Spencer Kenner (SBN 148930)
James E. Mizell (SBN 232698)
Emily M. Thor (SBN 303169)
DEPARTMENT OF WATER RESOURCES
Office of the Chief Counsel
1416 9th St., Room 1104
Sacramento, CA 95814
Telephone: 916-653-5966
E-mail: jmizell@water.ca.gov

Attorneys for California Department of Water Resources

DWR-1421

BEFORE THE

CALIFORNIA STATE WATER RESOURCES CONTROL BOARD

HEARING IN THE MATTER OF CALIFORNIA DEPARTMENT OF WATER RESOURCES AND UNITED STATES BUREAU OF RECLAMATION REQUEST FOR A CHANGE IN POINT OF DIVERSION FOR CALIFORNIA WATER FIX

SUR-REBUTTAL TESTIMONY OF CHANDRA CHILMAKURI

I, Chandra Chilmakuri, do hereby declare:

This testimony responds to the September 18, 2018 Ruling by the Hearing Officers requiring that DWR

> "provide written testimony – affirmed by a witness (or witnesses) – that identifies potential impacts to CCLP's water rights from the WaterFix Project and possible mitigation measures, including but not limited to any potential impacts that may result from coordinated operation of the proposed Byron Tract Forebay and Clifton Court Forebay. The testimony should identify and describe any analysis that has been conducted, or is planned to be conducted, about potential impacts to CCLP's water rights." (September 18, 2018 Ruling, p.4.)

I. POTENTIAL IMPACTS TO CCLP'S WATER RIGHT

The proposed project considered in the Administrative Draft Supplemental EIR/EIS (SWRCB-113) or Public Draft Supplemental EIR/EIS ("SEIR") (SWRCB-114) will not change the water quality and water levels available at CCLP's water diversion intake because the proposed control structure in the Jones Pumping Plant Intake Channel ("Control Structure") is a facility that is already a part of the approved project.

Additionally, operation of the Control Structure will not diminish water availability and conditions at CCLP's diversion point.

a. The Control Structure was included in prior analysis

The potential water quality and water level impacts were previously disclosed and analyzed because the control structure within the Jones Pumping Plant Intake Channel is a part of the approved project. (*See* DWR-616 and SWRCB-102 Ch. 3 – Mapbook Figures, Sheet 12 of 13, p.12.)

The testimony of Dr. Nader-Tehrani (DWR-66) and Ms. Smith (DWR-1015) properly discussed the impacts of the CA WaterFix, including explanations for the modeling results contained in DWR-500 and DWR-1074 through DWR-1078. Modeling previously submitted by DWR includes results at the junction of Old River and the Jones Pumping Plant Intake Channel, and I present that information below.

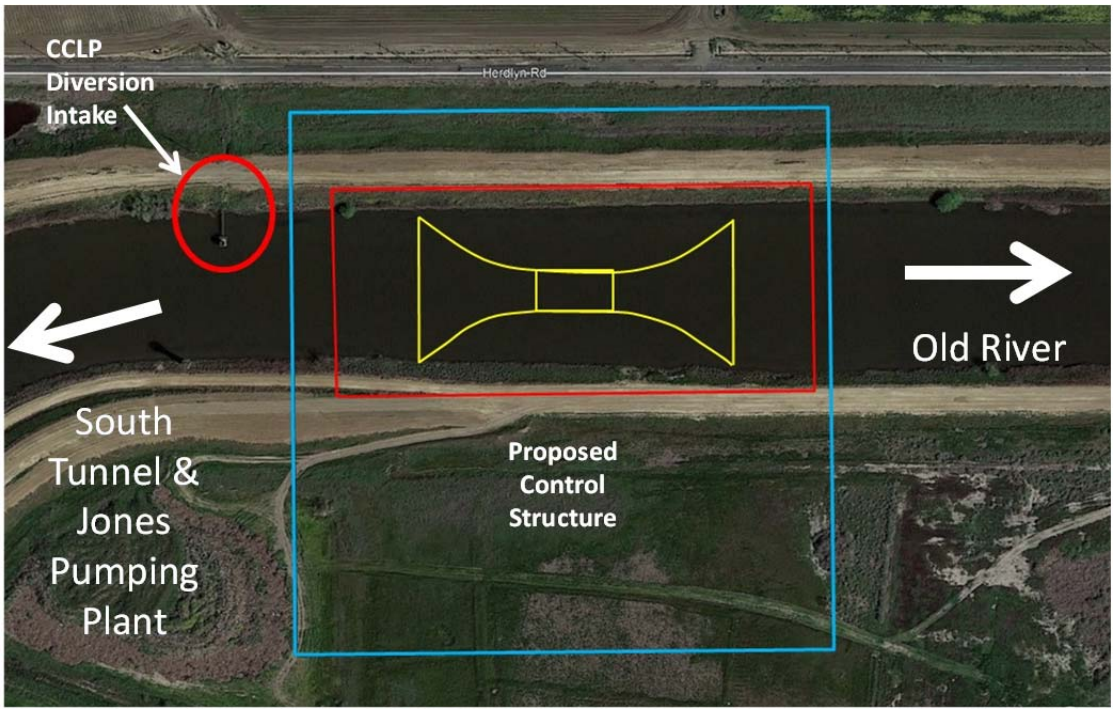

Figure 1: Location of CCLP's diversion intake in reference to the proposed Control Structure in the Jones Pumping Plant Intake Channel.

Figure 1 shows the location of CCLP's diversion intake in the Jones Pumping Plant Intake Channel in reference to the Old River, the proposed Control Structure

and the Jones Pumping Plant.

b. Operations based potential impacts

Currently, the Jones Pumping Plant Intake Channel is subject to existing water level variations and existing south Delta water quality in the Old River. With CA WaterFix, when the Control Structure gates are open and not impeding the Jones Pumping Plant Intake Channel then CCLP's diversion point will have similar or better conditions compared to the No Action Alternative. When the Control Structure gates are closed water quality analysis shows that water quality at CCLP's will be augmented by deliveries from the CA WaterFix and fresher water will be available. This is further discussed below.

II. ANALYSIS OF POTENTIAL IMPACTS OR PLANNED ANALYSIS OF POTENTIAL IMPACTS

Because there are no undisclosed new physical impacts to CCLP's water diversion intake under the proposed modifications to the CA WaterFix project within the Draft SEIR, the analysis of potential water quality or water level impacts is contained entirely within previous testimony. The potential impacts have been previously disclosed and analyzed because the Control Structure within the Jones Pumping Plant Intake Channel is a part of the approved project (*See* DWR-616 and SWRCB-102 Ch. 3 – Mapbook Figures, Sheet 12 of 13, p.12.) Thus, the effect of the Control Structure was included within the water quality and water level analyses previously conducted for CWF H3+. DSM2 model used to analyze the salinity and water levels in the Delta for CWF H3+, included a representation of the Control Structure operations even though the Control Structure itself was not explicitly included in DSM2. DSM2 boundary condition timeseries for Jones Pumping Plant exports from the south Delta channels reflects the operations of the Control Structure, meaning that when the model delivered water to Jones Pumping Plant from only the

CA WaterFix North Delta Diversion, the Jones Pumping Plant diversion from the south Delta was zero, and this represents a closed Control Structure. Conversely, when the model diverted water to Jones Pumping Plant from the south Delta there was a positive value in the boundary condition timeseries, which results in flow into the Jones Pumping Plant Intake Channel from the south Delta, and this represents an open Control Structure. The control structures explicitly included in DSM2 are defined in the model input files included in DWR-500 and DWR-1078 along with the complete bathymetric and boundary inputs. The DSM2 version 8.0.6 bathymetry inputs including the nodes and channel cross-sections for the south Delta region utilized for analysis of the CA WaterFix are contained within the file identified as DWR-1400. DWR-1408 shows an excerpt from DWR-1400 for DSM2 channel 126, as an example of the bathymetry input used. DWR-1420 shows a few control structures explicitly included in DSM2 model (excerpted from DWR-1078). DSM2 annual reports, such as DWR-1418, describe helpful details on the appropriate identification of technical data within the DSM2 model. Furthermore, the use of CSDP software to identify DSM2 node locations and develop DSM2 bathymetric inputs from observed bathymetric data is described in the user documentation found in DWR-1419. DWR-1142 Appendix 5B describes in detail the DSM2 modeling approach including the inputs used for the analysis of CWF H3+. I have identified and extracted the specific data for the location within the DSM2 results near the junction of Old River and the Jones Pumping Plant Intake Channel, which is presented below.

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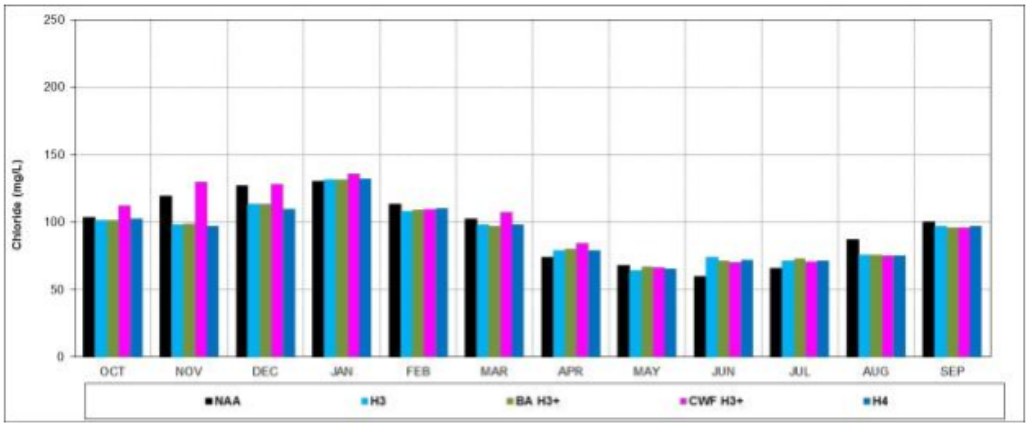
a. Modeled south Delta water levels and water quality was analyzed and disclosed

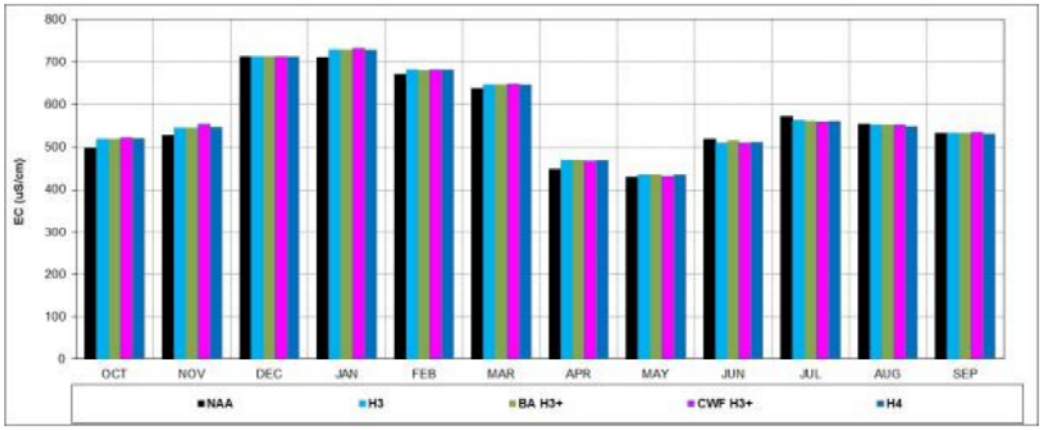
DWR-1071, p.13, Figure CL2, p.12, Figure EC5 and p.21, Figure W5 (excerpted below) illustrate the modeled water quality and water level impacts for CWF H3+ in the South Delta near the Jones Intake Channel. These figures show that anticipated water conditions in the South Delta under CWF H3+ are similar to conditions anticipated for the No Action Alternative.

Figure CL2: Monthly Average Chloride Concentration at Old River at Clifton Court.



**Model results are used for comparative purposes and not for predictive purposes*

Figure EC5: Monthly Average EC at Old River at Tracy Road



**Model results are used for comparative purposes and not for predictive purposes*

In DWR-66, Dr. Nader-Tehrani explained that, “Exhibit DWR-513, Figures CL1 to CL3 show the simulated chloride concentrations at Contra Costa Canal, Old River near Clifton Court, and Barker Slough/North Bay Aqueduct. (Exhibit DWR-513, pp.4-5.) At all these locations there is year round D-1641 chloride concentration objective to be at or below 250 mg/L. Model results show that the monthly average chloride concentrations for all alternatives at these locations stay below this threshold.” (DWR-66, p.6:21-26.) Ms. Smith updated the figures in DWR-513 in her Part 2 testimony (DWR-1015 and DWR-1071) as indicated by her testimony that, “the second section will describe CWF H3+ salinity and water level results and their relationship to BA H3+ and the NAA for locations presented previously in Part 1.” (DWR-1015, p.3:3-4.) Ms. Smith goes on to conclude that, “the chloride concentrations for CWF H3+ for all months is lower or similar to those for NAA with some exceptions.” (DWR-1015, p.19:16-18.)

It is my opinion that with the Jones Pumping Plant Intake Channel control structure gates open and no flow diverted from the Byron Tract Forebay, it is reasonably expected that CCLP’s diversion point would experience the water quality indicated by the Old River channel near the intake channel, which is expected to be similar to the NAA as reflected in Figure 2 below. Figure 3 shows that the volume of water originating from the DSM2 Martinez boundary location, an indicator of ocean water, is expected to reduce significantly under CWF H3+ compared to NAA in Old River near Clifton Court radial gates. This is another indicator of the expected south Delta salinity conditions near the Jones Pumping Plant Intake Channel.

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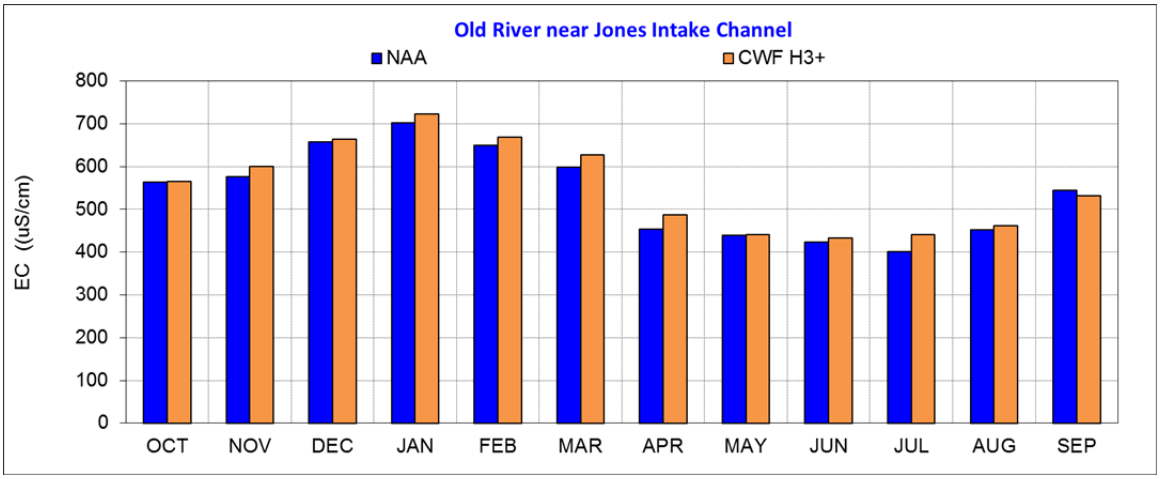

Figure 2: 82-year Average Modeled Monthly EC in Old River near Jones Intake Channel

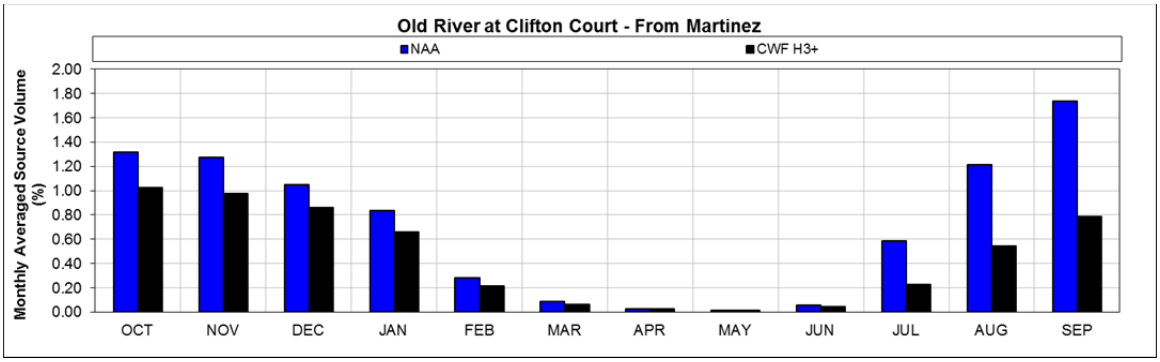

Figure 3: 82-year Average Modeled Volumetric Fingerprint of Water Originated from Ocean in Old River near Clifton Court Radial Gates

Water level analysis was previously discussed in the testimony of Dr. Nader-Tehrani and Ms. Smith. Dr. Nader-Tehrani stated that, "as expected, the results show smaller changes in water levels at locations that are farther from the three proposed NDD. In fact, according to Figures W3 to W5, there is very little change in water levels at Sacramento River at Rio Vista, Mokelumne River at Terminous, and Old River at Tracy Road. (Exhibit DWR-513, pp. 13-15.)" (DWR-66, p.10:10-13.) Ms. Smith states, "Water level effects for CWF H3+ and BA H3+ are similar to H3 and H4." (DWR-1015, p.4:22.)

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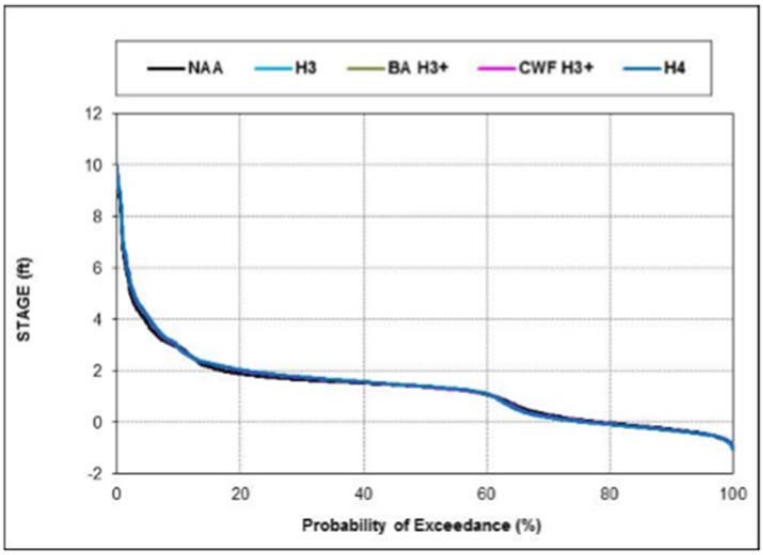
Figure W5: Probability of Exceedance for Daily Minimum Stage at Old River at Tracy Road



**Model results are used for comparative purposes and not for predictive purposes*

Figure 4 below indicates that the modeled daily minimum water levels in the Old River near the Jones Pumping Plant Intake Channel are similar to the No Action Alternative. It is my opinion, as explained earlier, that the water levels to be experienced at CCLP's diversion point when the Jones Pumping Plant Intake Channel control structure gates are open would be indistinguishable from the Old River near the Intake Channel, and therefore, are expected to be similar to No Action Alternative as shown in Figure 4.

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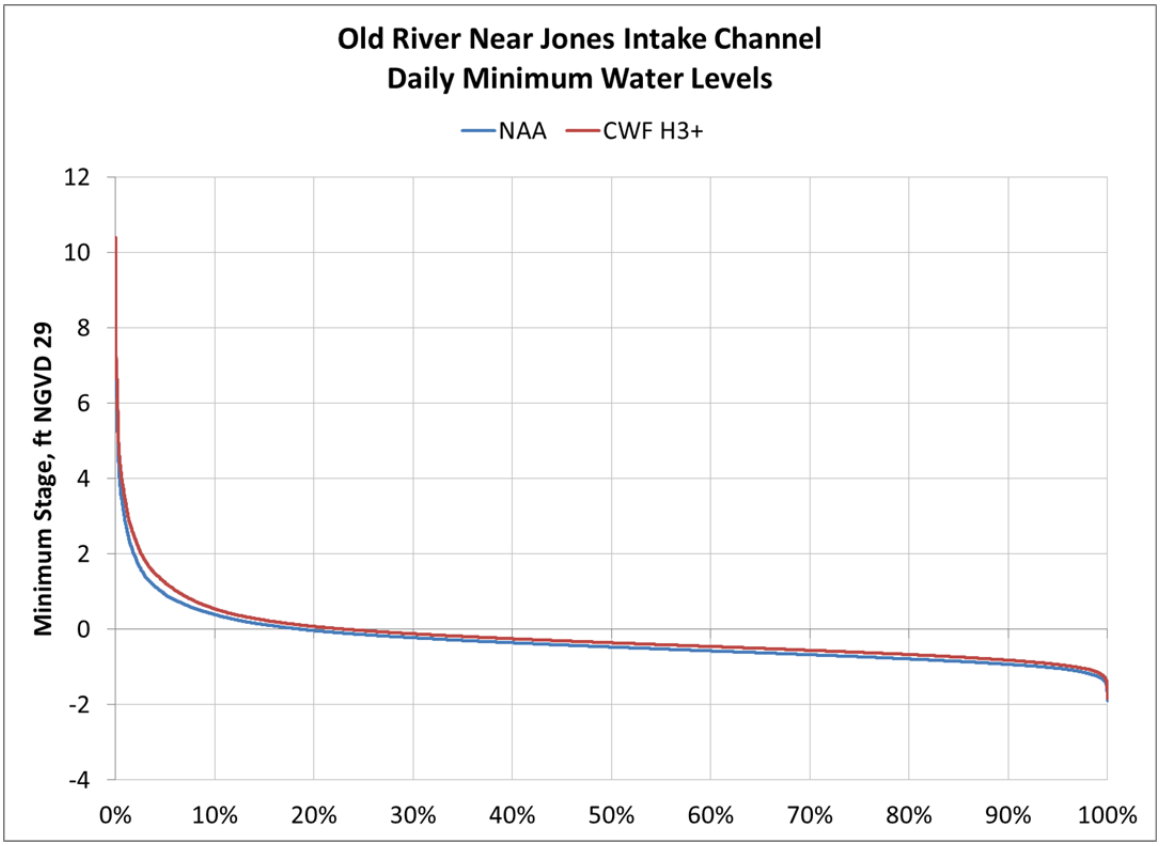

Figure 4: 82-year Modeled Daily Minimum Water Levels in Old River near Jones Intake Channel

b. Modeled water quality of CA WaterFix deliveries was analyzed and disclosed

As testified by Mr. Bednarski, when the Jones Pumping Plant Intake Channel control structure gates are closed the water available at CCLP's diversion point is augmented by deliveries from the CA WaterFix delivered via the South Tunnel and Canal. (DWR-1417, p.3.) There is analysis of the likely water quality of the exported water from Jones Pumping Plant, which is the same water that would be available at CCLP's diversion point, within the Final EIR/EIS ("FEIR"). Exhibit SWRCB-102, FEIR, Appendix 8H, Table EC-27, contains the information about the water quality available to Jones Pumping Plant. The title to that table is "Table EC-27: Period average EC levels at Bay-Delta Water Quality Control Plan compliance locations and frequency of exceedance of Bay-Delta Water Quality Control Plan objectives for Banks and Jones

pumping plants for existing conditions, the No Action Alternative (ELT), and Alternatives 4A, 2D and 5A."

I have excerpted the relevant portion of this table below.

Electrical Conductivity

Table EC-27: Period average EC levels at Bay-Delta Water Quality Control Plan compliance locations and frequency of exceedance of Bay-Delta Water Quality Control Plan objectives for Banks and Jones pumping plants for existing conditions, the No Action Alternative (ELT), and Alternatives 4A, 2D, and 5A.

Electrical Conductivity Alt 4A/2D/5A	Location	Period [a]	Period Average Concentration (µmohs/cm)					Other Relevant Threshold (1000 µmohs/cm) [b] Frequency of Criterion/Objective Exceedance (%)				
			Ex. Cond.	No Act. ELT	Alt 4A ELT	Alt 2D ELT	Alt 5A ELT	Ex. Cond.	No Act. ELT	Alt 4A ELT	Alt 2D ELT	Alt 5A ELT
Export Area	Banks PP	ALL	530	505	395	375	427	1	3	1	0	1
		DROUGHT	646	632	518	473	536	2	3	2	0	2
	Jones PP	ALL	555	531	409	398	464	0	1	0	0	1
		DROUGHT	683	664	523	501	566	0	0	0	0	0

Notes:
[a] ALL: Water years 1976-1991 represent the 16-year period modeled using DSM2. DROUGHT: Represents a 5 consecutive year (water years 1987-1991) drought period consisting of dry and critical water year types (as defined by the Sacramento Valley 40-30-30 water year hydrologic classification index).
[b] A 1,000 µmhos/cm objective, as a monthly average of mean daily EC, applies to the Banks and Jones pumping plants year-round. Compliance with EC objectives for other locations in the table is assessed on a different time-step and, thus, is summarized in a separate table in this Appendix.

I have enlarged the portion relevant to this testimony below.

Export Area	Banks PP	ALL	530	505	395
		DROUGHT	646	632	518
	Jones PP	ALL	555	531	409
		DROUGHT	683	664	523

As represented in this table, when the Jones Pumping Plant Intake Channel control structure gates are closed and the water available at CCLP's diversion point is augmented by water delivered from CA WaterFix through the South Tunnel and Canal the water quality will be better than under the Existing Conditions or the NAA. This can be seen by comparing the "Jones PP" numbers in the column for "Alt 4A ELT" to those found in the columns for the "No Act. ELT" and the "Ex. Cond."

Further, as shown in Figure 5 below, the expected salinity conditions at the Jones Pumping Plant and its Intake Channel, and by extension at CCLP's diversion intake, would be significantly better under CWF H3+ compared to NAA, when the Control Structure is operating. Figure 3 is based on the modeling results previously submitted as DWR-500 and DWR-1074 through DWR-1078.

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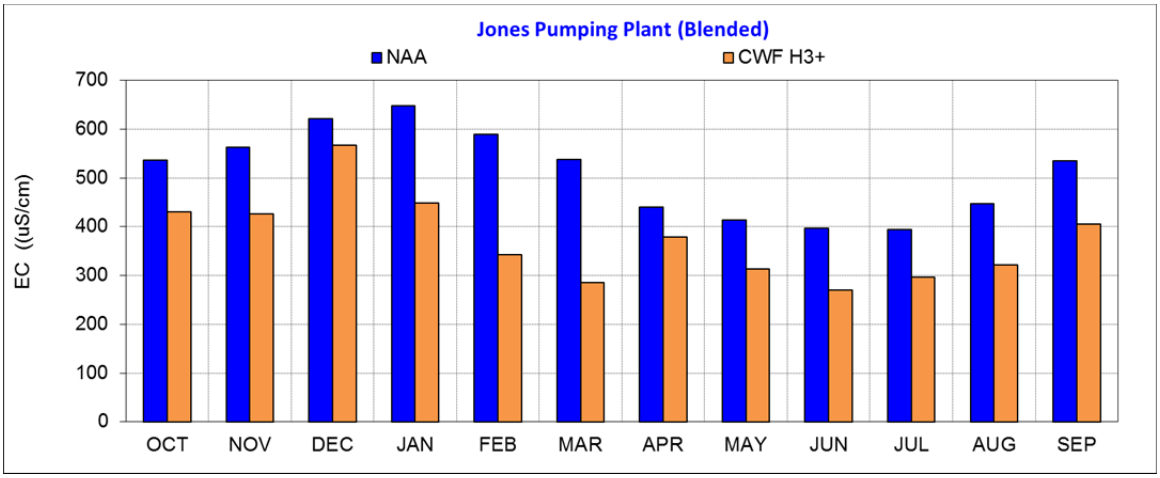

Figure 5: 82-year Average Modeled Monthly Blended EC at the Jones Pumping Plant

III. CONCLUSION

The Jones Pumping Plant Intake Channel control structure, when the gates are open, will not impede access to or quality of water available at the CCLP diversion point. The CA WaterFix, when the control structure gates are closed, will augment the water available at the CCLP diversion point. Additionally, if unexpected impacts do occur they will be mitigated.

Submitted September 24, 2018.

(Chandra Chilmakuri)