CALIFORNIA **URBAN WATER** AGENCIES

March 17, 2004

Jeremy Arrich
Department of Water Resources,
Division of Planning and Local Assistance
P.O. Box 942836
Sacramento, CA 94236-0001

Dear Mr. Arrich:

This is in reply to DWR's email notice dated February 3, 2004 regarding the release of the "State Feasibility Study of the In-Delta Storage Project."

Our principal concern is compliance with the provisions of the October 9, 2000 water rights protest dismissal agreement CUWA has with Delta Wetlands that was agreed to when the Delta Wetlands Project was before the State Water Resources Control Board. A key component of our agreement is a Water Quality Management Plan (WQMP), intended to assure that potential adverse water quality impacts would be avoided and addressed in operation of any subsequent project. The WQMP is similar to the separate protest dismissal agreement Delta Wetlands signed with Contra Costa Water District. In addition, the East Bay Municipal Utility District signed a protest dismissal agreement that focused on fishery protections and aqueduct security issues (both the CCWD and EBMUD agreements are referenced in the CUWA agreement, and the WQMP is incorporated by reference in the CCWD agreement). CUWA secured a clear commitment from the applicant/permittee Delta Wetlands to adhere to all three agreements as an assurance to protect our interests.

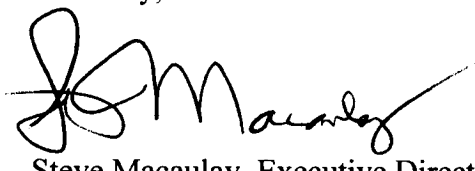
All three agreements also provided part of the foundation for the SWRCB water rights decision on the Delta Wetlands Project. The agreements include provisions making the terms and conditions binding on any successors in interest. We conclude that the current In-Delta Storage studies are the functional equivalent of a successor project.

We appreciate the hard work and detailed analysis done by DWR in the many components of the planning reports released over the past few months. However, the modeling to date by DWR does not show compliance with the provisions of the agreements. As stated in our February 12, 2002 letter to Bay-Delta Authority Executive Director Patrick Wright (copy attached), decision-makers and others will need an analysis which meets all of the proposed project's water quality requirements and all of its water rights operating restrictions before drawing conclusions regarding project benefits. Since neither the water quality requirements, nor the water rights operating restrictions have been met in the analysis, a true assessment of the project benefits cannot be made at this time. Further, optimistic comments on the feasibility of the project are made in the

executive summary and summary report which may be misleading to decision makers if not balanced by comments that acknowledge the severity of constraints to the project by the water quality requirements and operating restrictions, which have been identified in the State draft feasibility studies.

Attached are more detailed technical comments regarding aspects of the DWR studies and assumptions related to potential water quality impacts. Thank you for the opportunity to provide comments.

Sincerely,



Steve Macaulay, Executive Director
Attachments

February 12, 2002

Patrick Wright
Executive Director
CALFED
1416 9th Street, Rm. 1155
Sacramento, CA 95814

Subject: In-Delta Storage Program Water Quality Investigations

Dear Mr. Wright:

The purpose of this letter is to express our concurrence with the recommendations of CALFED and Department of Water Resources (DWR) staff as to the need for further water quality analyses before decisions are made regarding CALFED In-Delta Storage Facilities.

As you know, compliance with water quality objectives is a significant issue for this project. Water quality requirements which could affect project operations are set forth in SWRCB Decisions 1641 and 1643; in the water quality certification issued under Clean Water Act section 401; and in two water rights protest dismissal agreements between the proponents of one of the alternatives under consideration (Delta Wetlands Properties) and the California Urban Water Agencies and Contra Costa Water District. East Bay Municipal Utility District also has a settlement agreement with Delta Wetlands that does not cover water quality but is still important to CUWA. There are also certain restrictions on project operations under the new water rights for the project islands under consideration that appear to have been overlooked in the current CALFED operations modeling, e.g., restrictions on diversions to the reservoir islands.

We note that the summary of the November 27, 2001 Stakeholders meeting states:

> "A preliminary evaluation of the proposed Delta Wetland operations presented in the Revised EIR/EIS (JSA 2000) was completed using the Delta daily model. The draft results indicate that the operations presented in the 2000 EIR/EIS do not meet the Water Quality Management Plan requirements using the low bookend values for dissolved organic carbon. Model runs including reoperation of the project to meet the water quality objectives will not be included in the December report."

Further, the "Draft Summary for Stakeholders Briefing, January 16, 2002" states, among other things:

> "Water quality modeling simulations of the DW Project operations do not always comply with WQMP DOC, chloride and disinfection by-product criteria at urban intakes. Additional reductions could occur due to DOC, chloride, temperature and disinfection by-product criteria. Project re-operations could likely reduce these water quality impacts."

In the above document DWR staff recommends that CALFED:

- Undertake additional modeling studies to evaluate project operations that meet all WQMP criteria for DOC, chloride, temperature and disinfection by-products. Studies should also consider reservoir biological productivity. (Note; the key findings and conclusions on page 8 of the December 2001 "Integrated Storage Program Draft Summary Report" anticipate a yield reduction of 2 to 13 TAF to comply with the WQMP DOC criteria. We understand that estimate considers the carbon contribution from the soil, but not from vegetation. Therefore, the expected yield reduction would be greater).
- Develop laboratory methods to correlate soil characteristics with organic carbon release.
- Conduct experiments to investigate the complex ecological processes that may affect plant growth and carbon export from the reservoir islands.

Similarly, the December 2001 "Draft Report on Water Quality Investigations" now under review by the CALFED agencies (section 2.5.2) concludes:

> "The frequency and severity of water quality violations in the Alternative 1 scenario demonstrate that the simulated operations are not in accordance with the terms and conditions of the permit issued by the SWRCB and other limitations imposed on the Project. As a result, the water supply benefit associated with Alternative 1 is not a reliable indication of the Project's true benefit."

The DWR staff then makes specific recommendations as to follow-up work needed to complete an appropriate analysis.

We are fully aware of the complexities of the ongoing analysis and recognize it as a work-in-progress. Our intent herein is to confirm the necessity of the additional work that has been identified. The CALFED decision makers, CUWA, Delta Wetlands and other stakeholders must have available an analysis which meets all of the project's water quality requirements, and all of its water rights operating restrictions, before drawing any conclusions as to what the project can achieve.

Thank you for considering our comments. If CUWA can assist you in meeting our joint objective please contact me at (916) 552-2929.

Sincerely,

Walt Pettit

Walt Pettit
Executive Director

cc: Jim Easton
Project Manager
Delta Wetlands

Stephen Roberts, Chief
Division of Planning and Local Assistance
DWR

Gary Carlton, EO
CVRWQCB

Celeste Cantu, ED
SWRCB

California Urban Water Agencies
March 17, 2004

Comments on CBDA/DWR Integrated Storage Investigations
In-Delta Storage Program State Feasibility Study
Draft Reports on Operations and Water Quality

Observations on Operations and Water Quality Technical Analysis

The Department of Water Resources should be commended for its efforts to (1) provide a coherent technical analysis and (2) refine modeling tools and methodologies in support of the ISI In-Delta Storage Program. Noteworthy areas of advancement include:

- Development of a daily time step CALSIM II model
- Development of a simplified, yet credible, representation of interactions between Delta channels and wetlands
- Application of DSM2 fingerprinting methodologies to incorporate water quality constraints in CALSIM II
- Development of a multi-year planning methodology to evaluate dissolved oxygen concentrations in Delta channels

These advancements are expected to enhance future technical analyses of SWP-CVP operations and Delta water quality beyond their immediate application to the ISI In-Delta Storage Program.

Comments below focus generally on the ways in which unwarranted conclusions were drawn from the water quality technical analysis, rather than on any problems with the analysis itself.

Overall Conclusions

Chapter 2 of the Water Quality Report shows that the In-Delta Storage circulation alternative significantly violates the CUWA Water Quality Management Plan (WQMP) limitations placed on changes to organic carbon concentrations at urban intakes. A useful summary of these violations may be found in Table 2.5.10 on page 68. Note that under the circulation alternative Bacon Island releases water 55% of the time (Table 2.4.3). It is reasonable to assume that violations of the WQMP organic carbon standards at the export pumps caused by the project are a result of releases rather than diversions. Preliminary analyses confirm this point (M. Mierzwa, DWR, personal communication with R. Losee, MWD). From Table 2.5.10, 33% of the time the project will cause organic carbon violations at Banks; that is, 60% of the time water is released from Bacon Island, the project will be in violation. The In-Delta Storage operation was developed through CALSIM II modeling, as summarized in the Operations Report. Therefore, a feasible operations study has yet to be developed and the project yield numbers presented in the Operations Report are not supported. This review is focused on the DOC water quality

modeling, with less emphasis on the operations modeling and dissolved oxygen modeling.

In addition to significant violations of the WQMP organic carbon provisions, the Water Quality Report shows that the In-Delta Storage circulation alternative consistently violates the urban intake salinity increase provisions of the WQMP and of Contra Costa Water District's Protest Dismissal Agreement (CCWD's PDA). Some comments below address this concern.

Finally, the WQMP and CCWD's PDA contain a number of diversion and discharge limitations intended to protect water quality. Because of the limited time available for review of the Draft Feasibility Study, modeled compliance with all of these terms was not evaluated. The modeled violations of the organic carbon and salinity increase restrictions indicate that new modeling studies must be undertaken if conclusions about project operations are to be drawn. If such new studies are undertaken, diversions and releases, including diversions and releases for circulation, must show compliance with all relevant restrictions.

Operations Report

- Section 1.4 Key Findings and Recommendations (pages 3-4)
    - Bullet 5 states, "Due to strategic location of the In-Delta Storage reservoirs, immediate actions can be taken for salinity control. The reservoirs have a favorable impact to the location of the X2 line in the Delta." This finding was not validated through modeling studies and contradicts statements made in Section 5.3.6 (page 40). For example, Section 5.3.6 states "The CALSIM results indicate that the project's impact to X2 position and salinity are negligible."
    - Bullet 6 states, "DOC water quality problems can be diluted, with minor impacts to water supplies, using circulation operations." This finding was not validated through modeling studies, as discussed in the overall conclusions above.

- Section 3.4 Reiterations with DSM2 Model (page 15) – According to Section 4.4.1 on page 21, Study 4a (no circulation) reservoir diversion water quality was generated from Study 1 (no action base). While not explicitly stated, we assume that the same reservoir diversion water quality was used for Study 4b (circulation). Such an approximation may be reasonable for Study 4a, as ambient conditions would return to baseline conditions soon after the reservoir releases were made. But under Study 4b assumptions of frequent circulation, ambient conditions rarely return to baseline conditions. Therefore, such an approximation would be faulty for Study 4b.

- Section 5.4.2 Organic Carbon Evaluation (pages 41-55)
    - This lengthy section uses CALSIM results to draw conclusions about the ability of the In-Delta Storage project to meet WQMP requirements for organic carbon. DSM2 is a more appropriate tool for making assessments

about water quality. Therefore, one should rely on conclusions drawn in the Water Quality Report, rather than the Operations Report, to assess water quality impacts.
    - Results are presented for a wet year (1986), a below normal year (1979), and two dry years (1985 and 1987). Selecting representative years is convenient for illustration. However, conclusions cannot be drawn from an analysis of representative years alone.
    - On page 49, the following conclusion is drawn: "The results indicate that In-Delta Storage operations, both with and without circulation, stay within the required DOC standards at the export locations from January through June of typical wet and below normal years." As shown in Figures 5.26 and 5.30, no releases (above circulation volumes) are made from Webb during these months and year types; releases above circulation volumes are made from Bacon in June only. In spite of these minimal releases, the conclusion on page 49 is not validated by Figures 5.34 and 5.35. According to these figures, the DOC objective is violated at Banks in June of wet and below normal years.

- Section 5.5 Conclusions and Recommendations (page 58) – Bullet 2 states, "Resolution of water quality issues is possible with circulation of water through the island reservoirs." This conclusion is not supported by the modeling results.

Water Quality Report – Chapters 1-2

- Section 1.2 (page 2). The importance of operating the In-Delta Storage project in compliance with the terms of CUWA's WQMP is, properly, acknowledged. However, subsequent discussion of compliance is focused on the terms of the Operational Screening Criteria, Attachment 2 to the WQMP. The Drinking Water Quality Protection Principles, on Page 2 of the WQMP, also apply to project operations. In particular, the circulation operation now under consideration allows In-Delta Storage to reduce high concentrations of salt and carbon in project releases, but does so with more frequent circulation releases. Salt and carbon concentrations in the circulation releases that do not violate the numerical operational screening criteria may still violate the drinking water protection principles that require project operations to contribute toward continuous water quality improvement, to cause no water treatment cost increases, and to minimize and mitigate for any drinking water quality degradation.
- Section 1.2.2 Long-Term Requirement (page 3) – An analysis of the net long-term increase in DOC and salt loading was not provided. Given the nature of the circulation alternative, we suspect that the 5% objective is significantly violated. This requirement can only decrease project yield and operational flexibility.
- Section 1.2.3 Total Organic Carbon, bullet 1 (page 3) – While the modeled project operations minimize the number of days that the 14-day average TOC exceeds 4.0 mg/L, it does so in a manner that may be more detrimental to drinking water treatment plant operations and regulatory compliance, violating the intent of the criteria. Treatment plant compliance with the Stage 1 Disinfectants and Disinfection By-Products Rule is based on removing a certain percent of TOC based on influent

TOC and alkalinity. The limit of 4 mg/l TOC was selected for the WQMP because TOC removal requirements increase 10% when influent TOC exceeds 4 mg/l, and increases another 5% when influent TOC exceeds 8 mg/l. If compliance samples are collected during one of the TOC peaks, plants may fail to achieve the required removal rate unless they are always operating at the higher coagulant doses required by the peaks (costly), or are able to adjust operations on a daily basis (logistically difficult).

- Section 2.4.2.5 Stage / Storage (page 32) – Operating the islands at low stage as often as is modeled may create wind induced turbidity spikes similar to those experienced in Clifton Court Forebay. Re-suspension of organically rich peat soils into the water column by wind mixing was not modeled in this report, or in the chapter 3 field investigations. In addition, the mesocosm work revealed a significant contribution to shallow turbidity from release of gas bubbles from the sediments following drawdown and the loss of hydrostatic pressure (page 107). Further, gas bubble disturbance of the sediments was also associated with an increase rate of organic carbon concentration increase in the water column (Figs. 3.11, 3.12, 3.13).

- Section 2.4.2.5 Stage/Storage. – Examination of daily average project island storage for the circulation alternative (Fig. 2.4.6) shows that for about 9 to 9 ½ years out of 16 modeled Bacon and Webb island volumes will be 35 TAF or less. 35 TAF translates to a mean water depth of 2 m on both islands. These years of low volume storage on the islands will result in thousands of acres ideally suited for growth of aquatic and wetland plants. Long periods of low volume storage, such as would have occurred from 1987-1991, are likely to result in establishment of wetland vegetation unless control measures are taken. It is not clear what control measures might be taken if any are available and the cost of these measures have not been taken into account in the O&M estimates.

- Section 2.5.2 Chloride at Urban Intakes (pages 51-61) – The WQMP chloride concentration objectives are not met through the current operation. See Table 2.5.6 (page 57) for a summary of violation frequency.

  The tabulated violations are based upon 14-day average concentrations, which understate actual numbers of violations; the WQMP restriction on chloride concentration increases is based upon 14-day averages, but CCWD's PDA restriction on chloride concentration increases applies to daily values.

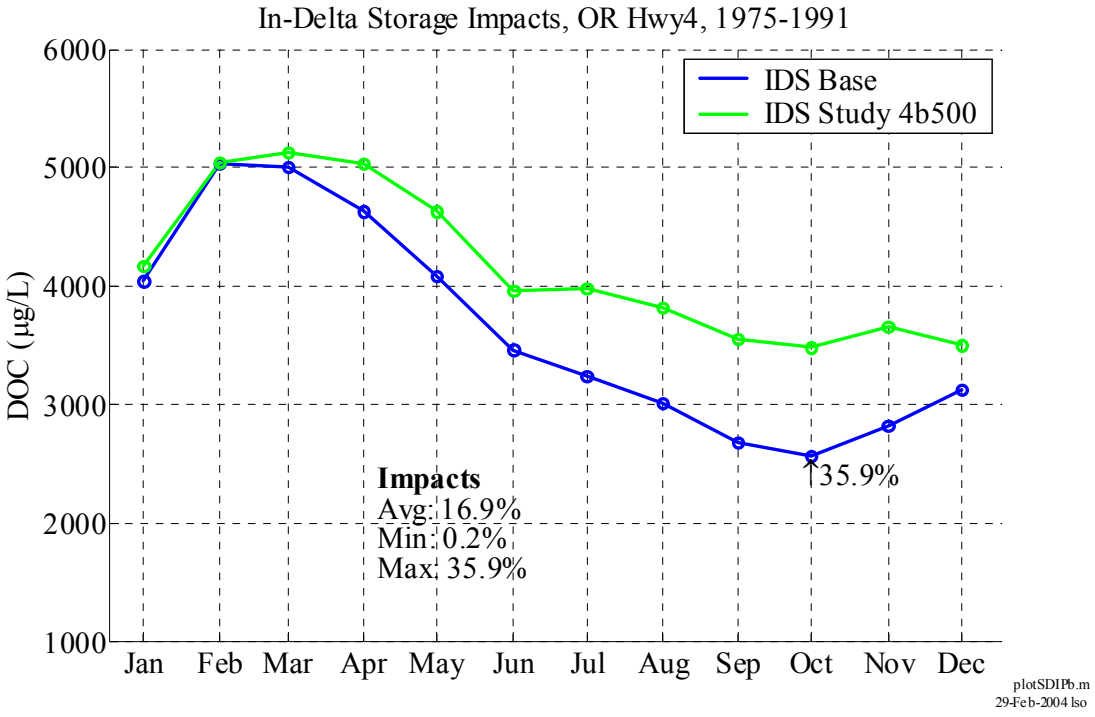
- Section 2.5.3 DOC at Urban Intakes (pages 61-72)
  - The text on page 62 states that increases in 14-day average DOC values are "fairly small." Table 2.5.9 (page 67) shows average DOC increases ranging between 0.4-0.6 mg/l, depending on location. Given base DOC values between 3.3-3.7 mg/l, average percent DOC increases range between 12-16%.
  - The WQMP organic carbon concentration objectives are not met through the current operations. In fact, the objectives are significantly violated. The frequency of violation is 9% at Rock Slough, 23% at LVR intake, 33% at

Banks, and 26% at Tracy. See Table 2.5.10 (page 68) for a summary of violation frequency and discussion in Overall Conclusions above.

- Section 2.5.4 TTHM at Urban Intakes (pages 72-84) - The WQMP TTHM concentration objectives are not met through the current operation. See Table 2.5.14 (page 80) for a summary of violation frequency.

- Section 2.5.5 Bromate at Urban Intakes (pages 84-95) - The WQMP bromate concentration objectives are not met through the current operation. In fact, the objectives are grossly violated. The frequency of violation is 19% at Rock Slough, 22% at LVR intake, 17% at Banks, and 20% at Tracy. See Table 2.5.18 (page 91) for a summary of violation frequency. A similar analysis as described in the Overall Conclusions for organic carbon and project operations should be undertaken for bromate.

- Section 2.6 Conclusions – The text states that median values show "… a very slight increase in all four water quality parameters covered in this study." The implication that modeled project operations have only slight impacts on Delta water quality is not justified. For example, as discussed above, average percent DOC increases are in the 12-15% range. Median percent DOC increases are similar. The plot below of mean monthly DOC at CCWD's Los Vaqueros intake was generated from IDS base case and Study 4b500 results; it shows increases that cannot be characterized as "very slight".



Water Quality Report - Chapter 3

- DWR staff have done a good job dealing with a difficult problem, estimating organic carbon loading for a project not yet constructed and without an analogous system available for study. The areal organic carbon loading rates used in the DSM2 model runs are within reason (Table 3.2 Use of OC Field Data in Modeling, page 132) given the uncertainty of scaling from mesocosm work to full scale operation. However, the mesocosm experiments do not provide information for long periods of low water level such as 1987 through 1991. As discussed above in the Stage and Storage section, long periods of shallow water will result extensive growths of aquatic and wetland plants. If the islands become densely covered with vegetation and then flooded, there could be a shift away from peat soil as the dominant source of organic carbon, as is the case in under the conditions simulated in the mesocosm work, to new plant carbon as the dominant source. If these sources of carbon are additive, then this situation would result in further violations of the WQMP and PDA. Since this likely scenario would result in a decrease in project yield and in operational flexibility, it should be identified in the feasibility summary report.

Water Quality Report – Chapter 4

- General Comment –DSM2 is not an appropriate tool for addressing most of the dissolved oxygen and temperature issues related to the In-Delta Storage Project. Therefore, reliable conclusions cannot be drawn from most of the analysis presented. Specifically, DSM2 cannot address dissolved oxygen and temperature in the reservoir. DSM2 could be used to address dissolved oxygen and temperature in the adjacent channels (as was shown in Chapter 4), but a transport model is not necessary for such analysis. The only appropriate impacts that DSM2 should be used to measure are temperature and dissolved oxygen changes at Turner Cut.

- 4.3.2 Dissolved Oxygen (page 138). The second paragraph states that "because discharge of stored water is prohibited if the DO of stored water is less than 6.0 mg/L, it is assumed that DO of island water would be at 6 mg/l at all times. In reality, this may require some aeration or application of other DO improvement technology..." Section 3.2.4 (page 109) indicates that DO dropped rapidly in the mesocosm when its air line kinked. Wind mixing and circulation will have to compete with the high oxygen demand of the rich peat soils and decay of the prolific plant and algae growth. Aeration or other DO improvement technology is a significant operational cost that has not been considered.