0001

PUBLIC HEARING
STATE WATER RESOURCES CONTROL BOARD
DIVISION OF WATER RIGHTS
STATE OF CALIFORNIA

---o0o---

SUBJECT: AMENDMENT OF CITY OF LOS ANGELES' WATER RIGHT LICENSES FOR DIVERSION OF WATER FROM STREAMS THAT ARE TRIBUTARY TO MONO LAKE

---o0o---

Held in
Resources Building
Sacramento, California
Monday, December 20, 1993

VOLUME XXVI

---o0o---

Reported by: Kelsey Davenport Anglin, RPR, CM, CSR No. 8553

0002

BOARD MEMBERS

MARC DEL PIERO
JOHN CAFFREY
JAMES STUBCHAER
JOHN W. BROWN
MARY JANE FORSTER

STAFF MEMBERS

DAN FRINK, Counsel
JAMES CANADAY, Environmental Specialist
STEVE HERRERA, Environmental Specialist
RICHARD SATKOWSKI, Engineer
HUGH SMITH, Engineer

COUNSEL AND OTHERS

For the U.S. Fish and Wildlife Service:

ERIKA NIEBAUER
Assistant Regular Solicitor
Office of Solicitor
Pacific Southwest Region
2800 Cottage Way
Sacramento, California 95825

For the Sierra Club:

LARRY SILVER:

For California Department of Fish and Game:

HAL THOMAS
VIRGINIA CAHILL
McDonough, Holland & Allen
555 Capitol Mall, Suite 950
Sacramento, California 95814

For the U.S. Forest Service:

JACK GIPSMAN
Office of General Counsel
U.S. Department of Agriculture

For the National Audubon Society and Mono Lake Committee:

BRUCE DODGE
PATRICK FLINN
Attorneys at Law
755 Page Mill Road
Palo Alto, California 94304

For California Trout:

RICHARD ROOS-COLLINS
CYNTHIA KOEHLER
Attorneys at Law
114 Sansome Street, Suite 1200
San Francisco, California 94104

For the City of LA and LA DWP:

THOMAS W. BIRMINGHAM
JANET GOLDSMITH
Attorneys at Law
Kronick, Moskovitz, Tiedemann & Girard
400 Capitol Mall, 27th Floor

Sacramento, California 95814

For State Lands Commission, Department of Parks and Recreation:

MARY SCOONOVER
Assistant Attorney General
1515 K Street
Sacramento, California 95814

For Meter Water District of Southern California and LA MWD:

VICTOR GLEASON
Attorney at Law
1111 Sunset Boulevard
Los Angeles, California 90050-0153

FRANK HASELTON
Haselton Associates

JOHN ARCULARIUS

0005

I N D E X

E X H I B I T S

0006

SACRAMENTO, CALIFORNIA
MONDAY, DECEMBER 20, 1993, 8:30 A.M.
---o0o---

HEARING OFFICER DEL PIERO: Ladies and Gentlemen, this hearing will again come to order. This is the time and place for the continuance of the hearing regarding the City of Los Angeles' water rights licenses for the diversion of water from tributary streams to Mono Lake.

When last we left, we were getting ready for a new panel; is that correct?

MR. FLINN: Yes, Sir. In a few minutes, Ms. Koehler will put on a panel of California Trout witnesses, and I'll explain how the panel's been divided up in a second.

Before we do that, there's some housekeeping matters I wanted to address. The first is to sort of advise the Board and the Staff and the parties about something about tomorrow's fisheries panel. Consistent with what has happened in some previous panels, we have decided to include Dr. Stine and Mr. Vorster on tomorrow's fisheries panel, but they will not be giving any direct testimony. They will be there only as resource people because as the testimony will elicit, the fisheries panel will rely in some measure on the

0007
work the two of them did, and we thought it'd be more efficient if they sat on the panel simply to answer any questions that might come up during the process of it. But again, there will be no direct testimony from either as part of that panel tomorrow.

The second is that I neglected, after the examination of the panel on aquatic productivity and birds, to move the admission of National Audubon Society and Mono Lake Committee Exhibit 237. This was the map of vegetation Dr. Stine identified from the Corey (phonetic) report, and at this point, I would ask that it be admitted.

HEARING OFFICER DEL PIERO: Forgive me, I'm sorry.

MR. FLINN: I was asking that National Audubon Society and Mono Lake Committee Exhibit 237, which is the Corey vegetation map Dr. Stine identified in the panel in which Dr. Herbst sat, I asked that that be admitted into evidence.

HEARING OFFICER DEL PIERO: Any objection?

MS. GOLDSMITH: No objection.

HEARING OFFICER DEL PIERO: The number?

MR. SATKOWSKI: 237.

(NAS/MLC Exhibit No. 237 was admitted into evidence.)

0008

MR. FLINN: Finally, a brief word about what we're going to do today. California Trout is putting on the first panel. Both of the subjects -- Audubon follows with the second. The subject of both panels is water supply and economics. It's not water supply first, economics second, but both. In the first panel is the Cal-Trout panel, Cal-Trout witnesses Dr. Dale and Mr. Fullerton. The second panel will include Dr. Dale, who is also an Audubon witness, but will include Drs. Trott and Campbell and Mr. Vorster. The is an interrelationship, as will be clear in the panels, but the division is between Cal-Trout and Audubon rather than by subject matter.

The final point I wanted to advise everyone is that one of our witnesses, Dr. David Campbell, is currently undergoing chemotherapy treatments. He is well enough to journey up here, but he gets tired easily, and I'm hoping that if we could -- if there's a need for a break or a recess or some other accommodation, that we can do that.

HEARING OFFICER DEL PIERO: We break for significantly less important things than that, Mr. Flinn.

(Laughter.)

MR. FLINN: I assured Dr. Campbell that that is

0009

the case, but I did want to alert everyone to that.

HEARING OFFICER DEL PIERO: We'll be more than happy to accommodate you.

MR. FLINN: Thank you.

HEARING OFFICER DEL PIERO: Good morning, Ms. Koehler?

MS. KOEHLER: Good morning, Mr. Del Piero.

HEARING OFFICER DEL PIERO: Did you have a nice weekend?
MS. KOEHLER: I had a lovely weekend. I hope yours was the same.
HEARING OFFICER DEL PIERO: Mine removed two and a half feet of correspondence from the last month and a half from my desk, and it was a great weekend because now I don't have to worry about it during the Christmas holidays.
MS. KOEHLER: These witnesses have not yet been sworn.
HEARING OFFICER DEL PIERO: Gentlemen, would you please rise and raise your right hand and answer affirmatively?
Do you promise to tell the truth during the course of this proceeding?
(All answer yes.)
HEARING OFFICER DEL PIERO: Please have a seat.

Proceed.

DIRECT EXAMINATION BY MS. KOEHLER

Q Mr. Fullerton, would be please identify yourself and spell your name for the record?
A MR. FULLERTON: I'm David Fullerton, F-U-L-L-E-R-T-O-N.
Q By whom are you employed?
A National Heritage Institute.
Q California Trout Exhibit 3-A is a document identified as the resume of David Fullerton. Does this document accurately state your education and experience?
A Yes.
Q Cal-Trout Exhibit 3-B is a document identified as a memorandum of understanding regarding urban water conservation in California dated September 1991. Did you rely on that document in preparing your testimony for this proceeding?
A Yes.
Q Cal-Trout Exhibit 3-C is a document entitled Assumptions and Methodology for Determining Estimates of Reliable Water Savings from the installation of ULF toilets dated July '92. Did you rely on that document in preparing your testimony for this proceeding?
A Yes.

Q Cal-Trout Exhibit 3-D is a document entitled Program Outline for Multi-Utility Clothes Washer Incentive Eligibility Standards dated August 15th, 1993. Did you rely on that document in preparing your testimony?
A Yes, I did.
Q Cal-Trout Exhibit 3 is identified as the testimony of David Fullerton. Did you prepare this exhibit?
A Yes.
Q Do you have any additions or corrections to make in your written testimony at this time?
A Yes, I do. In Paragraph 48, the number 150,000 should be changed to 100,000. That's Paragraph 48. In Paragraph 58, the words "objected by the hard conservation only scenario" should be deleted.

Q Is that all?
A Yes.
MR. HERRERA: Could you speak a little more directly into the microphone, please?
MR. FULLERTON: Is this better?
MR. HERRERA: Yeah, that's fine.
Q BY MS. KOEHLER: Would you please briefly summarize your professional experience relevant to this proceeding?
A I was the chief public interest negotiator in the

0012

negotiations leading to the urban conversation MOU. I was elected as the first convener of the urban conservation council and served in that office for two years until approximately two weeks ago. I developed, along with the Department of Los Angeles Water and Power and other agencies, the methodology used in the MOU for estimating the ULFT savings which are required both by law and by the MOU.
I also have extensive experience working with urban agencies on approved water management including the freeway process in which I was one of the founders, a negotiator, and a staff person. I've also served on several CWA, that's California Urban Water Agencies, advisory committees; one on urban reliability estimating the value of reliability, another on conservation and cost effectiveness analysis.
Q Would you please summarize your basic conclusions for the Board?
A I've got four basic conclusions that I draw from my work. One is that the demand for water projected in the DEIR for L.A. DWP is now out of date. It is far too high, and that required and proven conservation measures will dramatically lower the Los Angeles demand.
Secondly, Los Angeles can replace water that it

0013

might lose from Mono Lake under any alternative in the DEIR, and this remains true even if Club Fed standards reduce delta exports.
Third, the cost to DWP for replacing Mono water will be only a few dollars per capita per year for any of the alternatives in the DEIR.
And Fourth, the amount of Mono water at stake is less than 1 percent of the Southern California water demand, that internal adjustments within DWP can account for much of any loss that comes out of this proceeding, and that adjustments from Metropolitan can take care of much of the rest. In other words, any impact on Metropolitan is likely to be lost.
Q Mr. Fullerton, how did you reach these conclusions?
A Primarily through use of a very simple mass balance model which I constructed to model Los Angeles DWP. The model was developed along the same lines as the least cost model in the DEIR.
Q Why did you develop this model?
A Both Peter Vorster and I agreed that the DEIR model overstated the difficulty that DWP might face in coping with losses of Mono Lake water. In particular,

the demand use in that model was too high. The groundwater was not managed conjunctively; that is to

say, water was not built up in storage for use in dry years in that model. No value was given in the model to groundwater storage, and finally, it was a cumbersome model to use. So I developed a new model which is similar, but I think is a refinement on the DEIR model.

Q Would you summarize for the Board how your model works?

A Certainly. It's, as I said, a simple mass balance model. Water comes into the system, in this case, through the Los Angeles aqueduct, groundwater, reclamation, Metropolitan. There is a demand for that water, and you can input any demand you want for that water. And then there are assumptions about the cost of various supplies. And the model runs through a 20-year sequence, just as the model in the DEIR did.

The outputs from the model are the distribution of supplies; that is to say, in any given year, how much of any given supply was utilized by DWP in this 20-year sequence.

In addition, the cost of those supplies is calculated year by year and to the extent that there are any shortages, that is also noted year by year. The most fundamental change, again, that I made to the least cost model in the DEIR was the addition of a

much more sophisticated approach to looking at groundwater, so that we're doing multi-year planning, building up when supplies are available in the wet years, and then drawing down in the dry years in order to reduce impacts. I would note that this is very similar to the way that DWP actually operates its system.

Finally, I'd like to note that I developed the model and I developed conservation estimates resulting from appliances such as UFTs. The other supply and cost projections that were used in the model come from Larry Dale and the Audubon witnesses who will appear in the next panel.

Q Could you summarize for the Board your assumptions about the demand inputs used in your model?

A As I said, I felt the DEIR demand projections are outdated because of new things that have happened since 1990 when the projections were originally developed. Therefore, I and others involved have developed new projections for what we think can and should happen. And I can illustrate this using Figure 5 out of my written testimony.

Q We have -- we have copies of Figure 5 that we'll be happy to distribute for purposes of his report and discussion.

A If you look at this chart, which is Figure 5, the top line on the chart represents the demand projection made by L.A. DWP in 1990 --

MR. BIRMINGHAM: Excuse me. Excuse me. Ms. Koehler, is this Figure 5 from -- from

Mr. Fullerton's testimony?
MS. KOEHLER: Yes, it is. Mr. Fullerton should perhaps explain, we have made it a little cleaner for everybody to see for purposes of today's discussion, but it is precisely the same data.
MR. BIRMINGHAM: Then it's a modification of Figure 5?
MS. KOEHLER: It's not a modification of the information in Figure 5. It has simply been made easier to see visually.
HEARING OFFICER DEL PIERO: What's the issue?
MR. BIRMINGHAM: The only issue I raise is that the Figure 5 that has been put up appears at first glance to be different than the Figure 5 that's attached to the testimony and has a different scale and it has, in the testimony, it -- the vertical axis has different numbers on it than the vertical axis on this Figure 5. And I just wanted to make sure that it was the same.
MR. FULLERTON: I can address that. The data is

0017

the same. The scale has been changed for clarity. The cross bars -- there were no cross bars before. Two additional points have been added, which are 1991 and '92 L.A. DWP demand. That's the only actual addition to the chart. Otherwise, it's the same data.
MS. KOEHLER: Please proceed, Mr. Fullerton.
MR. FULLERTON: Thank you.
HEARING OFFICER DEL PIERO: Wait. Wait. Wait. Wait. Wait. Mr. Birmingham, do you wish to object?
MR. BIRMINGHAM: No. I don't think that -- I just wanted to make sure that it was the same graph. Apparently, there are some changes, but I can ask Mr. Fullerton about those changes.
HEARING OFFICER DEL PIERO: Okay. Please proceed, Mr. Fullerton.
MR. FULLERTON: I'll continue. The top line is the projection for 1990 made by DWP and utilized in the DEIR.
Moving down to the next line, we see the effects of what we're calling hard conservation. These are the additional savings that will result from installation of ULFTs and high-efficiency washing machines as a result of information -- as a result of law, as a result of the memorandum of understanding, all of which has occurred since 1990.

0018

The next line down is called hard conservation and pricing effect. This incorporates two additional savings which we believe will occur. The first is a savings of 10 percent, which will result from DWP's new pricing structure, and, Secondly, for the first five years, the demand is depressed to account for drought memory, which is the residual effect of the recent drought.
I would just note, going back one step to the hard conversation only line, that -- these savings result primarily from ultra low flush toilets and the methodology used is the one developed by the -- or in the MOU, the urban conservation MOU, and agreed to by

L.A. DWP. That's the methodology.
Finally, there are two additional points in the lower left hand of the graph, and these are, in 1991, L.A. DWP actual demand for 1992, estimated demand for DWP, and they're provided or put on the chart to provide context.
Q Could you now summarize for the Board the model outputs with regard to the water supply scenarios?
A Yes. I ran numerous scenarios with all kinds of changes to see how the system would react. I'd like to discuss two particular scenarios which I think are particularly relevant. One is what we call the base

0019

case. This is a least-cost scenario. It's not necessarily what DWP projects it will do in the future, but it's what we believe they can and should do if they want to achieve the lowest cost.
The second thing that I would like to present is what we call the worst-case scenario. It may not be the best choice of term, but it's the scenario in which the DWP system is, in a sense, stretched as far as we think is plausible.
Let me start with the base case. I can illustrate this with Figure 8 from my written testimony, if you put that up there. This, again, is the same data with the changed layout to make it easier to see. Basically, this is a graph over the 20-year sequence which shows the supply contributions year by year from the various sources of water available to DWP.
At the very bottom of this graph are contributions for Mono Lake water. The next step up, the green, are contributions from Owens. Above that, contributions from groundwater, then contributions from metropolitan, and finally, contributions from reclamation. And there would be, also, a notation for any shortages that were experienced.
The assumptions in coming up with this chart are, of course, the 6390 protective level that's indicated

0020

at the top. Also, I utilized LAMP runs for the inputs for the L.A. aqueduct using the same 20-year sequence as the DEIR. The demand, which is the very top of the envelope, represents the total demand of the DWP. This is our best estimate of demand with aggressive but plausible conservation. It's the equivalent of the hard-plus pricing effect in the last chart that I showed. It assumes conjunctive use, as I indicated, more dry year pumping, reclamation, which is approximately the same as that in the DEIR, and also DEIR assumptions about supplies available for Metropolitan.
The things I would want to leave you with on this chart are the ability of Metro -- or rather, the ability of DWP to cope better with dry years through the use of groundwater. If you look at the use of groundwater, you see that it is very successful at filling in the valleys in the supply available from the L.A. aqueduct, leaving a fairly small amount that needs to be made up from Metropolitan. In fact, in this particular run, the maximum net purchase is actually

only 177,000 acre-feet, and that compares to a preferential right, which is probably over 500,000 acre-feet in dry years.

The second case that I would like to discuss is

what we call the worst-case scenario. This is -- I can illustrate this with Figure 13 from my written testimony. Again, the format has been made more legible. This scenario, in our opinion, stretches the bounds of plausibility for what DWP might experience over the next 20 years. It's at the very highest lake level, 6410 that's considered in the DEIR. It has the highest level of demand that's considered in the DEIR starting at 700,000 and moving up to about 750,000. It uses the DEIR reclamation assumptions, and we have cut the dry year availability of Metropolitan by 25 percent to account for possible losses of supply availability from Metropolitan.

The thing that I would note about this chart is that we only have a maximum in this chart of purchase of 220,000 acre-feet. This was, in fact, the maximum allowed in dry years under this run. But that only causes one small shortage during these 20 years. And I would note again that the 220,000 acre-feet should be compared to what is probably a preferential right of over 500,000 acre-feet, so we're being very conservative.

Q Mr. Fullerton, in creating those two figures, did you assume that there would be Metropolitan water available for purchase by Los Angeles?

A Yes.

Q What was your basis for making this assumption?

A My assumption was based upon Metropolitan's own projections and I can illustrate this with a graph.

MS. KOEHLER: At this time, Cal-Trout would like to introduce a new exhibit and if Mr. Smith would be kind enough to tell us the next number in sequence.

MR. SMITH: This should be Cal-Trout 32.

MS. GOLDSMITH: What was the number?

MR. SMITH: Three two. Cal-Trout three two.

MR. FULLERTON: Referring to this graph, the top pair of lines here represents L.A. DWP's preferential right based upon Metropolitan's projections of their own future supply made in their bond statement. However, I would note that the Metropolitan supply doesn't include a full Colorado aqueduct. I believe Dr. Quinn suggested that they would have additional water from the Colorado, nor does it include transfers that Metropolitan might acquire through the Central Valley.

The bottom two lines represent the assumptions made in our -- in the NHI model. As you can see, they're much lower. I take this as strong evidence that the assumed availability of Metropolitan supply in the model is extremely conservative and perhaps even

overly conservative, but we wanted to be on the safe side.

Q BY MS. KOEHLER: Mr. Fullerton, are you aware of the

federal standards for delta protection which have been recently proposed?
A Yes, I am.
Q How would implementation of these standards as they have been proposed change MWD's ability to replace Mono Basin water for Los Angeles?
MR. BIRMINGHAM: Excuse me. I'm just going to, for purposes of the record,interpose an objection and note that this is going beyond the scope of the written testimony. I presume Ms. Koehler can get the same information on redirect because this will be a subject of my cross-examination, but she has now gone beyond the scope --
MS. KOEHLER: I don't believe that is correct. Mr. Fullerton, in his direct testimony, did discuss the possibility of -- since we were all anticipating the delta standards -- and therefore, he ran several scenarios of unreliable MWD water assuming explicitly the upcoming DWP standards those are Paragraphs 65 and 66 of his testimony.
HEARING OFFICER DEL PIERO: I'm going to overrule the objection. It's noted for the record.

0024

Proceed, Mr. Fullerton.
MR. FULLERTON: Thank you. I don't believe that the so-called Club Fed standards are likely to have any significant effect on Metropolitan's ability to provide water to make up for Mono Basin water. First of all, any gap between or any loss of Mono water, I think, is likely to be made up largely within the DWP service area. There's certainly a large gap between the conservation and reclamation projections which have been made by DWP and our projections, both in terms of the practices, in terms of the projects, in terms of the water. So I think that it's very likely that DWP will be -- will respond intelligently to any loss of water and will, in fact, increase its own efforts to develop water internally.
For any water that is, in fact, transmitted, in a sense, any impact that is transmitted to Metropolitan, I believe that at least a very large percentage of that is likely to be able to be made up by Metropolitan. They are in the process of a very aggressive program of water transfers, conjunctive use, storage, conservation and reclamation and appear very much on top of the situation and are very confident of being able to provide water in the future.
So I think the bottom line is going to be that any

0025

impact on Metropolitan out of this is likely to be very much less than 1 percent of the total Southern California demand, and it's going to be lost in the mist.
Q BY MS. KOEHLER: Mr. Fullerton, could you summarize for the Board your model's outputs regarding the costs to Los Angeles of replacing Mono Basin water?
A Yes, I can. I prepared a blow-up graph to illustrate this. Maybe we could raise that up so people can see that better. This is a composite graph which includes information from both Figure 15 and

Figure 16 in my written testimony that utilizes the same data.

The main thing to note on this graph is that looking -- starting at 6377 and going to 6410, which appear -- that appears to be the range of interest at the present time in this proceeding, the cost of lake level alternatives are really not very different.

In moving from the 6377 lake level to 6390, we're really looking at a per-capita, per-year impact of about $2.10 per person within Los Angeles. I would note by way of comparison that the DEIR numbers are roughly comparable to what we derived ourselves. The DEIR Figure 3-L-5 would estimate for this same jump in protection a cost of about $3.76 in moving from 6377 to

0026

6410. So we're a little lower, but still pretty much on the same line.

And finally --

HEARING OFFICER DEL PIERO: Excuse me, Mr. Fullerton. Mr. Flinn?

MR. FLINN: I was wondering if we couldn't have this particular document marked as an exhibit because it is a compilation. It would be helpful to refer --

HEARING OFFICER DEL PIERO: Do you have any problem with that?

MS. KOEHLER: I don't have any problem. That would be Exhibit 34?

MR. SMITH: 33.

HEARING OFFICER DEL PIERO: 33. Any objection to that? Mr. Birmingham?

MR. BIRMINGHAM: No.

HEARING OFFICER DEL PIERO: It will be so noted.

(Cal Trout Exhibit No. 33 was marked for identification.)

MR. HERRERA: Ms. Koehler, that's 20 minutes.

MS. KOEHLER: I request an additional 20 minutes. This is very complicated testimony.

HEARING OFFICER DEL PIERO: Granted.

MR. FULLERTON: The final point I would note about this curve or, in fact, both curves, if you see what

0027

I've done, I've superimposed the replacement cost curves for the best case and the worst case, and what you see is that the replacement cost is virtually identical in either case. I think that's significant. It shows that in a sense, whatever scenario is correct, the actual replacement cost is going to be more or less the same.

Q BY MS. KOEHLER: Mr. Fullerton, do you have a way of advising the Board as to the cost of the public trust revenue in this proceeding as opposed to the cost of the fish flow remedy?

A BY MR. FULLERTON: Yes, I do. And you'll be surprised to hear I've prepared a table to illustrate how this can be calculated.

MS. KOEHLER: We'd like to introduce this table as the next Cal-Trout Exhibit, 34.

HEARING OFFICER DEL PIERO: Mr. Birmingham?

MR. BIRMINGHAM: Same objection I've previously voiced.

MS. KOEHLER: My response to Mr. Birmingham's objection is that this chart is precisely parallel to L.A. DWP Exhibit 87, which was introduced on direct examination of Mr. Gewe by Mr. Birmingham. It's an exhibit that was certainly much farther afield in Mr. Gewe's direct testimony than Mr. Fullerton's. All

0028

of the information in this chart was derived from data that has previously been introduced to the Board, and since it was produced by Los Angeles in response to questions for Board Member Forster, we felt it was only appropriate to introduce the same type of information to respond to those questions as well.

HEARING OFFICER DEL PIERO: I'll overrule the objection.

(Cal Trout Exhibit No. 34 was marked for identification.)

MR. FULLERTON: This table represents the cost of water -- the amount of water and the cost of water needed over and above Fish and Game flows to achieve some of the various lake levels. If you look at the second column, you see that assuming -- in other words, assuming Fish and Game flows are given to reach the 6377 Mono Lake level costs nothing, either in water or in money, over the first 20 years or thereafter. To reach a 6383.5 Mono Lake level, costs approximately 10,000 acre-feet a year and about $3.9 million a year. And similarly, 6390 costs about 13,000 acre-feet and about $5.0 million a year, and 6410 costs about 19,000 at $8.0 million a year. These are outputs of the NHI model.

Q BY MS. KOEHLER: Mr. Fullerton, are you familiar with

0029

L.A. DWP Exhibit 87, a chart that's similar in title and format to this one?

A Yes, I am.

Q Are the cost figures on that chart similar to this one?

A The costs are much higher on that chart for two reasons. First of all, that chart assumes much lower fish flows, therefore, the cost of going to higher lake levels is going to be higher. Secondly, that chart did not allow any diversions whatsoever from Mono Lake during the transition period while the lake was moving up to its assigned lake level. By contrast, the numbers here do, in fact -- they are based upon LAMP runs, and they do, in fact, allow for exports from the Mono Basin. I think those are the two main differences why we see different numbers.

I guess -- if I could continue, my conclusions are very simple. One is, in a sense, that I think that the DEIR results are essentially correct, that the numbers we have come up with are similar. They show that, I think, DWP is better off than indicated in the DEIR, but they're still in the same ballpark. And what either of those mean is that the loss of Mono water will not translate into either shortages for Los Angeles or to significant expenses.

0030

MS. KOEHLER: That concludes my direct examination

of Mr. Fullerton. I have several questions for Dr. Dale as well.

HEARING OFFICER DEL PIERO: Dr. Dale, you'll forgive me. I have to step over there to make a long distance phone call. It's 9:15. I will be listening with the door open and Mr. Stubchaer will also be here. I hope you'll forgive me for having to leave the dais. Please proceed.

Q BY MS. KOEHLER: Dr. Dale, would you please identify yourself and spell your name for the record?

A BY DR. DALE: My name is Larry Dale, D-A-L-E.

Q By whom are you employed, Dr. Dale?

A I work for David Dornbush (phonetic) in the City of San Francisco as an economic consultant, and I'm an independent consultant working for myself.

Q Cal Trout Exhibit 2-A is a document identified as the resume of Larry L. Dale. Does this document accurately state your education and experience?

A Yes, it does.

Q Cal-Trout Exhibit 2-B is a document identified as the marginal cost pricing and the new L.A. DWP water rates by Michael Cataman (phonetic). Did you rely on that document in preparing your testimony for this proceeding?

0031

A Yes, I did.

Q Cal-Trout Exhibit 2 is identified as the testimony of Dr. Larry Dale. Did you prepare Cal-Trout Exhibit 2?

A Yes.

Q Do you have any additions or corrections to make in this document at this time?

A I have several corrections to make. On Page 6, Paragraph 9 of that document, I'd like to change the -- rather Paragraph 14, the name "Chapman" should be changed to "Campbell," C-A-M-P-B-E-L-L.

On Page 9 --

MR. FLINN: Hold on for a second.

MR. DALE: Then there are two corrections on Page 9 on Paragraph 22 and 23. Paragraph 22, the number 60,000 to 90,000 should be changed to 25,000 to 60,000.

On Page --

MS. GOLDSMITH: Excuse me. What page is that?

Q BY MS. KOEHLER: Dr. Dale, do you mean Page 8?

A BY DR. DALE: I don't have it right in front of me, but yes.

MS. GOLDSMITH: What were the numbers?

DR. DALE: The numbers were 60,000 to 90,000. And they should be changed to 25,000 to 60,000.

0032

And on paragraph 23, number 50,000 should be changed to 40,000.

Q BY MS. KOEHLER: Are there any other changes or corrections you need to make to this document?

A No, that's all.

Q Would you briefly summarize your education and experience relevant to this proceeding?

A I've been a resource economist for approximately 18 years, working on water resource questions for the

last ten years. I'm a consultant to urban water agencies on urban water conservation issues. I've been a consultant to the State Board on Bay-Delta issues, and I've been a consultant to the EPA on Bay-Delta issues. I'm now serving on the steering committee of the California Urban Water Conservation Council, also dealing with urban water conservation standards.

Q Would you please briefly summarize your testimony for the Board?

A My main function was to review the modeling work that David Fullerton did, and I can testify to its accuracy and internal consistency. I agree that Los Angeles can meet projected demands without suffering significant shortages.

I'd like to give a broader focus to that information in this oral testimony by distinguishing

0033

between replacement cost and shortage cost. Replacement cost, as David Fullerton just testified, is the amount of money that the department -- that DWP will have to pay to obtain the amount of water that Los Angeles would forego to allow for a particular lake level. In other words, the cost of finding replacement water. Here I'm using the term broadly to include conservation. So one thing that distinguishes replacement cost is that it's an out-of-pocket expense. It's actual money spent by an agency for water.

Fullerton's testimony dealt with the replacement cost for DWP of conjunctive use, reclamation, and other possible supplies to the city, and what distinguishes them as well is that they're relatively cheap. He finds them to be about $2 to $4 a person for the alternatives being considered here. That comes out to about $500 an acre-foot.

By contrast, shortage costs are not out-of-pocket expenses. Shortage costs tend to be the psychic costs of going without water, of doing without water for the things that people like to do, washing their cars, watering their lawns. It tends to be relatively expensive according to the studies that we've seen here, but it's important to remember that when people talk about a $2,000-per-acre-foot cost, that's what

0034

people value. That's what people say they value, water for doing things like watering their lawns and cleaning their cars. It's not what they spend for water.

Now, for there to be shortage costs in the MWD service area, we've already determined that there are not significant shortages in the L.A. area, but for there to be shortage costs in the MWD region, two things have to happen. There has to be a base shortage in the MWD region, and there has to be a substantial increase in DWP purchases of MWD water as a result of these Mono Lake proceedings. On neither count do shortage costs in the MWD area appear likely. Dr. Quinn's testimony and the MWD bond document suggest that that agency believes that they will have adequate supplies in the future. That would suggest they will have no shortages, no significant shortages, and thus no shortage costs.

In addition, David Fullerton's testimony indicated that there was likely to be a fall in DWP purchases of MWD water as a result of finding replacement costs -- replacement supplies to overcom -- and more than overcompensate for any loss of water from Mono Lake.

In addition, his work suggests that the least-cost procedure for the city would be to purchase MWD water that it has to purchase in the wet and normal years

0035

when the competition for that water is low so that it would be least likely to cause shortages at that time in the MWD region.

The final thing that I'd like to say that I do not agree with prior testimony that the Board should only rely on 100 percent firm dependable yield when it's doing its calculations of the economic impacts of the change in Mono Lake diversions. I believe that the focus should be on a reasonable estimate of future supplies, not on a firm yield-dependable yield estimate. I'm not saying you should ignore uncertainty, but I'm saying to get an accurate estimate of future costs, you need to use the most accurate prediction of expected future supplies.

That concludes my oral testimony.

HEARING OFFICER DEL PIERO: Thank you very much. Help me, Ms. Koehler. These witnesses are both put on only by Cal-Trout?

MS. KOEHLER: Mr. Fullerton is a Cal-Trout witness and Dr. Dale is a joint Cal-Trout/National Audubon witness.

MR. FLINN: But these witnesses in this testimony are only put on by Cal-Trout.

HEARING OFFICER DEL PIERO: That's what I was checking on.

0036

Mr. Birmingham?

MR. BIRMINGHAM: I do not understand that. Mr. Dale submitted separate testimony on behalf of --

MR. FLINN: Sure did. This is a matter of some controversy because I had to compete from time to time with Ms. Koehler for Dr. Dale's time, so I'm sensitive to the issue.

HEARING OFFICER DEL PIERO: I don't feel quite -- Mr. Birmingham is having the same difficulty keeping track of who's on first as I am.

Good morning.

MR. BIRMINGHAM: Good morning.

HEARING OFFICER DEL PIERO: You look remarkably well for married man.

MR. BIRMINGHAM: I feel wonderful. I don't feel quite so lost anymore.

HEARING OFFICER DEL PIERO: Good for you. Congratulations, again.

MR. BIRMINGHAM: Thank you.

CROSS-EXAMINATION BY MR. BIRMINGHAM

Q First, I have some questions for Dr. Dale. In your written testimony, Dr. Dale, you agree with a criticism of the DEIR economic analysis in that it uses a 20-year planning sequence. Is that correct?

A BY DR. DALE: That's correct.

0037
Q And in your opinion, that sequence is too short; is that correct?
A That's correct. It's too short -- it may possibly be too short to reveal the full variance of future water supplies to the region of Southern California.
Q Well, in fact, on Page 4 of your written testimony, you say that the planning sequence is too small to fully characterize the range of possible hydrologic outcomes. That's your testimony, isn't it?
A Yes, it is.
Q And that's your opinion, isn't it?
A Yes, that's my opinion.
Q Now, isn't it correct that Mr. Fullerton's model uses the same 20-year sequence?
A Yes. And I believe Mr. Fullerton also agreed that the sequence would better be longer to reveal the full extent of hydrologic outcomes.
Q So in your opinion, Mr. Fullerton's model is too small to -- the planning sequence is too small to fully characterize the range of possible hydrologic outcomes?
A It's -- it would better be longer to reveal the full extent. My sense is that the 20-year sequence does show a reasonable expectation of the outcomes.
Q Well, with respect to the Draft Environmental Impact Report economic analysis, it was your testimony
0038
that the 20-year planning sequence is too small to fully characterize the range of possible hydrologic outcomes?
MR. FLINN: Objection. Asked and answered.
HEARING OFFICER DEL PIERO: Overruled.
DR. DALE: Yes.
Q BY MR. BIRMINGHAM: Now, Mr. Fullerton, have you supplied your NHI model to the State Board Staff?
A BY MR. FULLERTON: No, I haven't, although I'm perfectly glad to do so.
Q During the last few --
HEARING OFFICER DEL PIERO: Excuse me, Mr. Birmingham. Mr. Fullerton, you have no reservations about giving that to us?
MR. FULLERTON: No.
HEARING OFFICER DEL PIERO: Ms. Koehler?
MS. KOEHLER: No reservations about supplying the model to the State Board.
HEARING OFFICER DEL PIERO: My initial reaction is we'd probably like to see it, but we'll talk about that later on.
Mr. Birmingham, pardon me for interrupting.
MR. BIRMINGHAM: I wonder if the same lack of reservations about supplying it to the State Board and JSA would apply to L.A. DWP.
0039
MS. KOEHLER: That's certainly the case as long as we can receive in exchange the modified model which we have requested from L.A. DWP. We have to do an even exchange of models.
HEARING OFFICER DEL PIERO: Mr. Birmingham?
MR. BIRMINGHAM: The modified risk model has been supplied to Cal-Trout.

MS. KOEHLER: That is incorrect.
MR. FLINN: It is incorrect. Only the -- Dr. Wade's so-called no-name model was supplied. The modified model was not.
MR. BIRMINGHAM: We'll make sure it is. This is the first that we've heard of this.
HEARING OFFICER DEL PIERO: Let me just acknowledge this for the record, okay? Mr. Birmingham, you're going to provide the requested model to both the State Board Staff as well as to the other parties that they're indicating a desire for.
Ms. Koehler, on behalf of Cal-Trout, you're going provide the model that Mr. Fullerton and Dr. Dale have worked on to L.A. DWP as well as to the State Board Staff as well as to any other parties. Is that correct?
MS. KOEHLER: That is correct.
HEARING OFFICER DEL PIERO: Is that correct,

0040

Mr. Birmingham?
MR. BIRMINGHAM: That's correct.
HEARING OFFICER DEL PIERO: Good. Please proceed, Sir.
Q BY MR. BIRMINGHAM: Now, Mr. Dale, with respect to the use of the 20-year planning sequence, you would expect the output of Mr. Fullerton's model, if you were to use a full 50-year hydrology for each forecast, you'd provide a better picture of water supply; is that correct?
A BY DR. DALE: Yes, that is correct.
HEARING OFFICER DEL PIERO: Excuse me, Mr. Birmingham. Before we leave that point, in order for the State Board Staff to have adequate time to evaluate both models that we've been talking about and all the subsequent information, I'd appreciate it if those would be delivered to the State Board Staff -- what do you think Mr. Smith? By the 2nd of January? Is that too tight?
MR. SMITH: As soon as possible.
HEARING OFFICER DEL PIERO: As soon as possible is not a date certain. Pick a date certain.
MR. SMITH: January 2nd.
HEARING OFFICER DEL PIERO: January 2nd, Ladies and Gentlemen, exchange of information and models to

0041

all parties. Okay? Thank you.
Pardon me, again, Mr. Birmingham.
Q BY MR. BIRMINGHAM: Isn't it correct, Dr. Dale, that a full history of the hydrology, the use of a full history of hydrology available in water supply planning is the standard practice?
A BY DR. DALE: It's the standard practice of the Department of Water Resources to use as large a hydrologic sequence as they can. I don't -- I should add, I don't criticizes Jones and Stokes for using the shorter version because I think in this case the advantages outweighed the costs.
Q Now, you've testified that the NHI model, which is Mr. Fullerton's model, incorporates a blended Metropolitan Water District rate which reflects

discounts offered on non-firm water; is that correct?
A That's correct.
Q Isn't it correct that there are constraints when non-firm water can be taken?
A I believe so.
Q And are there constraints on when non-firm water is useful to L.A. DWP?
MS. KOEHLER: Excuse me. I'd just like to make sure that both witnesses know that either one of them can answer these questions, and I just want to make

0042

sure that Mr. Fullerton knows that he is there to the extent that he's qualified to answer questions for Dr. Dale.
HEARING OFFICER DEL PIERO: Do you have any problems with either one of the panel answering?
MR. BIRMINGHAM: Absolutely not.
HEARING OFFICER DEL PIERO: Gentlemen, whenever you think it's appropriate.
Q BY MR. BIRMINGHAM: Is it correct, either one of you, that there are constraints on when non-firm water is more efficient for L.A. DWP?
A BY DR. DALE: Yes. I think it depends on storage within the groundwater basin to a large extent. If the groundwater basin is full, that would impose a constraint on the usefulness of non-firm yield to the City of Los Angeles.
Q Now, are either of you aware that Metropolitan Water District has cancelled its interruptable water supply rate?
A Yes, I read that.
Q You read that. Where did you read that?
A I can't remember where I read it, but I did see it just two weeks ago. I was reading that they had cancelled it.
Q Isn't it correct that the cancellation of the

0043

interruptable rate would affect some of the opinions that you've expressed here concerning the cost of replacing water for the Department of Water and Power?
A BY MR. FULLERTON: I don't think it would substantially change our conclusions. I believe it is and will continue to be Metropolitan's policy to use price and use discounts as a way to manage its water, and L.A. does and will have an ability to use -- utilize those discounts in the future. I think that you have utilized it over the past year, for example.
Q But isn't it correct that it will affect the analysis that you presented today?
A BY DR. DALE: Any change could affect it, but I agree with David Fullerton that there are other discount rates available to MWD, and looking at recent past history, I think we have pretty conservative assumptions about the cost of that MWD water.
Q I'd like to ask some questions -- and I guess these would best be directed to you, Mr. Fullerton. You testified about some of the charts that you've presented here today and indicated that they present the same data which are presented in your -- in the figures in your written testimony; is that correct?

A BY MR. FULLERTON: Yes.
Q Now, Figure 8, you've modified by changing the
0044
scale; is that correct?
A Which Figure 8 are you referring to?
Q I'm referring to Figure 8 which -- I'm sorry.
Figure 5. Figure 5.
A That's correct.
Q And you said that in addition to the data that are
included in Figure 5 that was submitted with the
written testimony, you have inserted the actual water
demand of the City of Los Angeles for 1991 and 1992?
A Yes. A least based upon my best information.
Q Now, I note that you've inserted that -- if what
I'm pointing to on Figure 5 that you've presented
today, is 1995 --
A Okay.
Q -- 1994, 1993, 1992, how did you adjust the
horizontal scale to include the water supply picture
for 1991 and 1992?
A It's off the chart.
Q So, in fact -- it's off the chart.
A I mean, it's to the left of the chart.
Q Now, let's talk about this next figure which
you've modified, this is Figure 8. Is that correct?
A Correct.
Q Now, when you supplied Figure 8 with your written
testimony, it was a histogram; is that correct?
0045
A Well, it was a stacked bar chart.
Q Stacked bar chart. And how would you characterize
this presentation today?
A An area chart. An area graph.
Q And one of the things that is different between
the chart that you submitted as Figure 8 with your
testimony and the figure that you've presented today is
that you have inverted the placement of some of the
water supplies; is that correct?
A Yes, that's correct. The reclamation, as we move
from the middle to the top.
Q Now, as I recall, I don't have it here in front of
me, but the Figure 8 that was submitted with your
testimony had reclamation between the Owens supply and
the groundwater supply; is that correct?
A Hold on a second. Yes. It had reclamation
between the Owens supply and the groundwater supply.
Q And now -- and the Figure 8 that you supplied with
your written testimony was -- it had the Metropolitan
Water District at the top of the graph; is that
correct?
A What I originally supplied, it had at the top.
That's correct.
Q Now, by submitting this new figure, you don't mean
to suggest that the reclamation supply is the marginal
0046
supply, do you?
A No.
Q It's the Metropolitan Water District supply which
is the marginal supply for L.A. DWP?
A In any given year, it's the marginal supply.

Q Now, was there some particular reason that you inverted the presentation in Figure 8? Did you discuss that with somebody?
A I felt that this was visually easier to understand, instead of having a small line that just ran up and down, up and down over the hills and valleys of the Owens, that since reclamation was relatively constant, it would be easier to understand on the top.
Q And the reason that you put -- in the Figure 8 that you submitted with your written testimony, the reason that Metropolitan was on the top is because Metropolitan is the marginal supply?
A No. There's no particular preference indicated by the relative positions.
Q Okay. Now, looking at the figure -- the Figure 13 that you've submitted with your written testimony today, that also has been modified from a bar chart that was submitted with your written testimony; is that correct?
A That's correct.

0047

Q And again, you have -- you have replaced the relative position of the Metropolitan Water District supply and the groundwater -- or reclamation supply; is that correct?
A Yes. The same changes were made.
Q And again, with respect to the Figure 13 that you've submitted with your written testimony today, you don't mean to imply by putting reclamation on the top that reclamation is the marginal supply?
A In a given year, it's not the marginal supply. It doesn't mean that you wouldn't build more reclamation based upon planning assumptions.
Q In any given year, Metropolitan Water District is the marginal supply for the Department of Water and Power?
A Yes, in a sense. It provides flex in the system in a given year. However, of course, if projections of supply and demand indicate that you're going to be using too much MWD water, obviously, you would attempt to develop other reliable sources of supply such as increasing the Bureau of reclamation. But in any given year, it's the flex in the system.
A BY DR. DALE: Can I interject something? I think you have to distinguish between a long run and a short run marginal supply and the short run, as David Fullerton

0048

suggests, it is the swing supply. But in a longer run, I think the availability and cost of MWD water is driving plans for other sources of supply and, in particular, I think it is creating a desire for more reclamation, both in L.A. and in the MWD region. And in that sense, that is also a marginal supply.
Q Dr. Dale, while you have the microphone and, Mr. Fullerton, feel free to jump in here if you think that it's necessary to provide the Board with a complete answer, but I had some questions I wanted to ask Dr. Dale about water quality.
It's correct, isn't it, Dr. Dale, that regardless of the source from which Mono Basin water is replaced,

it will be of a lesser quality than Mono Basin water?
MS. KOEHLER: Objection. Dr. Dale is not here as an expert on water quality. He's not qualified to answer that issue.
HEARING OFFICER DEL PIERO: Mr. Birmingham?
MR. BIRMINGHAM: I can try and lay a foundation, or I can ask it hypothetically. I'll ask it hypothetically.
HEARING OFFICER DEL PIERO: Okay. The objection is sustained.
Q BY MR. BIRMINGHAM: Dr. Dale, I'm going to ask you to assume some facts, and then I'm going to ask you to

0049

express an opinion on economics, the economics of water supply. I'm going to ask you to assume that the replacement water from whatever source will be of a lesser quality than the water that is diverted from the Mono Basin. I'm going to ask you to assume that the Mono Basin water diverted by the Department of Water and Power is the most mineral-free of all water available to the Los Angeles Department of Water and Power. I'm going to ask you to assume that water from the State Water Project has ten times the amount of dissolved minerals as water from the Mono Basin, and I'm going to ask you to assume that water from the Colorado River aqueduct has 15 times the dissolved minerals of the water from the Mono Basin.
Now, in your opinion, don't the citizens of the City of Los Angeles incur a cost by moving water from a high quality to a low quality?
A BY DR. DALE: In general, I believe there is a preference for better quality of water and to that degree, there's a psychic cost to accepting a lower quality supply. My understanding about the amounts of this supply, though, would lead me to assume that there was a significant difference.
Q Wasn't, in fact, there a cost to treat the water of a lower supply -- a lower quality?

0050

A Well, I'm not an expert on this, but my understanding is that in the past -- this has been more important than it is now and will be in the future, that in the past, supplies from the Sierras have been able to be used with very little treatment, but in the future, they're likely, particularly when combined with other sources, they're likely to have to be treated at a much greater cost regardless of the source. But again, I'm not an expert.
Q Now, when you were calculating the cost of replacing water from the Mono Basin with water from other -- other supplies, you did not include the costs associated with treating the lower quality water, did you?
A That's correct.
Q Now, again, I'm going to ask you to keep in mind that replacement supplies for Metropolitan Water District are from 10 to 15 times higher in total dissolved minerals than water diverted from the Mono Basin.
MS. KOEHLER: Objection. That assumes facts not

in evidence.
MR. BIRMINGHAM: I'm asking him to assume it.
HEARING OFFICER DEL PIERO: That's overruled.
MR. BIRMINGHAM: And, in fact, I believe it is in

0051

evidence. But --
HEARING OFFICER DEL PIERO: Whether it's in evidence or not, the nature of your questions are hypothetical. Go ahead.
Q BY MR. BIRMINGHAM: Let me state the assumptions for you again, Doctor, that the supply, the replacement supplies from Metropolitan Water District are from 10 to 15 times higher in dissolved solids than the water diverted from the Mono Basin.
Now, are you aware of any studies that measure the economic effects of water of poor quality, higher in total dissolved solids, on water heaters and in-home plumbing?
A BY DR. DALE: I'm aware of them. I can't state the specifics.
Q Is it true that -- and I'm going to ask you to assume, if you're not aware of the specifics, but if it's correct that the prolonged use of water that's high in total dissolved solids tends to decrease the life of plumbing in homes, that that is an increased cost of replacing high-quality water with low-quality water?
A Following those assumptions, I would agree.
Q And you didn't measure those costs in preparing your analysis on replacement costs, did you, Dr. Dale?

0052

A No. I did no analysis of that. I guess in general what the model that we used and David Fullerton developed follows almost all the same basic assumptions as the DEIR least-cost model, and water quality was not one of the considerations, as a number of other things were not considerations.
Q If you were going to develop an accurate model, you would want to include the costs of replacing high-quality water with low-quality water, wouldn't you, Dr. Dale?
A Well, if I had lots of time and energy and independent resources, yes. I think for purposes of clarity, I don't believe it was necessary in this case.
Q Now, a few moments ago, you said that you're not an expert on water quality?
A Yes.
Q So you can't tell us what costs are going to be associated with changing treatment when the Department of Water and Power begins using more and more Metropolitan Water District water. Isn't that correct?
A BY MR. FULLERTON: That's correct. Except to the extent that DWP purchases water that has already been treated by Metropolitan, we do have estimates for that price because the Met price includes that.
Q But, Mr. Fullerton, you don't know to what extent

0053

the Department of Water and Power receives treated water from Metropolitan Water District, do you?
A No.

Q And you don't know to what extent the Department of Water and Power must retreat water that it purchases treated from Metropolitan Water District, do you?
A No, I don't.
Q Mr. Dale -- excuse me. Dr. Dale, in preparing your analysis of the costs of replacing water from the Mono Basin with water purchased from Metropolitan Water District, did you consider the additional costs of treating water to remove arsenic?
A The model doesn't include a consideration of that.
Q So your answer is that you didn't include those costs?
A Yes.
MR. HERRERA: Mr. Birmingham, your time is up.
MR. BIRMINGHAM: I make an application for an additional 20 minutes.
HEARING OFFICER DEL PIERO: Granted.
MR. BIRMINGHAM: Thank you.
Q BY MR. BIRMINGHAM: Mr. Fullerton, your testimony states that the Draft Environmental Impact Report analysis did not include water conservation savings expected from implementation of the best management

0054

practices contained in the Urban Memorandum of Understanding. Is that correct?
A BY MR. FULLERTON: The practices were the same, but it didn't include the same level of effort that's required by the MOU.
Q And therefore, you concluded that the demands per user contained in the Draft Environmental Impact Report are too high?
A Yes. For that, and other reasons, including legislation.
Q The Draft Environmental Impact Report analysis was based upon population projections that were made prior to the 1990 census; is that correct?
A Yes.
Q And isn't it correct that there are new population projections based on the 1990 census?
A BY DR. DALE: I believe so. I've seen some draft projections. There are no official projections for the City of Los Angeles that I'm aware of.
Q Isn't it correct that the Southern California Association of Governments has made population projections from the 1990 census?
A BY MR. FULLERTON: I have seen some figures. I guess I don't know if they're finalized, but yes, I've seen figures.

0055

HEARING OFFICER DEL PIERO: Excuse me, Mr. Birmingham. Are they population projections from the 1990 census?
MR. FULLERTON: Yes, I believe so. They came out, I think, in the last six months.
HEARING OFFICER DEL PIERO: From census data or from projected population increases based on their planning?
MR. FULLERTON: I believe that these are population projections based upon the 1990 census.
HEARING OFFICER DEL PIERO: Okay.

Q BY MR. BIRMINGHAM: Now, is it correct, Mr. Fullerton --

HEARING OFFICER DEL PIERO: Mr. Birmingham, I want to point something out to you from the the standpoint of wherever you're pursuing this information. Normally, Counsel for the government don't project their population based on census information. Normally, they are projected based on general planning and what potential development capacity they have within the plans that they've internalized within their member agencies.

Normally, that information is produced by planning records between municipalities, and oftentimes, they have very little to do with historic census data. So I

0056

don't know whether they have or they have not, but I know what the common practice is because I served on a cause for eight years, and so in order to either prove or disprove a point, that single issue needs to be addressed definitively one way or the other.

Q BY MR. BIRMINGHAM: I believe it's your testimony, Mr. Fullerton, that, in fact, Southern California counsel has made projections based on the 1990 census; is that correct?

A BY MR. FULLERTON: I believe so.

MR. BIRMINGHAM: We will present that information.

HEARING OFFICER DEL PIERO: That's fine.

Q BY MR. BIRMINGHAM: Now, is it correct that those estimates show that by the year 2010, the population for Los Angeles will be approximately 4.2 to 4.3 million people?

A BY MR. FULLERTON: I don't remember the exact figures. I also am not sure we broke it out for DWP service area, whether it was -- you know, whether it's exactly the same area that they're looking at. But that sounds in the ballpark.

Q It's correct, isn't it, Mr. Fullerton, that the population projections based upon the pre-1990 census data were lower than the population projections based upon the 1990 census data?

0057

A Yes.

Q And the new projection -- population projections are approximately 8 to 9 percent higher than the population projections on which the Draft Environmental Impact Report is based; is that correct?

A I don't know the exact percentage. That sounds in the ballpark.

Q Is it correct that as a result of increased population, there will be an increased demand for water within the service area of Metropolitan Water District?

A Yes.

Q And is it correct that as a result of increased population, there will be increased demand for water within the service area of the Los Angeles Department of Water and Power?

A Yes. There will be increased demand if the projections are accurate.

Q Now, your testimony talks about estimates of replacing washing machines by more efficient types of

20 washing machines; is that correct?
21 A Yes.
22 Q Now, you say that based on very conservative
23 assumptions, you have made projections about
24 replacement by the year 2010; is that correct?
25 A Yes.
0058
01 Q What are the very conservative assumptions on
02 which you base those projections?
03 A I'd have to look at my testimony. Do you have a
04 paragraph number?
05 Q No, I don't, Mr. Fullerton. I'm sorry.
06 A Okay. I've got it.
07 Q Got it? You've projected a savings of 7,000
08 acre-feet; is that correct?
09 A In the testimony, I believe I used a much smaller
10 number than in the actual model to make it more
11 conservative.
12 Q I'm sorry. Would you state that again?
13 A Yes. In Paragraph 43, the number is 7,000
14 acre-feet, a savings is given as a total estimate which
15 would be 5500 acre-feet above what was projected in the
16 DEIR. When I actually did the model, I scaled that
17 back to be more conservative, I believe. I changed it
18 to 3,000.
19 Q In the model you used a 3,000 acre-foot savings?
20 A 3,000 acre-foot additional savings.
21 Q What assumptions did you make about the
22 replacement of these washing machines?
23 A I assumed -- well, I don't remember what I
24 assumed. It was a fairly high penetration rate by the
25 year 2010. I didn't assume all the savings at once.
0059
01 It's scaled up so that by the year 2010, approximately
02 3,000 acre-feet of additional water will be saved
03 within the DWP service area.
04 Q Do you know how many of these water-efficient
05 washing machines are available in the Southern
06 California market right now?
07 A I suspect not very many at present.
08 Q In fact, there are very few available; isn't that
09 correct?
10 A Yes.
11 Q And isn't it correct that these washing machines
12 cost in excess of $100 more than a conventional washing
13 machine?
14 A I don't know that. I do know that recent
15 estimates of how much money will be cost effective for
16 energy and water utilities in rebate is on the order of
17 2 to $300, so I think that any differential is likely
18 to be more than made up when the implementation
19 programs actually kick in.
20 Q Well, in fact, didn't Southern California Edison
21 have a program last year where it offered rebates if
22 one of these more efficient water washing machines was
23 purchased?
24 A I believe so.
25 Q And is it correct that only six customers applied
0060
01 to Southern California Edison for a rebate after

purchase of one of the more water-efficient washing machines?
A Yes. That's possible. My -- my assumption in the model -- first of all, if we're talking about 3,000 acre-feet, we're talking about something that's not very large. You can make it zero. It wouldn't change anything. However, the assumptions in the model are that this won't kick in for quite a few years. There are extensive efforts now underway to prepare for a massive effort on horizontal axis washing machines. I think it's very likely that we'll see federal standards in 1997 that are going to speed the production of machines. So I agree that certainly over the next couple of years, we're not going see any significant introduction of these machines, but it's on the horizon. It's going to kick in within the next five or ten years.
Q Mr. Fullerton, you would agree, wouldn't you, that generally, it's easier to achieve the first 10 percent of conservation than the next increment of 10 percent?
A I would agree within any particular appliance -- that is to say, if you to go an ultra low-flush toilet, if you to go an ultra, ultra low-flush toilet in the next stage, we're not going to get as many

0061

savings. However, if you go to, in a sense, virgin territory, no, it's not more difficult. It becomes more difficult within particular appliances or practices, yes.
Q Now, with respect to the ultra low-flush toilet, you made some certain assumptions about conservation in the NHI model; is that correct?
A Yes.
Q And is it correct that you estimated a 30 to 35,000 acre-foot savings based upon a 100 percent conservation -- I'm sorry, 100 percent conversion to ultra low-flush toilets?
A No. I didn't assume 100 percent conversion. The numbers were in the 80 to 90 percent range over the 20-year period.
Q Did you make an assumption that water purveyors would be able to impose a requirement to retrofit ultra low-flush toilets on resale of the house?
A I didn't make that assumption. That is one alternative. Let me say, the numbers that I generated were based upon commitments made by DWP and other agencies in the urban conservation MOU. Among the methods for reaching their targets is such a regulation or legislation. However, the agencies have discretion in how they achieve it. They can do it through a

0062

neighborhood program where they send people out to offer retrofits. They can do it through rebates. Any method they wish, but that's a commitment that they have made.
Q Isn't it correct that there was a bill that was considered by the legislature in the last session that would have required the retrofit of ultra low-flush toilets on resale?
A Yes.

Q What happened to that bill?
A It didn't pass.
Q Was there -- was there significant opposition to that bill?
A The primary opposition, I think, was from the realtors.
Q Now, is it correct that there may be an overlap between savings attributed to price effects and savings which accrue from landscape conservation?
A Absolutely.
Q And therefore, what is the potential for conservation resulting from landscape?
A I didn't evaluate that. I felt that it was incorporated in the pricing figure which was supplied to me by Dr. Campbell.
Q In fact, Dr. Campbell estimated an 8 to 10 percent

0063

conservation rate; is that correct?
A Yes.
Q Now, does the same -- the same overlap apply to price effects and appliance retrofits?
A I believe that there is likely to be some overlap. I think it's going to be far less significant than outdoor landscaping. I mean --
A BY DR. DALE: The only thing I can add to that, and Dr. Campbell can affirm this later, is that the studies that I've seen of the price elasticity of demand suggest that indoor demand is very inelastic and outdoor demand is much more elastic. These studies have been done without considering the best management practices and conservation practices that Mr. Fullerton's incorporated in the model. To that extent, there is some overlap but surprisingly little.
Q If there is some overlap, Dr. Dale, isn't it correct that the hard scenario, which Mr. Fullerton discusses on Page 25 of his testimony, would result in a higher conservation estimate than is likely to be achieved?
A Yes. But I don't want to venture a guess about the amounts.
Q Now, Mr. Fullerton, talking about Dr. Campbell's testimony, Dr. Campbell noted that the excess use

0064

charges imposed by L.A. DWP during the drought resulted in 67,000 requests for exemption. Is that your understanding?
MS. KOEHLER: Excuse me. Dr. Campbell is going to testify on the next panel and perhaps Mr. Birmingham could direct his questions about pricing to that. Mr. Fullerton has testified quite clearly that he simply used the information on pricing provided by Dr. Campbell.
MR. BIRMINGHAM: I believe that I'm entitled to cross-examine this witness about the basis of his opinions and to the extent that Dr. Campbell provided him with certain assumptions about -- which he relied on, I'm permitted to cross-examine this witness about the way changes of those assumptions would affect his opinion or, in fact, how his opinion is affected by the assumptions.

HEARING OFFICER DEL PIERO: I'm going to overrule the objection with this direction to you, Mr. Birmingham, that this clearly needs to be within the context of that information on which Mr. Fullerton relied to produce the information in the opinions that he's testifying to.
Q BY MR. BIRMINGHAM: Now, you made an assumption about 67,000 requests for exemptions; is that correct?

0065

A BY MR. FULLERTON: I didn't make any assumptions. I used the reduction-in-demand figures that was supplied to me by Dr. Campbell.
Q Let me ask both of you gentlemen a hypothetical question. Dr. Dale, this may be more appropriately addressed to you. I'm going to ask you to assume that there were approximately 100,000 requests for exemption from the drought regulation. Now, would there be administrative costs associated with the review of those requests for exemption?
A BY DR. DALE: Yes, of course.
Q Now, in calculating the cost of replacement or the economic costs associated with reduced water supply, did you include any administrative costs in implementing a program?
A BY MR. FULLERTON: No, I didn't. I guess I'm a little confused. I guess it feels like you're giving apples and oranges. Dr. Campbell was analyzing not the drought rate structure, but the entire rate structure, which is intended to run all years, whether they're in a shortage or not. In fact, our analysis shows that they're very unlikely to have many shortages. So I -- there may be administrative costs of exemptions, but I don't think you can generalize from what happened during the drought to what happened as a rule.

0066

Q Do you anticipate that the new pricing policies will have exceptions? Let me just state it differently.
Isn't it correct that the pricing policies that are in place now have exemptions?
A BY DR. DALE: Allow for exemptions. That's my understanding.
Q And when somebody applies for one of those exemptions, there is a cost associated with -- an administrative cost associated with processing and considering that exemption?
A I don't have information about how much the cost of administering DWP have gone up since they've instituted the new pricing rates. They may have hired someone else to handle it. That would be the cost we're talking about, I assume.
Q During your direct testimony, Mr. Fullerton, you've referred to the Club Fed water quality standards that you released on the 15th of December.
A BY MR. FULLERTON: Yes.
Q Now, in preparing your testimony, you assumed, didn't you, that the -- the new standards imposed by the Environmental Protection Agency would result in a 25 percent decrease -- here I'm referring to scenario four, a 25 percent decrease from diversions out of the

0067
delta during a dry or critical year?
A No. We assume a 25 percent decrease in the availability of Metropolitan's supply by DWP.
Q Where does Metropolitan get its water supplied to the Department of Water and Power?
A Well, it gets supplies from both the Colorado River and from the State Water Project.
Q Now, I'm going to ask you to assume that Dr. Tim Quinn (phonetic) appeared here and testified that the replacement water for the water which L.A. DWP must purchase as a result of the decision in this proceeding is going to come from the State Water Project. Making that assumption, does your opinion concerning the extent to which the EPA water quality standards affects Metropolitan Water District's ability to supply L.A. DWP change?
A No. Because we had such an enormous margin of safety in our estimates, I believe that even if there is a reduction in supply out of the delta, that our estimates are still going to be conservative. I note that a figure called MWD water available to DWP that I showed during my testimony shows that there's a huge gap between what Met says it will have available and what the NHI model assumed. The Met projections appear to be conservative now based upon Dr. Quinn's
0068
testimony. To the extent that those numbers might be pulled back a little bit by any reduction from the delta, I think it's not going to affect our analysis. It's still way above what we assumed.
I'd just note that if any reductions from the delta, Metropolitan is going to take about 25 percent of the reductions before any transfers take place. And, of course, with transfers, they could probably equalize that towards zero. And of those 25 percent, about 25 percent of that is attributable to loss of water to DWP. So to the extent the water is reduced out of the delta, we're talking about approximately 6 percent decrease in the DWP ability to get water from Met based upon the preferential right. It's not as big an impact.
Q You just mentioned preferential right, and I'm going to ask you a couple of questions about preferential right before I ask you to go to Page 29 of your testimony.
But preferential right, has the Department of Water and Power ever asserted its preferential right to purchase water from Metropolitan Water District?
A I don't know that. I don't believe it's ever been resolved. I don't think it's ever been -- I just don't know.
0069
Q So you don't know --
A I don't think that --
Q If I may finish my question before you answer it, I'd appreciate it.
You don't know to what extent the Department of Water and Power can rely on its preferential right to acquire water from Metropolitan Water District?

A I don't know that. It's really a legal question, I believe. Certainly, their demand for water from Metropolitan, with the exception of one or two drought years, in the last several years has been far below their preferential right, so it hasn't been a frequent issue in the past.

MR. HERRERA: Excuse me, Mr. Birmingham. That's 20 minutes.

MR. BIRMINGHAM: I'll make an application for an additional five minutes.

HEARING OFFICER DEL PIERO: I'll grant you an additional five minutes, Mr. Birmingham, but we're going to take a break now.

MR. BIRMINGHAM: Okay.

HEARING OFFICER DEL PIERO: Be back, Ladies and Gentlemen, in ten minutes.

(Whereupon a short recess was taken.)

HEARING OFFICER DEL PIERO: Ladies and Gentlemen,

0070

this hearing will again come to order.

Mr. Birmingham, five minutes.

MR. BIRMINGHAM: Five minutes. I will conclude in five minutes.

Q BY MR. BIRMINGHAM: We were just talking about the preferential right, Mr. Fullerton, and you indicated you weren't aware to what extent the Department of Water and Power can rely on its preferential right. I'm going to ask you to assume that DWP can rely on its preferential right.

Isn't it correct that at times of shortage, if DWP relies on its preferential right, there will be shortages in other areas of the Metropolitan Water District?

A BY MR. FULLERTON: Not necessarily. It depends on whether Metropolitan requires additional water to make up for.

Q If Metropolitan Water District has an adequate supply to fulfill 100 percent of the demand that's placed on it, there wouldn't be need for L.A. DWP to assert its preferential right; isn't that correct, Mr. Fullerton?

A I don't know if I understand the question.

Q If Metropolitan Water District has enough to satisfy the demands of all its member agencies, then it

0071

would not be necessary for L.A. DWP to assert its preferential right; isn't that correct?

A I don't know if DWP will assert whatever -- I assume they will and for whatever water they need.

Q Mr. Dale -- Dr. Dale, you said that the -- during your direct examination, you said that water shortage costs are, using your term, psychic costs; is that correct.

A BY DR. DALE: That's what I said, yes.

Q Isn't it correct that sometimes, in fact, there are hard economic costs associated with water shortage?

A I think they're the least part of it, but there are some.

Q For instance, if someone in Santa Barbara let all of their landscaping die during the most recent

drought, not only would that be a shortage cost, but it would cost that individual money to replace the landscaping at the conclusion of the drought. Isn't that right?
A I've read the studies that you're referring to, and to the degree that they replace their landscape in the same manner it was before, you can calculate what those costs would be.
Q And to the degree that they replace the landscaping at all, there were costs associated with

0072

the replacement of that landscaping; isn't that right?
A If they didn't want to change it, anyway, but if they had anticipated a change, here's an opportunity to do it.
Q Now, last week I read that the Governor made some kind of a statement about the potential economic costs in Southern California resulting from the EPA water quality standards. Are you familiar with what the Governor said last week about the need for Southern California for water from the delta?
A If you're referring to the Chronicle articles or the newspaper articles that I've read, yes.
Q If there's a water shortage which costs jobs in Southern California, that shortage cost is not a psychic cost, is it, Dr. Dale?
A If there were a loss of jobs, it wouldn't be a psychic cost, but I have never seen a study that demonstrated that there was a significant number of jobs lost in any shortage that we've experienced.
Q Just -- in the very few minutes I have remaining, Mr. Fullerton, I'd like to go back to this question that we were talking about on what you assumed in your analysis. Let's talk about your worst-case scenario. It assumes -- the worst-case scenario assumes that demand is equal to the hard scenario; is that correct?

0073

A BY MR. FULLERTON: No. Figure 13 refers to a scenario which is equal to the DEIR demand which is equal to the L.A. DWP demand projections.
Q And with respect to the scenario, you said a few moments ago that it assumes a 25 percent reduction in supply to Metropolitan Water District; isn't that right?
A No. It assumes a reduction of 25 percent in the availability of Met purchase, of Met water purchased by DWP. That was the basic assumption.
Q Now, looking at Page 29 of your testimony, it says, "The availability of Metropolitan Water District supplies reduced by 25 percent from DEIR levels during years classified by DWR as dry or critical for the Central Valley."
Now, isn't it correct that the reduction in water exports from the delta during normal years will be in excess of 25 percent as a result of the new standards imposed by EPA?
A BY DR. DALE: The federal agencies have released information suggesting that the average water shortage due to new standards would be something like 8 percent. That's the average over all years.

Q What would it be for critically dry years?
A It depends on how they're implemented. If all --

0074

if it's implemented on a pro-rata basis so that all users share in the costs of the standards, it would be on the order of 19 percent. That's the drop in exports in critical years only to the State Water Project.
Q You're aware that EPA has projected a loss of 800,000 to 1.8 million acre-feet in dry and critical years?
A Yes. Those are the numbers used in the economic studies to estimate impacts.
Q Used by EPA?
A Used by EPA.
Q Now, how much water does -- is normally -- in a dry critical year, how much water is exported out of the delta?
A It's on the order of 5.5 million acre-feet.
Q Now, the analysis that you performed, Mr. Fullerton, is based upon runs of the LAMP model; is that correct?
A BY MR. FULLERTON: Yes.
Q Now, there's been lots of testimony about LAMP in these proceedings, but to the extent that LAMP is modified, can you tell us to what extent that would change the opinions that you've expressed in your testimony?
A I just don't have enough information to answer

0075

that. I'm sorry.
Q So the opinions that you've expressed may have to be modified after LAMP has been modified?
A It's possible. I mean, my findings, I think, are so robust that it would take an extraordinary change in the LAMP run to make much difference. Conceivably, if there were massive errors made in the model, it would change my analysis.
MR. BIRMINGHAM: I have no further questions.
HEARING OFFICER DEL PIERO: Thank you very much. Mr. Birmingham.
Ms. Cahill?
MS. CAHILL: No questions for this panel.
HEARING OFFICER DEL PIERO: Thank you very much.
Mr. Flinn?
MR. FLINN: If I could ask someone to set up the overhead projector.
HEARING OFFICER DEL PIERO: How are things in Palo Alto this past weekend?
MR. FLINN: Brief. It passed by in too quick of a blur.
HEARING OFFICER DEL PIERO: About as brief as they were in Monterey.
MR. FLINN: I would suspect so. If I could get some help to pass those out.

0076

MR. BIRMINGHAM: I think the record should reflect that Mr. Flinn was in the Bay Area three days last week during the business week, so we can't feel too sorry for him.
HEARING OFFICER DEL PIERO: Okay. I won't feel

too sorry for Mr. Flinn. Thank you for pointing that out. Any expression of sympathy I've now withdrawn.

(Laughter.)

CROSS-EXAMINATION BY MR. FLINN

Q What I want to do, Gentlemen, is compare -- talk to you about the model runs and ask you to compare, if you will -- let's move this a little closer -- compare what's projected in the future with regard to the run versus what has historically been the case from 1978 to 1992. Now, we have put up on the overhead projector a document we have marked as National Audubon Society Exhibit 4-A. That is a corrected version of Exhibit 4, which, in our testimony with Dr. Dale and the next panel, we will identify the errors that were corrected in this, and we will be submitting this as a new exhibit.

But for -- what I'd like you Gentlemen to do is assume, hypothetically, that from 1978 to 1992, we have graphed the historical sources of supply to meet the demand, and would you confirm that from 1993 forward

0077

that it is a run from the NHI least cost model, which would compare to the color blowup Figure 8 that you've testified to?

A BY MR. FULLERTON: It looks very -- it looks the same.

Q Okay. Now, let me -- what I'd like to do is contrast what you project as MWD purchases versus what the historical MWD supplies were. Am I not correct that in 1991, there was the single largest purchase of MWD water in history?

A Yes.

Q And that was approximately 400,000 acre-feet of water?

A I don't know. I believe that's about right.

Q Okay. And the year before in 1990, they bought 395,000 acre-feet of water?

A It sounds right.

Q What is the most amount of water purchased under this model run from MWD?

A About 177,000 acre-feet.

Q Am I correct, then, that your model shows that in the 20-year sequence, you would buy actually less Met water than you would in 19 -- than you did in 1989, 1990, 1991, or 1992?

A Yes, that's correct.

0078

Q Now, let me ask you gentlemen to assume that there are, in fact, water treatment costs associated with purchasing Met water. Let me ask you further to assume that these costs are not borne by the use of reclaimed or groundwater.

Do you follow my assumption so far? Under that assumption, would I not be correct that there would actually be a cost savings in water treatment from the model run that shows a reduced reliance on MWD water from the historical pattern?

A Yes.

Q And has such a benefit to the City of Los Angeles been you incorporated in your modeling cost analysis?

A No. The model didn't deal with water quality costs plus or minus -- water quality costs or benefits.
Q Another question about water quality -- Dr. Dale, this is probably more for you because this is a question about psychics. Generally, do people express their desire for -- do you know, do people express their desire for a particular water quality standard by asking their elected representatives to set appropriate water quality standards?
A BY DR. DALE: That's the political process, yes.
Q And is it your understanding that whatever agency it is, MWD or DWP, is going to have to meet whatever

0079

their applicable water quality standards are no matter whether Mono Lake water is taken away or not?
A That's a good point. I think that these water quality costs are going to be borne in any case in these proceedings.
Q I want to substitute -- let me -- one more question here. You Gentlemen are aware, are you not, that --
MR. BIRMINGHAM: Excuse me, Mr. Flinn. May I interrupt for just one moment and ask the Reporter to mark the last answer?
THE REPORTER: Sure.
Q BY MR. FLINN: You Gentlemen are aware that L.A.'s own witness, Mr. Gewe, testified that in the L.A. service area itself by the year 2010 there would be, he projects, 80,000 acre-feet of reclaimed water. Do you recall that testimony or being aware of it?
A BY MR. FULLERTON: Yes.
Q Let me ask you to assume that's the case. Looking at the reclaimed figure here, showing 2010, 2011, how much reclaimed water is being projected as in use in this model run?
A For direct reclaimed, it's certainly less than that.
Q Isn't the peak approximately 56,000 acre-feet of

0080

water?
A I believe so. Okay. Yes. 56,000. I would note that there is some additional reclamation which is incorporated in the groundwater, however. In other words, there is some recharge into the basin, and it shows up as pumping. So it's a little higher than that.
Q Do we ever get as high as 80,000?
A We do get into that vicinity.
Q What's the highest we get?
A The total of the two is about 87,000, it looks like, under this -- under the base scenario.
Q And are you aware that both Dr. Trott and Jones and Stokes in the Draft EIR project more than 87,000 acre-feet of reclaimed water?
A Yes. The reason for the difference is that in the base run, DWP was so awash in water that I had to basically, in order to arrive at a least-cost solution, had to reduce the actual amount of reclamation that was utilized.
Q Now, here's an overhead of Cal-Trout 33, the MWD

water, and I think this is probably to you, Mr. Fullerton, but whoever wants to do it. What I'd like to do is mark on that chart where under both the 6390 base case and the worst-case scenarios, where MWD

0081

water peeks, where you ask for the most MWD water.
Here's a pen.
A The base case maximum purchase was approximately 177,000 at the maximum, which would be roughly in this range here.
In the worst-case scenario, we actually did bump up against the dry-year limitation in one year, so the purchase was limited, then, to 220, and there was a small shortage in that year.
Q If you added the shortage, how much higher would that be?
A It was about a 3 percent shortage, so it would add maybe another 15,000, which would raise it just very slightly.
Q Under all circumstances, is it substantially below even MWD's own dry year predictions?
A Oh, absolutely.
Q So to assume that there would be a shortage under your run, as shown on Figure 13, you would have to completely reject MWD's own projections about its ability to supply water?
A That's right. MWD would have to be off by more than a factor of two.
Q Let me talk a little bit about population. That issue came up. First of all, let me see if we can

0082

separate out population projections for the L.A. service area as opposed to Southern California generally. Do you Gentlemen have any specific knowledge one way or the other as to whether or not there is a projected -- whether any change in population increase is believed to be occurring in the L.A. service area as opposed to Southern California generally?
A BY DR. DALE: I think the unofficial current projections show an increase -- the unofficial SKAG projections that were reported to me to be based on the 1990 census show an increase in the L.A. service area.
Q Okay.
A I hasten to add they're unofficial and they've yet to be put through the planning process that may or may not change those. The planning process would involve zoning changes and other changes that would be needed to accommodate projections that are made in the first instance.
HEARING OFFICER DEL PIERO: Excuse me. Dr. Dale, are you -- do you know if the cities and the counties and the member agencies of SKAG normally modify their zones to correspond with population projections?
DR. DALE: No, I don't know.
HEARING OFFICER DEL PIERO: You don't know or you

0083

know that they don't?
DR. DALE: Well, I'm not real familiar with the planning process for the cities in the SKAG region.

What I was referring to was what I was told by the people at SKAG, I mean, the population division within SKAG as to what they needed to do before they could make an official projection.
Q BY MR. FLINN: In your history as an economist, Sir, have you ever seen a municipality decide to deliberately go about amending its general plan in order to meet population projection?
MR. BIRMINGHAM: I object.
HEARING OFFICER DEL PIERO: I'm going to overrule the objection. He characterized it as his experience as an economist.
DR. DALE: I don't have direct experience about that.
Q BY MR. FLINN: You've never seen it as an economist?
A BY DR. DALE: No. I haven't seen it.
Q These projections that you are aware of, are you aware of any information with the relative housing density that may be projected?
A BY MR. FULLERTON: I can tell you from the 1990 urban water management plan that the projections for future population growth in the L.A. DWP service area

0084

consisted primarily of multi-unit -- that is, the net growth will come primarily from apartments and other multi-unit housing, and I assume that the same would hold true here.
Q Does increase in population that occurs in multi-unit housing have the same per-capita increase in water use that occurs in single-family dwellings?
A No. It's lower. There's not the same amount of landscape per person. It's a major difference between the two types of housing.
Q And finally, does economic activity generally, in Southern California, have an impact on population growth?
A BY DR. DALE: Yes.
Q And does it likewise have an impact on water use?
A Yes.
Q And so the extent to which Southern California still suffers from an economic recession, that would tend to decrease water use notwithstanding population shifts?
A That's correct.
Q Now, finally, on administrative costs that you were asked about not included in your model, to your understanding, to the extent that there are any administrative costs, are those the result of simply

0085

the adoption of the new fee structure in Southern California, or is that somehow connected with the Mono Lake controversy?
A Well, it's certainly not directly connected to the extent that these proceedings had an impact on water supply in the region. That may have been an impetus for it, but at this point in time, before a decision was made, those costs have been incurred and would be incurred whatever decision was made.
Q Now, finally, let's assume that they are somehow connected with the Mono Lake controversy. Do you have

an opinion, Sir, as to whether or not these so-called administrative costs might exceed the amount of money L.A. has paid lawyers and consultants in the 15 years of this litigation?

MR. BIRMINGHAM: Objection --

HEARING OFFICER DEL PIERO: Sustained.

MR. BIRMINGHAM: And again, I appreciate Mr. Flinn's concern for the rate payers of the City of Los Angeles because I presume that we're not going to be paying them on application. Mr. Dodge isn't here to correct this, but when we subtract the amount that they will be applying for, we appreciate it.

HEARING OFFICER DEL PIERO: Mr. Flinn, if you want to object to his statement, you can do that, and I'll

0086

sustain that one also.

Gentlemen, let's proceed with the business at hand. Okay?

Q BY MR. FLINN: Do you have any reason to believe, Sir, that the administrative costs that you were discussing have any significance whatsoever to the overall costs at issue in this case?

A BY DR. DALE: I think it could have a fractional impact to the degree that Mono Lake proceedings decrease the supply of water available to the City of Los Angeles. So that rate payers' rates go up for some reason, there might be more requests for a change in rates. To that extent, there would be a small change in administrative costs.

MR. FLINN: Thank you.

HEARING OFFICER DEL PIERO: Thank you very much, Mr. Flinn, I think.

Mr. Valentine?

MR. VALENTINE: No questions for this panel.

HEARING OFFICER DEL PIERO: Do we have anybody else here who's interested in asking questions? Mr. Frink is interested in asking questions.

MR. FRINK: Good morning, Mr. Del Piero.

HEARING OFFICER DEL PIERO: You thought I was going to forget about you again.

0087

MR. FRINK: I didn't.

HEARING OFFICER DEL PIERO: I practiced all weekend to make sure I wasn't going to do that.

MR. FRINK: Great.

CROSS-EXAMINATION BY THE STAFF

Q BY MR. FRINK: I have just a few questions, Dr. Dale. You said earlier that you would not criticize Jones and Stokes Associates for using their 20-year water supply planning sequence, although there would be advantages in using a longer planning scenario. And I believe you said, in this case, that the advantages of using the 20-year planning scenario may have outweighed the costs.

Could you explain that statement a little more and summarize your understanding of what the reasons were that they used the 20-year planning sequence?

A BY DR. DALE: Yes, and I think David can add something to what I say.

My understanding is that they chose 20 years at

random out of a larger sequence in order to simplify the analysis and save money. But in a -- stepping back a bit from this, it's essentially arbitrary what number of years you use to determine what the variance of water supply or hydrology's going to be. DWR tries to use a historical sequence in much of its hydrology

0088

work, and I think that's often about a 70-year sequence.

In this case, it was a 50-year sequence because all the years of hydrology were not available for Mono Lake so that they could -- at least, Dr. Wade in his work used a 50-year sequence.

MR. FULLERTON: It's 50/20.

DR. DALE: 50 20-year sequences. But I think the best way to do it would be to try to estimate at the outset what you feel variance is going to be. That's done for flood planning. You talk about 500-year floods and thousand-year floods. The way they do it is because they've done estimates of the variance as they see it.

In this case, and in both cases, we're both talking about an arbitrarily chosen or a historically chosen number of years. So you can use as many as there are historically, you can try to get a better sense even beyond the historical record by estimating the variance, or you can try to take a very simple analysis such as Jones and Stokes did, which costs less and may be more readily understandable to people than a larger analysis.

MR. FULLERTON: Can I add something to that? I've read Dr. Wade's testimony on this issue. I agree that

0089

it would have been preferable to utilize more in years. However, what Dr. Wade's testimony does to me is confirm that this is a representative sample. That is to say, the numbers that he came up with in his 50 year runs were not very different from what these runs generated. I feel like that, to a large extent, vindicates the original choice or at least confirms it.

Q BY MR. FRINK: Okay. Mr. Fullerton, the modified version of Figure 5 from your testimony includes a couple of points to show the actual water demand for 1991-1992. I wonder if we could put that figure up there quickly. Yes. They're the points indicated with the boxes?

A BY MR. FULLERTON: Yes.

Q In the lower left of the figure?

A Yes.

Q Now, I may be confused here, but are those -- are each of those points placed off one year on the scale? In other words, if you were to back it up and actually go to 1991 and 1992, would they each be one further increment to the left?

A I think that may be correct. It could be that they need to be offset by half a foot in order to make it fully compatible. I'm actually not sure what the scale was. You might ask, I think, Peter Vorster in

0090

the next panel.

Q Okay. And the third box at the bottom, that is just a legend; is that correct, where it says "actual L.A. DWP demand"?
A Right. That's just a legend.
Q Okay. Dr. Dale, Mr. Birmingham asked you some hypothetical questions to elicit your views on the importance of considering differences in water quality in estimating the economic costs of replacing high-quality water with lesser-quality water. As an economist, would you agree that in evaluating the economic impact of different alternatives, one should look at the incremental costs of each alternative, rather than look at the absolute economic costs of any particular scenario?
A BY DR. DALE: Yes.
Q In evaluating the incremental water quality costs of alternative levels of Mono Basin water deliveries, then, I assume you'd want to examine the difference in the quantity of high-quality water from the Mono Basin that would be available under each of the alternatives and compare that? Compare those numbers?
A It would be easier to answer if I -- I don't really know how the water from Mono Lake is used. If it's spread widely throughout the city and blended with

0091

other supplies, then I suspect that the difference in quality is not noticeable. If it's concentrated in one region, one area, it would be easier to do an economic analysis that would show what I think you're getting at.
A BY MR. FULLERTON: I'd also say to some extent, it cuts two ways. To the extent that L.A. DWP manages their groundwater conjunctively, that's going to actually stabilize their purchases of Metropolitan water because in good years, they're going to be buying water to fill up their groundwater, and in bad years, they're going to be at least buffering the increase. They're going to be buffering net purchases by pumping out groundwater. So to the extent that the price -- the cost comes from a capital cost of having to upgrade a plant, you may not be seeing, you know, real large surges of Met water coming through. So it's not clear to me how the costs were cut.
MR. FRINK: Okay. Thank you. That's all the questions I have.
HEARING OFFICER DEL PIERO: Mr. Satkowski?
Q BY MR. SATKOWSKI: Yes. I have a few questions about Cal-Trout Exhibit 34, and I'm not sure which one --
A BY MR. FULLERTON: This chart?
Q Yes. -- which one of you actually discussed it.

0092

My first question is -- deals with column -- the first column there, and it says, "Reduce annual L.A. aqueduct delivery during the first 20 years." Is the reason you use 20 years in this averaging period because the model uses a 20-year period?
A BY DR. DALE: Yes. These numbers were taken out of the model.
Q Okay. Down under Footnote Number One, it says, "Fish flows assumed are the Department of Fish and Game

recommendations." Do you know which exhibit in the Fish and Game exhibits this refers to?
A No, I don't. These runs were supplied to me by Peter Vorster, and you'll to have ask him.
Q Would it be safe to assume, then, that these recommendations do not include the fishing flow recommendations that were brought forth or recommended, I believe last week?
A Yeah. That's correct. These were based upon older runs.
Q Footnote Six --
MR. BIRMINGHAM: Excuse me, Mr. Satkowski. Mr. Del Piero, I don't know if it would be appropriate. Mr. Vorster is here. He's previously been sworn. He's going to be a member of the panel this afternoon, and I wonder if it would be appropriate to just have him

0093

answer that question now?
MS. KOEHLER: We'd have no objection to that.
HEARING OFFICER DEL PIERO: Mr. Vorster? Did you hear the question?
MR. VORSTER: The question was whether the flushing flow recommendations that we used in this table, Cal-Trout Exhibit 34, incorporated the most recent recommendation. Not in exact form, but in quality, essentially, yes. It so happened that the quantity I used in these LAMP runs last September for wet years was virtually equivalent to the flushing flow recommendations in wet years.
In normal years, his flushing flow recommendation is slightly higher, a thousand acre-feet or so higher. I think you can use these numbers to make a relative comparison.
HEARING OFFICER DEL PIERO: Thank you. Please proceed, Mr. Satkowski.
Q BY MR. SATKOWSKI: Footnote Six, you say that, "If money from AB 444 were credited for meeting these lake levels, then the annual cost for the first 20 years would be reduced by approximately $4.0 million per year for each alternative."
How did you go about coming up with a $4.0 million per year number?

0094

A BY MR. FULLERTON: I did that. I consider it a fairly basic rule of thumb that you can translate a fixed number today into a constant stream which is about one-tenth the size. So if DWP were able to get $44 million today, that translates into roughly $4.0 million over -- a permanent stream of $4.0 million. Anyway, that's what I assume. You tell me if that would be the assumption.
A BY DR. DALE: If you put money in the bank at a 10 percent interest rate, if you put $50 million in at a 10 percent interest rate, you'd get 5 million a year. If it's about an 8 percent interest rate, that's basically how you make that equivalence. I suppose today I'd use a somewhat lower number.
Q Lower than 4.0 million?
A Lower than 8 percent interest.
A BY MR. FULLERTON: You're also paying it off in 20

years.
A BY DR. DALE: In the ballpark.
HEARING OFFICER DEL PIERO: It's beginning to sound like a discussion of home finances.
DR. DALE: That's right. It's almost identical.
MR. SATKOWSKI: Thank you. Those are all the questions I have.
HEARING OFFICER DEL PIERO: Thank you very much,

0095

Mr. Satkowski.
Mr. Smith?
Q BY MR. SMITH: Thank you and good morning.
I have a question about Cal-Trout Exhibit 2-B. DR. Henniman's (phonetic) -- Dr. Henniman's (phonetic) marginal cost pricing. On Page 9, there's a statement about the last sentence in the middle paragraph. "In the event the committee recommended the switch point be located at 550 gallons per capita per day, the Los Angeles City Council raised this to 750 gallons per capita per day before passing the final rate ordinance." A little bit of background on it, this was like a break point. They wanted to have the pricing of the water beyond that point as significantly -- would become significantly higher.
A BY DR. DALE: I understand.
Q You understand what I'm saying here? In previous testimony, Mr. Gewe from the Los Angeles Department of Water and Power said that the average household usage per day was, as estimated, 150. Do you recall that testimony?
A I wasn't here for the testimony.
Q Let's assume that's what he said. Maybe you can't answer that, but why would the -- why would the Blue Ribbon Committee and the Los Angeles City Council make

0096

this switch-off point 700 when the average use was 150?
A There were a couple of reasons.
Q Wouldn't it be logical to do something like 200 -- when you start using more than the average of 150 that you should maybe make it like 200 for the higher rate? I don't understand how these two figures coincide.
A BY MR. FULLERTON: I'm wondering if there's a difference between per-capita use and household use. I think that household use is going to be much higher than 150 gallons per day. It's going to be a lot closer. It's not the differential I think --
A BY DR. DALE: That's true. Another point to make, though, is that this is for -- one of the reasons for choosing a high break point is to permit middle class and -- or families who use small amounts of water not to face the brunt of costs of any -- any change such as might be anticipated during a shortage. And so there's an effort to try to reach the families that use the most water. And there's good reason besides equity to do that, and that is because households that use a lot of water tend to have a lot of outdoor use and the cost to decrease water applications outside are lower than costs indoors. And the more -- the larger the landscaping water use, the easier it is for families in general to decrease their water use.

0097

So I think it's an effort, in equity terms, to avoid hurting smaller households and on efficiency grounds, it's less expensive to decrease water use to large water users. As a general rule. Does that make sense?

MR. SMITH: I guess to a degree.

Thank you. That's all I have.

HEARING OFFICER DEL PIERO: Mr. Herrera?

MR. HERRERA: I have no questions, Mr. Del Piero.

HEARING OFFICER DEL PIERO: Mr. Canaday?

MR. CANADAY: None.

HEARING OFFICER DEL PIERO: Do you have all those grades taken care of?

MR. CANADAY: Yes, Sir.

HEARING OFFICER DEL PIERO: Good. I'm sure those students will appreciate it.

MR. CANADAY: Most of them.

HEARING OFFICER DEL PIERO: Mr. Stubchaer?

MR. STUBCHAER: Yes. I have just a couple of questions.

CROSS-EXAMINATION BY THE BOARD

Q BY MR. STUBCHAER: Dr. Dale, I believe you said that the selection of the period, base period for modeling was somewhat arbitrary?

A BY DR. DALE: Yes,

0098

Q And isn't it desirable for the base period for a hydrologic model to represent average conditions so that it doesn't include the effects of droughts or wet periods? In other words, for the precipitation during the base period to represent long-term average conditions?

A At a minimum, it should represent long-term averages. It should also try to incorporate some of the variation.

Q So then it's not really arbitrary. There is a criteria to which the base period could be compared?

A That's true, yes.

Q Do you know if the 20 years that were selected for this model represent average hydrologic conditions?

A BY MR. FULLERTON: I'd probably want to refer that to Peter Vorster. He would have a better --

Q If you don't know, that's fine.

A I know they made an attempt to do that by selecting wet, medium, and dry years in approximately the same proportions they've experienced historically. I'd refer more detail to Peter Vorster.

Q And then with regard to -- I think you mentioned that you know of no documented loss of jobs due to water shortage?

A BY DR. DALE: In urban areas, yes.

0099

Q Are you familiar with the study that was done of the drought in Santa Barbara in the '89, '90, '91 drought, that did document substantial loss of jobs in the nursery-landscape industries and also the agricultural on the urban fringes?

A I've heard of the study. I haven't actually read it. I know some of the people that worked on it. My

understanding was that there was a shortage of jobs during the drought that -- and I also understand there's an increase in jobs after the drought as there's more landscape work to be done. So, in my estimation, it about evens out.

MR. STUBCHAER: Okay. Thank you.

HEARING OFFICER DEL PIERO: Mr. Brown?

MR. BROWN: Just a couple.

Q BY MR. BROWN: Either of you Gentlemen, are you aware of what the state uses on an annual basis in water? Annual average? Currently?

A BY MR. FULLERTON: 35 million acre-feet, I'd say.

Q Do you know what the safe yield of the state is?

A No. I mean -- at the entire state level?

Q Right.

A No.

Q Do you know if the state water supply versus demand is in balance or out of balance today?

A BY DR. DALE: Well, I think right now, there are more demands being placed on water supplies than there is water being supplied, so to that extent, it's true. There is an imbalance.

Q Are you familiar with mining of groundwater in the San Joaquin Valley?

A Yes.

Q Do you know to what extent it is on an annual average basis?

A BY MR. FULLERTON: I believe it is about 8.0 million acre-feet, according to DWR estimates.

Q Do you know what the projections are in the next 20 years?

A No, I don't.

Q Would that have an impact on some of your testimony today if you knew the state was -- had an imbalance of water and that the shortfall is projected to grow? How would that bear on your testimony?

A BY DR. DALE: I guess my take on it is that that's a -- that's going to be a further incentive to farmers in the region where groundwater levels are falling to enter into water trades so they don't have to undertake agriculture that's causing it in the first instance.

And I'm also aware of other areas in the state where there's an increase in groundwater levels that, through proper state policy, could balance out, I think, that one million loss in the San Joaquin. I think -- I mean, it's silly for me to go on at length about this.

Q Have you read the Draft DWR Bulletin 160? Just came out. Have you seen that?

A Yes, I have seen it.

A BY MR. FULLERTON: I've glanced over it.

Q I believe the shortfall is projected to grow to maybe as much as four or five million acre-feet annually; is that correct?

A Could be. Sounds about right for what they projected.

Q I just wondered what impacts you may visualize it would have upon getting up the shortfall for the Los

Angeles area?
A Mainly, the problems are on an entirely different order of magnitude. We're talking about several tens of thousands of acre-feet here. The real fundamental changes in California water management are going to be induced by the larger shortages that you referred to. We're going to be seeing a lot of changes. A lot more groundwater banking, transfers, reclamation. A whole plethora of new adaptations to these stresses. The Owens -- the loss of Mono water is really a drop in the

0102

bucket compared to that and the same adaptations that will deal with a larger shortage will also deal with this shortage.

MR. BROWN: No further questions, Mr. Chairman.

HEARING OFFICER DEL PIERO: Thank you very much, Mr. Brown.

Ms. Koehler, redirect?

MS. KOEHLER: Thank you.

HEARING OFFICER DEL PIERO: Certainly.

REDIRECT EXAMINATION BY MS. KOEHLER

Q I have just a few questions. With regard first to the issue of the 20-year sequence, Mr. Fullerton, are you familiar were Dr. Wade's testimony on this?

A BY MR. FULLERTON: Yes.

Q Specifically, are you familiar with Table B of his testimony, which I will hand you if you don't have a copy available?

A Yes, I am, and thank you.

Q Did Dr. Wade employ 50 20-year sequences in his analysis of water availability?

A Yes, he did.

Q Is it your -- can you give us your opinion about the consequence of doing 50 20-year sequences as opposed to the single 20-year sequence employed by your model and by the Jones and Stokes model?

0103

A The numbers come out very close together. For example, at the 6383.5 foot alternative, the Jones and Stokes assumes 400,000 acre-feet on average from the L.A. aqueduct whereas the Table B from the 50 20-year runs would give 399,000 acre-feet. Some of the other ones are slightly different than that.

Basically, what I conclude from this is that this is, in fact, fairly a good representative run and is adequate.

Q Excuse me, Mr. Fullerton, when you say it is "a good representative run," which run do you mean?

A Let me put it this way. That the 20 years chosen appear to have statistical characteristics which were similar to those which you generate in doing 50 20-year runs.

Q And when you say "the 20 years chosen," you mean chosen by Jones and Stokes?

A Yes.

Q Thanks.

Turning to the questions of water quality which were brought up by Mr. Birmingham in his examination, can you tell me, either one of you, how much water are we really talking about here? What's at issue in terms

of annual acre-feet?
A It depends on the baseline, of course. But, for
0104
example, starting from 6377, in my analysis, we're looking at -- let's see, if I might -- if you start from 6377 as kind of your baseline, we're talking about a dollar, two dollars. Oh, how much water? We're talking about maybe 10 to 20 to 30,000 acre-feet.
Q Okay. And would you expect -- I guess this is a question for Dr. Dale. Would you expect any costs associated with the water quality impacts of this 20, 30,000 acre-feet on Los Angeles to be significant in terms of what Los Angeles pays annually for water?
A BY DR. DALE: I can't recall. I did see a study once. I think it was done in Contra Costa about how much people would pay for a better quality of water. I don't remember the specifics, but as I recall, it was a lesser order of magnitude than the costs that we're talking about here.
Q Okay. Thank you.
Mr. Fullerton, turning to your Exhibit 5, which I believe is displayed behind you, I have just a few questions about your water conservation analysis. Could you very briefly tell us what assumptions you made for this hard conservation only line, the middle line?
A BY MR. FULLERTON: Yes. I assumed changes -- I assumed that three things would happen that weren't
0105
considered in the DWP analysis. The first was the law passed in California last year which requires that all new toilets installed in the state as of next week, as of 1994, must be ultra low-flush toilets. That's new since this estimate was made. From now on, any time anyone breaks their toilet, replaces their toilet, remodels, anything, all those toilets are going to be 1.6 gallons of flush flows.
The next thing that I utilized was the Memorandum of Understanding which was negotiated in 1990, 1991, and signed in 1991. This has been previously presented to the State Board. As part of that MOU, a methodology was developed for estimating how many toilets or, rather, how much water urban agencies are committing to save from the installation of toilets. I used that methodology in calculating this number, also.
Third, I made an estimate of the amount of water that would be saved from the installation of toilets in commercial settings, airports, restaurants, and so on. We do not have improved methodology for that in the MOU. I made a rough estimate. It's much smaller than the residential, in any case.
And third, I estimated a savings from the introduction of more efficient washing machines. That's fairly inconsequential. It's less than 10
0106
percent of the total conservation here, but it's assuming that the economics are right for this. And it's going to be implemented in the next five years at very intense levels.
Q Thank you.

Can you tell us what -- what types of conservation measures you left out of the hard conservation only scenario?
A Well, I left out other types of appliances that would increase efficiency. I didn't include higher efficiency urinals, for example. I didn't include gray water which I think has quite a bit of potential. I didn't include washing -- or rather dishwashers and so on. I just focused on these three items and left everything else off.
Q Of all of those things that you left off in the hard conservation area, do you have reason to believe that those -- those appliances -- well, you have said that they have potential. Can you expand on that for us somewhat? How much potential do you think there is in the appliances which you left off the hard conservation scenario?
A I'm a little hesitant to hazard a guess since I haven't really looked into it. I think there is a very large potential for gray water, and of course gray

0107

water regulations are in the process of being adopted by the state. I'm not sure if they're cost effective at these prices, so on, so it's hard to give them an estimate of what's really appropriate. We're not looking at a huge new burst of conservation. I think we're looking at savings on the same order potentially as what I estimated here. Maybe less, maybe more.
Q So on that basis, would you say that it's a fair characterization that your hard conservation only scenario is fairly conservative?
A It's fairly conservative. It's not dramatically conservative. Some of the things that I mentioned that maybe aren't as likely to occur in the next 20 years but that will occur in the next 20 years. So this is kind of a new source to be tapped after this. I think what I did was conservative, but in the ballpark.
Q We've talked a little bit about population this morning. Based on the population numbers that Dr. Dale has discussed with you, these unofficial SKAG numbers, how do you think any increase in population over that which you included in your projections, how do you think that will affect your demand estimates?
A I think if those population numbers are correct, I think it bumps up the demand estimates by several percent, you know, which translates into, you know, 10

0108

to 20,000 extra acre-feet of demand over our base assumptions, over the hard-plus pricing effect assumptions.
Q Do you think it would bring demand anywhere near the demand assumptions in the Draft Environmental Impact Statement?
A No. It would still be a substantial drop.
MS. KOEHLER: Thank you. That's all I have.
HEARING OFFICER DEL PIERO: Thank you very much.
Mr. Birmingham?
RECROSS-EXAMINATION BY MR. BIRMINGHAM
Q Mr. Brown asked some questions about the California water plant update, and the 1993 draft which

has been introduced into evidence as L.A. DWP Exhibit 104-A. And I think both of you Gentlemen said that you have reviewed it. Is that correct?
A BY MR. FULLERTON: That would be perhaps overly generous. I've glanced through it.
Q Dr. Dale, you said you'd reviewed it?
A I've picked through it for numbers and information, yes.
Q Now, you both recognize that this is a draft and is subject to revision after hearing by the Department of Water Resources; is that correct?
A I don't know that I've seen the November draft.

0109

I've seen an earlier draft. I think it was October or September.
Q The report in Chapter 12, which is, I believe, entitled Water Balance talks about projected demand, and I know that you haven't had an opportunity to review it as thoroughly as you like -- would like, but I'll ask just a few questions about it. Mr. Canaday has been kind enough to give me his copy of Volume One, and I'll ask you Gentlemen to follow along with me in Chapter 12, entitled Water Supply and Demand Balance.
HEARING OFFICER DEL PIERO: There will be no problem with extra copies of this document.
MR. BIRMINGHAM: No problem.
HEARING OFFICER DEL PIERO: There are some perks in this job, Mr. Birmingham.
Q BY MR. BIRMINGHAM: On Page 369, I believe -- actually, I don't have my update -- my mark-up copy. There are some projections of population growth, and there's a projection that within the service area of the Metropolitan Water District of Southern California, there will be an increase in population demand by approximately 25 million people by the year 2020. And I'm looking here at page 367.
Now, the question -- have you found my reference to -- this is --

0110

A BY MR. FULLERTON: I found the page.
Q It's in the penultimate paragraph.
A BY DR. DALE: Actually -- yeah. That's right. Second to last.
Q It says, "Water shortages will vary from region to region and sector to sector. For example, the south coast region's population is expected to increase to over 25 million people by 2020 requiring an additional average water supply of 1.5 million acre-feet per year."
Now, do you -- as you Gentlemen sit here today, do you have any reason to doubt the accuracy of this projected increase in population that's stated on Page 367 of L.A. DWP Exhibit 104 for the south coast region?
MS. KOEHLER: Objection. These witnesses have already stated that they've taken only a superficial look at this document.
HEARING OFFICER DEL PIERO: Gentlemen, can you answer the question?
DR. DALE: I have no reason to disagree with it.

MR. FULLERTON: Could be, no.
HEARING OFFICER DEL PIERO: I'm going to overrule the objection. What they've been able to glean out of the document and what they haven't been able to glean

0111

out of document is not clear from their statements. If you don't know the answer, you can say you don't know the answer.
Q BY MR. BIRMINGHAM: Let me ask you Gentleman this question. In preparing your analysis of projected water demand in Southern California, you considered increased population; is that right?
A BY DR. DALE: We didn't do an analysis of water supply and demand in all of Southern California. The model analysis was concentrated on the Department of Water and Power in Los Angeles. In fact, I understand by agreement early on that there was -- it was decided not to do an analysis of the broader area.
But nonetheless, I have looked over Dr. Wade's testimony, and I assume he's incorporated these features into his analysis and, to that degree, I may be able to answer your questions.
Q Would you agree with me that the water supply of Los Angeles is related to the water supply of the entire Metropolitan Water District service area?
A BY MR. FULLERTON: Related in what sense? I mean --
Q If you don't understand my question, please don't answer it, and I'll explain it.
A Please explain yourself.
Q Is it correct that there is an interdependence or

0112

interrelationship between the water supply of the City of Los Angeles and, say, the City of San Diego?
A I'd say there's a weak linkage. L.A. DWP, perhaps, more than many other communities, has a very diverse, strong set of supply sources. There is a linkage between DWP supplies, but it's perhaps weaker than would be the case for other cities.
Q Now, you Gentlemen have expressed the opinion that Metropolitan Water District in the year 2010 is going to be able to supply the needs of the City of Los Angeles for water; isn't that correct?
A That's certainly my conclusion based on MWD's projections.
Q Now, when you were forming your opinion, did you consider the increased population that is expected for the service area of the Metropolitan Water District of Southern California?
A BY DR. DALE: I relied on that MWD bond document, and I assume that that document was incorporating recent population projections and that document appeared to show a high likelihood of a balance between demand and supply.
Q And you would agree, wouldn't you, that projected increases in population certainly would be relevant to an analysis of the ability to supply water in a region?

0113

A Yes, of course.
Q Now, have you reviewed Pages 375, 376, and 377 of L.A. DWP Exhibit 104, Dr. Dale?

A Which exhibit is that?
Q That's the state water --
A That's the one we're looking at here.
Q California Water Plan Update, Volume One?
A No, I have not.
HEARING OFFICER DEL PIERO: Mr. Birmingham, we're going to continue until your get your phone call, then we're going to break for one hour.
MR. BIRMINGHAM: All right. Actually, I had left a message with the agency with whom I'm supposed to have the call that I would call them at 11:35.
HEARING OFFICER DEL PIERO: That's fine, then we'll break until 12:35.
Ladies and Gentlemen, just so everybody understands, we're going to break a little early for lunch today. We're going to take a one-hour break from 11:35 to 12:35. We'll come back. We'll take our normal afternoon break. We'll take a 10-, maybe 15-minute break right around five o'clock, and I'm assuming we will be all day until seven.
MR. FLINN: With any luck, we should be out of here early. My direct of my panel, I hope, would take

0114

less than 15 minutes. I'm assuming we'll be out of here before that.
HEARING OFFICER DEL PIERO: That's fine, Mr. Flinn. If it works out that way, it will be great. I'm just letting everybody know that we're not going to go any later than seven o'clock tonight. If we get done earlier, we can go have fun for however long that is.
Q BY MR. BIRMINGHAM: On Pages 365 and then again on Page 367, the Draft California Water Plan, Volume One, projects an increased demand in Southern California of 1.5 acre-feet.
MR. FLINN: Which page?
MR. BIRMINGHAM: 365 --
MR. FLINN: 365.
MR. BIRMINGHAM: 365, the third paragraph from the bottom. It starts, "California annual's water -- net water demands."
Do you see the paragraph I'm referring to, Dr. Dale?
DR. DALE: I do, yes.
Q BY MR. BIRMINGHAM: And then under Urban Use, the next paragraph, the last sentence says, "Nearly half of the increased population is expected to occur in the south coast region increasing the region's annual water

0115

demand by 1.5 million acre-feet."
I'm going to ask you to assume that this projection is accurate. Would that projection affect the opinions that you've expressed concerning Metropolitan Water District's ability to supply L.A. with replacement water?
A BY DR. DALE: Well, it's hard for me to answer because my opinion's based on another document and the MWD testimony so -- I guess the question might be better directed to Tim Quinn (phonetic). I guess I better leave it at that.

Q Now, do you understand that Dr. Quinn's (phonetic) testimony about the ability of Metropolitan to supply water is contingent upon regulatory agencies being flexible in allowing diversions out of the delta?
A I didn't hear his testimony, but I heard that's what he said.
Q And if Dr. Quinn is optimistic, too optimistic about the flexibility of the federal regulatory agencies in allowing water to be diverted out of the delta, would that affect your opinion?
A If the MWD bond document and the investors in MWD and Tim Quinn (phonetic) are all wrong in this regard, it would change my opinion, yes.
Q The graph that you put up here, Cal-Trout Exhibit

0116

32, I believe -- I'm sorry. It's NAS and MLC Exhibit 4-A. Do you have a copy of that in front of you?
A BY MR. FULLERTON: This?
Q Now, as I understand, this is a chart that shows the historical and projected supplies, 1978 to 2011; is that correct?
A Yes.
Q Now, it's based upon what has happened historically, and it's based upon what you projected in the future with the use of your model?
A Yes.
Q Now, you've recently amended NAS and MLC 4-A; is that correct?
A I haven't. You'd have to ask -- you'd have to ask the Mono Lake Committee.
Q Well, now, maybe the Department of Water and Power is being too optimistic here, but when I look at 1993, it shows that there have been exports out of the Mono Basin for 1993.
A This is -- in 1993, I believe, is a projection.
Q I see.
A Let's see. Certainly, it shows exports during the 20-year sequence which is, of course, the hypothetical sequence.
Q But you don't expect there to be exports out of

0117

the Mono Basin in 1993?
A I don't know.
Q Do you expect there to be exports out of the Mono Basin in 1994?
A I don't know. These questions would be better directed to Peter Vorster.
Q Now, is it correct that the graph does not assume a prolonged drought during the period represented?
A Well, there's about a three-year dry sequence at the end, three to four years.
HEARING OFFICER DEL PIERO: Mr. Birmingham, you have a phone call.
MR. BIRMINGHAM: I've concluded my examination of these witnesses.
HEARING OFFICER DEL PIERO: You have?
Ladies and Gentlemen, we're on break for one hour. We'll be back at 25 minutes to one.
(Whereupon the lunch recess was taken.)
HEARING OFFICER DEL PIERO: Ladies and Gentlemen,

this hearing will again come to order. When last we left, Mr. Birmingham had just concluded his recross, and we were going to move on to Patrick Flinn, I think.

MR. FLINN: Assuming Ms. Cahill's absence suggests she has no questions.

HEARING OFFICER DEL PIERO: I would assume that. If she comes back in and indicates some great angst, we'll arrange to accommodate her needs.

MR. FLINN: My predecessors at the podium have all failed to note that during the recess last week, either Santa or one of his elves came in and has lightened our atmosphere here. I personally appreciate that and, of course, we can only speculate whether it was Santa or one of his elves. There is, of course, one person who meets the physical description of elfin here, and he's my first suspect, but we can't be sure, but I wanted to express my appreciation to the elf in question.

HEARING OFFICER DEL PIERO: Let me assure you that we will track that person down before the hearing's over.

MR. STUBCHAER: And see what fingerprints are on the contents of the stockings.

(Laughter.)

RECROSS EXAMINATION BY MR. FLINN

Q I only have really one question or subject area for you, Dr. Dale. This is to follow up.

Mr. Birmingham had asked you some questions about the urban water plan update to the draft from the Department of Water Resources. Do you recall that?

A BY DR. DALE: Yes, I do recall.

Q And do you recall he asked you if that projection of a 1.5-million-acre-feet increase in the year 2020 was something that affected your -- would affect your opinions, and you said you relied on the MWD bond statement with respect to projections.

Do you recall that testimony?

A Yes.

Q Okay. Do you have in front of you a copy of Audubon Exhibit 223, an excerpt from the bond report?

A Page 22 from that bond report.

Q Actually --

A Page 42.

Q Well, it's actually Page 36 on the official exhibit. It's the same table as on Page 36, and that's the table that you were referring to?

A That's the table I'm referring to, a comparison of water supplies and demand.

Q And Mr. Birmingham asked you about a projected MWD demand increase to the year 2020 of 1.5. To what year does this report go in the future? I made a mistake. Let me withdraw the question.

Mr. Birmingham's 1.5 million acre-feet was up to the year 2020. Up to what year do we go in the bond report?

A The bond report goes up to the year 2010.

Q Okay. Mr. Birmingham is talking about 1.5 to

2020. How many million acre-feet do we go in the bond report just to 2010?
A The incremental difference is -- the increase in demand is from 3.29 to -- in the year 1992, to 4.73 in the year 2010, which is an increase of 1.44 million acre-feet.
Q So the bond report you relied on actually has 1.4 rather than 1.5, but reaches that ten years earlier than the figures Mr. Birmingham was talking about; is that right?
A Yes, that's right.
Q Having looked to refresh your memory on the issue of this bond report, does 1.5 million to 2020 affect in any way any of the conclusions that you've drawn here today?
A No. I think it supports the conclusions.
MR. FLINN: Thank you.
HEARING OFFICER DEL PIERO: Thank you very much.
Ms. Cahill did you have any recross?
MS. CAHILL: No.
HEARING OFFICER DEL PIERO: Just checking.
Mr. Valentine?
MR. VALENTINE: Likewise.
HEARING OFFICER DEL PIERO: None for

0121

Mr. Valentine.
Any other parties interested in recross?
Mr. Frink?
MR. FRINK: No.
HEARING OFFICER DEL PIERO: None for you, Mr. Frink.
Mr. Satkowski chose not to join us after lunch. He must have had the chili.
MR. SMITH: He's working on the LAMP model.
HEARING OFFICER DEL PIERO: Mr. Smith?
Mr. Herrera?
MR. HERRERA: No questions.
HEARING OFFICER DEL PIERO: Mr. Canaday?
MR. CANADAY: No.
HEARING OFFICER DEL PIERO: No questions?
Gentlemen, thank you very much.
Do you have an offer, Ms. Koehler? Offer these Gentlemen's testimony in the record?
MS. KOEHLER: Yes. I do offer the testimony of these Gentlemen and the exhibits attached to their written testimony into evidence.
HEARING OFFICER DEL PIERO: Any objections? So ordered. Thank you very much.
MR. FRINK: In order that we're clear, do you have an identification --

0122

HEARING OFFICER DEL PIERO: Dr. Dale, you better take your donut with you. It may not last.
MR. FLINN: He gets to stay.
MR. BIRMINGHAM: Dr. Stine is joining him.
MR. FRINK: In order that we're clear on the exhibits that are admitted, are they just the testimony and the attached exhibits or were other exhibits that they discussed?
MS. KOEHLER: Any other exhibits that were entered

today. There were three exhibits entered today.
MR. SMITH: There are others included in it, but I'm assuming, Ms. Koehler, that you're talking about Cal-Trout 2 to A to B, Cal-Trout 3, 3-A, 3-B, 3-C, and 3-D. That's about one two, three, four, five, six, seven, eight.
MS. KOEHLER: And in addition to the three exhibits we introduced today, Cal-Trout -- I think it was 32, 33, and 34.
MR. SMITH: Yes. Those are the ones.
HEARING OFFICER DEL PIERO: Okay. Thank you.
(Cal Trout Exhibits No. 2, 2-A, 2-B, 3, 3-A, 3-B, 3-C, 3,D, 32, 33, 34, were admitted into evidence.)
MR. FLINN: We've got our new panel. We've got to

0123

location Dr. Campbell who I think is resting. You can take your seat. You're second to the closest.
HEARING OFFICER DEL PIERO: Mr. Birmingham, I hope things went well during the lunch hour.
MR. BIRMINGHAM: I was going to thank you for taking the lunch recess early. I was talking to the Board of Directors of Westlands Water District at 11:40, and suddenly they said, "We're going to have to put you on hold," and they put me on hold. And the receptionist came back and said, "They're not going to be able to talk to you now because Congressman Lehman just arrived."
I now understand the vagrancies of politics because they wanted to talk to Congressman Lehman rather than me. So we were delayed an hour.
HEARING OFFICER DEL PIERO: I've got tell you, having been on boards like that for a long time, the Congressman they could talk to for free. They've got to pay you.
MR. BIRMINGHAM: They put us on hold for about an hour, but I do appreciate you taking the lunch hour early.
HEARING OFFICER DEL PIERO: Absolutely.
Dr. Trott, you've not been sworn yet, have you?
DR. TROTT: No.

0124

HEARING OFFICER DEL PIERO: We'll wait until the other members of the panel have arrived.
HEARING OFFICER DEL PIERO: Where's Mr. Vorster?
MR. FLINN: He went looking for Dr. Campbell.
HEARING OFFICER DEL PIERO: Let the record reflect that we've been joined by the Chairman of the State Water Resources Control Board, the remarkable John Caffrey.
MR. CAFFREY: How much do I owe you now?
MR. STUBCHAER: He didn't say remarkable in which way, you notice.
MR. CAFFREY: You're in my chair, so you'll be higher and taller than me.
HEARING OFFICER DEL PIERO: You figured it out. I get in here early and lower everybody's chairs.
Drs. Campbell and Trott have not been sworn.
Gentlemen, those of you who have not had the oath

administered to you, if you'd stand and raise your right hand, please?
DR. CAMPBELL: May I please affirm when you get to that point?
HEARING OFFICER DEL PIERO: Of course.
Do you promise to tell the truth during the course of these proceedings?
(All say I do.)

HEARING OFFICER DEL PIERO: Our oath is designed to accommodate all.
Mr. Flinn, it's your show.
DIRECT EXAMINATION BY MR. FLINN
Q Thank you.
I just want to simply introduce the panel. We've got Peter Vorster, Dr. William Trott, Dr. David Campbell and Dr. Larry Dale.
I'd like to start with Mr. Vorster. If you could please, Mr. Vorster, briefly summarize your qualifications with respect to the subject matter of water supply and the operation modeling work that you've done.
A BY MR. VORSTER: I'll be giving my background on the hydrology and water management of the Mono Basin and the Los Angeles aqueduct system when I testify in January, but I can tell you that I've studied the Southern California water planning and management issue since 1977.
As the principal researcher on the California water atlas, I intensively study all aspects of California's hydroscape and, in particular, the Southern California water delivery system. In 1979, I prepared a comprehensive report on the water supplies of the Los Angeles Department of the Water and Power

for the National Audubon Society, and since then, I've been studying the alternative water management strategies that could be implemented to replace Mono Basin diversions.
In 1989, I commenced doctoral work in environmental planning at the University of California at Berkeley with an emphasis on water planning and management. I'm currently employed as a consultant, as a consultant on an integrated water resource plan for the Alameda County Water District -- I'm actually a subconsultant to the main consultant, and for the Portland, Oregon, metropolitan region.
I'm a member of three project advisory committees for studies sponsored by the California Urban Water Agencies, an association of large urban water agencies that DWP is a core member of. These studies include urban water supply reliability, financial incentives for urban water conversation, and the relationship between long-term water conservation and shortage management policies.
I participated in the negotiations and developed a Memorandum of Understanding regarding urban water conservation in California and in the three-way process to resolve California's water problems. I've also occasionally participated in negotiations to develop a

0127
Memorandum of Understanding regarding agricultural water conservation. I also was involved in the technical advisory group that developed the LAMP model.

I have extensive experience modeling the Los Angeles aqueduct system and the Mono Basin water balance. The subject of my Master's thesis was the Mono Basin water balance, and it was recognized by the Special Master in the U.S. versus California lawsuit as being the most complete and accurate representation of the hydrology of the Mono Basin.

I helped Dave Fullerton conceptualize and formulate the least-cost model that he earlier testified to, and I provided the conjunctive use in MWD purchasing assumptions. I provided the inputs for the Los Angeles aqueduct supply using the LAMP model and the Department of Fish and Game recommended fish flows among the assumptions that I used.

Q Mr. Vorster, is your testimony, signed on September 22nd, 1993, marked in this proceeding as Audubon Exhibit 1-A-D, your direct testimony in this case?

A Yes, it is.

Q Okay. Dr. Dale --

A Do you want me to summarize it?

0128

Q No. We'll just let it stand on its own in the interest of time.

MR. BIRMINGHAM: Thank you, Mr. Flinn.

MR. FLINN: I know. I was going to give you a chance to say something funny, but we'll just move on.

Dr. Dale, you already reviewed your --

HEARING OFFICER DEL PIERO: It's okay, Mr. Vorster. I'll give you a chance to say something funny later on.

(Laughter.)

Q BY MR. FLINN: Dr. Dale, you've already identified your qualifications. I would ask you if the testimony you signed on September 22nd, 1993, and marked in this proceeding as Exhibit 1-E, is your direct testimony in this case.

A BY DR. DALE: That's right. It is.

Q Are there some corrections to Exhibit 1-E and Audubon Exhibit 4 referenced in that document?

A Yes. As you mentioned before, we're going to replace Exhibit 4 with Exhibit 4-A, which has some very slight corrections to the demand in a couple of years. And on Page 2, I'd like to delete Number Four from the testimony.

MR. BIRMINGHAM: I'm sorry, would you repeat that?

0129

DR. DALE: On Page 2, there's five bullets in the middle of the page, and the fourth bullet down, I'd like to delete from the testimony.

MR. BIRMINGHAM: Thank you.

Q BY MR. FLINN: Are these corrections the result of a -- an error in inputting the data that created the graph Exhibit 4?

A BY DR. DALE: That's right.
Q Also, for the record at this point, we would withdraw Exhibit 3 which contains the same error. We don't need to replace it because the information is contained on 4-A.
Dr. Dale, what I'd like you to do is very briefly, if you could, step up to the projector there and explain to us what is depicted on Exhibit 4-A, bearing in mind that you are to give some testimony particularly about the projection aspect of it that you don't need to repeat.
A Okay. This is the combined historical and projected runs showing, at the top here, demand for water from DWP from the year 1978 up to the year 2011, and the historical period ends in 1993, I believe it is. And the different colors within the graph of this area graph show -- demonstrate the different types of water that are used to accommodate demand. And so at

0130

the bottom here is shown, what is this, Mono -- Mono Basin water, and then one up from that is Owens Basin water, and this is groundwater, and then at the very top you see -- at the very top in the historical area you see groundwater. You see how groundwater fills in many of the gaps, and then over here you have reclaimed water.
Q And the historical period, 1978 through 1992, did you rely on data supplied by Mr. Vorster for that?
A Yes, I did.
Q Thank you. You can take your seat.
Dr. Campbell, could you summarize your qualifications, please?
A BY DR. CAMPBELL: Let me get the microphone here. First of all, I reside in Los Angeles and am a homeowner and a customer of DWP. That may be somewhat rare for these hearings. And I earned my Ph.D. in agriculture and resource economics at the University of California at Berkeley and have two Master's degrees, one Master of Science from Berkeley and a Master of Economics from San Francisco State.
From 1982 to 1993, I was the economist for the National Wildlife Federation in Washington D.C. It's the largest conservation organization, we believe, in the world, five million member supporters.

0131

HEARING OFFICER DEL PIERO: What year was it?
DR. CAMPBELL: 1992 to 1993.
We had a staff as high as 700 people, but it's down around 580 or 570 right now. It's large.
HEARING OFFICER DEL PIERO: Was Secretary Wheeler there, then? Doug Wheeler?
DR. CAMPBELL: 1982? Yes. He was, first of all, with the agricultural -- hold on. It's a land group, anyway.
HEARING OFFICER DEL PIERO: American Farmlands.
DR. CAMPBELL: -- when I first met him, and then he was with the Sierra Club, I think.
And I was assigned to the water resources team, and I was the only economist. I worked with a lot of other issues, testified for Congress, maybe, 100 times

and mostly water issues. And then, as regards urban water issues, dealt with Fort Smith, Arkansas; North Texas Water District, Castro, Wyoming; L.A. Department of Water and Power, Delta River Basin Commission, et cetera, mainly on dealing with issues of reducing demand and using prices as a method of reducing demand. And, for example, Delta River Basin Commission, I probably attended 10, 15 meetings in a couple of years and had them adopt a water-conserving pricing structure.

0132

Los Angeles Department of Water and Power is sort of a -- just a lot of ad hoc discussions with the staff, and one of my recommendations which was accepted was the pricing schedule, and another one, monthly billing, is at least recommended by the Blue Ribbon Panel.

From 1979 until '82, I was the senior economist with the United States Resources Council and that's composed of seven secretaries and the administrator of the Environmental Protection Agency. It doesn't have a staff right now, but in the Carter Administration, it was very active, too active, I guess, for Secretary Watt.

I've taught at the University of Idaho, et cetera, and I'm being very active in economic and related groups being president of the American Water Resources Association, the National Capitol section, which is the largest section there. I'm on the publications and policy committee for the Metropolitan Water Resources Association and present papers, public papers, on many water resource issues.

Q Is the testimony that you signed on September 20th, 1993, and marked in this proceeding as Exhibit 1-D, your direct testimony in this case?

A Yes, it is.

0133

Q And can you summarize for us the highlights of that testimony?

A Yes. The testimony provides several reasons why I can state with confidence that the Los Angeles Department of Water and Power will be able to balance the supply and demand for water during the next 20 years without causing serious pain to its customers. I believe those are called shortage costs at these hearings.

And the first reason is you just can't ignore the remarkable record that DWP has performed in the last eight years. It's survived the major drought of 1986-91 with no serious business or household disruptions. The DWP's three-pronged conservation program succeeded in reducing the demand for water during the later period of the drought by over 25 percent from the 1986 levels. Mr. Gewe mentioned here that they didn't quite acknowledge the drought until about 1990.

The three prongs were education, water conservation, regulation and programs, and pricing, which at that time was called an excess user charge. They all combined to persuade Angelinos to use and

waste less water. Moreover, a continuation of similar programs, and maybe drought memory, is holding water

consumption in 1993 far below the 1986 levels. That's in spite of population increases. The effects of these programs are not included in the DWP's March 1991 report that forms the basis for much of the water demand estimates presented by DWP at these hearings.

And the future for sound water management looks even better. The DWP has begun implementation of the best management plans to reduce the demand for water and Dave Fullerton and Peter and others here were very active in getting that agreement on the BNPs, provide for continuous modification and improvement, so that the over a hundred California water agencies would not relax after they have achieved these modern excesses, and observing the large snow falls in the Sierras.

As Mr. Gewe stated in his testimony, the DWP's new pricing schedule and more sophisticated education programs will prod customers to adopt the BNPs and any other new BNPs that the committee introduces in the next several years.

My written testimony describes how and why the two-tiered pricing system works to reduce demand for Los Angeles. And demand management's not the only reason demand and supply of water in Los Angeles needs to be balanced. And implementation of water reclamation, groundwater recharge, and other supply

measures advocated by the collective panel and this morning's panel also will play an important role in achieving this role.

Q Thank you.

Dr. Trott, could you summarize your qualifications, please?

HEARING OFFICER DEL PIERO: Pat? Is there a reason to have this up on the screen?

MR. FLINN: I'm sorry. Let me take it down.

DR. TROTT: I'm Bill Trott. I'm a professor at Loyola-Marymount University in Los Angeles. I've taught there since 1984. I teach in the Department of Civil Engineering and Environmental Science. I've taught courses on hydrology, hydraulics, water resources planning, design, engineering, economics, water resources economics, computer modeling. I teach a class, a graduate class in computer analysis and environmental engineering.

I've also lectured at UCLA. I've taught classes there in hydrology and water resources. I also teach at the Cal State Long Beach. I teach the hydrology component there, a very successful review course that attracts about 500 engineers a year.

HEARING OFFICER STUBCHAER: Take the other mike. The other mike's more sensitive.

DR. TROTT: I've been very active consulting in the Southern California area. I've worked for -- as a consultant for the Corps of Engineers from 1979 to 1990. I developed software that models their flood control system in L.A. County, Orange County, and

Southern Arizona which includes the operation of all their flood control dams. This is currently being used by them as a real-time operation program that operates these reservoirs and channels during the flooding situation, and also on a day-to-day use to put out their daily reports, et cetera.

I have worked for Kyutz (phonetic) Municipal Water District modeling their distribution system. I've done extensive consulting in terms of hydrology and water resources studies in the Southern California area. I've also done -- I just completed a study on the economic feasibility of using landfill gas to generate electricity. And I work for the Southern California Gas Company to determine a bit of the cost analysis alternative to replacing underground sewage tanks.

Q BY MR. FLINN: Dr. Trott, is the testimony that you signed on September 22nd, 1993, and marked in this proceeding as Exhibit 1-Z, your direct testimony in this proceeding?

A BY DR. TROTT: Yes, it is.

0137

Q And would you summarize the highlights of it for us, please?

A Before that, I'd like make just two small corrections.

Q Yes, please.

A On Page 2, right at the bottom, it says, "Historical percentage of water for the years 1978 to 1982." This should be "1992". That's a typo in there. And that's presented correctly underneath the Figure 1 on the following page.

Also, in Table 1 on Page 4, the Draft EIR reclamation projects table, in 1994, it gives a cumulative total of 11,000 acre-feet. That total should be 7,000 acre-feet.

MS. GOLDSMITH: Where is it?

DR. TROTT: On Page 4, the Table 1, year 1994. On the cumulative acre foot column in the far right, it should be 7,000 rather than 11,000.

And then this extra 4,000 has been carried down, the remaining numbers in that column. Every one of those numbers should be reduced by 4,000, so the final number should be 122,280 rather than 126,280.

Q BY MR. FLINN: The numbers in the yield column are accurate, just the arithmetic in the cumulative column?

A BY DR. TROTT: That's correct.

0138

Q Any other changes?

And now could you highlight your testimony for us, please?

A Just to briefly summarize my testimony, essentially, I disagree with the contention that the loss of Mono Lake water must be replaced with MWD supplies. I feel DWP can compensate for the reduced Mono Lake exports in several ways; one of these being the implementation of water reclamation projects. Also, conjunctive use of the groundwater basins, in particular, the San Fernando Basin, and use of improved management practices.

I believe that water reclamation is a very

feasible alternative to the Mono Lake Water, and the DWP stated in its 1992 annual report that reclaimed water is an important, and I'm quoting, and largely untapped resource of even the city's long-term water needs. Nearly 500,000 acre-feet is recoverable and reusable water flows into the ocean each year in Los Angeles. Efforts are under way to reuse this water to displace imported water and supplement potable water supplies. This is a quote from DWP 1992 annual report.

I reviewed information from the City of Los Angeles' Office of Water Reclamation, Department of

0139

Water and Power Urban Water Management Plan, and other L.A. City documents, and I came up with a schedule of reclamation projects which I've listed under Table 2 on Page 5 of the testimony. The timing of these projects, I've assumed that the DWP is aggressively pursuing the water reclamation projects, as they have stated in many of their documents. The cost figures were determined from, essentially, the Draft EIR's cost figures, numbers presented by the L.A. City's Office of Water Reclamation and other city documents. I would assume that the MWD local projects program rebate of $154 is applicable to projects before 1999, and then I assumed that after 1999, the MWD water has become extensive enough such that they no longer qualify for these rebates.

The cumulative costs on the final column are just a weighted average of the project costs. For example, in 1993, the cumulative costs of $327. This assumes that we have 1300 acre-feet at $300 and 1900 acre-feet at $346, and then divided by the cumulative of 3200 acre-feet. And those numbers were computed in that manner right along that column.

In determining the amounts, the yields from the reclamation projects, I tried to utilize the full discharges from both the Tillman and L.A. Glendale

0140

sewage treatment plants.

A large portion of this water is going to be used for groundwater spreading, particularly in the San Fernando Basin. This basin has an overall pumping capacity of 250,000 acre-feet, so I assume the pumping capacity is not going to limit the amount of groundwater attracted. I realize there was a contamination problem in the southeastern part of the groundwater basin, and this will limit the pumping. I understand that Mr. Gewe testified that you could pump 180,000 acre-feet from this basin. I also know that from Mr. Fullerton's model that only 170,000 acre-feet was pumped from the San Fernando Basin. That was the maximum amount that he pumped. So I believe that the capability to extract the water is there once it is recharged.

Besides reclamation, there are other sources of water that I did not consider in the testimony. These could have been water transfers, increased pumping once contamination issues had been resolved in the southeastern part of the basin.

In conclusion, I just feel that the DWP can replace the Mono Lake water with other supplies. They don't need to rely totally on increases in the MWD supply.

MR. FLINN: Thank you, Sir. No further questions.

HEARING OFFICER DEL PIERO: Thank you very much, Mr. Flinn.

Mr. Birmingham?

Ms. Cahill, are you going to have questions of this panel?

MS. CAHILL: No.

HEARING OFFICER DEL PIERO: I sort of figured this all out.

Ms. Koehler, are you going to?

MS. KOEHLER: Just very briefly.

HEARING OFFICER DEL PIERO: Mr. Valentine? He took off. He's on the phone. Are you going to have questions of this panel, Mr. Valentine?

MR. VALENTINE: No. Thank you.

MR. BIRMINGHAM: He wasn't getting to you yet, Mr. Valentine. He was just planning.

CROSS-EXAMINATION BY MR. BIRMINGHAM

Q Mr. Vorster, when did you quit working for the State of California or the California Water Atlas?

A BY MR. VORSTER: That would have been early 1979.

Q Since 1979, how much time have you spent working for the Mono Lake Committee?

A How much time? In 1979, I was hired by a consulting firm in San Francisco that was retained by the Audubon Society to be a consultant to the Mono Lake Committee and National Audubon Society. I worked for that firm in 1986, and since 1986, I've been an independent consultant. So I guess you could say since 1979, I've been a consultant in one form or another to the Audubon Society and the Mono Lake Committee.

Q I once saw a photocopy of a Mono Lake Committee newsletter and they referred to a director there by the name of Peter Vorster. Are you the same Peter Vorster that was a director of the Mono Lake Committee?

A Yes. For about two months, three months, in 1979, I was the director. In fact, I passed up an opportunity to work for the Department of Water and Power and became a director of the Mono Lake Committee for three months. It was decided my best skills were as a technical consultant to the Audubon Societies.

HEARING OFFICER DEL PIERO: I guess we've established where his priorities are, haven't we?

MR. VORSTER: I would have been the Mono Basin hydrographer. That was the position I applied for.

HEARING OFFICER DEL PIERO: And was it offered?

MR. VORSTER: I took the written exam in Los Angeles and scored very high, and Mr. Jorgenson (phonetic), Ben Jorgenson, who is on the Water Atlas advisory panel, really encouraged me to follow up and go for the oral interviews, but I was unable to.

HEARING OFFICER DEL PIERO: You worked with William Carl?

MR. VORSTER: Yes. He was my -- I guess you could say he was my boss in the office planning and research.
Q BY MR. BIRMINGHAM: Is there any other reason you didn't go to work for the Department of Water and Power other than the fact you had to finish up your Water Atlas?
A BY MR. VORSTER: No, not really. I was born and raised in Los Angeles and always had an empathy for the Department of Water and Power.
Q There weren't any people that influenced you not to go to work for the Department of Water and Power?
A Not at all. I actually wanted to spend time in the eastern Sierras, and tried to figure out what the most flexible way was.
Q So since 1979 when you were director of the Mono Lake Committee, you worked pretty consistently for the Mono Lake Committee.
A As a consultant. I have other clients.
Q I wasn't quite sure. I was going to ask if you could help me out, Dr. Dale. Earlier, when you were on the last panel, I asked if NAS and MLC 4 had been

0144

modified, and doctor -- Mr. Fullerton said he didn't know, and you didn't jump in and say yes, it had been modified, but it has been. Is that right?
A BY DR. DALE: Yes. It's been modified by removing two little blips along the top that I think were due to a clerical error. I didn't think it was worth mentioning at the time.
Q That was done after you submitted your written testimony?
A Yes.
Q And Mr. Flinn has now withdrawn National Audubon Society and Mono Lake Committee Exhibit 3 because it has an error in it. What is the error that's in that exhibit?
A The same error. It's all -- if you're real interested, we should pick it up and show it to you. There are two little blips along the top. Instead of moving smoothly, it dropped down in two years, and when I first saw it, I thought that was the actual output. It turned out it was a clerical or input error.
Q Who made that input or clerical error, if you know?
A A Stanford graduate.
A BY MR. VORSTER: He had a hard time reading the fax that was transmitted to him.

0145

MR. HERRERA: Dr. Dale, could you use the microphone, please?
HEARING OFFICER DEL PIERO: I just want to get this on the record. The Stanford graduate had a hard time reading?
(Laughter.)
MR. VORSTER: At 3:00 a.m. in the morning, we all did.
HEARING OFFICER DEL PIERO: Please proceed, Mr. Birmingham.
MR. BIRMINGHAM: Thank you, Mr. Del

Piero.
HEARING OFFICER DEL PIERO: You're most welcome.
MR. BIRMINGHAM: Mr. Burlins (phonetic) at the University of California at Los Angeles thanks you as well.
Q BY MR. BIRMINGHAM: Earlier, in response to a question of the last panel, Mr. Vorster, you said that you had used -- you had prepared an exhibit using the Department of Fish and Game flushing flows; is that correct?
A BY MR. VORSTER: Yes. Could you refer me to the exhibit?
Q If I can find it. It was the table, I believe.
Thank you very much, Mr. Flinn.

0146

It was the table showing the projected annual Mono Basin replacement water costs?
A I supplied these numbers to NHI, and they prepared this table, the numbers that refer to the reduced annual L.A. aqueduct deliveries during first 20 years.
Q And you said that the flushing cycle that you used for preparation of this exhibit, was that of the Department of Fish and Game?
A At the time when I prepared this exhibit, the Department of Fish and Game advised me to use the Lee Vining Creek recommended flushing flows. I think "flushing cycle" is not quite the right word. They're not cycled in the same way the Finney flushing flows are. For Rush Creek, the Department of Fish and Game staff asked me to use a 200 cfs flushing flow for 30 days in wet years and for three days in normal years.
Q Did you do this analysis using the LAMP?
A Yes, I did.
Q Mr. Vorster, do you have an opinion concerning how realistic the reclamation goals of the Los Angeles Office of Reclamation are?
A Are you asking the question of me?
Q Yeah. I'm asking the question specifically of you, and then if anybody else wants to jump in, they're more than welcome to. But I know that you have an

0147

opinion concerning how realistic the goals of the Office of Reclamation are, and I was wondering if you could tell us what that opinion is.
A Well, I haven't expressed any opinion in my written testimony on reclamation.
Q I didn't say that you have, but I know that you have an opinion, and I'm asking you if you'll tell us what it is.
A The Office of Water Reclamation has been charged, I guess, to develop, to outline, what the reclamation goals for the City of Los Angeles are, and I think the person who's in charge, Bahman Sheihk, is a great proponent of reclamation and feels that with the aggressiveness that reclamation has been pursued in other areas of Southern California, other projects such as West Basin over in Orange County, that the reclamation goals can be achieved that he outlined.
My opinion is that they're based upon aggressive implementation, but a realistic implementation. If

there's a will, there's a way.
Q Isn't it correct, Mr. Vorster, that in 1990, you expressed an opinion that these goals were really very optimistic?
A You're probably referring to some testimony I gave in 1990 preliminary injunction hearing? Without seeing

0148

my testimony, I can't recollect.
Q Did you -- have you ever expressed an opinion other than that in your testimony?
A I can't recollect specifically. Can you show me some testimony where I may have said that?
Q Do you think that the goals of the Office of Reclamation are optimistic?
A Yes. If you take the view that you only implement one project at a time or if capital is limited -- for example, in the 1992 annual report by the City of Los Angeles, I think Mr. Gewe was quoted as saying that capital was limited for implementing reclamation projects. I could quote you the exact quote, but to the extent I think he's quoted as saying, "Although, we're limited by the capital required to build pipelines, we're convinced that water reclamation is a key element in proving the reliability of our future water supplies."
So there are constraints, but if they can be overcome, I think those goals are achievable. But they are -- you have to overcome hurdles and you have to move forward aggressively with several projects at one time.
Q And there are regulatory constraints as well; is that correct? And again, anybody can jump in. But is

0149

it correct, Mr. Vorster, that there are regulatory constraints?
A Yes. There are regulatory constraints or regulatory standards that have to be met in order for these projects to be implemented. Standards that are very clearly laid out for the department to kind of -- there's a step-by-step procedure that they have to go through in order to meet all the -- to get all the various permits, for example, to do a reclamation project.
Q Well, in fact, isn't it correct that for the Department of Water and Power's reclamation projects, for spreading the groundwater, those standards have yet to be established?
A BY DR. TROTT: Excuse me. Title 22, are you referring to the California --
Q Yes.
A My opinion that most of the people that are proceeding with the reclamation projects are feeling that the Title 22 standards are going to be adhered to, and that they're not completely defined yet. But the planning process is going along the line that these are going to be the standards.
Q You're familiar with the Upper San Gabriel River Reclamation Project, Dr. Trott?

0150

A The upper --

Q Are you familiar with the Upper San Gabriel River Groundwater Recharge Project?
A A little bit.
MR. STUBCHAER: Please use the microphone.
Q BY MR. BIRMINGHAM: In your analysis, you concluded the availability of reclaimed water from the Upper San Gabriel River Project; isn't that right?
A BY DR. TROTT: I'm not clear what you mean.
Q Is it your understanding that the Upper San Gabriel River Project is a project of the Department of Water and Power?
A It's not the specific project I used.
Q Are you familiar with the application pending before the Regional Water Quality Control Board for an Upper San Gabriel River Groundwater Recharge Project?
A This is --
Q If you're not familiar with it, then don't -- then just -- I don't know is a perfectly acceptable answer.
A I understand. I'm not clear if we're talking about the same project. I'll say no.
Q I'd like to look for a moment, if we can, at Table 2 in your testimony. Table 2 is your revision of a schedule of reclamation projects. Is that correct, Dr. Trott?

0151

A Yes.
Q Now, is it correct that L.A. DWP is the project manager of these projects?
A Yes.
Q And how long did you assume it would take to get these projects on line? Is that represented by the year in service beside each project?
A Yes, it is.
Q Now, you're aware, aren't you, that the Department of Water and Power estimates that it's going to take longer to get each one of these projects on line than you've estimated?
A Yes, I am.
Q Now, can you tell us which of the reclamation projects that are listed in Table 2 represent groundwater recharge projects, Dr. Trott?
A Yes. These would be East Valley Recharge One, Two, and Three, which come on line in 1995 for East Valley Recharge One, 1997 Recharge Two, and year 2000 for East Valley Recharge Three. Also, the head works projects coming on line in 1995 and 1996, are groundwater recharge projects.
Q Now, I didn't to go Stanford, either, but if we add up the volume of each one of these recharge projects, it adds up to 65,000 acre-feet; is that

0152

correct?
A That's correct.
Q And the total for the East Valley Recharge Projects is 50,000 acre-feet; is that correct?
A That's correct.
Q I'd like to have this document marked next in order, if I can.
Dr. Trott, I'm handing you a document that's been marked L.A. DWP Exhibit 108, and I'm asking if you've

ever seen this project or this document before?
A No, I haven't.
Q You have not seen that document?
A I'm sorry. Yes, I have.
Q You have seen that document. You are familiar with L.A. DWP Exhibit 108?
A Yes.
Q What is L.A. DWP Exhibit 108?
A It's the final groundwater recharge on the East Valley Water Reclamation Project.
Q Is it correct that it's excerpts from the executive summary of that report?
A Yes, it is.
Q Now, is this the project which you've identified as East Valley One, Two, and Three in your Table 2?
A Yes.

0153

Q Now, it's correct, isn't it, if we look at Page 1-1 of L.A. DWP Exhibit 108 that the projected yield of this East Valley Water Reclamation Project is 35,000 acre-feet?
A That's correct.
Q That's 15,000 acre-feet less than the amount that you projected; is that correct?
A In terms of groundwater recharge, yes.
Q If you look at the first sentence of this document, L.A. DWP 108 on Page 1-1, it says, "East Valley Water Reclamation Project will consist of a distribution and storage network that will deliver up to 35,000 acre-feet of reclaimed water from the Donald C. Tillman Water Reclamation Plant, Tillman plant, in the Sepulveda Basin, to the northeastern portion of the San Fernando Valley for groundwater recharge, irrigations, and industrial application." Isn't that correct?
A Yes, it is.
Q And that's 15,000 acre-feet less than you projected in your Table 2?
A Yes, it is.
Q You show in your Table 2 that the amount of water utilized at the head works project would be increased one year after its initial implementation; is that

0154

correct?
A You're referring to increasing from 1995 to 1996?
Q Yes.
A That's correct.
Q Now, would you expect that before that project can be -- the yield of that project can be increased, that there will be a need for testing?
A I believe the testing --
Q After the project is put on line, do you think it will require more testing before the yield of the project can be increased?
A Yes, I think so.
Q Do you think that there will have to be some monitoring before the yield of the project can be increased after it's put on line?
A There will be monitoring, yes.
Q In fact, doesn't the Regional Water Quality

Control Board require monitoring prior to increasing the usage of reclaimed water for spreading?
A Yes, they do.
Q Isn't it correct, generally, that monitoring takes more than a year to complete?
A Yes, it does.
Q Generally, it takes at least three years; isn't that right?

0155

A Yes.
Q Now, you mentioned that you understand that there is some contamination in certain parts of the San Fernando Valley. Are you aware that the -- that the site that's to be utilized for the head works reclamation project is contaminated by nitrates?
A Yes. I know that there's some contamination.
Q And it's also contaminated by organics; is that correct?
A I'm not sure.
Q Well, I'm going to ask you to assume that there are contamination problems. Would such contamination problems impede the implementation of the restoration project at the head works site?
A It could impede it. I'm not sure on the nitrates. Studies have shown that a lot of times when you percolate the water through groundwater, that you have some nitrate removal.
Q Well, the existence of contamination would lead to, you conclude, wouldn't it, that the monitoring that would be required after the project is put on line would, in fact, be more monitoring than is generally required by the Regional Water Quality Control Board?
A I'm not sure.
Q Now, is it your understanding that the amount of

0156

reclaimed water that can be spread for subsequent pumping and reuse is currently limited?
A In what regard?
Q Well, is it correct that there's a dilution factor which is imposed by state regulation?
A Yes, there is.
Q What is that dilution factor?
A It depends on the category coming out of the Tillman plant. Currently, it is a Category Two of effluent, so the mixing would be an 80/20 mixing.
Q And can you tell us what that 80/20 mixing means?
A It means that you have 80 percent of blended water for every 20 percent of reclaimed water.
Q So for every unit of water that's pumped out of the ground in a reclamation project, only 20 percent of that particular unit can be comprised of reclaimed water, is that correct?
A That's correct.
Q Now, the 67,000 -- actually, I'm sorry. The 65,000 acre-feet that you have identified in Table 2 for reclamation projects for groundwater spreading, that 65,000 acre-feet is going to be exceeded -- let me restate the question. The 80/20 dilution factor will be exceeded by the 65,000 acre-feet you've identified in Table 2. Is that correct, Dr. Trott?

0157
A Yes, it would be.
MR. HERRERA: Mr. Birmingham, your 20 minutes has elapsed.
MR. BIRMINGHAM: I make an application for another 20 minutes.
MR. CAFFREY: Granted. I presume that's what Mr. Del Piero has been doing.
MR. BIRMINGHAM: Mr. Del Piero has been very generous.
MR. CAFFREY: His leniency is known far and wide.
Q BY MR. BIRMINGHAM: Dr. Trott, or any of you, are you familiar with the types of costs that are associated with reclamation projects?
A BY DR. TROTT: Yes.
Q What is the proportion of fixed costs?
A It would depend upon where the water's treated at. Coming out of the Tillman and L.A. plant, the water is already treated, so the fixed costs would be mostly the plumbing and monitoring costs. I don't know the proportion.
Q Would a ratio of 80 percent fixed costs and 20 percent variable costs sound reasonable? If any of you know?
A I'm not sure.
Q Is anybody on the panel aware of the proportion of
0158
fixed costs which is variable costs? Then no one on this panel would be in a position to compare the marginal costs of an acre-foot of reclaimed water with the marginal costs of water that is pumped out of the Owens Valley or diverted from the Mono Basin; is that correct?
A BY DR. DALE: Well, if reclaimed water is typical of most groundwater recharge operations, I think it's going to have much higher fixed costs. The marginal costs would tend to be lower for reclaimed water.
On the other hand, my understanding of Mono Lake water is that it's got very low marginal costs. Those would be lower. Mono Lake water would be less expensive than reclaimed water. I think that's a general understanding of the issue.
Q Let's go back to the pumping issue, Mr. Trott. If we have 180,000 acre-feet per year of water which is being reclaimed --
HEARING OFFICER DEL PIERO: Mr. Birmingham?
I want you to hold that question. We're taking a 15-minute break. Okay.
(Whereupon a short recess was taken.)
HEARING OFFICER DEL PIERO: This hearing will again come to order.
Mr. Birmingham?
0159
MR. BIRMINGHAM: Thank you very much, Mr. Del Piero.
HEARING OFFICER DEL PIERO: Did you hold that thought, Sir?
MR. BIRMINGHAM: Yes, I did.
HEARING OFFICER DEL PIERO: Good.
MR. BIRMINGHAM: Yes, I can. Yes, I did.

Q BY MR. BIRMINGHAM: Dr. Trott, we've heard testimony from Dr. Campbell to the effect that -- I'm not sure it was Dr. Campbell, someone testified to the effect that pumping in the San Fernando Valley is limited to 180,000 acre-feet per year. Do you remember hearing that this afternoon?
A BY DR. TROTT: I did hear it this afternoon, but I was told that Mr. Bluey (phonetic) testified here.
Q Now, if L.A. DWP is restricted to pumping 180,000 acre-feet of water out of the San Fernando Basin on an annual basis and the Department of Health Services imposes a dilution standard of 80 percent -- or 20 percent reclaimed water, how much water would -- how much reclaimed water that had been spread for groundwater recharge could be pumped from the San Fernando Valley on an annual basis?
A It would be 20 percent of 180,000. About 36,000.
Q 36,000 acre-feet? That's less than the 65,000

0160

acre-feet that you've projected in figure -- Table 2 in your testimony. Is that correct?
A That is correct, yes.
MR. BIRMINGHAM: Can we deviate from the normal schedule? What I'd like to do, if I may, is I have just a very few questions for Dr. Campbell. What I'd like to do, if it's all right, Mr. Del Piero, is just ask the very few questions I have of Dr. Campbell, ask if any other parties have any questions for him, and then excuse him.
HEARING OFFICER DEL PIERO: Anybody have any problems with that?
MR. FLINN: No problems here.
MS. KOEHLER: No.
MR. VALENTINE: No.
MS. CAHILL: No.
HEARING OFFICER DEL PIERO: Proceed, Mr. Birmingham.
Q BY MR. BIRMINGHAM: Dr. Campbell, your testimony points to a chart on Page 4, and it states that while this lawsuit has been pending, the Department of Water and Power has obtained substantial additional supplies beyond that needed to replace Mono Basin water and for almost five years has been able to do so without Mono Basin water. Is that correct?

0161

A BY DR. CAMPBELL: What page is this?
Q I'm looking at page -- there's a chart on Page 4 of your testimony; is that correct?
A Right.
Q And about that chart, you state that --
A Um-hum.
Q -- that while the lawsuit has been pending, the Department of Water and Power has been able to obtain substantial additional supplies beyond that needed to replace the Mono Basin water; is that right?
A You're reading from Page 3?
Q Yes, I am.
A Yes.
Q Now, when we look at the vertical axis of the chart, Figure 1, what is represented on the vertical

axis, a thousand acre-feet?
A Right. Um-hum. Yes.
Q Thank you. Let me write that down.
Now, since 1990, there has been a decline in the Department of Water and Power's supply; is that right, Dr. Campbell?
A The supply?
Q Yes.
A Because total demand has fallen.
Q When I was going through my question, the fact

0162

that the supply has fallen as shown in your chart doesn't necessarily mean that demand has fallen, does it?
A Yes. This is showing gross deliveries for, I believe, years ending June 30.
Q Wasn't it clear that in 1990, 1991 we were in a pretty severe drought?
A Yes.
Q And during that period, there was rationing that was imposed for the City of Los Angeles; is that correct?
A I don't think there was rationing. There were regulations about watering on certain days and car washing. There wasn't any rationing in the sense that you were allowed ten gallons a day in the traditional sense of rationing.
A BY MR. VORSTER: I'll elaborate on that. There was -- DWP has a -- I guess you'd call it different phases of water conservation measures that they impose during shortage situations, and I think by the spring of 1991, they were in Phase Three. I don't remember my phases, and I think it required a 15 percent cutback. I think that only lasted for about a year because in the spring of 1992, they lifted that. I guess you could call that a mandatory reduction.

0163

A BY DR. CAMPBELL: I believe it was a goal. It's not that somebody's rationed. The water wasn't rationed.
MR. BIRMINGHAM: I don't have any further questions of Dr. Campbell.
HEARING OFFICER DEL PIERO: Thank you very much.
Any other questions of Dr. Campbell?
MS. KOEHLER: I only have one or two.
HEARING OFFICER DEL PIERO: Please come forward.
CROSS-EXAMINATION BY MS. KOEHLER
Q Dr. Campbell, you've testified with regard to L.A.'s conservation program this afternoon?
A BY DR. CAMPBELL: Yes.
Q And you've also testified about a pricing effect resulting in a rate structure; is that correct?
A Yes.
Q Is it your view that the conservation program -- and here I'm referring to what's been referred to today as hard conservation, that that will have an effect -- well, let me rephrase that.
Is it your view that the pricing effect that will result from the rate structure will be on top of any conservation that results from the hard conservation?
A That's a yes-and-no answer because both -- pricing

works to influence customers to adopt those measures or practices or fixtures, so that it's sometimes hard to

pull out the pricing from the other measures.
Q Well, let me ask you this, then. Is it your view that hard conservation -- that any conservation that results from hard conservation measures would be just the same with or without a rate structure?
A Especially those that are mandated, like low-flow toilets and showers. Those are mandated so that pricing doesn't, you know, has very little effect.
Q So, then, isn't your view that a rate structure, such as the one adopted by Los Angeles, would have additional impacts on water conservation in the area than if you just had the hard conservation alone without a rate structure?
A Sure. And the excess use charges that were in effect from '91 to '92, they track the reduction in water use just virtually -- virtually identical when they threw in the excess use charges at that time, which was -- is somewhat similar to the two-tiered rate structure that they've since adopted.
MS. KOEHLER: All right. Thank you. That's all that I have.
HEARING OFFICER DEL PIERO: Thank you very much, Ms. Koehler.
Mr. Valentine?
MR. VALENTINE: No questions.

HEARING OFFICER DEL PIERO: I'm sorry. Did someone have additional questions?
DR. CAMPBELL: I was just going to mention with regard to testimony earlier today about whether the State of California had adopted -- required retrofits on the sale of homes, and that's an ordinance in Los Angeles when you're purchasing a home. So it's sort of moot whether or not the state has adopted that.
HEARING OFFICER DEL PIERO: Mr. Frink?
Mr. Satkowski? Mr. Smith? Mr. Herrera? Mr. Canaday?
Dr. Campbell, thank you very much. You're excused.
DR. CAMPBELL: Can I stay here?
(Laughter.)
HEARING OFFICER DEL PIERO: Absolutely, if your social life is that bad.
(Laughter.)
MR. BIRMINGHAM: Actually, I was hoping you would leave so I could leave.
MR. FLINN: For what it was worth, I had no redirect.
HEARING OFFICER DEL PIERO: It wasn't worth much, Patrick.
CROSS-EXAMINATION BY MR. BIRMINGHAM (CONTINUED)
Q These questions are directed to Dr. Trott.

Dr. Trott, is it correct that reclaimed water has a substantially higher concentration of total organic carbons compared to Mono Basin water?
A BY DR. TROTT: Compared to Mono Basin water, yes.
Q Now, when treated with chlorine, is it correct

that total organic carbons change into PHMs?
A I'm not sure.
Q Let me ask you to assume that they do. Would the use of reclaimed water, assuming that the total organic carbons were treated with -- I'm sorry. The total organic carbons were treated with chlorine for trihalomethanes, would that increase the cost of using reclaimed water?
A I'm not sure what your question exactly is.
Q Well, we've heard testimony from Mr. Keubler. Have you read Mr. Keubler's testimony?
A No, I haven't.
Q Then you wouldn't be in a position to comment on the opinions that he's expressed about replacing Mono Basin water with water of less quality?
A No.
MR. BIRMINGHAM: I have no further questions.
HEARING OFFICER DEL PIERO: Thank you very much, Mr. Birmingham.
Ms. Koehler?

0167

MS. KOEHLER: Thank you. I have very few questions for the panel. I'm sure you're happy to hear that.
HEARING OFFICER DEL PIERO: Ecstatic. I've got goose bumps all over the place.
CROSS-EXAMINATION BY MS. KOEHLER (CONTINUED)
Q Mr. Vorster, there's been some discussion today about the LAMP runs which were used in the model which you and Mr. Fullerton developed. Can you tell us that if -- let me ask you this.
Is it correct that the LAMP model is now being revised under the auspices of Jones and Stokes and the Water Board Staff?
A BY MR. VORSTER: Yes, it is.
Q And you're involved in that?
A Yes, I am.
Q Would you expect that the runs that would be provided by this LAMP model would alter substantially the results of the model?
A No, I don't think so. Because the absolute values may change just hypothetically. We don't know that. Maybe on the order of 5 to 8,000 acre-feet of yield on average per year, but the incremental -- the relative difference between one alternative and another alternative, let's say the Fish and Game Code and the

0168

6410 alternative, it doesn't change very much at all, very minor amounts. So that the incremental -- a very insignificant change.
Q Thank you.
Another question about the model, Mr. Vorster. Let's assume that it's necessary -- or Mr. Dale or whoever is qualified to answer this question. Let's assume that the assumptions in that model are altered to defer the availability of reclamation water from various projects for, say, three years, for example. Would you expect that to have significant change on the model outputs with regard to water supply in the Los Angeles?

A BY DR. DALE: Insignificant change.
A BY MR. VORSTER: I agree.
Q   Thank you.
     And I'm not sure who is qualified to answer these questions, so I'll just put it out to the panel -- to answer this question, rather.
     There have been some discussions today about funding constraints with regard to reclamation supplies in Los Angeles. To what extent will the funding that has been provided or will be provided to L.A. DWP per AB 444 and the recent Memorandum of Understanding help ease any such financial constraints?

0169

     MR. BIRMINGHAM: Objection. Can we confer with the Hearing Officer?
     HEARING OFFICER DEL PIERO: Sure.
     (Discussion held off the record.)
     HEARING OFFICER DEL PIERO: Ladies and Gentlemen, this hearing will again come to order.
     Ms. Koehler, I'm going to sustain the objection and ask that you frame your question in the manner of a hypothetical.
     MS. KOEHLER: Yes, I'll do so. I'm going to rephrase my question.
Q BY MS. KOEHLER: Assuming hypothetically that funding from the state becomes available to the City of Los Angeles for the purposes of building, you know, a reclamation project. To what extent would that ease the financial constraints that have been discussed in this proceeding today?
A BY DR. DALE: I think without a question it will lower the cost of reclamation projects and ease financial constraints. I guess the main point is that there are some factors that can increase costs, including delays, and others that will lower them, such as what you just mentioned.
     MS. KOEHLER: That concludes my questions for this panel. Thank you.

0170

     HEARING OFFICER DEL PIERO: Thank you very much, Ms. Koehler.
     Where are we now? Mr. Valentine?
     MR. VALENTINE: I have no questions.
     HEARING OFFICER DEL PIERO: Mr. Frink?
     MR. FRINK: Yes. I have just one or two, I believe.

CROSS-EXAMINATION BY THE STAFF

Q   Dr. Trott, Mr. Birmingham asked you some questions about the maximum percentage of reclaimed water which can be mixed with water from other sources before the reclaimed water is spread for groundwater recharge purposes. Do you or any other member of the panel have any information regarding the percent of reclaimed water in the Metropolitan Water District service area that is applied directly for use in landscaping? A rough breakdown? Do you have any idea as to how much might be used directly and how much is used either for groundwater recharge or potable purposes?
A BY DR. CAMPBELL: I don't have that number.
A BY MR. VORSTER: I have some documents that would

give the number and I could look it up.
Q Are they already exhibits in the proceeding, Mr. Vorster?
A No, they aren't. The source of my information
0171
would be a survey that the Metropolitan Water District did of their member agencies, and I think they were asked on a form to break down their reclamation by the different categories, recharge, and industrial, and irrigation, as far as I know. So that would be survey responses that were provided by the member agencies.
Q The portion of reclaimed water that is used for industrial use and landscaping is not subject to any sort of a mixing requirement, is it?
A BY DR. TROTT: No, it isn't. It's just a groundwater recharge.
MR. FRINK: I believe that's all my questions. Thank you.
HEARING OFFICER DEL PIERO: Mr. Satkowski?
MR. SATKOWSKI: Yes.
Q BY MR. SATKOWSKI: Dr. Trott, your Table 2, which is a revised schedule of reclamation projects, lists the projects and the year in service. I have just a general question.
Was this reclamation schedule used by David Fullerton in his analysis?
A BY DR. TROTT: Yes, I believe so.
Q Mr. Vorster, earlier today you commented on the Department of Fish and Game flushing flow recommendations; is that correct?
0172
A BY MR. VORSTER: Yes, I did.
Q Can the original LAMP model or the revised LAMP model that was mentioned a little bit earlier -- and the revised model is now called LAMP Version 3.0, could either of those two models model correctly the year type flushing flow recommendations by the Department of Fish and Game?
A If I understand your question, as the models are currently configured, there's a three-part breakdown for wet, normal, and dry based upon the 20 and 80 percent exceedence level, and I think the recommendation made by Dr. Condolf (phonetic) was either a five-part breakdown using categories of 20 percent exceedence or a three-part on a 33 percent category. So the LAMP model would have to be revised to incorporate that. As currently configured, they would not have to be able to do that correctly.
Q Would you recommend that the model would have to be revised to handle that situation?
A If it were designed to simulate Fish and Game flushing flow recommendations, it would have to.
Q Also, are you aware of the Department of Fish and Game's recommendation that Grant Lake water be released to Rush Creek to meet the Fish and Game's fishery flow recommendations?
0173
A Yes, I am.
Q And can the LAMP three-month model handle that sort of situation in its current form?

A We had a meeting last week on it, and I think Version Three had that switch taken out. I understand it's going to be put back in. Version Two had that switch. I used it in my LAMP runs I provided as input to the NHI model.

MR. SATKOWSKI: Thank you. Those are all the questions I have.

HEARING OFFICER DEL PIERO: Thank you very much, Mr. Satkowski.

Mr. Smith?

MR. SMITH: I have no questions.

HEARING OFFICER DEL PIERO: Mr. Herrera?

MR. HERRERA: I have no questions.

HEARING OFFICER DEL PIERO: Mr. Canaday?

Q BY MR. CANADAY: This is to Dr. Dale. In one of your last responses, you talked about the increase in costs would be due to delays of the reclamation projects. That includes environmental permitting. Is that the kind of delay that you would be thinking about?

A BY DR. DALE: I was speaking very generally about the difficulty of getting reclamation projects on line and, as a general rule, and if you look off into the future,

0174

as we are, for 20 years, if you're going to put more effort and money into pushing reclamation projects along at an earlier date, you can bring them on line. I'm not sure I understood your question. Does that answer it?

Q You used a generic delay and I was asking, one of the delays that would, in fact, increase costs would be the environmental permitting process?

A Yes, that's right.

A BY MR. VORSTER: May I respond to that? Everyone talks about environmental permitting process being a delay. The environmental permitting process is pretty well laid out, and it's just a matter of going step by step and going through hoops to do it. Some of the reclamation projects that we've heard discussed -- the West Basin Project has gone through the permitting process at a fairly rapid clip, and we'll be seeing the use of that water in the next couple of years.

HEARING OFFICER DEL PIERO: Thank you very much, Mr. Canaday. Mr. Flinn?

MR. FLINN: A few questions here.

REDIRECT EXAMINATION BY MR. FLINN

Q Mixing. Mixing of reclaimed water for groundwater recharge and the 80/20. Anyone, but probably Dr. Trott, are there any other physical solutions or

0175

filtering solutions in particular that could affect mixing, the need to mix 80/20?

A BY DR. TROTT: Yes, there are.

Q Well, could you explain what that would be?

A If you could upgrade the effluent to a Category One effluent, then the mixing is 50/50. This would require organic removal, which essentially would be activated carbon filter, which would be one way, and this would eliminate the TLC problem. And the title two guidelines say that you can mix 50/50.

Q Is this activated charcoal filtering something

that is fairly new in any water treatment?
A No. It's a common treatment for a tertiary treatment. It would need to be added to the Tillman plant. From an engineering standpoint that's not a very difficult thing to do. So it could be -- from an engineering standpoint, it could be added to the Tillman plant, and that way, you could increase the mixing to a 50/50 mix.
Q Now, in your estimate of reclamation projects, did you necessarily assume that all 50,000 acre-feet of water that you show as being possibly available for groundwater recharge is, in fact, used for groundwater recharge?
A On the East Valley Project, I was assuming that

0176

the project was a 50,000 acre-foot project. Several documents, DWP and DWR documents, have classified that as a 50,000 acre-foot project. As far as the end using, I have to assume an end use, so I assume groundwater recharge as an end use.
You could have other end uses for this water. In other words, if you wanted to make that a 35,000 acre-foot groundwater recharge project and a 20,000 acre-foot industrial and irrigation project as the end uses, that's another possibility. What I was looking at was the size of the project to begin with, which was a 50,000 acre-foot project.
Q Is among the documents you referred to identifying -- this is a 50,000 acre-foot project, the document that is Audubon Exhibit 99, the City's Office of Water Reclamation newsletter dated September 1992, showing you a copy?
A This is one of the documents.
Q And is another one of the documents you relied on the Department of Water and Power's drought contingency plan, Audubon Society Exhibit 61 on Page 12?
A Yes. I'm familiar with the document.
Q And is yet another one of the documents an October 7th, 1993, document from one Dennis A. Tito (phonetic), president of the Department of Water and Power Board of

0177

Commissioners marked as National Audubon Society and Mono Lake Committee Exhibit 228,and specifically referring to Page 3 of that document?
A Yes. That's another one of the documents.
Q Dr. Trott, Mr. Birmingham asked you some questions about monitoring and the amount of time and monitoring it might take, and he asked you about whether it might be one year or three years.
Are you aware of any particular statutory or regulatory requirement that fixes the time limit of monitoring as being greater than one year?
A No, I'm not.
Q And in your best professional judgment, if a competent, thorough, knowledgeable, monitoring program were set up, do you have any reason to believe that absent some specific monitoring requirement, the projects couldn't be brought on line according to the schedule that you set forth?
A I think they could be brought on line.

Q Now, there was another question raised about contamination having to do with the head works. And I will show you again City's reclamation newsletter, Audubon Exhibit 99 and show you an article on Page 3 of that appeared to be authored by one Allie A. Caremi (phonetic), Ph.D., P.E. Could you look at that,

0178

please? Do you see the article there?
A Yes, I do.
Q And would you read the third full paragraph?
A "And the local results from the first year of the pilot studies show that -- complete removal of coliform bacteria from the extract water was verified. The organic content of the water -- BOD and total organic carbon TOC were reduced by 93 percent and 86 percent relatively. Their average concentrating traces in the extracted water were one milligram per liter and 1.6 milligrams per liter respectively. The study monitors 184 water quality constituents."
Q And could you tell us -- does the article identify for whom the author of that statement works?
A He's a water quality planning engineer with the DWP and the principal investigator of the head works reclaimed water project.
Q Now, finally, a word on costs. Mr. Birmingham asked some questions about fixed costs versus variable costs, and I want to get a little more detail as to exactly how the costs on reclamation were drive.
Dr. Trott, did you start your cost analysis with cost figures that were contained in the Draft Environmental Impact Report?
A That was my initial starting point.

0179

Q And then did you make adjustments to them based on MWD's rebate program?
A Yes, I did.
Q Could you explain what that rebate program is, or anyone on the panel?
A Local projects program rebates $154 an acre-foot for projects that will replace MWD water as long as the replacement water was more expensive than the MWD water.
Q Now, did you assume that the original DEIR numbers that you started with, did you assume that they amortized fixed costs and appropriately calculated marginal costs?
A Yes, I did.
Q Have you read any testimony from any part of the proceeding that challenged that particular component of the Jones and Stokes work?
A No, I haven't.
MR. FLINN: I think I'm through, Sir, but what I was hoping we might do is take a short break so I could gather my notes and check with the witnesses to make sure I haven't missed anything.
HEARING OFFICER DEL PIERO: Ladies and Gentlemen, we're going to be getting out of here early today, I can tell. You were right, Ms. Koehler, I'm getting

0180

very excited.

DR. CAMPBELL: He wants to watch a football game.
HEARING OFFICER DEL PIERO: I don't know what I'd do if I got to my office with more than two or three minutes 'til five o'clock to spare.
Mr. Birmingham, take rest of the afternoon off. Have a honeymoon.
MR. BIRMINGHAM: During Mr. Flinn's recess I can state now from experience that there are a lot of things that are more fun than cross-examination.
HEARING OFFICER DEL PIERO: What a difference a weekend makes, right?
(Whereupon a short recess was taken.)
HEARING OFFICER DEL PIERO: Ladies and Gentlemen, this hearing will again come to order. Mr. Flinn?
Q BY MR. FLINN: I did have one more point. Dr. Dale, I guess this is for you. Are you familiar with the extent to which, particularly in the base case, Fullerton, Figure 5 -- Figure 8, the extent to which that model run assumes a particular level of water reclamation used in groundwater recharge?
A BY DR. DALE: Yes, I now am. That is 30,000 acre-feet under the base case run.
Q So I take it even if we assume this is correct, every single thing the Department of Water and Power

0181

asserts, would that affect the conclusions you would draw with respect to Figure 8?
A No. And Figure 8 never goes above 3,000 acre-feet recharge to the ground.
MR. FLINN: Thank you.
HEARING OFFICER DEL PIERO: Thank you very much, Mr. Flinn.
Mr. Birmingham?
RECROSS EXAMINATION BY MR. BIRMINGHAM
Q Dr. Dale, in response to the second to the last question by Mr. Flinn, you responded, "I now am." When did you become aware of the information --
A BY DR. DALE: I had to refamiliarize myself to the output of the Fullerton model.
Q Do you have a copy of that here with you?
A I have some pages that summarize one of the runs of that model.
Q Would it be possible for us to take a look at those?
A I should talk to my cohorts here.
HEARING OFFICER DEL PIERO: Who do they belong to?
MR. FLINN: This is NHI stuff. That would probably be Ms. Koehler's call to make.
HEARING OFFICER DEL PIERO: Mr. Birmingham, why

0182

don't you put that request on hold until we get Ms. Koehler back in here. Ms. Koehler?
MS. KOEHLER: Yes.
HEARING OFFICER DEL PIERO: Dr. Dale has a copy of a run, I believe, of the model put together by Mr. Fullerton, and Mr. Birmingham has requested to look at it. Do you have a problem with that?
MS. KOEHLER: Which one is it?
DR. DALE: It is -- basically, it's the output for

one of the base case runs for the Fullerton model.
MS. KOEHLER: We're planning on providing all that data to the parties in any event. Mr. Fullerton is still here. Would it be useful to question him on that? He's probably in a much better position to do so.
HEARING OFFICER DEL PIERO: You're going to be getting it, Mr. Birmingham. Did you want it out of context, or do you want the balance of the information?
MR. BIRMINGHAM: I just want the basis of Dr. Dale's response.
HEARING OFFICER DEL PIERO: You'll be getting it. Thank you, Ms. Koehler.
We kept in mind, Ladies and Gentlemen, that everybody was going to exchange their model information

0183

by the 2nd of January so that we don't have any problems. I just wanted to repeat that for the record.
MR. VORSTER: Isn't the 2nd of January a Sunday?
HEARING OFFICER DEL PIERO: I guess you guys are going to have to get it in by the 31st, then. New Years Eve is only a holiday after five not after noon.
I'll tell you what, if somebody slips it in by the 3rd and nobody complains vigorously about it, I'm not going to object. Do good. It's the new year.
Q BY MR. BIRMINGHAM: Dr. Trott, you said you based your analysis of reclaimed water on the announcements of the Office of Reclamation. is that correct? Specifically, the projected capacity of the East Valley Project?
A BY DR. TROTT: Yes. That among other documents. It was confirmed in several documents.
Q When you say "it was confirmed," you didn't ask the Department of Water and Power if that was going to be the ultimate capacity of their project, did you?
A No, I didn't. I assumed that the publications were reflecting the actual capacity.
A BY MR. VORSTER: And also I think there is a Draft EIR for the East Valley Project.
Q But the ultimate engineering report became the

0184

application of the Regional Water Quality Control Board which we've now submitted as L.A. DWP Exhibit 108. You did refer to that document?
A Yes.
Q You did refer to that document?
A I didn't see that document until after I made my written testimony. Since the written testimony was submitted, I've been aware of that document.
Q The document, Exhibit 108, L.A. DWP 108 was prepared in April 1993. Dr. Trott, Mr. Flinn asked you a question, if you were aware of any water quality testimony in this proceeding that would have changed an opinion that you held. He asked you a few minutes ago. You haven't read all of the water quality testimony that's been submitted in connection with this proceeding, have you?
A No, I haven't.

MR. FLINN: I don't think I referred to the water quality testimony.
Q BY MR. BIRMINGHAM: Dr. Dale, Ms. Koehler asked you a hypothetical question about state funding being available to help cover the cost of the reclamation projects. Do you remember that hypothetical question that she asked you?
A BY DR. DALE: I can paraphrase it.

Q That's okay. My question is having funding available from the state doesn't overcome the physical limitations to water recycling; is that correct?
A No. I think it can affect the timing, but it doesn't overcome physical obstacles.
Q And it doesn't overcome the regulatory obstacles that are imposed by the Department of Health Services? This is a question perhaps somebody else on the panel would be better qualified to answer.
A BY MR. VORSTER: You refer to regulatory obstacles. I refer to them just as regulatory standards the Department of Health Services made very clear to any applicant for the reclamation project.
Q Mr. Vorster, it's understandable that you say that. Mr. Flinn referred to NAS and MLC Exhibit 99, which is a publication of the Office of Water Reclamation for the City of Los Angeles. Now, it's your understanding that the Office of Water Reclamation is not part of the Department of Water Resources -- excuse me, the Department of Water and Power; isn't that correct?
A That is correct. I think it's part of the Department of Public Works or associated with it.
Q Page 2 of Exhibit 99 there's this headline that says, "Red tape clogs water garden project." Did you

see that headline?
A I don't have Exhibit 99 in front of me.
Q This is NAS MLC Exhibit 99 Page 2. Do you see the headline that says red tape clogs --
A Yes, I do.
Q -- water garden project?
A Yes, I do.
Q When you read that article from the Office of Water Reclamation, it refers to regulatory red tape; is that correct?
A It refers to a four-year regulatory odyssey finally may be drawing to a close. I don't see anything about red tape in the article, itself. I think it's a regulatory odyssey, perhaps, is what they're referring to.
Q And there it refers to a four-year regulatory odyssey?
A Yes.
Q Is that consistent with -- a four-year regulatory odyssey, is that consistent with your statement earlier in response to a question about the -- asked by Mr. Canaday about the environmental permitting process? I think you said that these projects now were going through at a fairly rapid clip.
A I said some projects are. I gave the example of

0187
the West Basin Project. Some go fast and some get clogged.
Q Thank you.
Now, I asked Mr. -- Dr. Trott about the Upper San Gabriel project, and he wasn't familiar with it. Are you familiar with the Upper San Gabriel Project, Mr. Vorster?
A Only very peripherally. Not in any kind of detail.
Q Now, is it your understanding that the Upper San Gabriel River Reclamation Project has -- has had an application pending before the Regional Water Quality Control Board for approximately three years?
A I don't know that.
Q Well, let me ask you the hypothetical question. I'm going to ask you to assume that the Upper San Gabriel River Groundwater Recharge Project has had an application under consideration by the Regional Water Quality Control Board for a period of approximately three years. Would that be going through at a fairly rapid clip?
A No. If I -- may I explain my answer?
Q Well, three years is not a rapid clip?
A Not by -- but I think they -- my understanding of that project is that they had to develop a monitoring
0188
plan, and I think that the three years, I assume it's tied up in monitoring.
Q Now, isn't it your understanding that the Upper San Gabriel River Project is a project that is nearly identical to L.A. DWP's East Valley Groundwater Recharge Program?
A It's identical to the extent that it's using reclaimed water for recharge, yes.
Q I asked you a question, and I want to make sure we've got the record straight because Mr. Satkowski followed up with another question. I asked you during my initial cross-examination whether or not you had used the LAMP model to analyze the Department of Fish and Game recommendations for fish inflows, and I believe you testified that you had. Is that correct?
A Yes, I had. But the flushing flows recommendations that were available to me at the time -- I think I explained --
Q Now, you have not analyzed the Department of Fish and Game flow recommendations that have been supplied to the Board as part of the Department of Fish and Game's -- can't be used to analyze those flush flows; is that right?
A I think I answered Mr. Satkowski's question affirmatively, yes.
0189
Q So before, when you were making the comparison and this morning when you testified when you were sitting next to Mr. Flinn, when you were making the comparison of the flushing flows that were recommended as part of the Department of Fish and Game's written case and the recommendations that were submitted by Mr. Candol during his presentation, that comparison was not based

on a LAMP analysis?
A No, it wasn't.
Q I've asked this of each one of the panels of economists that have appeared here and water supply experts, and I'll ask each one of you.
Dr. Dale, are you familiar with the conservation efforts of the City of Los Angeles?
A BY DR. DALE: I've read about them, yes.
Q Compared to the conservation efforts of other water purveyors in California, how would you rate the efforts of the Department of Water and Power?
A If I judged the effort in terms of the amount of water conserved over the recent past, I'd say the City of San Francisco has probably conserved a good bit more, East Bay Mud has conserved about the same, Santa Barbara more. In general, the City of Los Angeles has done a great job of conservation, if you look at it nationwide or even statewide.

0190

Q So if you look at Los Angeles on a statewide basis, it's your opinion that L.A. DWP has done a great job in conserving water over the last couple of years?
A It could do more, but in comparison with most other cities, not all, but most other cities, it's done a good job.
Q In fact, it's implemented 15 of the 16 best management practices; is that right?
A I haven't looked at the list, but I know it's accomplished most of them.
Q And the ultra low-flush toilet best management practice is a practice that is based on a program implemented initially by the Department of Water and Power; is that correct?
A A study?
Q No. The best management practice of retrofitting ultra low-flush toilets is included in the MOU as a result of a program that was originally initiated by the Department of Water and Power; isn't that correct? If you don't know --
A I don't know for sure, but I know the City of Los Angeles has taken the lead in that particular area.
Q Dr. Trott, how would you rate the City of Los Angeles in its conservation efforts compared to other places in California?

0191

A BY DR. TROTT: I believe they're doing a good job.
Q Mr. Vorster?
A BY MR. VORSTER: I would concur. The last couple of years they've done an excellent job.
Q So you would not expect that water -- regardless of the amount of water that's diverted out of the Mono Basin, presuming some is, assuming some is, assuming some water is diverted out of the Mono Basin by the Department of Water and Power, you wouldn't expect that that water will be used in an inefficient manner generally speaking, would you?
A Again, in the last several years, the Department has responded, I think, admirably, and I think I would agree, they would use the water efficiently. But as Dr. Dale said, there's always room for improvement.

Q Isn't it your understanding -- and again, I'll put this to any of you but perhaps, Dr. Trott, you may want to answer. The Department of Water and Power is going to undertake reclamation projects regardless of the decision that's made in this proceeding; is that correct?
A BY MR. VORSTER: I believe they will, to the extent that it makes economic sense. I think. I think Jerry Gewe gave testimony that they would only use $750 per acre-foot. If projects cost more than that, at this

0192

point in time --
Q And is it the understanding of the members of this panel that the Department of Water and Power looks to reclamation projects as a means of meeting future demands?
A BY DR. TROTT: Yes.
Q Maybe I should ask the question a little different, future increased demands in water?
A I consider it as one alternative, but from an engineering standpoint, in meeting future demands, you always look at the variety of alternatives and you try to pick the most efficient ones. Reclamation is definitely a very feasible alternative.
Q And, in fact, it's being considered by the Department of Water and Power?
A Yes, it is.
A Jerry Gaely (phonetic), in his testimony, I think, said that they planned to meet all future increases in demands with the water reclamation project.
MR. BIRMINGHAM: I have no further questions.
HEARING OFFICER DEL PIERO: Thank you very much, Mr. Birmingham.
Miss Cahill?
MS. CAHILL: No questions.
HEARING OFFICER DEL PIERO: Ms. Koehler?

0193

MS. KOEHLER: I have just a couple of questions.
RECROSS EXAMINATION BY MS. KOEHLER
Q Dr. Dale, you just testified, I believe, that L.A. has done a great job with its water conservation programs; is that correct?
A BY DR. DALE: That's correct.
MR. BIRMINGHAM: Excuse me. I'm sorry.
HEARING OFFICER DEL PIERO: He did.
MR. BIRMINGHAM: I was asked a question by my co-Counsel and I answered the question myself. I beg your pardon. Excuse me, Ms. Koehler.
HEARING OFFICER DEL PIERO: Please proceed, Ms. Koehler.
Q BY MS. KOEHLER: Would you also agree that L.A. has done a great job of accounting for the savings this program is going to bring to Los Angeles, or does Los Angeles' estimate of future demand in this proceeding understate the benefits of its own water conservation program?
A BY DR. DALE: I'd have to answer that in a complicated way. Los Angeles has helped pay for very expensive and useful studies of the amount of water saved with ultra low-flush toilets. So to that degree,

they are making a big effort to measure savings, but they were not incorporated in the latest demand figures

for water in the City of Los Angeles that have been used in our model run.

Q In fact, Dr. Dale, isn't it correct that the evidence submitted by Los Angeles in this proceeding with regard to its demand is taken straight out of the 1990 Urban Water Management Plan?

A Yes.

Q And does that Urban Water Management Plan give credit to Los Angeles for any of these excellent programs which L.A. has implemented since that Urban Water Management Plan was released?

A It gives partial credit for some of them, but not anything like the full credit that it should take, in my opinion.

Q Thank you.

Mr. Vorster, I just have a couple of quick questions for you. You're looking tired, so I will make them very quick.

You've just been discussing with Mr. Birmingham newspaper accounts regarding the difficulties in bringing reclamation plants on line; isn't that correct?

A BY MR. VORSTER: I don't think they were newspaper accounts. They were a newsletter account from the Office of Water and Reclamation.

Q Who would you -- or to anybody on the panel, who would you consider to be a reliable source of information about the regulatory difficulties or lack of difficulties that the City of Los Angeles will be facing in the next months and years with the new reclamation plants on line?

A You asked the question who would be an authority?

Q Right. In L.A.'s Office of Reclamation?

A Well, the head of the Office of Water Reclamation, or at least he was -- most recently was Bahman Sheihk. I believe his contract was up for renewal. Jerry Gewe would be another person. Jerry Atwater or Don Kendall would be good sources of information.

MS. KOEHLER: Thank you. That's all I have.

HEARING OFFICER DEL PIERO: Thank you very much, Ms. Koehler.

Mr. Valentine?

MR. VALENTINE: No questions.

HEARING OFFICER DEL PIERO: Mr. Frink?

MR. FRINK: I just wonder if Mr. Vorster would spell the name of the former head of the Office of Water Reclamation.

HEARING OFFICER DEL PIERO: Bahman Sheihk is spelled B-A-H-M-A-N S-H-E-I-H-K, or maybe K-H.

MR. VORSTER: I'm impressed.

HEARING OFFICER DEL PIERO: Well, don't be. Mr. Sheikh worked for me. Before he was in charge of the reclamation program for the City of Los Angeles, Mr. Sheikh was chief consultant to Monterey County, then Monterey County Water Reclamation program that

developed the reclamation component of a $40 million sewer system for all of northern Monterey County, and I was on the Board of Directors that hired him. We've -- we're old friends. Old friends.

MR. FRINK: I have no questions.

HEARING OFFICER DEL PIERO: Mr. Smith?

MR. SMITH: I have no questions.

HEARING OFFICER DEL PIERO: Mr. Herrera?

MR. HERRERA: No.

HEARING OFFICER DEL PIERO: Mr. Canaday?

MR. CANADAY: No.

HEARING OFFICER DEL PIERO: Gentlemen?

Mr. Birmingham, I want you to note this is the third miracle.

(Laughter.)

HEARING OFFICER DEL PIERO: Gentlemen, I'd like to express my appreciation for your attendance and participation here today.

Mr. Flinn, do you want to make an offer into the record?

0197

MR. FLINN: I do. I would offer testimonial Exhibits 1-D, 1-E, 1-Z, and 1-A-B. and now the following painfully long list of numerical exhibits. 54, 58, 60, 76 --

MR. SMITH: Start again.

MR. FLINN: 54, 58, 60, 76, 80, 79, 78, 82, 83, 86, 87, 88, 89, 62 --

HEARING OFFICER DEL PIERO: That's a test, Mr. Flinn.

MR. FLINN: -- 90, 91, 92, 93, 94, 95, 96, 97, 101, 99, 171, 228, 2 --

MR. SMITH: Just a plain old 2?

MR. FLINN: Just a plain old 2.

-- 4-A, and 204. That's it.

HEARING OFFICER DEL PIERO: Any objections?

MR. FLINN: The letter ones, 1-D, as in dog, 1-E, as in echo, 1-Z, as in Zorro, and 1-A-D, as in dog.

HEARING OFFICER DEL PIERO: Hearing no objections, those are ordered into the record.

(NAS/MLC Exhibits Nos. 1-D, 1-E, 1-Z, 1-A-D, 54, 58, 60 76, 80, 79, 78, 82, 83, 86, 87, 88, 89, 62, 90, 91, 92, 93, 94, 95, 96, 97, 101, 99, 171, 228, 2, 4-A, 204, were

0198

admitted into evidence.)

HEARING OFFICER DEL PIERO: Yes, Sir?

MR. BIRMINGHAM: L.A. DWP would offer Exhibit 108.

HEARING OFFICER DEL PIERO: Any objections to that? Ordered into the record.

(L.A. DWP Exhibit No. 108 was admitted into evidence.)

HEARING OFFICER DEL PIERO: Anything else, Ladies and Gentlemen? Mr. Canaday?

MR. CANADAY: Just to remind the parties that tomorrow under the threat of death by Mr. Dodge, I guess we have the Trihey panel.

HEARING OFFICER DEL PIERO: 8:30 tomorrow. Be here or be in trouble with Dodge.

MR. CANADAY: And then on Wednesday, we will have Dennis Martin from U.S. Forest Service, a witness from the U.S. Fish and Wildlife Service, and the Sierra Club.

HEARING OFFICER DEL PIERO: I want to know, did you all get together and cook this up to get the afternoon off?

Ladies and Gentlemen, this hearing is adjourned until tomorrow morning, 8:30.

(Whereupon the proceedings were adjourned at 3:10 p.m.)

---o0o---

REPORTER'S CERTIFICATE

---o0o---

STATE OF CALIFORNIA)
) ss.
COUNTY OF SACRAMENTO)

I, KELSEY DAVENPORT ANGLIN, certify that I was the official court reporter for the proceedings named herein; and that as such reporter, I reported, in verbatim shorthand writing, those proceedings, that I thereafter caused my shorthand writing to be reduced to typewriting, and the pages numbered 1 through 198 herein constitute a complete, true and correct record of the proceedings:

PRESIDING OFFICER: Marc Del Piero
JURISDICTION: State Water Resources Control Board
CAUSE: Mono Lake Diversions
DATE OF PROCEEDINGS: December 20, 1993

IN WITNESS WHEREOF, I have subscribed this certificate at Sacramento, California, on this 8th day of January, 1994.

_____

Kelsey Davenport Anglin, RPR, CM, CSR No. 8553