talk
20 to or cross-examine Jones & Stokes on it, to explain that
21 particular bullet.
22 But the way I interpret it, the model results in Table
23 2B, I think that is what the results are looking at. I am
24 sorry, 2A. There are certainly some diversions during the
25 summer months, as well as the spring months, that replace
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01 water that evaporates on the reservoir.
02 MS. MURRAY: To your knowledge, is it your
03 understanding that those were included in Jones & Stokes'
04 model despite -- what is your understanding of those
05 diversions?
06 MR. FORKEL: I think I explained that. When I
07 interpreted the model, that there was some replacement as
08 evaporative losses when there was surplus water available.
09 MS. MURRAY: You testified that yield effects and DFG
10 measures were modeled to show reduction in yield from 154 to
11 106.
12 Do you recall that?
13 MR. FORKEL: Yes.
14 MS. MURRAY: Was this change a result of the RPM's only?
15 MR. FORKEL: I was going from the work Jones & Stokes
16 did that is in DW-5, and it included the measures that were
17 being proposed for the March 25th memo, and it included the
18 RPM's and ACMS that are in your current document.
19 MS. MURRAY: In effect, that change from 154 to 106
20 would be a result of not just the RPMs, but also the ACMS?
21 MR. FORKEL: Yes, that's right.
22 MS. MURRAY: You also testified that a 15-day window
23 for diversion limitation is a powerful tool.
24 Hypothetically, for the month of February what would happen
25 if you used up your 15 days, what would happen during the
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01 rest of the month?

02 MR. FORKEL: The way that the Delta Wetlands Project
03 fills is a function of the head differential between
04 channels and the reservoir islands. So, our capacity to
05 divert water reduces throughout the month as the reservoir
06 becomes full. So during the first week or two, we have much
07 greater capacity. And if we can fill in three or four weeks
08 and the measures were applied for the first two weeks and
09 there are no more days available, then you would not have
10 the ability to limit based upon San Joaquin River flows.
11 However, you would also be at the tail end of our
12 filling process, when those flows would be very low anyway,
13 and you may not need to have a limitation at that time.
14 MS. MURRAY: And that your final operations could also
15 allow for fills in March? Again, you are not at the end,
16 you still have another month to go?
17 MR. FORKEL: I am assuming that we can still fill in
18 approximately a month, so we can't fill once we are full.
19 So at the end of the fill period, there may be some certain
20 amount of days when that protection is no longer available.
21 But whether they start --
22 MS. MURRAY: If you have a 30-day period and you apply
23 them for 15, is there 15 days --
24 MR. FORKEL: It is about half the time.
25 MS. MURRAY: You testified that a contract was needed
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01 to ensure environmental water releases are not exported,
02 and that that would be difficult to obtain.
03 You recall that?
04 MR. FORKEL: That is what I said, yes.
05 MS. MURRAY: Isn't it true that Water Code Section 1707
06 also would allow you to dedicate releases to the
07 environment? Are you aware?
08 MR. NELSON: Mr. Stubchaer, I would object to this.
09 She is asking a purely legal question that Mr. Forkel is not
10 a water attorney and that is something to be briefed.
11 MS. MURRAY: I can reformulate the question.
12 HEARING OFFICER STUBCHAER: Please do.
13 MS. MURRAY: Are you aware of any Water Code provisions
14 that allow for dedication?
15 MR. NELSON: That is asking whether he is aware of the
16 Water Code, and, again, it is a legal question.
17 HEARING OFFICER STUBCHAER: He can answer if he is
18 aware.
19 MR. FORKEL: I am not specifically aware of the terms
20 and conditions of that code, but I do know that there are
21 codes that exist that are associated with environmental
22 waters.
23 MS. MURRAY: Is it your understanding that DF&G is
24 asking the Board to require a portion of storage water to be
25 discharged to environmental benefits, environmental storage
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01 provision?
02 MR. FORKEL: I missed the first part of the question.
03 MS. MURRAY: Is it your understanding that we are
04 asking the Board to require Delta Wetlands to discharge
05 water for environmental benefits?
06 MR. FORKEL: Yes.

07 MS. MURRAY: To the best of your knowledge, does the
08 Board have the authority to condition Delta Wetlands' water
09 rights for releases for environmental benefits, to the best
10 of your knowledge?

11 MR. NELSON: Mr. Stubchaer.

12 HEARING OFFICER STUBCHAER: Where is that in the
13 rebuttal testimony?

14 MS. MURRAY: His statements regarding the
15 environmental water, the taking portion.

16 HEARING OFFICER STUBCHAER: Mr. Nelson.

17 MR. NELSON: He simply referred to and talked about
18 the footnotes addressing the environmental water, and he
19 addressed the fact that Fish and Game's request for up to 20
20 percent of Delta Wetlands Project, in his opinion, is a
21 take. That has nothing to do with whether or not the Board
22 has the authority to impose a term in, and Mr. Forkel did
23 not even address the Board's authority with respect to the
24 environmental water condition.

25 HEARING OFFICER STUBCHAER: Restate the question.

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01 MS. MURRAY: The implication was that the Board does
02 not have the authority to require this.

03 HEARING OFFICER STUBCHAER: Will you please restate the
04 question, so I can make my ruling?

05 MS. MURRAY: Is it your understanding that the Board
06 does not have the authority to require environmental water
07 releases?

08 HEARING OFFICER STUBCHAER: I will permit the witness
09 to answer if he knows the answer.

10 MR. FORKEL: I don't know. I don't know what they are
11 able to do or not able to do.

12 MS. MURRAY: What in the Final Operations Criteria
13 protects discharges of environmental water from being
14 exported?

15 MR. FORKEL: I am sorry, what?

16 MS. MURRAY: What provision in the Final Operations
17 Criteria protects environmental water now under federal
18 Biological Opinions from being exported?

19 MR. FORKEL: There is nothing that protects the
20 environmental water in the current final operations
21 criteria from being exported, other than the fact that the
22 fishery agencies can use that water as they see fit and
23 coordinate it with other efforts.

24 I don't believe that it is a problem. If it is well
25 coordinated, you could coordinate with the pulse flow. You

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01 could easily release this water.

02 My concern was that you are requiring us to make a
03 contractual guarantee for your discharges when they are at
04 your complete discretion.

05 MS. MURRAY: No further questions.

06 HEARING OFFICER STUBCHAER: Okay. I believe that was
07 the last party who wished to cross-examine Mr. Forkel.

08 Anyone else?

09 Staff? Mr. Sutton.

10 ---oOo---

11 REBUTTAL CROSS-EXAMINATION OF DELTA WETLANDS PROPERTIES

12 BY STAFF
13 MR. SUTTON: Mr. Forkel, just to follow up on that last
14 question in terms of whether or not the environmental water
15 would be exported or prohibited from being exported through
16 some sort of contractual arrangement.
17 Would this possibly -- would this provision of no
18 export of environmental water possibly be a contract term or
19 condition between Delta Wetlands and the purchaser of the
20 water?
21 MR. FORKEL: That would be one way to handle it.
22 MR. SUTTON: Thank you.
23 HEARING OFFICER STUBCHAER: Any other staff questions?
24 Thank you, Mr. Forkel.
25 Dr. Denton, Contra Costa Water District, and Ms.

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01 Brenner.
02 MR. MADDOW: Mr. Stubchaer, Dr. Shum is coming up, not
03 for the purpose of cross-examination, but in the event that
04 reference to overhead is necessary. It would be convenient
05 for him to do that.
06 Second, I would just like to note for the record that
07 during the break Ms. Leidigh showed me where there was a
08 copy machine which could be used. We've made copies and
09 distributed them of CCWD Exhibit 11, which was introduced
10 during Dr. Shum's rebuttal testimony.
11 HEARING OFFICER STUBCHAER: Thank you.
12 MR. MADDOW: Ms. Brenner, if you don't mind, I would
13 like to sit here during the cross, please. I will not be
14 distracting.
15 HEARING OFFICER STUBCHAER: As long as you don't coach
16 the witness.
17 MR. MADDOW: Believe me, I wouldn't even try.

18 ---000---
19 REBUTTAL CROSS-EXAMINATION OF CONTRA COSTA WATER DISTRICT
20 BY DELTA WETLANDS PROPERTIES
21 BY MS. BRENNER

22 MS. BRENNER: Good afternoon, Dr. Denton.
23 DR. DENTON: Afternoon.
24 MS. BRENNER: I want to go to your outflow idea that
25 you guys are assuming that the ag diversion, foregone ag

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01 diversion would never become outflow.
02 Isn't it true that there is a number of scenarios which
03 could occur and you must consider in determining whether the
04 foregone ag diversions will become outflow or not?
05 DR. DENTON: That's true.
06 MS. BRENNER: If we go to those scenarios, if the Delta
07 is in excess conditions, is deemed to be in excess
08 conditions, wouldn't the benefits of a reduced ag diversions
09 go to outflow?
10 DR. DENTON: The reduced diversions would go to
11 outflow. There probably wouldn't be benefit because it is
12 already excess.
13 MS. BRENNER: Okay.
14 If the Delta is in balanced condition, the
15 export/inflow ratio controls, isn't it also true the
16 benefits of the reduced ag diversions would go to outflow?

17 DR. DENTON: Not necessarily. There maybe other --
18 Contra Costa, for instance, could divert that water to Los
19 Vaqueros. The only thing would be for inflow.
20 MS. BRENNER: If you're in balance?
21 MR. DENTON: Yes. We have the right to redivert CVP
22 water. There has to be an accounting of water.
23 MS. BRENNER: So, there has to be an accounting of
24 water, but there is a possibility that the foregone ag would
25 would be going to outflow?

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01 DR. DENTON: Yes.
02 MS. BRENNER: If the Delta was in balanced conditions
03 and the Delta outflow is controlling, that would be the one
04 instance where the foregone ag diversion would not go to
05 outflow?
06 DR. DENTON: The Delta outflow or the water quality
07 standards which could be converted into equivalent outflows.
08 MS. BRENNER: That is one scenario that you are talking
09 about?
10 DR. DENTON: That is one we focused in on, but there
11 might be others.
12 MS. BRENNER: That is the one that is clear that there
13 would be the benefits of foregone ag diversion wouldn't
14 occur?
15 DR. DENTON: It might occur as a water supply benefit,
16 but not a water quality benefit.
17 MS. BRENNER: Would you describe the Fischer Delta
18 Model as a way to accurately predict salinity levels in the
19 Delta or as a comparative tool?
20 DR. DENTON: I think, as we testified earlier, it's
21 good for seawater intrusion modeling and for times when
22 agricultural drainage is not a major contributor. But
23 because of the crude way it has simulated, in terms of
24 spreading agricultural drainage over three areas only, if
25 you try to get down to individual island, you may have

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01 problems.
02 We have actually calibrated it over, I think, a 20-year
03 period and got good agreement, basically, in times when
04 there is agricultural drainage.
05 MS. BRENNER: It is useful are as a comparative tool.
06 Is it not?
07 DR. DENTON: Yes. If it is -- as long as it is good in
08 the absolute, it should be good as a comparative, as well.
09 MS. BRENNER: I would like to go to CCWD-7, Figure 1
10 that you have utilized in your rebuttal testimony today.
11 According to the CCWD G model estimate, what is the Rock
12 Slough chlorine if X2 is at Collinsville after X2 has been
13 higher or outflow has been higher, and the effect of outflow
14 is about 7,000 cfs?
15 We can put that figure up.
16 DR. DENTON: You are referring to just my looking at
17 the figure or want more general?
18 MS. BRENNER: If you look at the figure, I think you
19 can answer the question.
20 DR. DENTON: It could be as high -- you are talking
21 about Collinsville being 81 kilometers, and it could be as

22 high as 25, 26 --
23 HEARING OFFICER STUBCHAER: Your voice trailed off.
24 DR. DENTON: I was looking at the maximum value at 81
25 kilometers. There is a value for, I think, 2.7 kilometers,
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01 represent a salinity intrusion impact of about 26 milligrams
02 per liter chloride.
03 MS. BRENNER: What I am looking at is what would the
04 chloride level at Rock Slough be?
05 DR. DENTON: The actual absolute value?
06 MS. BRENNER: Right.
07 DR. DENTON: If we can put up --
08 MS. BRENNER: It has your chloride levels on that.
09 DR. DENTON: We have that table there. If you look at
10 base, Table 1, CCWD Exhibit 7, the continuation on -- it is
11 Page 10 of 13. If you look at that, the last three columns,
12 the first of those says that at the time maximum impact
13 occurs was down to 53 or 54 chlorides in the base case and
14 it rose to 80 chlorides. In the several months prior to
15 that, it was obviously higher, up to 156.
16 MS. BRENNER: That is if X2 is at Collinsville?
17 DR. DENTON: Yes.
18 MS. BRENNER: What is the chloride estimate if X2
19 location is near Chipps Island, so the GI reach is about
20 12,000 cfs?
21 DR. DENTON: You can't derive that from this because
22 this is dynamic and it is changing, and it depends not just
23 on the instantaneous outflow at that particular time.
24 You are asking a similar question what is this state --
25 MS. BRENNER: I am saying if X2 is stable, it's been
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01 there.
02 DR. DENTON: It has to be there for quite a long time
03 because the way a model accounts for it depends on not just
04 what the outflow history is, but how it gets translated all
05 the way from -- what is the stream average at Rock Slough?
06 MS. BRENNER: What is your G average?
07 DR. DENTON: I can look at one number here. So if you
08 state the question again.
09 MS. BRENNER: The chloride estimate, what is the
10 chloride estimate if X2's location is near Chipps Island, so
11 the G average is about 12,000 cfs?
12 DR. DENTON: So, you talked about 12,000. That would
13 be about 25, say, 25 chloride.
14 MS. BRENNER: If you understand, the scope of my
15 questions was is that the same type of answer you gave to
16 the first one where X2 is Collinsville, your G average is
17 about 7,000 cfs?
18 DR. DENTON: If X2 is at Collinsville, it is probably
19 closer to 50, the chlorides.
20 MS. BRENNER: What is the chloride estimate if X2 is
21 located at kilometer 71?
22 DR. DENTON: 71? If it was steady state, then that
23 would be around, I guess, around 25, again.
24 MS. BRENNER: About 25.
25 What will the effect of the outflow be to maintain X2
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01 at that 71?

02 DR. DENTON: That was raised the last time I was
03 cross-examined. Depending on which equation you used, if
04 you used the Kimmerer-Monismith equation, it would be 25.
05 If you look at Table 1, there is a whole range of scenarios
06 because it isn't in a steady state system. You can look at
07 a whole range of scenarios, depending whether it was higher
08 or lower previously, things like that.

09 MS. BRENNER: In Figure 1, why wasn't the no-project in
10 Delta Wetlands' operations chloride level shown?

11 DR. DENTON: Because we were looking at impacts of the
12 Delta Wetlands Project on chlorides at Rock Slough, so we
13 were just showing the changes. We could have done the
14 percentage changes, for instance. Here we are just on the
15 absolute changes.

16 MS. BRENNER: Just absolute changes from base?

17 DR. DENTON: Whatever the base condition was at that
18 time.

19 MS. BRENNER: To the project condition?

20 DR. DENTON: Change in Rock Slough chloride from the
21 base case to the with-project.

22 MS. BRENNER: Isn't the effect of the change in
23 chloride somewhat dependent on the actual chloride
24 concentration of the no-project condition?

25 DR. DENTON: It's, yes, dependent on a lot of factors,
0200 including that. Remember that these data are really a
02 replotting of Figure 1 of my original CCWD Exhibit 4, which
03 did, in fact, show both the base case and the Rock Slough
04 chloride axis Y-X or scattered plot. You can get that
05 information from there.

06 MS. BRENNER: Did you consider a 5 milligrams per liter
07 change to be significant?

08 DR. DENTON: As we testified earlier, in terms of the
09 Los Vaqueros modeling, there was a lot to do with the EIR.
10 We were concerned that modeling some of the models were not
11 able to model accurately below that.

12 So any number below that we considered additional
13 significance, and anything above that we looked at again.

14 MS. BRENNER: So, 10 milligrams per liter chloride
15 change, do you consider that significant?

16 DR. DENTON: Yes.

17 MS. BRENNER: 25 milligrams per liter chloride change
18 is also significant?

19 DR. DENTON: Right.

20 MS. BRENNER: In your opinion?

21 DR. DENTON: In my opinion. The only caveat on that is
22 that we also had the idea of a five percent change. So, if
23 you add Chipps Island or something like that where you've
24 already got a huge base case, chloride is small on that.
25 Actually, an estimate of the change to that magnitude would
0201 be a very, very small percentage change. So percentagewise
02 it would be not be significant, like Chipps or somewhere on
03 the ocean.

04 When you get down into the interior Delta and you are
05 talking about a change from 50 to a hundred or something

06 like that, then it is significant percentage change.
07 MS. BRENNER: 50 to a hundred, 50 milligrams per liter
08 change is?
09 DR. DENTON: Yes.
10 MS. BRENNER: Is it your understanding that the
11 proposed Delta Wetlands' mitigation measures would not allow
12 chloride impacts that you described on Pages 7 through 8 of
13 CCWD Exhibit 7, that is a change from 225 milligram per
14 liter to 300 milligrams per liter, even though the planning
15 model simulated this one exceedance?
16 DR. DENTON: Right. If the mitigation measure were
17 carried through, then that would be eliminated.
18 MS. BRENNER: I have nothing further.
19 HEARING OFFICER STUBCHAER: Thank you.
20 Anyone else, other than staff?
21 Staff?
22 Mr. Sutton.

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01 REBUTTAL CROSS-EXAMINATION OF CONTRA COSTA WATER DISTRICT
02 BY STAFF
03 MR. SUTTON: Dr. Denton, could you put up that Table 1
04 again that you just had up? I wanted to -- I thought I
05 heard you say something, and I wanted to clarify for the
06 record.
07 You were talking about the outflow in November and
08 December of 1979. And I thought I understood you to say
09 that it would have been more appropriate to wait until
10 January and February of 1980 to divert when the outflow was
11 much higher?
12 DR. DENTON: I was thinking more if there were a permit
13 condition that limited diversions or did not allow Delta
14 Wetlands to divert when the outflows were as low as they
15 would be in November or December of '79, they would have
16 still had the opportunity to fill in the next two months
17 because of the high outflows. X2 would have been beyond 71
18 or less than 71, and they could have filled.
19 In this case it would have just shifted it over by two
20 months and still would have been able to fill,
21 theoretically, without any reduction of yield.
22 MR. SUTTON: In November and December of 1979, you or I
23 or Delta Wetlands or anybody else didn't know that we were
24 going to get those kind of 107,000 cfs outflows in January?
25 DR. DENTON: No, we didn't. What you do is you do a

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01 modeling study where the whole series of statistical
02 probabilities of hydrology or historical hydrology and look
03 at the results. In other months, it could be a different
04 picture than what I was describing there for '79 and '80.
05 MR. SUTTON: Recognizing the limitations of
06 statistical modeling, I don't think anybody would have -- do
07 you anticipate that anybody would have guessed that would
08 have the two wettest years in history followed by the two
09 driest years in history this year?
10 DR. DENTON: No.

11 MR. SUTTON: Thank you.
12 DR. DENTON: I think the Delta Accord did it.
13 HEARING OFFICER STUBCHAER: Any other questions by
14 staff?
15 I have no questions, so thank you for your
16 participation.
17 Before we recess to Tuesday, August 19th at 9:00 a.m.
18 in this room, are there any questions or comments from
19 anyone?
20 Staff?
21 MR. CANADAY: Just the reminder to the parties to
22 update their exhibit lists, and we would like to have those
23 lists submitted that day.
24 HEARING OFFICER STUBCHAER: Ms. Brenner.
25 MS. BRENNER: I would like the Board to know and the
0204 people that are remaining in the room we have the written
01 testimony of Warren Shaul, the rebuttal testimony is
02 available now.
03 HEARING OFFICER STUBCHAER: Okay, we are in recess.
04 (Hearing adjourned at 3:30 p.m.)
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REPORTER'S CERTIFICATE

01
02
03
04 STATE OF CALIFORNIA)
04) ss.
05 COUNTY OF SACRAMENTO)
06
06
07
08 I, ESTHER F. WIATRE, certify that I was the
09 official Court Reporter for the proceedings named herein,
10 and that as such reporter, I reported in verbatim shorthand
11 writing those proceedings;
12 That I thereafter caused my shorthand writing to be

13 reduced to typewriting, and the pages numbered 7 through 204
14 herein constitute a complete, true and correct record of the
15 proceedings.

16

17 IN WITNESS WHEREOF, I have subscribed this certificate
18 at Sacramento, California, on this
19 6th day of August 1997.

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ESTHER F. WIATRE
CSR NO. 1564