BEFORE THE

CALIFORNIA STATE WATER RESOURCES CONTROL BOARD

CALIFORNIA WATERFIX WATER RIGHT CHANGE PETITION HEARING	)))

JOE SERNA, JR. BUILDING

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

SIERRA ROOM

1001 I STREET

SECOND FLOOR

SACRAMENTO CALIFORNIA

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MR. MIZELL: Thank you. With that, I will introduce Mr. Leahigh, who will begin the presentations, and they will coordinate amongst themselves to progress through all of the witnesses.

CO-HEARING OFFICER DODUC: Thank you.

WITNESS LEAHIGH: Good morning, Hearing Officers, Board Member, Board Staff. Again, John Leahigh with the Department of Water Resources. Appreciate the opportunity here for rebuttal testimony.

I would like to go over -- tell you the eight topics that I -- that will be part of my rebuttal. First of all, how the uncertainty relates to project allocation decisions; how the majority of water for State Water Project export is from sources other than Lake Oroville; how the vast majority of releases from Lake Oroville are non-discretionary; how export capacity goes unused during periods when stored water could be moved under existing conditions; how the California WaterFix will allow for an increased opportunity to capture excess flows as a substitute for stored water; how challenges associated with the exceptional droughts are completely independent of the California WaterFix; how the California WaterFix would not fundamentally change Delta hydrodynamics, if anything, only increase the efficiency. And lastly,

how we would not expect a change in Term 91 periods with the California WaterFix.

MR. MIZELL: And, Mr. Leahigh, if I can interrupt shortly here.

Are you going to be utilizing DWR-10 during your talk?

WITNESS LEAHIGH: Yes, I will.

MR. MIZELL: Okay. Mr. Hunt, if we could bring up DWR-10, please.

WITNESS LEAHIGH: Thank you. So for the first topic of how uncertainty and how it relates to project allocation decisions -- hold on just a second. If I can figure out how to -- this way.

MR. OCHENDUSZKO: Mr. Leahigh, if you could just identify when you want the next slide, Mr. Hunt can help you out.

WITNESS LEAHIGH: Okay, sure.

Next slide, please.

So I'll start with -- this is just a list. I'm not going to -- I'm going to go through it real fast here. In terms of -- well, let me start with -- so this first topic is in rebuttal to Mr. Bourez's testimony as part of the Sacramento Valley Water Users' case in chief, where he contended that his model is a more realistic representation of what actual operations

would be under the California WaterFix by claiming quote, "Operators have more information at their disposal to make decisions," unquote.

While it's true that the operators do have more information available to them, the real world is much more complex and much more uncertain than what Mr. Bourez simulates under his model runs.

So the list you have in front of you on the slide is -- are a number of the factors and the variables that are considered as part of the allocation decision process -- current and projected storages, forecasted runoff for the year, and that's not just runoff into Lake Oroville but throughout the system. That's the highest degree of uncertainty that exists from year to year.

There will be the required Feather River flows, Feather River settlement contract deliveries out of Thermalito Afterbay, the anticipated depletions in the system in the Valley and also in the Delta, anticipated Delta outflow requirements and salinity objectives.

Another area of large uncertainty is the anticipated export restrictions of -- as they relate to the biological opinions. And then also the delivery patterns for the contractors south of the Delta.

Next slide, please.

So I talked about the area of most uncertainty. That's the runoff forecast. And the project receives these through Bulletin 120, which is a runoff forecast based on the snow surveys, the monthly snow surveys.

Got an example here from 2012.

Early on in the spring, there's an enormous amount of uncertainty in terms of the actual runoff that we would expect to see in any given year. So the example here in February, the difference between the driest and the wettest forecast would be -- was 3.3 million acre-feet in that particular year, and that's just for the inflow into Oroville alone.

As we step through the spring months, that uncertainty begins to funnel down as we get more knowledge in terms of the actual snowpack accumulation and as we get through the majority of the rainy season.

But even by the -- by May, which is typically when we provide our final allocation to our contractors, the amount of uncertainty in this particular example was still 665,000 acre-feet. So although that's a great reduction from what that uncertainty was earlier in the year, it's still a very significant number.

And that's -- so, for example, that 665,000 acre-feet, if we release that for export, would constitute a month and a half worth of exports.

So there's still going to be a significant amount of uncertainty in terms of our actual use of Banks Pumping Plant for the summer, for example.

Also a large degree of uncertainty would be to what extent the NMFS, the National Marine Fishery Service, and United States Fish and Wildlife Service biological opinions, to what extent those restrictions will affect export capabilities in the winter and the spring.

And that uncertainty, the difference in the range, is up to 200,000 acre-feet per month, which is something that's not known ahead of time. And also, just the exact amount of water that would be necessary to meet the D1641 requirements, especially the water quality requirements, we have estimates of the water supply necessary to meet those, but until we actually operate through the summer, we won't absolutely know.

Next slide, please.

So because we don't want to over-promise on our delivery capability to our customers, we use a conservative estimate on the ranges of uncertainty. So that would be, for example, on the drier end of the

range of the Bulletin 120 forecast for runoff. And in addition, we will assume something other than the least restrictive biological opinion case.

So these would be the Old and Middle River limitation -- negative flow of the Old and Middle River limitations.

And then of course, the projects operate -- as I said, they operate -- the projects in realtime conditions, and if, in most cases, additional water is available to us in the summer, which is often the case because we are using a conservative estimate, that additional water could be pumped into San Luis Reservoir, not necessarily allocated in that year but held over for project purposes in the following year.

So MBK's modeling incorporates more foresight than the operators truly possess in the real-world operations. As I said, we use a conservative end of the range for those uncertainties. And for that reason, I believe the petitioner's modeling better reflects the real-life operations and, therefore, does a better job of simulating the real-world project operations.

Next slide, please.

Actually, I'll go ahead and skip the next couple slides and go to the graphic. Thank you.

So the next topic is how the majority of Water Board SWP export is from sources other than Lake Oroville. And this is in rebuttal to -- Mr. Nomallini, during the case in chief for Central Delta, asserted that the projects should not export water during the winter until it becomes clear that the current year will not be dry.

Mr. Nomallini's implication that upstream storages are being imprudently drafted early in the year for export is based on a false premise that the source of the project's exports is always from upstream storage. In fact, the source of winter exports, even in the driest years, is predominantly from surplus flows that would end up as excess Delta outflow if not exported and put to beneficial use by the projects.

So these stacked bar charts that you see before you are examples of three different year types. So this is historical data that shows the primary sources of water for export at the State Water Project Delta export facilities. An example for a wet year is 2011. We've got 2012 as an example of kind of an average year, and 2015 as an extreme critical -- critically dry year.

You can see the lowest bar on these columns is the flood control releases and unstored flow, which is

the source of water for export in many years. And predominantly in wet and dry years, it's the majority of the source for the supply. Now, of course, in the critically dry years, there's very little of it, but it makes up the majority of the source of the water for export.

The blue bars represent water that was released -- that was required to be released from Lake Oroville and then, after serving that initial purpose, is then picked up at the State Water Project exports.

The red bars indicate the volume of water that would be released explicitly for the purpose of export by the State Water Project from Oroville.

So, again, what you can see is the vast majority of the water that's exported in the very wet cases and the dry cases is not from stored -- is not from water that's released -- stored water that's released from Lake Oroville. In the average years, it makes up a larger component of the total, but it's -- still the majority of the supply is from non-discretionary releases or other excess flows in the system.

Next slide, please. In fact, you can go to the next graphic if you would. Thanks.

So the next topic is along the same lines.

How is the vast majority of releases from Lake Oroville -- how are those comprised? And so in a similar assertion by California Sport Fishing Protection Alliance in its case in chief, it was asserted that the State Water Project releases too much storage in drier years. Most release of stored water in every year is released for purposes other than export. The projects have no discretion in releasing the vast majority of the water that we do. So again, here's the three years of example: wet, normal, critically dry.

The first block there, the blue block, is minimum required releases to the Feather River through our FERC license through agreements with the Department of Fish and Wildlife.

The next block, the purple block, would be releases for flood control purposes in order to maintain the required vacant storage in Lake Oroville for flood protection.

The next block, the green block, would be releases from Lake Oroville that are explicitly to meet the Delta requirements. So this would include the flow requirements, the salinity requirements.

The next block up is the orange block, represents the releases out of the lake for afterbay settlement contractor deliveries.

And the final piece, the red block, that's the only portion that is released for the State Water Project exports.

And again, you can see sort of the same pattern. In the wetter years and the dry years, there's very little of that discretionary release. It does show up primarily in the average years, but it is a small portion of the total. Most of that -- most of those releases are for non-discretionary reasons.

Next slide, please.

So the next topic --

Actually, if you would go directly to the next graph. There we go. Thank you.

So the next topic is how export capacity goes unused during periods when stored water would be moved under existing conditions.

So as part of the case in chief again for California Sports Fishing Protection Alliance, it was asserted that the petitioner's modeling for State Water Project operations should be expected to be more aggressive in releasing additional stored water from Lake Oroville for exports South of Delta during the summer months because of the greater diversion capability afford by the North Delta diversion.

In a similar manner, Mr. Bourez asserted that

modeling should be expected to show a greater use of Central Valley project Joint Point of Diversion at the State Water Project export facilities. These assertions are not borne out by project policy or the historical practice of limiting release of upstream stored water in all but the wettest years.

So what you have in front of you, once again, is a historical -- is historical data depicted in a graphical form, and it is color-coded by year type. So we have -- this is all of the years back to the year 2000, ending last year, with the wet years in blue, above-normal and below-normal years in green, dry years in orange, and critically dry years in red.

And this is the -- on the Y-axis are volumes -- volume of acre-feet. And this is for the three-month period July through September. And the reason I picked these months is that they constitute the three months where the majority of stored water would be moved at the export facilities.

The dashed red line represents the full permitted capacity for export during these three months for both the Central Valley Project and the State Water Project, so a little over 2 million acre-feet of capacity under existing conditions.

The solid red line represents the actual use

of that capacity in each of these years. The dotted red line represents the use of Joint Point of Diversion by the Central Valley Project at the State's facilities. So the dotted red line is actually a subset of the solid red line.

And then the only other line on there is the gray, which is the unmet demand during that -- during each of these particular years.

So this is just a demonstration that the reason we would not be utilizing the full capacity for export is not because of a demand limitation. So you can see in most of these years, there was unmet demand, with the exception of the 2006.

So the point on this is, if you look at the -- so the wetter years, 2011, 2006, and 2005, which was actually a wet year on the San Joaquin Basin, those were the only years where we utilized the full permitted capacity of both projects. You can see in all of the other years, the full capacity under existing conditions was not utilized.

And to get back to those wetter years, as I had represented in the previous bar charts, the source of that water would have been excess flows that would have been available even during the summer in those wetter-type years.

So in all of the other years, this would have represented the movement of stored water from the upstream SWP and CVP reservoirs to the Project's export facilities in the Delta.

So the evidence does not support the assertion by the protestants that the projects would be expected to draft more storage out of upstream reservoirs due to increased summer capacity afforded by the California WaterFix when the projects are not fully utilizing all the conveyance capacity that's available to us today for that purpose.

In fact, the State Water Project moderates releases of stored water. The first block of water that we reserve upstream is to meet regulatory and contractual obligations. The next portion of the additional storage is managed for State Water Project contractor deliveries in a way that balances between maximizing average annual deliveries and for providing some dry-year reliability.

And the strategy for obtaining this is that -- that supply is that the higher the State Water Project allocation in any given year, the greater the storage that's left behind in Lake Oroville to guard against a dry year and to protect that dry-year allocation.

Next slide, please.

So that -- as part of this same rebuttal, that leads to the next topic, which is how the California WaterFix will allow for an increased opportunity to capture excess flows as a substitute for stored water.

So the petitioner's modeling which I'm going to show in the next slide has increased the reliance on unstored flow in many of the cases, and it's decreased the reliance on stored releases. So this is completely consistent with the strategy that I just discussed.

The MBK modeling, on the other hand, increased reliance on both stored -- well, increased the use of both stored releases and unstored flow. So it's quite more aggressive in the use of the stored water, and this is inconsistent with that policy or strategy, if you will.

Next slide, please.

So here are the results. This was presented as part of the petitioner's modeling and, again, color-coded by the different year types.

And under this particular case, we're comparing the no action alternative with H3. And what you can see here is that it shows an increase in export capabilities for the State Water Project under all the year types. And that's that -- the reason for that increase, if you can see the breakdown of the sources

of water, is -- comes from the increased capabilities of exporting excess unstored flows. And that's in the -- primarily in the winter and the spring. It actually shows somewhat of a decrease in the use of stored water for export in each of these.

And that's entirely consistent with that strategy that I just discussed where, in years where we're able to give a higher allocation to our contractors in order to balance that average annual delivery with dry-year reliability, we will leave even additional storage for carryover into the following year to protect against those drier years.

So that's the effect that's captured here as part of the petitioner's modeling.

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In contrast, in MBK's modeling of the California WaterFix -- now, this is a slightly different. This is MBK-modeled Alternative 4A. So it's a slightly different -- it's not -- it's not the H3. But the point still holds here, in that as consistent with the petitioner's modeling, there is greater use of capture of unstored flow in the winter and the spring.

But MBK takes it a step further and shows additional stored water being released in the summer

months for export. And that's entirely inconsistent with not only the strategy that I discussed but historical practice if you look at -- based on the other evidence that I provided.

So next slide, please.

So -- so -- and -- okay. So increased opportunities to capture excess flows as a substitute for stored water. So along this same theme with California WaterFix, what the regime that's reflected in this modeling -- essentially what it does is it restores some of the capabilities that existed prior to the implementation of the biological opinions in 2008 and 2009.

So it increases -- it restores some of that ability to capture some of the spring runoff events for beneficial use.

The -- so when the BiOps were applied in 2008 and 2009, they limited the amount of reverse flow for the South Delta diversions. But with the use now of the North Delta diversion, there would be an opportunity to capture some of those excess flows in the winter and the spring without -- while still meeting those limitations in the South Delta.

So next slide, please.

So here is modeling results from DWR's

delivery reliability report. These are from two different reports, one from 2005 which predated the biological opinions, and one from 2011 following the biological opinions.

But this shows that same change in general pattern that I've been talking about where, prior to the biological opinions, more of the supply for the projects came from the winter and the spring -- or for the State Water Project came from the winter and the spring. And after the biological opinions in the 2011, you can see higher exports in the summer months.

So the projects actually became more dependent on stored water from upstream reservoirs after the biological opinions. And what the California WaterFix would allow for is restoration back more so to that previous operating regime where we would rely more on the unstored flows in the spring and the winter, and actually become less reliant on the stored water during the summer period.

Next slide, please.

So the next topic I wanted to cover is how challenges associated with exceptional droughts are completely independent of the California WaterFix.

So a couple of the parties -- well, Mr. Shutes and Ms. Paulsen, among others, asserted that it is

unreasonable for the California WaterFix to rely on temporary urgency change petitions.

So TUCPs are rare and only implemented under extreme conditions. Now, unfortunately, we have seen some extreme conditions in recent years. And this was part of my case in chief testimony.

With 2013, the lowest precipitation on record for any calendar year, a hundred years going back, 2014 by far the warmest on record, over 4 degrees Fahrenheit warmer than any year on record -- or I'm sorry -- than the average.

2015 was the lowest snowpack; essentially no snowpack in 2015, so these were extreme cases. And the TUCPs were one -- were only one of several emergency management actions that were taken to balance the shortages among the various beneficial uses in those years.

So although exceptional droughts and adverse hydrologic changes associated with climate change do present challenges, these are completely independent from the proposed California WaterFix project.

Next slide, please.

So next I'd like to address how the California WaterFix would not fundamentally change Delta hydrodynamics and, if anything, will improve the

efficiency of those hydrodynamics.

Again, it might be easier if I go to the graphic. If you could just scroll to -- there we go. Thank you.

So Mr. Brodsky in the Save the California Delta Alliance claimed that the operations of the California WaterFix would represent a big change in the way water would be flowing in the Delta. I continue to argue as part of this rebuttal that the fundamental hydrodynamics do not change.

So during wetter periods, which was part of my case in chief, I showed the example where in big flow years or big flow periods and certainly this year, as an example, when there's very wet conditions, the North Delta diversion would be skimming off the top of the large Delta inflows and really have no appreciable change to the Delta hydrodynamics.

What I'd like to focus more on this rebuttal is the hydrodynamics in the drier periods in periods where the Delta is in balanced conditions.

So under -- the graphic in front of you shows the -- essentially the flow regimes in the Delta. On the left would be the existing condition without the California WaterFix, without the North Delta diversion.

We currently rely on Cross Channel flow.

That's through the Cross Channel. That's the whole reason it was designed and constructed, was to bring freshwater Sacramento River water into the Central Delta. That is needed in order to meet the Delta standards, to meet the Central Delta ag standards, to meet the M and I water quality standards within the Delta.

There's also a need for some level of reverse net Old and Middle River flow, and that's to -- for some of this fresher water to get into the M and I export locations at Contra Costa Water District as well as the M and I locations which are the project exports themselves at -- from Clifton Court and Jones Pumping Plant.

What you can also see here is at times there is also a certain amount of reverse flow in the western Delta. And that's due to not only the natural tidal conditions during spring tides, for example, but it's also from the diversions of all types in the interior Delta. During periods when the projects are pumping heavily in the South Delta and they must rely on a larger amount of water from the upstream reservoirs, this -- so this negative -- this reverse flow in the western Delta becomes more pronounced with high South Delta export.

In order to counteract this -- and this negative flow in the western Delta brings salts in with it. That's a mechanism for salt transport into the interior. So in order to meet the standards, what the projects are required to do is release additional water from upstream reservoirs in order to provide additional outflow to counter this negative western Delta flow.

This additional water for outflow is often also referred to as "carriage water." Carriage water represents an inefficient use of the upstream stored water.

With the California WaterFix hydrodynamics depicted on the right, we will continue to need the cross-Delta flow as we do today -- that's not going to change -- in order to meet the interior and M and I water quality objectives.

However, the North Delta diversion in the tunnels will allow for some amount of the project exports to go directly to the south -- to the Banks Pumping Plant and Jones Pumping Plant, and this would, therefore, not require -- this would result in less South Delta pumping which would also result in less negative West Delta reverse flow, which would have less of a detriment in terms of the salinity coming to the Delta. And, therefore, it would also require much less

carriage water.

And so that would actually result in less water being released from project upstream storages, which would represent a more efficient movement of water from the projects to their customers south of the Delta.

So next slide, please.

So the last topic is -- so Mr. Bourez in his testimony contended that the frequency and duration of Term 91 periods would increase with the proposed WaterFix. Term 91 is a condition determined by the State Water Resources Control Board when supplemental project supplies are needed to meet in-basin uses.

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So as part of this proposed project, in-basin uses are not expected to change with the California WaterFix. And, if anything, as I've just laid out in the hydrodynamics section, the amount of stored water to meet the Bay-Delta standards would not be expected to increase. If anything, because of the increased efficiency, we would see decreases in the amount of stored water to move the same amount of export.

Therefore, the frequency of Term 91, I would not expect that to change whatsoever as part of the proposed California WaterFix.

And so that concludes my rebuttal. Thank you.

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

Next? And before you begin, I would like to take a lunch break at some point, near around noon. So I'll leave it to you to determine the best time for there to be a break in your testimony between you and the next witnesses.

Unless, Mr. Mizell, you believe all your witnesses can be done within the next 90 minutes or so?

MR. MIZELL: No, I think we will need to take a break. And maybe if Mr. Munevar can look for one of the transitions between your presentation and Ms. Parker's presentation.

CO-HEARING OFFICER DODUC: All right.

WITNESS MUNEVAR: Okay.

CO-HEARING OFFICER DODUC: And also while we still have Ms. Spaletta here, at some point we'd like to get some clarification on your objections. So we'll ask you to come up at that point.

Mr. Munevar?

WITNESS MUNEVAR: Well, good morning, Hearing Officer, Members of the Board, Board Staff. Thank you for allowing me to present my rebuttal testimony. My name is Armin Munevar, and I've previously testified in