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May 25, 2021

Via Electronic Mail

Jeanine Townsend
Clerk to the Board
State Water Resources Control Board
1001 I Street
Sacramento, CA 95814

Bay-Delta@waterboards.ca.gov

Re: Comments on State Water Resources Control Board's May 2021
Draft Water Unavailability Methodology for the Delta
Watershed

Dear Ms. Townsend:

Byron-Bethany Irrigation District (BBID) appreciates the State Water Resources Control Board (State Board) providing an opportunity for stakeholders, like BBID, to learn about, and comment on, the State Board's new Water Unavailability Methodology for the Delta Watershed (Draft Methodology). The State Board provided notice for the workshop regarding the Draft Methodology on May 12, 2021, as well as access to resources related to the development of the Draft Methodology, such as the Draft Methodology Report, Technical Appendices, and Water Unavailability Methodology Spreadsheet (Spreadsheet). The workshop occurred nine calendar days later, on May 21, 2021. The deadline for written comments is four calendar days later – the close of business on May 25, 2021. BBID provides its comments on the Draft Methodology below, which are relatively general given the compressed time schedule and complexity of both the Draft Methodology and hydrology of the Bay-Delta.

General Comment:

BBID agrees with the State Board that the Draft Methodology implements changes to the water availability analysis used in the 2015/2016 drought. However, BBID does not believe that the Draft Methodology can support either determining water availability/unavailability or curtailing water diversions of water rights holders, post-1914 or otherwise. Indeed, some of the fatal flaws of the water availability analysis used in the 2015/2016 drought, as specified in the State Board's Water Right Order 2016-0015, dismissing an administrative civil liability (ACL) complaint against BBID and a draft cease and desist order against the West Side Irrigation District (WR Order 2016-0015),¹ remain unaddressed in the Draft Methodology. BBID respectfully

¹ BBID and the West Side Irrigation District consolidated into one irrigation district, effective on September 2, 2020, and BBID is the successor district.

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encourages the State Board to address all of the flaws noted in WR Order 2016-0015, as well as its comments below, prior to relying on the Draft Methodology to issue notices of water unavailability and/or curtailment notices/orders.

Specific Comments:

1. Modify Figure 5 to distinguish gauges used to quantify supply from other gauges.

Section 2.1.3 of the Draft Methodology Report states that 20 Delta subwatersheds were used for developing the monthly supply estimates, 10 each in the Sacramento River and San Joaquin River Watersheds. On Figure 5 in the Draft Methodology Report, all of the gauges are indicated to be full natural flow (FNF) gauges (depicted as yellow dots). (§ 2.1.3, p. 14.) While some of the 20 subwatershed gauges used to estimate supply rely on data (or "gap-filling") from other subwatershed gauges, BBID recommends the State Board modify Figure 5 to distinguish the 20 gauges it used to quantify supply from the various other gauges for enhanced clarity. In addition, the legend in Figure 5 should be modified to indicate that the subwatershed boundaries shown are derived from Hydrologic Unit Code level 8 watersheds (HUC8s). Including a separate map (or maps) showing the boundaries of the HUC8s that comprise the subwatersheds listed in the "Subwatersheds" tab of the spreadsheet would also be helpful.

2. Improper consideration of Delta return flows as supply available to diverters upstream of the Delta.

The Draft Methodology uses "CalSim 3" modeling results to determine estimated percentages of return flows within the Sacramento River Watershed (§ 2.2.6.1, Table 5, p. 38) and the San Joaquin River Watershed (Table 6) for the months of May through September. Per Technical Appendix A,² the return flow percentages in these tables include agricultural and municipal return flows. However, the Draft Methodology does not consider the Delta as a separate area, but rather one composed of the lower portions of the Sacramento Valley Floor, San Joaquin Valley Floor, and Mokelumne subwatersheds. The Draft Methodology appears to add the return flows assumed for Delta diverters to the subwatershed-wide supply, such that return flows in the Delta are

² See https://www.waterboards.ca.gov/drought/drought_tools_methods/docs/wua_app_a.pdf.

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counted as supply available to diverters within portions of the subwatersheds upstream from the Delta. This is physically impossible and potentially overstates the amount of demand within these upstream subwatersheds that could be supplied from available supply, which results in an inaccurate reckoning of supply available to Delta diverters. BBID recommends that the State Board treat the Delta as its own supply and demand area, as much as possible, so that only demands that have physical access to the available supply are charged against the supply.

Diversions for irrigation, and associated return flows, for water rights users in the legal Delta function differently than for areas outside of tidal influence, including areas with flowing streams and all land surfaces fully above sea level that exist in the valley floor areas outside of the legal Delta. In the legal Delta, water is pumped onto and off of lands to help manage soil moisture, creating different return flow regimes than for areas outside of the legal Delta. Furthermore, water associated with return flows remains locally available as part of the "Delta Pool," Return flows to the Delta are essentially not released downstream. Unlike in upland areas, where return flows are unavailable to the original diverter, return flows to the Delta remain within the Delta and available for diversion.

Individual water rights flagged as "yes" in the "In Legal Delta?" column in the Spreadsheet should not have the same Demand factor applied as a water right diverted many miles away, such as from the Sacramento River near Red Bluff or the Feather River.

3. Omission of treated effluent discharges from municipal wastewater treatment plants to rivers and Delta channels as additional sources of supply.

By its own admission, the Draft Methodology does not include treated effluent discharges as contributions to supply. Page 39 of the Draft Methodology Report states that wastewater treatment plant discharge data reviewed in 2015 "were determined to be too variable and incomplete to use in the water supply analysis[,]" and that "the volume of abandoned flows from wastewater treatment plants is limited by the significant, ongoing efforts of communities to re-use their treated wastewater and by urban water conservation efforts." (§ 2.2.6.1, p. 39.) In a footnote on the same page, the Draft Methodology Report goes on to state that Sacramento Regional County

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Sanitation District (Regional San), the City of Tracy, and the City of Modesto "have variously claimed the right to treated wastewater for downstream diversion and beneficial use, to sell the treated wastewater using a natural water course as a conveyance, or to withhold the treated wastewater from stream discharge and direct it to another use." (*Id.*, fn. 19.) The Draft Methodology Report provides no detail as to whether these claims have been validated or approved. To the extent these claims have been neither validated nor approved, BBID recommends including the discharges of treated effluent from municipal wastewater treatment plants to rivers and Delta channels as a source of supply, at least for 2021.

BBID notes that Regional San discharges are considered a component of Delta Inflow in the U.S. Bureau of Reclamation's calculation of Net Delta Outflow Index (NDOI). Similar to Item 2 above, because Regional San discharges within the legal Delta, this supply would be available only to Delta diverters and not to diverters within portions of the subwatersheds upstream of the Delta. To the extent that similar data are available for other dischargers, and their claims have not been approved or implemented, BBID believes that those discharges should also be considered in the Supply estimation.

4. Omission of releases from main stem tributary reservoirs in excess of FNF.

The Draft Methodology Report states, "Given time constraints, the [M]ethodology does not yet distinguish between abandoned instream flows that are met by bypassing flow and those met by storage releases." (§ 2.1.6, p. 23.) Based on use of the word "yet" it appears that the Draft Methodology does not add to supply releases of abandoned water from main stem tributary reservoirs that are in excess of FNF. BBID believes omitting these releases from the Draft Methodology underestimates supply.

5. Failure to consider Delta hydrodynamics and residence time.

The Draft Methodology does not consider Delta hydrodynamics and residence time. The Draft Methodology states:

The use of monthly supply forecasts and demand estimates (see Section 2.2 below) is assumed to negate the need to consider the water's transit time within the Delta watershed (i.e., it takes less

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than a month for water to flow from its headwaters to a downstream diverter. (§ 2.1.4, p. 16, emphasis added.)

Section 2.2 of the Draft Methodology Report presents a procedure for determining demand estimates that does not consider or discuss transit times or Delta hydrodynamics.

In Section 2.3.3 of the Draft Methodology Report, the State Board discusses "Proration of Legal Delta Demands," stating:

Diverters in the Legal Delta (defined by the 1959 Delta Protection Act) may have access to water supplies from both the Sacramento and San Joaquin River watersheds. To account for this, demands within the Legal Delta were divided between the two watersheds based on the monthly proportion of supply available within each watershed. For example, if the Sacramento River watershed constitutes 80 percent of the supply within the Delta watershed for a given month, 80 percent of the Legal Delta demand is charged against Sacramento River watershed supply for that month and 20 percent is charged against San Joaquin River watershed supply. Monthly supply ratios between Sacramento and San Joaquin River watersheds were calculated based on data for 2021, either previous months' FNF values or the 90 percent exceedance supply forecast scenarios for future months. Diverters within the Legal Delta are only proposed to receive notices of water unavailability if both the Sacramento River watershed analysis and the San Joaquin River watershed analysis show that water will be unavailable at their priority of right. The hydrology of the Legal Delta is complex. This proration method offers a simplified and generous assessment of water availability in the Legal Delta in this critically dry period. (§ 2.3.3, p. 43.)

The State Water Board is correct in stating "[t]he hydrology of the Legal Delta is complex." (*Ibid.*) However, accounting for this complexity is critical to a proper determination of water availability for all water rights for diverters located within the Delta. In response to the ACL at issue in Order 2016-0015, BBID provided a thorough analysis of the behavior and residence time of water within the Delta, making key points with respect to Delta hydrodynamics,

which BBID incorporates herein and restates below as they remain relevant and unaddressed in the Draft Methodology.³

- a) Delta residence times are on the order of three months during the summer and fall of dry years.

Residence time is a measure of the amount of time that water spends within a system; residence time is a function of the amount of water present in the system and the flow rate of water into (or out of) the system. The average amount of water within the Delta can be estimated at approximately 1.2 million acre-feet. At an inflow rate of 9,000 cubic-feet per second (cfs),⁴ the residence time of the Delta would be approximately 2.2 months. At an inflow rate of 6,900 cfs, the lowest 30-day average flow rate in summer 2015,⁵ the residence time of the Delta would be approximately 2.9 months.

The time required for water to travel from a FNF measurement location into and through the Delta, and to diversion locations in the south Delta, ranges from weeks (during high flows) to months (during periods of low flow).

Numerical models of the Delta can be used to determine both the source of water within the Delta and, for water at any given location within the Delta, the date that water entered the Delta. During the last drought, modeling performed using the Department of Water Resources' (DWR) Delta Simulation Model II (DSM2) was used to demonstrate that the majority of the water diverted by BBID in June 2015 was comprised of the FNF of the Sacramento River that entered the Delta many months prior to that time.⁶

³ Expert Report of Susan C. Paulsen, Ph.D., P.E.: Availability of Water in Old River, Sacramento-San Joaquin Delta, During Drought Conditions. January 2016 and Errata to Expert Report of Susan C. Paulsen (BBID 384), attached hereto as Exhibit A.

⁴ According to the California Data Exchange Center (CDEC), the combined flow rate of the Sacramento River at Freeport and the San Joaquin River at Vernalis was 9,101 cfs on May 23, 2021. Data obtained from CDEC, May 24, 2021.

⁵ The lowest 30-day flow was 6,874 cfs and was computed using data describing the daily average flows of the Sacramento River at Freeport and the San Joaquin River at Vernalis. Data obtained from CDEC, May 25, 2021.

⁶ Specifically, from June 13-25, 2015, the period of the ACL complaint issued against BBID by the State Board.

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- b) FNF are determined far upstream of the Delta and cannot be used as an indicator of the availability of water within the Delta.

Given the fact that during dry conditions, residence times in the Delta are on the order of months, it is inappropriate to use FNF as a real-time indicator of water availability in the Delta. Model simulations could be used to determine the relationship between FNF and "availability" within the Delta, but the Draft Methodology does not present any such analyses. Because residence times in the Delta are several months during dry conditions, it is inappropriate to consider FNF in a given month to be indicative of the availability of water within the Delta during the same month.

- c) Delta channels are below sea level and water is always present within the Delta, and any evaluation of water availability must consider both water quality and water source.

The salinity of water within the Delta results from the balance of freshwater flows and higher salinity water entering the Delta from the west as a result of tidal action. As noted by DWR:

Because the Delta is open to the San Francisco Bay complex and the Pacific Ocean and its channels are below sea level, it never has a shortage of water. If the inflow from the Central Valley is insufficient to meet the consumptive needs of the Delta, saline water from the bay fills the Delta from the west. Thus, the local water supply problem in the Delta becomes one of poor water quality, not insufficient quantity. (Delta Water Facilities: Program for Delta Protection and Water Transfer, Water Conservation, Water Recycling, Surface and Groundwater Storage, Bulletin No. 76 (DWR July 1978), p. 27, emphasis added.)

Because Delta channels are below sea level, water will always be present in the Delta, and an analysis of availability must focus on the quality of water, including both the salinity and the source of water within the Delta. The complexity of flow in Delta channels was recognized by the State Board Division of Water Rights as early as 1926:

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It is difficult if not impossible to estimate the influence of a diversion at any one point in these delta channels upon the available water supply at other points or the influence of a diversion from one of the tributary streams upon the available water supply at a particular point in the delta. The fact is that the delta channels form a vast reservoir through which the drainage from Sacramento and San Joaquin Rivers pours to form a barrier in the upper end of San Francisco Bay, Suisun Bay and the lower delta against the salt water which would otherwise enter Golden Gate and San Francisco Bay. (Water Board Opinion and Order Decision 100, signed by Edward Hyatt, Jr., Chief, Division of Water Rights (April 17, 1926), p. 11, emphasis added.)

Historical data show both that water was present at the BBID diversion location and that water was of suitable quality for diversion, even during critically dry conditions. Under historical conditions prior to about 1917, water in the Delta was predominantly fresh, and would have been fresh year-round at the (then-future) BBID diversion location during all hydrologic year types.

In 1931, the year with the lowest Sacramento River flow index in the pre-State Water Project and Central Valley Project (collectively, "Projects") time period, BBID diverted water during the months of June, July, and August, in volumes comparable to those months of other years in the pre-Project time period. Even during the drought conditions of 1977, BBID was able to divert, and did divert, water as it had in the past. In short, water was present at the BBID intake location and was of usable quality.⁷

The Draft Methodology Report states that "[d]iversion by users when supplies do not exist at their priority of right results in the need for additional releases of stored water from Project reservoirs in order to repel salinity intrusion from the ocean." (Introduction, p. 1.) However, it would be incorrect to imply that the natural condition of the Delta was to have high salinity in drought years, or that water was (or is) unavailable to in-Delta diverters under these conditions, given the long residence times of water in the Delta.

⁷ For detail, see Exhibit A.

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In effect, the Delta serves as a reservoir for storing water from winter rains and spring snow melt; in early summer, the Delta contains water that flowed in during the winter and spring months, in addition to agricultural return flows from prior months. This water should be available for diversion within the Delta, as it has been in the past.

6. Return flows associated with redirection of stored Project water should be included in available supply.

The Draft Methodology Report states that the methodology "...is not intended to address other supplies of water like redirection of previously stored water for use by Project contractors." (§ 1, p. 3.) And that the methodology "...is not intended to account for demands for previously stored water, imported supplies, and contractual demands." (§ 2.2, p. 26.) This latter statement is preceded by noting the methodology "...evaluates demands for natural and abandoned flows." (*Ibid.*) The Draft Methodology Report also indicates that "[s]easonally stored water, including releases of previously stored water for downstream use, is not available for diversion or use by diverters other than the entity that stored the water, their contractors, or recipients of a transfer." (§ 2.1.2, item 3, p. 11.) However, the Report does not address return flows associated with the redirection of these supplies.

Further review of the available materials, including the Spreadsheet, indicate that Projects' demands are represented as diversion to storage, primarily during the winter and spring months, with little or zero demand for May through October. Since the Report indicates that the redirection of stored water is not included as a demand, the zero values in the primary irrigation months appear consistent with the Draft Methodology. However, while not included in the Spreadsheet, professional experience indicates the Projects' diversion to storage is released from storage and delivered to contractors during the typical irrigation months – May through September, or October. During some of these same months, some Project contractors, especially Settlement Contractors, are diverting their own water rights (which are also reflected in the Spreadsheet and hereafter referred to as "base flows"). These base flows are co-mingled with the redirection of stored Project water rights at different ratios throughout each year, depending on hydrologic conditions and other factors. Rediversion of stored water during these months, whether co-mingled or not, results in return flows occurring in these same months, which would be consistent with "Abandoned Return Flows," as the term is used

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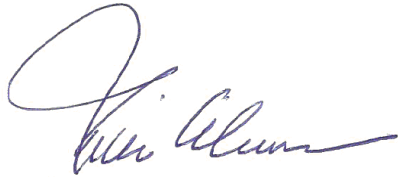
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in the Report. (§2.1.2, p. 11.) Yet according to the Draft Methodology, these return flows are excluded from the available supplies available during these same months. The Draft Methodology should be modified to include these return flows.

Should you have any questions about these comments, please feel free to contact me.

Very truly yours,

A handwritten signature in blue ink, appearing to read "Rick Gilmore". The signature is fluid and cursive, with a large initial "R" and "G".

BYRON BETHANY IRRIGATION DISTRICT

Rick Gilmore

General Manager