

APRIL 26 1994

## Exhibit CCWD-1 (1994 Workshops)

Statement of Contra Costa Water District  
Submitted to State Water Resources Control Board

Review of Standards for the  
San Francisco Bay/Sacramento-San Joaquin Estuary  
April, 1994

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Summary

1. Contra Costa Water District agrees that during this review, the State Board should concentrate its attention on issues for which the Environmental Protection Agency is now proposing standards.
2. Contra Costa Water District has estimated additional Delta outflow requirements to achieve EPA's proposed estuarine habitat standard, based on recent (1968-1991) hydrology. Requirements for incremental flows are highly variable and are not well-correlated with hydrologic year type. The analysis suggests that the proposed standards should be refined to avoid requirements for flows that substantially exceed those needed to replicate historical conditions.

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Introduction

Contra Costa Water District has prepared a technical assessment of the estuarine habitat standards proposed by the U. S. Environmental Protection Agency. A report of the District's assessment is presented as Exhibit CCWD-2 (1994 Workshops).

Exhibit CCWD-2 is one of the reports comprising analyses of the proposed standards conducted for the California Urban Water Agencies. The report addresses the technical meaning of the term, "two parts per thousand", or "X2". It also addresses possible implementation measures for the proposed standard and additional flow requirements needed to satisfy the standard. It is accompanied by Exhibit CCWD-3 (1994 Workshops), the District's formal comment letter to EPA on the proposed standards dated March 10, 1994.

Exhibits CCWD-2 and CCWD-3 form the basis for much of Contra Costa Water District's discussion of the several issues before the Board during the current series of workshops. The District's comments on selected key issues identified in the notice of workshops for the month of April follow.

### Standards to be Addressed During Review

In announcing its plans for these proceedings, the State Board has correctly assigned the highest priority to reviewing standards for protection of fish and wildlife uses. Contra Costa Water District agrees that the State Board should focus the current review on those issues for which the U. S. Environmental Protection Agency is now proposing standards.

Fish and wildlife issues are perhaps the most complex and least precisely understood matters to be dealt with in the Bay-Delta estuary. The Board can expect to receive substantial amounts of new information and technical evidence in terms of both the physical and biological sciences in the course of its review of these issues. Concentrating on these issues will provide maximum opportunity to complete the current review promptly and to adopt effective standards for protection of public trust resources.

Standards to protect uses other than fish and wildlife were thoroughly debated and considered by the State Board during development of the 1991 Water Quality Control Plan. These standards have not been challenged by EPA or any other regulatory agency. We are not aware of any new information that might affect the State Board's decisions on these matters. It seems premature to suggest more protective standards for agricultural or municipal and industrial uses while the needs of public trust resources remain unresolved. At the same time, low salinity is considered an important factor in estuarine habitat, particularly with respect to the recovery of Delta smelt, a species currently listed under the Endangered Species Act. For that reason, it would be inappropriate to suggest reducing the incidental protection provided by salinity standards for any beneficial use.

Contra Costa Water District recommends that the State Board concentrate its review on the issues dealt with in EPA's proposed standards.

### Water Supply Effects of Proposed Standards

The principal mechanism for achieving the proposed estuarine habitat standards is regulation of flow from the Delta to San Francisco Bay. Flows required to satisfy the standards, compared with those of a "base case" in which the standards are not in effect, provide a measure of water supply effects. The analysis summarized here is described in detail in Exhibit CCWD-2. As its base case, the analysis uses estimated historical Delta outflows for water years 1968 through 1991, as presented in the DAYFLOW tabulations prepared by the California Department of Water Resources.

From the DAYFLOW record, the analysis computes a time sequence of antecedent historical flows using a model developed by Dr. R. A. Denton of the Contra Costa Water District. The model is described

in Exhibit CCWD-2. Based on the proposed estuarine habitat standards, Denton's model is then used to estimate Delta outflow requirements in addition to the historical flows.

Requirements for Additional Delta Outflow

Exhibit CCWD-2 presents an analysis of flow requirements of the proposed standards on a year-by-year basis, both graphically and in tabular form at pages 32-33. Results are summarized as follows:

Additional Delta Outflow Requirements  
(Thousand acre-feet per year)

Year Type	Average Additional Flow	Range
All	1,000 ± 70	0-2,880
Critical	1,550 ± 150	1,190-2,470
Dry	1,000 ± 150	650-1,290
Below Normal	1,000 ± 200	810-1,130
Above Normal	550 ± 200	90-1,220
Wet	900 ± 100	0-2,880

This summary illustrates two important points: incremental outflow requirements of the proposed estuarine habitat standards are quite variable within year types, and the requirements are not well-correlated with year type. Some of the variability is due to the analytical technique and uncertainty in the data upon which it depends (outflow estimates, field salinity measurements). However, much variability results from highly non-uniform temporal distribution of runoff within individual water years.

For example, the greatest requirement for additional outflow in the sequence analyzed is 2,880,000 acre-feet for the hydrology of water year 1970, a wet year. Most precipitation and runoff in 1970 occurred before the end of January, while the proposed standards call for salinity control in later months, from February through June. Under the condition represented by the hydrology of 1970 the proposed standards, which are based on total annual unimpaired runoff as measured by the Sacramento River Index, require flows substantially greater than those necessary to replicate historical conditions from February through June.

Like total annual hydrology, the proposed control period of February through June also displays significant variability in the distribution of unimpaired flow. Exhibit CCWD-4 (1994 Workshops) displays the monthly Sacramento River Index from February through

June for three historical "wet" water years: 1967, 1986 and 1970. These years had approximately equal total annual unimpaired runoff. However, runoff from February through June varied by a factor of more than two due to markedly different monthly distributions.

Contra Costa Water District believes that the proposed estuarine habitat standards can form the basis for developing an effective program for protection of public trust uses in the Bay-Delta estuary. However, for reasons suggested in the foregoing discussion, we believe the standards can be refined to accomplish their objectives in terms of replicating historical conditions with substantially lower effects on water supplies.

Exhibits CCWD-2 and CCWD-3 discuss alternative standards designed to meet the estuarine habitat needs outlined by the Environmental Protection Agency in its Federal Register Notice of January 6, 1994, while reducing anomalies associated with hydrologic variability. We will address these issues more fully during subsequent workshops of the current series.

#### Notes on Analytical Method

The method used to produce the results reported above supplements the technique usually used by taking a fundamentally different approach to address a somewhat different question. The usual technique involves conducting a mathematical simulation of operations of the Central Valley water resources system using a computer program such as DWRSIM or PROSIM. These programs are based on estimates of historical unimpaired runoff in Delta tributaries. They simulate operational changes in reservoir storage and Delta diversions needed to comply with standards. The programs produce estimates of monthly average flows required to meet salinity standards, based on assumed relationships between flow and salinity.

The method used in Exhibit CCWD-2 produces estimates of additional outflow requirements based upon a historical sequence of daily flows rather than a simulated sequence of monthly flows. It does not analyze the operational measures needed to furnish the flows. However, it offers important advantages including a well-defined calibration based on field data and a resulting ability to account for salinity effects of antecedent flows. In addition, because of the manner in which the model is derived, its use permits analysis of uncertainty in the estimated results.

Thus this method complements other techniques, but does not replace them. Contra Costa Water District is prepared to assist the State Board in applying the method to other questions associated with Bay-Delta salinity control.